

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

- Standard Frequencies: 10MHz, 19.44MHz, 20MHz, 38.88MHz, 40MHz
- 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

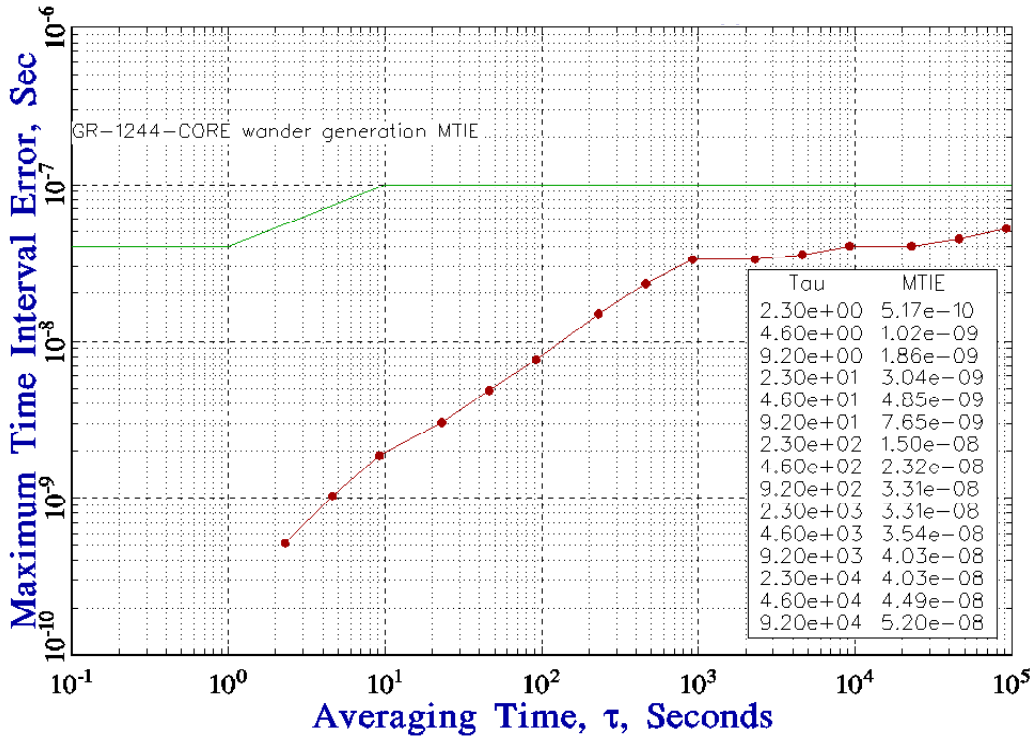
Performance Specifications

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	

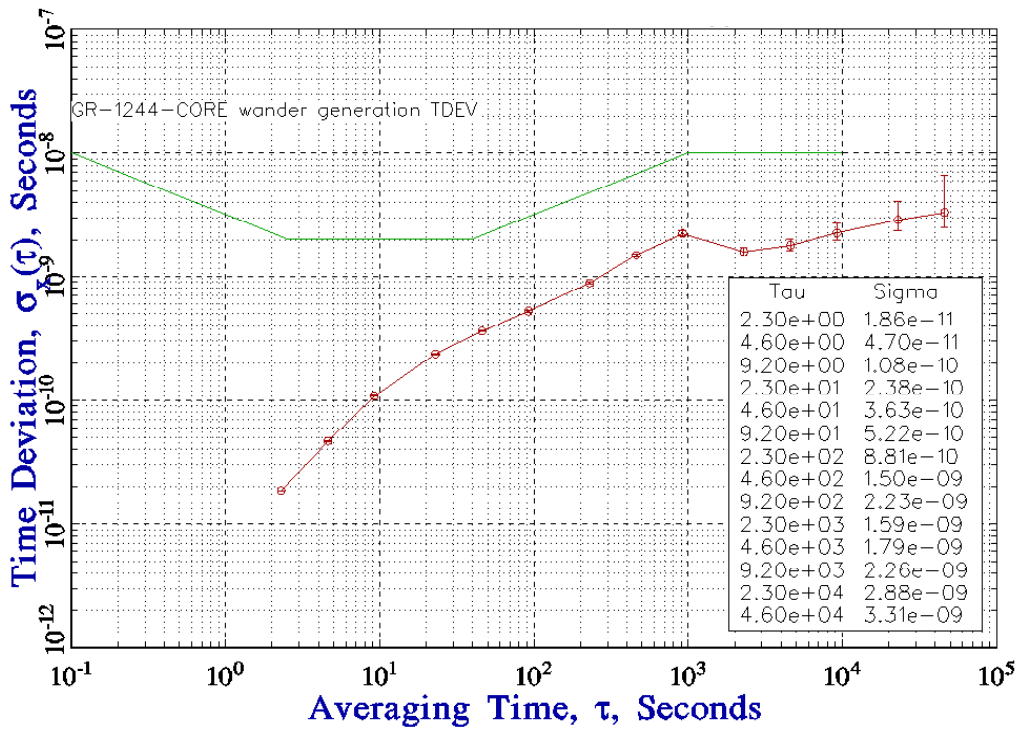
Performance Specifications

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
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		85		°C
Supply Voltage			5.5		V

FREQUENCY STABILITY

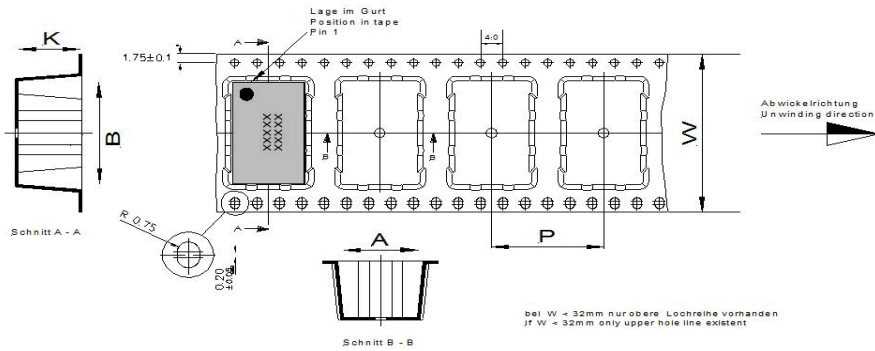


TIME STABILITY



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

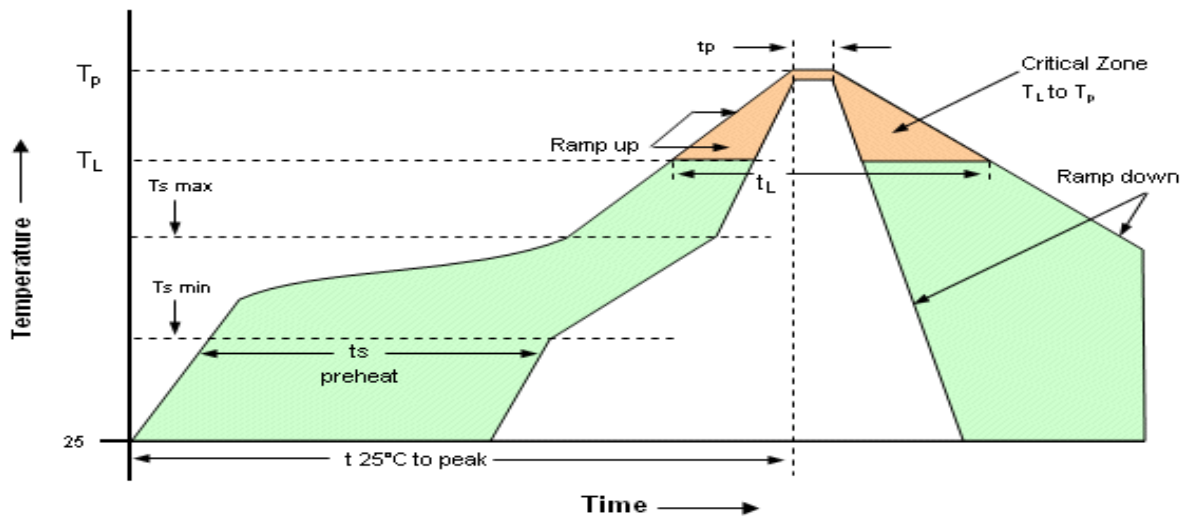
Tape and Reel Dimensions (OX-403)



Maßangaben in mm : A, B und K Maße vom Bauelement abhängig, Fertigungstoleranzen entsprechen der DIN IEC 286-3	Dimension in mm : A, B und K are dependent upon component dimensions, production tolerance complying DIN IEC 286-3
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Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
OX-403	44	50	300	20

Recommended Reflow Profile



Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate (T_L to T_p)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min T_{Smin} -Temperature Min T_{Smax} -Time (min to max) t_s	150°C 200°C 60-180 seconds	Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
T_{Smax} to T_L -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Peak Temperature (T_p)	max 260°C	Ramp-down Rate	6°C/ second max

Note: All temperatures refer to topside of the package, measured on the package body surface.

Ordering Information

OX - 402 2 - E A J - 108 0 - 20M0000000

Product Family
OX: OCXO

Package
THT: 4022
SMT: 4033

Height
2: 10.2mm
3: 12.2mm

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:

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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