

Designing and manufacturing innovative frequency control devices since 1927

# Miniature, Ceramic, Surface Mount Crystal

# **SM60**

Monitor's SM60 provides a miniature crystal in a highly reliable package that is specifically designed for surface mount applications. Hermetically-sealed construction ensures long term stability and exceptional aging characteristics.

#### **APPLICATIONS**

M Wireless RF

M PCMCIA

M Cameras

M Disk Drives

M DISK Drives

M PDAs

#### **FEATURES**

M Ultra-slim 1.0mm profile

M Surface Mount

M Reflow solderable at 2601C for 10 secs max

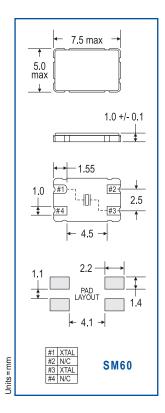
M Tape & Reel (1000pcs/reel)

#### **SPECIFICATIONS**

Frequency Range	9.8304 MHz ~ 100.0 MHz*
Operating Temp Range	-101C ~ 601C
Storage Temp Range	-401C ~ 851C
Shunt Capacitance	7.0 pF max
Calibration Tolerance @ 251C	$\pm$ 10ppm, $\pm$ 25ppm & $\pm$ 50ppm options available
Frequency Tolerance vs Temp Range	$\pm$ 50ppm from -101C $\sim$ 601C standard (call for other options)
Equivalent Series Resistance (MHz = $\Omega$ max) Fundamental unless otherwise otherwise indicated	9.8304 ~ 9.9999 = 80 10.0000 ~ 15.9999 = 60 16.0000 ~ 32.0000 = 40 28.0000 ~ 83.9999 = 60 (3rd Overtone) 84.0000 ~ 100.0000 = 80 (5th Overtone)
Drive Level	0.1 mW max
Humidity	85% RH, 851C, 48 Hours
Hermetic Seal	Leak Rate 2 x 10 <sup>-8</sup> ATM-cm <sup>3</sup> /sec max
Solderability	MIL-STD-202F Method 208E
Vibration	MIL-STD-202F Method 204 / 35G, 50~2000 Hz (<25.0 MHz) / 20G, 50~2000 Hz (25.0 MHz)
Shock	MIL-STD-202F Method 213B Test Cond E, 1000G, 1/2 Sine Wave
Packaging	16mm Tape & Reel (1000pcs/reel std, or Bulk <1000pcs)

<sup>\*</sup> Call for your specific frequency requirement



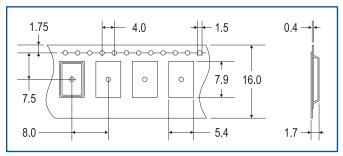


Monitor Products Company Inc reserves the right to make changes to its products and product specifications without notice. No liability is assumed as a result of their use or application.

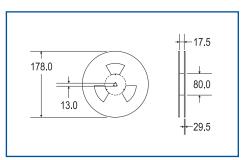
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# **SM60**



TAPE DIMENSIONS (1000 pcs/reel)



REEL DIMENSIONS

### **Series Resonance:**

At series resonance, the crystal looks resistive in the circuit, and correlation of frequency is not a problem. It must be specified if unit is to be manufactured at series or at a particular load capacitance.



## **Anti-Resonance Parallel:**

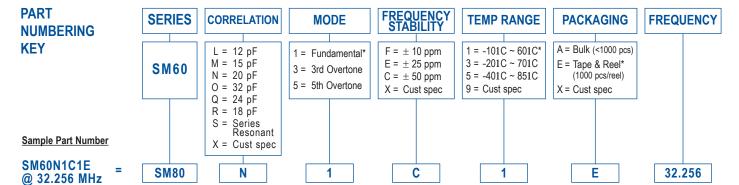
Units = mm

Crystals operating at anti-resonance will look inductive in the circuit. Changes of reactive values in the circuit will change the crystal frequency. If the crystal is to be used at anti-resonance, the load capacitance should always be specified. The load capacitance C<sub>1</sub> is the



$$F_{p} = \frac{1}{2\pi} \sqrt{\frac{C_{1} + C_{0}}{L_{1} C_{1} C_{0}}}$$

dynamic capacitance of the total circuit as measured across the crystal terminals



<sup>\*</sup> Standard

Call factory for additional options. Use full descriptive part number when ordering. Parts will be marked with series and frequency only.

Monitor Products has a proven track record as a pioneer manufacturer in the frequency control market. If our extensive selection of standard and engineered crystals and oscillators does not meet your spec, we will work with you towards a customized solution.

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