

Revised in November 2019

Ultra Low Power High Stability Miniature OCXO

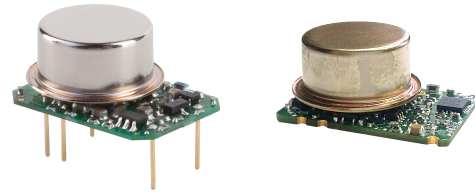
Features

Very Low Power Consumption: 0.18W at +25°C
Shock resistant, 500G 1ms – option "D"
High Stability: up to ±2 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

Portable Wireless Communications
Mobile Test equipment
Synthesizers
Battery Powered Application

14 DIP compatible



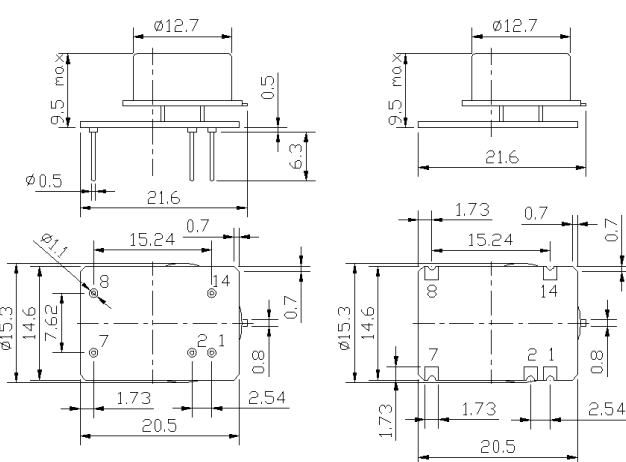
RoHS compliant

Description

The MXO37 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.

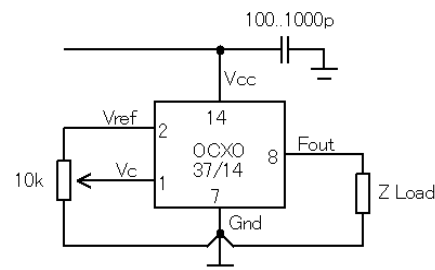
The novel MXO37/14P version differs from the basic MXO37/14 model by improved oscillator circuitry providing essentially better temperature stability at the same miniature sizes, extremely low power consumption and low phase-noise level.

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, $V_{cc}=0.5 \cdot V_{ref}$		±0.1		ppm		
RF output								
HCMOS (TTL) option	Load		10		15/5	kOhm pF	10/100 MHz	
	H-level voltage	V_H	$V_{cc}=5V$ $V_{cc}=3.3V$	3.8 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	$V_{cc}=5V$ $V_{cc}=3.3V$	+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		700 180	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 2.8	V		
Tuning range		Compliance with 10 years of aging	±0.3	±1.0		ppm	positive slope	
Reference voltage	V_{ref}	$V_{cc}=5V$ $V_{cc}=3.3V$	4.0 2.7		4.3 3.1	V		
Frequency stability								
vs. temperature		ref. 25°C, air flow 0.5 m/s max.	±1.0			ppb	See ordering code	
vs. supply voltage		ref V_{cc} typ.		±2.0		ppb		
G – sensitivity		worst direction, 0 – 1kHz vibration BW (for 0 – 2kHz BW height of OCXO 10.5mm)	±0.2		±1.0	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		30	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

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

1	Implementation type
<i>Code</i>	<i>Specification</i>
-	14 DIP
S - T	SMD
D -	14 DIP 500G Shock
DS - T	SMD 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	A, B, C, D, E	-	
29	±2e-9	A, B, C, D, E, F	-	
39	±3e-9	A, B, C, D, E, F	-	
59	±5e-9	A, B, C, D, E, F, G	A	
18	±1e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F	
28	±2e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G	
38	±3e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q	
58	±5e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q	
17	±1e-7	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q	

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	≤20 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	≤120 MHz
G	3/0.3	≤120 MHz
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.