ple
PLETRONICS
www.pletronics.com   425-776-1880

Lead Free ✓

- Pletronics' SM33 Series 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 or cut tape packaging is available.

- 0.75 to 50 MHZ
- 2.0 x 2.5 mm LCC Ceramic Package
- Enable/Disable Function
- Disable function includes low standby power mode
- Low Jitter

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: 0.022 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
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo Output Voltage	-0.5V to V_{CC} + 0.5V
Io Output Current	+25 mA to -25 mA

Thermal Characteristics

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 50 to 70°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Part Number:

SM33	45	T	E	V	- 75.0M	-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 MHz

Supply Voltage V_{CC}
V = 3.3V ± 10%

Temperature Range
Blank = Temp. range -10 to +70°C
E = Temp. range -40 to +85°C

Series Model

Frequency Stability
44 = ± 25 ppm
45 = ± 50 ppm
00 = ± 100 ppm

Series Model

Part Marking:

P*FF.FF*
• *YMDxx*

Marking Legend:
P = Pletronics
FF.FF = Frequency in MHZ
YMD = Date of Manufacture (year and week, or year-month-day)
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	8	9	0	1	2
Year	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					

SM33T Series 3.3 V
CMOS Clock Oscillators
February 2009

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

Item	Min	Max	Unit	Condition
Frequency Range	0.75	50	MHz	
Frequency Accuracy "00" "45 "44	-100 -50 -25	100 50 25	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
Output Waveform		CMOS		
Output High Level	90	-	%	of V_{CC} Cload = 15 pF (See load circuit)
Output Low Level	-	10	%	
Rise and Fall Time	-	10	nS	
Output Symmetry	40	60	%	at 50% point of V_{CC}
Enable/Disable Internal Pull-up	50	-	Kohm	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	
Standby Current I_{CC}	-	10	uA	
Operating Current I_{CC}	-	7 13 19	mA	Fout < 20 MHz 20 MHz >= Fout <40 MHz Fout >= 40MHz
Enable time	-	10	mS	Time for output to reach a logic state
Disable time	-	150	nS	Time for output to reach a high Z state
Start up time	-	10	mS	Time for output to reach specified frequency
Aging	-5	+5	ppm	First year at 25ºC
Operating Temperature Range	-10	+70	ºC	Standard Temperature Range
	-40	+85	ºC	Extended Temperature Range "E" Option
Storage Temperature Range	-55	+100	ºC	

Phase Noise Performance
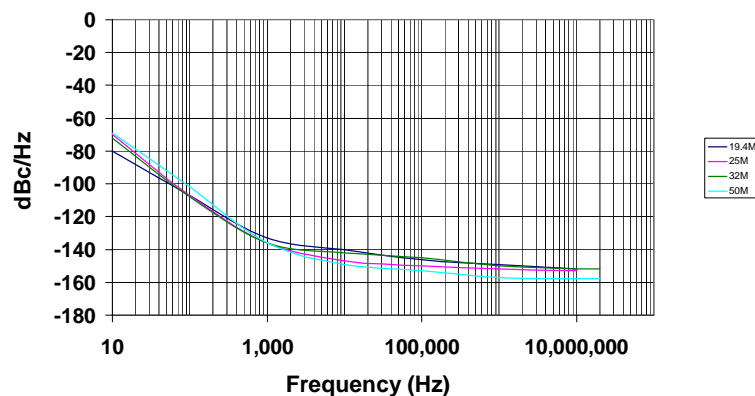
Load Circuit and Test Waveform
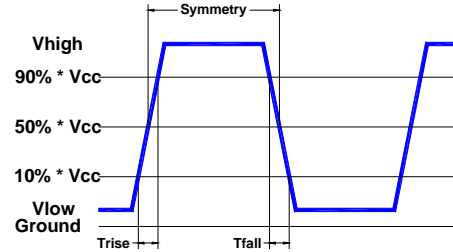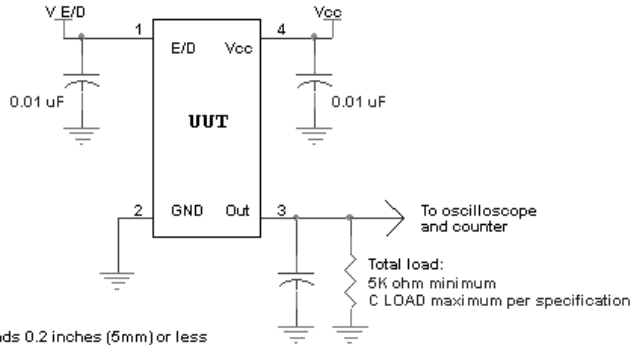
Reliability: Environmental Compliance

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

P/N:

SM3345TV-33.0M

Customer P/N:

12345678

Qty: D/C

1000   0514B5

RoHS Compliant

2nd LvL Interconnect

Category=e4

Max Safe Temp=260C for 10s 2X Max

Mechanical:
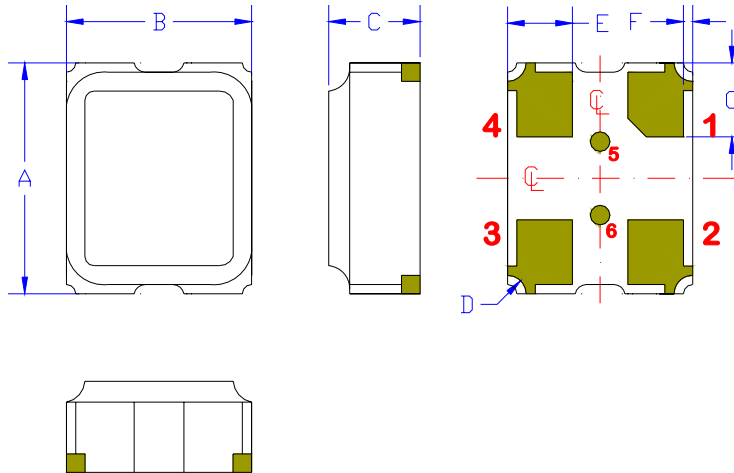
	Inches	mm
A	0.098 +0.004	2.50 +0.10
B	0.079 +0.004	2.00 +0.10
C	0.039 +0.004	1.00 +0.10
D[1]	0.008	0.20R
E[1]	0.028	0.70
F[1]	0.004	0.10
G[1]	0.031	0.80

Not to Scale

[1] Typical dimensions

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

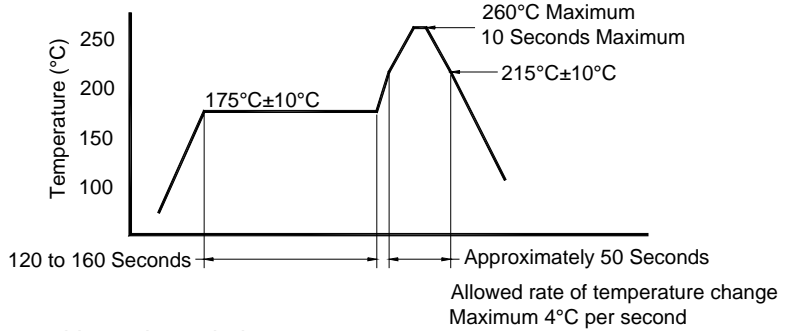| Pad	Function	Note
1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. When this pad is logic low the output will be inhibited (high impedance state.) Recommend connecting this pad to V_{CC} if the oscillator is to be always on.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

Lead Free

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.
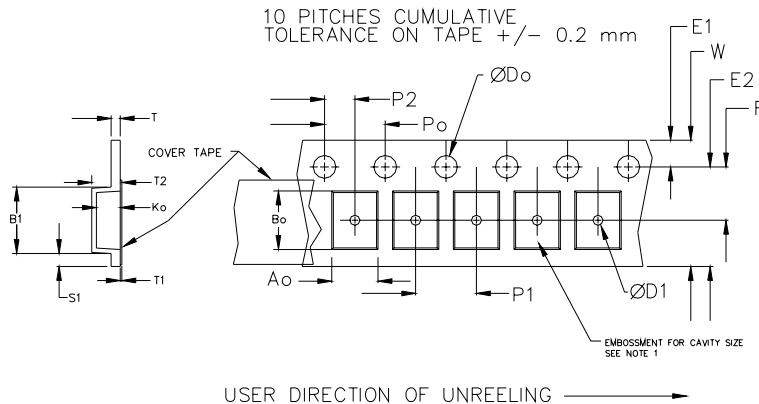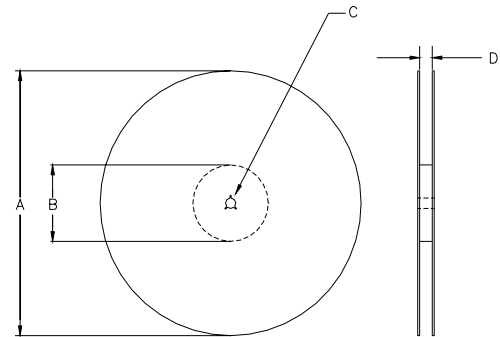
Reflow Cycle (typical for lead free processing)

260°C Maximum
10 Seconds Maximum

215°C±10°C

175°C±10°C

120 to 160 Seconds

Approximately 50 Seconds

Allowed rate of temperature change
Maximum 4°C per second

The part may be reflowed 2 times without degradation.

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 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	---	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
8 mm	2.9	6.25	1.75±0.1	4.0 ±0.1	1.1	8.1	Note 1

Note 1: Embossed cavity to conform to EIA-481-B   Dimensions in mm   Not to scale

10 PITCHES CUMULATIVE
TOLERANCE ON TAPE +/- 0.2 mm

COVER TAPE

USER DIRECTION OF UNREELING

		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	
	mm	63.5	101.6	95.3	Tape Width
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

IMPORTANT NOTICE

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