

# 3.3V Surface Mount 7.5x5mm Crystal Clock Oscillator HSM9x3-series

CONNOR  
WINFIELD



XO

The Connor-Winfield HSM943, HSM933, HSM923, and HSM913 are 7.5mm x 5mm, 3.3V LVC MOS, 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 high volume production.



## Features:

- 1.0 to 170 MHz
- 3.3V Operation
- RoHS Compliant
- Tri-State Enable/Disable
- Power Saving Function: 10uA When Disabled
- Overall Frequency Tolerance:
  - HSM943  $\pm 20$  ppm, HSM913  $\pm 25$  ppm
  - HSM923  $\pm 50$  ppm, HSM933  $\pm 100$  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 (Vdd) | -0.5    | -       | 5.0     | Vdc   |       |

## Operating Specifications

| Parameter            | Minimum | Nominal | Maximum | Units | Notes |
|----------------------|---------|---------|---------|-------|-------|
| Frequency Range (Fo) |         |         |         |       |       |
| HSM943               | 1.0     | -       | 155.52  | MHz   |       |
| HSM913               | 1.0     | -       | 170     | MHz   |       |
| HSM923               | 1.0     | -       | 170     | MHz   |       |
| HSM933               | 1.0     | -       | 170     | MHz   |       |
| Frequency Tolerance  |         |         |         |       |       |
| HSM943               | -20     | -       | 20      | ppm   | 1     |
| HSM913               | -25     | -       | 25      | ppm   | 1     |
| HSM923               | -50     | -       | 50      | ppm   | 1     |
| HSM933               | -100    | -       | 100     | ppm   | 1     |
| Operating Temp Range | -10     | -       | 70      | °C    |       |
| Supply Voltage (Vdd) | 2.97    | 3.3     | 3.63    | Vdc   |       |
| Supply Current (Idd) |         |         |         |       |       |
| 1.544 to 31.999 MHz  |         |         | 15      | mA    |       |
| 32 to 49.999 MHz     |         |         | 20      | mA    |       |
| 50 to 66.999 MHz     |         |         | 25      | mA    |       |
| 67 to 124.999 MHz    |         |         | 40      | mA    |       |
| 125 to 170 MHz       |         |         | 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 (Idd) | -               | -       | 10              | uA    |       |

### Notes:

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

2111 Comprehensive Drive  
Aurora, Illinois 60505  
Phone: 630-851-4722  
Fax: 630-851-5040  
[www.conwin.com](http://www.conwin.com)



Bulletin **Sm007**  
Page **1 of 3**  
Revision **33**  
Date **22 May 2024**

LVC MOS Output Characteristics

| Parameter                    |                      | Minimum | Nominal | Maximum | Units  | Notes |
|------------------------------|----------------------|---------|---------|---------|--------|-------|
| Load                         | -                    | -       | 15      | pF      |        |       |
| Voltage                      | High (Voh)           | 2.91    | -       | -       | Vdc    |       |
|                              | Low (Vol)            | -       | -       | 0.33    |        |       |
| Current                      | High (Ioh)           | -4      | -       | -       | mA     |       |
|                              | Low (Iol)            | -       | -       | 4       |        |       |
| Duty Cycle at 50% of Vdd     |                      | 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     | ns     |       |
|                              | 50.00 to 99.9999 MHz | -       | 1.5     | 3.0     | ns     |       |
|                              | 100.00 to 170 MHz    | -       | 0.5     | 1.0     | ns     |       |
| Start-Up Time                |                      | -       | -       | 10      | ms     |       |
| Jitter                       | (10 Hz to 20 MHz)    | -       | -       | 5       | ps RMS |       |
|                              | (12 kHz to 20 MHz)   | -       | -       | 1       | ps RMS |       |

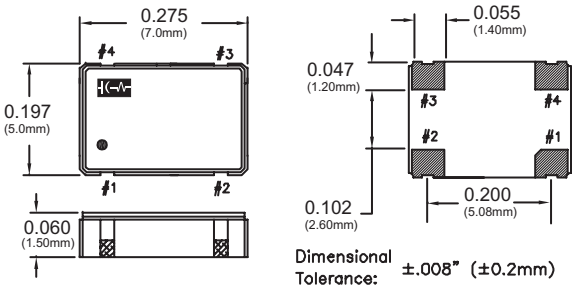
Package Characteristics

|                            |                                                              |
|----------------------------|--------------------------------------------------------------|
| Package                    | Hermetically sealed ceramic package and grounded metal cover |
| Moisture Sensitivity Level | MSL-1                                                        |

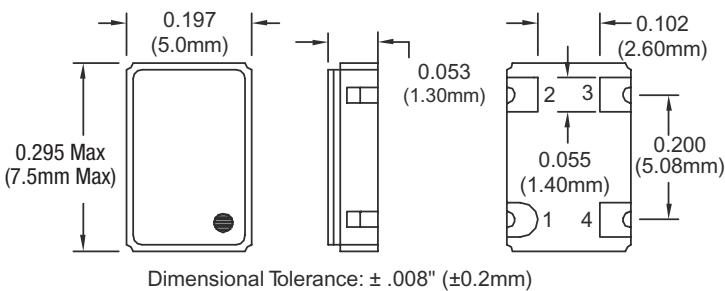
Environmental Characteristics

|                    |                                                                  |
|--------------------|------------------------------------------------------------------|
| Vibration:         | Vibration per Mil Std 883E Method 2007.3 Test Condition A.       |
| Shock:             | Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B |
| Soldering Process: | RoHS compliant lead free. See soldering profile on page 3.       |

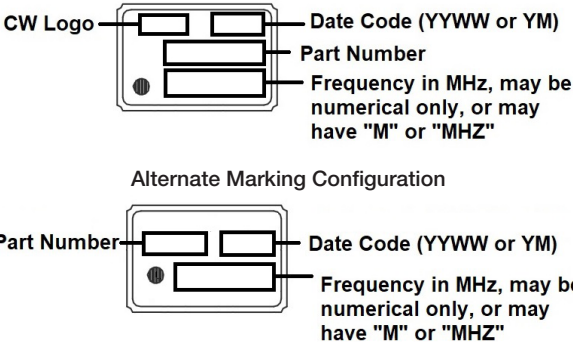
Package Outline 1



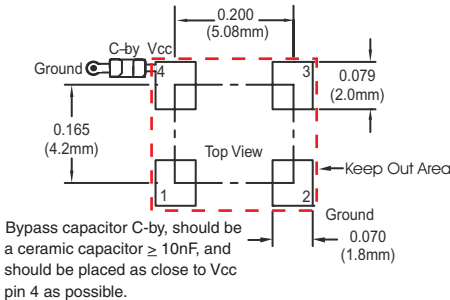
Package Outline 2



HSM-Series Marking Configurations



Suggested Pad Layout

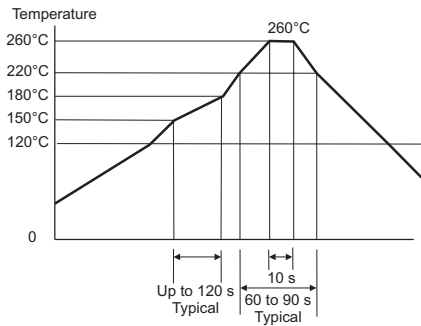


Pin Connections

| Pin Connections  |
|------------------|
| 1: Tri-State E/D |
| 2: Ground        |
| 3: Output        |
| 4: Vdd           |

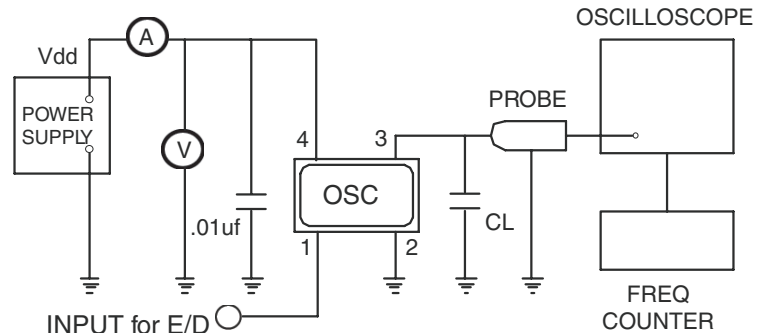
|          |             |
|----------|-------------|
| Bulletin | Sm007       |
| Page     | 2 of 3      |
| Revision | 33          |
| Date     | 22 May 2024 |

## Solder Profile

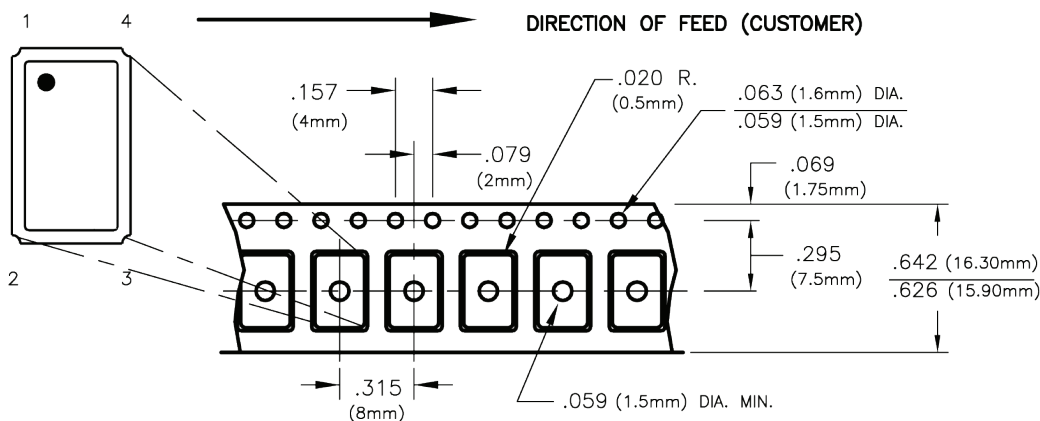


Meets IPC/JEDEC J-STD-020C

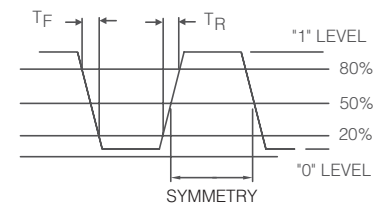
## Test Circuit



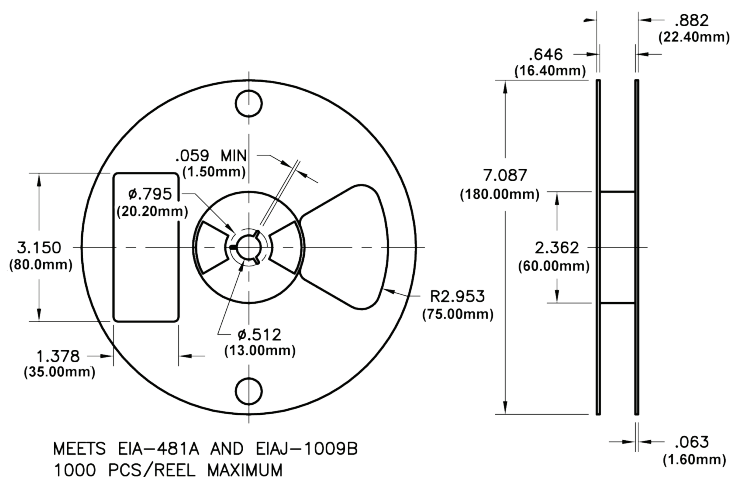
## Tape and Reel Dimensions



## Output Waveform



## Reel Dimensions



MEETS EIA-481A AND EIAJ-1009B  
1000 PCS/REEL MAXIMUM

## Ordering Information Example

HSM943 - 155.52M  
CLOCK SERIES CENTER  
FREQUENCY

|          |             |
|----------|-------------|
| Bulletin | Sm007       |
| Page     | 3 of 3      |
| Revision | 33          |
| Date     | 22 May 2024 |