

Abramzon Xtal Technologies



Magic Xtal Ltd. - manufacturer

MXO37/8P

Revised in November 2019

Low power high stability low phase-noise miniature OCXO

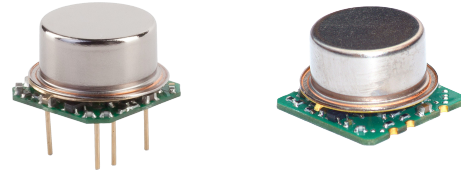
Features

Miniature DIP8 sizes
 Shock resistant, 500G 1ms – option "D"
 Low power consumption (to 130 mW at +25°C)
 High frequency stability (to ± 2 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

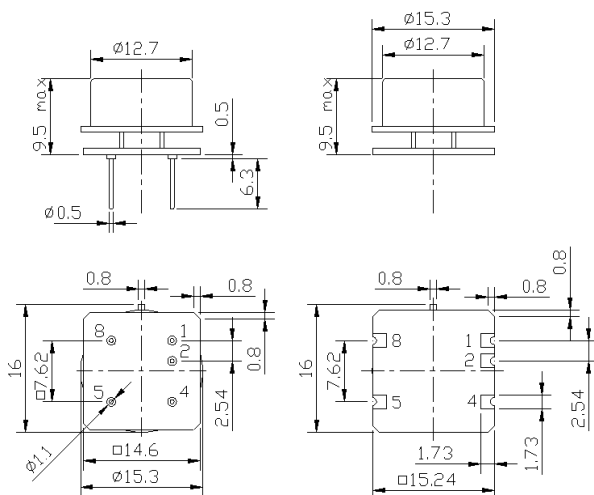


RoHS compliant

Description

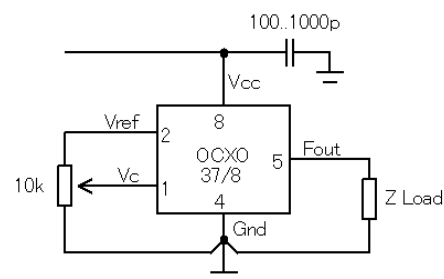
The crystal plate inside the TO-8 vacuum holder. Such approach results in radical reduction of the OCXO sizes, power consumption and warm-up time. In spite of very small sizes and extremely low power consumption these oscillators exhibit excellent frequency stability and low phase-noise level comparable with that of the high-end conventional OCXO designs. The MXO37/8P and MXO37/8PS-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



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	$(f-f_0)/f_0$	$+25^\circ\text{C}, V_c=0.5*V_{ref}$		± 0.1		ppm		
RF output								
HCMOS (TTL) option	Load		10		15/5	kOhm pF	10/100 MHz	
	H-level voltage	V_{HI}	$V_{cc}=5\text{ V}$ $V_{cc}=3.3\text{ V}$	3.8 2.4		V		
	L-level voltage	V_{LI}			0.4	V		
	Duty cycle			45		55	%	
	Rise/Fall time					10/3	ns	10/100 MHz
Sine-wave option	Level	L	$V_{cc}=5\text{ V}$ $V_{cc}=3.3\text{ V}$	+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, $+25^\circ\text{C}$			1200 180	mW	10MHz, $-40^\circ\text{C}..85^\circ\text{C}$	
Warm-up time	t_{up}	at $+25^\circ\text{C}$ to $\Delta f/f=1e-7$ at $+25^\circ\text{C}$ 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	$V_{cc}=5\text{ V}$ $V_{cc}=3.3\text{ V}$	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}	$V_{cc}=5\text{ V}$ $V_{cc}=3.3\text{ V}$	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.	± 2.0			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 height of OCXO 10.5mm)	± 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 $V_{cc}=5\text{V}$	
		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		± 0.1			ppb	10MHz see ordering code	
	first year	after 30 days of operation	± 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 $+85^\circ\text{C}$							
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

Ordering code

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

1 Implementation type	
Code	Specification
-	8 DIP
S - T	8 DIP SMD
D -	8 DIP 500G Shock
DS - T	8 DIP 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 10MHz 5V	Temperature range code available for 100MHz 5V
XY	±Xe-Y		
19	±1e-9	A, B, C, D, E	-
29	±2e-9	A, B, C, D, E, F	-
39	±3e-9	A, B, C, D, E, F	-
59	±5e-9	A, B, C, D, E, F, G	A
18	±1e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F
28	±2e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G
38	±3e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q
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*
B	0.2/0.02
Z	0.3/0.03
C	0.5/0.05
D	1/0.1
E	1.5/0.15
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.