



PLETRONICS SM7S Series Miniature SMD Crystal



SM7S
2.05 x 1.2 x 0.6 mm
Ceramic Package

Features

- Pletronics' SM7S Series is a miniature low profile surface mount watch crystal.
- Package is ideal for automated surface mount assembly and reflow practices.
- Tape and Reel Packaging.
- 32.768 kHz

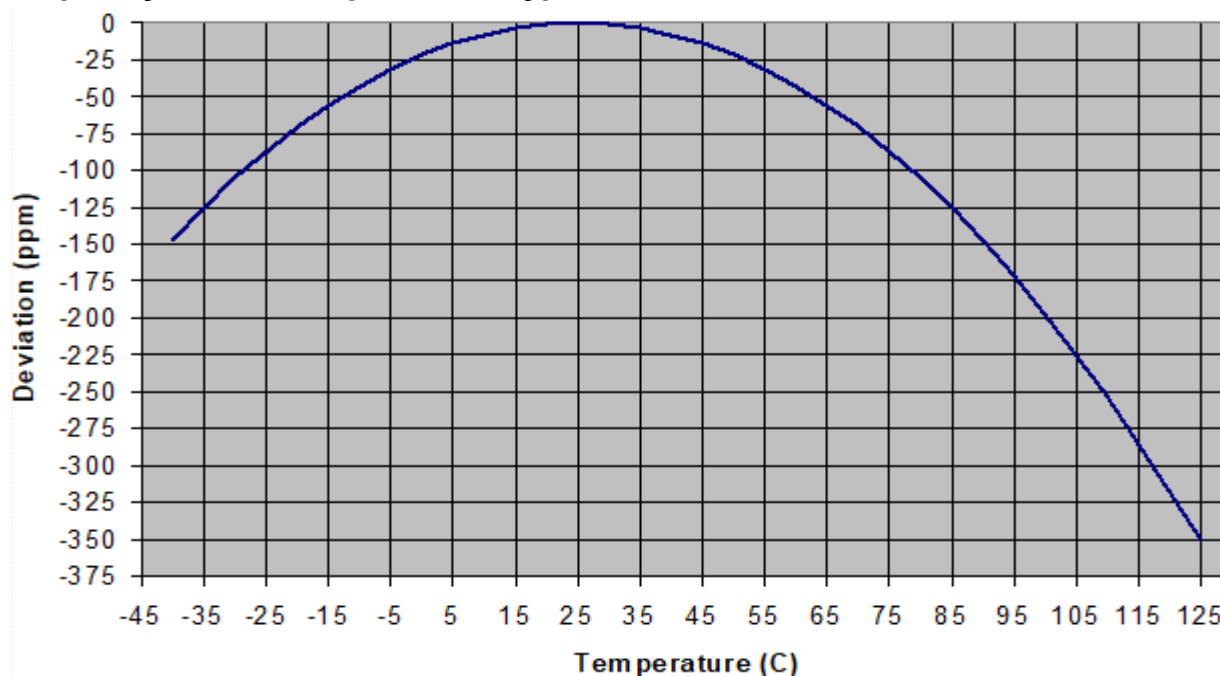
Applications

RTC

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	-	32.768	-	kHz	
Calibration Frequency Tolerance	-	-	±20	ppm	Standard at 25°C ± 3°C. See page 2 for all options
Frequency Stability	0.028	-0.034	-0.04	ppm/Δ°C ²	
Turnover Temperature	20	25	30	°C	
Operating Temperature Range	-40	-	+85	°C	
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	80	kΩ	At 25°C
Drive Level	-	-	0.5	μW	
Q Factor	30000	-	-		
Shunt Capacitance (C0)	-	1.3	-	pF	Pad to Pad Capacitance
Insulation Resistance	500	-	-	MΩ	@100VDC
Aging at 25°C±3°C	-	-	±3	ppm	for the first year at +25°C ± 3°C

Frequency versus Temperature - Typical Performance





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Part Numbering

Series Model	Load Capacitance (CLoad) in pF	Frequency in kHz	Frequency Calibration Tolerance
SM7S	-9	-32.768K	-20
	Blank = 12.5pF 9 = 9pF 7 = 7pF 6 = 6pF		10 = ±10 ppm 20 = ±20 ppm

Device Marking

1. Marking consists of a manufacturing date code
2. Orientation of marking may be mixed on the tape
3. Traceability of part's specification is lost once removed from reel

Package Labeling

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

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

P/N:	
SM7S-32.768K-20	
Customer P/N:	
12345678	
Qty:	
1000	
D/C:	
8HK-WY	
MSL: 1	

RoHS Compliant

2nd Lvl Interconnect

Category=e4

Max Safe Temp=260C for 10s 2X Max

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: 0.004 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

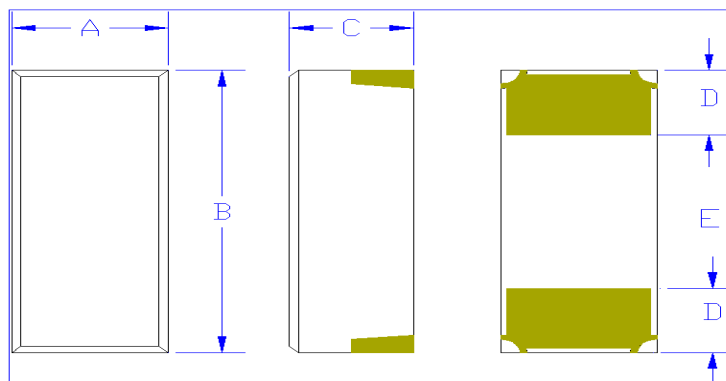
Reliability

Parameter	Condition
Mechanical Shock	JESD22-B104
Vibration	JESD22-B103
Solderability	IPC J-STD-002
Thermal Shock	MIL-STD-883 Method 1011, Condition A

Mechanical Dimensions/Solder Pad Layout

	Inches	mm
A	0.047 ± 0.004	1.2 ± 0.1
B	0.08 ± 0.004	2.05 ± 0.1
C	0.024 max	0.6 max
D¹	0.02	0.5
E¹	0.004	1.0

¹ Typical dimensions

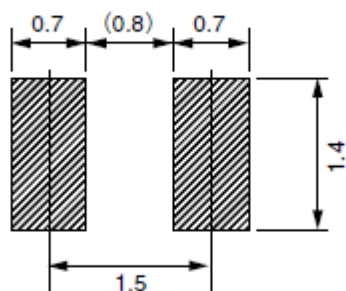


Contacts (pads): Gold (0.3 to 1µm) over Nickel (1.27 to 8.89 µm)

The chamfered pad may or may not be present and may be on either pad.

The crystal is symmetrical. The part can be rotated 180° when being assembled on the PCB and will still perform correctly. One pad may have a chamfered corner.

Solder pad layout



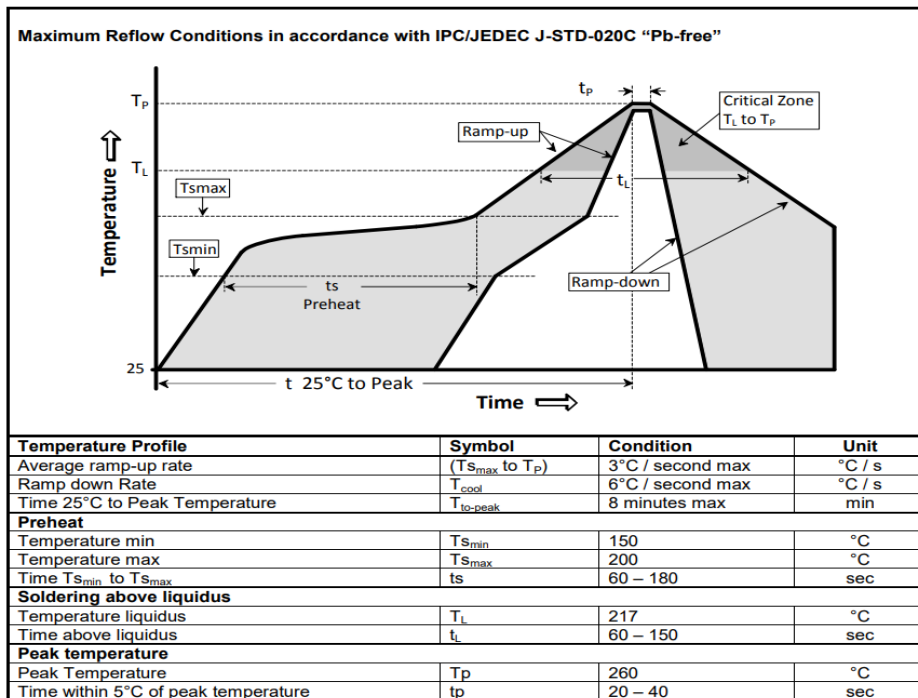
Pad Layout

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

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.
- These very small crystals have high ESR, the oscillator start-up and operation should take this into consideration.

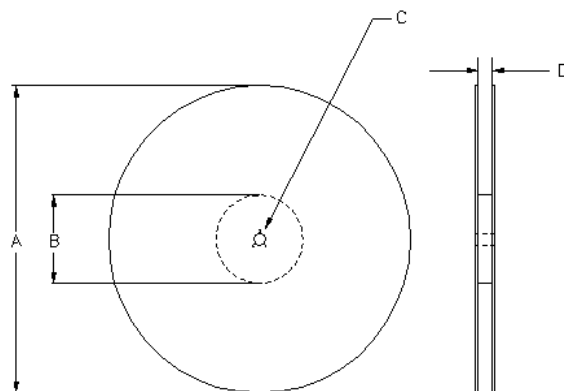
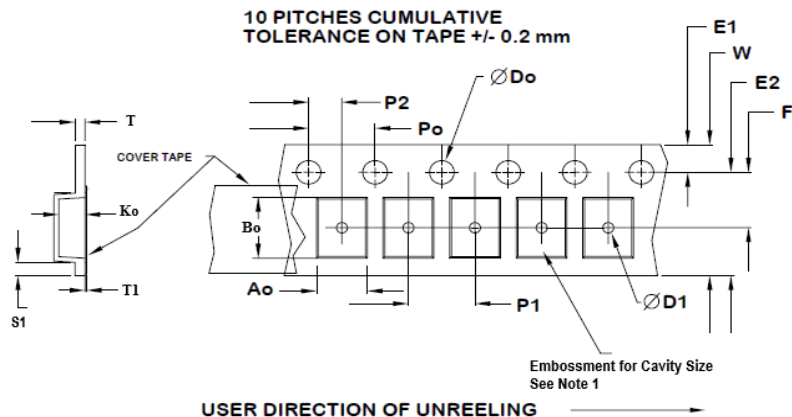
Reflow Cycle



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

Tape and Reel

Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 1000. 8mm tape, 4mm pitch.



Tape Dimensions Table 1							
Tape Size	E2 typ	F	P1	W	Ao	Bo	Ko
8mm	6.25	3.5 ±0.05	4.0 ±0.1	8.2	2.25	1.45	0.75

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

Tape Dimensions Table 2								
Tape Size	Do	D1	E1	Po	P2	S1 min	T max	T1 max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.3	0.1

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.30	60	13.0 +0.5 -0.2	Tape size +2.0 -0.0



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Pletronics Purchasing Instructions

Megatec/Citizen: CM2012H32768DZFT for 12.5pF
CM2012H32768DZBT for 6pF
CM2012H32768DZYT for 7pF
CM2012H32768DZCT for 9pF



PLETRONICS SM7S Series **Miniature SMD Crystal**

Pletronics Testing Instructions



For Internal Use Only

File Name: sm7s_revi.pub, sm7s_revi.pdf

Written by: BC

Approved by:

Revision History

September 2012	A	Initial Release
February 19, 2013	B	Updated to SMI datasheet specs. (See Below)
April 5, 2013	C	Added 10ppm option.
October 17, 2013	D	Added picture.
November 7, 2018	E	Updated logos and notice page
July 18, 2022	F	Reformat from wordperfect
August 25, 2022	G	Corrected T/R specs
April 17, 2023	H	Added Solder layout
May 17, 2023	I	Added the missing 25C condition for ESR