PLETRONICS
www.pletronics.com 425-776-1880

PE11M Series 3.3 V
PECL Clock Oscillators

December 2007

- Pletronics' PE11M Series is a quartz crystal controlled precision square wave generator with a PECL output.
- Minimizes RFI radiation, eases meeting FCC Class B emissions standards.
- Tube packaging is available.
- 1 to 250 MHz
- Full Size Thru-Hole DIP package
- No Enable/Disable Function
- 3rd Overtone Crystals used
- Low Jitter
- 5x7 mm LCC ceramic oscillator inside

Pletronics Inc. certifies this device is in accordance with the RoHS 5/6 (2002/95/EC) and WEEE (2002/96/EC) directives.

Pletronics Inc. guarantees the device does not contain the following:
Cadmium, Hexavalent Chromium, Lead (< 1000 ppm), Mercury, PBB's, PBDE's
Weight of the Device: 3.76 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020C
Second Level Interconnect code: e1

Absolute Maximum Ratings:

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +7.0V
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 120°C/Watt depending on the solder pads, ground plane and construction of the PCB.

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Part Number:

PE11	45	M	E	V	-125.0M	-XX

Internal code or blank
Frequency in MHz
Supply Voltage V_{cc} **V** = 3.3V ± 10%
Optional Enhanced OTR **Blank** = Temp. range -10 to +70°C **E** = Temp. range -40 to +85°C
Series Model
Frequency Stability **45** = ± 50 ppm **44** = ± 25 ppm **20** = ± 20 ppm
Series Model

Part Marking:

PLE	**or**	**PE11M*X***
PE11M		***FFFFF*M**
***FFFFF*M**		**PLE *XX***
• ***YMDXX***		• ***YYWWXX***

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

Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from the marking. 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

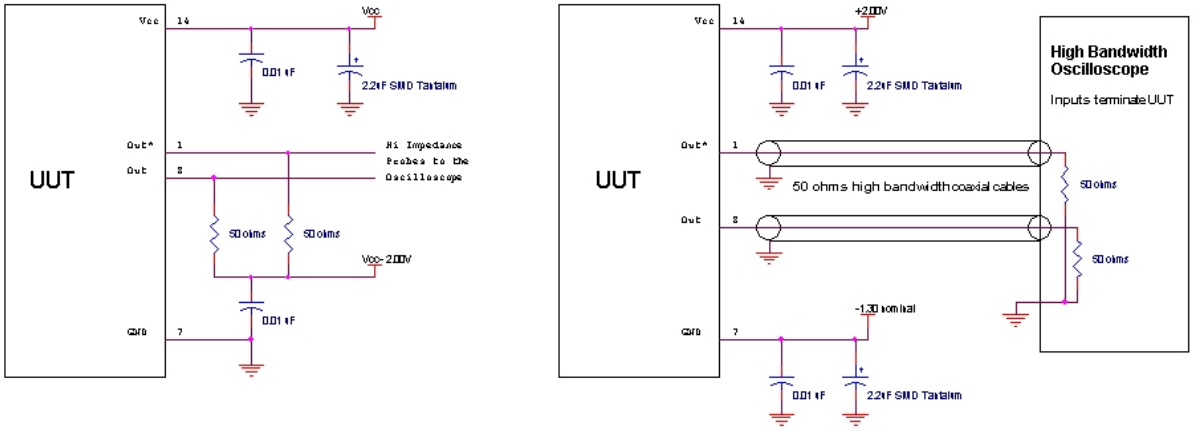
Code	A	B	C	D	E	F	G	H	J	K	L	M
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

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					

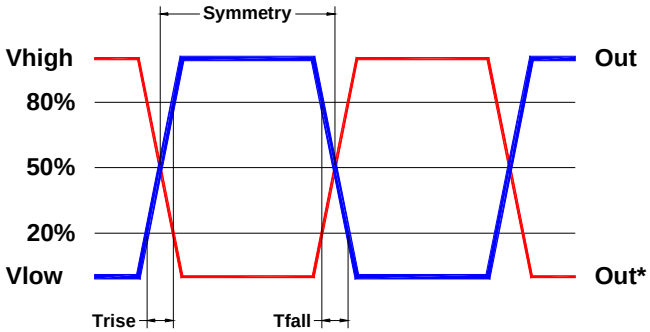
Electrical Specification for 3.30V ±10% over the specified temperature range

Item	Min	Max	Unit	Condition
Frequency Range	1	250	MHz	
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 (0°C to 85°C)	2.275	2.420	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.975	1.120	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.025	-0.880	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output High Level (-40°C)	2.216	2.420	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.916	1.120	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.084	-0.88	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Low Level (0°C to 85°C)	1.490	1.680	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.190	0.380	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.810	-1.620	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Low Level (-40°C)	1.470	1.745	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.170	0.445	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.830	-1.555	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Symmetry	45	55	%	at 50% point of V_{CC} (See load circuit)
Jitter	-	0.2	pS RMS	12 KHz to 20 MHz from the output frequency
	-	2.8	pS RMS	10 Hz to 1 MHz from the output frequency
Output T_{RISE} and T_{FALL}	-	0.7	nS	Vth is 20% and 80% of waveform
V_{CC} Supply Current (I_{CC})	-	90	mA	
Start up time	-	10	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	

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

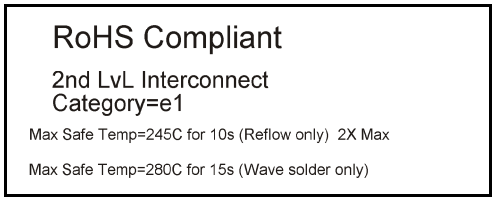
ESD Rating

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

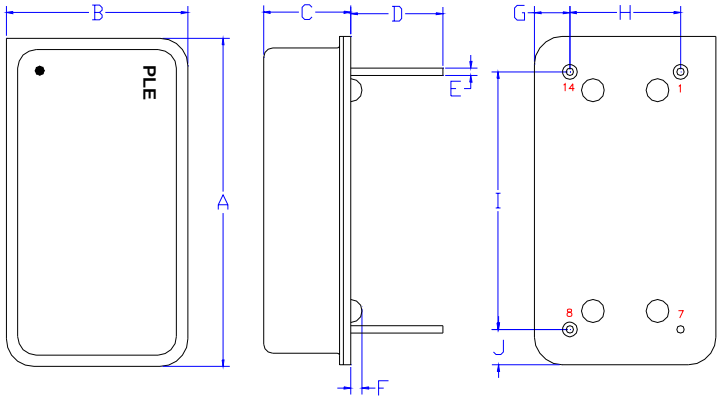
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



PCB Mounting

Wave solder at 255°C to 280°C with maximum wave exposure of 15 seconds
Reflow solder maximum exposure of 245°C for 15 seconds
Soldering done in a nitrogen atmosphere enhances the solder joint quality.

Mechanical:



Cover:
Kovar
Electroless Nickel Plated
1 µinch (25 µm) typical
Resistance welded to base

Label:
White Kapton with Black Letters
–or--

Blue Epoxy heat cure ink with laser marked lettering

Base:
Kovar
Glass to metal sealed leads

Pin 7 Connected to case

Not to scale

	Inches	mm
A	0.787 ±0.005	20.00 ±0.13
B	0.487 ±0.005	12.37 ±0.13
C	0.225 ±0.011	5.72 ±0.28
D[1]	0.250	6.35
E[1]	0.020	0.51
F[1]	0.031	0.79
G[1]	0.094	2.37
H[1]	0.300	7.62
I[1]	0.600	15.24
J[1]	0.094	2.37

[1] Nominal dimension

Pin	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.
7	Ground (GND)	
8	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.
14	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

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.

IMPORTANT NOTICE

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.**PLETRONICS INC. DOCUMENT CONTROL**

This is the document control page. **This is not printed or part of the PDF that can be downloaded on the web site.** This is to keep the history of the datasheet document and all revisions.

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Written By:	R Gubser
Approved By:	Melody Mistlin and Claude Lee after sales and engineering group review.

This specification was written for the following configurations:
using SM77 and AZ100ELT20 IC inside OR using PE77D 3.3V inside (not available yet)

Revision History:

May 2006	Initial Release
July 28, 2007	Changed the A dimension of package 0.887 to 0.787 rag
Dec 2007	Deleted * in front of output in pinout table, updated temp range from 0-70 to -10-70, added YMD codes, updated RoHS label