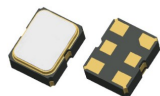




# PLETRONICS LV33J Series 2.5V LVDS Clock Oscillator



LV33JW  
2.5 x 2.0 x 0.9 mm  
LCC Ceramic Package

## Features

- 2.5 x 2.0mm Quartz crystal controlled Precision Square Wave Oscillator
- LVDS Output
- Enable/Disable Function on pad 1
- Ultra Low Jitter
- 2.5V nominal Supply Voltage
- 100 - 220 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 <sup>2</sup>	100	-	220	MHz	Not all frequencies available, check with PLE sales
Frequency Stability <sup>2</sup> $\pm 20 = 20^*$ , $\pm 25 = 44$ , $\pm 50 = 45$	$\pm 20$	-	$\pm 50$	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C $\pm$ 2°C, shock, vibration and temperatures. *limited frequencies, see page 2
Operating Temperature Range <sup>2</sup>	-10 -20 -40 -40 -40	-	+70 +70 +85 +105 +125	°C	Standard range Extended range <b>C</b> option Extended range <b>E</b> option Extended range <b>G</b> option Extended range <b>H</b> option
Supply Voltage <sup>1,2</sup> V <sub>DD</sub>	2.25	2.50	2.75	V	
Supply Current I <sub>DD</sub>	-	-	35	mA	
Output Waveform	LVDS				Load = 100Ω. Recommended termination is DC-Coupled (Point to Point)
Differential Output Voltage V <sub>OD</sub>	247	-	454	mV	See Load Circuit R = 100 ohms
Output Offset Voltage V <sub>OS</sub>	1.125	1.25	1.375	V	
Differential Output Error ΔV <sub>OD</sub>	-	-	50	mV	
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	-	0.4	ns	V <sub>th</sub> is 20% and 80% of output swing
Startup Time	-	-	5	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	At output crossing point
V <sub>DISABLE</sub> V <sub>IL</sub>	-	-	30	%V <sub>CC</sub>	Referenced to Ground
V <sub>ENABLE</sub> V <sub>IH</sub>	70	-	-		
Enable Time	-	-	5	ms	
Disable Time	-	-	200	ns	
Enable/Disable Internal Pull-up	30	70	150	Kohm	To V <sub>CC</sub> , measured with pad 1 = 0.0 volts
Output Leakage V <sub>OUT</sub> = V <sub>CC</sub> V <sub>OUT</sub> = 0V	- -10	-	+10 -	μA	Pad 1 low, device disabled
Standby Current	-	-	30	μA	
rms Phase Jitter	-	0.05	0.1	ps	12 kHz to 20 MHz offset
Phase Noise 1 kHz 10 kHz 100 kHz 1 MHz 10 MHz 20 MHz	-	-138 -150 -159 -161 -163 -163	-	dBc/Hz	25°C $\pm$ 2°C at 156.25 MHz
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



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## Part Number

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V <sub>CC</sub>	Frequency in MHz	Optional T&R code (Std 3K, no designator)
LV33	45	J	E	W	- 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 G = -40 to +105°C H = -40 to +125°C	W = 2.5V ± 10%	100-220 MHz	T250 = 250 per Reel T500 = 500 per Reel T1K = 1000 per Reel

\* Contact PLE sales for limited frequencies. Full frequency range available which excludes aging.  
Temperature Options G and H apply to ±50ppm stability

## Device Marking

FF.FF L
• YMxxx

FF.FF = Frequency in MHz (Max 5 characters includes decimal) Examples: 156.25M is 156.2; 50MHz is 50.0  
L = LVDS  
YM = Date Code, All other marking is internal code

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 YM (Year Month)

Code	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

## Package Labeling

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

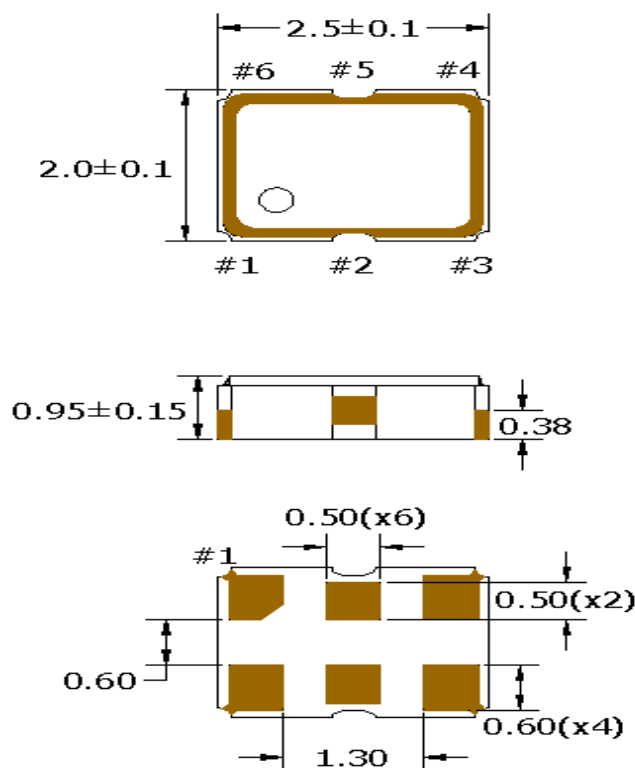
P/N:	
PLE Part Number	
Customer P/N:	
12345678	
Qty:	
3000	
D/C:	
2A1	
MSL: 1	

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 and REACH directives.

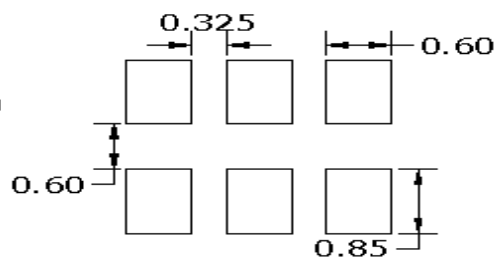
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
Weight of the Device: 0.015 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020D  
Second Level Interconnect code: e4

## Mechanical Dimensions - Solder Pad Layout



Pin Connections	
PIN #	Function
1	Enable/Disable
2	No connect
3	Ground/Lid
4	Output
5	Output N
6	Vcc

ENABLE/DISABLE	
PIN1	Output
V <sub>IH</sub> /Open	Active
V <sub>IL</sub> /Gnd	Disabled/Tristate



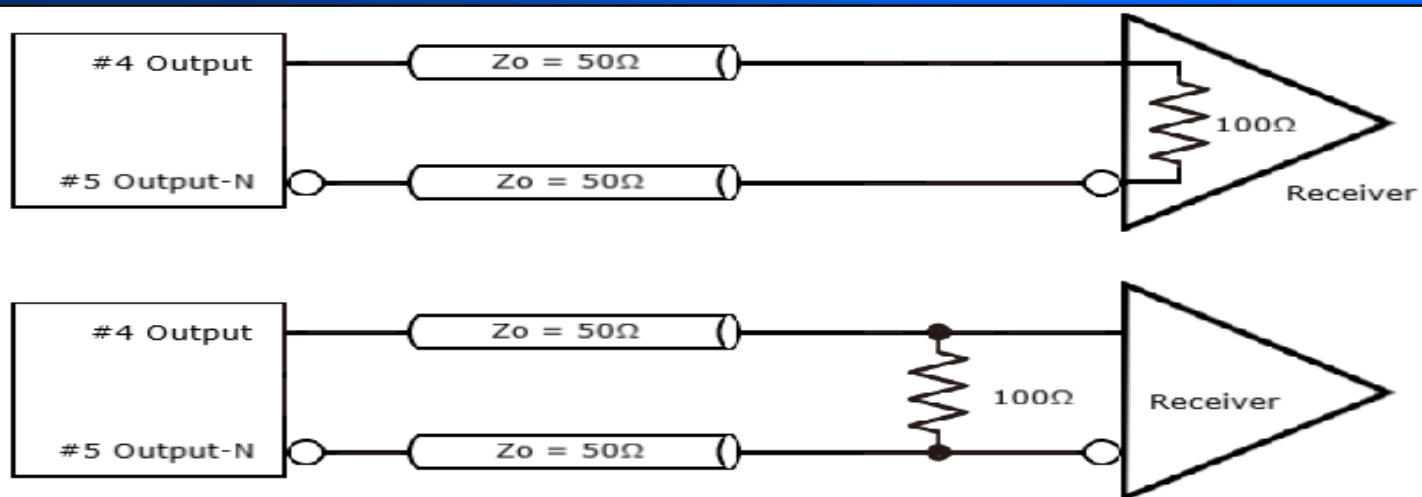
## Dimensions in mm

Contacts (pads): Gold (0.3 to 1.0  $\mu\text{m}$ ) over Nickel (1.27 to 8.89  $\mu\text{m}$ )

### Pad Layout

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

## Recommended Termination



For any other terminations, the oscillator should be sampled and tested in the application. Both outputs shall be terminated and biased for proper operation.

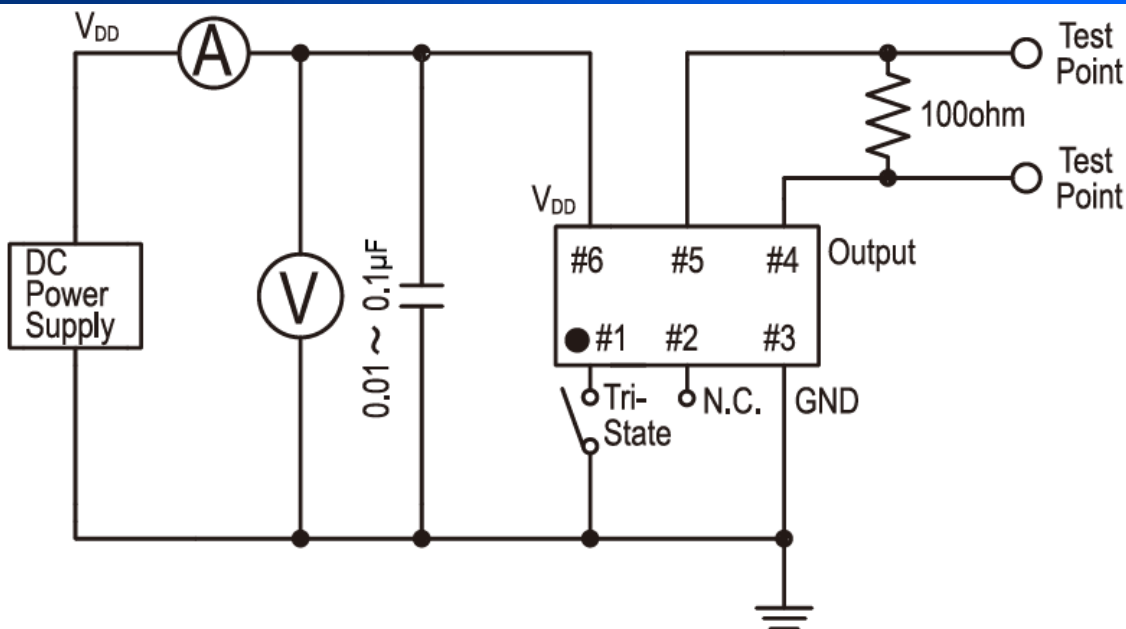
For Optimum Jitter Performance, Pletronics recommends:

- 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

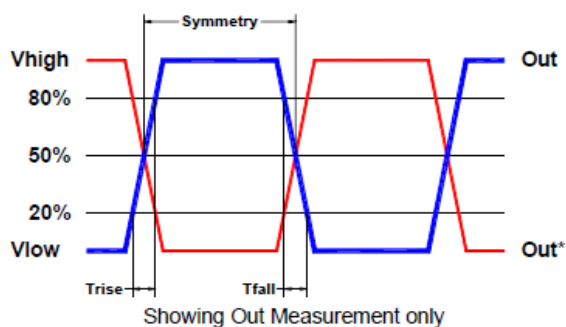


# PLETRONICS LV33J Series 2.5V LVDS Clock Oscillator

## Electrical Test /Load Circuit



Test Waveform



## Environmental / ESD Ratings

Reliability: Environmental

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

ESD Rating

Model	Min. Voltage	Condition
Human Body Model	2000V	JESD22-A114
Machine Model	200V	JESD22-A115

Absolute Maximum Ratings

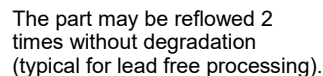
Parameter	Unit
V <sub>DD</sub> Supply Voltage	-0.3V to +4.5V
V <sub>i</sub> Input Voltage	-0.3V to V <sub>DD</sub> + 0.3V
V <sub>o</sub> Output Voltage	-0.3V to V <sub>DD</sub> + 0.3V

### Thermal Characteristics:

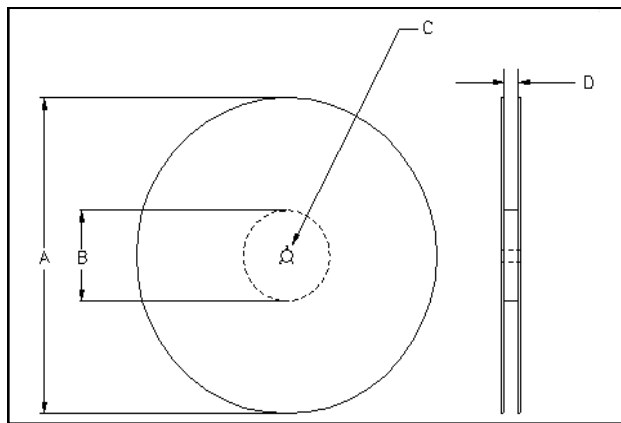
The maximum die or junction temperature is 150°C



**Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"**



Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 250. 8mm tape, 4mm pitch.



Reel Dimensions (may vary) Table 3

	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.50	60	13.0 +0.5 -0.2	8.4 +2.0 -0.0



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PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

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