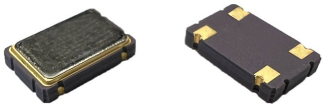
CARDINAL COMPONENTS

CC85 Series 5.0V CMOS Clock Oscillator



CC85
7.0 x 5.0 x 1.5 mm
LCC Ceramic Package

Features

- CMOS Output (will interface with TTL devices)
- Enable/Disable Function includes low standby power
- Low Jitter
- 5.0V nominal Supply Voltage
- 1-60 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	-	60	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]	0 -40	- -	+70 +85	°C	
Supply Voltage [1, 2] V_{CC}	4.5	5.0	5.5	V	5.0V ± 10%
Input Current I_{CC}	-	-	65	mA	
Output Waveform	CMOS				CL = 15pF max
Duty Cycle	40	-	60	%	At 50% point of V_{CC}
Output V_{HIGH} V_{OH}	0.9Vcc	-	-	V	See Load Circuit
Output V_{LOW} V_{OL}	-	-	0.1Vcc	V	See Load Circuit
Rise/Fall Time	-	-	3	ns	0.1Vcc ~ 0.9Vcc levels
Startup Time	-	-	10	ms	Time for output to reach specified frequency
$V_{DISABLE}$ V_{IL}	-	-	0.3Vcc	V	applied to Pad 1
V_{ENABLE} V_{IH}	0.7Vcc	-	-	V	applied to Pad 1
Enable Time	-	-	10	ms	Time for output to reach a logic state
Disable Time	-	-	50	µs	Time for output to reach a high Z state
Disable Standby Current	-	-	10	µA	
Enable/Disable Internal Pull-up	30	70	150	KΩ	To V_{CC}
Storage Temperature Range	-55	-	+125	°C	

Part Number

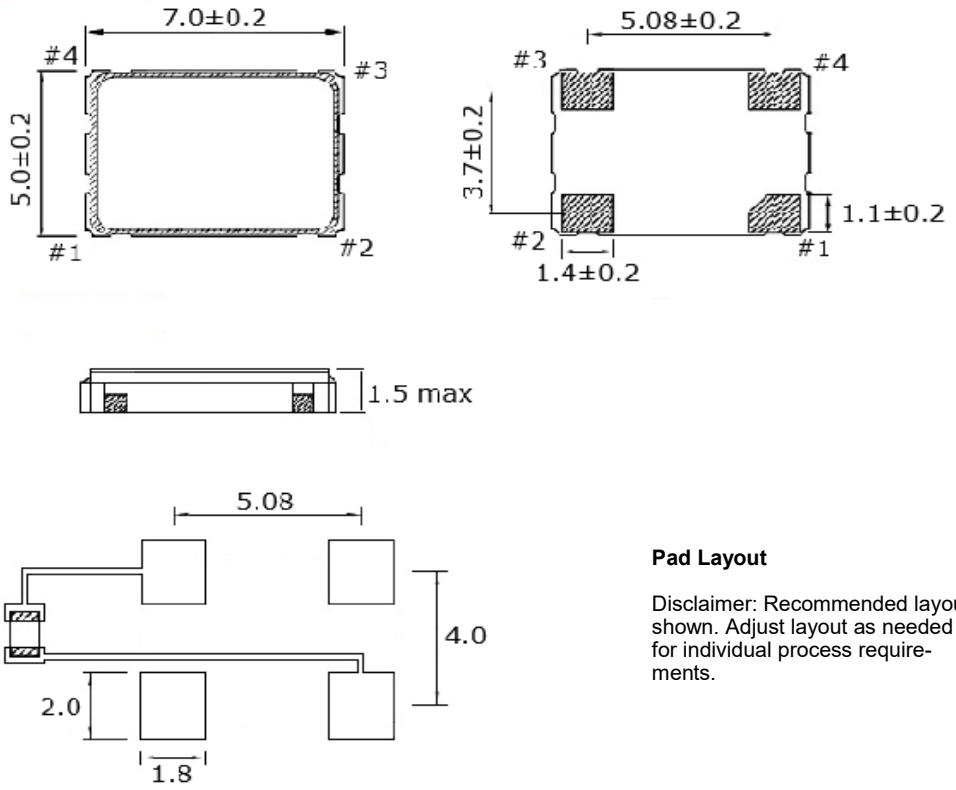
Example: CC85Z-A2B245-50.0TS

Series Model	Packaging		Operating Temperature	Stability	Symmetry		Frequency (MHz)	Enable/Disable
CC85	**Z**	**-**	**A2**	**B2**	**45**	**-**	**50.0**	**TS**
	Z = Tape/Reel Blank = Tape Only		**A2 = -40 ~ +85°C** Blank = 0 ~ +70°C	BR = ±25 ppm **B2 = ±50 ppm** Blank = ±100 ppm	**45 = 45/55%** Blank = 40/60%			**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

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Mechanical Dimensions (mm)



Pad Layout

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

To ensure optimal oscillator performance, place a by-pass capacitor of 0.01~0.1µF as close to the part as possible between V_{CC} and GND pads.

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

Layout

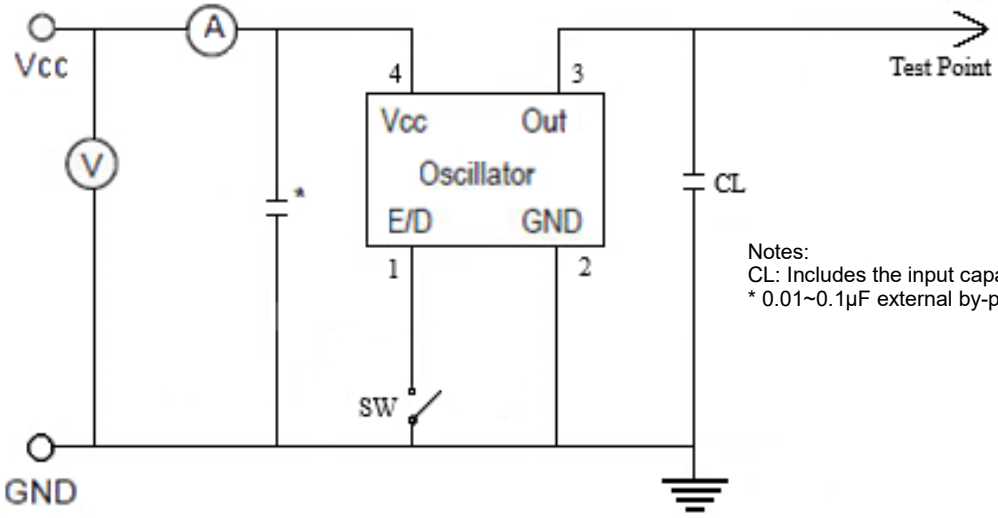
Pad	Function	Note
1	Output Enable/Disable	The oscillator shall operate when this pad is not connected. The output will be inhibited (high impedance state) when this pad is logic low. Recommend connecting this pad to V_{CC} if the oscillator is to be always on.
2	Ground (GND)	
3	Output	CMOS
4	V_{CC} Supply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

For Optimum Jitter Performance, Cardinal recommends:

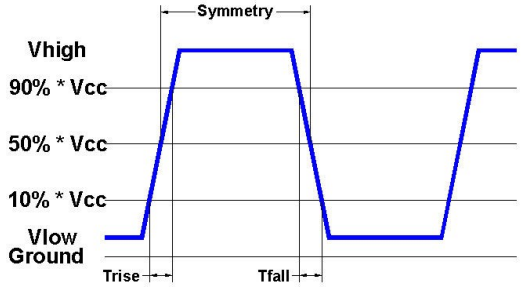
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans

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Electrical Test / Load Circuit



Notes:
CL: 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	-0.5V to +7.0V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo Output Voltage	-0.5V to V_{CC} + 0.5V

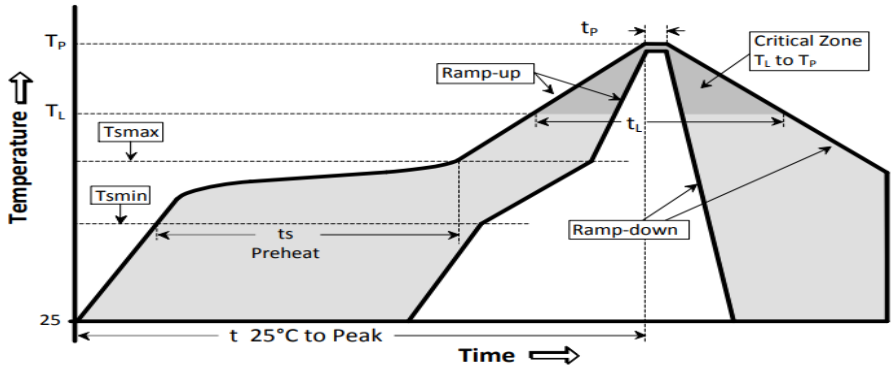
Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

Cardinal Components. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.16 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

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Reflow Cycle

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

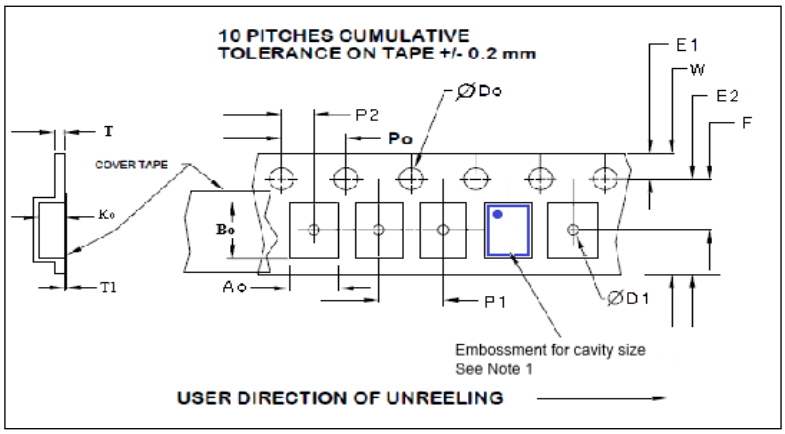


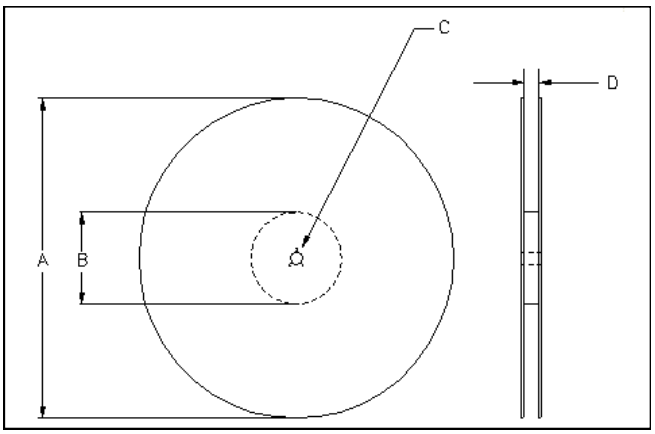
Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time 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. 16mm tape, 8mm pitch.





Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
16mm	14.25	7.5 ±0.05	8.0 ± 0.1	16.3	5.56±0.1	7.85±0.1	2.0±0.1

Dimensions in mm Drawing Not to scale

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

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

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.50	60	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0

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