

# 3.3V Surface Mount Crystal Clock Oscillator HSM6x3-series

# CONNOR WINFIELD



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## XO

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.

## Features:

- 1.0 to 170 MHz
- 3.3V Operation
- RoHS Compliant
- Tri-State Enable/Disable
- Power Saving Function: 10uA When Disabled
- Overall Frequency Tolerance:  
HSM613  $\pm$  25 ppm  
HSM623  $\pm$  50 ppm  
HSM633  $\pm$  100 ppm
- Temperature Range: -40 to 85°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)					
HSM613	1.0	-	125	MHz	
HSM623	1.0	-	170	MHz	
HSM633	1.0	-	170	MHz	
Frequency Tolerance					
HSM613	-25	-	25	ppm	1
HSM623	-50	-	50	ppm	1
HSM633	-100	-	100	ppm	1
Operating Temp Range	-40	-	85	°C	
Supply Voltage (Vdd)	3.0	3.3	3.6	Vdc	
Supply Current (Icc)					
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 (Icc)	-	-	10	uA	

## Notes:

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





## LVMOS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	-	15	pF	
Voltage High (Voh)	2.91	-	-	Vdc	
Low (Vol)	-	-	0.33	Vdc	
Current High (Ioh)	-2	-	-	mA	
Low (Iol)	-	-	2	mA	
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	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	
Period Jitter	-	3	5	ps RMS	
Integrated Phase Jitter (BW=12kHz to 20MHz)	-	0.5	1	ps RMS	
SSB Phase Noise at 10Hz offset	-	-60	-	dBc/Hz	
SSB Phase Noise at 100Hz offset	-	-90	-	dBc/Hz	
SSB Phase Noise at 1KHz offset	-	-125	-	dBc/Hz	
SSB Phase Noise at 10KHz offset	-	-140	-	dBc/Hz	
SSB Phase Noise at 100KHz offset	-	-145	-	dBc/Hz	

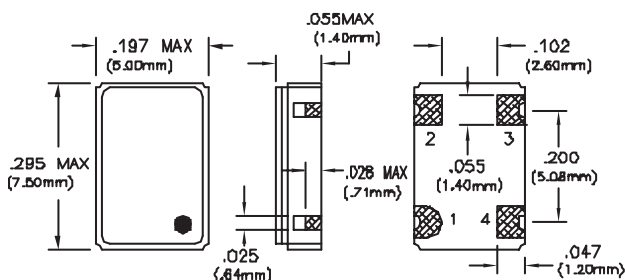
## Package Characteristics

Package Hermetically sealed ceramic package and grounded metal cover

## 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 Layout



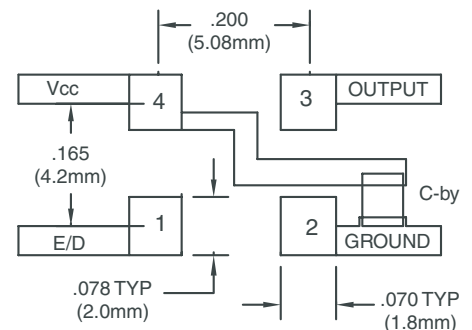
Dimensional Tolerance:  $\pm .02"$  (.508mm)  
 $\pm .005"$  (.127mm)

### Pin Connections

#### Pin Connections

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

### Suggested Pad Layout

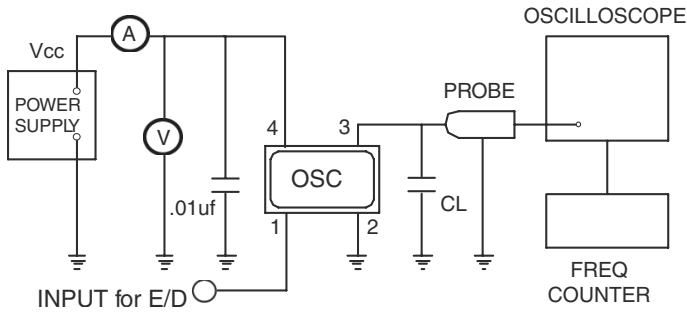


Bypass capacitor C-by should be a ceramic capacitor  $\geq 0.01\mu\text{F}$

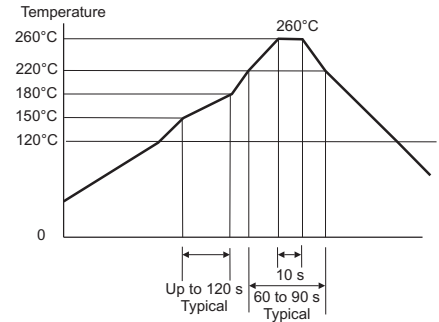
Bulletin **SM044**  
Page **2 of 3**  
Revision **16**  
Date **07 April 2021**



## Test Circuit

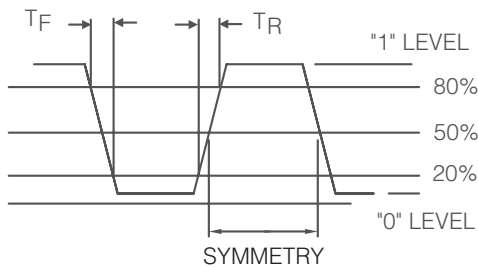


## Solder Profile



Meets IPC/JEDEC J-STD-020C

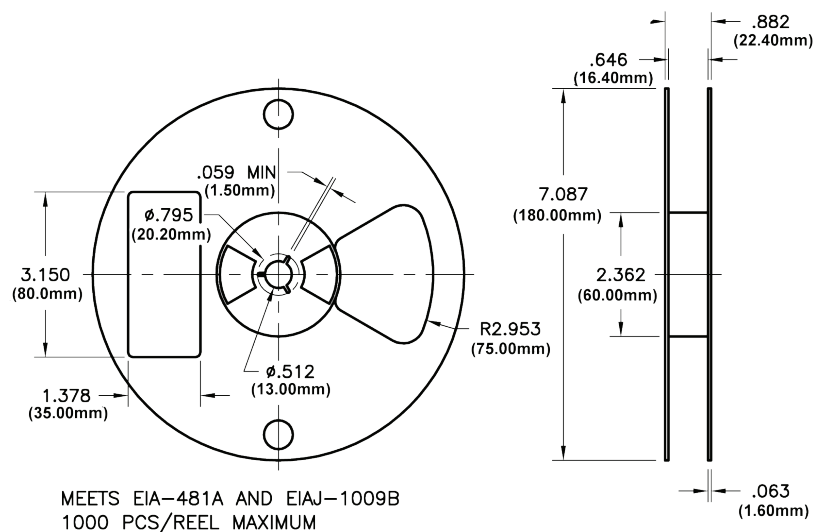
## Output Waveform



## Ordering Information Examples

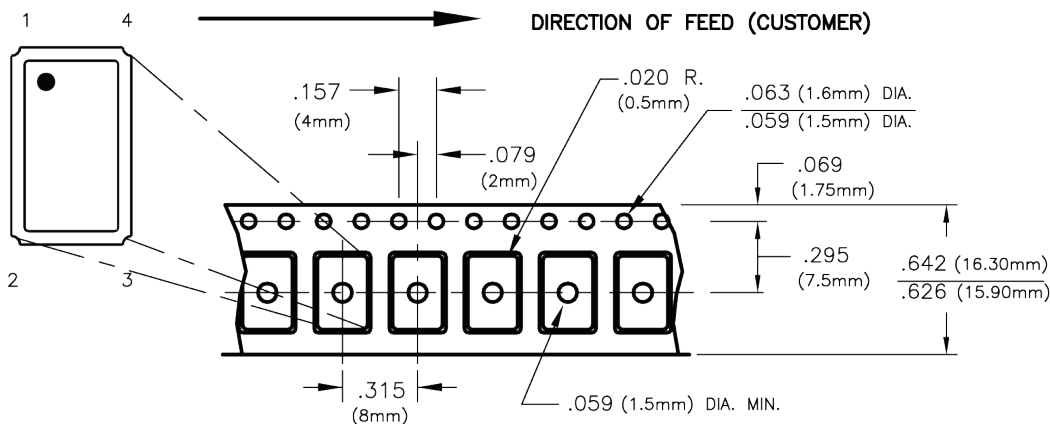
HSM633	-	048.0M
CLOCK SERIES		CENTER FREQUENCY
HSM633	-	125.0M
CLOCK SERIES		CENTER FREQUENCY

## Tape and Reel Dimensions



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

## Tape and Reel Dimensions



Bulletin	SM044
Page	3 of 3
Revision	16
Date	07 April 2021