



Revised in March 2015

MXOC series - High stability low phase-noise OCXOs

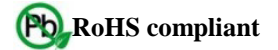
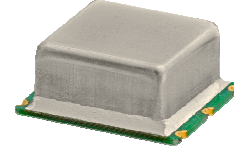
Features

High temperature stability: to ± 1 ppb in $(-40 +85)^{\circ}\text{C}$
 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
 Compact surface mount packaging

Typical Applications

Cellular Base Stations
 Instrumentation
 Stratum 3E Clock Systems
 Radar Reference
 Microwave Applications

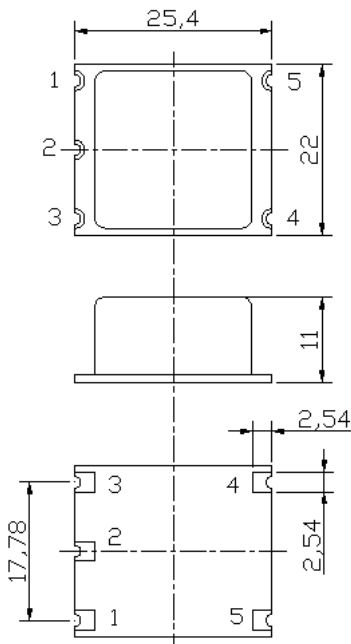
Packaging type S: "Surface mount" 25x22x11.0 mm



Description

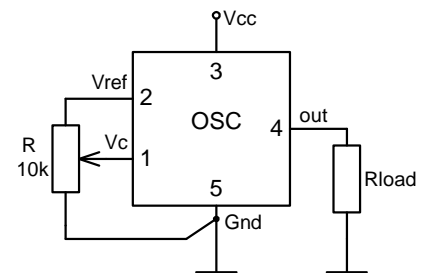
The MXOC series oven-controlled crystal oscillators are intended for wide applications where high temperature stability, low aging, low phase-noise along and compact sizes are major requirements. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages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

Physical Dimensions



*12.7 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 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
Sine-wave option	Level	L		+6	+8	+10	dBm
	Load	R _L			50		Ohm
	Harmonics level					-30	dBc
Sub-harmonics level				none		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 Δf/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 V _{cc} 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	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	Non-condensing, 95%						
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms						
Vibration	Per MIL-STD-202, 10G swept sine 10 to 500 Hz						
Impermeability	Not hermetical. Don't wash or immerse into liquid when cleaning!						
Soldering conditions	Hand solder only – not reflow compatible. 260°C, 10s (on pins)						

* No frequency control option – on customer requirement

Ordering code

MXOCS - 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...F	-	
29	±2e-9	A...F	-	
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	≤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	≤50 MHz
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±5%
5	5V±5%
2	12V±10%

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