

7.0 x 5.0 x 1.3mm
LCC Ceramic Package

Features

- CMOS Output (will interface with TTL devices)
- Enable/Disable Function (optional Standby function)
- 3.3V or 5.0V nominal Supply Voltage
- Size: 7 x 5mm
- Factory programmed

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 |
|--|---------------------------|-------------|---------------------------|------|--|
| 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 V _{DD} = 3.0~3.6V |
| 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 | | 55 | % | Fo ≤ 50 MHz, CL ≤ 50pF 50 MHz < Fo ≤ 66MHz; CL ≤ 15pF 66 MHz < Fo ≤ 125MHz, CL ≤ 25pF 125 MHz < Fo ≤ 133MHz, CL ≤ 15pF |
| | 45 | | 55 | | |
| | 40 | | 60 | | |
| | 40 | | 60 | | |
| Parameter | Min | Typ | Max | Unit | |
| CMOS @ 0.5V _{DD} level; V _{DD} = 4.5~5.5V | 45 | | 55 | % | Fo ≤ 66 MHz, CL ≤ 25pF 66 MHz < Fo ≤ 125MHz; CL ≤ 25pF 125 MHz < Fo ≤ 133MHz, CL ≤ 15pF |
| | 40 | | 60 | | |
| | 40 | | 60 | | |
| Parameter | Min | Typ | Max | Unit | |
| CMOS @ 0.5V _{DD} level; V _{DD} = 3.0~3.6V | 45 | | 55 | % | Fo ≤ 40 MHz, CL ≤ 30pF 40 MHz < Fo ≤ 100MHz; CL ≤ 15pF |
| | 40 | | 60 | | |

Rise/Fall Time

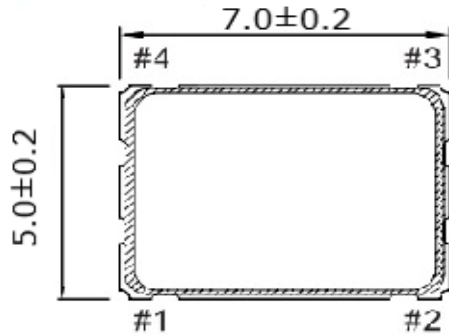
| Parameter | Min | Typ | Max | Unit | |
|----------------|-----|-----|-----|------|--|
| Rise/Fall Time | | | 1.8 | ns | 0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=50pF 0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=25pF 0.8V~2.0V, V _{DD} = 4.5~5.5V, CL=15pF 0.2V _{DD} ~0.8V _{DD} , V _{DD} = 4.5~5.5V, CL=50pF 0.2V _{DD}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

Part Number Example: CPPFX7LZ-A7BP-50.0TS

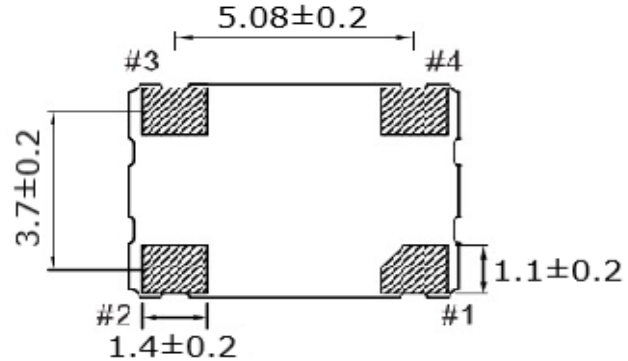
| Series Model | Logic | Package Size (mm) | Supply Voltage V _{CC} | Packaging | Operating Temperature Range | Frequency Stability (ppm) | Frequency (MHz) | Enable/Disable |
|--------------|--------|-------------------|--------------------------------|-----------------------------------|--|-----------------------------------|------------------------------|---------------------------------|
| CPPFX | C | 7 | L | Z | A7 | BP | 50.0 | TS |
| | C=CMOS | 7 = 7 x 5 | L = 3.3V Blank= 5.0V | Blank = Tape only Z= Tape/reel | Blank = 0 to +70°C A5 = -20 to +70°C A7 = -40 to +85°C | BR = ±25 BP = ±50 B6 = ±100 | 5V: 1 - 133 3.3V: 1 - 100 | TS = Tristate PD = Powerdown |

Mechanical Dimensions (mm)

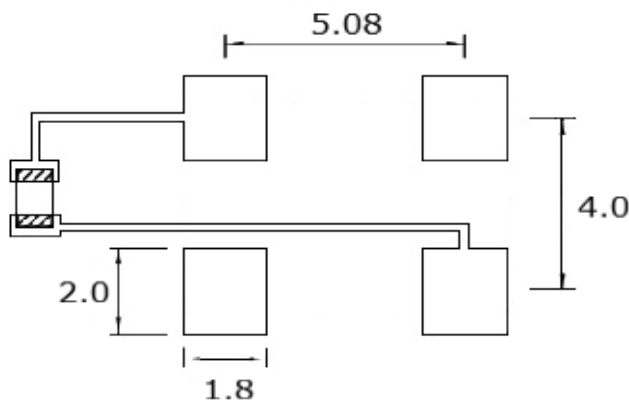
[TOP VIEW]



[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)

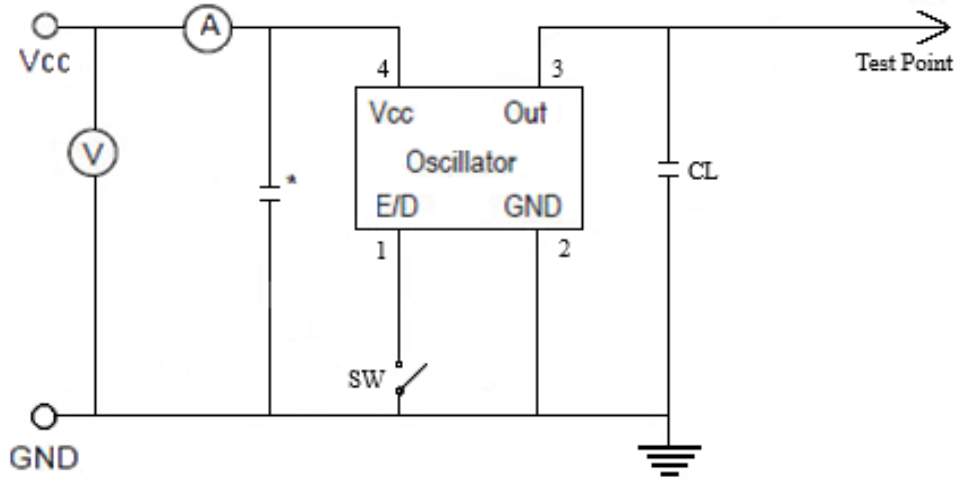
Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

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

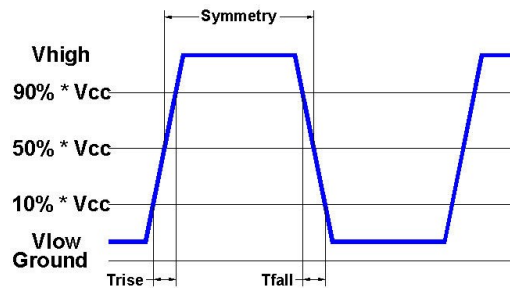
For Optimum Jitter Performance, Cardinal recommends:

- 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
 * 0.01~0.1 μ F 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 |

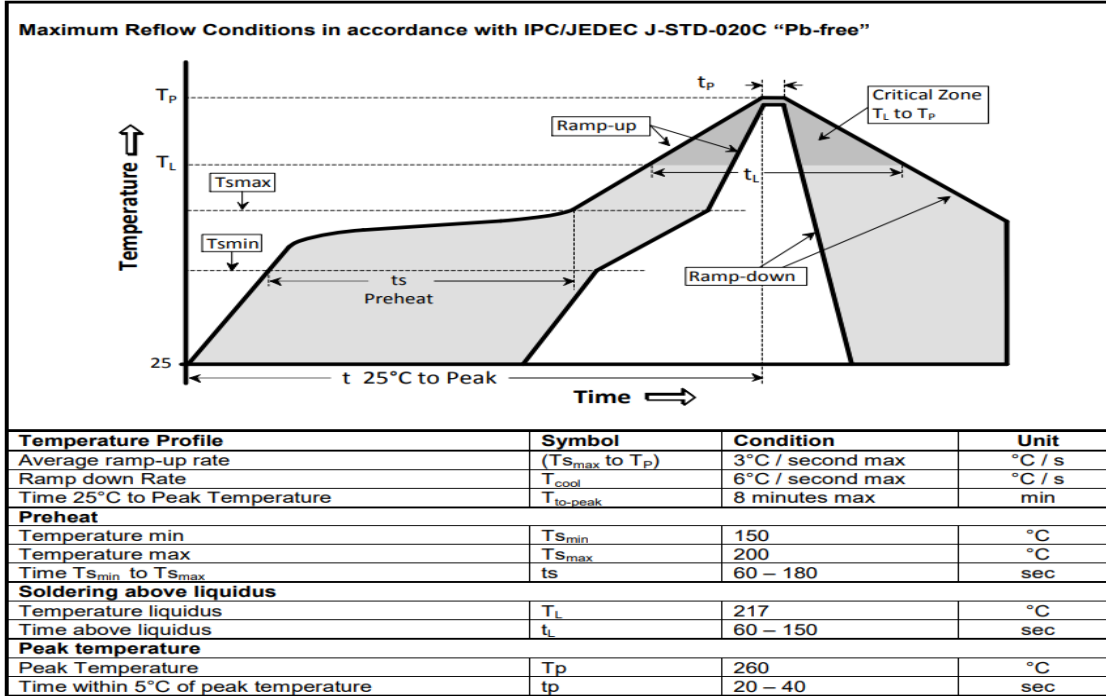
Absolute Maximum Ratings

| 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

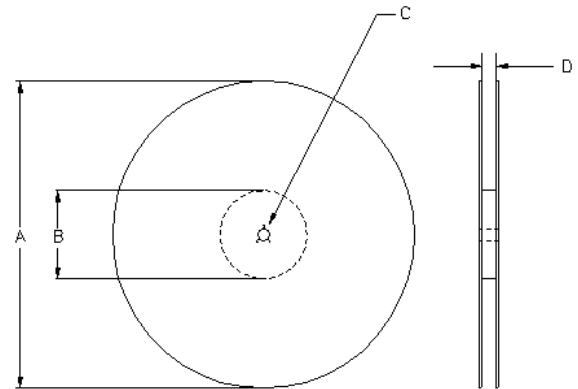
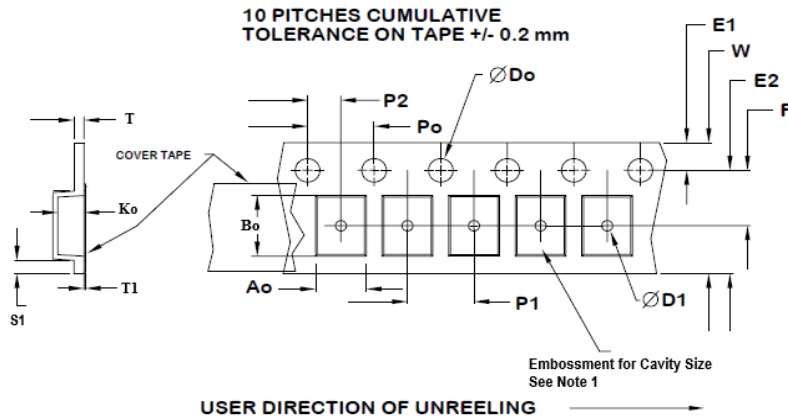
Reflow Cycle



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 |

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 | S1 min | 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 | 0.6 | 0.3 | 0.1 |

| Reel Size | A | | B | | C | D |
|-----------|--------|-------|--------|-------|----------------------|-----------------------------------|
| | Inches | mm | Inches | 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 | | |

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