



## CMOS HA-A390 Series

### Description

The **HA-A390 Series** of quartz crystal oscillators provide CMOS compatible signals for general purpose timing applications.

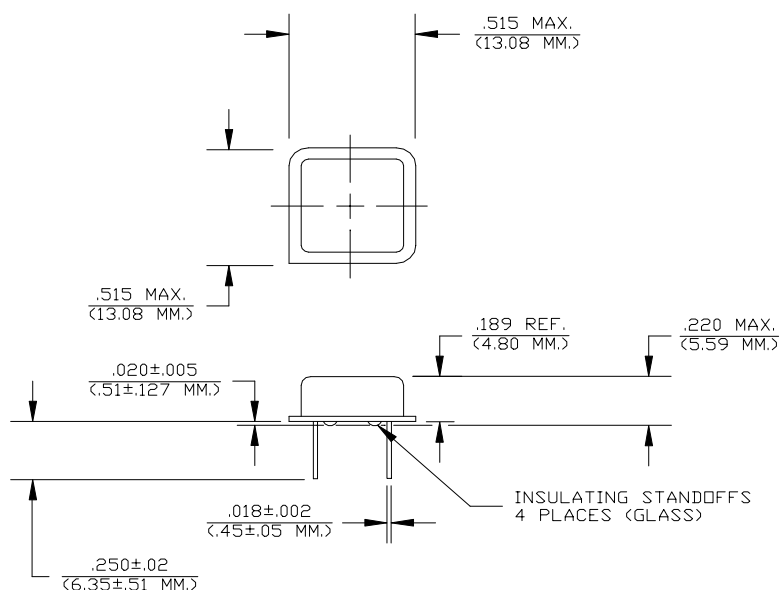
### Features

- Wide frequency range—70.1MHz to 125.0MHz
- 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
- 3.3 volt operation
- Low Jitter
- High Q Crystal actively tuned oscillator circuit
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- High frequencies due to proprietary design
- All metal, resistance weld, hermetically sealed package
- Gold plated leads - Solder dipped leads available upon request

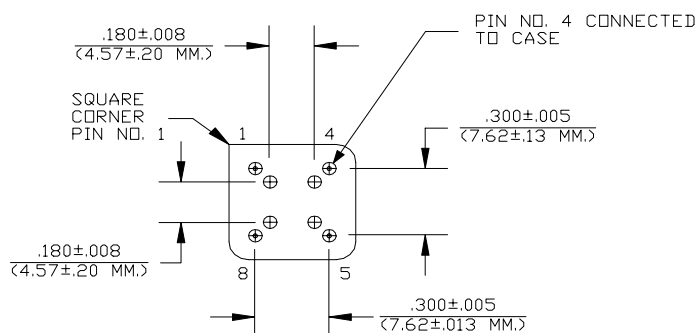
### Electrical Connection

Pin Connection

1	N.C.
4	Grd & Case
5	Output
8	V <sub>DD</sub>



Dimensions are in inches and MM.



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HA-A390 Series Continued  
CMOS

Rev. C

## Operating Conditions and Output Characteristics

### Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	-----	-----	70.1MHz	-----	125.0MHz
Duty Cycle	-----	@ $V_{DD}/2$	45/55%	-----	55/45%
Logic 0	$V_{OL}$	@ 600 $\mu$ A	-----	0.1V	0.2V
Logic 1	$V_{OH}$	@ 600 $\mu$ A	$V_{DD}-0.2V$	$V_{DD}-0.1V$	-----
Rise & Fall Time	tr,tf	10-90% $V_O$	-----	1 ns	2 ns
Jitter, RMS <sup>(2)</sup>	-----	-----	-----	-----	5 psec
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	$V_{DD}$	-----	3.135V	3.3V	3.465V
Supply Current	$I_{DD}$	No Load	0.0 mA	40 mA	60 mA
Output current	$I_O$	-----	0.0 mA	-----	$\pm 25.0$ mA
Operating temperature	$T_A$	-----	0°C	-----	70°C
Storage temperature	$T_S$	-----	-55°C	-----	125°C
Power Dissipation	$P_D$	-----	-----	-----	208 mW
Lead temperature	$T_L$	Soldering, 10 sec.	-----	-----	300°C
Load	-----	-----	-----	-----	15pf
Start-up Time	$t_s$	-----	-----	-----	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:

- Standard frequency stability ( $\pm 20, \pm 25, \pm 50$ ppm & others available)
- Jitter performance is frequency dependent. Please contact factory for full characterization.

### Creating a Part Number

HA - A39X - FREQ

#### Package Code

HA Ledged 4 pin (8 pin)  
SA Ledged 4 pin (8 pin) SMD  
Gull Wing

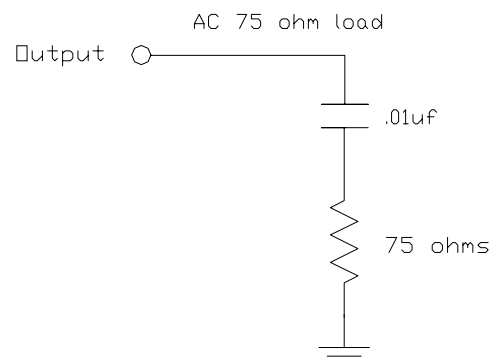
#### Input Voltage

Code Specification  
A 3.3V  
5V

#### Tolerance/Performance

0  $\pm 100$ ppm 0-70°C  
1  $\pm 50$ ppm 0-70°C  
7  $\pm 25$ ppm 0-70°C  
9 Customer Specific  
A  $\pm 20$ ppm 0-70°C  
B  $\pm 50$ ppm -40 to +85°C  
C  $\pm 100$ ppm -40 to +85°C

### Test Load:



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