



Revised in March 2015

## MXOC series - High stability low phase-noise OCXOs

### Features

High temperature stability: (up to  $\pm 1$  ppb over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ )  
 Very low phase noise: (to  $-175$  dBc/Hz, floor)  
 Low aging: to  $0.2$  ppb/day and  $20$  ppb/year  
 Fundamental operation at  $5$  through  $150$  MHz  
 Compact packaging

### Typical Applications

Cellular Base Stations  
 Instrumentation  
 Stratum 3E clock systems  
 Microwave communication  
 Radar reference

Packaging type E: "Europack"  
 $36 \times 27 \times 10.6$  mm

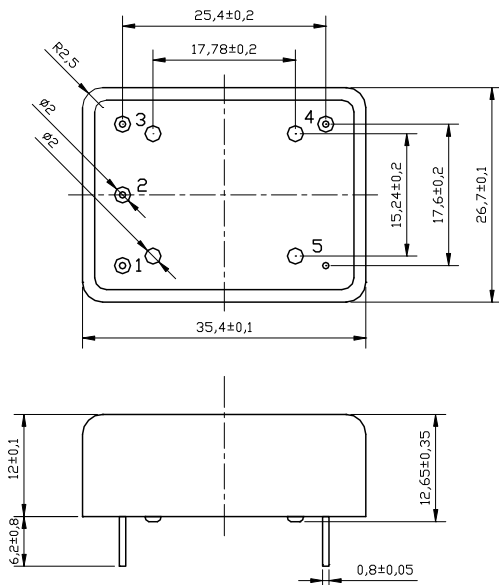


RoHS compliant

### Description

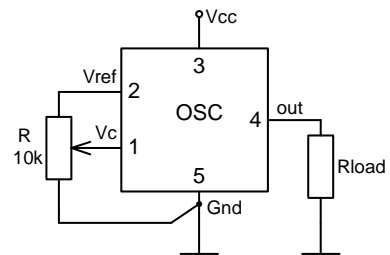
The MXOC series oven-controlled crystal oscillators are intended for wide applications where high temperature stability, low aging, low phase-noise along and compact sizes are major requirements. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages on customer choice: MXOCE, MXOCI, MXOCR, MXOCS models.

### Physical Dimensions



\* 10.6 mm height is available

### Pin Connections



Pin	Signal
1	Electrical tuning
2	Reference voltage
3	+V Supply
4	RF Out
5	GND

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**Specification**

Parameter	Sym.	Conditions	Value			Unit	Note	
			Min.	Typ.	Max.			
Frequency range	f <sub>0</sub>		5		150	MHz	Fundamental operation	
<b>RF output</b>								
HCMOS (TTL) option	Load		10		15	kOhm pF	for 10 MHz operational frequency	
	H-level voltage	V <sub>H</sub>	V <sub>cc</sub> =5 or 12 V V <sub>cc</sub> =3.3 V	3.8 2.4		V V		
	L-level voltage	V <sub>L</sub>			0.4	V		
	Duty cycle			45		55	%	
	Rise/Fall time					10	ns	for 10 MHz operational frequency
Sine-wave option	Level	L		+6	+8	+10	dBm	
	Load	R <sub>L</sub>			50		Ohm	
	Harmonics level					-30	dBc	
Sub-harmonics level				none				
<b>Power supply</b>								
Voltage	V <sub>cc</sub>		4.75	5.0	5.25	V	3.3V, 12V optional	
Power consumption		Warm-up state Steady state, +25°C		3.2 1	3.5 1.2	W W		
Warm-up time	t <sub>up</sub>	to Δf/f=1e-7, at +25°C			180	s	ref. to frequency after 30 min.	
<b>Frequency control*</b>								
Control voltage range	V <sub>c</sub>	V <sub>cc</sub> =5 or 12 V V <sub>cc</sub> =3.3 V	0 0		4.2 2.8	V V	Positive tuning slope (standard option)	
Tuning range			±0.5	±1		ppm		
Reference voltage	V <sub>ref</sub>	V <sub>cc</sub> =5 or 12 V V <sub>cc</sub> =3.3 V	4.1 2.7	4.2 2.8	4.3 2.9	V V		
<b>Frequency stability</b>								
vs. temperature		-40°C to +85°C, ref 25°C		±10		ppb	See chart below	
vs. supply voltage		ref V <sub>cc</sub> typ.		±1		ppb		
vs. acceleration		Worst direction	±0.5		±1	ppb/G		
SSB Phase noise		1 Hz	-106/-	-100/-		dBc/Hz	for 10MHz/100 MHz operational frequency	
		10 Hz	-135/-95	-125/-90				
		100 Hz	-155/-130	-145/-120				
		1 kHz	-163/-155	-155/-150				
		10 kHz	-170/-170	-165/-165				
		100 kHz	-172/-175	-168/-168				
Allan variance		1 s	5	10		e-12		
Aging	per day	after 30 days of operation	0.2			ppb	See chart below	
	first year		20			ppb		
	for 20 years			0.5				ppm
<b>Environmental, mechanical conditions.</b>								
Operating temperature range	See chart below							
Storage temperature range	-60°C to +90°C							
Humidity	Hermetically sealed							
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms							
Vibration	Per MIL-STD-202, 10G swept sine 10 to 2000 Hz							
Washing conditions	Washing with water or alcohol based detergent allowed only with final enough drying stage							
Soldering conditions	Hand solder only – not reflow compatible. 260°C 10s (on pins)							

\* No frequency control option – on customer requirement

**Ordering code**

MXOCE - C 18 B 5 T - 10 MHz  
 1 2 3 4 5

1	Temperature range
Code	Specification
A	0°C..50°C
B	-10°C..60°C
C	0°C..70°C
D	-20°C..70°C
E	-30°C..70°C
F	-40°C..85°C
G	-55°C..85°C
H	-40°C..125°C

2	Stability over temperature			
Code	Specification	Temperature range code available		
		for 10 MHz	for 100 MHz	
XZ	±Xe-Y	A...B		
50	±5e-10	A...F		
19	±1e-9	A...G		
29	±2e-9	A...H		
39	±3e-9	A...G	A	
59	±5e-9	A...G	A...F	
18	±1e-8	A...G	A...G	
28	±2e-8	A...H	A...G	
58	±5e-8	A...H	A...G	
17	±1e-7	A...H	A...G	

3	Aging per day/year, ppb/ppm	
Code	Specification	
B	0.2/0.02	≤10 MHz
Z	0.3/0.03	
C	0.5/0.05	≤20 MHz
D	1/0.1	≤40 MHz
E	1.5/0.15	≤50 MHz
F	2/0.2	≤120 MHz
G	3/0.3	
H	5/0.5	≤150 MHz

Deviation of the parameters is possible on customers' requirements

4	Supply voltage	
Code	Specification	
3	3.3V±5%	
5	5V±5%	
2	12V±10%	

5	Output	
Code	Specification	
T	HSMOS/TTL	
S	Sine-wave	

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