HC49 Crystals

LEADED QUARTZ CRYSTALS

ISSUE 11; 6 OCTOBER 2004

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: ±3ppm typical per year

Standard Frequency Tolerances and Stabilities

- ±5ppm, ±10ppm, ±15ppm, ±20ppm, ±30ppm, ±50ppm, ±100ppm

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/s² for 6ms, three shocks in each direction along three mutually perpendicular planes
- Vibration: 10 to 60Hz 0.75mm displacement, 60 to 500Hz 98.1m/s² acceleration, 30 minutes in each of three mutually perpendicular planes

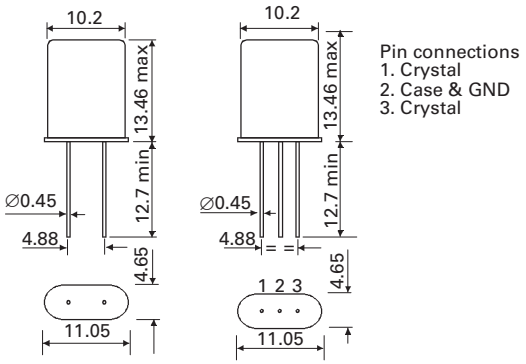
Marking

- Includes Frequency

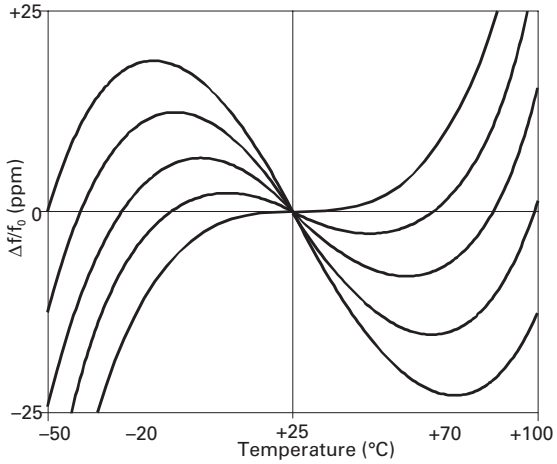
Minimum Order Information Required

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

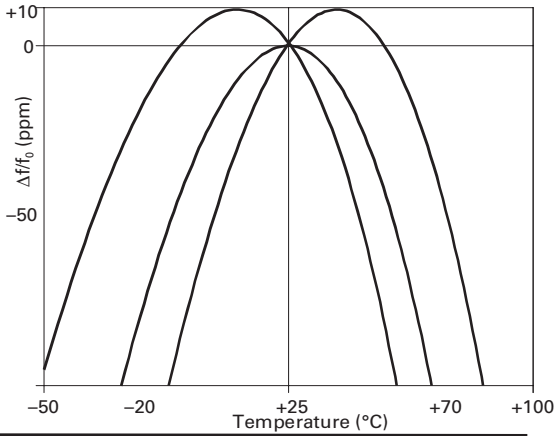
Outline in mm - HC49 & HC49-3L



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



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



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Electrical Specification – maximum limiting values

Frequency Range *(For lower Freq's, please contact sales office)*	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		

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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