

Revised in October 2023

Ultra Low Power High Stability Miniature OCXO

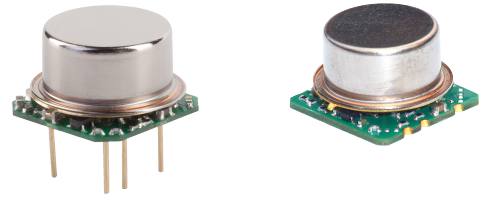
Features

Very low power consumption (to 70mW at +25°C)
 High frequency stability (to ± 5 ppb over -40°C to 85°C)
 Very fast warming-up to 30 s.
 Very low phase-noise level (-172 dBc/Hz, floor)
 Low aging (to 0.1ppb/day, 0.015ppm/year)
 Fundamental operation at up to 150 MHz

Typical Applications

Portable Wireless Communications
 Mobile Test equipment
 Beacons & Rescue systems
 Battery Powered Applications

8 DIP compatible

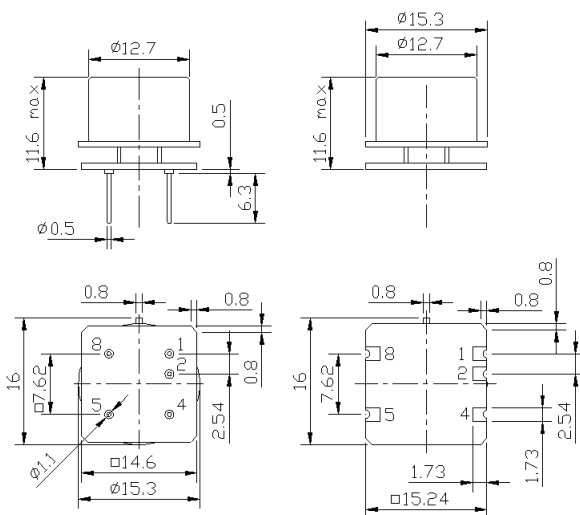


RoHS compliant

Description

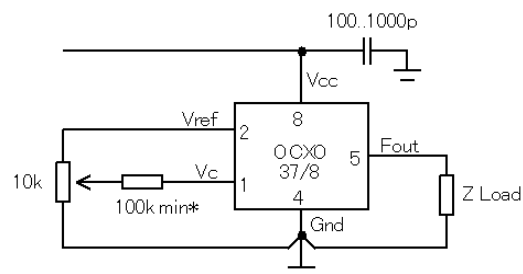
The crystal plate inside the TO-8 vacuum holder. Such approach results in radical reduction of the OCXO sizes, power consumption and warm-up time. In spite of very small sizes and extremely low power consumption these oscillators exhibit excellent frequency stability and low phase-noise level comparable with that of the high-end conventional OCXO designs. The MXO37/8UP and MXO37/8UPS-T (SMD) models have DIP8 compatible sizes and pins-out and are the world smallest high stability OCXOs.

Physical Dimensions



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

Pin Connections



* required for some versions

Pin	Signal
1	Electrical tuning
2	Reference voltage
4	GND
5	RF Out
8	+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, $V_{cc}=0.5*V_{ref}$		±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			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}	$V_{cc}=5V$ $V_{cc}=3.3V$	4.1 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.	±5.0			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	±1.0		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							
Vibration	Per MIL-STD-202, 5G 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

MXO37/8UP	S - T	C	58	C	5	S	- 10 MHz
	1	2	3	4	5	6	

1	Packaging type
Code	Case
-	8 DIP
S - T	SMD

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 10MHz 5V	Temperature range code available for 100MHz 5V	
XY	±Xe-Y			
39	±3e-9	A, B	-	
59	±5e-9	A, B, C, D, E, F	-	
18	±1e-8	A, B, C, D, E, F, G	A, B	
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, 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*	≤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
Code	Specification
T	HSMOS
S	Sine wave

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