

3.3V Surface Mount Crystal Clock Oscillator HSM6

**CONNOR
WINFIELD**
HCW

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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:

1.544 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

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	-	-2	mA	
Low (Iol)	-	-			
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



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 $+125^{\circ}\text{C}$ / 30 minutes
Hermetical	No bubbles appear in Flourinert (FC-43) at $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 5 minutes
Solvent Resistance	Marking will withstand immersion in Isopropyl Alcohol or Trichloroethylene

Soldering

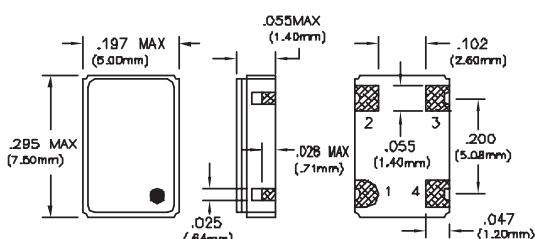
General Conditions 260°C max x 10 sec max x 2 times max or 230°C max x 180 sec max x 1 time

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: $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 4) Depth of immersion: Up to electrical terminal 5) Immersing time: Within 2 sec ± 0.5 sec into solder bath

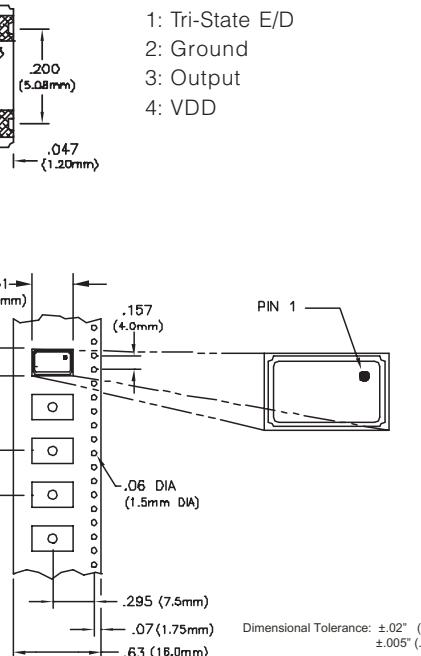
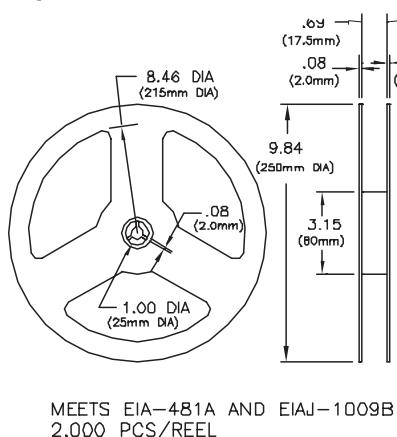
After performing the above procedures, a newly soldered coverage shall be greater than 90%



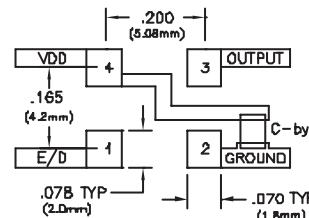
Pin Connections

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

Tape and Reel Dimensions

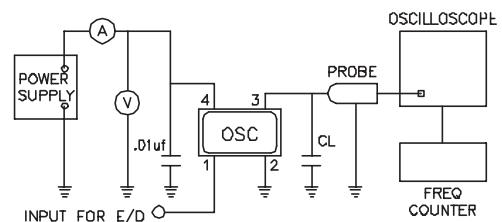


Suggested Pad Layout

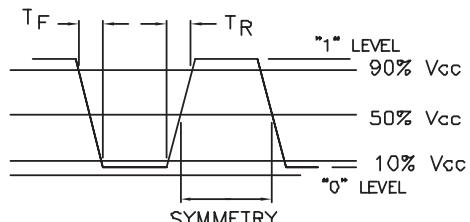


Bypass capacitor, C-by, should be ceramic capacitor $\geq .01\text{uf}$.

Test Circuit



Output Waveform



Ordering Information

HSM633 - 125.0M

CLOCK
SERIES

CENTER
FREQUENCY

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Date	27 Nov 2007