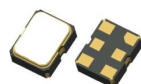




PLETRONICS PE33-J Series 3.3V PECL Clock Oscillator



PE33JV
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
- 3.3V 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 ²	100	-	220	MHz	Not all frequencies available, check with PLE sales
Frequency Stability ² $\pm 20 = 20^*$, $\pm 25 = 44$, $\pm 50 = 45$	± 20		± 50	ppm	Includes supply voltage change, load change, aging for 1 year at $25^\circ\text{C} \pm 2^\circ\text{C}$, shock, vibration and temperatures. *limited frequencies, see page 2
Operating Temperature Range ²	-10 -20 -40 -40 -40	-	+70 +70 +85 +105 +125	$^\circ\text{C}$	Standard range Extended range C option Extended range E option Extended range G option Extended range H option
Supply Voltage ^{1,2} V_{CC}	2.97	3.3	3.63	V	
Supply Current I_{CC}	-	-	68	mA	
Output Waveform	PECL				
Output High Level V_{OH}	$V_{\text{CC}} - 1.085$	$V_{\text{CC}} - 0.95$	$V_{\text{CC}} - 0.88$	V	Referenced to Ground
Output Low Level V_{OL}	$V_{\text{CC}} - 1.81$	$V_{\text{CC}} - 1.7$	$V_{\text{CC}} - 1.62$	V	Referenced to Ground
Output Voltage Amplitude V_{OPP}	0.4	-	-	V	Single ended measurement
Output T_{RISE} and T_{FALL}	-	-	0.5	ns	V_{th} is 20% and 80% of output V_{OPP}
Start Up Time	-	-	5	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	50% of output V_{OPP}
V_{DISABLE} V_{IL}	-	-	0.3 V_{CC}	V	Referenced to ground
V_{ENABLE} V_{IH}	0.7 V_{CC}	-			
Enable Time	-	-	5	ms	
Disable Time	-	-	200	ns	
Enable/Disable Internal Pull-up	30	70	150	K Ω	To V_{CC} , measured with pad 1 = 0.0 volts
Output Leakage $V_{\text{OUT}} = V_{\text{CC}}$ $V_{\text{OUT}} = 0\text{V}$	-10 -10	-	+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	$25^\circ\text{C} \pm 2^\circ\text{C}$ at 125 MHz
Storage Temperature Range	-55	-	+125	$^\circ\text{C}$	

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 code (Std 3K no designator)
PE33	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 G = -40 to +105°C H = -40 to +125°C	V = 3.3V ± 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 P
• YMxxx

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

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

RoHS Compliant

2nd Lvl Interconnect

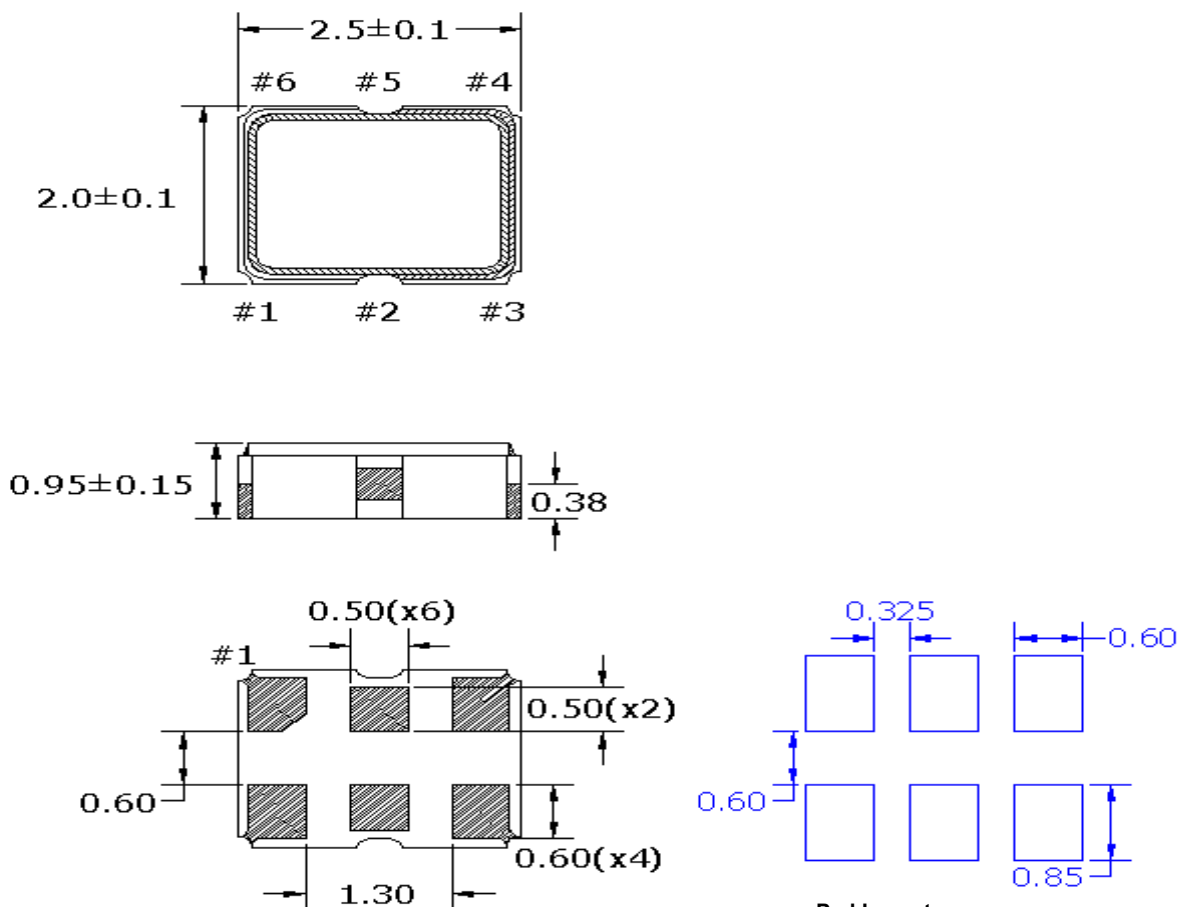
Category=e4

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



Dimensions in mm

Pad Layout

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

Contacts (pads): Gold (0.3 to 1.0 μ m) over Nickel (1.27 to 8.89 μ 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

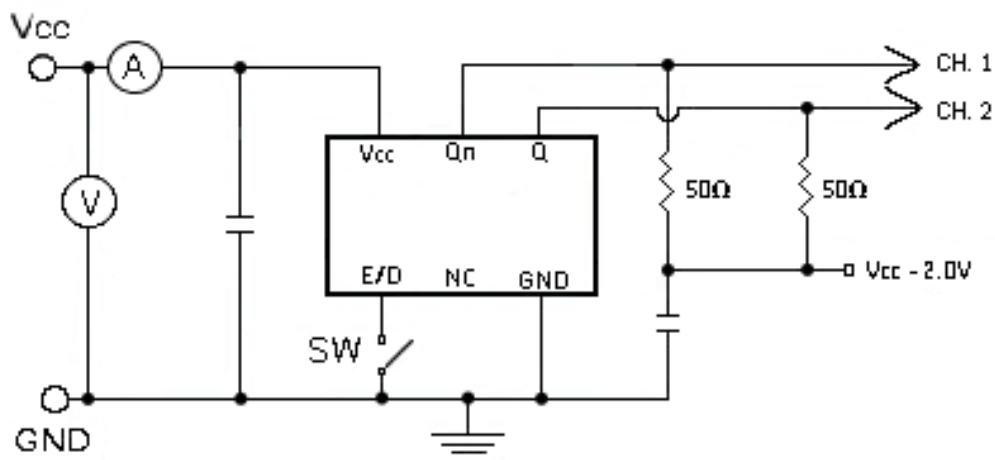
For Optimum Jitter Performance, Pletronics recommends:

- 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

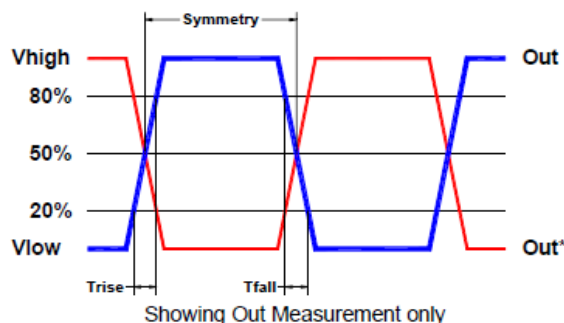


PLETRONICS PE33-J Series 3.3V PEGL Clock Oscillator

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 _{CC} Supply Voltage	-0.3V to +4.5V
V _i Input Voltage	-0.3V to V _{CC} + 0.3V
V _o Output Voltage	-0.3V to V _{CC} + 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"

The graph illustrates the temperature profile for maximum reflow conditions. The Y-axis represents Temperature (°C) and the X-axis represents Time. The profile starts at 25°C, ramps up to a peak temperature (T_P) at time t_P , and then ramps down. Key parameters include:

- T_P : Peak temperature.
- T_L : Liquidus temperature.
- T_{smax} : Maximum temperature during the soak phase.
- T_{smin} : Minimum temperature during the soak phase.
- t_s : Soak time.
- t_L : Time in liquidus.
- $t_{25^\circ\text{C to Peak}}$: Time from 25°C to the peak.
- t_P : Time to peak.
- t_L : Time in liquidus.
- t_s : Soak time.
- T_{smax} : Maximum temperature during the soak phase.
- T_{smin} : Minimum temperature during the soak phase.
- T_L : Liquidus temperature.
- T_P : Peak temperature.
- t_P : Time to peak.
- t_L : Time in liquidus.
- t_s : Soak time.
- $t_{25^\circ\text{C to Peak}}$: Time from 25°C to the peak.

The graph also indicates the "Critical Zone" (the time from T_L to T_P) and the "Preheat" time (the time from 25°C to the start of the ramp-up). The "Ramp-up" and "Ramp-down" times are also shown.

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(T _{smax} to T _P)	3°C / second max	°C / s
Ramp down Rate	T _{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	T _{to-peak}	8 minutes max	min
Preheat			
Temperature min	T _{Smin}	150	°C
Temperature max	T _{Smax}	200	°C
Time T _{Smin} to T _{Smax}	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T _L	217	°C
Time above liquidus	t _L	60 – 150	sec
Peak temperature			
Peak Temperature	T _P	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

Technical drawing of a tape reel showing dimensions and labels. The drawing includes a side view on the left and a top view on the right. The side view shows the tape thickness T_1 , the reel width K_0 , and the cover tape thickness I . The top view shows the reel diameter $\varnothing D_0$, the inner diameter $\varnothing D_1$, the pitch P_1 , the pitch P_2 , the pitch P_0 , the width B_0 , the width A_0 , the width W , the width E_1 , the width E_2 , and the width F . The drawing also indicates the user direction of unreeling and the embossment for cavity size.

10 PITCHES CUMULATIVE
TOLERANCE ON TAPE $\pm 0.2 \text{ mm}$

COVER TAPE

T_1

K_0

I

$\varnothing D_0$

$\varnothing D_1$

P_1

P_2

P_0

B_0

A_0

W

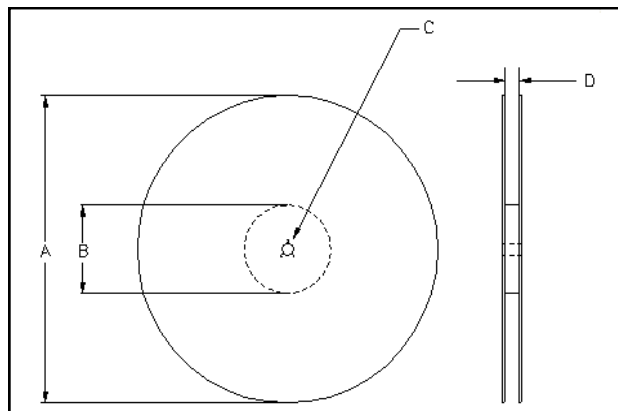
E_1

E_2

F

Embossment for cavity size
See Note 1

USER DIRECTION OF UNREELING



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

	A		B		C	D
Reel Size	Inch-es	mm	Inches	mm	mm	mm
7	7.0	178	2.50	63.5	13.0 +0.5 -0.2	8.4 +2.0 -0.0

Type 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



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