3.3V Surface Mount 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 HCMOS, Surface Mount, Fixed Frequency Crystal Oscillators (XO) designed for use in all applications requiring precision clocks. The surface mount package is designed for high-density mounting and is optimum for mass production

Features:

- 1.544 to 170 MHz
- 3.3V Operation
- 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: 0 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	0	-	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	

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	pS RMS	

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

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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

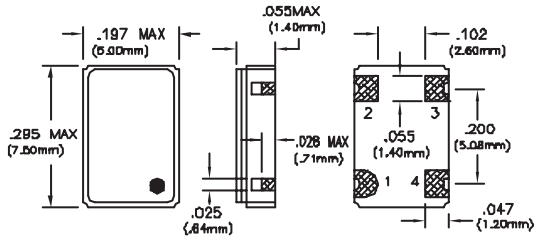
Soldering

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%

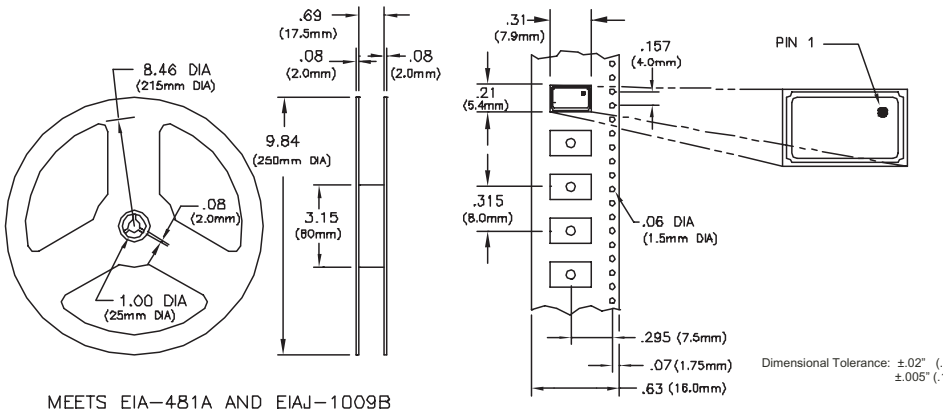


Dimensional Tolerance: ±.02" (.508mm)
±.005" (.127mm)

Pin Connections

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

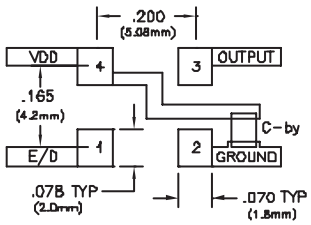
Tape and Reel Dimensions



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

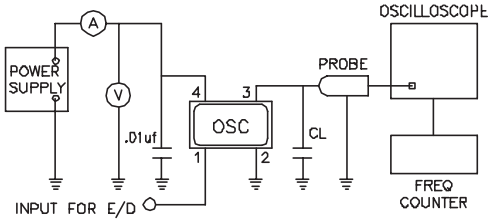
Dimensional Tolerance: ±.02" (.
±.005" (.

Suggested Pad Layout

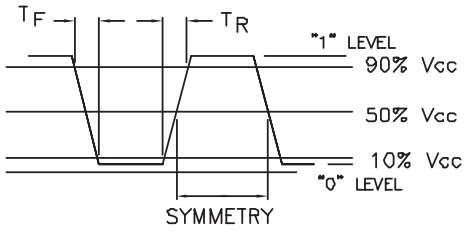


Bypass capacitor, C-by, should be ceramic capacitor ≥ .01uf.

Test Circuit



Output Waveform



Marking Information

Part Number	Marking Variations
HSM913	HSM913XX
	HM913XX
HSM023	HSM923XX
	HM923XX
HSM933	HSM933XX
	HM933XX
HSM943	HSM943XX
	HM943XX
	XX = Date Code

Ordering Information

HSM943 - 125.00 MHz

CLOCK SERIES

CENTER FREQUENCY

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