PLETRONICS
www.pletronics.com 425-776-1880

OeM4213-19.20M
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
OEM4213
19.20M
- ***YMDzz***

PLE	=	Pletronics
OEM4	=	Model number of the series
19.20		frequency in MHZ
4213	=	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	

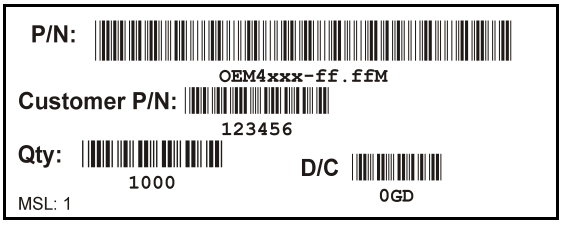
Reliability: Environmental Compliance

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 OEM4213-19.20M

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



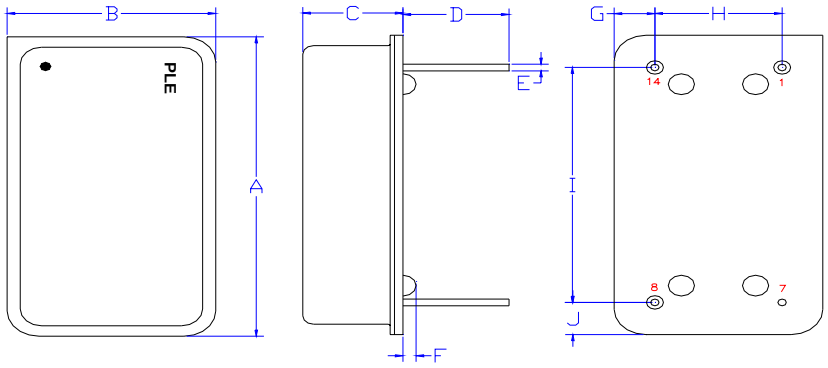
RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

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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