

Revised in December 2017

## Very low power high stability low phase-noise miniature OCXO

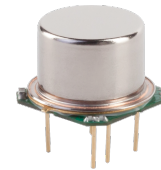
### Features

*Miniature DIP8 sizes*  
*Very low power consumption (to 180mW at +25°C)*  
*High frequency stability (to  $\pm 10$  ppb over -40°C to 85°C)*  
*Very fast warming-up (to 30 s)*  
*Very low phase-noise level (-165 dBc/Hz, floor)*  
*Low aging (to 0.1ppb/day, 0.015ppm/year)*  
*Fundamental operation at up to 100 MHz*

### Typical Applications

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

### 8 DIP compatible

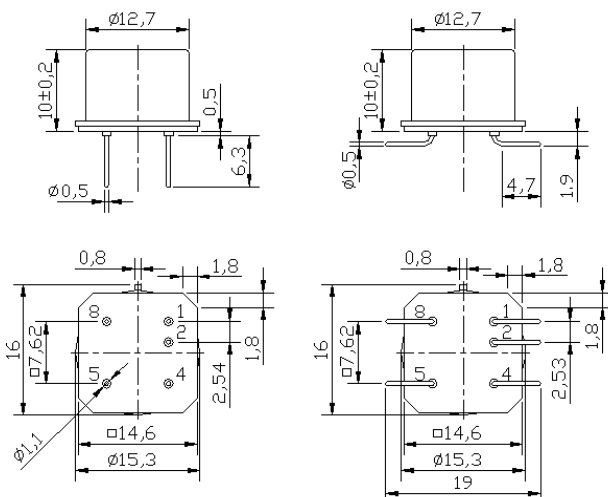


RoHS compliant

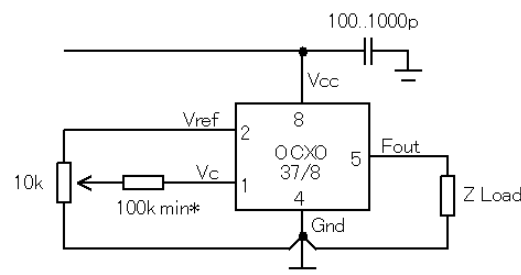
## Description

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 MXO37/8 and MXO37/8S (SMD) models have DIP8 compatible sizes and pins-out and are the world smallest high stability OCXOs.

### Physical 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		100	MHz		
Initial tolerance	$(f-f_0)/f_0$	+25°C, $V_{cc}=0.5*V_{ref}$		±0.1		ppm		
<b>RF output</b>								
HCMOS (TTL) option	Load		10		15/5	kOhm pF	10/100 MHz	
	H-level voltage	$V_H$	$V_{cc}=5V$ $V_{cc}=3.3V$	3.7 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					
<b>Power supply</b>								
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	
<b>Frequency control</b>								
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	$V_{ref}$	$V_{cc}=5V$ $V_{cc}=3.3V$	4.0 2.7	4.2 2.8	4.3 2.9	V		
<b>Frequency stability</b>								
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		ppb		
G – sensitivity		worst direction, 0 – 1kHz vibration BW (for 0 – 2kHz BW consult the factory)	±0.3	±1		ppb/G		
Retrace		24h work after 24h off			±10	ppb	10MHz	
SSB Phase noise  Typical phase noise is default option. For different phase noise consult the factory.		1 Hz	-100/----	-90/----		dBc/Hz	10/100MHz $V_{cc}=5V$	
		10 Hz	-130/-95	-120/-90				
		100 Hz	-148/-125	-141/-120				
		1 kHz	-155/-150	-150/-141				
		10 kHz	-163/-163	-160/-158				
		100 kHz	-163/-163	-160/-160				
<b>Allan deviation</b>			1 s	5	20	e-12	10MHz	
<b>Aging</b>	per day	after 30 days of operation	±0.1			ppb	10MHz see ordering code	
	first year		±0.015			ppm		
<b>Environmental, mechanical conditions</b>								
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, 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**

<b>MXO37</b>	/8	-	C	58	C	5	- 10 МГц
	<b>1</b>		<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	

<b>1</b> Packaging type	
Code	Case
/8	8 DIP
/8S	8 DIP SMD

<b>2</b> 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

<b>3</b> 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	-	-	
59	±5e-9	A, B		
18	±1e-8	A, B, C, D, E, F, G		
28	±2e-8	A, B, C, D, E, F, G, Q	A	
38	±3e-8	A, B, C, D, E, F, G, Q	A, B	
58	±5e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E	
17	±1e-7	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q	

<b>5</b> Supply voltage	
Code	Specification
3	3.3V±5%
5	5V±5%

<b>4</b> 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	≤20 MHz
C	0.5/0.05	
D	1/0.1	≤40 MHz
E	1.5/0.15	≤50 MHz
F	2/0.2	≤100 MHz
G	3/0.3	
H	5/0.5	≤100 MHz

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