

## MtronPTI HPO Series For Harsh Environment Applications

### Electrical Specifications:

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency of Operation	F <sub>O</sub>	25.000		150.000	MHz	
<b>Frequency Stabilities</b>						
Frequency Stability Over the Temperature Range	ΔF/F	-5		+5	ppm	Over -55°C to +125°C (F <sub>Max</sub> - F <sub>Min</sub> )/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
<b>Output</b>						
Output Type		HCMOS/TTL Compatible				
Output Load		15			pF/TTL	
Symmetry (duty cycle)	T <sub>DC</sub>	45		55	%	½ V <sub>DD</sub>
Logic "1" Level	V <sub>OH</sub>	90% V <sub>DD</sub>			V	HCMOS load
Logic "0" Level	V <sub>OL</sub>			10% V <sub>DD</sub>	V	
Rise/Fall Time	T <sub>R</sub> /T <sub>F</sub>		1.8	3	nS	From 10% to 90% V <sub>DD</sub>
Random Jitter				4	pS RMS	
Phase Jitter	φ <sub>J</sub>			1	pS RMS	Integrated 12kHz to 20MHz
Period Jitter				5	pS RMS	RMS
Cycle to Cycle Jitter				5	pS	
<b>SSB Phase Noise</b>						
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
<b>Additional Specifications</b>						
Tristate Enable Logic		80% V <sub>DD</sub> 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 <sub>SU</sub>			10	mS	
<b>Supply</b>						
Operating Voltage	V <sub>DD</sub>	3.135	3.3	3.465	V	
Operating Current	I <sub>DD</sub>			90	mA	
<b>Temperature Range</b>						
Operating Temperature	T <sub>A</sub>	-55		+125	°C	
Storage Temperature	T <sub>S</sub>	-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 <sup>-8</sup> 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 <sub>DD</sub>

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

Legend	
yy	Year
ww	Work week

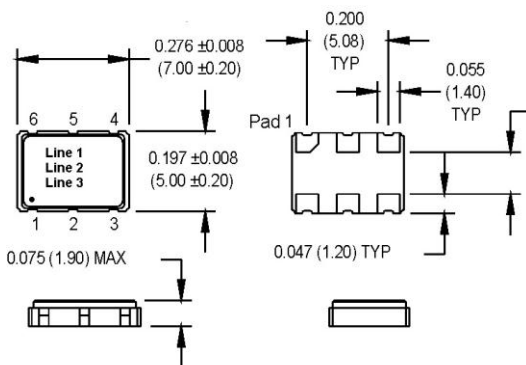


Figure 1 – Leadless Configuration

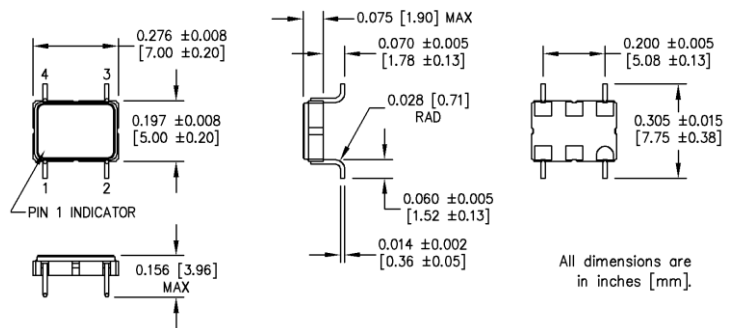


Figure 2: Gull Wing Leaded Configuration

### 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