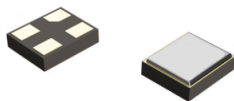




PLETRONICS SMX1210

Ultra Miniature SMD Crystal



SMX1210
1.2 x 1.0 x 0.35 mm
Ceramic Package

Features

- Ultra Miniature low profile surface mount crystal
- Tape and Reel Packaging
- AT Cut Crystal
- 27 MHz to 80 MHz

Applications

Bluetooth
WLAN
IoT
Wearables

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	27	-	80	MHz	*Developed: 27.12MHz, 32MHz, 40MHz, 48MHz, 76.8MHz
Calibration Frequency Tolerance	± 10	-	± 20	ppm	at 25°C ± 3°C, see part number guide below for available options
Frequency Stability	± 10	-	± 30	ppm	see part number guide below for available options
Operating Temperature Range	-40	-	+105	°C	see part number guide below for available options
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	100 50	Ω	27 MHz ≤ Freq < 50 MHz 50 MHz ≤ Freq ≤ 80 MHz
Drive Level	-	-	200	μW	Use 10μW for testing
Shunt Capacitance (C ₀)	-	-	3.0	pF	Pad to Pad Capacitance
Aging at 25°C ± 3°C	-	-	± 3	ppm	for the first year
	-	-	± 2	ppm	after the first year

*Developed does not imply stocked part

Part Numbering

Series Model	Load Capacitance (C _{Load}) in pF	Frequency in MHz	Frequency Calibration Tolerance (at 25°C)	Frequency Stability	Fundamental Mode AT Cut Crystal	Operating Temperature Range	
						Lowest	Highest
SMX1210	-8	-40.0M	-20	F	1	L	K
	Parallel Resonance from 6 to 12 pF		(Typical Values Shown) 10 = ±10 ppm 15 = ±15 ppm 20 = ±20 ppm	See Table Below	1 = Fundamental	C = 0°C E = -10°C G = -20°C L = -40°C	E = +60°C G = +70°C K = +85°C P = +105°C

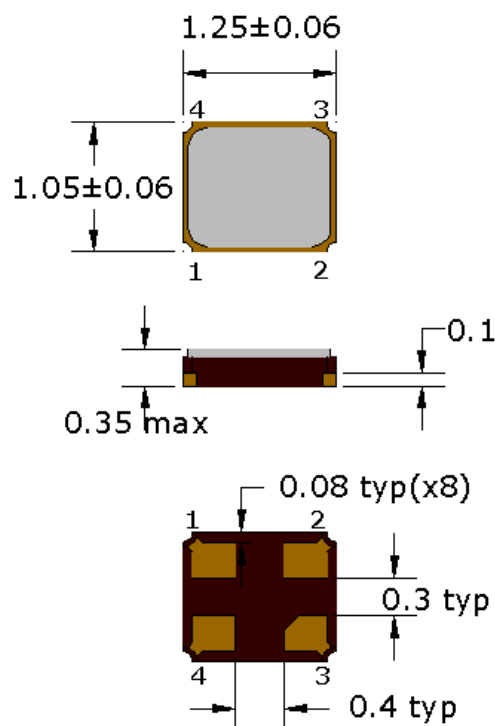
Available Frequency Stability versus Temperature in ppm

Operating Temperature Range		D	E	F	G
	CODE	±10	±15	±20	±30
-10 to +60°C	EE	•	•	•	•
-10 to +70°C	EH	•	•	•	•
-20 to +70°C	GG	•	•	•	•
-40 to +85°C	LK		Δ	•	•
-40 to +105°C	LP				Δ

• = Available

Δ = Check with Pletronics

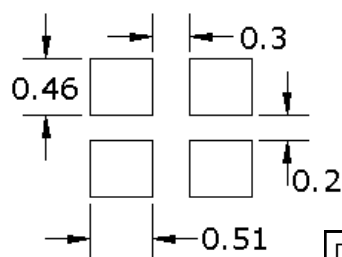
Mechanical Dimensions



Pad Connections

- 1 Crystal
- 2 Lid
- 3 Crystal
- 4 N.C.

It is recommended to tie 2 and 4 together



Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Dimensions in mm

Contacts (pads): Gold (0.3 to 1µm) over Nickel (1.27 to 8.89 µm)

The crystal connection is symmetrical. The part can be rotated 180° when being assembled on the PCB.

For Optimum Jitter Performance, Pletronics recommends:

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.
- The package should be grounded for optimum performance, connect pad 2 and 4 to ground.
- These very small crystals have high ESR, the oscillator start-up and operation should take this into consideration.
- These very small crystals should have their maximum drive level limited to 200 µW.



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Device Marking

FF.F
.YWx

FF.F = Frequency (4 characters includes decimal)
YWx = Date Code (Year Week), x = Internal Code

Specifications such as part number, frequency stability, and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code (Year Week)

Y Code	6	7	8	9	0	1	W Code	A ~ Z	a ~ z
Year	2026	2027	2028	2029	2030	2031	Week	1 ~ 26	27 ~ 52

Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

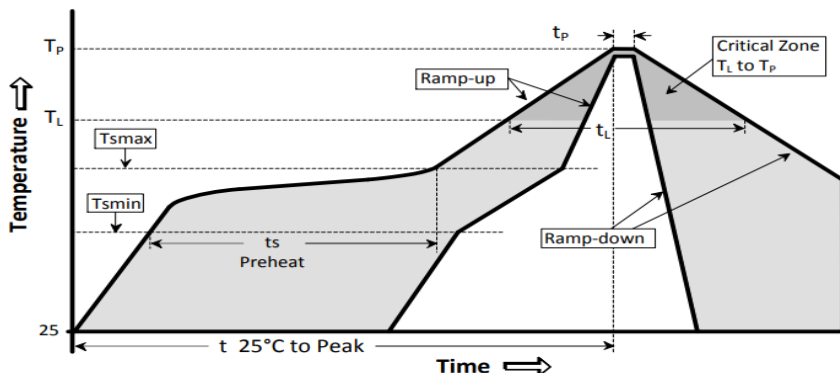
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 1.6 mg
Moisture Sensitivity Level: 1 As defined in J-STD-020D

Reliability

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Damp Heat	JESD22-A101
Thermal Cycle	MIL-STD-883 Method 1010, Condition B
Low Temp Storage	IEC 60068-2-1

Reflow Cycle

Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

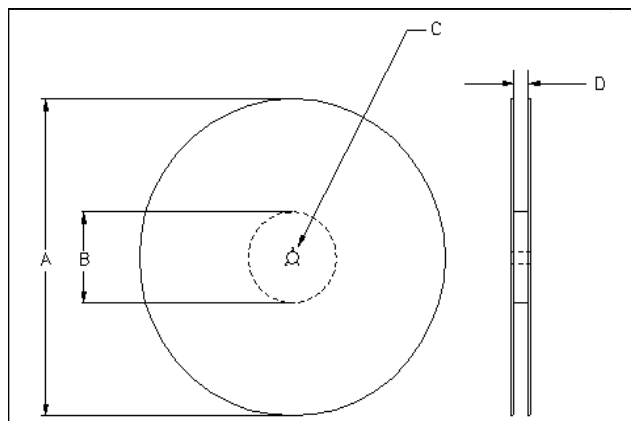
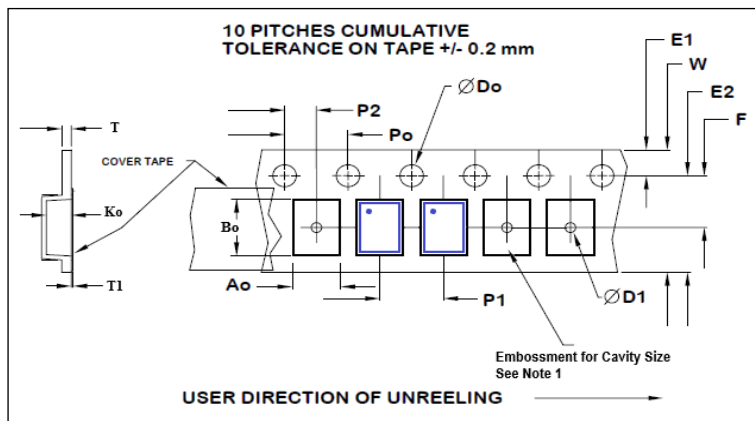


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(T _{smax} to T _P)	3°C / second max	°C / s
Ramp down Rate	T _{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	T _{to-peak}	8 minutes max	min
Preheat			
Temperature min	T _{smin}	150	°C
Temperature max	T _{smax}	200	°C
Time T _{smin} to T _{smax}	t _s	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T _L	217	°C
Time above liquidus	t _L	60 – 150	sec
Peak temperature			
Peak Temperature	T _P	260	°C
Time within 5°C of peak temperature	t _P	20 – 40	sec

Tape and Reel

Tape and Reel standard quantity 3K per reel, cut tape for < 3000. 8mm tape, 4mm pitch.



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
8mm	6.25	3.5 ± 0.1	4.0 ± 0.1	8.1	1.1 ± 0.1	1.3 ± 0.1	0.45 ± 0.1

Dimensions in mm Drawing Not to scale
Note 1: Embossed cavity to conform to EIA- 481-B

Tape Constant Dimensions Table 1

Tape Size	Do	D1	E1	Po	P2	T	T1 max
8mm	1.55 ± 0.05	1.0 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.2	0.1

Reel Dimensions (may vary) Table 3

	A	B	C	D
Reel Size	mm	mm	mm	mm
7	180	60	13.0 ± 0.5	9.3 +1.0 -0.0



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