

7.0 x 5.0 x 1.3mm
LCC Ceramic Package

Features

- Field Programmable with the [PG-3200](#) oscillator programming instrument within seconds.
- Can be programmed twice
- CMOS Output (will interface with TTL devices)
- 3.3V or 5.0V nominal Supply Voltage
- Size: 7 x 5mm
- Enable/Disable Function (optional Standby function)

Applications

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

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Programmable Frequency Range	1	-	133	MHz	(3.3V: 1 - 100MHz)
Frequency Stability ²	±25	-	±100	ppm	For all supply voltages, load changes, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures.
Operating Temperature Range options ²	0 -20 -40	- - -	+70 +70 +85	°C	
Supply Voltage ^{1,2} V _{DD}	2.97	-	5.5	V	See Part Number options on page 2
Supply Current I _{DD} (No Load)	-	-	45 25	mA	V _{DD} = 5.0V V _{DD} = 3.3V
Output Type	CMOS				Clload = 50pF max, V _{DD} = 4.5~5.5V, ≤66MHz Clload = 25pF max, V _{DD} = 4.5~5.5V, >66MHz Clload = 30pF max, V _{DD} = 3.0~3.6V, ≤40MHz Clload = 15pF max, V _{DD} = 3.0~3.6V, >40MHz
	TTL				Clload = 50pF max; V _{DD} = 4.5~5.5V, ≤40MHz
Duty Cycle	-	-	-	%	See Page 2
Output V _{OH} (TTL Level) (CMOS Level)	2.4	-	-	V	V _{DD} = 4.5~5.5V
	V _{DD} - 0.4			V	All voltages
Output V _{OL}	-	-	0.4	V	See Load Circuit and waveform page
Output T _{RISE} and T _{FALL}	-	-	-	ns	See page 2
Startup Time	-	-	2	ms	Time for output to reach specified frequency
V _{DISABLE}	-	-	0.8 0.2V _{DD}	V	V _{DD} = 4.5~5.5V V _{DD} = 3.0~3.6V
V _{ENABLE}	2.0 0.7V _{DD}	-			V _{DD} = 4.5~5.5V
Enable Time	-	-	2	ms	
Disable Time - Pin 1 low to Output Hi-Z	-	T/2	T+10	ns	T = Frequency Period
Disable Current	-	-	-	mA	Enable/Disable: Pad 1 low, output disabled; See above Supply Current Standby option: Pad 1 low, output disabled, oscillator shutdown
	-	0.4	-		
RMS Period Jitter	-	40	50	ps	≤33MHz >33MHz
		30	40		
Period Jitter, Pk-Pk		100	250	ps	>1,000,000 samples ≤33MHz >33MHz
		75	175		
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

Duty Cycle

Parameter	Min	Typ	Max	Unit	
TTL @ 1.4V level; V _{DD} = 4.5~5.5V	45 45 40 40		55 55 60 60	%	Fo ≤ 50 MHz, CL ≤ 50pF 50 MHz < Fo ≤ 66MHz; CL ≤ 15pF 66 MHz < Fo ≤ 125MHz, CL ≤ 25pF 125 MHz < Fo ≤ 133MHz, CL ≤ 15pF

Parameter	Min	Typ	Max	Unit	
CMOS @ 0.5V _{DD} level; V _{DD} = 4.5~5.5V	45 40 40		55 60 60	%	Fo ≤ 66 MHz, CL ≤ 25pF 66 MHz < Fo ≤ 125MHz; CL ≤ 25pF 125 MHz < Fo ≤ 133MHz, CL ≤ 15pF

Parameter	Min	Typ	Max	Unit	
CMOS @ 0.5V _{DD} level; V _{DD} = 3.0~3.6V	45 40		55 60	%	Fo ≤ 40 MHz, CL ≤ 30pF 40 MHz < Fo ≤ 100MHz; CL ≤ 15pF

Rise/Fall Time

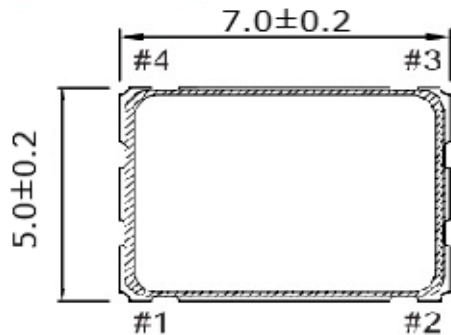
Parameter	Min	Typ	Max	Unit	
Rise/Fall Time			1.8 1.2 0.9 3.4 4.0 2.4	ns	0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=50pF 0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=25pF 0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=15pF 0.2V _{DD} ~0.8V _{DD} , V _{DD} = 4.5~5.5V, CL=50pF 0.2V _{DD} ~0.8V _{DD} , V _{DD} = 3.0~3.6V, CL=30pF 0.2V _{DD} ~0.8V _{DD} , V _{DD} = 3.0~3.6V, CL=15pF

Part Number Example: CPPFXX-A7BP-XX.XXXNP

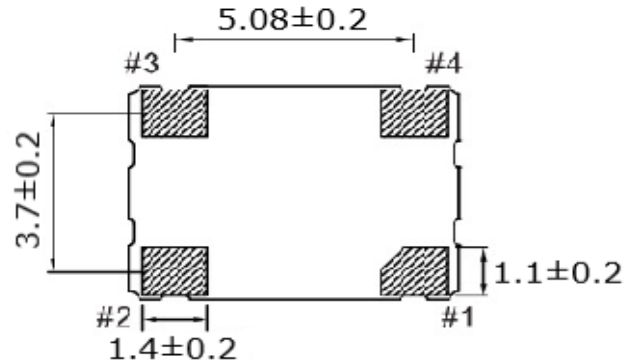
Series Model	Package Size (mm)		Operating Temperature Range	Frequency Stability (ppm)			
CPPFXX	7	-	A7	BP	-	XX.XXX	NP
	7 = 7 x 5		Blank = 0 to +70°C A5 = -20 to +70°C A7 = -40 to +85°C	BR = ±25 BP = ±50 B6 = ±100			

Mechanical Dimensions (mm)

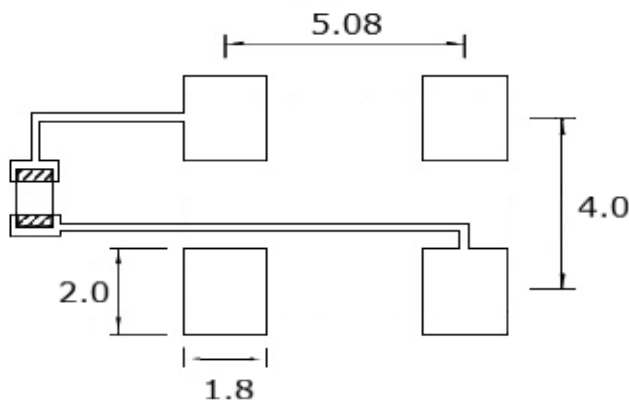
[TOP VIEW]



[BOTTOM VIEW]



[SIDE VIEW]



Pin#	Function
1	Enable/disable
2	Gnd
3	Output
4	Vcc

Enable/Disable	
Pin 1	Output
Open	Active
Logic '1'	Active
Ground / Logic '0'	Tristate

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 0.01~0.1 μ F as close to the part as possible between V_{CC} and GND pads.

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

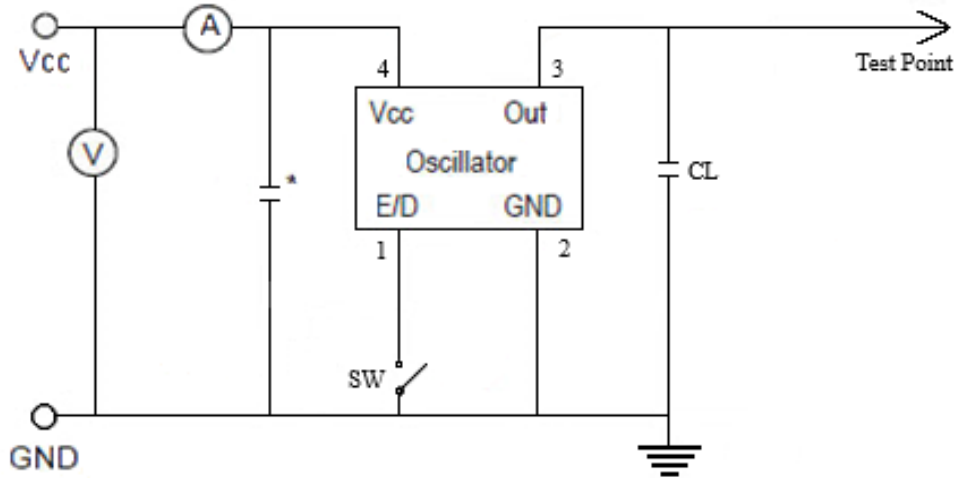
Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

Cardinal Components guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
 Weight of the Device: 0.148 grams
 Moisture Sensitivity Level: 1 As defined in J-STD-020D
 Second Level Interconnect code: e4

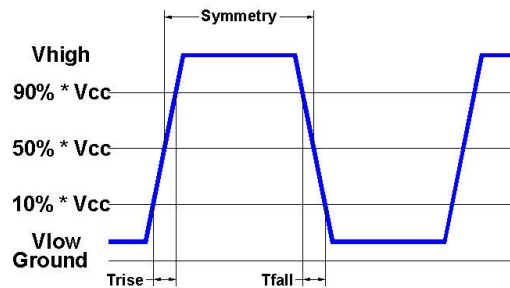
For Optimum Jitter Performance, Cardinal recommends:

- 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

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	MIL-STD-883 3015.7
Machine Model	200V	EIAJ ED-4701/304

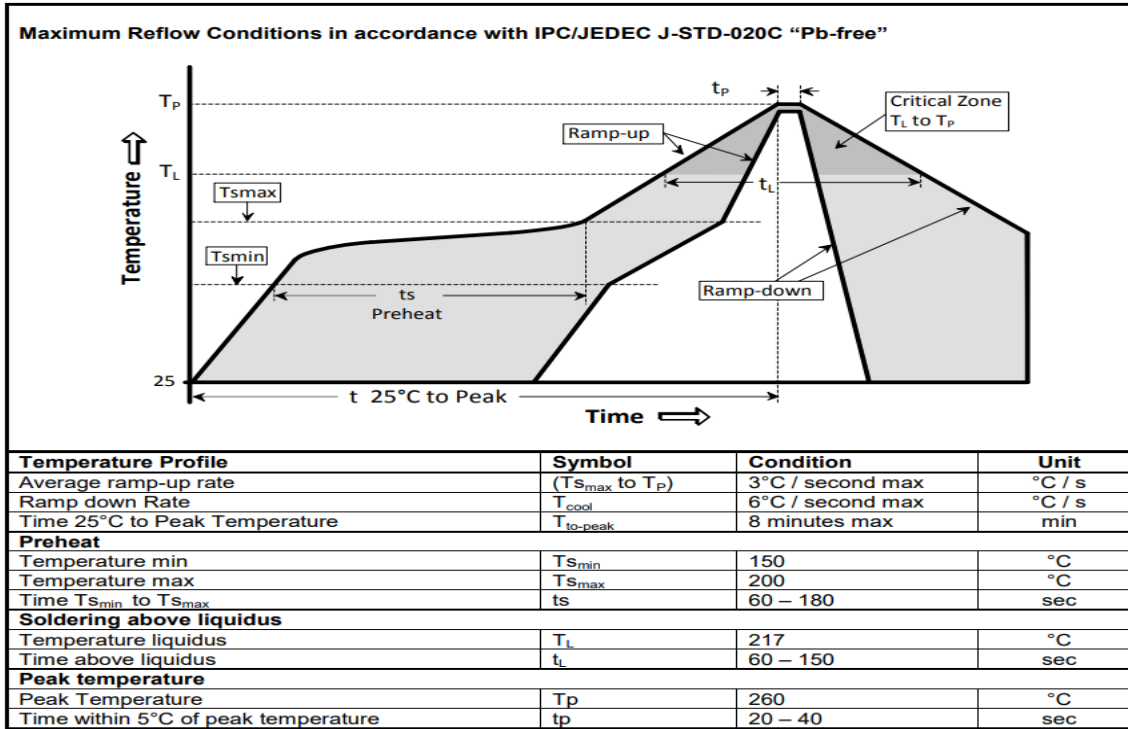
Absolute Maximum Ratings

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 100°C

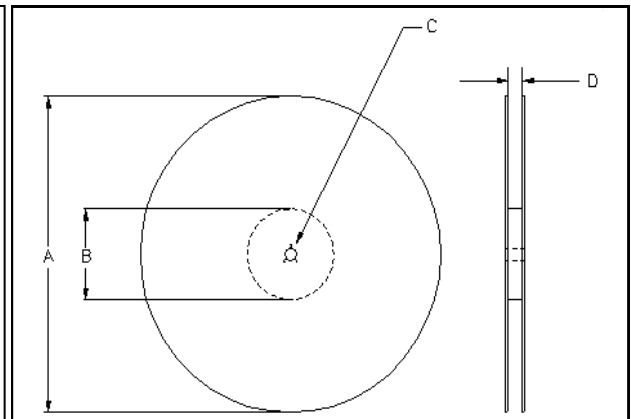
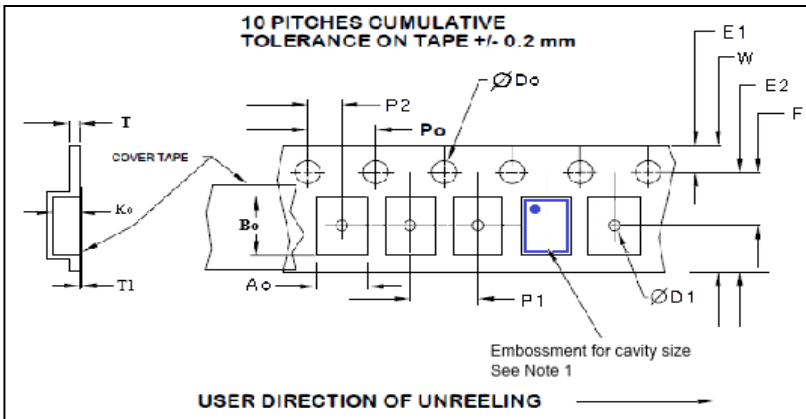
Reflow Cycle



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.



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		
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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