



Revised in December 2017

High stability low phase-noise OCXO

Features

Extended to 300 MHz frequency range (multiplication is used)
 Up to 3 ppb temperature stability in (-40...+85)°C at 100 MHz
 Very low aging – to 50 ppb/year at 100 MHz
 Low Allan variance, 5s to 1×10^{-12}
 Compact Packaging

Typical Applications

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

Packaging type E: "Europack" 35.4x26.7

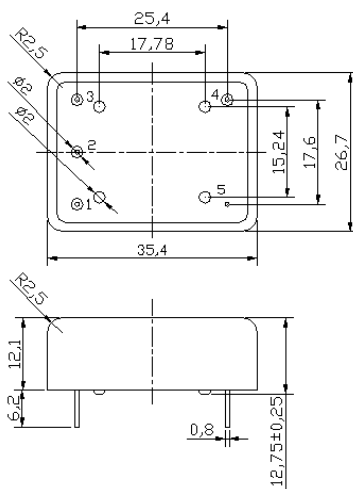


RoHS compliant

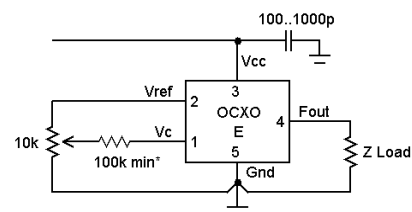
Description

The OCXOs of series MXOH operate in wide frequency range - from 30 to 300 MHz with usage of internal frequency multiplication by 3 or 5. Besides, the internal multiplication of frequency enables to the oscillators improvement, comparing with the MXOC series, of the temperature stability, aging and Allan variance in 30-150 MHz operational range. The module concept of the OCXOs design allowed realization of same performance in a variety of small packages on customer choice: MXOHE, MXOHI, MXOHR, MXOHS models.

Physical Dimensions



Pin Connections



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

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Specification

Parameter	Sym.	Conditions	Value			Unit	Note	
			Min.	Typ.	Max.			
Frequency range	f_0		30		300	MHz	Frequency multiplication on 3 and 5	
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		5	kOhm pF	100 MHz	
	H-level voltage	V_H	$V_{cc}=5\text{ V}, 12\text{ V}$ $V_{cc}=3.3\text{ V}$	3.8 2.4		V		
	L-level voltage	V_L			0.4	V		
	Duty cycle			45		55	%	
	Rise/Fall time					3	ns	100 MHz
Sine-wave option	Level	L	$V_{cc}=5\text{ V}, 12\text{ V}$ $V_{cc}=3.3\text{ V}$	+7 +4		dBm		
	Load	R_L			50	Ohm		
	Harmonics level					-30	dBc	
Sub-harmonics level						-40	dBc	100 MHz
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	100MHz, -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	$V_{cc}=5\text{ V}, 12\text{ V}$ $V_{cc}=3.3\text{ V}$	0 0		4.3 3.1	V		
Tuning range		Compliance with 10 years of aging	±0.5			ppm	positive slope	
Reference voltage	V_{ref}	$V_{cc}=5\text{ V}, 12\text{ V}$ $V_{cc}=3.3\text{ V}$	4.0 2.5		4.3 3.1	V		
Frequency stability								
vs. temperature		ref. 25°C, air flow 0.5 m/s max.	±3.0			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)	±0.5	±1.0		ppb/G		
Retrace		24h work after 24h off			±10	ppb	100MHz	
SSB Phase noise Typical phase noise is default option. For different phase noise consult the factory.		10 Hz	-110	-100		dBc/Hz	100MHz Frequency multiplication on 5 $V_{cc}=5\text{ V}, 12\text{ V}$	
		100 Hz	-130	-121				
		1 kHz	-145	-135				
		10 kHz	-155	-145				
		100 kHz	-155	-150				
Allan deviation		1 s	5	20		e-12	100MHz	
Aging	per day	after 30 days of operation	±0.5			ppb	100MHz see ordering code	
	first year		±0.05			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

MXOHE	-	B	18	B	5	T	- 100 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

2		Stability over temperature	
Code	Specific.	Temperature range code available for 100MHz 5V	Temperature range code available for 300MHz 5V
XY	±Xe-Y		
29	±2e-9	A, B	-
39	±3e-9	A, B, C, D, E, F	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	A, B, C, D, E, F, G, Q
28	±2e-8	A, B, C, D, E, F, G, Q	A, B, C, D, E, F, G, Q
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

3		Aging per day/year, ppb/ppm	
Code	Specification		
A	0.1/0.015	For frequency range of 30-150 MHz	
B	0.2/0.02		
Z	0.3/0.03		
C	0.5/0.05		
D	1/0.1		
E	1.5/0.15	For frequency range of 150-300 MHz	
F	2/0.2		
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.