



Helping Customers Innovate, Improve & Grow



OX-400 / 401

Features

- 4-Pin Dip
- Fast warm-up
- TCXO replacement for better short term stability
- Frequency Range, 10 MHz to 160 MHz
- Standard frequencies, 20 MHz (SC); 13 MHz (AT)

Applications

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

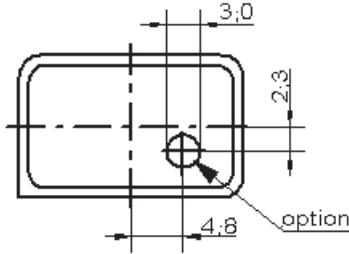
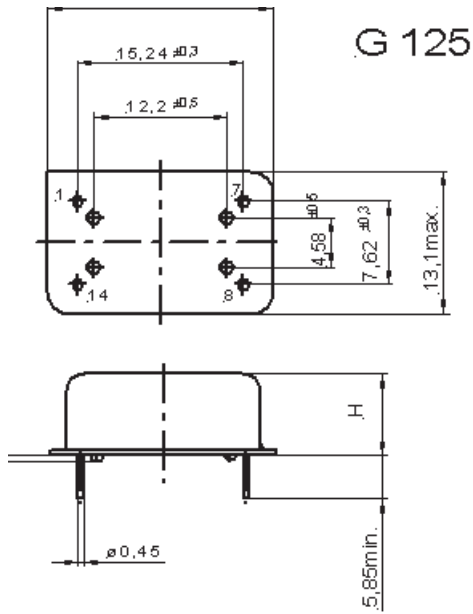
Performance Specifications

Frequency Stabilities ¹ (AT-Cut Crystal-Standard - 10 to 160 MHz)						
Parameter	Min	Typical	Max	Units	Condition	Options ⁵
vs. operating temperature range (referenced to +25°C)	-100		+100	ppb	-20 to +70°C	
	-250		+250	ppb	-20 to +70°C	
	-250		+250	ppb	-40 to +85°C	
Initial tolerance	-0.5		+0.5	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-20		+20	ppb	V _s ±5% static	
vs. load change	-20		+20	ppb	Load ±5% static	
vs. aging / day	-10		+10	ppb	after 30 days of operation	
vs. aging / year	-300		+300	ppb	≤ 60MHz after 30 days of operation	
	-500		+500	ppb	≥ 60 MHz after 30 days of operation	
Warm-up time			3	minutes	to ±200ppb of final frequency (1 hour reading) @ +25°C	
Frequency Stabilities ¹ (SC-Cut Crystal-Option - 10 to 160 MHz)						
vs. operating temperature range (referenced to +25°C)	-10		+10	ppb	-20 to +70°C	
	-25		+25	ppb	-20 to +70°C	
	-50		+50	ppb	-40 to +85°C	
Initial tolerance	-0.2		+0.2	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-10		+10	ppb	V _s ±5% static	
vs. load change	-10		+10	ppb	Load ±5% static	
vs. aging / day	-5.0		+5.0	ppb	after 30 days of operation	
vs. aging / year	-100		+100	ppb	≤ 60 MHz; after 30 days of operation	
vs. aging / year	-500		+500	ppb	≥ 60 MHz; after 30 days of operation	

Performance Specifications

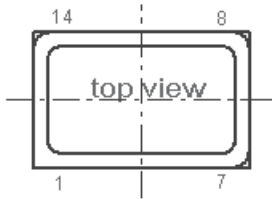
Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Units	Condition
Supply voltage (standard)	3.135	3.3	3.465	VDC	
	4.75	5.0	5.25	VDC	
Power consumption			2.5	Watts	during warm-up
			1.0	Watts	steady state @ +25°C
RF Output					
Signal [standard]	HCMOS				
Load		15		pF	
Signal Level (Vol)			0.4	VDC	with Vs=3.3V and 15pF Load
Signal Level (Vol)			0.5		with Vs=5.0V 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 and 15pF Load
Duty Cycle	45		55	%	@ (Voh-Vol)/2
Signal	Sine Wave				
Load		50		Ω	
Output Power @3,3V	2	5	8	dBm	50 Ω load
Putput Power @ 5.0V	5	8	11	dBm	50 Ω load
Harmonics			-30	dBm	50 Ω load
Frequency Tuning (EFC) 10 to 160 MHz					
Tuning Range	Fixed OCXO; No adjust				Option ⁵
Tuning Range	±5.0		±12	ppm	
	±1.0		±3	ppm	
Linearity	10%				
Tuning Slope	Positive				
Control Voltage Range	0.0	1.4	2.8	VDC	with Vs=3.3V
	0.0	2	4.0	VDC	with Vs=5.0V
Additional Parameters					
Phase Noise ³			-65 -95 -120 -140 -145	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	1 Hz 10 Hz 100 Hz 1 kHz 10 kHz
					@ 10MHz
Weight			8.0	g	
Processing & Packing	Handling & Processing Note				
Absolute Maximum Ratings					
supply voltage (Vs)			6.5	V	with Vs=3.3 & 5.0 VDC
Output Load			50	pF	
Operable Temperature Range	-55		+85	°C	
Storage Temperature Range	-55		+125	°C	

Outline Drawing / Enclosure



OX-400	
Height "H"	Pin Length "L"
8.5	5.85min.

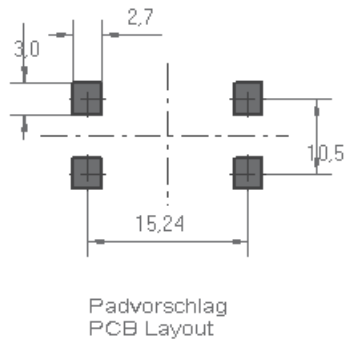
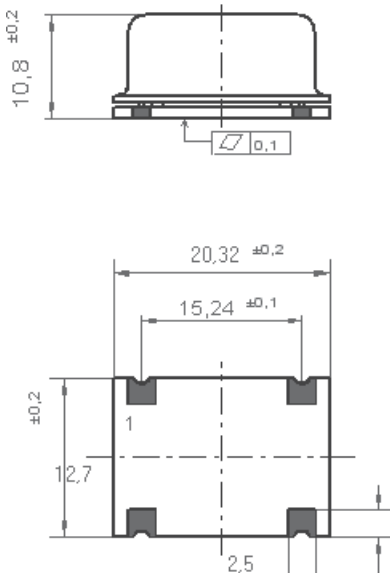
Pin Connections	
1	Electronic Frequency Control Input (EFC)
7	Ground (Case)
8	RF Output
14	Supply Voltage Input



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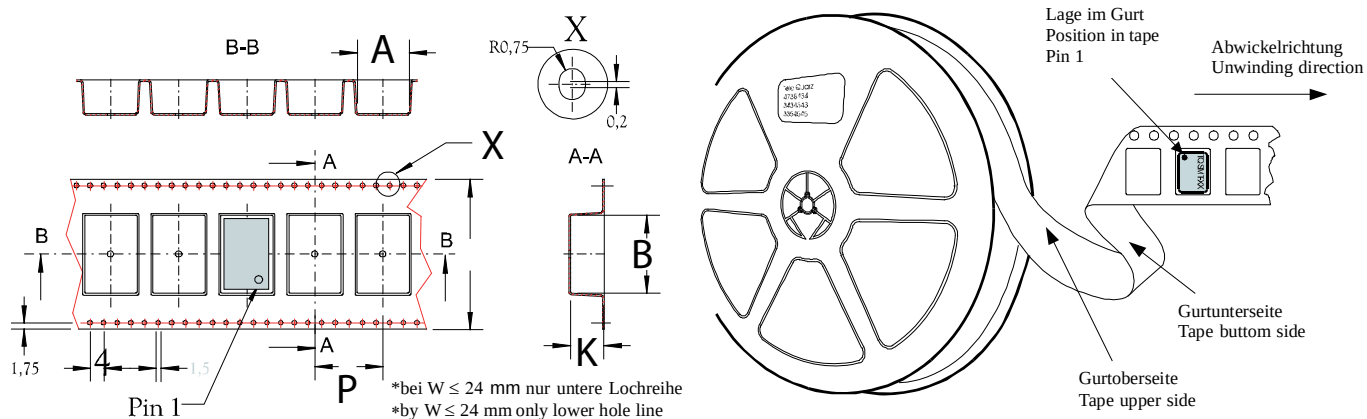
OX-401	
Height "H"	Pin Length "L"
10.8	N/A

Pin Connections	
1	Electronic Frequency Control Input (EFC)
7	Ground (Case)
8	RF Output
14	Supply Voltage Input



Dimensions in inches mm

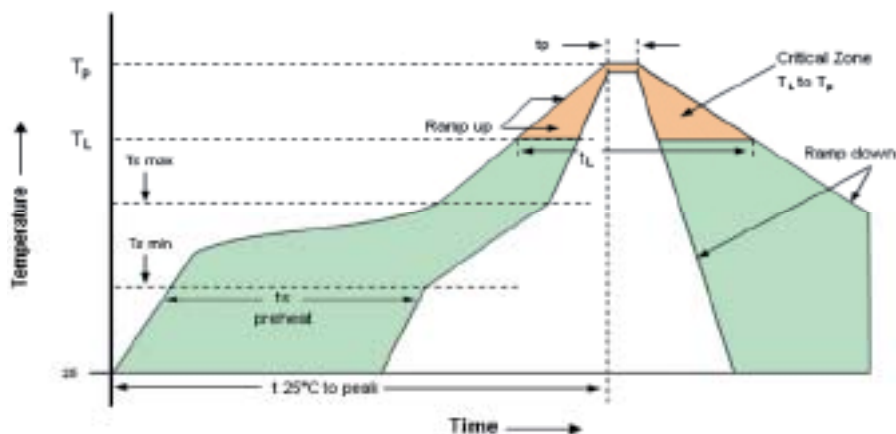
Standard Shipping Method (OX-401)



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
Typ OX-401	44	50	300	20

Recommended Reflow Profile

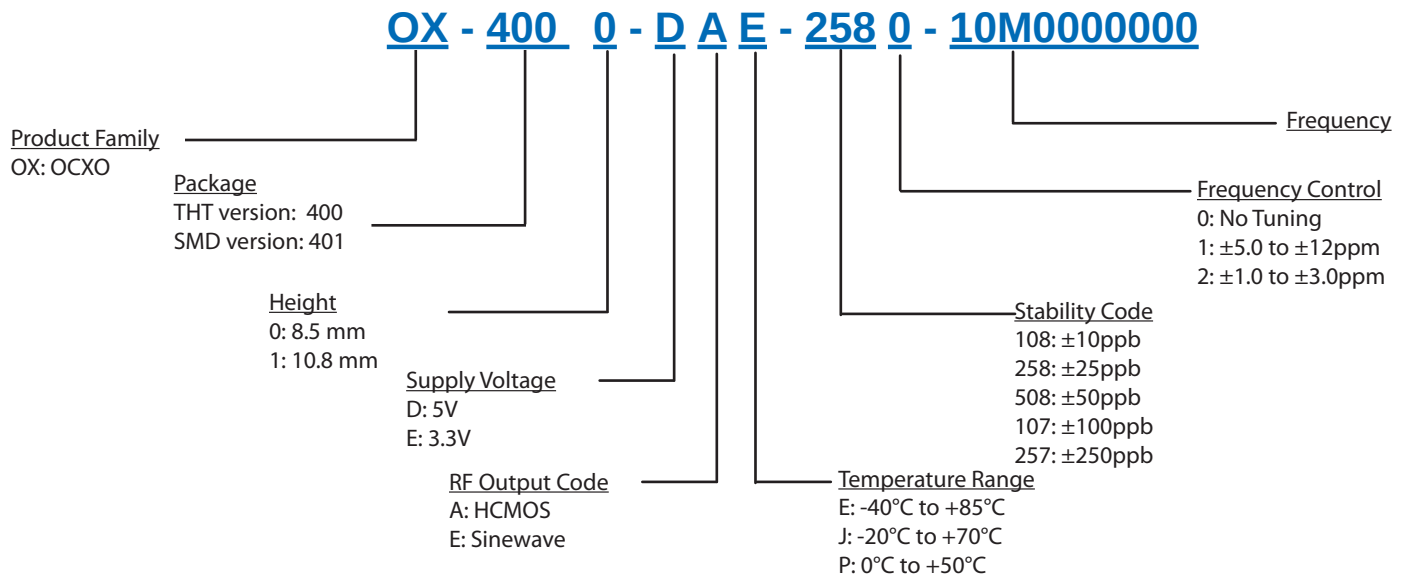
Solderprofile:



Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min T_{Smin} -Temperature Min T_{Smax} -Time (min to max) t_S	150°C 200°C 60-180 seconds	Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
T_{Smax} to T_L -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (t_P)	20-40 seconds
Peak Temperature (T_P)	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.
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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