



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

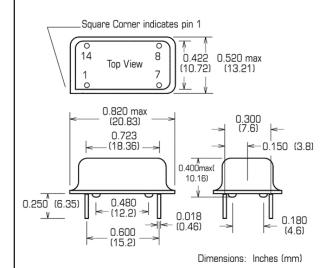
Frequency Stabilities¹ (SC-Cut Crystal-Option)						
Parameter	Min	Typical	Max	Unit	Condition	
vs. operating temperature range (referenced to +25°C)	-200 -150 -100 -50 -35 -25		+200 +150 +100 +50 +35 +25	ppb ppb ppb ppb ppb ppb	-40 to +85°C -20 to +70°C -0 to +70°C -40 to +85°C (height code 0 and 3 only) -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	at time of shipment, nominal EFC $V_s\pm 5\%$ static (CMOS outputs) $V_s\pm 5\%$ static (sine outputs) Load $\pm 5\%$ 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	

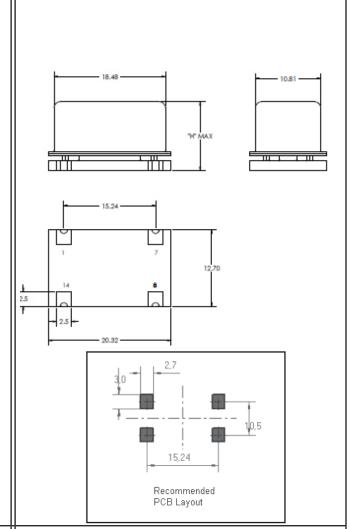
Performance Specifications

Parameter Min Typical Max Unit Commitment of Depth Controlling of De	Supply Voltage (Vs)							
Supply Voltage	Parameter	Min	Typical	Max	Unit	Condition		
Power Consumption S.165 S.3 S.3 Wolt Matts during warm-up (SV versions) dur	c ly h	4.75	5.0	5.25	VDC	ordering code D		
Power Consumption Power Service	Supply voltage	3.165	3.3	3.465	VDC	ordering code E (HCMOS only)		
Segonal Standard Stan					Watts			
Signal (Standard)	Power Consumption							
Signal [Standard] HCMOUND Signal Level (Vol) 15 pp with Vs=SV and 15 pP Load Signal Level (Vol) 3.6 - VDC with Vs=S3 v and 15 pP Load Signal Level (Vol) 3.6 - VDC with Vs=3.3V and 15 pP Load Signal Level (Vol) 2.4 - VDC with Vs=3.3V and 15 pP Load WDC with Vs=3.3V and 15 pP Load Signal Level (Vol) - - VDC with Vs=3.3V and 15 pP Load WDC with Vs=3.3V and 15 pP Load -							te @ +25 C	
Load 15 15 pF with Vs=SV and 15 pF Load Signal Level (Vol) 3.6 0.5 VDC with Vs=SV and 15 pF Load Signal Level (Voh) 3.6 0.3 VDC with Vs=SV and 15 pF Load Signal Level (Voh) 2.4 0.3 VDC with Vs=3.3V and 15 pF Load Duty Cycle 40 60 % @ (Voh Vol)/2 Load 55 8.8 11 dBm \$0.0 Load Harmonics 5 8.8 11 dBm \$0.0 Load Frequency Tuning (EFC) Tuning Range ±1.0 2.2 4.0 Bm \$0.0 Load Frequency Tuning (EFC) Tuning Stange ±1.0 2.3 ppm \$0.0 Load	Signal [Standard]							
Signal Level (Voh) 3.6 0.5 VDC with Vs=5V and 15 pF Load Signal Level (Voh) 3.6 0.0 VDC with Vs=3V and 15 pF Load Signal Level (Voh) 2.4 0.0 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 2.4 0.0 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 2.4 0.0 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 2.4 0.0 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 4.0 0.0 0.0 with Vs=3.3V and 15 pF Load Signal Level (Voh) 4.0 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 5.0 8.0 0.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 9.0 9.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			1	WIOS	nF			
Signal Level (Voh) 3.6 Image: Composition of the			13	0.5		with Vs=5V ar	nd 15 pF Load	
Signal Level (Vol) 2.4 0.3 VDC with Vs=3.3V and 15 pF Load Signal Level (Voh) 2.4 0.0 MDC with Vs=3.3V and 15 pF Load Duty Cycle 40 60 % @ (Voh-Vol)/2 Load 50 Ω Ω	_	3.6		0.5				
Signal Level (Voh) 2.4 Howely Cycle VDC with Vs=3.3V and 15 pF Load Duty Cycle 40 60 % @ (Voh-Vol)/2 Load SO SO Ω Output Power @ SV 5 8 11 dBm \$50 Ω Load Frequency: Turning Range ±1.0 2.30 ppm Prostret Linearity 1 5 % \$ Tuning Slope 0.0 2.0 4.0 VDC \$ \$ **Control Voltage Range 0.0 2.0 4.0 VDC \$ \$ \$ **Control Voltage Range 0.0 2.0 4.0 VDC \$ <t< td=""><td></td><td>3.0</td><td></td><td>0.3</td><td></td><td></td><td></td></t<>		3.0		0.3				
Duty Cycle 40 60 % @ (Voh-Vol)/2 Load Sinewaye (5V supply, height code 0 or 3 only) Common (50) Common (50) Common (50) Common (50) Common (50) Common (50) Some (50) Common (50) Some (50) Common (50) Some (50) Common (50) Some (50) Common (5	_	2.4		0.5				
Sineway (Supply) → Included (Single of Supply) Single of Supply → Included (Single of Supply)				60				
Load 50 8 11 dBm 50 □ 10 50 □ 10 30 □ 10		-	(5V supply, I		or 3 only)	2 (13)		
Harmonics	Load		i					
Harmonics	Output Power @ 5V	5	8	11	dBm	50 Ω	load	
Tuning Range ±1.0 ±3.0 ppm Linearity 5 % Tuning Slope				-40	dBm			
Tuning Range ±1.0 ±3.0 ppm Linearity 5 % Tuning Slope								
Linearity 1 5 % Image: Note of the product of the pr	Tuning Range	±1.0	·					
Control Voltage Range				5	%			
Note	Tuning Slope							
Phase Noise ³	Control Voltage Range	0.0	2.0	4.0	VDC	5 V ve	rsions	
Phase Noise³ Image: Company of the compa		0	1.5	3.0	VDC	3.3 V v	ersions	
Phase Noise³ Image: Complete the complete			Additio	onal Param	eters			
Phase Noise³ Image: Compliant of the property of the						1		
Compositivity Compositivi	Dhasa Naisa3						@ 100MH ~	
G-Sensitivity Sensitivity Sensitivity	Phase Noise					· ···-	@ 1001/11112	
Weight Same Same				-160	dBc/Hz	100 kHz		
Weight 8 9 9 Supply Voltage (Vs) 6.0 V Output Load 50 pF Operable Temperature Range -55 +85 °C Sine Vibration (Endurance) MIL-STD-202, Method 214, Condition I-D Humidity MIL-STD-202, Method 112, Condition D Altitude MIL-STD-202, Method 210, Condition D Altitude MIL-STD-202, Method 210, Condition A, B,C Terminal Strength MIL-STD-202, Method 210, Condition A,B,C Terminal Strength MIL-STD-202, Method 210, Condition C (5 bends at 45°, 2 lbs) Moisture Sensitivity level 1 ROHS Compliantt Yes	G-Sensitivity			1				
Supply Voltage (Vs) Supply Voltage (Vs) Output Load Operable Temperature Range 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 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	Woight					worst direction - request a custom part		
Supply Voltage (Vs) Output Load Operable Temperature Range -55 Environmental and Product Classification Shock (Endurance) MIL-STD-202, Method 213, Condition J, 30 g 11 ms Sine 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	weight		Absoluto					
Output Load Operable Temperature Range -55 -55 -55 -55 -55 -55 -55 -55 -55 -5	Supply Voltago (Vs)		Absolute	1				
Operable Temperature Range 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					-			
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		-55			-			
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 ROHS Compliantt Yes	Operable lemperature hange							
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 ROHS Compliantt Yes								
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	Shock (Endurance)					1		
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		MIL-STD-202,	Method 213	, Condition J	, 30 g 11 ms		een each avis	
SealMIL-STD-202, Method 112, Condition DAltitudeMIL-STD-202, Method 105, sea level to spaceResistance to Soldering HeatMIL-STD-202, Method 210, Condition A,B,CTerminal StrengthMIL-STD-202, Method 11, Condition C (5 bends at 45°, 2 lbs)Moisture Sensitivity level1ROHS ComplianttYes	Sine Vibration (Endurance)	MIL-STD-202, MIL-STD-202,	Method 213 Method 201	, Condition J and 204, Co	, 30 g 11 ms Indition A, exce		eep each axis	
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	Sine Vibration (Endurance) Random Vibration (Endurance)	MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214	, Condition J and 204, Co , Condition I-	, 30 g 11 ms Indition A, exce		eep each axis	
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	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214 Method 103	, Condition J and 204, Co , Condition I- , Condition B	, 30 g 11 ms ndition A, exce D , 100% rh		eep each axis	
Terminal Strength MIL-STD-202, Method 11, Condition C (5 bends at 45°, 2 lbs) Moisture Sensitivity level 1 ROHS Compliantt Yes	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity Seal	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214 Method 103 Method 112	, Condition J and 204, Co , Condition I- , Condition B , Condition D	, 30 g 11 ms ndition A, exce D , 100% rh		eep each axis	
Moisture Sensitivity level 1 ROHS Compliantt Yes	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity Seal Altitude	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214 Method 103 Method 112 Method 105	, Condition J and 204, Co , Condition I , Condition E , Condition E	, 30 g 11 ms indition A, exce D i, 100% rh o space		eep each axis	
ROHS Compliantt Yes	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity Seal Altitude Resistance to Soldering Heat	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214 Method 103 Method 112 Method 105 Method 210	, Condition J and 204, Co , Condition I , Condition E , condition E , sea level to	, 30 g 11 ms ndition A, exce D , 100% rh) space ,,B,C	pt 5 g to 500 Hz, 1 swe	eep each axis	
	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity Seal Altitude Resistance to Soldering Heat Terminal Strength	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202,	Method 213 Method 201 Method 214 Method 103 Method 112 Method 105 Method 210	, Condition J and 204, Co , Condition I , Condition E , condition E , sea level to	, 30 g 11 ms ndition A, exce D , 100% rh) space ,,B,C	pt 5 g to 500 Hz, 1 swe	eep each axis	
,	Sine Vibration (Endurance) Random Vibration (Endurance) Humidity Seal Altitude Resistance to Soldering Heat Terminal Strength Moisture Sensitivity level	MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, MIL-STD-202, 1	Method 213 Method 201 Method 214 Method 103 Method 112 Method 105 Method 210	, Condition J and 204, Co , Condition I , Condition E , condition E , sea level to	, 30 g 11 ms ndition A, exce D , 100% rh) space ,,B,C	pt 5 g to 500 Hz, 1 swe	eep each axis	

Performance Specifications

Outline Drawing / Enclosure



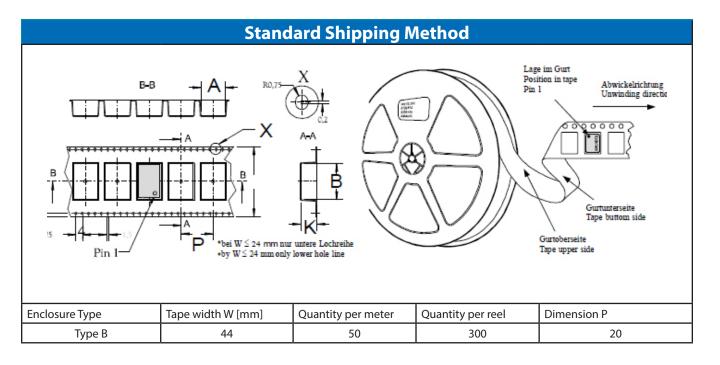


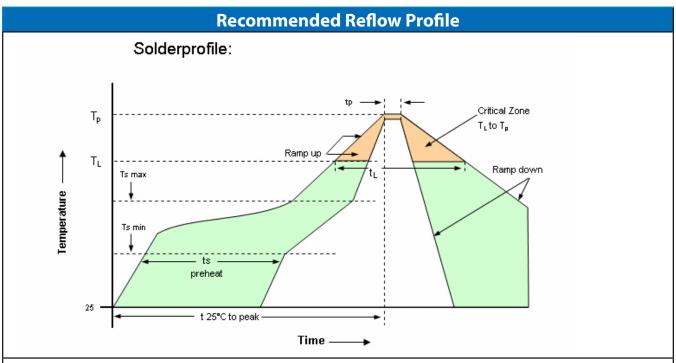
Dimensions in inches (mm)

Туре А						
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

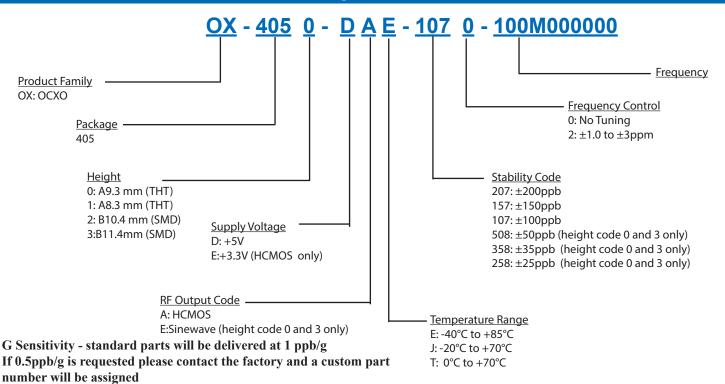
	Type B					
Code	Height "H"	Pin Length "L" Min				
2	10.4	NA				
3	11.4	NA				
	Pin Connections					
1	Electronic Frequency Control Input (EFC)					
7	Ground (Case)					
8	RF Output					
14	Supply Voltage Input (VS)					





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



Notes:

- 1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- 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).
- Phase noise degrades with increasing output frequency.
- Subject to technical modification.
- Contact factory for availability.

Contact Information

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