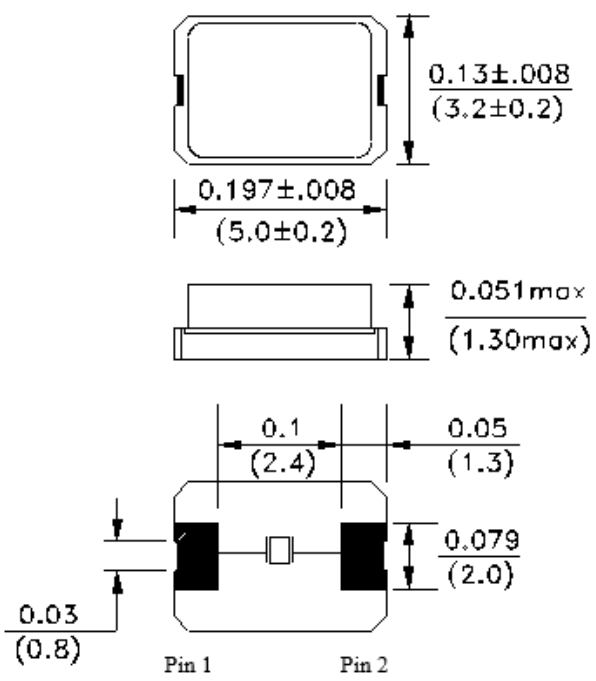
Features

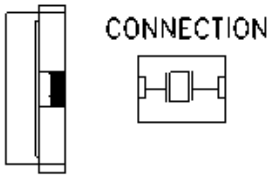
- SMD Quartz Crystal Resonator
- Tolerance: ±15ppm Available
- Operating Temperature -10°C to +60°C to -40°C to +125°C

STANDARD SPECIFICATIONS	
PARAMETERS	**MAX (Unless otherwise noted)**
Frequency Range Fundamental 3rd Overtone	 **8.000 to 54.000 MHz** **54.100 to 80.000 MHz**
Operation Mode	**Fundamental or** **3rd Overtone**
Operating Temperature	**-10°C to +60°C, see options**
Storage Temperature	**-40°C to +90°C**
Frequency Tolerance @ 25°C	**± 50PPM, see options**
Frequency Stability over the Operating Temperature (ref. to +25°C)	**± 50PPM, see options**
Equivalent Series Resistance (ESR) 8.000 ≤ F < 9.000 (Fund) 9.000 ≤ F < 10.000 (Fund) 10.000 ≤ F < 16.000 (Fund) 16.000 ≤ F < 20.000 (Fund) 20.000 ≤ F < 30.000 (Fund) 30.000 ≤ F ≤ 54.000 (Fund) 54.000 < F ≤ 80.000 (3rd OT)	 **140 Ω** **120 Ω** **60 Ω** **40 Ω** **30 Ω** **25 Ω** **60 Ω**
Shunt Capacitance (C0)	**7.0 pF**
Load Capacitance (CL)	**18 pF, Standard (see options if other than STD)**
Drive Level	**10 µW Typ** **100 µW**
Aging (@25°C±3°C First year)	**±5ppm**
Insulation Resistance@ 100Vdc ± 15V	**500 MOhms**
RoHS Compliant	**Yes, , Pb in Glass, exemption 7C-I per RoHS II Directive 2011/65/EU Annex**
Pb Free	**No**
MSL	**NA**

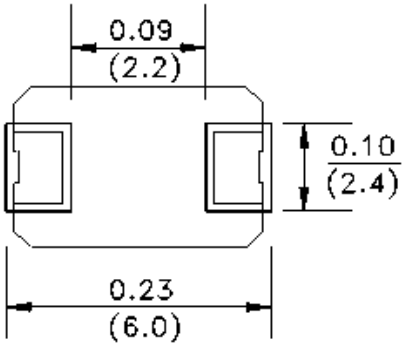
Operating Temp.	Freq. Stability							
	U:±10ppm	G:±15ppm	X:±20ppm	W:±25ppm	Y:±30ppm	H:±35ppm	Std:±50ppm	Q:±100ppm
Std: -10°C ~ +60°C	√	√	√	√	√	√	√	√
E: 0°C ~ +70°C	√	√	√	√	√	√	√	√
B: -20°C ~ +70°C	√	√	√	√	√	√	√	√
C: -30°C ~ +70°C		√	√	√	√	√	√	√
N: -30°C ~ +85°C		√	√	√	√	√	√	√
D: -40°C ~ +85°C			√	√	√	√	√	√
J: -40°C ~ +105°C					√	√	√	√
K: -40°C ~ +125°C							√	√

DIMENSIONS / MECHANICALSPECIFICATIONS

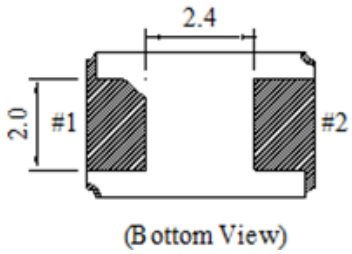




Recommended land pattern



Alternative bottom packaging 1:



(Bottom View)

Dimensions: Inches(mm)

Sealing Method = Glass Sealing

Part Numbering Guide

Available Options & Part Identification for Ceramic SMD Crystal ELM3 Sample PN: ELM3-20.000MHz-E7U-T							
ELM3	**-20.000MHz**			**-E**	**7**	**U**	**-T**
AEL Model	**Frequency**	**Load Capacitance (pF)** Please specify CL (min 6pF) in pF or S for series **e.g. 9 = 9pF**	**ESR** Custom ESR if other than Standard **e.g. -R20**	**Operating Temperature Range** **E: 0 ~ +70°C** B: -20 ~ +70°C C: -30 ~ +70°C N: -30 ~ +85°C D: -40 ~ +85°C J: -40 ~ +105°C K: -40 ~ +125°C	**Frequency Tolerance** **7: ±15ppm** 2: ±20ppm 3: ±25ppm 4: ±30ppm	**Frequency Stability** **U: ±10ppm** G: ±15ppm X: ±20ppm W: ±25ppm Y: ±30ppm H: ±35ppm Q: ±100ppm	**Values Added Options** Blank: Bulk T: 1,000 pcs

Reflow Profile [JDEC J-STD-020]

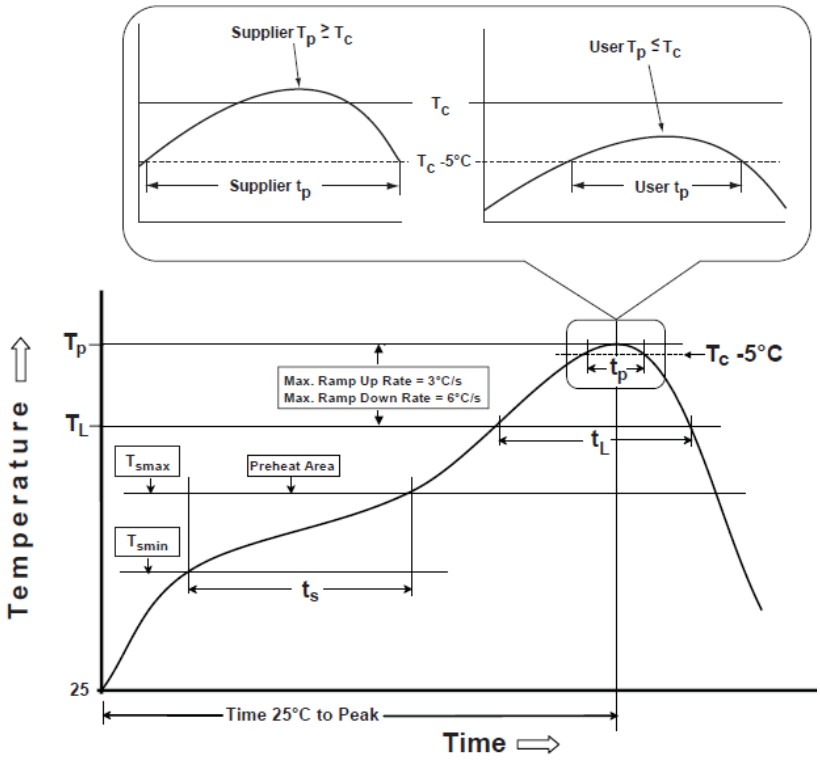


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≥350**
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

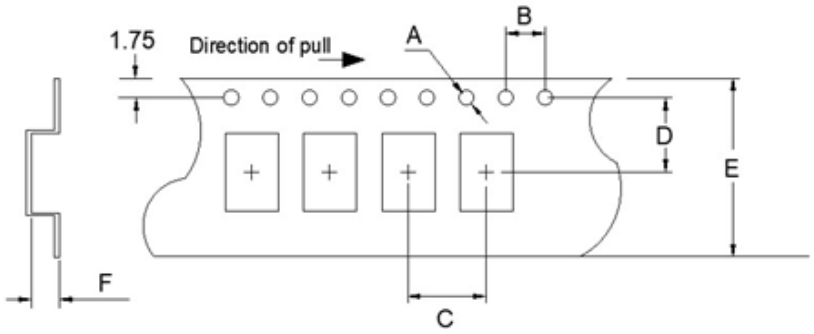
Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	**Volume mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >2000**
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_P)*	***see Table 1***	***see Table 2***
Time (t_p)** within 5°C of the specified classification temperature (T_C)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max

*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

TAPE SPECIFICATIONS (mm)						
A	B	C	D	E	F	REEL QTY
Ø1.5	4.0	8.0	5.5	12.0	1.75	1,000 pcs/reel



REEL SPECIFICATIONS (mm)						
G	H	I	J	K	L	M
2.0	Ø13	---	Ø61	Ø179	12.5	--