

Helping Customers Innovate, Improve & Grow



OX-200

### 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

Frequency Stabilities <sup>1</sup> (AT-Cut Crystal-Standard - )						
Parameter	Min	Typical	Max	Units	Condition	Options <sup>5</sup>
vs. operating temperature range (referenced to +25°C)	-50		+50	ppb	0 to +70°C	
	-100		+100	ppb	-20 to +70°C	
	-150		+150	ppb	-20 to +70°C	
	-200		+200	ppb	-40 to +85°C	
Initial tolerance	-0.3		+0.3	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-10		+10	ppb	V <sub>s</sub> ±5% static	
vs. load change	-10		+10	ppb	Load ±5% static	
vs. aging / day	-2		+2	ppb	after 30 days of operation	
vs. aging / year	-500		+500	ppb	after 30 days of operation	
vs. aging / year (following year)	-250		+250	ppb	after 30 days of operation	
Warm-up time			5	minutes	to ±100ppb of final frequency (1 hour reading) @ +25°C	
Frequency Stabilities <sup>1</sup> (SC-Cut Crystal-Option - 10 to 160 MHz)						
vs. operating temperature range (referenced to +25°C)	-10		+10	ppb	0 to +70°C	
	-20		+20	ppb	-20 to +70°C	
	-25		+25	ppb	-20 to +70°C	
	-30		+30	ppb	-40 to +85°C	
Initial tolerance	-0.2		+0.2	ppm	at time of shipment, nominal EFC	
vs. supply voltage change	-5		+5	ppb	V <sub>s</sub> ±5% static	
vs. load change	-5		+5	ppb	Load ±5% static	
vs. aging / day	-1		+1	ppb	after 30 days of operation	
vs. aging / year	-100		+100	ppb	after 30 days of operation	
vs. aging / year (following year)	-50		+50	ppb	after 30 days of operation	
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		
	4.75	5.0	5.25	VDC		
	11.4	12.0	12.6	VDC		
Power consumption			3.0	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 & 12V 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 & 12V 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)						
Tuning Range	Fixed OCXO; No adjust				Option <sup>5</sup>	
Tuning Range	±3.0		±8	ppm		with AT cut crystal
	±0.75		±2.0	ppm		with SC cut crystal
Linearity	10%					
Tuning Slope	Positive					
Control Voltage Range	0.0	1.4	2.8	VDC	with Vs=3.3V	
	0.0	2.0	4.0		with Vs=5.0V	
	0.0	2.0	4.0	VDC	with Vs=12.0V	
Reference Voltage Output (Vref)						
Reference Voltage	2.75	2.8	2.85	VDC	with Vs = 3.3 VDC	
	3.92	4.0	4.08	VDC	with Vs = 5.0 VDC	
	4.9	5.0	5.1	VDC	with Vs =12 VDC	
Additional Parameters						
Phase Noise <sup>3</sup>			-90	dBc/Hz	1 Hz	@ 10MHz with SC Cut
			-120	dBc/Hz	10 Hz	
			-140	dBc/Hz	100 Hz	
			-145	dBc/Hz	1 kHz	
			-150	dBc/Hz	10 kHz	
Phase Noise <sup>3</sup>			-75	dBc/Hz	1 Hz	@ 10MHz with AT Cut
			-100	dBc/Hz	10 Hz	
			-130	dBc/Hz	100 Hz	
			-140	dBc/Hz	1 kHz	
			-150	dBc/Hz	10 kHz	
Weight			14	g		
Processing & Packing	Handling & Processing Note					

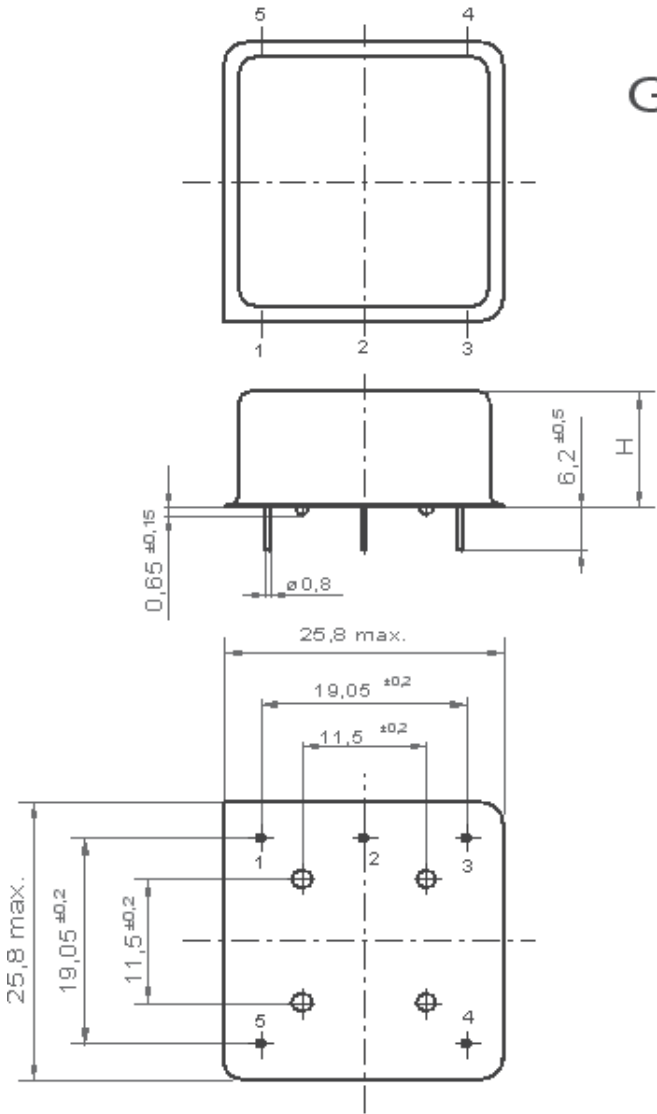
Absolute Maximum Ratings					
supply voltage (Vs)			6.5	V	with Vs=3.3 & 5.0 VDC
			15.0	V	with Vs= 12 VDC
Output Load			50	pF	
Operable Temperature Range	-55		+85	°C	
Storage Temperature Range	-55		+125	°C	

## Outline Drawing / Enclosure

G265

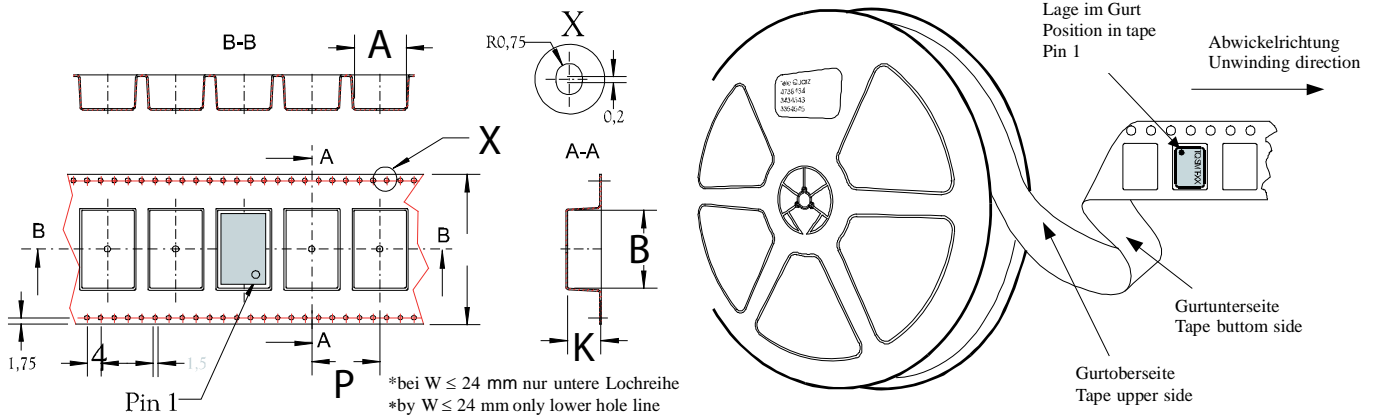
OX-200	
Height "H"	Pin Length "L"
10.4	6.2 min.
12.7	6.2 min
13,4	6.2 min

Pin Connections	
1	RF Output
2	Ground (Case)
3	Electronic Frequency Control Input (EFC)
4	Reference Voltage Option
5	Supply Voltage Input (VS)



Dimensions in mm

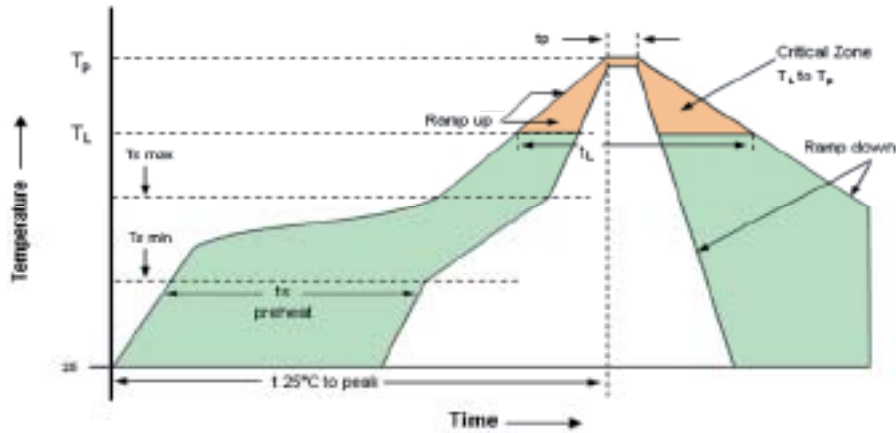
# Standard Shipping Method (OX-301)



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
Typ OX-401	44	37.5	280	32

## Recommended Reflow Profile

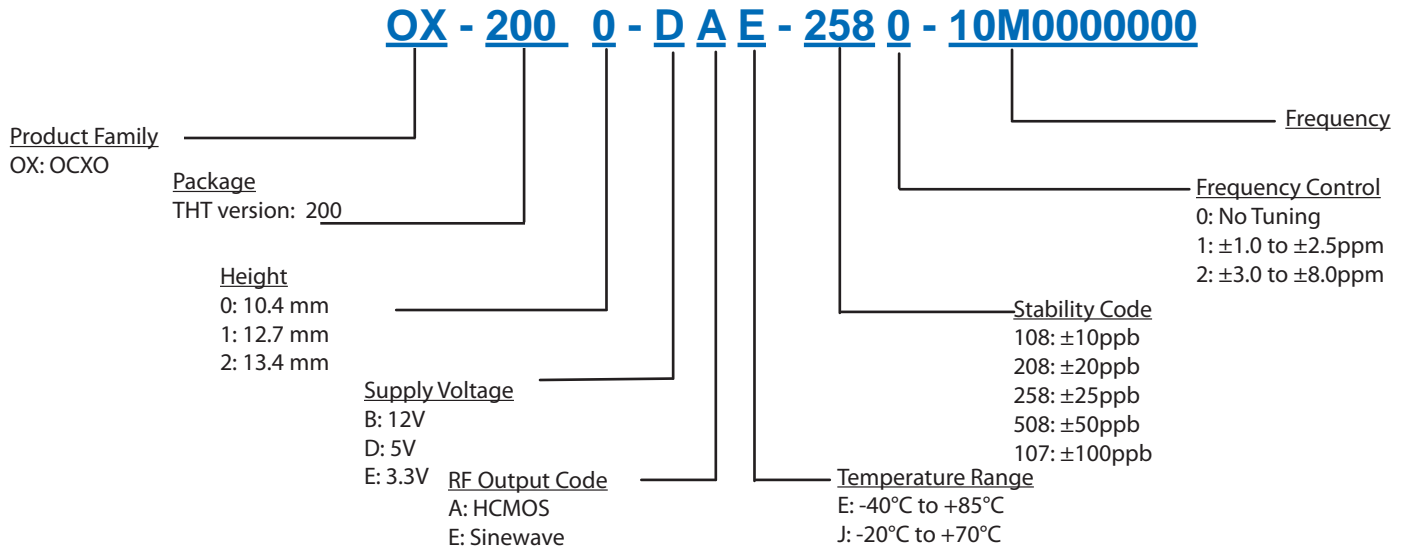
Solderprofile:



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.

## For Additional Information, Please Contact

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