



Description

The OX-402 is part of a series of oscillators specifically designed to support Timing Over Packet applications, in particular 1588-2008 based frequency and phase reference systems. The OX-402 is stratum 3E compliant.

Features

- Standard Frequencies: 10; 12,8; 20; 24,576; 25 MHz
- Excellent temperature stability
- Superior long term stability
- Optimized to support Timing Over Packet applications
- Stratum 3E compliant according to GR1244

Applications

- SETS clock support
- Wireless Base Stations
- Edge and Core Routers

Performance Specifications

Frequency Stability ¹					
Parameter	Min	Typ	Max	Units	Notes
Over all stability (df/f ₀)			±4.6	ppm	Free run accuracy
Holdover			10	ppb	Over 24 hours and 40°C window
Drift			±1	ppb	Over 24 hours and ±2.8°C
Temperature stability (df/f)			±10	ppb	-40 to 85°C
Initial Tolerance (df/f ₀)			±500	ppb	@25°C
vs. supply voltage change (df/f)			±10	ppb	static; 3.3V ± 5%
vs. load change (df/f)			±10	ppb	static; Load ± 5%
vs. aging / daily (df/f)			± 1	ppb	after 30 days; @25°C
vs. aging / month (df/f)			± 25	ppb	after 30 days; @25°C
vs. aging / year (df/f)			± 100	ppb	after 30 days; @25°C
vs. aging / 10 years (df/f)			± 1	ppm	after 30 days; @25°C
Phase Stability					
Parameter	Min	Typ	Max	Units	Notes
Jitter			< 1.00	ps rms	@12kHz to 20MHz
MTIE 1s		0.2		ns	Wander Generation per GR1244, system performance when locked through a 1mHz loop bandwidth, see typical performance data.
MTIE 10s		2.0		ns	
MTIE 100s		10.0		ns	
MTIE 1000s		40.0		ns	

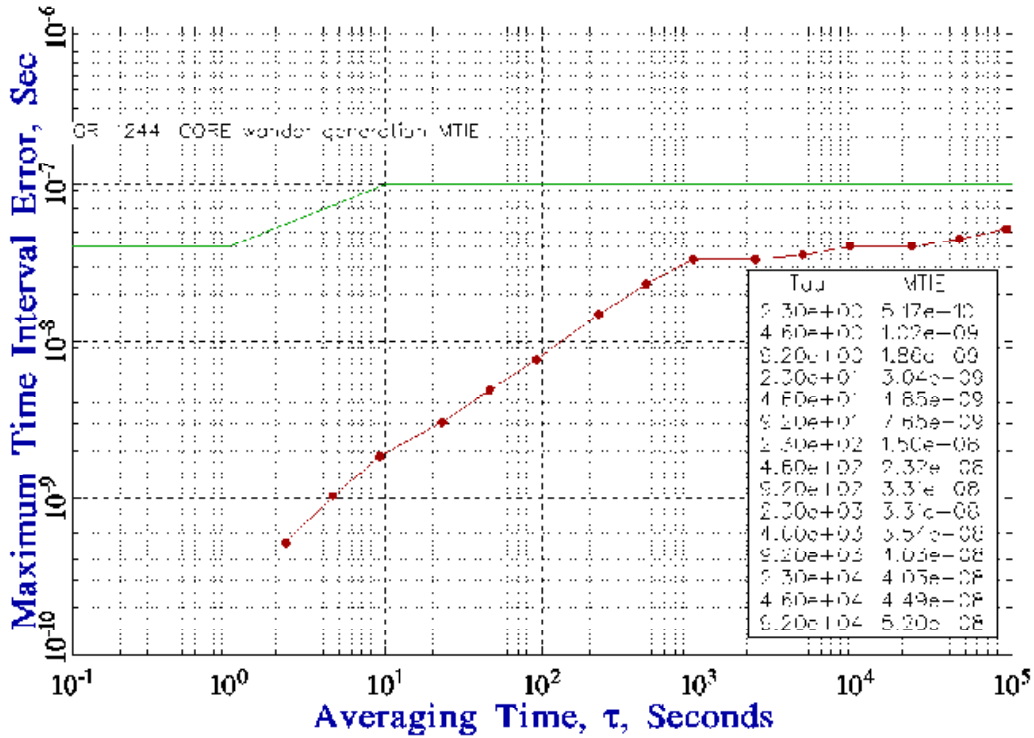
Performance Specifications

Phase Stability (continued)					
Parameter	Min	Typ	Max	Units	Notes
TDEV 1s		0.015		ns	Wander Generation per GR1244, system performance when locked through a 1mHz loop bandwidth, see typical performance data.
TDEV 10s		0.13		ns	
TDEV 100s		1.5		ns	
TDEV 1000s		5.0		ns	
Phase Noise					
Parameter	Min	Typ	Max	Units	Notes
Phase Noise at 1 Hz Offset		-85	-60	dBc/Hz	At 20MHz
Phase Noise at 10 Hz Offset		-110	-90	dBc/Hz	
Phase Noise at 100 Hz Offset		-130	-115	dBc/Hz	
Phase Noise 1 kHz Offset		-143	-130	dBc/Hz	
Phase Noise at 10 kHz Offset		-150	-145	dBc/Hz	
RF Output					
Signal	LVCMOS				
Load	15			pF	±10%
Rise Time	< 10			ns	@ 10% to 90% V _{out}
Fall Time	<10			ns	@90% to 10% V _{out}
Duty Cycle	45/55			%	@ 1.65 V
V Low	x < 0.4			V	
V High	x > 2.4			V	
Supply					
Supply Voltage (V _s)	3.3±10%			V	
Current consumption	< 330			mA	Steady state, @ V _s nom, 25°C
Current consumption	< 757			mA	During warm up, @ V _s
Additional Parameters					
Warm Up Time	< 3			minutes	@ 25°C to final frequency
Absolute Maximum Ratings					
	Min		Max		Units
Operating temperature range	-40		85		°C
Storage temperature range	-50		85		°C
Supply Voltage			5.5		V

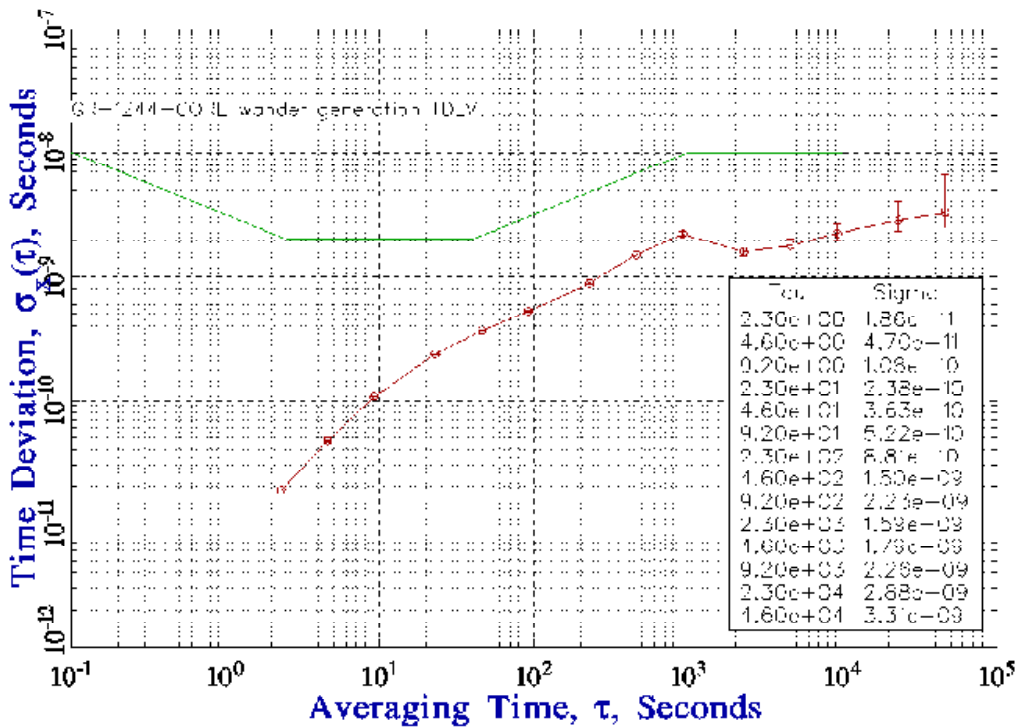
Additional Environmental Conditions

Parameter	Description
Rapid temperature changes	MIL-883-1010 Cond B 1000 cycles -55/125C
Vibration	MIL-STD-883 Meth 2007 Cond A 20G 20-2000Hz 4x in each 3axis 4 min
Shock	JESD22-B104-B 100G 1,5ms 6 shocks in each direction
Solderability	J_STD_002C Cond A, Through hole device/ Cond. B, SMD 255C (dipping time 50,5sec.) Dip+Look with 8h damp pre-treatment: solder wetting >95%
Solvent resistance	MIL-STD-883 Meth 2015 Solv. 1,3,4
ESD	HBM JESD22-A114-E Class 2 10* 2000V
Moisture Sensit.	Level 1 JESD22-A113-B
RoHS compliance	100% RoHS 6 compliant
Washable	washable device

FREQUENCY STABILITY



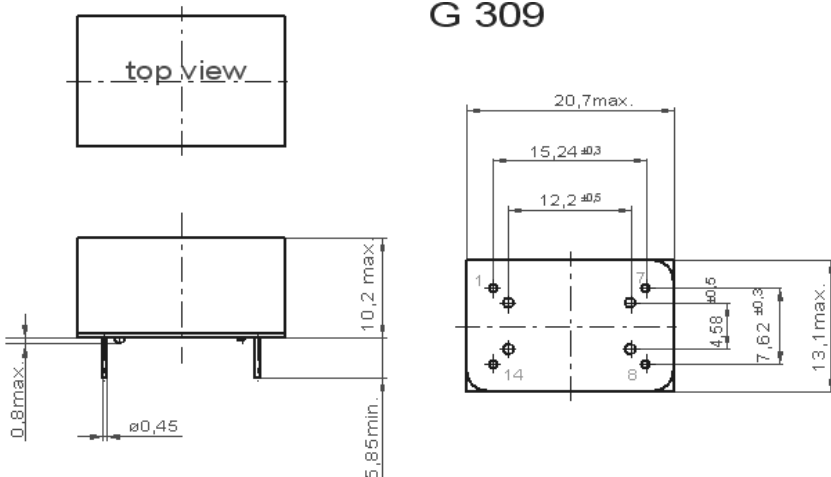
TIME STABILITY



Wander Generation per GR1244, system performance when locked through a 1mHz loop bandwidth.

Outline Drawing / Enclosure OX-402

Dimensions in mm



G 309

Height Codes		
Code	Height "H"	Pin Length "L"
2	10.2	5.85

Pin Assignment	
Pin	Connection
1	I.C. (do not connect)
7	GND
8	RF Out
14	V _s (Supply)

Ordering Information

OX - 402 2 - E A J - 108 0 - 20M000000

Product Family
OX: OXCO

Package
THT: 4022

Height
2: 10.2mm

Supply Voltage
E: +3.3V

RF Output Code
A: HCMOS

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C

Stability Code
108: ±10ppb

Frequency Control
0: Fixed Frequency

Frequency

Notes:

- Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
- Phase noise degrades with increasing output frequency.
- Subject to technical modification.
- Contact factory for availability.

For Additional Information, Please Contact

USA:

Vectron International
267 Lowell Road
Suite 102
Hudson, NH 03051
Tel: 1.888.328.7661
Fax: 1.888.329.8328

Europe:

Vectron International
Landstrasse, D-74924
Neckarbischofsheim, Germany
Tel: +49 (0) 7268.801.100
Fax: +49 (0) 7268.801.282

Asia:

Vectron International
1589 Century Avenue, the 19th Floor
Chamtime International Financial Center
Shanghai, China
Tel: 86.21.6081.2888
Fax: 86.21.6163.3598

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