



LV99D Series 3.3 V LVDS Clock Oscillators

November 2018



- Pletronics' LV99D Series is a quartz crystal controlled precision square wave generator with an LVDS output.
- The package is designed for high density surface mount designs.
- Low cost mass produced oscillator.
- Tape and Reel or cut tape packaging is available.
- 5 x 7 mm LCC Ceramic Package
- Enable/Disable Function on pad 1
- Output frequency is synthesized.
- Low Jitter

**Pletronics Inc. certifies this device is in accordance with the
RoHS 6/6 (2011/65/EC) and WEEE (2002/96/EC) directives.**

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

Absolute Maximum Ratings:

Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +5.0V
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 155°C
The thermal resistance junction to board is 30 to 50°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Part Number:

LV99	45	D	E	V	-375.0M	-XX	
							Packaging code or blank T250 = 250 per Tape and Reel T500 = 500 per Tape and Reel T1K = 1000 per Tape and Reel
							Frequency in MHz
							Supply Voltage V_{CC} V = 3.3V \pm 10%
							Temperature Range blank = -10 to +70°C C = -40 to +70°C E = -40 to +85°C
							Series Model
							Frequency Stability 45 = \pm 50 ppm 44 = \pm 25 ppm 20 = \pm 20 ppm
							Series Model

Part Marking:

PLE LV99
FF.FFF M
• YMDXX

Marking Legend:

PLE = Pletronics
 FF.FFF M = Frequency in MHz
 YMD = Date of Manufacture (year-month-day)
 All other marking is internal factory codes

Codes for Date Code YMD

Code	6	7	8	9	0	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2016	2017	2018	2019	2020	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

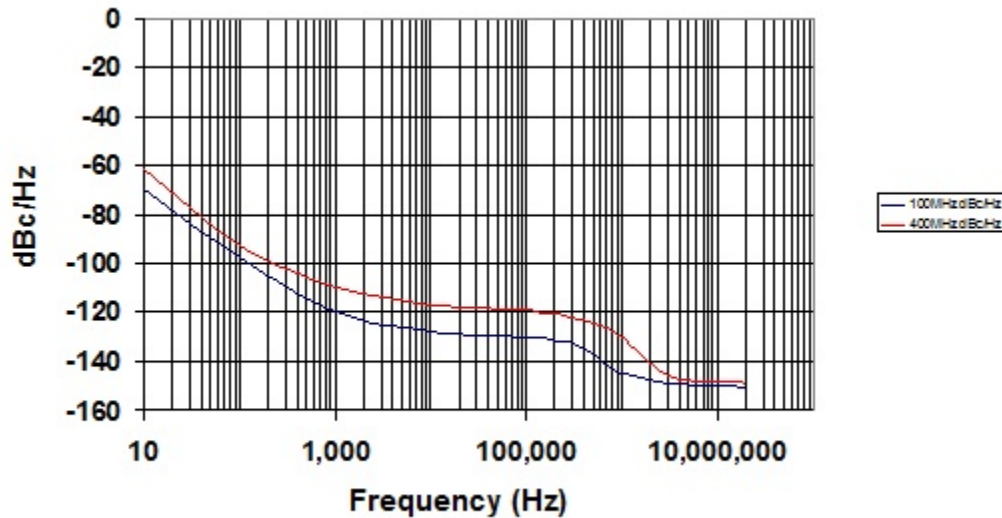
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Electrical Specification for 3.30V $\pm 10\%$ over the specified temperature range and the frequency range of 10.9 MHz to 670 MHz

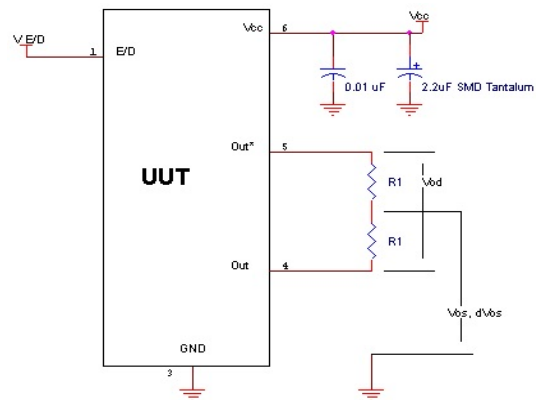
Item	Min	Max	Unit	Condition
Frequency Accuracy “45”	-50	+50	ppm	For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures
“44”	-25	+25		
“20”	-20	+20		
Output Waveform	LVDS			
Output High Level	--	1.60	Volts	See load circuit R1 = 50 ohms
Output Low Level	0.90	--	Volts	
Differential Output (V _{OD})	250	450	mVolts	
Output Offset Voltage (V _{OS})	1.125	1.375	Volts	
Differential Output Error (dV _{OS})	--	50	mVolts	
Output Symmetry	47	53	%	Referenced to 50% of amplitude or crossing point
Output T _{RISE} and T _{FALL}	150	230	pS	V _{th} is 20% and 80% of waveform
Jitter	-	0.6	pS RMS	Measured from 12KHz to 20MHz from F _{nominal}
	-	2.8		Measured from 10Hz to 20MHz from F _{nominal}
Output Short Circuit Current	-	-20	mA	V _{out} = 0.0V
Vcc Supply Current	-	80	mA	
Enable/Disable Internal Pull-up	50	-	Kohm	To Vcc (equivalent resistance)
V disable	-	0.8	Volts	Referenced to Ground
V enable	2.0	-	Volts	Referenced to Ground
Output leakage V _{OUT} = V _{CC}	-20	+20	uA	Pad 1 low, device disabled
V _{OUT} = 0V	-20	+20	uA	
Enable	-	10	nS	Time for output to reach a logic state
Disable time	-	10	nS	Time for output to reach a high Z state
Start up time	-	5	mS	Measured from the time Vcc = 3.0V
Operating Temperature Range	-10	+70	°C	Standard Temperature Range
	-20	+70	°C	Extended Temperature Range “C” Option
	-40	+85	°C	Extended Temperature Range “E” Option
Storage Temperature Range	-55	+125	°C	

Specifications with Pad 1 E/D open circuit

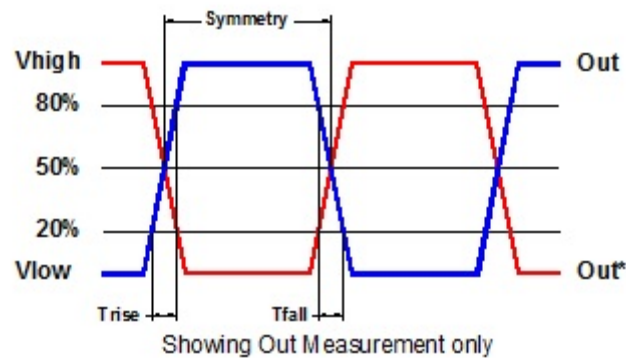
Typical Phase-Noise Response



Load Circuit



Test Waveform



Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	2000	MIL-STD-883 Method 3115
Charged Device Model	1500	JESD 22-C101

Package Labeling

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

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

P/N:		
	LV9920DV-312.50M	
Customer P/N:		
	12345678	
Qty:		D/C 
	1000	7AA-BT

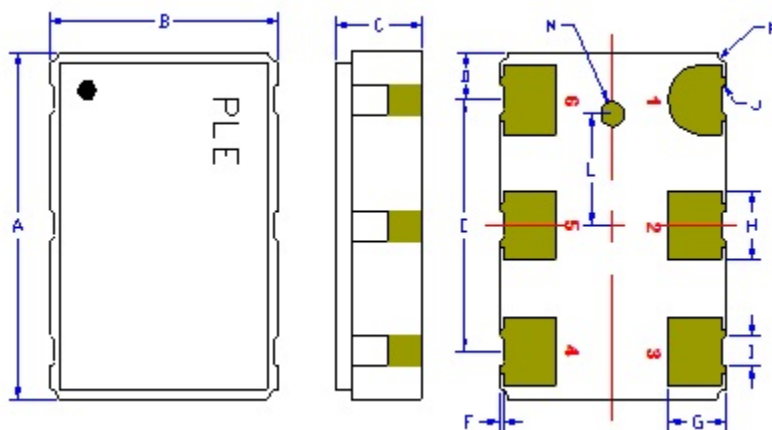
RoHS Compliant

2nd Lvl Interconnect

Category=e4

Max Safe Temp=260C for 10s 2X Max

Mechanical:



Contacts:

Gold 11.8 to 39.4 μinches (0.3 to 1.0 μm)
over

Nickel 50 to 350 μinches (1.27 to 8.89 μm)

Center metalized pad "M" on the base is
not internally connected.

¹ Typical dimensions

Not to Scale

	Inches	mm
A	0.276 ±0.006	7.00 ±0.15
B	0.197 ±0.006	5.00 ±0.15
C	0.067 max	1.70 max
D ¹	0.038	0.96
E ¹	0.200	5.08
F ¹	0.004	0.10
G ¹	0.050	1.27
H ¹	0.055	1.40
I ¹	0.024	0.60
J ¹	0.004r	0.10r
K ¹	0.008r	0.20r
L ¹	0.089	2.25
M ¹	0.010r	0.25r

Pad	Function	Note
1	Output Enable/Disable	When this pad is not connected the oscillator shall operate. If <0.80 volts, the output will be inhibited (high impedance state.) Recommend connecting this pad to V _{CC} if the oscillator is to be always on.
2	No connect	This pad should be connected to Ground or Supply Voltage to lower the packages thermal resistance.
3	Ground (GND)	
4	Output	The outputs must be terminated, 100 ohms between the outputs is the ideal termination. Capacitor coupled terminations can be used.
5	Output*	
6	Supply Voltage (V _{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

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Contacting Pletronics Inc.

Pletronics Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880
Fax: 425-776-2760
E-mail: ple-sales@pletronics.com
URL: www.pletronics.com

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