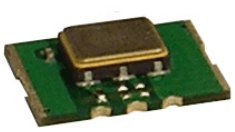
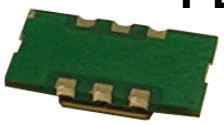
PE91/PE97 Series 3.3 V PECL Clock Oscillators

July 2007





- Pletronics PE91/PE97 Series is a quartz crystal controlled precision square wave generator with an PECL output.
- Solder pad compatible legacy PECL oscillator solutions.
- FR4 base using the PE93 or PE99 5x7 mm ceramic packaged SMD device.
- Tape and Reel packaging is available.
- 10.9 to 1,175 MHZ
- 9.7 mm x 14.0 mm 'B' package
- Enable/Disable Function:
  PE91 on pad 2
  PE97 on pad 1
- Low Jitter

This series, PE91 and PE97, is not recommended for new designs.
Use PE93 or PE99 series for new designs .

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: 0.66 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020C
Second Level Interconnect code: e4

Absolute Maximum Ratings:

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +6.5V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo Output Voltage	-0.5V to V_{CC} + 0.5V

Thermal Characteristics

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 40 to 80°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics standard warranty. Production processsing does not necessarily include testing of all parameters.

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PE91/PE97 Series 3.3 V
PECL Clock Oscillators

July 2007

Part Number:

PE9*x* | 45 | D | E | V | -125.0M | -XX

Packaging code or blank T250 = 250 per Tape and Reel T500 = 500 per Tape and Reel T1K = 1000 per Tape and Reel
Frequency in MHZ
Supply Voltage V_{cc} **V** = 3.3V ± 10%
Temperature Range **blank** = -10 to +70°C **E** = -40 to +85°C
Series Model
Frequency Stability **45** = ± 50 ppm **44** = ± 25 ppm **20** = ± 20 ppm
Series Model (*x* is 1 or 7)

Part Marking:

PLE PE9x
***FF.FFF* M**
• ***YMDXX***

Marking Legend:

PLE = Pletronics X = 1 or 7
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	7	8	9	0	1	2
Year	2007	2008	2009	2010	2011	2012

Code	A	B	C	D	E	F	G	H	J	K	L	M
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

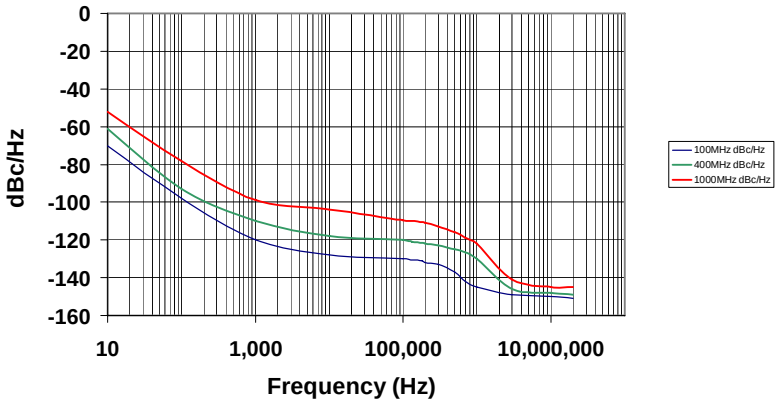
Code	1	2	3	4	5	6	7	8	9	A	B	C
Day	1	2	3	4	5	6	7	8	9	10	11	12
Code	D	E	F	G	H	J	K	L	M	N	P	R
Day	13	14	15	16	17	18	19	20	21	22	23	24
Code	T	U	V	W	X	Y	Z					
Day	25	26	27	28	29	30	31					

Electrical Specification for 3.30V ±10% over the specified temperature range and the frequency range of 10.9 MHZ to 766 MHZ and 876 MHZ to 1,175MHz

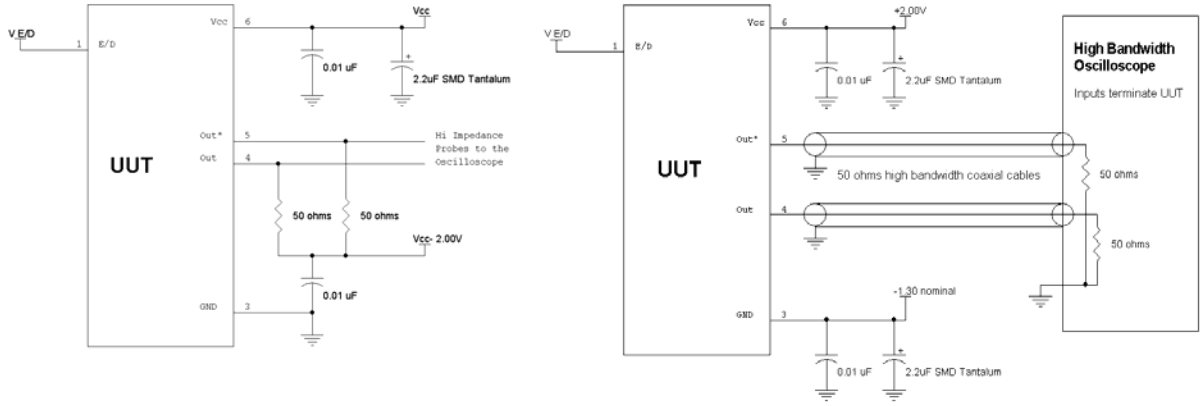
Item	Min	Max	Unit	Condition
Frequency Accuracy "**45**"	-50	+50	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
"**44**"	-25	+25		
"**20**"	-20	+20		
Output Waveform	PECL / ECL			
Output High Level	2.12	2.49	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.82	1.19	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.18	-0.81	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Low Level	1.83	1.99	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.53	0.69	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.47	-1.31	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Symmetry	47	53	%	at 50% point of V_{CC} (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_{RISE} and T_{FALL}	100	300	pS	Vth is 20% and 80% of waveform
V_{CC} Supply Current (I_{CC})	-	90	mA	
Enable/Disable Internal Pull-up	50	-	Kohm	to V_{CC}
V disable	-	0.8	volts	Referenced to pad 3
V enable	2.00	-	volts	Referenced to pad 3
Output leakage $V_{OUT} = V_{CC}$	-50	+50	uA	Pad 1 low, device disabled
V_{OUT} = 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
	- 40	+85	°C	Extended Temperature Range "**E**" Option
Storage Temperature Range	-55	+125	°C	

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

Typical Phase-Noise Response

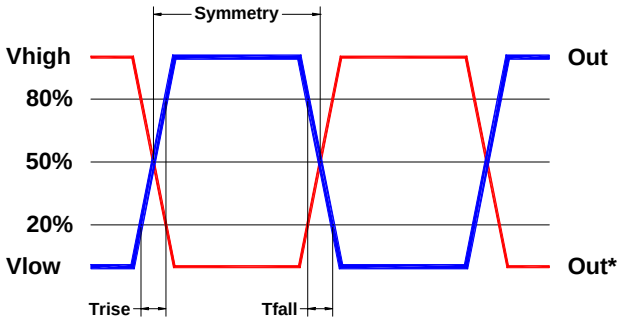


Load Circuit



E/D shown on pad 1 for PE97, will be on pad 2 for PE91

Test Waveform



Showing Out Measurement only

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

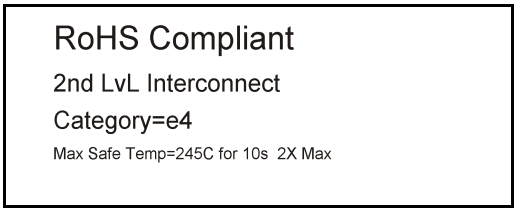
Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

Package Labeling

Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII
(The part number will show as PE91xx or PE97xx)



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



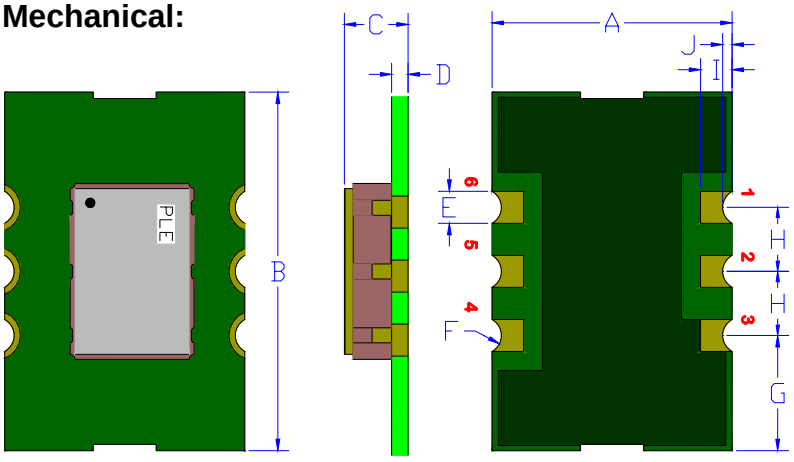
Layout and application information

For Optimum Jitter Performance, Pletronics recommends:

- a ground plane under the device
- no large transient signals (both current and voltage) should be routed under the device
- do not layout near a large magnetic field such as a high frequency switching power supply
- do not place near piezoelectric buzzers or mechanical fans.

As much ground plane and thermal paths that can be realized under and to the side of the part is desired.

Mechanical:



FR4 PCB Base:
Solder masked
All via holes tented on bottom
Copper Clad ½ oz. Typical
Gold plated 0.02 µinch (0.5 µm)

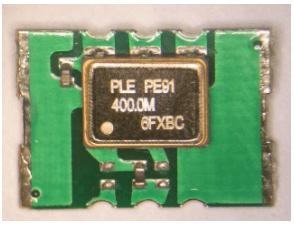
Label:
Laser engraved on the 5x7 mm oscillator that is mounted on the FR4 base

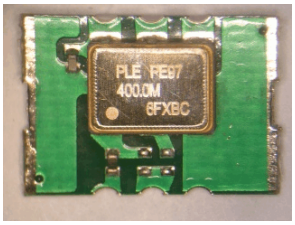
Pin 3 Ground plane is typical

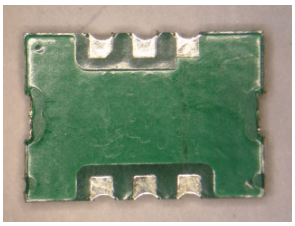
Not to scale

	Inches	mm
A	0.380 ±0.010	9.65 ±0.25
B	0.550 ±0.010	13.97 ±0.25
C	0.098 ±0.010	2.49 ±0.25
D[1]	0.026 typ.	0.66
E[1]	0.050	1.27
F[1]	0.028 R	0.72 R
G[1]	0.180	4.57
H[1]	0.100	2.54
I[1]	0.050	1.27
J[1]	0.015	0.38

[1] Typical Dimensions

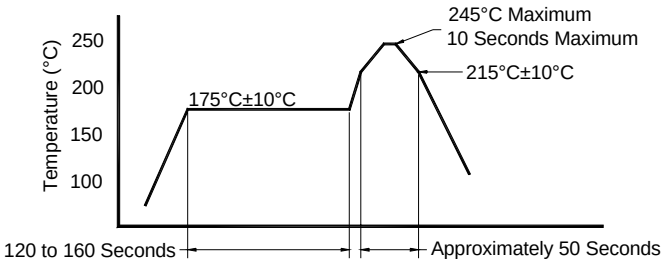






PE91 Pad	PE97 Pad	Function	Note
2	1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. This is not a recommended condition!!!!!! When this pad is <0.80 volts, the output will be inhibited (High impedance state) Recommend connecting this pad to V_{CC} if the oscillator is to be always on.
1	2	No function	Recommend connecting this pad to ground. The is internal connection.
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_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

Reflow Cycle (typical for lead free processing)



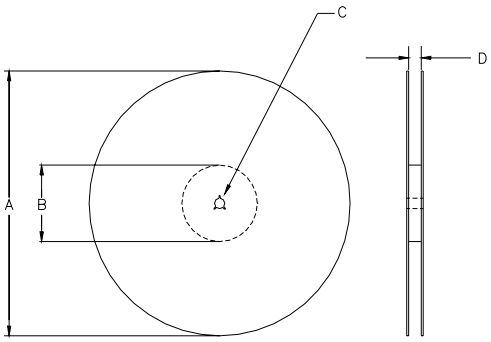
The part may be reflowed 2 times without degradation.

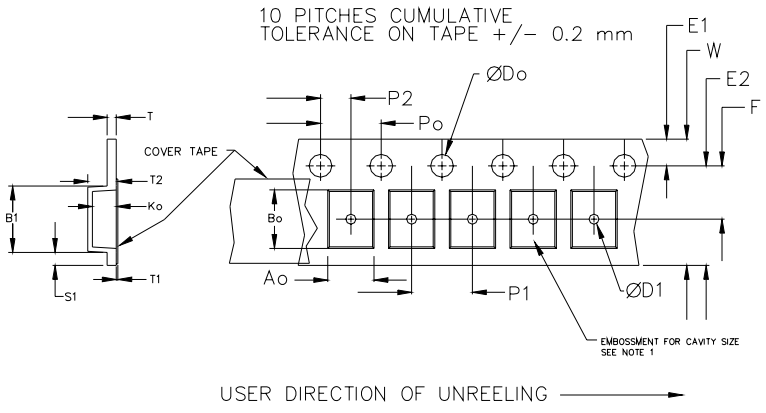
Tape and Reel: available for quantities of 250 to 1000 per reel

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	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	0.6	0.6	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
24 mm	12.1	14.25	7.5 ±0.1	16.0 ±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	Tape Width
C	mm	13.0 +0.5 / -0.2			
D	mm	---	---	24.4 +2.0 -0.0	24.0

Reel dimensions may vary from the above

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