

VLU7 Series 3.3V LVDS VCXO Oscillators

November 2018

- Pletronics' VLU7 Series is a voltage - quartz crystal controlled precision square wave generator with a LVDS output.
- See VPU7 for PECL output
- Tape and Reel or cut tape packaging
- 10.9 MHz to 670 MHz
- Enable/Disable Function on pad 2
- Output frequency is synthesized
- Low Jitter



**Pletronics Inc. certifies this device is in accordance with the
RoHS (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: 0.28 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020D.1

Second Level Interconnect code: e4

Absolute Maximum Ratings:

Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +4.6V
V _i Input Voltage	-0.5V to V _{CC} + 0.5V
V _o Output Voltage	-0.5V to V _{CC} + 0.5V
I _o Output Current	-50mA

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:

VLU7029036	EG	000	050	- 312.5M	-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
						Pullability in ppm (Vcontrol) APR 050 = + 50 ppm minimum is standard 075 = + 75 ppm minimum 100 = ± 100 ppm minimum
						Stability in ppm (Stability in ppm * 10) 000 = APR 500 = ± 50 ppm 250 = ± 25 ppm (typical values shown)
						Temperature Range EG = -10 to +70°C LK = -40 to +85°C
						Series Model

Part Marking:

PLE VLU7
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

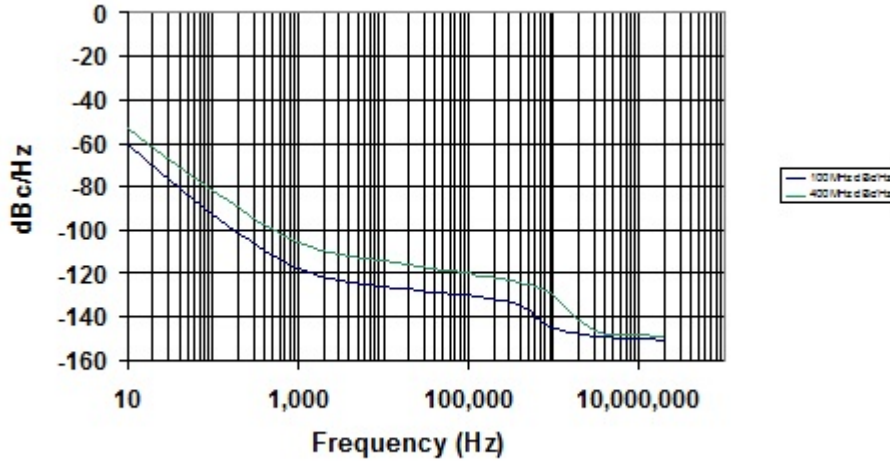
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

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

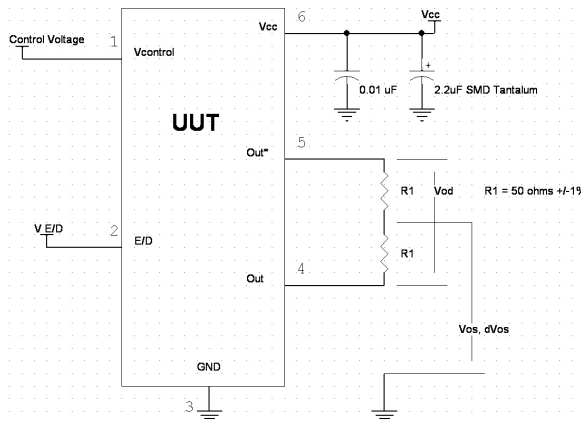
Item	Min	Max	Unit	Condition
Pullability, Absolute Pull Range	-50 -75 -100	+50 +75 +100	ppm	APR includes the effects of supply voltages, load changes, aging for 1 year, shock, vibration and temperature. Defined by part number.
Output Waveform	LVDS			
Output High Level	--	1.60	Volts	See load circuit R1 = 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	-	0.8	pS RMS	Measured from 12KHz to 20MHz from $F_{nominal}$
	-	3.2		Measured from 10Hz to 20MHz from $F_{nominal}$
Output Short Circuit Current	-	-20	mA	$V_{out} = 0.0V$
Modulation Bandwidth	10	-	KHz	$V_{control} = 1.65V \pm 1.50 V$, -3dB
$V_{control}$ Resistance (Pad 1)	20	-	Kohm	
Voltage vs. Frequency Linearity	-10	+10	%	$V_{control} = 1.65V \pm 1.50 V$
V_{CC} Supply Current	-	90	mA	
Enable/Disable Internal Pull-up	50	-	Kohm	To V_{CC} (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	μA	Pad 1 low, device disabled
	$V_{OUT} = 0V$	-20		
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 $V_{CC} = 3.0V$
Operating Temperature Range	-10	+70	$^{\circ}C$	Standard Temperature Range
	-40	+85	$^{\circ}C$	Extended Temperature Range "E" Option
Storage Temperature Range	-55	+125	$^{\circ}C$	

Specifications with Pad 2 E/D open circuit or connected to V_{CC}

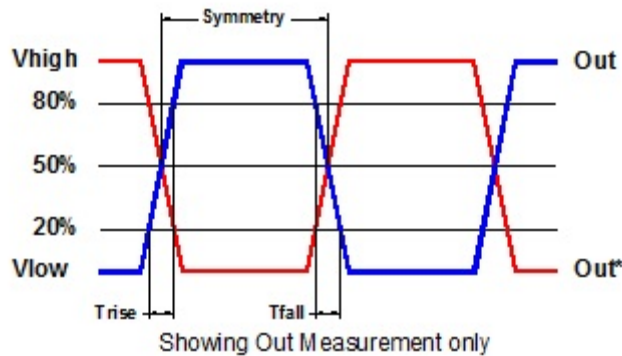
Typical Phase-Noise Response



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

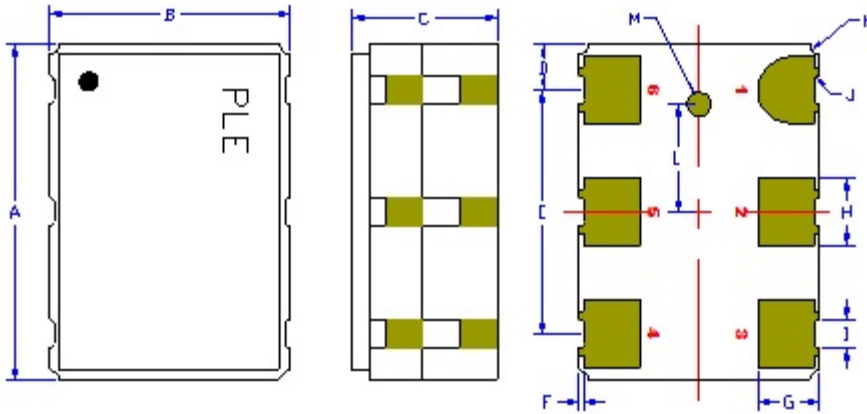
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

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

P/N:  VLU7029036EG100050-100.0M Customer P/N:  12345678 Qty:  1000 D/C  MSL: 1 4AN3LGC2-SF2

RoHS Compliant 2nd Lvl Interconnect Category=e4 Max Safe Temp=260C for 10s 2X Max

Mechanical:



	Inches	mm
A	0.276 \pm 0.006	7.00 \pm 0.15
B	0.197 \pm 0.006	5.00 \pm 0.15
C	0.117 max	2.97 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

Contacts (pads):

Gold 11.8 to 39.4 μ mches (0.3 to 1.0 μ m)
over

Nickel 50 to 350 μ mches (1.27 to 8.89 μ m) Not to Scale

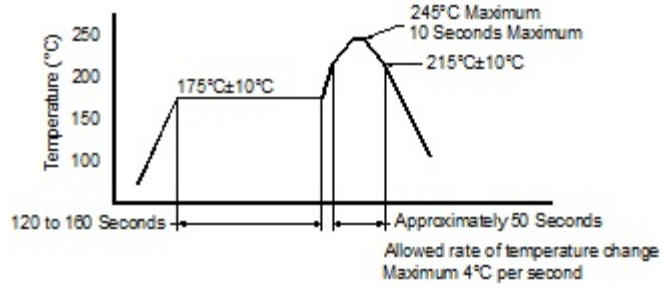
Center metallized pad on the base is internally connected, may be open or connected to V_{cc} or to Ground.

¹ Typical dimensions

Do not permit solder to bridge the upper gold contacts on the side.

Pad	Function	Note
1	Vcontrol	Modulates the output frequency
2	Output Enable/Disable	When this pad is not connected the oscillator shall operate. When this pad is <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.
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.

Reflow Cycle (typical for lead free processing)



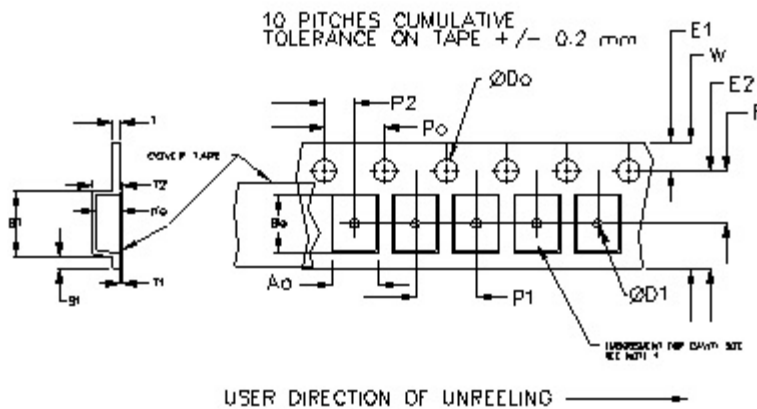
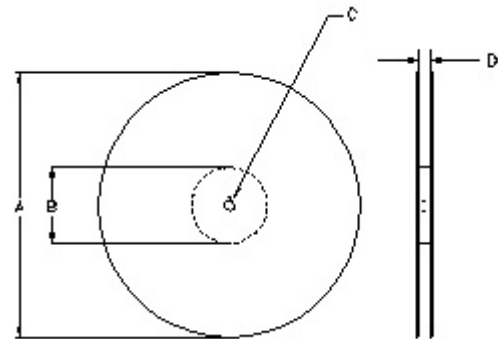
The part may be reflowed 2 times without degradation.

Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5	1.0	1.75	4.0	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5			2.0 ±0.1			
16mm	+0.1 -0.0	1.5	±0.1	±0.1	2.0 ±0.1			
24mm		1.5						

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	7.5 ± 0.1	8.0 ± 0.1	8.0	16.3	Note 1

Note 1: Embossed cavity to conform to EIA-481-B Dimensions in mm Not to scale



		REEL DIMENSIONS			Tape Width
A	inches	7.0	10.0	13.0	
	mm	177.8	254.0	330.2	
B	inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.0
	mm	---	---	24.4 +2.0 -0.0	24.0
	mm	---	---	32.4 +2.0 -0.0	32.0

Reel dimensions may vary from the above

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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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