

3.3V Surface Mount 7.5x5mm Crystal Clock Oscillator HSM9

**CONNOR
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XO

The Connor-Winfield HSM943, HSM933, HSM923, and HSM913 are 7.5mm x 5mm, 3.3V LVCMOS, 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

Features:

1.544 to 170 MHz
3.3V Operation
RoHS Compliant
Tri-State Enable/Disable
Power Saving Function: 10uA When Disabled
Overall Frequency Tolerance:
HSM943 ± 20 ppm, HSM913 ± 25 ppm
HSM923 ± 50 ppm, HSM933 ± 100 ppm
Temperature Range: -10 to 70°C
Ceramic Surface Mount Package
Tape and Reel Packaging

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) HSM943 HSM913 HSM923 HSM933 | 1.544 | - | 125 & 155.52 170 170 170 | MHz | |
| Frequency Tolerance HSM943 HSM913 HSM923 HSM933 | -20 -25 -50 -100 | - | 20 25 50 100 | ppm | 1 |
| Operating Temp Range | -10 | - | 70 | °C | |
| Supply Voltage (Vdd) | 2.97 | 3.3 | 3.63 | Vdc | |
| Supply Current (Icc) 1.544 to 31.999 MHz 32 to 49.999 MHz 50 to 66.999 MHz 67 to 124.999 MHz 125 to 170 MHz | - | - | 15 20 25 40 50 | mA | |

Input Characteristics

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

LVCMOS Output Characteristics

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|--|-------------|-------------|---------------|------------------|-------|
| Load | - | - | 15 | pF | |
| Voltage High (Voh) Low (Vol) | 2.91 - | - - | - 0.33 | Vdc | |
| Current High (Ioh) Low (Iol) | -2 - | - - | - 2 | mA | |
| Duty Cycle at 50% of Vcc | 45 | 50 | 55 | % | |
| Rise / Fall Time: 10% to 90% 0.8V to 2.4V 20% to 80% | - - - | - 1 1 | 6 1.5 2 | nS | |
| Start-Up Time | - | - | 10 | mS | |
| Jitter (10 Hz to 20 MHz) (12 kHz to 20 MHz) | - - | - - | 5 1 | pS RMS pS RMS | |

Notes:

- Inclusive of calibration @ 25°C, frequency vs temperature stability, supply voltage change, load change, shock and vibration, 15 years aging.
- Oscillator output is enabled with no connection on pad 1

Specifications subject to change without notice. All dimensions in inches. © Copyright 1998 The Connor-Winfield Corporation



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Revision **29**
Date **27 Nov 2007**

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

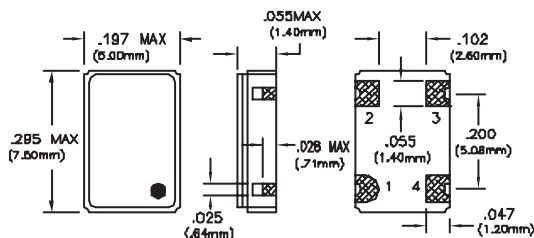
Free Drop The specimen shall meet electrical characteristics after tested 3 times, Free Drop testing on the hard wooden board from a height of 75 cm.

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%

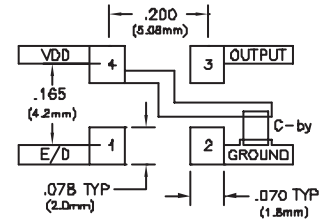


Dimensional Tolerance: ±.02" (.508mm)
±.005" (.127mm)

Pin Connections

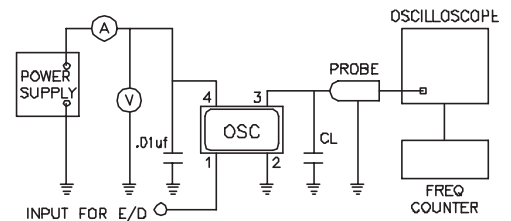
- 1: Tri-State E/D
- 2: Ground
- 3: Output
- 4: VDD

Suggested Pad Layout

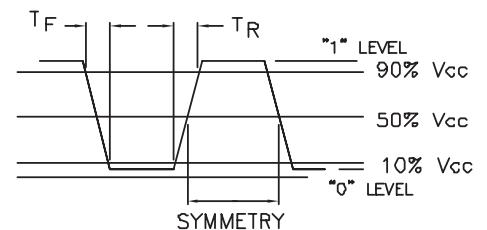


Bypass capacitor, C-by, should be ceramic capacitor ≥ .01uf.

Test Circuit



Output Waveform



Marking Information

| Part Number | Marking Variations |
|-------------|---------------------|
| HSM913 | HSM913XX HM913XX |
| HSM923 | HSM923XX HM923XX |
| HSM933 | HSM933XX HM933XX |
| HSM943 | HSM943XX HM943XX |
| | XX = Date Code |

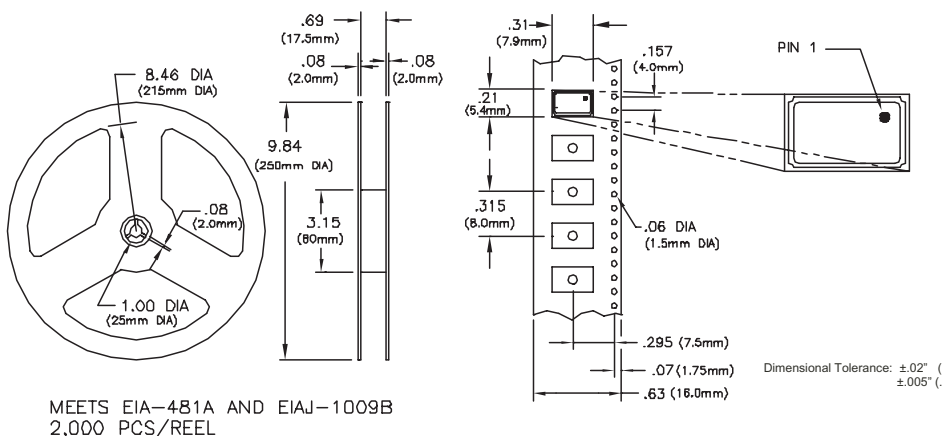
Ordering Information

HSM943 - 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