
**OX-228**

### Features

- Surface Mount package
- SC\_CUT Crystal
- Low Profile Compact Package
- standard frequency: 10, 20

### Applications

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

## Performance Specifications

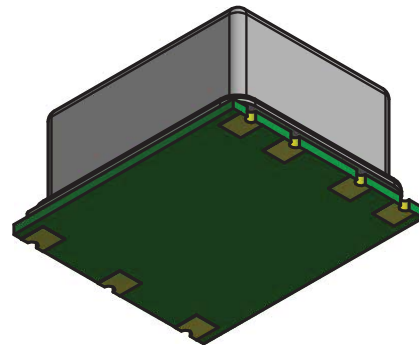
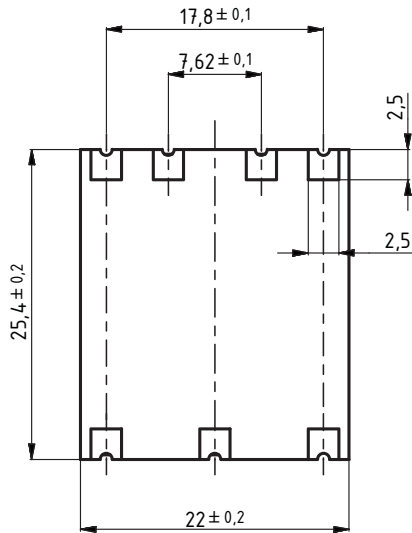
Frequency Stabilities <sup>1</sup> (SC-Cut Crystal - 10 & 20 MHz)					
Parameter	Min	Typical	Max	Units	Condition
vs. operating temperature range (referenced to +25°C)	-1		1	ppb	--40 to +85°C
Initial tolerance	-0.2		+0.2	ppm	at time of shipment, nominal EFC V <sub>s</sub> ±5% static Load ±5% static @ 10 Mhz after 30 days of operation @ 10 Mhz after 30 days of operation
vs. supply voltage change	-1		+1	ppb	
vs. load change	-1		+1	ppb	
vs. aging / day	-0.1		+0.1	ppb	
vs. aging / year	-20		+20	ppb	
vs. aging / 10 year	-75		+75	ppb	
start up time		0.25	2	sec	
Warm-up time			5	minutes	to ±100ppb of final frequency (1 hour reading) @ +25°C

## Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard)	3.135	3.3	3.465	VDC		
Power consumption			4.0	Watts	during warm-up	
			1.35	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 (Voh)	2.4			VDC	with Vs=3.3V and 15pF Load	
rise time			5	ns		
fall time			5	ns		
Duty Cycle	45		55	%	@ (Voh-Vol)/2	
Frequency Tuning (EFC)						
Tuning Range	Fixed OCXO; No adjust					
Additional Parameters						
Phase Noise <sup>3</sup>				dBc/Hz	1 Hz	@ 10MHz
				dBc/Hz	10 Hz	
				dBc/Hz	100 Hz	
				dBc/Hz	1 kHz	
				dBc/Hz	10 kHz	
				dBc/Hz	100kHz	
Weight			12	g		
Processing & Packing	Handling & Processing Note					

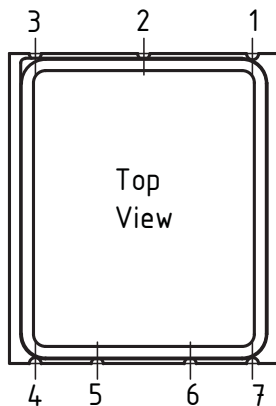
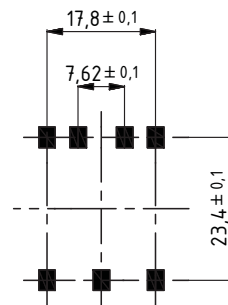
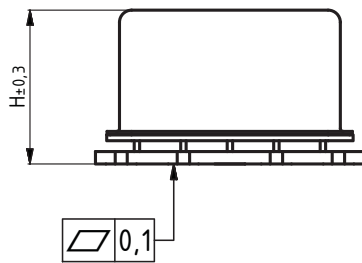
Absolute Maximum Ratings					
supply voltage (Vs)			5.5	V	with Vs=3.3 & 5.0VDC
Output Load			50	pF	
Operable Temperature Range	-45		+85	°C	
Storage Temperature Range	-45		+85	°C	

## Outline Drawing / Enclosure



G343

OX-228	
Height "H"	cover material
12.1	metal

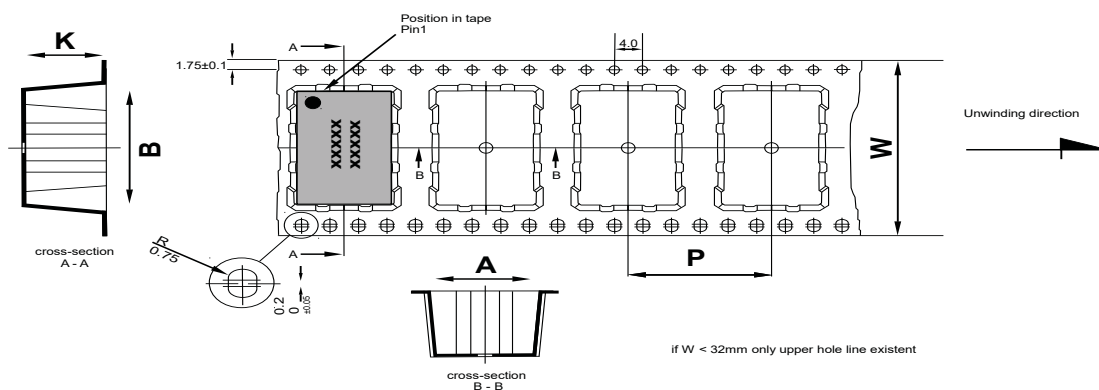


Dimensions in mm

Padvorschlag  
land pattern  
recommendation

Pin Connections	
1	I.C (Do not connect)
2	N.C
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)

# Standard Shipping Method (OX-228)



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-228 (12.1mm)	44	37.5	175	28

## Recommended Reflow Profile

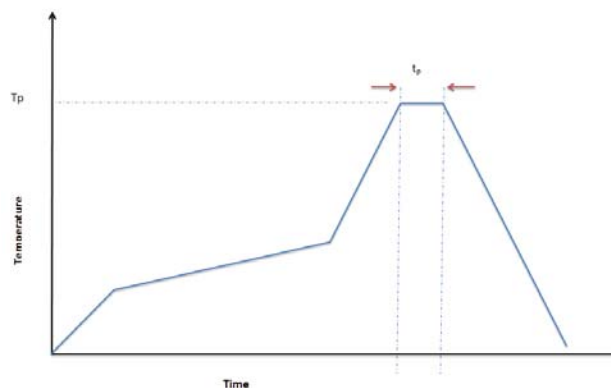
TP: max 260°C (@ solder joint, customer board level)

T<sub>p</sub>: 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.

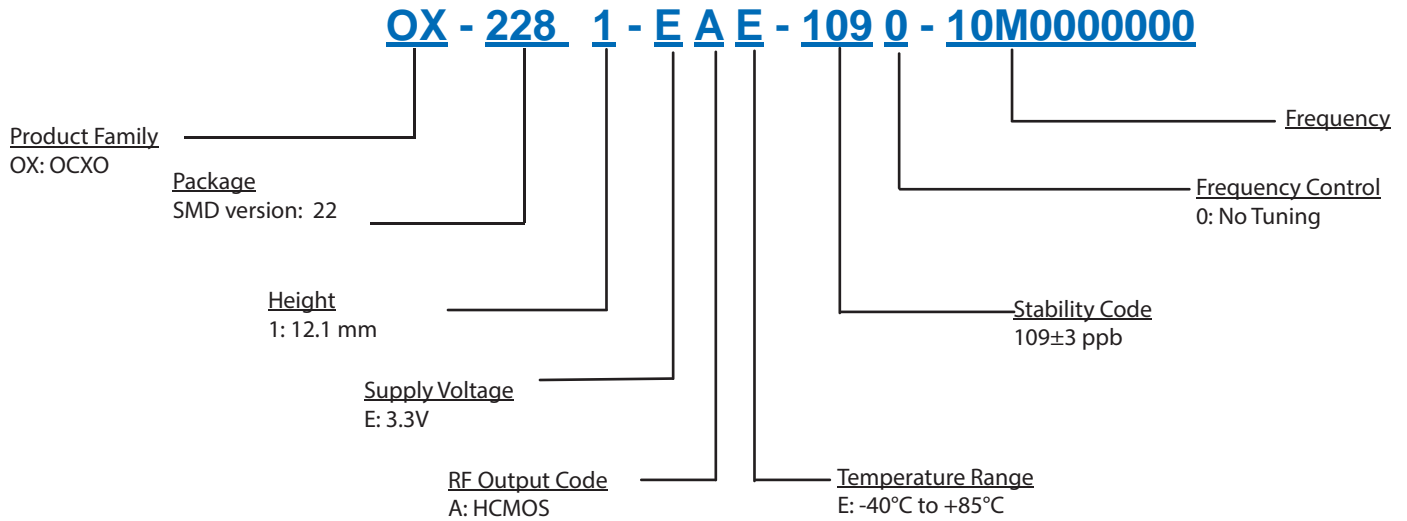


## Additional Environmental Conditions

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	washable device

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

## 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.



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