

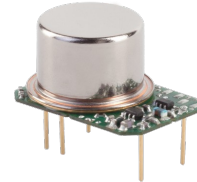
Revised in March 2019

Low Power High Stability Miniature OCXO

Features

Very Low Power Consumption: 0.18W at +25°C
High Stability: up to ±10 ppb -40°C to 85°C
Fast Warming-up to 30 s
Low Phase Noise: -172 dBc/Hz floor
Low Aging: 0.1 ppb/day, 15 ppb/year
Wide Frequency range: 8 – 150 MHz

14 DIP compatible



Typical Applications

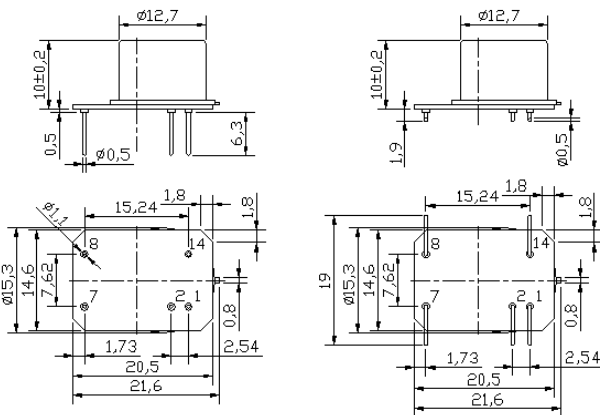
High precision GPS receivers
Portable Wireless Communications
Mobile Test Equipment
UHF Synthesizers
Battery Powered Application

RoHS compliant

Description

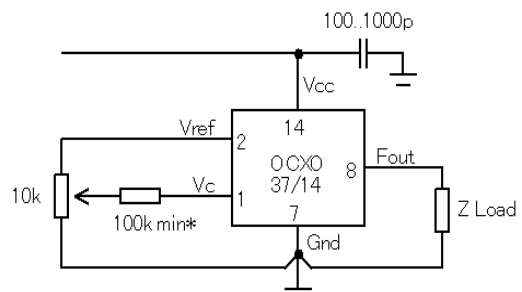
The MXO37 series utilizes the internal heating resonator technology (IHR) with arrangement of the oven system together with the crystal plate inside the TO-8 vacuum holder. Such approach results in radical reduction of the OCXO sizes, power consumption and warm-up time. The MXO37/14 and MXO37/14S (SMD) models have DIP14 compatible sizes and pins-out. The oscillators provide extraordinary combination of tiny sizes and extremely low power consumption with superb frequency stability and very low phase-noise level. Fundamental operation at up to 150 MHz enables very low spurious level in the output spectra and thereby substantial reduction of the phase jitter. That makes the MXO37/14 oscillators a very attractive solution for UHF synthesizers and other portable microwave applications.

Physical Dimensions



The manufacturer reserves the right to reduce the external dimensions without changing of connecting dimensions.

Pin Connections



* required for some versions

Pin	Signal
1	Electrical tuning
2	Reference voltage
7	GND
8	RF Out
14	+V Supply

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Specification

Parameter	Sym.	Conditions	Value			Unit	Note	
			Min.	Typ.	Max.			
Frequency range	f_0		8		150	MHz		
Initial tolerance	$(f-f_0)/f_0$	+25°C, $V_{cc}=0.5*V_{ref}$		±0.1		ppm		
RF output								
HCMOS (TTL) option	Load		10		15/5	kOhm pF	10/100 MHz	
	H-level voltage	V_{Hl}	$V_{cc}=5V$ $V_{cc}=3.3V$	3.7 2.4		V		
	L-level voltage	V_{Ll}			0.4	V		
	Duty cycle			45		55	%	
	Rise/Fall time					10/3	ns	10/100 MHz
Sine-wave option	Level	L	$V_{cc}=5V$ $V_{cc}=3.3V$	+7 +4		dBm		
	Load	R_L			50	Ohm		
	Harmonics level					-25	dBc	
Sub-harmonics level			none					
Power supply								
Voltage	V_{cc}		4.75 3.15	5.0 3.3	5.25 3.45	V		
Power consumption		Warm-up time Steady state, +25°C		180	1200	mW	10MHz, -40°C..85°C	
Warm-up time	t_{up}	at +25°C to $\Delta f/f=1e-7$ at +25°C to $\Delta f/f=1e-8$	30	60 120		s	ref. to freq. after 15 min. of operation	
Frequency control								
Control voltage range	V_c	$V_{cc}=5V$ $V_{cc}=3.3V$	0 0		4.2 3.0	V		
Tuning range		Compliance with 10 years of aging	±0.3	±1		ppm	positive slope	
Reference voltage	V_{ref}	$V_{cc}=5V$ $V_{cc}=3.3V$	4.1 2.7	4.2 2.8	4.3 2.9	V		
Frequency stability								
vs. temperature		ref. 25°C, air flow 0.5 m/s max.	±10			ppb	See ordering code	
vs. supply voltage		ref V_{cc} typ.		±2		ppb		
G – sensitivity		worst direction, 0 – 1kHz vibration BW (for 0 – 2kHz BW consult the factory)	±0.2	±1		ppb/G		
Retrace		24h work after 24h off			±10	ppb	10MHz	
SSB Phase noise		1 Hz	-105/----		-90/----	dBc/Hz	10/100MHz $V_{cc}=5V$	
		10 Hz	-135/-100		-120/-90			
		100 Hz	-155/-130		-145/-120			
		1 kHz	-165/-155		-155/-150			
		10 kHz	-170/-170		-165/-165			
		100 kHz	-172/-172		-165/-165			
Allan deviation		1 s	5		40	e-12	10MHz	
Aging	per day	after 30 days of operation	±0.1			ppb	10MHz see ordering code	
	first year		±0.015			ppm		
Environmental, mechanical conditions								
Airflow velocity	0.5 m/s maximum							
Operating temperature range	See ordering code							
Storage temperature range	-60°C to +85°C							
Power voltage	-0.5V to $V_{cc}+20\%$							
Control voltage	-0.5V to 6V							
Humidity	Non-condensing 95%							
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms							
Vibration	Per MIL-STD-202, 10G swept sine 0 to 2000Hz							
Soldering conditions	Hand solder only – not reflow compatible. 260°C 10s (on pins)							
Washing Conditions	Washing with water or alcohol based detergent allowed only with final enough drying stage							

For ordering code – see next page

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Ordering code

MXO37	/14	-	F	59	C	5	S	- 10 МГц
	1		2	3	4	5	6	

1 Packaging type	
Code	Case
/14	14 DIP
/14S	14 DIP SMD

2 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
Q	-60°C..85°C

3 Stability over temperature				
Code	Specific.	Temperature range code available for 10MHz 5V	Temperature range code available for 100MHz 5V	
XY	±Xe-Y			
19	±1e-9	-	-	
29	±2e-9	-	-	
39	±3e-9	A, B	-	
59	±5e-9	A, B, C, D, E	-	
18	±1e-8	A, B, C, D, E, F, G, Q	A	
28	±2e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E	
38	±3e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F	
58	±5e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G	
17	±1e-7	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G	

5 Supply voltage	
Code	Specification
3	3.3V±5%
5	5V±5%

4 Aging per day/year, ppb/ppm		
Code	Specification	
A	0.1/0.015*	≤10 MHz
B	0.2/0.02	
Z	0.3/0.03	≤20 MHz
C	0.5/0.05	
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

* available for temperature range A,B,C,D,E

6 Output	
Code	Specification
T	HSMOS
S	Sine wave

Deviation of the parameters is possible on customer's requirements. Please consult the factory.