



Features

Ultra high stability - to $\pm 5 \times 10^{-11}$ (-30 to +70)°C
 Very low aging - to $\pm 1 \times 10^{-10}$ /day, 1.5×10^{-8} /year
 Low phase-noise level (-165 dBc/Hz, TYP, floor)
 Excellent Allan variance, 1s to 1×10^{-12}
 Small size packaging

Typical Applications

Rubidium Standard Replacement
 GPS Receivers
 Instrumentation
 Stratum 2 Clock Systems

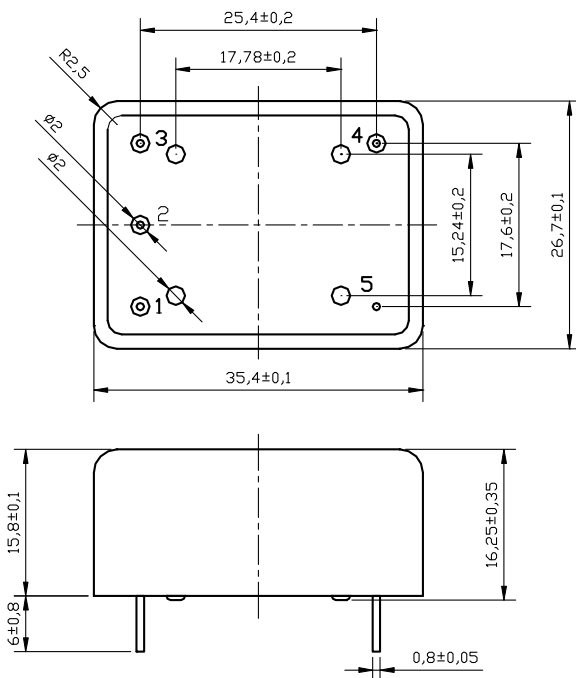
Packaging: "Europack" 36x27x16.3 mm



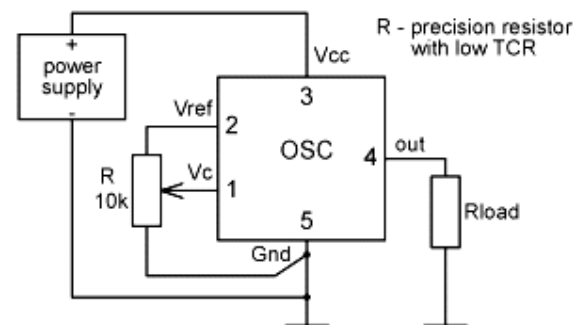
Description

The OCXOs of MXODE series use the double-oven structure providing perfect temperature stabilization of the high precision crystal resonator and the oscillator circuitry. At only 15 cm³ volume and about 1.5 W power consumption the OCXOs provide up to 5×10^{-11} temperature stability in (-30 +70)°C , 1×10^{-12} /1s Allan variance and aging 1×10^{-10} /day aging rate. The MXODE series is excellent to use in Stratum II clock system, instrumentations, local reference as Rb-standard replacement and in other high-end applications. The oscillators are available in 8 - 100 MHz operational frequency range.

Physical Dimensions



Pin Connections



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



Specification

Parameter	Sym.	Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Frequency range	f ₀		5		100	MHz	
RF output							
HCMOS (TTL) option	Load		10		15	kOhm	for 10 MHz operational frequency
	H-level voltage	V _H	3.8			V	
	L-level voltage	V _L			0.4	V	
	Duty cycle		45		55	%	
	Rise/Fall time				10	ns	
Sine-wave option	Level	L	+6	+8	+10	dBm	for 10 MHz operational frequency
	Load	R _L		50		Ohm	
	Harmonics level				-30		dBc
Sub-harmonics level		Operational frequency <30 MHz Operational frequency ≥30 MHz		none	-40	dBc	Frequency multiplier is used
Power supply							
Voltage	V _{cc}		4.75	5.0	5.25	V	3.3, 12V supply available
Power consumption		Warm-up state Steady state, +25°C		5 1.25	1.5	W W	
Warm-up time	t _{up}	to Δf/f=1e-8, at +25°C			5	min	ref. to frequency after 30 min.
Frequency control*							
Control voltage range	V _c	V _{cc} =5 or 12 V V _{cc} =3.3 V	0 0		4.2 2.8	V	Tuning slope - positive
Tuning range			±0.3	±0.4		ppm	
Reference voltage	V _{ref}	V _{cc} =5 or 12 V V _{cc} =3.3 V	4.0 2.7	4.2 2.8	4.3 2.9	V V	
Frequency stability							
vs. temperature		-40°C to +85°C, ref 25°C	±0.1			ppb	See chart below
vs. supply voltage		ref V _{cc} typ.	±0.1			ppb	
SSB Phase noise		1 Hz			-100	dBc/Hz	for 10MHz operational frequency
		10 Hz			-130		
		100 Hz			-147		
		1 kHz			-155		
		10 kHz			-165		
Allan variance		1 s	1			e-12	
Aging	per day	after 30 days of operation	±0.1			ppb	see chart below
	first year		±15			ppb	
	for 10 years		±0.3			ppm	
Environmental, mechanical conditions.							
Operating temperature range	See chart below.						
Storage temperature range	-60°C to +90°C						
Humidity	Hermetically sealed						
Mechanical shock	Per MIL-STD-202, 30G half sine pulse, 11ms						
Vibration	Per MIL-STD-202, 5G swept sine 10 to 500 Hz						
Washing conditions	Washing with water or alcohol based detergent allowed only with final enough drying stage						
Soldering conditions	Hand solder only – not reflow compatible. 260°C 10s (on pins)						

* No frequency control option – on customer requirement

Ordering code

MXODE - B 20 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	-40°C..85°C

2	Stability over temperature		
Code	Specification	Temperature range code available*	
XZ	±Xe-Y		
51	±5e-11	A...E	
10	±1e-10	A...F	
20	±2e-10	A...F	
30	±3e-10	A...G	
50	±5e-10	A...G	
19	±1e-9	A...G	

3	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	

4	Supply voltage	
Code	Specification	
5	5V±5%	
3	3V±5%	
2	12V±10%	

5	Output	
Code	Specification	
T	HSMOS/TTL	
S	Sine-wave	

*For 10 MHz operational frequency

Deviations of the parameters are possible on Customer's requirements.