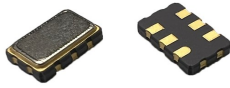




# PLETRONICS LV55F/G Series 3.3V LVDS Clock Oscillator



LV55F/G  
5.0 x 3.2 x 1.35mm  
LCC Ceramic Package

## Features

- Pletronics' LV55F/G Series is a Quartz crystal controlled Precision Square Wave Oscillator
- LVDS Output
- Enable/Disable Function on pad 1
- Low Jitter
- 3.3V nominal Supply Voltage
- 13.5 - 220 MHz 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>	13.5 35	-	110 220	MHz	'F' Series Devices 'G' Series Devices
Frequency Stability <sup>2</sup> ± 20 = <b>20*</b> , ± 25 = <b>44</b> , ± 50 = <b>45</b>	±20	-	±50	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures. *limited frequencies, see page 2
Operating Temperature Range <sup>2</sup>	-10 -20 -40	-	+70 +70 +85	°C	Standard range Extended range <b>C</b> option Extended range <b>E</b> option
Supply Voltage <sup>1,2</sup> V <sub>CC</sub>	2.97	3.3	3.63	V	
Supply Current I <sub>CC</sub>	-	12 16	20 27	mA	<80 MHz <b>'F' Series</b> ≥80 MHz
		12 16 20 24	20 27 34 40	mA	<90 MHz <b>'G' Series</b> ≥90 MHz to <125 MHz ≥125 MHz to <160 MHz ≥160 MHz
Output Waveform	LVDS				Load = 100Ω. Recommended termination is DC-Coupled (Point to Point)
Differential Output Voltage V <sub>OD</sub>	250	350	450	mV	
Output Offset Voltage V <sub>OS</sub>	1.125	1.25	1.375	V	
Differential Output Error ΔV <sub>OD</sub>	-	-	50	mV	
Output High Level V <sub>OH</sub>	-	1.43	1.6	V	
Output Low Level V <sub>OL</sub>	0.9	1.1	-	V	
Output T <sub>RISE</sub> and T <sub>FALL</sub>		0.15	0.4	ns	V <sub>th</sub> is 20% and 80% output swing
Startup Time	-	-	2	ms	Time for output to reach specified frequency
Duty Cycle	≤ 200 MHz	45	55	%	At output crossing point
	> 200 MHz	40	60		
V <sub>DISABLE</sub> V <sub>IL</sub>	-	-	0.3V <sub>CC</sub>	V	Referenced to Ground
V <sub>ENABLE</sub> V <sub>IH</sub>	0.7V <sub>CC</sub>	-	-		
Enable Time	-	-	2	ms	Time for output to reach a logic state
Disable Time	-	-	200	ns	Time for output to reach a high Z state
Output Leakage	V <sub>OUT</sub> = V <sub>CC</sub>	-	+10	μA	Pad 1 low, device disabled
	V <sub>OUT</sub> = 0V	-10	-		
Standby Current	-	-	10	μA	
Jitter		-	0.6	ps	12 kHz to 20 MHz from the output frequency 10 Hz to 1 MHz from the output frequency
		-	2.8		
Phase Noise	100 Hz	-	-103	dBc/Hz	25°C ± 2°C at 106.25 MHz
	1 kHz	-	-129		
	10 kHz	-	-141		
	100 kHz	-	-146		
	1 MHz	-	-153		
20 MHz	-	-157			
Storage Temperature Range	-55	-	+125	°C	

Notes: Specifications with Pad 1 E/D open circuit

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

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



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## Part Number

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V <sub>cc</sub>	Frequency in MHz	Optional T&R Packaging code
LV55	45	F or	E	V	- 100.0M	-XX
	45 = ± 50 ppm (STD) 44 = ± 25 ppm 20* = ± 20 ppm		Blank = -10 to +70°C (STD) C = -20 to +70°C E = -40 to +85°C	V = 3.3V ± 10%	13.5 - 220 MHz	T250 = 250 per Reel T500 = 500 per Reel T1K = 1000 per Reel (Std for 1K pcs)

\* Contact PLE sales for limited frequencies. Full frequency range available which excludes aging.

## Device Marking

<b>PFF.FF L t</b> • YMDxxx	P = Pletronics FF.FF L = Frequency in MHz, L for LVDS (frequency is 5 characters, including the decimal) t = Version, F or G YMD = Date Code, All other marking is internal codes
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Note: Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

Code	5	6	7	8	9	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2025	2026	2027	2028	2029	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

## Package Labeling

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)  
 Font is Courier New  
 Bar code is 39-Full ASCII

RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)  
 Font is Arial

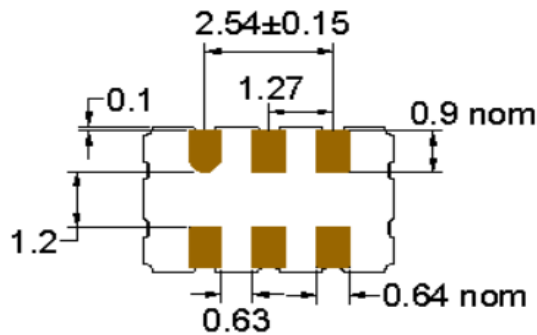
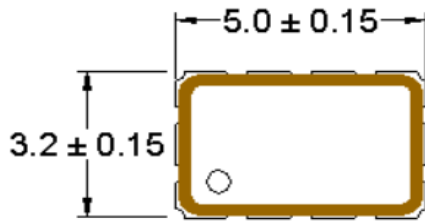
<b>P/N:</b> PLE Part Number <b>Customer P/N:</b> 12345678 <b>Qty:</b> 1000 <b>D/C</b> 2A1 MSL: 1
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<b>RoHS Compliant</b> 2nd LvL Interconnect Category=e4 Max Safe Temp=260C for 10s 2X Max
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Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
 Weight of the Device: 0.055 grams  
 Moisture Sensitivity Level: 1 As defined in J-STD-020D  
 Second Level Interconnect code: e4

## Mechanical Dimensions



### Dimensions in mm

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

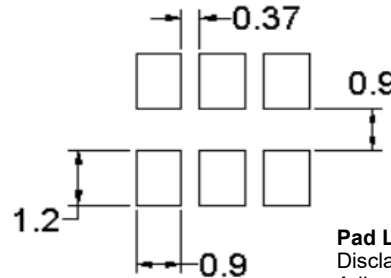
## Pad Connections

Pad	Function
1	Enable/Disable
2	NC
3	Ground
4	Output
5	Output N
6	Vcc

### ENABLE/DISABLE

Pad 1	Outputs
V <sub>IH</sub> /Open	Active
V <sub>IL</sub> /Gnd	Disabled/Tristate

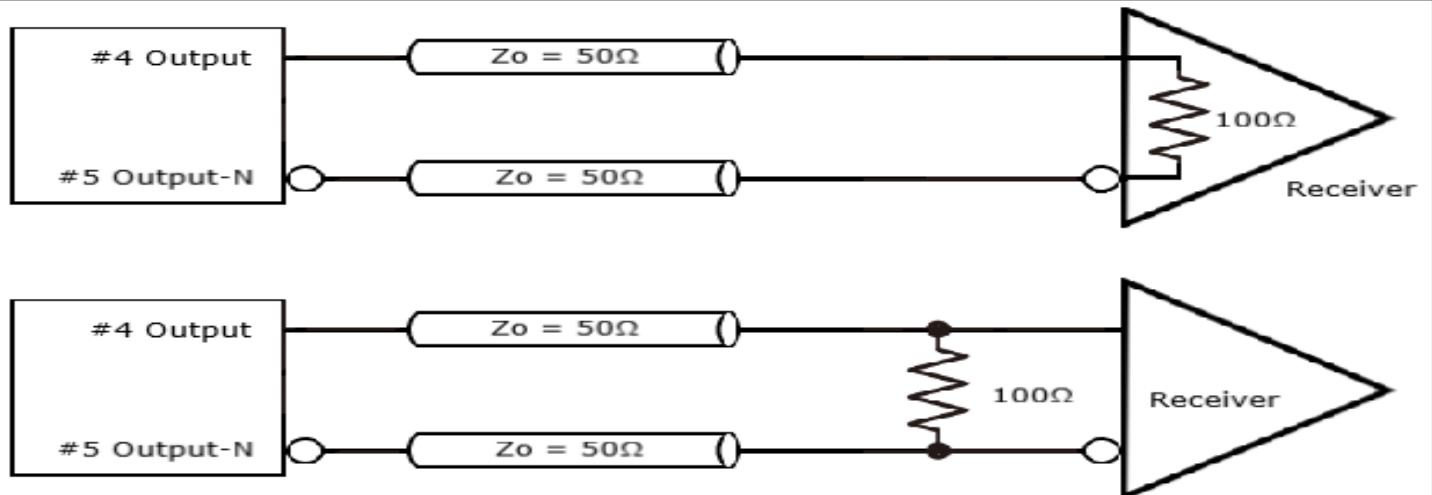
## Solder Pad Layout



### Pad Layout

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

## Recommended Termination

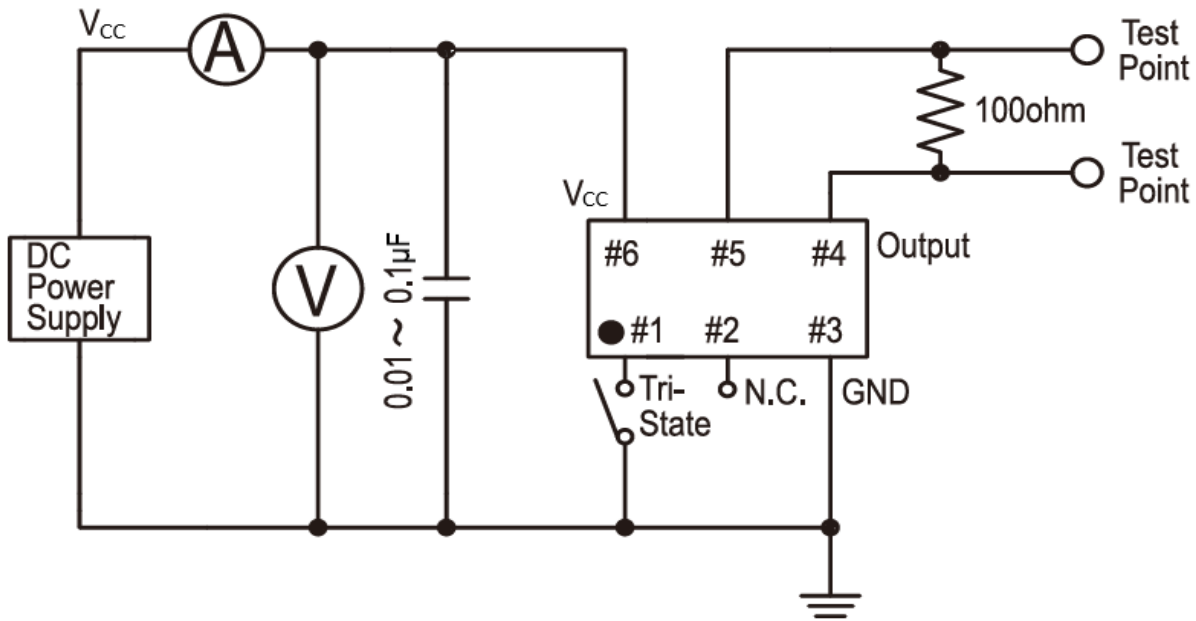


For any other terminations, the oscillator should be sampled and tested in the application. Both outputs shall be terminated and biased for proper operation.

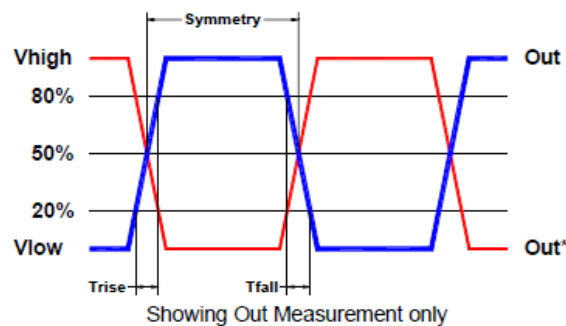
For Optimum Jitter Performance, Pletronics recommends:

- 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



Test Waveform



## 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	JESD22-A114
Machine Model	200V	JESD22-A115

Absolute Maximum Ratings

Parameter	Unit
V <sub>cc</sub> Supply Voltage	-0.5V to +5.0V
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:

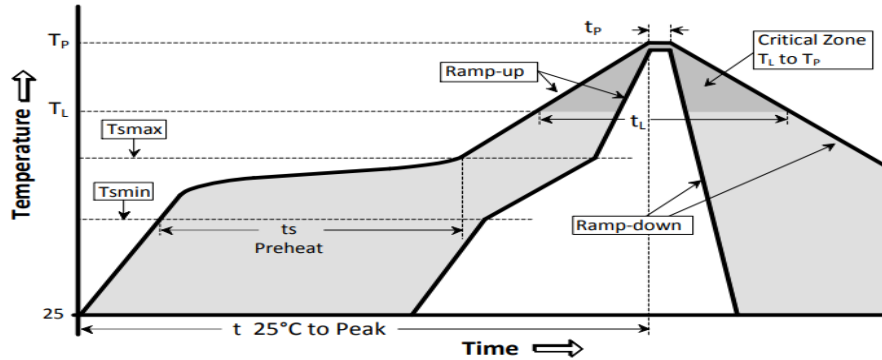
The maximum die or junction temperature is 150°C



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## Reflow Cycle

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

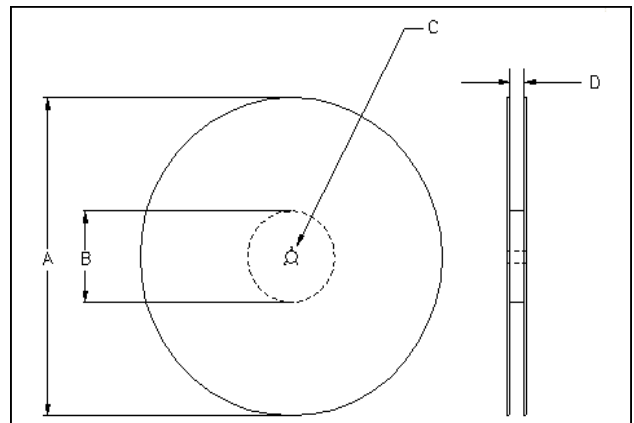
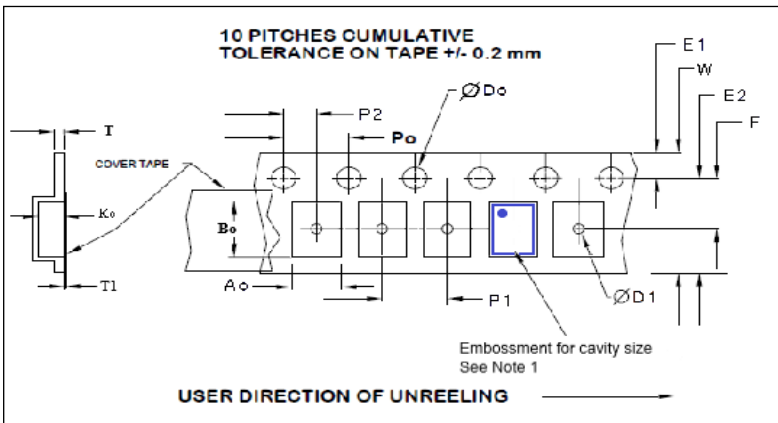


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	$(T_{S_{max}} \text{ to } T_p)$	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
<b>Preheat</b>			
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
<b>Soldering above liquidus</b>			
Temperature liquidus	$T_L$	217	°C
Time above liquidus	$t_L$	60 – 150	sec
<b>Peak temperature</b>			
Peak Temperature	$T_p$	260	°C
Time within 5°C of peak temperature	$t_p$	20 – 40	sec

## Tape and Reel

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 250. 12mm (or 16mm) 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
16mm	14.25	7.5 ±0.05	8.0 ±0.1	16.3	3.6±0.1	5.4±0.1	1.4±0.1

Reel Dimensions (may vary) Table 3

Reel Size	A		B		C	D
	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

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
12mm	1.5 +0.1 -0.0	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.3	0.1
16mm		1.5			2.0 ±0.1		



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