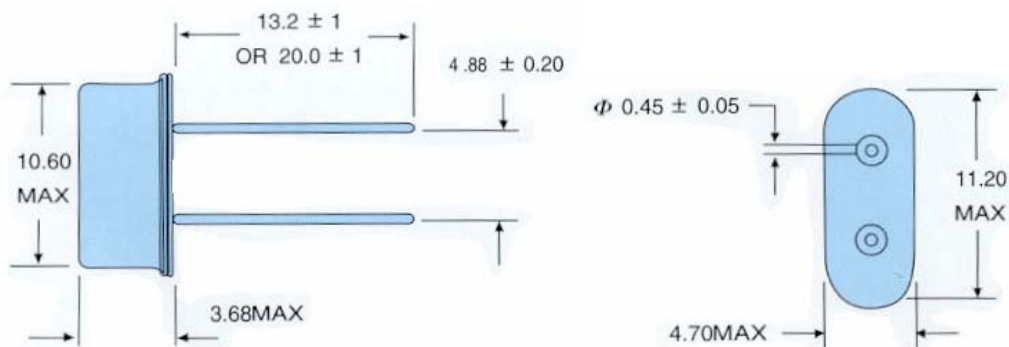
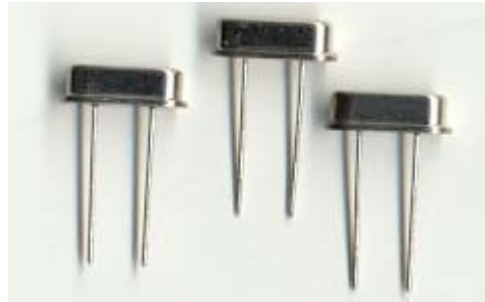


TSQ - HC-49U/S - QUARTZ CRYSTAL UNITS



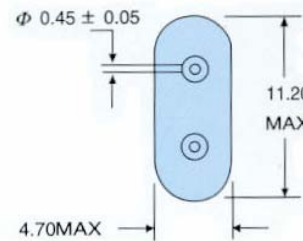
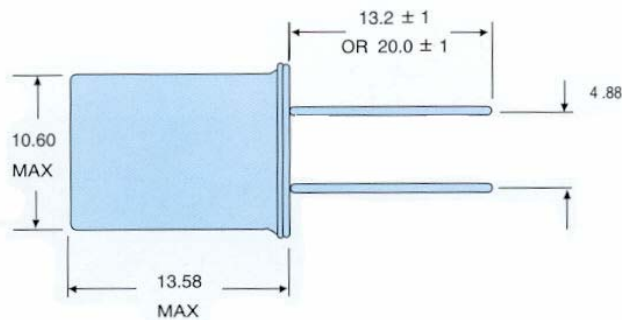
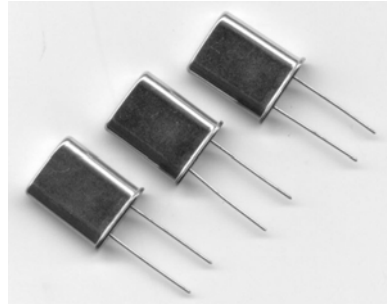
ELECTRICAL SPECIFICATIONS

Frequency Range	3.200MHz to 70.000MHz
Frequency Tolerance (at 25°C)	±30ppm (standard) of please specify
Frequency Stability Over Operating Temperature Range	±30ppm (standard) of please specify
Operating Temperature Range	-10°C to 60°C (standard) of please specify
Aging (at 25°C)	±5ppm/year Max
Storage Temperature range	- 40°C to 85°C
Shunt Capacitance	7pF Max
Insulation Resistance	500Megohms Min at DC 100V
Drive Level	1mwatts Max
Load Capacitance (CL)	Customer ASSIGN

ESR / MODE / CUT

Frequency Range	ESR (Ω)	Mode / Cut
3.200MHz to 3.999MHz	120Max	Fundamental/AT
4.000MHz to 5.999MHz	90Max	Fundamental/AT
6.000MHz to 7.999MHz	50Max	Fundamental/AT
8.000MHz to 11.999MHz	40Max	Fundamental/AT
12.000MHz to 14.999MHz	30Max	Fundamental/AT
15.000MHz to 27.000MHz	20Max	Fundamental/AT
20.000MHz to 36.000MHz	20Max	Fundamental/BT
24.000MHz to 29.999MHz	120Max	Third overtone/AT
30.000MHz to 39.999MHz	80Max	Third overtone/AT
40.000MHz to 70.000MHz	60Max	Third overtone/AT

TSQ - HC-49U - QUARTZ CRYSTAL UNITS



ELECTRICAL SPECIFICATIONS

Frequency Range	1.800MHz to 150.000MHz
Frequency Tolerance (at 25°C)	±30ppm (standard) of please specify
Frequency Stability Over Operating Temperature Range	±30ppm (standard) of please specify
Operating Temperature Range	-20°C to 70°C (standard) of please specify
Aging (at 25°C)	±5ppm/year Max
Storage Temperature range	- 40°C to 85°C
Shunt Capacitance	7pF Max
Insulation Resistance	500Megohms Min at DC 100V
Drive Level	1mwatts Max
Load Capacitance (CL)	Customer ASSIGN

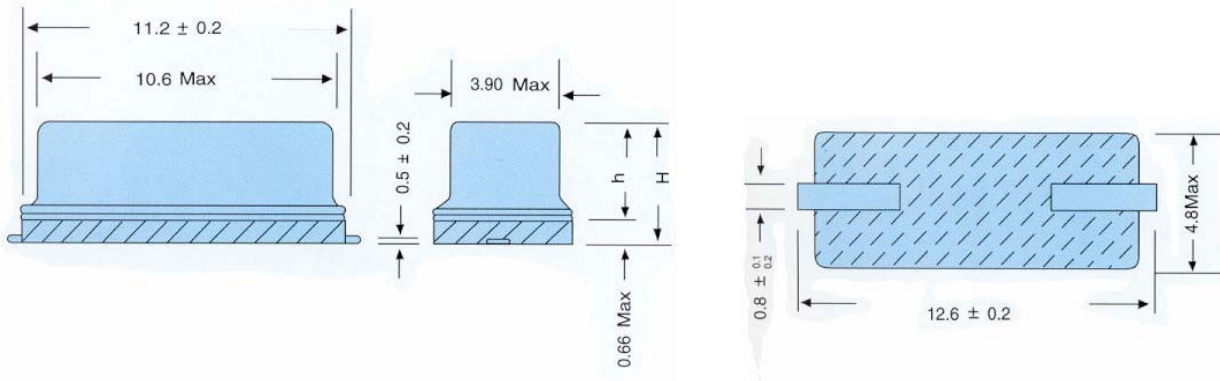
ESR / MODE / CUT

Frequency Range	ESR (Ω)	Mode / Cut
1.800MHz to 1.999MHz	500Max	Fundamental/AT
2.000MHz to 2.999MHz	300Max	Fundamental/AT
3.000MHz to 3.499MHz	150Max	Fundamental/AT
3.500MHz to 3.999MHz	90Max	Fundamental/AT
4.000MHz to 4.999MHz	70Max	Fundamental/AT
5.000MHz to 5.999MHz	50Max	Fundamental/AT
6.000MHz to 7.999MHz	40Max	Fundamental/AT
8.000MHz to 12.999MHz	30Max	Fundamental/AT
13.000MHz to 30.000MHz	20Max	Fundamental/AT
20.000MHz to 36.000MHz	20Max	Fundamental/BT
24.000MHz to 70.000MHz	40Max	Third overtone/AT
60.000MHz to 150.000MHz	90Max	Fifth overtone/AT

TSQ - HC-49S/SMD - QUARTZ CRYSTAL UNITS



h : 3.6+/-0.3, H : 3.82 +/-0.3



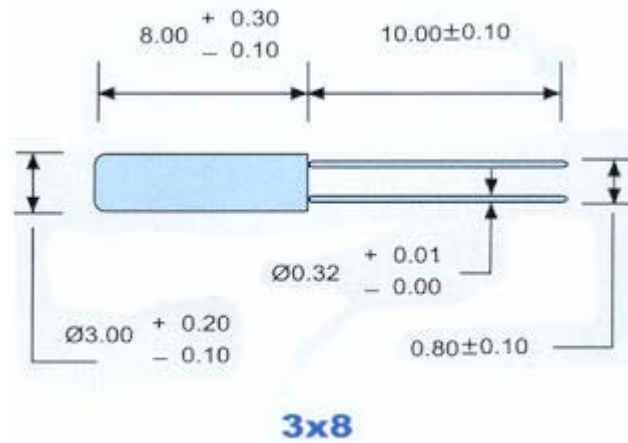
ELECTRICAL SPECIFICATIONS

Frequency Range	S2:10.000MHz to 70.000MHz
S3:3.200MHz to 70.000MHz	
Frequency Tolerance (at 25°C)	±30ppm (standard) of please specify
Frequency Stability Over Operating Temperature Range	±30ppm (standard) of please specify
Operating Temperature Range	-10°C to 60°C (standard) of please specify
Aging (at 25°C)	±5ppm/year Max
Storage Temperature range	- 40°C to 85°C
Shunt Capacitance	7pF Max
Insulation Resistance	500Megohms Min at DC 100V
Drive Level	1mwatts Max
Load Capacitance (CL)	Customer ASSIGN

ESR / MODE / CUT

Frequency Range	ESR (Ω)	Mode / Cut
3.200MHz to 3.999MHz	120Max	Fundamental/AT
4.000MHz to 5.999MHz	90Max	Fundamental/AT
6.000MHz to 7.999MHz	50Max	Fundamental/AT
8.000MHz to 11.999MHz	40Max	Fundamental/AT
12.000MHz to 14.999MHz	30Max	Fundamental/AT
15.000MHz to 27.000MHz	20Max	Fundamental/AT
20.000MHz to 36.000MHz	20Max	Fundamental/BT
24.000MHz to 29.999MHz	120Max	Third overtone/AT
30.000MHz to 39.999MHz	80Max	Third overtone/AT
40.000MHz to 70.000MHz	60Max	Third overtone/AT

TSQ - 3 X 8 CYLINDER TYPE



PARAMETERS	3*8
Frequency	32768Hz
Load Capacitance	12.5PF
Frequency Tolerance	± 20 ppm
Series Resistance	30 ~100K Ω
Turnover Temperature	25°C
Drive Level	1 μ w (max)
Operating temperature	-10°C ~ +60°C
Aging	± 5 ppm
Insulation Resistance	200M Ω (min) at DC 100V ± 10 V
Storage Temperature range	-55°C to + 125°C
Storage Humidity	0 ~ 95%