

**Data sheet**

**AT-39**

**Through Hole Cylinder type Quartz Crystal (dia. 3.2 x 9.2 mm)**

**FEATURES**

- High reliability and good stability
- Outstanding shock resistance, vibration resistance
- Cylindric metal package vacuum sealed
- Applications: Consumer electronics, Microprocessor clocks...



Parameter	min.	typ.	max.	Unit	Condition
Frequency range	4.0		70.0	MHz	
Fundamental	4.0		30.0	MHz	
3rd overtone	31.0		70.0	MHz	
Vibration mode	AT cut, fundamental, 3rd ovt				
Frequency stability					
Initial tolerance @25°C		±30		ppm	Specify (see options)
vs. operating temperature range		±30		ppm	Specify (see options)
operating temperature range	-10		+60	°C	Specify (see options)
Equivalent Series Resistance (ESR)	See table 1				
Load Capacitance (CL)	Series or 8pF to 32pF (see options)				
Shunt Capacitance (Co)			5.0	pF	
Drive Level			300	µW	
Aging		±5		ppm	At 25°C, first year
Insulation Resistance	500			MΩ	@ 100Vdc
Enclosure (see drawing) (LxWxH)	Dia. 3.2 x 9.2			mm	
Packing	Bulk in bag				

**Ordering Code:**

Freq. Tolerance @ 25°C	Freq. Stability	Operating Temp. range	Load Capacitance	Mode	Frequency in MHz	(ESR if other than STD)
20 = ± 20ppm	20 = ± 20ppm	<b>D</b> = -10 / +60°C	Please specify CL	F = Fundamental	Specify the	Specify a value
25 = ± 25ppm	25 = ± 25ppm	<b>E</b> = 0° / +70°C	in pF or	3 = 3rd overtone	frequency in MHz	in Ω
30 = ± 30ppm	30 = ± 30ppm	<b>F</b> = -20° / +70°C	S for series			
50 = ± 50ppm	50 = ± 50ppm	<b>G</b> = -30° / +75°C				
		<b>H</b> = -30° / +85°C				
		<b>K</b> = -40° / +85°C				

**Example: AT-39-30-30-F-20-F-17.600MHz**

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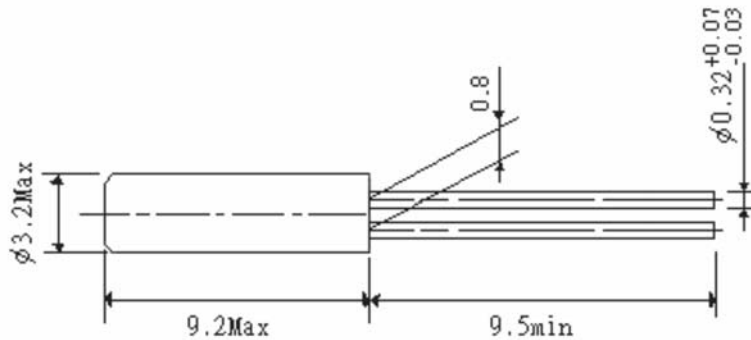
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**Outline Dimensions:**

**Table 1 : Standard ESR**

Frequency	Mode	ESR
4.0 ~ 5.9 MHz	Fundamental	150 Ω max.
6.0 ~ 9.9 MHz	Fundamental	100 Ω max.
10.0 ~ 30.0 MHz	Fundamental	60 Ω max.
31.0 ~ 70.0 MHz	3rd overtone	100 Ω max.



**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*