

MtronPTI HPO Series For Harsh Environment Applications

Electrical Specifications:

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency of Operation	F _O	25.000		150.000	MHz	
Frequency Stabilities						
Frequency Stability Over the Temperature Range	ΔF/F	-5		+5	ppm	Over -55°C to +125°C (F _{Max} - F _{Min})/2
Total Frequency Stability Over 20-years (ref. Model Table)		-25 -50		+25 +50	ppm	Includes tolerance at +25°C, variation in supply voltage, deviation over operating temperature range and 20 years aging @ +25°C
Output						
Output Type		HCMOS/TTL Compatible				
Output Load		15			pF/TTL	
Symmetry (duty cycle)	T _{DC}	45		55	%	½ V _{DD}
Logic "1" Level	V _{OH}	90% V _{DD}			V	HCMOS load
Logic "0" Level	V _{OL}			10% V _{DD}	V	
Rise/Fall Time	T _R /T _F		1.8	3	nS	From 10% to 90% V _{DD}
Random Jitter				4	pS RMS	
Phase Jitter	φ _J			1	pS RMS	Integrated 12kHz to 20MHz
Period Jitter				5	pS RMS	RMS
Cycle to Cycle Jitter				5	pS	
SSB Phase Noise						
Typical (100MHz) Under Static Conditions			-70		dBc/Hz	@ 10Hz Offset
			-104		dBc/Hz	@ 100Hz Offset
			-123		dBc/Hz	@ 1000Hz Offset
			-130		dBc/Hz	@ 10kHz Offset
			-135		dBc/Hz	@ 100kHz Offset
Additional Specifications						
Tristate Enable Logic		80% V _{DD} or N/C			V	Pad 1, Clock Signal Output
Tristate Disable Logic				0.5	V	Pad 1, Output to High-Z
Start-up Time	T _{SU}			10	mS	
Supply						
Operating Voltage	V _{DD}	3.135	3.3	3.465	V	
Operating Current	I _{DD}			90	mA	
Temperature Range						
Operating Temperature	T _A	-55		+125	°C	
Storage Temperature	T _S	-55		+125	°C	

Environmental, Mechanical & Test Report Requirements:

Mechanical Shock	Per MIL-STD-202, Method 213, Condition C (100 g's, 6 ms duration, ½ sinewave)
Vibration	Per MIL-STD-202, Method 201 & 204 (10 g's from 10-2000 Hz)
Thermal Cycle	Per MIL-STD-883, Method 1010, B (-55°C to 125°C, 15 min. dwell, 10 cycles)
Hermeticity	Per MIL-STD-202, Method 112 (1 x 10 ⁻⁸ atm cc/s of Helium)
Solderability	Per EIAJ-STD-002
Package Type	6 Pad Ceramic Leadless or 4-lead Gull Wing Configuration (Ref. Figure 1 and Figure 2)

Special Screening Steps:

The parts shall be subjected to the following screening sequence after they are sealed.

1. Burn-in: 168-hours minimum @ +125°C
2. Frequency vs Temperature Test
3. Final Electrical Test

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Dimensions, Pin Out, & Marking Information:

Pad	Lead	Function
1	1	Tristate
2		N/C
3	2	Ground
4	3	Output
5		N/C
6	4	+V _{DD}

Part Marking	
Line 1	HPO-xxxx
Line 2	fffMffffff
Line 3	M yyww

Legend	
yy	Year
ww	Work week

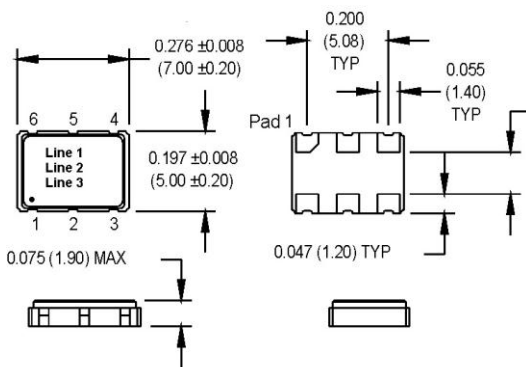


Figure 1 – Leadless Configuration

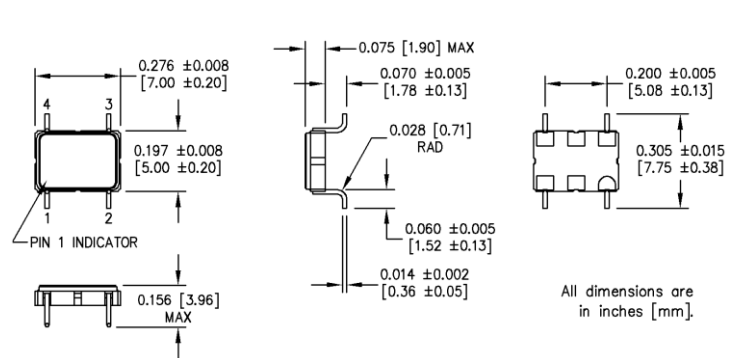


Figure 2: Gull Wing Leaded Configuration

Part Number & Ordering Information:

MtronPTI Model	Package Style	Frequency Stability
HPO-310	6-pad Leadless	±50ppm
HPO-311		±25ppm
HPO-320	4 Gull Wing Leads	±50ppm
HPO-321		±25ppm

Order Code Convention: MtronPTI Model # and Frequency

(ex.: **HPO-310-62.2080MHz**: 6-pad leadless configuration, ±50ppm 20-year stability @ 62.208MHz)

Consult the factory for additional supply voltage requirements.

Datasheet Revision Table:

Date	Rev.	Author	Details of Revision
05/23/13	-	BRM	Original Release