

Description

Xsis Electronics “XRH49x” Series High Temperature crystal units are designed and processed to operate over an extended temperature range of -55 °C to 230 °C. These crystal units are offered in hermetically sealed industry standard HC49/U type packages in various configurations as shown on this page and on page 5.

High temperature materials and proven processes are utilized to provide high reliability and long life at extreme temperatures.

Features

- > 3000G (0.5 mS) Shock Resistance
- 100% testing over operating temperature range
- Low Phase Noise
- Hermetically Sealed, Ceramic Package
- Tape & Reel packaging
- Made in USA, ECCN: EAR99

Applications

- Downhole Drilling Operations
- High Shock & Vibration
- High Temperature Avionics
- Gun Launched Munitions
- Jet Engine Sensors

Package Specifications &

- Cover Material: Nickel Silver
- Lead Material: Kovar
- Lead Finish: 6 to 15 microinches gold over 100 microinches Min. Nickel
- Weight: 1.2g typical, 1.5g Max.
- Seal: Hermetic – Resistance Welded
- Solder Reflow, Temp./Time: 260 °C Max for 10 Seconds Max.

Package Options



“XRH490”



“XRH491”



“XRH492”



“XRH493”

Contact Xsis Electronics at xisis@xisis.com for any special requirements.

ORDERING INFORMATION (Please build your part number from options below) :

P/N EXAMPLE: XRH490 - 1F30 - 30M00000 = 30.000 MHz, Fundamental Mode, 20 PF Load Capacitance, Frequency Accuracy of ± 100 PPM over -20°C to +200°C

XRH

490

-

1

-

F

-

30

- Frequency

Package Options

See Page 5

Mode

1 = Fundamental

3 = 3rd Overtone

5 = 5th Overtone

Load Capacitance Options

R = Series

A = 8 pF

B = 10 pF

C = 12 pF

D = 15 pF

E = 18 pF

F = 20 pF

G = 25 pF

H = 30 pF

Z = Custom

Frequency Accuracy Vs, Operating Temperature Range Options

21 = ± 40 PPM over -20°C to +150°C	***
22 = ± 100 PPM over -20°C to +150°C	*
23 = ± 150 PPM over -20°C to +150°C	*
24 = ± 40 PPM over -20°C to +180°C	***
25 = ± 100 PPM over -20°C to +180°C	***
26 = ± 150 PPM over -20°C to +180°C	*
27 = ± 100 PPM over -55°C to +180°C	***
28 = ± 150 PPM over -55°C to +180°C	*
29 = ± 250 PPM over -55°C to +180°C	*
30 = ± 100 PPM over -20°C to +200°C	***
31 = ± 150 PPM over -20°C to +200°C	***
32 = ± 200 PPM over -20°C to +200°C	*
33 = ± 250 PPM over -20°C to +200°C	*
34 = ± 100 PPM over -55°C to +200°C	***
35 = ± 150 PPM over -55°C to +200°C	***
36 = ± 200 PPM over -55°C to +200°C	*
37 = ± 250 PPM over -55°C to +200°C	*
38 = ± 200 PPM over -55°C to +220°C	***
39 = ± 300 PPM over -55°C to +220°C	*
40 = ± 250 PPM over -20°C to +230°C	***
41 = ± 350 PPM over -20°C to +230°C	*
42 = ± 250 PPM over -55°C to +230°C	***
43 = ± 350 PPM over -55°C to +230°C	*
44 = ± 45 PPM over -20°C to +180°C	***
45 = ± 300 PPM over -55°C to +200°C	*

*** Tight Stability

* Standard Stability

Contact Xsis Electronics at xisis@xisis.com (913-631-0448) for any special requirements.

Table I - Electrical Specifications, Fundamental, 3rd and 5th Overtone Oscillation modes

Parameter	Fundamental	3 rd	5 th
Nominal Frequency Range	2.9 MHz to 30.0 MHz	15.0 MHz to 90.0 MHz	40.0 MHz to 150 MHz
Mode	Fundamental	3 rd	5 th
Resonance Type	See Ordering Information		
Load Capacitance	See Ordering Information		
Frequency Accuracy Vs. Temperature	See Ordering Information		
Resistance (ESR)			
2.90 to 3.25 MHz	150 Ohms Max.		
3.26 to 3.50 MHz	90 Ohms Max.		
3.51 to 7.00 MHz	50 Ohms Max.		
7.01 to 10.00 MHz	30 Ohms Max.		
10.01 to 15.00 MHz	25 Ohms Max.		
15.00 to 30.00 MHz	20 Ohms Max.		
15.00 to 20.00 MHz		50 Ohms Max.	
20.01 to 60.00 MHz		40 Ohms Max.	
60.01 to 90.00 MHz		60 Ohms Max.	
40.00 to 90.00 MHz			50 Ohms Max.
90.01 to 125.00 MHz			60 Ohms Max.
125.01 to 150.00 MHz			65 Ohms Max.
Shunt Capacitance	7 pF Max.		
Unwanted Modes Resistance	> 2 times the Main Mode Resistance		
Storage Temperature	-55 °C to +125 °C		
Drive Level	50 µW Typical, 1 mW Max.		
Aging at 25°C per year	± 3 PPM Max		

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Table II - Environmental Specifications :

Crystal Units shall be able to withstand any of the following environmental stresses with change in Frequency of less than 5 PPM and change in resistance of less than 10%.

Test - Inspection	Test Method - Condition
Shock	MIL-STD-202, Method 213, Cond. C
Vibration	MIL-STD-202, Method 204, Cond. A, 3 hours minimum.
Thermal Shock	MIL-STD-202, Method 107, Cond. B
Moisture Resistance	MIL-STD-202, Method 106, except Step 7b, Vibration, is not applicable.

Table III - 100% Screening per MIL-PRF-3098, Class B

Test - Inspection	Test Method – Condition
Pre-seal Visual Examination	MIL-PRF-3098, Method 4.10.2.2
Stabilization Bake (Prior to Seal)	MIL-STD-883, Method 1008, Condition C (+150 °C), 24 hours minimum
Seal (Fine and Gross Leak)	MIL-PRF-3098, Para. 4.10.26
Frequency and Resistance over Operating Temperature	MIL-PRF-3098, Para. 4.10.18
External Visual & Mechanical	MIL-PRF-3098, Para. 4.10.2.1

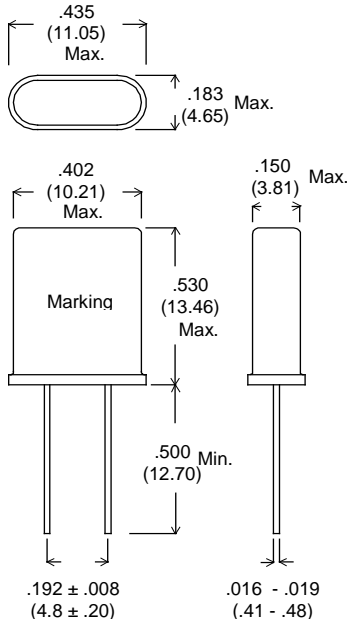
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Table IV - Environmental

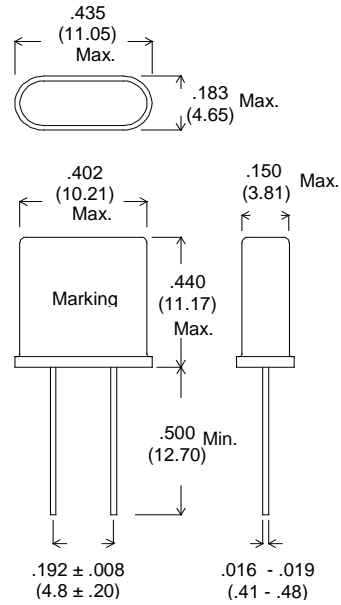
XRH49x series crystal units are designed to meet or exceed the Environmental tests specified below. Customized screening and environmental testing are also available to meet your special requirements.

Test	Test Conditions
Mechanical Shock:	3000G, 0.5 mS shock.
Vibration, Random:	20G RMS, 10 Hz to 2000 Hz
Thermal Shock:	MIL-STD-202, Method 107, Condition B
Temperature Cycle:	MIL-STD-883, Method, 1010, Condition B
Moisture Resistance:	MIL-STD-202, Method 106
Salt Atmosphere:	MIL-STD-202, Method 101
Acceleration:	MIL-STD-883, Method 2002, Condition A, 5000G
Terminal Strength:	MIL-STD-202, Method 211. Cond. A (4 pound for Pins, 2 pound for wire leads)
Fine Leak:	MIL-STD-202, Method 112, Condition C-IIIc (1x10 ⁻⁸ atm-cc/sec)
Gross Leak:	MIL-STD-202, Method 112, Condition D
Solderability:	MIL-STD-202, Method 208 (ANSI-EIA-J-STD-002)
Resistance to Soldering Heat:	MIL-STD-202, Method 210, Condition B or C
Resistance to Solvents:	MIL-STD-202, Method 215
Low Temperature Storage:	MIL-PRF-3098

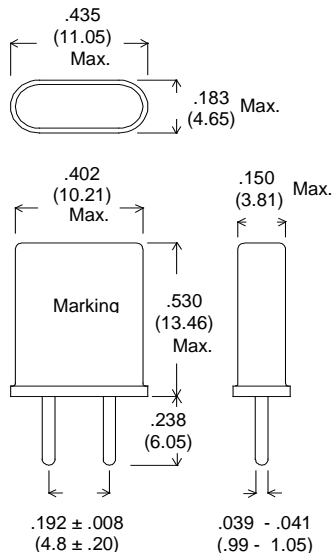
Package Type, Outline and Pin Connections – Dimensions are in inches (mm)



Package Option ‘XRH490’

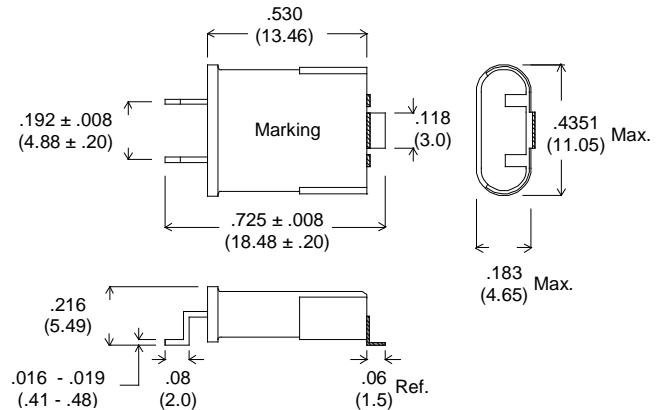


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Dimensions are in inches (mm)



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