

# 3.3V Surface Mount Crystal Clock Oscillator HSM6



## 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  $\pm 25$  ppm  
HSM623  $\pm 50$  ppm  
HSM633  $\pm 100$  ppm  
Temperature Range: -40 to 85°C  
Ceramic Surface Mount Package  
Tape and Reel Packaging

## 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.

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## 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)	$\geq 70\%$ Vdd	-	-	Vdc	2
Disable Voltage - (Vil)	-	-	$\leq 30\%$ Vdd	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 10% to 90%	-	-	6	nS	
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



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Date **27 Nov 2007**

## Package Characteristics

Package	Hermetically sealed ceramic package and metal cover
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## 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

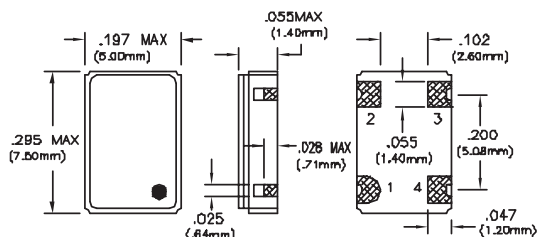
## Soldering

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%.

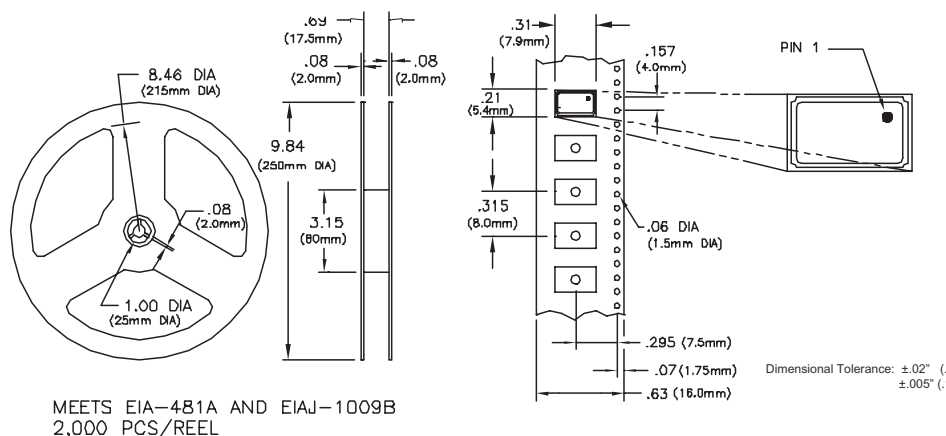


Dimensional Tolerance:  $\pm .02"$  (.508mm)  
 $\pm .005"$  (.127mm)

## Pin Connections

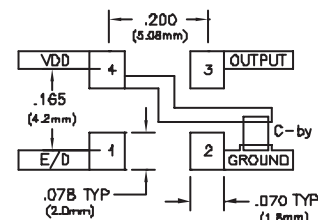
- 1: Tri-State E/D
- 2: Ground
- 3: Output
- 4: VDD

## Tape and Reel Dimensions



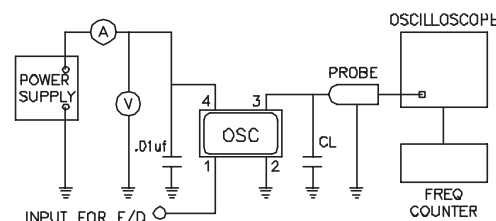
Dimensional Tolerance:  $\pm 0.02"$  ( $\pm 0.508$  mm)  
 $\pm 0.005"$  ( $\pm 0.127$  mm)

## Suggested Pad Layout

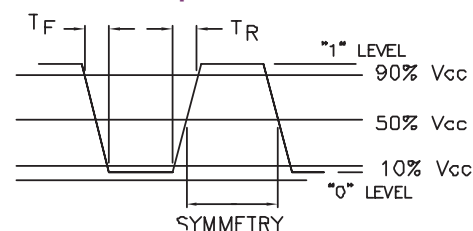


Bypass capacitor, C-by, should be ceramic capacitor  $\geq .01\mu\text{f}$ .

## Test Circuit



### Output Waveform



## Ordering Information

HSM633 - 125.0M

CLOCK  
SERIES

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