

S3884 - 32.768K CMOS Clock Oscillator

June 2007

- Pletronics' S3884 is a quartz crystal controlled precision square wave generator with a CMOS output.
- Solder pad compatible with the Epson SG615 and SG8002J and many other 9x14mm plastic J lead packages.
- FR4 base with a mechanical metal cover.
- Tape and Reel packaging is available.
- 32.768 kHz
- 9.04mm x 8.91mm (S 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: 0.4 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 +7.0V
V _i Input Voltage	-0.5V to V _{CC} + 0.5V
V _o 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.



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Part Number:

S3884	- 32.768K	-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 kHz
			Series Model

Part Marking:

PLE
S3884
32.768K
ymd

Where: *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:		
	S3884-32.768K	
Customer P/N:		
	12345678	
Qty:		D/C 
	1000	0514-R

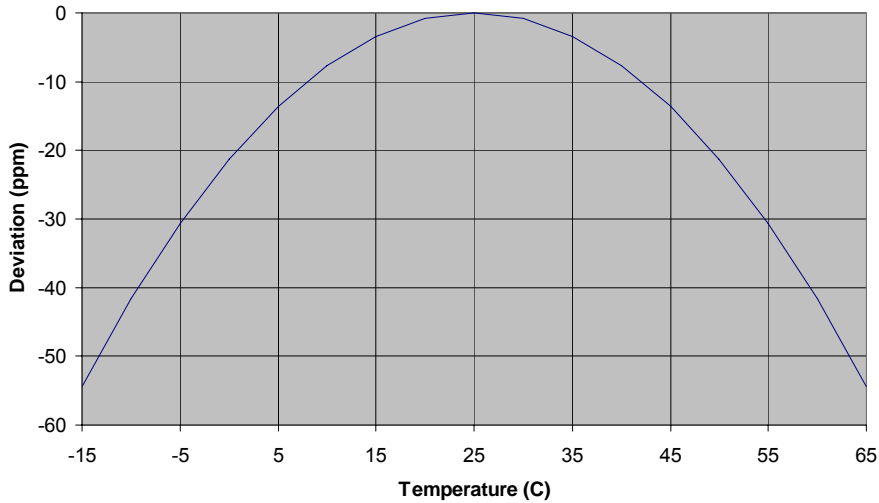
RoHS Compliant
2nd Lvl Interconnect
Category=e4
Max Safe Temp=245C for 10s 2X Max

Electrical Specification for V_{CC} 1.5V to 5.0V over -10 to +60°C

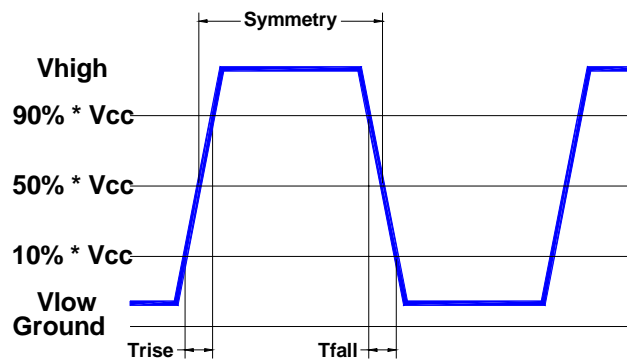
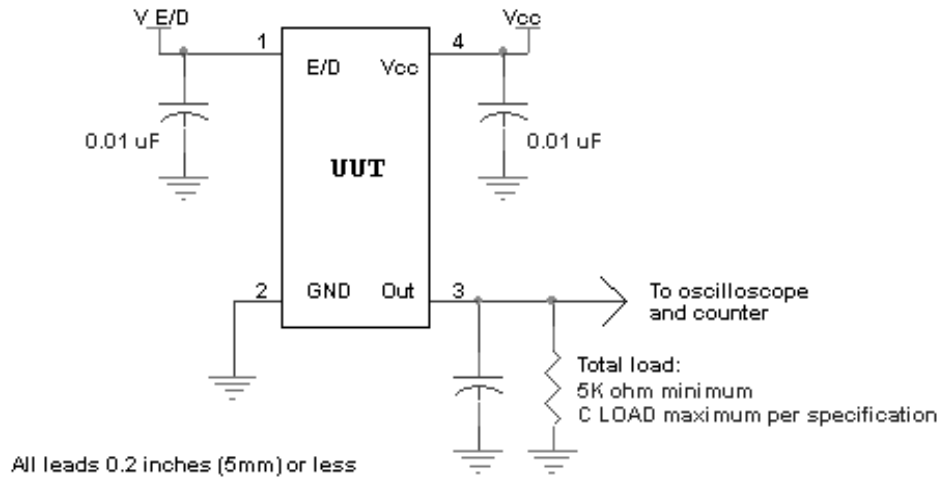
Item	Min	Typ	Max	Unit	Condition	
Frequency	32.768			kHz		
Frequency Calibration Tolerance	-30	0	+30	ppm	at 25 °C	
Frequency Stability *	-60	-	+30	ppm	over -10 to +60 °C	
Output Waveform	CMOS					
Output High Level	90	-	-	%	of V _{CC} (See load circuit)	
Output Low Level	-	-	10	%	of V _{CC} (See load circuit)	
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	45	50	55	%		
Enable/Disable Internal Pull-up	1	-	-	Mohm	to V _{CC}	
V disable	-	-	30	%	of V _{CC} applied to pad 1	
V enable	70	-	-	%	of V _{CC} applied to pad 1	
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	-10	-	+60	°C		
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

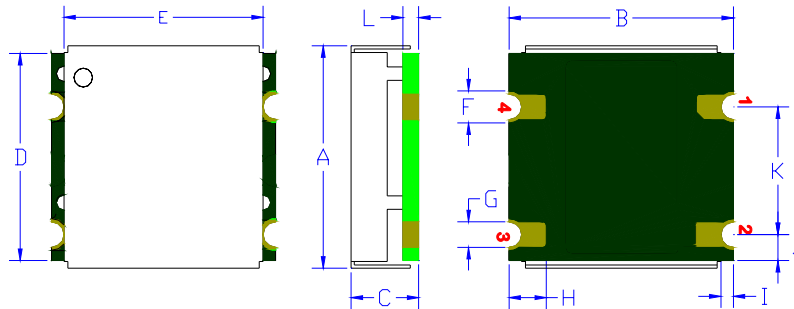
Typical Frequency versus Temperature Characteristics



Load Circuit and Test Waveform



Mechanical:



	Inches	mm
A	0.351 \pm 0.003	8.91 \pm 0.07
B	0.356 \pm 0.005	9.04 \pm 0.13
C	0.103 \pm 0.005	2.62 \pm 0.13
D ¹	0.324	8.23
E ¹	0.316	8.03
F ¹	0.050	1.27
G ¹	0.040	1.02
H ¹	0.059	1.50
I ¹	0.020	0.51
J ¹	0.040	1.02
K ¹	0.200	5.08
L ¹	0.026 typical	0.66

Cover:

Centered on the base
304 Stainless Steel
0.010 inch (0.25 μ m)
Electroless Nickel Plated
1 μ inch (25 μ m) typical

FR4 PCB Base:

Solder masked
All via holes tented on bottom
Copper Clad ½ oz. Typical
Gold plated 0.02 μ inch (0.5 μ m)

Label:

White Kapton with Black Letters
—or—
Blue Epoxy heat cure ink with laser
marked lettering

Pin 3 Ground plane is typical

Not to scale

¹ Typical dimension

- 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.

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 _{CC} if the oscillator is to be always on.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V _{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

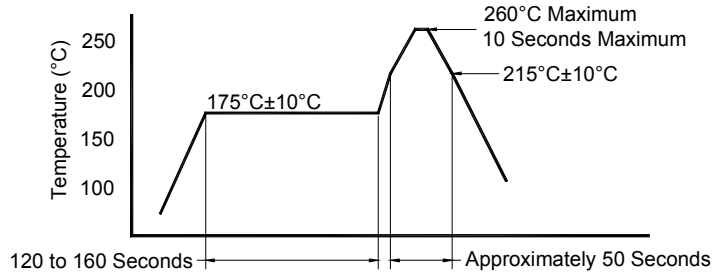
Layout and application information



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.

Reflow Cycle (typical for lead free processing)



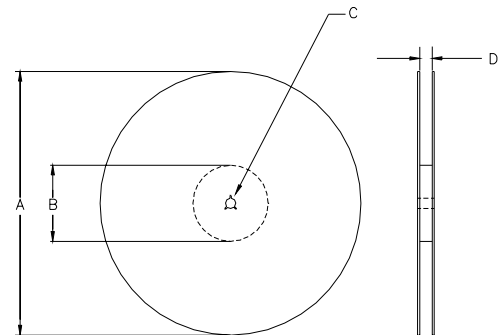
The part may be reflowed 2 times without degradation.

Allowed rate of temperature change
Maximum 4°C per second

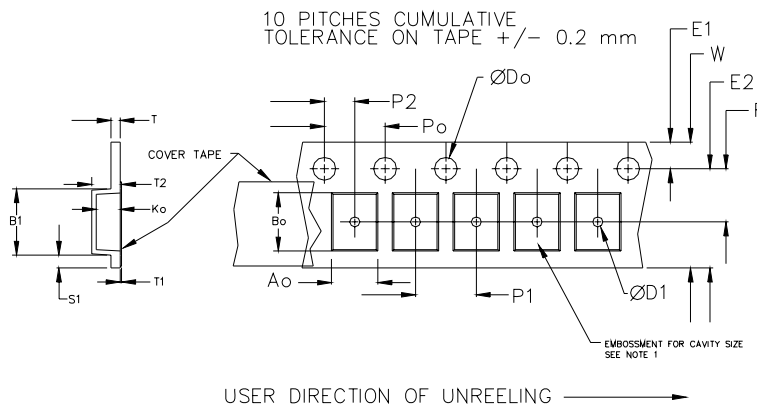
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

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			
24mm		1.5			1.5			

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
24 mm	9.88	22.25	11.5 ±0.1	16.0 ±0.1	3.22	24.3	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	Tape Width
	mm	63.5	101.6	95.3	
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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Contacting Pletronics Inc.

Pletronics Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880
Fax: 425-776-2760
E-mail: ple-sales@pletronics.com
URL: www.pletronics.com

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