



Revised in March 2015

Low power high-strength miniature OCXO

Features MXO37/14D

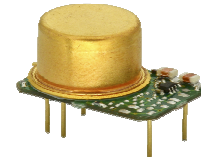
Very small sizes
Ultra low power consumption: 0.23W at +25°C
Very high mechanical strength: to up 500G, 1 ms shocks,
Vibration 30G to 2000Hz sine
High frequency stability: to ± 10 ppb over -40°C to 85°C
Fast warming up: to 60s –typical, 30s – optionally
Operational frequency range: 8 – 100 MHz

Typical Applications

Portable and battery fed wireless
Mobile test equipment
Beacons & Rescue systems
Equipment working at severe mechanical factors

14DIP compatible

MXO37/14D

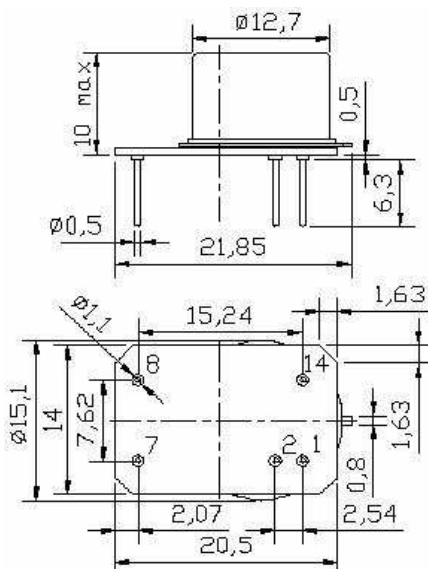


RoHS compliant

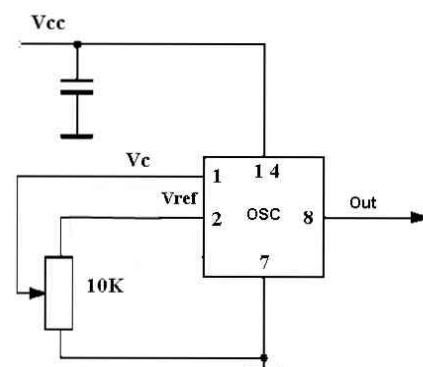
Description

The MXO37 series uses the internal heating resonator (IHR) technology with arrangement of the whole 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 its warm-up time providing at that excellent temperature stability, low phase-noise and aging. The MXO37/14D model utilizes essentially strengthened mechanical construction of the IHR enabling extraordinary mechanical durability.

Physical Dimensions



Pin Connections



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

Specification

Ultra Low Power High Durable Miniature OCXO

Parameter		Sym.	Conditions	Value			Unit	Note		
				Min.	Typ.	Max.				
Frequency range		f ₀		8		100	MHz			
RF output										
HCMOS	Load			10		15	kOhm pF	10 MHz op. freq.		
	H-level voltage	V _H	V _{cc} =5 V V _{cc} =3.3 V	3.8 2.4			V			
	L-level voltage	V _L				0.4	V			
	Duty cycle			45		55	%			
	Rise/Fall time					10	ns	10 MHz op. freq.		
Sine-wave	Level	L _S			+8		dBm			
	Harmonics	L _H				-25	dBc			
	Load	R _L		45	50	55	Ohm			
	Sub-harmonics	L _{SH}		none			dBc			
Power supply										
Voltage		V _{cc}		4.75	5.0	5.25	V	3.3V available		
Power consumption			Warm-up state Steady state, +25°C		1.0 0.23		W W			
Warm-up time		t _{up}	to Δf/f=1e-7, at +25°C, V _{cc} =5V to Δf/f=1e-7, at +25°C, V _{cc} =3.3V	30 40	60 70		s	ref. to frequency after 15 min for 10 MHz		
Frequency control										
Control voltage range		V _c	V _{cc} =5 V V _{cc} =3.3 V	0 0		4.2 2.8	V V	Tuning slope - positive		
Tuning range				±0.5	±1		ppm			
Reference voltage		V _{ref}	V _{cc} =5 V V _{cc} =3.3 V	4.1 2.7	4.2 2.8	4.5 2.9	V V			
Frequency stability										
vs. temperature			-30°C to +70°C, ref 25°C		±50		ppb	See chart below		
vs. supply voltage			ref V _{cc} typ.		±2		ppb			
vs. acceleration			Worst direction	0.5		±1	ppb/G			
SSB Phase noise			1 Hz 10 Hz 100 Hz 1 kHz 10 kHz	-97/- -130/-95 -152/-125 -162/-155 -165/-165	-95/- -125/-90 -145/-120 -155/-150 -162/-162		dBc/Hz	For 10MHz/100 MHz operational frequency.		
Aging	per day		after 30 days of operation		±0.5				ppb	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			Non-condensing 95%							
Mechanical shock			Per MIL-STD-202, 500G half sine pulse, 1 ms							
Vibration			Per MIL-STD-202, 30G swept sine 10 to 2000 Hz							

Ordering code

MXO37	/14D-	C	58	C	5	S	-	10 MHz
1	2	3	4	5	6			

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	
		10MHz	100MHz
XZ	$\pm X_e-Z$		
59	$\pm 5e-9$	A...B	-
18	$\pm 1e-8$	A...G	-
28	$\pm 2e-8$	A...G	A
38	$\pm 3e-8$	A...G	A...B
58	$\pm 5e-8$	A...G	A...G
17	$\pm 1e-7$	A...G	A...G

3	Aging: per day/per year, $10^{-9}/10^{-6}$
Code	
Z	0.3/0.03 $\leq 10\text{ MHz}$
C	0.5/0.05 $\leq 20\text{ MHz}$
D	1/0.1 $\leq 40\text{ MHz}$
E	1.5/0.15 $\leq 50\text{ MHz}$
F	2/0.2 $\leq 100\text{ MHz}$
G	3/0.3 $\leq 100\text{ MHz}$
H	5/0.5 $\leq 100\text{ MHz}$

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

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