Low Phase Noise OCXOs

10 MHz, phase noise down to -115 dBc/Hz @ 1Hz / -146 dBc/Hz @ 10 Hz

XO5123 Series

FEATURES

Stress compensated crystal cut
High stability – 5 x 10^{-12} Allan deviation
Low aging – ± 0.1 ppm/year

Ultra-low phase noise

Standard	**-140 dBc/Hz @ 10 Hz**
	-169 dBc/Hz floor
Low	**-145 dBc/Hz @ 10 Hz**
	-170 dBc/Hz floor
Ultra	**-115 dBc/Hz @ 1 Hz**
	-146 dBc/Hz @ 10 Hz
	-172 dBc/Hz floor

Sine output
Oven monitor, enable, low g-sensitivity options
Thru-hole Europack – 36 x 27 mm

APPLICATIONS

Lab instrumentation
Satellite communications
Radar
COTS

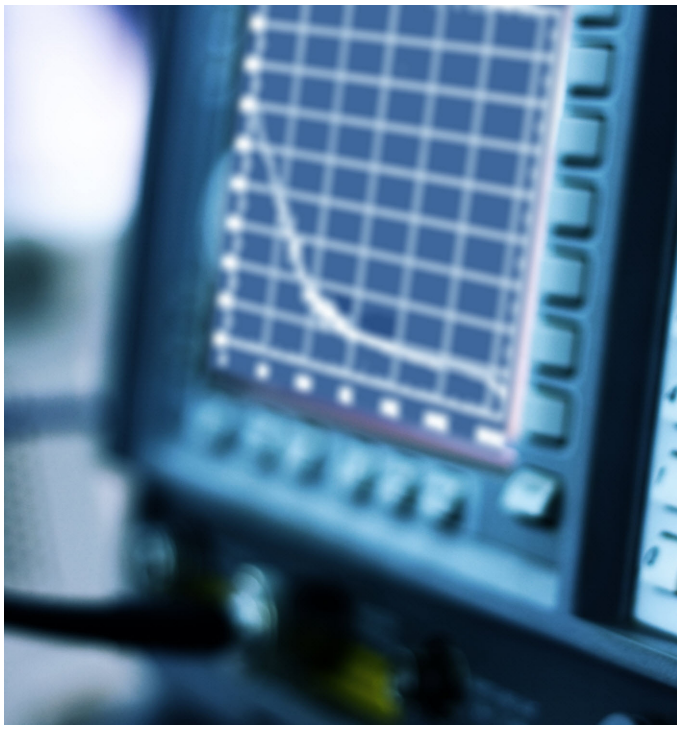
SOLID FOUNDATION

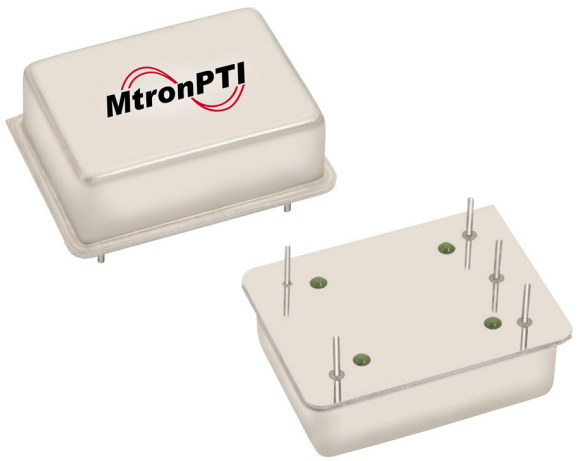
Precision measurement and reliability communications need a solid reference

Network analyzer measurements are only as good as the noise they themselves generate. Satellite communication terminals and radar need low noise to hold the channel and provide a clear image. MtronPTI's XO5123 Series Low Phase Noise OCXOs bring the ultra-low phase noise and high stability these systems need.

In the near past, low noise reference oscillators were bulky multi-cubic-inch boxes, perhaps designed by system builders themselves. No more. MtronPTI's XO5123 Series delivers down to -115 dBc/Hz @ 1 Hz and -172 dBc/Hz noise floor in a small, 36 x 27 mm, 'Europack' package. Consuming only 2.5 Watts steady state and with ± 0.1 ppm/year aging, the XO5123 Series also meets SWaP (low size, weight and power) requirements as well as ensuring long, accurate equipment life.

Nearly fifty years of crystal science and high performance oscillator design and manufacturing helps MtronPTI's XO5123 Series make measurements a bit more accurate, data links more reliable and situational awareness more complete.





2525 Shader Road, Orlando FL 32804
Mtronpti.com 407-298-2000

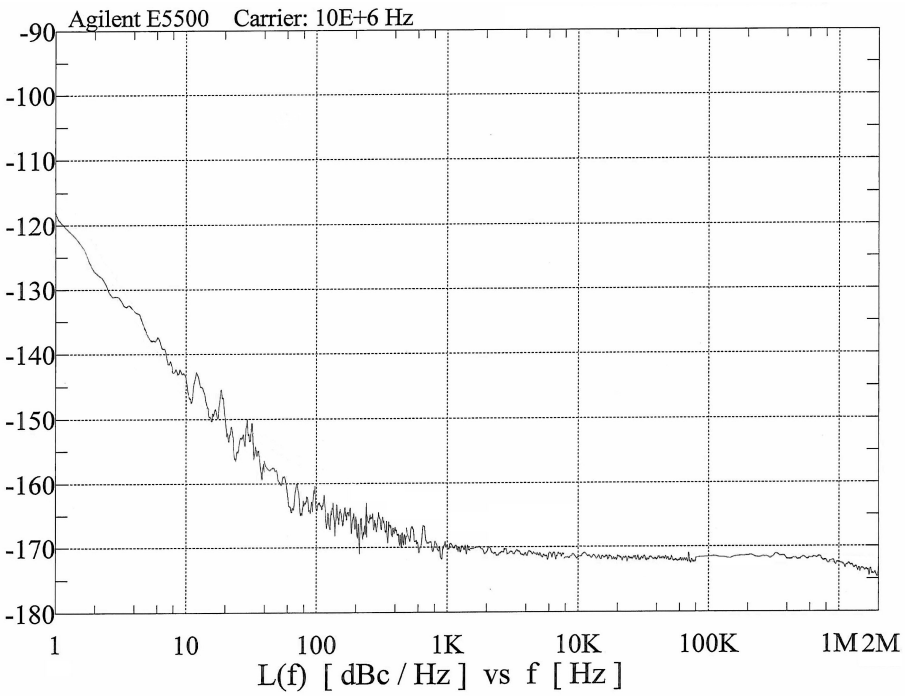
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Comment
OUTPUT FREQUENCY						
Nominal	F_O		10.000000		MHz	
Initial Frequency Accuracy		-0.1		+0.1	ppm	At time of shipment
vs. Temperature Range		-10		+10	ppb	-20 ℃ to +70 ℃, other ranges available
vs. Supply Voltage		-2.0		+2.0	ppb	±5 % change in voltage
vs. Load		-2.5		+2.5	ppb	±5 % change in load
Aging/Day		-0.5		+0.5	ppb	After 30 days power on
Aging/Year		-0.1		+0.1	ppm	
Short Term Stability (Allan deviation)				5	$x10^{-12}$	Per second
RF OUTPUT						
Output Type			Sinewave			
Output Load			50		Ω	
Level	V_{OH}		+10		dBm	Into 50Ω
Frequency Adjustment						
Method			External Voltage Tuned			
Tuning Slope			Positive			Other slope ranges available
Tuning Voltage	V_{TUNE}	0	2.5	+5	V_{DC}	
Modulation bandwidth		1			kHz	
TUNING						
Method			Digital control			
Steps			250		V_{DC}	
Data			8 bit			Parallel word
Tuning speed				25	µs	
PHASE NOISE	Standard Phase Noise Version					
SSB Phase Noise (static) achieved after warm-up			-105		dBc/Hz	@ 1 Hz Offset
				-140		@ 10 Hz Offset
				-155		@ 100 Hz Offset
				-162		@ 1 kHz Offset
				-169		@ 10 kHz Offset
				-169		@ 100 kHz Offset
	Low Phase Noise Version					
				-112	dBc/Hz	@ 1 Hz Offset
				-145		@ 10 Hz Offset
				-155		@ 100 Hz Offset
				-162		@ 1 kHz Offset
				-170		@ 10 kHz Offset
				-170		@ 100 kHz Offset
	Ultra-low Phase Noise Version					
				-115	dBc/Hz	@ 1 Hz Offset
				-146		@ 10 Hz Offset
				-158		@ 100 Hz Offset
				-165		@ 1 kHz Offset
				-170		@ 10 kHz Offset
				-172		@ 100 kHz Offset
OTHER PARAMETERS						
Warm-up Time	ΔF/F			5	Minutes	To be within ±100 ppb @ 25 ℃, referenced to the frequency after 24-hour power on
Harmonics				-30	dBc	
Spurious				-80	dBc	
Supply Voltage and Power						
Supply Voltage	V_S	4.75	5.0	5.25	V_{DC}	12 volt and other options available
Power Consumption				2.5	Watts	Steady state @ 25 ℃ in still air
				4.5	Watts	In still air @ turn on

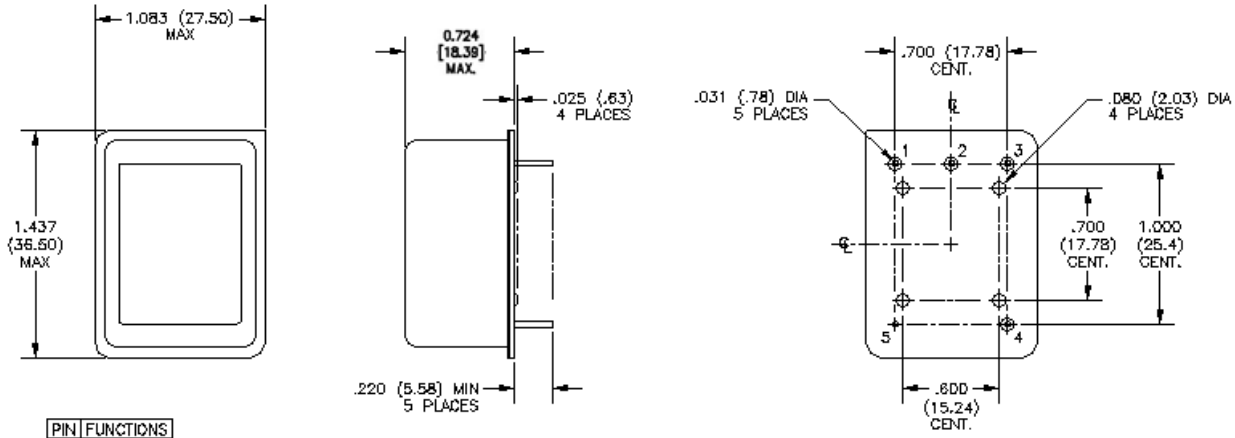
Environmental & Physical

Parameter	Symbol	Min.	Typ.	Max.	Units	Comment
Operating Temperature	OTR	-20		+70	℃	
Storage Temperature	STR	-55		+85	℃	
Vibration (survival)	Per MIL-STD 202G, Method 204, Condition A					
Shock (survival)	Per MIL-STD 202G, Method 213, Condition C					
Solderability	Per EIAJ-STD-002					
RoHS	Full RoHS Compliance					

Typical Phase Noise Plot (Ultra-low phase noise version)



Mechanical, marking and pin out



PIN	FUNCTIONS
1.	Vtune
2.	Vref
3.	SUPPLY
4.	RF OUT
5.	GROUND

DIMENSIONS ARE SHOWN IN INCHES (MM)
PIN NUMBERS SHOWN FOR REFERENCE ONLY

Revision History

Date	Rev.	Orig.	Details of Revision
20141217	1	DPD	Preliminary

2525 Shader Road, Orlando FL 32804
Mtronpti.com 407-298-2000