

# HC49 Crystals

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## Delivery Options

- Common frequencies maybe available from stock

## Holder Style

- HC49 crystals are resistance welded, hermetically sealed in an inert atmosphere with glass to metal seals securing the lead wires
- Holders suffixed '-3L' have a centre third wire which grounds the case

## General Specifications

- Load Capacitance ( $C_L$ ): 10pF to 75pF or Series
- Drive Level: 1mW max.
- Static Capacitance ( $C_0$ ): 7pF max.
- Ageing:  $\pm 3$ ppm typical per year

## Standard Frequency Tolerances and Stabilities

- $\pm 5$ ppm,  $\pm 10$ ppm,  $\pm 15$ ppm,  $\pm 20$ ppm,  $\pm 30$ ppm,  $\pm 50$ ppm,  $\pm 100$ ppm

## Operating Temperature Ranges

- 0 to 50°C -40 to 90°C
- 10 to 60°C -55 to 105°C
- 20 to 70°C -55 to 125°C
- 30 to 80°C

## Storage Temperature Range

- 55 to 125°C

## Environmental Specification

- Shock: 981m/s<sup>2</sup> for 6ms, three shocks in each direction along three mutually perpendicular planes
- Vibration: 10 to 60Hz 0.75mm displacement, 60 to 500Hz 98.1m/s<sup>2</sup> acceleration, 30 minutes in each of three mutually perpendicular planes

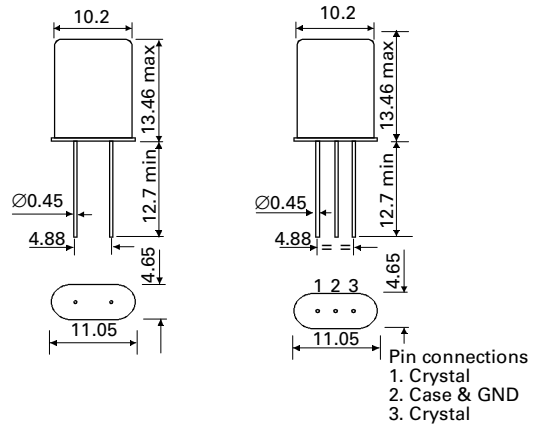
## Marking

- Includes Frequency

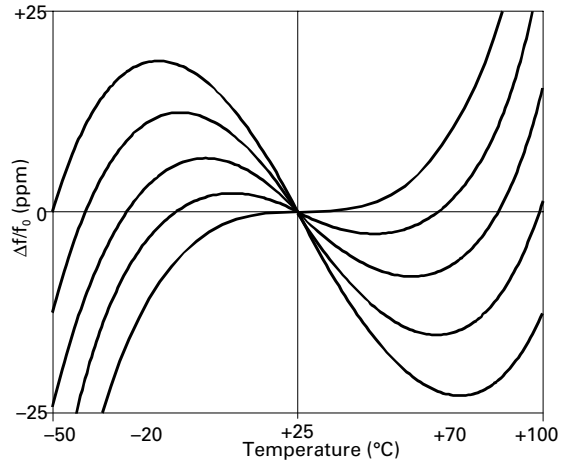
## Minimum Order Information Required

- Frequency + Holder + Frequency Tolerance @ 25°C + Frequency Stability + Operating Temperature Range + Circuit Condition + Overtone Order + Tape & Reel Packaging Available

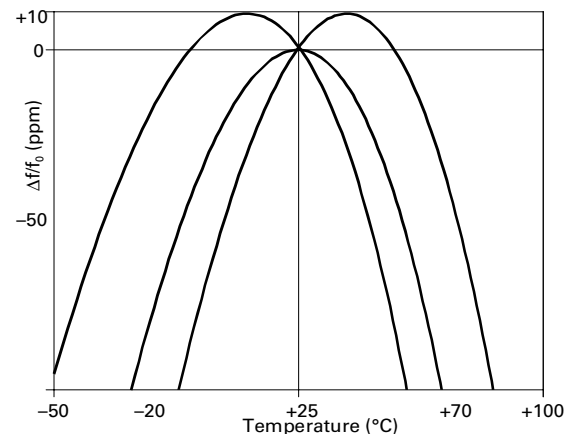
Outline in mm - HC49 & HC49-3L



Typical Frequency vs Temperature Curves for various angles of AT-cut crystals



Typical Frequency vs Temperature Curves for various angles of BT-cut crystals



**Electrical Specification – maximum limiting values**

Frequency Range <i>(For lower Freq's, please contact sales office)</i>	Frequency Tolerance @ 25°C ±2°C	Operating Temperature Range	Frequency Stability Available Over Operating Temperature		ESR max.	Vibration Mode
			Minimum	Maximum		
1.84320 to < 2.0MHz	±5ppm to ±100ppm	0 to 50°C	±15ppm	±200ppm	800Ω	Fundamental AT cut
		–10 to 60°C	±20ppm	±200ppm		
		–20 to 70°C	±20ppm	±200ppm		
		–30 to 80°C	±25ppm	±200ppm		
		–40 to 90°C	±30ppm	±200ppm		
		–55 to 105°C	±50ppm	±200ppm		
		–55 to 125°C	±100ppm	±200ppm		
2.0 to < 3.0MHz	±5ppm to ±100ppm	0 to 50°C	±15ppm	±200ppm	600Ω	Fundamental AT cut
		–10 to 60°C	±20ppm	±200ppm		
		–20 to 70°C	±20ppm	±200ppm		
		–30 to 80°C	±25ppm	±200ppm		
		–40 to 90°C	±30ppm	±200ppm		
		–55 to 105°C	±50ppm	±200ppm		
		–55 to 125°C	±100ppm	±200ppm		
3.0 to < 4.0MHz	±5ppm to ±100ppm	0 to 50°C	±15ppm	±200ppm	150Ω	Fundamental AT cut
		–10 to 60°C	±20ppm	±200ppm		
		–20 to 70°C	±20ppm	±200ppm		
		–30 to 80°C	±25ppm	±200ppm		
		–40 to 90°C	±30ppm	±200ppm		
		–55 to 105°C	±50ppm	±200ppm		
		–55 to 125°C	±55ppm	±200ppm		
4.0 to < 7.0MHz	±5ppm to ±100ppm	0 to 50°C	±10ppm	±100ppm	100Ω	Fundamental AT cut
		–10 to 60°C	±15ppm	±100ppm		
		–20 to 70°C	±15ppm	±100ppm		
		–30 to 80°C	±20ppm	±100ppm		
		–40 to 90°C	±25ppm	±100ppm		
		–55 to 105°C	±50ppm	±100ppm		
		–55 to 125°C	±50ppm	±100ppm		
7.0 to < 10.0MHz	±5ppm to ±100ppm	0 to 50°C	±10ppm	±100ppm	50Ω	Fundamental AT cut
		–10 to 60°C	±10ppm	±100ppm		
		–20 to 70°C	±10ppm	±100ppm		
		–30 to 80°C	±20ppm	±100ppm		
		–40 to 90°C	±25ppm	±100ppm		
		–55 to 105°C	±50ppm	±100ppm		
		–55 to 125°C	±50ppm	±100ppm		
10.0 to 36.0MHz	±5ppm to ±100ppm	0 to 50°C	±5ppm	±100ppm	35Ω	Fundamental AT cut
		–10 to 60°C	±5ppm	±100ppm		
		–20 to 70°C	±10ppm	±100ppm		
		–30 to 80°C	±20ppm	±100ppm		
		–40 to 90°C	±25ppm	±100ppm		
		–55 to 105°C	±50ppm	±100ppm		
		–55 to 125°C	±50ppm	±100ppm		

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Frequency Range	Frequency Tolerance @ 25°C ±2°C	Operating Temperature Range	Frequency Stability Available Over Operating Temperature		ESR max.	Vibration Mode
			Minimum	Maximum		
20.0 to 45.0MHz	Inclusive with Frequency stability	0 to 50°C	±50ppm	±100ppm	35Ω	Fundamental BT cut
		−10 to 60°C	±50ppm	±100ppm		
		−20 to 70°C	±100ppm	±100ppm		
		−30 to 80°C	±100ppm	±100ppm		
21.0 to 90.0MHz	±5ppm to ±100ppm	0 to 50°C	±5ppm	±100ppm	40Ω	3rd Overtone AT cut
		−10 to 60°C	±5ppm	±100ppm		
		−20 to 70°C	±10ppm	±100ppm		
		−30 to 80°C	±20ppm	±100ppm		
		−40 to 90°C	±25ppm	±100ppm		
		−55 to 105°C	±50ppm	±100ppm		
		−55 to 125°C	±50ppm	±100ppm		
45.0 to 135.0MHz	Inclusive with Frequency Stability	0 to 50°C	±50ppm	±100ppm	35Ω	3rd Overtone BT cut
		−10 to 60°C	±50ppm	±100ppm		
		−20 to 70°C	±100ppm	±100ppm		
		−30 to 80°C	±100ppm	±100ppm		
60.0 to 150.0MHz	±5ppm to ±100ppm	0 to 50°C	±5ppm	±100ppm	70Ω	5th Overtone AT cut
		−10 to 60°C	±5ppm	±100ppm		
		−20 to 70°C	±10ppm	±100ppm		
		−30 to 80°C	±20ppm	±100ppm		
		−40 to 90°C	±25ppm	±100ppm		
		−55 to 105°C	±50ppm	±100ppm		
		−55 to 125°C	±50ppm	±100ppm		
90.0 to 225.0MHz	Inclusive with Frequency Stability	0 to 50°C	±50ppm	±100ppm	70Ω	5th Overtone BT cut
		−10 to 60°C	±50ppm	±100ppm		
		−20 to 70°C	±100ppm	±100ppm		
		−30 to 80°C	±100ppm	±100ppm		
85.0 to 210.0MHz	±5ppm to ±100ppm	0 to 50°C	±5ppm	±100ppm	100Ω	7th Overtone AT cut
		−10 to 60°C	±5ppm	±100ppm		
		−20 to 70°C	±10ppm	±100ppm		
		−30 to 80°C	±20ppm	±100ppm		
		−40 to 90°C	±25ppm	±100ppm		
		−55 to 105°C	±50ppm	±100ppm		
		−55 to 125°C	±50ppm	±100ppm		
125.0 to 300.0MHz	Inclusive with Frequency Stability	0 to 50°C	±50ppm	±100ppm	100Ω	7th Overtone BT cut
		−10 to 60°C	±50ppm	±100ppm		
		−20 to 70°C	±100ppm	±100ppm		
		−30 to 80°C	±100ppm	±100ppm		

Frequency Range	Frequency Tolerance @ 25°C ±2°C	Operating Temperature Range	Frequency Stability Available Over Operating Temperature		ESR max.	Vibration Mode
			Minimum	Maximum		
110.0 to 270.0MHz	±5ppm to ±100ppm	0 to 50°C	±5ppm	±100ppm	150Ω	9th Overtone AT cut
		−10 to 60°C	±5ppm	±100ppm		
		−20 to 70°C	±10ppm	±100ppm		
		−30 to 80°C	±20ppm	±100ppm		
		−40 to 90°C	±25ppm	±100ppm		
		−55 to 105°C	±50ppm	±100ppm		
		−55 to 125°C	±50ppm	±100ppm		

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