



PLETRONICS LV55J Series 3.3V LVDS Clock Oscillator



LV55JV
3.20 x 5.0 x 1.35 mm
LCC Ceramic Package

Features

- Pletronics' LV55J Series is a Quartz crystal controlled Precision Square Wave Oscillator
- LVDS Output
- Enable/Disable Function on pad 1
- Low Jitter
- 3.3V nominal Supply Voltage
- 25-175 MHz Frequency Range

Applications

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

Electrical Characteristics

| Parameter | Min | Typ | Max | Unit | Condition |
|--|-------------------|------------------------------------|-------------------|------------------|--|
| Frequency Range ² | 25 | - | 175 | MHz | Consult factory for other options |
| 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} | - | 3.3 | - | Volts | ± 5% |
| Supply Current I _{CC} | - | - | 39 | mA | |
| Output Waveform | LVDS | | | | |
| Output High Level V _{OH} | - | - | 1.6 | Volts | See Load Circuit R = 50 ohms |
| Output Low Level V _{OL} | 0.9 | - | - | Volts | |
| Differential Output Voltage V _{OD} | 247 | - | 454 | mVolts | |
| Output Offset Voltage V _{OS} | 1.125 | - | 1.375 | Volts | |
| Differential Output Error ΔV _{OD} | - | - | 50 | mVolts | |
| Output T _{RISE} and T _{FALL} | - | - | 0.4 | nS | V _{th} is 20% and 80% 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} | - | - | 30 | %V _{CC} | Referenced to Ground |
| V _{ENABLE} | 70 | - | - | | |
| Enable Time | - | - | 10 | mS | Time for output to reach a logic state |
| Disable Time | - | - | 200 | nS | Time for output to reach a high Z state |
| Enable/Disable Internal Pull-up | 30 | - | 150 | Kohm | To V _{CC} , measured with pad 1 = 0.0 volts |
| Output Leakage V _{OUT} = V _{CC} V _{OUT} = 0V | -10 -10 | - | +10 +10 | μA | Pad 1 low, device disabled |
| Standby Current | - | - | 15 | μA | |
| Jitter | - | 0.1 | - | pS | 12 kHz to 20 MHz from the output frequency at 156.25 MHz |
| Phase Noise 10 Hz 100 Hz 1 kHz 10 kHz 100 kHz | - | -64 -98 -127 -142 -152 | - | dBc/Hz | 25°C ± 2°C at 156.25 MHz |
| 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

² Specified by part number



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Part Number

| Series Model | Frequency Stability | | Operating Temperature Range | Supply Voltage V_{CC} | Frequency in MHz | Optional T&R Packaging code |
|--------------|---|---|--|-------------------------|------------------|--|
| LV55 | 45 | J | E | V | - 100.0M | -XX |
| | 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 | V = 3.3V \pm 10% | 25-175 MHz | T250 = 250 per Reel T500 = 500 per Reel T1K = 1000 per Reel (Std for 1K pcs) |

Device Marking

PFFF.FF L

• YMDxx

P = Pletronics
FFF.FF L = Frequency in MHz, L for LVDS
YMD = Date Code, All other marking is internal 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 | 7 | 8 | 9 | 0 | 1 | Code | A | B | C | D | E | F | G | H | J | K | L | M |
|------|------|------|------|------|------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 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: | |
| | LV5545JV-100.0M |
| Customer P/N: | |
| | 12345678 |
| Qty: | |
| | 1000 |
| D/C | |
| | 4GX-MTB |
| MSL: 1 | |

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

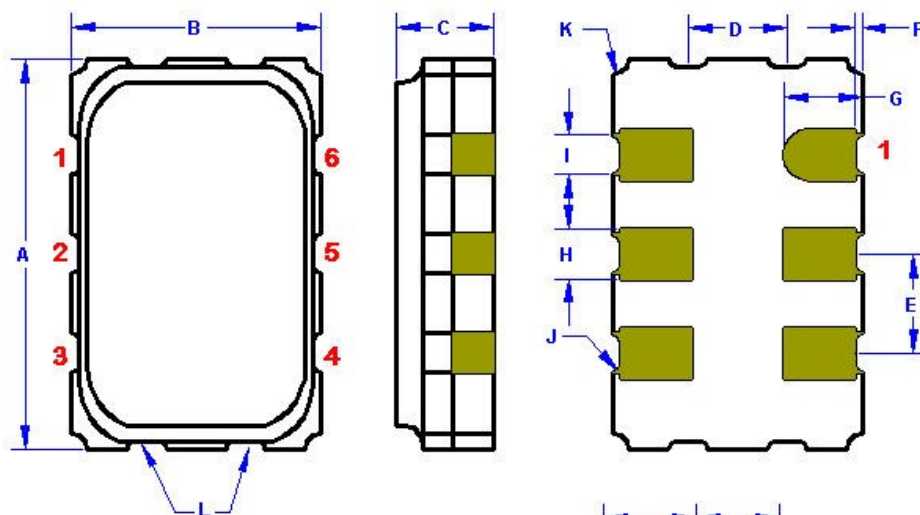
Pletronics Inc. certifies this device is in accordance with the RoHS 3 (2015/863) and WEEE 2 (2012/19/EU) directives.

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

Mechanical Dimensions

| | Inches | mm |
|----------------|----------------------|-------------|
| A | 0.197 ± 0.006 | 5.00 ± 0.15 |
| B | 0.126 ± 0.006 | 3.20 ± 0.15 |
| C | 0.053 max | 1.35 max |
| D ¹ | 0.047 | 1.20 |
| E ¹ | 0.050 | 1.27 |
| F ¹ | 0.004 | 0.10 |
| G ¹ | 0.039 | 1.00 |
| H ¹ | 0.025 | 0.64 |
| I ¹ | 0.018 | 0.45 |
| J ¹ | 0.004R | 0.10R |
| K ¹ | 0.008R | 0.20R |
| L | End Detents optional | |

¹ Typical dimensions



Pad Layout mm shown

Disclaimer: Recommended layout shown.
Adjust layout as needed for individual
process requirements.

(Not to Scale)

Contacts (pads): Gold 11.8 to 39.4 μinches (0.3 to 1.0 μm) over Nickel 50 to 350 μinches (1.27 to 8.89 μm)

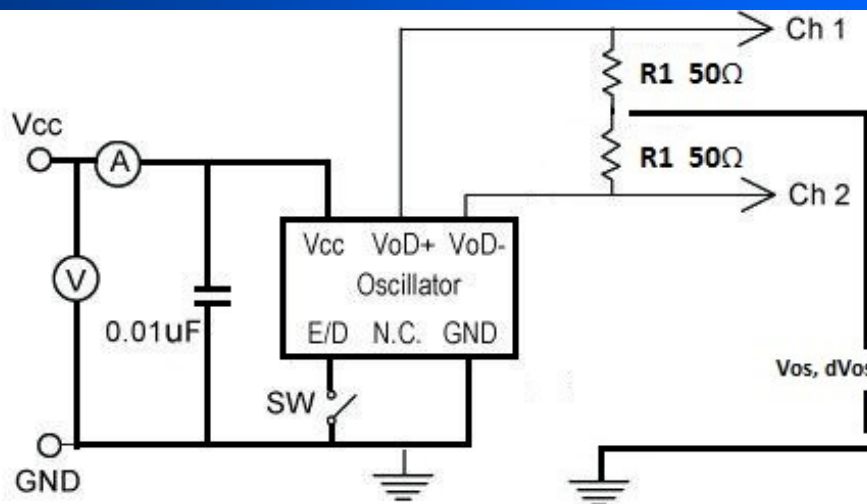
Layout

| Pad | Function | Note |
|-----|--------------------------------|---|
| 1 | Output Enable/Disable | The oscillator shall operate when this pad is not connected. The output will be inhibited (high impedance state) when this pad is logic low. Recommend connecting this pad to V _{CC} if the oscillator is to be always on. |
| 2 | No connect | There is no internal connection to this pad. Recommend connecting to pad 1 to permit E/D input on either pad for layout. |
| 3 | Ground (GND) | |
| 4 | Output | Both outputs must be terminated and biased for proper operation. The ideal termination is 100 ohms between the outputs |
| 5 | Output* | |
| 6 | V _{CC} Supply Voltage | Connect an appropriate power supply bypass capacitor as close as possible to pad 4 |

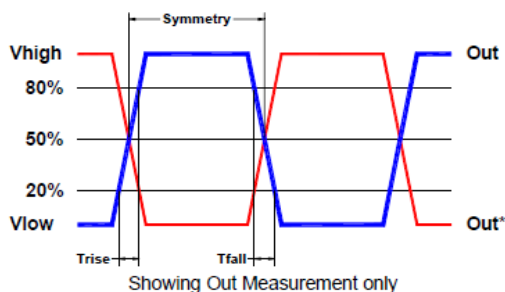
For Optimum Jitter Performance, Pletronics recommends:

- 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 | Condition |
|------------------|--------------------------------------|
| Mechanical Shock | JESD22-B104 |
| Vibration | JESD22-B103 |
| Solderability | IPC J-STD-002 |
| Thermal Shock | MIL-STD-883 Method 1011, Condition A |

ESD Rating

| Model | Min. Voltage | Condition |
|----------------------|--------------|--------------|
| Human Body Model | 2000V | JESD22-A114 |
| Charged Device Model | 500V | JESD 22-C101 |
| Machine Model | 200V | JESD22-A115 |

Absolute Maximum Ratings

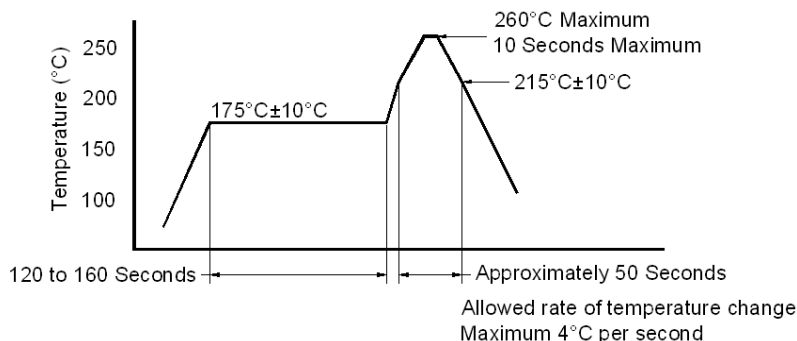
| Parameter | Unit |
|--------------------------------|---------------------------------|
| V _{CC} Supply Voltage | -0.5V to +5.0V |
| V _i Input Voltage | -0.5V to V _{CC} + 0.5V |
| V _o Output Voltage | -0.5V to V _{CC} + 0.5V |

Thermal Characteristics:

The maximum die or junction temperature is 155°C

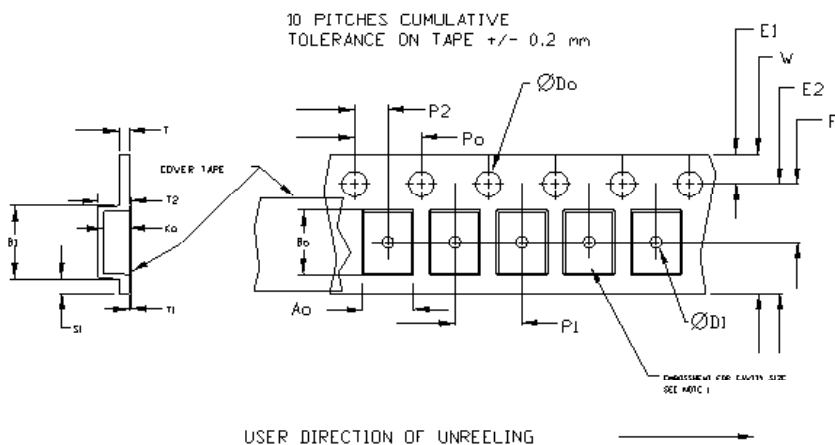
The thermal resistance junction to board is 45 to 65°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Reflow Cycle



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

Tape and Reel



Tape Constant Dimensions Table 1

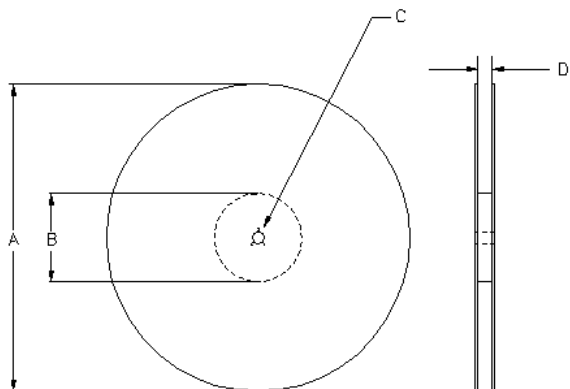
| Tape Size | Do | D1 min | E1 | Po | P2 | S1 min | T max | T1 max |
|-----------|--------------|--------|------|------|-------|--------|-------|--------|
| 8mm | 1.5 | 1.0 | 1.75 | 4.0 | 2.0 | 0.6 | 0.6 | 0.1 |
| 12mm | | 1.5 | | | ±0.05 | | | |
| 16mm | +0.1 -0.0 | 1.5 | ±0.1 | ±0.1 | 2.0 | 0.6 | 0.6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

Tape Variable Dimensions Table 2

| 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 Dimensions (may vary) Table 3

| Reel Size | A | | B | | C | D |
|-----------|--------|-------|--------|-------|--------------|----------------|
| | Inches | mm | Inches | mm | mm | 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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