Certificate – Сертификат – 證明書 – Certificat – 증명서

Certificate No. : HUAX240318024KC

huaxiang

Certificate of Conformity

Certificate's Holder	:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer	:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Product Name	:	**Smart watches**
Product Model (S)	:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Trade Mark	:	N/A
Related Standard(s)	:	**IEC62321-3-1:2013,IEC62321-5:2013, IEC62321-4:2013+A1:2017, IEC62321-7-1:2015, IEC 62321-7-2:2017, IEC 62321-6:2015, IEC 62321-8:2017**
Report No.	:	**HUAX240318024KR**

The product described above has been consolidated by us and found in compliance with the council RoHS 2.0 Directive 2011/65/EU Annex II (EU) 2015/863 as last amended by Directive (EU) 2017/2102. It is only valid in connection with the test report

Green Product RoHS

Shenzhen Huaxiang Testing Co., Ltd. IMPARTIAL Approved

Mar. 21, 2024

Certification Manager

Shenzhen Huaxiang Testing Co., Ltd
201, Building A10, Fuhai Information Port, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen City, Guangdong Province, China Web.:Http:// www.hua-x.com
E-mail: huaxiang@hua-x.com Tel.:+86-0755-23010432

TEST REPORT

Applicant	:	Shenzhen Tiankang Medical Technology Co., Ltd
Address	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen

Report on the submitted sample said to be:

Sample name	:	Smart watches
Trade Mark	:	N/A
Model	:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Manufacture	:	Shenzhen Tiankang Medical Technology Co., Ltd
Address	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Sample received date	:	Mar. 15, 2024
Testing period	:	Mar. 15, 2024- Mar. 21, 2024

Test Requested:	**Conclusion :.**
The test results comply with the limits of RoHS 20 Directive (EU) 2015/863and (EU)2017/2102 amending Annex II to Directive 2011/65/EU — Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs and PBDEs Content —Di-(2-ethylhexyl) phthalate(DEHP), Benzylbutyl phthalate(BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate(DIBP) Content	Pass

****** FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) ******

Shenzhen Huaxiang Testing Co., Ltd

Drafted By: ---------- (Kevin su)

Approved By: ---------- LAB Manager: **Amy jiang**

Date: Mar. 21, 2024

Test Part Description:.

Specimen No.	Description.
01	Charger
02	Metal
03	Cable
04	Metal
05	Silicone
06	Battery
07	Screen
08	Metal
09	Chip capacitor
10	Chip

TEST RESULT:

1.Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs and PBDEs—RoHS Directive (EU) 2015/863.

Test Items	Unit	Test Method	Result					MDL	Limit
			01	02	03	04	05		
Lead (Pb)	mg/kg	IEC 62321-5:2013, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	1000
Mercury (Hg)	mg/kg	IEC 62321-4:2013+A1:2017*, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	1000
Cadmium(Cd)	mg/kg	IEC 62321-5:2013, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	100
Hexavalent Chromium (CrVI)	$\mu g/cm^2$	IEC 62321-7-1:2015, UV-VIS	N.D.	N.D.	N.D.	N.D.	N.D.	0.10	0.10
Monobromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Dibromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tribromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tetrabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Pentabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Hexabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Heptabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Octabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Nonabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Decabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Sum of PBBs	mg/kg	-	N.D.	N.D.	N.D.	N.D.	N.D.	-	1000
Monobromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Dibromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tribromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tetrabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Pentabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Hexabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Heptabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Octabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Nonabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Decabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Sum of PBDEs	mg/kg	-	N.D.	N.D.	N.D.	N.D.	N.D.	-	1000

Test Items	Unit	Test Method	Result					MDL	Limit
			06	07	08	09	10		
Lead (Pb)	mg/kg	IEC 62321-5:2013, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	1000
Mercury (Hg)	mg/kg	IEC 62321-4:2013+A1:2017*, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	1000
Cadmium(Cd)	mg/kg	IEC 62321-5:2013, ICP-OES	N.D.	N.D.	N.D.	N.D.	N.D.	2	100
Hexavalent Chromium (CrVI)	$\mu g/cm^2$	IEC 62321-7-1:2015, UV-VIS	N.D.	N.D.	N.D.	N.D.	N.D.	0.10	0.10
Monobromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Dibromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tribromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tetrabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Pentabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Hexabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Heptabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Octabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Nonabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Decabromobiphenyl	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Sum of PBBs	mg/kg	-	N.D.	N.D.	N.D.	N.D.	N.D.	-	1000
Monobromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Dibromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tribromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Tetrabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Pentabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Hexabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Heptabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Octabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Nonabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Decabromodiphenyl ether	mg/kg	IEC 62321-6:2015, GC-MS	N.D.	N.D.	N.D.	N.D.	N.D.	5	-
Sum of PBDEs	mg/kg	-	N.D.	N.D.	N.D.	N.D.	N.D.	-	1000

Note:

1. mg/kg = milligram per kilogram = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. "-" = Not Regulated
5. Boiling-water-extraction:
   Negative = Absence of Cr(VI) coating / surface layer: the detected concentration in boiling-water-extraction solution is less than 0.10μg with $1cm^2$ sample surface area.
   Positive = Presence of Cr(VI) coating / surface layer: the detected concentration in boiling-water-extraction solution is greater than 0.13μg with $1cm^2$ sample surface area.
   Inconclusive =the detected concentration in boiling-water-extraction solution is greater than 0.10μg and less than 0.13μg with $1cm^2$ sample surface area.
6. Positive = result be regarded as not comply with RoHS requirement
7. Negative = result be regarded as comply with RoHS requiremen

2. Di-(2-ethylhexyl) phthalate(DEHP), Benzylbutyl phthalate(BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP) Content—RoHS Directive (EU) 2015/863.

Test method: With reference to IEC 62321-8:2017*, analysis was performed by GC-MS.

Test Items	Unit	Result					MDL	Limit
		01	02	03	04	05		
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Benzylbutyl phthalate (BBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Dibutyl phthalate (DBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Diisobutyl phthalate(DIBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000

Test Items	Unit	Result					MDL	Limit
		06	07	08	09	10		
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Benzylbutyl phthalate (BBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Dibutyl phthalate (DBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000
Diisobutyl phthalate(DIBP)	mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	50	1000

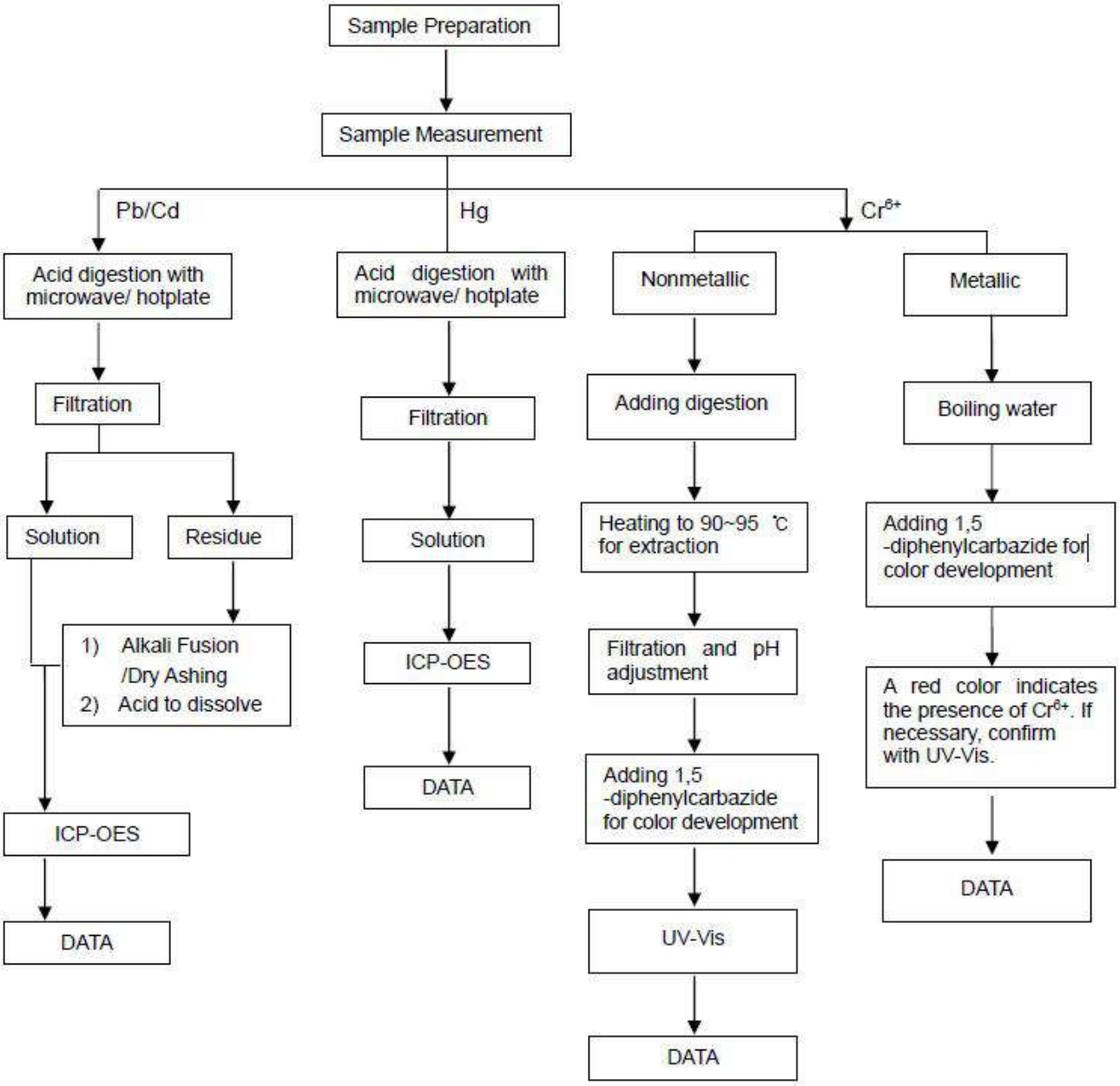
Note:

1. mg/kg = milligram per kilogram = ppm
2. N.D. = Not Detected (<MDL)
3. MDL = Method detection limit
4. “*”=The test method of Phthalates is not authorized by CNAS

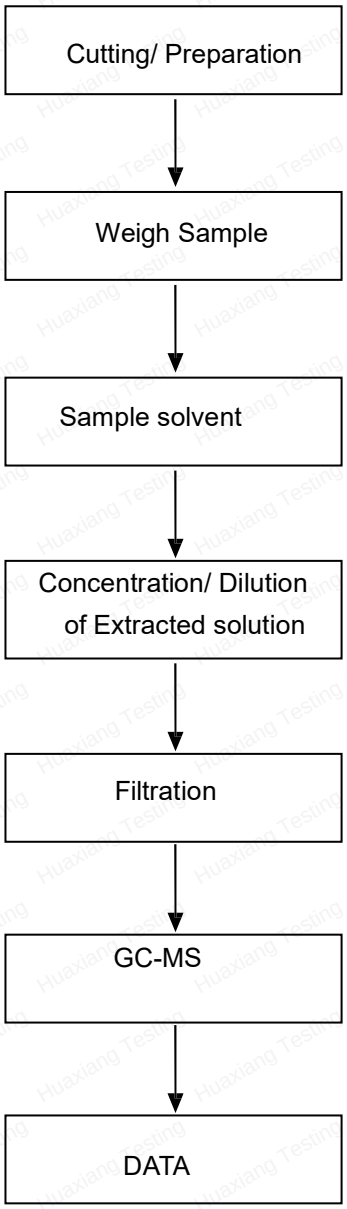
FLOW CHART FOR ROHS TESTING:

Pb/Cd/Hg/Cr6+ Testing Flow Chart

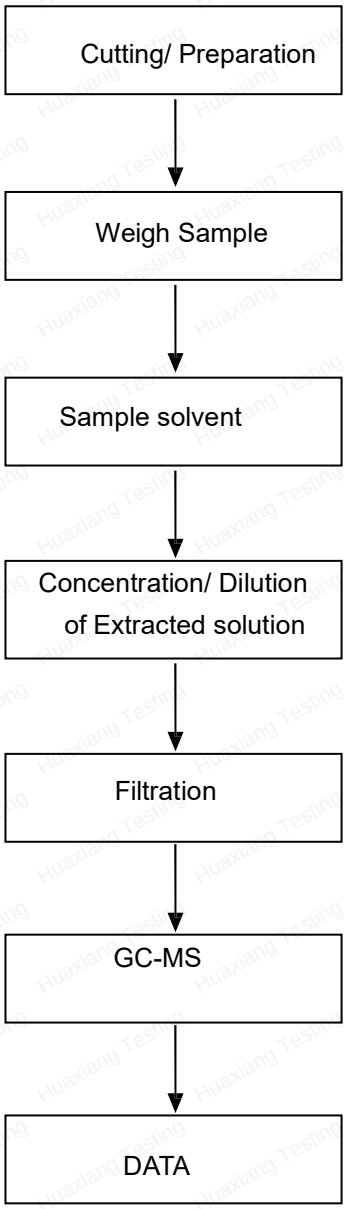
1) These samples were dissolved totally by pre-conditioningmethod according to below flow chart (Cr^{6+} test method excluded)



PBBs/PBDEs Testing Flow Chart



Phthalates Testing Flow Chart



PHOTOGRAPH OF SAMPLE:

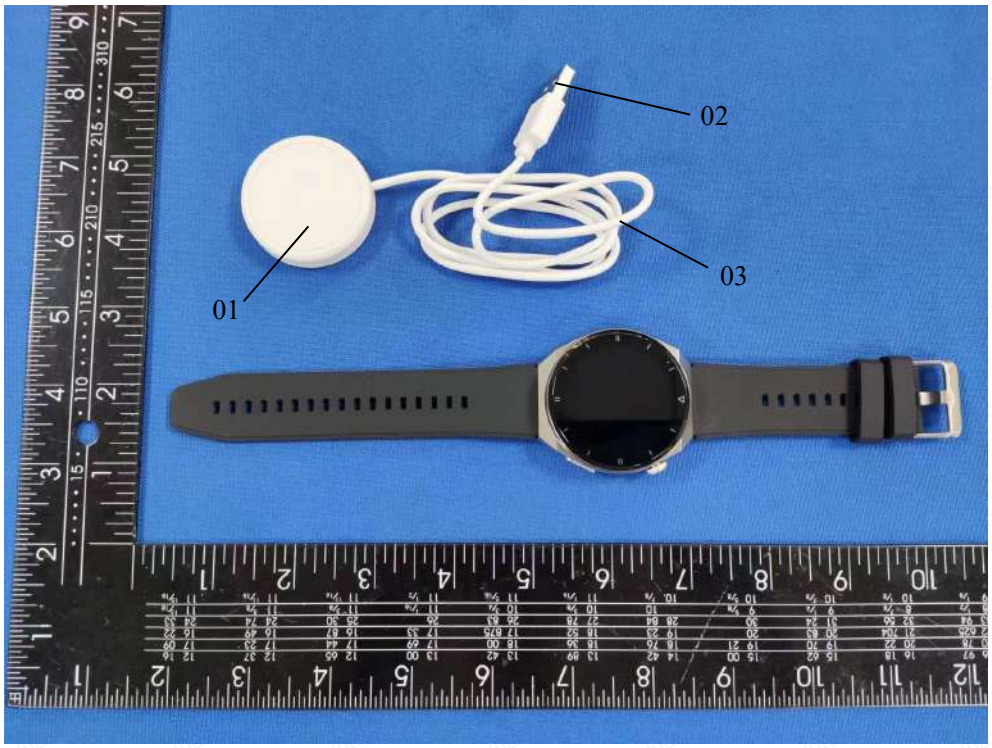


Photo 1

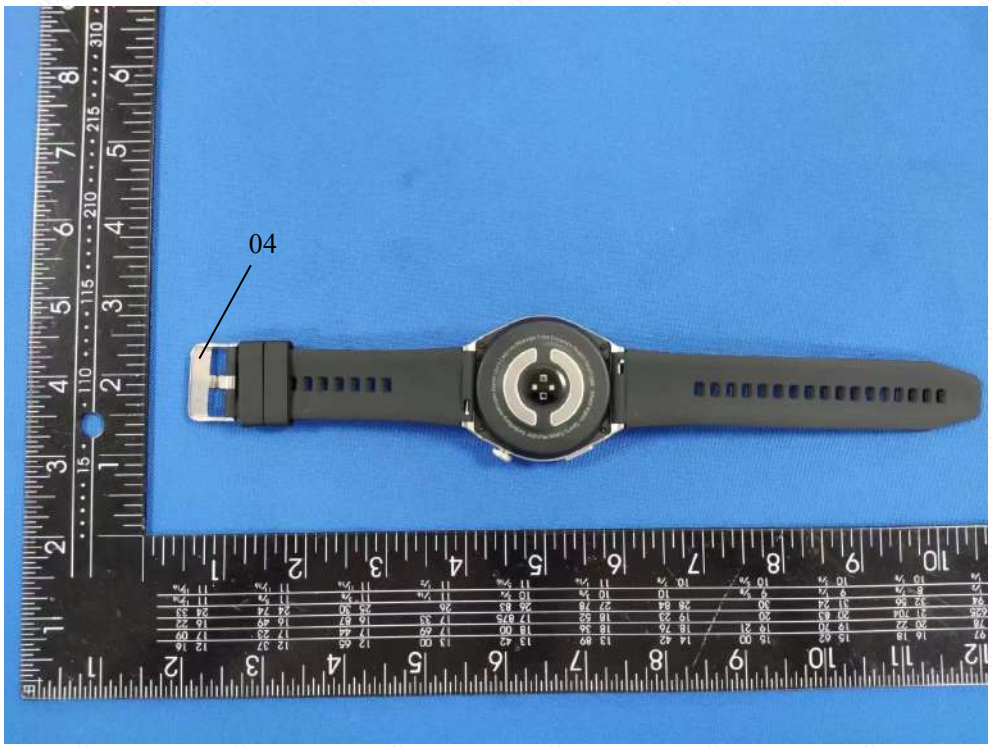


Photo 2

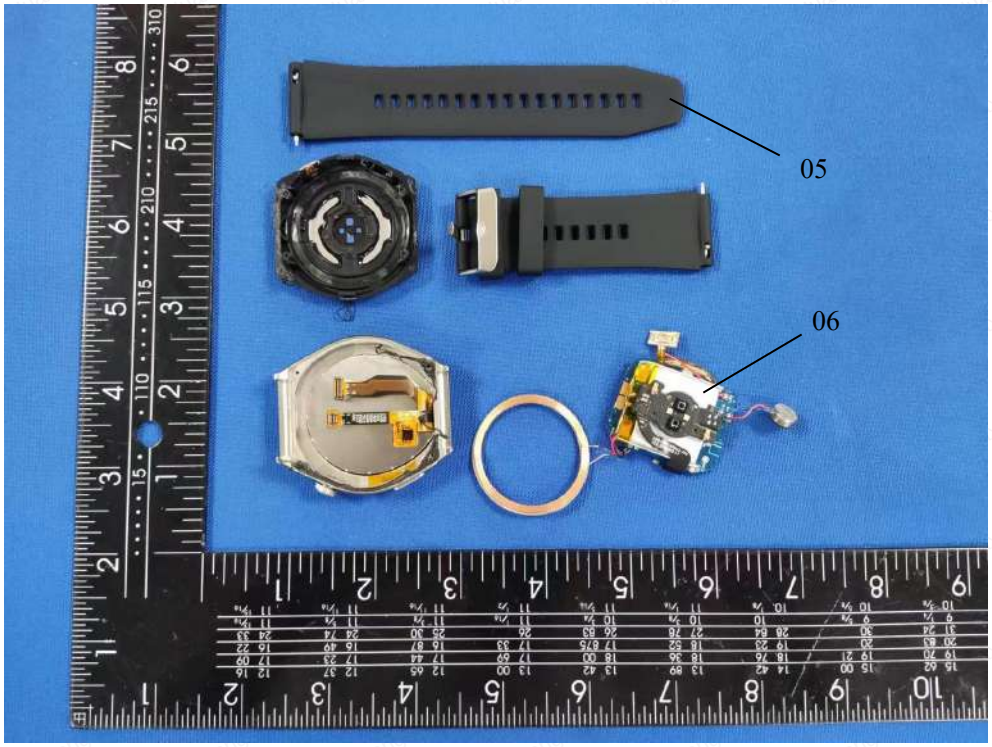


Photo 3

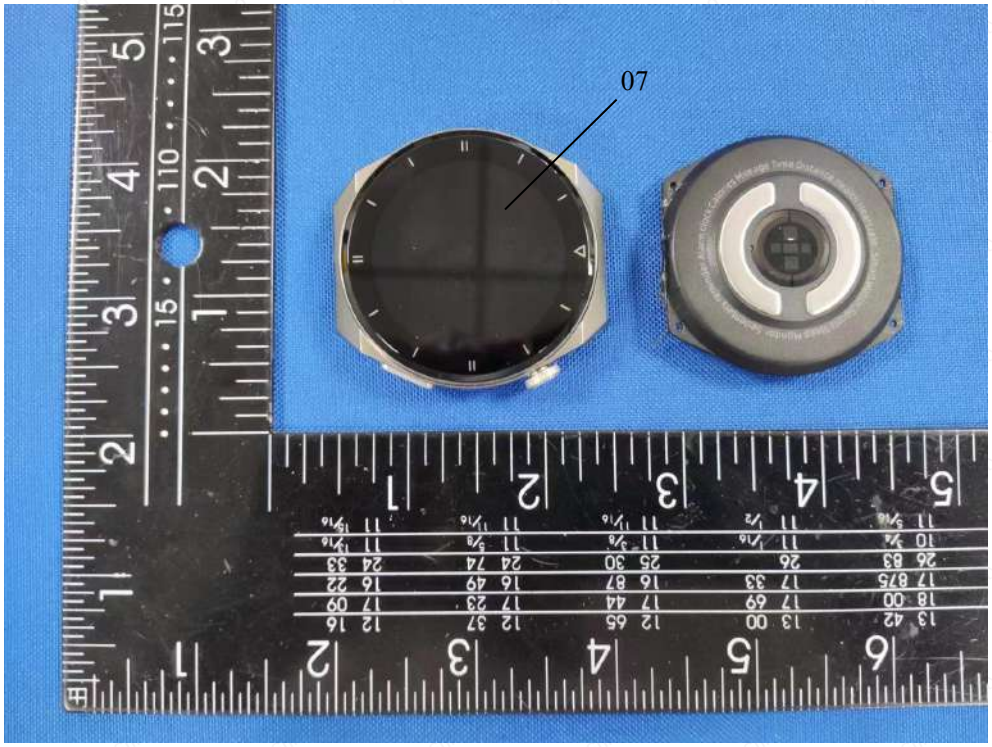


Photo 4

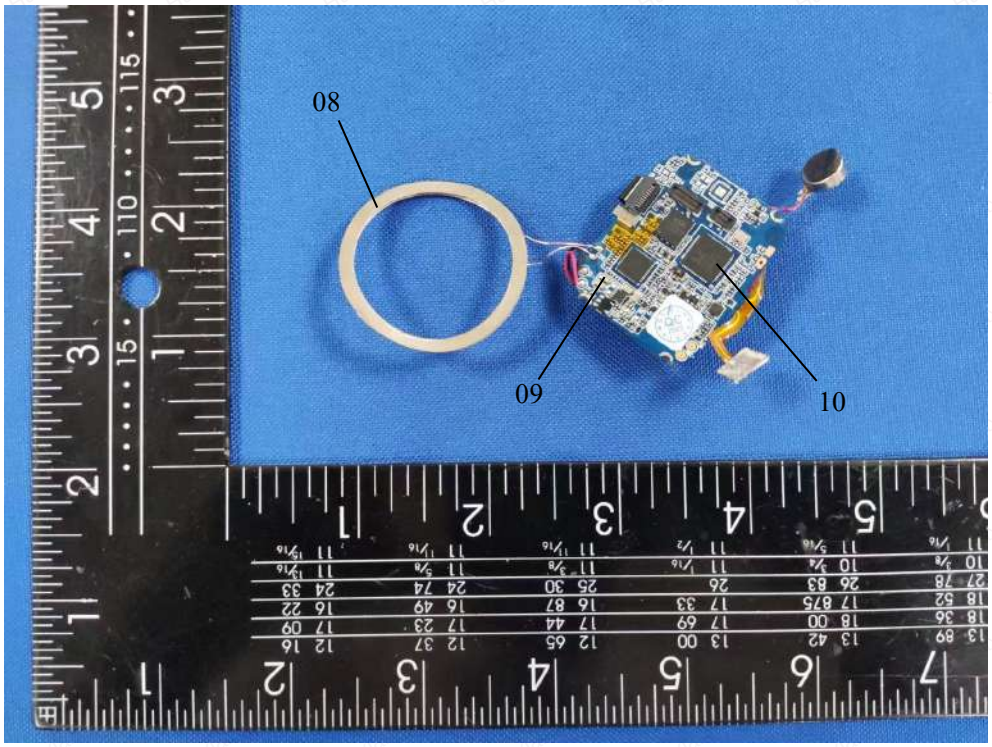


Photo 5

※※※※※※ **THE END** ※※※※※※

LVD TEST REPORT

On Behalf of

Shenzhen Tiankang Medical Technology Co., Ltd

Product Name:	Smart watches
Trademark:	N/A
Model Number:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Prepared For:	Shenzhen Tiankang Medical Technology Co., Ltd
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Prepared By:	Shenzhen Huaxiang Testing Co., Ltd
Address:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Report No.:	HUAX240318025KR

TEST REPORT

EN IEC 62368-1:2020+A11:2020
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Reference No.....:	HUAX240318025KR
Contents.....:	47 pages
Test Date.....	Mar. 15, 2024 - Mar. 21, 2024
Date of issue.....:	Mar. 21, 2024
Testing laboratory	
Name.....:	Shenzhen Huaxiang Testing Co., Ltd
Address……..……..:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Testing location.....:	Same as above
Client	
Name.....:	Shenzhen Tiankang Medical Technology Co., Ltd
Address…….. ..:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Test specification	
Standard.....:	EN IEC 62368-1:2020+A11:2020
Test procedure .....:	CE-LVD
Non-standard test method.....:	N.A.
Test item	
Description.....:	Smart watches
Trademark.....:	N/A
Model and/or type reference.....:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Manufacturer.....:	Shenzhen Tiankang Medical Technology Co., Ltd
Address……..:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Rating(s).....:	DC 5V

Testing procedure and testing location

Laboratory name……	:	Shenzhen Huaxiang Testing Co., Ltd
Testing location/address:	:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Testing procedure	:	TL ☒ RMT ☐ SMT ☐ WMT ☐ TMP ☐
Prepared by (Engineer)		Kevin Su
Reviewed By (Supervisor)	:	Amy Jiang

Test item particulars	
Classification of use by.....:	☒ Ordinary person ☒ Instructed ☐ person Skilled ☒ person ☒ Children likely to be present
Supply Connection .....:	☐ AC Mains ☐ DC Mains ☒ External Circuit - not Mains connected - ☒ ES1 ☐ ES2 ☐ ES3
Supply % Tolerance .....:	☐ +10%/-10% ☐ +20%/-15% ☐ +_____%/ -_____% ☒ None
Supply Connection – Type .....:	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ mating connector ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: not mains connected
Considered current rating of protective device as part of building or equipment installation .....:	16 A Installation location: ☐ building; ☐ equipment
Equipment mobility .....:	☐ Movable ☐ hand-held ☒ transportable ☐ stationary ☐ for building-in ☐ direct plug-in ☐ rack-mounting ☐ wall-mounted
Over voltage category (OVC)	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other: not mains connected
Class of equipment	☐ Class I ☐ Class II ☒ Class III
Access location.....	☐ restricted access location ☒ N/A
Pollution degree (PD)	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified maxium operating ambient.....	40°C
IP protection class	☒ IPX0 ☐ IP____.
Power Systems.....	☐ TN ☐ TT ☐ IT -____V_{L-L}
Altitude during operation (m)	☒ 2000 m or less☐ _____m
Altitude of test laboratory (m)	☒ 2000 m or less☐ _____m

POSSIBLE TEST CASE VERDICTS:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
TESTING:	
Date of receipt of test item.....	Mar. 15, 2024
Date (s) of performance of tests.....	Mar. 15, 2024 - Mar. 21, 2024
General product information:	

GENERAL REMARKS:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

When determining the test result, measurement uncertainty has been considered.

Name and address of factory (ies)..... :	Same as manufacturer

List of Attachments:
Attachment No. 1: Photograph.

Summary of testing:

Tests performed:
The submitted samples were found to comply with the requirements of: EN IEC 62368-1:2020+A11:2020

Copy of marking plates

Smart watches

Model : TK20P

Rating: DC 5V

Shenzhen Tiankang Medical Technology Co., Ltd

602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen

Made in China

Remark:

1) The CE marking and WEEE symbol (if any) should be at least 5mm and 7mm respectively in height.

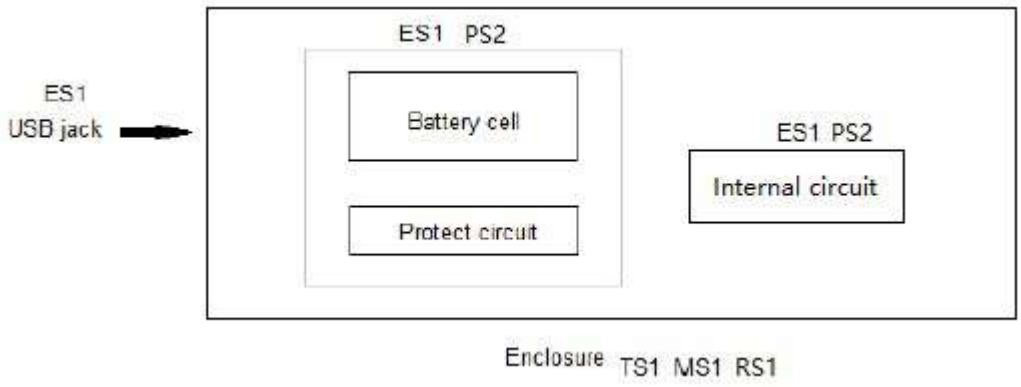
2) The markings and instructions are the minimum requirements required by safety standard. For final production samples, the additional markings which do not give rise to misunderstanding may be added.

3) As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or mark and the postal address will be marked on the products before being place on the market.

4) Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input	ES1
Source of electrical energy	**Corresponding classification (ES)**
Internal circuitry	ES1
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts):	PS2
Source of power or PIS	**Corresponding classification (PS)**
Internal circuit	PS2
Battery cell output	PS2
Battery pack output	PS2
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component	Glycol
Source of hazardous substances	**Corresponding chemical**
Complied with annex M	Li-ion
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit	MS2
Source of kinetic/mechanical energy	**Corresponding classification (MS)**
Sharp edges and corners	MS1
Equipment mass	MS1
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure	TS1
Source of thermal energy	**Corresponding classification (TS)**
All accessible parts	TS1
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product	RS1
Type of radiation	**Corresponding classification (RS)**
LED light	RS1

ENERGY SOURCE DIAGRAM
Indicate which energy sources are included in the energy source diagram. Insert diagram below



☒ **ES** ☒ **PS** ☒ **MS** ☒ **TS** ☒ **RS**

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	**Possible Hazard**			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES1	N/A	N/A	N/A
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Internal circuitry	PS2: <100 Watt circuit	1. No ignition occurred. 2. No parts exceeding 90% of its spontaneous ignition temperature.	1. PCB is complied with V-0 material; 2. all other components: at least V-2 except for mounted on min. V-1 material or small parts of combustible material	
Battery	PS2: <100 Watt circuit	1. No ignition occurred. 2. No parts exceeding 90% of its spontaneous ignition temperature.	1. PCB is complied with V-0 material; 2. all other components: at least V-2 except for mounted on min. V-1 material or small parts of combustible material	
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
Complied with annex M	Li-ion Battery	N/A	N/A	N/A
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Sharp edges and corners	N/A	N/A	N/A
Ordinary	MS1: Equipment mass	N/A	N/A	N/A
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: Accessible plastic enclosure	N/A	N/A	N/A
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	LED light: exempt group	N/A	N/A	N/A
Supplementary Information: (1) See attached energy source diagram for additional details. (2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault				

EN IEC 62368-1			
Clause	Requirement	Remark	Result
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	See appended table 4.1.2	P
4.1.2	Use of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
4.1.3	Equipment design and construction	No accessible part which could cause injury	P
4.1.15	Markings and instructions.....:	(See Annex F)	P
4.4.4	Safeguard robustness	See below	P
4.4.4.2	Steady force tests.....:	(See Annex T)	P
4.4.4.3	Drop tests.....:	(See Annex T)	P
4.4.4.4	Impact tests.....:		N
4.4.4.5	Internal accessible safeguard enclosure and barrier tests.....:		N
4.4.4.6	Glass Impact tests.....:		N
4.4.4.7	Thermoplastic material tests.....:	(See Annex T)	P
4.4.4.8	Air comprising a safeguard.....:		N
4.4.4.9	Accessibility and safeguard effectiveness	No damaged	P
4.5	Explosion	No explosion occurs during normal/abnormal operation and single fault conditions	P
4.6	Fixing of conductors		N
4.6.1	Fix conductors not to defeat a safeguard		N
4.6.2	10 N force test applied to.....:		N
4.7	Equipment for direct insertion into mains socket-outlets		N
4.7.2	Mains plug part complies with the relevant standard.....:	See above	N
4.7.3	Torque (Nm).....:	See above	N
4.8	Products containing coin/button cell batteries	No coin/button batteries used.	N
4.8.2	Instructional safeguard		N
4.8.3	Battery Compartment Construction		N
	Means to reduce the possibility of children removing the battery.....:		—
4.8.4	Battery Compartment Mechanical Tests.....:		N
4.8.5	Battery Accessibility		N
4.9	Likelihood of fire or shock due to entry of conductive object.....:	It's impossible entry of a conductive object from outside the equipment.	N

5	**ELECTRICALLY-CAUSED INJURY**		P
5.2.1	Electrical energy source classifications.....:	(See appended table 5.2)	P
5.2.2	ES1, ES2 and ES3 limits	ES1	P

EN IEC 62368-1			
Clause	Requirement	Remark	Result
5.2.2.2	Steady-state voltage and current.....:	See appended table 5.2)	P
5.2.2.3	Capacitance limits.....:		N
5.2.2.4	Single pulse limits .....:	No such single pulses with the EUT	N
5.2.2.5	Limits for repetitive pulses.....:	No such repetitive pulses with the EUT	N
5.2.2.6	Ringing signals .....:	No such ringing signals with the EUT	N
5.2.2.7	Audio signals .....:		N
5.3	Protection against electrical energy sources	ES1	N
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	See above.	N
5.3.2.1	Accessibility to electrical energy sources and safeguards		N
5.3.2.2	Contact requirements		N
	a) Test with test probe from Annex V .....:		N
	b) Electric strength test potential (V).....:		N
	c) Air gap (mm) .....:		N
5.3.2.4	Terminals for connecting stripped wire		N
5.4	Insulation materials and requirements		N
5.4.1.2	Properties of insulating material		N
5.4.1.3	Humidity conditioning.....:		N
5.4.1.4	Maximum operating temperature for insulating materials .....:		N
5.4.1.5	Pollution degree .....:		—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N
5.4.1.5.3	Thermal cycling		N
5.4.1.6	Insulation in transformers with varying dimensions		N
5.4.1.7	Insulation in circuits generating starting pulses		N
5.4.1.8	Determination of working voltage		N
5.4.1.9	Insulating surfaces		N
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N
5.4.1.10.2	Vicat softening temperature.....:		N
5.4.1.10.3	Ball pressure .....:		N
5.4.2	Clearances		N
5.4.2.2	Determining clearance using peak working voltage		N
5.4.2.3	Determining clearance using required withstand voltage .....:		N
	a) a.c. mains transient voltage .....:		—
	b) d.c. mains transient voltage .....:		—
	c) external circuit transient voltage .....:		—
	d) transient voltage determined by measurement ...		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N
5.4.2.5	Multiplication factors for clearances and test voltages.....:		N

EN IEC 62368-1			
Clause	Requirement	Remark	Result
5.4.3	Creepage distances.....:		N
5.4.3.1	General		N
5.4.3.3	Material Group .....:		—
5.4.4	Solid insulation		N
5.4.4.2	Minimum distance through insulation .....:		N
5.4.4.3	Insulation compound forming solid insulation		N
5.4.4.4	Solid insulation in semiconductor devices		N
5.4.4.5	Cemented joints		N
5.4.4.6	Thin sheet material		N
5.4.4.6.1	General requirements		N
5.4.4.6.2	Separable thin sheet material		N
	Number of layers (pcs) .....:		N
5.4.4.6.3	Non-separable thin sheet material		N
5.4.4.6.4	Standard test procedure for non-separable thin sheet material.....:		N
5.4.4.6.5	Mandrel test		N
5.4.4.7	Solid insulation in wound components		N
5.4.4.9	Solid insulation at frequencies >30 kHz.....:		N
5.4.5	Antenna terminal insulation		N
5.4.5.1	General		N
5.4.5.2	Voltage surge test		N
	Insulation resistance (MΩ).....:		—
5.4.6	Insulation of internal wire as part of supplementary safeguard.....:		N
5.4.7	Tests for semiconductor components and for cemented joints		N
5.4.8	Humidity conditioning		N
	Relative humidity (%).....:		—
	Temperature (°C) .....:		—
	Duration (h) .....:		—
5.4.9	Electric strength test.....:		N
5.4.9.1	Test procedure for a solid insulation type test		N
5.4.9.2	Test procedure for routine tests		N
5.4.10	Protection against transient voltages between external circuit		N
5.4.10.1	Parts and circuits separated from external circuits		N
5.4.10.2	Test methods		N
5.4.10.2.1	General		N
5.4.10.2.2	Impulse test.....:		N
5.4.10.2.3	Steady-state test.....:		N
5.4.11	Insulation between external circuits and earthed circuitry .....:		N
5.4.11.1	Exceptions to separation between external circuits and earth		N
5.4.11.2	Requirements		N
	Rated operating voltage U_{op} (V).....:		—

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Clause	Requirement	Remark	Result
	Nominal voltage U_{peak} (V).....:		—
	Max increase due to variation U_{sp} .....:		—
	Max increase due to ageing ΔU_{sa} .....:		—
	U_{op}= U_{peak} + ΔU_{sp} + ΔU_{sa} .....:		—
5.5	Components as safeguards		N
5.5.1	General		N
5.5.2	Capacitors and RC units		N
5.5.2.1	General requirement		N
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector.....:		N
5.5.3	Transformers		N
5.5.4	Optocouplers		N
5.5.5	Relays		N
5.5.6	Resistors		N
5.5.7	SPD's		N
5.5.7.1	Use of an SPD connected to reliable earthing		N
5.5.7.2	Use of an SPD between mains and protective earth		N
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable.....:		N
5.6	Protective conductor		N
5.6.2	Requirement for protective conductors		N
5.6.2.1	General requirements		N
5.6.2.2	Colour of insulation		N
5.6.3	Requirement for protective earthing conductors		N
	Protective earthing conductor size (mm^2) .....:		—
5.6.4	Requirement for protective bonding conductors		N
5.6.4.1	Protective bonding conductors		N
	Protective bonding conductor size (mm^2).....:		—
	Protective current rating (A) ..... :		—
5.6.4.3	Current limiting and overcurrent protective devices		N
5.6.5	Terminals for protective conductors		N
5.6.5.1	Requirement		N
	Conductor size (mm^2), nominal thread diameter (mm). .....:		N
5.6.5.2	Corrosion		N
5.6.6	Resistance of the protective system		N
5.6.6.1	Requirements		N
5.6.6.2	Test Method Resistance (Ω) .....:		N
5.6.7	Reliable earthing		N
5.7	Prospective touch voltage, touch current and protective conductor current		N
5.7.2	Measuring devices and networks		N
5.7.2.1	Measurement of touch current.....:		N
5.7.2.2	Measurement of prospective touch voltage		N

EN IEC 62368-1			
Clause	Requirement	Remark	Result
5.7.3	Equipment set-up, supply connections and earth connections		N
	System of interconnected equipment (separate connections/single connection).....:		—
	Multiple connections to mains (one connection at a time/simultaneous connections).....:		—
5.7.4	Earthed conductive accessible parts.....:		N
5.7.5	Protective conductor current		N
	Supply Voltage (V) .....:		—
	Measured current (mA) .....:		—
	Instructional Safeguard .....:		N
5.7.6	Prospective touch voltage and touch current due to external circuits		N
5.7.6.1	Touch current from coaxial cables		N
5.7.6.2	Prospective touch voltage and touch current from external circuits		N
5.7.7	Summation of touch currents from external circuits		N
	a) Equipment with earthed external circuits Measured current (mA) .....:		N
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA).....:		N
6	**ELECTRICALLY- CAUSED FIRE**		P
6.2.2	Power source circuit classifications	PS (power source) classification determined by measuring the maximum power in Figures 34 and 35 for load and power source circuits.	P
6.2.2.1	General	See the following details.	P
6.2.2.2	Power measurement for worst-case load fault....:	(See appended table 6.2.2)	P
6.2.2.3	Power measurement for worst-case power source fault.....:	(See appended table 6.2.2)	P
6.2.2.4	PS1 .....:	(See appended table 6.2.2)	P
6.2.2.5	PS2 .....:	(See appended table 6.2.2)	P
6.2.2.6	PS3 .....:		N
6.2.3	Classification of potential ignition sources		N
6.2.3.1	Arcing PIS .....:		N
6.2.3.2	Resistive PIS .....:	No PIS	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials .....:	(See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6)	P
6.3.1 (b)	Combustible materials outside fire enclosure	No such materials used.	N
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method	Method by control fire spread.	P
6.4.2	Reduction of the likelihood of ignition under single		N

EN IEC 62368-1			
Clause	Requirement	Remark	Result
	fault conditions in PS1 circuits		
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		N
6.4.3.1	General		N
6.4.3.2	Supplementary Safeguards		P
	Special conditions if conductors on printed boards are opened or peeled	No such case happened.	N
6.4.3.3	Single Fault Conditions.....:		N
	Special conditions for temperature limited by fuse		N
6.4.4	Control of fire spread in PS1 circuits		P
6.4.5	Control of fire spread in PS2 circuits		P
6.4.5.2	Supplementary safeguards .....:	(See appended tables 4.1.2 and Annex G) PCB: V-0	P
6.4.6	Control of fire spread in PS3 circuit		N
6.4.7	Separation of combustible materials from a PIS		N
6.4.7.1	General .....:		N
6.4.7.2	Separation by distance		N
6.4.7.3	Separation by a fire barrier		N
6.4.8	Fire enclosures and fire barriers		N
6.4.8.1	Fire enclosure and fire barrier material properties		N
6.4.8.2.1	Requirements for a fire barrier	No such construction.	N
6.4.8.2.2	Requirements for a fire enclosure	No such construction.	N
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N
6.4.8.3.1	Fire enclosure and fire barrier openings	No openings.	N
6.4.8.3.2	Fire barrier dimensions	No barrier used.	N
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm) :		N
	Needle Flame test		N
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) .....:		N
	Flammability tests for the bottom of a fire enclosure .....:		N
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c) .....:		N
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating .....:		N
6.5	Internal and external wiring		N
6.5.1	Requirements		N
6.5.2	Cross-sectional area (mm2) .....:		
6.5.3	Requirements for interconnection to building wiring .....:	No such interconnection to building wiring.	N
6.6	Safeguards against fire due to connection to additional equipment		P
	External port limited to PS2 or complies with Clause Q.1	See appended table Annex Q.1.	P

EN IEC 62368-1			
Clause	Requirement	Remark	Result
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		P
7.2	Reduction of exposure to hazardous substances	No hazardous chemicals within the equipment.	N
7.3	Ozone exposure	No ozone production within the equipment.	N
7.4	Use of personal safeguards (PPE)	No such consideration.	N
	Personal safeguards and instructions.....:	See above.	—
7.5	Use of instructional safeguards and instructions	No chemical-caused injuries, the instruction safeguard was not required.	N
	Instructional safeguard (ISO 7010) .....:	(See Annex F)	—
7.6	Batteries .....:	Complied with Annex M	P
8	***MECHANICALLY-CAUSED INJURY***		P
8.1	General	See the following details.	P
8.2	Mechanical energy source classifications	Sharp edges and corners, classified as MS1 Equipment mass < 7 kg, classified as MS1	P
8.3	Safeguards against mechanical energy sources	MS1	N
8.4	Safeguards against parts with sharp edges and corners	Accessible edges and corners of the equipment are rounded and are classified as MS1.	P
8.4.1	Safeguards	See above.	N
8.5	Safeguards against moving parts		N
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment	See above.	N
8.5.2	Instructional Safeguard..... :	See above.	—
8.5.4	Special categories of equipment comprising moving parts		N
8.5.4.1	Large data storage equipment		N
8.5.4.2	Equipment having electromechanical device for destruction of media		N
8.5.4.2.1	Safeguards and Safety Interlocks.....:		N
8.5.4.2.2	Instructional safeguards against moving parts		N
	Instructional Safeguard .....:		
8.5.4.2.3	Disconnection from the supply		N
8.5.4.2.4	Probe type and force (N).....:		N
8.5.5	High Pressure Lamps		N
8.5.5.1	Energy Source Classification		N
8.5.5.2	High Pressure Lamp Explosion Test .....:		N
8.6	Stability	< 7 kg	N
8.6.1	Product classification		N
	Instructional Safeguard .....:		
8.6.2	Static stability		N

EN IEC 62368-1			
Clause	Requirement	Remark	Result
8.6.2.2	Static stability test		N
	Applied Force .....:		
8.6.2.3	Downward Force Test		N
8.6.3	Relocation stability test		N
	Unit configuration during 10° tilt .....:		
8.6.4	Glass slide test		N
8.6.5	Horizontal force test (Applied Force) .....:		N
	Position of feet or movable parts .....:		
8.7	Equipment mounted to wall or ceiling		N
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) .....:		N
8.7.2	Direction and applied force .....:		N
8.8	Handles strength		N
8.8.1	Classification		N
8.8.2	Applied Force .....:		N
8.9	Wheels or casters attachment requirements		N
8.9.1	Classification		N
8.9.2	Applied force.....:		—
8.10	Carts, stands and similar carriers	No such device provided within the EUT.	N
8.10.1	General		N
8.10.2	Marking and instructions		N
	Instructional Safeguard .....:		—
8.10.3	Cart, stand or carrier loading test and compliance		N
	Applied force.....:		
8.10.4	Cart, stand or carrier impact test		N
8.10.5	Mechanical stability		N
	Applied horizontal force (N).....:		
8.10.6	Thermoplastic temperature stability (°C) .....:		N
8.11	Mounting means for rack mounted equipment		N
8.11.1	General		N
8.11.2	Product Classification		N
8.11.3	Mechanical strength test, variable N .....:		N
8.11.4	Mechanical strength test 250N, including end stops		N
8.12	Telescoping or rod antennas .....:	No such device provided within the EUT.	N
	Button/Ball diameter (mm) .....:	See above.	

9	**THERMAL BURN INJURY**		P
9.2	Thermal energy source classifications	All accessible surfaces are classified as TS1, see appended table 5.4.1.4, 6.3.2, 9.0, B.2.6	P
9.3	Safeguard against thermal energy sources	See above.	P

EN IEC 62368-1			
Clause	Requirement	Remark	Result
9.4	Requirements for safeguards		P
9.4.1	Equipment safeguard	Enclosure temperatures do not exceed TS1 limits.	P
9.4.2	Instructional safeguard .....:		N
10	**RADIATION**		P
10.2	Radiation energy source classification	RS1: LED light	P
10.2.1	General classification		N
10.3	Protection against laser radiation		N
	Laser radiation that exists equipment:		
	Normal, abnormal, single-fault.....:		N
	Instructional safeguard.....:		
	Tool .....:		
10.4	Protection against visible, infrared, and UV radiation		P
10.4.1	General		P
10.4.1.a)	RS3 for Ordinary and instructed persons .....:		N
10.4.1.b)	RS3 accessible to a skilled person.....:		N
	Personal safeguard (PPE) instructional safeguard.....:		
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1..:		N
10.4.1.d)	Normal, abnormal, single-fault conditions .....:		N
10.4.1.e)	Enclosure material employed as safeguard is opaque.....:		N
10.4.1.f)	UV attenuation.....:		N
10.4.1.g)	Materials resistant to degradation UV.....:		N
10.4.1.h)	Enclosure containment of optical radiation.....:		N
10.4.1.i)	Exempt Group under normal operating conditions .....:	Exempt Group	P
10.4.2	Instructional safeguard.....:		N
10.5	Protection against x-radiation	No such x-radiation generated from the equipment.	N
10.5.1	X- radiation energy source that exists equipment :		N
	Normal, abnormal, single fault conditions		N
	Equipment safeguards.....:		N
	Instructional safeguard for skilled person.....:		N
10.5.3	Most unfavourable supply voltage to give maximum radiation.....:		
	Abnormal and single-fault condition.....:		N
	Maximum radiation (pA/kg).....:		N
10.6	Protection against acoustic energy sources	No such consideration for the purpose of personal music players.	N
10.6.1	General		N
10.6.2	Classification		N
	Acoustic output, dB(A) .....:		N

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Clause	Requirement	Remark	Result
	Output voltage, unweighted r.m.s. .....:		N
10.6.4	Protection of persons		N
	Instructional safeguards.....:		N
	Equipment safeguard prevent ordinary person to RS2 .....:		
	Means to actively inform user of increase sound pressure .....:		
	Equipment safeguard prevent ordinary person to RS2.....:		
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N
10.6.5.1	Corded passive listening devices with analog input		N
	Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output .....:		
10.6.5.2	Corded listening devices with digital input		N
	Maximum dB(A).....:		
10.6.5.3	Cordless listening device		N
	Maximum dB(A).....:		

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.2	Normal Operating Conditions	See the following details.	P
B.2.1	General requirements .....:	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers.....:	Test according to requirements of annex E	P
B.2.3	Supply voltage and tolerances		N
B.2.5	Input test.....:	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements .....:	(See appended table B.3&B.4)	P
B.3.2	Covering of ventilation openings	No ventilation openings provided.	N
B.3.3	D.C. mains polarity test		N
B.3.4	Setting of voltage selector.....:	No setting of voltage selector within the EUT	N
B.3.5	Maximum load at output terminals .....:	No such terminals.	N
B.3.6	Reverse battery polarity	Impossible reverse polarity by inherent design.	P
B.3.7	Abnormal operating conditions as specified in Clause E.2.		P
B.3.8	Safeguards functional during and after abnormal operating conditions	All safeguards remained effectively.	P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited.....:		N
B.4.3	Motor tests		N
B.4.3.1	Motor blocked or rotor locked increasing the internal		N

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Clause	Requirement	Remark	Result
	ambient temperature .....:		
B.4.4	Short circuit of functional insulation	See the following details.	P
B.4.4.1	Short circuit of clearances for functional insulation	(See appended table B.3 &B.4)	P
B.4.4.2	Short circuit of creepage distances for functional insulation	(See appended table B.3 &B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards	No coated printed boards within the EUT	N
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		N
B.4.6	Short circuit or disconnect of passive components	(See appended table B.3 &B.4)	P
B.4.7	Continuous operation of components	The EUT is continuous operating type and no such components intended for short time operation or intermittent operation	N
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions	(See appended table B.3&B.4)	P
B.4.9	Battery charging under single fault conditions....:	Complied with the annex M	P
C	**UV RADIATION**		N
C.1	Protection of materials in equipment from UV radiation	No such UV generated from the equipment.	N
C.1.2	Requirements		N
C.1.3	Test method		N
C.2	UV light conditioning test		N
C.2.1	Test apparatus		N
C.2.2	Mounting of test samples		N
C.2.3	Carbon-arc light-exposure apparatus		N
C.2.4	Xenon-arc light exposure apparatus		N
D	**TEST GENERATORS**		N
D.1	Impulse test generators	No such consideration.	N
D.2	Antenna interface test generator		N
D.3	Electronic pulse generator		N
E	**TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS**		P
E.1	Audio amplifier normal operating conditions		P
	Audio signal voltage (V) .....:	0.24	
	Rated load impedance (Ω) .....:	4Ω	
E.2	Audio amplifier abnormal operating conditions	(See appended table B.3 &B.4)	P
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	General requirements	See the following details.	P
	Instructions – Language .....:	English	

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Clause	Requirement	Remark	Result
F.2	Letter symbols and graphical symbols	See the following details.	P
F.2.1	Letter symbols according to IEC60027-1	Letter symbols for quantities and units are complied with IEC 60027-1.	P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific	Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010.	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	Equipment marking is located on the exterior surface and is easily visible.	P
F.3.2	Equipment identification markings	See the following details.	P
F.3.2.1	Manufacturer identification .....:	See copy of marking plate.	
F.3.2.2	Model identification.....:	See copy of marking plate.	
F.3.3	Equipment rating markings	See the following details.	P
F.3.3.1	Equipment with direct connection to mains		N
F.3.3.2	Equipment without direct connection to mains	See above.	P
F.3.3.3	Nature of supply voltage .....:		
F.3.3.4	Rated voltage.....:	5V	
F.3.3.4	Rated frequency .....:		
F.3.3.6	Rated current or rated power .....:	15MA	
F.3.3.7	Equipment with multiple supply connections	Only one supply connection.	N
F.3.4	Voltage setting device	No such device on the equipment.	N
F.3.5	Terminals and operating devices	See below	N
F.3.5.1	Mains appliance outlet and socket-outlet markings .....:	No such devices on the equipment.	N
F.3.5.2	Switch position identification marking .....:	No such switch on the equipment.	N
F.3.5.3	Replacement fuse identification and rating markings .....:		N
F.3.5.4	Replacement battery identification marking.....:		N
F.3.5.5	Terminal marking location		N
F.3.6	Equipment markings related to equipment classification	Class III	N
F.3.6.1	Class I Equipment		N
F.3.6.1.1	Protective earthing conductor terminal		N
F.3.6.1.2	Neutral conductor terminal		N
F.3.6.1.3	Protective bonding conductor terminals		N
F.3.6.2	Class II equipment (IEC60417-5172)		N
F.3.6.2.1	Class II equipment with or without functional earth		N
F.3.6.2.2	Class II equipment with functional earth terminal marking		N
F.3.7	Equipment IP rating marking .....:	This equipment is classified as IPX0.	
F.3.8	External power supply output marking		N

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Clause	Requirement	Remark	Result
F.3.9	Durability, legibility and permanence of marking	See the following details.	P
F.3.10	Test for permanence of markings	The label was subjected to the permanence of marking test, 15 sec. for water and 15 sec. for petroleum spirit. After each test, the marking remained legible.	P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking		N
	b) Instructions given for installation or initial use	Relevant safety caution texts and installation instruction are available.	P
	c) Equipment intended to be fastened in place		N
	d) Equipment intended for use only in restricted access area		N
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N
	f) Protective earthing employed as safeguard		N
	g) Protective earthing conductor current exceeding ES 2 limits		N
	h) Symbols used on equipment		P
	i) Permanently connected equipment not provided with all-pole mains switch	The EUT is not a permanently connected equipment	N
	j) Replaceable components or modules providing safeguard function		N
F.5	Instructional safeguards		P
	Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction		P

G	**COMPONENTS**		P
G.1	**Switches**		N
G.1.1	General requirements	No such switch as disconnect devices provided within the equipment.	N
G.1.2	Ratings, endurance, spacing, maximum load		N
G.2	**Relays**		N
G.2.1	General requirements	No such relay provided within the equipment.	N
G.2.2	Overload test		N
G.2.3	Relay controlling connectors supply power		N
G.2.4	Mains relay, modified as stated in G.2		N
G.3	**Protection Devices**		N
G.3.1	Thermal cut-offs	No thermal cut-off provided within the equipment.	N
G.3.1.1a)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)	See above.	N

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Clause	Requirement	Remark	Result
&b)			
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)	See above.	N
G.3.1.2	Thermal cut-off connections maintained and secure	See above.	N
G.3.2	Thermal links		N
G.3.2.1a)	Thermal links separately tested with IEC 60691	No thermal link provided within the equipment.	N
G.3.2.1b)	Thermal links tested as part of the equipment	See above.	N
	Aging hours (H).....:	See above.	—
	Single Fault Condition.....:	See above.	—
	Test Voltage (V) and Insulation Resistance (Ω)..:	See above.	—
G.3.3	PTC Thermistors	No PTC thermistor provided within the equipment.	N
G.3.4	Overcurrent protection devices		N
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N
G.3.5.1	Non-resettable devices suitably rated and marking provided	No such component.	N
G.3.5.2	Single faults conditions .....:		N
G.4	**Connectors**		N
G.4.1	Spacings	No such connector within the EUT	N
G.4.2	Mains connector configuration .....:		N
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N
G.5	**Wound Components**		N
G.5.1	Wire insulation in wound components	No such component.	N
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		N
G.5.1.2 b)	Construction subject to routine testing		N
G.5.2	Endurance test on wound components		N
G.5.2.1	General test requirements		N
G.5.2.2	Heat run test		N
	Time (s).....:		—
	Temperature (°C).....:		—
G.5.2.3	Wound Components supplied by mains		N
G.5.3	**Transformers**		N
G.5.3.1	Requirements applied (IEC61204-7, IEC61558- 1/-2, and/or IEC62368-1).....:		N
	Position.....:		
	Method of protection.....:		
G.5.3.2	Insulation		N
	Protection from displacement of windings.....:		—
G.5.3.3	Overload test.....:		N
G.5.3.3.1	Test conditions		N
G.5.3.3.2	Winding Temperatures testing in the unit		N
G.5.3.3.3	Winding Temperatures - Alternative test method		N

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Clause	Requirement	Remark	Result
G.5.4	**Motors**		N
G.5.4.1	General requirements		N
	Position .....:		—
G.5.4.2	Test conditions		P
G.5.4.3	Running overload test		N
G.5.4.4	Locked-rotor overload test		N
	Test duration (days) .....:		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N
G.5.4.5.2	Tested in the unit		N
	Electric strength test (V) .....:		—
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h) .....:		N
	Electric strength test (V) .....:		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N
G.5.4.6.2	Tested in the unit		N
	Maximum Temperature .....:		N
	Electric strength test (V) .....:		N
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h) .....:		N
	Electric strength test (V) .....:		N
G.5.4.7	Motors with capacitors		N
G.5.4.8	Three-phase motors		N
G.5.4.9	Series motors		N
	Operating voltage .....:		—
G.6	**Wire Insulation**		N
G.6.1	General		N
G.6.2	Solvent-based enamel wiring insulation		N
G.7	**Mains supply cords**		N
G.7.1	General requirements		N
	Type .....:		—
	Rated current(A).....:		—
	Cross-sectional area (mm^2), (AWG) .....:		—
G.7.2	Compliance and test method		N
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N
G.7.3.2	Cord strain relief		N
G.7.3.2.1	Requirements		N
	Strain relief test force (N) .....:		—
G.7.3.2.2	Strain relief mechanism failure		
G.7.3.2.3	Cord sheath or jacket position, distance (mm)....:		—
G.7.3.2.4	Strain relief comprised of polymeric material		N
G.7.4	Cord Entry.....:		N
G.7.5	Non-detachable cord bend protection		N

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Clause	Requirement	Remark	Result
G.7.5.1	Requirements		N
G.7.5.2	Mass (g).....:		—
	Diameter (m).....:		—
	Temperature (°C).....:		—
G.7.6	Supply wiring space		N
G.7.6.2	Stranded wire		N
G.7.6.2.1	Test with 8 mm strand		N
G.8	**Varistors**		N
G.8.1	General requirements	No VDRs.	N
G.8.2	Safeguard against shock		N
G.8.3	Safeguard against fire		N
G.8.3.2	Varistor overload test .....:		N
G.8.3.3	Temporary overvoltage .....:	(See appended table B.3)	N
G.9	**Integrated Circuit (IC) Current Limiters**		N
G.9.1 a)	Manufacturer defines limit at max. 5A.	No IC current limiter provided within the equipment.	N
G.9.1 b)	Limiters do not have manual operator or reset		N
G.9.1 c)	Supply source does not exceed 250 VA .....:		
G.9.1 d)	IC limiter output current (max. 5A) .....:		
G.9.1 e)	Manufacturers' defined drift .....:		
G.9.2	Test Program 1		N
G.9.3	Test Program 2		N
G.9.4	Test Program 3		N
G.10	**Resistors**		N
G.10.1	General requirements		N
G.10.2	Resistor test		N
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N
G.10.3.1	General requirements		N
G.10.3.2	Voltage surge test		N
G.10.3.3	Impulse test		N
G.11	**Capacitor and RC units**		N
G.11.1	General requirements		N
G.11.2	Conditioning of capacitors and RC units		N
G.11.3	Rules for selecting capacitors		N
G.12	**Optocouplers**		N
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results).....:		N
	Type test voltage Vini .....:		
	Routine test voltage, Vini,b .....:		
G.13	**Printed boards**		P
G.13.1	General requirements	See the following details.	P

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Clause	Requirement	Remark	Result
G.13.2	Uncoated printed boards	The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage requirements	P
G.13.3	Coated printed boards	No coated printed board provided within the equipment.	N
G.13.4	Insulation between conductors on the same inner surface		N
	Compliance with cemented joint requirements (Specify construction).....:		
G.13.5	Insulation between conductors on different surfaces		N
	Distance through insulation.....:		N
	Number of insulation layers (pcs) .....:		—
G.13.6	Tests on coated printed boards		N
G.13.6.1	Sample preparation and preliminary inspection		N
G.13.6.2a)	Thermal conditioning		N
G.13.6.2b)	Electric strength test		N
G.13.6.2c)	Abrasion resistance test		N
G.14	**Coating on components terminals**		N
G.14.1	Requirements .....:	(See G.13)	N
G.15	**Liquid filled components**		N
G.15.1	General requirements		N
G.15.2	Requirements		N
G.15.3	Compliance and test methods		N
G.15.3.1	Hydrostatic pressure test		N
G.15.3.2	Creep resistance test		N
G.15.3.3	Tubing and fittings compatibility test		N
G.15.3.4	Vibration test		N
G.15.3.5	Thermal cycling test		N
G.15.3.6	Force test		N
G.15.4	Compliance		N
G.16	**IC including capacitor discharge function (ICX)**		N
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N
b)	Impulse test using circuit 2 with Uc = to transient voltage .....:		N
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N
C2)	Test voltage.....:		
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N
D2)	Capacitance .....:		
D3)	Resistance .....:		

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Clause	Requirement	Remark	Result
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N
H.1	General		N
H.2	Method A		N
H.3	Method B		N
H.3.1	Ringing signal		N
H.3.1.1	Frequency (Hz) .....:		—
H.3.1.2	Voltage (V) .....:		—
H.3.1.3	Cadence; time (s) and voltage (V) .....:		—
H.3.1.4	Single fault current (mA): .....:		—
H.3.2	Tripping device and monitoring voltage .....:		N
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N
H.3.2.2	Tripping device		N
H.3.2.3	Monitoring voltage (V).....:		—
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N
	General requirements		N
K	**SAFETY INTERLOCKS**		N
K.1	General requirements	No safety interlock provided within the equipment.	N
K.2	Components of safety interlock safeguard mechanism	(See Annex G)	N
K.3	Inadvertent change of operating mode		N
K.4	Interlock safeguard override		N
K.5	Fail-safe		N
	Compliance .....:	(See appended table B.4)	N
K.6	Mechanically operated safety interlocks		N
K.6.1	Endurance requirement		N
K.6.2	Compliance and Test method .....:		N
K.7	Interlock circuit isolation		N
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location) .....:		N
K.7.2	Overload test, Current (A).....:		N
K.7.3	Endurance test		N
K.7.4	Electric strength test .....:	(See appended table 5.4.11)	N
L	**DISCONNECT DEVICES**		N
L.1	General requirements		N
L.2	Permanently connected equipment		N
L.3	Parts that remain energized		N
L.4	Single phase equipment		N
L.5	Three-phase equipment		N
L.6	Switches as disconnect devices		N
L.7	Plugs as disconnect devices		N

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Clause	Requirement	Remark	Result
L.8	Multiple power sources		N
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		P
M.1	General requirements		P
M.2	Safety of batteries and their cells		P
M.2.1	Requirements		P
M.2.2	Compliance and test method (identify method)...:		P
M.3	Protection circuits		P
M.3.1	Requirements		P
M.3.2	Tests		P
	- Overcharging of a rechargeable battery	(See appended table Annex M)	P
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery	(See appended table Annex M)	P
M.3.3	Compliance .....:	No chemical leakage, no liquid spillage, no explosion, no emission fo flame or expulsion of molten metal	P
M.4	Additional safeguards for equipment containing secondary lithium battery		P
M.4.1	General		P
M.4.2	Charging safeguards		P
M.4.2.1	Charging operating limits		P
M.4.2.2a)	Charging voltage, current and temperature .....:	(See appended table Annex M.4)	P
M.4.2.2 b)	Single faults in charging circuitry.....:	(See appended table Annex M.4)	P
M.4.3	Fire Enclosure		P
M.4.4	Endurance of equipment containing a secondary lithium battery		P
M.4.4.2	Preparation		P
M.4.4.3	Drop and charge/discharge function tests		P
	Drop		P
	Charge		P
	Discharge		P
M.4.4.4	Charge-discharge cycle test		P
M.4.4.5	Result of charge-discharge cycle test		P
M.5	Risk of burn due to short circuit during carrying		N
M.5.1	Requirement		N
M.5.2	Compliance and Test Method (Test of P.2.3)		N
M.6	Prevention of short circuits and protection from other effects of electric current		P
M.6.1	Short circuits		P
M.6.1.1	General requirements		P
M.6.1.2	Test method to simulate an internal fault		P
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method) .....:		P
M.6.2	Leakage current (mA).....:	0.01mA	P

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Clause	Requirement	Remark	Result
M.7	Risk of explosion from lead acid and NiCd batteries		N
M.7.1	Ventilation preventing explosive gas concentration		N
M.7.2	Compliance and test method		N
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N
M.8.1	General requirements		N
M.8.2	Test method		N
M.8.2.1	General requirements		N
M.8.2.2	Estimation of hypothetical volume *Vz* (m^3/s) .....:		—
M.8.2.3	Correction factors .....:		—
M.8.2.4	Calculation of distance *d* (mm) .....:		—
M.9	Preventing electrolyte spillage		N
M.9.1	Protection from electrolyte spillage		N
M.9.2	Tray for preventing electrolyte spillage		N
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) .....:		P
N	**ELECTROCHEMICAL POTENTIALS**		N
	Metal(s) used.....:		—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		P
	Figures O.1 to O.20 of this Annex applied.....:	Considered.	—
P	**SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS**		N
P.1	General requirements	No openings	N
P.2.2	Safeguards against entry of foreign object		N
	Location and Dimensions (mm) .....:		—
P.2.3	Safeguard against the consequences of entry of foreign object		N
P.2.3.1	Safeguards against the entry of a foreign object		N
	Openings in transportable equipment		N
	Transportable equipment with metalized plastic parts .....:		N
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) .....:		N
P.3	Safeguards against spillage of internal liquids	No such construction.	N
P.3.1	General requirements		N
P.3.2	Determination of spillage consequences		N
P.3.3	Spillage safeguards		N
P.3.4	Safeguards effectiveness		N
P.4	Metallized coatings and adhesive securing parts	No such construction.	N

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Clause	Requirement	Remark	Result
P.4.2 a)	Conditioning testing		N
	Tc (°C) .....:		—
	Tr (°C).....:		—
	Ta (°C) .....:		—
P.4.2 b)	Abrasion testing .....:		N
P.4.2 c)	Mechanical strength testing.....:		N
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		P
Q.1	Limited power sources		P
Q.1.1 a)	Inherently limited output		N
Q.1.1 b)	Impedance limited output		N
	- Regulating network limited output under normal operating and simulated single fault condition	See appended table Annex Q.1	P
Q.1.1 c)	Overcurrent protective device limited output		N
Q.1.1 d)	IC current limiter complying with G.9		N
Q.1.2	Compliance and test method		N
Q.2	Test for external circuits – paired conductor cable	See appended table Annex Q.1	P
	Maximum output current (A) .....:		—
	Current limiting method .....:		
R	**LIMITED SHORT CIRCUIT TEST**		N
R.1	General requirements	No such consideration.	N
R.2	Determination of the overcurrent protective device and circuit		N
R.3	Test method Supply voltage (V) and short-circuit current (A)). .....:		N
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W	The fire enclosure used material was approved.	N
	Samples, material .....:		—
	Wall thickness (mm).....:		—
	Conditioning (°C).....:		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N
	- Material not consumed completely		N
	- Material extinguishes within 30s		N
	- No burning of layer or wrapping tissue		N
S.2	Flammability test for fire enclosure and fire barrier integrity		N
	Samples, material .....:		—
	Wall thickness (mm).....:		—
	Conditioning (°C).....:		—

EN IEC 62368-1			
Clause	Requirement	Remark	Result
	Test flame according to IEC 60695-11-5 with conditions as set out		N
	Test specimen does not show any additional hole		N
S.3	Flammability test for the bottom of a fire enclosure		N
	Samples, material .....:		—
	Wall thickness (mm).....:		—
	Cheesecloth did not ignite		N
S.4	Flammability classification of materials		N
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N
	Samples, material .....:		—
	Wall thickness (mm).....:		—
	Conditioning (test condition), (°C) .....:		—
	Test flame according to IEC 60695-11-20 with conditions as set out		N
	After every test specimen was not consumed completely		N
	After fifth flame application, flame extinguished within 1 min		N

T	**MECHANICAL STRENGTH TESTS**		**P**
T.1	General requirements	See the following details.	P
T.2	Steady force test, 10 N .....:		N
T.3	Steady force test, 30 N .....:		N
T.4	Steady force test, 100 N .....:	(See appended table T.4)	P
T.5	Steady force test, 250 N .....:		N
T.6	Enclosure impact test		N
	Fall test		N
	Swing test		N
T.7	Drop test .....:	Complete equipment was dropped onto a horizontal surface from the height of 1000 mm for three times.	P
T.8	Stress relief test .....:	(See appended table T.8)	P
T.9	Impact Test (glass)	No such glass provided within the equipment.	N
T.9.1	General requirements	See above.	N
T.9.2	Impact test and compliance	See above.	N
	Impact energy (J) .....:		—
	Height (m).....:		—
T.10	Glass fragmentation test .....:	(See sub-clause 4.4.4.9)	N
T.11	Test for telescoping or rod antennas	No such antennas provided within the equipment.	N
	Torque value (Nm) .....:	See above.	—

EN IEC 62368-1			
Clause	Requirement	Remark	Result
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFECTS OF IMPLOSION**		N
U.1	General requirements	No CRT provided within the equipment.	N
U.2	Compliance and test method for non-intrinsically protected CRTs	See above.	N
U.3	Protective Screen.....:	See above.	N
V	**DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)**		P
V.1	Accessible parts of equipment	Following the probes test specified in this annex except Figure V.3., V.4 and V.5 is not suitable.	P
V.2	Accessible part criterion	No live parts can be accessible.	P

EN IEC 62368-1			
Clause	Requirement	Remark	Result

ATTACHMENT TO TEST REPORT EN IEC 62368-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment Part 1: Safety requirements)			
	CENELEC COMMON MODIFICATIONS (EN)		--
1	NOTE Z1		P
4.Z1	Protective devices included as integral parts of the equipment or as parts of the building installation:		N
	a) Included as parts of the equipment		N
	b) For components in series with the mains; by devices in the building installation		N
	c) For pluggable type B or permanently connected; by devices in the building installation		N
5.4.2.3.2.4	Interconnection with external circuit		N
10.2.1	Additional requirements in 10.5.1		N
10.5.1	RS1 compliance measurement conditions		P
10.6.2.1	EN 71-1:2011, 4.20 and methods and distances		N
10.Z1	Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz		N
G.7.1	NOTE Z1		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		--
4.1.15	**Denmark, Finland, Norway and Sweden:** Class I pluggable equipment type A marking		N
4.7.3	**United Kingdom:** Torque test socket-outlet BS 1363, and the plug part BS 1363.		N
5.2.2.2	**Denmark:** Warning for high touch current		N
5.4.11.1 and Annex G	**Finland and Sweden:** Separation of the telecommunication network from earth		N
5.5.2.1	**Norway:** Capacitors rated for the applicable line-to-line voltage (230 V).		N
5.5.6	**Finland, Norway and Sweden:** Resistors used as basic safeguard or bridging basic insulation comply with G.10.1 and G.10.2.		N
5.6.1	**Denmark:** Protection for pluggable equipment type A; integral part of the equipment		N
5.6.4.2.1	**Ireland and United Kingdom:** The protective current rating is taken to be 13 A		N
5.6.5.1	**Ireland and United Kingdom:** Conductor sizes of flexible cords to be accepted by terminals for equipment rated 10 A to 13 A		N
5.7.5	**Denmark:** The installation instruction affixed to the equipment if high protective conductor current		N

EN IEC 62368-1			
Clause	Requirement	Remark	Result
5.7.6.1	**Norway and Sweden:** Television distribution system isolation text in user manual		N
5.7.6.2	**Denmark:** Warning for high touch current		N
B.3.1 and B.4	**Ireland and United Kingdom:** Tests conducted using an external miniature circuit breaker or protective devices included as an integral part of the direct plug-in equipment		N
G.4.2	**Denmark:** Appliances rated ≤13 A provided with a plug according to DS 60884-2-D1:2011.		N
	Class I equipment provided with socket-outlets provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.		N
	If a single-phase equipment having rated >13 A or poly- phase equipment provided with a supply cord with a plug, plug in accordance with the standard sheets DK 6- 1a in DS 60884-2-D1 or EN 60309-2.		N
	Mains socket outlets intended for providing power to Class II apparatus rated 2,5 A in accordance with DS 60884-2-D1:2011 standard sheet DKA 1- 4a.		N
	Other current rating socket outlets in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.		N
	Mains socket-outlets with earth in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1- 3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a		N
G.4.2	**United Kingdom:** The plug part of direct plug-in equipment assessed to BS 1363		N
G.7.1	**United Kingdom:** Equipment fitted with a ‘standard plug’ in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768		N
G.7.1	**Ireland:** Apparatus provided with a plug in accordance with Statutory Instrument 525: 1997, “13 A Plugs and Conversion Adapters for Domestic Use		N
G.7.2	**Ireland and United Kingdom:** A power supply cord for equipment which is rated over 10 A and up to and including 13 A.		N
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		--
10.5.2	**Germany:** Cathode ray tube intended for the display of visual images, authorization or application of type approval and marking.		N

4.1.2	TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity[1]
Battery	HuiZhou Kangpin Lai Technology Co., Ltd	KPL65430	5V, 125mAH	IEC 62133	Tested with appliance
PCB	Yuwei Electronics	A57A	V-1.0, 130°C	UL 94	UL
Internal wire	Kangdakuan	1571#28	380MM*2C	UL 758	UL
Plastic enclosure	Anjiahongli	ABS PP	V-0, 105°C	UL94	UL
Sensor	Ming Hao	DA260	24Ω	EN IEC 60730	Tested with appliance
LED	Rohm electron	0402	2.2V, 10mA	UL94	UL
SMD IND	TDK	MLF2012E330JTD25	2*1.2*1.2mm	UL 94	UL
Supplementary information:--					

4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests		N
(The following mechanical tests are conducted in the sequence noted.)			
4.8.4.2	TABLE: Stress relief test		—
Part	Material	Oven Temperature (°C)	Comments
4.8.4.3	TABLE: Battery replacement test		—
Battery part no. .....:			—
Battery Installation/withdrawal		Battery Installation/Removal Cycle	Comments
		1	
		2	
		3	
		4	
		5	
		6	
		8	
		9	
		10	
4.8.4.4	TABLE: Drop test		—

4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests		N
(The following mechanical tests are conducted in the sequence noted.)			
Impact Area	Drop Distance	Drop No.	Observations
		1	
		2	
		3	
4.8.4.5	TABLE: Impact		—
Impacts per surface	Surface tested	Impact energy (Nm)	Comments
4.8.4.6	TABLE: Crush test		—
Test position	Surface tested	Crushing Force (N)	Duration force applied (s)
Supplementary information:			

4.8.5	TABLE: Lithium coin/button cell batteries mechanical test result		N
Test position	Surface tested	Force (N)	Duration force applied (s)
Supplementary information:			

5.2	Table: Classification of electrical energy sources						P
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (Apk or Arms)	Hz	
1	5V	Internal circuit	Normal	4	--	DC	ES1
			Abnormal	--	--	--	
			Single fault – SC/OC: USB SC	4	--	DC	
2	Fully charged battery	Battery pack output	Normal	5V	0	DC	ES1
			Abnormal	--	--	--	
			Single fault – SC/OC: P- and B -, SC	5V	0	DC	

5.2.2.3 – Capacitance Limits						
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class
				Capacitance, nF	Upk (V)	
--	--	--	Normal	--	--	--
			Abnormal	--	--	
			Single fault – SC/OC	--	--	

5.2.2.4 – Single Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	Ipk (mA)	
--	--	--	Normal	--	--	--	
			Abnormal	--	--	--	
			Single fault – SC/OC	--	--	--	--

5.2.2.5 – Repetitive Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
--	--	--	Normal	--	--	--	--
			Abnormal	--	--	--	
			Single fault – SC/OC	--	--	--	

Test Conditions:
Normal – Abnormal –
Supplementary information: SC=Short Circuit, OC=Short Circuit

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements			P
	Supply voltage (V) .....:	5VDC		—
	Ambient T_{amb} (°C) .....:	24.8	25.1	—
Maximum measured temperature T of part/at:		T (°C)		Allowed T_{max} (°C)
PCB		35.8	38.6	130
Internal wire		27.2	28.5	70
Battery surface		31.3	33.1	45
Enclosure inside near battery		27.8	28.3	Ref.
Enclosure outside near battery		27.2	27.5	48

Supplementary information: *) Temperature limits for winding include less 10K for thermocouple measurement method.

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	TK20P (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Supplementary information:
Note 1: Tma should be considered as directed by appliable requirement
Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics		N
Allowed impression diameter (mm) .....:		≤ 2 mm	—
Object/Part No./Material	Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)
--	--	--	--
Supplementary information:			

5.4.2.2, 5.4.2.4 and 5.4.3	TABLE: Minimum Clearances/Creepage distance						N
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz)[1]	Required cl (mm)	cl (mm)[2]	Required cr (mm)[3]	cr (mm)
--	--	--	--	--	--	--	--

Supplementary information:
Note 1: Only for frequency above 30 kHz
Note 2: See table 5.4.2.4 if this is based on electric strength test
Note 3: Provide Material Group

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage			N
	Overvoltage Category (OV):			--
	Pollution Degree:			--
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)
--		--	--	--
Supplementary information:				

5.4.2.4	TABLE: Clearances based on electric strength test			N
Test voltage applied between:	Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No	
--	--	--	--	
Supplementary information:				

5.4.4.2, 5.4.4.5 c) 5.4.4.9	TABLE: Distance through insulation measurements					N
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)	
--	--	--	--	--	--	
Supplementary information:						

5.4.9	TABLE: Electric strength tests			N
Test voltage applied between:	Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No	

5.4.9	TABLE: Electric strength tests			N
Test voltage applied between:	Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No	
Functional:				
--	--	--	--	
Basic/supplementary:				
--	--	--	--	
Reinforced:				
--	--	--	--	
Routine Tests:				
--	--	--	--	
Supplementary information:				

5.5.2.2	TABLE: Stored discharge on capacitors				N
Supply Voltage (V), Hz	Test Location	Operating Condition (N, S)	Switch position On or off	Measured Voltage (after 2 seconds)	ES Classification
--	--	--	--	--	--

Supplementary information:
X-capacitors installed for testing are:
□ bleeding resistor rating:
□ ICX:
Notes:
A. Test Location:
Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth
B. Operating condition abbreviations:
N – Normal operating condition (e.g., normal operation, or open fuse); S –Single fault condition

5.6.6.2	TABLE: Resistance of protective conductors and terminations			N
Accessible part	Test current (A)	Duration(min)	Voltage drop (V)	Resistance(Ω)
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
Supplementary information:				

5.7.2.2, 5.7.4	TABLE: Earthed accessible conductive part	N
Supply voltage.....:		—
Location	Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)
--	1	--
--	2*	--
--	3	--
--	4	--
--	5	--
--	6	--
--	7	--

Supplementary Information:

Notes:

[1] Supply voltage is the anticipated maximum Touch Voltage

[2] Earthed neutral conductor [Voltage differences less than 1% or more]

[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.

[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

6.2.2	Table: Electrical power sources (PS) measurements for classification				P
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s*)	PS Classification
A	Battery pack output	Power (W) :	--	0.148	PS2
		V_A (V) :	--	3.7	
		I_A (A) :	--	0.04	
B	Battery cell output before protect board	Power (W) :	--	0.532	PS2
		V_A (V) :	--	3.5	
		I_A (A) :	--	0.152	

Supplementary Information:

(*) Measurement taken only when limits at 3 seconds exceed PS1 limits

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)			N
Location	Open circuit voltage After 3 s (Vp)	Measured r.m.s current (Irms)	Calculated value (Vp x Irms)	Arcing PIS? Yes / No
--	--	--	--	--
Supplementary information: An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V_p) and normal operating condition rms current (I_{rms}) is greater than 15.				

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				P
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
Battery cell	S-C	22.5	11.9	No	No
Supplementary Information: A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification. A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.					

8.5.5	TABLE: High Pressure Lamp		N
Description	Values	Energy Source Classification	
Lamp type.....:		—	
Manufacturer .....:		—	
Cat no. .....:		—	
Pressure (cold) (MPa) .....:		MS_	
Pressure (operating) (MPa).....:		MS_	
Operating time (minutes).....:		—	
Explosion method.....:		—	
Max particle length escaping enclosure (mm) .:		MS_	
Max particle length beyond 1 m (mm).....:		MS_	
Overall result .....:			
Supplementary information:			

B.2.5	TABLE: Input test						P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
4.0	0.018	--	0.072	0.09	--	--	1/8 power of non-clipped output power, 1 kHz sinusoidal wave, and operated on bluetooth mode.
4.0	0.021	--	0.084	0.09	--	--	Only charging.
4.0	0.022	--	0.088	--	--	--	1/8 power of non-clipped output power, 1 kHz sinusoidal wave, and operated on bluetooth mode.
Supplementary information:							

B.3, B.4	TABLE: Abnormal operating condition tests							P
Ambient temperature (°C) .....:			25°C if not mentioned					—
Power source for EUT: Manufacturer, model/type, output rating .:			See page 2					—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
U1	S-C	5VDC	10 mins	--	--	--	--	The appliance can't work, no harzard, no broken
D1	S-C	5VDC	10 mins	--	--	--	--	The appliance can't work, no harzard, no broken
C3	S-C	5VDC	10 mins	--	--	--	--	The appliance can't work, no harzard, no broken
Battery	S-C	5VDC	10 mins	--	--	--	--	The appliance can't work, no harzard, no broken
Battery	Over-charge	5VDC	7 hours	--	--	--	--	Unit normal working, Record temperature: PCB: 33.2°C Battery surface: 32.4°C No damage, no hazard.
Battery	Over-discharge	--	7 hours	--	--	--	--	Unit normal working, Record temperature: PCB: 32.8°C Battery surface: 31.5°C No damage, no hazard.

Supplementary information:

Annex M	TABLE: Batteries								P
The tests of Annex M are applicable only when appropriate battery data is not available									--
Is it possible to install the battery in a reverse polarity position? .....:							--		--
	Non-rechargeable batteries				Rechargeable batteries				
	Discharging		Un-intentional charging		Charging		Discharging		Reversed charging
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition	--	--	--	12A	400mA	12A	400mA	--	--
Max. current during fault condition	--	--	--	12A	400mA	12A	400mA	--	--

Test results:		Verdict
- Chemical leaks	No leaks	P
- Explosion of the battery	No explosion	P
- Emission of flame or expulsion of molten metal	No emission	P
- Electric strength tests of equipment after completion of tests	--	P
Supplementary information:		

Annex M.4	**Table: Additional safeguards for equipment containing secondary lithium batteries**				P
Battery/Cell No.	Test conditions	Measurements			Observation
		U	I (A)	Temp (C)	
--	Normal	3.7	400mA	45	--
--	Abnormal	--	--	--	--
--	Single fault–SC/OC	--	--	--	--
Supplementary Information: see table Annex B.4 for detail					

Battery identification	Charging at T_{lowest} (°C)	Observation	Charging at $T_{highest}$ (°C)	Observation
602040 Li-ion Battery	0	Charging current: 0	45	Charging current: 0
Supplementary Information:				

Annex Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**						N
Note: Measured UOC (V) with all load circuits disconnected:							
Output Circuit	Components	U_{OC} (V)	I_{SC} (A)		S (VA)		
			Meas.	Limit	Meas.	Limit	
--	--	--	--	--	--	--	
Supplementary Information: S-C=Short circuit, O-C=Open circuit							

T.2, T.3, T.4, T.5	TABLE: Steady force test				P
Part/Location	Material	Thickness (mm)	Force(N)	Test Duration (sec)	Observation
Top enclosure	Plastic	1.5	100	5	No damaged
Side enclosure	Plastic	1.5	100	5	No damaged
Bottom enclosure	Plastic	1.5	100	5	No damaged
Supplementary information:					

T.6, T.9	TABLE: Impact tests			N
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
--	--	--	--	--
--	--	--	--	--
Supplementary information:				

T.7	TABLE: Drop tests			P
Part/Location	Material	Thickness(mm)	Drop Height (mm)	Observation
Top enclosure	Plastic	1.5	1000	No damaged
Side enclosure	Plastic	1.5	1000	No damaged
Bottom enclosure	Plastic	1.5	1000	No damaged
Supplementary information:				

T.8	TABLE: Stress relief test				P
Part/Location	Material	Thickness(mm)	Oven Temperature (°C)	Duration (h)	Observation
Completed sample	Plastic enclosure (for all sources)	Min. 1.5	70	7	No damaged, no hazards.
Supplementary information: For details refer to appended table 4.1.2.					

ATTACHMENTS: REAL PHOTOS

Photo 1

Photo 2

Photo 3

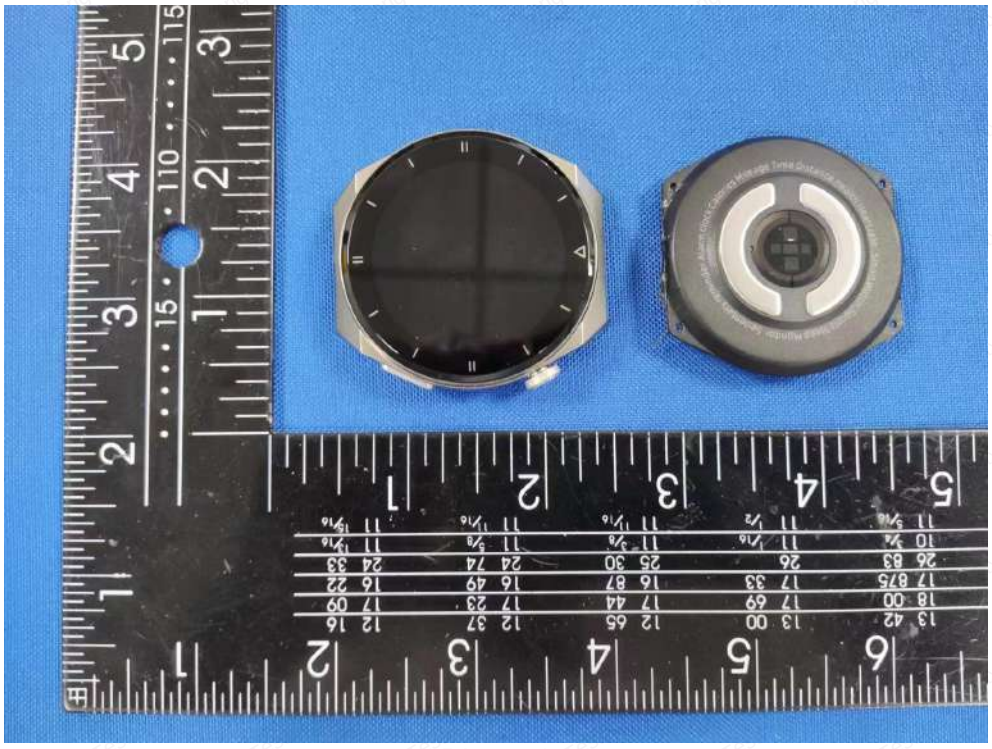

Photo 4

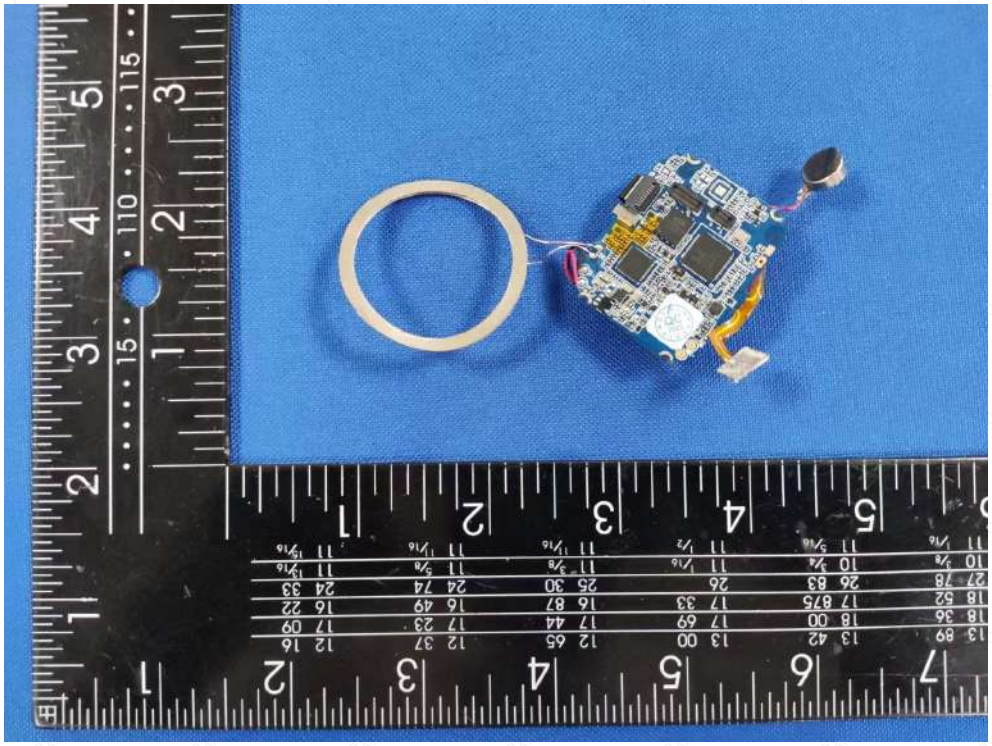

Photo 5

*****End of the report*****

EN62479 TEST REPORT

On Behalf of

Shenzhen Tiankang Medical Technology Co., Ltd

Product Name:	Smart watches
Trademark:	N/A
Model Number:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Prepared For:	Shenzhen Tiankang Medical Technology Co., Ltd
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Prepared By:	Shenzhen Huaxiang Testing Co , Ltd
Address:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Report No.:	HUAX240318026KR

TEST REPORT DECLARATION

Applicant	:	Shenzhen Tiankang Medical Technology Co., Ltd
Address :	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
EUT Description :	:	Smart watches
Model Number	:	TK20P
Test Date		Mar. 15, 2024 - Mar. 21, 2024
Date of Report		Mar. 21, 2024

Test Standards:

EN62479:2010

The EUT described above is tested by Huaxiang Testing Technology Co , Ltd EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT.huaxiang is assumed full responsibility for the accuracy of the test results. Also, this report shows th at the EUT technically complies with the EN62479:2010 requirements.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the Shenzhen Huaxiang Testing Co , Ltd.

Prepared by(Test Engineer): Joan Wang

Approved(Manager): Amy Jiang

. General Information

General Description Of EUT

Equipment	Smart watches
Brand Name	N/A
Model Name.	TK20P
OEM Brand/Model Name	TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Model Difference	Remark: supplementary models are similar except the model name for different power. All the tests of this report are carried on TK20P.
Applicant	Shenzhen Tiankang Medical Technology Co., Ltd
Applicant Address	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer	Shenzhen Tiankang Medical Technology Co., Ltd
Manufacturer Address	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Product Description	The EUT is Smart watches Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	/
Power Source	DC 5V
Power Rating	DC 5V
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	N/A

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

. EN 62479 REQUIREMENT

GENERAL INFORMATION

The essential requirements of Directive 99/5/ec in the article 3.1(a) and the limits must be taken from Council Recommendation 2014/53/EU for General Population or from the ICNIRP Guidelines for Occupational Exposure, EN 62479:2010 assesment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to humanexposure to electromagnetic fieldS (10 MHz to 300 GHz)

Limit

A. Typical usage, installation and the physical characteristics of equipment make iti nherently compliant with the applicable EMF exposure levels such as those listed in the bibliography. This low-power equipment includes unintentional (or non-intentional) radiators, for example incandescent light bulbs and audio/visual (A/V) equipment, information technology equipment (ITE) and multimedia equipment (MME) that does not contain radio transmitters.

NOTE Equipment is described as A/V equipment, ITE or MME if its main use is playback/recording of music, voice or images, or processing of digital information.

B. The input power level to electrical or electronic components that are capable of radiating electromagnetic energy in the relevant frequency range is so low that the available antenna power and/or the average total radiated power cannot exceed the low-power exclusion level defined in 4.2.

C. The available antenna power and/or the average total radiated power are limited by product standards for transmitters to levels below the low-power exclusion level defined in 4.2.

D. Measurements or calculations show that the available antenna power and/or the average total radiated power are below the low-power exclusion level defined in 4.2.

2.3 Result

PASS

The available antenna power of this EUT is **1.95mW(2.679dBm)** the power are below the low-power exclusion level defined in 4.2(Pmax: 20mW).

APPENDIX- PHOTOS OF EUT

Photo 1

Photo 2

Photo 3

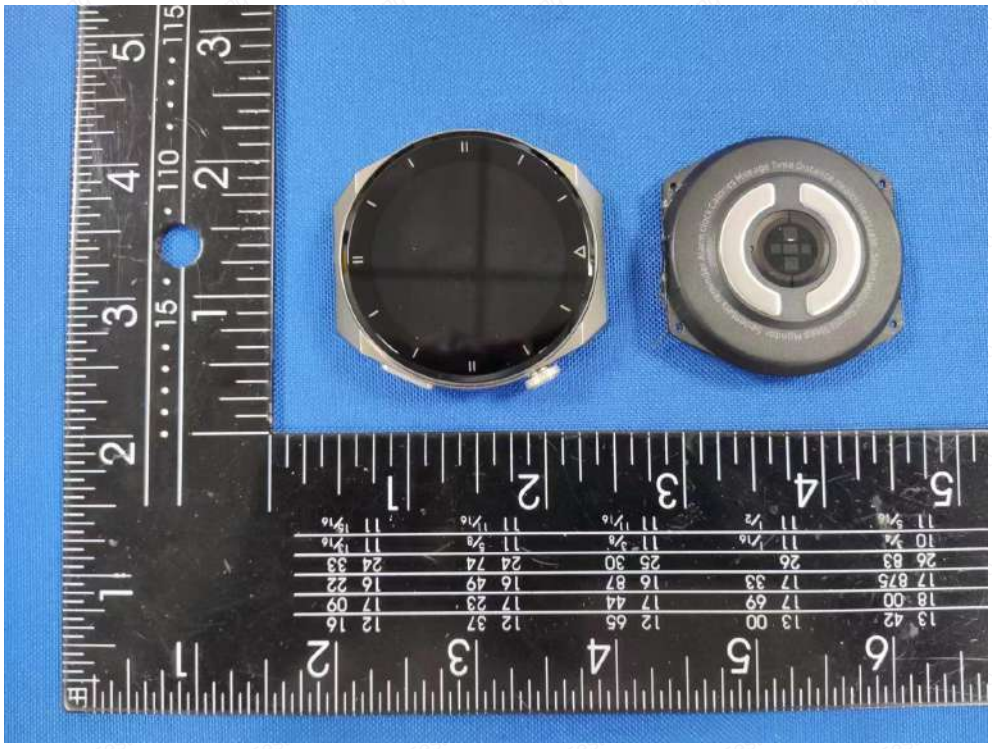

Photo 4

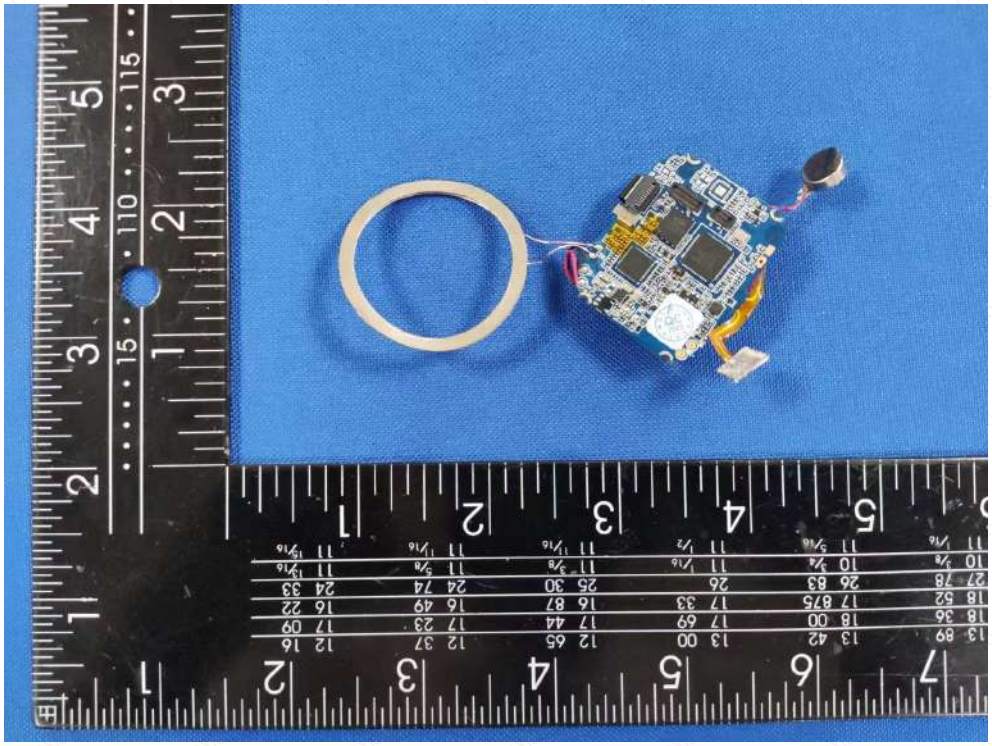

Photo 5

**********END OF REPORT**********

EMC TEST REPORT

On Behalf of

Shenzhen Tiankang Medical Technology Co., Ltd

Product Name:	Smart watches
Trademark:	N/A
Model Number:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Prepared For:	Shenzhen Tiankang Medical Technology Co., Ltd
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Prepared By:	Shenzhen Huaxiang Testing Co , Ltd
Address:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Report No.:	HUAX240318027KR

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TEST REPORT DECLARATION

Applicant	:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address :	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer:	:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address :	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
EUT Description :	:	**Smart watches**
Model Number	:	**TK20P**
Rating(s)	:	DC 5V
Test Date		Mar. 15, 2024 - Mar. 21, 2024
Date of Report		Mar. 21, 2024

Test Standards:

ETSI EN 301 489-1 V2.2.3

ETSI EN 301 489-17 V3.2.4

The EUT described above is tested by Huaxiang Testing Technology Co , Ltd. EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen Huaxiang Testing Co , Ltd. is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the2014/30/EU directive and its amendment requirements.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Prepared by(Test Engineer): Joan Wang

Approved(Manager): Amy Jiang

. TEST SUMMARY

Test procedures according to the technical standards:
ETSI EN 301 489-1 V2.2.3
ETSI EN 301 489-17 V3.2.4

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55022:2010	Conducted Emission	Class B	N/A	
	Radiated Emission	Class B	PASS	
EN61000-3-2:2006/A2:2009	Harmonic Current Emission	Class A or D NOTE (2)	N/A	
EN 61000-3-3:2008	Voltage Fluctuations & Flicker	------	N/A	
EMC Immunity				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006/A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2004/A1:2010	Fast transients	B	N/A	
EN 61000-4-5:2006	Surges	B	N/A	
EN 61000-4-6:2009	Injected Current	A	N/A	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C / C **NOTE (3)**	N/A	

NOTE:
(1)" N/A" denotes test is not applicable in this Test Report
(2) The power consumption of EUT is less than 75W and no Limits apply.
(3) Voltage dip: 0% reduction – Performance Criteria **B**
Voltage dip: 70% reduction – Performance Criteria **C**
Voltage Interruption: 0% Interruption – Performance Criteria **C**
(4) For client's request and manual description, the test will not be executed.

TEST FACILITY

Name and address of the testing laboratory :

Shenzhen Huaxiang Testing Co , Ltd

201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U** · where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** · providing a level of confidence of approximately **95** %。

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U · (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U · (dB)	NOTE
OS01	ANSI	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
OS02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Equipment	Smart watches
Brand Name	N/A
Model Name.	TK20P
OEM Brand/Model No.	TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Model Difference	Remark: supplementary models are similar except the model name for different power. All the tests of this report are carried on TK20P.
Manufacturer	Shenzhen Tiankang Medical Technology Co., Ltd
Manufacturer Address	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Power Source	DC 5V
Power Rating	DC 5V
Connecting I/O Port(s)	Please refer to the User's Manual

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Smart watches

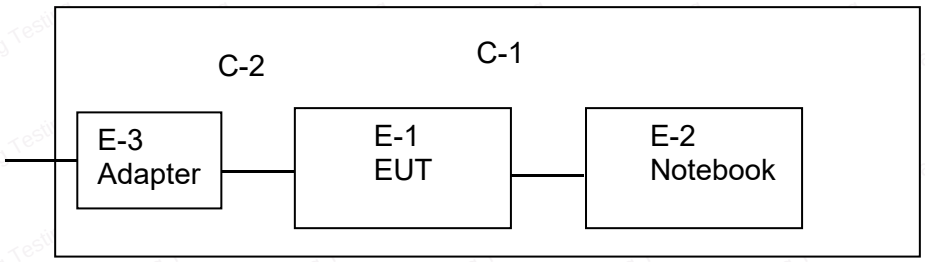
For Conducted Test	
Final Test Mode	Description
Mode 1	Smart watches

For Radiated Test	
Final Test Mode	Description
Mode 1	Smart watches

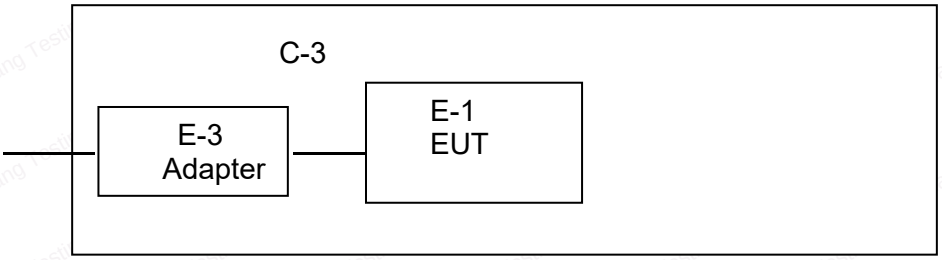
For EMS Test	
Final Test Mode	Description
Mode 1	Smart watches

DESCRIPTION OF TEST SETUP

Radiated:



Conduction:



DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Smart watches	N/A	TK20P	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

MEASUREMENT INSTRUMENTS LIST

CONDUCTED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00042991	Nov. 20, 2024
2	LISN	EMCO	3816/2	00042990	Nov. 20, 2024
3	Pulse Limiter	Electro-Metrics	EM-7600	112644	Nov. 20, 2024
4	50Ω Terminator	N/A	N/A	N/A	Nov. 20, 2024
5	Test Cable	N/A	C01	N/A	Nov. 20, 2024
6	EMI Test Receiver	R&S	ESCI	100082	Nov. 20, 2024

RADIATED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3058	Nov. 20, 2024
2	Test Cable	N/A	10M_OS02	N/A	Nov. 20, 2024
3	Test Cable	N/A	OS02-1/-2/-3	N/A	Nov. 20, 2024
4	Pre-Amplifier	Anritsu	MH648A(OS 02)	M10061	Nov. 20, 2024
5	EMI Test Receiver	R&S	ESCI	100082	Nov. 20, 2024
6	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A
7	Turn Table	Chance Most	CMTB-1.5	N/A	N/A

HARMONICS AND FILCK

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonic & Flicker	California	PACS-1	72345	Nov. 20, 2024
2	Power Source	California	3001iX	56310	Nov. 20, 2024

ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	Thermo	MZ-15/EC	0502184	Nov. 20, 2024

RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	R&S	SMT 06	832080/007	Nov. 20, 2024
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Nov. 20, 2024
3	Power Amplifier	AR	150W1000M1	320946	Nov. 20, 2024
4	Microwave Horn Antenna	AR	AT4002A	321467	Nov. 20, 2024
5	Power Amplifier	AR	25S1G4A	308598	Nov. 20, 2024

SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMC Immunity Test System	Thermo	EMCPRO PLUS	0502176	Nov. 20, 2024

INJECTION CURRENT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	IFR	2023A	202301/368	Nov. 20, 2024
2	Power Amplifier	AR	75A250AM1	0320709	Nov. 20, 2024
3	CDN	FCC	FCC-801-M2	06043	Nov. 20, 2024
4	EM Clamp	FCC	F-203I-23MM	504	Nov. 20, 2024

. EMC EMISSION TEST

CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

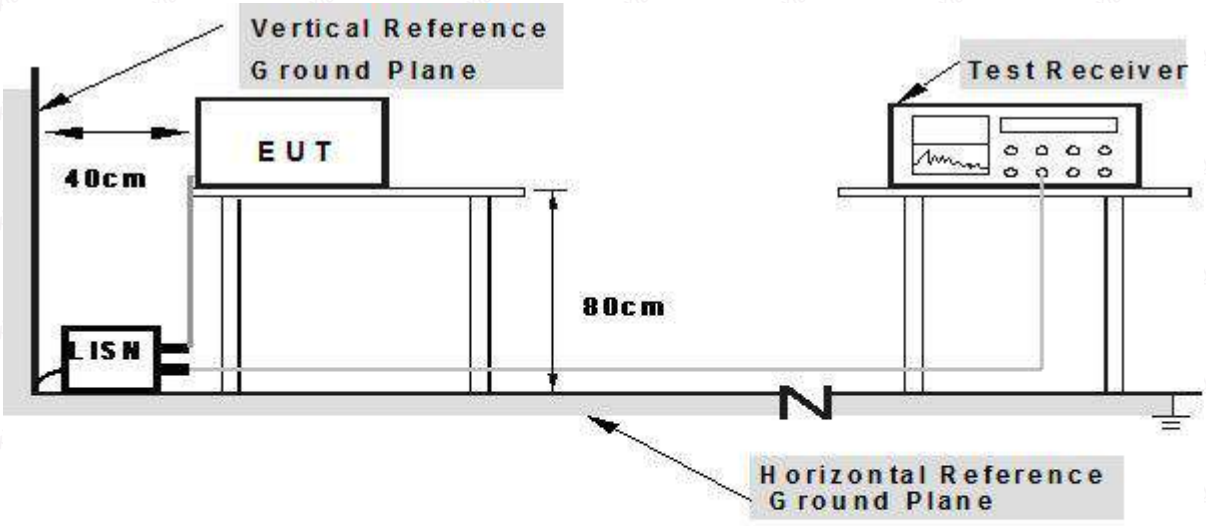
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

RADIATED EMISSION MEASUREMENT

LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (at 10m) dBuV/m		Class B (at 10m) dBuV/m	
	Peak	Avg	Peak	Avg
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 22/ FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

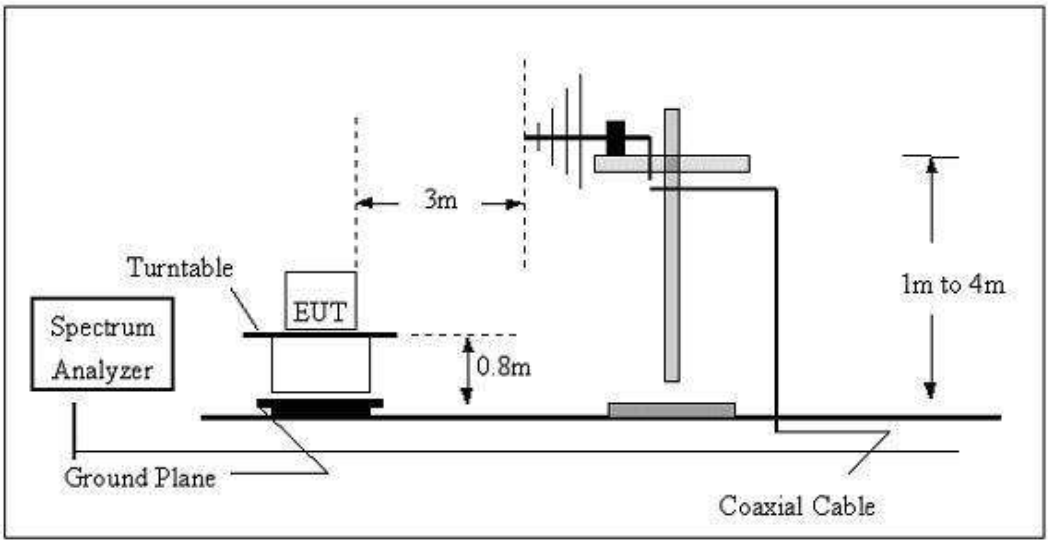
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP

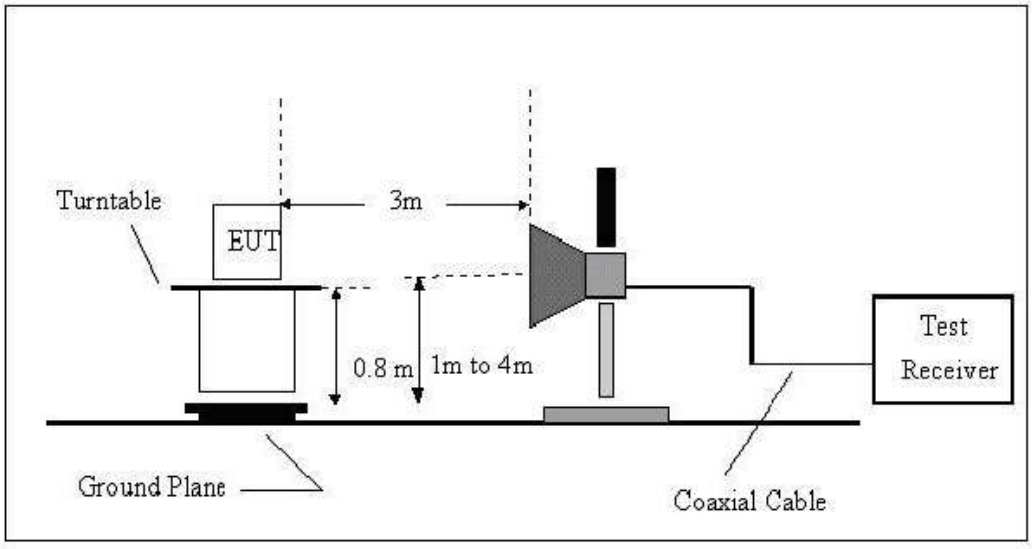
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Above 1GHz

(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



EUT OPERATING CONDITIONS

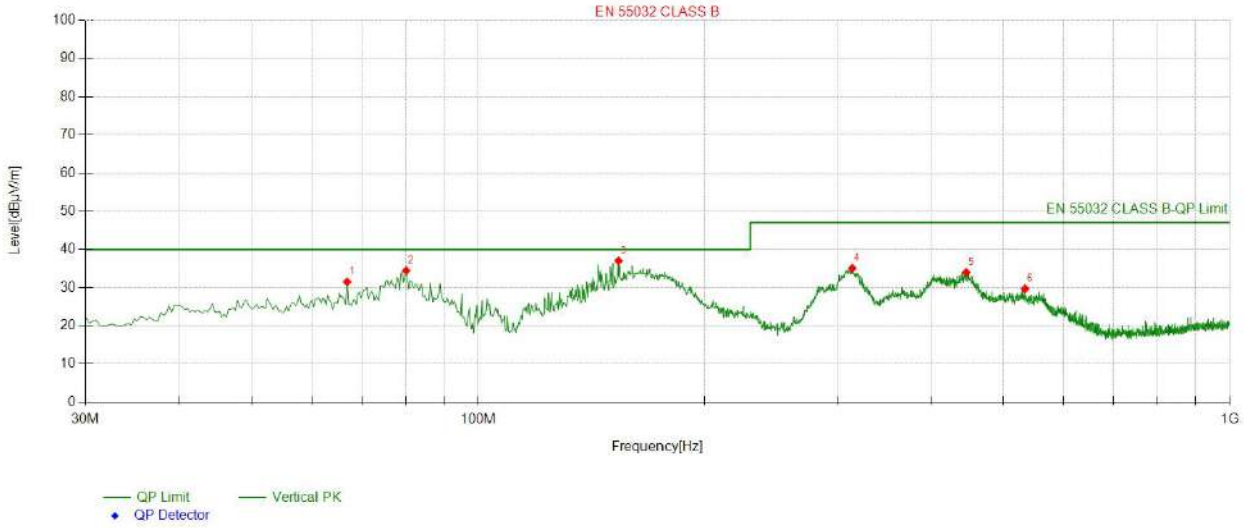
The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS (30-1000MHz)

EUT:	Smart watches	Model Name :	TK20P
Temperature:	24 ℃	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Mode :	Smart watches	Polarization :	Horizontal
Test Power :			

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	80.133378	-21.03	46.10	25.07	40.00	14.93	100	193	Horizontal
2	143.20440	-16.63	46.85	30.22	40.00	9.78	100	136	Horizontal
3	317.21573	-17.01	53.57	36.56	47.00	10.44	100	117	Horizontal
4	401.63387	-15.49	53.62	38.13	47.00	8.87	100	329	Horizontal
5	564.97165	-12.81	38.70	25.89	47.00	21.11	100	47	Horizontal
6	828.57619	-9.26	30.77	21.51	47.00	25.49	100	136	Horizontal

EUT:	Smart watches	Model Name :	TK20P
Temperature:	24 ℃	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Mode :	Smart watches	Polarization :	Vertical
Test Power :			



Suspected List

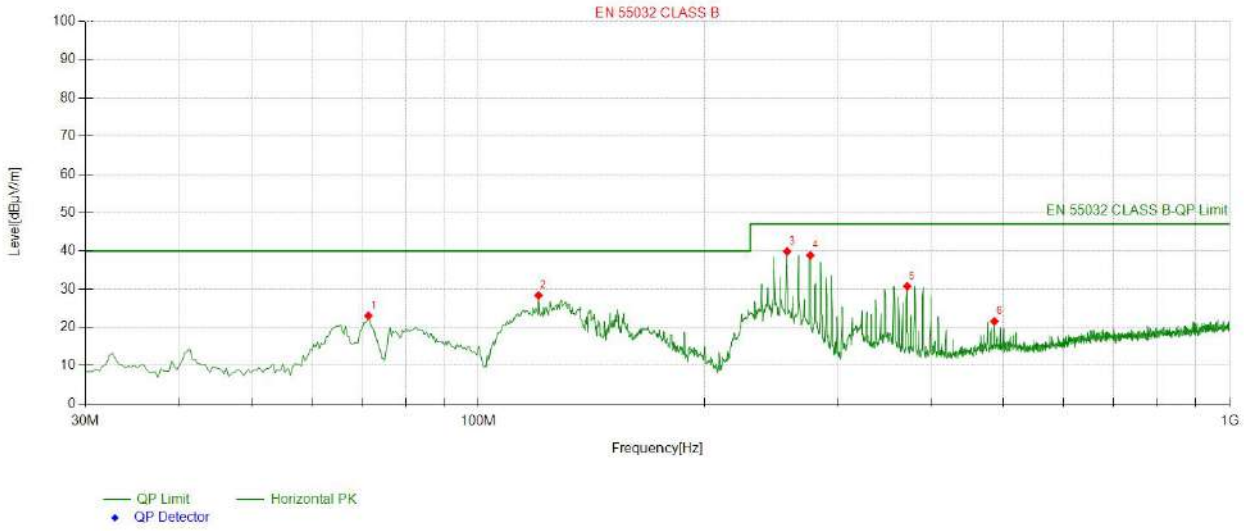
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	66.872291	-19.11	50.57	31.46	40.00	8.54	100	349	Vertical
2	80.133378	-21.03	55.44	34.41	40.00	5.59	100	351	Vertical
3	153.55451	-16.21	53.22	37.01	40.00	2.99	100	307	Vertical
4	314.30476	-17.10	52.16	35.06	47.00	11.94	100	171	Vertical
5	445.62187	-14.49	48.45	33.96	47.00	13.04	100	99	Vertical
6	533.59786	-13.36	43.04	29.68	47.00	17.32	100	184	Vertical

TEST RESULTS(1000-6000)

EUT:	Smart watches	Model Name :	TK20P
Temperature:	24 ℃	Relative Humidity:	54 %
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Mode :	Smart watches		
Test Power :			

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.996999	-16.48	47.83	31.35	40.00	8.65	100	280	Vertical
2	71.400467	-19.92	49.86	29.94	40.00	10.06	100	287	Vertical
3	145.46848	-16.55	47.66	31.11	40.00	8.89	100	308	Vertical
4	276.46215	-17.84	49.15	31.31	47.00	15.69	100	329	Vertical
5	381.25708	-15.95	37.55	21.60	47.00	25.40	100	316	Vertical
6	486.05201	-14.05	38.63	24.58	47.00	22.42	100	130	Vertical

EUT:	Smart watches	Model Name :	TK20P
Temperature:	24 ℃	Relative Humidity:	54 %
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Mode :	Smart watches		
Test Power :			



Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.400467	-19.92	42.95	23.03	40.00	16.97	100	5	Horizontal
2	120.24008	-17.93	46.34	28.41	40.00	11.59	100	343	Horizontal
3	257.37912	-18.32	58.20	39.88	47.00	7.12	100	251	Horizontal
4	276.46215	-17.84	56.70	38.86	47.00	8.14	100	219	Horizontal
5	371.87729	-16.14	46.85	30.71	47.00	16.29	100	232	Horizontal
6	486.05201	-14.05	35.61	21.56	47.00	25.44	100	109	Horizontal

3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

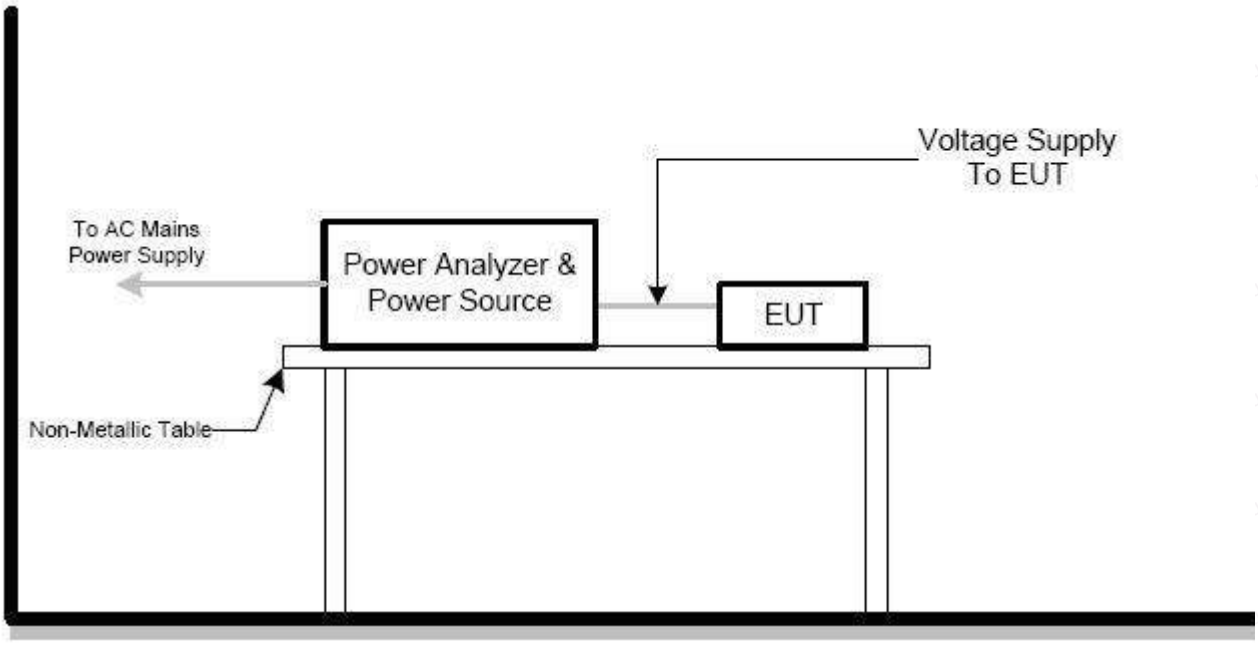
3.3.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
b. The classification of EUT is according to section 5 of EN 61000-3-2: 2000.The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to600 W of the following types: Personal computers and personal computer monitors and television receivers.
c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.
d. For the actual test configuration, please refer to the related item –EUT Test Photos.

3.3.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.4 TEST SETUP



3.3.5 TEST RESULTS

N/A(Below 75W)

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

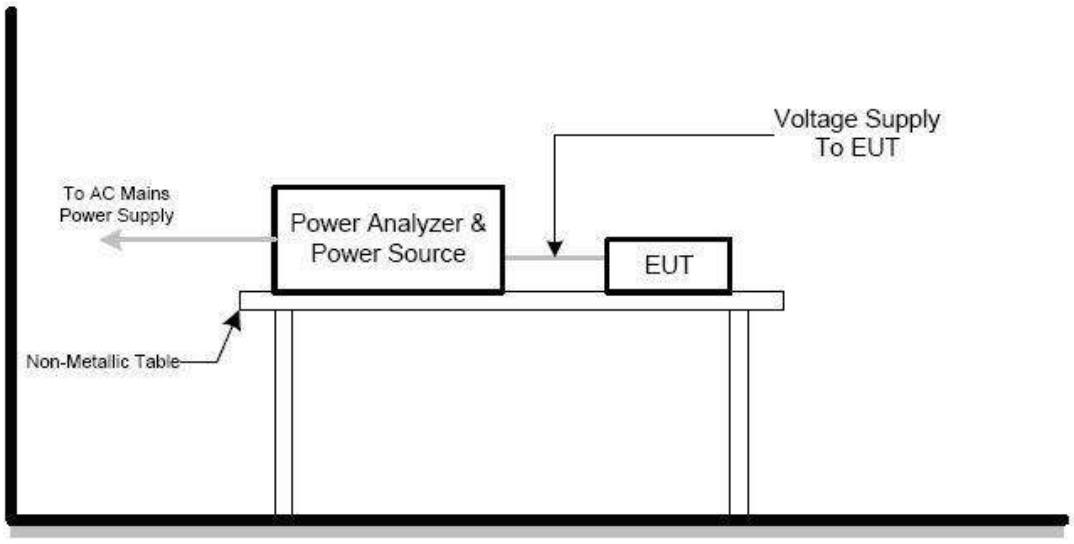
3.4.2TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.4.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.4 TEST SETUP



3.4.5 TEST RESULTS

EUT:		Model Name :	
Temperature:		Relative Humidity:	
Pressure:		Test Date :	
Test Mode :			
Result:			

Test Parameter	Measurement Value	Limit	Remarks
Pst		1.0	N/A
D(t)>3.3%(ms)		500	N/A
d_{max}(%)		4%	N/A
d_c(%)		3.3%	N/A

. EMC IMMUNITY TEST

STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION Level	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B	Pass
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B	Pass
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz 1400 MHz to 2700 MHz 230V/m(rms), 1000Hz, 80%, AM modulated	Enclosure	A	Pass
3. EFT/Burst IEC/EN 61000-4-4	1.0KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B	N/A
	0.5 KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B	N/A
4. Surges IEC/EN 61000-4-5	0.5 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-N	B	N/A
	1 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B	N/A
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz 230V(rms), 1000Hz 80 % , AM Modulated 150Ω source impedance	CTL/Signal Port	A	N/A
	0.15 MHz to 80 MHz 230V(rms), 1000Hz 80 % , AM Modulated 150Ω source impedance	AC Power Port	A	N/A
	0.15 MHz to 80 MHz 230V(rms), 1000Hz 80 % , AM Modulated 150Ω source impedance	DC Power Port	A	N/A
6. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 0% Voltage dip 70% Interruption 0%	AC Power Port	B C C	N/A

* Remark:

N/A : denotes test is not applicable in this Test Report

(1) : The EUT is a battery operating device and no any other cable connection to PC device.

(2) : Applicable only to cables which according to the manufacturer's specification supports communication on cables lengths greater than 3 m.

(3) : Applicable only to equipment containing devices susceptible to magnetic fields

GENERAL PERFORMANCE CRITERIA

According to **EN 301489**standard, the general performance criteria as following:

Criterion A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

PERFORMANCE CRITERIA FOR CT AND CR

A communication link shall be established at the start of the test, and maintained during the test. During the test, the RXQUAL of the downlink shall not exceed 3, measured during each individual exposure in the test sequence. Both the uplink speech output level and the downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band Pass filter of width 200 Hz, centered on 1 kHz (audio breakthrough check). At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

PERFORMANCE CRITERIA FOR TT AND TR

A communications link shall be established at the start of the test. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

ESD TESTING

TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge:2kV/4kV/8kV (Direct) Contact Discharge:2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	AC Discharge
Discharge Period:	1 second minimum

TEST PROCEDURE

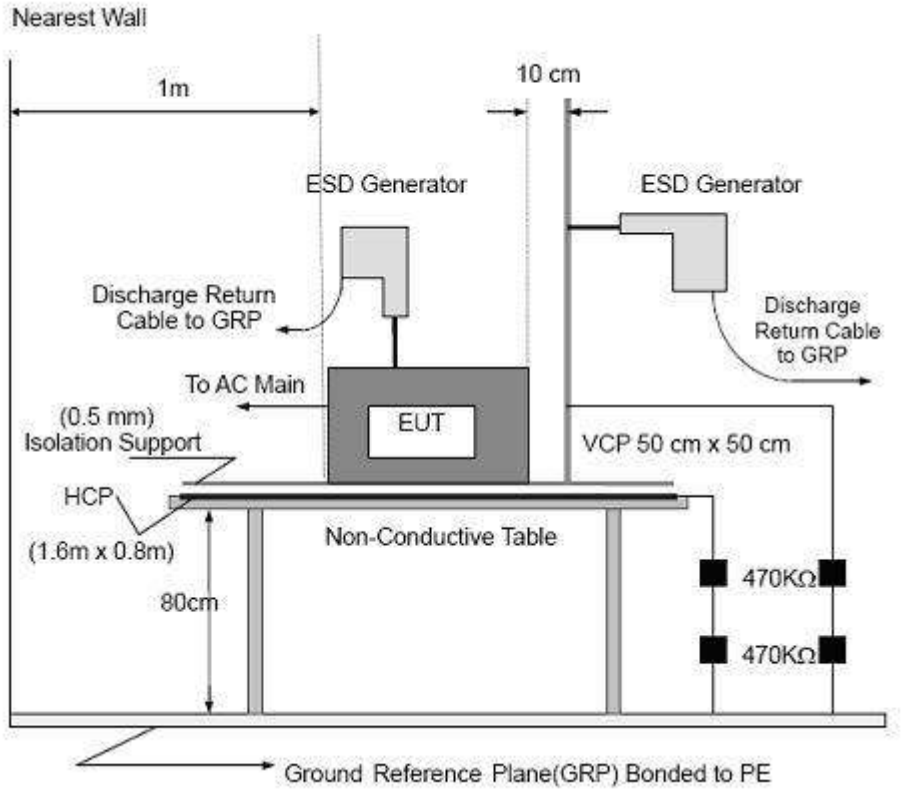
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

TEST RESULTS

EUT:	Smart watches	Model Name :	TK20P
Temperature:	25 ℃	Relative Humidity:	45%
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Power :			

Test Mode: Smart watches Mode

Mode	Air Discharge								Contact Discharge							
	2KV		4KV		8KV		12KV		2KV		4KV		6KV		8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
enclosure	A	A	A	A	A	A										
slit	A	A	A	A	A	A										
Port	A	A	A	A	A	A										
Metal									A	A	A	A				
HCP									A	A	A	A				
VCP									A	A	A	A				
Observation	**TT,TR**								**TT,TR**							
Criteria	**B**								**B**							
Result	**A**								**A**							
Judgment	**PASS**								**PASS**							

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1.left side 2.right side 3.front side 4.rear side
5) N/A - denotes test is not applicable in this test report

RS TESTING

TEST SPECIFICATION

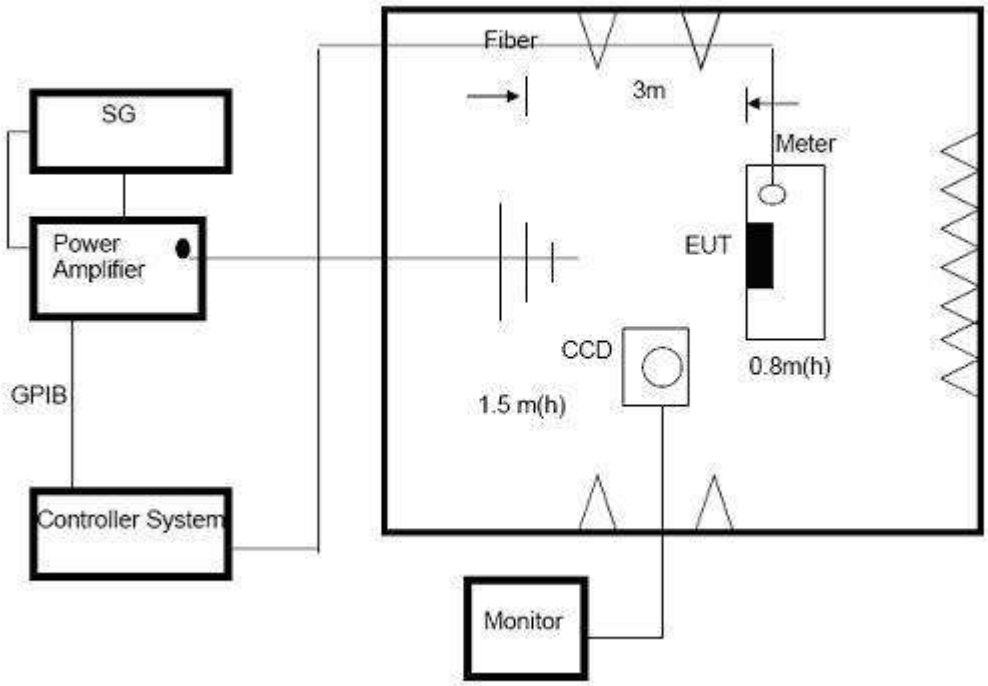
Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz ,1400MHz-2700MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The field strength level was 230V/m.
b. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

TEST RESULTS

EUT:	Smart watches	Model Name :	TK20P
Temperature:	25 ℃	Relative Humidity:	45%
Pressure:	1010 hPa	Test Date :	2024-03-18
Test Power :			

Test Mode: Smart watches Mode

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results	Judgment
80~1000 1400-2700	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**CT,CR**	**A**	**A**	**Pass**
			Rear				
			Left				
			Right				

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - the test is not applicable in this test report.
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

EFT/BURST TESTING

TEST SPECIFICATION

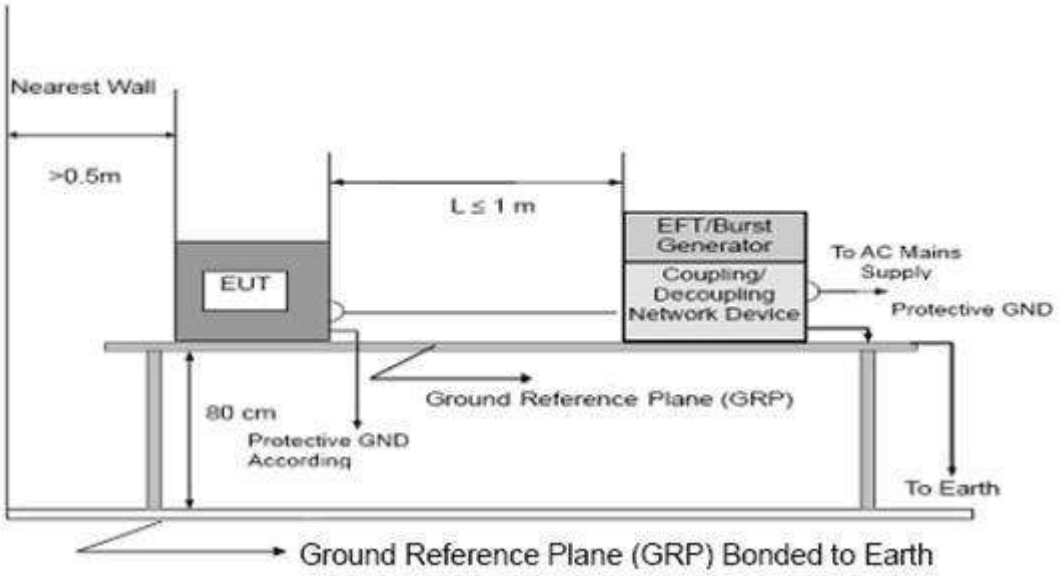
Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line:1 kV Signal/Control Line:0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

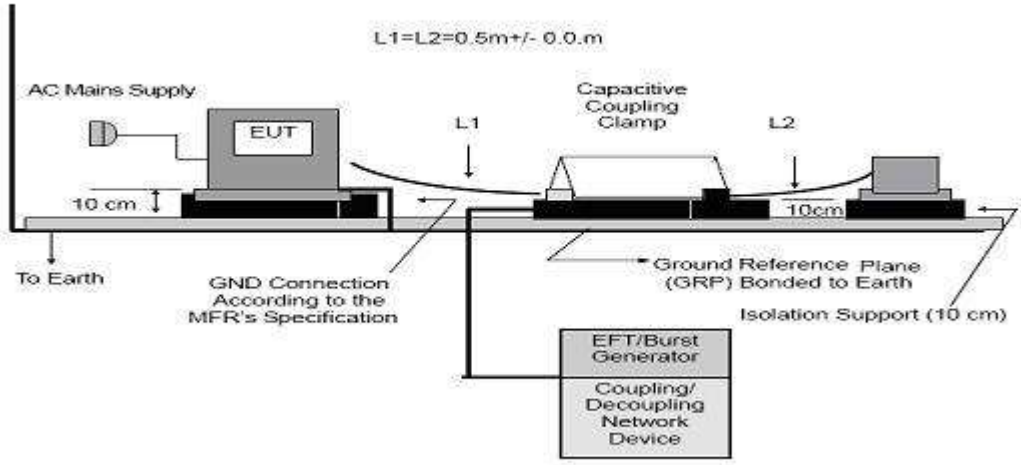
TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
b. Both positive and negative polarity discharges were applied.
c. The duration time of each test sequential was 1 minute
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

TEST RESULTS

EUT:		Model Name :	
Temperature:		Relative Humidity:	
Pressure:		Test Date :	
Test Power :			

Coupling Line		Test level (kV)								Observation	Criterion	Result
		0.5		1		2		4				
		+	-	+	-	+	-	+	-			
AC line	L	A	A	A	A					TT,TR	N/A	N/A
	N	A	A	A	A							N/A
	PE											N/A
	L+N	A	A	A	A							N/A
	L+PE											N/A
	N+PE											N/A
	L+N+PE											N/A
DC Line												N/A
Signal Line												N/A

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

2) N/A - the test is not applicable in this test report

3) Criteria A: There was no change operated with initial operating during the test.

4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

5) Criteria C: The system shut down during the test.

SURGE TESTING

TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line:0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L1-L2, L1-PE, L2-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

TEST PROCEDURE

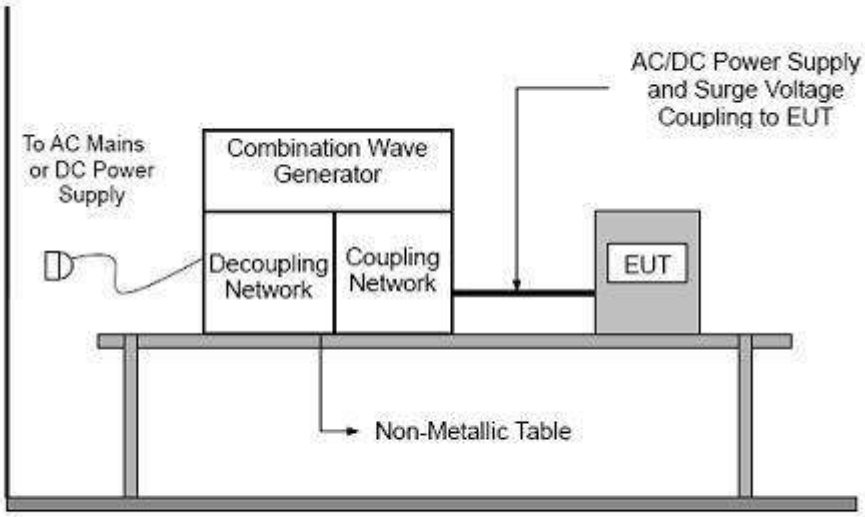
a. For EUT power supply:
The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP


AC/DC Power Supply
and Surge Voltage
Coupling to EUT
To AC Mains
or DC Power
Supply
Combination Wave
Generator
Decoupling
Network
Coupling
Network
EUT
Non-Metallic Table

TEST RESULTS

EUT:		Model Name :	
Temperature:		Relative Humidity:	
Pressure:		Test Date :	
Test Mode :			
Test Power :			

Coupling Line			Test level								Observation	Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV				
			+	-	+	-	+	-	+	-			
AC line	L-N	0°	A	A	B	B					TT,TR	B	N/A
		90°	A	A	B	B							
		180°	A	A	B	B							
		270°	A	A	B	B							
	L-PE	0°											N/A
		90°											
		180°											
		270°											
	N-PE	0°											N/A
		90°											
		180°											
		270°											
DC Line													N/A
Signal Line													N/A

Note:

1) Polarity and Numbers of Impulses:5 Pst / Ngt at each tested mode
2) N/A - the test is not applicable in this Test Report
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

INJECTION CURRENT TESTING

TEST SPECIFICATION

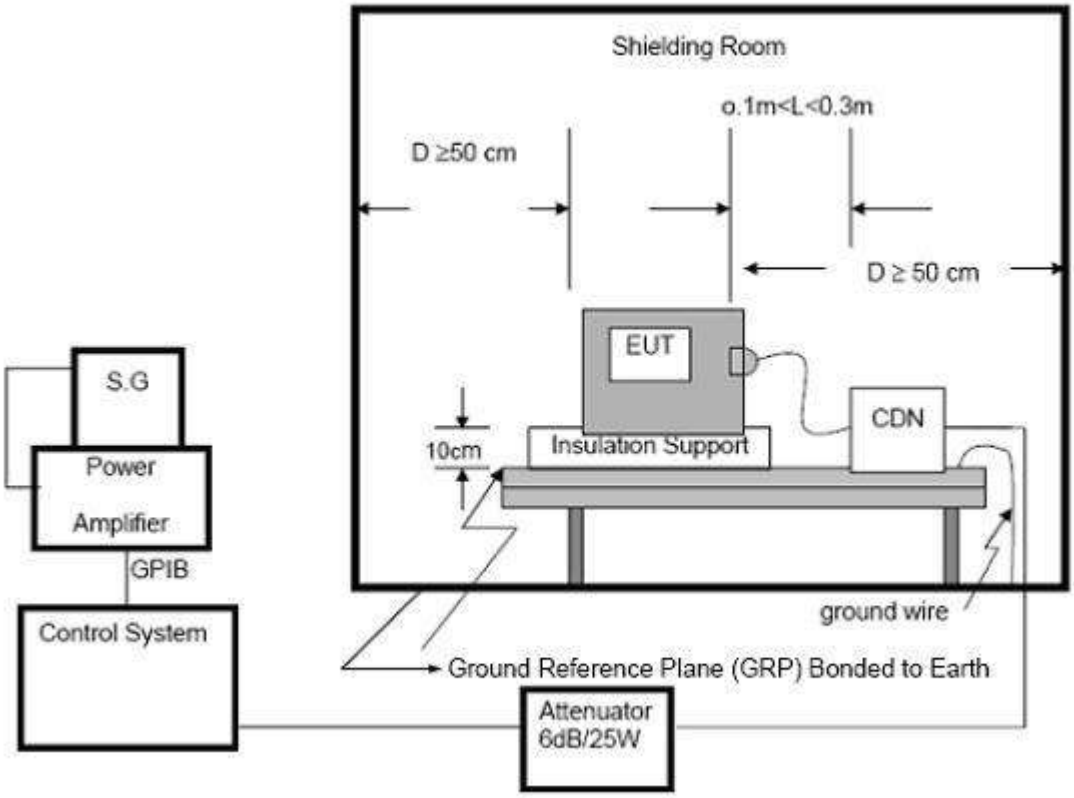
Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The field strength level was 230V.
b. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

TEST RESULTS

EUT:		Model Name :	
Temperature:		Relative Humidity:	
Pressure:		Test Date :	
Test Mode :			
Test Power :			

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Observation	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	230V(rms) AM Modulated 1000Hz, 80%	**CT, CR**	**A**	**N/A**	**N/A**
Input/ Output DC. Power Port	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**
Signal Line	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**

Note:

1) N/A – the test is not applicable in this Test Report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

VOLTAGE INTERRUPTION/DIPS TESTING

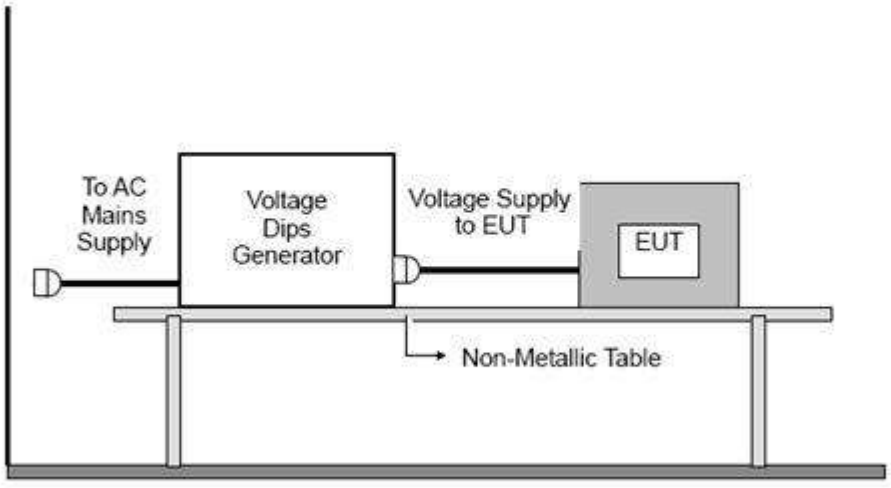
TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance	B (For 0% Voltage Dips) C (For 70% Voltage Dips) C (For 0% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST RESULTS

EUT:		Model Name :	
Temperature:		Relative Humidity:	
Pressure:		Test Date :	
Test Power :			

Voltage Reduction	Duration (ms)	Observation	Perform Criteria	Results	Judgment
Voltage dip 0%	10	**TT, TR**	**B**		**N/A**
Voltage dip 0%	20	**TT, TR**	**B**		**N/A**
Voltage dip 70%	500	**TT, TR**	**B**		**N/A**
Voltage interruptions	5000	**TT, TR**	**C**		**N/A**

Note:

1). N/A - the test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

APPENDIX-PHOTOGRAPHS OF EUT

Photo 1

Photo 2

Photo 3

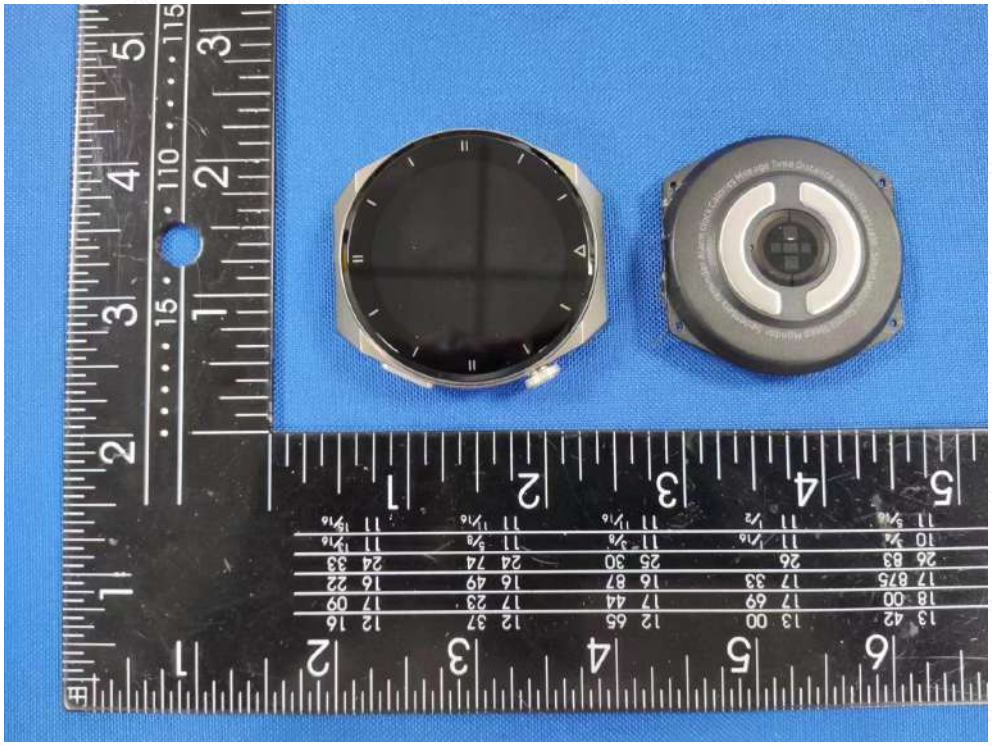


Photo 4

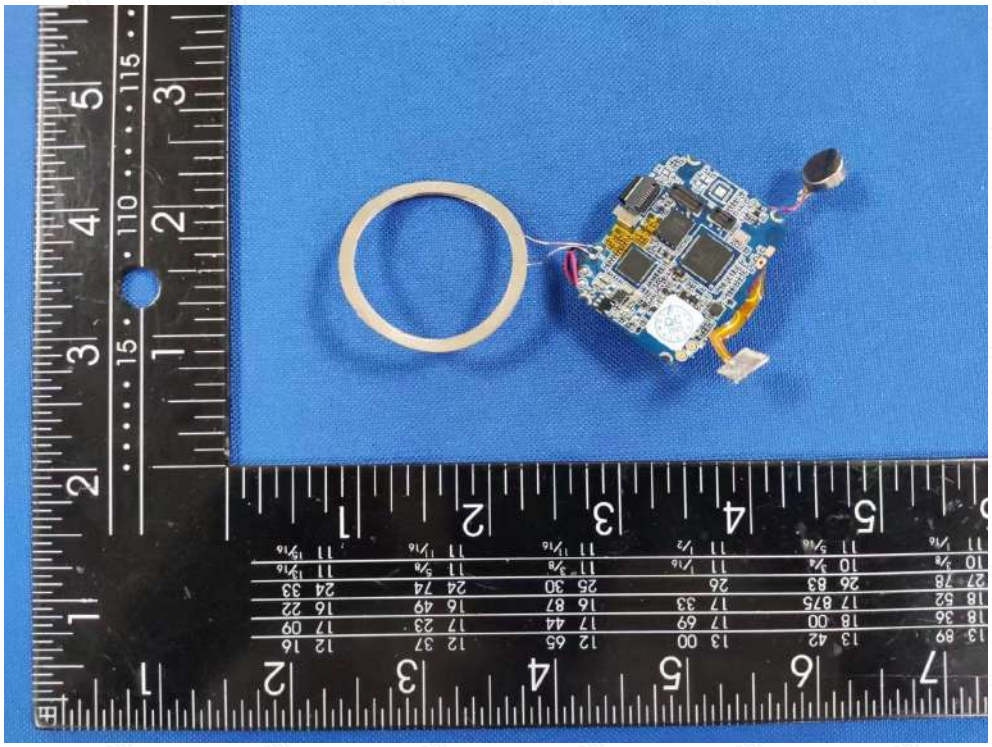


Photo 5

**********END OF REPORT**********

Certificate – Сертификат – 證明書 – Certificat – 증명서

Certificate No. : HUAX240318028KC

Certificate of Conformity

Certificate's Holder : **Shenzhen Tiankang Medical Technology Co., Ltd**

Address : 602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen

Manufacturer : **Shenzhen Tiankang Medical Technology Co., Ltd**

Address : 602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen

Product Name : **Smart watches**

Product Model (S) : TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19

Trade Mark : N/A

Requirement		Applied Specifications/ Standards	Document Evidence
Art.3.1(a)	Safety	EN IEC 62368-1:2020+A11:2020	HUAX240318025KR
Art.3.1(a)	Health	EN62479:2010	HUAX240318026KR
Art.3.1(b)	EMC	ETSI EN 301 489-1 V2.2.3 ETSI EN 301 489-17 V3.2.4	HUAX240318027KR
Art.3.2	Radio	ETSI EN 300 328 V2.2.2	HUAX240318028KR

Based on voluntary evaluation of product samples and technical documents, we confirm that The above products comply with the requirements of EU directives. The above products We have passed the standard tests we have listed and comply with the committee's RED Directive 2014/53/EU.

CE

Shenzhen Huaxiang Testing Co., Ltd. IMPARTIAL Product Safety

Mar. 21, 2024

Certification Manager

Shenzhen Huaxiang Testing Co., Ltd
201, Building A10, Fuhai Information Port, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen City, Guangdong Province, China Web.:Http:// www.hua-x.com
E-mail: huaxiang@hua-x.com Tel.:+86-0755-23010432

TEST REPORT

On Behalf of

Product Name:	Smart watches
Trademark:	N/A
Model Number:	TK20P, TK10, TK20, TK22, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P, TK60, TK61, TK62, TK65, TK66, TK68, TK69, TK16, TK26, TK28, TK63, TK71Pro, TK72, TK76, TK73, TK74, TK75, TK77, TK78, TK79, TK25, TK27, TK29, TK15, TK17, TK18, TK19
Prepared For:	Shenzhen Tiankang Medical Technology Co., Ltd
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Prepared By:	Shenzhen Huaxiang Testing Co., Ltd
Address:	201, Building A10, Fuhai Information Port, Fuhai Street, Bao'an District, Shenzhen City
Report No.:	HUAX240318028KR

TABLE OF CONTENT

(Note: N/A means not applicable)

TEST REPORT DECLARATION

Applicant	:	Shenzhen Tiankang Medical Technology Co., Ltd
Address :	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer:		Shenzhen Tiankang Medical Technology Co., Ltd
Address:	:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
EUT Description :	:	Smart watches
Model Number	:	TK20P
Test Date	:	Mar. 15, 2024 - Mar. 21, 2024
Date of Report	:	Mar. 21, 2024

Test Standards:

ETSI EN 300 328 V2.2.2 (2019-07)

The EUT described above is tested by Shenzhen Huaxiang Testing Technology Co , Ltd. EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. ZTS is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the ETSI EN 300 328 V2.2.2 (2019-07) requirements. .
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the Shenzhen Huaxiang Testing Technology Co , Ltd.

Prepared by(Test Engineer): Kevin Su

Approved(Manager): Amy Jiang

1. VERSION

Report No.	Issue Date	Description	Approved
HUAX240318028KR	Mar. 21, 2024	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	ETSI EN 300 328 V2.2.2		
Test Item	**Test Requirement**	**Test Method**	**Results**
Transmitter Parameters			
RF Output Power	Clause 4.3.1.2	Clause 5.4.2	PASS
Power Spectral Density	Clause 4.3.2.3	Clause 5.4.3	N/A[1]
Duty cycle, Tx-Sequence, Tx-gap	Clause 4.3.1.3	Clause 5.4.2	N/A[2]
Accumulated Transmit time, Frequency Occupation & Hopping Sequence	Clause 4.3.1.4	Clause 5.4.4	PASS
Hopping Frequency Separation	Clause 4.3.1.5	Clause 5.4.5	PASS
Medium Utilization	Clause 4.3.1.6	Clause 5.4.2	N/A[2]
Adaptivity	Clause 4.3.1.7	Clause 5.4.6	N/A[3]
Occupied Channel Bandwidth	Clause 4.3.1.8	Clause 5.4.7	PASS
Transmitter unwanted emissions in the OOB domain	Clause 4.3.1.9	Clause 5.4.8	PASS
Transmitter unwanted emissions in the spurious domain	Clause 4.3.1.10	Clause 5.4.9	PASS
Receiver Parameters			
Receiver spurious emissions	Clause 4.3.1.11	Clause 5.4.10	PASS
Receiver Blocking	Clause 4.3.1.12	Clause 5.4.11	PASS
Geo-location capability	Clause 4.3.1.13	Clause 5.4.12	N/A[4]
Remark: N/A[1]: Only for equipment using wide band modulations other than FHSS N/A[2]: Only for non-Adaptive equipment. N/A[3]:The maximum ouput power of EUT less than 10dBm, so not applicable N/A[4]: Only for equipment with geo-location capability Tx: In this whole report Tx (or tx) means Transmitter. Rx: In this whole report Rx (or rx) means Receiver. RF: In this whole report RF means Radiated Frequency. CH:In this whole report CH means channel.			

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3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10-7

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	TK20P
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: TK20P
Bluetooth Version:	Bluetooth 5.0
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	Bluetooth: 2402-2480MHz
Max. RF output power:	Bluetooth:3.14dBm
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK
Antenna installation:	Bluetooth: External antenna
Antenna Gain:	Bluetooth: 1dBi
Ratings:	AC 5V

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	79	/

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting (GFSK/Π/4DQPSK/8DPSK)	2402MHz	2441MHz	2480MHz
Receiving (GFSK/Π/4DQPSK/8DPSK)	2402MHz	2441MHz	2480MHz

4.6 Test Environment

Humidity(%):	55
Atmospheric Pressure(kPa):	101.1
Normal Voltage(DC):	12V
Normal Temperature(℃)	25
Low Temperature(℃)	0
High Temperature(℃)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

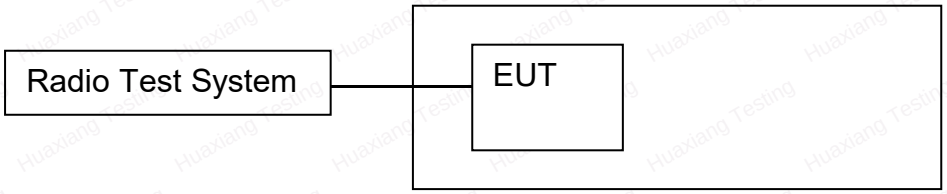
5.2 Test Instrument Used

No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2024.11.20
2	Power Sensor	Agilent	U2021XA	MY56120032	2024.11.20
3	Power Sensor	Agilent	U2021XA	MY56120034	2024.11.20
4	Communication test set	R&S	CMW500	108058	2024.11.20
5	Spectrum Analyzer	R&S	FSP40	100550	2024.11.20
6	Signal Generator	Agilent	N51850Hz,	MY49060920	2024.11.20
7	Signal Generator	Agilent	N5182A	MY47420195	2024.11.20
8	Communication test set	Agilent	E5515C	MY50102567	2024.11.20
9	band rejection filter	Shenxiang	MSF2400-2483.5MS-1154	2018101500 1	2024.11.20
10	band rejection filter	Shenxiang	MSF5150-5850 MS-1155	2018101500 1	2024.11.20
11	band rejection filter	Xingbo	XBLBQ-DZA120	190821-1-1	2024.11.20
12	BT&WI-FI Automatic test software	Micowave	MTS8310	Ver. 2.0.0.0	2024.11.20
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2024.11.20
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2024.11.20
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	2024.11.20
16	966 chamber	C.R.T.	966 Room	966	2024.11.20
17	Receiver	R&S	ESPI	100362	2024.11.20
18	Amplifier	HP	8447E	2945A02747	2024.11.20
19	Amplifier	Agilent	8449B	3008A01838	2024.11.20
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	869	2024.11.20

21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	2024.11.20
22	Software	Fala	EZ-EMC	FA-02A2 RE	2024.11.20
23	3-Loop Antenna	Daze	ZN30401	17014	2024.11.20
24	loop antenna	ZHINAN	ZN30900A	/	2024.11.20
25	Horn antenna	A/H/System	SAS-574	588	2024.11.20
26	Amplifier	AEROFLEX	/	S/N/ 097	2024.11.20

6. RF OUTPUT POWER

6.1 Block Diagram Of Test Setup



6.2 Limit

For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. See clause 5.3.1 m). For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

Limit
20dBm

6.3 Test procedure

Step 1:

• Use a fast power sensor suitable for 2.4 GHz and capable of minimum 1 MS/s.
• Use the following settings:
- Sample speed 1 MS/s or faster.
- The samples shall represent the RMS power of the signal.
- Measurement duration: For non-adaptive equipment: equal to the observation period defined in clause 4.3.1.3.2 or clause 4.3.2.4.2. For adaptive equipment, the measurement duration shall be long enough to ensure a minimum number of bursts (at least 10) are captured.
NOTE 1: For adaptive equipment, to increase the measurement accuracy, a higher number of bursts may be used.

Step 2:

• For conducted measurements on devices with one transmit chain:
- Connect the power sensor to the transmit port, sample the transmit signal and store the raw data. Use these stored samples in all following steps.
• For conducted measurements on devices with multiple transmit chains:
- Connect one power sensor to each transmit port for a synchronous measurement on all transmit ports.
- Trigger the power sensors so that they start sampling at the same time. Make sure the time difference between the samples of all sensors is less than 500 ns.
- For each individual sampling point (time domain), sum the coincident power samples

of all ports and store them. Use these summed samples in all following steps.

Step 3:

• Find the start and stop times of each burst in the stored measurement samples. The start and stop times are defined as the points where the power is at least 30 dB below the highest value of the stored samples in step 2.

NOTE 2: In case of insufficient dynamic range, the value of 30 dB may need to be reduced appropriately.

Step 4:

• Between the start and stop times of each individual burst calculate the RMS power over the burst using the formula below. Save these Pburst values, as well as the start and stop times for each burst.

$$P_{burst} = \frac{1}{k}\sum_{n=1}^{k} P_{sample}(n)$$

with 'k' being the total number of samples and 'n' the actual sample number

Step 5:

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 6:

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

• If applicable, add the additional beamforming gain "Y" in dB.

• If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used.

• The RF Output Power (P) shall be calculated using the formula below:

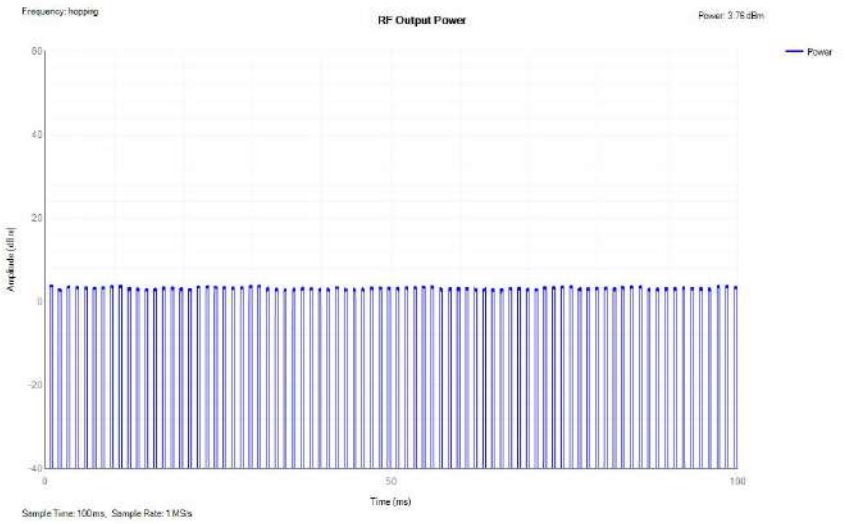
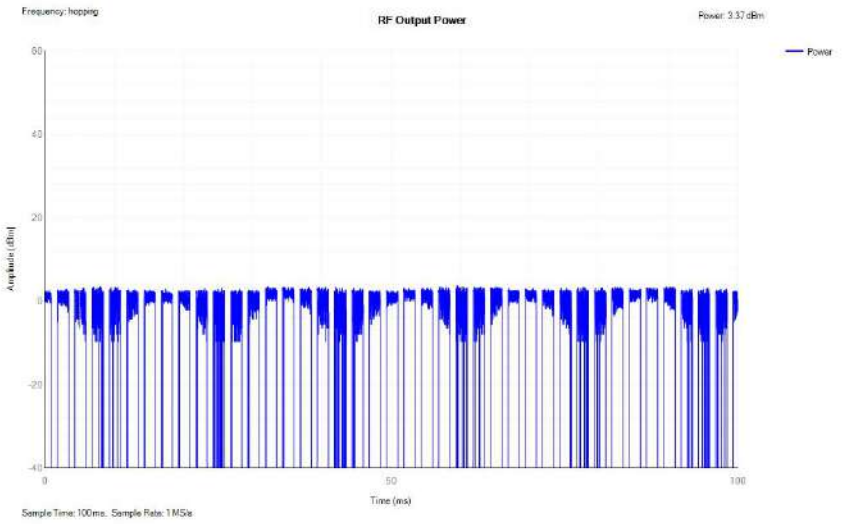
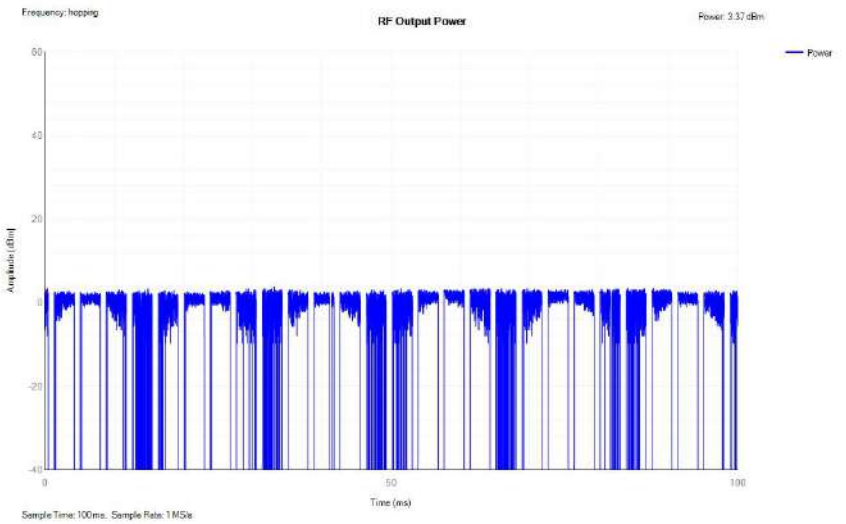
P = A + G + Y

• This value, which shall comply with the limit given in clause 4.3.1.2.3 or clause 4.3.2.2.3, shall be recorded in the test report.

6.4 Test Result

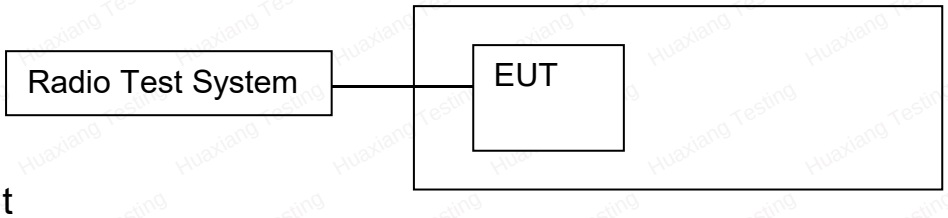
Modulation	Test conditions (Temperature)	EIRP (dBm) Hopping mode
GFSK	Normal	3.76
	Lower	3.45
	Upper	3.13
π/4DQPSK	Normal	3.37
	Lower	2.91
	Upper	2.64
8DPSK	Normal	3.37
	Lower	3.21
	Upper	3.14
Limit		≤100mW (20dBm)
Remark: P = A + G + Y,G=1dBi,x=100%		

Remark: This Report only show the test plots of the worst case.

GFSK	
π/4 DQPSK	
8DPSK	

7. ACCUMULATED TRANSMIT TIME, MINIMUM FREQUENCY OCCUPATION AND HOPPING SEQUENCE

7.1 Block Diagram Of Test Setup



7.2 Limit

Adaptive Frequency Hopping equipment shall be capable of operating over a minimum of 70 % of the band specified in clause 1.
The Accumulated Transmit Time on any hopping frequency shall not be greater than 400 ms within any observation period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used. In order for the equipment to comply with the Frequency Occupation requirement, it shall meet either of the following two options:

Option 1: Each hopping frequency of the hopping sequence shall be occupied at least once within a period not exceeding four times the product of the dwell time and the number of hopping frequencies in use.

Option 2: The occupation probability for each frequency shall be between ((1 / U) × 25 %) and 77 % where U is the number of hopping frequencies in use.

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

7.3 Test procedure

Step 1:

- The output of the transmitter shall be connected to a spectrum analyzer or equivalent.
- The analyzer shall be set as follows:

- Centre Frequency: Equal to the hopping frequency being investigated
- Frequency Span: 0 Hz
- RBW: ~ 50 % of the Occupied Channel Bandwidth
- VBW: ≥ RBW
- Detector Mode: RMS
- Sweep time: Equal to the applicable observation period (see clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2)
- Number of sweep points: 30 000
- Trace mode: Clear / Write

- Trigger: Free Run

Step 2:

• Save the trace data to a file for further analysis by a computing device using an appropriate software application or program.

Step 3:

• Identify the data points related to the frequency being investigated by applying a threshold.

The data points resulting from transmissions on the hopping frequency being investigated are assumed to have much higher levels compared to data points resulting from transmissions on adjacent hopping frequencies. If a clear determination between these transmissions is not possible, the RBW in step 1 shall be further reduced. In addition, a channel filter may be used.

• Count the number of data points identified as resulting from transmissions on the frequency being investigated and multiply this number by the time difference between two consecutive data points.

Step 4:

• The result in step 3 is the Accumulated Transmit Time which shall comply with the limit provided in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 and which shall be recorded in the test report.

Step 5:

NOTE 1: This step is only applicable for equipment implementing Option 1 in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 for complying with the Frequency Occupation requirement and the manufacturer decides to demonstrate compliance with this requirement via measurement.

• Make the following changes on the analyser and repeat step 2 and step 3.

Sweep time: 4 × Dwell Time × Actual number of hopping frequencies in use

The hopping frequencies occupied by the equipment without having transmissions during the dwell time (blacklisted frequencies) should be taken into account in the actual number of hopping frequencies in use. If this number cannot be determined (number of blacklisted frequencies unknown) it shall be assumed that the equipment uses the maximum possible number of hopping frequencies.

• The result shall be compared to the limit for the Frequency Occupation defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2. The result of this comparison shall be recorded in the test report.

Step 6:

• Make the following changes on the analyzer:

- Start Frequency: 2 400 MHz

- Stop Frequency: 2 483,5 MHz

- RBW: ~ 50 % of the Occupied Channel Bandwidth (single hopping frequency)

- VBW: ≥ RBW

- Detector Mode: RMS

- Sweep time: 1 s

- Trace Mode: Max Hold

- Trigger: Free Run

NOTE 2: The above sweep time setting may result in long measuring times. To avoid such long measuring times, an FFT analyser could be used.

• Wait for the trace to stabilize. Identify the number of hopping frequencies used by the hopping sequence.

• The result shall be compared to the limit (value N) defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2. This value shall be recorded in the test report.

For equipment with blacklisted frequencies, it might not be possible to verify the number of hopping frequencies in use. However they shall comply with the requirement for Accumulated Transmit Time and Frequency Occupation assuming the minimum number of hopping frequencies (N) defined in clause 4.3.1.4.3.1 or clause 4.3.1.4.3.2 is used.

Step 7:

• For adaptive equipment, using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6, it shall be verified whether the equipment uses 70 % of the band specified in clause 1. The result shall be recorded in the test report.

7.4 Test Result

Accumulated Transmit Time

Channel	Modulation	Accumulated Transmit Time (ms)	Limit (ms)	Result
LCH	GFSK	118.72	400	Pass
	π/4DQPSK	265.69	400	Pass
	8DPSK	311.04	400	Pass
HCH	GFSK	118.349	400	Pass
	π/4DQPSK	265.69	400	Pass
	8DPSK	305.28	400	Pass

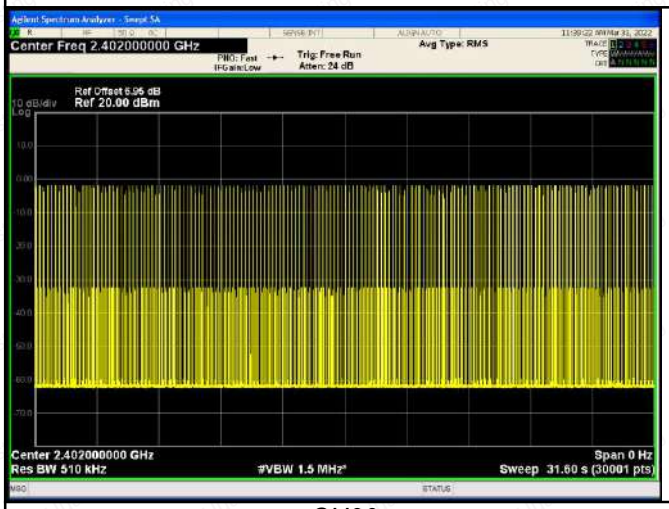
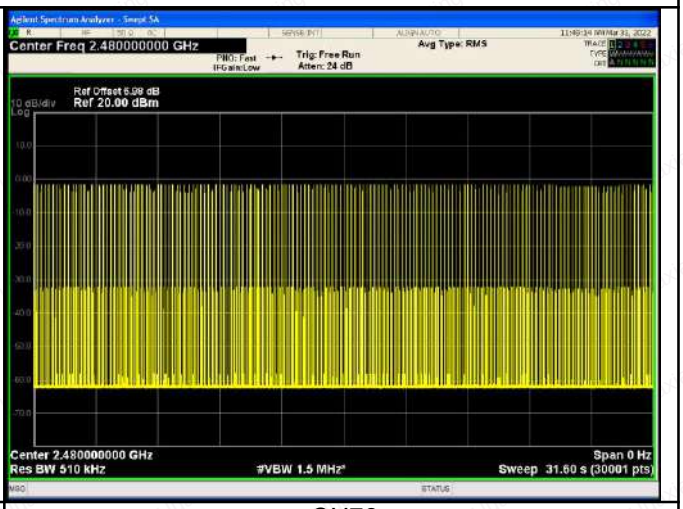
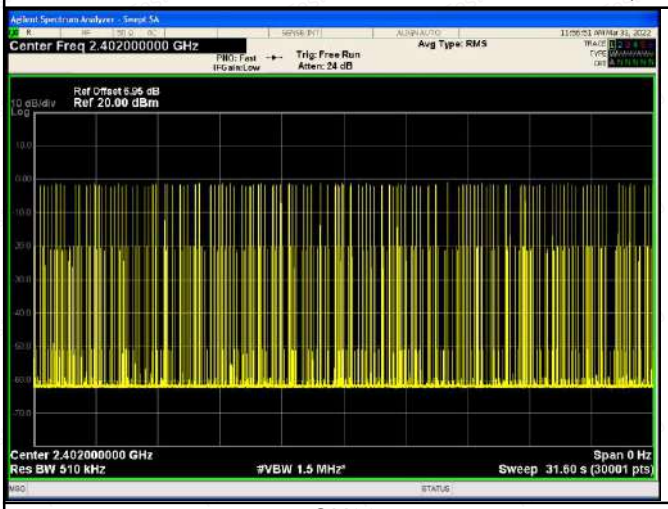
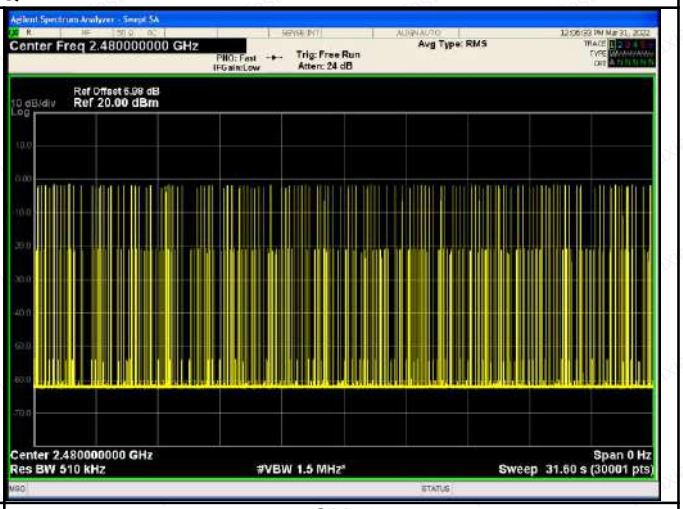
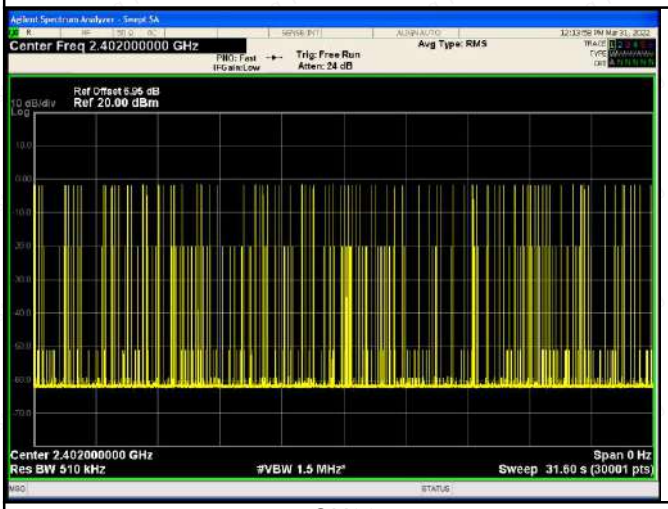
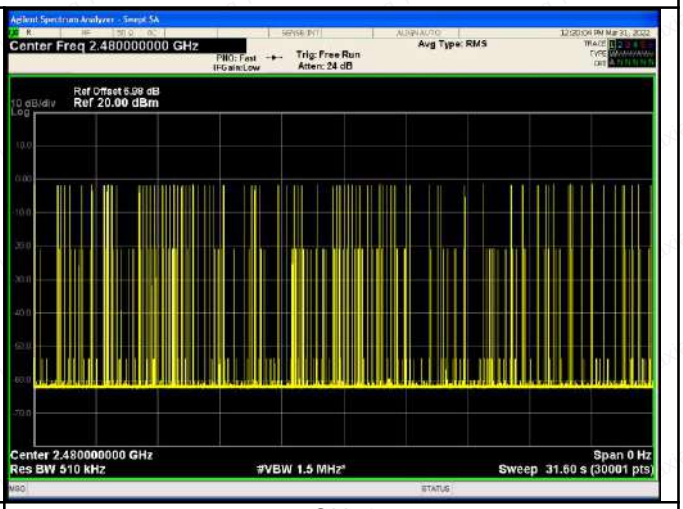
Minimum Frequency Occupation

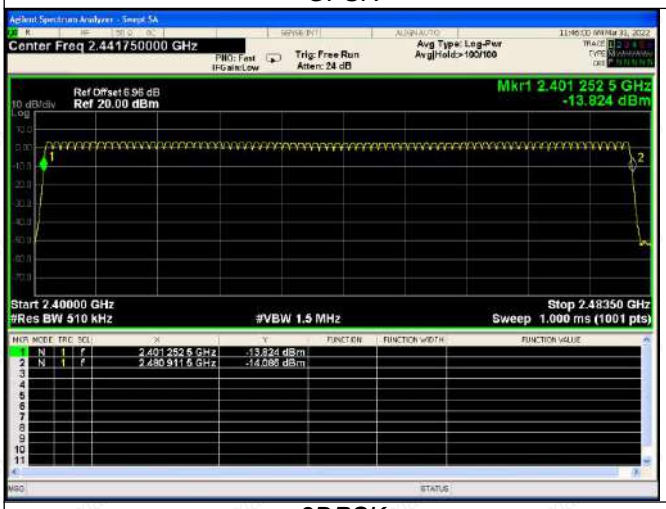
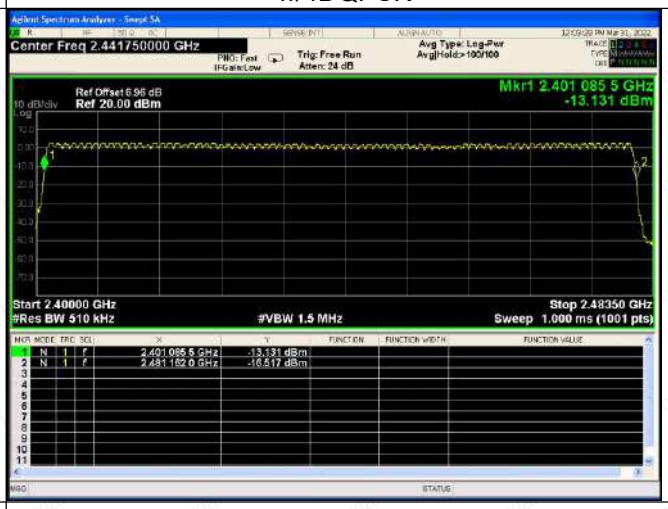
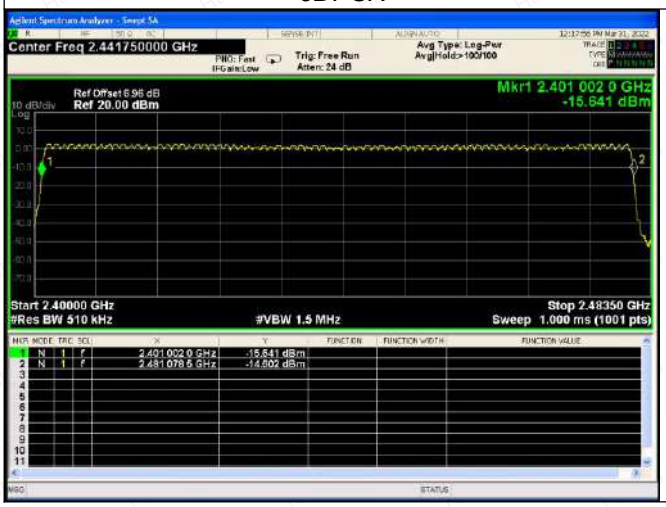
Channel	Modulation	Occupied period	Limit	Result
LCH	GFSK	1	4≥X≥1	Pass
	π/4DQPSK	1		Pass
	8DPSK	1		Pass
HCH	GFSK	1		Pass
	π/4DQPSK	1		Pass
	8DPSK	1		Pass

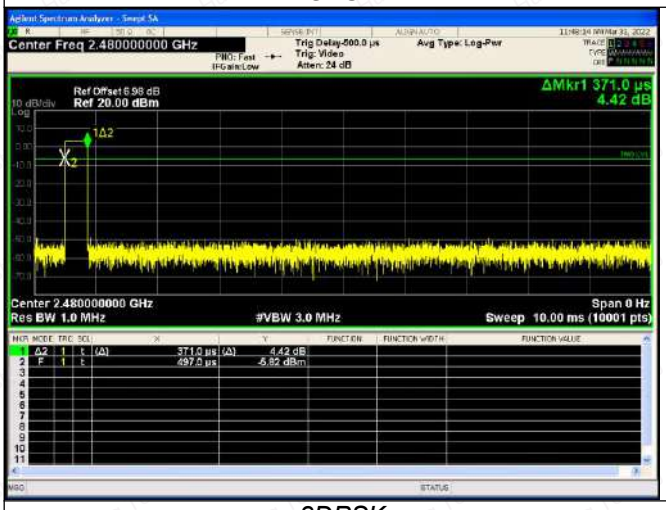
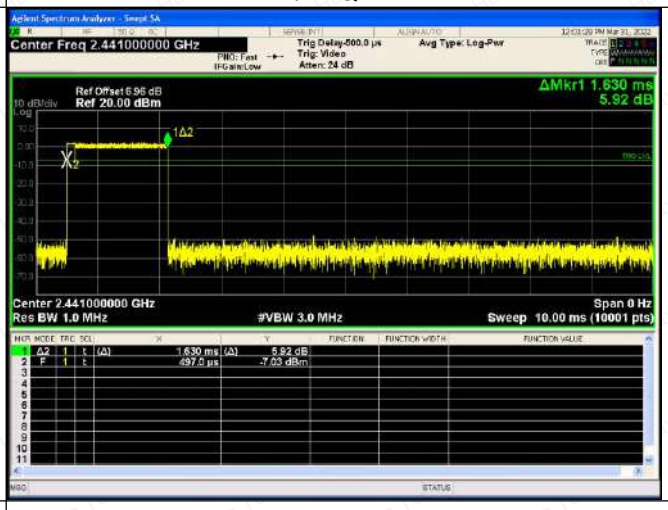
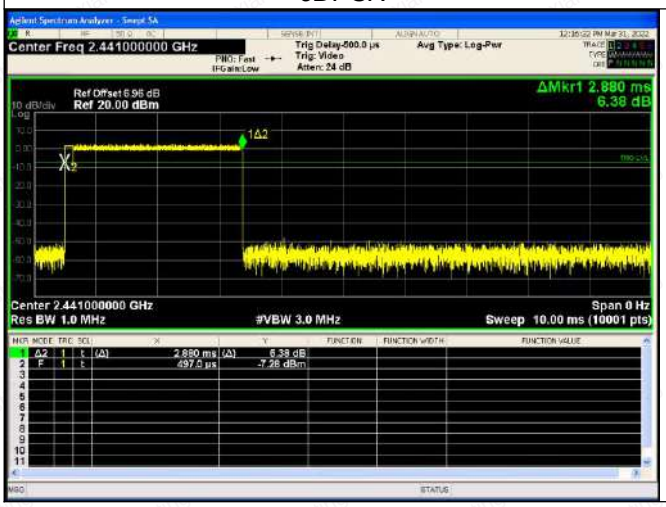
Hopping Sequence

Modulation	One pulse time (ms)	Number of Hopping Channel	Limit	-20 dB Bandwidth (%)	Limit	Result
GFSK	0.371	79	≥15	95.4	70 % of the band 2400MHz-2483.5MHz	Pass
π/4DQPSK	1.63	79		95.9		
8DPSK	2.88	79		95.8		

Test Graphs

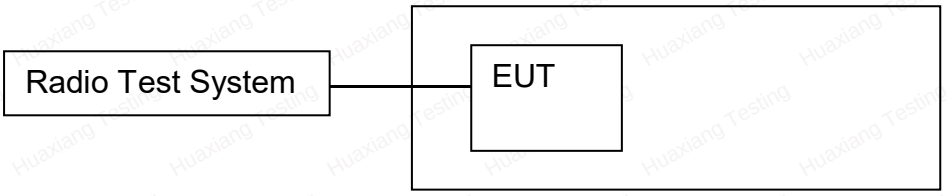
Accumulated Transmit Time	
GFSK	
	
CH00	*CH78*
π/4DQPSK	
	
CH00	*CH78*
8DPSK	
	
CH00	*CH78*

Hopping Sequence	
GFSK	π/4DQPSK
	
8DPSK	
	

One pulse time	
GFSK	π/4DQPSK
	
8DPSK	
	

8. HOPPING FREQUENCY SEPARATION

8.1 Block Diagram Of Test Setup



8.2 Limit

For Non-adaptive frequency hopping systems
The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth (see clause 5.3.1.5.3) of a single hop, with a minimum separation of 100 kHz.
For Adaptive frequency hopping systems
The minimum Hopping Frequency Separation shall be 100 kHz.

8.3 Test procedure

The Hopping Frequency Separation as defined in clause 4.3.1.5 shall be measured and recorded using any of the following options. The selected option shall be stated in the test report.

Option 1

Step 1:

• The output of the transmitter shall be connected to a spectrum analyser or equivalent.

• The analyser shall be set as follows:

- Centre Frequency: Centre of the two adjacent hopping frequencies
- Frequency Span: Sufficient to see the complete power envelope of both hopping frequencies
- RBW: 1 % of the span
- VBW: 3 × RBW
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep time: 1 s

Step 2:

• Wait for the trace to stabilize.

• Use the marker function of the analyser to define the frequencies corresponding to the lower -20 dBr point and the upper -20 dBr point for both hopping frequencies F1 and F2. This will result in $F1_L$ and $F1_H$ for hopping frequency F1 and in $F2_L$ and $F2_H$ for hopping frequency F2. These values shall be recorded in the report.

Step 3:

• Calculate the centre frequencies $F1_C$ and $F2_C$ for both hopping frequencies using the formulas below. These values shall be $F1_C = \frac{F1_L + F1_H}{2}$ $F2_C = \frac{F2_L + F2_H}{2}$

• Calculate the -20 dBr channel bandwidth (BW_{CHAN}) using the formula below. This value shall be recorded in the report.

$$BW_{CHAN} = F1_H - F1_L$$

• Calculate the Hopping Frequency Separation (FHS) using the formula below. This value shall be recorded in the report.

$$F_{HS} = F2_C - F1_C$$

• Compare the measured Hopping Frequency Separation with the limit defined in clause 4.3.1.5.3. In addition, for non-Adaptive Frequency Hopping equipment, the Hopping Frequency Separation shall be equal to or greater than Occupied Channel Bandwidth as defined in clause 4.3.1.8 or:

$$F_{HS} \geq \text{Occupied Channel Bandwidth}$$

• See figure 4:

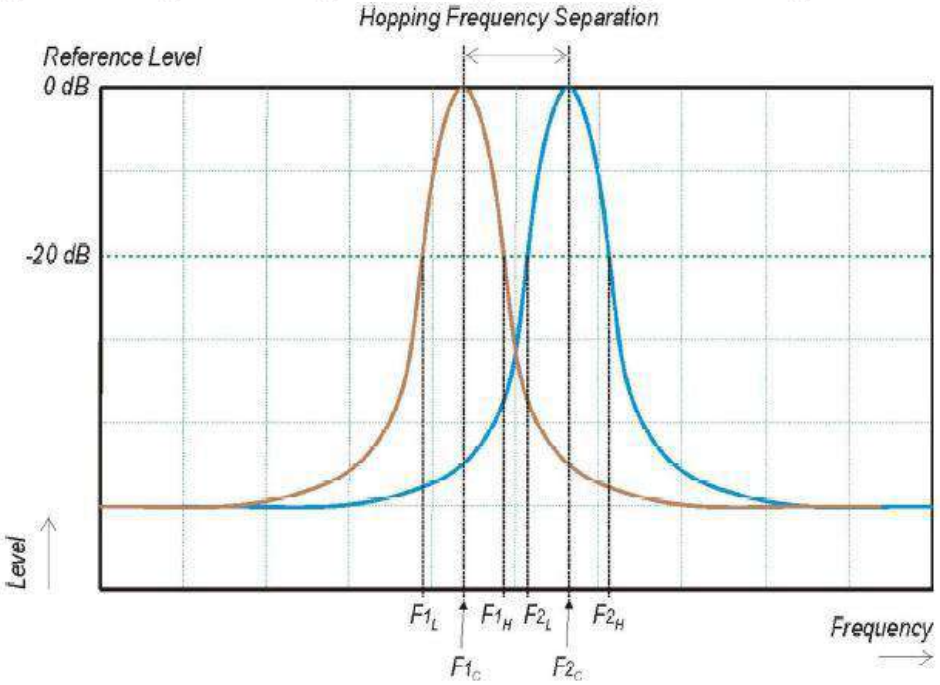


Figure 4: Hopping Frequency Separation

For adaptive equipment, in case of overlapping channels which will prevent the definition of

the -20 dBr reference points $F1_H$ and $F2_L$, a higher reference level (e.g. -10 dBr or - 6 dBr) may be chosen to define the reference points $F1_L$; $F1_H$; $F2_L$ and $F2_H$.

Alternatively, special test software may be used to:

• force the UUT to hop or transmit on a single Hopping Frequency by which the -20 dBr reference points can be measured separately for the two adjacent Hopping Frequencies; and/or

• force the UUT to operate without modulation by which the centre frequencies F1C and F2C can be measured directly.

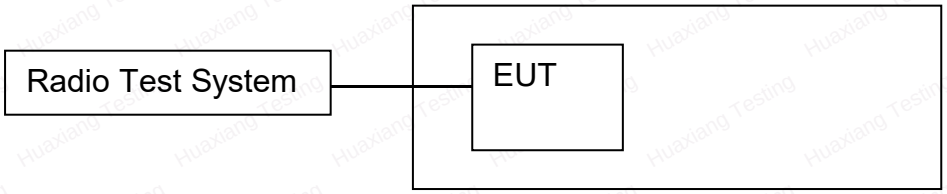
The method used to measure the Hopping Frequency Separation shall be documented in the test report.

8.4 Test Result

Mode		Measurement (MHz)	Limit (MHz)	Result
GFSK	DH1	0.9677	0.1	PASS
	DH3	0.9963	0.1	
	DH5	1.0101	0.1	

9. OCCUPIED CHANNEL BANDWIDTH

9.1 Block Diagram Of Test Setup



9.2 Limit

The Occupied Channel Bandwidth shall fall completely within the band given in 2.4GHz to 2.4835GHz.
In addition, for non-adaptive systems using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

9.3 Test procedure

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test
- Resolution BW: ~ 1 % of the span without going below 1 %
- Video BW: 3 × RBW
- Frequency Span: 2 × Nominal Channel Bandwidth
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep time: 1 s

Step 2:

Wait for the trace to stabilize.

Find the peak value of the trace and place the analyser marker on this peak.

Step 3:

Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT.

This value shall be recorded.

NOTE: Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

9.4 Test Result

Modulation	Frequency (MHz)	Frequency Range (MHz)		Occupied Channel (MHz)
GFSK DH1	Low	2401.594	/	0.859
	High	/	2480.412	0.851
π/4-DQPSK 2DH3	Low	2401.417	/	1.185
	High	/	2480.587	1.181
8DPSK 3DH5	Low	2401.421	/	1.193
	High	/	2480.581	1.19

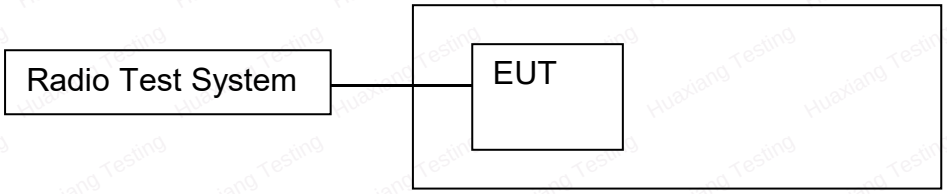
GFSK DH1 Low Channel		
GFSK DH1 High Channel		

π/4-DQPSK 2DH3 Low Channel		
π/4-DQPSK 2DH3 High Channel		

8DPSK 3DH5 Low Channel		
8DPSK 3DH5 High Channel		

10. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

10.1 Block Diagram Of Test Setup



10.2 Limit

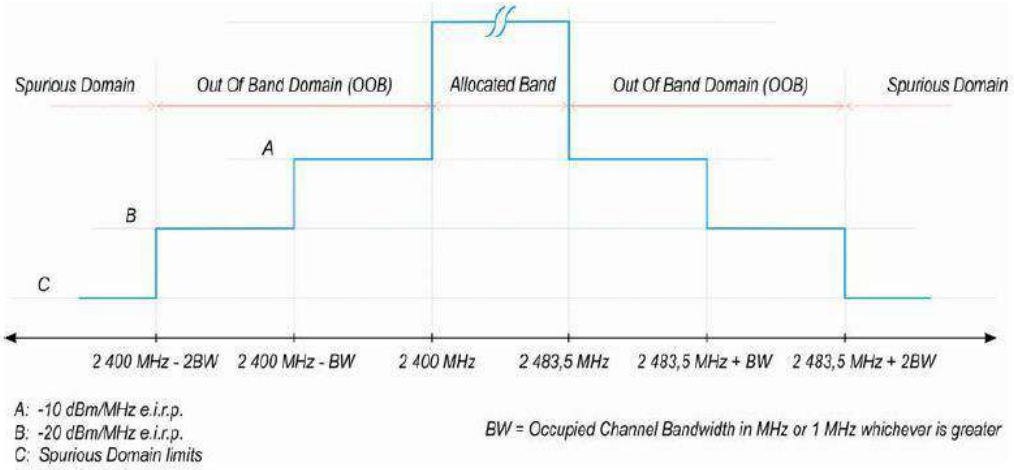


Figure 3: Transmit mask

10.3 Test procedure

The applicable mask is defined by the measurement results from the tests performed under clause 5.3.8 (Occupied Channel Bandwidth).

The test procedure is further as described under clause 5.3.9.2.1.

The Out-of-band emissions within the different horizontal segments of the mask provided in figures 1 and 3 shall be measured using the steps below. This method assumes the spectrum analyser is equipped with the Time Domain Power option.

Step 1:

- Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz

- Detector Mode: RMS

- Trace Mode: Max Hold

- Sweep Mode: Continuous

- Sweep Points: Sweep Time [s] / (1 µs) or 5 000 whichever is greater

- Trigger Mode: Video trigger

NOTE 1: In case video triggering is not possible, an external trigger source may be used.

- Sweep Time: > 120 % of the duration of the longest burst detected during the measurement of the RF Output Power

Step 2 (segment 2 483,5 MHz to 2 483,5 MHz + BW):

- Adjust the trigger level to select the transmissions with the highest power level.
- For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.
- Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.
- Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.
- Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 3 (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW):

- Change the centre frequency of the analyser to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 4 (segment 2 400 MHz - BW to 2 400 MHz):

- Change the centre frequency of the analyser to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 5 (segment 2 400 MHz - 2BW to 2 400 MHz - BW):

- Change the centre frequency of the analyser to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover

this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 6:

- In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits

provided by the mask given in figure 1 or figure 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

- In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the measurements need to be repeated for each of the active transmit chains. The declared antenna assembly gain "G" in dBi for a single antenna shall be added to these results. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered. Comparison with the applicable limits shall be done using any of the options given below:

- Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added. The additional beamforming gain "Y" in dB shall be added as well and the resulting values compared with the limits provided by the mask given in figure 1 or figure 3.

- Option 2: the limits provided by the mask given in figure 1 or figure 3 shall be reduced by

10 × log10(Ach) and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

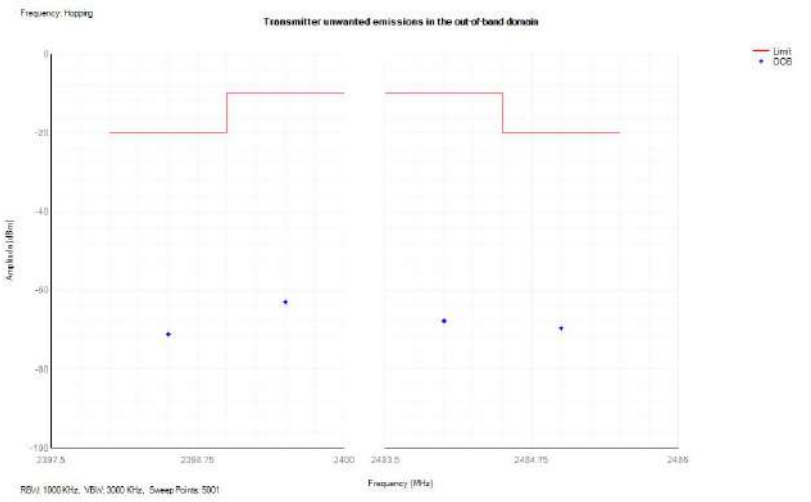
NOTE 2: Ach refers to the number of active transmit chains.

It shall be recorded whether the equipment complies with the mask provided in figure 1 or figure 3.

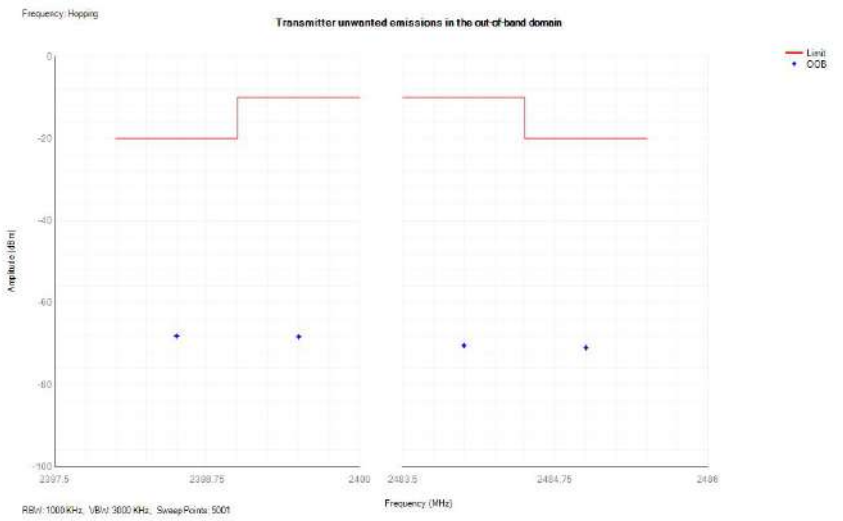
10.4 Test Result

Modulation : GFSK (the worst data)

Low Channel				
Test Freq (MHz)	**Antenna**	**Freq(MHz)**	**Level**	**Limit**
2402	Antenna 1	2399.5	-62.93	-10
2402	Antenna 1	2398.5	-69.57	-20

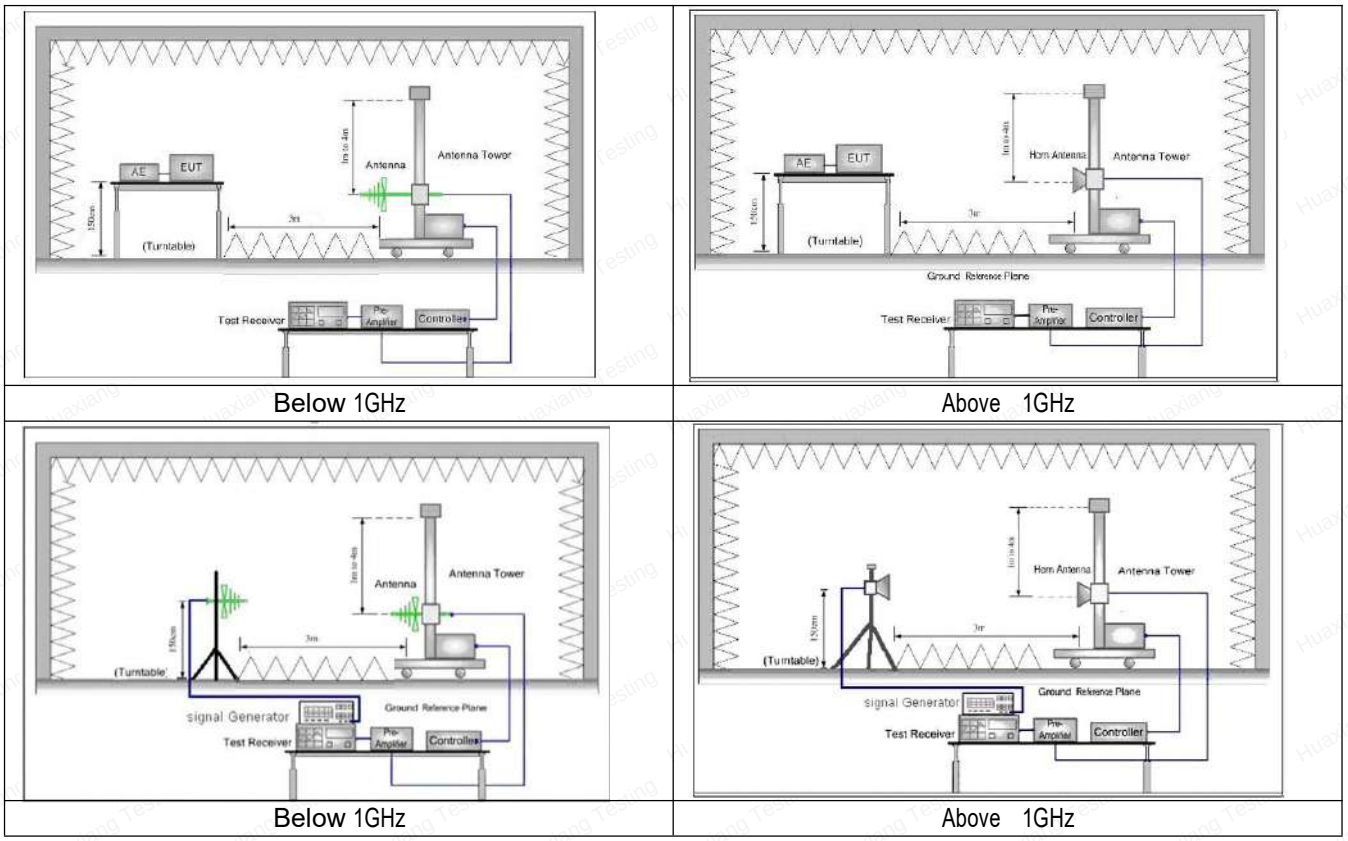


High Channel				
Test Freq (MHz)	**Antenna**	**Freq(MHz)**	**Level**	**Limit**
2480	Antenna 1	2484	-68.31	-10
2480	Antenna 1	2485.362	-68.15	-20



11. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

11.1 Block Diagram Of Test Setup



Below 1GHz | Above 1GHz

Below 1GHz | Above 1GHz

11.2 Limits

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	RBW/VBW
30 MHz to 47 MHz	-36 dBm	100 kHz/300KHz
47 MHz to 74 MHz	-54 dBm	100 kHz/300KHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz/300KHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz/300KHz
118 MHz to 174 MHz	-36 dBm	100 kHz/300KHz
174 MHz to 230 MHz	-54 dBm	100 kHz/300KHz
230 MHz to 470 MHz	-36 dBm	100 kHz/300KHz
470 MHz to 694 MHz	-54 dBm	100 kHz/300KHz
694 MHz to 1 GHz	-36 dBm	100 kHz/300KHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz/3MHz

11.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

11.4 Test Results

Modulation : GFSK (the worst data)
Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
46.855	-54.71	-12.54	-67.25	-36.00	-31.25	peak	1.5	235	H
67.812	-54.88	-12.01	-66.89	-54.00	-12.89	peak	1.9	288	H
104.393	-55.55	-12.09	-67.64	-54.00	-13.64	peak	1.5	264	H
217.237	-52.78	-10.53	-63.31	-54.00	-9.31	peak	1.8	127	H
326.081	-53.00	-10.13	-63.14	-36.00	-27.14	peak	1.1	275	H
871.542	-52.56	-0.59	-53.15	-36.00	-17.15	peak	1.1	115	H
46.627	-55.09	-12.20	-67.29	-36.00	-31.29	peak	1.0	117	V
101.100	-55.03	-12.28	-67.31	-54.00	-13.31	peak	1.9	161	V
182.112	-55.48	-12.31	-67.80	-54.00	-13.80	peak	1.6	305	V
219.312	-53.09	-11.14	-64.23	-54.00	-10.23	peak	1.3	328	V
325.980	-52.78	-9.59	-62.37	-36.00	-26.37	peak	1.0	239	V
870.594	-52.10	-0.43	-52.52	-36.00	-16.52	peak	1.7	222	V
High Channel									
45.096	-54.96	-12.15	-67.11	-36.00	-31.11	peak	1.7	131	H
68.288	-54.61	-12.16	-66.77	-54.00	-12.77	peak	1.2	331	H
106.269	-56.25	-12.47	-68.72	-54.00	-14.72	peak	1.3	257	H
217.643	-52.93	-11.03	-63.96	-54.00	-9.96	peak	1.1	162	H
326.258	-53.04	-10.01	-63.06	-36.00	-27.06	peak	1.8	153	H
871.782	-51.76	-0.48	-52.23	-36.00	-16.23	peak	1.7	336	H
48.953	-55.39	-12.36	-67.74	-36.00	-31.74	peak	1.8	113	V
100.179	-55.39	-12.65	-68.04	-54.00	-14.04	peak	1.5	154	V
183.170	-55.94	-11.90	-67.85	-54.00	-13.85	peak	1.3	189	V
218.302	-53.61	-11.21	-64.82	-54.00	-10.82	peak	1.2	158	V
326.398	-53.16	-9.61	-62.77	-36.00	-26.77	peak	1.6	175	V
869.286	-52.22	-0.28	-52.50	-36.00	-16.50	peak	1.5	133	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

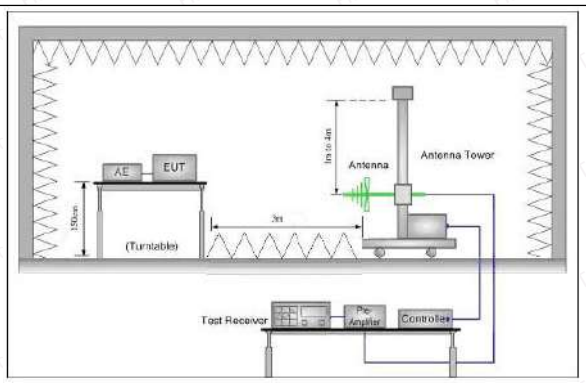
Above 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
4804	-54.28	8.41	-45.87	-30.00	-15.87	peak	1.2	341	H
7206	-52.38	12.55	-39.83	-30.00	-9.83	peak	1.3	135	H
4804	-54.78	8.41	-46.37	-30.00	-16.37	peak	1.1	272	V
7206	-52.47	12.55	-39.92	-30.00	-9.92	peak	1.4	177	V
High Channel									
4960	-55.07	8.51	-46.56	-30.00	-16.56	peak	1.6	274	H
7440	-52.50	12.69	-39.81	-30.00	-9.81	peak	1.0	220	H
4960	-54.28	8.51	-45.77	-30.00	-15.77	peak	1.7	209	V
7440	-52.40	12.69	-39.71	-30.00	-9.71	peak	1.5	117	V

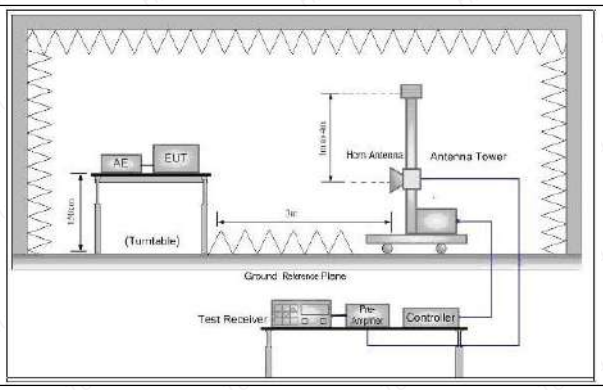
Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

12. RECEIVER SPURIOUS EMISSIONS

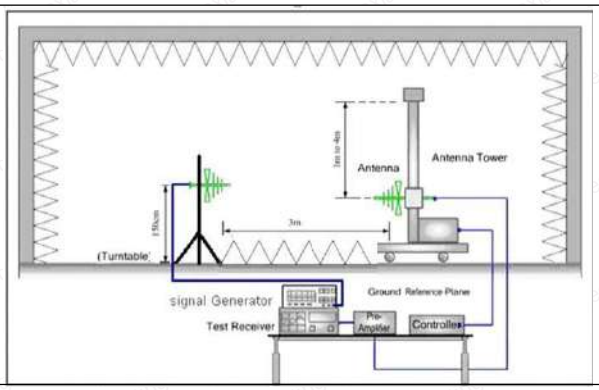
12.1 Block Diagram Of Test Setup



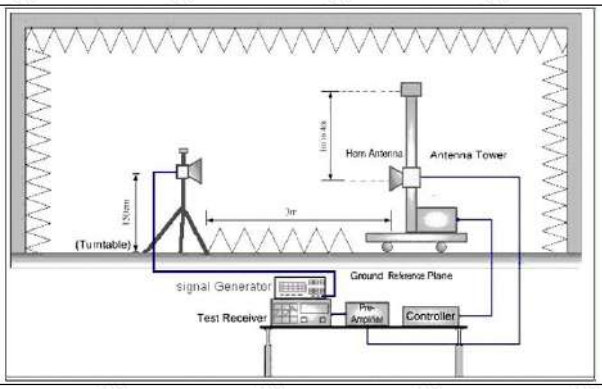
Below 1GHz



Above 1GHz



Below 1GHz



Above 1GHz

12.2 Limits

Frequency(MHz)	Limit
30-1000	-57dBm
1000-12750	-47dBm

12.3 Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the nonconductive turntable 1.5m above the ground in a full anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 1.5 m above the ground in a full anechoic chamber..

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

12.4 Test Results

Modulation : GFSK (the worst data)
Below 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
44.345	-60.26	-12.48	-72.74	-57.00	-15.74	peak	1.2	166	H
67.944	-60.62	-11.91	-72.53	-57.00	-15.53	peak	1.0	103	H
105.157	-60.61	-11.98	-72.59	-57.00	-15.59	peak	1.8	148	H
217.174	-62.75	-10.49	-73.24	-57.00	-16.24	peak	1.9	121	H
326.525	-61.23	-9.53	-70.76	-57.00	-13.76	peak	1.8	153	H
870.111	-69.03	-0.47	-69.50	-57.00	-12.50	peak	1.5	302	H
47.055	-60.41	-12.17	-72.58	-57.00	-15.58	peak	1.4	118	V
100.208	-61.48	-12.44	-73.92	-57.00	-16.92	peak	1.8	224	V
183.203	-62.49	-12.36	-74.85	-57.00	-17.85	peak	1.7	353	V
217.830	-60.78	-10.66	-71.43	-57.00	-14.43	peak	1.7	192	V
327.021	-59.31	-10.00	-69.31	-57.00	-12.31	peak	1.6	217	V
869.580	-69.92	0.16	-69.77	-57.00	-12.77	peak	1.6	289	V
High Channel									
46.888	-60.89	-12.43	-73.32	-57.00	-16.32	peak	1.2	129	H
66.875	-60.19	-12.22	-72.41	-57.00	-15.41	peak	1.6	316	H
104.607	-60.71	-12.54	-73.25	-57.00	-16.25	peak	1.5	194	H
217.159	-61.94	-11.17	-73.11	-57.00	-16.11	peak	1.5	148	H
327.140	-62.01	-9.48	-71.49	-57.00	-14.49	peak	1.3	127	H
869.959	-69.39	0.03	-69.36	-57.00	-12.36	peak	1.2	348	H
46.831	-60.61	-11.97	-72.58	-57.00	-15.58	peak	1.3	143	V
100.201	-60.92	-11.90	-72.82	-57.00	-15.82	peak	1.8	284	V
183.747	-62.28	-12.03	-74.31	-57.00	-17.31	peak	1.2	210	V
218.152	-60.87	-10.64	-71.51	-57.00	-14.51	peak	1.3	103	V
327.483	-59.58	-9.82	-69.40	-57.00	-12.40	peak	1.7	351	V
870.590	-69.85	-0.66	-70.51	-57.00	-13.51	peak	1.6	149	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

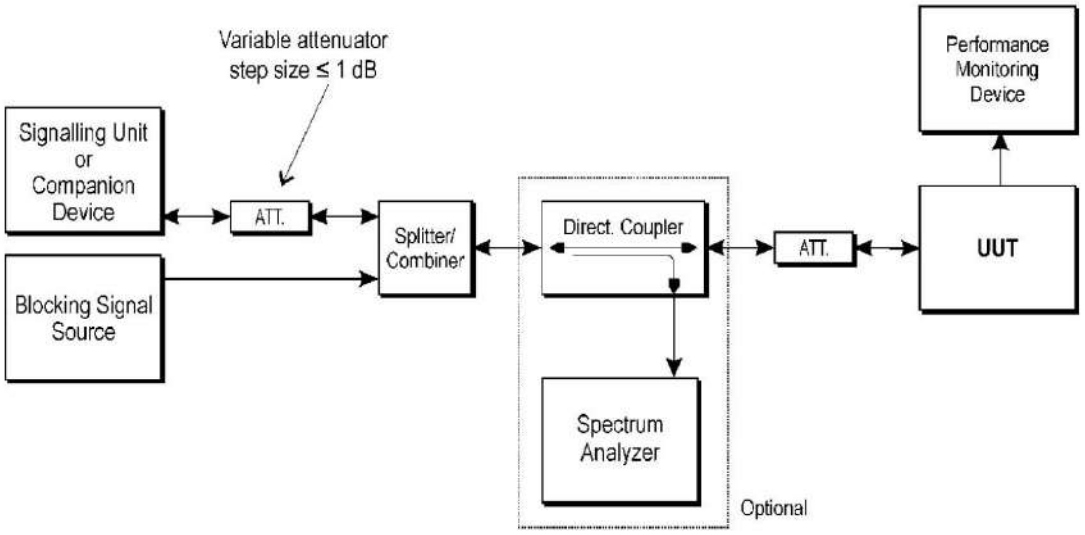
Above 1GHz

Freq (MHz)	Rd_level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Over (dB)	detector	Height	Degree	Antenna polarization
Low Channel									
2248.52	-61.32	3.12	-58.20	-47.00	-11.20	peak	1.2	104	H
2248.76	-60.19	3.14	-57.05	-47.00	-10.05	peak	1.5	326	V
High Channel									
2443.41	-59.70	3.52	-56.18	-47.00	-9.18	peak	1.5	170	H
2443.69	-62.38	3.53	-58.85	-47.00	-11.85	peak	1.8	130	V

Remark:
Absolute Level = Receiver Reading + Factor
Factor = Antenna Factor + Cable Loss – Pre-amplifier

13. RECEIVER BLOCKING

13.1 Block Diagram Of Test Setup



13.2 Limit

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Table 15: Receiver Blocking parameters receiver Category 2 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Table 16: Receiver Blocking parameters receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

13.3 Test procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.11.2.

13.4 Test Result

Modulation : GFSK (the worst data)

Receiver Category 2					
GFSK Transmitting	P_{min}(dBm)	Blocking Frequency(MHz)	Blocking Power(dB)	Measured PER(%)	Limit (%)
2402	-58	2380	-34	0.35	10
2402	-58	2504	-34	0.44	10
2402	-58	2300	-34	0.38	10
2402	-58	2584	-34	0.18	10
2441	-58	2380	-34	0.59	10
2441	-58	2504	-34	0.37	10
2441	-58	2300	-34	0.29	10
2441	-58	2584	-34	0.73	10
2480	-58	2380	-34	0.66	10
2480	-58	2504	-34	0.47	10
2480	-58	2300	-34	0.45	10
2480	-58	2584	-34	0.45	10
Note:This report only shows the worst case test data.					

14. EUT PHOTOGRAPHS

N/A

15. EUT TEST SETUP PHOTOGRAPHS

Photo 1

Photo 2

Photo 3

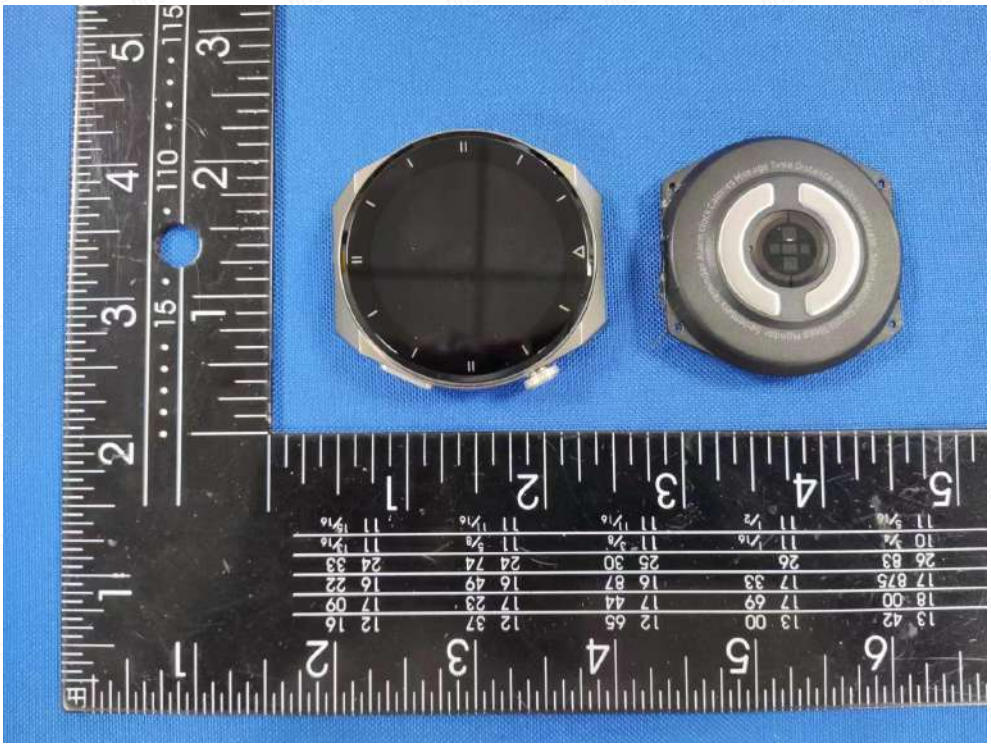


Photo 4

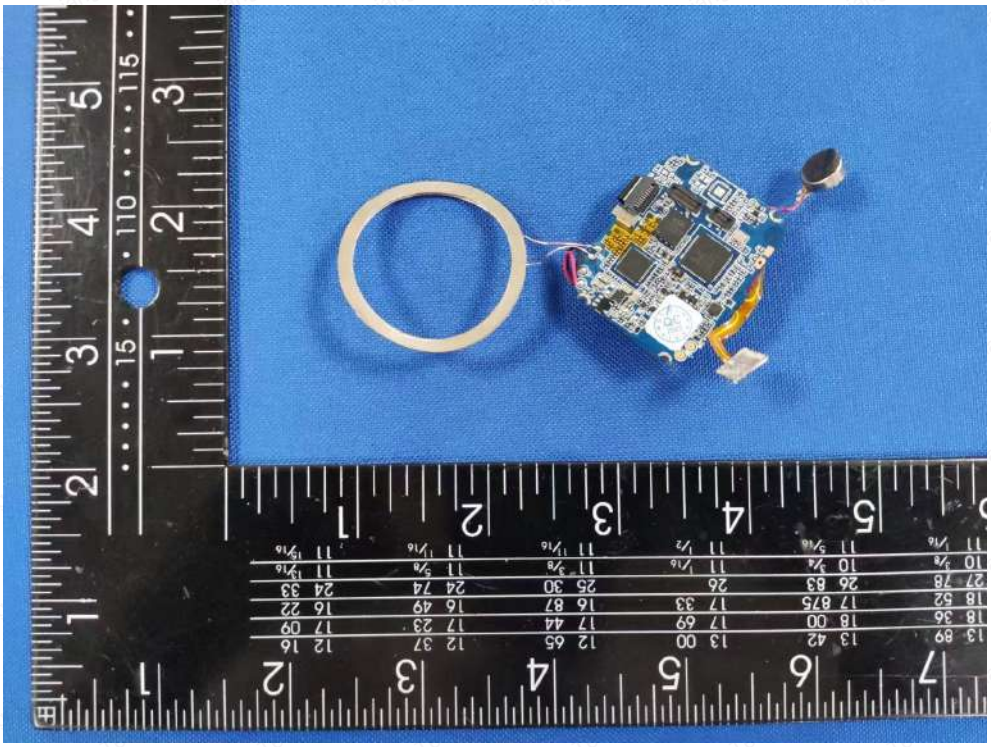


Photo 5

※※※※※ END OF REPORT ※※※※※

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

LGAI Technological Center S.A. (APPLUS)
**Ronda de la Font del Carme, s/n
P.O. Box 08193,**
Barcelona,
Spain

Date of Grant: 07/20/2023

Application Dated: 07/14/2023

Shenzhen Tiankang Medical Technology Co., Ltd
602, Building A5, Anle Industrial Zone, No. 172
Hangcheng Avenue, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen,
China

Attention: Xuelian Liu , Sales manager

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2BAXT-TK22
Name of Grantee: Shenzhen Tiankang Medical Technology Co., Ltd
Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Smart Watch

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
CC	15C	2402.0 - 2480.0	0.0012		

Output power listed is conducted.

CC: This device is certified pursuant to two different Part 15 rules sections.

TCB

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NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2BAXT-TK22
Name of Grantee: Shenzhen Tiankang Medical Technology Co., Ltd
Equipment Class: Digital Transmission System
Notes: Smart Watch

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
CC	15C	2402.0 - 2480.0	0.0026		

Output power listed is conducted.

CC: This device is certified pursuant to two different Part 15 rules sections.

Appendix - EUT Photos

Model: TK22

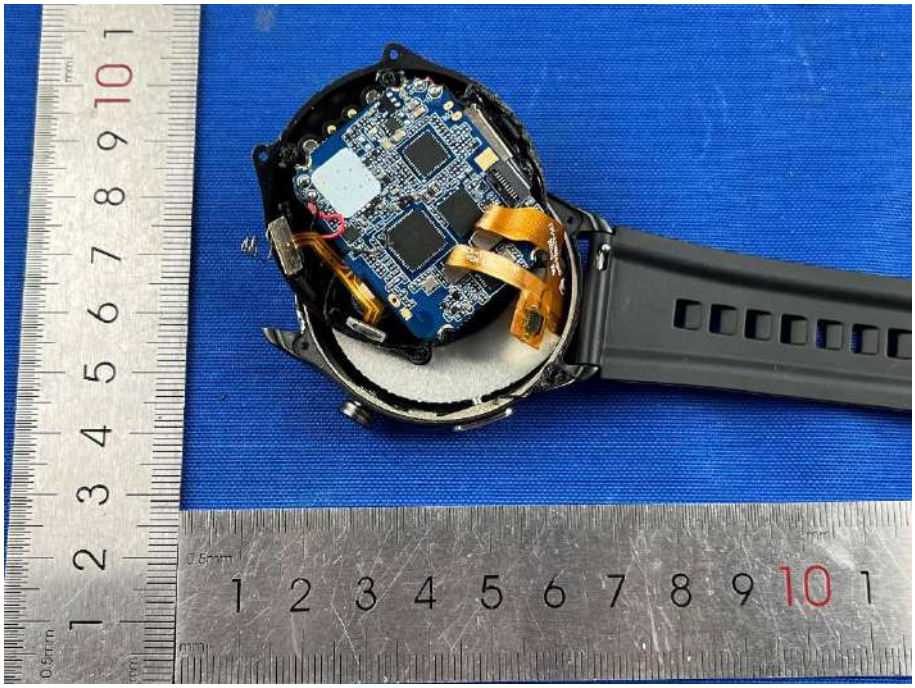

0.5mm
1 2 3 4 5 6 7
mm


0.5mm
1 2 3 4 5 6
mm


0.5mm
1 2 3 4 5 6 7
mm


0.5mm
1 2 3 4 5 6


0.5mm
1 2 3 4 5 6 7 8 9

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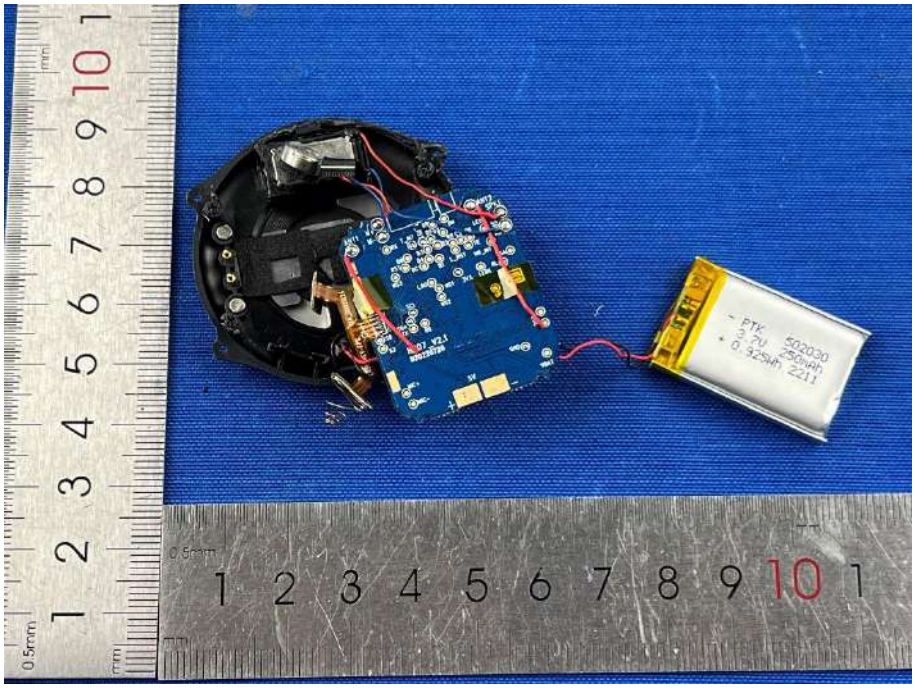
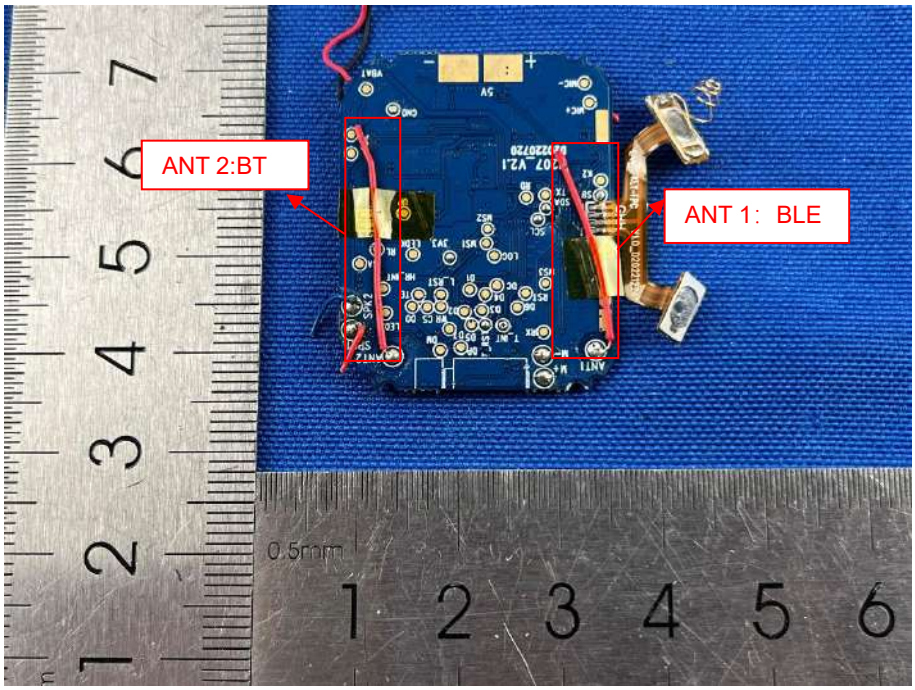
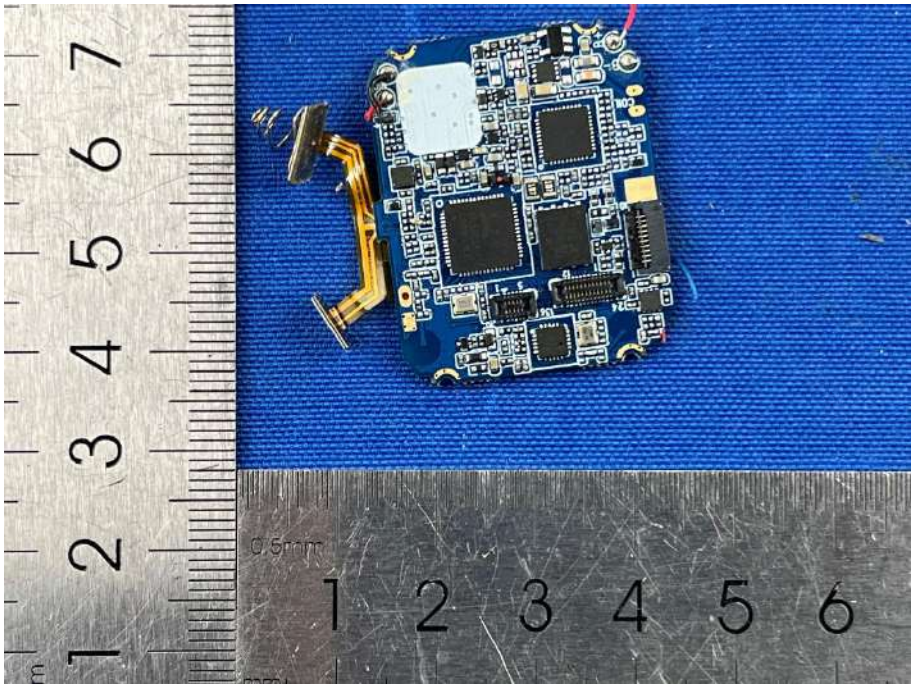
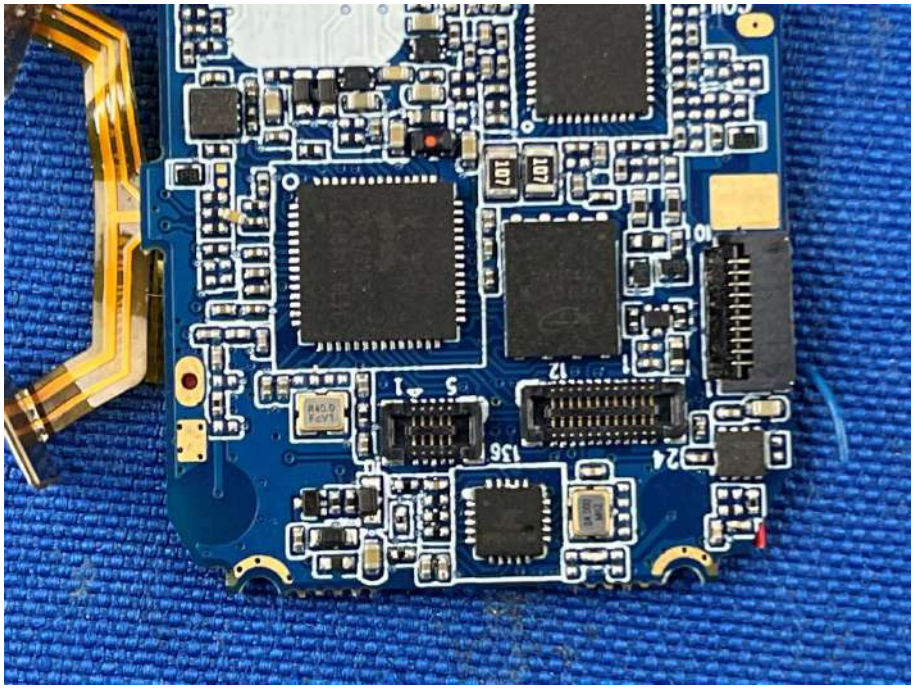
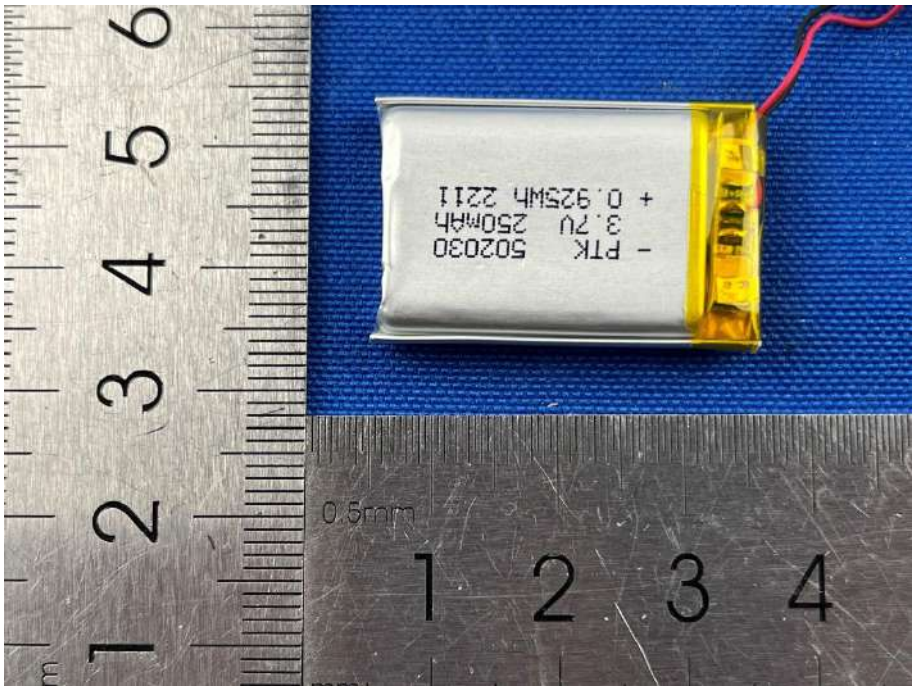
2022.12 J06
1 12
24 13
HCX-C128-FPC-A0
YCH 2253




ANT 2:BT
ANT 1: BLE


0.5mm
1 2 3 4 5 6



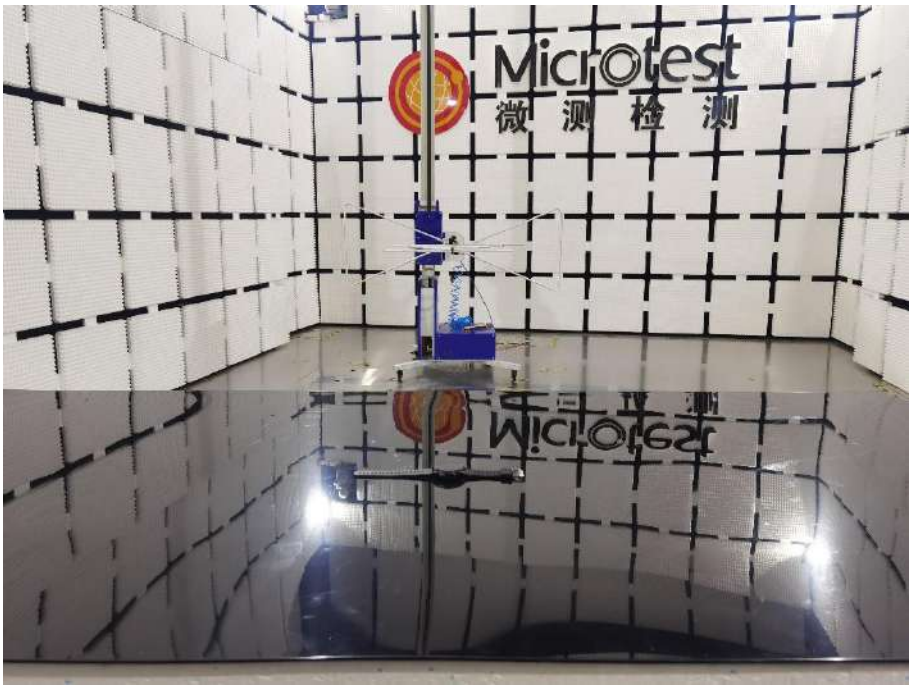


----End of Report----

Appendix - Test Setup Photos

Model: TK22

Radiated emissions –Below 1 GHz



Radiated emissions –Above 1 GHz

----End of Report----

Microtest
微 测 检 测

中国认可
国际互认
检测
TESTING
CNAS L5868

Test Report

Report No.:	MTi230307002-01E1
Date of issue:	2023-05-04
Applicant:	Shenzhen Tiankang Medical Technology Co., Ltd
Product:	Smart Watch
Model(s):	TK22, TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
FCC ID:	2BAXT-TK22

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

Address: 101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.

2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Table of contents

Applicant:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Factory:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Product description	
Product name:	Smart Watch
Trademark:	N/A
Model name:	TK22
Series Model:	TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
Standards:	FCC 47 CFR Part 15 Subpart C
Test method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
Date of Test	
Date of test:	2023-04-21 ~ 2023-05-04
Test result:	Pass

Test Engineer : Yanice Xie

(Yanice Xie)

Reviewed By: : Leon Chen

(Leon Chen)

Approved By: : Tom Xue

(Tom Xue)

1 General Description

1.1 Description of EUT

Test Result Certification	
Product name:	Smart Watch
Model name:	TK22
Series Model:	TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Input: DC 5V 500mA Battery: DC 3.7V 250mAh
Hardware version:	V2.1
Software version:	V1.8.0
Accessories:	Cable: USB Charging cable 0.6m
Test sample(s) number:	MTi230307002-01S1001
RF specification:	
Bluetooth version:	V5.1
Operation frequency:	2402 MHz ~ 2480 MHz
Modulation type:	GFSK
Antenna(s) information:	Antenna 1 type: linear antenna Antenna 1 gain: 0.52dBi
Max. peak conducted output power:	4.16 dBm

1.2 Description of test modes

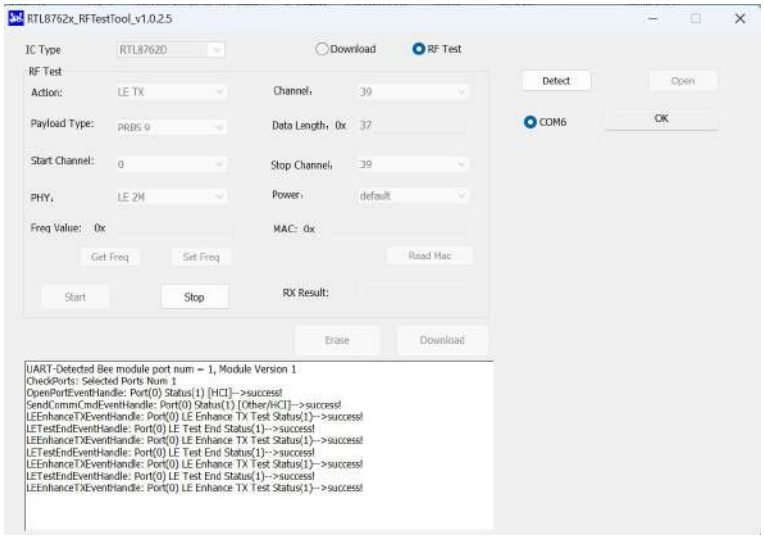
1.2.1 Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Note: The test software has been used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Mode	Test Software	RTL8762x_RFTestTool		
	Channel	2402MHz	2440MHz	2480MHz
BLE_1M	Power setting	Default	Default	Default
BLE_2M		Default	Default	Default

The test software:



1.3 Environmental conditions for testing

Environment of test site:

Temperature:	15ºC~35ºC
Humidity:	20 % RH ~ 75 % RH

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/
Support cable list			
Description	Length (m)	From	To
/	/	/	/

2 Measurement uncertainty

Parameter	Measurement uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Occupied Bandwidth	±3 %
Conducted RF output power	±0.16 dB
Conducted spurious emissions	±0.21 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission (30 MHz~1 GHz)	±4.2 dB
Radiated emission (above 1 GHz)	±4.3 dB
Power spectral density	±0.16 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3 Summary of Test Result

No.	FCC reference	Description of test	Result
1	§ 15.203	Antenna requirement	Pass
2	§ 15.207	AC power line conducted emissions	N/A
3	§ 15.247(d), 15.209, 15.205	Radiated spurious emissions	Pass
4	§ 15.247(a)(2)	DTS bandwidth	Pass
5	§ 15.247(b)(3)	Maximum conducted output power	Pass
6	§ 15.247(e)	Power Spectral Density	Pass
7	§ 15.247(d)	Conducted emission at the band edge	Pass
8	§ 15.247(d)	Conducted spurious emissions	Pass
9	/	Duty Cycle	Pass

Notes:

N/A means not applicable.
Since the EUT cannot be operating while charging, therefore AC power line conducted emissions test is not required.

4 Test Laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

5 Equipment List

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTi-E002	EMI Test Receiver	R&S	ESCI3	101368	2022/05/05	2023/05/04
MTi-E023	Artificial power network	Schwarzbeck	NSLK8127	NSLK8127# 841	2022/05/05	2023/05/04
MTi-E025	Artificial power network	Schwarzbeck	NSLK8127	8127183	2022/05/05	2023/05/04
MTI-E043	EMI test receiver	R&S	ESCI7	101166	2022/05/05	2023/05/04
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2024/05/29
MTI-E044	Broadband antenna	Schwarzbeck	VULB9163	9163-1338	2021/05/30	2024/05/29
MTI-E045	Horn antenna	Schwarzbeck	BBHA9120D	9120D-2278	2021/05/30	2024/05/29
MTI-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2022/05/05	2023/05/04
MTI-E048	Pre-amplifier	Agilent	8449B	3008A01120	2022/05/05	2023/05/04
MTi-E120	Broadband antenna	Schwarzbeck	VULB9163	9163-1419	2021/05/30	2024/05/29
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2022/04/15	2023/04/14
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2023/04/14	2024/04/25
MTi-E123	Pre-amplifier	Agilent	8449B	3008A04723	2022/05/05	2023/05/04
MTi-E135	Horn antenna	Schwarzbeck	BBHA 9170	00987	2021/05/30	2024/05/29
MTi-E136	Pre-amplifier	Space-Dtronics	EWLAN1840G -G45	210405001	2022/05/05	2023/05/04
MTi-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2022/05/05	2023/05/04
MTi-E067	RF Control Unit	Tonscend	JS0806-1	19D8060152	2022/05/05	2023/05/04
MTi-E068	RF Control Unit	Tonscend	JS0806-2	19D8060153	2022/05/05	2023/05/04
MTi-E069	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2022/05/05	2023/05/04
MTI-E010S	EMI Measurement Software	Farad	EZ-EMC Ver. EMEC-3A1	/	/	/
MTI-E014S	RF Test System	Tonscend	TS®JS1120 V2.6.88.0330	/	/	/

Note: the calibration interval of the test equipment is 12 or 24 months and the calibrations are traceable to international system unit(SI)

6 Test Result

6.1 Antenna requirement

§ 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Description of the antenna of EUT

The antenna of the EUT is permanently attached.

Conclusion:

The EUT complies with the requirement of § 15.203.

6.2 AC power line conducted emissions

6.2.1 Limits

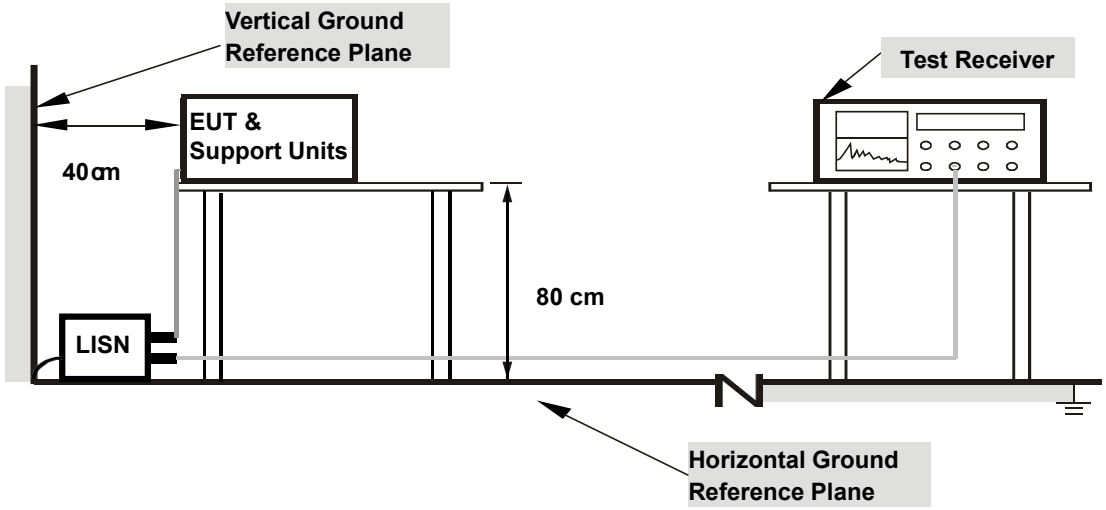
Frequency (MHz)	Detector type / Bandwidth	Limit-Quasi-peak dBµV	Limit-Average dBµV
0.15 -0.5	Average / 9 kHz	66 to 56	56 to 46
0.5 -5		56	46
5 -30		60	50

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

6.2.2 Test Procedures

a) Test method: ANSI C63.10-2013 Section 6.2.
b) The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).
c) Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.
d) The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.
e) The test data of the worst-case condition(s) was recorded.

6.2.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.2.4 Test Result

Notes:

Since the EUT cannot be operating while charging, therefore AC power line conducted emissions test is not required.

All modes of operation of the EUT were investigated, and only the worst-case results are reported.

Calculation formula:

Measurement (dBµV) = Reading Level (dBµV) + Correct Factor (dB)
Over (dB) = Measurement (dBµV) – Limit (dBµV)

6.3 Radiated spurious emission

6.3.1 Limits

§ 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

§ 15.209 Radiated emission limits at restricted bands:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note 1: the tighter limit applies at the band edges.
Note 2: the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

§ 15.35 (b) requirements:
When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

According to ANSI C63.10-2013, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

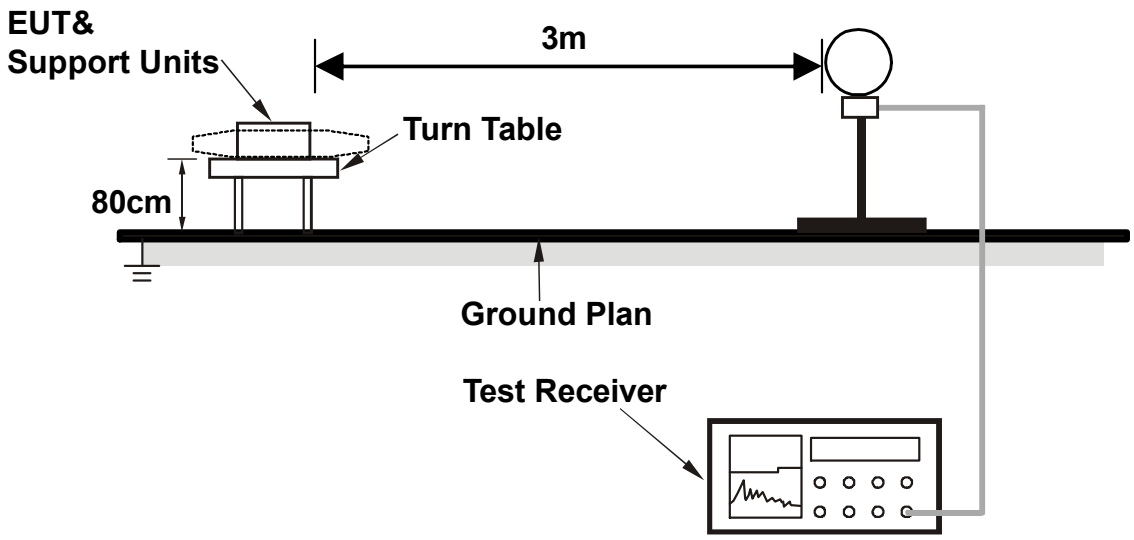
Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Frequency range of measurements for unlicensed wireless device with digital device

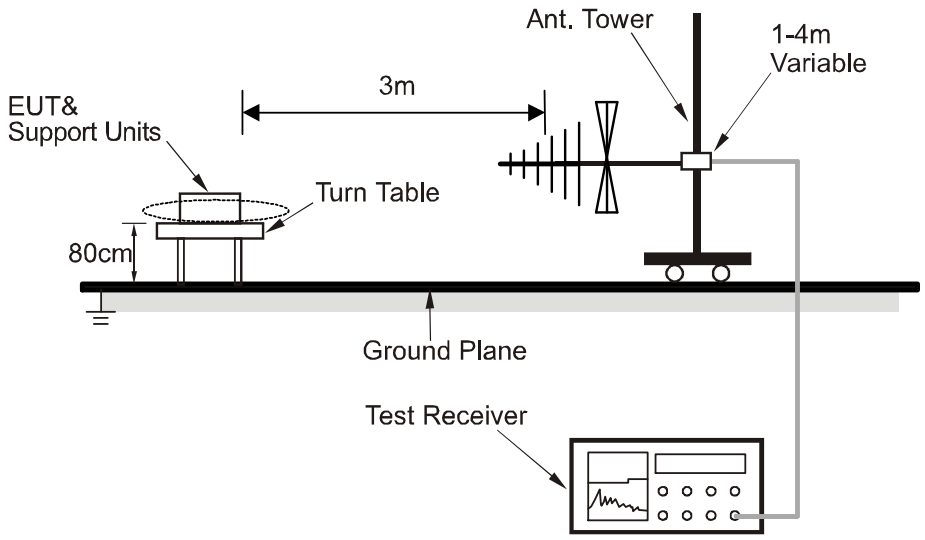
Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency range of measurement
Below 1.705 MHz	30 MHz
1.705 MHz to 108 MHz	1000 MHz
108 MHz to 500 MHz	2000 MHz
500 MHz to 1000 MHz	5000 MHz
Above 1000 MHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower

6.3.2 Test setup

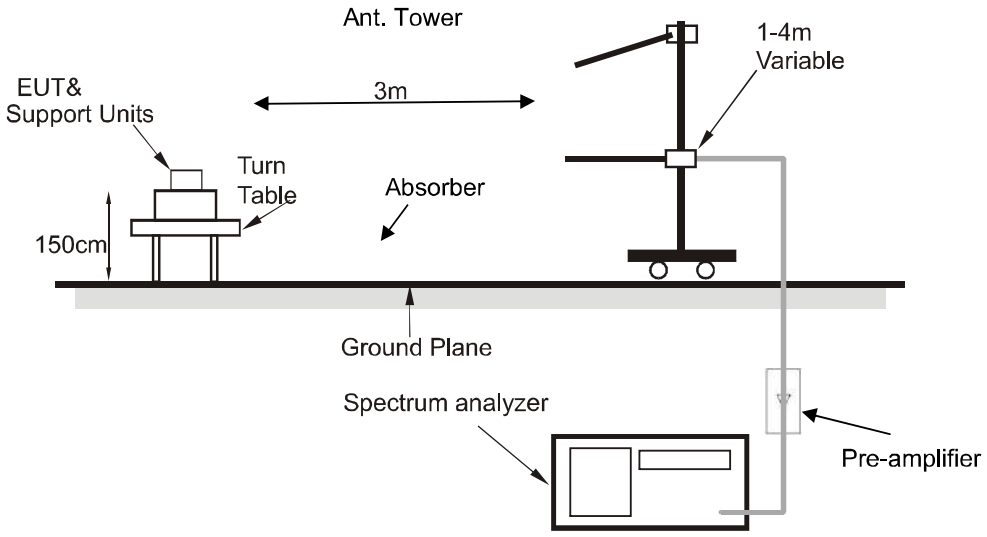
Below 30MHz:



30MHz~1GHz:



Above 1GHz:



For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.3.3 Test procedure

a) Test method: ANSI C63.10-2013 Section 6.3, 6.4, 6.5, 6.6, 11.11, 11.12, 11.13.
b) The EUT is placed on an on-conducting table 0.8 meters above the ground plane for measurement below 1GHz, 1.5 meters above the ground plane for measurement above 1GHz.
c) Emission blew 18 GHz were measured at a 3 meters test distance, above 18 GHz were measured at 1-meter test distance with the application of a distance correction factor
d) The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Test instrument setup

Frequency	Test receiver / Spectrum analyzer setting
9 kHz ~ 150 kHz	Quasi Peak / RBW: 200 Hz
150 kHz ~ 30 MHz	Quasi Peak / RBW: 9 kHz
30 MHz ~ 1 GHz	Quasi Peak / RBW: 120 kHz
Above 1 GHz	Peak / RBW: 1 MHz, VBW: 3MHz, Peak detector AVG / RBW: 1 MHz, VBW: 3MHz, Average detector

6.3.4 Test results

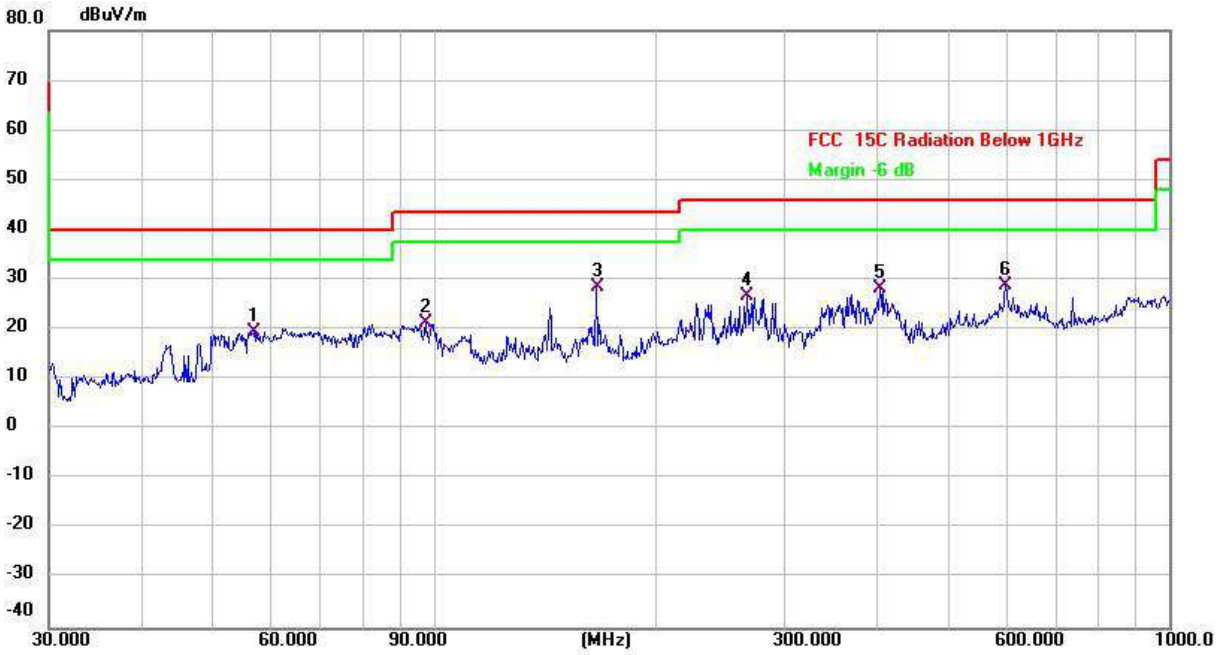
Notes:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.
All modes of operation of the EUT were investigated, and only the worst-case results are reported.
There were no emissions found below 30MHz within 20dB of the limit.

Calculation formula:
Measurement (dBμV/m) = Reading Level (dBμV) + Correct Factor (dB/m)
Over (dB) = Measurement (dBμV/m) – Limit (dBμV/m)

Radiated emissions between 30MHz – 1GHz

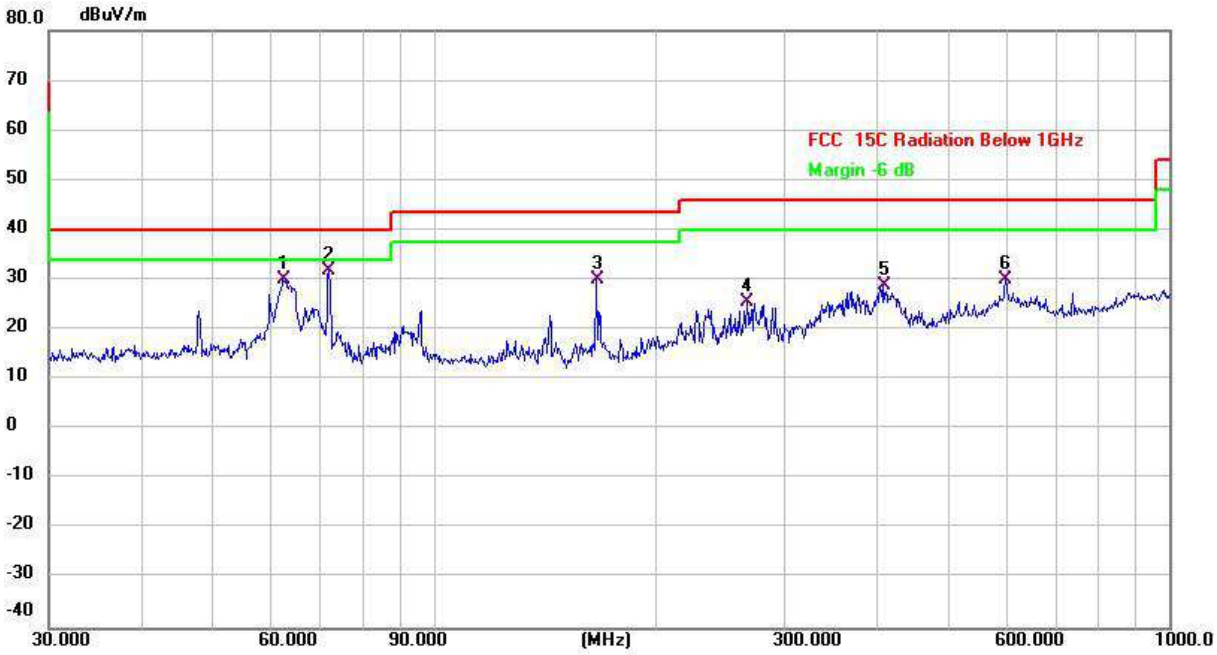
Test mode:	BLE 2Mbps – 2440 MHz TX mode	Polarization:	Horizontal
Power supply:	DC 3.7V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		56.9911	30.20	-10.68	19.52	40.00	-20.48	QP
2		97.4557	31.95	-10.51	21.44	43.50	-22.06	QP
3	*	166.6512	40.28	-11.76	28.52	43.50	-14.98	QP
4		266.6089	34.61	-7.97	26.64	46.00	-19.36	QP
5		404.6664	34.97	-6.75	28.22	46.00	-17.78	QP
6		599.3211	31.60	-2.65	28.95	46.00	-17.05	QP

Radiated emissions between 30MHz – 1GHz

Test mode:	BLE 2Mbps – 2440 MHz TX mode	Polarization:	Vertical
Power supply:	DC 3.7V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		62.4314	41.37	-11.32	30.05	40.00	-9.95	QP
2	*	72.0843	43.39	-11.64	31.75	40.00	-8.25	QP
3		166.6514	41.78	-11.76	30.02	43.50	-13.48	QP
4		266.6089	33.61	-7.97	25.64	46.00	-20.36	QP
5		408.9460	35.39	-6.54	28.85	46.00	-17.15	QP
6		599.3212	32.60	-2.65	29.95	46.00	-16.05	QP

Radiated emissions 1 GHz ~ 25 GHz

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
BLE 2Mbps - 2402 MHz TX mode							
4804.000	47.29	0.74	48.03	74.00	-25.97	Peak	V
4804.000	43.49	0.74	44.23	54.00	-9.77	AVG	V
7206.000	40.81	6.02	46.83	74.00	-27.17	Peak	V
7206.000	34.33	6.02	40.35	54.00	-13.65	AVG	V
9608.000	41.89	5.88	47.77	74.00	-26.23	Peak	V
9608.000	35.54	5.88	41.42	54.00	-12.58	AVG	V
4804.000	47.29	0.74	48.03	74.00	-25.97	Peak	H
4804.000	43.49	0.74	44.23	54.00	-9.77	AVG	H
7206.000	40.81	6.02	46.83	74.00	-27.17	Peak	H
7206.000	34.33	6.02	40.35	54.00	-13.65	AVG	H
9608.000	41.89	5.88	47.77	74.00	-26.23	Peak	H
9608.000	35.54	5.88	41.42	54.00	-12.58	AVG	H
BLE 2Mbps - 2440 MHz TX mode							
4880	40.69	1.05	41.74	74.00	-32.26	Peak	V
4880	34.51	1.05	35.56	54.00	-18.44	AVG	V
7320	40.66	5.94	46.60	74.00	-27.40	Peak	V
7320	34.28	5.94	40.22	54.00	-13.78	AVG	V
9760	41.08	6.55	47.63	74.00	-26.37	Peak	V
9760	34.78	6.55	41.33	54.00	-12.67	AVG	V
4880	40.56	1.05	41.61	74.00	-32.39	Peak	H
4880	34.31	1.05	35.36	54.00	-18.64	AVG	H
7320	40.50	5.94	46.44	74.00	-27.56	Peak	H
7320	34.28	5.94	40.22	54.00	-13.78	AVG	H
9760	41.17	6.55	47.72	74.00	-26.28	Peak	H
9760	34.91	6.55	41.46	54.00	-12.54	AVG	H

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
BLE 2Mbps - 2480 MHz TX mode							
4960.000	40.97	1.50	42.47	74.00	-31.53	Peak	V
4960.000	34.84	1.50	36.34	54.00	-17.66	AVG	V
7440.000	39.97	5.61	45.58	74.00	-28.42	Peak	V
7440.000	33.61	5.61	39.22	54.00	-14.78	AVG	V
9920.000	41.44	6.10	47.54	74.00	-26.46	Peak	V
9920.000	35.15	6.10	41.25	54.00	-12.75	AVG	V
4960.000	42.00	1.50	43.50	74.00	-30.50	Peak	H
4960.000	35.83	1.50	37.33	54.00	-16.67	AVG	H
7440.000	40.44	5.61	46.05	74.00	-27.95	Peak	H
7440.000	34.40	5.61	40.01	54.00	-13.99	AVG	H
9920.000	42.00	6.10	48.10	74.00	-25.90	Peak	H
9920.000	36.03	6.10	42.13	54.00	-11.87	AVG	H

Radiated emissions at band edge

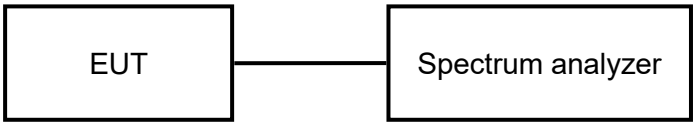
Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
BLE 2Mbps – Low band-edge							
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
2310.000	48.23	-8.08	40.15	74.00	-33.85	Peak	V
2310.000	37.59	-8.08	29.51	54.00	-24.49	AVG	V
2390.000	63.54	-7.71	55.83	74.00	-18.17	Peak	V
2390.000	41.56	-7.71	33.85	54.00	-20.15	AVG	V
2310.000	48.15	-8.08	40.07	74.00	-33.93	Peak	H
2310.000	37.43	-8.08	29.35	54.00	-24.65	AVG	H
2390.000	64.05	-7.71	56.34	74.00	-17.66	Peak	H
2390.000	40.86	-7.71	33.15	54.00	-20.85	AVG	H
BLE 2Mbps – High band-edge							
2483.500	60.51	-7.24	53.27	74.00	-20.73	Peak	V
2483.500	39.68	-7.24	32.44	54.00	-21.56	AVG	V
2500.000	48.03	-7.17	40.86	74.00	-33.14	Peak	V
2500.000	37.95	-7.17	30.78	54.00	-23.22	AVG	V
2483.500	65.47	-7.24	58.23	74.00	-15.77	Peak	H
2483.500	40.18	-7.24	32.94	54.00	-21.06	AVG	H
2500.000	51.94	-7.17	44.77	74.00	-29.23	Peak	H
2500.000	38.07	-7.17	30.90	54.00	-23.10	AVG	H

6.4 DTS bandwidth

6.4.1 Limits

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.4.2 Test setup



6.4.3 Test procedures

Test method: ANSI C63.10-2013 Section 11.8.1

6.4.4 Test results

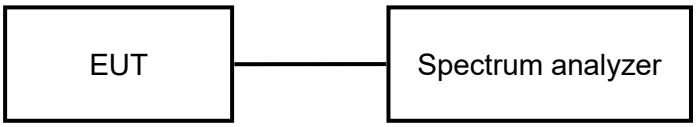
Note: See the appendix A

6.5 Maximum conducted output power

6.5.1 Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

6.5.2 Test setup



6.5.3 Test procedure

Test method for peak power: ANSI C63.10-2013 Section 11.9.1.1
Test method for average power: ANSI C63.10-2013 Section 11.9.2.3.1 Method AVGPM

6.5.4 Test results

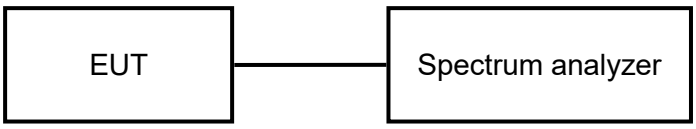
Note: see the appendix B

6.6 Power spectral density

6.6.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.6.2 Test setup



6.6.3 Test Procedure

Test method: ANSI C63.10-2013 Section 11.10.2

6.6.4 Test Results

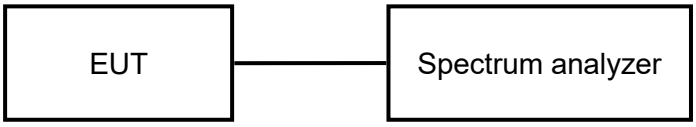
Note: see the appendix C

6.7 Band edge (Conducted)

6.7.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.7.2 Test setup



6.7.3 Test procedure

Test method: ANSI C63.10-2013 Section 11.13

6.7.4 Test results

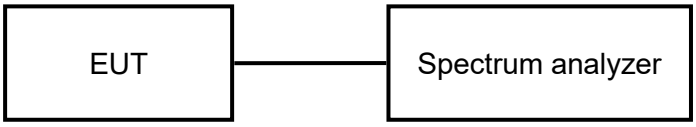
Note: see the appendix D

6.8 Conducted spurious emissions

6.8.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.8.2 Test setup



6.8.3 Test procedure

Test method: ANSI C63.10-2013 Section 11.11

6.8.4 Test results

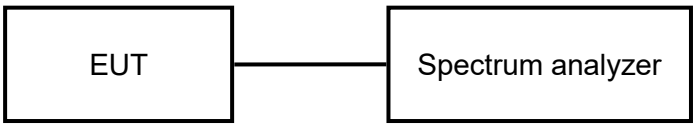
Note: see the appendix E

6.9 Duty Cycle

6.9.1 Conformance Limit

None, for reporting purposes only.

6.9.2 Test setup



6.9.3 Test procedure

Test method: KDB 558074 section 6, zero-span spectrum analyzer method.

6.9.4 Test Results

Note: see the appendix F

Appendix A: DTS Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	0.672	0.5	PASS
		2440	0.632	0.5	PASS
		2480	0.776	0.5	PASS
BLE_2M	Ant1	2402	1.068	0.5	PASS
		2440	1.184	0.5	PASS
		2480	1.080	0.5	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

Appendix B: Maximum conducted output power

Test Result-Peak

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	2402	4.07	≤30	PASS
		2440	4.15	≤30	PASS
		2480	3.68	≤30	PASS
BLE_2M	Ant1	2402	4.06	≤30	PASS
		2440	4.16	≤30	PASS
		2480	3.68	≤30	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

Appendix C: Maximum power spectral density

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-10.68	≤8.00	PASS
		2440	-11.43	≤8.00	PASS
		2480	-11.83	≤8.00	PASS
BLE_2M	Ant1	2402	-12.76	≤8.00	PASS
		2440	-13.65	≤8.00	PASS
		2480	-14.36	≤8.00	PASS

Test Graphs

BLE_1M_Ant1_2402

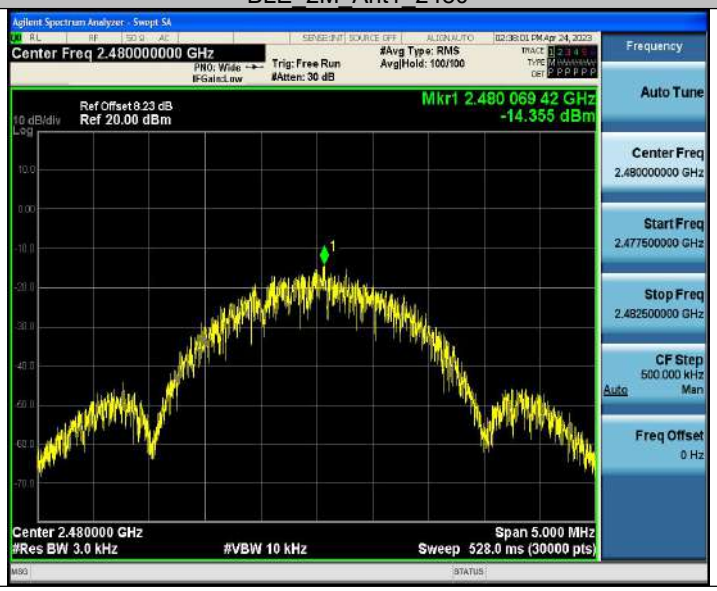
BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

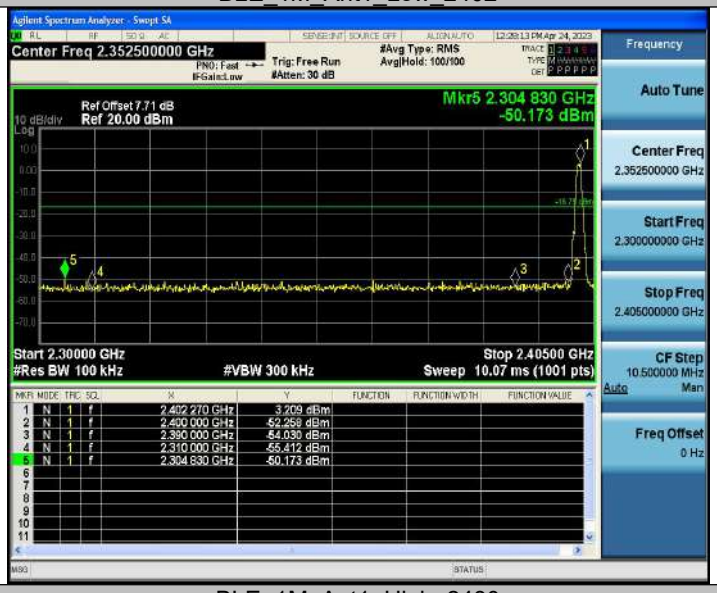
BLE_2M_Ant1_2480



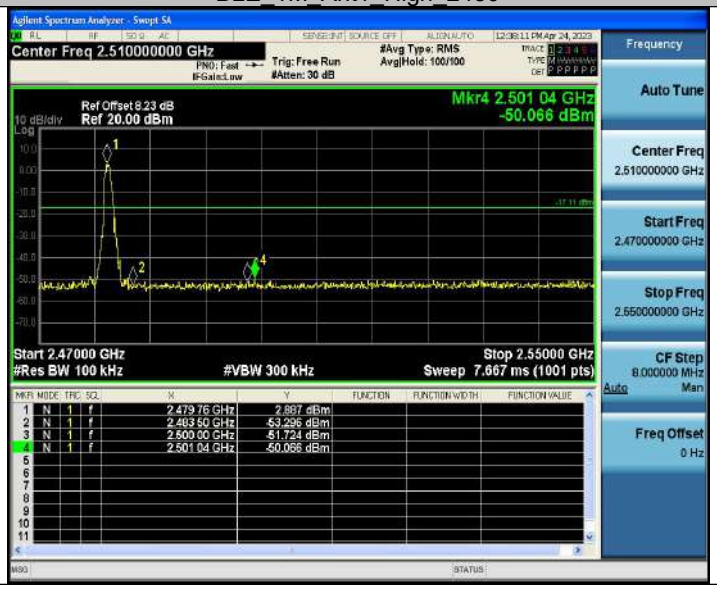
Appendix D: Band edge measurements

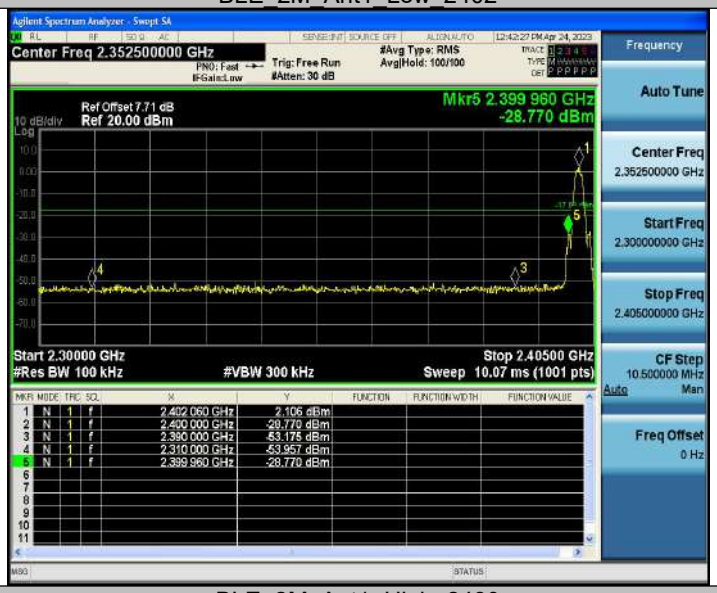
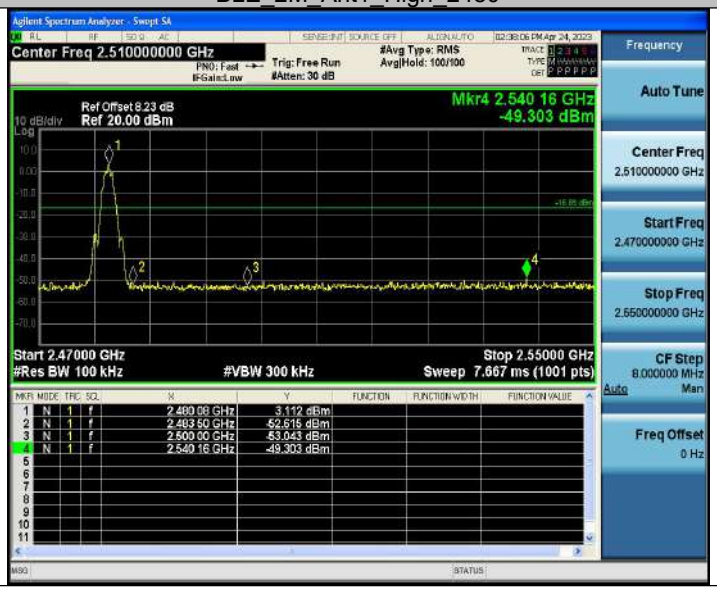
Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480

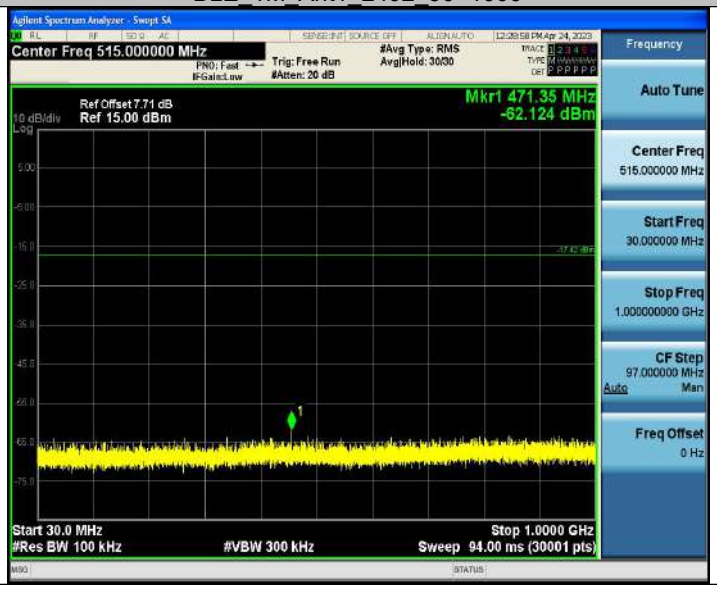


BLE_2M_Ant1_Low_2402

BLE_2M_Ant1_High_2480


Appendix E: Conducted Spurious Emission

Test Graphs

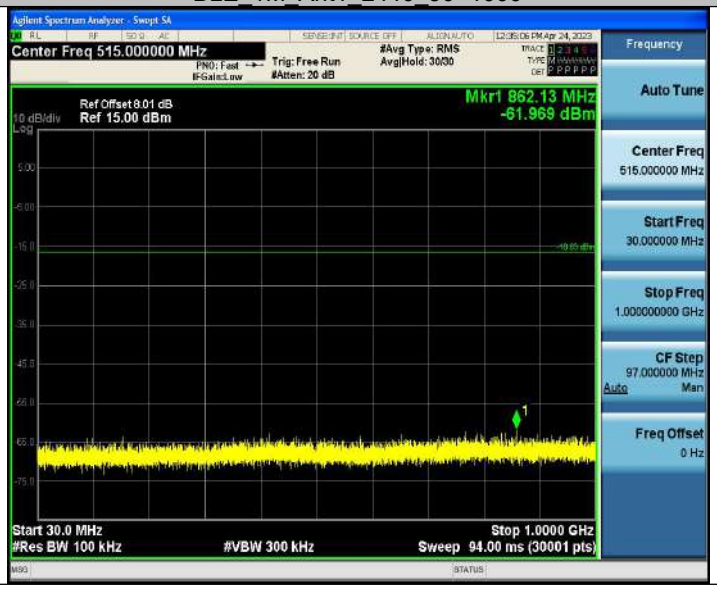
BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000


BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

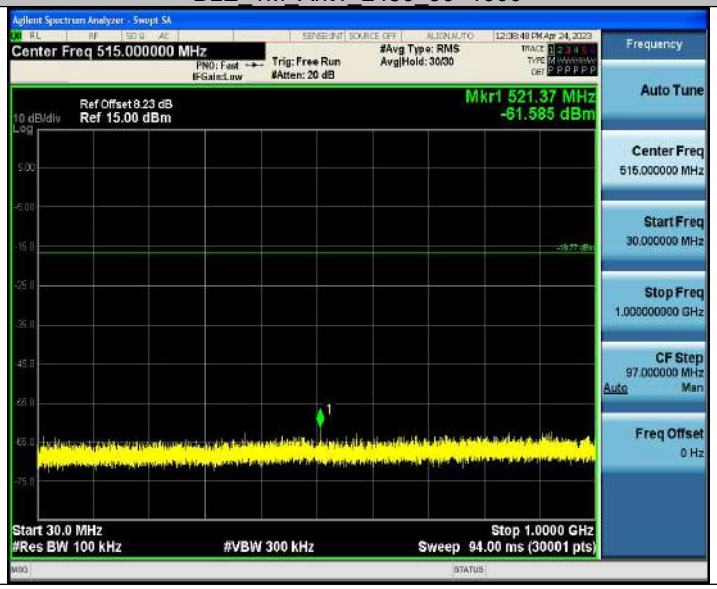
BLE_1M_Ant1_2440_30~1000



BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant1_2480_0~Reference

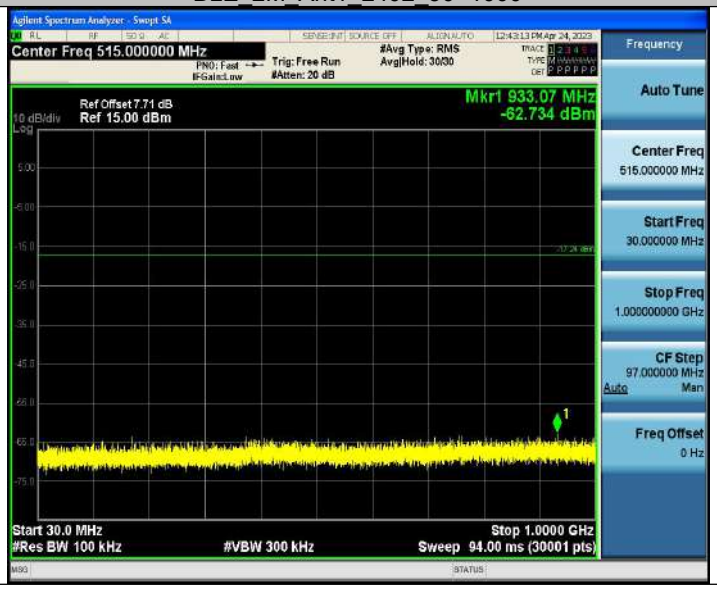
BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

BLE_2M_Ant1_2402_0~Reference

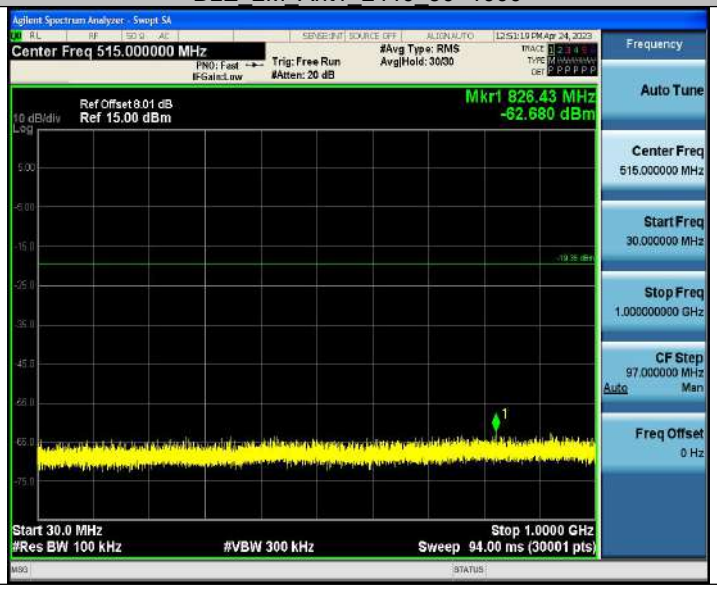
BLE_2M_Ant1_2402_30~1000



BLE_2M_Ant1_2402_1000~26500

BLE_2M_Ant1_2440_0~Reference

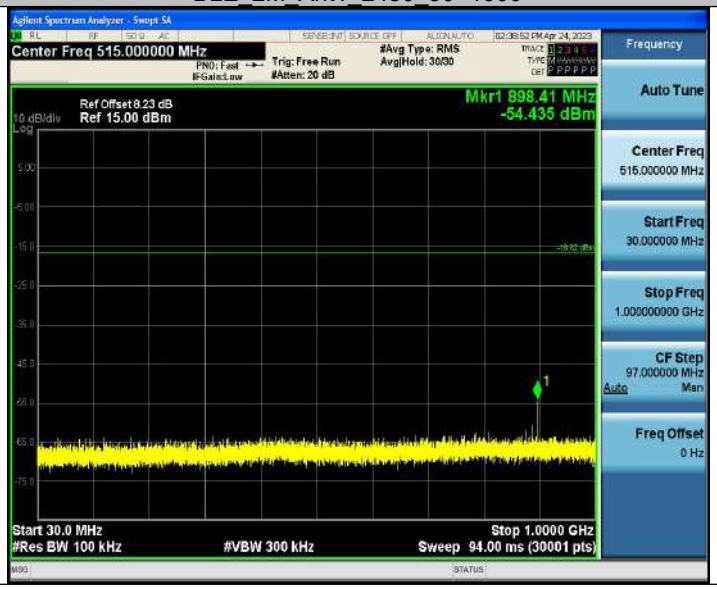
BLE_2M_Ant1_2440_30~1000



BLE_2M_Ant1_2440_1000~26500

BLE_2M_Ant1_2480_0~Reference

BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500

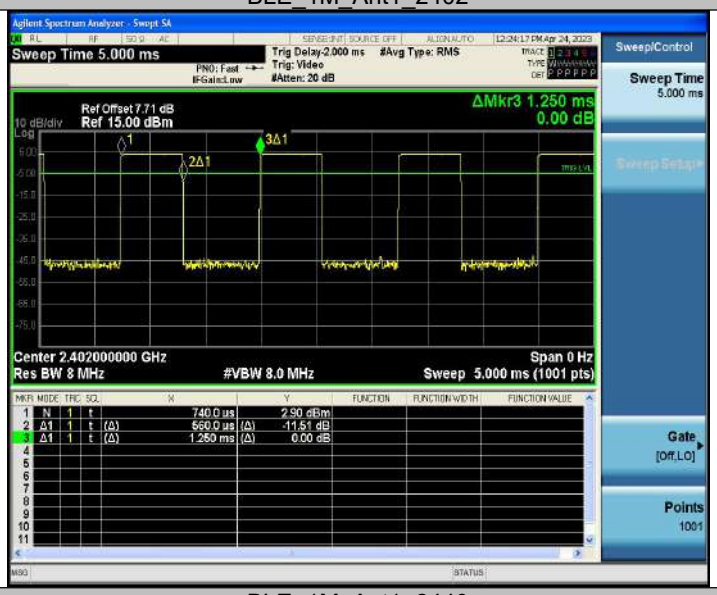

Appendix F: Duty Cycle

Test Result

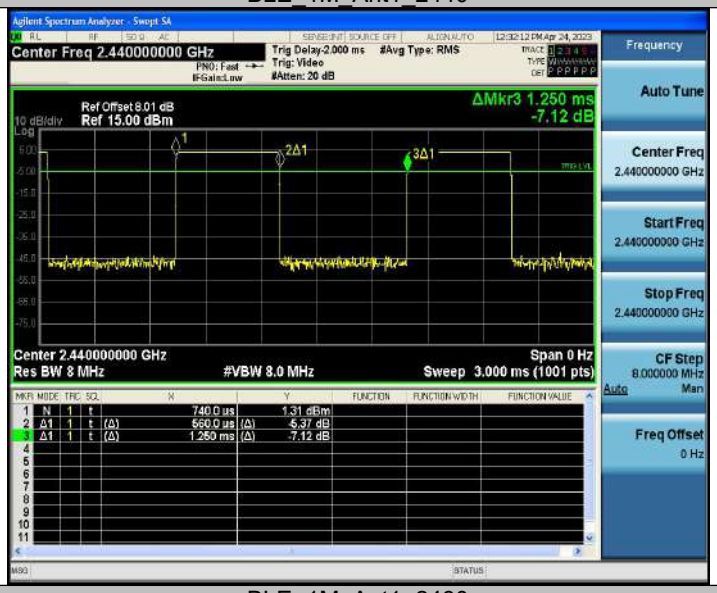
Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	0.56	1.25	44.80	3.49
		2440	0.56	1.25	44.80	3.49
		2480	0.56	1.25	44.80	3.49
BLE_2M	Ant1	2402	0.31	0.62	50.00	3.01
		2440	0.31	0.62	50.00	3.01
		2480	0.31	0.62	50.00	3.01

Test Graphs

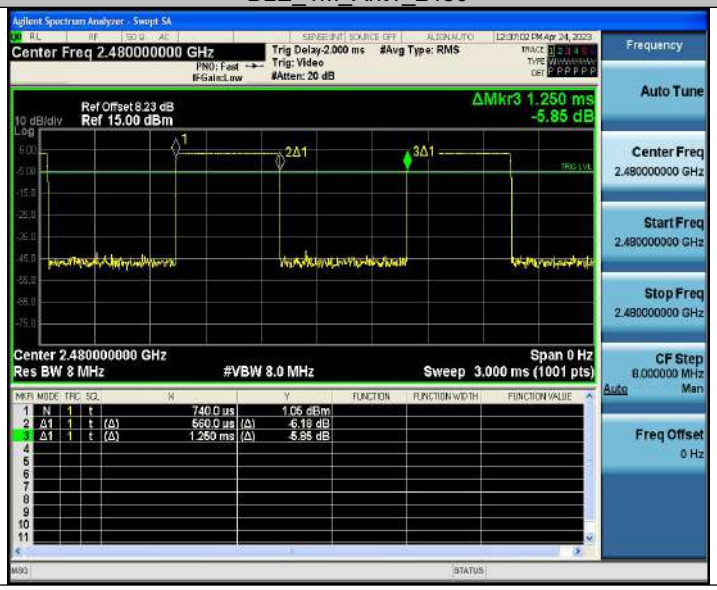
BLE_1M_Ant1_2402



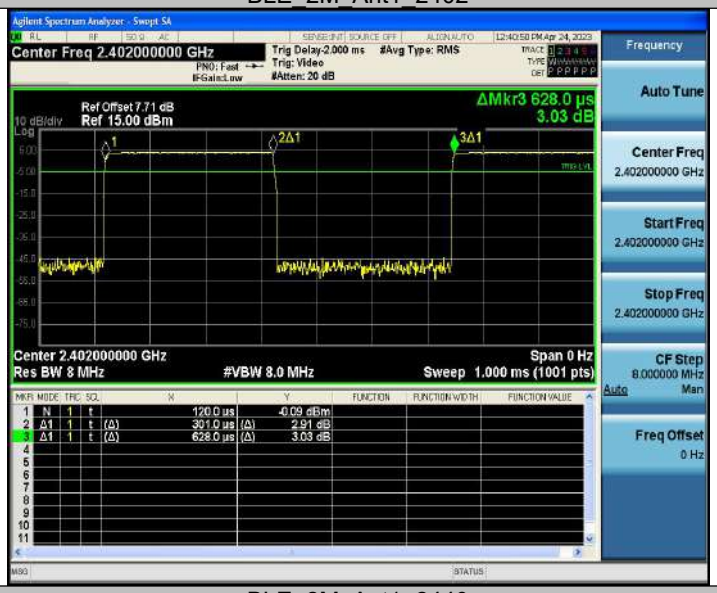
BLE_1M_Ant1_2440



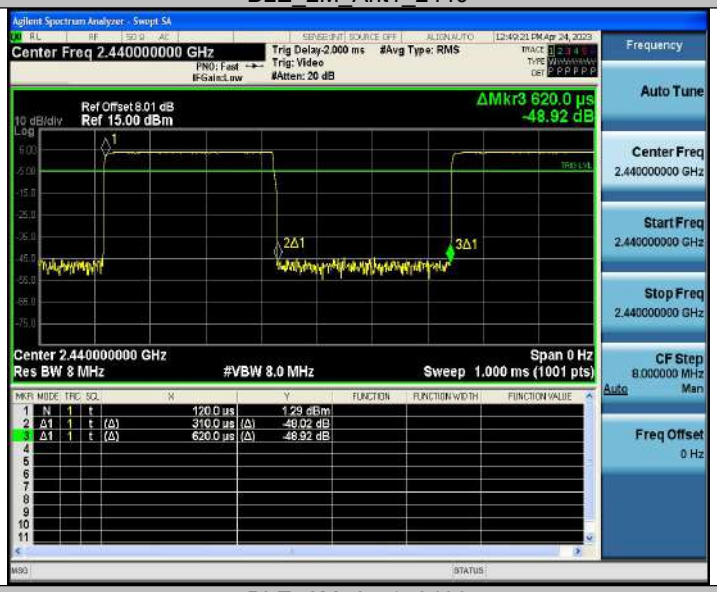
BLE_1M_Ant1_2480



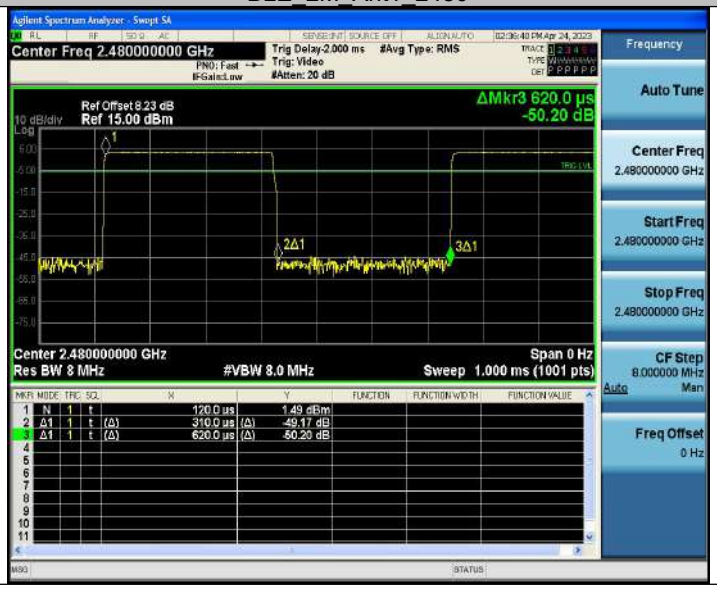
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



Photographs of the Test Setup

See the Appendix – Test Setup Photos.

Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----

Microtest
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检测
TESTING
CNAS L5868

Test Report

Report No.:	MTi230307002-01E2
Date of issue:	2023-05-04
Applicant:	Shenzhen Tiankang Medical Technology Co., Ltd
Product:	Smart Watch
Model(s):	TK22, TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
FCC ID:	2BAXT-TK22

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

Address: 101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.

2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Table of contents

Test Result Certification	
Applicant:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Factory:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Product description	
Product name:	Smart Watch
Trademark:	N/A
Model name:	TK22
Series Model:	TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
Standards:	FCC 47 CFR Part 15 Subpart C
Test method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02
Date of Test	
Date of test:	2023-04-21 ~ 2023-05-04
Test result:	Pass

Test Engineer : Yanice Xie

(Yanice Xie)

Reviewed By: : Leon Chen

(Leon Chen)

Approved By: : Tom Xue

(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Smart Watch
Model name:	TK22
Series Model:	TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Input: DC 5V 500mA Battery: DC 3.7V 250mAh
Hardware version:	V2.1
Software version:	V1.8.0
Accessories:	Cable: USB Charging cable 0.6m
Test sample(s) number:	MTi230307002-01S1001
RF specification:	
Bluetooth version:	V5.1
Operation frequency:	2402 MHz ~ 2480 MHz
Modulation type:	GFSK, π/4-DQPSK
Antenna(s) information:	Antenna 2 type: linear antenna Antenna 2 gain: 0.52dBi
Maximum conducted output power:	0.74 dBm

1.2 Description of test modes

1.2.1 Operation channel list

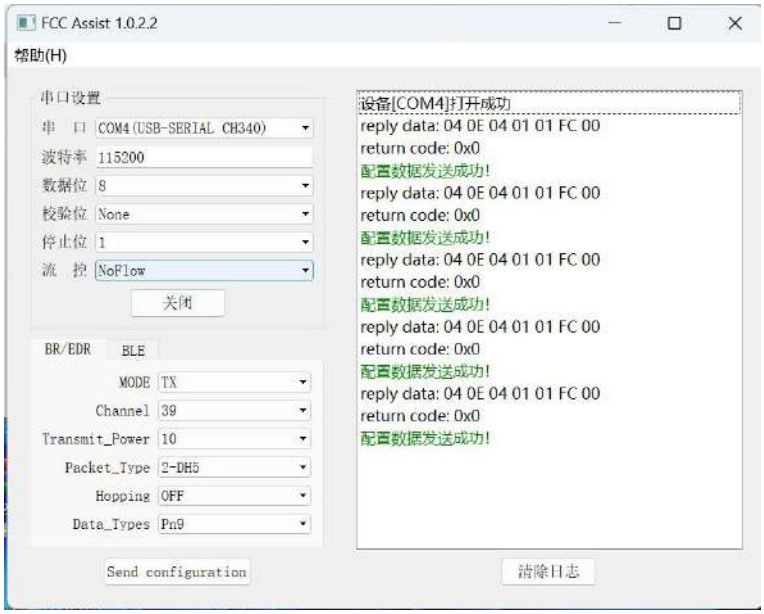
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	-	-

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Mode	Test Software	FCC_assist_1.0.2.2		
	Channel	2402MHz	2441MHz	2480MHz
GFSK	Power setting	10	10	10
π/4-DQPSK		10	10	10

The test software:



1.3 Test conditions

Environment of test site:

Temperature:	15ºC~35ºC
Humidity:	20 % RH ~ 75 % RH

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
/	/	/	/
Support cable list			
Description	Length (m)	From	To
/	/	/	/

2 Measurement uncertainty

Parameter	Measurement uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Occupied Bandwidth	±3 %
Conducted RF output power	±0.16 dB
Conducted spurious emissions	±0.21 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission (30 MHz~1 GHz)	±4.2 dB
Radiated emission (above 1 GHz)	±4.3 dB

Note: the measurement uncertainty is calculated and correspond to a factor k = 2 (which provide confidence levels of 95.45 %)

3 Summary of Test Result

No.	FCC reference	Description of test	Result
1	§ 15.203	Antenna requirement	Pass
2	§ 15.207	AC power line conducted emissions	N/A
3	§ 15.247(d), 15.209, 15.205	Radiated spurious emissions	Pass
4	§ 15.247(a)(1)	20dB emission bandwidth	Pass
5	§ 15.247(b)(1)	Maximum conducted output power	Pass
6	§ 15.247(a)(1)	Carrier Frequencies Separation	Pass
7	§ 15.247(a)(1)	Time of occupancy	Pass
8	§ 15.247(a)(1)	Number of hopping channels	Pass
9	§ 15.247(d)	Band edge (Conducted)	Pass
10	§ 15.247(d)	Conducted spurious emissions	Pass

Notes:

N/A means not applicable.
Since the EUT cannot be operating while charging, therefore AC power line conducted emissions test is not required.

4 Test Laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

5 Equipment List

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTi-E002	EMI Test Receiver	R&S	ESCI3	101368	2022/05/05	2023/05/04
MTi-E023	Artificial power network	Schwarzbeck	NSLK8127	NSLK8127# 841	2022/05/05	2023/05/04
MTi-E025	Artificial power network	Schwarzbeck	NSLK8127	8127183	2022/05/05	2023/05/04
MTI-E043	EMI test receiver	R&S	ESCI7	101166	2022/05/05	2023/05/04
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2024/05/29
MTI-E044	Broadband antenna	Schwarzbeck	VULB9163	9163-1338	2021/05/30	2024/05/29
MTI-E045	Horn antenna	Schwarzbeck	BBHA9120D	9120D-2278	2021/05/30	2024/05/29
MTI-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2022/05/05	2023/05/04
MTI-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2022/05/05	2023/05/04
MTI-E048	Pre-amplifier	Agilent	8449B	3008A01120	2022/05/05	2023/05/04
MTi-E120	Broadband antenna	Schwarzbeck	VULB9163	9163-1419	2021/05/30	2024/05/29
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2022/04/15	2023/04/14
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2023/04/14	2024/04/25
MTi-E123	Pre-amplifier	Agilent	8449B	3008A04723	2022/05/05	2023/05/04
MTi-E135	Horn antenna	Schwarzbeck	BBHA 9170	00987	2021/05/30	2024/05/29
MTi-E136	Pre-amplifier	Space-Dtronics	EWLAN1840G -G45	210405001	2022/05/05	2023/05/04
MTi-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2022/05/05	2023/05/04
MTi-E067	RF Control Unit	Tonscend	JS0806-1	19D8060152	2022/05/05	2023/05/04
MTi-E068	RF Control Unit	Tonscend	JS0806-2	19D8060153	2022/05/05	2023/05/04
MTi-E069	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2022/05/05	2023/05/04
MTI-E010S	EMI Measurement Software	Farad	EZ-EMC Ver. EMEC-3A1	/	/	/
MTI-E014S	RF Test System	Tonscend	TS®JS1120 V2.6.88.0330	/	/	/

Note: the calibration interval of the test equipment is 12 or 24 months and the calibrations are traceable to international system unit(SI)

6 Test Result

6.1 Antenna requirement

§ **15.203 requirement:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Description of the antenna of EUT

The antenna of the EUT is permanently attached.

Conclusion:

The EUT complies with the requirement of § 15.203.

6.2 AC power line conducted emissions

6.2.1 Limits

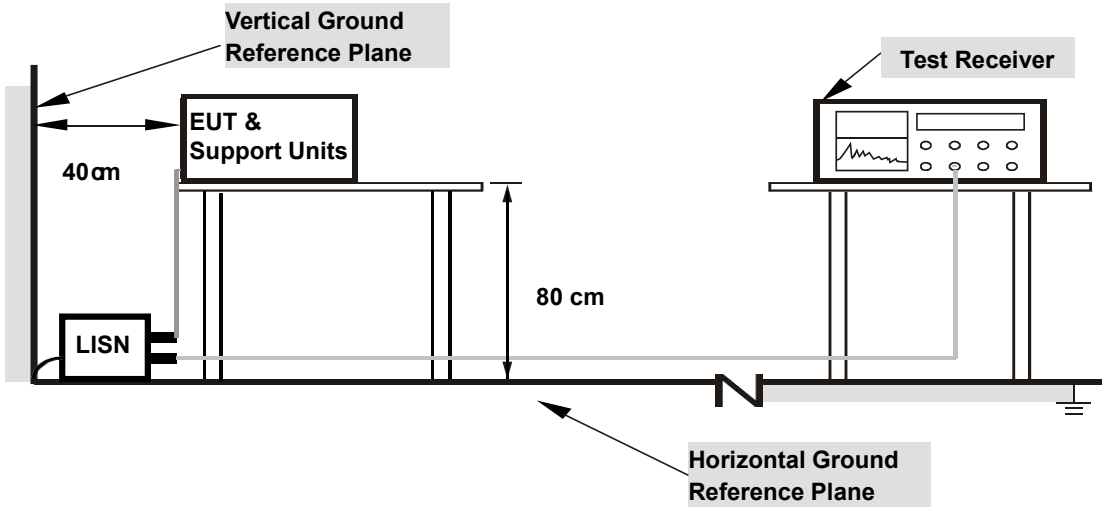
Frequency (MHz)	Detector type / Bandwidth	Limit-Quasi-peak dBµV	Limit-Average dBµV
0.15 -0.5	Average / 9 kHz	66 to 56	56 to 46
0.5 -5		56	46
5 -30		60	50

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

6.2.2 Test Procedures

a) Test method: ANSI C63.10-2013 Section 6.2.
b) The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).
c) Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.
d) The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.
e) The test data of the worst-case condition(s) was recorded.

6.2.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.2.4 Test Result

Notes:

Since the EUT cannot be operating while charging, therefore AC power line conducted emissions test is not required.

All modes of operation of the EUT were investigated, and only the worst-case results are reported.

Calculation formula:

Measurement (dBµV) = Reading Level (dBµV) + Correct Factor (dB)
Over (dB) = Measurement (dBµV) – Limit (dBµV)

6.3 Radiated spurious emission

6.3.1 Limits

§ 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

§ 15.209 Radiated emission limits; general requirements.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note 1: the tighter limit applies at the band edges.
Note 2: the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

§ 15.35 (b) requirements:
When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

According to ANSI C63.10-2013, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

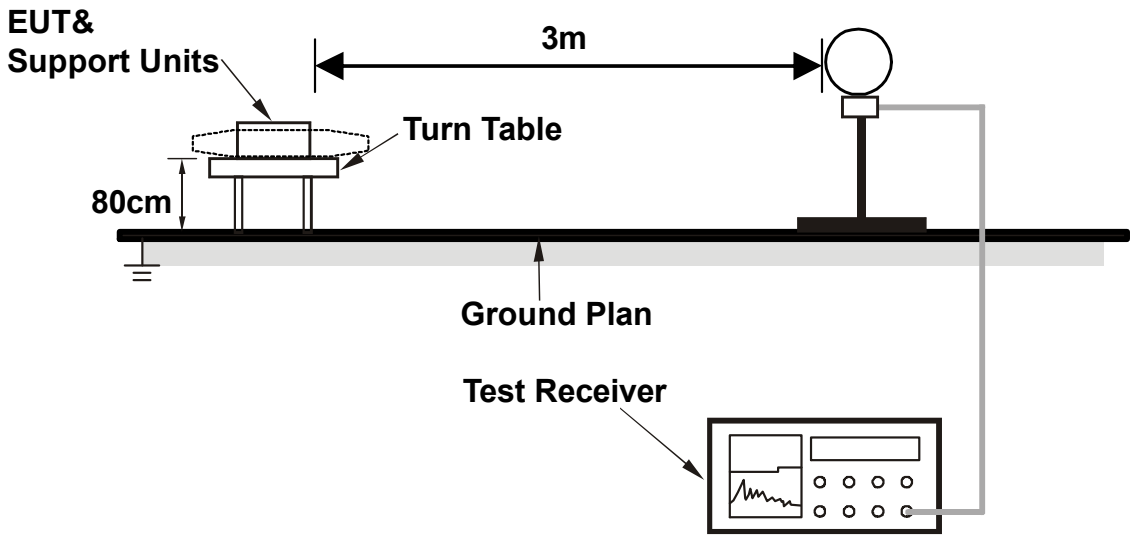
Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Frequency range of measurements for unlicensed wireless device with digital device

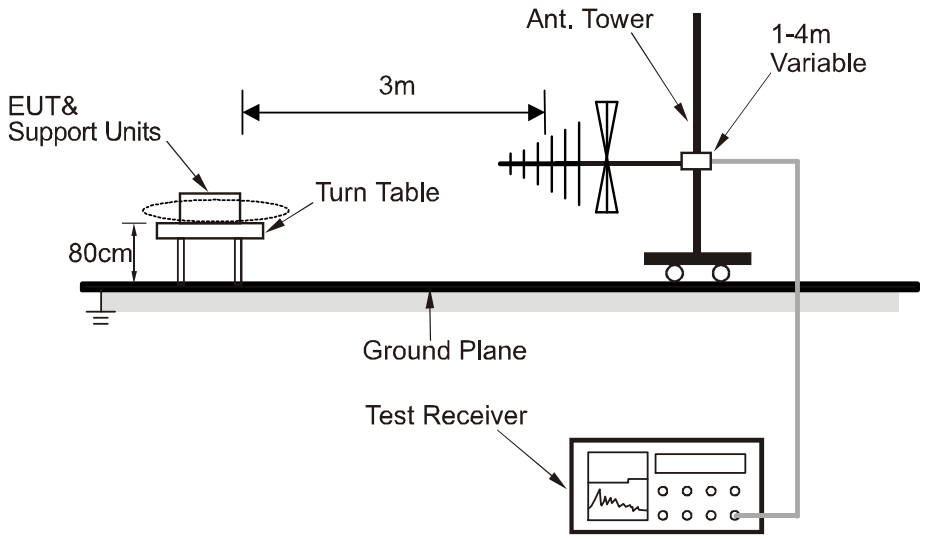
Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency range of measurement
Below 1.705 MHz	30 MHz
1.705 MHz to 108 MHz	1000 MHz
108 MHz to 500 MHz	2000 MHz
500 MHz to 1000 MHz	5000 MHz
Above 1000 MHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower

6.3.2 Test setup

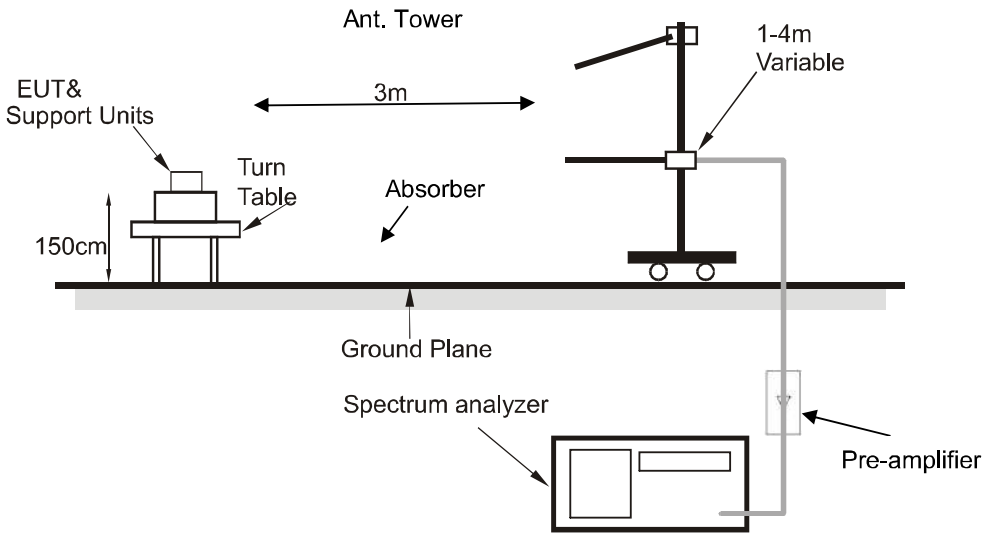
Below 30MHz



30MHz~1GHz



Above 1GHz



For the actual test configuration, please refer to the related item – Photographs of the test setup.

6.3.3 Test procedure

a) Test method: ANSI C63.10-2013 Section 6.3, 6.4, 6.5, 6.6, 6.10.
b) The EUT is placed on an on-conducting table 0.8 meters above the ground plane for measurement below 1GHz, 1.5 meters above the ground plane for measurement above 1GHz.
c) Emission blew 18 GHz were measured at a 3 meters test distance, above 18 GHz were measured at 1-meter test distance with the application of a distance correction factor
d) The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

KDB 558074 D01 15.247 Meas Guidance v05r02
The use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the unwanted emission limit is subject to an average field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

Test instrument setup

Frequency	Test receiver / Spectrum analyzer setting
9 kHz ~ 150 kHz	Quasi Peak / RBW: 200 Hz
150 kHz ~ 30 MHz	Quasi Peak / RBW: 9 kHz
30 MHz ~ 1 GHz	Quasi Peak / RBW: 120 kHz
Above 1 GHz	Peak / RBW: 1 MHz, VBW: 3MHz, Peak detector AVG / RBW: 1 MHz, VBW: 1/T, Peak detector

6.3.4 Test results

Notes:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

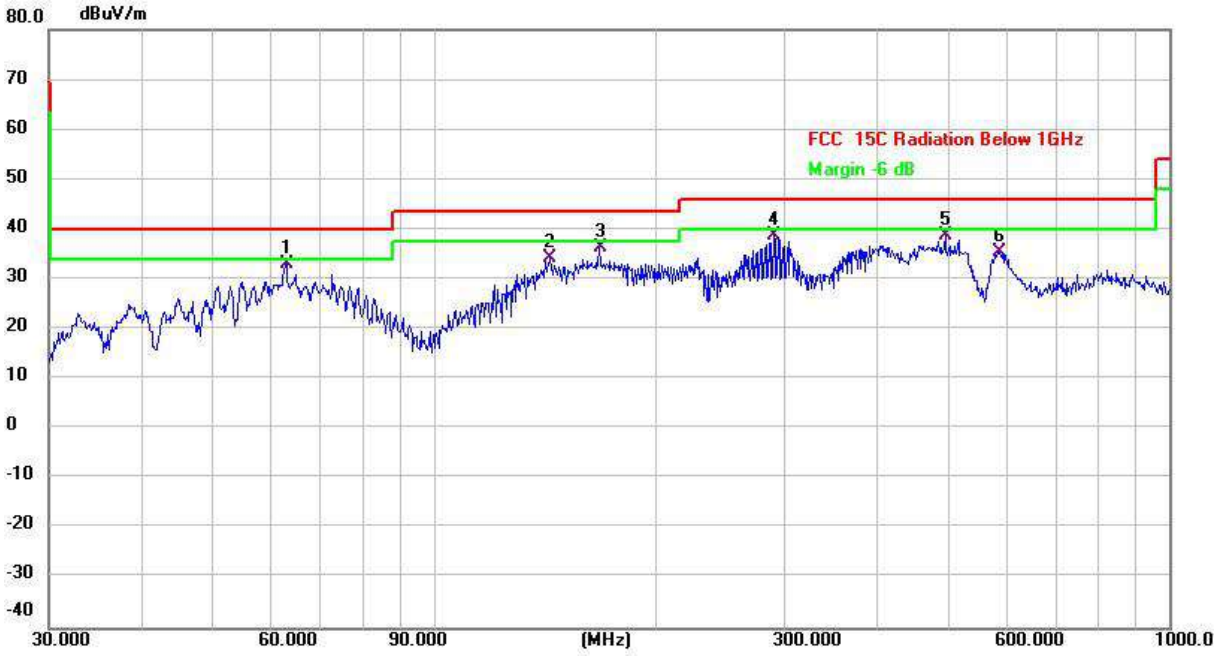
All modes of operation of the EUT were investigated, and only the worst-case results are reported.

There were no emissions found below 30MHz within 20dB of the limit.

Calculation formula:
Measurement (dBμV/m) = Reading Level (dBμV) + Correct Factor (dB/m)
Over (dB) = Measurement (dBμV/m) – Limit (dBμV/m)

Radiated emissions between 30MHz – 1GHz

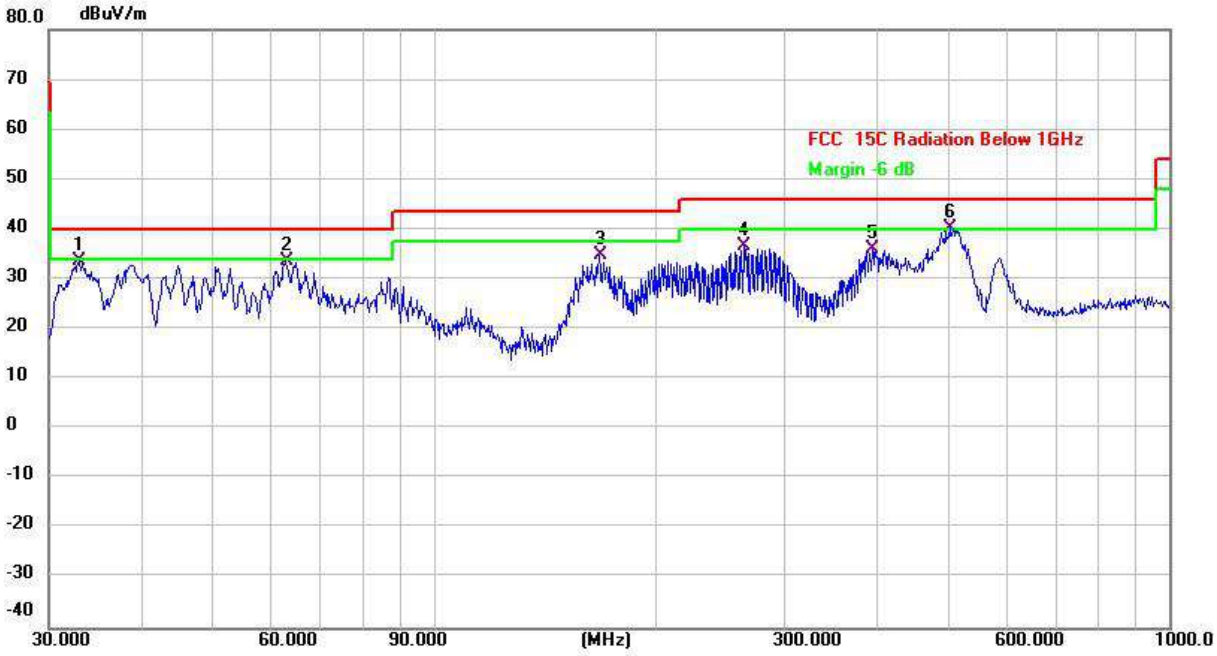
Test mode:	TX 2DH5-2480	Polarization:	Horizontal
Power supply:	DC 3.7V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	63.0916	44.51	-11.34	33.17	40.00	-6.83	QP
2		143.8295	46.92	-12.71	34.21	43.50	-9.29	QP
3		167.8243	48.00	-11.72	36.28	43.50	-7.22	QP
4		290.0172	46.71	-8.10	38.61	46.00	-7.39	QP
5		495.9344	43.69	-5.06	38.63	46.00	-7.37	QP
6		584.7895	38.46	-2.88	35.58	46.00	-10.42	QP

Radiated emissions between 30MHz – 1GHz

Test mode:	TX 2DH5-2480	Polarization:	Vertical
Power supply:	DC 3.7V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		32.9791	44.17	-10.39	33.78	40.00	-6.22	QP
2		62.8708	44.85	-11.33	33.52	40.00	-6.48	QP
3		167.8243	46.69	-11.72	34.97	43.50	-8.53	QP
4		263.8190	44.63	-8.00	36.63	46.00	-9.37	QP
5		394.8545	42.88	-6.96	35.92	46.00	-10.08	QP
6	*	502.9395	45.15	-4.85	40.30	46.00	-5.70	QP

Radiated emissions 1 GHz ~ 25 GHz

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
π/4-DQPSK - 2402 MHz TX mode							
4804.000	42.38	0.74	43.12	74.00	-30.88	Peak	V
4804.000	38.36	0.74	39.10	54.00	-14.90	AVG	V
7206.000	41.09	6.02	47.11	74.00	-26.89	Peak	V
7206.000	35.01	6.02	41.03	54.00	-12.97	AVG	V
9608.000	41.46	5.88	47.34	74.00	-26.66	Peak	V
9608.000	35.35	5.88	41.23	54.00	-12.77	AVG	V
4804.000	48.60	0.74	49.34	74.00	-24.66	Peak	H
4804.000	43.39	0.74	44.13	54.00	-9.87	AVG	H
7206.000	42.91	6.02	48.93	74.00	-25.07	Peak	H
7206.000	36.54	6.02	42.56	54.00	-11.44	AVG	H
9608.000	45.03	5.88	50.91	74.00	-23.09	Peak	H
9608.000	38.57	5.88	44.45	54.00	-9.55	AVG	H
π/4-DQPSK - 2441 MHz TX mode							
4882.000	45.50	1.05	46.55	74.00	-27.45	Peak	V
4882.000	41.18	1.05	42.23	54.00	-11.77	AVG	V
7323.000	41.12	5.94	47.06	74.00	-26.94	Peak	V
7323.000	35.08	5.94	41.02	54.00	-12.98	AVG	V
9764.000	42.72	6.55	49.27	74.00	-24.73	Peak	V
9764.000	36.61	6.55	43.16	54.00	-10.84	AVG	V
4882.000	50.62	1.05	51.67	74.00	-22.33	Peak	H
4882.000	46.18	1.05	47.23	54.00	-6.77	AVG	H
7323.000	40.65	5.94	46.59	74.00	-27.41	Peak	H
7323.000	34.39	5.94	40.33	54.00	-13.67	AVG	H
9764.000	42.49	6.55	49.04	74.00	-24.96	Peak	H
9764.000	36.13	6.55	42.68	54.00	-11.32	AVG	H

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
π/4-DQPSK - 2480 MHz TX mode							
4960.000	44.30	1.50	45.80	74.00	-28.20	Peak	V
4960.000	39.83	1.50	41.33	54.00	-12.67	AVG	V
7440.000	40.22	5.61	45.83	74.00	-28.17	Peak	V
7440.000	33.63	5.61	39.24	54.00	-14.76	AVG	V
9920.000	44.20	6.10	50.30	74.00	-23.70	Peak	V
9920.000	38.42	6.10	44.52	54.00	-9.48	AVG	V
4960.000	48.39	1.50	49.89	74.00	-24.11	Peak	H
4960.000	43.83	1.50	45.33	54.00	-8.67	AVG	H
7440.000	40.91	5.61	46.52	74.00	-27.48	Peak	H
7440.000	34.55	5.61	40.16	54.00	-13.84	AVG	H
9920.000	44.53	6.10	50.63	74.00	-23.37	Peak	H
9920.000	38.32	6.10	44.42	54.00	-9.58	AVG	H

Radiated emissions at band edge

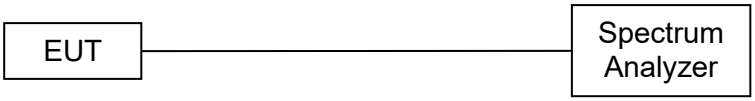
Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
π/4-DQPSK – Low band-edge							
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
2310.000	47.39	-8.08	39.31	74.00	-34.69	Peak	V
2310.000	37.20	-8.08	29.12	54.00	-24.88	AVG	V
2390.000	49.28	-7.71	41.57	74.00	-32.43	Peak	V
2390.000	39.17	-7.71	31.46	54.00	-22.54	AVG	V
2310.000	48.45	-8.08	40.37	74.00	-33.63	Peak	H
2310.000	37.34	-8.08	29.26	54.00	-24.74	AVG	H
2390.000	55.50	-7.71	47.79	74.00	-26.21	Peak	H
2390.000	45.73	-7.71	38.02	54.00	-15.98	AVG	H
π/4-DQPSK – High band-edge							
2483.500	48.12	-7.24	40.88	74.00	-33.12	Peak	V
2483.500	38.44	-7.24	31.20	54.00	-22.80	AVG	V
2500.000	49.12	-7.17	41.95	74.00	-32.05	Peak	V
2500.000	38.82	-7.17	31.65	54.00	-22.35	AVG	V
2483.500	52.96	-7.24	45.72	74.00	-28.28	Peak	H
2483.500	41.89	-7.24	34.65	54.00	-19.35	AVG	H
2500.000	51.15	-7.17	43.98	74.00	-30.02	Peak	H
2500.000	42.07	-7.17	34.90	54.00	-19.10	AVG	H

6.4 20dB emission bandwidth

6.4.1 Limits

None, for reporting purposes only.

6.4.2 Test setup



6.4.3 Test procedures

Test method: ANSI C63.10-2013 Section 6.9.2

6.4.4 Test results

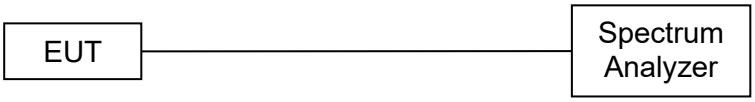
Note: See the Appendix A

6.5 Maximum conducted output power

6.5.1 Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

6.5.2 Test setup



6.5.3 Test procedure

Test method: ANSI C63.10-2013 Section 7.8.5

6.5.4 Test results

Note: see the Appendix B

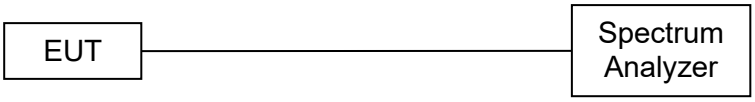
6.6 Carrier frequency separation

6.6.1 Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater

6.6.2 Test setup



6.6.3 Test procedure

Test method: ANSI C63.10-2013 Section 7.8.2

6.6.4 Test results

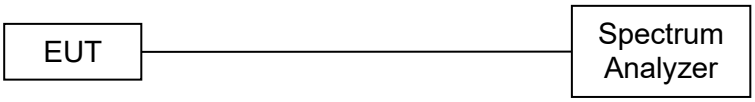
Note: see the Appendix C

6.7 Time of occupancy

6.7.1 Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

6.7.2 Test setup



6.7.3 Test procedure

Test method: ANSI C63.10-2013 Section 7.8.4

6.7.4 Test results

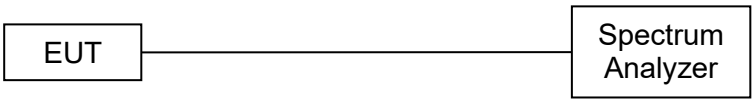
Note: see the Appendix D

6.8 Number of hopping channels

6.8.1 Limit

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

6.8.2 Test setup



6.8.3 Test procedure

Test method: ANSI C63.10-2013 Section 7.8.3

6.8.4 Test results

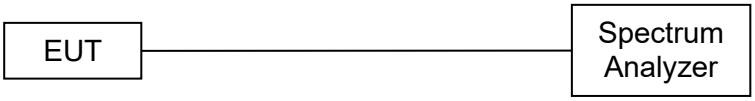
Note: see the Appendix E

6.9 Band edge (Conducted)

6.9.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.9.2 Test setup



6.9.3 Test procedure

Test method: ANSI C63.10-2013 Section 6.10.4

6.9.4 Test results

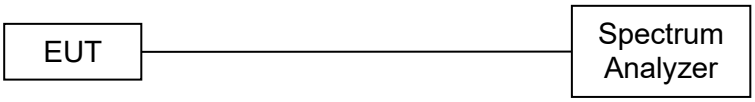
Note: see the Appendix F

6.10 Conducted spurious emissions

6.10.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.10.2 Test setup



6.10.3 Test procedure

Test method: ANSI C63.10-2013 Section 7.8.8

6.10.4 Test results

Note: See the Appendix G

APPENDIX A: 20DB EMISSION BANDWIDTH

Test Result

Test Mode	Antenna	Frequency [MHz]	20db EBW [MHz]
DH5	Ant1	2402	1.035
		2441	1.071
		2480	1.056
2DH5	Ant1	2402	1.332
		2441	1.362
		2480	1.359

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

APPENDIX B: MAXIMUM CONDUCTED OUTPUT POWER

Test Result Peak

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	-1.2	≤30.00	PASS
		2441	-1.29	≤30.00	PASS
		2480	-0.01	≤30.00	PASS
2DH5	Ant1	2402	-0.4	≤20.97	PASS
		2441	-0.51	≤20.97	PASS
		2480	0.74	≤20.97	PASS

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

APPENDIX C: CARRIER FREQUENCY SEPARATION

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
DH5	Ant1	Hop	1	≥0.714	PASS
2DH5	Ant1	Hop	0.996	≥0.908	PASS

Test Graphs

DH5_Ant1_Hop

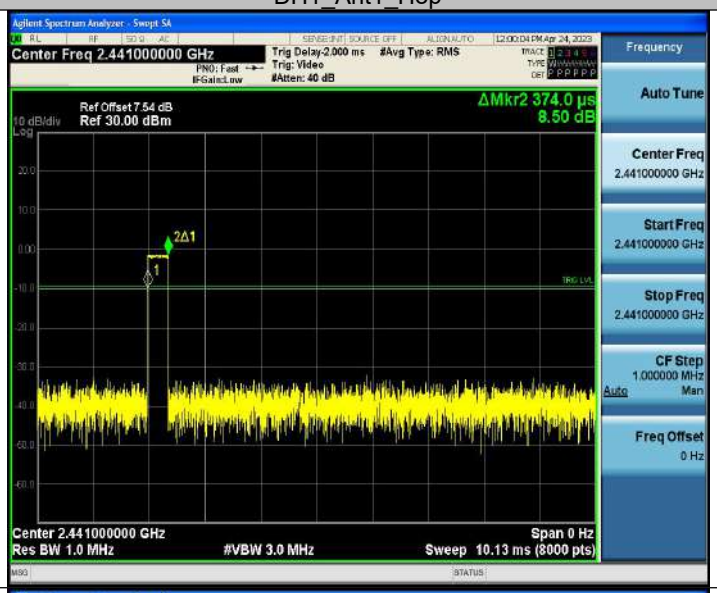
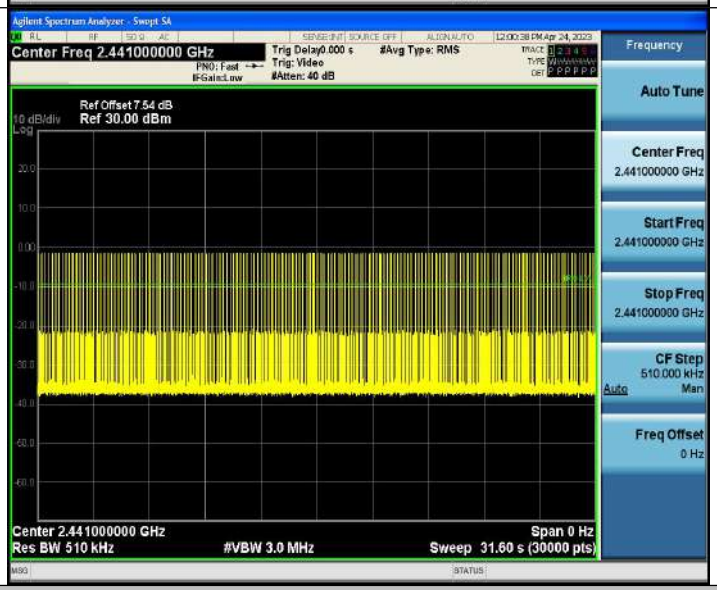
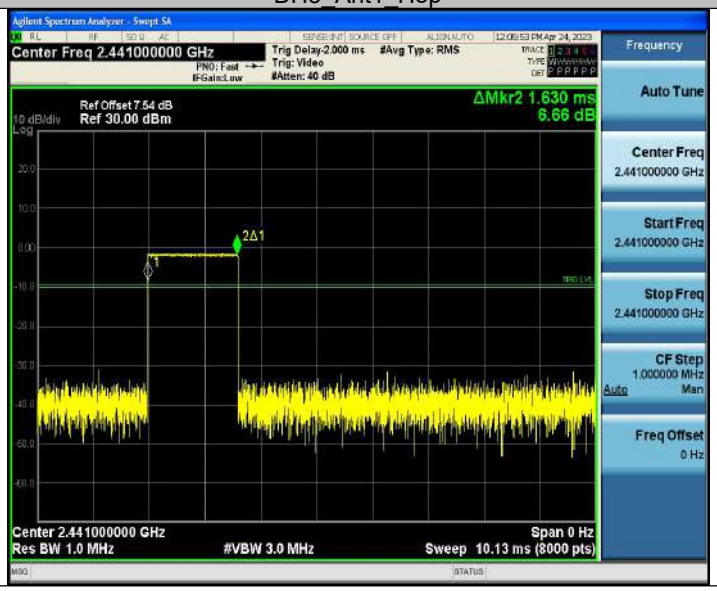
2DH5_Ant1_Hop

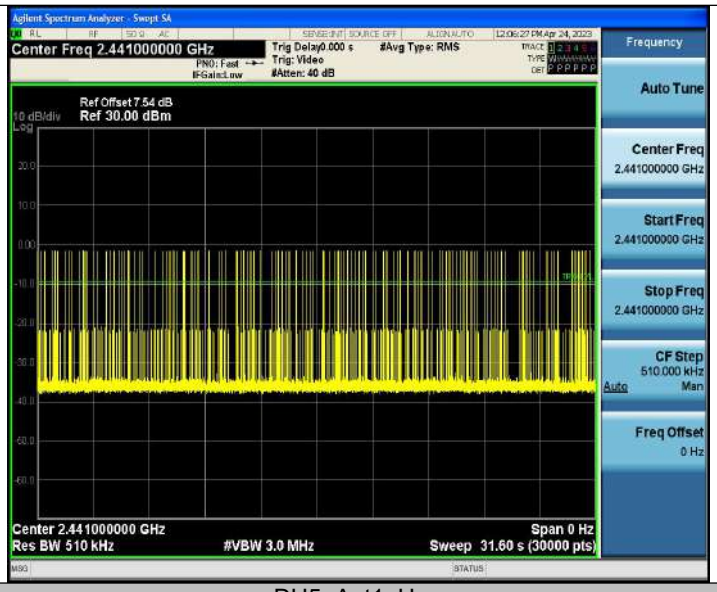
APPENDIX D: TIME OF OCCUPANCY

Test Result

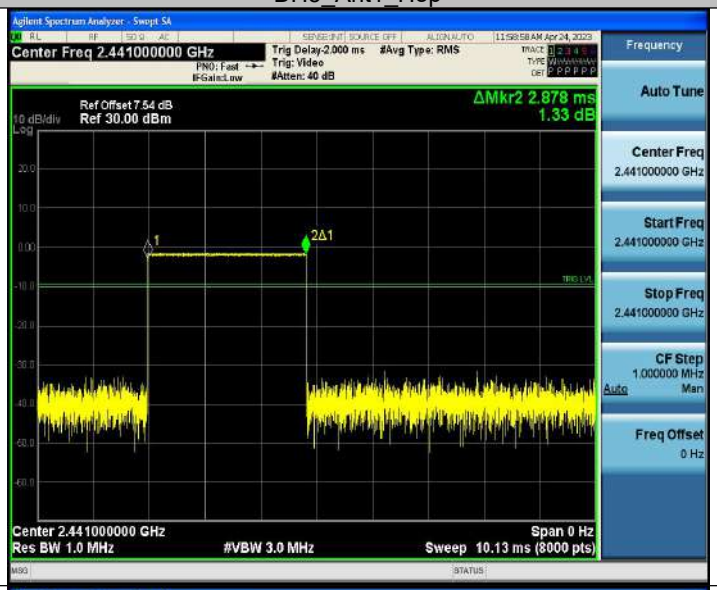
Test Mode	Antenna	Frequency [MHz]	BurstWidth [ms]	Hops in 31.6s [Num]	Result [s]	Limit [s]	Verdict
DH1	Ant1	Hop	0.374	316	0.118	≤0.4	PASS
DH3	Ant1	Hop	1.630	153	0.249	≤0.4	PASS
DH5	Ant1	Hop	2.878	114	0.328	≤0.4	PASS
2DH1	Ant1	Hop	0.384	315	0.121	≤0.4	PASS
2DH3	Ant1	Hop	1.635	156	0.255	≤0.4	PASS
2DH5	Ant1	Hop	2.884	115	0.332	≤0.4	PASS

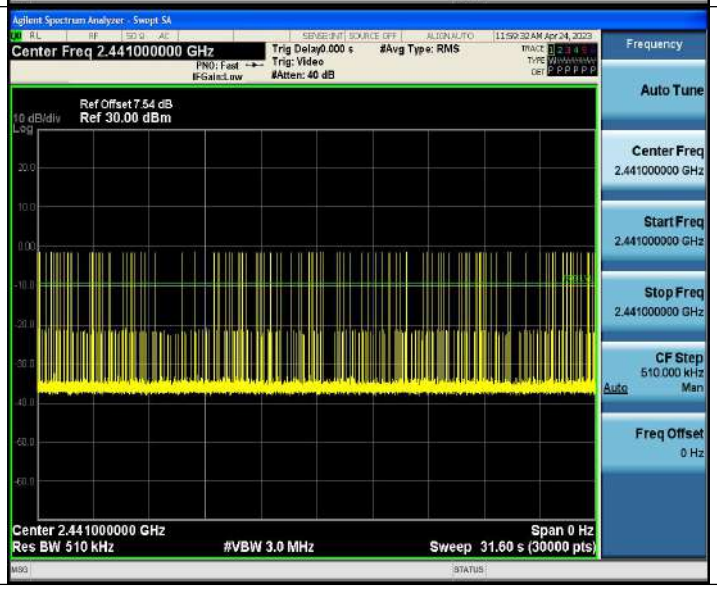
Test Graphs

DH1_Ant1_Hop


DH3_Ant1_Hop


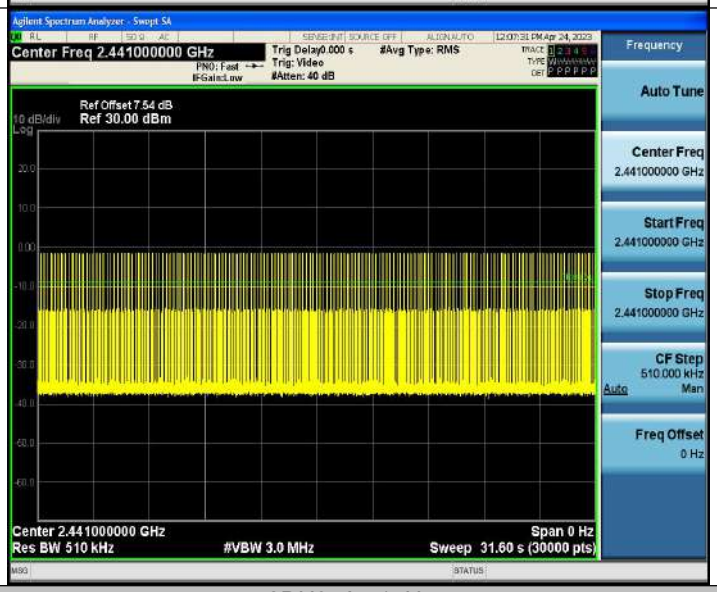
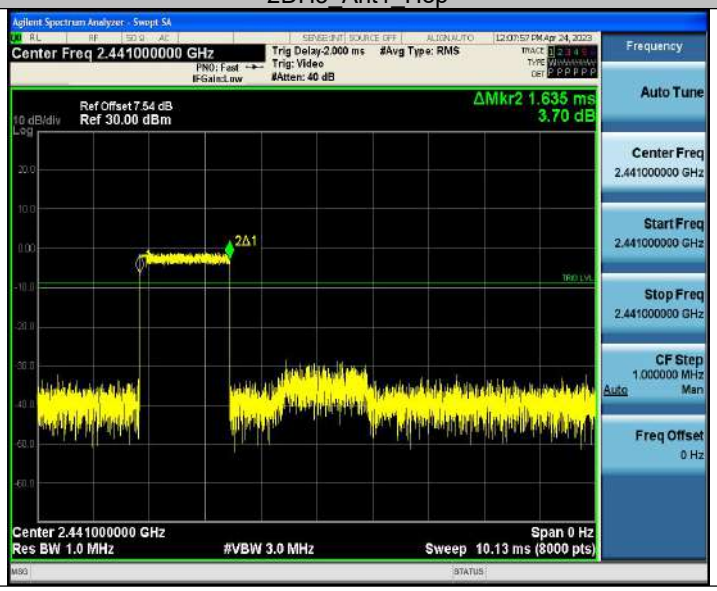

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay 0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
Ref Offset 7.54 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

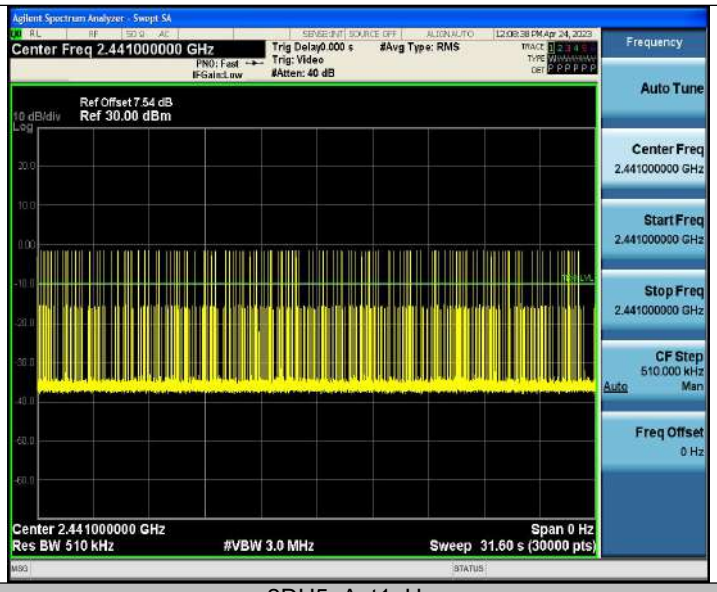
DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay -2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
Ref Offset 7.54 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.878 ms
1.33 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

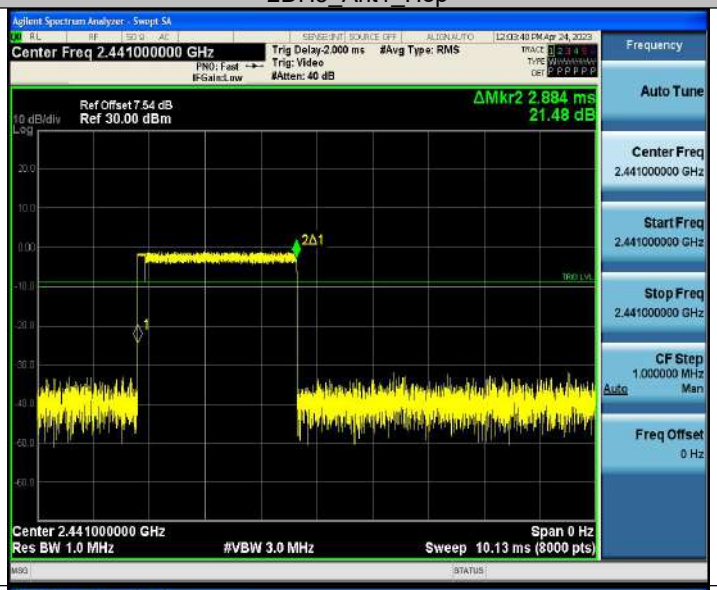

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay 0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
Ref Offset 7.54 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

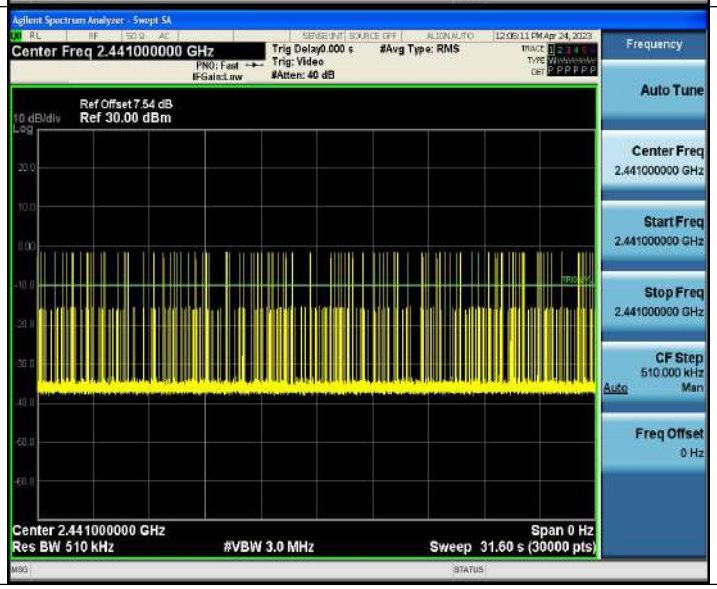
2DH1_Ant1_Hop


2DH3_Ant1_Hop




2DH5_Ant1_Hop





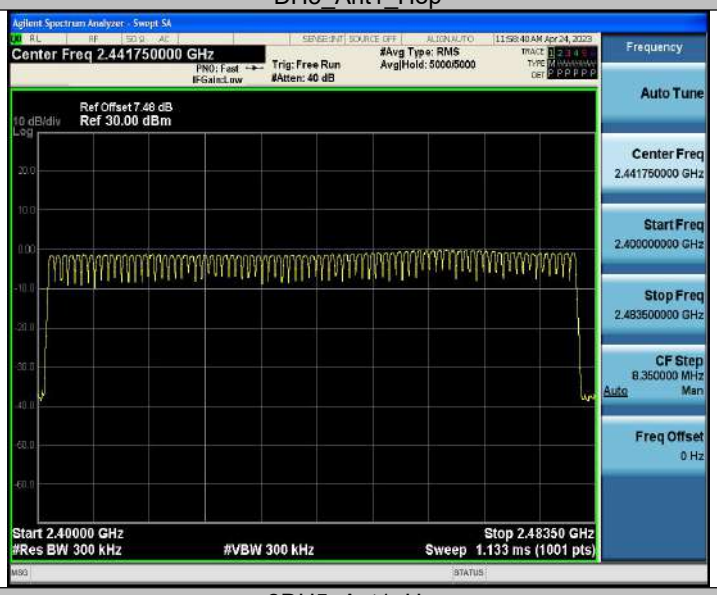
APPENDIX E: NUMBER OF HOPPING CHANNELS

Test Result

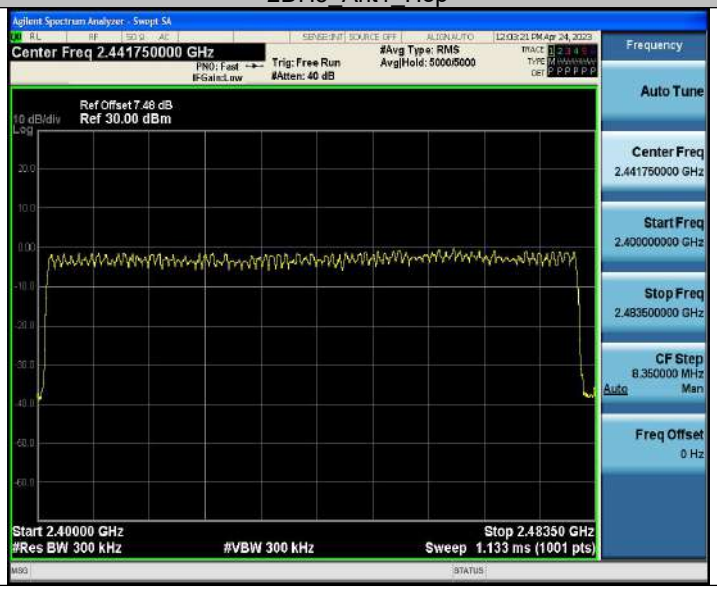
Test Mode	Antenna	Frequency [MHz]	Result [Num]	Limit [Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

DH5_Ant1_Hop



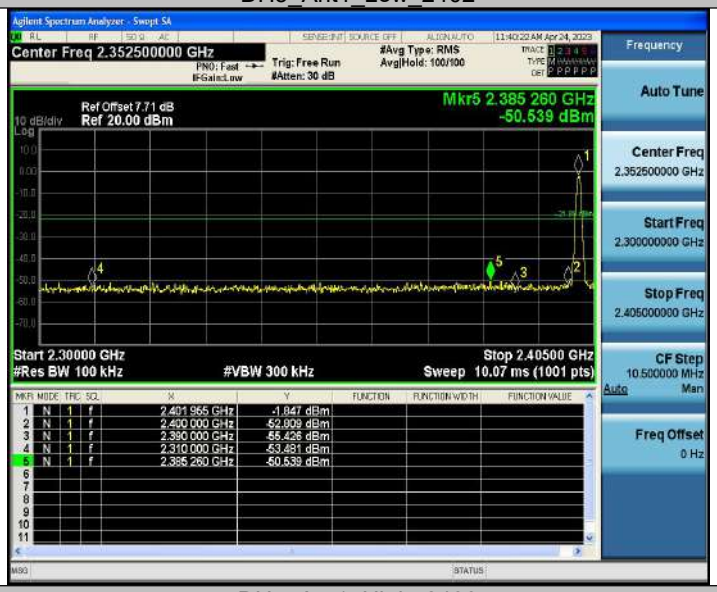
2DH5_Ant1_Hop



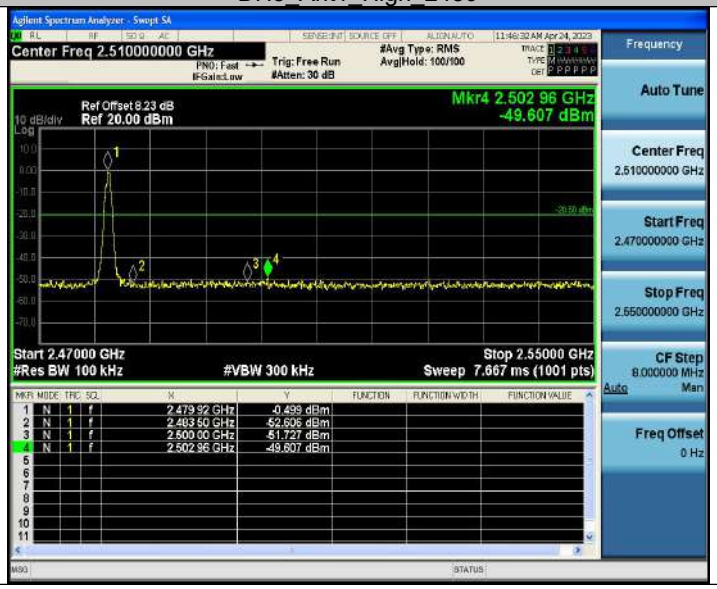
APPENDIX F: BAND EDGE MEASUREMENTS

Test Graphs

DH5_Ant1_Low_2402

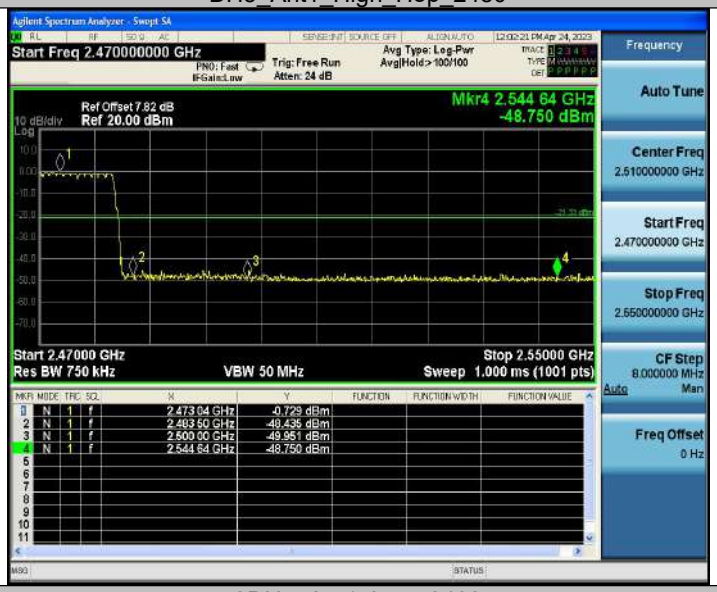


DH5_Ant1_High_2480

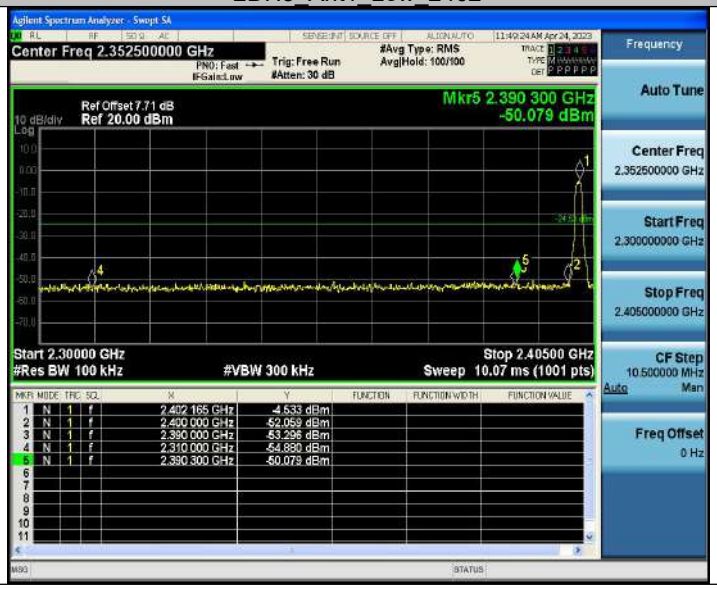


DH5_Ant1_Low_Hop_2402

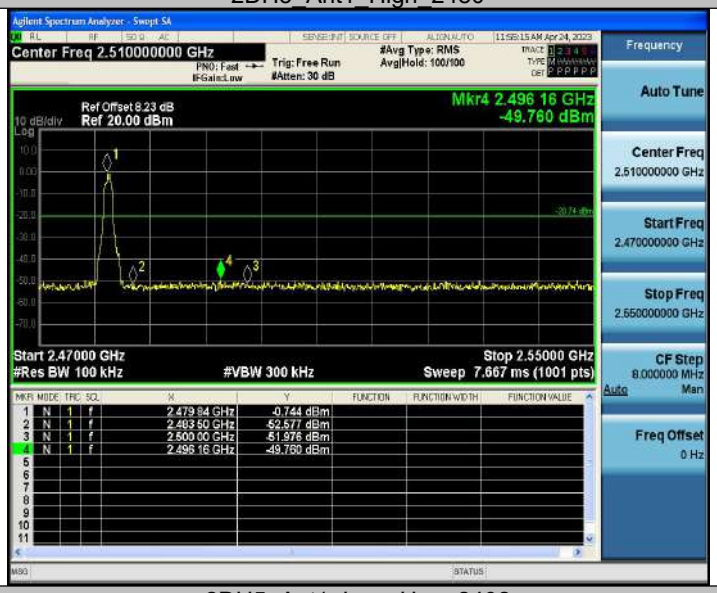
DH5_Ant1_High_Hop_2480



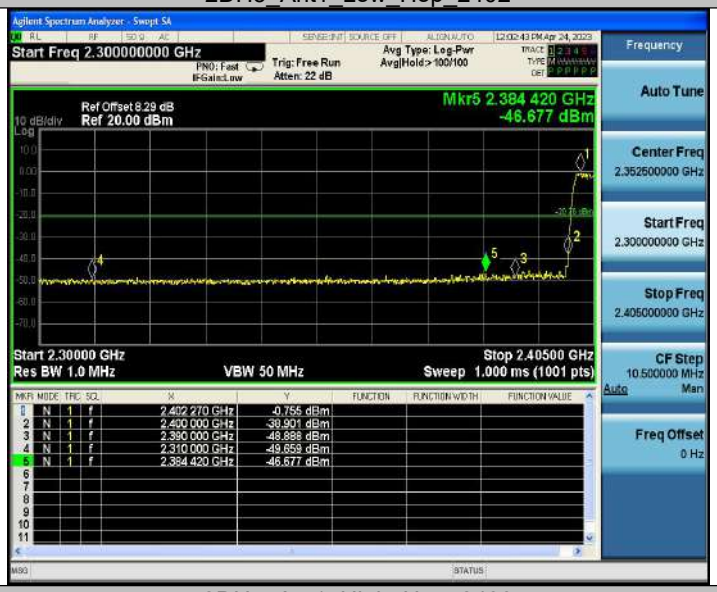
2DH5_Ant1_Low_2402



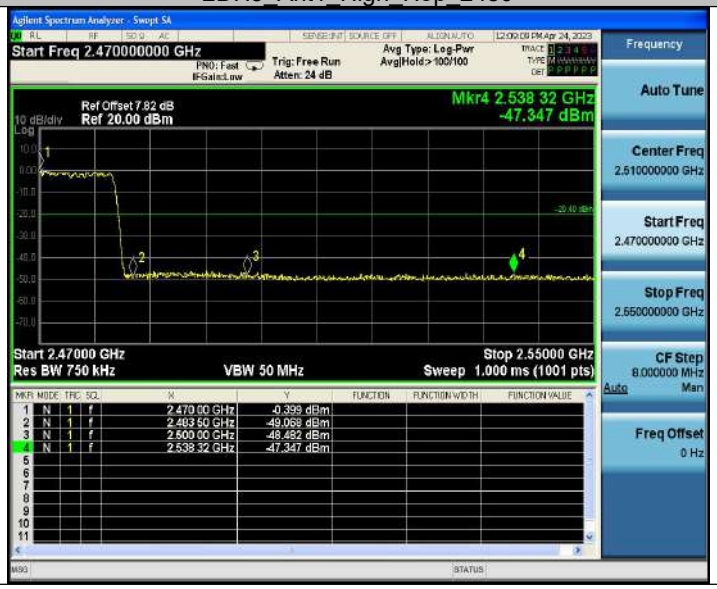
2DH5_Ant1_High_2480



2DH5_Ant1_Low_Hop_2402



2DH5_Ant1_High_Hop_2480

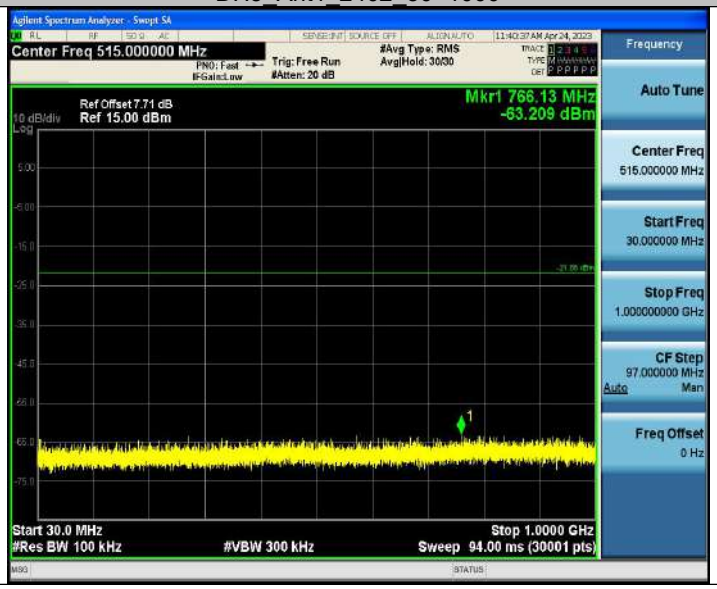


APPENDIX G: CONDUCTED SPURIOUS EMISSION

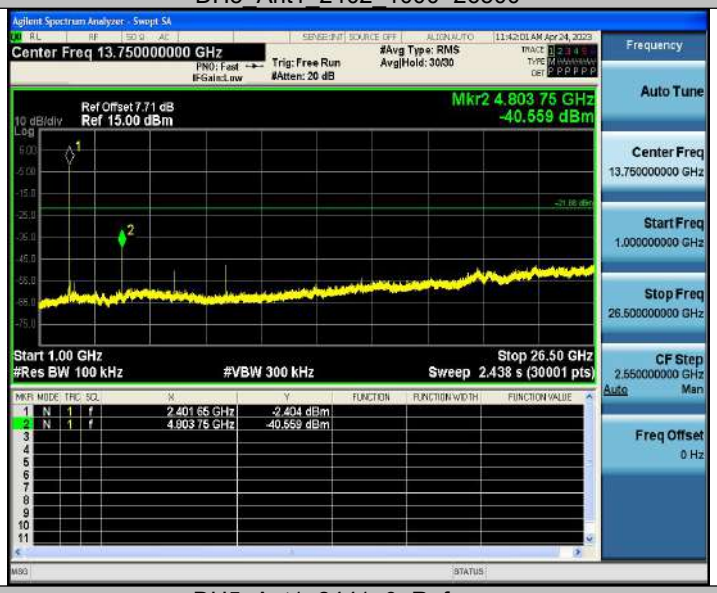
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

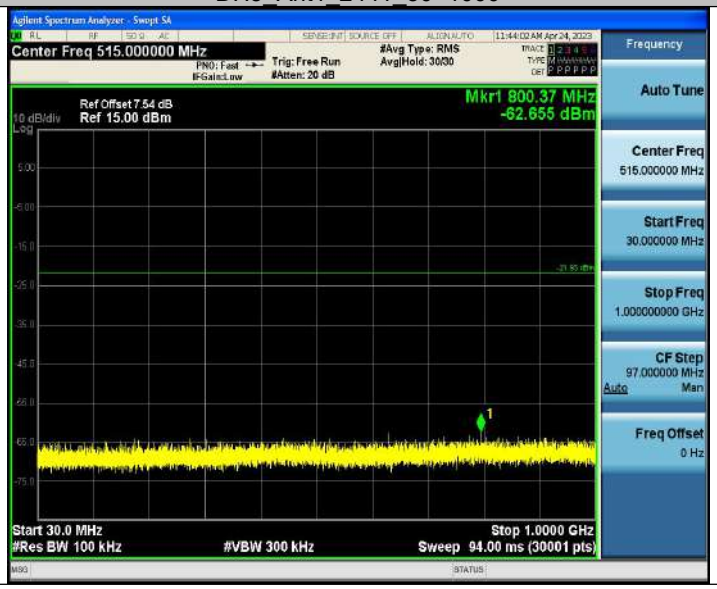


DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0~Reference

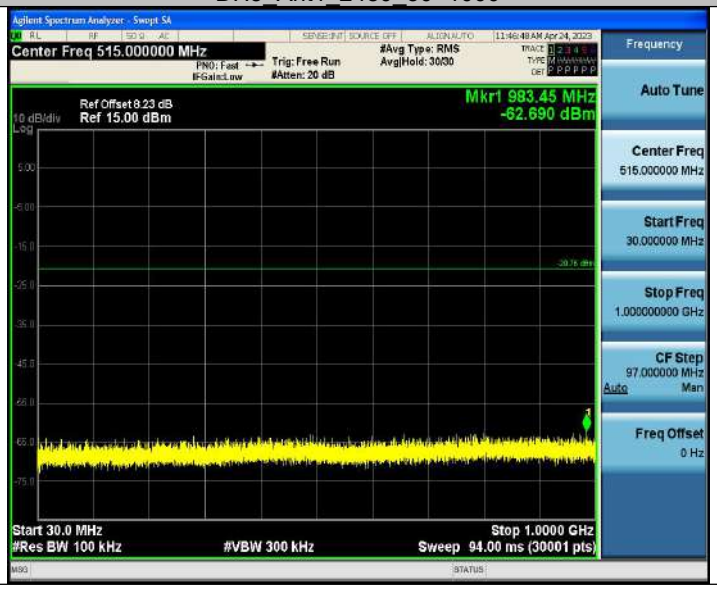
DH5_Ant1_2441_30~1000



DH5_Ant1_2441_1000~26500

DH5_Ant1_2480_0~Reference

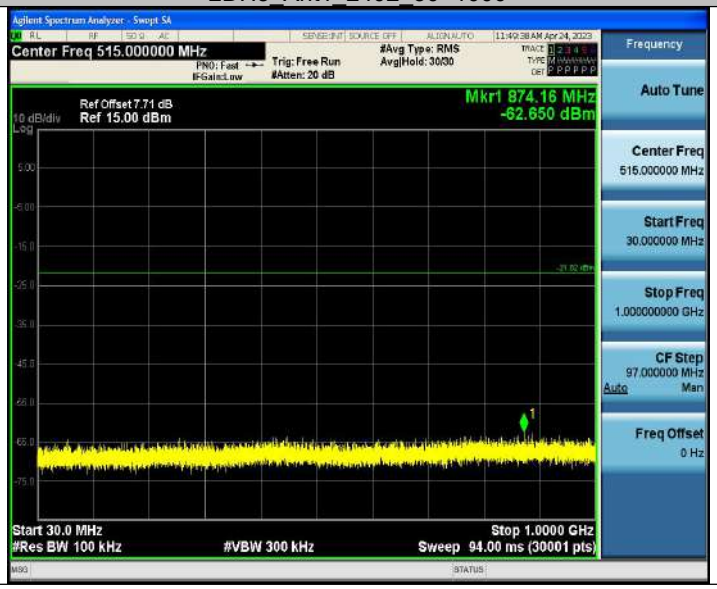
DH5_Ant1_2480_30~1000



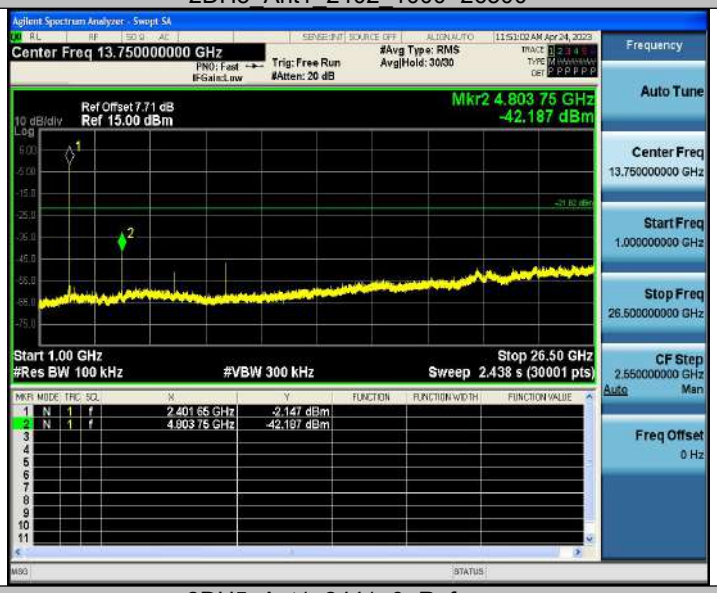
DH5_Ant1_2480_1000~26500

2DH5_Ant1_2402_0~Reference

2DH5_Ant1_2402_30~1000

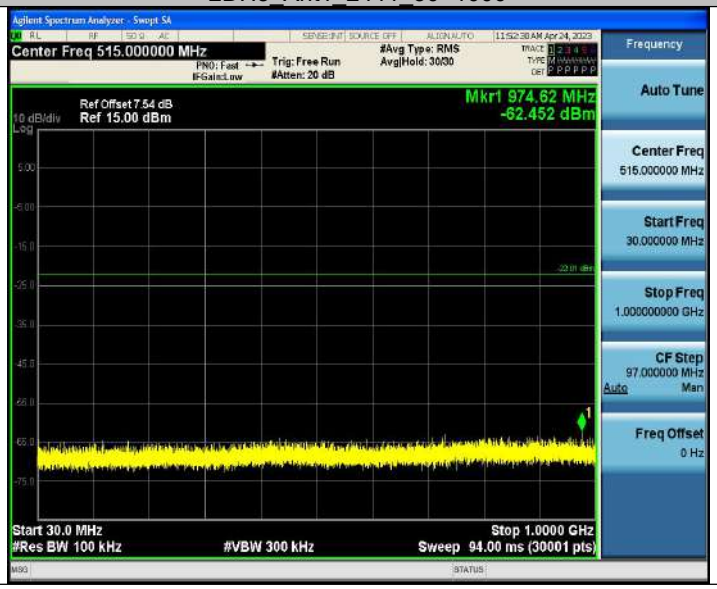


2DH5_Ant1_2402_1000~26500

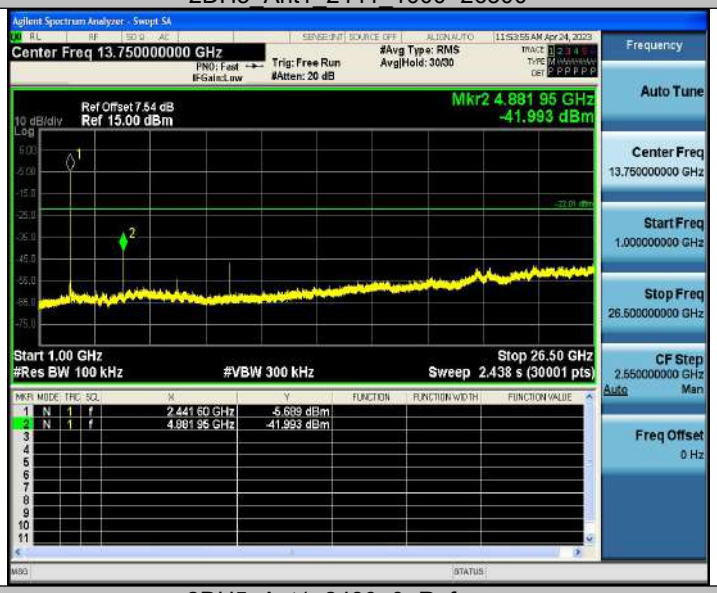


2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

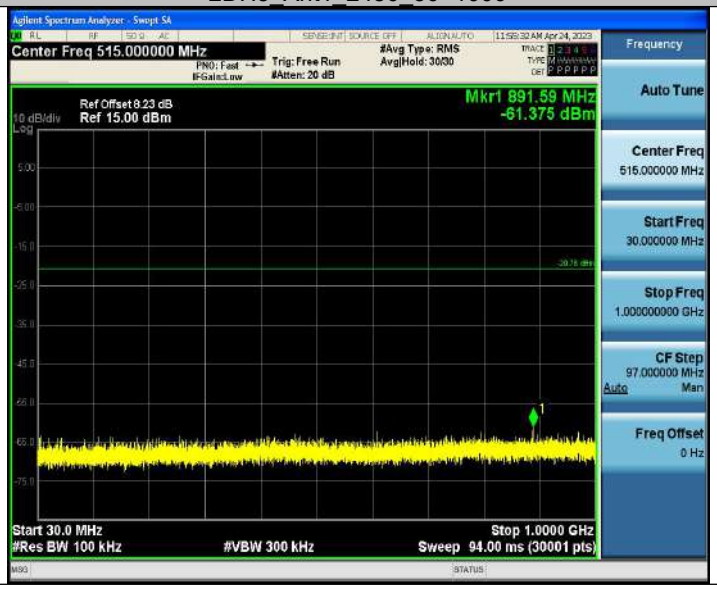


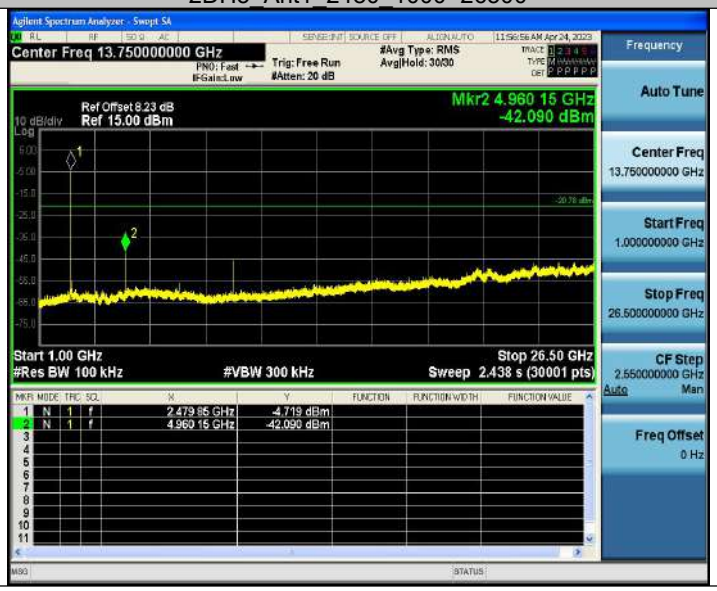
2DH5_Ant1_2441_1000~26500



2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000



2DH5_Ant1_2480_1000~26500


Photographs of the Test Setup

See the Appendix – Test Setup Photos.

Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----

RF EXPOSURE
Test Report

Report No.:	MTi230307002-01E3
Date of issue:	2023-05-04
Applicant:	Shenzhen Tiankang Medical Technology Co., Ltd
Product:	Smart Watch
Model(s):	TK22, TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
FCC ID:	2BAXT-TK22

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.

Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

Instructions

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2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Applicant:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Manufacturer:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Factory:	**Shenzhen Tiankang Medical Technology Co., Ltd**
Address:	602, Building A5, Anle Industrial Zone, No. 172 Hangcheng Avenue, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen
Product description	
Product name:	Smart Watch
Trademark:	N/A
Model name:	TK22
Serial Model:	TK20P, TK10, TK20, TK12, TK10P, TK30, TK31, TK80, TK81, TK82, TK83, TK86, TK88, TK90, TK91, TK92, TK93, TK96, TK98, TK99, TK11P, TK12P, TK13P, TK14P, TK15P, TK16P, TK21P, TK22P, TK23P, TK24P, TK25P, TK26P, TK30P, TK31P, TK32P, TK70P, TK71P, TK72P, TK73P, TK74P, TK75P, TK76P, TK77P, TK78P, TK79P
Standards:	N/A
Test method:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-04-21 ~ 2023-05-04
Test result:	Pass

Test Engineer : Yanice Xie

(Yanice Xie)

Reviewed By: : Leon Chen

(Leon Chen)

Approved By: : Tom Xue

(Tom Xue)

Table of Contents

1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition(s), listed below, is (are) satisfied.

These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

The minimum test separation distance defined in 4.1 f) is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.

To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified, typically in the SAR measurement or SAR analysis report, by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, according to the required published RF exposure KDB procedures.

When no other RF exposure testing or reporting are required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for SAR test exclusion.

When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions.

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

   1) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz
   2) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

   1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/f(MHz))]

2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

3) SAR measurement procedures are not established below 100 MHz.

When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any SAR test results below 100 MHz to be acceptable.

2. SAR Test Exclucsion Thresholds

We use 5mm as separation distance to calculated.

Bluetooth DSS:

Transmit Frequency (GHz)	Mode	Measured Power (dBm)	Tune-up power (dBm)	Max tune-up power(dBm)	Result calculation	1g SAR
2.402	GFSK	-1.2	(-1)±1	0	0.3100	3
2.441		-1.29	(-1)±1	0	0.3125	3
2.480		-0.01	0±1	1	0.3965	3
2.402	π/4-DQPSK	-0.4	0±1	1	0.3902	3
2.441		-0.51	0±1	1	0.3934	3
2.480		0.74	0±1	1	0.3965	3

Bluetooth DTS:

Transmit Frequency (GHz)	Mode	Measured Power (dBm)	Tune-up power (dBm)	Max tune-up power(dBm)	Result calculation	1g SAR
2.402	BLE-1M	4.07	4±1	5	0.9802	3
2.440		4.15	4±1	5	0.9881	3
2.480		3.68	3±1	4	0.7911	3
2.402	BLE-2M	4.06	4±1	5	0.9802	3
2.440		4.16	4±1	5	0.9881	3
2.480		3.68	3±1	4	0.7911	3

Conclusion:

Simultaneous transmit:

BR&EDR+BLE=0.3965+0.9881=1.3846

For the max result: 1.3846≤ 3.0 for 1g SAR, No SAR is required.

----END OF REPORT----