XO5160 - XO5164 Series
14 pin DIP, 3.3, 5.0 or 12.0 Volt, HCMOS/TTL/Sinewave, OCXO

MtronPTI®

RoHS Compliant

- **Standard DIP/DIL package offering tight stabilities, fast warm-up, and low current**
- **Ideal for PCS base stations, cellular base stations, phase locking, and SAR/SAT applications**
- **SMT Surfboard Option**

Ordering Information

XO51xx   A   C   V5   D   -R   00-0000 MHz

Product Series
XO5160 = 5V HCMOS/TTL
XO5161 = 12V HCMOS/TTL
XO5162 = 5V Sinewave
XO5163 = 12V Sinewave
XO5164 = 3.3V HCMOS

Operating Temperature
A = 0°C to +60°C
B = -20°C to +70°C
C = -40°C to +85°C

Frequency Stability
H: ±0.05 ppm (0.10 ppm pk-pk)   **G:** ±0.075 ppm (0.15 ppm pk-pk)
A: ±0.1 ppm (0.20 ppm pk-pk)   **B:** ±0.15 ppm (0.30 ppm pk-pk)
C: ±0.2 ppm (0.40 ppm pk-pk)   **D:** ±0.25 ppm (0.50 ppm pk-pk)
E: ±0.3 ppm (0.60 ppm pk-pk)   **F:** ±0.5 ppm (1.00 ppm pk-pk)
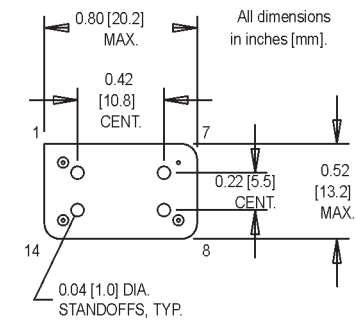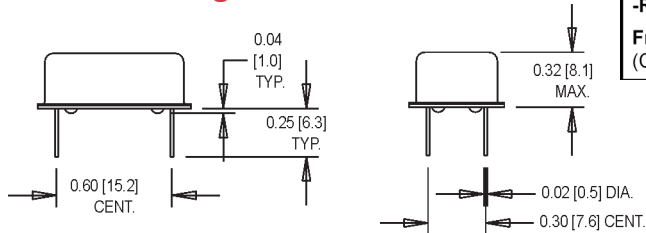
Frequency Adjustment
R1 = Internal voltage with external potentiometer (Fig. 1)
V5 = External voltage with external potentiometer (Fig. 2)
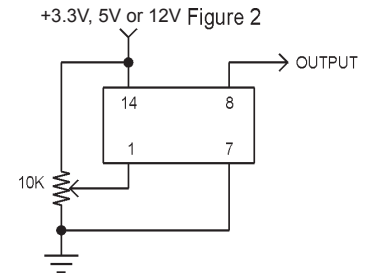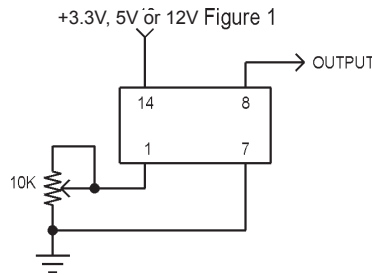
Package Configuration
D: 14 pin DIP
S: Surfboard

RoHS Compliance
Blank: non RoHS compliant part
-R: RoHS compliant part

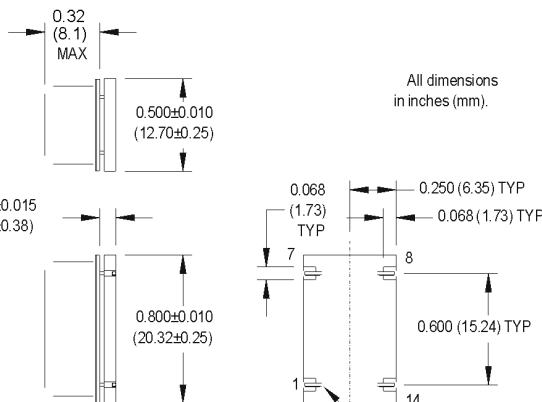**Frequency of Operation**
(Customer Specified)

M7003Sxxx, M7006Sxxx, M7007Sxxx, M7008Sxxx & M7009Sxxx - Contact factory for datasheets.
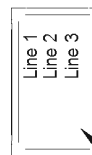
PTH Package D

0.04 [1.0] TYP.
0.25 [6.3] TYP.
0.60 [15.2] CENT.

0.32 [8.1] MAX.
0.02 [0.5] DIA.
0.30 [7.6] CENT.

0.80 [20.2] MAX.
0.42 [10.8] CENT.
All dimensions in inches [mm].
0.22 [5.5] CENT.
0.52 [13.2] MAX.
0.04 [1.0] DIA. STANDOFFS, TYP.

+3.3V, 5V or 12V **Figure 1**

OUTPUT
14   8
1   7
10K

+3.3V, 5V or 12V **Figure 2**

OUTPUT
14   8
1   7
10K

SMTPackage S

Pin Connections

PIN	FUNCTION
1	Frequency Adjust
7	Case ground & supply return
8	R.F. Output
14	Supply (+)

0.32 (8.1) MAX
0.500±0.010 (12.70±0.25)
0.087 ±0.015 (2.21 ±0.38)
Line 1 Line 2 Line 3
0.800±0.010 (20.32±0.25)
PIN 1 DESIGNATOR

All dimensions in inches (mm).

0.068 (1.73) TYP
0.250 (6.35) TYP
0.068 (1.73) TYP
7   8
0.600 (15.24) TYP
1   14
ELECTRICALLY ACTIVE, 4 PLACES MUST BE INSULATED FROM EXTERNAL CIRCUITRY.

SUGGESTED SOLDER PAD LAYOUT
0.456 (11.58)
0.112 (2.84)
0.600 (15.24)
0.078 (1.98)

Please see **www.mtronpti.com** for our complete offering and detailed datasheets. Contact us for your application specific requirements: MtronPTI **1-800-762-8800.**

Revision: 7-7-08

Electrical Specifications

Parameter		Symbol	Min.	Typ.	Max.	Units	Conditions/Notes
Frequency Range		F_O	10.0000		40.0000	MHz	
Operating Temperature		T_A	-40		+85	°C	See Ordering Information & Table 1
Frequency Stability			±0.05		±0.5	ppm	See Ordering Information & Table 1
Short-Term Stability					5×10^{-10}		Tau = 0.1 to 30 secs.
Frequency Vs. Aging					0.7	ppm	First year
					±4.0	ppm	For 10 years
Frequency Vs. Supply					±0.1	ppm	For ±0.2 volt supply variation
Frequency Vs. Load					±0.01	ppm	
Supply Voltage	XO5160	V_{dd}	4.75	5.0	5.25	V	
	XO5161	V_{dd}	11.5	12.0	12.5	V	
	XO5162	V_{dd}	4.75	5.0	5.25	V	
	XO5163	V_{dd}	11.5	12.0	12.5	V	
	XO5164	V_{dd}	3.15	3.3	3.45	V	
Supply Current	XO5160	I_{dd}			70	mA	At +30°C
	XO5161	I_{dd}			30	mA	At +30°C
	XO5162	I_{dd}			70	mA	At +30°C
	XO5163	I_{dd}			30	mA	At +30°C
	XO5164	I_{dd}			110	mA	At +30°C
Turn-On Current		I_{to}			250	mA	After 10 secs.
Warm-Up Time					2×10^{-7}		2 min after power up following 4 hour off time – reference to frequency after 1 hour of operation
Tuning Voltage	XO5160	V_T	0.5		5.0	V	
	XO5161	V_T	0		5.0	V	
	XO5162	V_T	0.5		5.0	V	
	XO5163	V_T	0		5.0	V	
	XO5164	V_T	0		3.3	V	
Frequency Adjustment			±4.0			ppm	Over tuning voltage range
Output Level			1		2	Vpk-pk	Sinewave 50 Ohm load
Symmetry		Sym	45/55		55/45	%	Ref. To ½ V_{dd} HCMOS output logic
Output Load		R_L			15	pF	XO5160, XO5161, XO5164 only
		R_L			10	LSTTL	XO5160, XO5161, XO5164 only
		R_L		50		Ohms	XO5162, XO5163 only
Rise/Fall Time (10% to 90%)		Tr/Tf			7	nS	1-40 MHz (Frequency dependent) HCMOS output logic
Logic Level "0"		V_{OL}			10% Vdd	V	HCMOS output logic
Logic Level "1"		V_{OH}	90% Vdd			V	HCMOS output logic
Phase Noise (Typical) 10 MHz							
1 Hz				-70		dBc/Hz	Offset from carrier
10 Hz				-100		dBc/Hz	Offset from carrier
100 Hz				-130		dBc/Hz	Offset from carrier
1 kHz				-140		dBc/Hz	Offset from carrier
10 kHz				-145		dBc/Hz	Offset from carrier
100 kHz				-150		dBc/Hz	Offset from carrier

Environmental

Parameter	Value
Vibration	2000 Hz, 10 g
Storage Temperature	-55°C to +125°C
Hermeticity	Per MIL-STD-202, Method 112
Solderability	Per EIAJ-STD-002
Max Soldering Conditions	+245°C for 10 secs. Max. (DIP version only)
Max Soldering Conditions	+220°C for 10 secs. Max. (SMT version only)

XO5160-XO5162: TTL Load – see load circuit diagram #1. HCMOS Load – see load circuit diagram #2.