



OHM4 Series 5.0V CMOS Oven Controlled Oscillators

May 2008

- Ovenized quartz crystal high precision square wave generator with a CMOS output.
- Tube packaging is available.
- 10 to 40 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 _{CC} Supply Voltage | -0.5V to +7.0V |
| V _i Input Voltage | -0.5V to V _{CC} + 0.5V |
| V _o Output Voltage | -0.5V to V _{CC} + 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):

| | | | | | | | |
|------------|---|---|-----|-----|---------|-----|---|
| OHM4048052 | G | G | 010 | 040 | -20.00M | -XX | |
| | | | | | | | Internal code or blank |
| | | | | | | | Frequency MHZ (standards Shown) 10.000 12.800 16.000 16.384 19.440 20.000 32.768 40.000 |
| | | | | | | | Electronic Frequency Control 000 = No EFC 030 = ± 3.0 ppm minimum 080 = ± 8.0 ppm minimum 150 = ± 15.0 ppm minimum 999 = ± 4.0 ppm with 0 to 10K ohm |
| | | | | | | | Frequency Stability (examples shown here) 003 = ± 25 ppb for 0°C to 60°C 008 = ± 75 ppb for 0°C to 60°C 005 = ± 50 ppb for -20°C to 70°C 015 = ± 150 ppb for -20°C to 70°C 010 = ± 100 ppb for -40°C to 85°C 025 = ± 250 ppb for -40°C to 85°C |
| | | | | | | | Upper Operating Temperature C = 50°C F = 65°C J = 80°C D = 55°C G = 70°C K = 85°C E = 60°C H = 75°C L = 90°C |
| | | | | | | | Lower Operating Temperature A = 10°C D = -5°C G = -20°C J = -30°C B = 5°C E = -10°C H = -25°C K = -35°C C = 0°C F = -15°C I = -30°C L = -40°C |
| | | | | | | | Series Model |

Part Marking:

PLE
OHM4050c
fff.fff M
 ymdannn

Where: **c** = N for no EFC, R for resistor, V for voltage
fff.fff = Frequency in MHZ
Ym d a n n n = 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 |

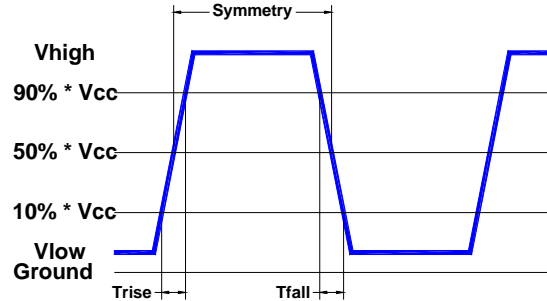
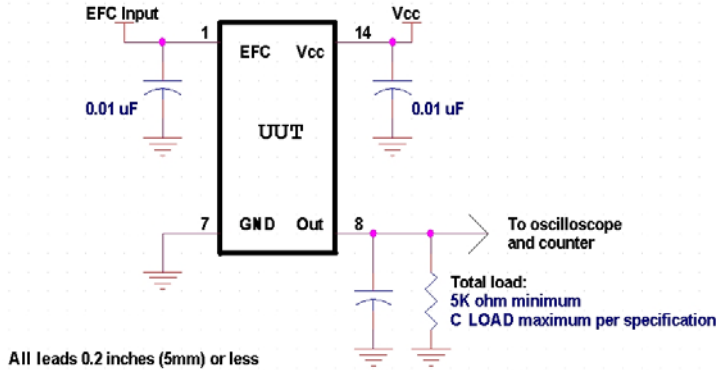
| Code | A | B | C | D | E | F | G | H | J | K | L | M |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Month | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |

| 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 | | | | | |

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

| Item | Min | Max | Unit | Condition | |
|------------------------------------|-------|-----------|--------|--|----------------------------------|
| Frequency Range | 10 | 40 | 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 | |
| Aging 1 st 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 | -- | -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 Clod = 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 | -- | 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 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

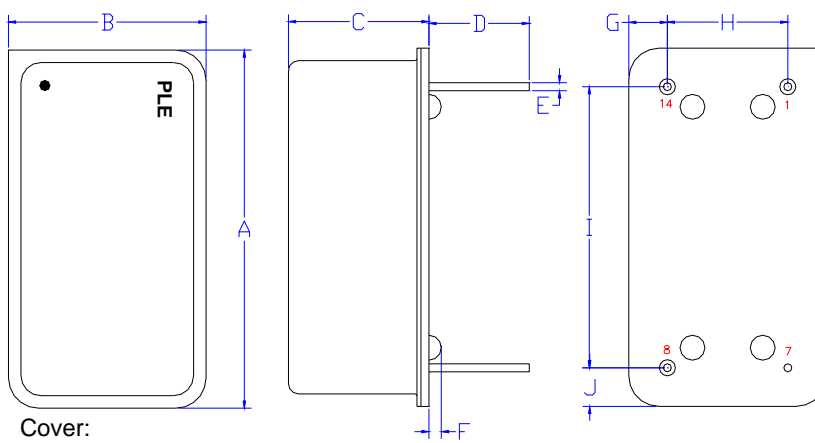
| | |
|---------------|---------------------------|
| P/N: | |
| | OHM4048052GG010040-20.00M |
| Customer P/N: | |
| | 12345678 |
| Qty: | |
| | 1000 |
| D/C | |
| | 0510M012 |

| |
|-------------------------------------|
| RoHS Compliant |
| 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°C ± 5°C for 5 seconds maximum per pin

Mechanical:



Cover:
Kovar
Electroless Nickel Plated
1 μinch (25 μm) typical
Resistance welded to base

Base:
Kovar
Glass to metal sealed leads

Label:
Laser Engraved – or –

Pin 7 Connected to case

White Kapton with Black Letters

Not to scale

| | Inches | mm |
|----------------|--------------|----------|
| A | 0.800 ±0.005 | 20.3 max |
| B | 0.52 ±0.005 | 13.2 max |
| C | 0.315 max | 8.00 max |
| D ¹ | 0.250 | 6.35 |
| E ¹ | 0.020 | 0.51 |
| F ¹ | 0.040 max | 1.0 max |
| G ¹ | 0.110 | 2.79 |
| H | 0.300 | 7.62 |
| I ¹ | 0.600 | 15.24 |
| J ¹ | 0.100 | 2.53 |

¹ 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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