



Revised in March 2015

MXOC series - High stability low phase-noise OCXOs

Features

High temperature stability: (up to ± 1 ppb over -40°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"
 36x27x10.6 mm

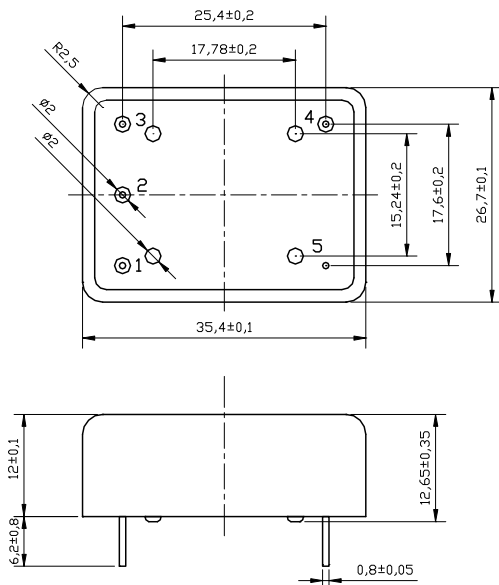


RoHS compliant

Description

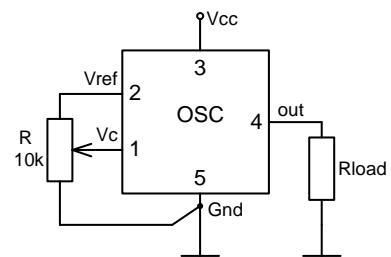
The MXOC series oven-controlled crystal oscillators are intended for wide applications where high temperature stability, low aging, low phase-noise along and compact sizes are major requirements. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages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



Specification

Parameter	Sym.	Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Frequency range	f_0		5		150	MHz	Fundamental operation
RF output							
HCMOS (TTL) option	Load		10		15	kOhm	for 10 MHz operational frequency
	H-level voltage	V_H	$V_{cc}=5$ or 12 V $V_{cc}=3.3$ V	3.8 2.4		pF V	
	L-level voltage	V_L			0.4	V	
	Duty cycle			45		55	%
	Rise/Fall time					10	ns
Sine-wave option	Level	L	+6	+8	+10	dBm	
	Load	R_L		50		Ohm	
	Harmonics level				-30	dBc	
Sub-harmonics level			none				
Power supply							
Voltage	V_{cc}		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	
Warm-up time	t_{up}	to $\Delta f/f=1e-7$, at +25°C			180	s	ref. to frequency after 30 min.
Frequency control*							
Control voltage range	V_c	$V_{cc}=5$ or 12 V $V_{cc}=3.3$ V	0 0		4.2 2.8	V	Positive tuning slope (standard option)
Tuning range			± 0.5	± 1		ppm	
Reference voltage	V_{ref}	$V_{cc}=5$ or 12 V $V_{cc}=3.3$ V	4.1 2.7	4.2 2.8	4.3 2.9	V	
Frequency stability							
vs. temperature		-40°C to +85°C, ref 25°C		± 10		ppb	See chart below
vs. supply voltage		ref Vcc 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			
Environmental, mechanical conditions.							
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	$\pm Xe-Y$	A...B		
50	$\pm 5e-10$	A...F		
19	$\pm 1e-9$	A...F	-	
29	$\pm 2e-9$	A...F	-	
39	$\pm 3e-9$	A...G	A	
59	$\pm 5e-9$	A...G	A...F	
18	$\pm 1e-8$	A...G	A...G	
28	$\pm 2e-8$	A...H	A...G	
58	$\pm 5e-8$	A...H	A...G	
17	$\pm 1e-7$	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 $\pm 5\%$	
5	5V $\pm 5\%$	
2	12V $\pm 10\%$	

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