

SAB Book

Amplificador de distribución RF (47 a 862 MHz).

APLICACIÓN

Diseñado como amplificador de distribución y línea para instalaciones de tamaño medio.

CARACTERÍSTICAS

- El circuito está alojado en un chasis metálico de una sola pieza.
- Alta linealidad.
- Paso DC pass para alimentación de previos.
- Ecualización conmutable de 12 dB.
- Atenuación conmutable de 10 dB para señales altas.
- Salida TEST.

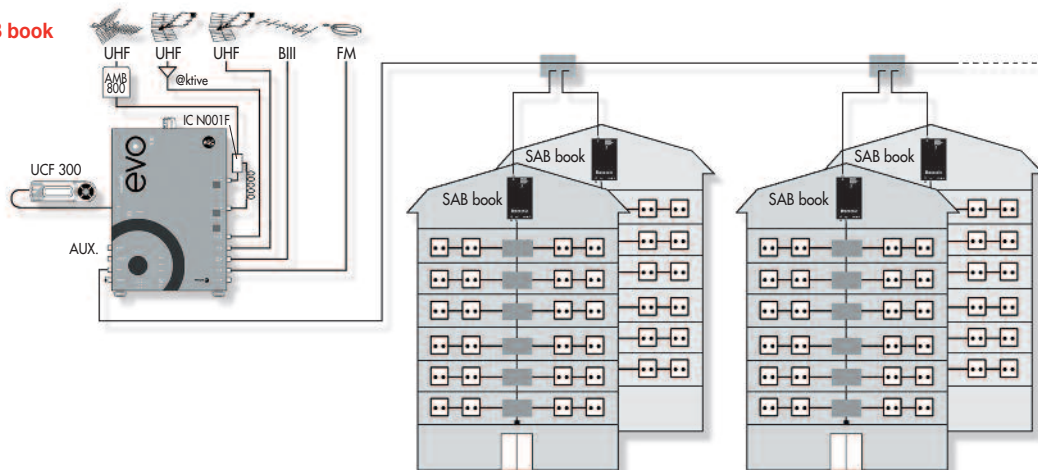


Alimentación	185 ÷ 265 Vac
Consumo	7W (70mA)
Temperatura de funcionamiento	- 0 a 50 °C

MODELO		SAB book
Referencia		35960
Número de entradas		1
Ancho de banda	MHz	47 ÷ 862
Ganancia	dB	37
Regulación	dB	20
Atenuación conmutable	dB	10
Ecualización conmutable	dB	12 (47 MHz)
Figura de ruido (ganancia max.)	dB	5,5
Nivel de entrada sin atenuación	dBµV	40 ÷ 75 (50 ÷ 85)*
Nivel de salida DIN 45004 B (-60 dB)	dBµV	> 120
Pérdidas de retorno IN/OUT	dB	> 10
Salida TEST	dB	- 30
Paso DC 12V		12 V 100mA conmutable
Apantallamiento	dB	class A
Dimensiones embalaje	mm	290 x 156 x 47

*10 dB atenuador ON

EJEMPLO
MicroMATV EVO + SAB book





**DECLARACION DE CONFORMIDAD
DECLARATION DE CONFORMITÉ
DECLARATION OF CONFORMITY
DECLARAÇÃO DE CONFORMIDADE
DICHIARAZIONE DI CONFORMITÀ**

**Decl. N°
121222-04**

Fabricante/ Fabricant/ Manufacturer/ Fabricante/ Produttore : **FAGOR ELECTRONICA, S.COOP.**

Dirección/ Adresse/ Address/ Direção/ Indirizzo : **B° San Andrés s/n - P.O. Box 33
20500 MONDRAGON
(Guipúzcoa) Spain**

NIF / VAT : **F-20 027975**

Declara bajo su exclusiva responsabilidad la conformidad del producto :
Déclare, sous notre responsabilité, la conformité du produit :
Declare under our own responsibility the conformity of the product :
Declara exclusiva responsabilidade a conformidade do produto :
Dichiara sotto la propria responsabilità che il prodotto:

SAB BOOK

Según los requerimientos de las Directivas del Parlamento Europeo:
Selon les spécifications des Directives du Parlement Européen :
According to the specifications of directives of the European Parliament:
Com as especificações da Directivas do Parlamento Europeu:
Sotto i requisiti delle direttive del Parlamento Europeo:

EMC	2014/30/EU
LVD	2014/35/EU
ROHS	2011/65/EU

Para su evaluación se han aplicado las Normas:
Pour l'évaluation ont été appliqués les Normes:
For the evaluation, the following Standards were applied:
Para a avaliação, as seguintes Normas foram aplicadas:
Per gli standard di valutazione sono stati applicati:

**EN 50083-2 :2012 + A1 : 2015
EN 60065 :2014
EN 60728-11 :2010
EN 50581 :2012**

Fecha: **Dec. 2016**

Date:

J.M. Saiz

**Jefe Calidad Tratamiento de Señal
Head of Quality Dept., Signal Processing**

Test report No:
 NIE: 71202REM.003


Test report

EN 55032 (2015) / AC (2016) / A11 (2020): Electromagnetic compatibility of multimedia equipment - Emission requirements.

EN 55035 (2017) + A11 (2020): Electromagnetic compatibility of multimedia equipment - Immunity requirements.

EN 61000-3-2 (2019): Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current =16 A per phase)

EN 61000-3-3 (2013) / A1 (2019): Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.

(*) Identification of item tested	Not provided data
(*) Trademark	SAB-BOOK
(*) Model and /or type reference	35960
Other identification of the product	HW version: Not provided data SW version: Not provided data
(*) Features	Not provided data
Manufacturer	FAGOR ELECTRONICA, S.COOP BARRIO SAN ANDRES S/N, 20500 MONDRAGON (GUIPUZCOA)
Test method requested, standard	EN 55032 (2015) / AC (2016) / A11 (2020) EN 55035 (2017) + A11 (2020) EN 61000-3-2 (2019) EN 61000-3-3 (2013) / A1 (2019)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Industrial & Automotive EMC Lab Manager 
Date of issue	2022-10-13
Report template No	FDT08_24 (* "Data provided by the client")

Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456) Fecha: 2022.10.26 16:17:17 +02'00'



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Acronyms

Acronym ID	Acronym Description
	Step Size
CPL	Zones / Coupling Cables
CPL Type	Coupling Type
Code	EMC Test Code
Freq Rng	Frequency Range
Freq Rng [L]	Frequency Range [Lower Limit]
Freq Rng [U]	Frequency Range [Upper Limit]
Immunity Lvl	Immunity Level
Line	Conducted Emissions - Tested Line
MP	Measurement Point
OM	Operation Mode
Pol	Polarization
Rep Freq	Repetition Frequency
S/	Sample
V	Verdict
Volt Immunity Lvl	Voltage Immunity Severity Level
Volt Immunity Type	Voltage Immunity Type

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

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2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150 kHz to 30 MHz is $I = \pm 3,9$ dB for quasi-peak measurements, $I = \pm 3,2$ dB for peak measurements ($k = 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 6000 MHz is $I = \pm 4,7$ dB for quasi-peak measurements, $I = \pm 4,3$ dB for peak and average measurements ($k = 2$).

The total uncertainty of the measurement system for the harmonic current measurement is:

Current Harmonics: Intensity = $\pm 0,73\%$

Voltage Harmonics: Voltage = $\pm 0,58\%$

Confidence level: $k=2$.

The total uncertainty of the measurement system for the voltage fluctuations and flicker measurement is:

Pst Meter: $I = \pm 0,58\%$; Plt Meter: $I = \pm 0,58\%$; Idc = $0,58\%$

Idmax = $0,58\%$; Confidence level: $k=2$.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested")
2. The sample consists of a SAB-BOOK

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/02	71202_1.1	Receptor TV	SAB BOOK	--	2022-02-24	Element Under Test
S/02	71202_1.1	Receptor TV	SAB BOOK	--	2022-02-24	Element Under Test

Notes referenced to samples during the project.

Id	Note
S/02	Original sample adding one Premo FA-1Z Filter in the AC power supply cable

Test sample description

Test Sample description (compulsory information for EMC and RF testing services)

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	[]	[]	[]		
	[]	[]	[]		
	[]	[]	[]		
	[]	[]	[]		
	[]	[]	[]		
Supplementary information to the ports..... :						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[X]	AC: 185 - 265 Vac	[]	[]	[]	[]	[]
	[]	AC:	[]	[]	[]	[]	[]
	[]	DC:					
[]	DC:						
Rated Power	7 W						
Clock frequencies.....	Not provided data						
Other parameters	Not provided data						
Software version	Not provided data						
Hardware version	Not provided data						
Dimensions in cm (W x H x D)	29 X 15,8 X 47						

Mounting position	<input type="checkbox"/>	Table top equipment		
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment		
	<input type="checkbox"/>	Floor standing equipment		
	<input type="checkbox"/>	Hand-held equipment		
	<input type="checkbox"/>	Other:		
Modules/parts.....	Module/parts of test item		Type	Manufacturer

Accessories (not part of the test item)	Description		Type	Manufacturer
	CABLE DE RED		POWER	FAGOR

Documents as provided by the applicant	Description		File name	Issue date
	MANUAL DE USUARIO	
	HOJA TÉCNICA	

⁽³⁾ Only for Medical Equipment

Identification of the client

FAGOR ELECTRONICA, S.COOP
BARRIO SAN ANDRES S/N, 20500 MONDRAGON (GUIPUZCOA)

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-03-24
Date (finish)	2022-09-28

Document history

Report number	Date	Description
71202REM.003	2022-10-13	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Armando Moles Tejedor, Humberto Perez Guerrero, Juan Manuel Pino Blanco and Ricardo Jose Turcios Oliva.

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P

List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
6719	ATENUATOR, 6DB, 100W, DC A 2.4GHZ	100-A-FFN-06	BIRD	2023-07-27
6230	AVG POWER SENSOR 6 GHZ	NRP6A	ROHDE AND SCHWARZ	2023-01-17
6229	AVG POWER SENSOR 6 GHZ	NRP6A	ROHDE AND SCHWARZ	2023-01-17
4141	CURRENT INJECTION PROBE 4kHz-400MHz	CIP 9136A	TESEQ	--
2853	CURRENT PROBE 10kHz-150MHz	9206-1	SOLAR ELECTRONICS	2023-10-06
3973	DIPS AND INTERRUPTIONS GENERATOR	EXT-TRA3000 D	EMC-PARTNER	2022-12-02
7711	ELECTROSTATIC DISCHARGE SIMULATOR (ESD)	ESD3000	EMC-PARTNER	2024-02-03
5779	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-28
6607	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-28
4579	HYBRID BILOG ANTENNA 80MHz-6GHz	3149	ETS LINDGREN	--
2849	INSERTION UNIT 10V 9kHz-3GHz	URV5-Z2	ROHDE AND SCHWARZ	2023-09-13
6806	MAGNETIC FIELD ANTENNA 1x1m	MS 100N	EM TEST	--
6227	POWER AMPLIFIER 125W 9KHz-250MHz	BBA150	ROHDE AND SCHWARZ	--

Control No.	Equipment	Model	Manufacturer	Next Calibration
8052	POWER AMPLIFIER 250W/110W/100W 80MHz- 1GHz/0,69GHz-3,2GHz/2,5GHz- 6GHz	BBA150	ROHDE AND SCHWARZ	--
7614	SEMIANECHOIC ABSORBER LINED CHAMBER V	FACT 3 200 STP	ETS LINDGREN	--
8051	SIGNAL GENERATOR 8kHz- 6GHz	SMB100B	ROHDE AND SCHWARZ	2023-12-28
6228	SIGNAL GENERATOR 9kHz- 1.1GHz	SMC100A	ROHDE AND SCHWARZ	2023-11-16
5881	SIGNAL GENERATOR 9kHz- 40GHz	N5173B	KEYSIGHT TECHNOLOGIES	2024-04-28
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
4636	SONDA DE CORRIENTE, 10kHz – 500MHz	F55	FCC	2023-09-30
7553	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2023-04-19
4454	THREE-PHASE AC SWITCH	NSG 2200-3	TESEQ	2023-08-30
1650	THREE-PHASE ARTIFICIAL V- NETWORK 100A	NNLK8121	SCHWARZBECK	2023-02-08
2873	THREE-PHASE ARTIFICIAL V- NETWORK 500A	NNLK8130	SCHWARZBECK MESS- ELEKTRONIK	2023-07-25
4430	THREE-PHASE POWER SOURCE 30KVA	MX30-3Pi	CALIFORNIA INSTRUMENTS	2024-07-04
5151	TRANSIENT LIMITER 10DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2024-10-18
3598	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	2023-05-06

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
EN 55032	RE Radiated emission. Electromagnetic field measure	Pass	--
EN 55032	CE Continuous conducted emission	Pass	--
EN 61000-3-2	HAR-Phase I Conducted emission. Harmonic current measurement (Phase I wire)	Pass	--
EN 61000-3-3	FLK-Phase I Conducted emission. Voltage fluctuations and flicker measurement (Phase I wire)	Pass	--
EN 55035	RI Radiated RF Electromagnetic field immunity test	Pass	--
EN 55035	CI Immunity to conducted disturbances, induced by radiofrequency fields	Pass	--
EN 55035	EFT Electrical fast transient / burst immunity test	Pass	--
EN 55035	SUR Surge immunity test	Pass	--
EN 55035	HFI H Fields Immunity Test	Pass	--
EN 55035	VDI Voltage dips, short interruptions and voltage variations immunity test	Pass	--
EN 55035	ESD Electrostatic discharge immunity test	Pass	--
<u>Supplementary information and remarks:</u>			
None			

Appendix A: Test results

Appendix A context

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<i>ESD Electrostatic discharge immunity test</i>	36

Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

Id	Description
OM/01	EUT ON. Standby mode. Power supply: 230 Vac.
OM/02	EUT ON. Receiving 854 MHz DVB-T2 signal. power supply: 230 Vac.

Fails criteria for immunity test

According to EN 55035 (2017) + A11 (2020):

General:

General performance criteria are defined in 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

Performance criteria A:

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criteria B:

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criteria C:

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Monitoring for immunity test

For every operation mode, the monitoring performed over the samples under test is shown in the following table:

Id	CFC Monitoring	TFT Monitoring
OM/01	N/A	N/A
OM/02	By means of a spectrum analyzer was checked the output signal through the device during and after the test.	By means of a spectrum analyzer was checked the output signal through the device after the test.

Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
EN 55032 (2015) / AC (2016) / A11 (2020)	EN 55032 (2015) / AC (2016) / A11 (2020)	RE Radiated emission. Electromagnetic field measure
EN 55035 (2017)	EN 61000-4-3 (2006) / A1 (2008) / A2 (2010)	RI Radiated RF Electromagnetic field immunity test
EN 55032 (2015) / AC (2016) / A11 (2020)	EN 55032 (2015) / AC (2016) / A11 (2020)	CE Continuous conducted emission
EN 61000-3-2 (2019)	EN 61000-3-2 (2019)	HAR-Phase I Conducted emission. Harmonic current measurement (Phase I wire)
EN 61000-3-3 (2013) / A1 (2019)	EN 61000-3-3 (2013) / A1 (2019)	FLK-Phase I Conducted emission. Voltage fluctuations and flicker measurement (Phase I wire)
EN 55035 (2017) + A11 (2020)	EN 61000-4-6 (2009)	CI Immunity to conducted disturbances, induced by radiofrequency fields
EN 55035 (2017) + A11 (2020)	EN 61000-4-4 (2012)	EFT Electrical fast transient / burst immunity test
EN 55035 (2017) + A11 (2020)	EN 61000-4-5 (2014)	SUR Surges immunity test
EN 55035 (2017) + A11 (2020)	EN 61000-4-8 (2010)	HFI Power frequency magnetic fields
EN 55035 (2017) + A11 (2020)	EN 61000-4-11 (2004)	VDI Voltage dips and short interruptions
EN 55035 (2017) + A11 (2020)	EN 61000-4-2 (2009)	ESD Electrostatic discharge immunity test

Test Cases Details

EN 55032

RE Radiated emission. Electromagnetic field measure

Limits for Class B measured at 3m:

Frequency range (MHz)	Measured field limit at 3 m (dB μ V/m) Quasi-Peak measurement
30 to 230	40
230 to 1000	47

Frequency range (MHz)	Measured field limit at 3 m (dB μ V/m)	
	Average	Peak
1000 to 3000	50	70
3000 to 6000	54	74

Results

S/	OM	Code	Freq Rng (MHz)	V
01	OM/02	RE0101LR	[30, 1000]	P
01	OM/02	RE0101HR	[1000, 6000]	P

Verdict

Pass

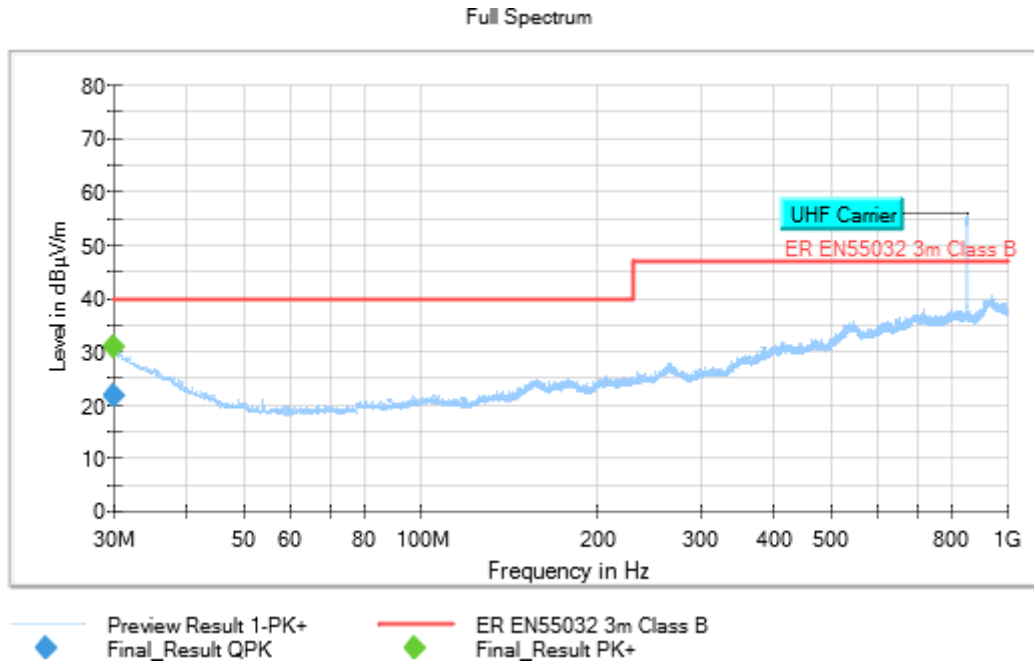
Attachments

EMC Test Code = RE0101LR, Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/02. EUT ON. receiving 854 MHz DVB-T2 signal. power supply: 230 Vac.

Images:



Tables:

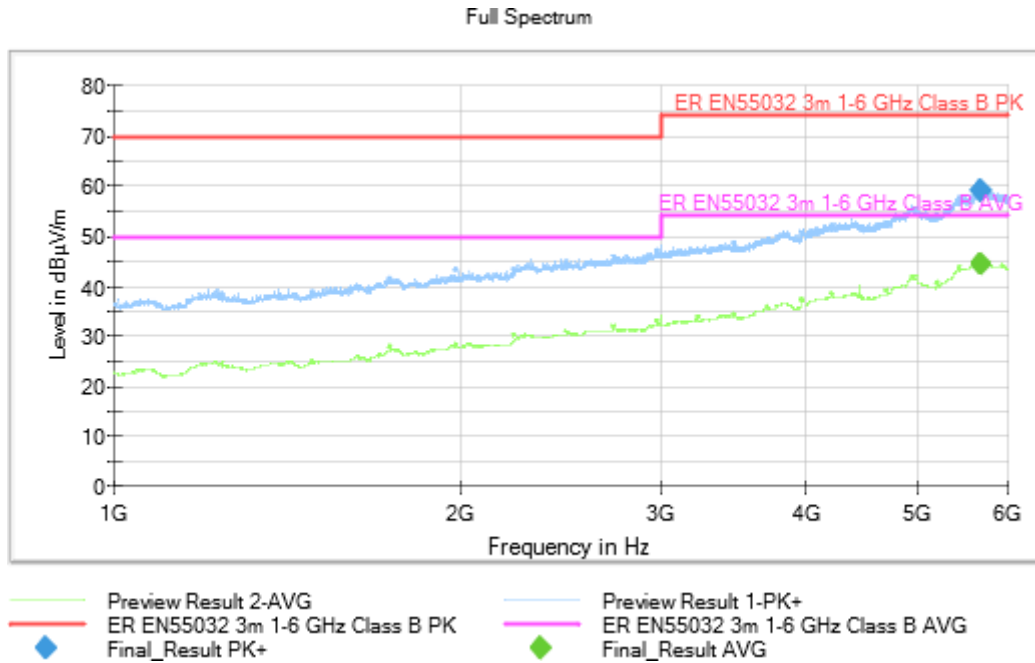
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
30.053100	---	30.68	---	---	100.0	H	180.0
30.053100	21.51	---	40.00	18.49	100.0	H	180.0

EMC Test Code = RE0101HR, Frequency Range MHz = [1000, 6000]

Sample ID: S/01

Operation Mode: OM/02. EUT ON. receiving 854 MHz DVB-T2 signal. power supply: 230 Vac.

Images:



Tables:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	PoI	Azimuth(deg)
5697.460000	---	44.42	54.00	9.58	307.0	V	8.0
5697.460000	59.06	---	74.00	14.94	307.0	V	8.0

RI Radiated RF Electromagnetic field immunity test

Limits

Range	Frequency	Modulation	Step	Level
A	80-1000MHz	AM 1 kHz Prof: 80%	LOG 1%	3 V/m
B	1782-1818MHz	AM 1 KHz Prof: 80%	LOG 1%	3 V/m
C	2574-2626MHz	AM 1 KHz Prof: 80%	LOG 1%	3 V/m
D	3465-3535MHz	AM 1 KHz Prof: 80%	LOG 1%	3 V/m
E	4950-5050MHz	AM 1 KHz Prof: 80%	LOG 1%	3 V/m

Results

S/	OM	CPL	Freq Rng (MHz)	Pol	Immunity Lvl (V/m)	Comments	V
01	OM/02	EUT front side	[80, 1000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT front side	[1000, 6000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT right side	[80, 1000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT right side	[1000, 6000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT left side	[80, 1000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT left side	[1000, 6000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT rear side	[80, 1000]	H/V	3	Ok, no fails detected.	P
01	OM/02	EUT rear side	[1000, 6000]	H/V	3	Ok, no fails detected.	P

Verdict

Pass

CE Continuous conducted emission

Limits

Limits for Class B: Mains ports AC

Frequency range (MHz)	Limit (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

Results

S/	OM	Code	Freq Rng (MHz)	Line	V
02	OM/01	CE02010N	[0.15, 30]	N	P
02	OM/01	CE0201L1	[0.15, 30]	L1	P
02	OM/02	CE02020N	[0.15, 30]	N	P
02	OM/02	CE0202L1	[0.15, 30]	L1	P

Verdict

Pass

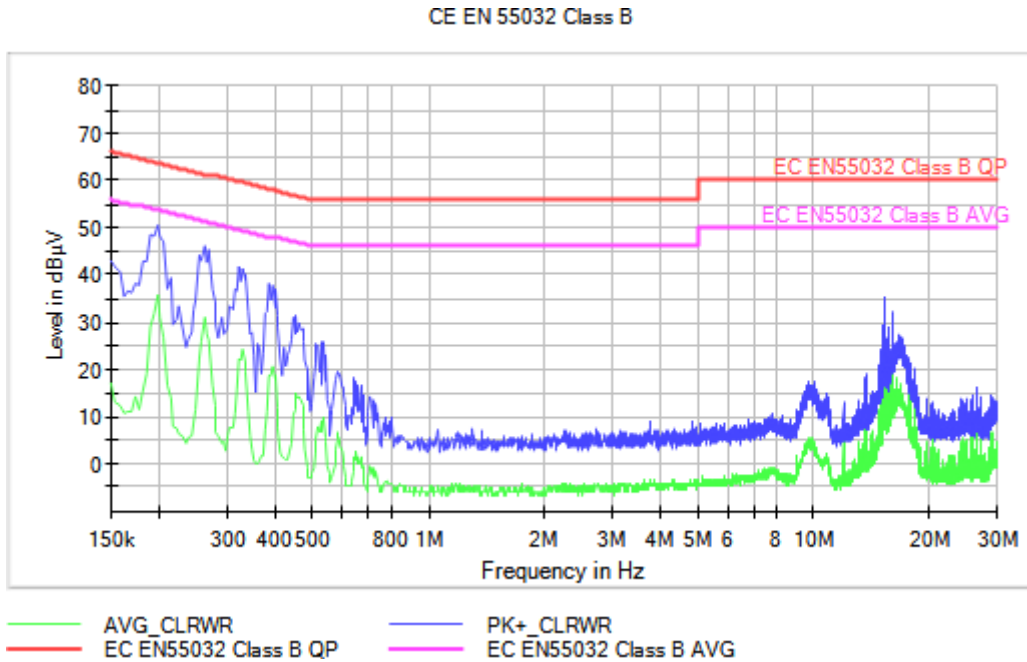
Attachments

EMC Test Code = CE02010N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/02

Operation Mode: OM/01. EUT ON. Standby mode. Power supply: 230 Vac.

Images:



Tables:

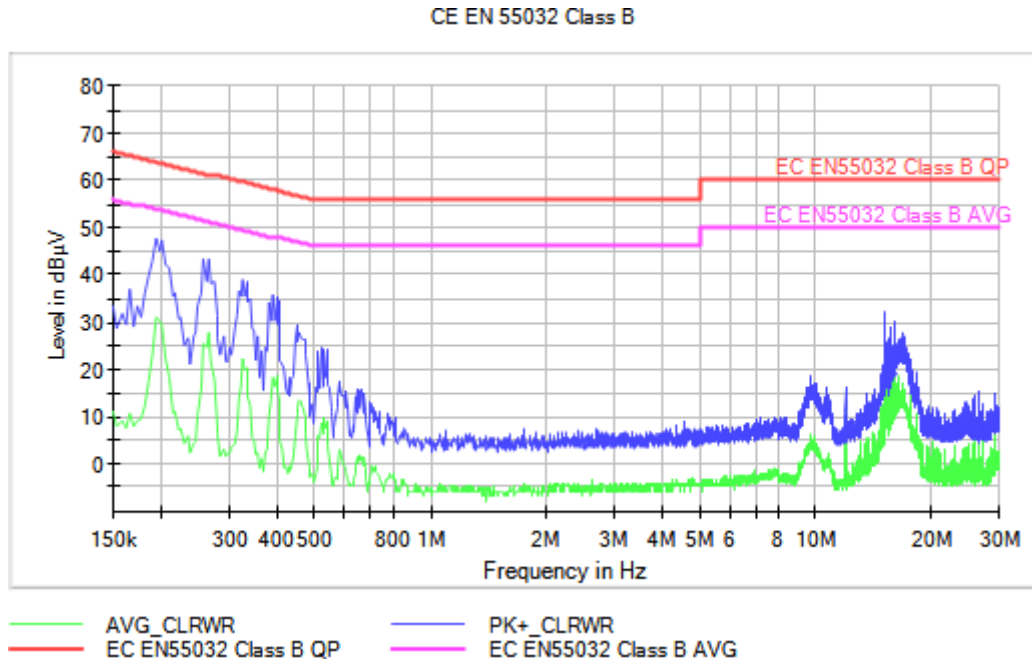
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.198000	50.7	35.7	N
0.262000	46.0	31.0	N
0.454000	31.2	15.1	N
0.742000	10.8	-4.2	N
1.306000	7.5	-5.0	N
2.722000	7.3	-4.9	N
3.798000	9.1	-3.3	N
10.038000	17.6	3.6	N
15.302000	35.4	28.2	N
17.698000	22.7	16.0	N

EMC Test Code = CE0201L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/02

Operation Mode: OM/01. EUT ON. Standby mode. Power supply: 230 Vac.

Images:



Tables:

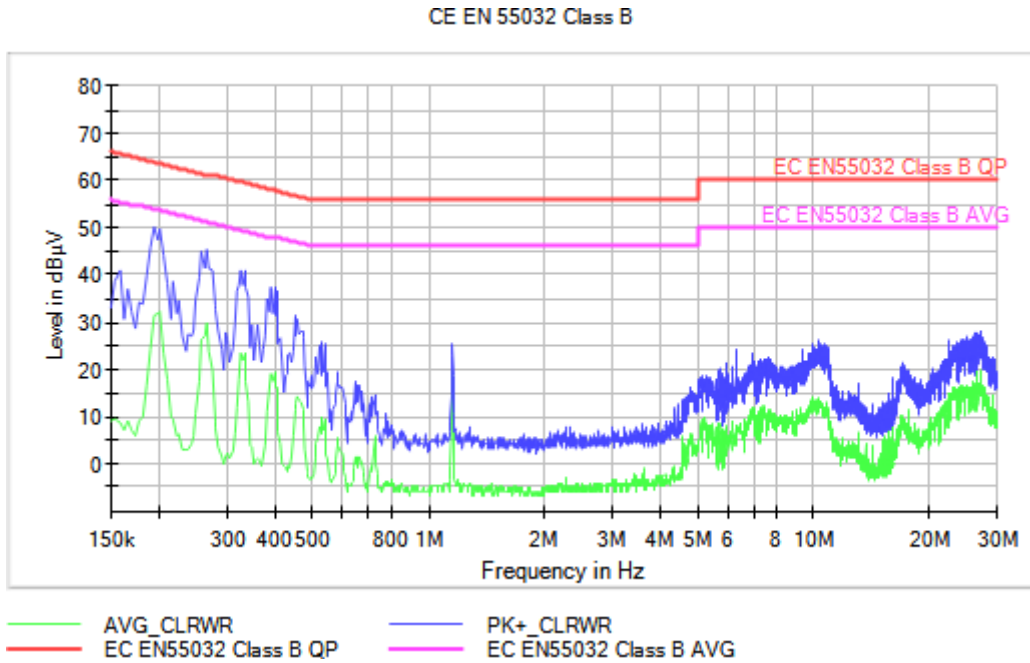
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.194000	47.9	30.9	L1
0.258000	43.5	25.6	L1
0.450000	29.3	10.9	L1
0.738000	11.3	-2.7	L1
1.750000	7.5	-4.9	L1
2.698000	7.6	-4.9	L1
4.586000	9.0	-4.1	L1
9.786000	18.8	4.2	L1
15.130000	32.2	26.2	L1
17.698000	22.2	12.9	L1

EMC Test Code = CE02020N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/02

Operation Mode: OM/02. EUT ON. receiving 854 MHz DVB-T2 signal. power supply: 230 Vac.

Images:



Tables:

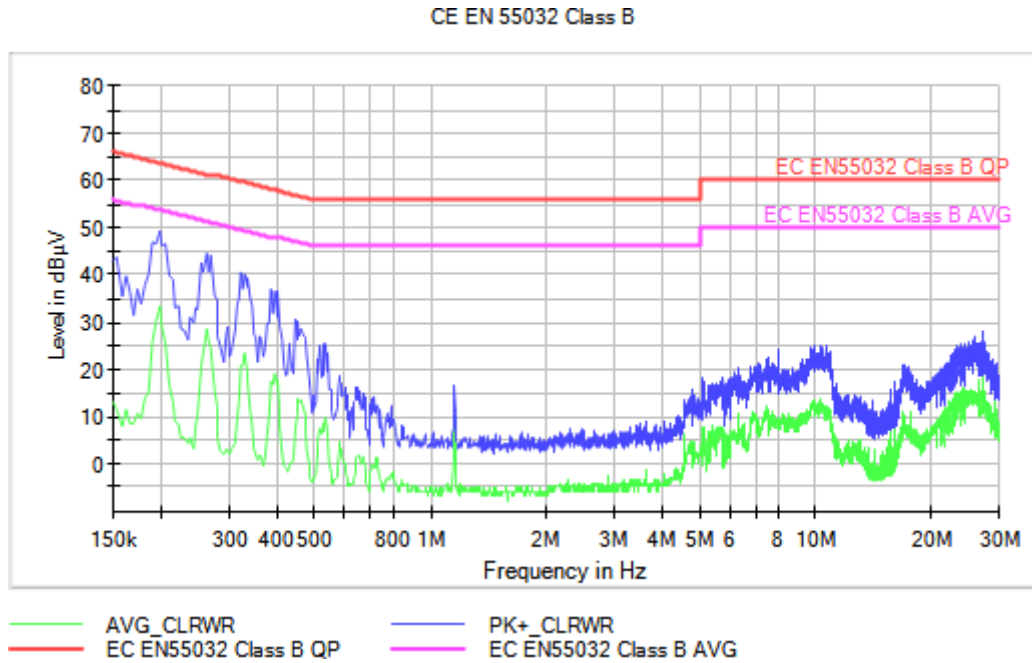
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.194000	50.0	31.4	N
0.266000	45.2	29.8	N
0.450000	31.2	11.6	N
1.154000	25.5	19.9	N
1.286000	8.1	-5.0	N
3.590000	8.9	-2.6	N
5.922000	21.6	6.8	N
10.330000	26.4	13.3	N
10.626000	25.5	11.1	N
27.442000	28.2	15.3	N

EMC Test Code = CE0202L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/02

Operation Mode: OM/02. EUT ON. receiving 854 MHz DVB-T2 signal. power supply: 230 Vac.

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.198000	49.2	33.5	L1
0.262000	44.7	28.7	L1
0.446000	30.8	7.1	L1
1.154000	16.8	10.6	L1
1.714000	6.7	-5.9	L1
3.482000	8.5	-3.3	L1
5.770000	18.4	8.0	L1
10.294000	25.1	12.4	L1
10.686000	25.2	10.8	L1
27.262000	28.1	14.9	L1

HAR-Phase I Conducted emission. Harmonic current measurement (Phase I wire)

Limits

Class A:

Odds Harmonics		Even Harmonics	
Harmonic Order	Maximum Current (A)	Harmonic Order	Maximum Current (A)
2	1.08	3	2.30
4	0.43	5	1.14
6	0.30	7	0.77
$8 \leq n \leq 40$	0.23*8/n	9	0.40
		11	0.33
		13	0.21
		$15 \leq n \leq 39$	0.15*15/n

Results

S/	OM	Code	Harm#	V
02	OM/02	Class A	40	P

Verdict

Pass

Attachments

EMC Test Code = Class A, Harmonic Number = 40

Sample ID: S/02

Operation Mode: OM/02. EUT ON. Receiving 854 MHz DVB-T2 signal. Power supply: 230 Vac.

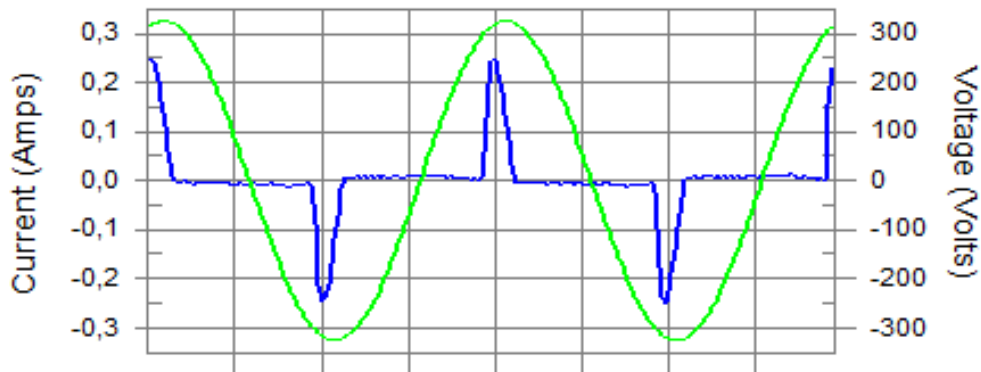
Images:

Harmonics – Class-A per Ed. 3.2 (2009) (Run time)

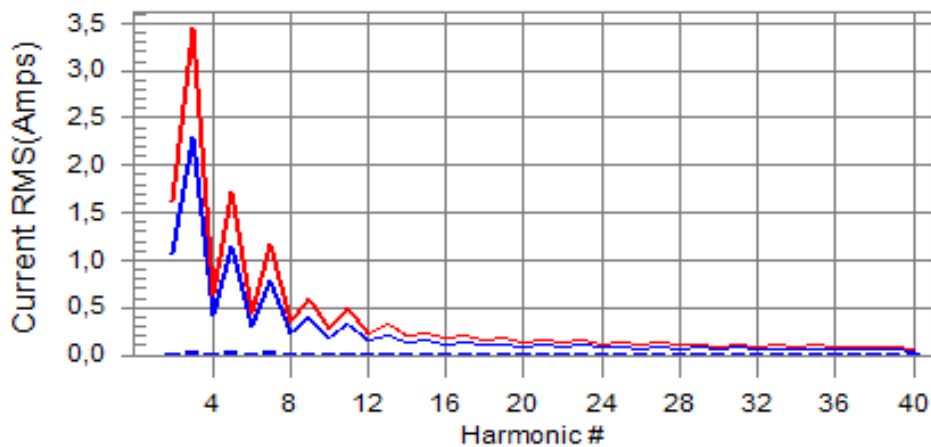
EUT: 71202	Tested by: DEKRA TC Spain
Test category: Class-A per Ed. 3.2 (2009) (European limits)	Test Margin: 100
Test date: 29/06/2013	Start time: 5:26:27
Test duration (min): 5	End time: 5:31:49
Comment: S/01	Data file name: H-010615.cts_data
Customer: FAGOR	

Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #9 with 5.04% of the limit.

FLK-Phase I Conducted emission. Voltage fluctuations and flicker measurement (Phase I wire)

Limits

Parameter	Description
$Pst < 1$	Short duration flicker indicator
$Plt < 0,65$	Long duration flicker indicator
$Dc \leq 3,3\%$	Relative steady-state voltage variation
$Dmax \leq 4\%$	Maximum relative voltage variation
$d(t) \leq 3,3\%$	For a duration of 500ms

Results

S/	OM	Code	V
02	OM/02	FLK0202	P

Verdict

Pass

Attachments

EMC Test Code = FLK0202

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Receiving 854 MHz DVB-T2 signal. Power supply: 230 Vac.

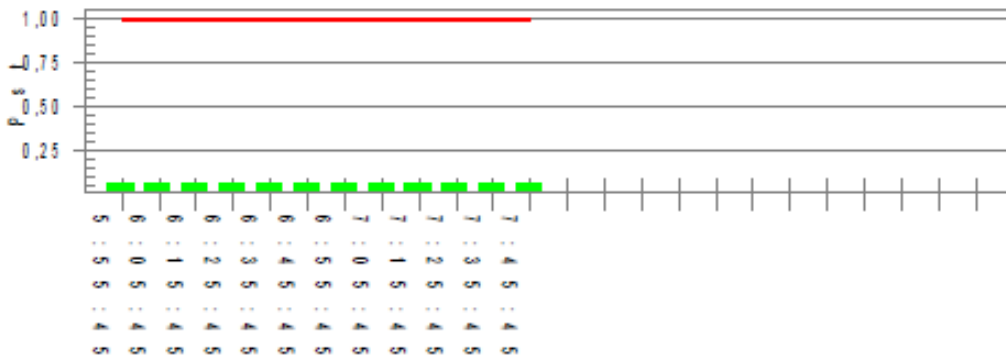
Images:

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

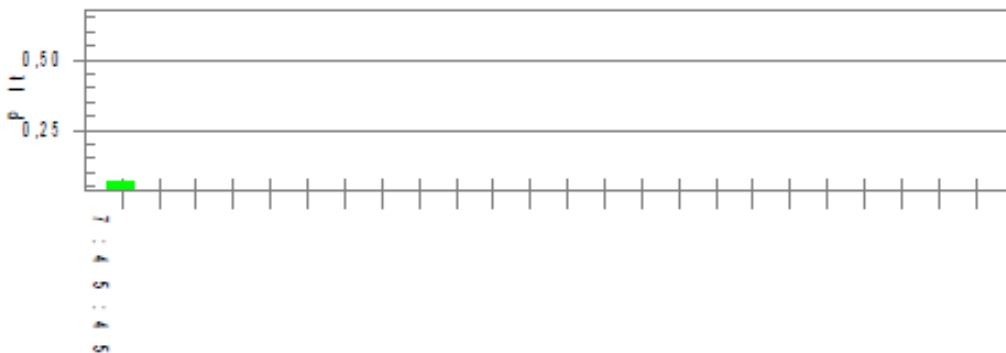
EUT: 71202	Tested by: DEKRA TC SPAIN
Test category: All parameters (European limits)	Test Margin: 100
Test date: 29/06/2013	Start time: 5:45:25
Test duration (min): 120	End time: 7:45:46
Comment: S/01	Data file name: F-010616.cts_data
Customer: FAGOR	

Test Result: Pass **Status: Test Completed**

Pst_t and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230,40		
Highest dt (%):	0,00	Test limit (%):	3,30 Pass
Time(mS) > dt:	0,0	Test limit (mS):	500,0 Pass
Highest dc (%):	0,00	Test limit (%):	3,30 Pass
Highest dmax (%):	0,00	Test limit (%):	4,00 Pass
Highest Pst (10 min. period):	0,064	Test limit:	1,000 Pass
Highest Plt (2 hr. period):	0,064	Test limit:	0,650 Pass

CI Immunity to conducted disturbances, induced by radiofrequency fields

Limits

Range	Frequency	Modulation	Step	Level
A	150 kHz - 10 MHz	AM 1 kHz Prof: 80%	1%	3 Vrms
B	10MHz – 30MHz	AM 1 kHz Prof: 80%	1%	3 to 1 Vrms
C	30MHz – 80MHz	AM 1 kHz Prof: 80%	1%	1 Vrms

Results

S/	OM	CPL	Freq Rng [L] (MHz)	Freq Rng [U] (MHz)	Immunity Lvl (Vrms)	Step Size (%)	Comments	V
02	OM/02	AC Mains	80.00000	0.15000	3 to 1	1	Ok, no fails detected	P
02	OM/02	Cable test output	80.00000	0.15000	3 to 1	1	Ok, no fails detected	P
02	OM/02	Cable VHF/UHF band input	80.00000	0.15000	3 to 1	1	Ok, no fails detected	P

Verdict

Pass

EFT Electrical fast transient / burst immunity test

Limits

Type	Application	Level(kV)	Repetition rate(kHz)
1	AC mains power input ports	±1kV	5kHz
2	DC mains power input ports	±0.5kV	5kHz
3	Analogue/Digital data ports	±0.5kV	5kHz

Results

S/	OM	CPL	CPL Type	Rep Freq (kHz)	Immunity Lvl (kV)	Comments	V
02	OM/02	AC Mains	1 (AC mains power input ports)	5	±1	Ok, no fails detected	P

Verdict

Pass

SUR Surge immunity test

Limits

Type	Application	Level (kV) Symmetrical coupling	Level (kV) Asymmetrical coupling
1	AC mains power input ports	± 1 kV	± 2 kV
2	DC mains power input ports	--	± 0.5 kV

TYPE	APPLICATION	LEVEL (kV) Unshielded symmetrical COUPLING Lines - Ground	LEVEL (kV) Coaxial or shielded COUPLING Shield – Ground
3	Analogue/Digital data ports	± 1 kV	± 0.5 kV

Results

S/	OM	CPL	CPL Type	Immunity Lvl (kV)	Comments	V
02	OM/02	AC mains	1 (AC mains power input ports)	±1	Ok, no fails detected	P
02	OM/02	AC mains	1 (AC mains power input ports)	±2	Ok, no fails detected	P
02	OM/02	Cable input and output EUT	3 (Signal, wired network and control ports)	±0.5	Ok, no fails detected	P

Verdict

Pass

VDI Voltage dips, short interruptions and voltage variations immunity test

Limits

Immunity levels for voltage interruptions:

Test	Severity level
A	100% during 5 s

Immunity levels for voltage dips and variations:

Test	Severity level
B	100% during 10 ms
C	30% during 500 ms

Results

S/	OM	Volt Immunity Type	Volt Immunity Lvl	Comments	V
02	OM/02	Dips and variations	100% during 10 ms	Ok, no fails detected	P
02	OM/02	Dips and variations	100% during 5 s	Ok, no fails detected	P
02	OM/02	Dips and variations	30% during 500 ms	Ok, no fails detected	P
02	OM/02	Interruptions	100% during 10 ms	Ok, no fails detected	P
02	OM/02	Interruptions	100% during 5 s	Ok, no fails detected	P
02	OM/02	Interruptions	30% during 500 ms	Ok, no fails detected	P

Verdict

Pass

HFI H Fields Immunity Test

Limits

Range	Frequency	Level
A	50Hz	1 A/m

Results

S/	OM	CPL	Immunity Lvl (A/m)	Comments	V
02	OM/02	Axis X	1	Ok, no fails detected	P
02	OM/02	Axis Y	1	Ok, no fails detected	P
02	OM/02	Axis Z	1	Ok, no fails detected	P

Verdict

Pass

ESD Electrostatic discharge immunity test

Limits

Coupling	Level
Direct contact discharge:	±4kV
Indirect contact discharge:	±4kV
Air discharge:	±2kV ±4kV ±8kV

DC: Direct contact discharge

ICH: Horizontal Indirect contact discharge

ICV: Vertical Indirect contact discharge

DA; Direct air discharge.

Results

S/	OM	CPL	CPL Type	Immunity Lvl (kV)	Comments	V
02	OM/02	Enclosure	ICH/ICV	±4	Ok, no fails detected	P
02	OM/02	Connectors	DC	±4	Ok, no fails detected	P
02	OM/02	Cables	DA	±2	Ok, no fails detected	P
02	OM/02	Screen	DA	±2	Ok, no fails detected	P
02	OM/02	Buttom	DA	±2	Ok, no fails detected	P
02	OM/02	Enclosure	DA	±2	Ok, no fails detected	P
02	OM/02	Cables	DA	±4	Ok, no fails detected	P
02	OM/02	Screen	DA	±4	Ok, no fails detected	P
02	OM/02	Buttom	DA	±4	Ok, no fails detected	P
02	OM/02	Enclosure	DA	±4	Ok, no fails detected	P
02	OM/02	Cables	DA	±8	Ok, no fails detected	P
02	OM/02	Screen	DA	±8	Ok, no fails detected	P
02	OM/02	Buttom	DA	±8	Ok, no fails detected	P
02	OM/02	Enclosure	DA	±8	Ok, no fails detected	P

Verdict

Pass

Photographs

