



# MONITOR PRODUCTS COMPANY INC

## SM37 M SM38 M SM39

Miniature, Surface Mount Watch Crystals

Monitor Products' SM37, SM38 and SM39 are miniature crystals in highly reliable packages specifically designed for surface mount applications. Hermetically-sealed construction ensures long-term stability and aging characteristics.

### ELECTRICAL SPECIFICATIONS

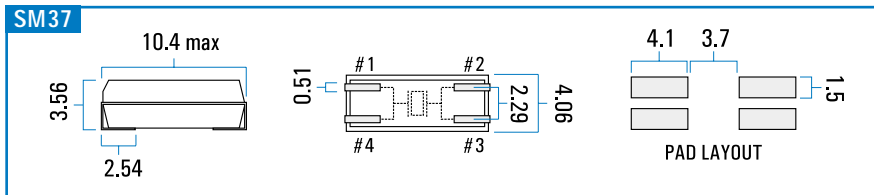
Nominal Frequency	32.768 KHz
Calibration Tolerance	± 20 ppm @ 251C
Temperature Stability	Parabolic Coefficient -0.04 max ppm/(Δ 1C) <sup>2</sup> max
Series Resistance	60.0 KΩ max
Load Capacitance	12.5 pF, ± 0.5 pF standard
Motional Capacitance	2.0 fF typical
Shunt Capacitance	0.85 pF typical
Drive Level	1 μW max
Aging (1st year)	± 3 ppm max, 251C ± 31C

### FEATURES

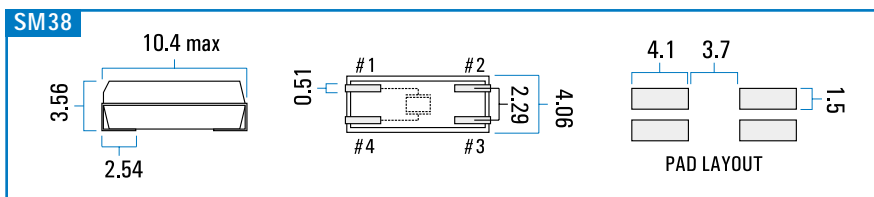
- M *Ideal for use with high-density circuit boards*
- M *Surface mount*
- M *Plastic package*
- M *Reflow solderable*
- M *Tape and reel*

### APPLICATIONS

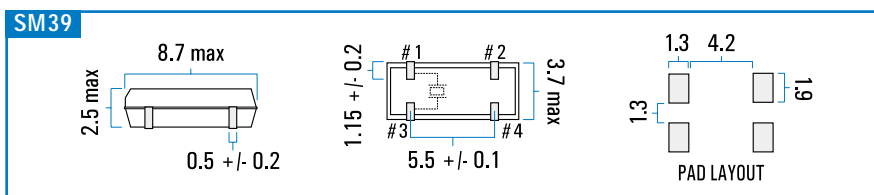
- M *Systems clock*
- M *Communication equipment*
- M *Computer applications*
- M *Disk drives*
- M *Cameras*
- M *Measuring instruments*



Units : mm Packaging: Tape & Reel (2000 pcs/reel) or Bulk (< 2000 pcs)



Units : mm Packaging: Tape & Reel (2000 pcs/reel) or Bulk (< 2000 pcs)



Packaging: Tape & Reel (3000 pcs/reel) or Bulk (< 3000 pcs)

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.

## MONITOR PRODUCTS COMPANY INC

*Designers and manufacturers of quality frequency control devices since 1927*

[10/14/99]

A BOWTHORPE company



### CORPORATE OFFICE / FACTORY

502 Via del Monte, Oceanside, CA 92054  
Tel: 760 433-4510 Fax: 760 434-0255

### REGIONAL SALES OFFICE

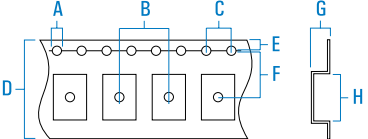
3415 Custer Road, Suite 117, Plano, TX 75023  
Tel: 972 758-8687 Fax: 972 758-7574

**ENVIRONMENTAL PERFORMANCE SPECIFICATIONS**

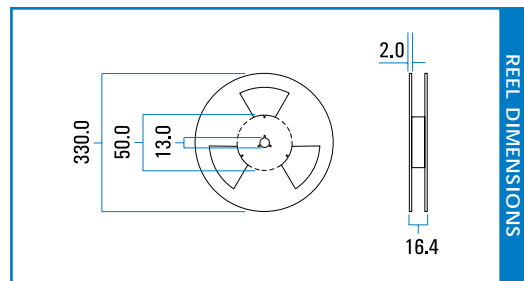
Operating Temperature Range	-401C ~ 851C
Storage Temperature Range	-551C ~ 1251C
Vibration	MIL-STD-202 Method 35G, 50 to 2000 Hz
Shock	MIL-STD-202 Method 213B Test Cond E, 1000G, 1/2 Sine Wave
Humidity	85% RH, 851C, 48 Hours
Hermetic Seal	Leak Rate $2 \times 10^{-8}$ ATM-cm <sup>3</sup> /sec max (inner package only)
Reflow Solderability	2601C, 10 secs max
Solderability	MIL-STD-202 Method 208E
Insulation Resistance	500 MΩ min @ 100 VDC
Packaging	Tape & Reel (SM37 & SM38= 2000pcs/reel; SM39 = 3000pcs/reel) or Bulk

	A	B	C	D	E	F	G	H	QTY
SM37 SM38	1.5	8.0	4.0	16.0	1.75	7.5	3.9	11.0	2000/reel
SM39	1.5	8.0	4.0	16.0	1.75	7.5	2.7	8.7	3000/reel

TAPE DIMENSIONS



Units : mm



**HOW TO ORDER**

	SERIES	CORRELATION	MODE	FREQUENCY STABILITY	TEMPERATURE RANGE	PACKAGING	FREQUENCY (KHz)
	SM37 SM38 SM39	L = 12.5 pf*	1= Fundamental*	B = 100ppm* C = 50ppm	5 = -401C ~ 851C 7 = -101C ~ 601C*	A= Bulk SM37/SM38: < 2000 pcs SM39: < 3000 pcs E= Tape & Reel* SM37/SM38: 2000 pcs/reel SM39: 3000 pcs/reel	
<b>Sample Part Numbers:</b>							
SM37L1C5A @	SM37	L	1	C	5	A	32.768
SM38L1B5A @	SM38	L	1	B	5	A	32.768
SM39L1C7E @	SM39	L	1	C	7	E	32.768

\* 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 is one of over 70 wholly-owned subsidiaries of Bowthorpe plc, an international technology group focused on the design, development, manufacture and marketing of specialist electronic products ([www.bowthorpe.com](http://www.bowthorpe.com)).

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.

