



Revised in March 2015

MXOC series - High stability low phase-noise OCXOs

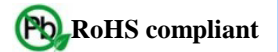
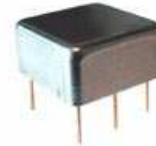
Features

High temperature stability: to ± 1 ppb in (-40 to +85) $^{\circ}$ C
 Very low phase noise: (to -175 dBc/Hz, floor)
 Low aging: to 0.2 ppb/day and 0.02 ppm/year
 Fundamental operation at 5 through 150 MHz
 Small sizes packaging

Typical Applications

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

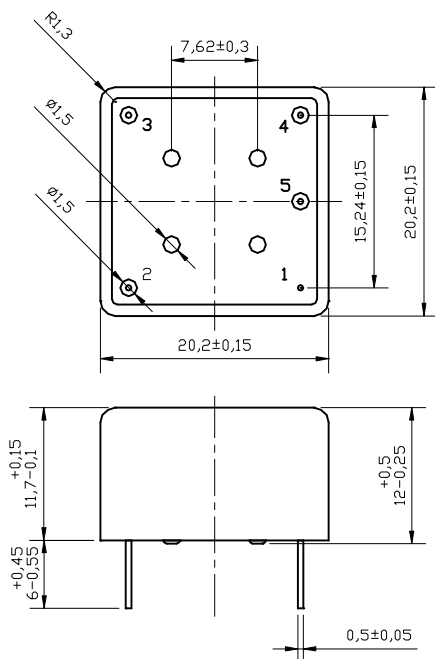
Packaging type R: 20x20x10.3 mm



Description

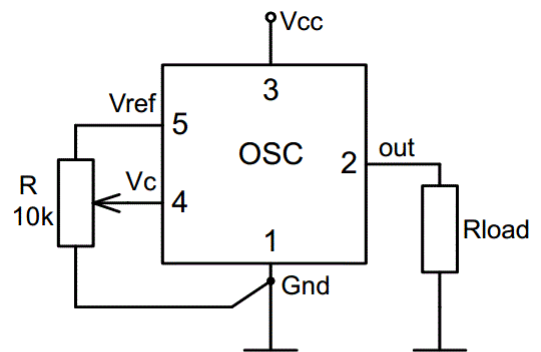
The MXOC series oven-controlled crystal oscillators are intended for wide applications where high temperature stability, low aging, low phase-noise along and compact sizes are major requirements. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages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

Physical Dimensions



* - 12.0 mm, 12.9 mm heights and 0.8 mm pins diameter are available

Pin Connections



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

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 pF	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		V V		
	L-level voltage	V_L			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_L			50		Ohm	
	Harmonics level					-30	dBc	
Spurious level					-100	dBc		
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 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 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 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 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	0.5		ppb	For 10 MHz (see chart below)	
	first year		20	50		ppb		
	for 20 years		0.3	0.5		ppm		
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 500 Hz (pins 0.5 mm), 10G swept sine 0-2000 Hz (pins 0.8 mm)							
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							

* No frequency control option – on customer requirement

Ordering code

MXOCR - 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	
XZ	$\pm Xe-Y$	for 10 MHz	for 100 MHz
50	$\pm 5e-10$	A...B	-
19	$\pm 1e-9$	A...F	-
29	$\pm 2e-9$	A...F	-
39	$\pm 3e-9$	A...G	-
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		
Z	0.3/0.03		≤ 10 MHz
C	0.5/0.05		≤ 20 MHz
D	1/0.1		≤ 40 MHz
E	1.5/0.15		≤ 50 MHz
F	2/0.2		
G	3/0.3		≤ 120 MHz
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		