

7.0 x 5.0 x 1.3mm
LCC Ceramic Package

Features

- CMOS Output (will interface with TTL devices)
- Enable/Disable Function (low standby power option)
- Low Jitter
- 1.8V, 2.5V, or 3.3V nominal Supply Voltage
- 1-160 MHz Frequency Range (1-125MHz at 1.8V)
- Size: 7 x 5mm
- Configurable Oscillator

Applications

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

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range ²	1	-	160	MHz	(1.8V frequency range 1-125MHz)
Frequency Stability ²	±20	-	±50	ppm	For all supply voltages, load changes, ageing for 1 year at 25°C ± 2°C, shock, vibration and temperatures.
Operating Temperature Range options ²	0 -20 -40 -40	- - - -	+70 +70 +85 +105	°C	
Supply Voltage ^{1,2} V _{CC}	1.8	-	3.3	V	± 5%, See Part Number options on page 2
Supply Current I _{CC}	-	-	-	mA	See page 2
Output Waveform	CMOS				Clload = 15 pF
Duty Cycle	45	-	55	%	At 50%V _{CC} level
Output V _{OH}	90	-	-	%V _{CC}	See Load Circuit and waveform page
Output V _{OL}	-	-	10	%V _{CC}	
Output T _{RISE} and T _{FALL}	-	-	2	ns	
Startup Time	-	-	8	ms	Time for output to reach specified frequency
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	-	-	100	ns	Time for output to reach a high Z state
Disable Current	- -	- 0.4	- -	mA	Enable/Disable: Pad 1 low, output disabled; See page 2 Standby option: Pad 1 low, output disabled, oscillator shutdown
Jitter	-	1.0	-	ps	12 kHz to 20 MHz @ 110 MHz
Storage Temperature Range	-55	-	+125	°C	

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

Input Current

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 3.3V	
Supply Current I _{cc}			27 30 35	mA	1MHz ≤ F _o < 75MHz 75MHz ≤ F _o < 125MHz 125MHz ≤ F _o < 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 2.5V	
Supply Current I _{cc}			27 30 35	mA	1MHz ≤ F _o < 75MHz 75MHz ≤ F _o < 125MHz 125MHz ≤ F _o ≤ 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 1.8V	
Supply Current I _{cc}			25	mA	1MHz ≤ F _o ≤ 125MHz	15pF load

Part Number Example: CPPYC7LZ-A7BP-125.0TS

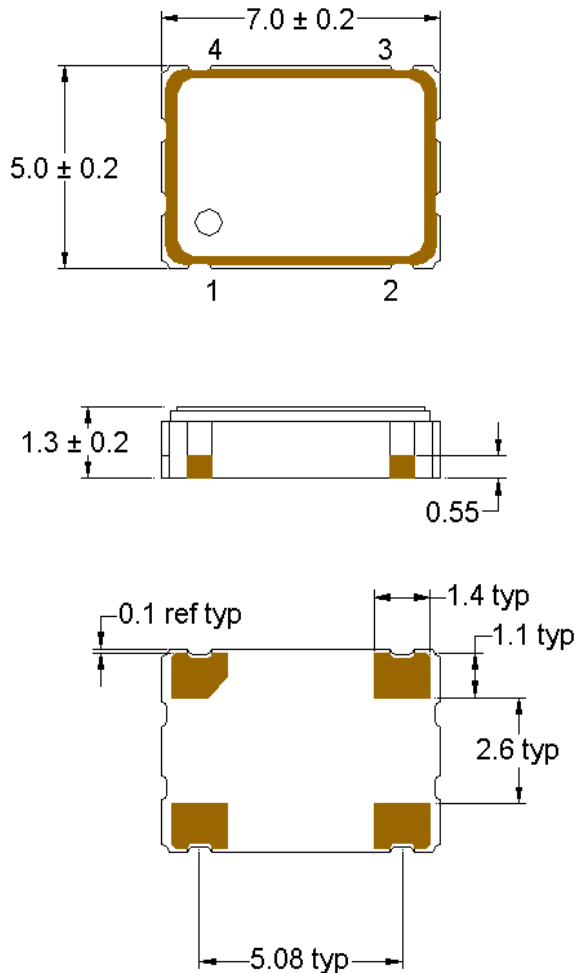
Series Model	Logic	Package Size (mm)	Supply Voltage V _{cc}	Packaging	Operating Temperature Range	Frequency Stability	Frequency in MHz	Enable/Disable
CPPY	C	7	L	Z	A7	BP	- 125.0	TS
	C=CMOS	7 = 7 x 5	K = 1.8V J = 2.5V L = 3.3V	Blank=Tape Only Z= Tape/reel	Blank = 0 to +70°C A5 = -20 to +70°C A7 = -40 to +85°C AJ = -40 to +105°C	BD = ±20 ppm BR = ±25 ppm BP = ±50 ppm	1 - 160 MHz (1.8V: 1-125MHz)	TS = Tristate PD = Powerdown

Frequency Stability selection chart

	±20	±25	±50
0 - +70°C	•	•	•
-20 - +70°C	•	•	•
-40 - +85°C	△	•	•
-40 - +105°C		△	•

• - Available △ - Check with Cardinal

Mechanical Dimensions

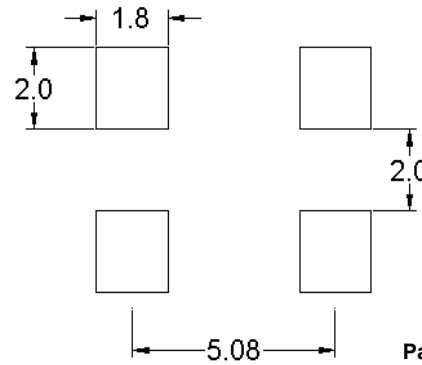


Dimensions in mm

Pad Connections

Pad	Function
1	Enable/Disable
2	Ground
3	Output
4	Vcc

ENABLE/DISABLE	
Pad 1	Output
V _H / Open	Active
V _L / Gnd	Disabled / Tristate



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)

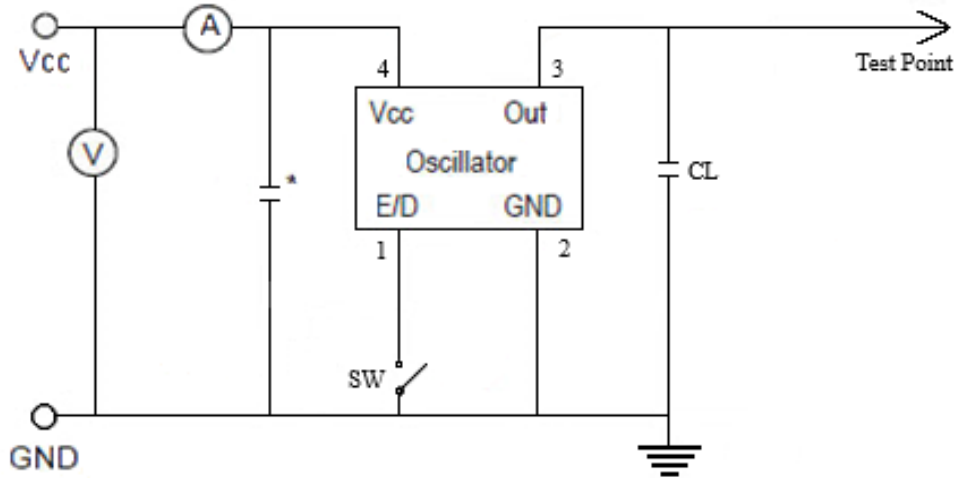
Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

Cardinal Components guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
 Weight of the Device: 0.15 grams
 Moisture Sensitivity Level: 1 As defined in J-STD-020D
 Second Level Interconnect code: e4

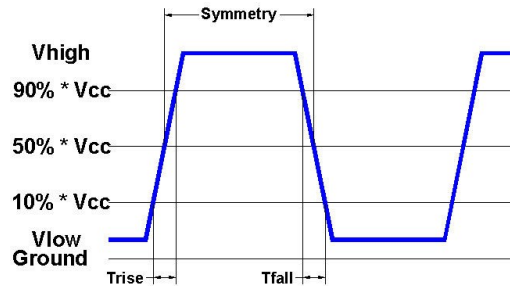
For Optimum Jitter Performance, Cardinal recommends:

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



Environmental / ESD Ratings

Reliability: Environmental

ESD Rating

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

Model	Min. Voltage	Condition
Human Body Model	2000V	MIL-STD-883 3015.7
Machine Model	200V	EIAJ ED-4701/304

Absolute Maximum Ratings

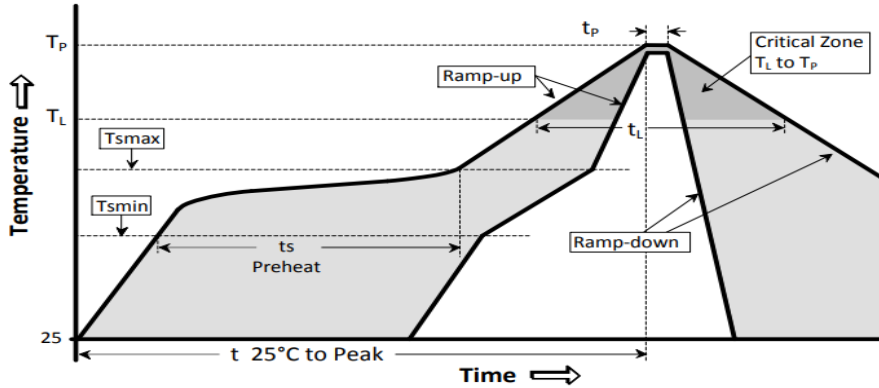
Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +7.0V
V _i Input Voltage	-0.5V to V _{CC} + 0.5V
V _o Output Voltage	-0.5V to V _{CC} + 0.5V

Thermal Characteristics:

The maximum die or junction temperature is 125°C

Reflow Cycle

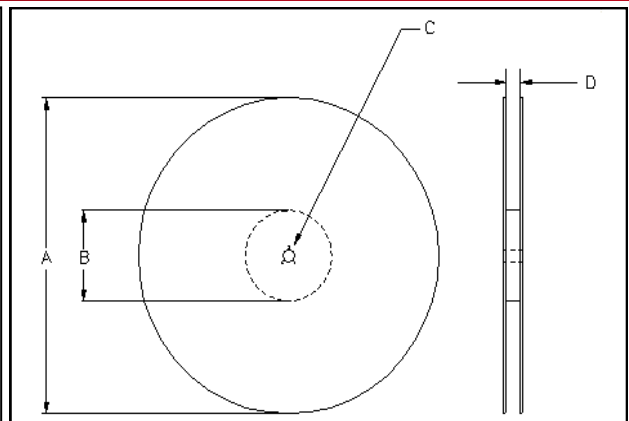
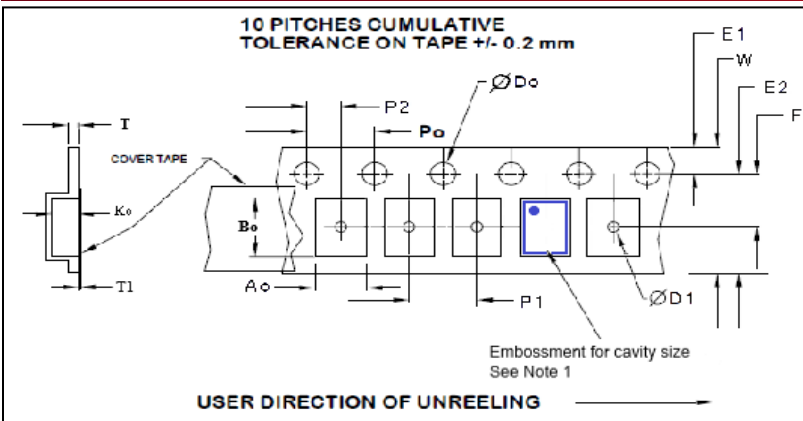
Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"



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

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	($T_{S_{max}}$ 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	$T_{to-peak}$	8 minutes max	min
Preheat			
Temperature min	$T_{S_{min}}$	150	°C
Temperature max	$T_{S_{max}}$	200	°C
Time $T_{S_{min}}$ to $T_{S_{max}}$	t_s	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	T_P	260	°C
Time within 5°C of peak temperature	t_p	20 – 40	sec

Tape and Reel



Part Size	Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko	Qty/reel standard
7050	16mm	14.25	7.5 ±0.05	8.0 ±0.1	16.3	5.56 ± 0.1	7.85 ± 0.1	2 ± 0.1	1K

Reel Size	A		B		C	D
	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.50	60	13.0	Tape size +0.4
13	13.0	330	3.75	100	+0.5 -0.2	+2.0 -0.0

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

Tape Size	Do	D1 typ	E1	Po	P2	T typ	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

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