

Helping Customers Innovate, Improve & Grow



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

- Available in three standard frequencies (10MHz, 12.8MHz and 20MHz)
- 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

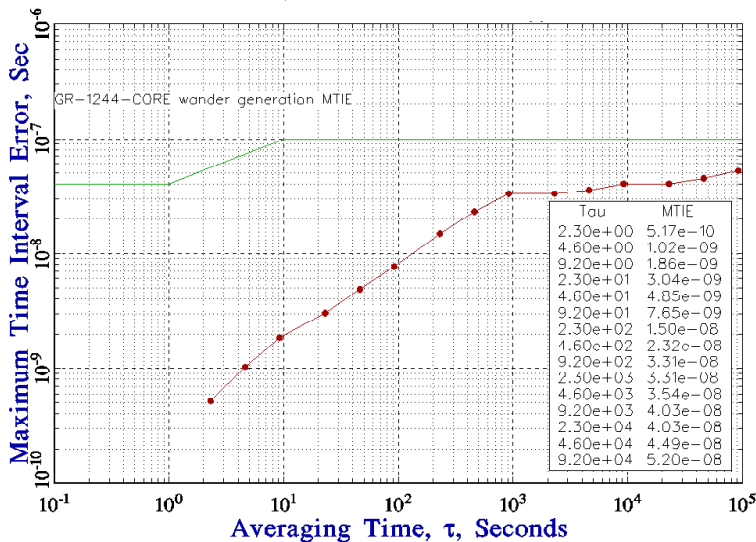
Frequency Stability ¹					
Parameter	Min	Typ	Max	Units	Notes
Over all stability (df/f ₀)			±4.6	ppm	Free run accuracy
Holdover			10	ppb	Over 24 hours and 40°C window
Drift			±1	ppb	Over 24 hours and ±2.8°C
Temperature stability (df/f)			±10	ppb	-20 to 70°C
Initial Tolerance (df/f ₀)			±500	ppb	@25°C
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

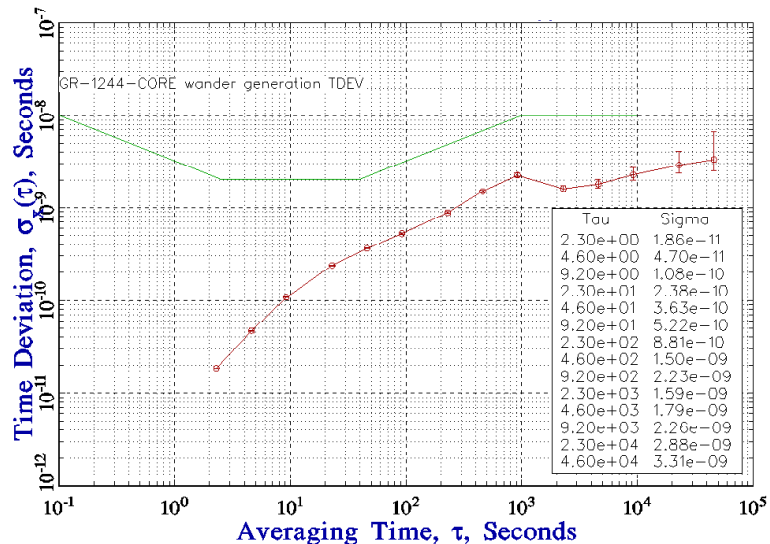
Phase Stability (continued)					
Parameter	Min	Typ	Max	Units	Notes
TDEV 1s		0.015		ns	Wander Generation per GR1244, system performance when locked through a 1mHz loop bandwidth, see typical performance data.
TDEV 10s		0.13		ns	
TDEV 100s		1.5		ns	
TDEV 1000s		5.0		ns	
Phase Noise					
Parameter	Min	Typ	Max	Units	Notes
Phase Noise at 1 Hz Offset		-85	-60	dBc/Hz	
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%
Fan out	3				
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
ROHS	100% ROHS 6 compliant				
Washable	Washable device (hermetically sealed).				
Absolute Maximum Ratings					
	Min		Max		Units
Operating temperature range	-40		85		°C
Storage temperature range	-50		90		°C

Typical Performance

FREQUENCY STABILITY

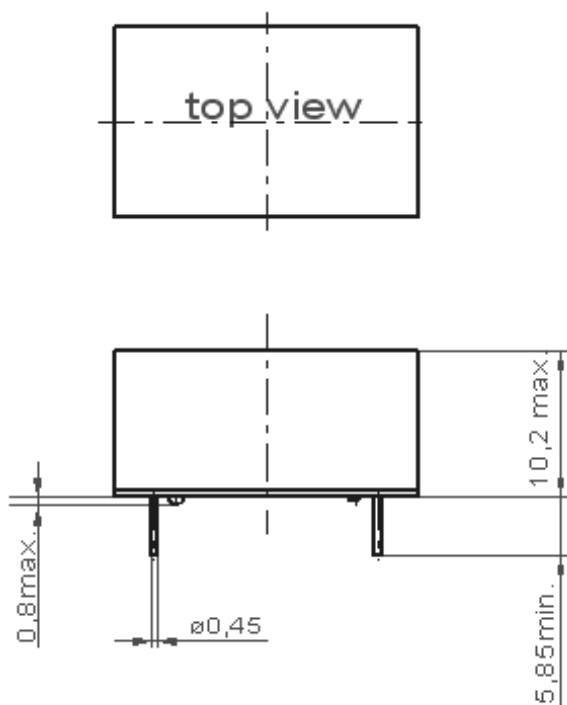


TIME STABILITY



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

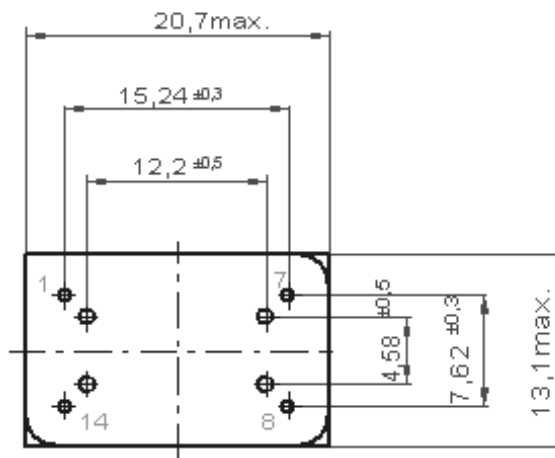
Outline Drawing / Enclosure



Dimensions in mm

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

G 309



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

Ordering Information

OX - 402 2 - E A J - 108 0 - 10M0000000

Product Family
OX: OCXO

Package
14x20mm Dip

Height
2: 10.2mm

Supply Voltage
E: +3.3V

RF Output Code
A: HCMOS

Temperature Range
J: -20°C to +70°C
T: 0°C to +70°C

Stability Code
108: ±10ppb

Frequency Control
0: Fixed Frequency

Frequency

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. 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).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

USA:

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

Europe:

Vectron International
Landstrasse, D-74924
Neckarbischofsheim, Germany
Tel: +49 (0) 3328.4784.17
Fax: +49 (0) 3328.4784.30

Asia:

Vectron International
1F-2F, No 8 Workshop, No 308 Fenju Road
WaiGaoQiao Free Trade Zone
Pudong, Shanghai, China 200131
Tel: 86.21.5048.0777
Fax: 86.21.5048.1881

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Rev: 11/2010