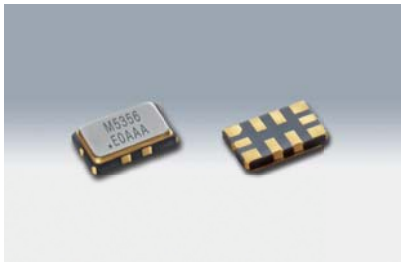


TC-MO / VC TC-MO - Super Low Jitter

MO5155/MO5156/MO5157/MO5356/MO5357/MO5358/MO5359



■ Features

- 5.0×3.2 mm Ceramic package
- LVCMOS or Clipped Sinewave output

■ Applications

- Synchronous Ethernet
- Small cell
- Optical transport-SONET/SDH, OTN
- IEEE1588
- Test and measurement



| Model | Output Frequency (MHz) | Frequency Tolerance ($\times 10^{-6}$) | Supply Voltage (V) | Current Consumption (mA Typ.) | Size (mm) | Output |
|--------|--------------------------|--|--------------------|-------------------------------|------------------------|--|
| MO5155 | 10 std. GNSS Freq. | $\pm 0.5, \pm 1.0, \pm 2.5$ | +2.25 to +3.63 | +40 to +50 | 5.0×3.2×0.95 (Ceramic) | Clipped Sinewave (1 to 60 MHz) LVCMOS |
| MO5156 | 1 to 60 | | | | | |
| MO5157 | 60 to 220 | | | | | |
| MO5356 | 1 to 60 | $\pm 0.1, \pm 0.2, \pm 0.25$ | +2.25 to +3.63 | +40 to +50 | 5.0×3.2×0.95 (Ceramic) | Clipped sinewave, LVCMOS |
| MO5357 | 60 to 220 | | | | | |
| MO5358 | 1.0 to 60 | ± 0.05 | +2.25 to +3.63 | +40 to +50 | 5.0×3.2×0.95 (Ceramic) | Clipped sinewave, LVCMOS |
| MO5359 | 60 to 189, 200 to 220 | | | | | |

■ Standard Specification (MO5356)

| Item | Legend | Min. | Typ. | Max. | Unit | Condition |
|--------------------------------------|-----------------------|---|-----------|---------|------------------|---|
| Output Frequency Range | f | 1 | - | 60 | MHz | |
| Supply Voltage | Vdd | +2.25 | +2.50 | +2.75 | V | |
| | | +2.52 | +2.80 | +3.08 | | |
| | | +2.70 | +3.00 | +3.30 | | |
| | | +2.97 | +3.30 | +3.63 | | |
| Operating Temperature Range | T _{use} | -20 | - | +70 | °C | Extended commercial |
| | | -40 | - | +85 | | Industrial |
| | | -40 | - | +105 | | Extended Industrial, ambient temperature |
| Initial Tolerance | F _{init} | -1.0 | - | +1.0 | $\times 10^{-6}$ | Inclusive of solder-down shift at 48 hours after 2 reflows at +25°C |
| Frequency Stability over temperature | F _{stab} | -0.10 | - | +0.10 | $\times 10^{-6}$ | Referenced to (f _{mas} + f _{min})/2 over the specified temperature range |
| | | -0.20 | - | +0.20 | | |
| | | -0.25 | - | +0.25 | | |
| First Year Aging | F _{aging1} | - | ± 1.0 | - | $\times 10^{-6}$ | T _A = +25°C |
| Pull Range | PR | ± 6.25 | | | $\times 10^{-6}$ | VC TC-MO mode. Contact KDS for $\pm 12.5, \pm 25$ |
| | | $\pm 6.25, \pm 10, \pm 12.5, \pm 25, \pm 50, \pm 80, \pm 100, \pm 125, \pm 150, \pm 200, \pm 400, \pm 600, \pm 800, \pm 1200, \pm 1600, \pm 3200$ | | | $\times 10^{-6}$ | DC TC-MO mode. |
| Upper Control Voltage | VC _U | Vdd×0.9 | - | - | V | |
| Control Voltage Range | VC _L | - | - | Vdd×0.1 | V | |
| Control Voltage Input Impedance | VC _z | 8 | - | - | MΩ | |
| Control Voltage Input Bandwidth | VC _c | - | 10 | - | kHz | |
| Frequency Change Polarity | - | Positive Slope | | | - | |
| Current Consumption | I _{dd} | - | +44 | +53 | mA | No load condition, f = 19.2 MHz, TC-MO and DC TC-MO mode. |
| | | - | +48 | +57 | | No load condition, f = 19.2 MHz, VC TC-MO mode. |
| OE Disable Current | I _{od} | - | +43 | +51 | mA | OE = GND, output is weakly pull down, TC-MO and DC TC-MO mode. |
| | | - | +47 | +55 | | OE = GND, output is weakly pull down, VC TC-MO mode. |
| Input Low Voltage | V _{IL} | - | - | Vdd×0.3 | V | For OE pin |
| Input High Voltage | V _{HI} | Vdd×0.7 | - | - | V | For OE pin |
| Start-up Time | T _{start} | - | 2.5 | 3.5 | ms | Time to first pulse, Measured from the time Vdd reaches its rated minimum value. |
| RMS Period Jitter | T _{jitt} | - | 0.8 | 1.1 | ps | f = 10 MHz |
| LVCMOS Output | | | | | | |
| Duty Cycle | DC | 45 | - | 55 | % | |
| Output Low Voltage | V _{OL} | - | - | Vdd×0.1 | V | I _{OL} = -3mA |
| Output High Voltage | V _{OH} | Vdd×0.9 | - | - | V | I _{OH} = +3 mA |
| Rise and Fall Time | Tr, Tf | 0.8 | 1.2 | 1.9 | ns | 10% to 90% Vdd. |
| RMS Phase Jitter (random) | T _{phj} | - | 0.31 | 0.48 | ps | f = 50 MHz, Integration bandwidth = 12 kHz to 20 MHz, -40 to +85 °C |
| Clipped Sinewave Output | | | | | | |
| Output Voltage Level | V _{out} | +0.8 | - | +1.2 | % | 10kΩ 10pF $\pm 10\%$ |
| Rise and Fall Time | Tr, Tf | - | 3.5 | 4.6 | V | 20% to 80% Vdd, 19.2MHz |
| RMS Phase Jitter (random) | T _{phj} | - | 0.31 | 0.48 | ps | f = 60 MHz, Integration bandwidth = 12 kHz to 20 MHz, -40 to +85 °C |
| Packing Unit | 1000pcs./reel (φ 180) | | | | | |