

# 3.3V Surface Mount 7.5x5mm Crystal Clock Oscillator HSM9

# CONNOR WINFIELD



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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	-	7.0	Vdc	

## Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Frequency Range (Fo)	1.544	-		MHz	
HSM943			125 & 155.52		
HSM913			170		
HSM923			170		
HSM933			170		
Frequency Tolerance		-		ppm	1
HSM943	-20		20		
HSM913	-25		25		
HSM923	-50		50		
HSM933	-100		100		
Operating Temp Range	-10	-	70	°C	
Supply Voltage (Vdd)	2.97	3.3	3.63	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)	≥ 70% Vdd	-	-	Vdc	2
Disable Voltage - (Vil)	-	-	≤ 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)	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	
0.8V to 2.4V	-	1	1.5		
20% to 80%	-	1	2		
Start-Up Time	-	-	10	mS	
Jitter (10 Hz to 20 MHz)	-	-	5	pS RMS	
(12 kHz to 20 MHz)	-	-	1	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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Date **18 May 2006**



## 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

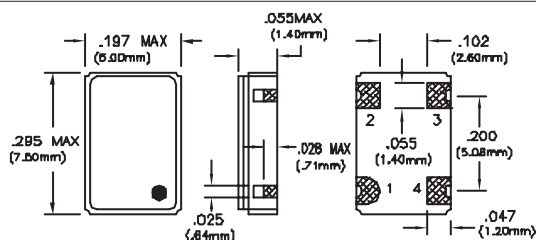
Free Drop The specimen shall meet electrical characteristics after tested 3 times, Free Drop testing on the hard wooden board from a height of 75 cm.

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%

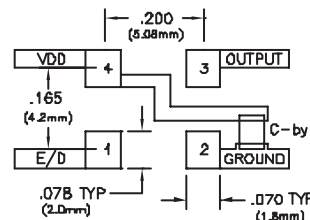


Dimensional Tolerance: ±.02" (.508mm)  
±.005" (.127mm)

## Pin Connections

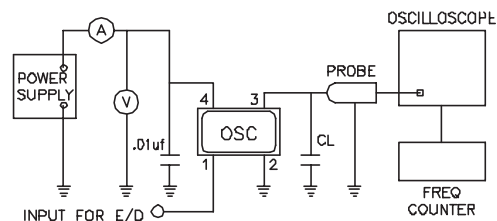
- 1: Tri-State E/D
- 2: Ground
- 3: Output
- 4: VDD

## Suggested Pad Layout

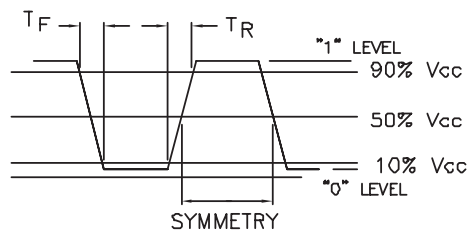


Bypass capacitor, C-by, should be ceramic capacitor ≥ .01µf.

## Test Circuit



## Output Waveform



## Marking Information

Part Number	Marking Variations
HSM913	HSM913XX HM913XX
HSM923	HSM923XX HM923XX
HSM933	HSM933XX HM933XX
HSM943	HSM943XX HM943XX

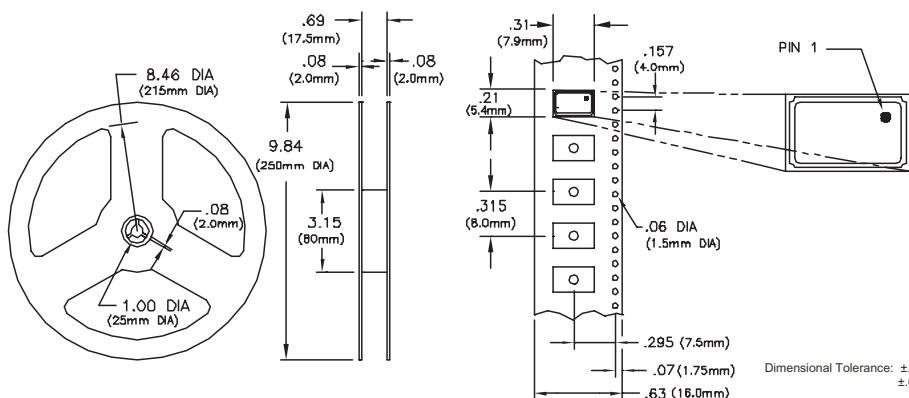
XX = Date Code

## Ordering Information

HSM943 - 125.00 MHz

CLOCK SERIES CENTER FREQUENCY

## Tape and Reel Dimensions



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

MEETS EIA-481A AND EIAJ-1009B  
2,000 PCS/REEL

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