

## CMOS HA-A370 Series

Rev. D

### Description

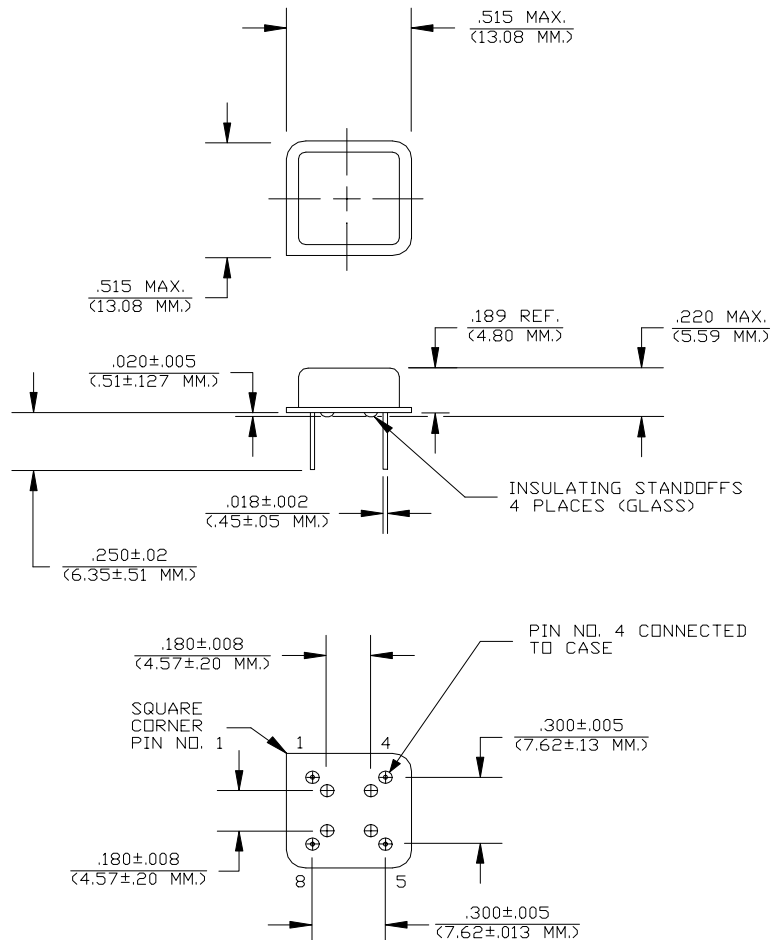
The **HA-A370 Series** of quartz crystal oscillators are resistance welded in an all metal package, offering RFI shielding, and are designed to survive standard wave soldering operations without damage. Insulated standoffs to enhance board cleaning are standard. Low voltage operation (3.3V).

### Features

- Wide frequency range—0.5MHz to 70.0MHz
- 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
- Low power consumption
- TTL compatible (HCT) at specified supply voltage
- 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>



HA-A370 Series Continued  
CMOS

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## Operating Conditions and Output Characteristics

### Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	----	----	0.5MHz	----	70.0MHz
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% $V_O$	----	----	8 ns
Jitter, RMS <sup>(2)</sup>	----	<40MHz Fund	----	----	8 psec
		<40MHz OT & >40MHz	----	----	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
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	$P_D$	----	----	----	138 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:

- 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.

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	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

#### Test Load:

