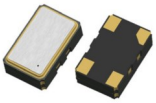
PLETRONICS UHD4 Series
TCXO / VCTCXO



UHD4
5.0 x 3.2 x 1.85 mm
LCC Ceramic Package

Features

- Pletronics' UHD4 Series Temperature Compensated Crystal Oscillator
- Optional Voltage Control Function
- Low Power / Fast Warm Up
- CMOS Output
- 2.5V to 3.3V nominal Supply Voltage
- Not all combinations possible - contact factory

Applications

SONET / SDH / DWDM
Test & Measurement
Telecom Transmission & Switching Equipment
Base Stations / Picocell
Wireless Communication Equipment

Electrical Characteristics

Parameter	**Min**	**Typ**	**Max**	**Unit**	**Condition** (Consult factory for other options)
Frequency Range [2]	10	-	40	MHz	See table below for developed frequencies
Frequency Stability vs. Temperature [2]	-200 -100 -50	-	+200 +100 +50	ppb	Over -40°C to +85°C Over -20°C to +70°C Over 0°C to +70°C
Frequency Initial Calibration	-	-	± 2.0	ppm	Referenced to the value 25°C ± 2°C ; Vc = 1.5V if VCTCXO
Operating Temperature Range [2]	-40	-	+85	°C	Contact factory for wider ranges
Supply Voltage [1, 2] V_{CC}	2.5	-	3.3	Volts	± 5%
Supply Current I_{CC}	-	4.0 5.0 7.0	-	mA	13 MHz 26 MHz Load: 15 pF, V_{CC} ± 5% 40 MHz
Frequency Stability vs. Supply	-	-	± 0.3	ppm	Load: 15 pF, V_{CC} ± 5%
Frequency Stability vs. Load	-	-	± 0.2	ppm	Load: 15 pF, V_{CC} ± 5%
Vcontrol Range	0.5	-	2.5	Volts	1.50 volts nominal for V_{CC}
Frequency Pullability [2]	0	±8.0	±12.0	ppm	Positive Slope
Output Waveform		CMOS			
Duty Cycle	40	50	60	%	Load: 15 pF Vth: T_R and T_F 10% and 90% of amplitude Vth: D.C. 50% of amplitude
Output V_{HIGH}	90	-	-	%Vdd	
Output V_{LOW}	-	-	10	%Vdd	
Output T_{RISE} and T_{FALL}	-	-	6.5	nS	
Startup Time	-	-	10.0	mS	Within ± 2.0 ppm of final frequency
Long Term Stability (Aging)	-	-	±1.0	ppm	Per year at 25°C ± 2°C
Phase Noise 100 Hz 1 kHz 10 kHz 100 kHz	-	-120 -134 -148 -150	-	dBc/Hz	25°C ± 2°C at 26.0 MHz
Storage Temperature Range	-55	-	+95	°C	

Note: [1] Place a 10nF power supply bypass capacitor next to device for correct operation
[2] Specified by part number.

The following is a list of developed frequencies. Consult factory for other options.

10.0M, 12.8M, 13.0M, 19.20M, 20.0M, 25.0M, 26.0M, 30.72M

Part Number (Possible Options shown)

Series Model	V_{CC} Supply Voltage [1]		Operating Temperature		Stability [1, 2]	Pullability [1]	Frequency
	Lowest	Highest	Lowest	Highest	(ppm * 100)	(ppm)	(MHz)
UHD4	**031**	**035**	**G**	**K**	**028**	**008**	**-20.0M**
	031 = 3.1 for 3.3 volts nominal **029** = 2.9 for 3.0 volts nominal **027** = 2.7 for 2.8 volts nominal **024** = 2.4 for 2.5 volts nominal	**035** = 3.5 for 3.3 volts nominal **031** = 3.1 for 3.0 volts nominal **029** = 2.9 for 2.8 volts nominal **026** = 2.6 for 2.5 volts nominal	**A** = +10°C **B** = +5°C **C** = +0°C **D** = -5°C **E** = -10°C **F** = -15°C **G** = -20°C **H** = -25°C **J** = -30°C **K** = -35°C **L** = -40°C	**A** = +40°C **B** = +45°C **C** = +50°C **D** = +55°C **E** = +60°C **F** = +65°C **G** = +70°C **H** = +75°C **J** = +80°C **K** = +85°C	**005** = ± 0.05 **010** = ± 0.10 **028** = ± 0.28 **050** = ± 0.50 **100** = ± 1.0	**000** = TCXO **005** = ± 5 **008** = ± 8 **012** = ± 12	10 - 40MHz

[1] Contact Factory for non-standard specifications
[2] Not all stabilities are available with all operating temperature ranges. Contact Factory for exact combinations available.

Device Marking

P*ff.ff*M

- *YMDxxx*

*ff.ff*M = Frequency in MHz
YMD = Date code (see table below)
P = Pletronics
x = Internal Factory Codes

Specifications such as part number, 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.

Code	2	3	4	5	6	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2022	2023	2024	2025	2026	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	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	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

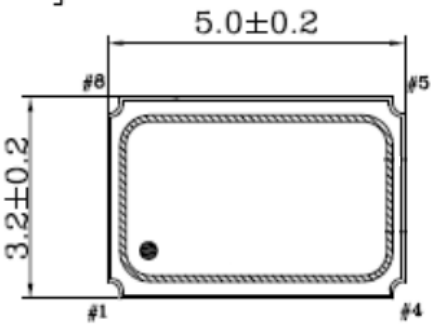
RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

Pletronics Inc. certifies this device is in accordance with the RoHS and REACHdirectives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.10 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

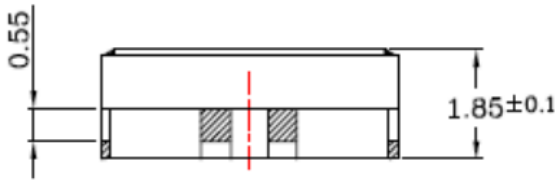
Mechanical Dimensions (mm)

[TOP VIEW]

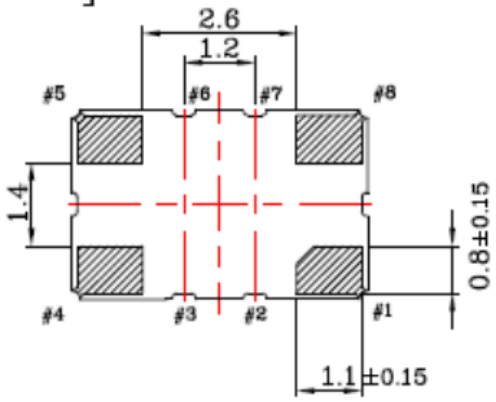


Pin 1 Mark

[SIDE VIEW]

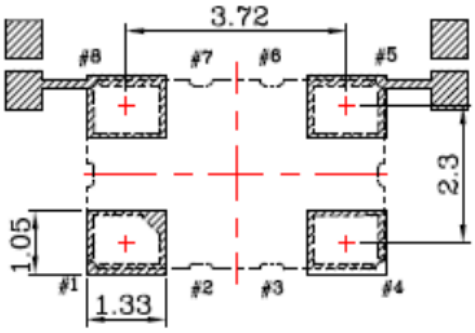


[BOTTOM VIEW]



Recommended soldering pattern

*To ensure optimal oscillator performance, place a by-pass capacitor of 0.1uF as close to the part as possible between Vdd and GND pads.



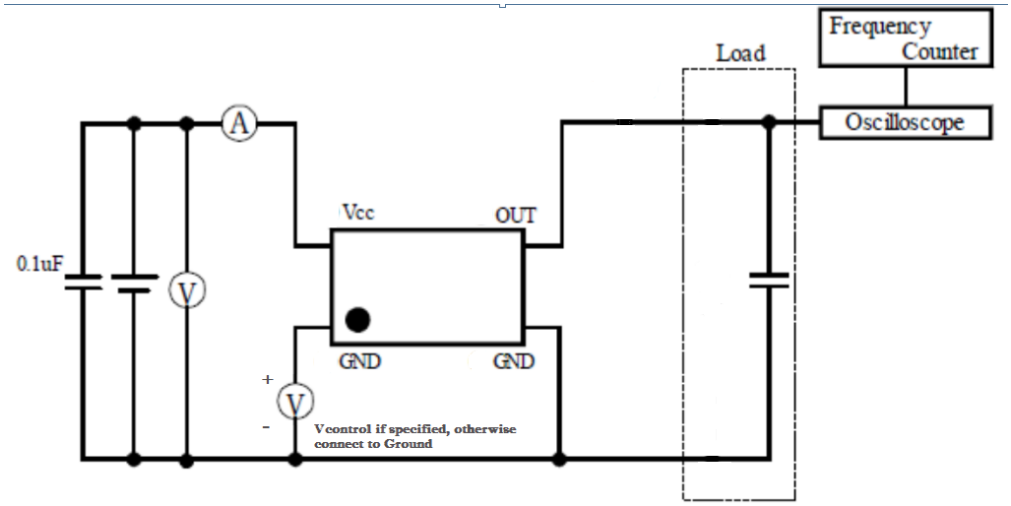
PIN#	FUNCTION
1	VCON:VC-TCXO NC:TCXO
4	GND
5	Fout
8	VDD

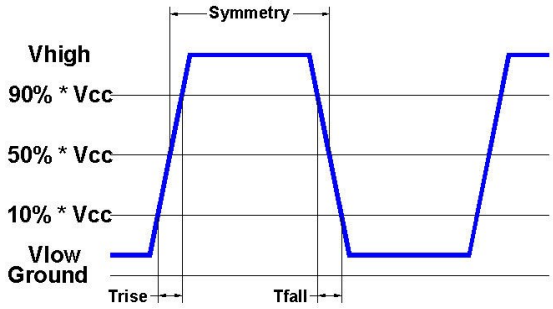
All connection points in the designated region have solder mask cover to avoid any electrical connections (top view shown)

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
- Minimize air flow across the device

Electrical Test /Load Circuit





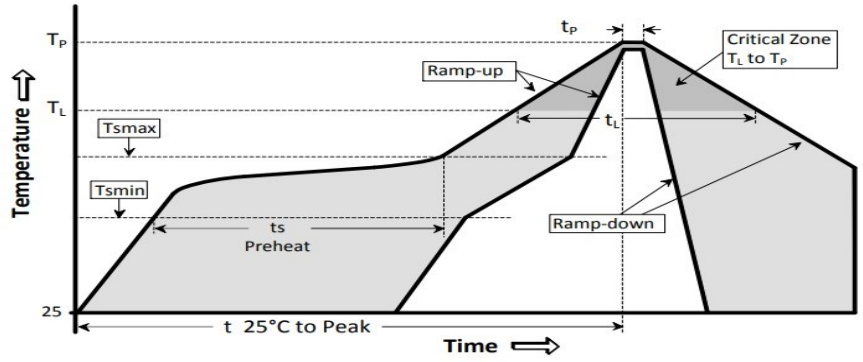
Absolute Maximum Ratings

Parameter	Unit
V_{CC} Supply Voltage	-0.6V to +4.6V
Vi Input Voltage	-0.6V to V_{CC} + 0.6V and less than 4.6V
Io Output Current	-10mA to +10mA

Thermal Characteristics:
The maximum die or junction temperature is 125°C

Reflow Cycle

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

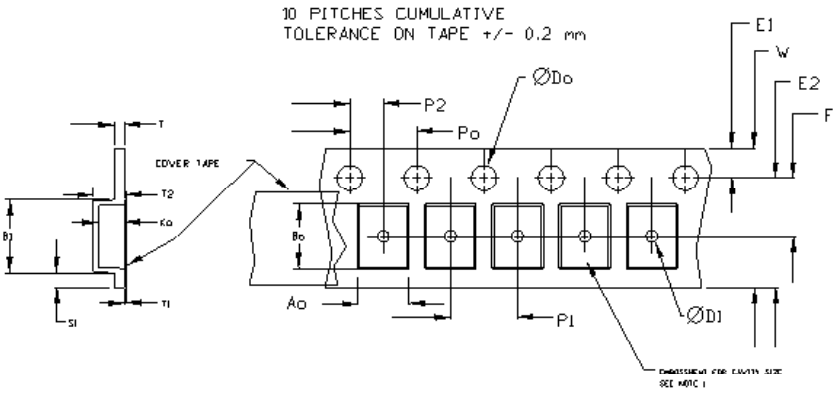


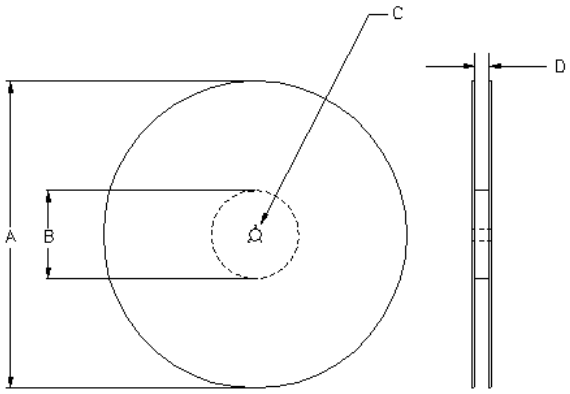
Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time Ts_{min} to Ts_{max}	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	Tp	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

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. 16mm tape, 8mm pitch.





Tape Constant Dimensions Table 1								
Tape Size	Do	D1 min	E1	Po	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	0.3	0.1
12mm		1.5						
16mm		1.5			2.0 ±0.1			
24mm		1.5						

Tape Variable Dimensions Table 2							
Tape Size	B1 max	E2 typ	F	P1	T2 max	W max	Ao, Bo & Ko
16mm	5.6	14.25	7.5 ±0.1	8.0 ±0.1	8.0	16.3	Note 1

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0
10	10.0	254.0	4.00	101.6		
13	13.0	330.2	3.75	95.3		

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