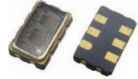




PLETRONICS PRONTO™ QL55 SERIES 2.5V

LVDS Clock Oscillator



QL55L
3.2 x 5.0 x 1.25 mm
LCC Ceramic Package

Features

- Pletronics' QL55L Series is a Quartz crystal controlled Precision Square Wave Oscillator
- LVDS Output
- Enable/Disable Function on pad 1
- Low Jitter
- 2.5V nominal Supply Voltage
- 10MHz-1500MHz nominal frequency

Applications

Driving A/Ds, D/As, FPGAs
Fibre Channel
Ethernet, GbE, SynchE
Medical
Storage Area Networking
COTS
Telecom

Electrical Characteristics

| Parameter | Min | Typ | Max | Unit | Condition |
|--|---------------------|------|---------------------|--------|--|
| Frequency Range ² | 10 | - | 1500 | MHz | |
| Frequency Stability vs. Temperature ² ± 20 = 20 , ± 25 = 44 , ± 50 = 45 | ±20 | - | ±50 | ppm | For all supply voltages, load changes, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures |
| Operating Temperature Range ² | -10 -20 -40 | - | +70 +70 +85 | °C | Standard range Extended range C option Extended range E option |
| Supply Voltage ^{1,2} V _{CC} | 2.125 | 2.50 | 2.625 | Volts | |
| Supply Current I _{CC} | - | - | 45 | mA | |
| Output Waveform | LVDS | | | | |
| Output High Level V _{OH} | - | - | 1.60 | Volts | |
| Output Low Level V _{OL} | 0.90 | - | - | Volts | |
| Output T _{RISE} and T _{FALL} | - | - | 1.0 | ns | V _{th} is 10% and 90% of waveform |
| Startup Time | - | - | 10 | ms | Time for output to reach specified frequency |
| Duty Cycle | 45 | - | 55 | % | Referenced to 50% if amplitude or crossing point |
| V _{DISABLE} | - | - | 0.3*V _{CC} | Volts | Referenced to Ground |
| V _{ENABLE} | 0.7*V _{CC} | - | - | | |
| Enable Time | - | - | 100 | ns | < 50MHz |
| | - | - | 200 | ns | > 50MHz |
| Disable Time | - | - | 50 | ns | Time for output to reach a high Z state |
| Standby Current | - | 18 | - | mA | Pad 1 low, device disabled |
| Phase Noise | 10 Hz | - | -66 | dBc/Hz | Precision Developed Frequencies: 100, 106.25, 150, 156.25, 162.5, 175, 187.5, 200, 212.5, 312.5MHz 25°C ± 2°C at 2.5V / 156.250 MHz |
| | 100 Hz | - | -96 | | |
| | 1 kHz | - | -112 | | |
| | 1 MHz | - | -136 | | |
| | 20 MHz | - | -154 | | |
| Jitter | - | 0.6 | - | ps rms | 12 kHz to 20 MHz from the output frequency @ 156.25Mhz |
| Phase Noise | 10 Hz | - | -51 | dBc/Hz | All Other Frequencies 25°C ± 2°C at 2.5V / 150.0 MHz |
| | 100 Hz | - | -88 | | |
| | 1 kHz | - | -108 | | |
| | 1 MHz | - | -135 | | |
| | 20 MHz | - | -151 | | |
| Jitter | - | 2.4 | - | ps rms | 12 kHz to 20 MHz from the output frequency @150.0MHz |
| Aging | - | - | ±1.0 | ppm | per year |
| Storage Temperature Range | -55 | - | +125 | °C | |

Notes: Specifications with Pad 1 E/D open circuit

¹ Place an appropriate power supply bypass capacitor next to device for correct operation



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Part Number

| Series Model | Frequency Stability | | Operating Temperature Range | Supply Voltage V _{CC} | Frequency in MHz |
|--------------|---|---|--|--------------------------------|------------------|
| QL55 | 45 | L | E | W | - 125.0M |
| | 45 = ± 50 ppm (STD) 44 = ± 25 ppm 20 = ± 20 ppm | | Blank = -10 to +70°C (STD) C = -20 to +70°C E = -40 to +85°C | W = 2.5V ±5% | 10-1500 MHz |

Device Marking

PRONTO
• YMDxxx

PRONTO = Pletronics Model
YMD = Date Code, Year Month Day (see below)
xxx = internal factory codes

Note: Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

| Code | 9 | 0 | 1 | 2 | 3 | Code | A | B | C | D | E | F | G | H | J | K | L | M |
|------|------|------|------|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 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 | D | E | F | G |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Code | H | J | K | L | M | N | P | R | T | U | V | W | X | Y | Z | |
| Day | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |

Package Labeling

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 250. 16mm tape, 8mm pitch.

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

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

| | |
|---------------|------------------|
| P/N: | |
| | QL5545LEW-125.0M |
| Customer P/N: | |
| | 12345678 |
| Qty: | |
| | 1000 |
| D/C: | |
| | 9DW |
| MSL: 1 | |

| |
|-----------------------------------|
| RoHS Compliant |
| 2nd Lvl Interconnect |
| Category=e4 |
| Max Safe Temp=260C for 10s 2X Max |

Pletronics Inc. certifies this device is in accordance with the RoHS 3 and WEEE 2 directives.

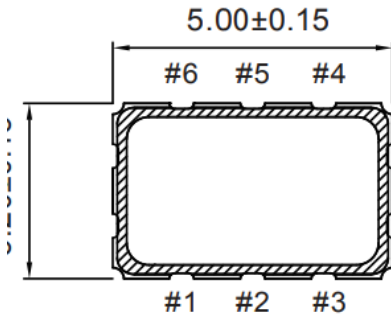
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.09 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4



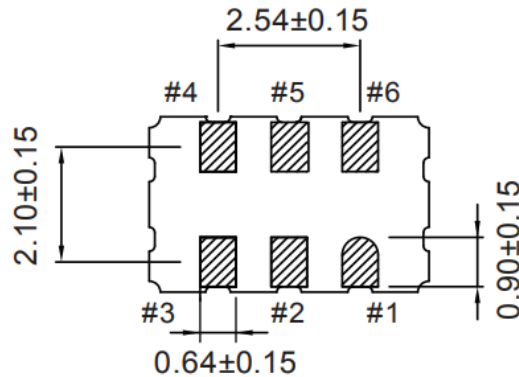
PLETRONICS *PRONTO*™ QL55 SERIES 2.5V LVDS Clock Oscillator

Mechanical Dimensions (mm)

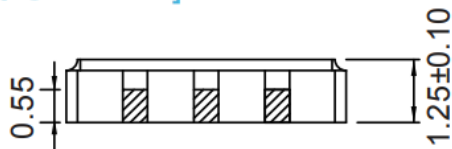
[TOP VIEW]



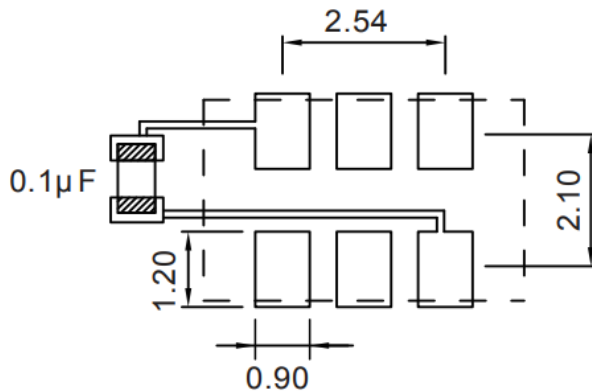
[BOTTOM VIEW]



[SIDE VIEW]



| Pin# | Function |
|------|-------------|
| 1 | Tri-State |
| 2 | NC |
| 3 | GND |
| 4 | Output |
| 5 | Comp.Output |
| 6 | VDD |



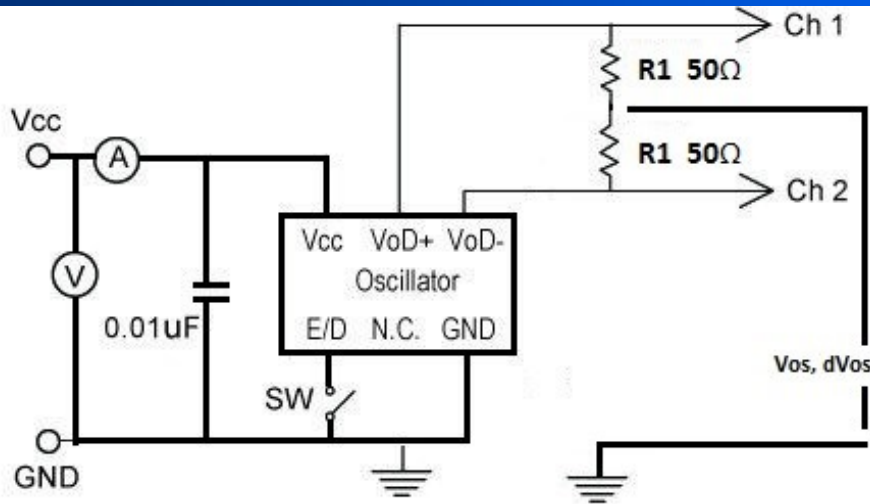
To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

For Optimum Jitter Performance, Pletronics recommends:

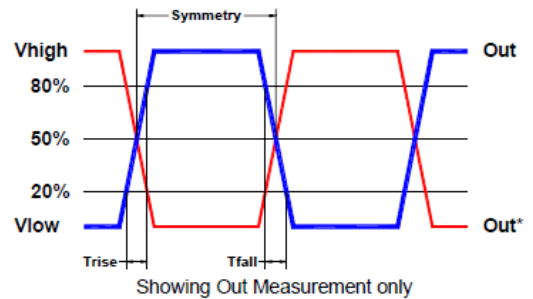
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans



Electrical Test /Load Circuit



Test Waveform



Environmental / ESD Ratings

Reliability: Environmental Compliance

| Parameter | Reference Standard | Test Condition |
|------------------|---|---|
| Vibration | MIL-STD-883 2007 Condition A JESD22-B103 Condition 1 | 10-2000Hz, 1.52mm, 20g, each axis for 4hrs |
| Thermal Shock | MIL-STD-883 1010 Condition B JESD22-A104 Condition B | -55°C, 125°C, soak time is 10 mins, with total 200 cycles |
| Mechanical Shock | MIL-STD-883 2002 Condition B JESD22-B104 Condition B | 1500g, half-sine, 0.5ms, each axis for 3 times |

ESD Ratings

| Model | Min. Voltage | Condition |
|------------------|--------------|-------------|
| Human Body Model | 2000V | JESD22-A114 |
| Machine Model | 120V | JESD22-A115 |

Thermal Characteristics:

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 45 to 65°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Absolute Maximum Ratings

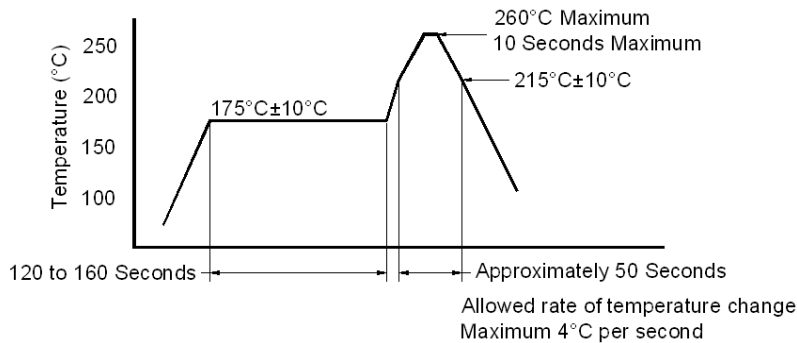
| Parameter | Unit |
|--------------------------------|---------------------------------|
| V _{CC} Supply Voltage | -0.5V to +5.0V |
| V _i Input Voltage | -0.5V to V _{CC} + 0.5V |
| V _o Output Voltage | -0.5V to V _{CC} + 0.5V |



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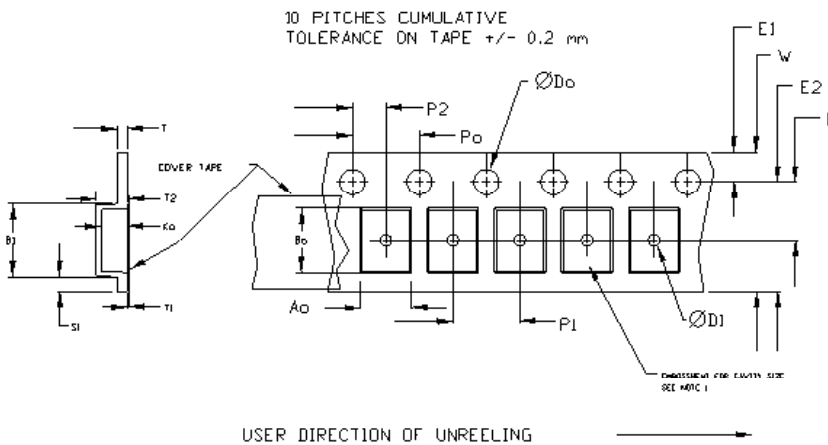
LVDS Clock Oscillator

Reflow Cycle



The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

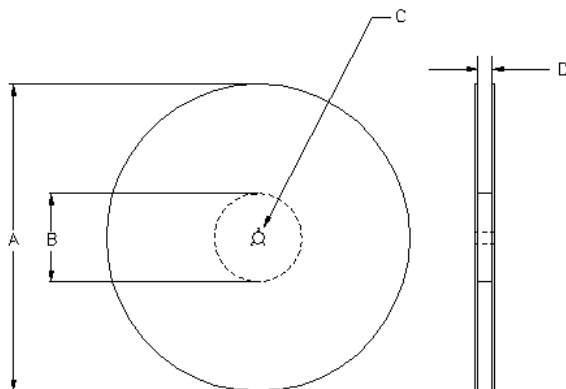


| Tape Size | Do | D1 min | E1 | Po | P2 | S1 min | T max | T1 max |
|-----------|--------------|--------|------|------|-------|--------|-------|--------|
| 8mm | 1.5 | 1.0 | 1.75 | 4.0 | 2.0 | 0.6 | 0.6 | 0.1 |
| 12mm | | 1.5 | | | ±0.05 | | | |
| 16mm | +0.1 -0.0 | 1.5 | ±0.1 | ±0.1 | 2.0 | | | |
| 24mm | | 1.5 | | | ±0.1 | | | |

| Tape Size | B1 max | E2 min | F | P1 | T2 max | W max | Ao, Bo & Ko |
|-----------|--------|--------|-------------|-------------|--------|-------|-------------|
| 16mm | 12.1 | 14.25 | 7.5 ±0.1 | 8.0 ±0.1 | 8.0 | 16.3 | Note 1 |

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA-481-B



| Reel Size | A | | B | | C | D |
|-----------|--------|-------|--------|-------|--------------|----------------|
| | Inches | mm | Inches | mm | | |
| 7 | 7.0 | 177.8 | 2.50 | 63.5 | 13.0 | Tape size +0.4 |
| 10 | 10.0 | 254.0 | 4.00 | 101.6 | +0.5 -0.2 | +2.0 -0.0 |
| 13 | 13.0 | 330.2 | 3.75 | 95.3 | | |



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