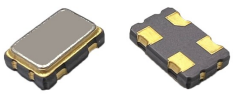
CARDINAL COMPONENTS

CC137L Series 3.3V CMOS Clock Oscillator



CC137L
5.0 x 3.2 x 1.2 mm
LCC Ceramic Package

Features

- CMOS Output (will interface with TTL devices)
- Enable/Disable Function includes low standby power
- Low Jitter
- 3.3V nominal Supply Voltage
- 1.0 -133 MHz Frequency Range

Applications

Driving A/Ds, D/As, FPGAs
Digital Video
Ethernet, GbE
Medical
Storage Area Networking
COTS
Broad Band Access
SONET/ SDH/ DWDM
Base Stations/ Picocell
Test & Measurement

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition	
Frequency Range [2]	1.0	-	133	MHz		
Frequency Stability [2]	±25	-	±100	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures.	
Operating Temperature Range [2]	-10 -10 -40	- - -	+60 +70 +85	°C	Standard range	
Supply Voltage [1] V_{CC}	2.97	3.30	3.63	V	3.3V ± 10%	
Input Current Icc	- - -	- - -	10 20 35	mA	≤ 40 MHz > 40 MHz to ≤ 75 MHz > 75 MHz	
Output Waveform	CMOS				CL = 15pF	
Duty Cycle	45 40	-	55 60	%	1.0 ~ 40 MHz > 40 MHz	At 50% point of V_{CC}
Output V_{HIGH}	90	-	-	%	of V_{CC}	See Load Circuit
Output V_{LOW}	-	-	10	%	of V_{CC}	
Rise/Fall Time	-	-	5	ns	≤ 40 MHz	
	-	-	3	ns	> 40 MHz	
$V_{DISABLE}$	-	-	30	%	Of V_{CC} applied to Pad 1	
V_{ENABLE}	70	-	-			
Enable Time	-	-	100	ns	Time for output to reach a logic state	
Disable Time	-	-	50	µs	Time for output to reach a high Z state	
Enable/Disable Internal Pull-up	30	70	150	KΩ	To V_{CC}	
Standby Current	-	-	10	µA	Pad 1 low, device disabled	
Jitter	-	0.15	-	ps RMS	At 100 MHz, 12kHz to 20MHz	
Storage Temperature Range	-55	-	+125	°C		

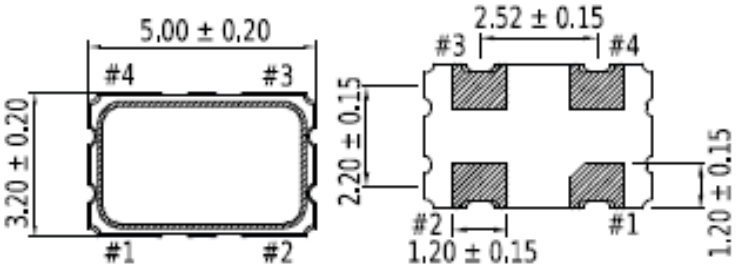
Part Number

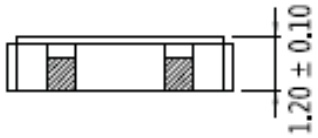
Example: CC137LZ-A2B245-50.0TS

Series Model	Packaging		Operating Temperature	Stability	Symmetry		Frequency (MHz)	Enable/Disable
CC137L	**Z**	**-**	**A2**	**B2**	**45**	**-**	**50.0**	**TS**
	Z = Tape/Reel Blank = Tape only		**A2 = -40 ~ +85°C** A1 = -10 ~ +70°C A0 = -10 ~ +60°C	BR = ±25ppm **B2 = ±50 ppm** Blank = ±100 ppm	**45 = 45/55%**			**TS = Tristate**

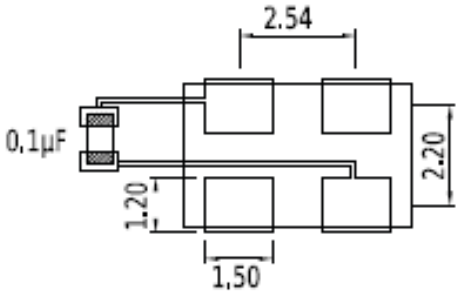
Notes: Specifications with Pad 1 E/D open circuit
[1] Place an appropriate power supply bypass capacitor next to device for correct operation
[2] Specified by part number

Mechanical Dimensions (mm)





Pin #	Function
1	Tri-state
2	GND
3	Output
4	V_{DD}



Pad Layout

Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Contacts (pads): Gold (0.3 to 1.0 µm) over Nickel (1.27 to 8.89 µm)

Layout

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

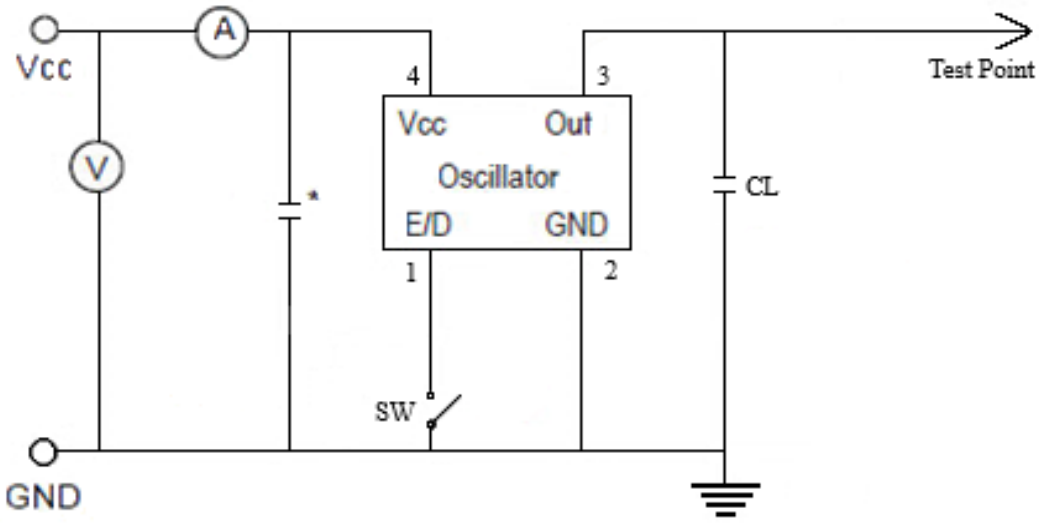
Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

Cardinal Components guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.06 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

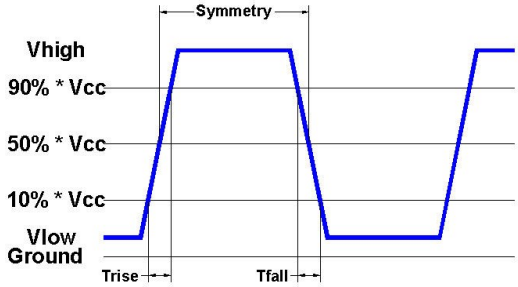
For Optimum Jitter Performance, Cardinal recommends:

- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans

Electrical Test / Load Circuit



Notes:
CL: 15 pF Includes the input capacitance of oscilloscope
* 0.01~0.1µF external by-pass filter is recommended



Environmental / ESD Ratings

Reliability: Environmental

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

ESD Rating

Model	Min. Voltage	Condition
Human Body Model	2000V	JESD22-A114
Machine Model	200V	JESD22-A115

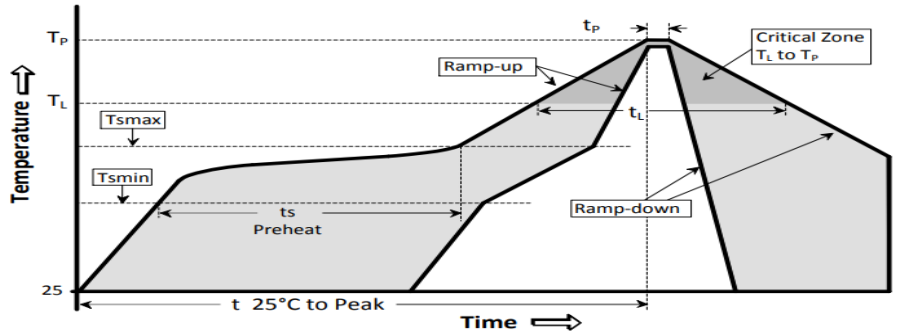
Thermal Characteristics:
The maximum die or junction temperature is 150°C

Absolute Maximum Ratings

Parameter	Unit
V_{CC} Supply Voltage	-0.3V to +4.0V
Vi Input Voltage	-0.3V to V_{CC} + 0.3V
Vo Output Voltage	-0.3V to V_{CC} + 0.3V

Reflow Cycle

Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

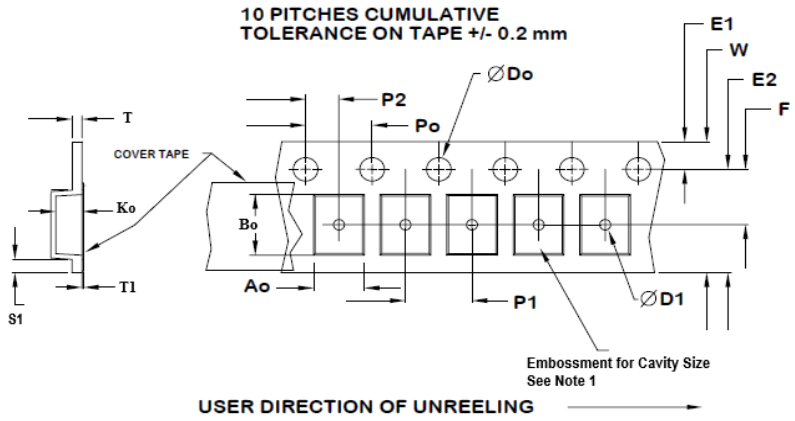


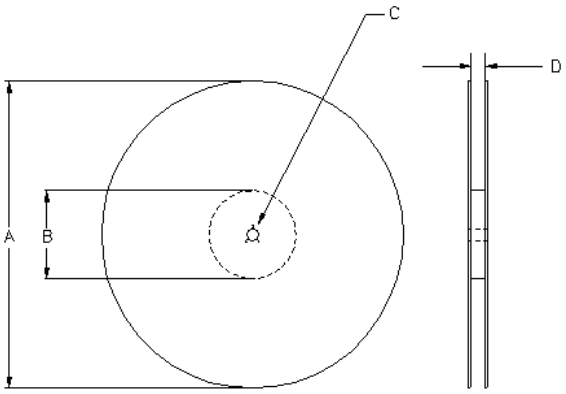
Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time Ts_{min} to Ts_{max}	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	Tp	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 250. 12mm tape, 8mm pitch.





Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
12mm	10.25	5.5 ±0.05	8.0 ±0.1	12.2	3.6±0.1	5.4±0.1	1.4±0.1

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0
10	10.0	254.0	4.00	101.6		
13	13.0	330.2	3.75	95.3		

Tape Constant Dimensions Table 1								
Tape Size	Do	D1 min	E1	Po	P2	S1 min	T max	T1 max
12mm	1.5 +0.1 -0.0	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.3	0.1
16mm		1.5			2.0 ±0.1			

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