

## PE99D Series 3.3 V PECL Clock Oscillators

October 2012

**Lead Free**



- Pletronics' PE99D Series is a quartz crystal controlled precision square wave generator with a PECL output.
- The package is designed for high density surface mount designs.
- Low cost mass produced oscillator.
- Tape and Reel or cut tape packaging.
- 5 x 7 mm LCC Ceramic Package
- Enable/Disable Function on pad 1
- Output frequency is synthesized.
- Low Jitter

**Pletronics Inc. certifies this device is in accordance with the  
RoHS 6/6 (2002/95/EC) and WEEE (2002/96/EC) directives.**

Pletronics Inc. guarantees the device does not contain the following:

Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's

Weight of the Device: 0.16 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020D.1

Second Level Interconnect code: e4

### Absolute Maximum Ratings:

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +4.6V
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
I <sub>o</sub> Output Current	-50mA

### Thermal Characteristics

The maximum die or junction temperature is 155°C

The thermal resistance junction to board is 30 to 50°C/Watt depending on the solder pads, ground plane and construction of the PCB.

## Part Number:

PE99	45	D	E	V	-125.0M	-XX	
							<b>Packaging code or blank</b> <b>T250</b> = 250 per Tape and Reel <b>T500</b> = 500 per Tape and Reel <b>T1K</b> = 1000 per Tape and Reel
							<b>Frequency in MHZ</b>
							<b>Supply Voltage V<sub>cc</sub></b> <b>V</b> = 3.3V ± 10%
							<b>Temperature Range</b> <b>blank</b> = -10 to +70°C <b>C</b> = -20 to +70°C <b>E</b> = -40 to +85°C
							<b>Series Model</b>
							<b>Frequency Stability</b> <b>45</b> = ± 50 ppm <b>44</b> = ± 25 ppm <b>20</b> = ± 20 ppm
							<b>Series Model</b>

## Part Marking:

**PLE PE99**  
**FF.FFF M**  
**• YMDXX**

## Marking Legend:

PLE = Pletronics  
 FF.FFF M = Frequency in MHz  
 YMD = Date of Manufacture (year-month-day)  
 All other marking is internal factory codes

## Codes for Date Code YMD

Code	0	1	2	3	4	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2010	2011	2012	2013	2014	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

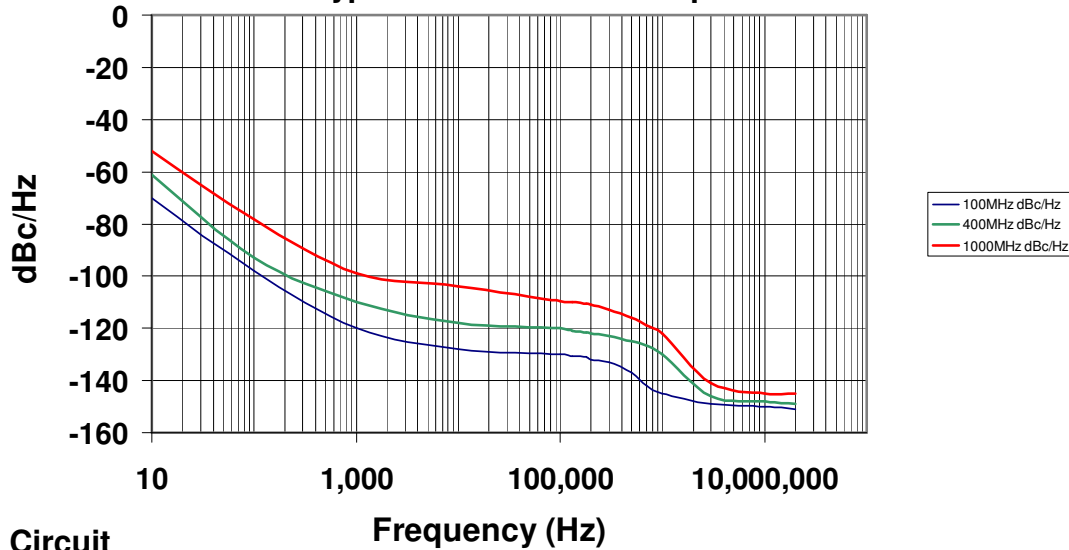
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

**Electrical Specification for 3.30V  $\pm 10\%$  over the specified temperature range and the frequency range of 10.9 MHZ to 766 MHZ and 876 MHZ to 1,175MHZ**

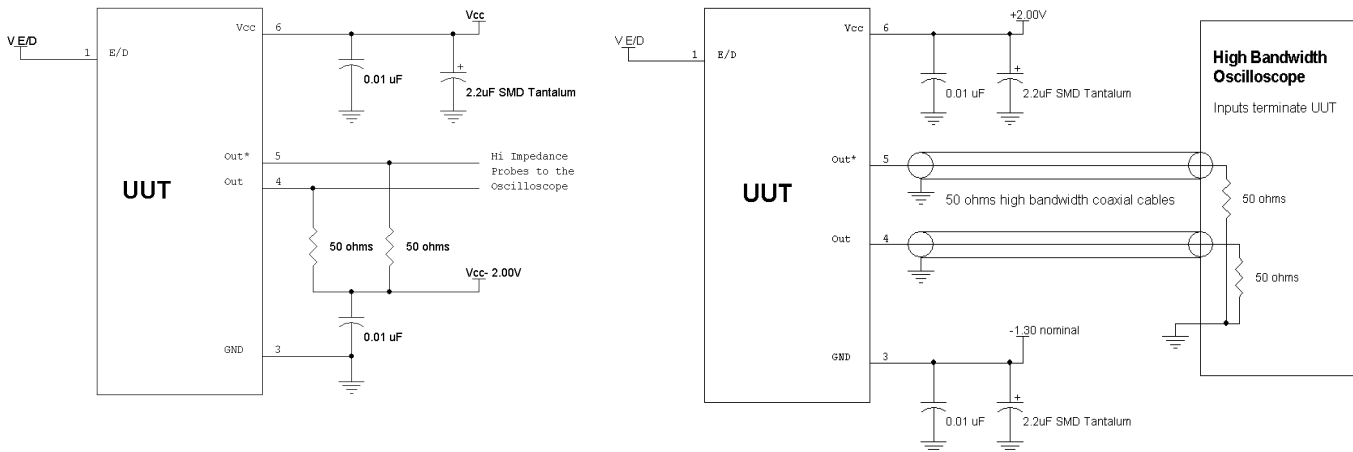
Item	Min	Max	Unit	Condition
Frequency Accuracy “45”	-50	+50	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
“44”	-25	+25		
“20”	-20	+20		
Output Waveform	PECL / ECL			
Output High Level	2.12	2.49	volts	Referenced to Ground, V <sub>CC</sub> = 3.3 V
	0.82	1.19	volts	Referenced to termination voltage, V <sub>CC</sub> = 3.3 V
	-1.18	-0.81	volts	Referenced to Vcc, V <sub>CC</sub> = 3.3 V
Output Low Level	1.83	1.99	volts	Referenced to Ground, V <sub>CC</sub> = 3.3 V
	0.53	0.69	volts	Referenced to termination voltage, V <sub>CC</sub> = 3.3 V
	-1.47	-1.31	volts	Referenced to Vcc, V <sub>CC</sub> = 3.3 V
Output Peak to Peak Level	0.405	1.076	volts	
Output Symmetry	47	53	%	at 50% point of V <sub>CC</sub> (See load circuit)
Jitter	-	0.6	pS RMS	12 KHz to 20 MHZ from the output frequency
	-	2.8	pS RMS	10 Hz to 20 MHZ from the output frequency
Output T <sub>RISE</sub> and T <sub>FALL</sub>	100	300	pS	Vth is 20% and 80% of waveform
V <sub>CC</sub> Supply Current (I <sub>CC</sub> )	-	90	mA	
Enable/Disable Internal Pull-up	50	-	Kohm	to V <sub>CC</sub>
V disable	-	0.8	volts	Referenced to pad 3
V enable	2.00	-	volts	Referenced to pad 3
Output leakage V <sub>OUT</sub> = V <sub>CC</sub>	-50	+50	uA	Pad 1 low, device disabled
V <sub>OUT</sub> = 0V	-50	+50	uA	
Enable time	-	10	nS	Time for output to reach a logic state
Disable time	-	10	nS	Time for output to reach a high Z state
Start up time	-	5	mS	Time for output to reach specified frequency
Operating Temperature Range	-10	+70	°C	Standard Temperature Range
	- 20	+70	°C	Extended Temperature Range “C” Option
	- 40	+85	°C	Extended Temperature Range “E” Option
Storage Temperature Range	-55	+125	°C	

Specifications with Pad 1 E/D open circuit or connected to  $V_{CC}$

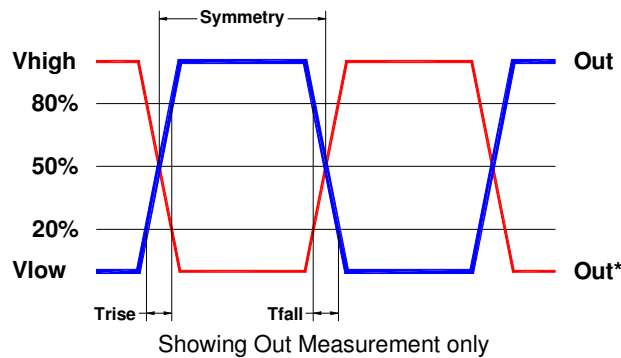
**Typical Phase-Noise Response**



**Load Circuit**



**Test Waveform**



## Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A






## ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	2000	MIL-STD-883 Method 3115
Charged Device Model	1500	JESD 22-C101

## Package Labeling

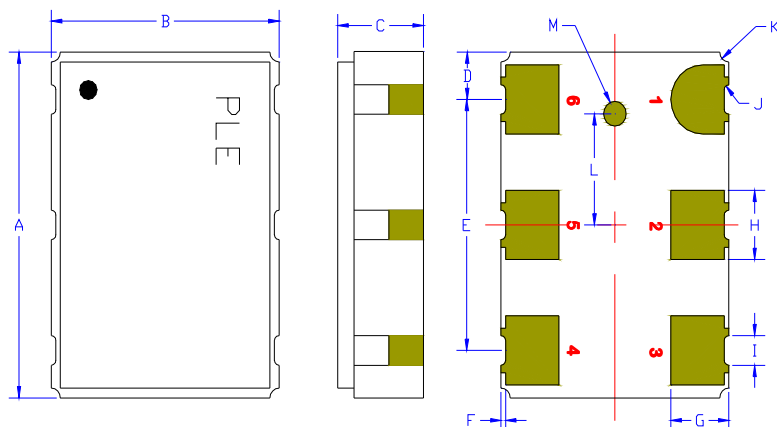
Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Courier New  
Bar code is 39-Full ASCII

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Arial

P/N:		
	PE9944DV-312 . 50M	
Customer P/N:		
	12345678	
Qty:		D/C 
	1000	7AA-BT

<p>RoHS Compliant</p> <p>2nd LvL Interconnect</p> <p>Category=e4</p> <p>Max Safe Temp=260C for 10s 2X Max</p>
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**Mechanical:**



**Contacts:**

Gold 11.8 to 39.4  $\mu$ inches (0.3 to 1.0  $\mu$ m)  
over  
Nickel 50 to 350  $\mu$ inches (1.27 to 8.89  $\mu$ m)

<sup>1</sup> Typical dimensions

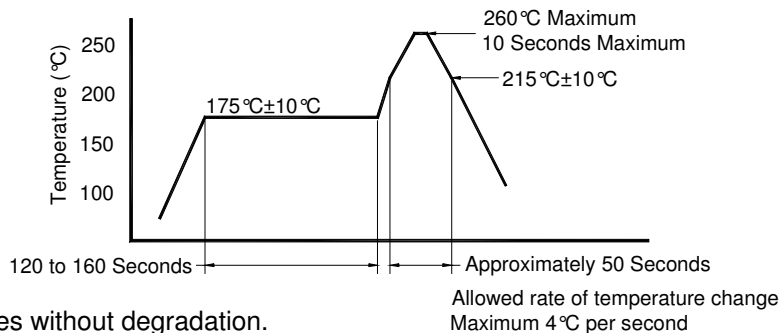
Not to Scale

Center metalized pad "M" on the base is  
not internally connected.

	Inches	mm
A	0.276 $\pm$ 0.006	7.00 $\pm$ 0.15
B	0.197 $\pm$ 0.006	5.00 $\pm$ 0.15
C	0.067 $\pm$ 0.010	1.70 $\pm$ 0.25
D <sup>1</sup>	0.038	0.96
E <sup>1</sup>	0.200	5.08
F <sup>1</sup>	0.004	0.10
G <sup>1</sup>	0.050	1.27
H <sup>1</sup>	0.055	1.40
I <sup>1</sup>	0.024	0.60
J <sup>1</sup>	0.004r	0.10r
K <sup>1</sup>	0.008r	0.20r
L <sup>1</sup>	0.089	2.25
M <sup>1</sup>	0.010r	0.25r

Pad	Function	Note
1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. When this pad is <0.80 volts, the output will be inhibited (high impedance state.) Recommend connecting this pad to V <sub>CC</sub> if the oscillator is to be always on.
2	No connect	The pad can be connected to V <sub>CC</sub> , Ground or left open. This pad is internally connected.
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 the Supply Voltage. The outputs become a High Z when disabled and the voltage level is determined by the termination circuitry.
5	Output*	
6	Supply Voltage (V <sub>CC</sub> )	Recommend connecting appropriate power supply bypass capacitors as close as possible.

## Reflow Cycle (typical for lead free processing)



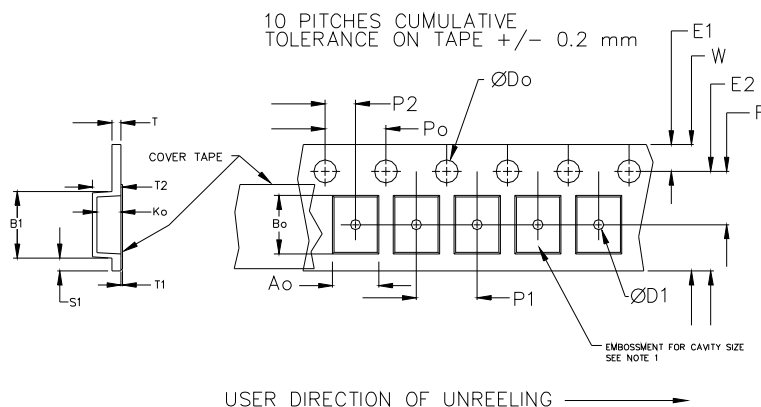
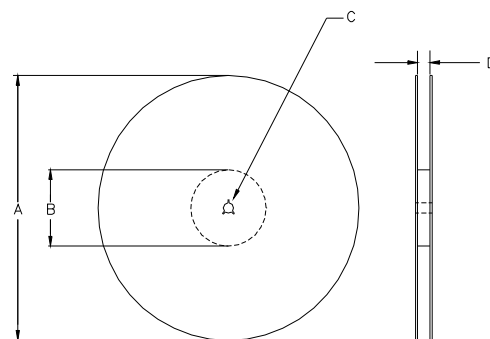
The part may be reflowed 3 times without degradation.

## Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5	1.0	1.75	4.0	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5			2.0 ±0.1			
16mm		1.5						
24mm		1.5						

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	7.5 ± 0.1	8.0 ± 0.1	8.0	16.3	Note 1

Note 1: Embossed cavity to conform to EIA-481-B Dimensions in mm Not to scale



REEL DIMENSIONS				
A	inches	7.0	10.0	13.0
	mm	177.8	254.0	330.2
B	inches	2.50	4.00	3.75
	mm	63.5	101.6	95.3
C	mm	13.0 +0.5 / -0.2		
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0
	mm	---	---	24.4 +2.0 -0.0
	mm	---	---	32.4 +2.0 -0.0

Reel dimensions may vary from the above

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- Подбор аналогов;
- Консультации по применению компонента;
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