

Helping Customers Innovate, Improve & Grow



**Description**

The OX-202 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-202 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**

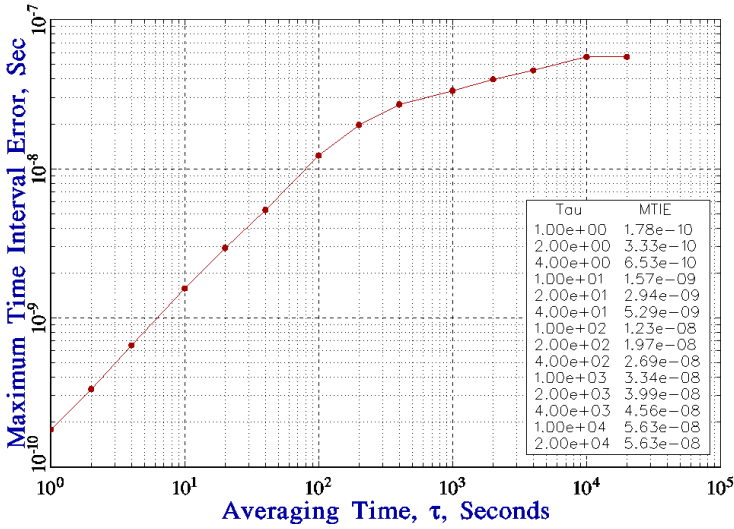
Frequency Stability <sup>1</sup>					
Parameter	Min	Typ	Max	Units	Notes
Over all stability (df/f <sub>0</sub> )			±2.6	ppm	Free run accuracy (20 years)
Drift			±1	ppb	Over 24 hours and ±3.0°C
Temperature stability (df/f)			10	ppb pk -pk	-40 to 85°C
Initial Tolerance (df/f <sub>0</sub> )			±0.5	ppm	@25°C
vs. supply voltage change (df/f)			±2	ppb	static; 3.3V ± 1%
vs. load change (df/f)			±5	ppb	static; Load ± 5%
vs. aging / daily (df/f)			±0.75	ppb	after 7 days; @25°C
vs. aging / month (df/f)			±25	ppb	after 7days; @25°C
vs. aging / year (df/f)			±100	ppb	after 7 days; @25°C
vs. aging / 20 years (df/f)			±2.0	ppm	after 7 days; @25°C
Phase Stability					
Parameter	Min	Typ	Max	Units	Notes
Jitter			1	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		1.6		ns	
MTIE 100s		12		ns	
MTIE 1000s		34		ns	

## Performance Specifications

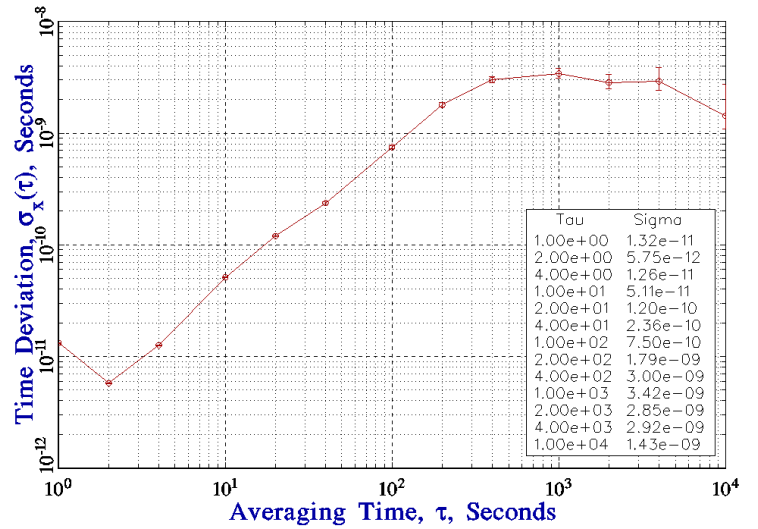
Phase Stability (continued)					
Parameter	Min	Typ	Max	Units	Notes
TDEV 1s		0.01		ns	Wander Generation per GR1244, system performance when locked through a 1mHz loop bandwidth, see typical performance data.
TDEV 10s		0.05		ns	
TDEV 100s		0.8		ns	
TDEV 1000s		3.5		ns	
Phase Noise					
Parameter	Min	Typ	Max	Units	Notes
Phase Noise at 1 Hz Offset			-85	dBc/Hz	
Phase Noise at 10 Hz Offset			-115	dBc/Hz	
Phase Noise at 100 Hz Offset			-135	dBc/Hz	
Phase Noise 1 kHz Offset			-145	dBc/Hz	
Phase Noise at 10 kHz Offset			-150	dBc/Hz	
Phase Noise at 100kHz Offset			-150	dBc/Hz	
RF Output					
Signal	HCMOS				
Load	15			pF	±10%
Rise Time	<10			ns	@ 10% to 90% V <sub>out</sub>
Fall Time	<10			ns	@90% to 10% V <sub>out</sub>
Duty Cycle	45/55			%	@ 50% V <sub>out</sub>
V Low	0.4			V	With V <sub>s</sub> 3.0V and 15pF load
V High	2.4			V	With V <sub>s</sub> 3.0V and 15pF load
V Low	0.5			V	With V <sub>s</sub> 5.0V and 15pF load
V High	3.5			V	With V <sub>s</sub> 5.0V and 15pF load
Supply					
Supply Voltage (V <sub>s</sub> )	3.3, 5.0			V	±10%
Power consumption	<1.5			W	Steady state, @ V <sub>s</sub> = 3.3V, 25°C
Power consumption	<3.3			W	During warm up, @ V <sub>s</sub> = 3.3V, 25°C
Additional Parameters					
Warm Up Time	3			minutes	@25°C to final frequency (1 Hour) within ±0.1ppm
ROHS	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

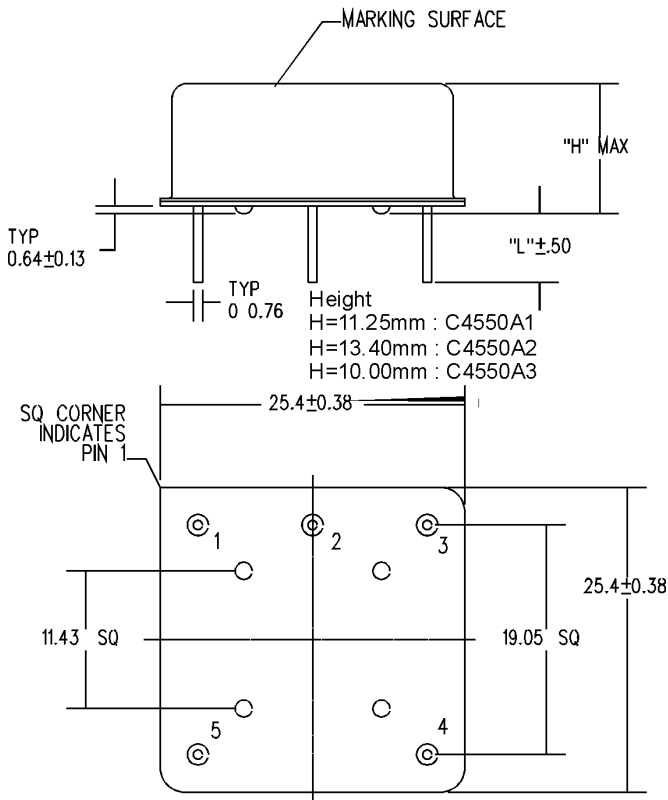


## TIME STABILITY



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	13.4	6.35

Pin Assignment	
Pin	Connection
1	RF Out
2	Ground (case)
3	NC
4	NC
5	Supply Voltage Input (V <sub>c</sub> )

## Ordering Information

### OX - 202 2 - E A E - 108 0 - 10M0000000

Product Family  
OX: OCXO

Package  
25.8 x 25.8 mm THT

Height  
2: 13.4 mm

Supply Voltage  
D: +5.0V  
E: +3.3V

RF Output Code  
A: HCMOS

Frequency

Frequency Control  
0: Fixed Frequency

Stability Code  
108: 10ppb pk-pk

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

#### 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

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