Utmost OCXO Solutions

Magic Xtal Ltd.

www.magicxtal.com www.mxtal.ru

Since 2001 Magic Xtal Ltd. develops and produces extraordinary OCXO products combining high frequency stability and low phase-noise level with miniature sizes and extremely low power consumption.

Being the world leader in the Internally Heated Resonator (IHR) technology Magic Xtal has created unique MXO37 series providing in (-40 +85)°C range up to 2 ppb temperature stability and -173 dBc/Hz noise floor at down to 130 mW power consumption and about 2 ccm volume. Utmost stability of the low power OCXOs is implemented in MXO37/R model packaged in 20x20x12.9 mm case and exhibiting 0.5 ppb temperature stability along with as low as 0.1 ppb/day aging.

In the field of ultra-high stability OCXOs Magic Xtal offers the double-oven MXODE model with 0.1 ppb frequency stability in (-40 +85)°C range and smallest in the class MXODR oscillator providing at 5 ccm packaging to 0.1 ppb temperature stability and 0.1 ppb/day aging rate.

Moreover, portfolio of the company includes high stability low phase-noise OCXOs of MXOC and MXOH series in a variety of small packages, high durable low power oscillators withstanding up to 1000 g mechanical shocks and other OCXO solutions with customized combination of advanced performances.

Quality of Magic's OCXO products is insured by own unique technologies, reliable manufacturing processes with every-step test procedures and long operation run before shipment as well as by effective QC system operating in compliance with ISO 9001 and IPC-A-610 standards.

Ultra-high stability OCXOs

27x36x16 mm

Ultimate frequency stability
MXODE

8–100 MHz

to 1E-10 in (-40+85)°C
to 1E-10/day aging
to 5E-13/1s Allan variance

20x20x12.6 mm

Ultra-high stability small size
MXODR

to 1E-10 in (-40+80)°C
to 1E-10/day aging
to 2E-12/1s Allan variance
to 35 s warm-up time

20x20x12.6 mm

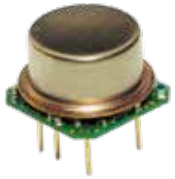
Ultra-high stability small size low power
MXO37/R

<180 mW consumption
to 5E-10 in (-40+80)°C
to 1E-10/day aging
to 3E-12/1s Allan variance

Low power miniature high stability OCXOs

DIP8 & DIP14 compatible

MXO37/8



15x15x9.5 mm

MXO37/14

15x21,5x9.5 mm

15x21,5x7.9 mm

Low profile (7.9 mm)

MO37/14L

20x20x12.6 mm

Hermetically sealed

MXO37/R

8–300 MHz

to 130 mW consumption
to 2 ppb in (-40 +85)°C
to 0.1 ppb/day aging
to 35 s warm-up time
to 0.3 ppb/g g-sensitivity

Phase-noise at 10 MHz

1 Hz	-105 dBc/Hz
10 Hz	-135 dBc/Hz
100 Hz	-155 dBc/Hz
1 KHz	-160 dBc/Hz
10 kHz	-170 dBc/Hz
100 kHz	-173 dBc/Hz

Fast warm-up low power miniature OCXOs

15x15x9.5 mm

DIP8 compatible

MXO37/8F

15x21.5x9.5 mm

DIP14 compatible

MXO37/14F

8–100 MHz

<30 s warm-up time
<170 mW consumption
<20 ppb in (-40 +85)°C
0.3 ppb/day aging

Phase-noise at 10 MHz

1 Hz	-100 dBc/Hz
10 Hz	-135 dBc/Hz
100 Hz	-155 dBc/Hz
1 KHz	-160 dBc/Hz
10 kHz	-170 dBc/Hz

High durable low power OCXOs

15x15x10.5 mm

DIP8 compatible

MXO37/8D

15x21.5x10.5 mm

DIP14 compatible

MXO37/14D

8–100 MHz

1000 g, 1 ms shocks
0-2000 Hz, 30 g vibration
<200 mW consumption
10 ppb in (-40 +85)°C
0.3 ppb/day aging
45 s warm-up time

Phase-noise at 10 MHz

1 Hz	-100 dBc/Hz
10 Hz	-130 dBc/Hz
100 Hz	-150 dBc/Hz
10 KHz	-170 dBc/Hz
100 kHz	-173 dBc/Hz

Low phase-noise OCXOs

Standard packaging

MXOC

5–150 MHz
1 ppb (-40 +85)°C

to 0.1 ppb/day
to 5E-13/1s AV

Low power low g-sensitivity

MXO37

8–150 MHz
<170 mW consumption
to 5 ppb in (-40 +85)°C

to 0.2 ppb/g sensitivity
to 0.3 ppb/day

Phase-noise at 10 MHz

1 Hz	-110 dBc/Hz
10 Hz	-140 dBc/Hz
100 Hz	-155 dBc/Hz
1 KHz	-165 dBc/Hz
10 kHz	-170 dBc/Hz

Phase-noise at 100 MHz

1 Hz	-105 dBc/Hz
10 Hz	-135 dBc/Hz
100 Hz	-160 dBc/Hz
1 KHz	-170 dBc/Hz
10 kHz	-175 dBc/Hz

Random vibration induced phase noise

$$L(f_g) = 20 \cdot \mathrm{Log}\left(\frac{\mathrm{Sens} \cdot \sqrt{2 \cdot A}}{2 \cdot f_g} \cdot F_0\right) [\mathrm{dBc/Hz}]$$

Sens [1/G] – sensitivity; A [G^2/Hz] – acceleration PSD; f_g [Hz] – vibration frequency; F_0 [Hz] –currier frequency.

Extra-high temperature OCXOs

20x20x12.6 mm

25x25x12.6 mm

27x36x12.6 mm

MXOC-H

up to 130°C operation temperature
10 ppb, (-40 +130)°C
0.3 ppb/day aging
500 g mechanical shocks
0–2000 Hz, 30 g vibration
8-13 MHz operation range