

SM8S Series Low Frequency Crystal

October 2013



- The Pletronics' SM8S 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
- 1.5 x 3.2 mm 2 pad
- XY Cut Crystal

Pletronics Inc. certifies this device is in accordance with the RoHS 6/6 (2011/65/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: 0.014 grams
 Moisture Sensitivity Level: 1 As defined in J-STD-020D.1
 Second Level Interconnect code: e4

Part Number:

| SM8S | -9 | -32.768K | -20 | -XX |
|---|----|----------|-----|-----|
| Internal code or blank | | | | |
| blank = ±30ppm at 25°C 20 = ±20ppm at 25°C | | | | |
| Nominal Frequency in KHz | | | | |
| Load Capacitance Blank = 12.5pF 9 = 9pF 7 = 7pF (other values are special order) | | | | |
| Model Number | | | | |

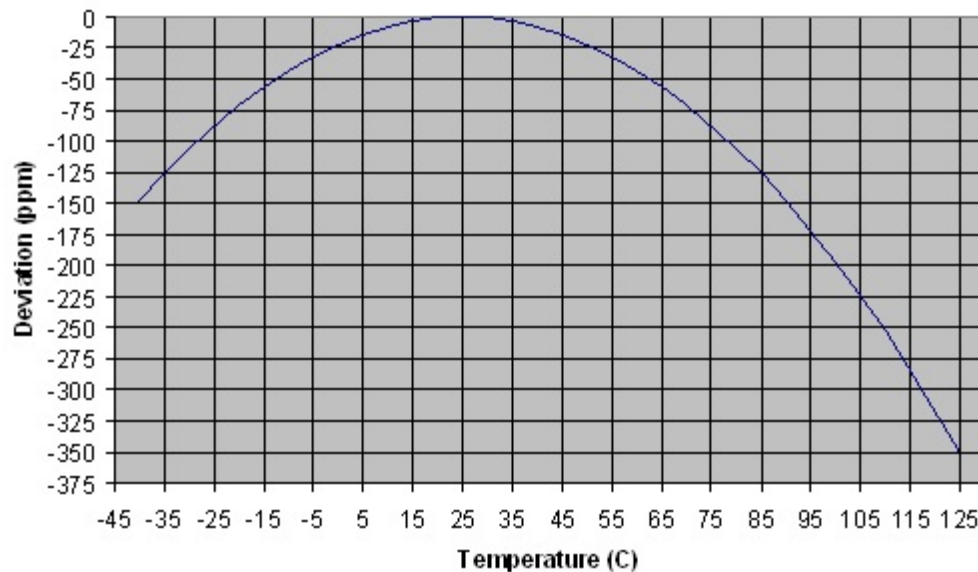
Reliability: Environmental Compliance

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

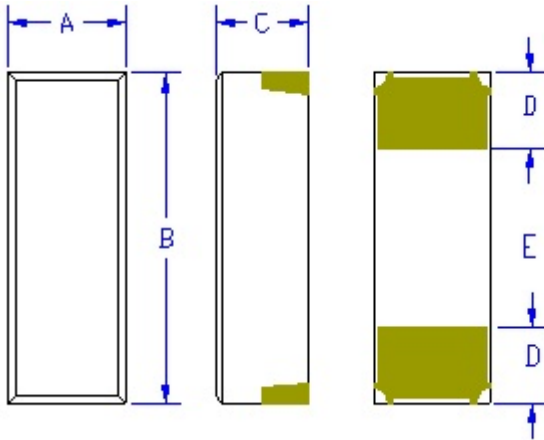
Electrical Specification:

| Item | Min | Max | Unit | Condition |
|---------------------------------|------------|------------|---------------------|---------------------------------|
| Frequency | 32.768 | | kHz | |
| Calibration Frequency Tolerance | -30 -20 | +30 +20 | ppm | standard at 25°C ± 3°C "20" |
| Equivalent Series Resistance | -- | 70K | Ohms | |
| Drive Level | -- | 1.0 | uW | |
| Turn Over Temperature | 20 | 30 | °C | Nominal is 25°C |
| Temperature Coefficient | -0.035 | | ppm/°C ² | typical |
| Q Factor | 30000 | -- | Q | |
| Shunt Capacitance | 1.7 | | pF | Pin to Pin Capacitance, typical |
| Motional Capacitance | 2.9 | | fF | typical |
| Aging (for first year) | -3 | +3 | ppm/Yr | at 25°C ± 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:



Mechanical:



| | Inches | mm |
|----------------|---------------|-----------|
| A | 0.059 ± 0.004 | 1.5 ± 0.1 |
| B | 0.126 ± 0.004 | 3.2 ± 0.1 |
| C | 0.039 max | 1.0 max |
| D ¹ | 0.0295 | 0.75 |
| E ¹ | 0.067 | 1.7 |

¹ Typical dimensions

Contacts :

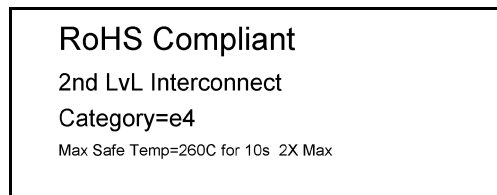
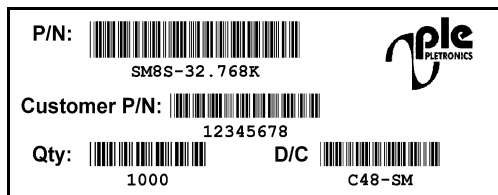
Gold 11.8 µinches 0.3 µm minimum over
 Nickel 50 to 350 µinches 1.27 to 8.89 µm

Not to Scale

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



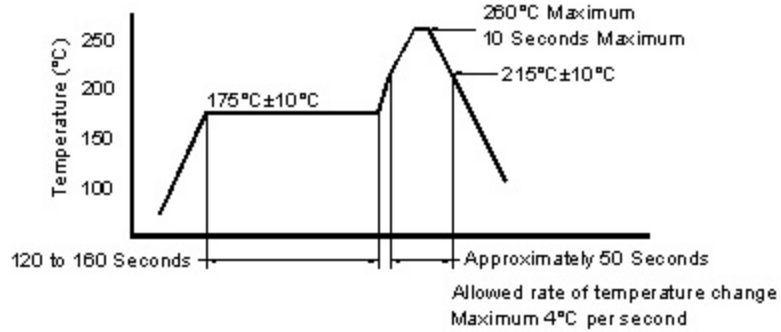
Part Marking:

- Marking consists of a 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.
- The signal leads to the SM8S, in most oscillator applications, are exceptionally high impedance. Remember to protect these leads from moisture and contamination as leakage paths can inhibit proper oscillator function.

Reflow Cycle (typical for lead free processing)



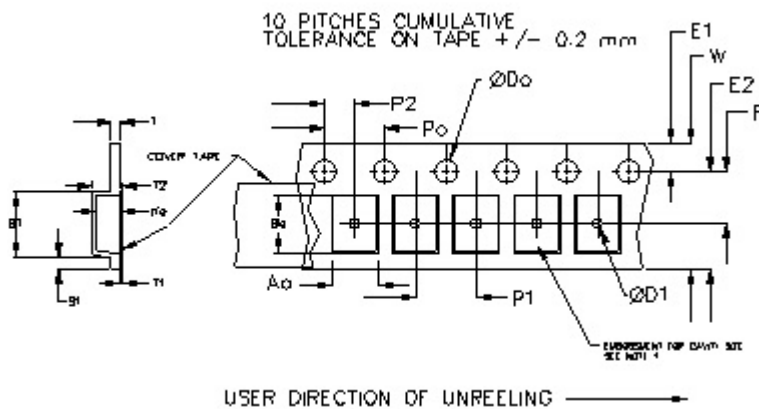
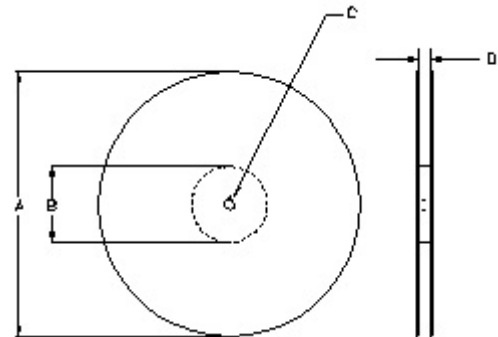
The part may be reflowed 2 times without degradation.

Tape and Reel: available for quantities of 3000 per reel

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

| Variable Dimensions Table 2 | | | | | | | |
|-----------------------------|--------|--------|-----------|-----------|--------|-------|-------------|
| Tape Size | B1 Max | E2 Min | F | P1 | T2 Max | W Max | Ao, Bo & Ko |
| 12 mm | 12.1 | 14.25 | 5.5 ± 0.1 | 4.0 ± 0.1 | 1.2 | 12.3 | Note 1 |

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



| REEL DIMENSIONS | | | | | |
|-----------------|--------|------------------|----------------|----------------|------------|
| A | inches | 7.0 | 10.0 | 13.0 | Tape Width |
| | mm | 177.8 | 254.0 | 330.2 | |
| B | inches | 2.50 | 4.00 | 3.75 | Tape Width |
| | mm | 63.5 | 101.6 | 95.3 | |
| C | mm | 13.0 +0.5 / -0.2 | | | Tape Width |
| D | mm | 12.4 +2.0 -0.0 | 12.4 +2.0 -0.0 | 12.4 +2.0 -0.0 | |

Reel dimensions may vary from the above

IMPORTANT NOTICE

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

PLE assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using PLE components. To minimize the risks associated with the customer products and applications, customers should provide adequate design and operating safeguards.

PLE products are not designed, intended, authorized or warranted to be suitable for use in life support applications, devices or systems or other critical applications that may involve potential risks of death, personal injury or severe property or environmental damage. Inclusion of PLE products in such applications is understood to be fully at the risk of the customer. Use of PLE products in such applications requires the written approval of an appropriate PLE officer. Questions concerning potential risk applications should be directed to PLE.

PLE does not warrant or represent that any license, either express or implied, is granted under any PLE patent right, copyright, artwork or other intellectual property right relating to any combination, machine or process which PLE product or services are used. Information published by PLE regarding third-party products or services does not constitute a license from PLE to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from PLE under the patents or other intellectual property of PLE.

Reproduction of information in PLE data sheets or web site is permissible only if the reproduction is without alteration and is accompanied by associated warranties, conditions, limitations and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. PLE is not responsible or liable for such altered documents.

Resale of PLE products or services with statements different from or beyond the parameters stated by PLE for that product or service voids all express and implied warranties for the associated PLE product or service and is an unfair or deceptive business practice. PLE is not responsible for any such statements.

Contacting Pletronics Inc.

Pletronics Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880
Fax: 425-776-2760
E-mail: ple-sales@pletronics.com
URL: www.pletronics.com

Copyright © 2006, 2007, 2008, 2009, 2010 Pletronics Inc.