



OX-224

Features

- Surface Mount package
- SC-CUT Crystal
- High Stability
- Low Phase Noise
- standard frequency: 10 MHz (Sinewave)
- ultra low aging rate

Applications

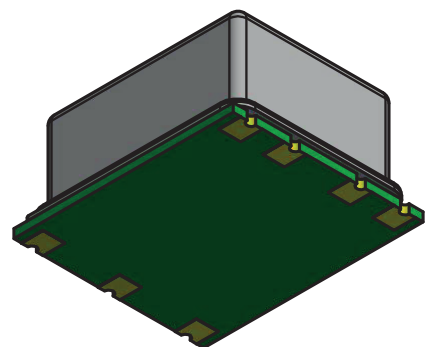
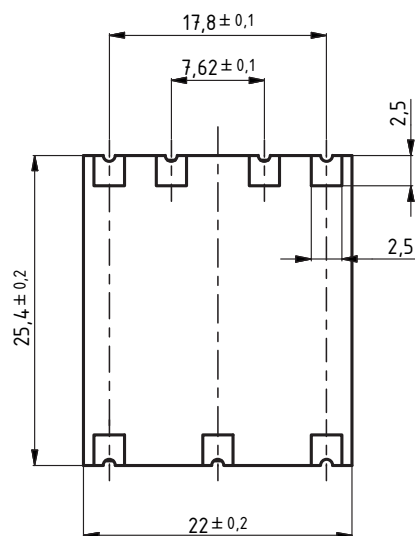
- Military Radar
- Instrumentation and Test Equipment
- Synthesizers
- Military communication equipment
- DRO reference
- Satellite Communications

Performance Specifications

Frequency Stabilities ¹ (10 MHz)					
Parameter	Min	Typical	Max	Units	Condition
vs. operating temperature range (referenced to +25°C)			2	ppb [pk-pk]	-40 to +85°C
Initial tolerance	-100		+100	ppb	at time of shipment, nominal EFC $V_s \pm 4\%$ static Load $\pm 5\%$ static after 7 days of operation after 7 days of operation
vs. supply voltage change	-1		+1	ppb	
vs. load change	-1		+1	ppb	
vs. aging / day	-0.2		+0.2	ppb	
vs. aging / year	-30		+30	ppb	
start up time		0.25	2	sec	
Warm-up time			5	minutes	< ± 20 ppb to frequency after 1h

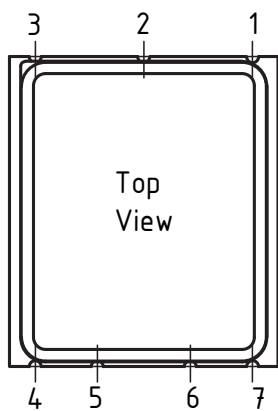
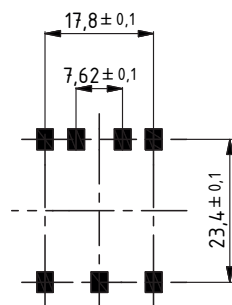
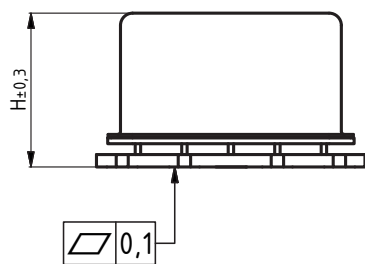
Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Units	Condition
Supply voltage (standard)	3.17	3.3	3.43	VDC	
Power consumption			1000	mA	during warm-up
			700	mA	steady state @ -40°C
			400	mA	steady state @ +25°C

RF Output						
Signal [standard]	Sinewave					
Load	47.5	50	52.5	Ohm		
Output Power	5	7	9	dBm	with Vs=3.3V and 50 Ohm Load	
Harmonics			-30	dBc		
Spurious			-80	dBc		
Frequency Tuning (EFC)						
Tuning Range	Fixed OCXO; No adjust					Opti- on ⁵
	±0.2		±0.5	ppm	@10 MHz	
Linearity			10%			
Tuning Slope		Positive				
Control Voltage Range	0.0	1.5	3.0	V		
Reference Voltage Output (Vref)						
Reference Voltage	2.97	3	3.03	V		
Additional Parameters						
Phase Noise ³		-113 -138 -140 -163 -168 -168 -168	-105 -135 -150 -160 -165 -165 -165	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1Hz 10 Hz 100 Hz 1 kHz 10 kHz 100kHz 1 MHz	@ 10MHz
HDEV		0.7	5	E-12 E-12	@1000.0 sec Condition: after 7 days operation @1.0 sec Condition: EFC generated with a voltage divider from Vref using 2x10kOhm Thin-Film Resistors	@ 10MHz
Weight			14	g		
Processing & Packing	Handling & Processing Note					
Absolute Maximum Ratings						
supply voltage (Vs)			5.5	V		
Operable Temperature Range	-40		+95	°C		
Storage Temperature Range	-40		+125	°C		



G343

OX-228	
Height "H"	cover material
12.1	metal

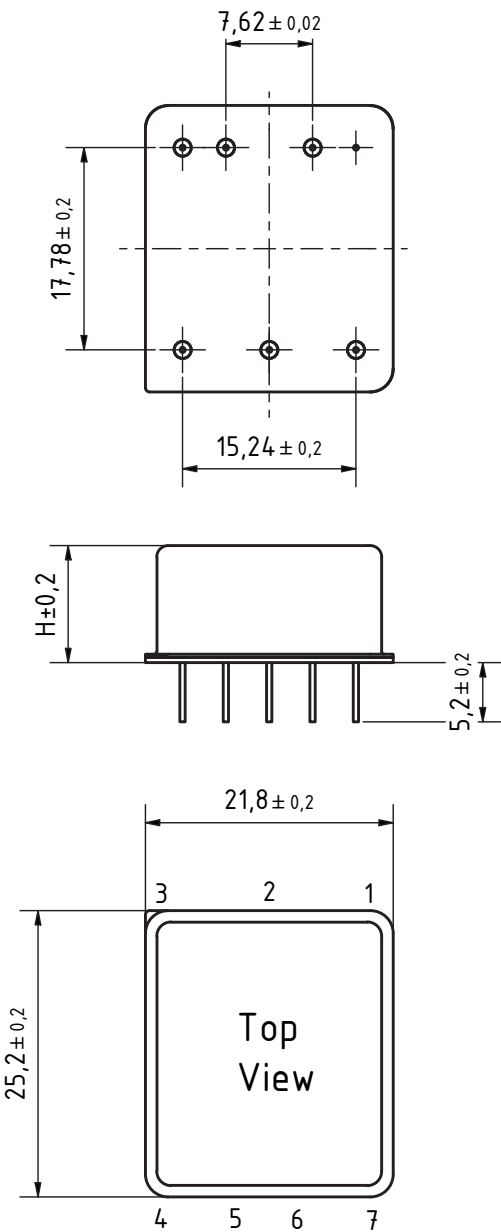


Dimensions in mm

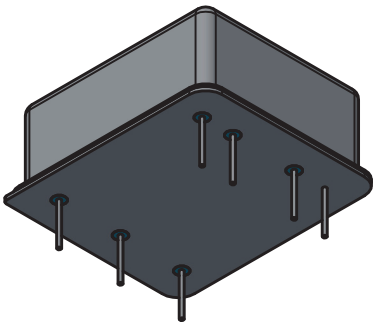
Padvorschlag
land pattern
recommendation

Pin Connections	
1	Vc (control voltage input)
2	Reference Voltage output
3	Supply Voltage Input (Vs)
4	RF Output
5	I.C (must remain un connected)
6	I.C (must remain un connected)
7	Ground (Case)

G350



Dimensions in mm

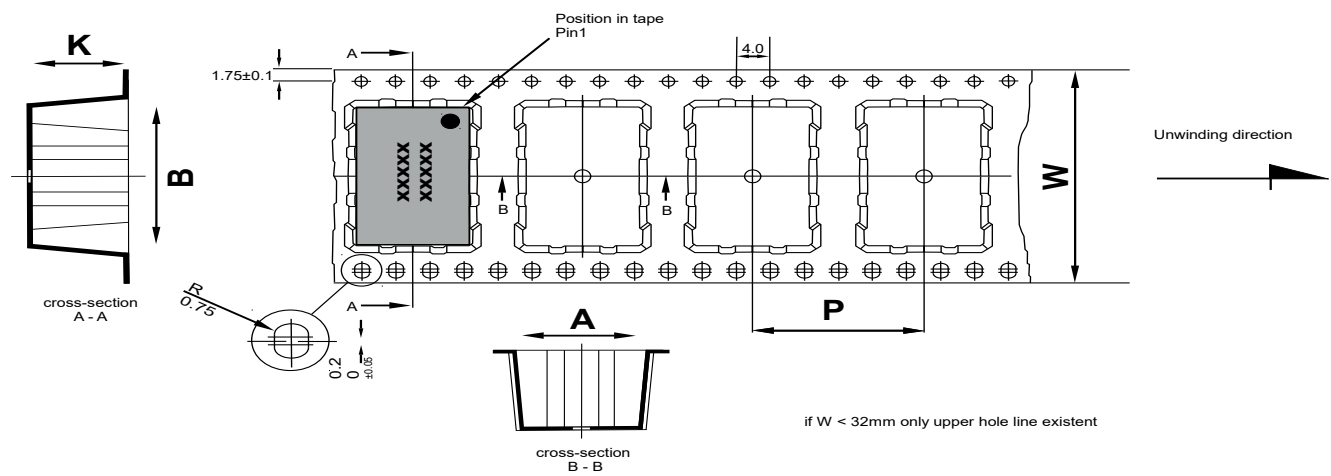


OX-228	
Height "H"	cover material
10.3 mm	metal

Note: This package has no stand-offs. To prevent short-circuit at the pins it is necessary to lift the package from the printed circuit board.

Pin Connections	
1	Vc (control voltage input)
2	I.C (must remain un connected)
3	Supply Voltage Input (Vs)
4	RF Output
5	Reference Voltage output
6	I.C (must remain un connected)
7	Ground (Case)

Standard Shipping Method

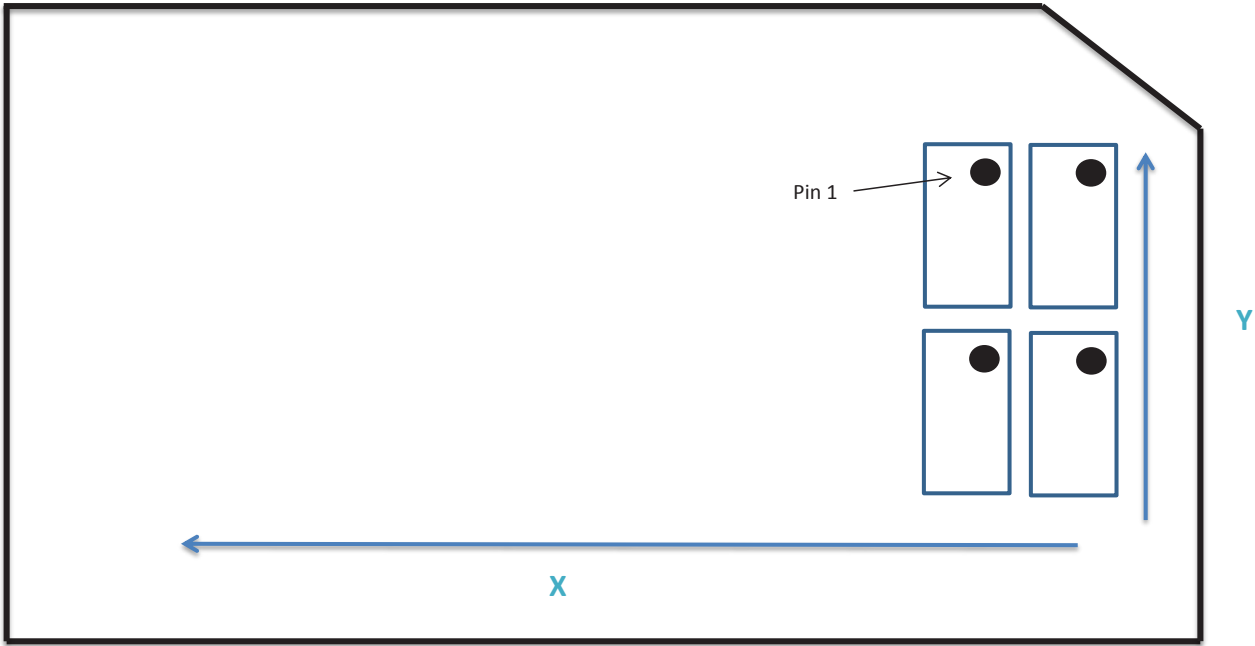


Dimension in mm:
A, B and K are dependent upon component dimensions
production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
OX-2241(12.1mm)	44	37.5	100	28

Standard Shipping Method (OX-400)



Enclosure Type	Method	colloums	rows	Quantity per Tray
Typ OX-400	Tray	10	4	40

Recommended Reflow Profile OX-2242

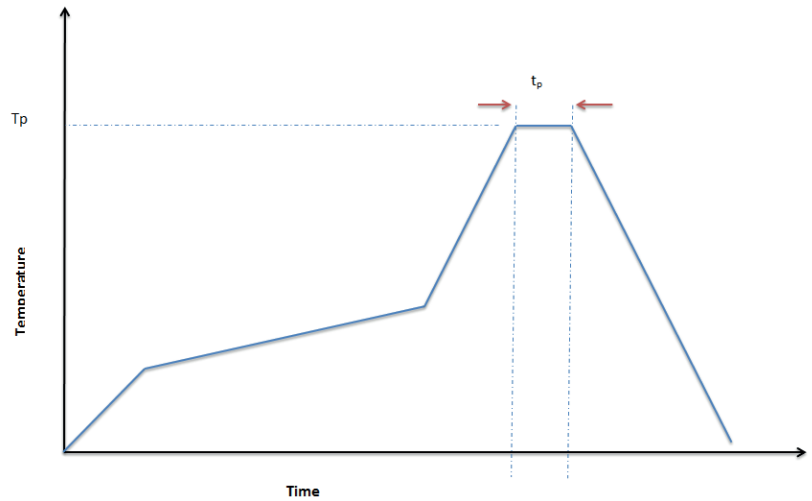
TP: max 260 °C (@ solder joint, customer board level)

T_p: max: 10...30 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.

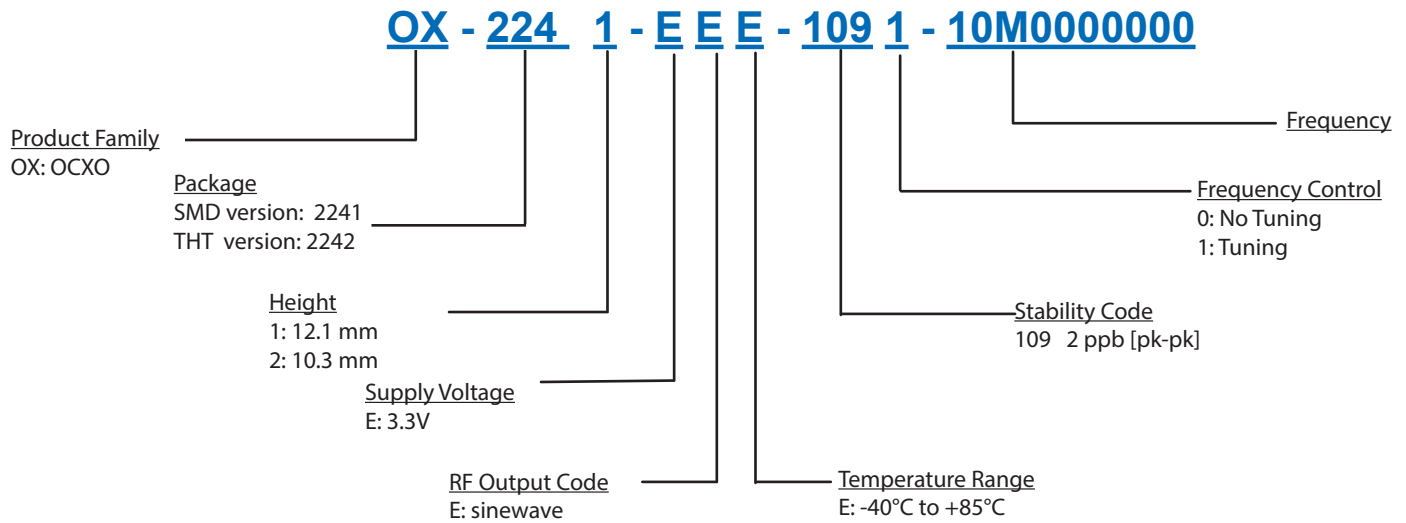


Note: All temperatures refer to topside of the package, measured on the package body surface.

Additional Environmental Conditions

Parameter	Description
High temp operating life(HTOL)	MIL-STD-202 Meth108A Cond C - 1000h @ 105°C power on
Low temp operating life(LTOL)	IEC 60068-2-1 Cond. Ae - 1000h @ -40°C power on
Reflow Simulation Test	MIL-STD-202G Meth 210F Cond. K - Total 3x Lead free profile (for SMD)
Temperature Cycling	JESD22-A104-D Cond.G - 1000cycles -40/+125°C; cycle time 30 min.
Vibration (sine)	JESD22-B103 Cond.2 - 10g 20-2000Hz 4x in each 3 axis 4min sweep time
Shock	Mech.Shock MIL-STD-202 Meth 213 Cond.C 100G 6ms 6 shocks in each direction
Solderability	J_STD_002C Cond A, Through hole device/ Cond. B, SMD 255C (diving 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-F Class 1C 10* 1000V
Moisture Sensit.	Level 1 JESD22-A113-B
RoHS compliance	100% RoHS 6 compliant
Washable	washable device

Ordering Information



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.

Contact Information

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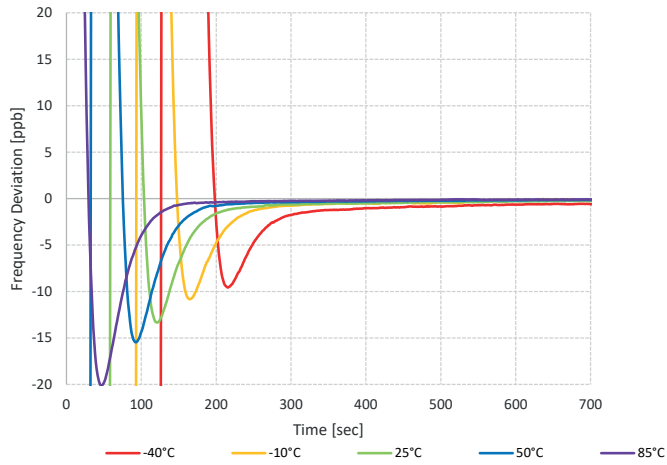
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typical performance data

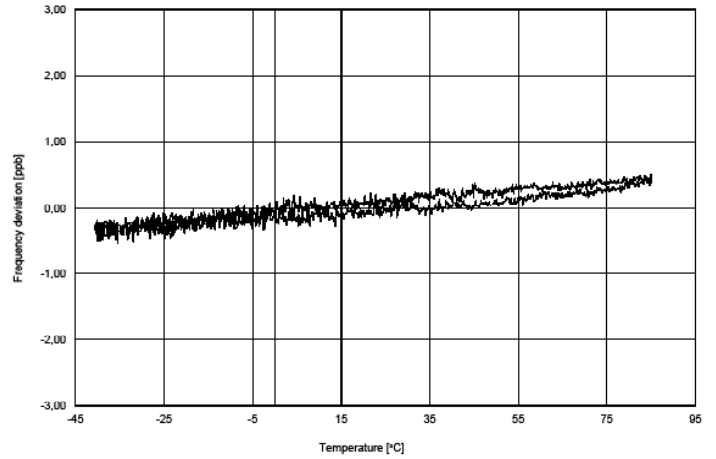
typical warm up

@ OX-2241-EEE-1091-10M0000000



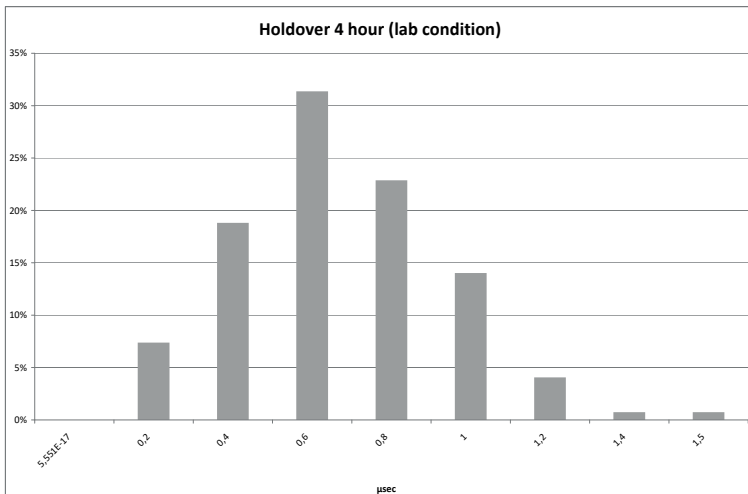
typical temp stability

@ OX-2241-EEE-1091-10M0000000



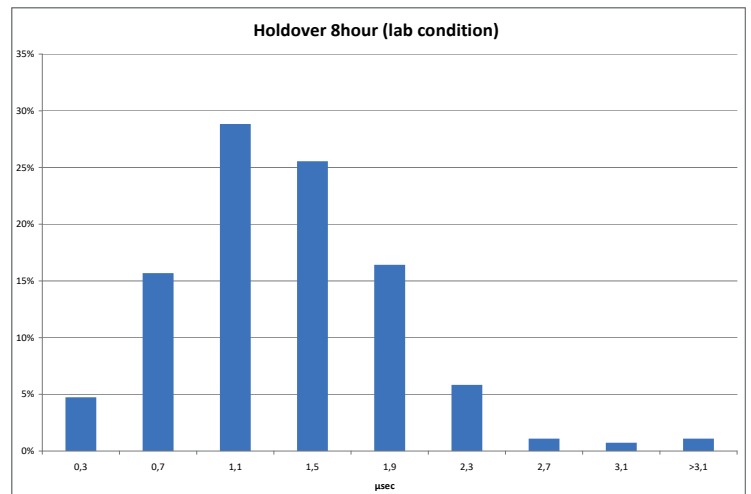
typical holdover over 4 hour lab condition

@ OX-2241-EEE-1091-10M0000000



typical holdover over 8 hour lab condition

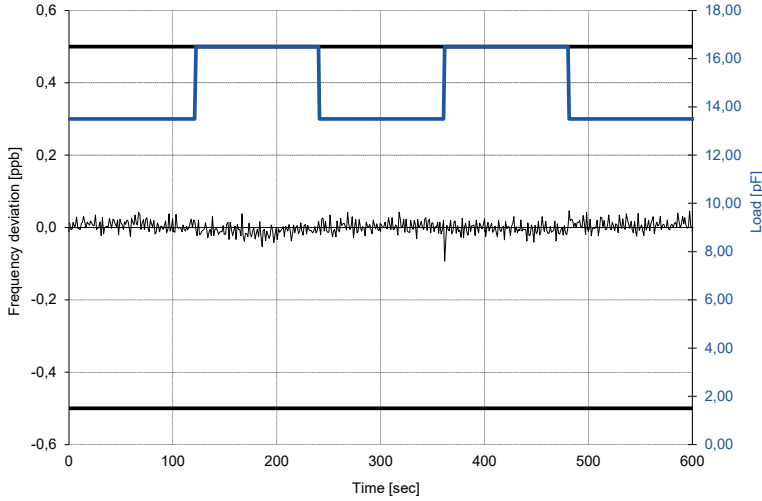
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typical performance data

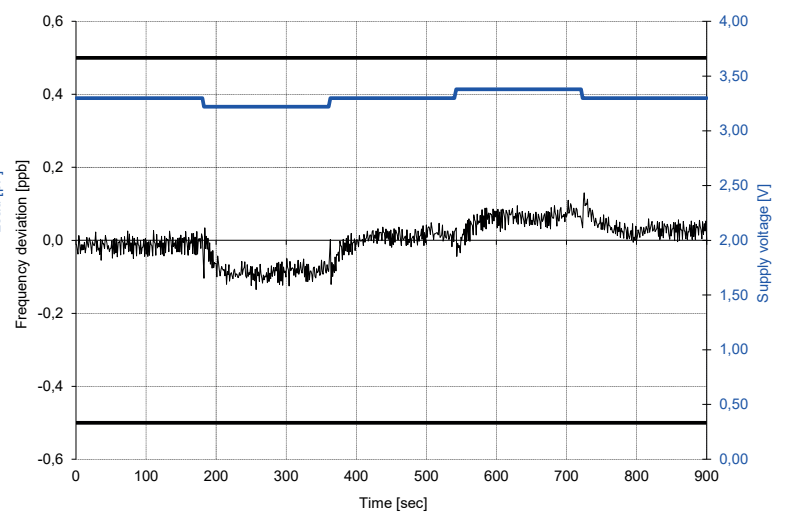
typical frequency vs. load change

@ OX-2241-EEE-1091-10M0000000



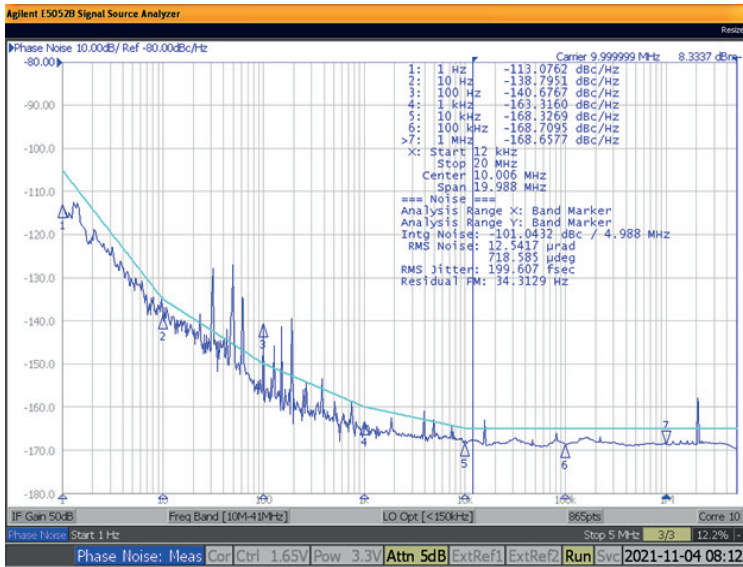
typical frequency vs. supply voltage

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typical Phase Noise

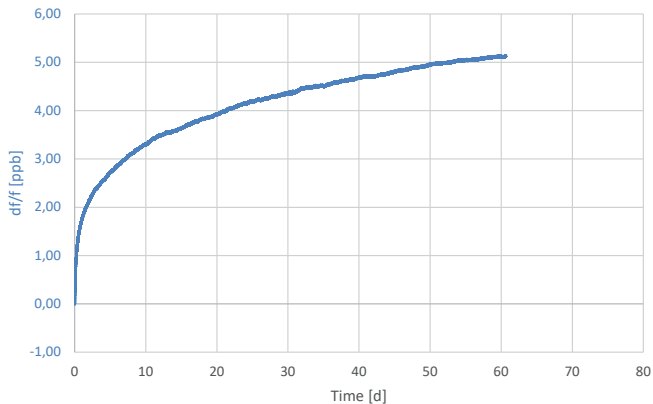
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typical performance data

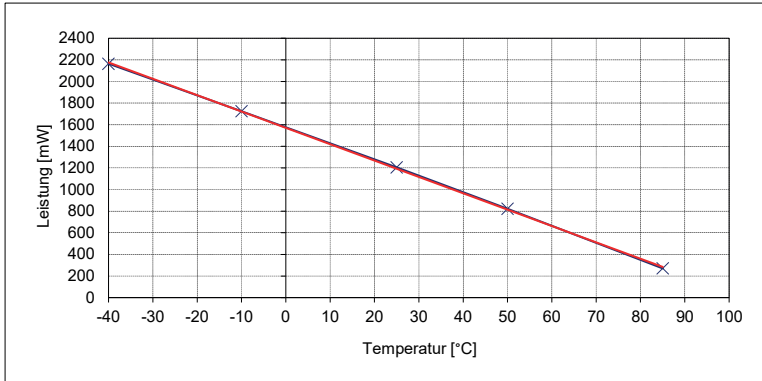
typical aging data

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typical power consumption vs. operating temperature

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recommended power on time after x days of power off

@ OX-2241-EEE-1091-10M0000000

