



## OHM4 Series 3.3V CMOS Oven Controlled Oscillators

June 2008

- Ovenized quartz crystal high precision square wave generator with a CMOS output.
- Tube packaging is available.
- 10 to 20 MHz
- Full Size Thru-Hole DIP package
- Electronic Frequency Control (EFC) optional
- Low Jitter - 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** (specification values shown are typical, call for other options):

OHM4032034	G	G	030	030	- 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
							<b>Electronic Frequency Control</b> <b>000</b> = No EFC <b>030</b> = $\pm$ 3.0 ppm minimum <b>080</b> = $\pm$ 8.0 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> (Standards shown here) <b>020</b> = $\pm$ 200 ppb for 0°C to 60°C ( <b>CE</b> ) <b>030</b> = $\pm$ 300 ppb for -20°C to 70°C ( <b>GG</b> ) <b>050</b> = $\pm$ 500 ppb for -40°C to 85°C ( <b>LK</b> )
							<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>A</b> = 10°C <b>D</b> = -5°C <b>G</b> = -20°C <b>J</b> = -30°C <b>B</b> = 5°C <b>E</b> = -10°C <b>H</b> = -25°C <b>K</b> = -35°C <b>C</b> = 0°C <b>F</b> = -15°C <b>I</b> = -30°C <b>L</b> = -40°C
							<b>Series Model</b>

**Part Marking:**

PLE  
OHM4033c  
fff.fff M  
ymdannn

Where: *c* = N for no EFC, R for resistor, V for voltage  
*fff.fff* = Frequency in MHz  
*Ym d a* = Date code (Year Month Day plus internal code)  
*nnn* = 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					



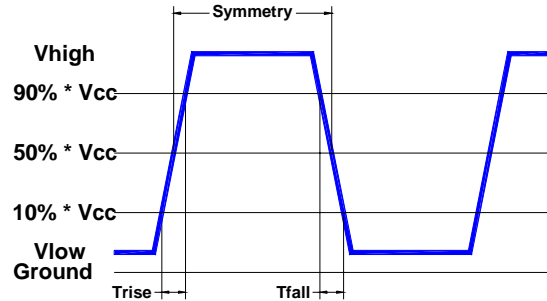
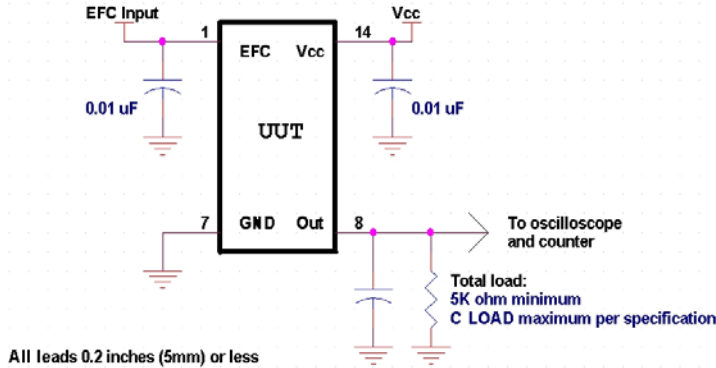
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## Specification for 3.30V $\pm 0.15V$ over the specified temperature range

Item	Min	Max	Unit	Condition	
Frequency Range	10	20	MHz	See list of standard frequencies	
Frequency Accuracy vs. Temperature	-500	500	ppb	determined by part number	
Frequency Accuracy vs. Supply	-100	+100	ppb	for Supply change of 0.15V	
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	
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	0V to 3.3V, 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	--	-70	dBc/Hz		
10 Hz	--	-100			
100 Hz	--	-130			
1,000Hz	--	-140			
Warmup	--	30	sec	within specification after turn on at 0°C	
Output Waveform	CMOS				
Output High Level	0.4	--	V	Below $V_{CC}$	See Load Circuit Clload = 15 pF
Output Low Level	--	0.4	V		
Output Symmetry	40	60	%	at 50% of $V_{CC}$	
$T_{rise}$ and $T_{fall}$	--	7	nS	10% to 90% of $V_{CC}$	
Power Supply Current	--	160	mA	at -20°C	
	--	100	mA	at +30°C	
Warmup	--	250	mA	for 30 seconds maximum	
Operating Temperature Range	-40	+85	°C	Part number defines the temperature range to meet the accuracy specification	
Storage Temperature Range	-65	+125	°C		

## Load Circuit and Test Waveform



## 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

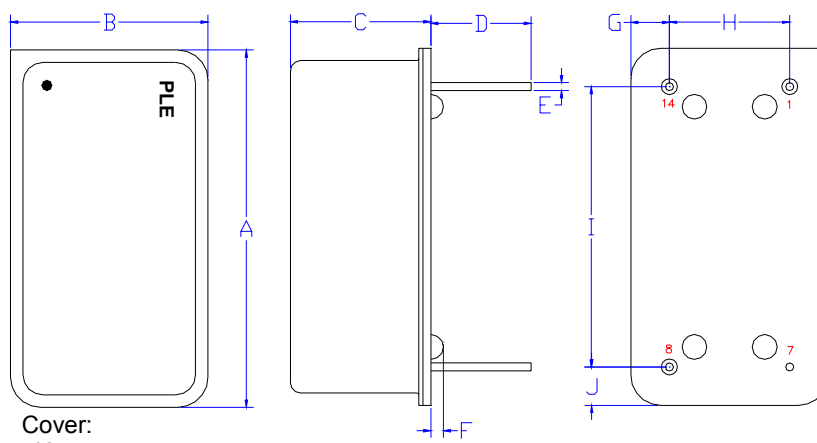
P/N:	
	OHM032034GG030030-10.0M
Customer P/N:	
	12345678
Qty:	
	1000
D/C:	
	8FEA010

<b>RoHS Compliant</b>
2nd LvL Interconnect Category=e1
Max Safe Temp=250C for 10s Per Lead
Hand Solder Recommended

## PCB Mounting (typical for lead free processing)

Hand soldering is recommended at  $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$  for 5 seconds maximum per pin

### Mechanical:



Cover:  
Kovar  
Electroless Nickel Plated  
1  $\mu\text{inch}$  (25  $\mu\text{m}$ ) typical  
Resistance welded to base

Base:  
Kovar  
Glass to metal sealed leads

Label:  
Laser Engraved – or –

White Kapton with Black Letters

Pin 7 Connected to case

**Not to scale**

	Inches	mm
A	0.800 $\pm 0.005$	20.3 max
B	0.52 $\pm 0.005$	13.2 max
C	0.315 max	8.00 max
D <sup>1</sup>	0.250	6.35
E <sup>1</sup>	0.020	0.51
F <sup>1</sup>	0.040 max	1.0 max
G <sup>1</sup>	0.110	2.79
H	0.300	7.62
I <sup>1</sup>	0.600	15.24
J <sup>1</sup>	0.100	2.53

<sup>1</sup> Nominal dimension

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 ( $V_{CC}$ )	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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## IMPORTANT NOTICE

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