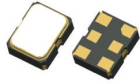




# PLETRONICS PE33J Series 2.5V PECL Clock Oscillator



PE33JW  
2.5 x 2.0 x 0.9 mm  
LCC Ceramic Package

## Features

- Quartz crystal controlled Precision Square Wave Oscillator
- PECL Differential Output
- Enable/Disable Function on pad 1
- Ultra Low Jitter
- 2.5V nominal Supply Voltage
- 100 - 320 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> (Fo)	100	-	320	MHz	Not all frequencies available, check with PLE sales
Frequency Stability <sup>2</sup> ± 20 = <b>20*</b> , ± 25 = <b>44</b> , ± 50 = <b>45</b>	±20		±50	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C ± 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>CC</sub> )	2.375	2.5	2.625	V	
Supply Current (I <sub>CC</sub> )	-	-	56 64 68	mA	100 MHz ≤ Fo ≤ 125 MHz 125 MHz < Fo ≤ 200 MHz Fo > 200 MHz
Output Type	LVPECL				
Output High Level (V <sub>OH</sub> )	V <sub>CC</sub> -1.085	V <sub>CC</sub> -0.95	V <sub>CC</sub> -0.86	V	Referenced to Ground
Output Low Level (V <sub>OL</sub> )	V <sub>CC</sub> -1.81	V <sub>CC</sub> -1.7	V <sub>CC</sub> -1.62	V	Referenced to Ground
Output Voltage Amplitude (V <sub>OPP</sub> )	0.4	-	-	V	Single ended measurement
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	-	0.5	ns	V <sub>th</sub> is 20% and 80% of output V <sub>OPP</sub>
Start Up Time	-	-	5	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	50% level of V <sub>OPP</sub> or output crossing point
V <sub>DISABLE</sub> (V <sub>IL</sub> )	-	-	0.3V <sub>CC</sub>	V	Referenced to ground
V <sub>ENABLE</sub> (V <sub>IH</sub> )	0.7V <sub>CC</sub>	-			
Enable Time	-	-	5	ms	
Disable Time	-	-	200	ns	
Enable/Disable Internal Pull-up	30	70	150	KΩ	To V <sub>CC</sub> , Pin 1 open or ≥0.7V <sub>CC</sub>
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
Phase Noise 1 kHz 10 kHz 100 kHz 1 MHz 10 MHz 20 MHz	-	-141 -155 -160 -162 -163 -163	-	dBc/ Hz	25°C ± 2°C at 125 MHz
Storage Temperature Range	-55	-	+125		

Notes: Specifications with Pad 1 E/D open circuit

<sup>1</sup> Place an appropriate power supply bypass capacitor as close to V<sub>CC</sub> as possible for best performance.

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



# PLETRONICS PE33J Series 2.5V PECL Clock Oscillator

## 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)
PE33	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 ± 5%	100 - 320 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

<b>FF.FF P</b>
• <b>YMxxx</b>

FF.FF = Frequency in MHz (Max 5 characters includes decimal) Examples: 156.25M is 156.2; 50MHz is 50.0  
P = PECL  
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

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

<b>RoHS Compliant</b>
2nd Lvl Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

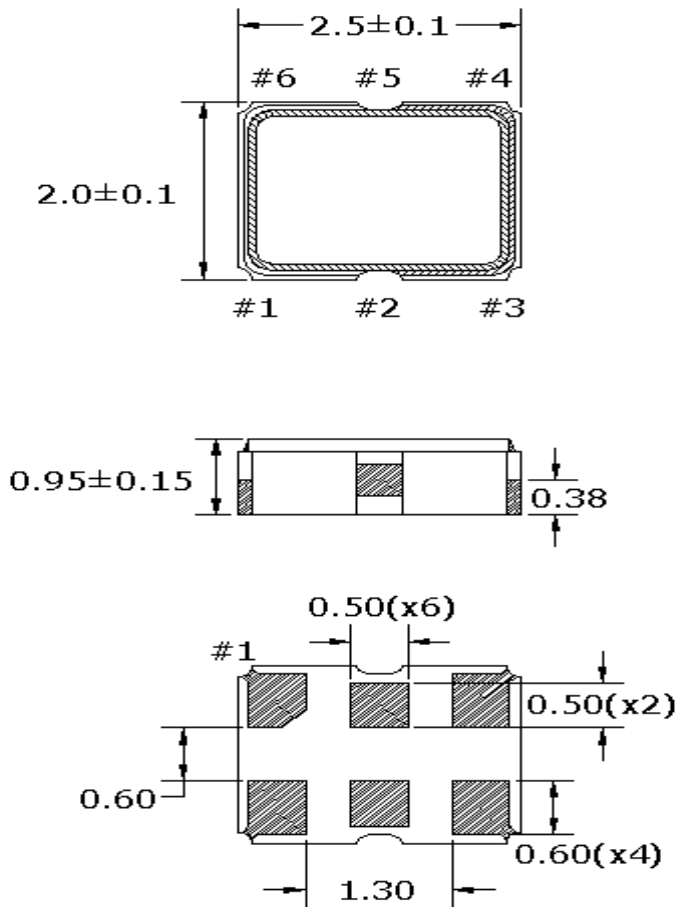
Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

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



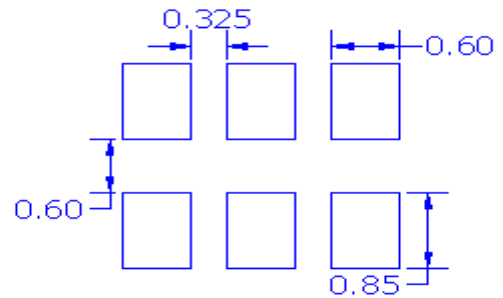
# PLETRONICS PE33J Series 2.5V PECL Clock Oscillator

## Mechanical Dimensions / Solder Pad Layout



### Pad Layout

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



Dimensions in mm

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

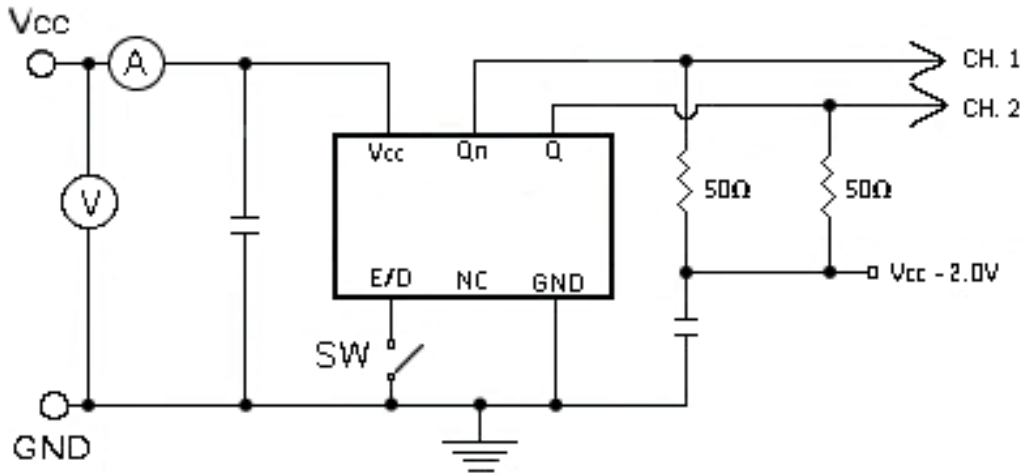
### Pinout

Pad	Function	Note
1	Output Enable/Disable	The oscillator shall operate when this pad is not connected or $\geq V_{IH}$ . The output will be inhibited (high impedance state) when this pad is $\leq V_{IL}$ or ground.. 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 50 ohms connected to 2.0V below supply voltage
5	OutputN	
6	$V_{CC}$ Supply Voltage	Connect an appropriate power supply bypass capacitor as close as possible to pad 6

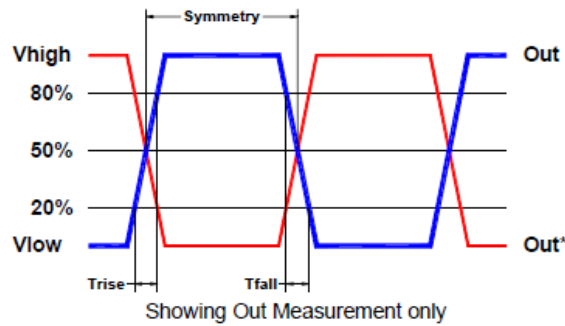
For Optimum Jitter Performance, Pletronics recommends:

- 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

ESD Rating

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

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

Absolute Maximum Ratings

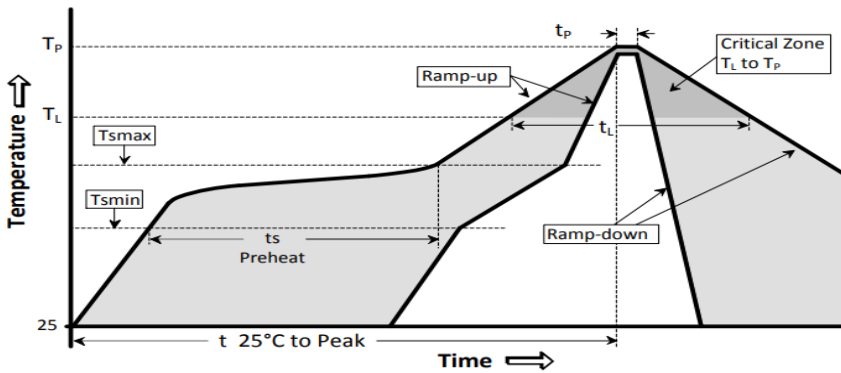
### Thermal Characteristics:

The maximum die or junction temperature is 150°C

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

## Reflow Cycle

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

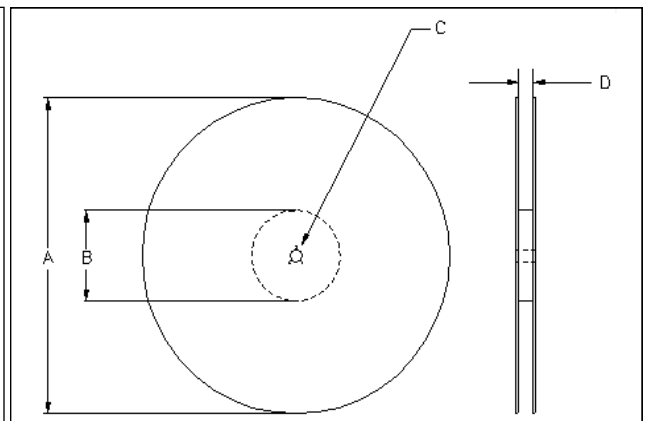
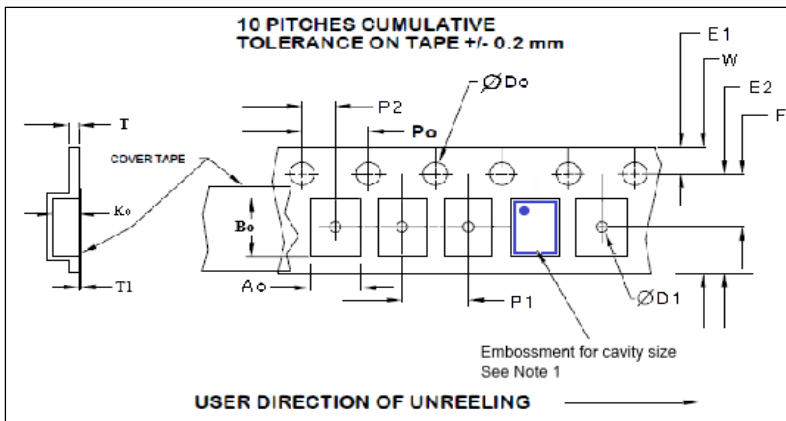


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate (TS <sub>max</sub> to TP)		3°C / second max	°C / s
Ramp down Rate	T <sub>cool</sub>	6°C / second max	°C / s
Time 25°C to Peak Temperature	T <sub>to-peak</sub>	8 minutes max	min
<b>Preheat</b>			
Temperature min	TS <sub>min</sub>	150	°C
Temperature max	TS <sub>max</sub>	200	°C
Time TS <sub>min</sub> to TS <sub>max</sub>	ts	60 – 180	sec
<b>Soldering above liquidus</b>			
Temperature liquidus	TL	217	°C
Time above liquidus	tl	60 – 150	sec
<b>Peak temperature</b>			
Peak Temperature	TP	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

## Tape and Reel

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



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
8mm	6.25	3.5 ±0.05	4.0 ±0.1	8.2	2.25±0.1	2.75±0.1	1.15±0.1

Dimensions in mm Drawing Not to scale

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

Tape Constant Dimensions Table 1

Tape Size	Do	D1 typ	E1	Po	P2	T max	T1 max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.3	0.1

Reel Dimensions (may vary) Table 3

Reel Size	A		B		C	D
	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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