

Revised in September 2021

High stability low phase-noise OCXO

Features

High temperature stability: to ± 0.5 ppb in (-40 +85) $^{\circ}$ 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

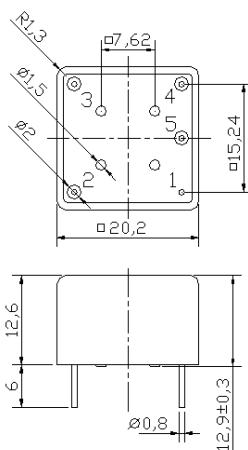
Packaging: 20.2 x 20.2 mm

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.

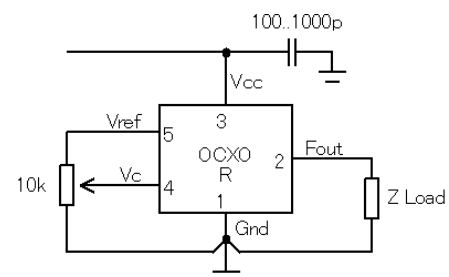
Physical Dimensions



12.0 mm, 10.3mm heights are available

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

Pin Connections



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, $V_c=0.5*V_{ref}$	±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)	±0.2	±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 deviation		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							
Vibration	Per MIL-STD-202, 10G sweep sine 0 to 2000Hz (10G swept sine 0 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

MXOCR	-	B	18	B	5	T	- 10 MHz
1	2	3	4	5			

1	Temperature range
<i>Code</i>	<i>Specification</i>
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	
<i>Code</i>	<i>Specific.</i>	<i>Temperature range code available for 10MHz 5V</i>	<i>Temperature range code available for 100MHz 5V</i>		
XY	±Xe-Y				
50	±5e-10	A, B, C, D, E, F			
19	±1e-9	A, B, C, D, E, F, G			
29	±2e-9	A, B, C, D, E, F, G, Q	A, B		
39	±3e-9	A, B, C, D, E, F, G, Q	A, B, C, D, E, F		
59	±5e-9	A, B, C, D, E, F, G, Q, H	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	
<i>Code</i>	<i>Specification</i>			
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
<i>Code</i>	<i>Specification</i>
3	3.3V±5%
5	5V±5%
2	12V±5%

5		Output
<i>Code</i>	<i>Specification</i>	
T	HSMOS/TTL	
S	Sine wave	

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