

Quartz Crystal HC-49U

H Series



Resistance Weld

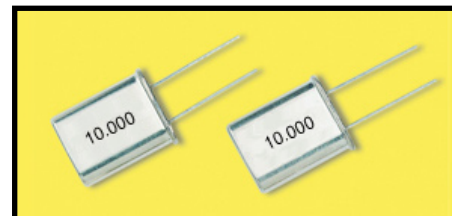
(HC-49U)

Features:

- Height = 13.46mm
- Wide frequency range
- Industry standard
- AT cut
- Excellent clock signal generator for chips
- **RoHs Compliant (Pb Free)**

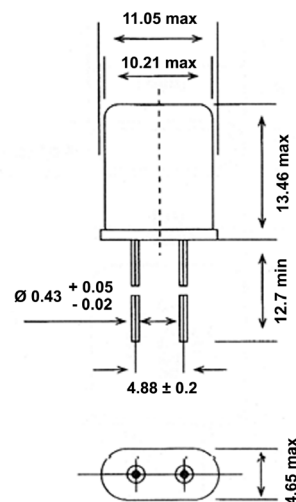
Options:

- Various temp. range
- Many tolerances
- Mylar spacer (plastic)
- Third lead
- Tape & reel
- Vinyl sleeve



Electrical Specifications:

Frequency Range	1.8432MHz - 200MHz
Frequency Tolerance	±30ppm @ 25°C ± 2°C (Typical), or specify
Frequency Stability over Temperature	±50ppm over -20°C ~ +70°C (Typical), or specify
Operating Temperature Range	-20°C ~ +70°C (Typical) -40°C ~ +85°C (Extended) or specify
Storage Temperature Range	-40°C ~ +85°C
Load Capacitance (CL)	Parallel: 10pF to 50pF or Series ∞
Aging	±5ppm per year maximum
Insulation Resistance	500 Meg Ohms min. at 0100VDC
Shunt Capacitance	7pF maximum
Drive Level	0.1mW Typical (1mW maximum)
Equivalent Series Resistance	see chart



Part Numbering System:

Example:

Frequency = 11.0592MHz, Holder = HC-49U, CL = 18pF
Mode = Fundamental, Oper. Temp. = -20°C to +70°C

11H0592 — 18 F

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ①
- First five digits of the frequency or all significant digit if frequency contains more than 5 digits.
 - Holder code represented by letter "H" for HC-49U holder type & indicating decimal point.

② Load Capacitance CL

Code	Load Capacitance
S	Series
18	18pF
20	20pF

③ Mode of Vibration

Code	Cut-Mode
F	AT Fund
3	AT 3rd OT
5	AT 5th OT

④ Operating Temperature

Code	Ranges
Nil	-20°C ~ +70°C
X	-40°C ~ +85°C

⑤ Mechanical Options

Code	Description
nil	No Options
3	3-pin base
S	Spacer
P	Plastic sleeve
L	3rd lead on top

⑥ Package

Code	Load Capacitance
Nil	Bulk
T	Tape & reel
C	Crimped leads T&R
G	Gullwing T&R

Optional

⑦ Frequency Tolerance		⑧ Frequency Stability	
Code	Tolerance	Code	Stability
1	± 10 ppm	1	± 10 ppm
1A	± 15 ppm	1A	± 15 ppm
2	± 20 ppm	2	± 20 ppm
2A	± 25 ppm	2A	± 25 ppm
3	± 30 ppm (Standard)	3	± 30 ppm
4	± 40 ppm	4	± 40 ppm
5	± 50 ppm	5	± 50 ppm (Standard)

* If any option is not applicable (ex. Code=Nil) simply continue building the part number omitting spaces.
Examples: 11H0592-20FT 12H288-SFXP

Remark: Specifications are subject to change without prior notice. Please confirm with our sales engineer.

Mechanical Characteristics:

Resistance to shock	± 3 ppm max. ±30hms max., naturally drop it 3 times on a hard wood plate from 100cm height.
Resistance to vibration	± 3 ppm max. ±30hms max.

Reliability:

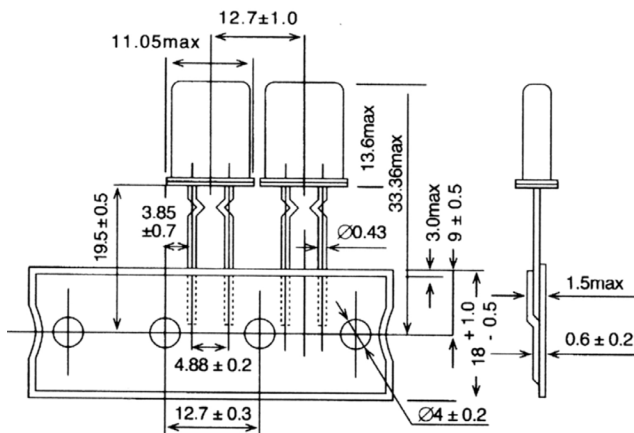
Aging	± 3 ppm max. / year
Air tightness	
(1) Gross leak	should be immersed in hot water (90 ± 5°C) for 5 minutes
(2) Fine leak	should be less than 5 x 10 ⁻⁸ atmcc/sec by helium leak detector
Low drive characteristics	Measured Δ1, C1, 3 point at 1.0, 10, 100μW

Equivalent Series Resistance (ESR) and Oscillation Mode:

Frequency Range	E.S.R. (Ω)	Mode	Frequency Range	E.S.R. (Ω)	Mode
1.843MHz ~ 1.999MHz	350 max.	Fundamental / AT	6.000MHz ~ 6.999MHz	50 max.	Fundamental / AT
2.000MHz ~ 2.399MHz	300 max.	Fundamental / AT	7.000MHz ~ 9.999MHz	30 max.	Fundamental / AT
2.400MHz ~ 2.999MHz	200 max.	Fundamental / AT	10.000MHz ~ 12.999MHz	20 max.	Fundamental / AT
3.000MHz ~ 3.199MHz	150 max.	Fundamental / AT	13.000MHz ~ 30.000MHz	20 max.	Fundamental / AT
3.200MHz ~ 3.499MHz	100 max.	Fundamental / AT	24.000MHz ~ 29.999MHz	50 max.	Third Overtone
3.500MHz ~ 3.899MHz	90 max.	Fundamental / AT	30.000MHz ~ 65.000MHz	40 max.	Third Overtone
3.900MHz ~ 4.099MHz	70 max.	Fundamental / AT	60.000MHz ~ 99.999MHz	90 max.	Third Overtone
4.100MHz ~ 5.999MHz	60 max.	Fundamental / AT	100.000MHz ~ 150.000MHz	60 max.	Third / Fifth Overtone

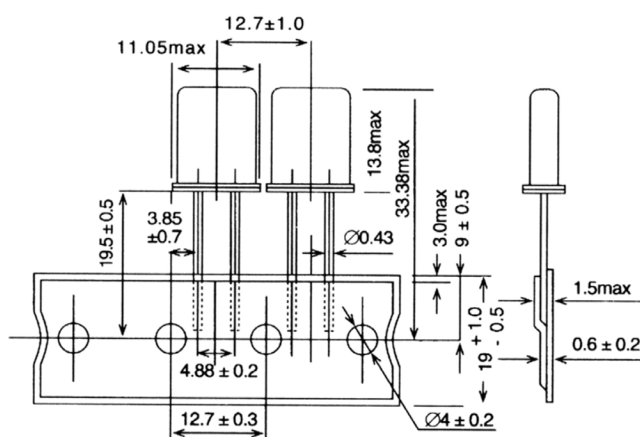
Crystal With Crimped Leads

(When Lead Length = 20)



Crystal With Straight Leads

(When Lead Length = 20)



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**Typical Frequencies Quick List:
ESR Values & Operating Modes**

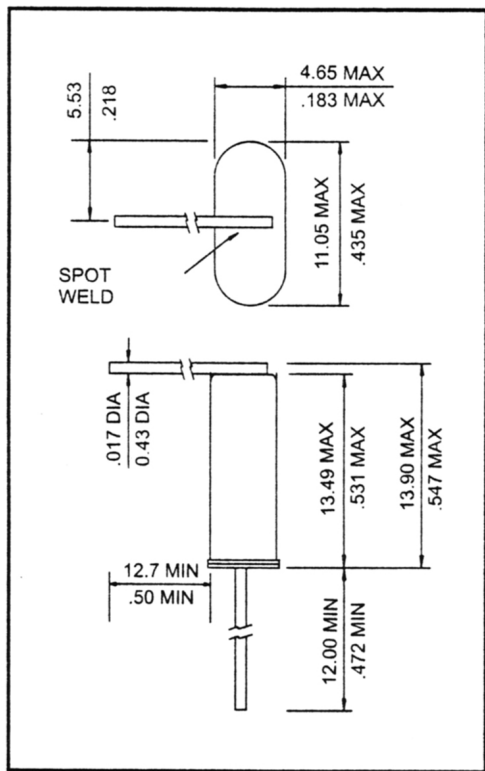
Frequency	Max Series Resistance (ohms)	Mode	Frequency	Max Series Resistance (ohms)	Mode
1.843200	350	Fund	14.318180	20	Fund
2.000000	300	Fund	14.745600	20	Fund
2.097152	300	Fund	15.000000	20	Fund
2.457600	200	Fund	16.000000	20	Fund
3.000000	150	Fund	16.384000	20	Fund
3.276800	100	Fund	16.934400	20	Fund
3.330000	100	Fund	17.360000	20	Fund
3.579545	90	Fund	18.000000	20	Fund
3.686400	90	Fund	18.432000	20	Fund
3.932160	70	Fund	19.660800	20	Fund
4.000000	70	Fund	20.000000	20	Fund
4.096000	70	Fund	20.945000	20	Fund
4.194304	60	Fund	22.118400	20	Fund
4.433619	60	Fund	23.400000	20	Fund
4.500000	60	Fund	24.000000	20	Fund
4.915200	60	Fund	24.576000	20	Fund
5.000000	60	Fund	25.000000	20	Fund
5.068800	60	Fund	27.000000	20	Fund
5.120000	60	Fund	29.491200	20	Fund
5.760000	60	Fund	30.000000	20	Fund
5.990400	60	Fund	24.000 ~ 29.999	50	3rd OT
6.000000	50	Fund	30.000 ~ 65.000	40	3rd OT
6.144000	50	Fund	60.000 ~ 99.999	90	3rd OT
6.176000	50	Fund	100.000 ~ 150.000	60	3rd/ 5th OT
6.400000	50	Fund			
7.000000	30	Fund			
7.159090	30	Fund			
7.200000	30	Fund			
7.372800	30	Fund			
7.485440	30	Fund			
8.000000	30	Fund			
8.467200	30	Fund			
8.867238	30	Fund			
9.000000	30	Fund			
9.216000	30	Fund			
9.600000	30	Fund			
9.930400	30	Fund			
10.000000	20	Fund			
10.240000	20	Fund			
11.000000	20	Fund			
11.059200	20	Fund			
12.000000	20	Fund			
12.096000	20	Fund			
12.288000	20	Fund			
13.592500	20	Fund			
14.000000	20	Fund			

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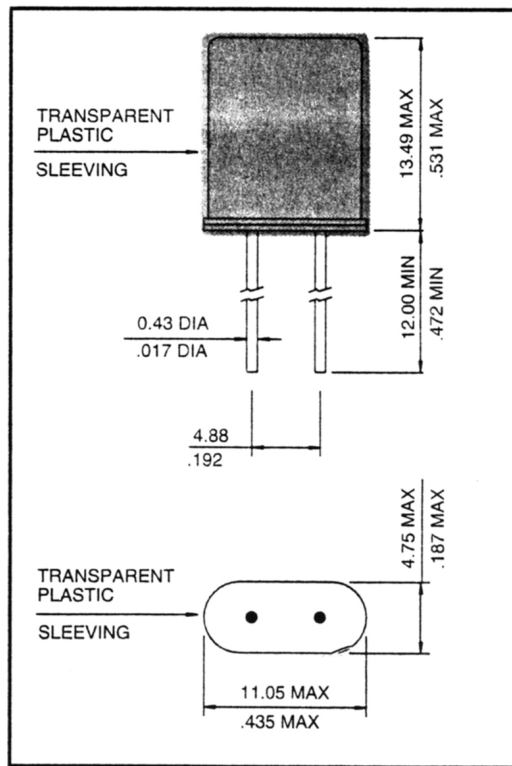
Resistance Weld

(HC-49U)

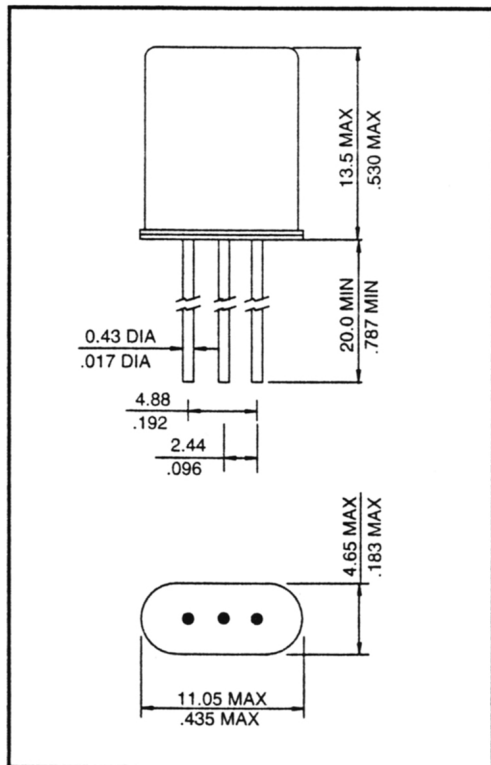
Mechanical Options:



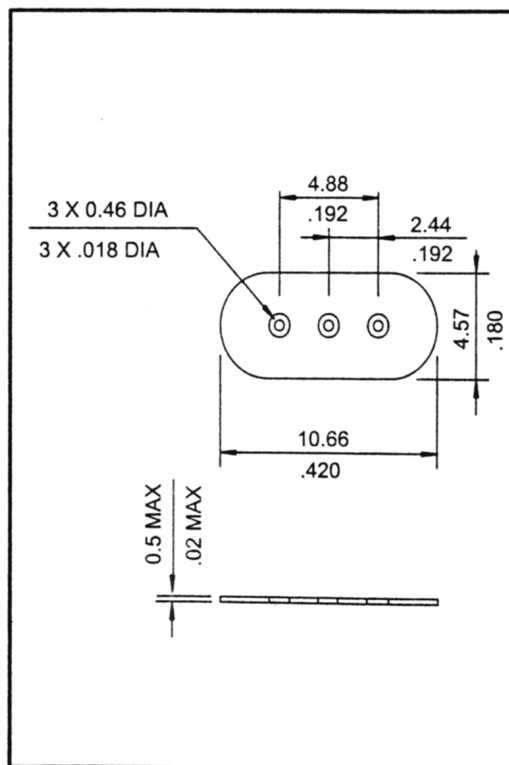
Code: L



Code: P



Code: 3



Code: S

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