PLETRONICS
www.pletronics.com 425-776-1880

OeM4214-20.00M
TCVCXO Oscillator

November 2010

- Pletronics' OeM4 is from the OeXO™ Series of temperature compensated voltage controlled crystal oscillator with a CMOS output.
- Tube packaging is available
- Hermetically sealed Metal Package to replace DIP/DIL OCXOs
- Supply Voltage range: 3.10 to 12.0V

Pletronics Inc. certifies this device is in accordance with the RoHS 6/6 (2002/95/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: 4.00 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D.1
Second Level Interconnect code: e1

Lead Free

Absolute Maximum Ratings:

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +12.0V
$V_{CONTROL}$ Voltage	-0.5V to +3.0V or limited to ±5mA
Vo Output Voltage	-0.5V to +6.0V

Thermal Characteristics

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 120°C/Watt depending on the solder pads, ground plane and construction of the PCB.

ESD Rating

Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

Part Marking:

PLE
OEM4214
20.00M
- ***YMDzz***

PLE	=	Pletronics
OEM4	=	Model number of the series
20.00		frequency in MHZ
4214	=	Model number
YMD	=	Year, Month and Date of manufacture
zz	=	internal factory code

Codes for Date Code YMD

Code	0	1	2	3	4	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2010	2011	2012	2013	2014	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	

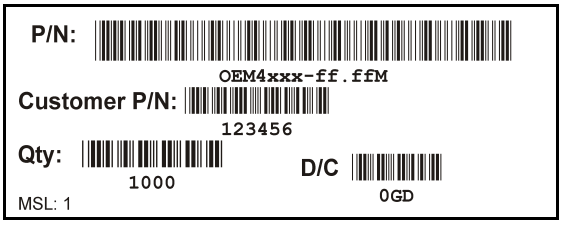
Reliability: Environmental Compliance

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

Package Labeling

Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII
The bar code will show the actual Part Number OEM4214-20.00M

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



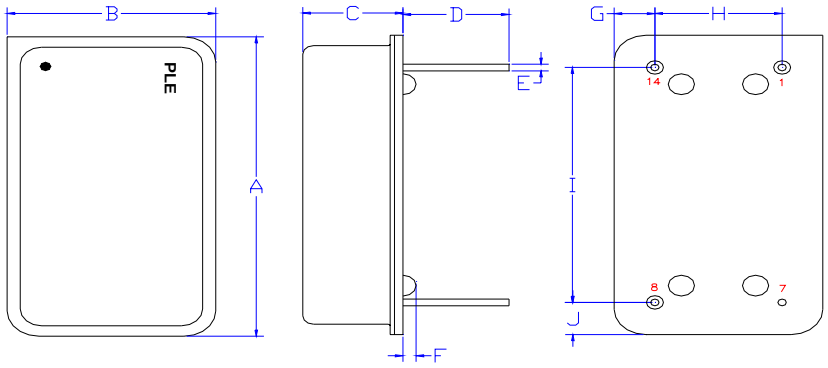
RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

Electrical Specification over the specified temperature range.

Item	Min	TYP	Max	Unit	Condition	
Frequency Stability over temperature	-250	-	250	ppb	Over -40°C to 85°C	at fixed supply voltage + load (reference to midpoint min/max frequency)
Holdover	-250 -125	0 0	250 125	ppb ppb	Over -40°C to 85°C for 24 hours Over ±5°C change for 24 hours	
Frequency Calibration	-2.0	-	2.0	ppm	Frequency offset at 25°C, 60 minutes after reflow.	
Supply voltage stability	-10	0	10	ppb	± 2% variation in supply voltage	
Load sensitivity	-5	-	5	ppb	10K ohm ±10% || 15 pF ±10%	
Warm Up	-	0.4	3.0	S	Time to reach specified frequency	
Aging rate following reflow	- - -	±10 ±3 ±1	- - -	ppb/day	1 day after reflow 7 days after reflow 30 days after reflow	
Long term stability (Aging)	-1000 -1500 -4600	- - -	1000 1500 4600	ppb	after 1 year after 5 years after 15 years	
Output Waveform	CMOS					
Output V_{HIGH}	2.80	-	-	V	Load: 10K ohm ±10% || 15 pF ±10% Vth: T_R and T_F 10% and 90% of amplitude Vth: D.C. 50% of amplitude	
Output V_{LOW}	-	-	0.20	V		
T_{RISE} and T_{FALL}	-	-	4.0	nS		
Duty Cycle	40	50	60	%		
Phase Noise 1 Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz	- - - - - -	-71 -92 -115 -135 -148 -149	- - - - - -	dBc/Hz	at 25°C	
Jitter	-	-	0.6	pS	Frequency offset from carrier 12kHz to 20MHz	
V Supply Range [1] V_{CC}	3.10	-	12.0	Volts		
Supply Current I_{CC}	-	-	5.0	mA		
$V_{CONTROL}$ Range	0.5	-	2.50	Volts	1.50 volts nominal	
$V_{CONTROL}$ Input Current	-50	-	50	uA		
Frequency Pullability	5	-	10	±ppm	Slope positive	
Linearity	-	0.05	2.0	%	In accordance with MIL-PRF-55310	
Operating Temperature	-40	-	+85	°C		
Storage Temperature	-55	-	+95	°C		

Note: [1] For correct operation a 10nF supply de-coupling capacitor should be placed next to the device.

Mechanical:



	Inches	mm
A	0.787 ±0.005	20.00 ±0.13
B	0.487 ±0.005	12.37 ±0.13
C	0.225 ±0.011	5.72 ±0.28
D[1]	0.250	6.35
E[1]	0.020	0.51
F[1]	0.031	0.79
G[1]	0.094	2.37
H[1]	0.300	7.62
I[1]	0.600	15.24
J[1]	0.094	2.37

[1] Nominal dimension

Cover:
Kovar
Electroless Nickel Plated
1 µinch (25 µm) typical
Resistance welded to base

Base:
Kovar
Glass to metal sealed leads

Label:
Laser marked

Pin 7 Connected to case

Not to scale

Pin	Name	Function
1	$V_{CONTROL}$	EFC, electronics frequency control. 1.5V is nominal input
7	Ground (case)	
8	Output	CMOS output
14	V_{CC}	Power supply. Be sure to bypass near the pin with 10nF low noise capacitor.

Layout and application information

For Optimum Stability and Jitter Performance, Pletronics recommends:

- a ground plane under the device
- no large transient signals (both current and voltage) should be routed under the device
- do not layout 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

PCB Mounting (typical for lead free processing)

Hand soldering is recommended.

Wave solder at 255°C to 280°C with maximum wave exposure of 15 seconds

Reflow solder maximum exposure of 245°C for 15 seconds
Soldering done in a nitrogen atmosphere enhances the solder joint quality.

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Pletronics Purchasing

This requires a TEW 3.2x5 20.00MHz TCXO made with the 5032D crystal. No substitution is allowed!!!

This device will be programmed and tested at Pletronics.

Based on using the On Semi Voltage regulator similar to:
NCP551SN29T1G
NCP623MN-30R2G

Output buffer Fairchild NC7SZ04

FR4 PCB assembly inside

PLETRONICS INC. DOCUMENT CONTROL

This is the document control page. **This is not printed or part of the PDF that can be downloaded on the web site.** This is to keep the history of the datasheet document and all revisions.

Part Number Family:	OeXO
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PDF File Name:	oem4214-20.00m.pdf
Written By:	D. Kenny, D. Marston, B. Gubser

Revision History:

August 31, 2010	Initial Release
November 16, 2010	Modified the hold over specification for both a wide and narrow range and defined loads to 10K 10pF Rag

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