

CJVHL5  
5.0 x 3.2 x 1.25 mm  
LCC Ceramic Package

### Features

- Quartz crystal controlled Precision Square Wave Oscillator
- LVDS Output
- Voltage Control function
- Enable/Disable Function on pad 2
- 3.3V nominal Supply Voltage
- 10MHz - 1500MHz frequency range

### Applications

Driving A/Ds, D/As, FPGAs  
Fibre Channel  
Ethernet, GbE, SynchE  
Medical  
Storage Area Networking  
COTS  
Telecom  
PON

### Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range <sup>2</sup>	10	-	1500	MHz	
Frequency pullability <b>APR</b> <sup>2</sup>	-	±50	-	ppm	Absolute pull range, includes effect of temperature stability
Operating Temperature Range <sup>2</sup>	-20 -40	-	+70 +85	°C	
Supply Voltage <sup>1,2</sup> V <sub>CC</sub>	2.97	3.3	3.63	V	TV <sub>CC</sub> ramp = 100µs min
Supply Current I <sub>CC</sub>	-	-	50	mA	
Output Waveform	LVDS				
Differential Output Voltage V <sub>OD</sub>	175	350	-	mV	
Output Offset Voltage V <sub>OS</sub>	-	1.25	-	V	
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	-	1.0	ns	V <sub>th</sub> is 10% and 90% of amplitude
Startup Time	-	-	10	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	Referenced to 50% of amplitude or crossing point
V <sub>DISABLE</sub>	-	-	0.3*V <sub>CC</sub>	Volts	Referenced to Ground
V <sub>ENABLE</sub>	0.7*V <sub>CC</sub>	-	-		
Enable Time	-	-	200	ns	< 50MHz
	-	-	100	ns	≥ 50MHz
Disable Time	-	-	50	ns	Time for output to reach a high Z state
Control Voltage	0	1.65	3.3		
Modulation Bandwidth	10	-	-	kHz	
Voltage vs. Frequency Linearity	-	10	-	%	
Standby Current	-	18	-	mA	Pad 2 low, device disabled
Aging	-	-	±3.0	ppm	per year
Storage Temperature Range	-55	-	+125	°C	

Notes: Specifications with Pad 2 E/D open circuit

<sup>1</sup> Place an appropriate power supply bypass capacitor next to device for correct operation

<sup>2</sup> Defined by part number

**Typical Phase Noise/Jitter**

Phase Noise	10 Hz 100 Hz 1 kHz 1 MHz 20 MHz	-66 -96 -112 -136 -154	dBc/Hz	<b>Precision Developed Frequencies:</b> 100, 106.25, 120, 150, 156.25, 162.5, 175, 187.5, 200, 212.5, 250.0, 312.5, 625.0MHz  25°C ± 2°C at 2.5V / 156.250 MHz
Jitter		0.6	ps rms	12 kHz to 20 MHz from the output frequency @ 156.25MHz
Phase Noise	10 Hz 100 Hz 1 kHz 1 MHz 20 MHz	-51 -88 -108 -135 -151	dBc/Hz	<b>All Other Frequencies</b>  25°C ± 2°C at 2.5V / 133 MHz
Jitter		2.4	ps rms	12 kHz to 20 MHz from the output frequency @133MHz

**Part Number (Example: CJVHL5Z-A7BP-100.0TS)**

Series Model	Logic	Package size	Supply Voltage	Packaging	Operating Temperature Range	Pullability (APR)	Frequency MHz	Enable/Disable
CJVH	L	5	L	Z	A7	BP	100.0	TS
	L = LVDS	5 = 5 x 3.2mm	L = 3.3V	Blank = Tape Only Z = Tape/Reel	A5 = -20 to +70°C A7 = -40 to +85°C	BP = ±50 ppm min	10 - 1500 MHz	TS=Tristate

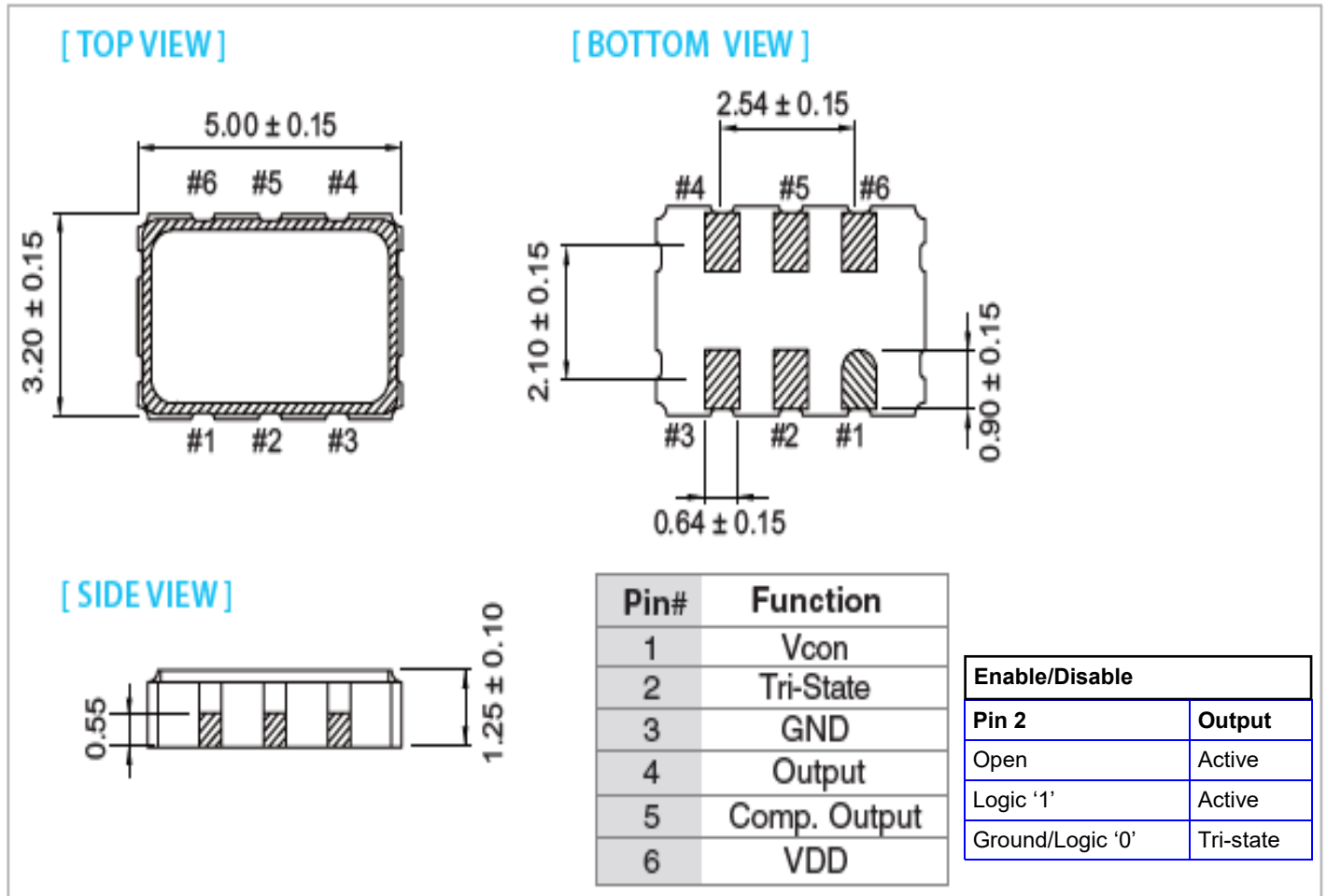
**Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.**

Cardinal Components Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
 Weight of the Device: 0.09 grams  
 Moisture Sensitivity Level: 1 As defined in J-STD-020D  
 Second Level Interconnect code: e4

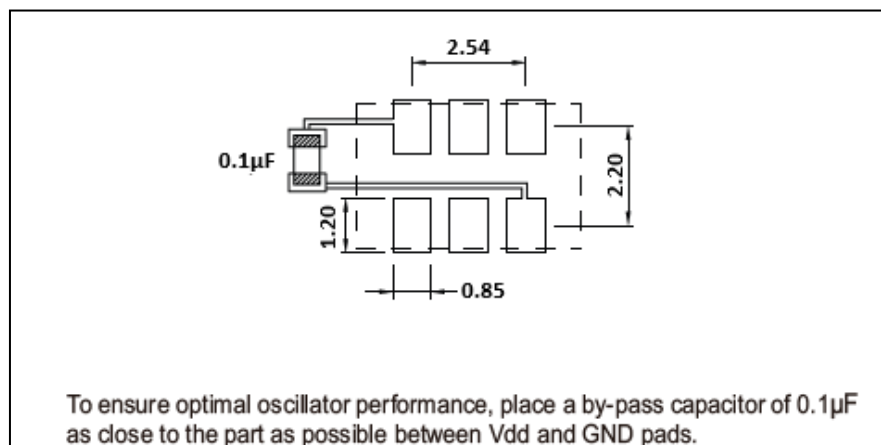
For Optimum Jitter Performance, Cardinal recommends:

- 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

### Mechanical Dimensions (mm)



**Contacts (pads): Gold (0.3 to 1.0  $\mu\text{m}$ ) over Nickel (1.27 to 8.89  $\mu\text{m}$ )**



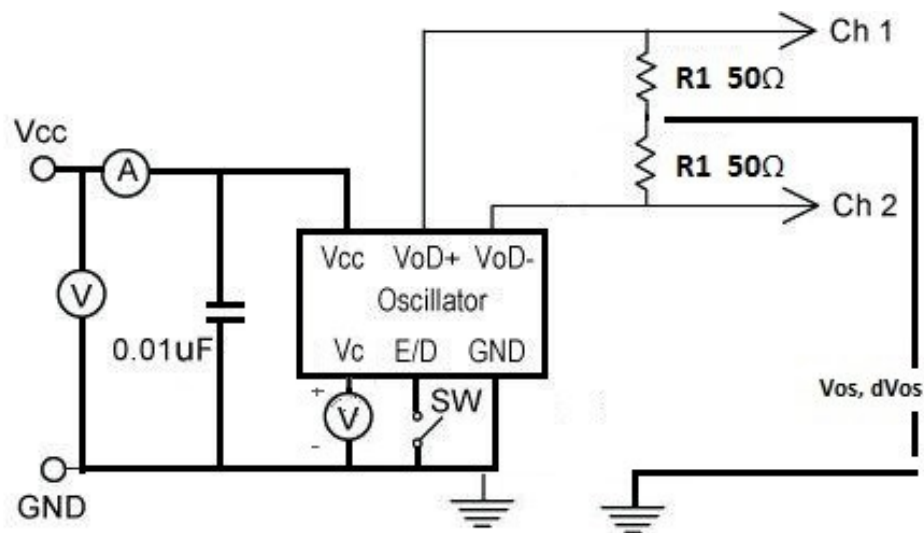
**Pad Layout** mm shown

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

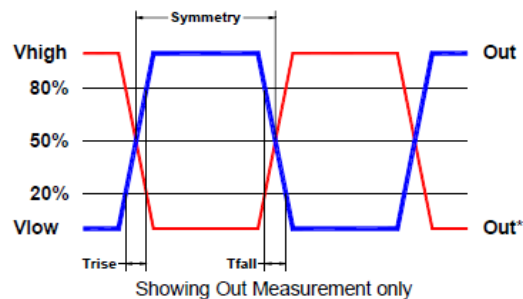
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### Electrical Test /Load Circuit



### Test Waveform



### 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
Charged Device Model	1000V	JESD22-C101
Machine Model	120V	JESD22-A115

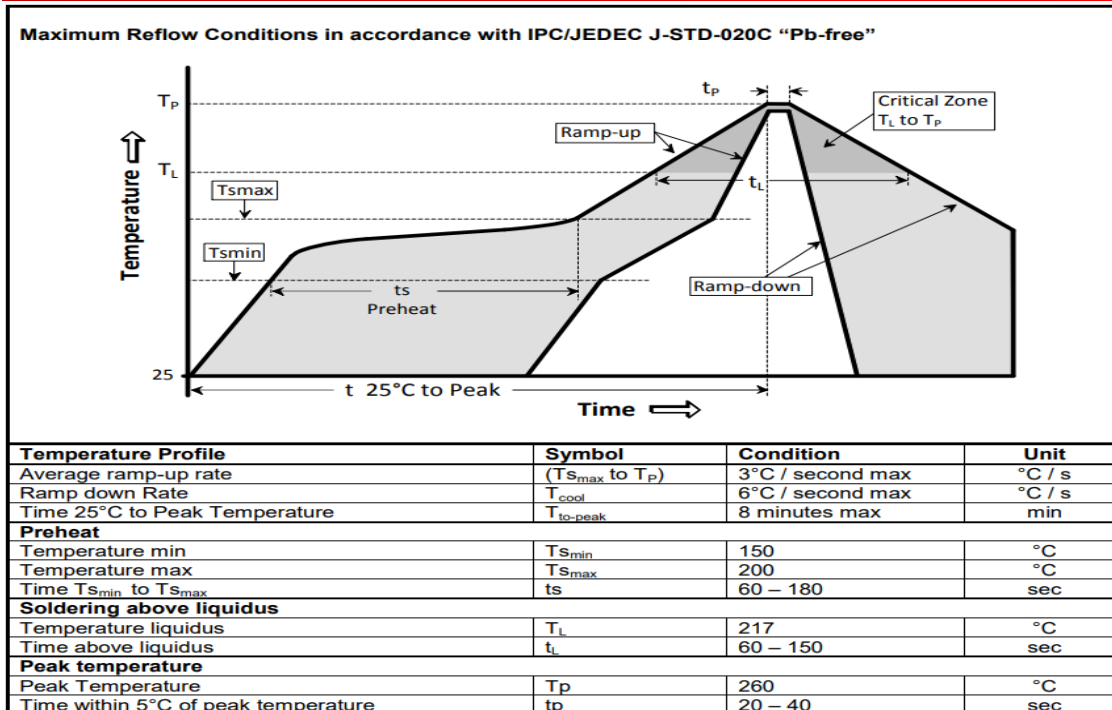
#### Absolute Maximum Ratings

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +4.2V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 0.5V

#### Thermal Characteristics:

The maximum die or junction temperature is 125°C

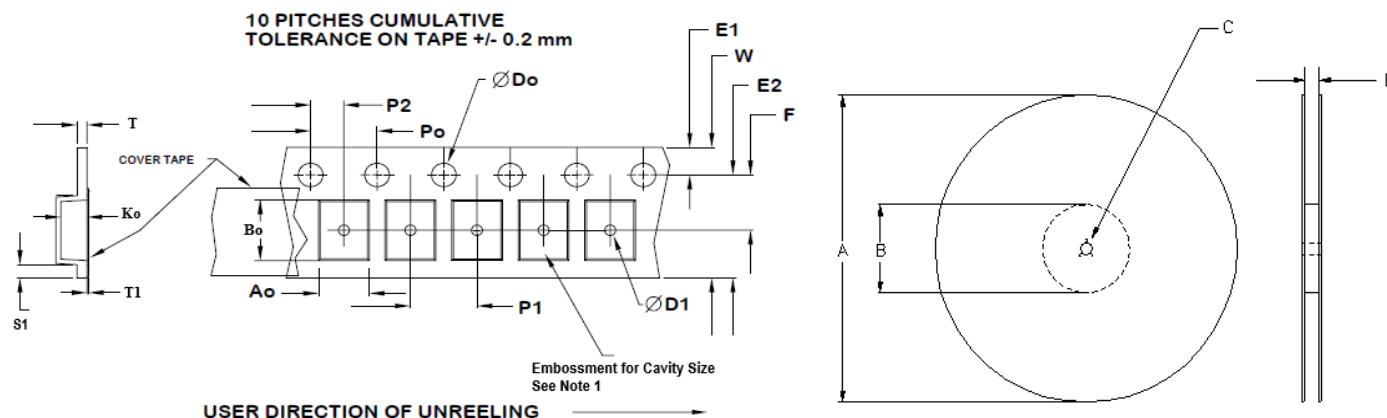
### Reflow Cycle



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. 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

Tape Constant Dimensions Table 1								
Tape Size	Do	D1	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 ±0.1	0.6	0.3	0.1

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

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