AXTAL ADVANCED XTAL PRODUCTS

| Specification | AXIOM37-14LP | Rev.: 1 | Date: 2016-02-29 |
|---|---|---|---|

**Oscillator type: Ultra-Low Power Low-Profile OCXO in DIL14 package**
**Produced in association with Magic Xtal – Model MXO37/14L**

| Parameter | min. | typ. | max. | Unit | Condition |
|---|---|---|---|---|---|
| **Frequency range** | 8 | | 120 | MHz | |
| **Standard frequencies** | | 10.000 / 100.000 | | MHz | |
| **Frequency stability** | | | | | |
| Initial tolerance @ +25°C | | ±100 | | ppb | $V_C$ @ VREF/2 |
| vs. operating temperature range | | Option 2 & 3<br>See tables 1 & 2 | | | steady state |
| vs. supply voltage variation (pushing) | | ±2 | | ppb | $V_S$ ±5 % |
| vs. load change (pulling) | | ±2 | | ppb | Load ±10 % |
| Long term (aging) per day,<br>after 30 days operation (Note 2) | | | ±2<br>±5 | ppb<br>ppb | < 50 MHz<br>≥ 50 MHz |
| Long term (aging) 1st year,<br>after 30 days operation (Note 2) | | | ±150<br>±500 | ppb<br>ppb | < 50 MHz<br>≥ 50 MHz |
| **Frequency adjustment range** | | | | | |
| Electronic Frequency Control (EFC) | ±0.5 | ±1.0 | | ppm | |
| EFC voltage $V_C$ | 0 | VREF/2 | VREF | V | |
| EFC slope ($\Delta f / \Delta V_C$) | | Positive | | | |
| EFC input impedance | 100 | | | kΩ | |
| **RF output** | | | | | |
| Signal waveform | | HCMOS | | | |
| Load | | | 10<br>5 | pF<br>pF | @ 10 MHz<br>@ 100 MHz |
| Symmetry (duty cycle) | 45 | | 55 | % | @ $V_S/2$ |
| Rise & decay time | | | 10 | ns | @ 10% ~ 90% $V_S$ |
| Spurious | | | -80 | dBc | |
| Warm-up time @ +25°C (Note 3) | | | 60 | sec | $\Delta f_{final}/f_0$ < ±0.1 ppm |
| Phase noise max. | 10.000 MHz | 100.000 MHz | | | |
| | -97 | - | | dBc/Hz | @ 1 Hz |
| | -127 | -95 | | dBc/Hz | @ 10 Hz |
| | -152 | -127 | | dBc/Hz | @ 100 Hz |
| | -162 | -153 | | dBc/Hz | @ 1 kHz |
| | -166 | -165 | | dBc/Hz | @ 10 kHz |
| | -166 | -170 | | dBc/Hz | @ 100 kHz |
| G-Sensitivity | | | ±1 | ppb/g | |
| **Short term stability (Allan deviation)** | | $2 \cdot 10^{-11}$ | | | τ = 1 s |
| **Reference voltage VREF output** | | 2.8<br>4.2 | | V<br>V | Option 1 = "33"<br>Option 1 = "50" |
| **Supply voltage $V_S$** | 3.15<br>4.75 | 3.3<br>5.0 | 3.45<br>5.25 | V<br>V | Option 1 = "33"<br>Option 1 = "50" |
| **Power consumption** (steady state) | | 0.15 | | W | @ +25°C |
| **Power consumption** (warm-up) | | 0.80 | | W | |
| **Enclosure (see drawing) (LxWxH)** | | 20.6x15.2x8.0 max. | | mm | |
| **Weight** | | | 15 | g | |
| **Packing** | | Palette | | | |

**Notes:**

1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Lower aging rates on request
3. Frequency referred to $f_{final}$ at 15 minutes after switch-on

## Absolute Maximum Ratings

| Parameter | min. | max. | Unit | Condition |
|---|---|---|---|---|
| Supply Voltage $V_S$ | -0.5 | $V_S$ + 10% | V | $V_S$ to GND |
| Control Voltage $V_C$ | -0.5 | 5 | V | $V_C$ to GND |
| Storage Temperature | -60 | +90 | °C | |

## Frequency stability vs. temperature

| Option 2 | Stability [ppb] |
|---|---|
| 05 | ±5 |
| 10 | ±10 |
| 20 | ±20 |
| 30 | ±30 |
| 50 | ±50 |
| | |

**Table 1**

| Lower Temperature | | | Upper Temperature | |
|---|---|---|---|---|
| Option 3 | T [°C] | | Option 3 | T [°C] |
| 0 | 0 | | A | +50 |
| 1 | -10 | | B | +60 |
| 2 | -20 | | C | +70 |
| 3 | -30 | | D | +75 |
| 4 | -40 | | E | +80 |
| | | | F | +85 |

**Table 2** **Standard: "1B" = -10°C to +60°C**

Note: Not all combinations of stability and temperature range may be available. Please consult factory.

## Ordering Code

| Model | Option 1 [Supply Voltage] | Option 2 [Stability] | Option 3 [Temperature range] | Revision | Frequency [MHz] |
|---|---|---|---|---|---|
| AXIOM37-14LP | 33 or 50 | Table 1 | Table 2 | Rev.1 | 10.000 |

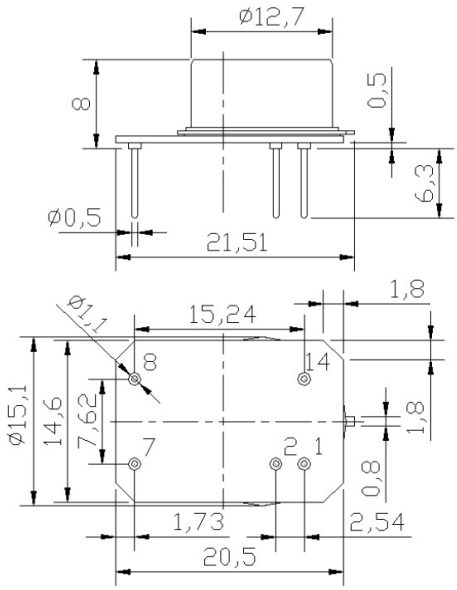
**Example: AXIOM37-14LP-50-05-1B_Rev.1 – 10.000 MHz**

## Handling and Testing

| Parameter | Procedure | Source |
|---|---|---|
| Handling and Testing | Application Note AXAN-011 | www.axtal.com |
| Processing | Application Note AXAN-012 | www.axtal.com |

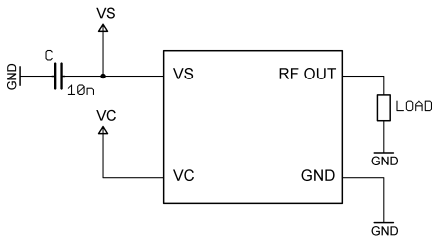
| Parameter | Procedure | | Condition |
|---|---|---|---|
| Electrostatic discharge (ESD) | | | |
| THD devices | IEC60749-26 | HBM | 2000 V |
| SMD devices | IEC60749-27 | MM | 200 V |
| Washable | ✖ Yes ☐ No | | |
| RoHS- Compliant | ✖ Yes ☐ No | | |

## Enclosure drawing




## Pin connections:

| Pin # | Symbol | Function |
|---|---|---|
| **1** | $V_C$ | Control Voltage (EFC) |
| **2** | VREF | Reference voltage |
| **7** | GND | Ground |
| **8** | RF OUT | RF Output |
| **14** | $V_S$ | Supply Voltage |




* See Application Note AXAN-011

## Environmental conditions

| Test | IEC 60068 Part … | IEC 60679-1 Clause | MIL-STD-202G Method | MIL-STD-810F Method | MIL-PRF-55310D Clause | Test conditions (IEC) |
|---|---|---|---|---|---|---|
| Sealing tests (if applicable) | 2-17 | 5.6.2 | 112E | | 3.6.1.2 | Gross leak: Test Qc,<br>Fine leak: Test Qk |
| Solderability<br>Resistance to soldering heat | 2-20<br>2-58 | 5.6.3 | 208H<br>210F | | 3.6.52<br>3.6.48 | Test Ta Method 1<br>Test $Td_1$ Method 2<br>Test $Td_2$ Method 2 |
| Shock* | 2-27 | 5.6.8 | 213B | 516.4 | 3.6.40 | Test Ea, 3 x per axes 100g,<br>6 ms half-sine pulse |
| Vibration, sinusoidal* | 2-6 | 5.6.7.1 | 201A<br>204D | 516.4-4 | 3.6.38.1<br>3.6.38.2 | Test Fc, 30 min per axes,<br>10 Hz - 55 Hz 0,75mm; 55 Hz - 2 kHz, 10g |
| Vibration, random* | 2-64 | 5.6.7.3 | 214A | 514.5 | 3.6.38.3<br>3.6.38.4 | Test Fdb |
| Endurance tests<br>- ageing<br>- extended aging | | <br>5.7.1<br>5.7.2 | 108A | | <br>4.8.35 | <br>30 days @ 85°C, OCXO @25°C<br>1000h, 2000h, 8000h @85°C |

## Revision History

| Rev. | Drawing | Date [dd.mm.yyyy] | Remarks | Author | Checked |
|---|---|---|---|---|---|
| 1 | D0 | 22.04.2015 | First issue | HH | HH |
| 1 | D1 | 18.09.2015 | Editorial changes | HH | HH |
| 1 | D2 | 29.02.2016 | Editorial changes | HH | HH |