



Revised in May 2017

High stability low phase-noise OCXO

Features

High temperature stability: to ± 1 ppb in $(-40$ to $+85)^\circ\text{C}$
 Very low phase noise: (to -175 dBc/Hz, floor)
 Low aging: to 0.1 ppb/day and 0.015 ppm/year
 Fundamental operation at 5 through 150 MHz
 Small sizes packaging

Typical Applications

Cellular Base Stations
 Instrumentation
 Microwave Applications
 Stratum 3E clock systems
 Radar reference

Packaging type I: "Inch x Inch" 25.8x25.8

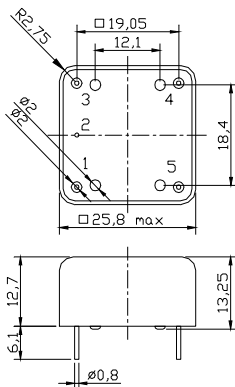


RoHS compliant

Description

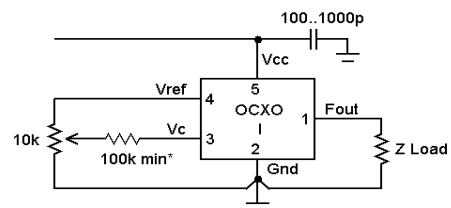
The MXOC series oven-controlled crystal oscillators are intended for wide applications where high temperature stability, low aging, low phase-noise along and compact sizes are major requirements. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages on customer choice: MXOCE, MXOCI, MXOCR, MXOCS models.

Physical Dimensions



12.3 mm, 10,6 mm height

Pin Connections



* required for some versions

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

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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_{Hi}	$V_{cc}=5V, 12V$ $V_{cc}=3.3V$	3.7 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	$V_{cc}=5V, 12V$ $V_{cc}=3.3V$	+7 +4		dBm		
	Load	R_L			50	Ohm		
	Harmonics level					-30	dBc	
Sub-harmonics level			none					
Power supply								
Voltage	V_{cc}		11.4 4.75 3.15	12.0 5.0 3.3	12.6 5.25 3.45	V		
Power consumption		Warm-up time Steady state, +25°C			3500 1200	mW	10MHz, -40°C..85°C	
Warm-up time	t_{up}	at +25°C to $\Delta f/f=1e-7$			180	s	ref. to freq. after 15 min. of operation	
Frequency control								
Control voltage range	V_c	$V_{cc}=5V, 12V$ $V_{cc}=3.3V$	0 0		4.3 3.1	V		
Tuning range		Compliance with 10 years of aging	±0.3			ppm	positive slope	
Reference voltage	V_{ref}	$V_{cc}=5V, 12V$ $V_{cc}=3.3V$	4.0 2.5		4.3 3.1	V		
Frequency stability								
vs. temperature		ref. 25°C, air flow 0.5 m/s max.	±1.0			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	±1.0		ppb/G		
Retrace		24h work after 24h off			±10	ppb	10MHz	
SSB Phase noise		1 Hz	-110/-		-90/-	dBc/Hz	10/100MHz $V_{cc}=5V, 12V$	
		10 Hz	-140/-100		-120/-85			
		100 Hz	-155/-130		-145/-115			
		1 kHz	-165/-155		-155/-150			
		10 kHz	-170/-170		-160/-160			
	100 kHz	-172/-175		-162/-165				
Allan variance		1 s	0.5		15	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	Hermetically sealed							
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms — optionally)							
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

MXOCI	-	B	18	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
F	-40°C..85°C
G	-55°C..85°C
Q	-60°C..85°C
H	-40°C..125°C

2	Stability over temperature		
Code	Specific.	Temperature range code available for 10MHz 5V	Temperature range code available for 100MHz 5V
XY	±Xe-Y		
50	±5e-10	A, B	-
19	±1e-9	A, B, C, D, E, F	-
29	±2e-9	A, B, C, D, E, F	-
39	±3e-9	A, B, C, D, E, F, G	A, B
59	±5e-9	A, B, C, D, E, F, G, Q	A, B, C, D, E, F
18	±1e-8	A, B, C, D, E, F, G, Q, H	A, B, C, D, E, F, G
28	±2e-8	A, B, C, D, E, F, G, Q, H	A, B, C, D, E, F, G, Q
38	±3e-8	A, B, C, D, E, F, G, Q, H	A, B, C, D, E, F, G, Q
58	±5e-8	A, B, C, D, E, F, G, Q, H	A, B, C, D, E, 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	
H	5/0.5	

4	Supply voltage
Code	Specification
3	3.3V±5%
5	5V±5%
2	12V±5%

5	Output
Code	Specification
T	HSMOS/TTL
S	Sine wave

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