

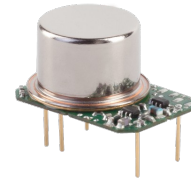
Low power high-strength high frequency Miniature OCXO

Features

Very small sizes
8 mm height is available
Ultra low power consumption: 0.23W at +25°C
Very high mechanical strength: to up 1000G, 0,5 ms shocks
Extended to 300 MHz frequency range (multiplication is used)
Vibration up to 30G to 2000Hz sine
Frequency stability to ± 20 ppb over -40°C to 85°C at 100 MHz
Fast warming up: to 60s to 0.1ppm accuracy
Operational frequency range: 30 – 300 MHz

Typical Applications

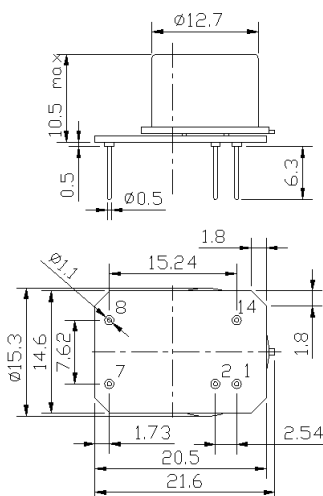
Portable and battery fed wireless
Mobile test equipment
Beacons & Rescue systems
Equipment working at severe mechanical factors

14 DIP compatible

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 MXO37H/14D model utilizes essentially strengthened mechanical construction of the IHR enabling extraordinary mechanical durability. Usage of the internal multiplication of frequency (by 3 or 5) enables extension of the operational frequencies up to 300 MHz and improvement as compared to the MXO37 series of the temperature stability and aging rate in 30-150 MHz range.

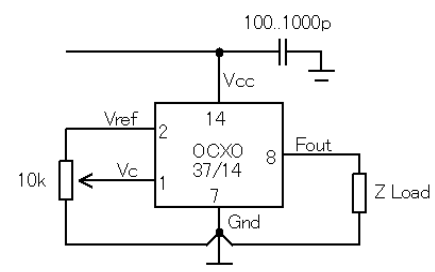
Physical Dimensions



8 mm height is available. Please consult the factory.

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

Revised in September 2021

Specification

Parameter	Sym.	Conditions	Value			Unit	Note	
			Min.	Typ.	Max.			
Frequency range	f_0		30		300	MHz	Frequency multiplication on 3 and 5	
Initial tolerance	$(f-f_0)/f_0$	+25°C, $V_c=0.5 \cdot V_{ref}$		±0.1		ppm		
RF output								
HCMOS (TTL) option	Load		10		5	kOhm pF	100 MHz	
	H-level voltage	V_H	$V_{cc}=5V$ $V_{cc}=3.3V$	3.7 2.4		V		
	L-level voltage	V_L			0.4	V		
	Duty cycle			45		55	%	
	Rise/Fall time					3.0	ns	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						-40	dBc	
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		230	1200	mW	100MHz, -40°C..85°C	
Warm-up time	t_{up}	at +25°C to $\Delta f/f=1e-7$ at +25°C to $\Delta f/f=1e-8$		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}	$V_{cc}=5V$ $V_{cc}=3.3V$	4.1 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.	±20	±50		ppb	See ordering code	
vs. supply voltage		ref V_{cc} typ.		±5		ppb		
G – sensitivity		worst direction, 0 – 1kHz vibration BW (for 0 – 2kHz BW consult the factory)	±0.2	±1.0		ppb/G		
Retrace		24h work after 24h off			±10	ppb	100MHz	
SSB Phase noise		10 Hz	-105		-90	dBc/Hz	100MHz multiplication by 3 $V_{cc}=5V$	
		100 Hz	-135		-115			
		1 kHz	-150		-140			
		10 kHz	-158		-150			
		100 kHz	-158		-150			
Allan deviation		1 s	10		50	e-12	100MHz	
Aging	per day	after 30 days of operation	±0.5			ppb	100MHz see ordering code	
	first year		±0.05			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, 500G half sine pulse, 1ms (1000G half sine pulse, 0,5ms — is available as option)							
Vibration	Per MIL-STD-202, 10G sweep sine 0 to 2000Hz (30G sweep sine 0 to 2000Hz — is available as option)							
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

Revised in September 2021

Ordering code

MXO37H/14D	F	59	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
Q	-60°C..85°C

2	Stability over temperature			
Code	Specific.	Temperature range code available for 100MHz 5V	Temperature range code available for 300MHz 5V	
XY	±Xe-Y			
59	±5e-9	A, B		
18	±1e-8	A, B, C, D, E, F		A
28	±2e-8	A, B, C, D, E, F, G		A, B, C, D, E
38	±3e-8	A, B, C, D, E, F, G		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, Q

3	Aging per day/year, ppb/ppm	
Code	Specification	
A	0.1/0.015*	For frequency range of 30-150 MHz
B	0.2/0.02	
Z	0.3/0.03	
C	0.5/0.05	
D	1/0.1	
E	1.5/0.15	For frequency range of 150-300 MHz
F	2/0.2	
G	3/0.3	
H	5/0.5	

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

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

6	Output
Code	Specification
T	HSMOS
S	Sine wave

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