

## **MN745-0640.00-10.00**

### **Phase Locked Voltage Controlled SAW Oscillator**

#### **DESCRIPTION**

The MN745-0640.00-10.00 Phase Locked Voltage Controlled SAW Oscillator (VCISO) is a member of Spectrum Microwave's MN745 series of high performance low noise phase locked SAW oscillators designed for the military applications.

The design is based upon a fundamental VCISO in the 375 MHz to 750 MHz frequency range. The phase lock loop bandwidth can be optimized for phase noise and vibration sensitivity.

The MN745 series of phase locked VCISOs accepts external reference frequencies up to 32 MHz.



#### **FEATURES**

- Combines the high fundamental frequency and low noise of a SAW Oscillator with the frequency stability of a user applied reference.
- Low Phase Noise (10 kHz loop bandwidth)
  - -112 dBc/Hz at 1 kHz
  - -115 dBc/Hz at 10 kHz
- Low vibration sensitivity
  - $.05 \times 10^{-9}$  per g ( $F_{VIB} < 1$  kHz)
- -40°C to 85°C operating range

#### **APPLICATIONS**

- Local Oscillators
- Low Noise Clocks
- Reference Frequency Multiplier

#### **ABSOLUTE MAX RATINGS**

Operating Temperature: -40°C to 85°C  
Storage Temperature: -55°C to 125°C  
Power Supply Voltage: 6V



**SPECIFICATIONS**

Specifications apply at Vcc = 5.0V and Tcase = 25°C unless otherwise specified.

Parameter	Minimum	Typical	Maximum	Units	Notes
Center Frequency Range	375	625	750	MHz	
Lock Range	-100		100	ppm	
Output Power	8	10	12	dBm	-40°C to 85°C
Harmonic Spurious			-30	dBc	
Non-coherent Spurious			-75	dBc	
Reference Spurious			-65	dBc	Note 1
Reference Frequency	1		32	MHz	
SSB Phase Noise					
$\Delta f = 10 \text{ Hz}$		-65			Note 1
$\Delta f = 100 \text{ Hz}$		-95			Note 1
$\Delta f = 1 \text{ kHz}$		-110		dBc/Hz	Note 1
$\Delta f = 10 \text{ kHz}$		-115		dBc/Hz	Note 1
$\Delta f = 100 \text{ kHz}$		-140		dBc/Hz	Note 1
$\Delta f = 1 \text{ MHz}$		-155		dBc/Hz	Note 1
$\Delta f = 10 \text{ MHz}$		-155		dBc/Hz	Note 1
Reference SSB Phase Noise					
$\Delta f = 10 \text{ Hz}$		-103			Note 1
$\Delta f = 100 \text{ Hz}$		-133			Note 1
$\Delta f = 1 \text{ kHz}$		-148		dBc/Hz	Note 1
$\Delta f = 10 \text{ kHz}$		-150		dBc/Hz	Note 1
$\Delta f = 100 \text{ kHz}$		-150		dBc/Hz	Note 1

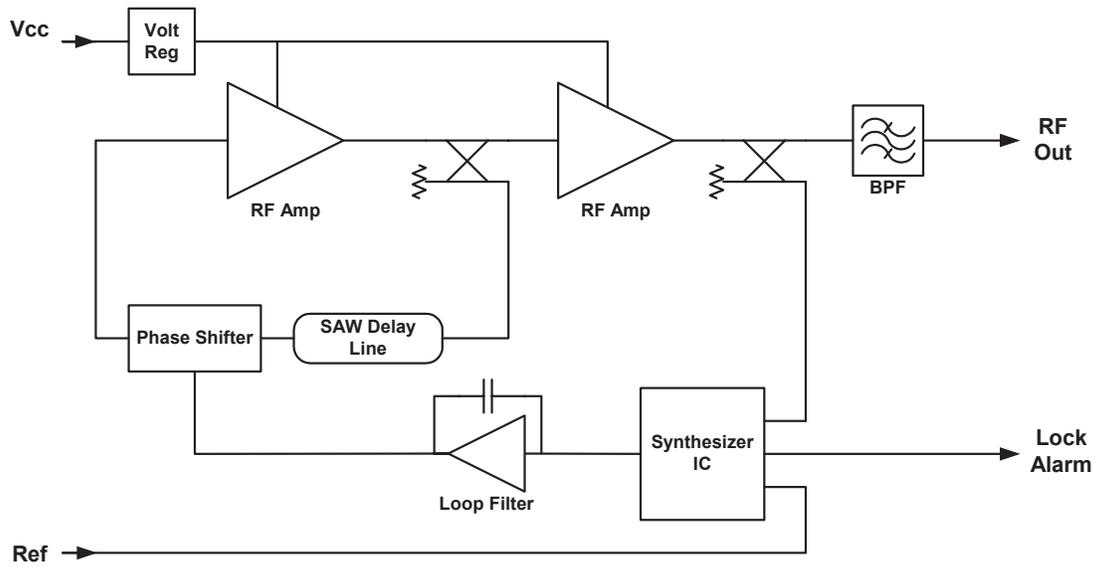


**SPECIFICATIONS**

Parameter	Minimum	Typical	Maximum	Units	Notes
$\Delta f = 1 \text{ MHz}$		-150		dBc/Hz	Note 1
$\Delta f = 10 \text{ MHz}$		-150		dBc/Hz	Note 1
Loop Bandwidth		10		kHz	Set to optimize phase noise and vibration sensitivity
Vibration Sensitivity		$.005 \times 10^{-9}$		1/G <sub>PEAK</sub>	Note 1
Lock Detect, Locked	2.0		3.3		LVTTL
Lock Detect, Unlocked	0.0		0.8	V	LVTTL
Vcc	4.75	5	5.25	Volts	
Icc		110	140	mA	
Operating Temperature	-40		85	°C	Case temperature

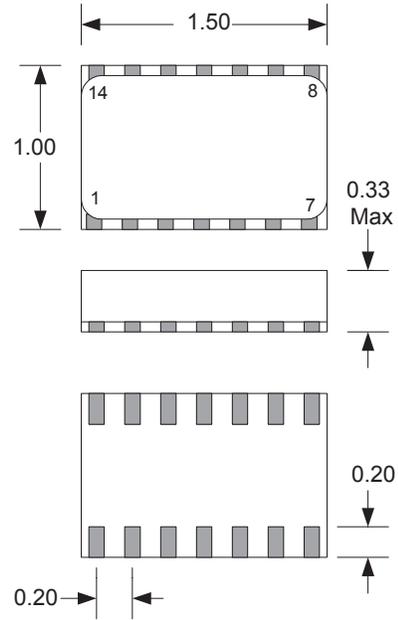
Note 1: 640 MHz Output Frequency, 10 MHz Reference Frequency, 10 kHz PLL Loop Bandwidth. Note that the close-in phase noise will vary with loop bandwidth and reference frequency.

**BLOCK DIAGRAM**

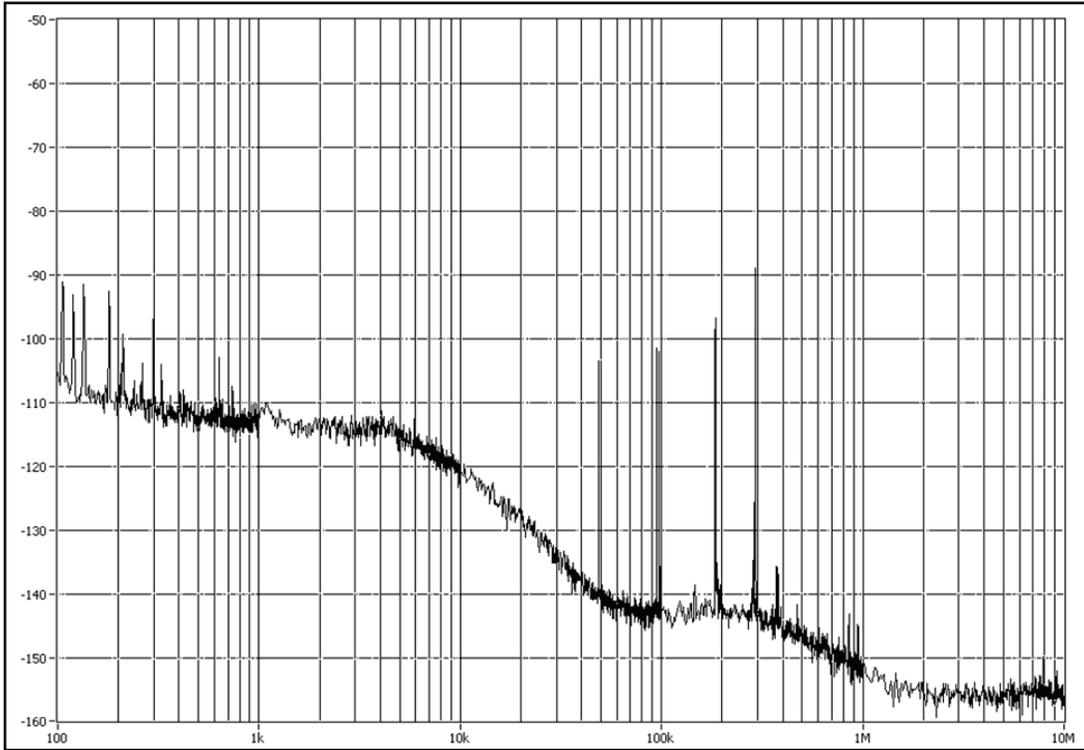


**OUTLINE DRAWING**

Pin	Function
1	Reference Input
2, 3, 4, 5, 6	Ground
7	Ground
8	RF Output
9, 13	Ground
10	DNC
11	Lock Alarm
12, 14	Vcc



**PHASE NOISE DATA**



Typical MN745-0640.00-10.00 SSB Phase Noise

Note: The noise spectrum from 100 kHz to 10 MHz is the noise floor of the phase noise test set.