



## Features

- 6-Pin SMD package
- Fast warm-up
- Frequency Range, 10 MHz to 40 MHz
- Standard freq: 10, 12.8, 20, 24.576, 25, 30.72 MHz
- High Reliability (based on fully integrated Design)
- Low Power

## Applications

- Base stations 5G & 4 G)
- Test equipment
- Small Cell
- Military communication equipment
- Stratum 3
- SyncE; 1588

## Performance Specifications

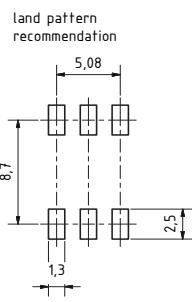
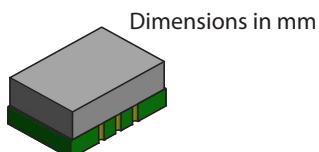
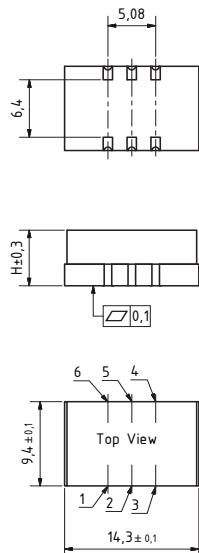
Frequency Stabilities <sup>1</sup> 10 to 40 MHz						
Parameter	Min	Typical	Max	Units	Condition	
vs. operating temperature range (referenced to +25°C)	-20 -10 -20		+20 +10 +20	ppb ppb ppb	-40 to +85°C -40 to +85°C -40 to +95°C	Options <sup>2</sup>
slope	-2		+2	ppb/°C	@ Temp stab. +/-10ppb	
Initial tolerance	-0.5		+0.5	ppm	at time of shipment, nominal EFC $V_s \pm 5\%$ static Load $\pm 5\%$ static after 30 days of operation after 30 days of operation after 30 days of operation	
vs. supply voltage change	-10		+10	ppb		
vs. load change	-10		+10	ppb		
vs. aging / day	-5	$\pm 2$	+5	ppb		
vs. aging / year	500		+500	ppb		
vs. aging / 10 years	-3		3	ppm		
Holdover drift			5	ppb	over 24 hours, constant temperature ( $\pm 1^\circ\text{C}$ ) ; after 30 days continuous operation	
Start up time			200	msec		
Warm-up time			3	minutes	to $\pm 20$ ppb of final frequency (1 hour reading) $\pm 25^\circ\text{C}$	
Loop bandwidth for wander generation compliance	3			mHz	MTIE compliant with GR-1244 Fig 5-5 TDEV compliant with GR-1244 Fig 5-4 ; measurement setup: oscillator stabilized 24 hours at Constant Temperature ( $\pm 1^\circ\text{C}$ , still air), data collected over 100,000 seconds at 1 second intervals (-3dB cutoff, 1st order high pass loop filter)	

## Performance Specifications

Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Units	Condition
Supply voltage (standard)	3.135	3.3	3.465	VDC	
Power consumption		1.3	1.5	Watts	during warm-up
		0.4	0.5	Watts	steady state @ +25°C
RF Output					
Signal [standard]	LVHCMOS				
Load		15		pF	
Signal Level (Vol)			0.4	VDC	with Vs=3.3V and 15pF Load
Signal Level (Voh)	2.97	3.3		VDC	with Vs=3.3V and 15pF Load
Duty Cycle	45		55	%	@ (Voh-Vol)/2
Ron		26.5		Ω	
Roff		22		Ω	
Frequency Tuning (EFC)					
Tuning Range	Fixed OCXO; No adjust				
Additional Parameters					
Phase Noise <sup>3</sup>		-99	-90	dBc/Hz	10 Hz
		-125	-120	dBc/Hz	100 Hz
		-145	-140	dBc/Hz	1 kHz
		-155	-150	dBc/Hz	10 kHz
		-160	-155	dBc/Hz	100kHz
Weight		1.0	g		
Processing & Packing	Handling & Processing Note				
Absolute Maximum Ratings					
Supply voltage (Vs)		3.8	V		with Vs=3.3 VDC
Output Load		50	pF		
Operable Temperature Range	-40		+95	°C	
Storage Temperature Range	-40		+125	°C	

## Outline Drawing / Enclosure

G367



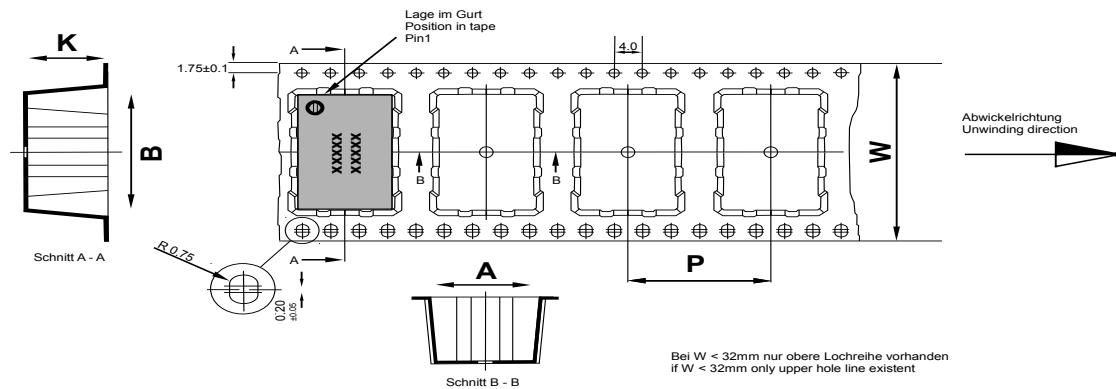
OX-502

Height "H"	cover material
6.2	plastic

Pin Connections

1	I.C (Do not connect) / EFC (option)
2	N.C
3	Ground (Case)
4	RF Output
5	N.C
6	Supply Voltage Input

# Standard Shipping Method (OX-502)



Maßangaben in mm:	Dimension in mm:
A, B und K Maße von Bauelement abhängig	A, B und K are dependent upon component dimensions
Fertigungstoleranzen entsprechen der DIN IEC 286-3	production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

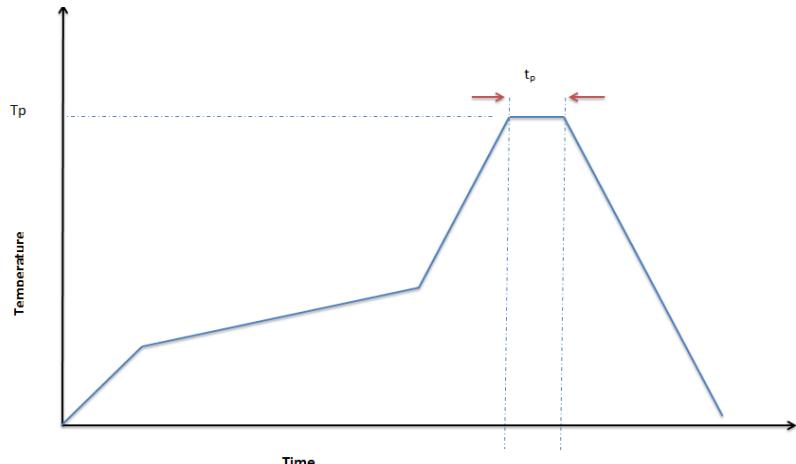
Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
OX-502 (6.2 mm)	24	83.3	400	12

## Reflow Profile

TP: max 250°C (@ solder joint, customer board level)  
 Tp: max: 10...40 sec

Additional Information:  
 This SMD oscillator has been designed for pick and place reflow soldering

SMD oscillators must be on the top side of the PCB during the reflow process.



## Additional Environmental Conditions

Parameter	Description
Temperature Cycling	JESD22-A104-D Cond.G - 500cycles -40/+125C;cycle time 30min
Vibration, Sine	MIL-STD-883 Meth 2007 Cond A - 20g 20-2000Hz 4x in each 3 axis 4min sweep time
Mechanical Shock	MIL-STD-202 Meth 213B Cond. F - 1500g 0,5ms 6 shocks in each direction
Solderability	J-STD-002C Cond. A, Trough hole device; Cond.B, SMD (correspond to MIL-STD-883 Meth 2003) - 255C (dipping Time 5 0,5sec.) Dip&Look with 8h damp pre-treatment: solder wetting >95%
Solvent resistance	MIL-STD-883 Meth 2003) - 255C (dipping Time 5 0,5sec.) Dip&Look with
ESD	8h damp pre-treatment: solder wetting >95%
Moisture Sensit.	JESD22-A113-B - only if > MSL 1
RoHS compliance	100% RoHS 6 compliant
Washable	non-washable device
High temp operating life(HTOL)	MIL-STD-202 Meth108A Cond C - 1000h @ 105C power on
Low temp operating life(LTOL)	IEC 60068-2-1 Cond. Ae - 1000h @ -40C power on

## Ordering Information

**OX - 502 1 - E A E - 208 0 - 20M000000**

Product Family  
OX: OCXO

Package  
SMD version

Height  
1: 6.2

Supply Voltage  
E: 3.3V

RF Output Code  
A: HCMOS

Frequency

Frequency Control  
0: No Tuning

Stability Code  
208:  $\pm 20\text{ppb}$   
108:  $\pm 10\text{ppb}$

Temperature Range  
E:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
8:  $-40^\circ\text{C}$  to  $+95^\circ\text{C}$

### 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 ( $25^\circ\text{C}$ ).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

## Contact Information

### USA:

100 Watts Street  
Mt Holly Springs, PA 17065  
Tel: 1.717.486.3411  
Fax: 1.717.486.5920

### Europe:

Landstrasse  
74924 Neckarbischofsheim  
Germany  
Tel: +49 (0) 7268.801.0  
Fax: +49 (0) 7268.801.281



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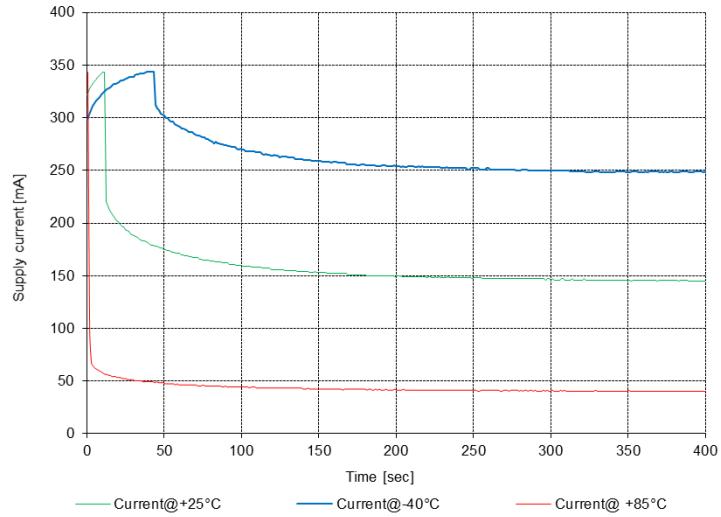
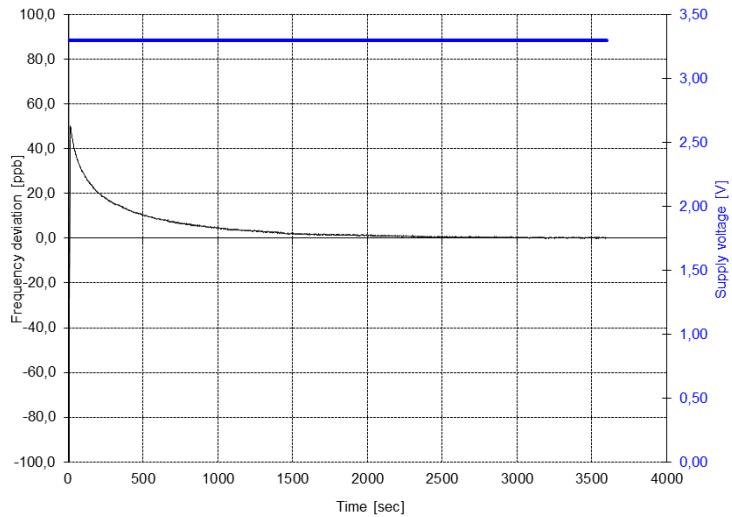
## typical performance data

### typical warm up (frequency vs. time)

@ OX-5021-EAE-1080-20M000

### typical current consumption during power on

@ OX-5021-EAE-1080-20M000

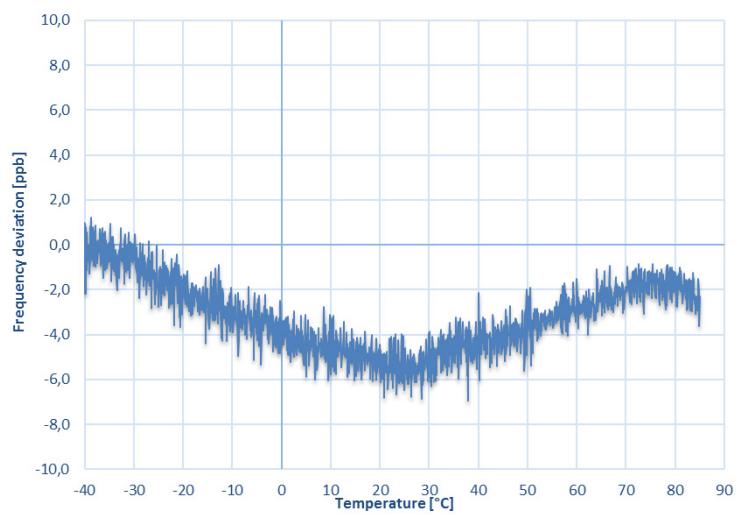
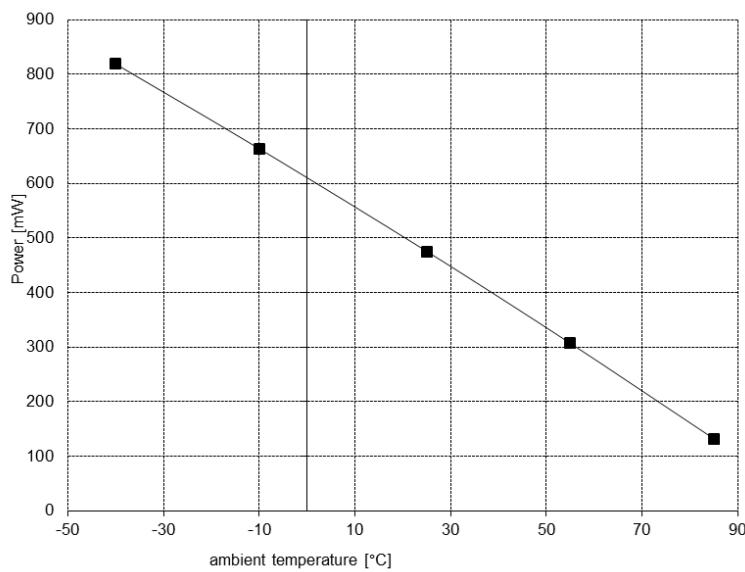


### typical power consumption vs. operating temperature

@ OX-5021-EAE-1080-20M000

### typical frequency vs. temperature stability

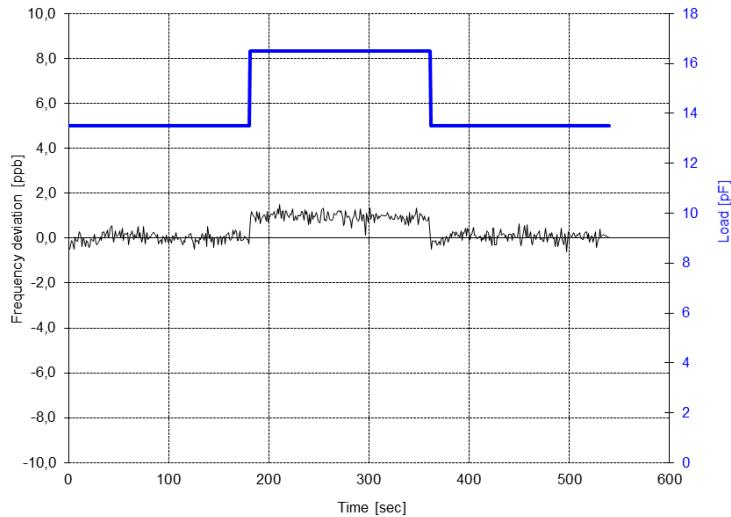
@ OX-5021-EAE-1080-20M000



## typical performance data

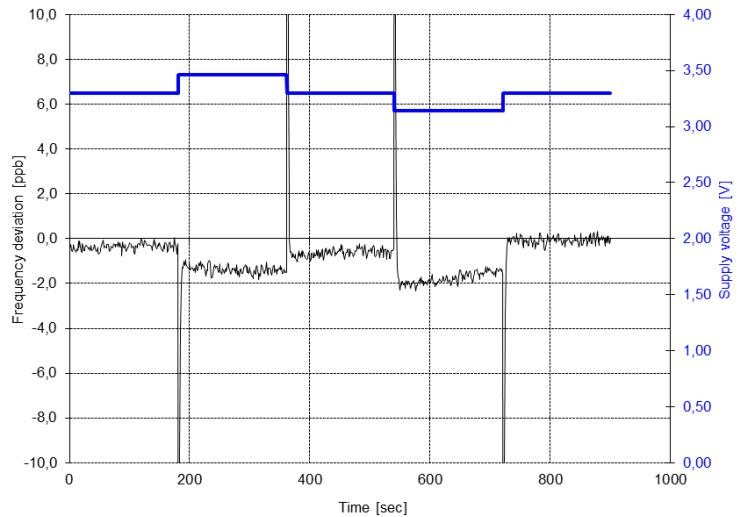
### typical frequency vs. load change

@ OX-5021-EAE-1080-20M000



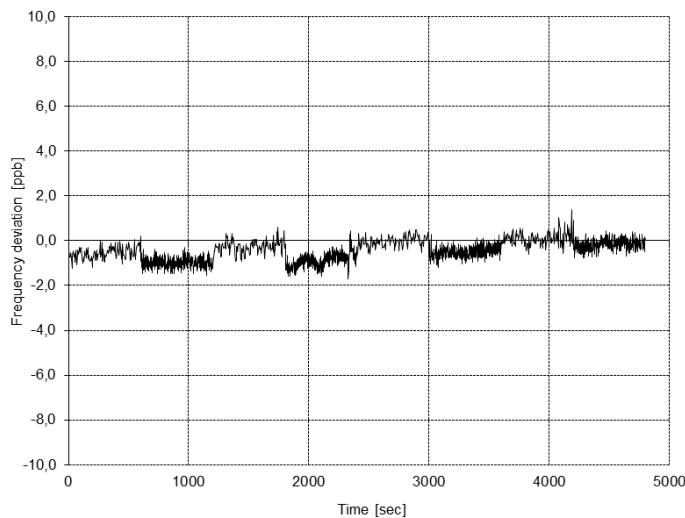
### typical frequency vs. supply voltage

@ OX-5021-EAE-1080-20M000



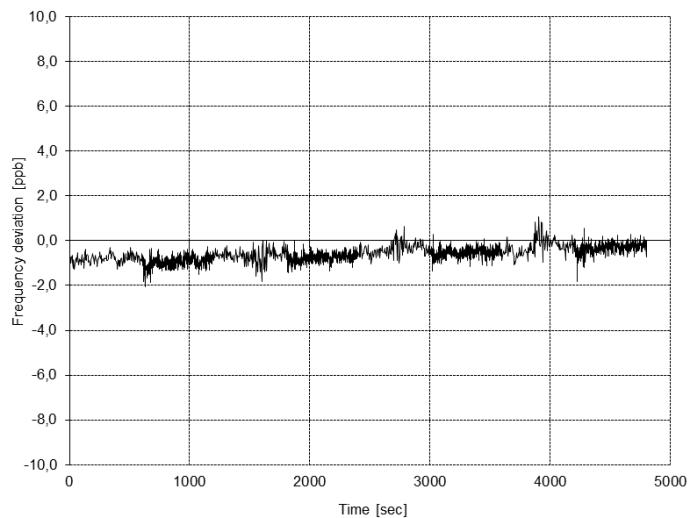
### typical frequency. vs cycled airflow without additional cover

@ OX-5021-EAE-1080-20M000



### typical frequency. vs cycled airflow with additional cover

@ OX-5021-EAE-1080-20M000



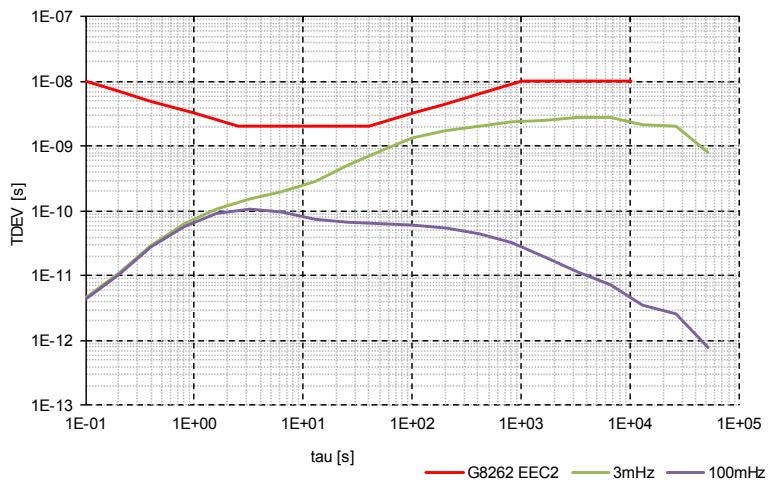
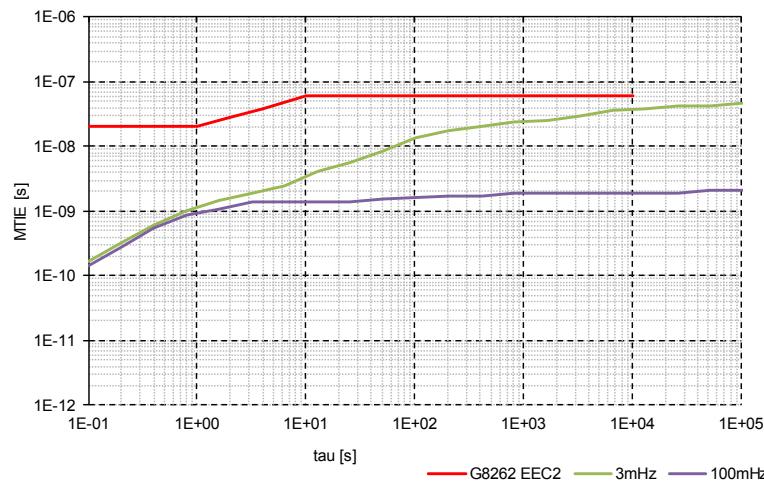
## typical performance data

### typical MTIE @ 3mHz loop Bandwidth

@ OX-5021-EAE-1080-20M000

### typical TDEV @ 3mHz loop Bandwidth

@ OX-5021-EAE-1080-20M000



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