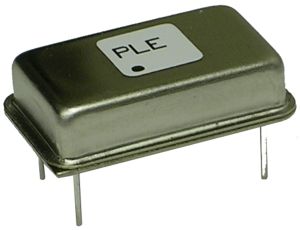
PLETRONICS
www.pletronics.com 425-776-1880



P1145-HCM-32.768K
CMOS Clock Oscillator

February 2013

- Pletronics' P1145-HCM is a quartz crystal controlled precision square wave generator with a CMOS output.
- Minimizes RFI radiation, eases meeting FCC Class B emissions standards.
- Tube packaging is available.
- 32.768 KHz
- Full Size Thru-Hole DIP package
- Enable/Disable Function on pin 1 with low power consumption
- **Fast Start-up Time of 500 mS or less**

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: 3.72 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.

Part Number:

P1145-HCM	- 32.768K	-XX	
			Internal code or blank
			Frequency in kHz
			Series Model

Part Marking:

PLE	**or**	**PLE**
P11HCM		**PHCM*X***
32.768K		**32.768K**
• ***YMDXX***		• ***YYWWXX***

Legend:
PLE = Pletronics
YMD or YYWW = Date of Manufacture (Year - month - day or year and week)
All other marking is internal factory codes

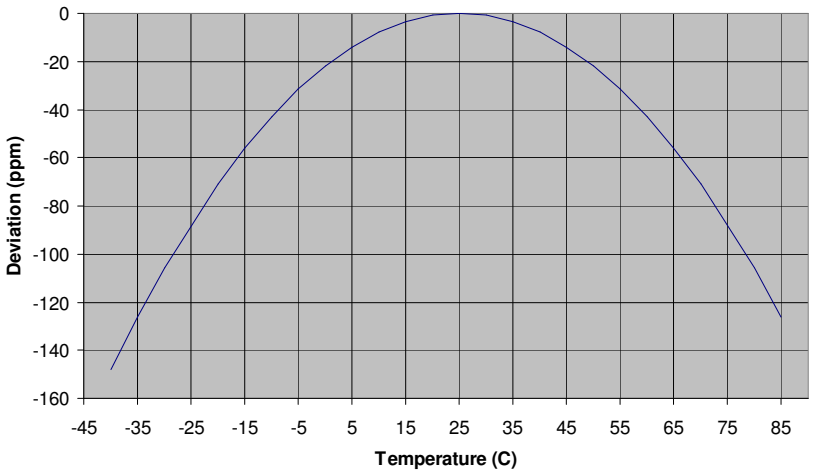
Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from the marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Electrical Specification for Vcc 1.5V to 5.0V over - 40 to +85°C

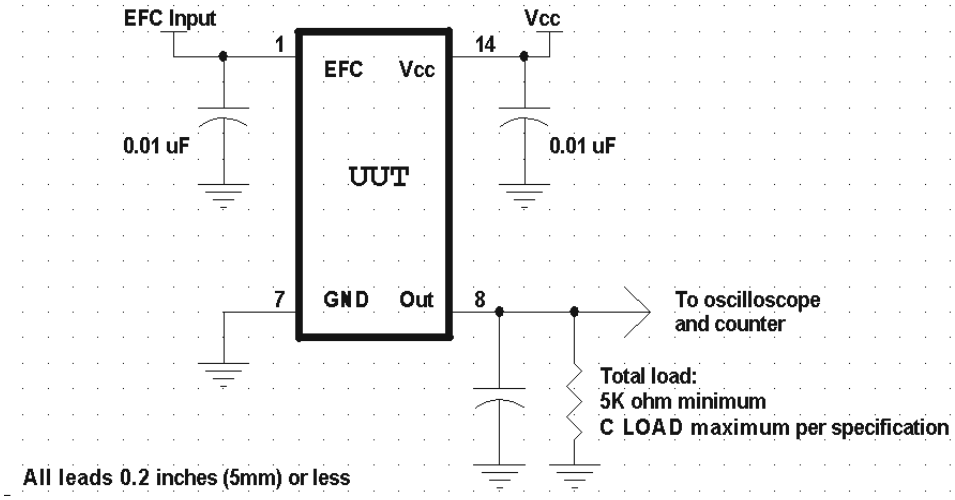
Item	Min	Typ	Max	Unit	Condition	
Frequency		32.768		kHz		
Frequency Calibration Tolerance	-30	0	+30	ppm	at 25 °C	
Frequency Stability *	-60	-	+30	ppm	when operating at 0 to +70 °C	
	-200	-	+30	ppm	when operating at -40 to +85 °C	
Output Waveform		CMOS				
Output High Level	90	-	-	%	of V_{CC} (See load circuit)	
Output Low Level	-	-	10	%		
Output T_{RISE} and T_{FALL}	-	100	150	nS	C_{LOAD} = 15pF T_R / T_F 10% to 90% and D.C. at 50% point of V_{CC} (See load circuit)	
Output Symmetry	40	50	60	%		
Enable/Disable Internal Pull-up	1	-	-	Mohm	to V_{CC}	
V disable	-	-	30	%	of V_{CC} applied to pad 1	
V enable	70	-	-	%		
Output leakage $V_{OUT} = V_{CC}$	-10	-	+10	uA	Pad 1 low, device disabled	
V_{OUT} = 0V	-10	-	+10	uA		
Supply Current (I_{CC})	-	3.3	9.0	uA	V_{CC} = 1.5V	C_{LOAD} = 15 pF
	-	4.0	10.0	uA	V_{CC} = 1.8V	
	-	4.2	11.0	uA	V_{CC} = 2.0V	
	-	5.0	12.0	uA	V_{CC} = 2.7V	
	-	6.0	15.0	uA	V_{CC} = 3.3V	
	-	8.0	20.0	uA	V_{CC} = 5.0V	
Standby Current I_{CC}	-	-	3	uA	Pad 1 low, device disabled	
Enable time	-	-	100	nS	Time for output to reach a logic state	
Disable time	-	-	100	nS	Time for output to reach a high Z state	
Start up time	-	-	500	mS	Time for output to reach specified frequency	
Operating Temperature Range	-40	-	+85	°C		
Storage Temperature Range	-55	-	+125	°C		

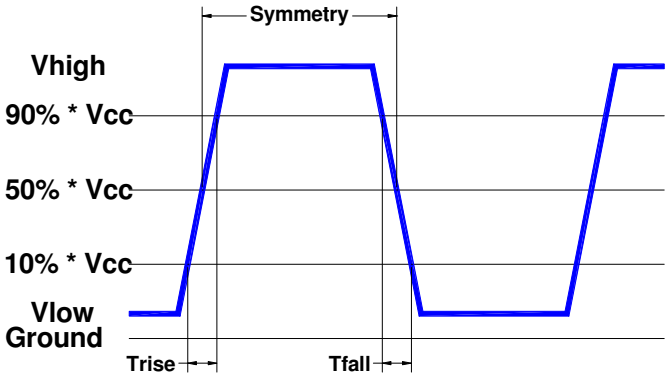
*For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
Specifications with Pin 1 E/D open circuit

Typical Frequency versus Temperature Characteristics



Load Circuit and 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

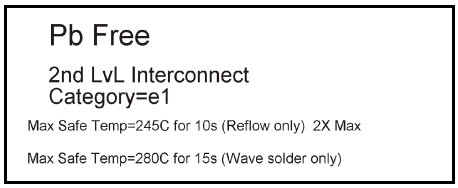
ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	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

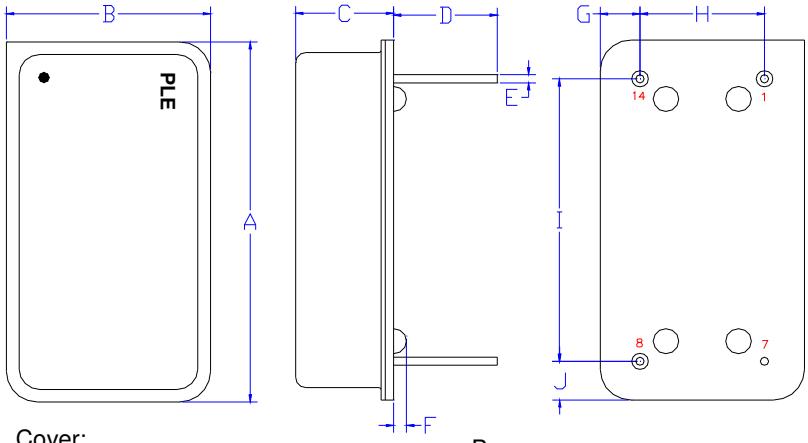
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



PCB Mounting

Wave solder at 255ºC to 280ºC with maximum wave exposure of 15 seconds
Reflow solder maximum exposure of 245ºC 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 Enable/Disable	When this pin is not connected the oscillator shall operate. When this pin is logic low the output will be inhibited (high impedance state.) Recommend connecting this pad to V_{CC} if the oscillator is to be always on.
7	Ground (GND)	
8	Output	
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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