MICROCHIP

Vectron™ Oscillators

OX-405

Oven Controlled Crystal Oscillator

The OX-405 is the smallest low noise (-160 dBc/Hz floor) OCXO at 100 MHz designed with a four-point mount SC-cut crystal, making it ideal for applications where shock, acceleration and harsh environments are of concern.

Features

- 4-Pin Dip
- Fast Warm-up
- Frequency Range: 80 MHZ to 120 MHZ
- Low g-sensitivity
- Low Phase Noise

Applications

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

Performance Specifications

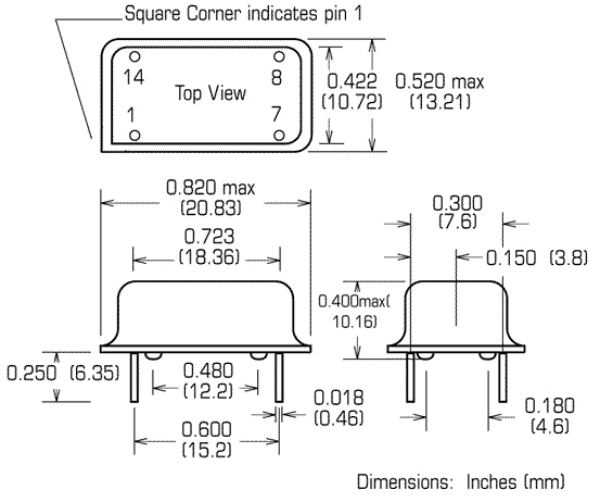
Frequency Stabilities[1] (SC-Cut Crystal-Option)					
Parameter	Min	Typical	Max	Unit	Condition
vs. operating temperature range (referenced to +25°C)	-200 -150 -100 -50 -35 -25		+200 +150 +100 +50 +35 +25	ppb ppb ppb ppb ppb ppb	-40 to +85°C -20 to +70°C -0 to +70°C -40 to +85°C (height code 0 and 3 only) -20 to +70°C (height code 0 and 3 only) -0 to +70°C (height code 0 and 3 only)
Initial tolerance vs. supply voltage change vs. supply voltage change vs. load change vs. aging/day vs. aging/1st year	-400 -50 -25 -10 -3 -300		+400 +50 +25 +10 +3 +300	ppb ppb ppb ppb ppb ppb	at time of shipment, nominal EFC V_S ±5% static (CMOS outputs) V_S ±5% static (sine outputs) Load ±5% static after 30 days of operation after 30 days of operation
Warm-up time			2	minutes	to ±100ppb of final frequency (1 hour reading) @ +25°C

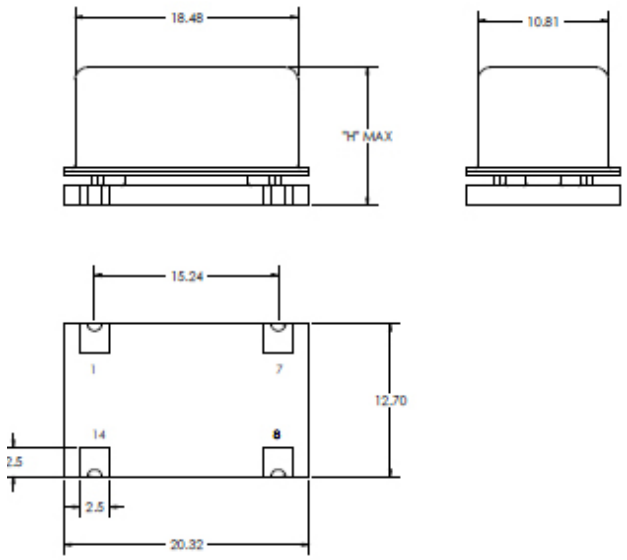
Performance Specifications

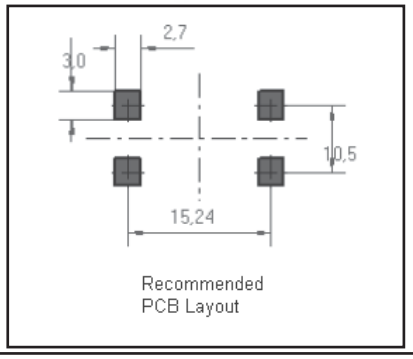
Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Unit	Condition	
Supply Voltage	4.75	5.0	5.25	VDC	ordering code D	
	3.165	3.3	3.465	VDC	ordering code E (HCMOS only)	
Power Consumption			3.5 4.5 1.0	Watts Watts Watts	during warm-up (5V versions) during warn-up (3V version) steady state @ +25°C	
RF Output						
Signal [Standard]	HCMOS					
Load		15		pF		
Signal Level (Vol)			0.5	VDC	with Vs=5V and 15 pF Load	
Signal Level (Voh)	3.6			VDC	with Vs=5V and 15 pF Load	
Signal Level (Vol)			0.3	VDC	with Vs=3.3V and 15 pF Load	
Signal Level (Voh)	2.4			VDC	with Vs=3.3V and 15 pF Load	
Duty Cycle	40		60	%	@ (Voh-Vol)/2	
	Sinewave (5V supply, height code 0 or 3 only)					
Load		50		Ω		
Output Power @ 5V	5	8	11	dBm	50 Ω load	
Harmonics			-40	dBm		
Frequency Tuning (EFC)						
Tuning Range	±1.0		±3.0	ppm		
Linearity			5	%		
Tuning Slope	Positive					
Control Voltage Range	0.0	2.0	4.0	VDC	5 V versions	
	0	1.5	3.0	VDC	3.3 V versions	
Additional Parameters						
Phase Noise[3]			-95 -125 -145 -155 -160	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 100MHz
G-Sensitivity			1 0.5	ppb/g ppb/g	worst direction - standard worst direction - request a custom part	
Weight			8	g		
Absolute Maximum Ratings						
Supply Voltage (Vs)			6.0	V		
Output Load			50	pF		
Operable Temperature Range	-55		+85	°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 to space					
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 Sensitivity level	1					
ROHS Compliantt	Yes					
Storage Temperature Range	-55		+125	°C		

Performance Specifications

Outline Drawing / Enclosure







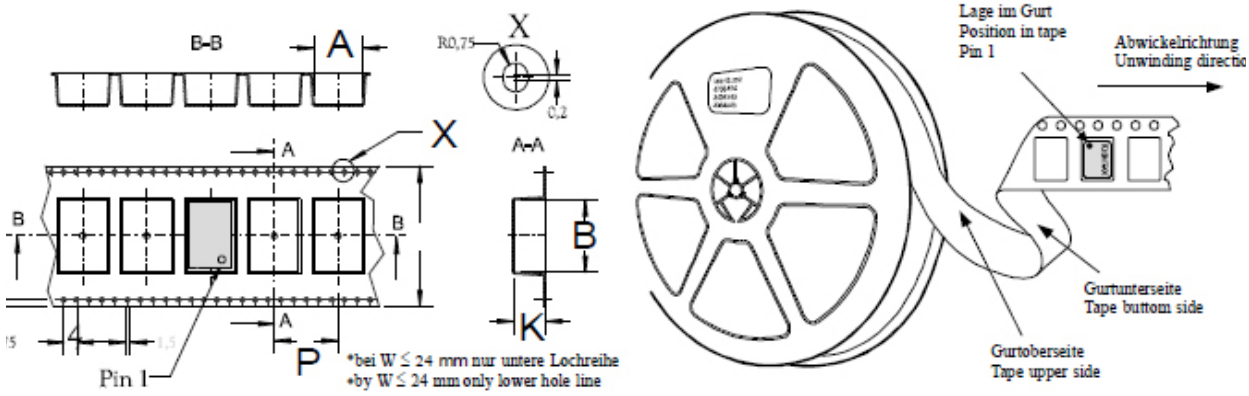
Dimensions in inches (mm)

Type A		
Code	Height "H"	Pin Length "L" Min
0	9.3	5.85
1	8.3	5.85
Pin Connections		
1	Electronic Frequency Control Input (EFC)	
7	Ground (Case)	
8	RF Output	
14	Supply Voltage Input (VS)	

Dimensions in mm

Type B		
Code	Height "H"	Pin Length "L" Min
2	10.4	NA
3	11.4	NA
Pin Connections		
1	Electronic Frequency Control Input (EFC)	
7	Ground (Case)	
8	RF Output	
14	Supply Voltage Input (VS)	

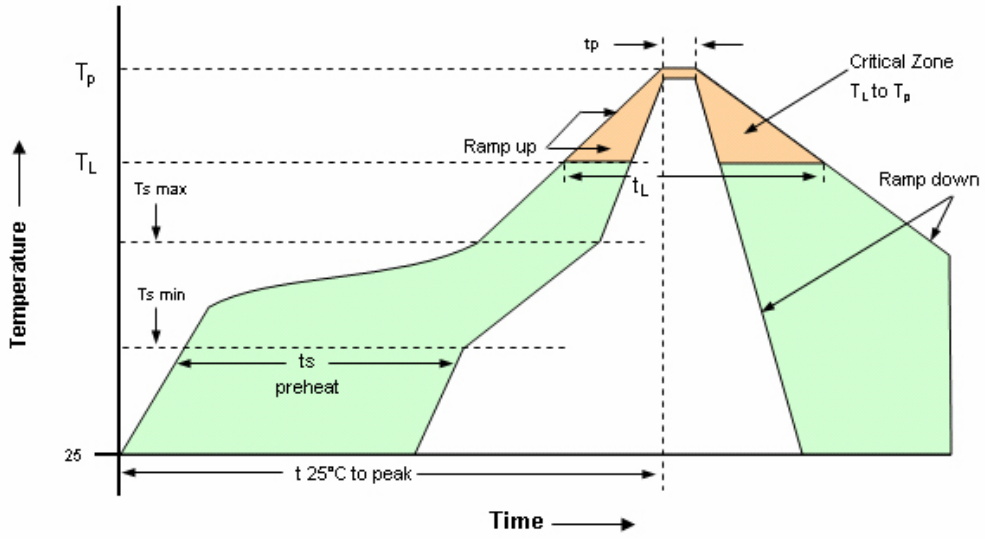
Standard Shipping Method



Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P
Type B	44	50	300	20

Recommended Reflow Profile

Solderprofile:



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 - 405 0 - D A E - 107 0 - 100M000000

Product Family
OX: OCXO

Package
405

Height
0: A9.3 mm (THT)
1: A8.3 mm (THT)
2: B10.4 mm (SMD)
3:B11.4mm (SMD)

Supply Voltage
D: +5V
E:+3.3V (HCMOS only)

RF Output Code
A: HCMOS
E:Sinewave (height code 0 and 3 only)

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C
T: 0°C to +70°C

Stability Code
207: ±200ppb
157: ±150ppb
107: ±100ppb
508: ±50ppb (height code 0 and 3 only)
358: ±35ppb (height code 0 and 3 only)
258: ±25ppb (height code 0 and 3 only)

Frequency Control
0: No Tuning
2: ±1.0 to ±3ppm

Frequency

G Sensitivity - standard parts will be delivered at 1 ppb/g
If 0.5ppb/g is requested please contact the factory and a custom part number will be assigned

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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