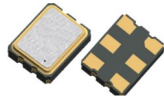




# PLETRONICS PRONTO™ QL44L SERIES 3.3V

## LVDS Clock Oscillator



QL44L  
2.5 x 3.2 x 0.9 mm  
LCC Ceramic Package

### Features

- Pletronics' QL44L 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
- 10MHz-1500MHz nominal frequency

### 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 <sup>2</sup>	10	-	1500	MHz	
Frequency Stability vs. Temperature <sup>2</sup> ± 20 = <b>20</b> , ± 25 = <b>44</b> , ± 50 = <b>45</b>	±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 <sup>2</sup>	-10 -20 -40	-	+70 +70 +85	°C	Standard range Extended range <b>C</b> option Extended range <b>E</b> option
Supply Voltage <sup>1,2</sup> V <sub>CC</sub>	2.97	3.30	3.63	Volts	
Supply Current I <sub>CC</sub>	-	-	50	mA	
Output Waveform	LVDS				
Output High Level V <sub>OH</sub>	-	-	1.60	Volts	
Output Low Level V <sub>OL</sub>	0.90	-	-	Volts	
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	-	1.0	ns	V <sub>th</sub> 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 <sub>DISABLE</sub>	-	-	0.3*V <sub>CC</sub>	Volts	Referenced to Ground
V <sub>ENABLE</sub>	0.7*V <sub>CC</sub>	-	-		
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, 120, 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

<sup>1</sup> Place an appropriate power supply bypass capacitor next to device for correct operation

<sup>2</sup> Specified by part number

Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics standard warranty. **May 21, 2020 Rev C**  
Production processing does not necessarily include testing of all parameters.



# PLETRONICS PRONTO™ QL44L SERIES 3.3V

## LVDS Clock Oscillator

### Part Number

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V <sub>CC</sub>	Frequency in MHz
QL44	45	L	E	V	- 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	V = 3.3V ±5%	10-1500MHz

### 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:   
QL4445LEV-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.

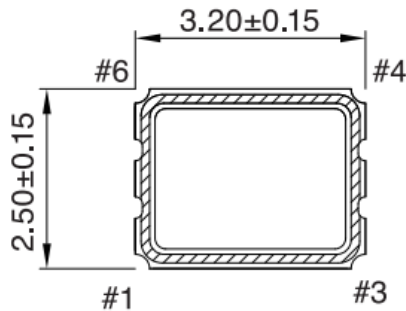
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
Weight of the Device: 0.041 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020D  
Second Level Interconnect code: e4



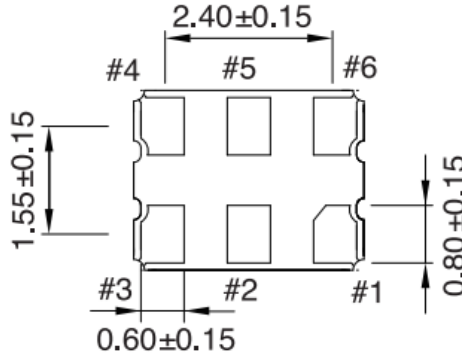
# PLETRONICS *PRONTO*™ QL44L SERIES 3.3V LVDS Clock Oscillator

## Mechanical Dimensions (mm)

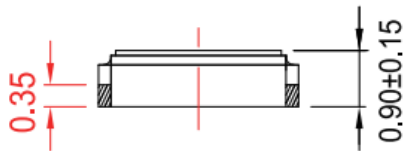
[ TOP VIEW ]



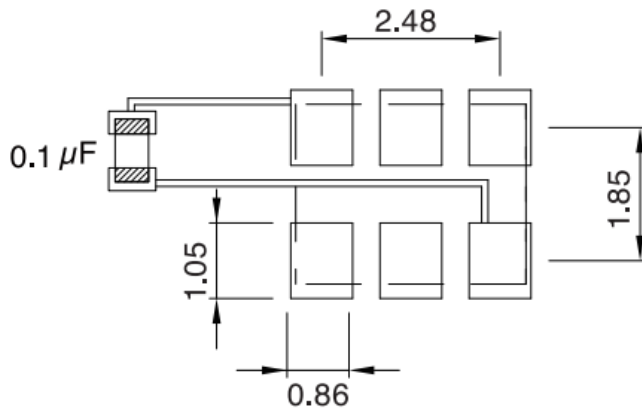
[ BOTTOM VIEW ]



[ SIDE VIEW ]



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



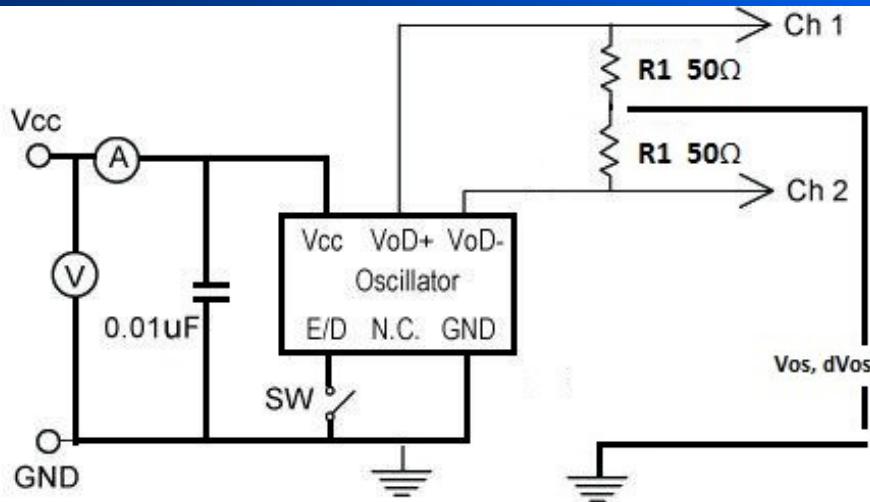
To ensure optimal oscillator performance, place a by-pass capacitor of 0.1 µF as close to the part as possible between Vdd and GND pads.

For Optimum Jitter Performance, Pletronics recommends:

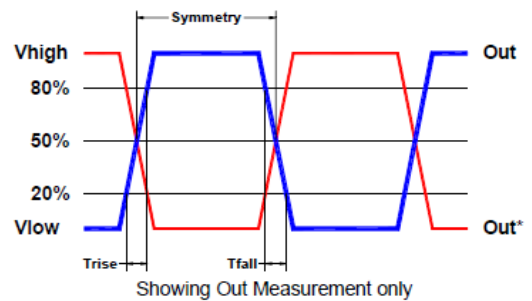
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans



### 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:

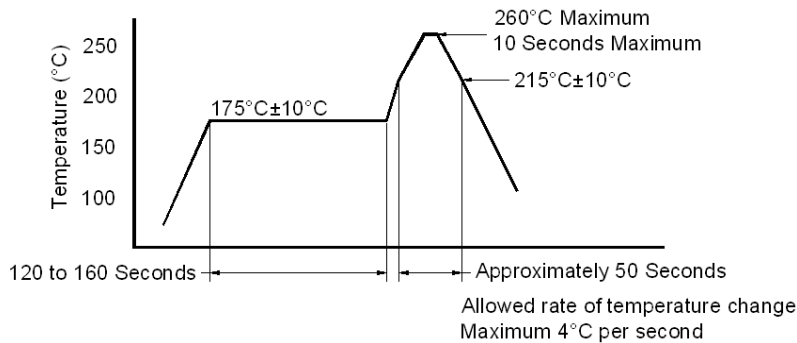
The maximum die or junction temperature is 155°C  
The thermal resistance junction to board is 45 to 65°C/Watt depending on the solder pads, ground plane and construction of the PCB.

### Absolute Maximum Ratings

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +5.0V
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

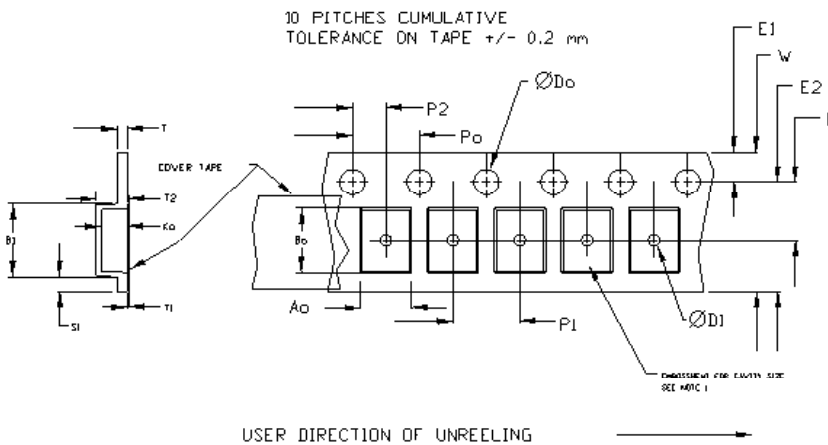


### Reflow Cycle



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

### Tape and Reel

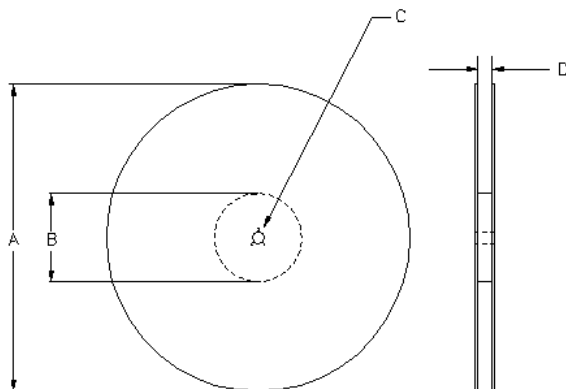


Tape Size	Do	D1 min	E1	Po	P2	S1 min	T max	T1 max
8mm	1.5	1.0	1.75	4.0	2.0	0.6	0.6	0.1
12mm		1.5			±0.05			
16mm	+0.1 -0.0	1.5	±0.1	±0.1	2.0			
24mm		1.5			±0.1			

Tape Size	B1 max	E2 min	F	P1	T2 max	W max	Ao, Bo & Ko
8mm	4.55	6.25	3.5 ±0.05	4.0 ±0.1	1.55	8.3	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		



# PLETRONICS *PRONTO*™ QL44L SERIES 3.3V LVDS Clock Oscillator

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