



**THE DATASHEET OF
HSM613-020.0M**





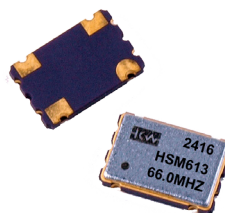
3.3V Surface Mount Crystal Clock Oscillator HSM6x3-series



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XO

The Connor-Winfield HSM613, HSM623, and HSM633 are 5x7mm, 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 ± 25 ppm
 - HSM623 ± 50 ppm
 - HSM633 ± 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 (Vdd)	-0.5	-	5.0	Vdc	

Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Frequency Range (Fo)					1
HSM613	1.0	-	125	MHz	
HSM623	1.0	-	170	MHz	
HSM633	1.0	-	170	MHz	
Frequency Tolerance					
HSM613	-25	-	25	ppm	2
HSM623	-50	-	50	ppm	2
HSM633	-100	-	100	ppm	2
Operating Temp Range	-40	-	85	°C	
Supply Voltage (Vdd)	3.0	3.3	3.6	Vdc	
Supply Current (Idd)					
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)	≥ 70% Vdd	-	-	Vdc	3
Disable Voltage - (Vil)	-	-	≤ 30% Vdd	Vdc	
Enable Time	-	-	10	mS	
Disable Time	-	-	150	nS	
Output Disable Current (Idd)	-	-	10	uA	

Notes:

1. Not all frequency and stability options are available at Digi-Key
2. Inclusive of calibration @ 25°C, frequency stability vs temperature, supply voltage change, load change, shock and vibration, 10 years aging.
3. 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	
Typical SSB Phase Noise (Fo=100MHz)					
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	

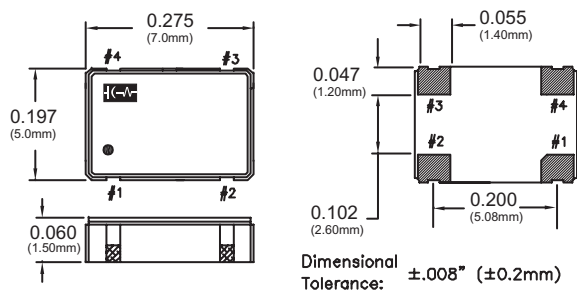
Package Characteristics

Package	Hermetically sealed ceramic package and grounded metal cover
Moisture Sensitivity Level	MSL-1

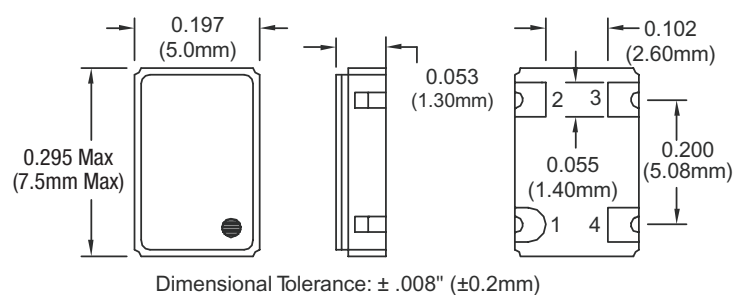
Environmental Characteristics

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.

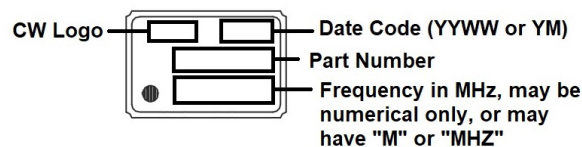
Package Outline 1



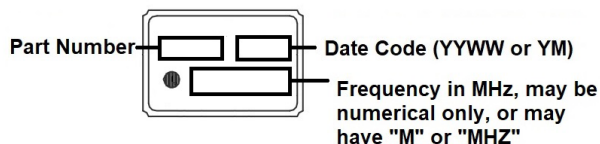
Package Outline 2



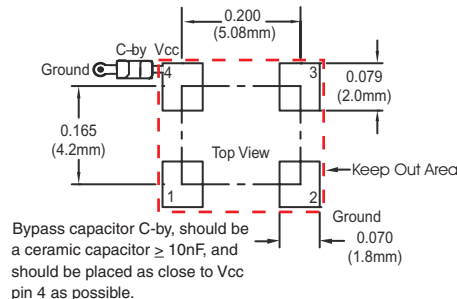
HSM-Series Marking Configurations



Alternate Marking Configuration



Suggested Pad Layout



Pin Connections

Pin Connections

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

Bulletin	SM044
Page	2 of 3
Revision	17
Date	01 May 2024

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