

3.3V Surface Mount Crystal Clock Oscillator HSM6



XO

Features:

1.544 to 170 MHz
3.3V Operation
RoHS Compliant
Tri-State Enable/Disable
Power Saving Function: 10uA When Disabled
Overall Frequency Tolerance:
HSM613 ± 25 ppm
HSM623 ± 50 ppm
HSM633 ± 100 ppm
Temperature Range: -40 to 85°C
Ceramic Surface Mount Package
Tape and Reel Packaging

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The Connor-Winfield HSM613, HSM623, and HSM633 are 7.5mm x 5mm, 3.3V HCMOS, Surface Mount, Fixed Frequency Crystal Oscillators (XO) designed for use in all applications requiring precision clocks. The RoHS compliant surface mount package is designed for high-density mounting and is optimum for mass production.

Absolute Maximum Ratings

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|----------------------|---------|---------|---------|-------|-------|
| Storage Temperature | -55 | - | 125 | °C | |
| Supply Voltage (Vcc) | -0.5 | - | 5.0 | Vdc | |

Operating Specifications

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|----------------------|---------|---------|---------|-------|-------|
| Frequency Range (Fo) | 1.544 | - | | MHz | |
| HSM613 | | | 125 | | |
| HSM623 | | | 170 | | |
| HSM633 | | | 170 | | |
| Frequency Tolerance | | - | | ppm | 1 |
| HSM613 | -25 | | 25 | | |
| HSM623 | -50 | | 50 | | |
| HSM633 | -100 | | 100 | | |
| Operating Temp Range | -40 | - | 85 | °C | |
| Supply Voltage (Vdd) | 3.0 | 3.3 | 3.6 | Vdc | |
| Supply Current (Icc) | - | - | | mA | |
| 1.544 to 31.999 MHz | | | 15 | | |
| 32 to 49.999 MHz | | | 20 | | |
| 50 to 66.999 MHz | | | 25 | | |
| 67 to 124.999 MHz | | | 40 | | |
| 125 to 170 MHz | | | 50 | | |

Input Characteristics

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|------------------------------|--------------------|---------|--------------------|-------|-------|
| Enable Voltage - (Vih) | $\geq 70\% V_{dd}$ | - | - | Vdc | 2 |
| Disable Voltage - (Vil) | - | - | $\leq 30\% V_{dd}$ | Vdc | |
| Enable Time | - | - | 10 | mS | |
| Disable Time | - | - | 150 | nS | |
| Output Disable Current (Icc) | - | - | 10 | uA | |

HCMOS Output Characteristics

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|------------------------------|---------|---------|---------|--------|-------|
| Load | - | - | 15 | pF | |
| Voltage High (Voh) | 2.91 | - | - | Vdc | |
| Low (Vol) | - | - | 0.33 | | |
| Current High (Ioh) | -2 | - | - | mA | |
| Low (Iol) | - | - | 2 | | |
| Duty Cycle at 50% of Vcc | 45 | 50 | 55 | % | |
| Rise / Fall Time: 20% to 80% | | | | | |
| 1.544 to 19.999 MHz | - | 3.0 | 6.0 | nS | |
| 20.00 to 49.999 MHz | - | 2.0 | 4.0 | | |
| 50.00 to 99.9999 MHz | - | 1.5 | 3.0 | | |
| 100.00 to 170 MHz | - | 0.5 | 1.0 | | |
| Start-Up Time | - | - | 10 | mS | |
| Jitter (10 Hz to 20 MHz) | - | - | 5 | pS RMS | |
| (12 kHz to 20 MHz) | - | - | 1 | | |

Notes:

- Inclusive of calibration @ 25°C, frequency stability vs temperature, supply voltage change, load change, shock and vibration, 10 years aging.
- Oscillator output is enabled with no connection on pad 1

Specifications subject to change without notice. All dimensions in inches. © Copyright 2009 The Connor-Winfield Corporation



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Package Characteristics

Package Hermetically sealed ceramic package and metal cover

Environmental Characteristics

Temperature Cycle The specimen shall meet electrical characteristics after tested 5 cycles of -55°C / 30 minutes and +125°C / 30 minutes
Hermetical No bubbles appear in Flourinert (FC-43) at 125°C ±5°C for 5 minutes
Solvent Resistance Marking will withstand immersion in Isopropyl Alcohol or Trichloroethylene

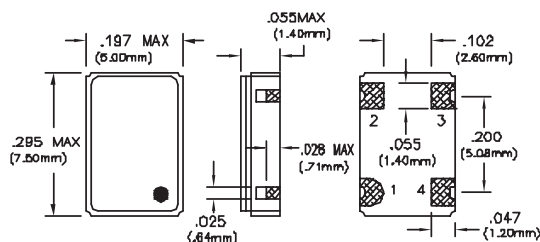
Soldering

General Conditions 260°C max x 10 sec max x 2 times max or 230°C max x 180 sec max x 1 time
Typical Operation Data (Vapor phase reflow)
20 to 100 sec up to 215°C, 50 sec
at 215°C, then down to room temperature per 1 to 5°C / sec

Mechanical Characteristics

Free Drop The specimen shall meet electrical characteristics after tested 3 times, Free Drop testing on the hard wooden board from a height of 75 cm.
Vibration The specimen shall meet electrical characteristics after tested by the following conditions: 10-55Hz 1.5mm Amplitude, 55-2000 Hz 20 G's, 2 hours for each plane
Thermal Shock After applied Thermal Shock of 260°C max x 10 sec max x 2 times, or 230°C max x 180 sec max, the specimen shall meet electrical characteristics
Solderability (EIAJ-RCX-0102.101 Condition 1a)
1) Flux: MIL-F-14256 (WW Rosin=25%, Isopropyl Alcohol = 75%)
2) Solder: QQ-S-571 (Sn = 63%, Pb = 37%)
3) Solder bath temperature: 235°C ±5°C
4) Depth of immersion: Up to electrical terminal
5) Immersing time: Within 2 sec ±0.5 sec into solder bath

After performing the above procedures, a newly soldered coverage shall be greater than 90%

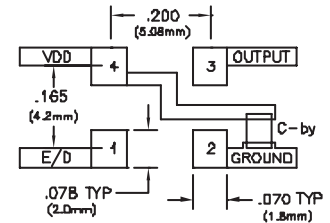


Dimensional Tolerance: ±.02" (.508mm)
±.005" (.127mm)

Pin Connections

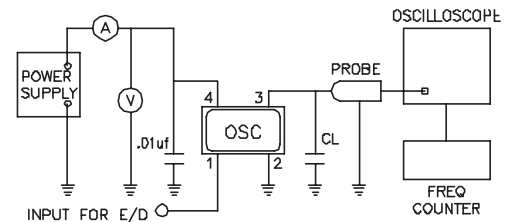
- 1: Tri-State E/D
- 2: Ground
- 3: Output
- 4: VDD

Suggested Pad Layout

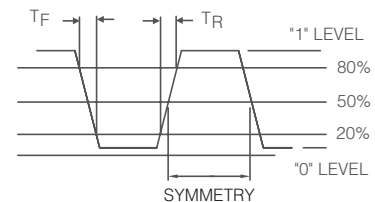


Bypass capacitor, C-by, should be ceramic capacitor ≥ .01uf.

Test Circuit



Output Waveform



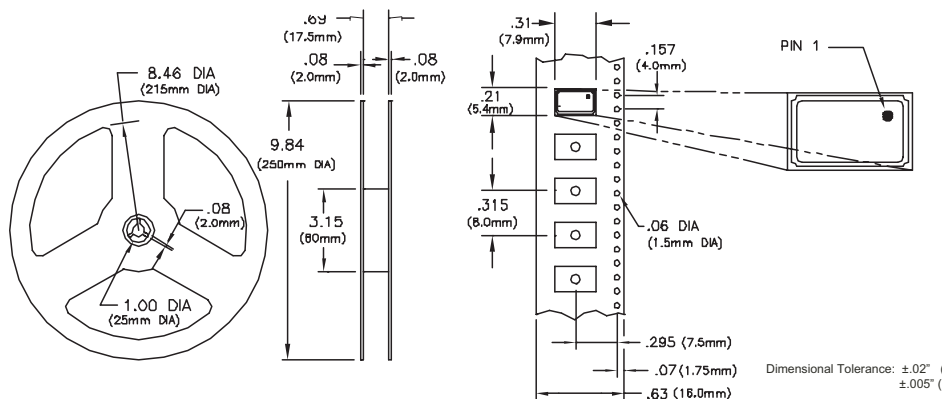
Ordering Information

HSM633 - 125.0M

CLOCK
SERIES

CENTER
FREQUENCY

Tape and Reel Dimensions



Dimensional Tolerance: ±.02" (.508mm)
±.005" (.127mm)

MEETS EIA-481A AND EIAJ-1009B
2,000 PCS/REEL

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