

## CMOS HA-1450 Series

### Description

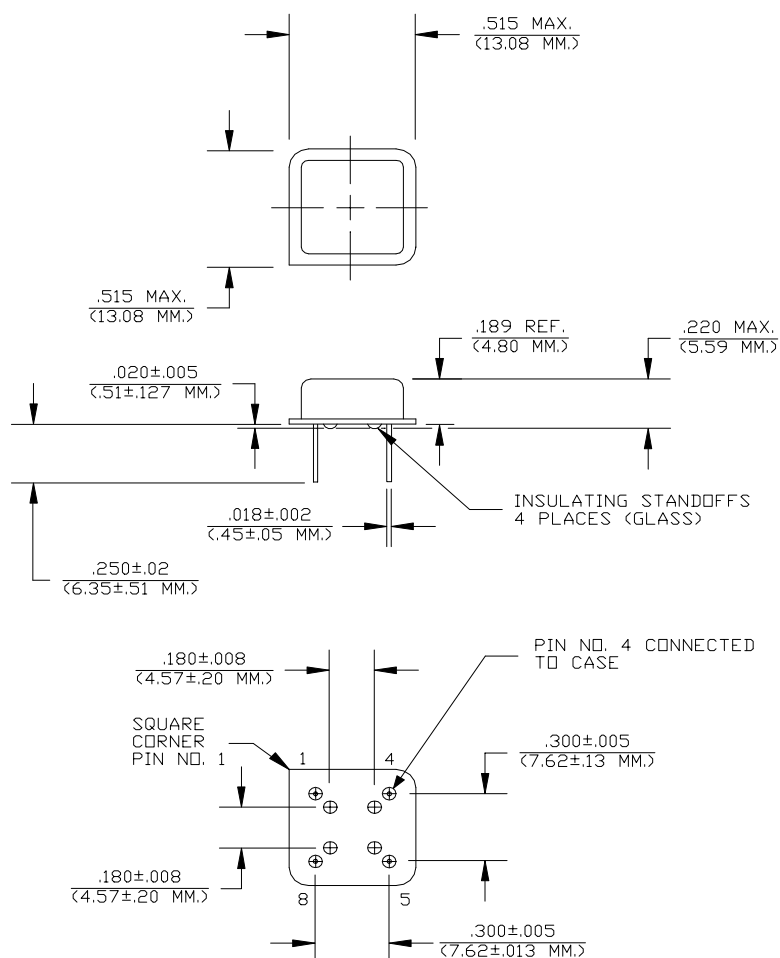
The **HA-1450 Series** of quartz crystal oscillators provide enable/disable 3-state CMOS compatible signals for bus connected systems. Supplying Pin 1 of the HA-1450 units with a logic "1" or open enables its pin 8 output. In the disabled mode, pin 8 presents a high impedance to the load. All units are 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)



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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	-----	@ $V_{DD}/2$	45/55%	-----	55/45%
Logic 0	$V_{OL}$	@ 600 $\mu$ A	-----	-----	0.2V
Logic 1	$V_{OH}$	@ 16mA	-----	-----	0.4V
		@ 600 $\mu$ A	$V_{DD}-0.2V$	-----	-----
		@ 16mA	$V_{DD}-0.4V$	-----	-----
Rise & Fall Time	$t_{r,f}$	10-90%	-----	-----	3 ns
TPZ	-----	-----	-----	-----	25 ns
Jitter, RMS <sup>(2)</sup>	-----	-----	-----	-----	8 psec
Enable/Disable					
Logic High Voltage	-----	-----	$V_{DD}-1.5V$	-----	-----
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**

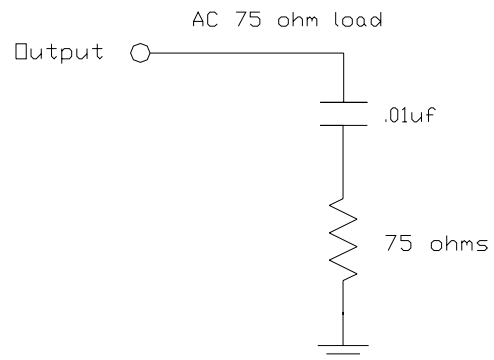
Parameter	Symbol	Conditions	Min	Typical	Max
Supply Voltage	$V_{DD}$	-----	4.75V	5.0V	5.25V
Supply Current	$I_{DD}$	No Load	0.0 mA	-----	40mA
Output current	$I_O$	-----	0.0 mA	-----	$\pm 16.0$ mA
Operating temperature	$T_A$	-----	0°C	-----	70°C
Storage temperature	$T_S$	-----	-55°C	-----	125°C
Power Dissipation	$P_D$	-----	-----	-----	210 mW
Lead temperature	$T_L$	Soldering, 10 sec.	-----	-----	300°C
Load	-----	-----	-----	-----	15pf
Start-up time	$t_s$	-----	-----	2 ms	10 ms

**Environmental and Mechanical Characteristics**

Mechanical Shock	Per MIL-STD-202, Method 213, Condition E
Thermal Shock	Per MIL-STD-883, 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 $1 \times 10^{-8}$ atm.cc/sec of helium

**Footnotes:**

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

**Test Load:****Creating a Part Number****HA - A145X - FREQ**

Package Code	Tolerance/Performance
HA Ledged 4 pin (8 pin)	0 $\pm 100$ ppm 0-70°C
SA Ledged 4 pin (8 pin) SMD	1 $\pm 50$ ppm 0-70°C
Gull Wing	7 $\pm 25$ ppm 0-70°C
<b>Input Voltage</b>	9 Customer Specific
Code Specification	A $\pm 20$ ppm 0-70°C
A 3.3V	B $\pm 50$ ppm -40 to +85°C
5V	C $\pm 100$ ppm -40 to +85°C

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