# HC49/4H SMX CRYSTALS

#### **ISSUE 9; 18 OCTOBER 1999**

### **Delivery Options**

 Common frequencies are available from stock. Please see p143 for details

# Holder Style

- HC49/4H SMX crystals are resistance welded, hermetically sealed in an inert atmosphere with glass to metal seals securing the lead wires. The lead wires are formed into a gull wing and mounted on a plastic former
- Lower profiles available, please contact our sales office

## **General Specifications**

- Load Capacitance (CL): 10pF to 75pF or Series
- Drive Level: 0.5mW max
- Static Capacitance (C<sub>0</sub>): 9pF max
- Ageing: ±3ppm typical per year

## **Standard Frequencies**

3.579545MHz, 3.68640MHz, 4.0MHz,
4.91520MHz, 5.0MHz, 6.0MHz, 7.37280MHz,
8.0MHz, 8.1920MHz, 9.83040MHz, 10.0MHz,
11.05920MHz, 12.0MHz, 14.318180MHz,
14.74560MHz, 15.360MHz, 16.0MHz,
18.4320MHz, 19.66080MHz, 20.0MHz

# **Standard Frequency Tolerances and Stabilities**

±50ppm, ±100ppm

#### **Operating Temperature Ranges**

- 0 to 50°C
- -10 to  $60^{\circ}C$
- -20 to  $70^\circ C$
- -30 to  $80^{\circ}C$

# Storage Temperature Range

■ -40 to 85°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

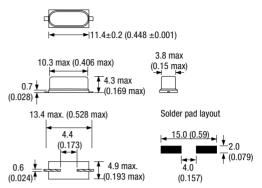
## Marking

Frequency only

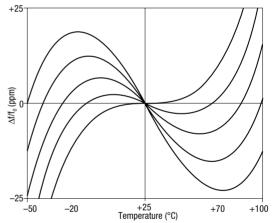
#### **Minimum Order Information Required**

Frequency + Holder + Frequency Tolerance @ 25°C
+ Frequency Stability + Operating Temperature
Range + Circuit Condition + Overtone Order

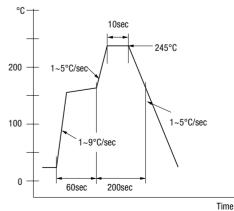
#### Outline in mm (inches)



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



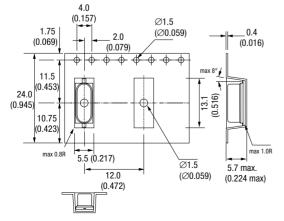
# **Typical Solder Condition - Infrared Reflow**



Frequency Range	Frequency Tolerance @ 25°C ±2°C	Operating Temperature Range	Frequency Stability Available Over Operating Temperature		ESR Max	Vibration Mode
			Minimum	Maximum		
3.50 to < 5.0MHz	±15ppm to ±100ppm	0 to 50°C	±15ppm	±100ppm	200Ω	Fundamenta AT cut
		-10 to 60°C	±20ppm	±100ppm		
		–20 to 70°C	±20ppm	±100ppm		
		-30 to 80°C	±25ppm	±100ppm		
5.0 to < 8.0MHz	±15ppm to ±100ppm	0 to 50°C	±15ppm	±100ppm	120Ω	Fundamenta AT cut
		-10 to 60°C	±20ppm	±100ppm		
		–20 to 70°C	±20ppm	±100ppm		
		-30 to 80°C	±25ppm	±100ppm		
8.0 to < 12.0MHz	±15ppm to ±100ppm	0 to 50°C	±10ppm	±100ppm	70Ω	Fundamenta AT cut
		-10 to 60°C	±15ppm	±100ppm		
		–20 to 70°C	±15ppm	±100ppm		
		-30 to 80°C	±20ppm	±100ppm		
12.0 to <25.0MHz	±15ppm to ±100ppm	0 to 50°C	±10ppm	±100ppm	50Ω	Fundamenta AT cut
		-10 to 60°C	±15ppm	±100ppm		
		–20 to 70°C	±15ppm	±100ppm		
		-30 to 80°C	±20ppm	±100ppm		
25.0 to 32.0MHz	±15ppm to ±100ppm	0 to 50°C	±10ppm	±100ppm	30Ω	Fundamenta AT cut
		-10 to 60°C	±15ppm	±100ppm		
		–20 to 70°C	±15ppm	±100ppm		
		-30 to 80°C	±20ppm	±100ppm		
25.0 to 40.0MHz	Inclusive with Frequency Stability	0 to 50°C	±50ppm	±100ppm	50Ω	Fundamenta BT cut
		-10 to 60°C	±50ppm	±100ppm		
		-20 to 70°C	±100ppm	±100ppm		
		-30 to 80°C	±100ppm	±100ppm		
25.0 to 70.0MHz	±15ppm to ±100ppm	0 to 50°C	±15ppm	±100ppm	100Ω	3rd Overtone AT cut
		-10 to 60°C	±20ppm	±100ppm		
		-20 to 70°C	±20ppm	±100ppm		
		-30 to 80°C	±25ppm	±100ppm		

## Electrical Specification - maximum limiting values

# Outline in mm (inches) - Tape



## Outline in mm (inches) - Reel (scale 1:8)

