

- Operation from 8MHz to 6.4GHz
- Phase Noise of -165 dBc/Hz
- LO Power +13dBm
- Proprietary IF Circuitry
- High Carrier Suppression



## SUMMARY

The Holzworth HX3400 Phase Detector was designed with an emphasis on making phase noise measurements and to be used in analog phase locked loops where performance is a priority. The HX3400 uses a proprietary IF circuit that maintains optimal signal to noise ratio, improving the performance over standard phase detectors typically by 3dB to 6dB.

The HX3400 Phase Detector helps take the guess work out of phase noise measurements with fully characterized and guaranteed performance. Holzworth products are 100% final performance tested for phase noise verification<sup>1</sup>.

## SPECIFICATIONS<sup>2</sup>

PARAMETER	MIN	TYP	MAX	UNITS	COMMENTS
LO/RF Frequency Range	8		6400	MHz	50 ohms
IF Frequency Range	DC		1M	Hz	50 ohms or High Impedance
LO Power	+10	+13	+ 16	dBm	
RF Power			+ 13	dB	Not to exceed LO minus 3dB
Phase Noise 100MHz, 10kHz Offset 100MHz, 1Hz intercept		-165 -140	-160 -135	dBc/Hz dBc/Hz	
Phase Detector Constant ( $K_D$ ) RF = +14dBm, LO = +14dBm		0.3		V/rad	IF into 500 ohms
LO/RF Rejection		50		dB	
LO / RF / IF Connectors	SMA Female				
Housing Dimensions (LxWxH)	1.75" x 1.5" x 0.5" (44.5mm x 38.1mm x 12.7mm)				

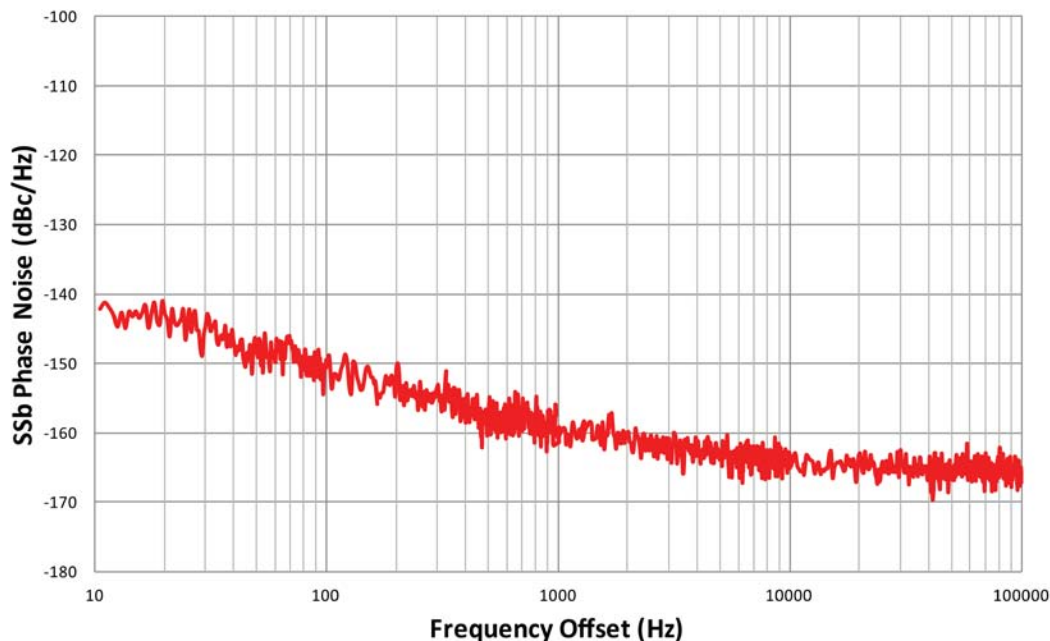
<sup>1</sup> Final performance verification at LO=100MHz, LO<sub>PWR</sub>=+14dBm, RF<sub>PWR</sub>=+14dBm

<sup>2</sup> Specifications are subject to change per the discretion of Holzworth Instrumentation, Inc.

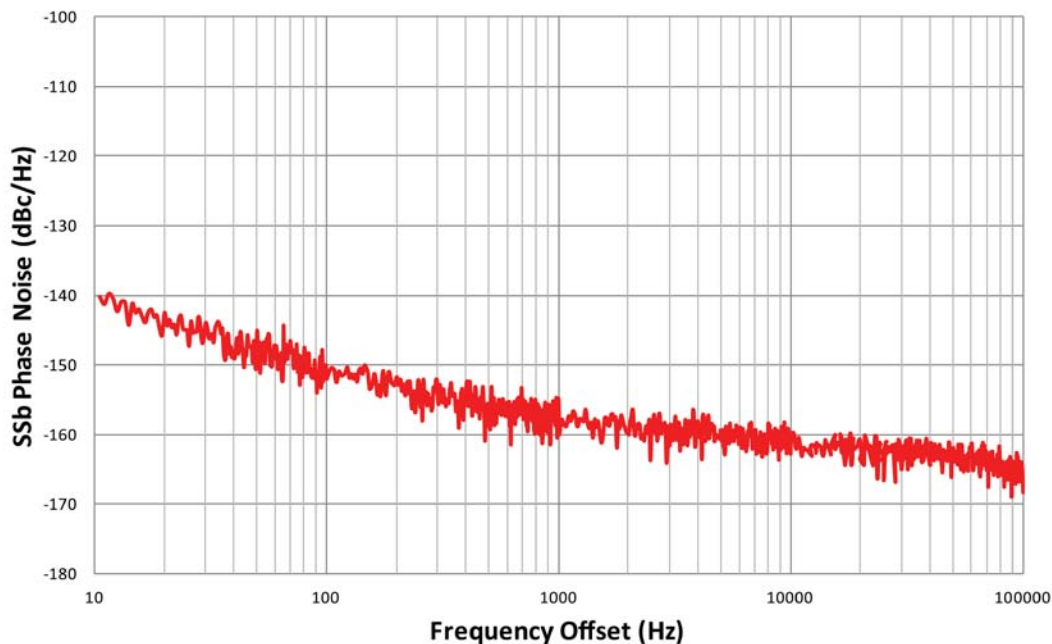
## RoHS Compliant

**HX3400 PERFORMANCE DATA**

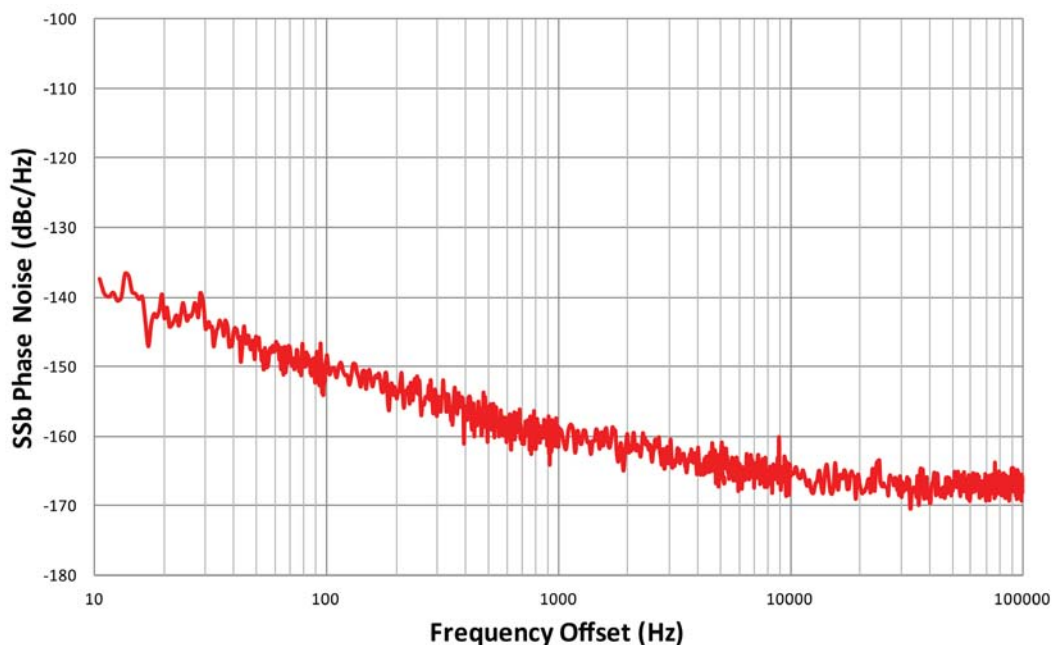
The data provided here demonstrates typical performance of the HX3400 Phase Detector under ambient laboratory conditions.



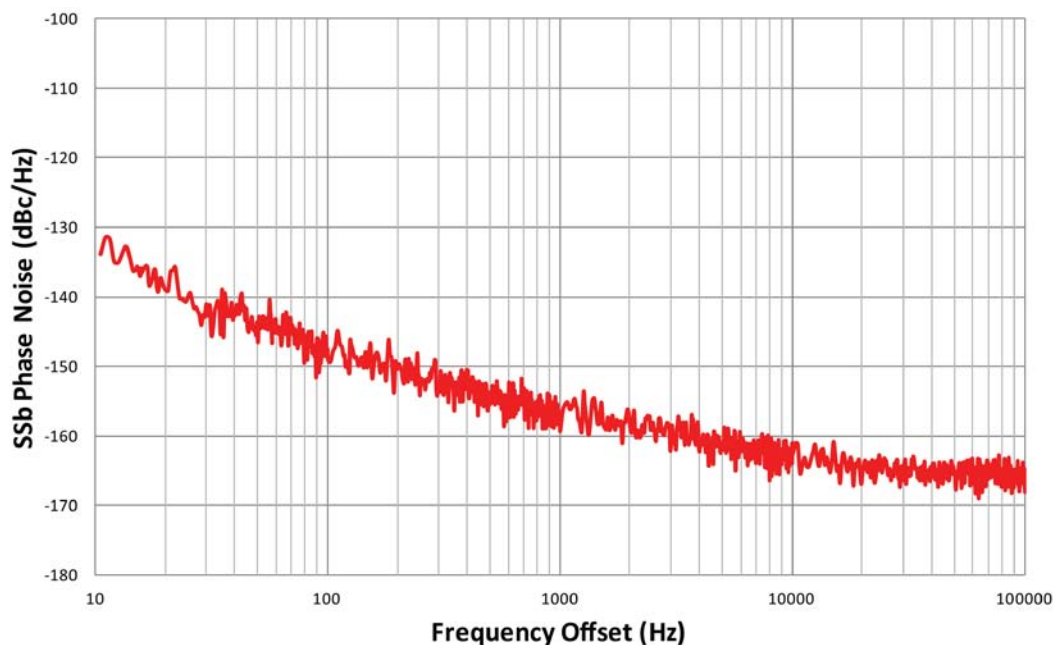
**Figure 1: SSB Phase Noise, Carrier = 10MHz**  
**(LO = 10dBm, RF = 2dBm)**



**Figure 1: SSB Phase Noise, Carrier = 100MHz**  
**(LO = 10dBm, RF = 2dBm)**

**HX3400 PERFORMANCE DATA (continued)**

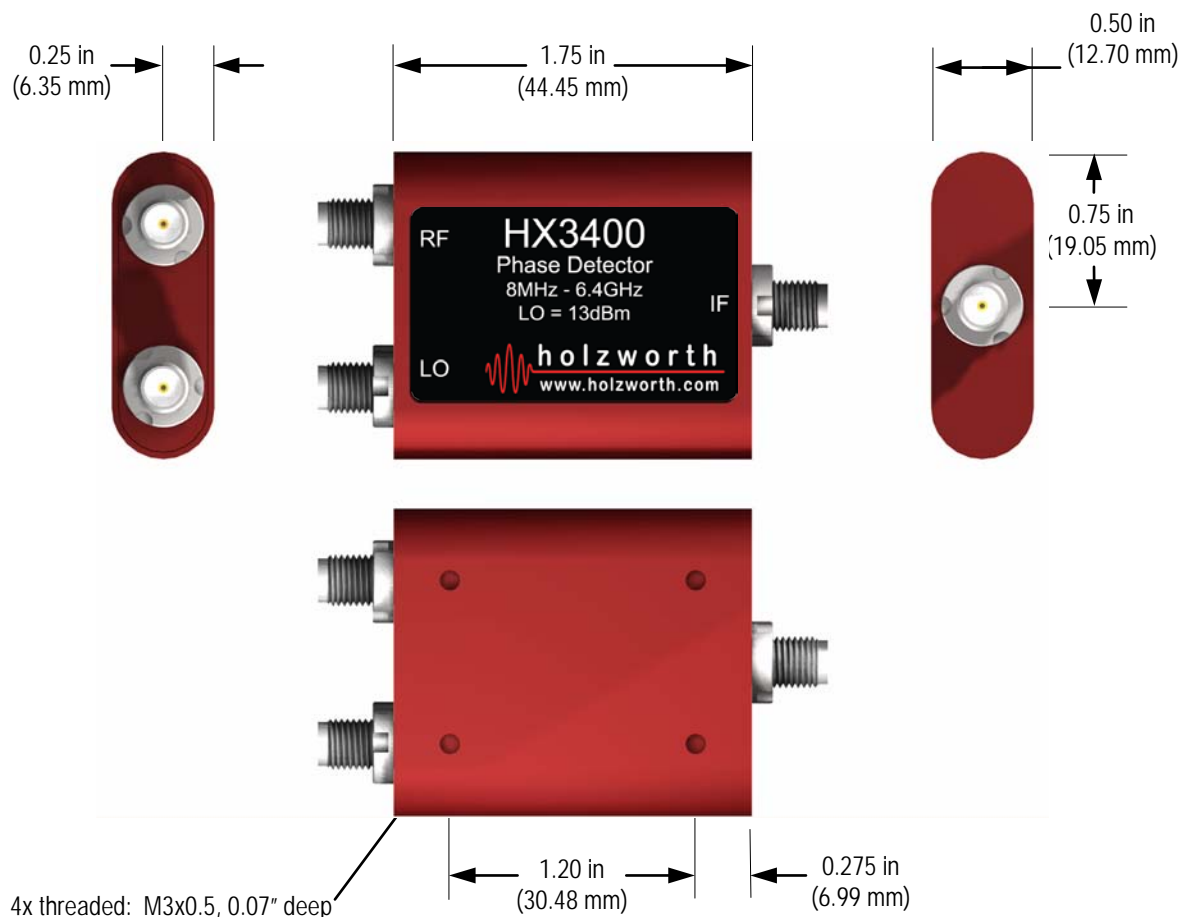
**Figure 1: SSB Phase Noise, Carrier = 1GHz**  
(LO = 10dBm, RF = 2dBm)



**Figure 1: SSB Phase Noise, Carrier = 6GHz**  
(LO = 10dBm, RF = 2dBm)

## MECHANICAL

The HX3400 comes in a compact, shielded housing complete with threaded mounting holes for ease of system integration into various test sets.



RoHS Compliant

## WARRANTY

All Holzworth phase detectors come with a 1 year 100% product warranty covering manufacturing defects. All product repairs and maintenance must be performed by Holzworth Instrumentation. Holzworth reserves the right to invalidate the warranty for any product that has been tampered with or used improperly. Refer to Holzworth Terms & Conditions of Sales for more details.