



Revised in November 2019

Low Power Miniature Low Profile OCXO

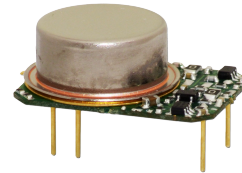
Features

8 mm height
Shock resistant, 500G 1ms – option "D"
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

Typical Applications

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

14 DIP compatible

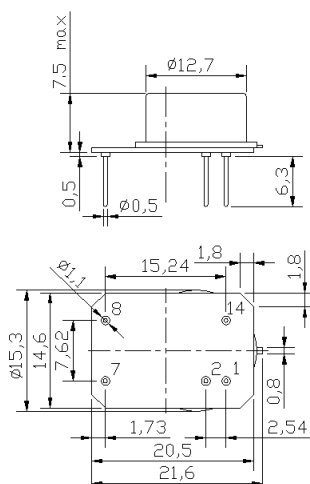


RoHS compliant

Description

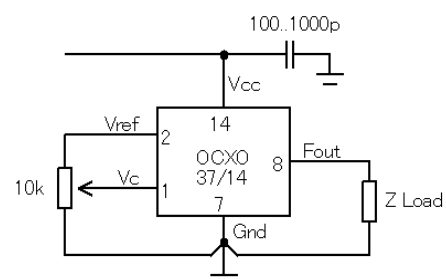
The MX037 series utilizes the internal heating resonator (IHR) technology incorporating the whole oven system together with the crystal plate inside the TO-8 vacuum holder. Such OCXO concept results in radical reduction of its volume, power consumption and warm-up time. In spite of the miniature sizes and extremely low power consumption such oscillators exhibit excellent temperature stability, low phase-noise and aging rate being at the level of high-end OCXOs using conventional oven designs.

Physical Dimensions



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

Pin Connections



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 _C =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 _H	V _{cc} =5 V V _{cc} =3.3 V	3.7 2.4			V	
	L-level voltage	V _L				0.4	V	
	Duty cycle			45		55	%	
	Rise/Fall time					10/3	ns	10/100 MHz
Sine-wave option	Level	L	V _{cc} =5 V V _{cc} =3.3 V	+7 +4			dBm	
	Load	R _L			50		Ohm	
	Harmonics level					-25	dBe	
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 Δf/f=1e-7 at +25°C to Δf/f=1e-8	30	60 120		s	ref. to freq. after 15 min. of operation
Frequency control								
Control voltage range		V _C	V _{cc} =5 V V _{cc} =3.3 V	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} =5 V V _{cc} =3.3 V	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 (500G half sine pulse, 1ms - option "D")						
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

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

1	Packaging type
<i>Code</i>	<i>Case</i>
-	standard
D -	500G Shock

2	Temperature range
<i>Code</i>	<i>Specification</i>
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			
<i>Code</i>	<i>Specific.</i>	<i>Temperature range code available for 10MHz 5V</i>	<i>Temperature range code available for 100MHz 5V</i>	
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
<i>Code</i>	<i>Specification</i>
3	3.3V±5%
5	5V±5%

4	Aging per day/year, ppb/ppm	
<i>Code</i>	<i>Specification</i>	
A	0.1/0.015*	≤10 MHz
B	0.2/0.02	
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

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

6	Output
<i>Code</i>	<i>Specification</i>
T	HSMOS
S	Sine wave

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