



## OSM4 Series 5.0V Sinewave Oven Controlled Oscillators

March 2007

- Ovenized quartz crystal high precision square wave generator with a Sine Wave output.
- Tube packaging is available.
- 10 to 20 MHz
- Full Size Thru-Hole DIP package
- Electronic Frequency Control (EFC) optional
- Good phase noise characteristics

**Pletronics Inc. certifies this device is in accordance with the RoHS 6/6 (2002/95/EC) and WEEE (2002/96/EC) directives.**

Pletronics Inc. guarantees the device does not contain the following:  
Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
Weight of the Device: 6.2 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020C  
Second Level Interconnect code: e1

### Absolute Maximum Ratings:

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +7.0V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 0.5V

### Reliability: Environmental Compliance

Parameter	Condition
Vibration	10 to 2000 Hz / 10 g
Shock	2000 g, 0.3 mS, ½ sine
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A



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**Part Number:**

OSM4048052 G G 010 040 -20.00M -XX

OSM4048052 G G 010 040 -20.00M -XX	Internal code or blank
	<b>Frequency MHZ</b> (standards Shown) 10.000 12.800 16.000 16.384 19.440 20.000 32.768 40.000
	<b>Electronic Frequency Control</b> <b>000</b> = No EFC <b>020</b> = $\pm$ 2.0 ppm minimum <b>040</b> = $\pm$ 4.0 ppm minimum <b>150</b> = $\pm$ 15.0 ppm minimum <b>999</b> = $\pm$ 4.0 ppm with 0 to 10K ohm
	<b>Frequency Stability</b> <b>003</b> = $\pm$ 25 ppb for 0°C to 60°C <b>008</b> = $\pm$ 75 ppb for 0°C to 60°C <b>005</b> = $\pm$ 50 ppb for -20°C to 70°C <b>015</b> = $\pm$ 150 ppb for -20°C to 70°C <b>010</b> = $\pm$ 100 ppb for -40°C to 85°C <b>025</b> = $\pm$ 250 ppb for -40°C to 85°C
	<b>Upper Operating Temperature</b> <b>C</b> = 50°C <b>F</b> = 65°C <b>J</b> = 80°C <b>D</b> = 55°C <b>G</b> = 70°C <b>K</b> = 85°C <b>E</b> = 60°C <b>H</b> = 75°C <b>L</b> = 90°C
	<b>Lower Operating Temperature</b> <b>C</b> = 0°C <b>F</b> = -15°C <b>J</b> = -30°C <b>D</b> = -5°C <b>G</b> = -20°C <b>K</b> = -35°C <b>E</b> = -10°C <b>H</b> = -25°C <b>L</b> = -40°C
<b>Series Model</b>	

**Part Marking:**

PLE  
OSM4050c  
fff.fff M  
ymdannn

Where: c = N for no EFC, R for resistor, V for voltage  
fff.fff = Frequency in MHz  
Ymda = Date code (Year Month Day plus internal code)  
n n n = Device number

Standard values are listed, consult Pletronics Inc. for other options. Specifications such as frequency stability and operating temperature range, etc. are not identified from the marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

**Codes for Date Code YMD**

Code	6	7	8	9	0	1	2
Year	2006	2007	2008	2009	2010	2011	2012

Code	A	B	C	D	E	F	G	H	J	K	L	M
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C
Day	1	2	3	4	5	6	7	8	9	10	11	12
Code	D	E	F	G	H	J	K	L	M	N	P	R
Day	13	14	15	16	17	18	19	20	21	22	23	24
Code	T	U	V	W	X	Y	Z					
Day	25	26	27	28	29	30	31					



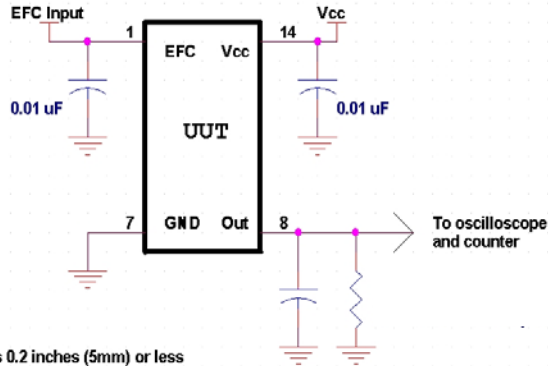
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## Specification for 5.00V $\pm$ 0.20V over the specified temperature range

Item	Min	Max	Unit	Condition	
Frequency Range	10	20	MHZ	See list of standard frequencies	
Frequency Accuracy vs. Temperature	-250	250	ppb	determined by part number	
Frequency Accuracy vs. Supply	-100	+100	ppb	for Supply change of 0.2V	
Frequency Accuracy vs. Load	-10	+10	ppb	Load change of $\pm$ 10%	
Frequency Accuracy Short Term	-0.5	+0.5	ppb	for periods of 0.1 seconds to 30 seconds	
	-0.05	+0.05	ppb	for a period of 1 second	
Aging	1 <sup>st</sup> Year	-0.70	+0.70	ppm	
	10 Years	-4.0	+4.0	ppm	Accumulated for 10 years
Frequency Control	Voltage	-4.0	+4.0	ppm	0.5V to 5.0V, determined by part number > 47 K ohm
	(positive slope) Resistance	-4.0	+4.0	ppm	0 to 10 Kohm, determined by part number > 4.7 K ohm
Phase Noise	1 Hz	--	-80	dBc/Hz	
	10 Hz	--	-110		
	100 Hz	--	-135		
	1,000Hz	--	-145		
Warmup	--	30	sec	within specification after turn on at 0°C	
Output Waveform	Sine Wave				
Output Level	1.0	2.0	V PP	50 ohm load	See Load Circuit
	2.0	4.0	V PP	1K ohm // 5pF	
Output Harmonics	--	-10	dBc	50 ohm load	
Output Spurious	--	-70	dBc	50 ohm load	
Power Supply Current	--	110	mA	at -20°C	
	--	70	mA	at +30°C	
	Warmup	--	250	mA	for 10 seconds maximum
Operating Temperature Range	-40	+85	°C	Part number defines the temperature range to meet the accuracy specification	
Storage Temperature Range	-55	+125	°C		

## Load Circuit (nominal load: 50 ohms)



All leads 0.2 inches (5mm) or less

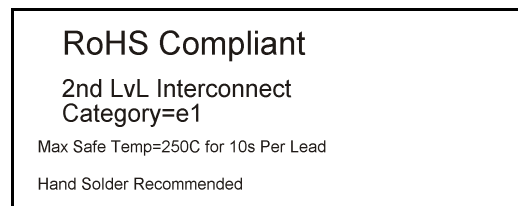
## ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	2000	MIL-STD-883 Method 3115
Charged Device Model	2000	JESD 22-C101

## Package Labeling

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Courier New  
Bar code is 39-Full ASCII

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Arial

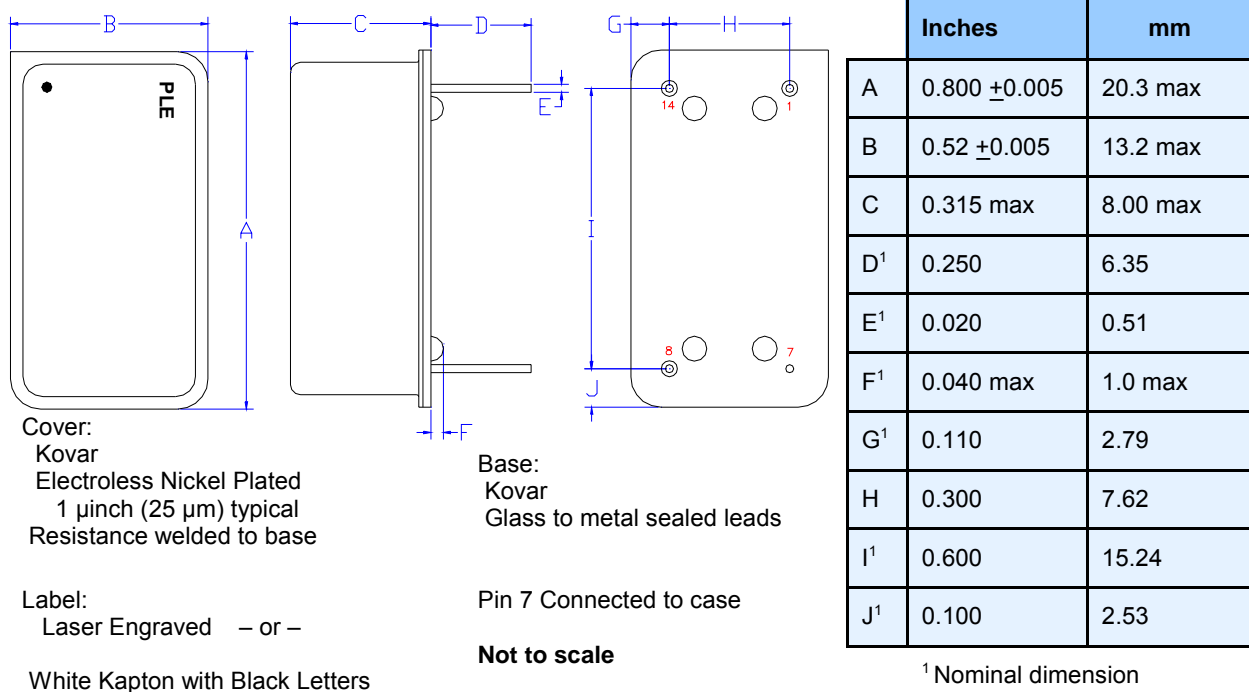


(Will show OSM on label)

## PCB Mounting (typical for lead free processing)

Hand soldering is recommended at 250°C maximum for 5 seconds maximum per pin

### Mechanical:



Pin	Function	Note
1	EFC	10 K ohm to ground –OR– 0.5 to 5.0V control voltage, depends on option ordered. Use the 30% value for initial operation
7	Ground (GND)	
8	Output	
14	Supply Voltage (V <sub>CC</sub> )	Recommend connecting appropriate power supply bypass capacitors as close as possible.

## Layout and application information

For Optimum Jitter Performance, Pletronics recommends:

- Minimize air flow over the oscillator
- Stabilize the power supply voltage for best performance.



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