



Revised in November 2019

Ultra Low Power High Frequency High Stability Miniature OCXO

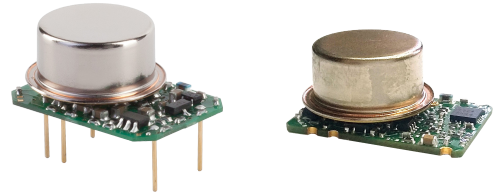
Features

Very low power consumption - to 0.18W at +25°C
 Shock resistant, 500G 1ms – option "D"
 14 DIP compatible sizes and pins-out
 Extended to 300 MHz frequency range (multiplication is used)
 Up to 1×10^{-8} temperature stability in (-40...+85)°C at 100 MHz
 Very low aging – to 50 ppb/year at 100 MHz
 Low Allan variance, 1s 1×10^{-11}
 Fast warming up - to 30 s

Typical Applications

Portable and Low Power
 Synthesizer Reference
 Microwave Communications
 Instrumentation
 Radar Reference

14 DIP compatible

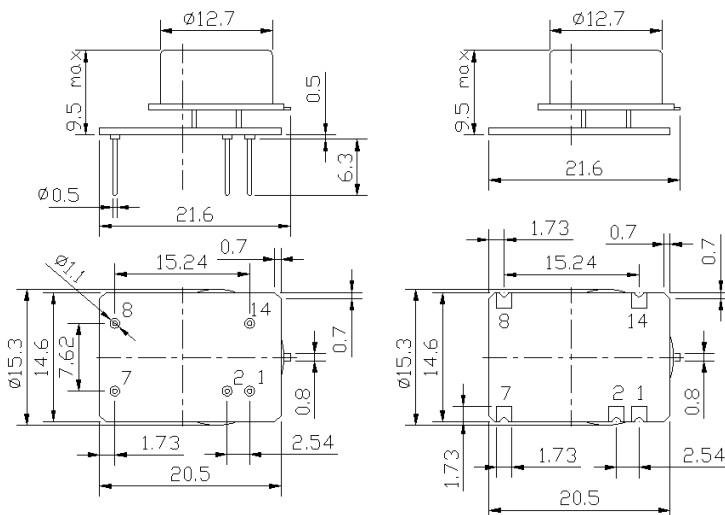


RoHS compliant

Description

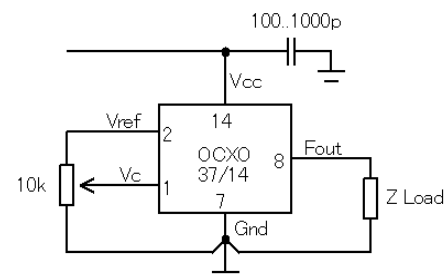
The MXO37H/14 series like the other MXO37 series utilizes the internally heated resonator technology (IHR) providing very low power consumption, miniature sizes and fast warming up. Usage of the internal multiplication of frequency (by 3 or 5) enables extension of the operational frequencies up to 300 MHz and improvement as compared to the MXO37 series of the temperature stability and aging rate in 30-150 MHz range.

Physical Dimensions



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		30		300	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		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	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		180	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 $\Delta f/f=1e-8$	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		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.		±2.0		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	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, 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

MXO37H/14P	S - T	F	59	C	5	S	- 100 MHz
	1	2	3	4	5	6	

1 Implementation type	
Code	Case
-	14 DIP
S - T	SMD
D -	14 DIP 500G Shock
DS-T	SMD 500G Shock

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 100MHz 5V	Temperature range code available for 300MHz 5V	
XY	±Xe-Y			
59	±5e-9	A	-	
18	±1e-8	A, B, C, D, E, F	A	
28	±2e-8	A, B, C, D, E, F, G, Q	A, B, C, D	
38	±3e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E	
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	
Code	Specification
3	3.3V±5%
5	5V±5%

4 Aging per day/year, ppb/ppm		
Code	Specification	
A	0.1/0.015*	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	150-300 MHz
F	2/0.2	
G	3/0.3	
H	5/0.5	

* 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.