OX-220

Oven Controlled Crystal Oscillator

Features

- Reflow Process Compatible
- Surface Mount package
- SC_CUT Crystal
- Low Profile Compact Package (8.3mm)
- Standard Frequencies: 10; 12.8; 19.2; 20; 26; 30.72 Mhz

Applications

- Base stations
- Test equipment
- Synthesizers
- Military communication equipment
- Digital Switching

Performance Specifications

Frequency Stabilities[1] (SC-Cut Crystal-Option - 10 to 40 MHz)					
Parameter	Min	Typical	Max	Units	Condition
vs. operating temperature range (referenced to +25°C)	-10 -10		+10 +10	ppb ppb	-20 to +70°C -40 to +85°C
Initial tolerance vs. supply voltage change vs. load change vs. aging / day vs. aging / day vs. aging / year vs. aging / year	-0.2 -5 -5 -0.5 -1 -60 -100		+0.2 +5 +5 +0.5 +1 +60 +100	ppm ppb ppb ppb ppb ppb ppb	at time of shipment, nominal EFC V_S ±5% static Load ±5% static ≤10 Mhz after 30 days of operation > 10 Mhz after 30 days of operation ≤ 10 Mhz after 30 days of operation > 10 Mhz after 30 days of operation
Holdover					
start up time					
Warm-up time			5	minutes	to ±100ppb of final frequency (1 hour reading) @ +25°C

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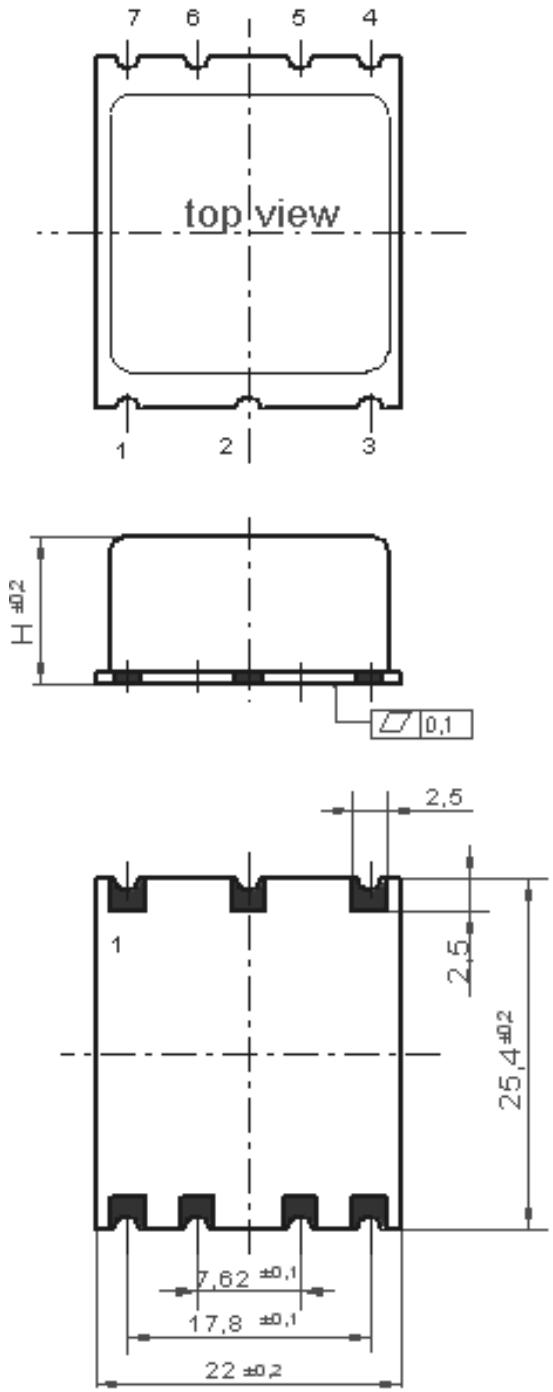
Performance Specifications

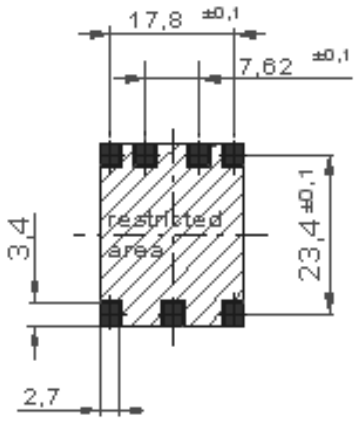
Parameter	Min	Typical	Max	Units	Condition	
Supply Voltage (Vs)						
Supply voltage (standard)	3.135	3.3	3.465	VDC		
	4.75	5.0	5.25	VDC		
Power consumption			3.1	Watts	during warm-up	
			1.5	Watts	steady state @ +25°C	
RF Output						
Signal [standard]	HCMOS					
Load		15		pF		
Signal Level (Vol)			0.4	VDC	with Vs=3.3V and 15pF Load	
Signal Level (Vol)			0.5		with Vs=5.0V & 12V and 15pF Load	
Signal Level (Voh)	2.4			VDC	with Vs=3.3V and 15pF Load	
Signal Level (Voh)	3.5				with Vs=5.0V & 12V and 15pF Load	
Duty Cycle	45		55	%	@ (Voh-Vol)/2	
Rise time			5	ns		
Fall time			5	ns		
Signal	Sine Wave					
Load		50		Ω		
Output Power @3,3V	2	5	8	dBm	50 Ω load	
Output Power @ 5.0V	5	8	11	dBm	50 Ω load	
Harmonics			-30	dBm	50 Ω load	
Frequency Tuning (EFC)						
Tuning Range	Fixed OCXO; No adjust					Option[5]
	±0.8		±2.4	ppm	with SC cut crystal	
Linearity	10%					
Tuning Slope	Positive					
Control Voltage Range	0.0	1.4	2.8	VDC	with Vs=3.3V	
	0.0	2.0	4.0	VDC	with Vs=5.0V	
modulation						
Reference Voltage Output (Vref)						
Reference Voltage	2.75	2.8	2.85	VDC	with Vs = 3.3 VDC	
	3.92	4.0	4.08	VDC	with Vs = 5.0 VDC	
Additional Parameters						
Phase Noise[3]		-80 -110 -138 -148 -152	-70 -105 -130 -140 -145	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz	@ 30.72MHz with SC Cut
Phase Noise[3]		-90 -120 -140 -148 -152	-80 -110 -135 -145 -145	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz	@ 20MHz with SC Cut
Weight			10	g		
Processing & Packing	Handling & Processing Note					

Absolute Maximum Ratings					
supply voltage (Vs)			5.5	V	with Vs=3.3 & 5.0 VDC
Output Load			50	pF	
Operable Temperature Range	-45		+85	°C	
Storage Temperature Range	-45		+85	°C	

Outline Drawing / Enclosure



OX-220	
Height "H"	cover material
12.1	plastic
8.5	plastic



Padvorschlag
land pattern
recommendation

Pin Connections	
1	Electronic Frequency Control Input (EFC)
2	Reference Voltage output
3	Supply Voltage Input (Vs)
4	RF Output
5	Oven Alarm
6	N.C or Option (must remain un connected)
7	Ground (Case)

Dimensions in mm

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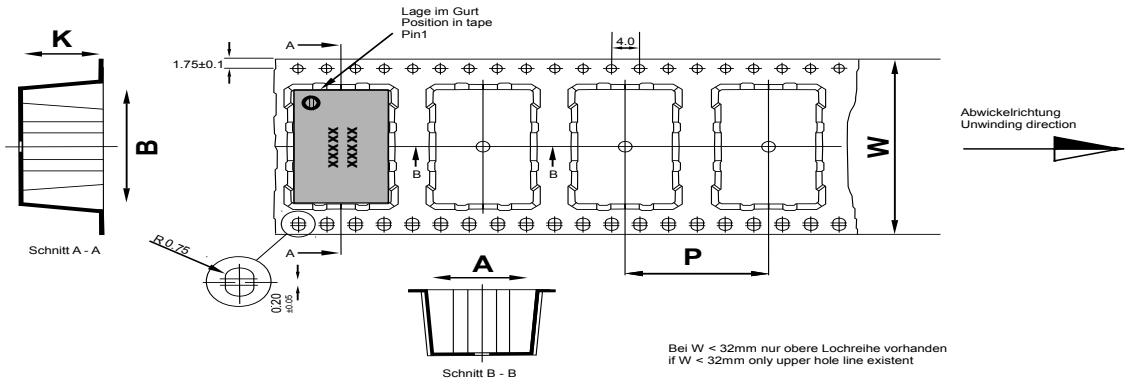
Standard Shipping Method (OX-220 / OX -221)



Maßangaben in mm:	Dimension in mm:
A, B und K Maße von Bauelement abhängig	A, B und K are dependent uppon 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-2201 (12.1mm)	44	37.5	175	28
OX-2206 (8.5mm)	44	37.5	250	28

Recommended Reflow Profile

IPC/JEDEC J-STD-020 (latest revision)
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.

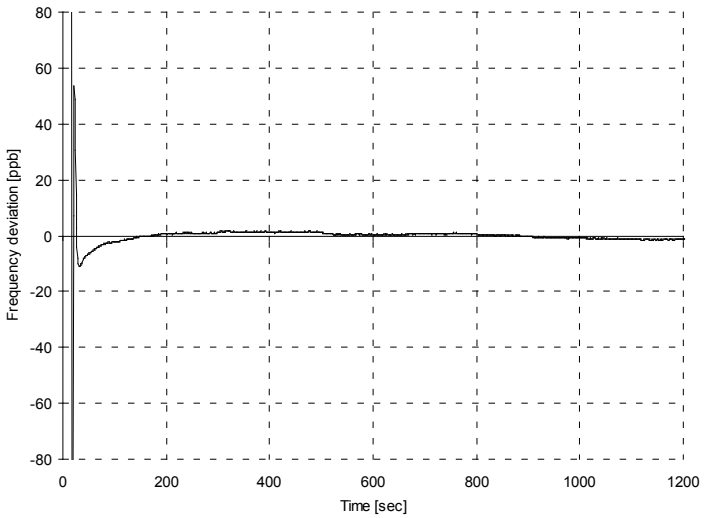
Additional Environmental Conditions

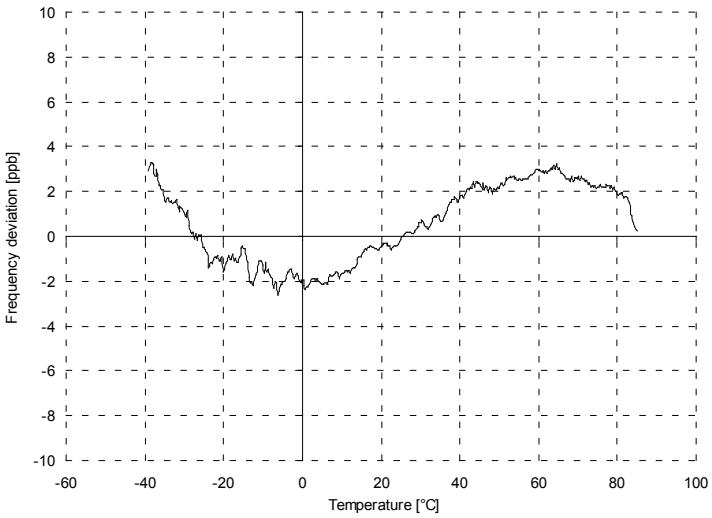
Parameter	Description
Rapid temperature changes	MIL-883-1010 Cond B 1000 cycles -55/125C
Vibration	MIL-STD-883 Meth 2007 Cond A 20G 20-2000Hz 4x in each 3axis 4 min
Shock	Mech.Shock MIL-STD-202 Meth 213 Cond.C 100G 6ms 6 shocks in each direction
Solderability	J_STD_002C Cond A, Through hole device/ Cond. 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	non-washable device

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

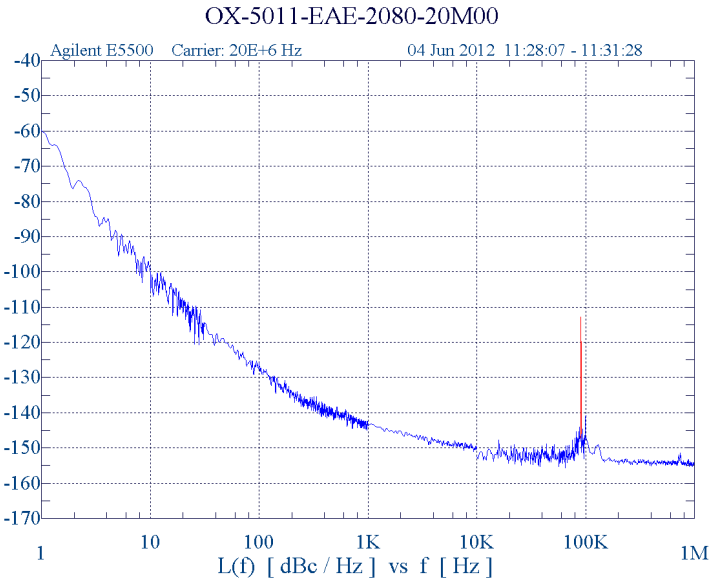
typical performance data

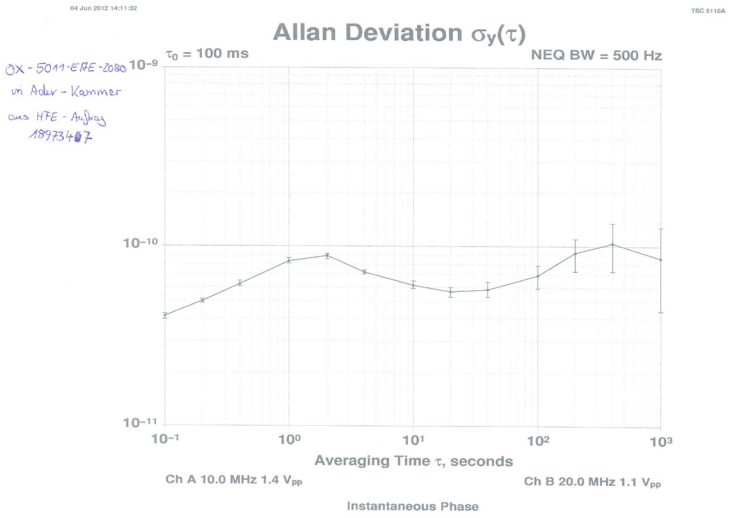
typical warm up	typical temp stability
@ OX-2201-EAE-1080-20M00	@ OX-2201-EAE-1080-20M00





typical Phase Noise	typical ADEV
@ OX-2201-EAE-1080-20M00	@ OX-2201-EAE-1080-20M00





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typical performance data

typical aging data	typical frequeny vs. supply voltage
@ OX-2201-EAE-1080-20M00	@ OX-2201-EAE-1080-20M00

typical frequency vs. load change	typical retrace
@ OX-2201-EAE-1080-20M00	@ OX-2201-EAE-1080-20M00

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typical performance data

typical case temperature vs outside temperature	typical power consumption vs operating temperauture
@ OX-2201-EAE-1080-20M00	@ OX-2201-EAE-1080-20M00

recomended power on time after x days of power off	
@ OX-2201-EAE-1080-20M00	

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Ordering Information

OX - 220 1 - D A E - 108 0 - 10M0000000

- **Product Family**
  OX: OCXO
- **Package**
  SMD version: 220
- **Height**
  1: 12.1 mm
  6: 8.5 mm
- **Supply Voltage**
  D: 5V
  E: 3.3V
- **RF Output Code**
  A: HCMOS
  E: Sinewave
- **Temperature Range**
  E: -40°C to +85°C
  J: -20°C to +70°C
- **Stability Code**
  108: ±10ppb
- **Frequency Control**
  0: No Tuning
  1: ±0.8 to ±2.4ppm
- **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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