

### CMOS HA-1450 Series

### Description

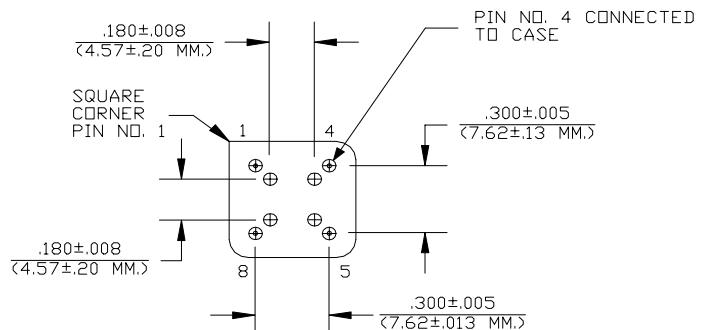
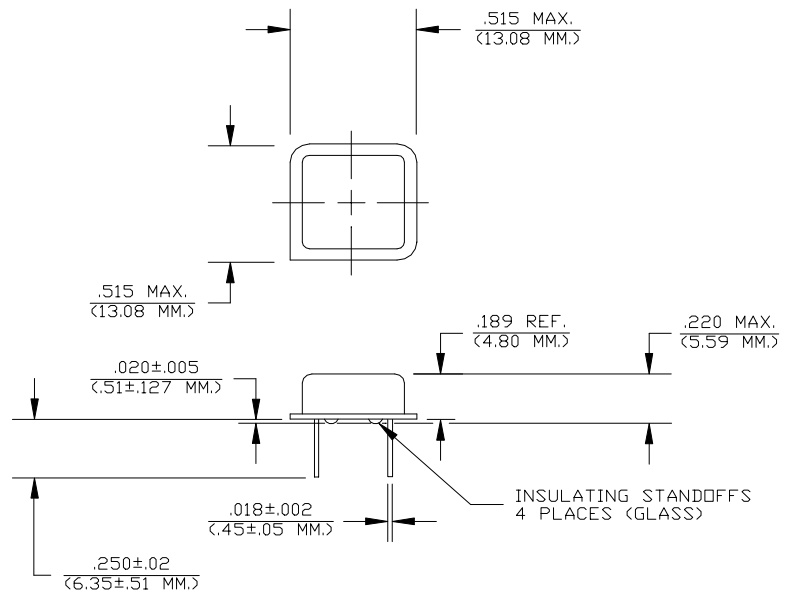
The **HA-1450 Series** of quartz crystal oscillators provide enable/disable 3-state CMOS compatible signals for bus connected systems. Supplying Pin 1 of the HA-1450 units with a logic "1" or open enables its pin 8 output. In the disabled mode, pin 8 presents a high impedance to the load. All units are designed to survive wave soldering operations without damage.

### Features

- Wide frequency range— 0.5MHz to 30.0MHz
- User specified tolerance available
- Will withstand vapor phase temperatures of 253°C for 4 minutes maximum
- Space-saving alternative to discrete component oscillators
- High shock resistance, to 3000g
- All metal, resistance weld, hermetically sealed package
- Low Jitter
- High Q Crystal actively tuned oscillator circuit
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- Low power consumption
- Gold plated leads - Solder dipped leads available upon request
- CMOS and TTL output levels
- RoHS Compliant, Lead Free Construction (unless solder dipped leads are supplied)

### Electrical Connection

Pin	Connection
1	Enable Input
4	Grd & Case
5	Output
8	V <sub>DD</sub>



Dimensions are in inches and (MM)

**HA-1450 Series** Continued  
CMOS

**Rev. F**

### Operating Conditions and Output Characteristics

#### Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	----	----	0.5MHz	----	30.0MHz
Duty Cycle	----	@ V <sub>DD</sub> /2	45/55%	----	55/45%
Logic 0	V <sub>OL</sub>	@ 600μA	----	----	0.2V
Logic 1	V <sub>OH</sub>	@ 16mA	----	----	0.4V
		@ 600μA	V <sub>DD</sub> -0.2V	----	----
		@ 16mA	V <sub>DD</sub> -0.4V	----	----
Rise & Fall Time	tr,tf	10-90%	----	----	3 ns
Tpz	----	----	----	----	25 ns
Jitter, RMS <sup>(2)</sup>	----	----	----	----	8 psec
Enable/Disable					
Logic High Voltage	----	----	V <sub>DD</sub> -1.5V	----	----
Logic Low Voltage	----	----	----	----	1.5V
Frequency Stability <sup>(1)</sup>	dF/F	Overall conditions including: voltage, calibration, temp., 10 yr aging, shock, vibration	-100ppm	----	+100ppm

#### General Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Supply Voltage	V <sub>DD</sub>	----	4.75V	5.0V	5.25V
Supply Current	I <sub>DD</sub>	No Load	0.0 mA	----	40mA
Output current	I <sub>O</sub>	----	0.0 mA	----	±16.0 mA
Operating temperature	T <sub>A</sub>	----	0°C	----	70°C
Storage temperature	T <sub>S</sub>	----	-55°C	----	125°C
Power Dissipation	P <sub>D</sub>	----	----	----	210 mW
Lead temperature	T <sub>L</sub>	Soldering, 10 sec.	----	----	300°C
Load	----	----	----	----	15pf
Start-up time	t <sub>S</sub>	----	----	2 ms	10 ms

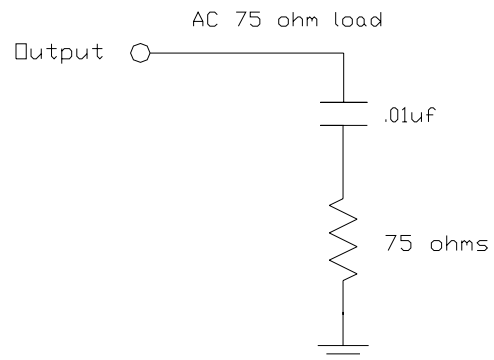
#### Environmental and Mechanical Characteristics

Mechanical Shock Per MIL-STD-202, Method 213, Condition E  
 Thermal Shock Per MIL-STD-833, Method 1011, Condition A  
 Vibration 0.060" double amplitude 10 Hz to 55 Hz, 35g's 55Hz to 2000 Hz  
 Soldering Condition 300°C for 10 seconds  
 Hermetic Seal Leak rate less than 1 x 10<sup>-8</sup> atm.cc/sec of helium

#### Footnotes:

- Standard frequency stability (±20,±25,±50ppm & others available)
- Jitter performance is frequency dependent. Please contact factory for full characterization. RMS jitter bandwidth of 12kHz to 20MHz.

#### Test Load:



Creating a Part Number	
<b>HA - A145X - FREQ</b>	
<b>Package Code</b>	<b>Tolerance/Performance</b>
HA Leaded 4 pin (8 pin)	0 ±100ppm 0-70°C
SA Leaded 4 pin (8 pin) SMD	1 ±50ppm 0-70°C
Gull Wing	7 ±25ppm 0-70°C
<b>Input Voltage</b>	9 Customer Specific
Code Specification	A ±20ppm 0-70°C
A 3.3V	B ±50ppm -40 to +85°C
5V	C ±100ppm -40 to +85°C



**FREQUENCY  
CONTROLS, INC.**