

## Data sheet

### F2012

### 32.768KHz 2 pad SMD Crystal (2.0x1.2x0.6mm)

## FEATURES

- Miniature Ceramic SMD package, 2 pad (Reflow is possible)
- Temperature range -40/+85°C (Industrial Applications)
- Ultra-thin thickness 0.6mm
- Excellent aging characteristics
- Applications: Wireless, Commercial and Industrial equipment...



Parameter	min.	typ.	max.	Unit	Condition
Frequency		32.768		KHz	
Vibration mode	XY-cut				
Frequency stability					
Initial tolerance @25°C	±20, ±50			ppm	
Operating temperature range	-40		+85	°C	
Turnover temperature	25°C ±5 °C				
Parabolic curvature constant	-0.045x10 <sup>-6</sup> /°C <sup>2</sup> max.				
Equivalent Series Resistance (ESR)	90KΩ max.				
Load Capacitance (CL)	Standard: 12.5pF ( 9pF, 7pF optional)				
Shunt Capacitance (Co)			2.0	pF	
Drive Level			0.1	μW	
Aging			±3	ppm	At 25°C, first year
Insulation Resistance	500			MΩ	@ 100Vdc
Enclosure (see drawing) (LxWxH)	2.0 x 1.2 x 0.6			mm	
Packing	3000 pcs per reel				

### Ordering Code:

Tolerance	Load Capacitance
20 = ±20ppm	12.5 = 12.5pF
50 = ±50ppm	9 = 9pF
	7 = 7pF

### Standard specifications:

- ± 50ppm
- 12.5pF

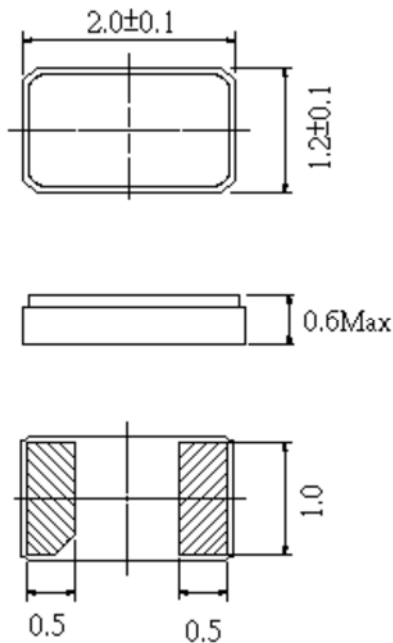
Example: F2012-50-9

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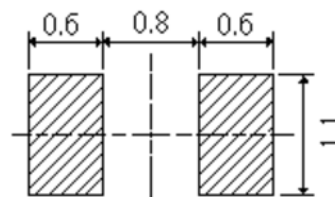
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### Outline Dimensions (mm):



### Recommended Soldering Pattern



### Environmental conditions

Test	IEC 60068 Part ...	IEC 60679-1 clause ...	Test conditions (IEC)
Sealing tests (if applicable)	2-17	5.6.2	Gross leak: Test Qc, Fine leak: Test Qk
Solderability	2-20	5.6.3	Test Ta Method 1
Resistance to soldering heat	2-58		Test Td <sub>1</sub> Method 2 Test Td <sub>2</sub> Method 2
Shock*	2-27	5.6.8	Test Ea, 3 x per axes 100g, 6 ms half-sine pulse
Vibration, sinusoidal*	2-6	5.6.7.1	Test Fc, 30 min per axes, 10 Hz - 55 Hz 0,75mm; 55 Hz - 2 kHz, 10g
Vibration random *	2-64	5.6.7.3	Test Fdb
Endurance tests			
- ageing		5.7.1	30 days @ 85°C, OCXO @25°C
- extended aging		5.7.2	1000h, 2000h, 8000h @85°C

Rev. 2 dated 01-02-2013