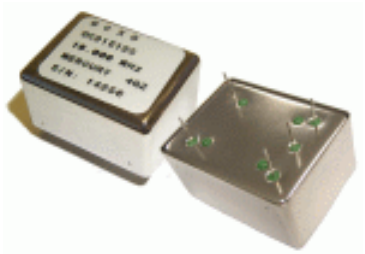
# OCXO (Oven Controlled Crystal Oscillators) +12.0 V
# OC31T12A; OC31T12S Series HCMOS Square Wave

MERCURY Since 1973

Mercury OC31T is 36.2x27.2 mm 5 pin solder sealed metal pacakge with 25.4x17.8 mm pin-to-pin spacing high stability low aging OCXO. Besides standard AT cut crystal, users can also choose SC cut crystal for better performance. 50 ohm load sine output is available as OC31E series.



## General Specifications

| | | | | | | |
|---|---|---|---|---|---|---|
| **Output Wave Form** | | | HCMOS square wave. Wave form code is "**T**" | | | |
| **Frequency Range** | | | 1.0 MHz ~100.0 MHz | | | |
| **Type of Crystal Cut Used** | | | **AT**-cut. Use "**A**" for crystal code or **SC**-cut: use "**S**" for crystal code. Please refer to technical note TN031 for SC and AT-cut crystal comparison | | | |
| **Supply Voltage (Vcc)** | | | +12.0 $V_{D.C}$ ±5% (voltage code is "**12**") | | | |
| **Initial Calibration Tolerance** | | | ±0.05 ppm max. at time of shipment; Vcon=+2.5V, at +25°C | | | |
| **Frequency Stability vs** | **Operating Temperature Range (custom spec. on request)** | | **AT-cut** crystal | | **SC-cut** crystal | |
| | | | ±0.03 ppm over -20°C to +70°C<br>±0.05 ppm over -20°C to +70°C<br>±0.1 ppm over -20°C to +70°C | | ±0.01 ppm over -20°C to +70°C<br>±0.03 ppm over -20°C to +70°C<br>±0.05 ppm over -20°C to +70°C | |
| | | | ±0.05 ppm over -40°C to +85°C<br>±0.1 ppm over -40°C to +85°C<br>±0.5 ppm over -40°C to +85°C | | ±0.03 ppm over -40°C to +85°C<br>±0.05 ppm over -40°C to +85°C<br>±0.1 ppm over -40°C to +85°C | |
| | **Aging** | | **AT-cut**: ±0.1 ppm typical first year.<br>**SC-cut**: ±0.05 ppm typical first year. | | | |
| | **Supply Voltage ±5% Variation** | | ±10 ppb max. | | | |
| | **Load ±5% variation:** | | ±10 ppb max. | | | |
| | **Warm-up time (at +25°C)** | | **AT-cut**: 3 minutes max. Within ±0.5 ppm of its reference frequency.<br>**SC-cut**: 1 minute max. Within ±0.1 ppm of its reference frequency. | | | |
| **Voltage Control on pin 1 (EFC) (Electronics Frequency Tuning)** | | **Freq. Deviation Range** | **AT-cut**: ±5 ppm typical<br>**SC-cut**: ±0.7 ppm typical | | | |
| | | **Control Voltage Range** | 0.5 V to 4.5 V | | | |
| | | **Transfer Function** | Positive: Increasing control voltage increases output frequency. | | | |
| | | **Input Impedance** | 100 K Ω min. | **EFC Linearity** | ±10% max. | |
| **Power** | **Power Dissipation (at +25°C)** | | **Warm-up**: 250 mA max.<br>**Steady-state**: 120 mA max. | | | |
| **Output** | **Wave From** | | HCMOS | | | |
| | **Load (Fan out)** | | 15 pF typical | **Duty Cycle (measured at 50% Vcc)** | 50% ± 10% | |
| | **Output Voltage Logic High ($V_{OH}$)** | | +4.5 V min. | **Output Voltage Logic Low ($V_{OL}$)** | +0.5 max. | |
| | **Rise and Fall Time** | | 5 nS max. (measured at 20% ⇄ 80% of waveform) | | | |
| | **Phase Noise** | **Offset** | 10 Hz | 100 Hz | 1 KHz | 10 KHz |
| | | **10 MHz AT-cut XTAL** | -110 dBc typ. | -135 dBc typ. | -150 dBc typ. | -155 dBc typ. |
| **Storage Temperature** | | | -40°C to +105°C | | | |
| **Shock** | | | 2000 G's, 0.3 ms ½ sine | | | |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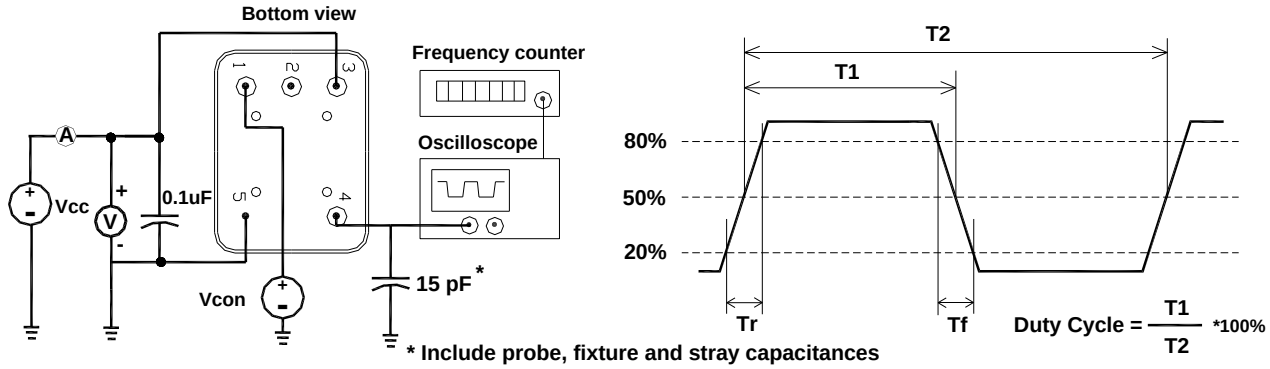
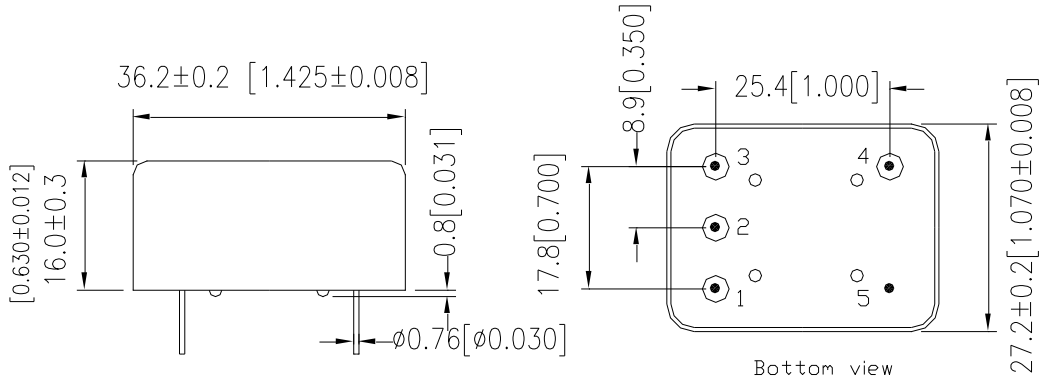
| | |
|---|---|
| **Vibration** | 10 to 2000 Hz / 10 G's |

## OC31T Test Circuit




## OC31T Series Package Dimensions and Pin Connections: unit mm

Pin 1: Voltage Control EFC Pin 2: Reference Voltage Output Pin 3: Supply Voltage
Pin 4: RF Output Pin 5: Ground / Case




## Part Number Format and Example:

| **Example**: OC31T12A-10.000-0.1/-20+70 | | | | | | | |
|---|---|---|---|---|---|---|---|
| OC31T12 | A | — | 10.000 | — | 0.1 | / | -20+70 |
| ❶ | ❷ | dash | ❸ | Dash | ❹ | slash | ❺ |

❶: OC31T12: OC31 series; "T" for CMOS Square wave; "12" for +12.0 V supply voltage
❷: Crystal type. "**A**" for AT-cut crystal; "**S**" for SC-cut crystal ❸: Frequency in MHz
❹: Frequency stability in ppm ❺: Operating temperature range in Celsius