



# SM20S Series Low Frequency Crystal

March 2012



- The Pletronics' SM20S Series is a miniature surface mount crystal.
- The package is ideal for automated surface mount assembly and reflow practices.
- · Tape and Reel packaging

- 32.768 KHz only
- 3.8 x 8 mm 4 pad
- XY Cut Crystal

# Pletronics Inc. certifies this device is in accordance with the RoHS (2002/95/EC) and WEEE (2002/96/EC) directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's

Weight of the Device: 0.118 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020C

Second Level Interconnect code: e3

#### **Part Number:**

SM20S	- 32.768K	- 6PF	-XX	
				Internal code or blank
				Load Capacitance Blank = 12.5pF 6 = 6pF
				Nominal Frequency in KHz
				Model Number

#### **Reliability: Environmental Compliance**

Parameter	Condition		
Mechanical Shock	MIL-STD-883 Method 2002, Condition A		
Vibration	MIL-STD-883 Method 2007, Condition A		
Solderability	MIL-STD-883 Method 2003		
Thermal Shock	MIL-STD-883 Method 1011, Condition A		

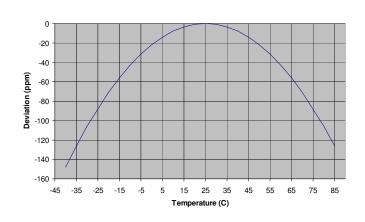


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# **Electrical Specification:**

Item	Min Max		Unit	Condition
Frequency	32.768		kHz	
Calibration Frequency Tolerance	-20	+20	ppm	at +25°C
Equivalent Series Resistance		50K	Ohms	
Drive Level		1.0	uW	
Turn Over Temperature	20	30	°C	Nominal is 25°C
Temperature Coefficient	-0.	035	ppm/°C²	typical
Q Factor	50000		Q	
Shunt Capacitance	1.0		pF	Pin to Pin Capacitance, typical
Motional Capacitance	1.9		fF	typical
Aging (for first year)	-5	+5	ppm/Yr	at 25°C <u>+</u> 3°C
Insulation Resistance	500M		Ohms	at 100V DC
Crystal Cut				XY Cut
Operating Temperature Range	-40	+85	°C	
Storage Temperature Range	-55 +125		°C	
Shock Resistance	-10	+10	ppm	
Vibration Resistance	-5 +5		ppm	
Reflow Resistance -5		+5	ppm	

## **XY Crystal Frequency** versus Temperature **Typical Performance:**



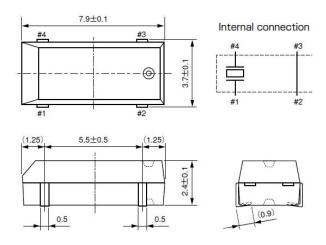
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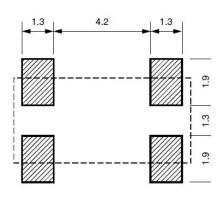


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#### Mechanical:





#### **Dimensions specified are typical**

### **Package Labeling**

Label is 1" x 2.6" (25.4mm x 66.7mm) Font is Courier New Bar code is 39-Full ASCII



Label is 1" x 2.6" (25.4mm x 66.7mm) Font is Arial

Pb Free
2nd LvL Interconnect
Category=e3
Max Safe Temp=260C for 10s 2X Max

## Part Marking:

- · Marking consists of an internal manufacturing date code
- Orientation of marking may be mixed on the tape
- · Traceability of part's specification is lost once removed from reel

### Layout and application information

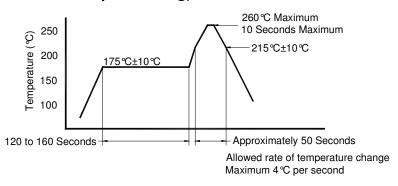
- Trace lengths to the crystal should be kept as short as possible.
- · The crystal connections are sensitive to noise.

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### Reflow Cycle (typical for lead free processing)



The part may be reflowed 2 times without degradation.

### Tape and Reel: available for quantities of 250 to 1000 per reel

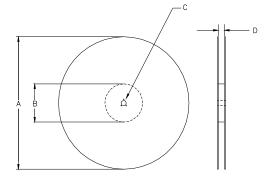
Constant Dimensions Table 1								
Constant Dimensions Table I								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm		1.0			2.0			
12mm	1.5	1.5	1.75	4.0	<u>+</u> 0.05	0.0	0.05	0.4
16mm	+0.1 -0.0	1.5	<u>+</u> 0.1	<u>+</u> 0.1	2.0	0.6	0.25	0.1
24mm		1.5			<u>+</u> 0.1			

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	5.5 <u>+</u> 0.1	8.0 <u>+</u> 0.1	1.2	12.3	Note 1

Note 1: Embossed cavity to conform to EIA-481-B

Dimensions in mm

Not to scale



		REE			
Α	inches	7.0	10.0	13.0	
	mm	177.8	254.0	330.2	
В	inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	Tape Width
С	mm	13	wiatri		
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.0
	mm			24.4 +2.0 -0.0	24.0
	mm			32.4 +2.0 -0.0	32.0

Reel dimensions may vary from the above

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