



## CMOS HA-370 Series

Rev. F

### Description

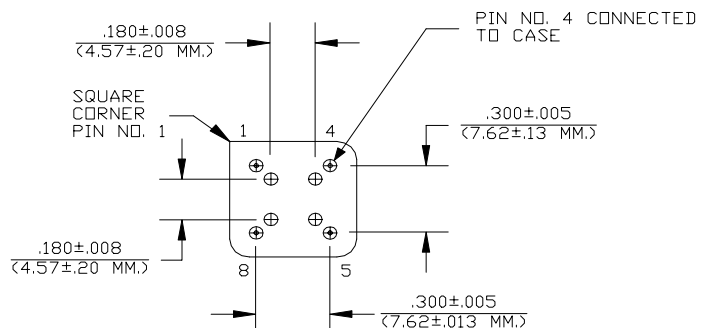
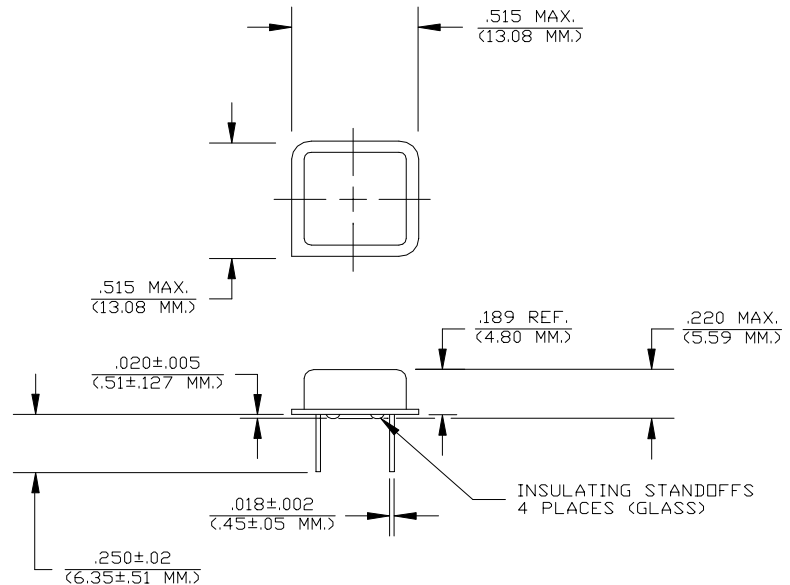
The **HA-370 Series** of quartz crystal oscillators are resistance welded in an all metal package, offering RFI shielding, and are designed to survive standard wave soldering operations without damage. Insulated standoffs to enhance board cleaning are standard.

### Features

- Wide frequency range—3.0MHz to 100.0MHz
- 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
- Low power consumption
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- High frequencies due to proprietary design
- Gold plated leads - Solder dipped leads available upon request
- RoHS Compliant, Lead Free Construction (unless solder dipped leads are supplied)

### Electrical Connection

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



HA-370 Series Continued  
CMOS

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## Operating Conditions and Output Characteristics

### Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	-----	-----	3.0MHz	-----	100.0MHz
Duty Cycle	-----	@ $V_{DD}/2$	45/55%	-----	55/45%
Logic 0	$V_{OL}$	@ 600 $\mu$ A	-----	-----	0.2V
Logic 1	$V_{OH}$	@ 600 $\mu$ A	$V_{DD}-0.2V$	-----	-----
Rise & Fall Time	tr,tf	10-90% $V_O$	-----	-----	-----
Jitter, RMS <sup>(2)</sup>	-----	<40MHz	-----	-----	8 ns
		40MHz & greater	-----	-----	4 ns
		<40MHz Fund	-----	-----	8.0 psec
Frequency Stability <sup>(1)</sup>	dF/F	<40MHz OT & >40MHz	-----	-----	5.0 psec
		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	-----	50 mA
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	$P_D$	-----	-----	-----	263 mW
Lead temperature	$T_L$	Soldering, 10 sec.	-----	-----	300°C
Load	-----	-----	-----	-----	15pf
Start-up Time	$t_s$	<20MHz	-----	-----	2 ms
		20MHz or greater	-----	-----	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 $1 \times 10^{-8}$ 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. RMS jitter bandwidth of 12kHz to 20MHz.

Creating a Part Number	
<b>HA - A37X - FREQ</b>	
<b>Package Code</b>	<b>Tolerance/Performance</b>
HA Ledged 4 pin (8 pin)	0 $\pm 100$ ppm 0-70°C
SA Ledged 4 pin (8 pin) SMD Gull Wing	1 $\pm 50$ ppm 0-70°C
<b>Input Voltage</b>	7 $\pm 25$ ppm 0-70°C
Code Specification	9 Customer Specific
A 3.3V	A $\pm 20$ ppm 0-70°C
5V	B $\pm 50$ ppm -40 to +85°C
	C $\pm 100$ ppm -40 to +85°C

#### Test Load:

