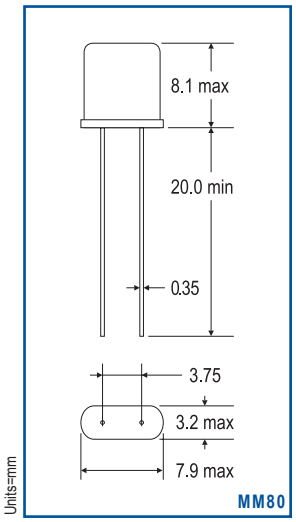
Miniature Quartz Crystals

MM80 M SM80

Monitor Products' MM80 (thru-hole) and SM80 (surface mount) provide ultra-miniature crystals in highly reliable, resistance-welded packages.



ELECTRICAL SPECIFICATIONS

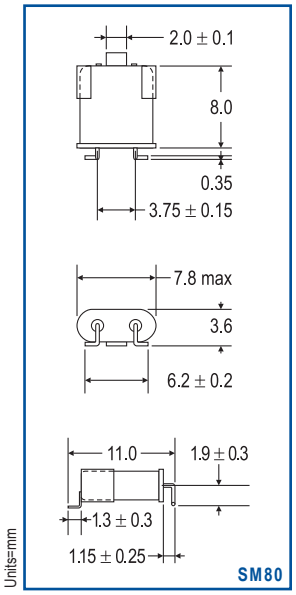
Frequency Range	3.579545 MHz ~ 200.0 MHz*
Operating Temp Range	-201C ~ 701C
Storage Temp Range	-551C ~ 1051C
Calibration Tolerance	± 50ppm @ 251C
Drive Level	100.0 μW max
Shunt Capacitance	7.0 pF
Frequency Tolerance vs Temp Range	± 50ppm from -201C ~ 701C
Equivalent Series Resistance** (MHz = Ω max)	6.0 ~ 8.0 = 120 8.1 ~ 12.0 = 80 12.1 ~ 25.0 = 40 32.0 ~ 80.0 = 70 (3rd OT) 81.0 ~ 160.0 = 100 (5th OT) 161.0 ~ 180.0 = 140 (7th OT) 181.0 ~ 200.0 = 160 (9th OT)

* Call for your specific frequency requirement

Fundamental unless otherwise indicated

APPLICATIONS

- M Wireless RF
- M PCMCIA
- M Cameras
- M PDAs
- M Disk Drives



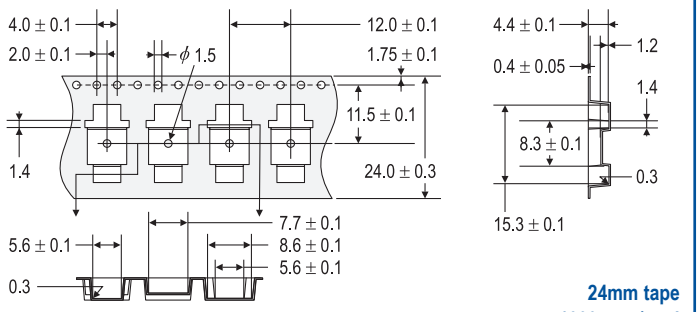
ENVIRONMENTAL PERFORMANCE SPECIFICATIONS

Operating Temp Range	-201C to 701C standard
Storage Temp Range	-551C to 1051C
Humidity	85% RH, 851C, 48 Hours
Hermetic Seal	Leak Rate 2 x 10^{-8} ATM-cm^3/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
MIL-0-55310	Exceeds environmental and electrical specifications of equivalent MIL-0-55310
Packaging	24mm Tape & Reel (1000pcs/reel standard, or Bulk <1000pcs)

07-02-01

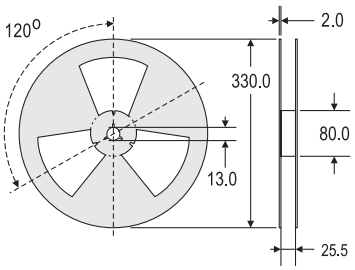
MONITOR PRODUCTS COMPANY INC
502 VIA DEL MONTE, OCEANSIDE, CA 92054 **TEL:** 760.433.4510 **FAX:** 760.434.0255
WWW.MONITOR-PRODUCTS.COM

MM80 M SM80



TAPE DIMENSIONS (SM80 ONLY)

Units = mm



REEL DIMENSIONS (SM80 ONLY)

CRYSTAL CORRELATION THEORY

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.

$$F_S = \frac{1}{2\pi\sqrt{L_1 C_1}}$$

Anti-Resonance Parallel:
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_L is the dynamic capacitance of the total circuit as measured across the crystal terminals.

$$F_p = \frac{1}{2\pi}\sqrt{\frac{C_1 + C_0}{L_1 C_1 C_0}}$$

PART NUMBERING KEY

SERIES	CORRELATION	MODE	FREQUENCY STABILITY	TEMP RANGE	PACKAGING	FREQUENCY
MM80 (Thru-Hole) SM80 (SMD)	L = 12 pF M = 15 pF N = 20 pF O = 32 pF Q = 24 pF S = Series Resonant X = Cust spec	1 = Fundamental* 3 = 3rd Overtone 5 = 5th Overtone 7 = 7th Overtone	C = ± 50 ppm* X = Cust spec	3 = -201C~701C* 9 = Cust spec	A = 2 lead E = Tape & Reel (1000 pcs/reel - SM80 only - X = Cust spec	

Sample Part Numbers

	SERIES	CORRELATION	MODE	FREQUENCY STABILITY	TEMP RANGE	PACKAGING	FREQUENCY
MM80N1C3A @ 14.31818MHz =	MM80	N	1	C	3	A	14.318
SM80S3C3E @ 46.0MHz =	SM80	S	3	C	3	E	46.0

* 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.

MONITOR PRODUCTS COMPANY INC
502 VIA DEL MONTE, OCEANSIDE, CA 92054 **TEL:** 760.433.4510 **FAX:** 760.434.0255
WWW.MONITOR-PRODUCTS.COM