



Revised in March 2015

MXOH series – High stability high frequency OCXOs

Features

Extended to 300 MHz frequency range (multiplication is used)
 Up to 3 ppb temperature stability in (-40...+85)°C at 100 MHz
 Very low aging – to 50 ppb/year at 100 MHz
 Low Allan variance, 1s to 1×10^{-11}
 Compact Packaging

Typical Applications

Wireless Communications
 Synthesizer Reference
 Microwave Communications
 Instrumentation

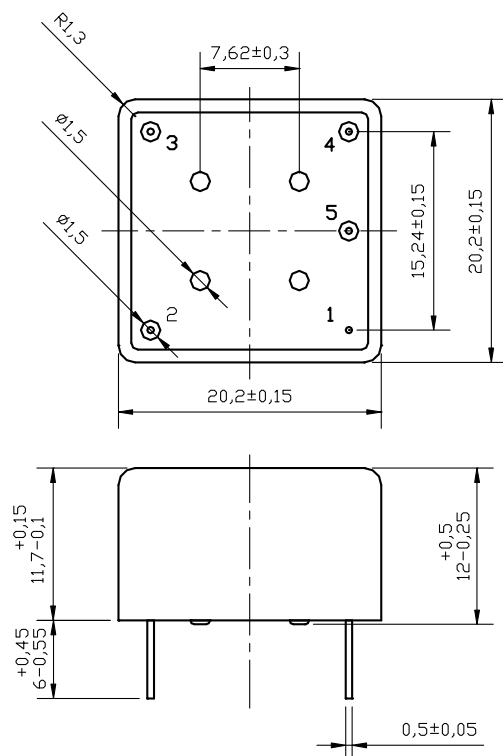
Packaging type R: 20.4 x 20.4 x 10.5 mm



Description

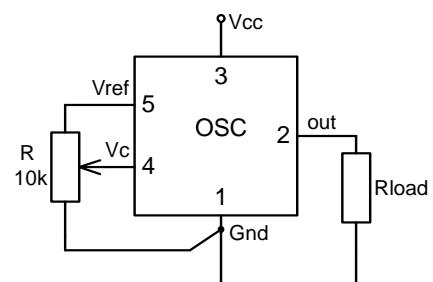
The OCXOs of series MXOH operate in wide frequency range - from 30 to 300 MHz with usage of internal frequency multiplication by 3 or 5. Besides, the internal multiplication of frequency enables to the oscillators improvement, comparing with the MXOC series, of the temperature stability, aging and Allan variance in 30-150 MHz operational range. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages on customer choice: MXOHE, MXOHI, MXOHR, MXOHS models.

Physical Dimensions



*10.3 mm, 12.9 mm heights and 0.8 mm pins diameter are available on customer requirement

Pin Connections



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

Specification

OCXO Specification	Sym.	Condition	Value			Unit	Note	
			Min.	Typ.	Max.			
Operational Frequency Range	f_0		30		300	MHz	Frequency multiplication	
RF output								
HCMOS/TTL compatible option	Load		10		5	kOhm pF	for 100MHz operational freq.	
	H - level voltage	V_H	$V_{cc}=5$ or 12 V $V_{cc}=3.3$ V	3.8 2.4		V		
	L - level voltage	V_L			0.4	V		
	Rise & Fall time				2.5	ns	for 100MHz operational freq.	
	Duty cycle			45		55	%	
Sine-wave option	Level	L	$V_{cc}=5$ or 12 V	+5	+7	+11	dBm	
	Load	R_L			50		Ohm	
	Harmonics					-30	dBc	
Sub-harmonics						-40	dBc	
Power supply								
Voltage	V_{cc}		4.75	5.0	5.25	V	3.3V, 12V available	
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	sec.	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	for 100MHz operational freq.	
Reference voltage	V_{ref}	$V_{cc}=5$ or 12 V $V_{cc}=3.3$ V	4.10 2.70	4.20 2.80	4.30 2.90	V V		
Frequency stability								
vs. temperature		-40°C to +85°C, ref 25°C	± 3			ppb	For 100 MHz, see chart below	
vs. supply voltage		ref Vcc typ.		± 3		ppb		
vs. acceleration		Worst direction	± 0.5		± 1	ppb/G		
SSB Phase noise		10 Hz		-95		dBc/Hz	for 100 MHz operational freq.	
		100 Hz		-125				
		1 kHz		-140				
		10 kHz		-150				
		100 kHz		-155				
Allan variance		1 s	10	30		e-12		
Aging	per day	after 30 days of operation	± 0.5			ppb	For 100 MHz (see chart below)	
	first year		± 0.05			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 (on pins)							

* No frequency control option – on customer requirement

Ordering code

MXOHR - E 18 C 5 S - 100 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

2	Stability over temperature			
Code	Specification	Temperature range code available		
XZ	$\pm Xe-Z$	for 100 MHz (mult. by 5)	for 300 MHz (mult. by 3)	
29	$\pm 2e-9$	A...B	-	
39	$\pm 3e-9$	A...F	A...B	
59	$\pm 5e-9$	A...G	A...F	
18	$\pm 1e-8$	A...G	A...G	
28	$\pm 2e-8$	A...G	A...G	
58	$\pm 5e-8$	A...G	A...G	
17	$\pm 1e-7$	A...G	A...G	

3	Aging per day/year, ppb/ppm	
Code	Specification	
B	0.2/0.02	For frequency range of 30-150 MHz
Z	0.3/0.03	
C	0.5/0.05	
D	1/0.1	
E	1.5/0.15	
F	2/0.2	For frequency range of 150-300 MHz
G	3/0.3	
H	5/0.5	

4	Supply voltage	
Code	Specification	
3	3.3V $\pm 5\%$	
5	5V $\pm 5\%$	
2	12V $\pm 10\%$	

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

Deviation of the parameters is possible on customers' requirements.