



Features

- Surface Mount Crystal
- High Precision and Reliability
- Excellent Heat Resistance
- RoHS Compliant

Table 1: General Specifications

Frequency Range	3 MHz ~ 70 MHz
Frequency Tolerance at 25°C	Select from Table 3
Operating Temperature Range (OTR)	Select from Table 4
Temperature Stability	Select from Table 4
Equivalent Series Resistance	Select from Table 2
Drive Level	100 μ Watts (typ.)
Shunt Capacitance, C0	7.0 pF (max.)
Resonance Condition	XXS – Series, XXP – Parallel with xx pF (for parallel, please specify the xx value in pF)
Aging @ 25°C	± 3 ppm/ Year (max.)

Table 2: Mode of Oscillation/ Equivalent Series Resistance

Frequency Range (MHz)	Mode of Oscillation	ESR (max.)
3 ~ 3.4	Fundamental	300 Ω
3.5 ~ 6.0	Fundamental	120 Ω
6.1 ~ 10.0	Fundamental	60 Ω
10.1 ~ 30.0	Fundamental	40 Ω
27.0 ~ 30.0	3rd Overtone	150 Ω
30.1 ~ 50.0	3rd Overtone	100 Ω
50.1 ~ 70.0	3rd Overtone	80 Ω

Table 3: Frequency Tolerance at 25°C

Code	Tolerance
D	±10 ppm
E	±15 ppm
F	±20 ppm
G	±25 ppm
H	±30 ppm
M	±50 ppm
K	±100 ppm

Table 4: Frequency Stability over OTR

OTR Code	Stability Code		D	E	F	G	H	M	K
	Temperature Stability		±10 ppm	±15 ppm	±20 ppm	±25 ppm	±30 ppm	±50 ppm	±100 ppm
D F E C H5 G H I K	Operating Temperature Range	-10°C to +60°C	█	█	█	█	█	█	█
		0°C to +70°C	█	█	█	█	█	█	█
		-10°C to +70°C	█	█	█	█	█	█	█
		-20°C to +70°C	█	█	█	█	█	█	█
		-5°C to +85°C	█	█	█	█	█	█	█
		-30°C to +80°C	█	█	█	█	█	█	█
		-30°C to +85°C	█	█	█	█	█	█	█
		-40°C to +85°C	█	█	█	█	█	█	█
		-55°C to +105°C	█	█	█	█	█	█	█

█ Denotes Available □ Denotes not Available

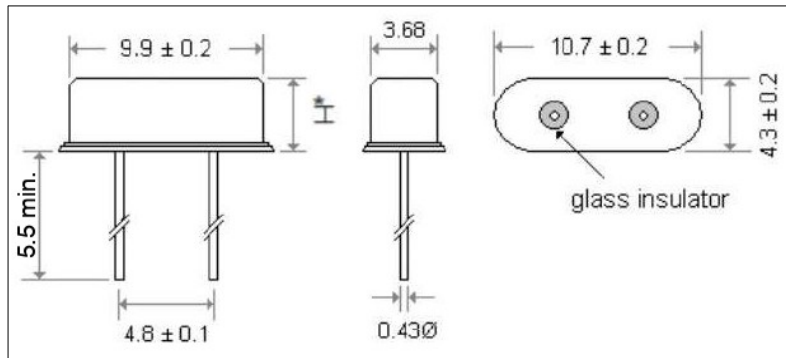
Table 5: Environmental Specifications

Vibration	Frequency: 20 Hz ~ 200 Hz Amplitude: 1.52 mm peak, Acceleration: 20g Vibration waveform: Sine waveform Duration: 4 minutes each, 4 Cycles, 3 directions (X,Y,Z)
Drop Test	Method of Drop: Free Drop Dropping Floor: Hard wood board, 3cm/ min. Height: 75 cm ±1.0 cm No. of Drops: 3

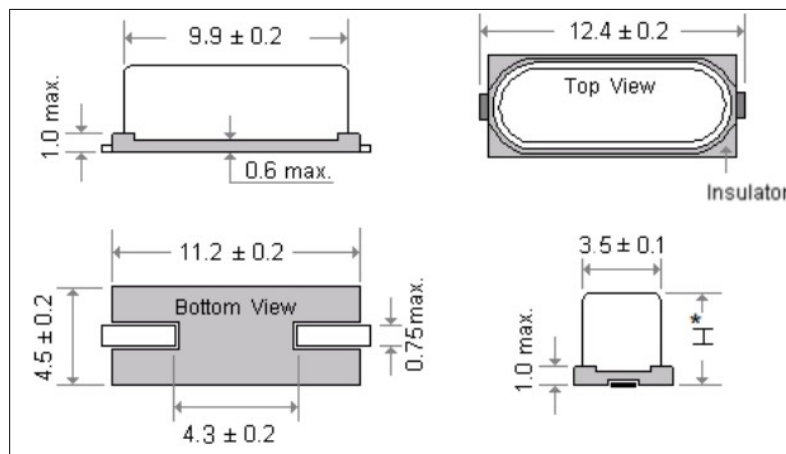
Quartz Crystal

Mechanical Specifications

HC-49S



HC-49S, 2 Pad SMD



▲ All dimensions are in mm.
Tolerance is ± 0.1 mm,
unless otherwise specified.

Pin profile/ Height*	Code
2 pin with 3.5 mm height	2
2 pin with 2.5 mm height	5
2 pad with 4.5 mm height	S
2 pad with 3.5 mm height	S3

Ordering Information

Example

49S	2	F	I	H	1	20P	020M000000
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Series

Pin Profile

Tolerance: ± 20 ppm

OTR: -40°C to 85°C

Freq. 20 MHz

Resonance Condition
XXS: Series
20P: Parallel with 20 pF

Mode: 1: Fundamental
3: 3rd Overtone

Stability over OTR: ± 30 ppm

Specifications subject to change without prior notice

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Note: Not all combination of options are available. Other specifications may be available upon request.

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REVISION 02

Page 2 of 2

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