

Revised in May 2017

Miniature Ultra High Stability Low power OCXO

Features

Miniature 5 ccm packaging
Power consumption: <math><180\text{ mW}</math>
High stability - to $\pm 5 \times 10^{-10}$ over -40 to $+80^\circ\text{C}$
Low aging rate - to $\pm 1 \times 10^{-10}/\text{day}$, $1.5 \times 10^{-8}/\text{year}$
Low Allan variance value – up to $3 \times 10^{-12}/1\text{s}$
Frequency range: 5 to 150 MHz

Typical Applications

GPS Disciplined Mobile Frequency Standards
Portable Instrumentation
Mobile Communication Systems
Battery Supply Beacons

Packaging: 20.2 x 20.2 mm

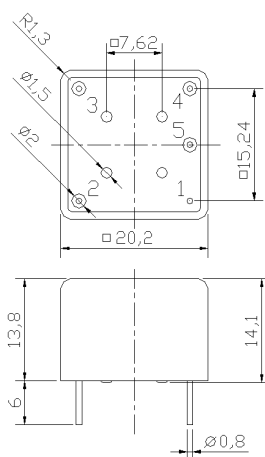


RoHS compliant

Description

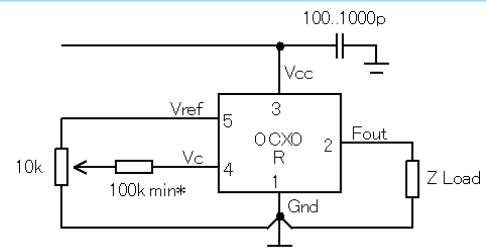
The MXO37/R model is built on advanced internally heated resonator (IHR) technology providing combination of very low power consumption and small sizes with outstanding frequency stability in wide temperature range that is unachievable with usage of conventional OCXO designs. The unique parameters of the oscillators make it very prospective for application in various high-end portable (especially battery supplied) equipment demanding superb frequency stability at minimal power consumption and smallest sizes.

Physical Dimensions



12.9 mm, 12.0 mm height and 0.5 mm pins are available

Pin Connections



* required for some versions

Pin	Signal
1	GND
2	RF Out
3	+V Supply
4	Electrical tuning
5	Reference voltage

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Specification

Parameter	Sym.	Conditions	Value			Unit	Note	
			Min.	Typ.	Max.			
Frequency range	f_0		5		150	MHz		
Initial tolerance	$(f-f_0)/f_0$	+25°C, $V_{cc}=0.5*V_{ref}$	±0.01	±0.1		ppm		
RF output								
HCMOS (TTL) option	Load		10		15/5	kOhm pF	10/100 MHz	
	H-level voltage	V_H	$V_{cc}=5V$ $V_{cc}=3.3V$	3.7 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					-30	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		180	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		4.3 3.0	V		
Tuning range		Compliance with 10 years of aging	±0.3			ppm	positive slope	
Reference voltage	V_{ref}	$V_{cc}=5V$ $V_{cc}=3.3V$	4.0 2.5		4.3 3.1	V		
Frequency stability								
vs. temperature		ref. 25°C, air flow 0.5 m/s max.	±0.5			ppb	See ordering code	
vs. supply voltage		ref V_{cc} typ.		±0.2		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		1 Hz	-110/----		-90/----	dBc/Hz	10/100MHz $V_{cc}=5V$	
		10 Hz	-140/-100		-120/-90			
		100 Hz	-155/-130		-145/-120			
		1 kHz	-165/-155		-155/-150			
		10 kHz	-170/-170		-165/-165			
		100 kHz	-170/-173		-165/-165			
Allan variance		1 s	3		30	e-12	10MHz	
Aging	per day	after 30 days of operation	±0.1			ppb	10MHz see ordering code	
	first year		±0.15			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	Hermetically sealed							
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms							
Vibration	Per MIL-STD-202, 10G swept sine 10 to 2000Hz (5G swept sine 10 to 500Hz for OCXO with 0.5mm pins)							
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/R	-	B	50	B	5	T	-	10 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
J	-40°C..80°C
F	-40°C..85°C
G	-55°C..85°C
Q	-60°C..85°C

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

2				Stability over temperature
Code	Specific.	Temperature range code available for 10MHz 5V	Temperature range code available for 100MHz 5V	
XY	±Xe-Y			
30	±3e-10	A, B		-
50	±5e-10	A, B, C, D, E, J		-
19	±1e-9	A, B, C, D, E, J, F		-
29	±2e-9	A, B, C, D, E, J, F		-
39	±3e-9	A, B, C, D, E, J, F		A, B
59	±5e-9	A, B, C, D, E, J, F, G		A, B, C, D, E, J
18	±1e-8	A, B, C, D, E, J, F, G, Q		A, B, C, D, E, J, F, G
28	±2e-8	A, B, C, D, E, J, F, G, Q		A, B, C, D, E, J, F, G
38	±3e-8	A, B, C, D, E, J, F, G, Q		A, B, C, D, E, J, F, G
58	±5e-8	A, B, C, D, E, J, F, G, Q		A, B, C, D, E, J, F, G, Q
17	±1e-7	A, B, C, D, E, J, F, G, Q		A, B, C, D, E, J, F, G, Q

3			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		≤120 MHz
H	5/0.5		≤150 MHz

5		Output
Code	Specification	
T	HSMOS/TTL	
S	Sine wave	

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