

## S3883 - 32.768K CMOS Clock Oscillator

November 2008

- Pletronics' S3883 is a quartz crystal controlled precision square wave generator with a CMOS output.
- The package is designed for high density surface mount designs.
- This is a low cost mass produced oscillator.
- Tape and Reel packaging is available.
- 32.768 kHz
- 4 x 6.5 mm LCC Ceramic Package
- Enable/Disable Function on pad 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, Mercury, PBB's, PBDE's

Weight of the Device: 0.2 grams

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

Second Level Interconnect code: e4

### Absolute Maximum Ratings:

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +7.0V
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

### 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.



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## Part Number:

S3883	E	-32.768K	-XX	
				<b>Packaging code or blank</b> T250 = 250 per cut Tape T500 = 500 per cut Tape T1K = 1000 per Tape and Reel
				<b>Frequency in KHz</b>
				<b>Optional Enhance OTR</b> Blank = -10°C to +60°C E = -40°C to +85°C
				<b>Series Model</b>

## Part Marking:

**S3883**  
**32.768K**  
**PLE ywwa**

or

**S3883**  
**32.768K**  
**PLE ymd**

Where: *ywwa* or *ymd* = Date code

### 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					

**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

P/N:		
	S3883-32.768K	
Customer P/N:		
	12345678	
Qty:		D/C 
	1000	0514-H

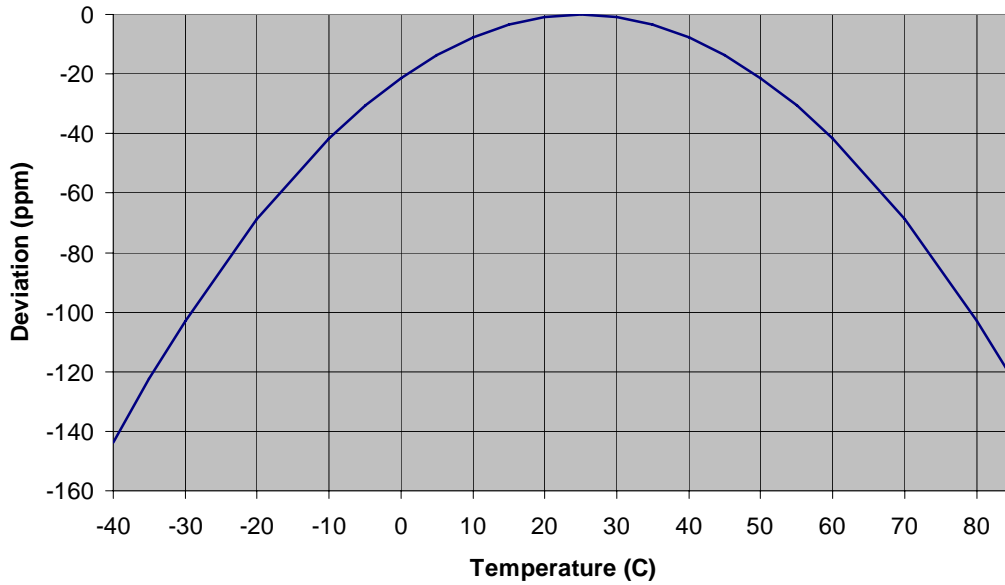
<p><b>RoHS Compliant</b></p> <p>2nd Lvl Interconnect</p> <p>Category=e4</p> <p>Max Safe Temp=260C for 10s 2X Max</p>
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### Electrical Specification for V<sub>CC</sub> 1.5V to 5.0V over -10 to +60 °C

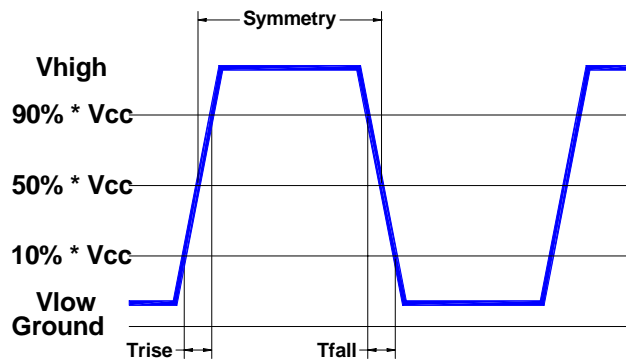
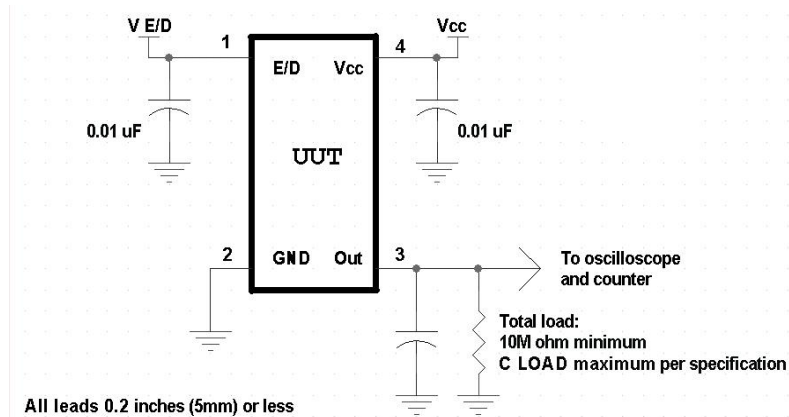
Item	Min	Typ	Max	Unit	Condition	
Frequency	32.768			kHz		
Frequency Calibration Tolerance	-30	0	+30	ppm	at 25 °C	
Frequency Stability *	-60	-	+30	ppm	over -10 to +60 °C	
Output Waveform	CMOS					
Output High Level	90	-	-	%	of V <sub>CC</sub> (See load circuit)	
Output Low Level	-	-	10	%	of V <sub>CC</sub> (See load circuit)	
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	100	150	nS	C <sub>LOAD</sub> = 15pF T <sub>R</sub> / T <sub>F</sub> 10% to 90% and D.C. at 50% point of V <sub>CC</sub> (See load circuit)	
Output Symmetry	45	50	55	%		
Enable/Disable Internal Pull-up	1	-	-	Mohm	to V <sub>CC</sub>	
V disable	-	-	30	%	of V <sub>CC</sub> applied to pad 1	
V enable	70	-	-	%	of V <sub>CC</sub> applied to pad 1	
Output leakage V <sub>OUT</sub> = V <sub>CC</sub>	-10	-	+10	uA	Pad 1 low, device disabled	
V <sub>OUT</sub> = 0V	-10	-	+10	uA		
Supply Current (I <sub>CC</sub> )	-	3.3	9.0	uA	V <sub>CC</sub> = 1.5V	C <sub>LOAD</sub> = 15 pF
	-	4.0	10.0	uA	V <sub>CC</sub> = 1.8V	
	-	4.2	11.0	uA	V <sub>CC</sub> = 2.0V	
	-	5.0	12.0	uA	V <sub>CC</sub> = 2.7V	
	-	6.0	15.0	uA	V <sub>CC</sub> = 3.3V	
	-	8.0	20.0	uA	V <sub>CC</sub> = 5.0V	
Standby Current I <sub>CC</sub>	-	-	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	-10 -40	-	+60 +85	°C	Standard Optional "E"	
Storage Temperature Range	-55	-	+125	°C		

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

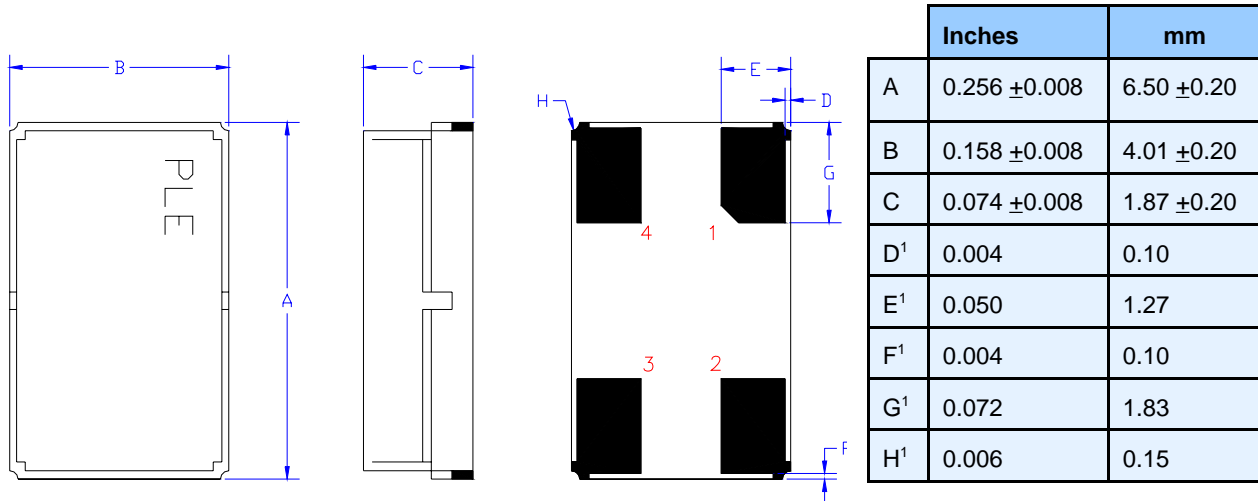
## Typical Frequency versus Temperature Characteristics



## Load Circuit and Test Waveform



## Mechanical



Not to Scale

<sup>1</sup> Typical dimensions

### Contacts :

Gold 11.8 μinches 0.3 μm minimum over  
 Nickel 50 to 350 μinches 1.27 to 8.89 μm

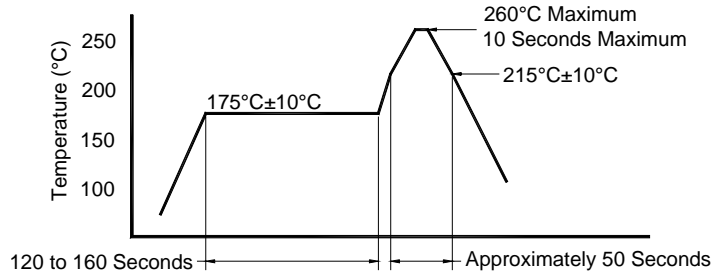
Pad	Function	Note
1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. When this pad is logic low the output will be inhibited (high impedance state.) Recommend connecting this pad to V <sub>CC</sub> if the oscillator is to be always on.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V <sub>CC</sub> )	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.

## Reflow Cycle (typical for lead free processing)



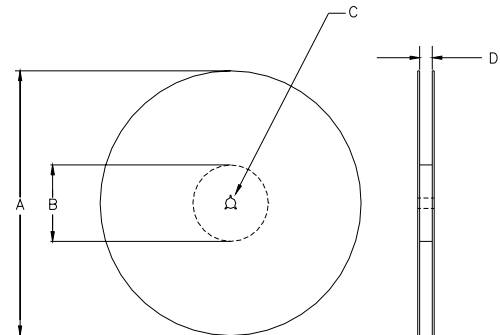
The part may be reflowed 2 times without degradation.

Allowed rate of temperature change  
Maximum 4°C per second

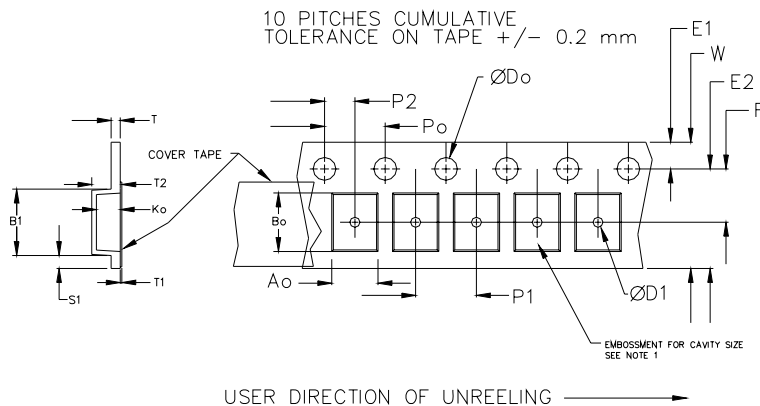
## Tape and Reel: available for quantities of 1000 per reel, cut tape for < 1000

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		+0.1 -0.0			1.5				2.0 ±0.1
24mm		1.5			2.0 ±0.1				

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			Tape Width
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	16.0

Reel dimensions may vary from the above



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