

# Utmost OCXO Solutions



**Magic Xtal Ltd.**

[www.magicxtal.com](http://www.magicxtal.com) [www.mxtal.ru](http://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.

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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  $5E-11$  in  $(-30+70)^{\circ}C$   
to  $1E-10$ /day aging  
to  $5E-13$ /1s Allan variance



20x20x12.6 mm

Ultra-high stability  
small size  
**MXODR**

to  $2E-10$  in  $(-30+70)^{\circ}C$   
to  $1E-10$ /day aging  
to  $2E-12$ /1s Allan variance  
to 35 s warm-up time



20x20x12.6 mm

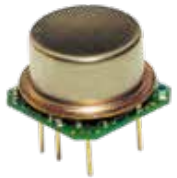
Ultra-high stability  
small size low power  
**MX037/R**

<180 mW consumption  
to  $5E-10$  in  $(-40+80)^{\circ}C$   
to  $1E-10$ /day aging  
to  $2E-12$ /1s Allan variance

# Low power miniature high stability OCXOs

DIP8 & DIP14 compatible

**MX037/8**      **MX037/14**



15x15x9.5 mm



15x21,5x9.5 mm



15x21,5x7.9 mm

Low profile (7.9 mm)

**M037/14L**



20x20x12.6 mm

Hermetically sealed

**MX037/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  
**MX037/8F**

**8–100 MHz**

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



15x21.5x9.5 mm

DIP14 compatible  
**MX037/14F**

**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  
**MX037/8D**



15x21.5x10.5 mm

DIP14 compatible  
**MX037/14D**

**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

### MX037



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

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

Sens [1/G] – sensitivity; A [G<sup>2</sup>/Hz] – acceleration PSD;  
f<sub>g</sub> [Hz] – vibration frequency; F<sub>0</sub> [Hz] – carrier 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**