

CRYSTAL UNITS

TIGHT TOLERANCE SERIES

Specialized crystals used in end-products that require tighter stability, both at room temperature and over a specific extended operating temperature range, are considered tight tolerance crystal units. Applications such as Pagers, Temperature Compensated Crystal oscillators, local oscillators (2nd L.O.), microwave and phase lock loop all require this type of crystal. These crystals are designed to operate in a rugged environment and provide long term reliability for both military and commercial applications. For reference see page 43 for “ Build Your Own Part Number”.

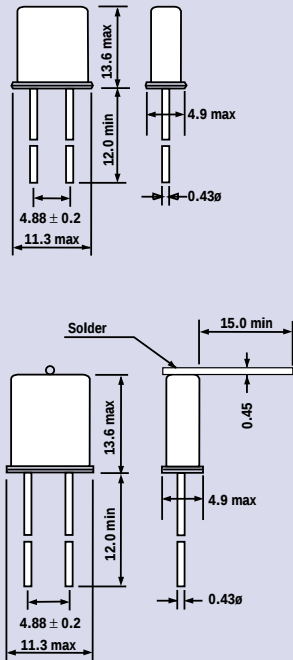
Typical Electrical Characteristics

- Frequency Range : 8.0 MHz to 350.0 MHz
- Calibration Tolerance @ 25°C : ± 10 ppm
- Operating Temp Range : -30°C to +80°C
- Calibration Tolerance over Temp Range : ± 10 ppm
- Co (Shunt Capacitance): 7.0 pf Max
- Aging : ± 2ppm/year
- Drive Level : 100 µW
- CL (Load Capacitance): Specified

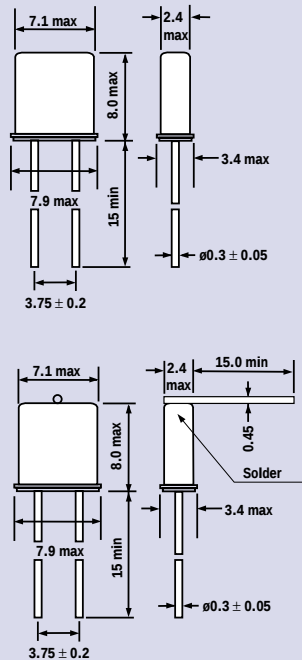
Frequency Tolerance	Operating Temperature Range:	Series Resistance
A = ±5ppm	E = 0°C to 50°C	8.0-12.000 MHz Fund 50 ohms
B = ±10ppm	F = -10°C to 60°C	12.000-18.00 MHz Fund 40 ohms
C = ±20ppm	G = -20°C to 70°C	18.00-30.000 MHz Fund 30 ohms
D = ±30ppm	H = -30°C to 80°C	30.0-50.000 MHz Fund 25 ohms
	I = -40°C to 85°C	30.0-80.000 MHz 3rd 50 ohms
	J = -55°C to 105°C	60.00-150.000 MHz 5th 80 ohms
		70.00-350.000 MHz 7th 90 ohms

PDI PART NUMBER	9844	7983	9569	7570	9912	9913
FREQUENCY	20.945 MHz	16.80 MHz	16.80 MHz	14.40 MHz	20.945 MHz	75.925 MHz
OSCILLATION MODE	FND	FND	FND	FND	FND	FND
Rs (Max Resistance)	30 ohms	25 ohms	30 ohms	21 ohms	25 ohms	40 ohms
TOLERANCE @ 25° C	±15 ppm	±10 ppm	±10 ppm	±15 ppm	±10 ppm	+5 ppm to +29 ppm
OPERATING TEMP RANGE	-30° to 80° C	-30° to 85° C	+5° to 40° C	-40° to 90° C	-10° to 50° C	+5° C to 40° C
CHANGE OVER TEMP RANGE	±20 ppm	±15 ppm	±2.5 ppm	±15 ppm	±15 ppm	5 ° C:-2.5 to +5.5 90 ° C:-5.5 to +2.5
DRIVE LEVEL	.5 µW	10 µW	10 µW	200 µW	10 µW	10 µW
SEAL METHOD	Res Weld	Res Weld	Res Weld	Res Weld	Res Weld	Res Weld
Co (SHUNT CAPACITANCE)	7.0 pF Max	3.0 pF to 7.0 pF Max	4pF Max	4.5 pF to 6.5 pF Max	4.5 pF Max	3.0 pF to 5.5 pF Max
C1 (MOTIONAL CAPACITANCE/ Delta F/ F)				27 f/f ± 10%	250 ± 10%	+9 ppm to +27 ppm
CL (LOAD CAPACITANCE)	33.7 pF	20.0 pF	12.0 pF	32.0 pF	32.0 pF	SERIES
AGING	±2 ppm	±5 ppm	±2 ppm	±5 ppm	±2 ppm	±2 ppm
PACKAGE	HA	U5	U1	HA	T9	U1

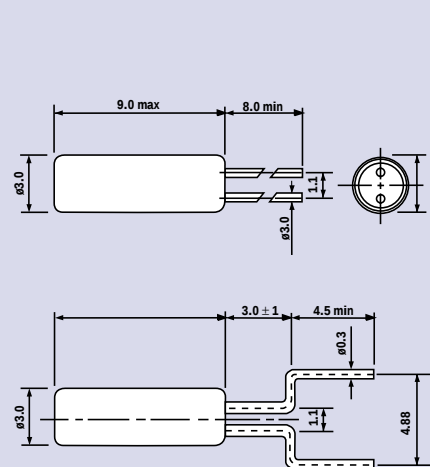
Package # HA (HC-49U)



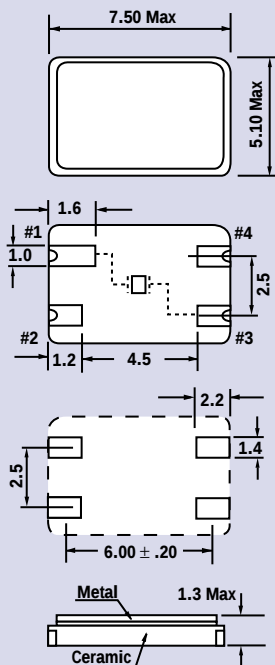
Package # U1 (UM-1)



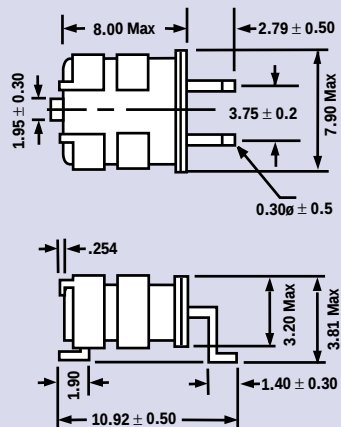
Package # T9 (3 x 9 Tubular)



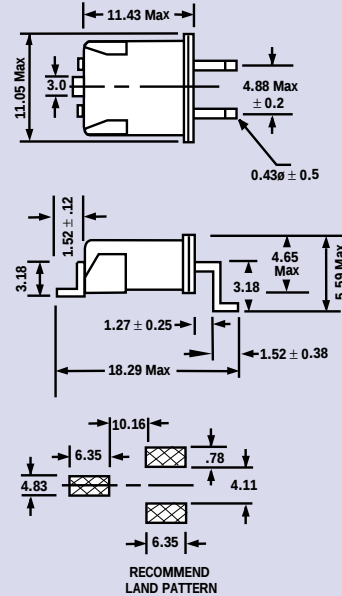
Package C7 Series (SMD Crystal)



Package UM Series (Crystal)



Package HAG (Crystal)



STANDARD TIGHT TOLERANCE FREQUENCIES

Nominal Frequency (MHz)	Frequency Tolerance Temperature	Temperature Range	Frequency Over Operating Range	Available Package	PDI Part Number
4.00000	±15ppm	-10°C to 60°C	±10ppm	HA	8430
5.12000	±10ppm	-30°C to 80°C	±20ppm	HA	7720
6.17600	±15ppm	-10°C to 60°C	±10ppm	HA	7477
6.40000	±10ppm	-30°C to 80°C	±15ppm	HA	7822
10.00000	±8ppm	-30°C to 80°C	±30ppm	U1	8132
10.10880	±10ppm	-30°C to 80°C	±30ppm	U1	8276
10.24500	±10ppm	-30°C to 80°C	±30ppm	HA	7808
11.15500	±25ppm	-40°C to 90°C	±15ppm	HA	7681
12.28800	±10ppm	-30°C to 80°C	±15ppm	HA	8150
12.80000	±10ppm	-30°C to 80°C	±10ppm	U1	8146
14.40000	±15ppm	-30°C to 80°C	±10ppm	HA	7570
15.36000	±15ppm	-30°C to 80°C	±10ppm	HA	7506
16.00000	±10ppm	-30°C to 80°C	±10ppm	U1	7113
16.01250	±13ppm	-30°C to 80°C	±10ppm	U1	7974
16.38400	±18ppm	-30°C to 80°C	±10ppm	HA	8274
16.80000	±10ppm	-30°C to 80°C	±10ppm	U1	7983
17.44500	±20ppm	-30°C to 80°C	±15ppm	T9	7637
18.33500	±20ppm	-30°C to 80°C	±15ppm	T9	7649
20.48000	±10ppm	-30°C to 80°C	±15ppm	HA	8244
20.94500	±10ppm	-20°C to 70°C	±25ppm	U1	7117
20.95000	±10ppm	-30°C to 80°C	±10ppm	U1	9260
24.00014	±15ppm	-30°C to 80°C	±10ppm	HA	7369
26.99500 (3rd)	±10ppm	-30°C to 80°C	±10ppm	HA	7566
35.25120 (3rd)	±15ppm	-30°C to 80°C	±10ppm	HA	7269
44.39500 (3rd)	±10ppm	-30°C to 85°C	±10ppm	U1	8838
44.39500 (Fun)	±10ppm	-30°C to 85°C	±10ppm	U1	8837
44.54500 (3rd)	±10ppm	-30°C to 80°C	±15ppm	U1	7792
44.64500 (3rd)	±10ppm	-30°C to 80°C	±15ppm	U1	7436
44.84500 (3rd)	±10ppm	-30°C to 85°C	±10ppm	U1	7607
69.74500 (3rd)	±10ppm	-30°C to 70°C	±15ppm	U1	9843
106.50270 (5th)	±15ppm	-30°C to 80°C	±15ppm	HA	7163
196.03500 (7th)	±10ppm	-20°C to 70°C	±25ppm	U1	7170

Other Frequencies available upon request (See PDI Crystal Order Form).