



S3880 - 32.768K CMOS Clock Oscillator

August 2011



- The Pletronics' S3880 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
- 32.768 kHz
- 1.5 x 3.2 x 1.0 mm LCC Ceramic Package
- **Enable/Disable Function on pad 3**
- **Output on pad 1**
- **Excellent shock resistance**
- **Start-up Time of 0.5 Seconds or less**

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: 0.04 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D.1
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 145°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.

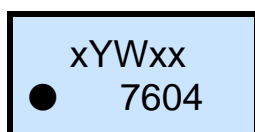
ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

Part Number:

S3880	- 32.768K	-XX	
			Packaging code or blank T1K = 1000 per Tape and Reel T3K = 3000 per Tape and Reel Smaller quantities or quantities that are not in 1K or 3K increments are all supplied as "cut tape" with no leader or trailer.
			Frequency in kHz
			Series Model

Part Marking:



Y Year
 WW Week
 xxx Manufacturing lot information
 7604 Part designation

Reliability: Environmental Compliance

Parameter	Maximum Frequency Change	Condition
Mechanical Shock	±5ppm	5000g at 0.3mS, ½ sine
Vibration	±5ppm	20g from 10Hz to 2,000Hz

Parameter	Condition
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

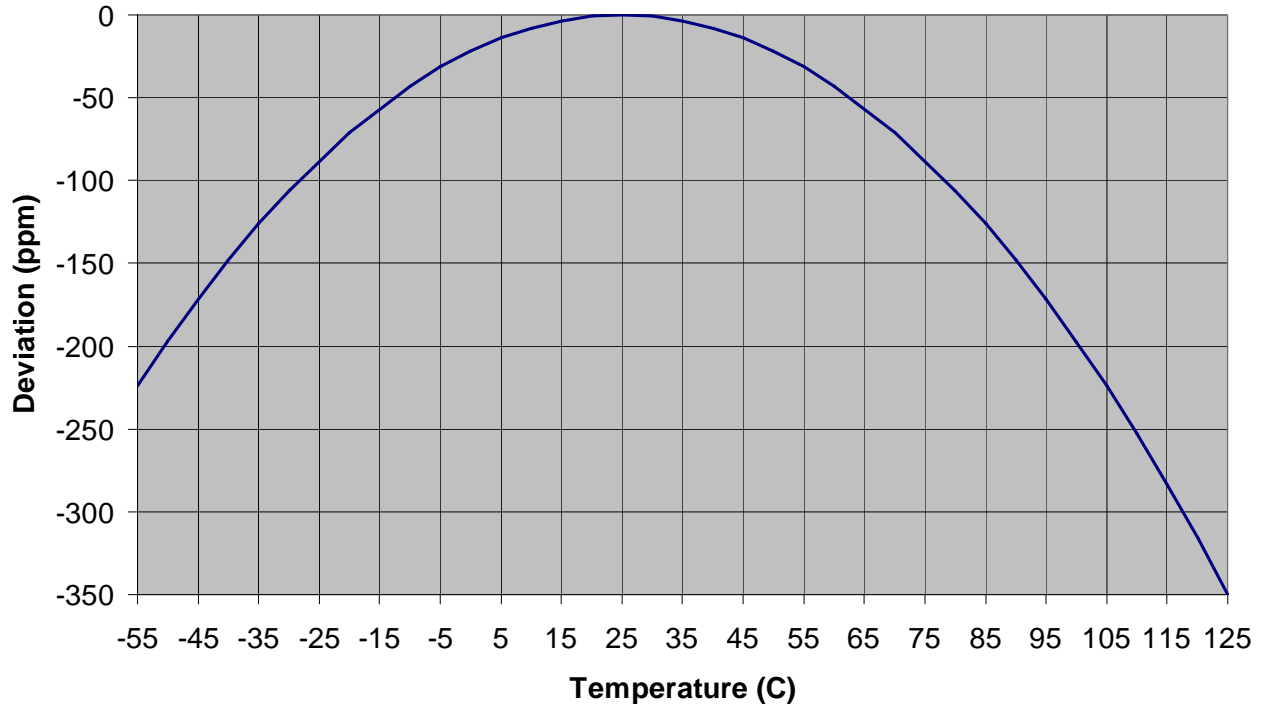
Electrical Specification for V_{CC} 1.2V to 5.5V over - 55 to +125°C

Item	Min	Max	Unit	Condition	
Frequency	32.768		kHz		
Frequency Calibration Tolerance	-20	+20	ppm	at V _{CC} = 3.3V and 25 °C	
Frequency Stability *	-70	+20	ppm	when operating at -20 to +70 °C	
	-170	+20	ppm	when operating at -40 to +85 °C	
Frequency versus Supply	0	±1.5	ppm/V	for V _{CC} range of 2.3 V to 5.5V	
Output Waveform	CMOS				
Output High Level	V _{CC} - 0.4	-	V	I _{OH} = 1.0mA	C _{LOAD} =10pF (See load circuit)
Output Low Level	-	0.4	V	I _{OL} = -1.0mA	
Output T _{RISE} and T _{FALL}	-	70	nS	C _{LOAD} = 10pF T _R / T _F 10% to 90% and D.C. at 50% point of V _{CC} (See load circuit)	
Output Symmetry	40	60	%		
V disable	-	20	%	of V _{CC} applied to pad 3	
V enable	80	-	%	of V _{CC} applied to pad 3	
Output leakage	V _{OUT} = V _{CC}	-10	+10	uA	Pad 3 low, device disabled
	V _{OUT} = 0V	-10	+10	uA	
Supply Current (I _{CC})	-	0.3	uA	V _{CC} = 1.2 V	C _{LOAD} = 10 pF
	-	0.5	uA	V _{CC} = 3.0 V	
	-	0.9	uA	V _{CC} = 5.5 V	
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	-	0.5	S	Time for output to reach specified frequency	
Operating Temperature Range	-55	+125	°C		
Storage Temperature Range	-55	+125	°C		

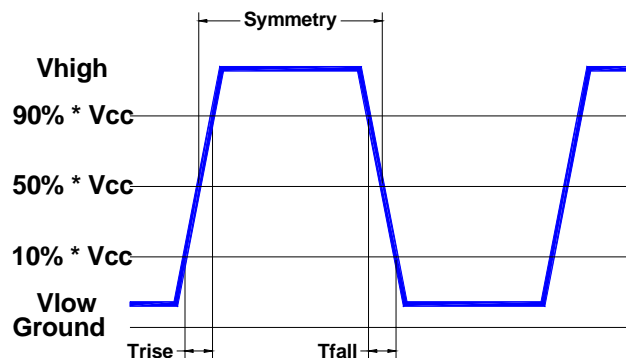
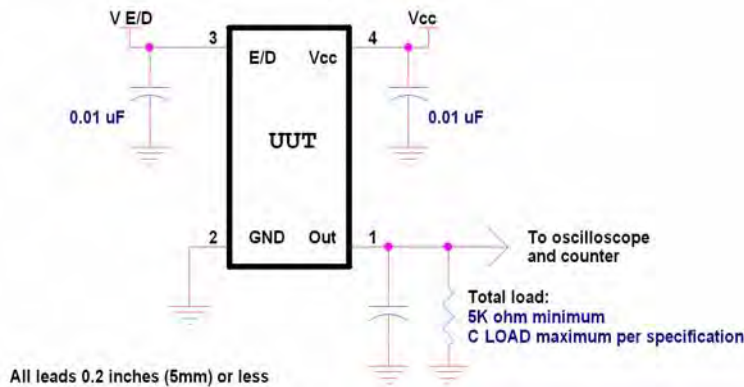
* Temperature characteristics Deviation in ppm = $(T - T_0)^2 * (-0.035 \text{ppm}/^\circ\text{C}^2) \pm 10\%$
 T is temperature in °C T₀ is the turn over temperature in °C

Specifications with Pad 3 E/D open circuit unless otherwise stated.

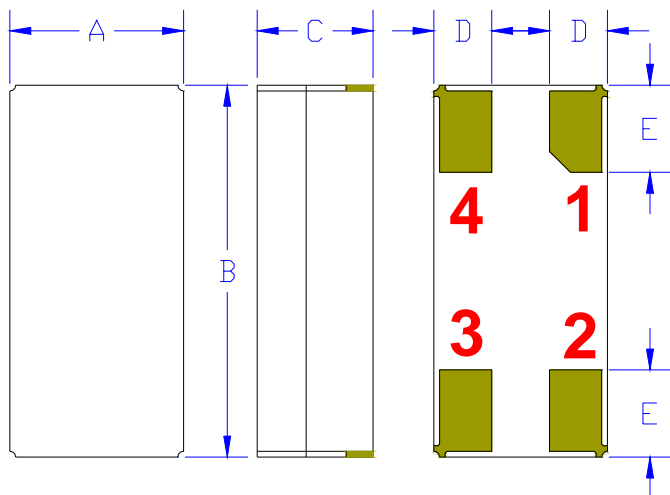
Typical Frequency versus Temperature Characteristics



Load Circuit and Test Waveform



Mechanical:



	Inches	mm
A	0.059 ±0.006	1.5 ±0.15
B	0.126 ±0.006	3.2 ±0.15
C	0.039 max	1.0 max
D ¹	0.020	0.50
E ¹	0.030	0.75

Contacts :

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

Not to Scale

¹ Typical dimensions

IMPORTANT: The pin assignments are different from many clock oscillators

Pad	Function	Note
1	Output	
2	Ground (GND)	
3	Enable/Disable Output	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.
4	Supply Voltage (V _{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

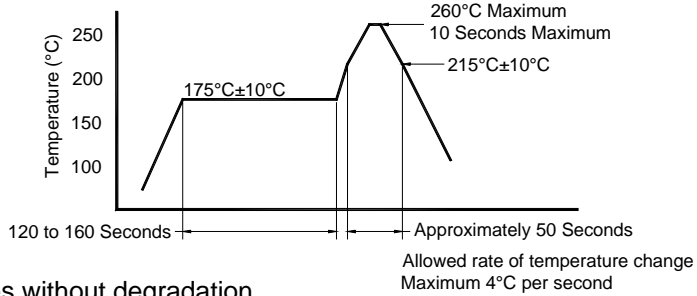


Layout and application information

For Optimum Jitter Performance, Pletronics recommends:

- a ground plane under the device while avoiding connection to the two dot pads on the bottom. Use the PCB solder mask to isolate the two dot pads
- 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)

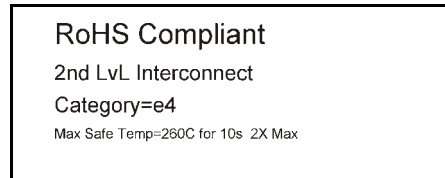


The part may be reflowed 2 times without degradation.

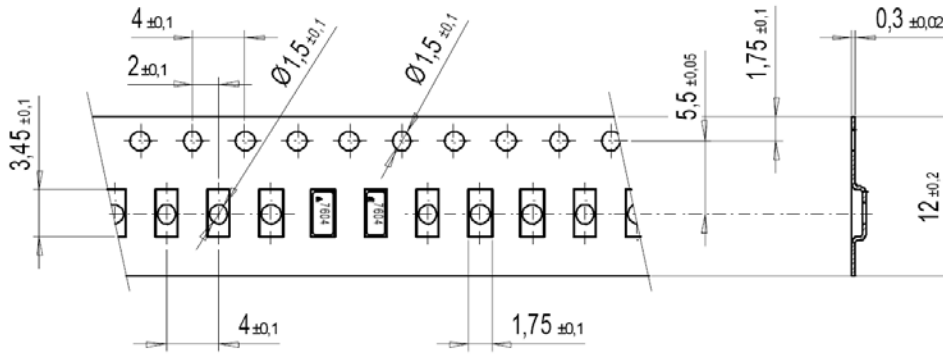
Package Labeling

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



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



→ Direction of Feed

All Dimensions are in mm.

Tape and Reel	12mm Carrier Tape	Polycarbonate black, conductive
	300mm Leader and trailer	if Quantity in 1K or 3K increments
Cover Tape	Base Material	Polyester, conductive
	Adhesive Material	Pressure-sensitive
Reel	7 inch	Polystyrene