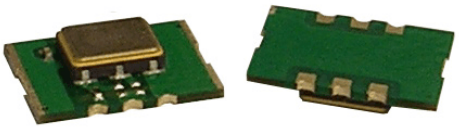


PE11B Series 3.3 V
PECL Clock Oscillators

January 2008

- Pletronics' PE11B Series is a quartz crystal controlled precision square wave generator with an PECL output.
- Solder pad compatible with many 9x14 Plastic J lead packages.
- FR4 base with a mechanical metal cover.
- Tape and Reel or Tube packaging is available.
- 10.9 to 1,100 MHZ
- 9.9 mm x 13.97 mm 'B' package
- Enable/Disable Function
- Low Jitter

This series, PE11B, is not recommended for new designs.
Use PE93 or PE99 series for new designs, these are not pin/pad compatible .

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: 1.34 or .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 60 to 100°C/Watt depending on the solder pads, ground plane and construction of the PCB.

PE11B Series 3.3 V
PECL Clock Oscillators

January 2008

Part Number:

PE11	45	B	E	V	-125.0M	-XX

Part Marking:

Packaging code or blank T250 = 250 per Tape and Reel T500 = 500 per Tape and Reel T1K = 1000 per Tape and Reel	PLE PE99 *FFFFF*M • *YMDXX* -or- PLE PE11B *FFFFF*M • *YMDXX* -or- PLE PE11B *FFFFF*M • *YMDXX* -or- PE11B*X* *FFFFF*M PLE *XX* • *YYWWXX* -or- PE11B*X* *FFFFF*M PLE *XX* • *YYWWXX*
Frequency in MHz	
Supply Voltage V_{cc} **V** = 3.3V ± 10%	
Optional Enhanced OTR **E** = Temperature range -40 to 85°C	
Series Model	
Frequency Stability **45** = ± 50 ppm **44** = ± 25 ppm **20** = ± 20 ppm	
Series Model	

Legend:

PLE = Pletronics
*FFFFF*M = Frequency in MHz
YMD or YYWW = Date of Manufacture (Year - month - day or year and week)
All other marking is internal factory codes. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD

Code	6	7	8	9	0	1	2
Year	2006	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

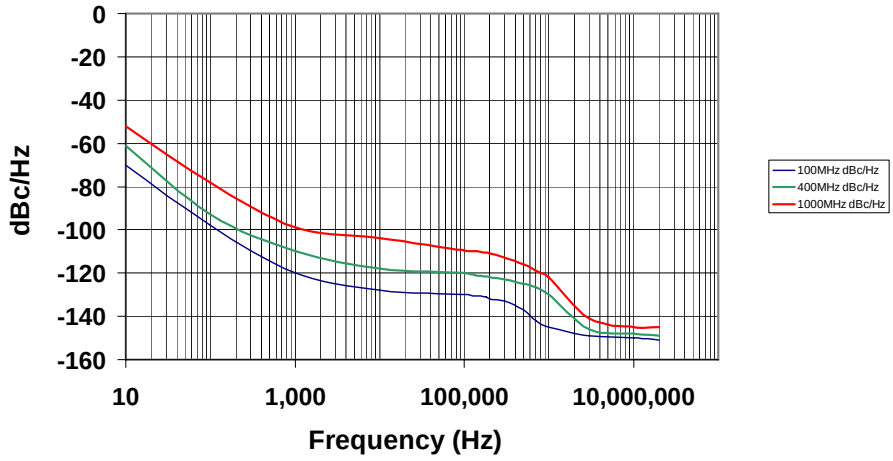
Code	1	2	3	4	5	6	7	8	9	A	B	C
Day	1	2	3	4	5	6	7	8	9	10	11	12
Code	D	E	F	G	H	J	K	L	M	N	P	R
Day	13	14	15	16	17	18	19	20	21	22	23	24
Code	T	U	V	W	X	Y	Z					
Day	25	26	27	28	29	30	31					

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

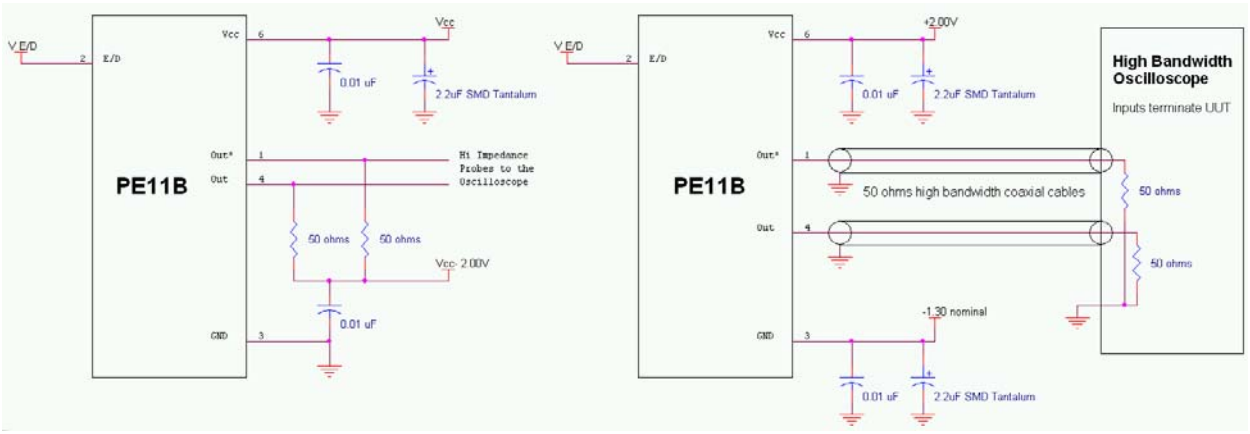
Item	Min	Max	Unit	Condition
Frequency Accuracy "45"	-50	+50	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
"44"	-25	+25		
"20"	-20	+20		
Output Waveform	PECL / ECL			
Output High Level	2.12	2.49	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.82	1.19	volts	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}

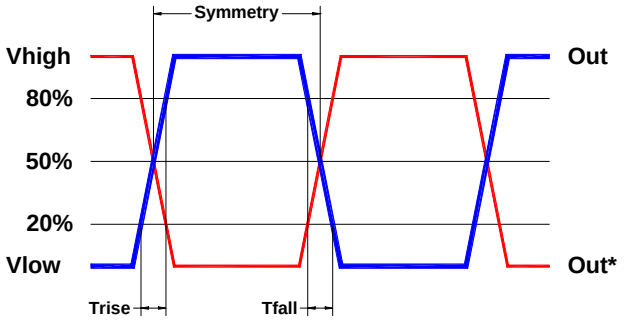
Typical Phase-Noise Response



Load Circuit



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

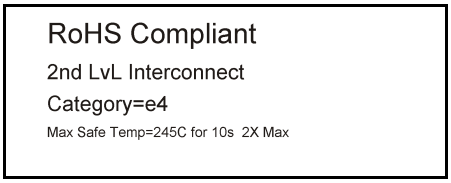
ESD Rating

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 PE33 will show PE11)

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

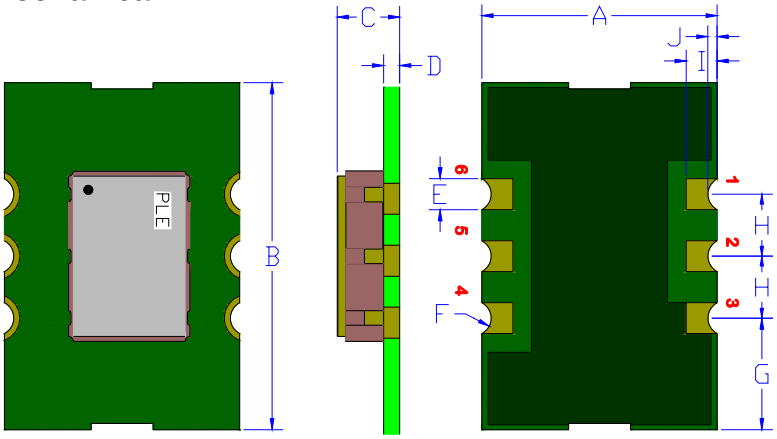


Layout and application information

Recommend connecting Pad 1 and Pad 2 together to permit the design to accept Enable/Disable on both input pads

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.

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	0.134 ±0.010	3.40 ±0.25
D[1]	0.062	1.57
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	Function	Note
1	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.
2	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.
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	N.C.	No internal connection
6	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

Mechanical (obsolete version):

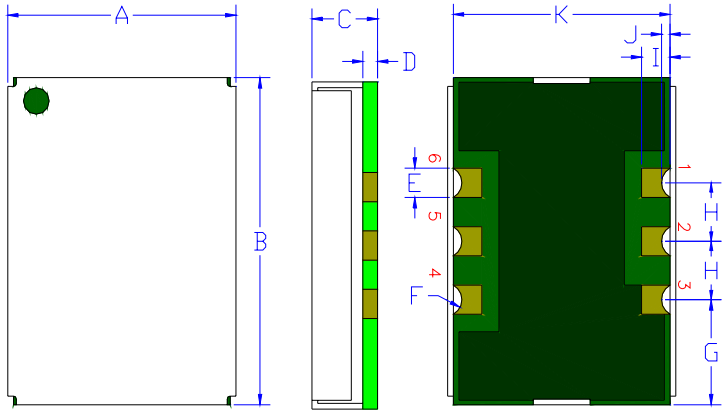
The cover is no longer being supplied over this part. This part is made with a hermetically sealed PE99xxDV series oscillator. This part is now exposed.

The cover has been deleted, the cover was causing problems with the newer high temperature RoHS lead free processes. The cover purpose was only cosmetic.

All parts with 2008 date codes will be made in the new fashion.

There is no change in electrical properties.

Pletronics does recommend that all designs should transition to the PE99xxDV ceramic part.



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:
White Kapton with Black Letters
–or--
Blue Epoxy heat cure ink covering top with laser marked lettering

Cover:
Centered on the base
304 Stainless Steel
0.010 inch (0.25µm)
Electroless Nickel Plated
1 µinch (25 µm) typical

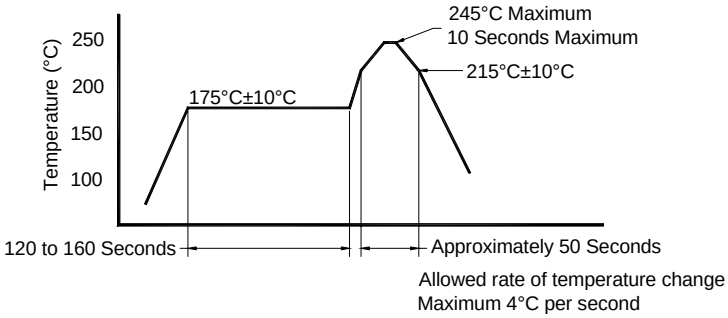
Pin 3 Ground plane is typical

Not to scale

	Inches	mm
B	0.550 ±0.010	13.97 ±0.25
A	0.390 ±0.010	9.90 ±0.25
C	0.105 ±0.010	2.67 ±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
K[1]	0.380	9.65

- The package is not hermetically sealed.
- The sides are intentionally left open to permit cleaning material to freely flow in the package, thus minimizing the accumulation of contaminants during cleaning processes.
- The internal part of the package must be thoroughly dry before operating.

Reflow Cycle (typical for lead free processing)



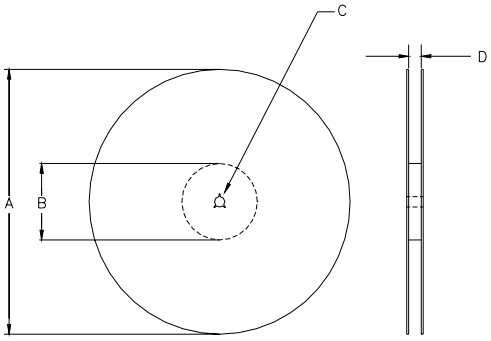
The part may be reflowed 2 times without degradation.

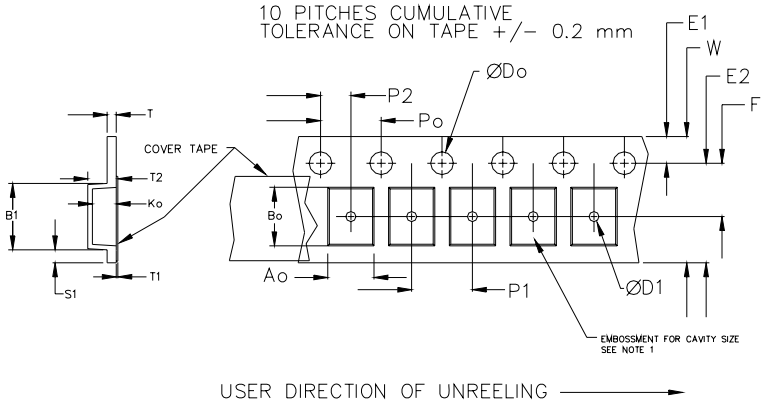
Tape and Reel: available for quantities of 250 to 1000 per reel

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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