Microprocessor Crystal 13.5 x 4.6

Features

- **Wide Frequency Range**
- **Industry Standard Package**
- **Excellent Clock Signal Generator for CPU's**

❖ Specifications

Parameter		Value
Frequency Range		1.000 MHz to 200.000 MHz
Mode of Oscillation	Fundamental	1.000 to 65.000 MHz
	Third Overtone	20.000 to 90.000 MHz
	Fifth Overtone	60.000 to 200.000 MHz
Frequency Tolerance at 25°C		±30 ppm Standard (±10, ±20, ±50 available)
Frequency Stability over Temperature		±50 ppm Standard (±10, ±20, ±30 & ±100 ppm available)
Operating Temperature Range		-20°C to +70°C Standard -40°C to +85°C Extended
Storage Temperature Range		-55°C to +125°C
Aging		±5 ppm per Year maximum
Load Capacitance		10 pF to 32 pF or Series
Equivalent Series Resistance		See Table 1
Shunt Capacitance		7.0 pF maximum
Drive Level		100 μW Typ., 1000 μW Max
Shock Resistance		±5 ppm Maximum 75 cm Drop Test in 3 axes onto a hardwood surface

Table 1

Frequency (MHz	Mode	MAX ESR (Ohms)
1.000 to 1.999	FUND	700
2.000 to 2.399	FUND	500
2.400 to 2.999	FUND	400
3.000 to 3.199	FUND	200
3.200 to 3.599	FUND	180
3.600 to 3.999	FUND	150
4.000 to 4.499	FUND	80
4.500 to 5.299	FUND	60
5.300 to 6.099	FUND	50
6.199 to 6.999	FUND	40
7.000 to 9.999	FUND	30
10.000 to 24.099	FUND	25
24.100 to 30.999	FUND / 3OT	25 / 50
31.000 to 75.000	3 OT	50
75.000 to 124.999	5OT	80
125.00 to 149.99	5OT	100
150.00 to 200.00	5OT	120

❖ Environmental

Parameter	Value
Moisture Sensitivity Level	1
RoHS	6/6 Complaint & Lead Free
REACH SVHC	Compliant
Halogen Free	Compliant
ESD Classification Level	N/A
Termination Finish	Sn
Unit Weight (grams)	0.88

❖ **Mechanical Specification**

13.49 MAX
.531 MAX

12.00 MIN
.472 MIN

0.43 DIA
.017 DIA

4.88
.192

11.05 MAX
.435 MAX

4.65 MAX
.183 MAX
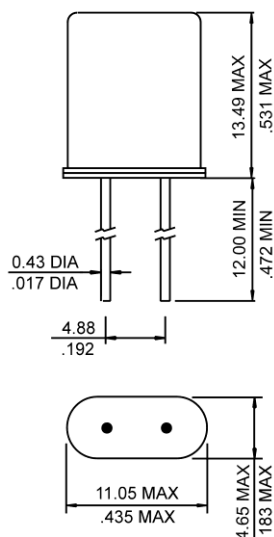
❖ **Packaging**

Bulk

❖ **Part Numbering**

AA	-	24.000	-	18	-	XXXX
Product Family		Frequency (MHz)		Load Capacitance (pF) 9 to 32 pF or S for Series		1) Tolerance, 2) Stability, 3) Mode, 4) Temperature Tolerance: E=±10 ppm, D=±20ppm, F=±30 ppm, B=±50 ppm (standard) Stability: D=±20ppm, F=±30 ppm, B=±50 ppm (standard), C=±100 ppm Mode: blank = Fundamental, 3=3rd Overtone, 5=5th Overtone Temperature range: blank standard, E=Extended

EXAMPLE: AA-24.000-12-DF

Microprocessor Crystal, 13.5 x 4.6, 24.000 MHz, 12 pF load Capacitance, tolerance ±20 ppm and stability ±30 ppm, Fundamental mode, standard Temperature range -20°C to +70°C
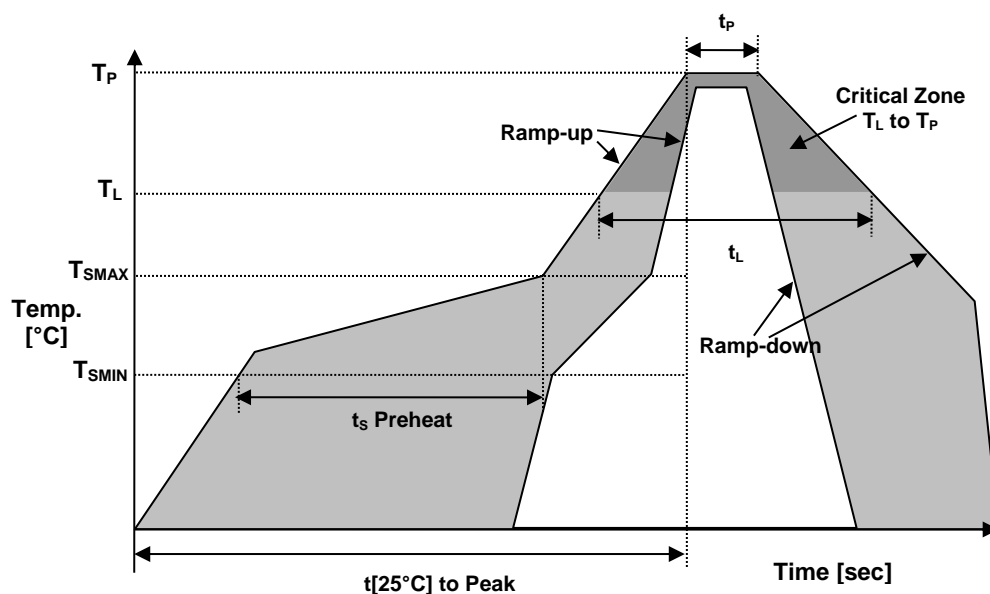
EXAMPLE: AA-8.000-10-BBE

Microprocessor Crystal, 13.5 x 4.6, 8.000 MHz, 10 pF load Capacitance, standard tolerance (±50 ppm), stability (±50 ppm), Fundamental mode, Extended Temperature range -40°C to +85°C

Reflow Profile

Reflow Profile (Reference IPC/JEDEC J-STD-020)		
Temperature Min Preheat	T_{SMIN}	150°C
Temperature Max Preheat	T_{SMAX}	200°C
Time (T_{SMIN} to T_{SMAX})	t_S	60 – 180 sec.
Temperature	T_L	217°C
Peak Temperature	T_P	260°C
Ramp-Up Rate	R_{UP}	3°C / sec. max
Ramp-Down Rate	R_{DOWN}	6°C / sec. max
Time within 5°C of Peak Temperature	T_P	10 sec.
Time t[25°C] to Peak Temperature	t[25°C] to Peak	480 sec.
Time	T_L	60 – 150 sec.

AA PRODUCT FAMILY

- **MARKING**

FFF.FFF MHz
L T E
Ryyxxww

FFF – Frequency in MHz
x – Internal Production ID code
L – Load Capacitance Code or S
T – Tolerance Code
E – Extended Temperature Range or blank if standard
y – Year code
w – Week code

LOAD CAPACITANCE CODE			
CODE	C_L (pF)	CODE	C_L (pF)
A	20	J	12
B	18	K	10
C	16	M	14
D	30	N	15
F	12.5	P	13
G	32	8	8
H	22	9	9

TOLERANCE CODE	
CODE	TOL (ppm)
C	±100
B	±50
F	±30
D	±20
E	±10

YEAR CODE	
Year	Code
2011	1
2012	2
2013	3
2014	4
2015	5
2016	6
2017	7
2018	8
2019	9
2020	0

ALPHA WEEK CODE					
Week	Code	Week	Code	Week	Code
1	a	19	s	37	K
2	b	20	t	38	L
3	c	21	u	39	M
4	d	22	v	40	N
5	e	23	w	41	O
6	f	24	x	42	P
7	g	25	y	43	Q
8	h	26	z	44	R
9	i	27	A	45	S
10	j	28	B	46	T
11	k	29	C	47	U
12	l	30	D	48	V
13	m	31	E	49	W
14	n	32	F	50	X
15	o	33	G	51	Y
16	p	34	H	52	Z
17	q	35	I		
18	r	36	J		

- **APPROVAL**

DRAWN BY	FP, 16 May 2017
APPROVED BY	FP, 16 May 2017
REVISION	A, Initial Release