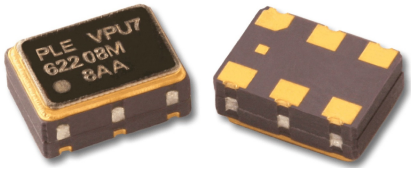
PLETRONICS
Innovations in Frequency Control



VPU7 Series 3.3V
PECL VCXO Oscillators

November 2018

Lead Free

- Pletronics' VPU7 Series is a voltage - quartz crystal controlled precision square wave generator with a PECL output
- See VLU7 for LVDS output
- Tape and Reel or cut tape packaging
- 10.9 MHZ to 1,175MHz
- 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
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo 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:

VPU7029036	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 VPU7
***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

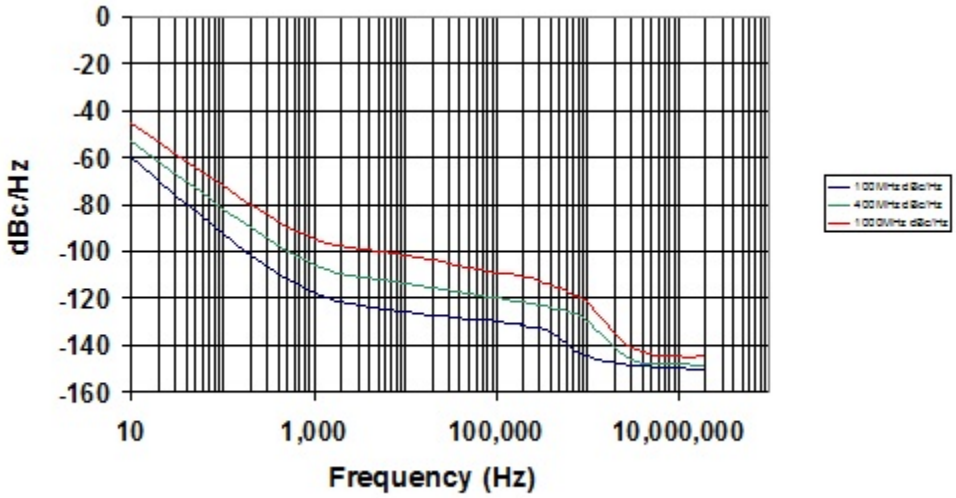
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	**H**	**J**	**K**	**L**	**M**	**N**	**P**	**R**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Electrical Specification for 3.30V ±10% over the specified temperature range and the frequency range of 10.9 MHZ to 766 MHZ and 876 MHZ to 1,175MHz

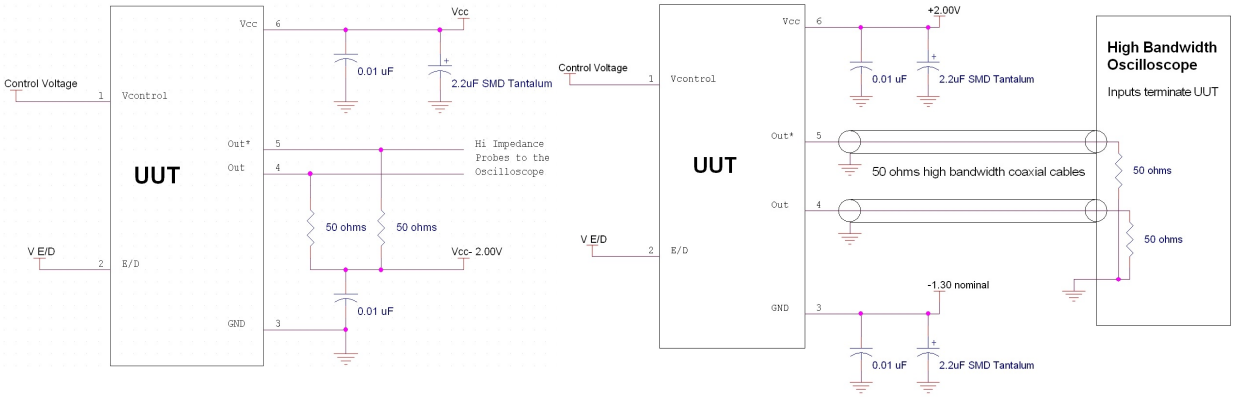
Item	Min	Max	Unit	Condition
Pullability, Absolute Pull Range	-50 -75 -100	+50 +75 +100	ppm	APR includes the effect of temperature stability, aging, supply voltage and load. Defined by part number.
Output Waveform	PECL / ECL			
Output High Level	2.12	2.49	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.82	1.19	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.18	-0.81	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Low Level	1.83	1.99	volts	Referenced to Ground, V_{CC} = 3.3 V
	0.53	0.69	volts	Referenced to termination voltage, V_{CC} = 3.3 V
	-1.47	-1.31	volts	Referenced to Vcc, V_{CC} = 3.3 V
Output Peak to Peak Level	0.405	1.076	volts	
Output Symmetry	47	53	%	at 50% point of V_{CC} (See load circuit)
Modulation Bandwidth	10	-	KHz	Vcontrol = 1.65V ±1.50 V , -3dB
Vcontrol Resistance (Pad 1)	20	-	Kohm	
Voltage vs Frequency Linearity	-10	+10	%	Vcontrol = 1.65V ±1.50 V
Jitter	-	0.8	pS RMS	12 KHz to 20 MHZ from the output frequency
	-	3.2	pS RMS	10 Hz to 20 MHZ from the output frequency
Output T_{RISE} and T_{FALL}	100	300	pS	Vth is 20% and 80% of waveform
V_{CC} Supply Current (I_{CC})	-	110	mA	
Enable/Disable Internal Pull-up	50	-	Kohm	to V_{CC}
V disable	-	0.8	volts	Referenced to pad 3
V enable	2.00	-	volts	Referenced to pad 3
Output leakage $V_{OUT} = V_{CC}$	-50	+50	uA	Pad 1 low, device disabled
V_{OUT} = 0V	-50	+50	uA	
Enable time	-	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	Time for output to reach specified frequency
Operating Temperature Range	-10	+70	°C	Standard Temperature Range
	- 40	+85	°C	Extended Temperature Range
Storage Temperature Range	-55	+125	°C	

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

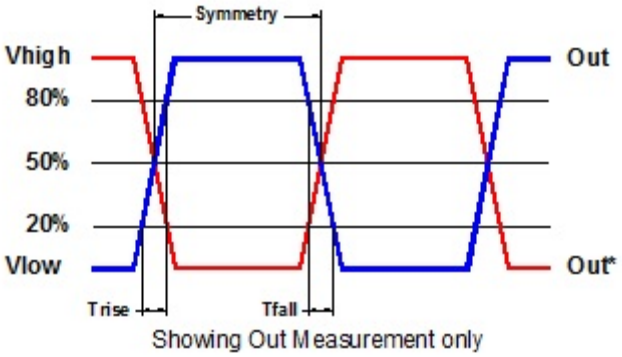
Typical Phase-Noise Response



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

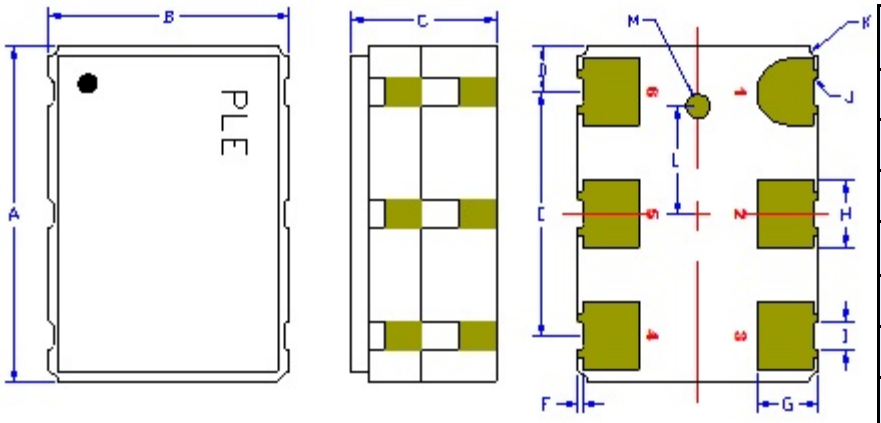
Package Labeling

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

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

Mechanical:



	Inches	mm
A	0.276 ±0.006	7.00 ±0.15
B	0.197 ±0.006	5.00 ±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 µinches (0.3 to 1.0 µm) over
Nickel 50 to 350 µinches (1.27 to 8.89 µm)

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

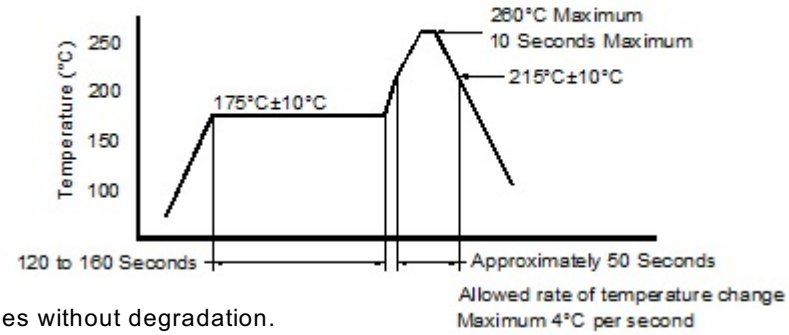
[1] Typical dimensions

Not to Scale

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	Both outputs must be terminated and biased for proper operation. The ideal termination is 50 ohms connected to 2.0V below the Supply Voltage. The outputs become a High Z when disabled and the voltage level is determined by the termination circuitry.
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)



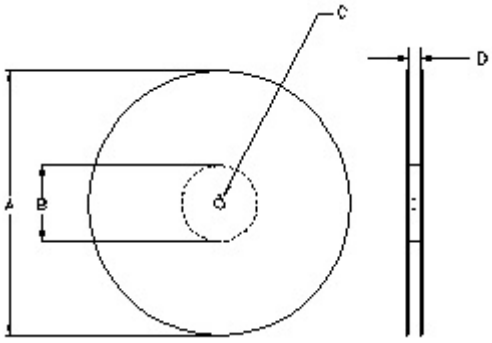
The part may be reflowed 2 times without degradation.

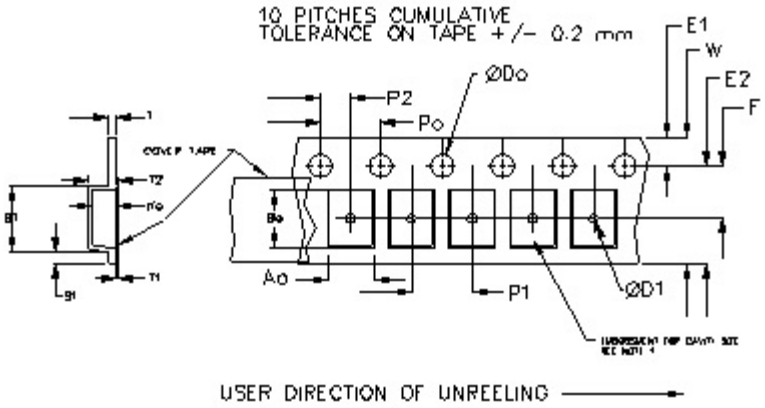
Tape and Reel: available for quantities of 250 to 1000 per reel, cut tape for < 250

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.6	0.1
12mm		1.5			2.0 ±0.1			
16mm		1.5						
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			
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	Tape Width
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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http://moschip.ru/get-element

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