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OX-200

Oven Controlled Crystal Oscillator

Features

- Reflow Process Compatible
- AT-Cut and SC-Cut Crystal Options
- Low Profile Compact Package

Applications

- Base Stations
- Test Equipment
- Synthesizers
- Military Communication Equipment
- Digital Switching

Performance Specifications

Parameter	Min	Typical	Max	Unit	Condition
Frequency Stabilities[1] (AT-Cut Crystal-Standard)					
vs. operating temperature range (referenced to +25°C)	-50 -100 -150 -200		+50 +100 +150 +200	ppb ppb ppb ppb	0 to +70°C -20 to +70°C -40 to +70°C -40 to +85°C
Initial tolerance vs. supply voltage change vs. load change vs. aging/day vs. aging/1st year vs. aging/year (following years)	-0.3 -10 -10 -2 -500 -250		+0.3 +10 +10 +2 +500 +250	ppm ppb ppb ppb ppb ppb	at time of shipment, nominal EFC V_S ±5% static Load ±5% static after 30 days of operation after 30 days of operation after 30 days of operation
Warm-up time			5	minutes	to ±100ppb of final frequency (1 hour reading) @ +25°C
Frequency Stabilities[1] (SC-Cut Crystal-Option)					
vs. operating temperature range (referenced to +25°C)	-10 -20 -25 -30		+10 +20 +25 +30	ppb ppb ppb ppb	0 to +70°C -20 to +70°C -40 to +70°C -40 to +85°C
Initial tolerance vs. supply voltage change vs. load change vs. aging/day vs. aging/1st year vs. aging/year (following years)	-100 -5 -5 -1 -100 -50		+100 +5 +5 +1 +100 +50	ppb ppb ppb ppb ppb ppb	at time of shipment, nominal EFC V_S ±5% static Load ±5% static after 30 days of operation after 30 days of operation after 30 days of operation
Warm-up time			5	minutes	to ±10ppb of final frequency (1 hour reading) @ +25°C

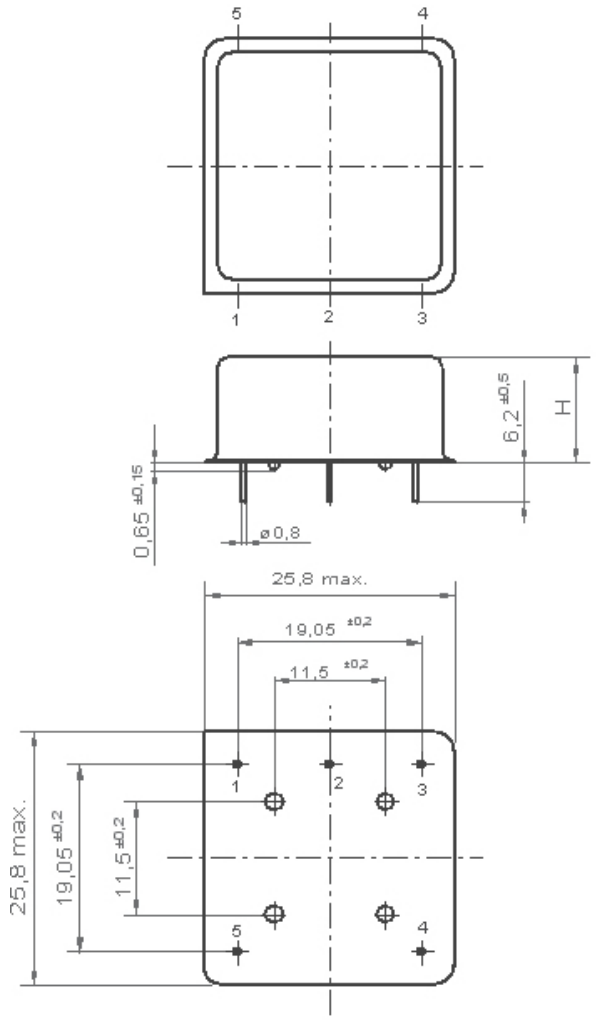
Performance Specifications

Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Unit	Condition
Supply Voltage	3.135	3.3	3.465	VDC	
Supply Voltage	4.75	5.0	5.25	VDC	
Supply Voltage	11.4	12.0	12.6	VDC	
Power Consumption			3.0 1.0	Watts Watts	during warm-up steady state @ +25°C
RF Output					
Signal [Standard]	HCMOS				
Load		15		pF	
Signal Level (Vol)			0.4 0.5	VDC VDC	with Vs=3.3V and 15 pF Load with Vs=5V & 12V and 15 pF Load
Signal Level (Voh)	2.4 3.5			VDC VDC	with Vs=3.3V and 15 pF Load with Vs=5V & 12V and 15 pF Load
Duty Cycle	45		55	%	@ (Voh-Vol)/2
Signal	Sinewave				
Load		50		Ohms	
Output Power	+2.0 +5.0	+5.0 +8.0	+8.0 +11.0	dBm dBm	with Vs=3.3V and 50 Ohm load with Vs=5V & 12V and 50 Ohm load
Harmonics			-30	dBc	50 Ohm load
Frequency Tuning (EFC)					
Tuning Slope	Fixed OCXO; No adjust				
Tuning Range	±3.0 ±0.75		±8.0 ±2.0	ppm ppm	with AT cut crystal with SC cut crystal
Linearity			10	%	
Tuning Slope	Positive				
Control Voltage Range	0.0 0.0	1.4 2.0	2.8 4.0	VDC VDC	with Vs=3.3V with Vs=5V & 12V
Reference Voltage Output (VRef)					
Reference Voltage	2.75 3.92 4.9	2.8 4.0 5.0	2.85 4.08 5.1	VDC VDC VDC	with Vs=3.3V with Vs=5V with Vs=12V
Additional Parameters					
Phase Noise[3]			-90 -120 -140 -145 -150	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz @ 10MHz with SC cut
Phase Noise[3]			-75 -100 -130 -140 -150	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz @ 10MHz with AT cut
Weight			14	g	

Absolute Maximum Ratings					
Parameter	**Min**	**Typical**	**Max**	**Unit**	**Condition**
Supply Voltage (Vs)			6.5 15	V V	with Vs=3.3V & 5V with Vs=12V
Output Load			50	pF	
Operable Temperature Range	-55		+85	°C	
Storage Temperature Range	-55		+125	°C	

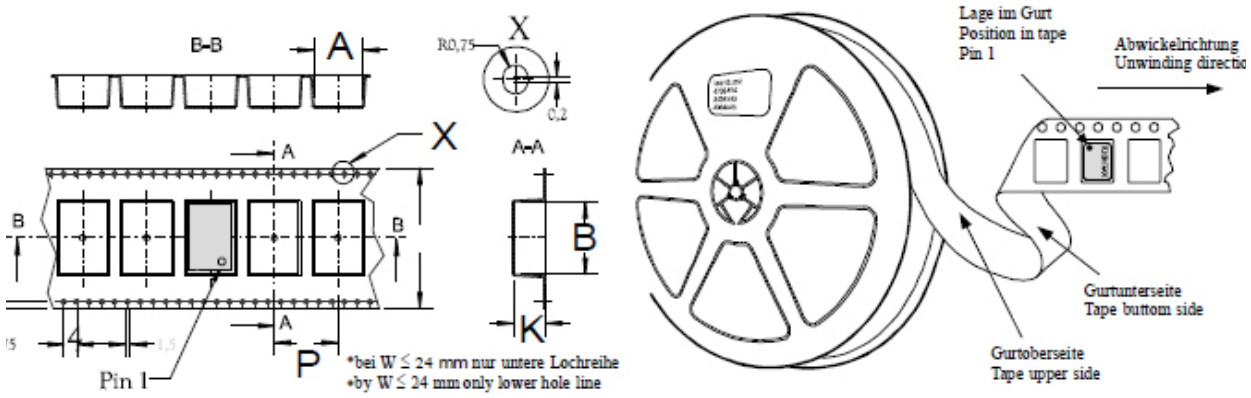
Environmental and Product Classification					
Shock (Endurance)	MIL-STD-202, Method 213, Condition J, 30 g 11 ms				
Sine Vibration (Endurance)	MIL-STD-202, Method 201 and 204, Condition A, except 5 g to 500 Hz, 1 sweep each axis				
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-D				
Humidity	MIL-STD-202, Method 103, Condition B, 100% rh				
Seal	MIL-STD-202, Method 112, Condition D				
Altitude	MIL-STD-202, Method 105, sea level to30,000 ft				
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A,B,C				
Terminal Strength	MIL-STD-202, Method 11, Condition C (5 bends at 45°, 2 lbs)				
Moisture Sensitive Level	1				
RoHS	6 (fully compliant) - no pure tin options available upon request, the device will be assigned a customer part number , not orderable through ordering codes				
Storage Temperature Range	-55		+125	°C	

Outline Drawing / Enclosure



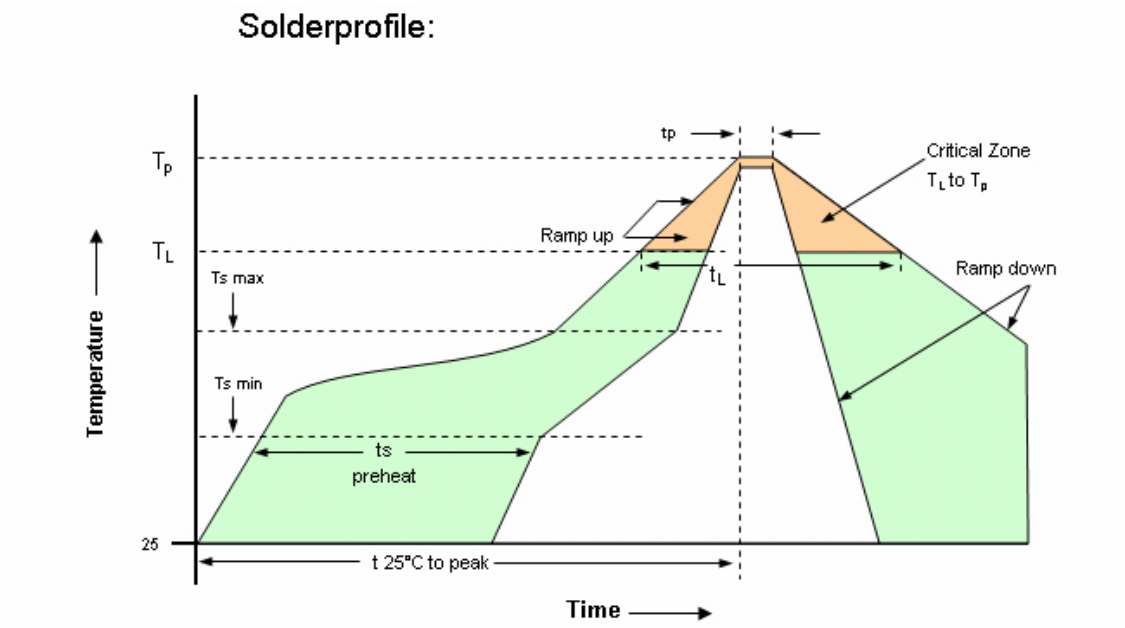
OX-200		
Code	Height "H"	Pin Length "L" Min
0	10.4	6.2
1	12.7	6.2
2	13.4	6.2
Pin Connections		
1	RF Output	
2	Ground (Case)	
3	Electronic Frequency Control Input (EFC)	
4	Reference Voltage Option	
5	Supply Voltage Input (VS)	

Standard Shipping Method



Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P
Type B	44	33.3	250	34
Type C	44	33.3	250	34

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 Tp)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min Ts_{min}) -Temperature Min Ts_{max}) -Time (min to max) (ts)	150°c 200°c 60-180 seconds	Time maintainted above - Temperature (T_L) - Time (t_L)	217°C 60-150 seconds
Ts_{max} to T_L - Ramp-up Rate	3°C/second max.		
Time maintainted above - Temperature (T_L) - Time (t_L)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (tp)	20-40 seconds
Peak Temperature (Tp)	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 - 200 0 - D A E - 258 0 - 10M0000000

Product Family
OX: OCXO

Package
THT version: 200

Height
0: 10.4 mm
1: 12.7 mm
2: 13.4 mm

Supply Voltage
B: +12V
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
208: ±20ppb
258: ±25ppb
308: ±30ppb
508: ±50ppb
107: ±100ppb

Frequency Control
0: No Tuning
1: ±0.75 to ±2.0ppm (SC)
2: ±3.0 to ±8.0ppm (AT)

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.

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