*Engineering Development Model*

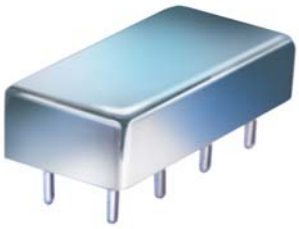
# Voltage Controlled Oscillator

# POS-EDR5189

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability.
At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

Please click "Back", and then click "Contact Us" for Applications support.



**CASE STYLE : A06**

| ELECTRICAL SPECIFICATIONS 50Ω | | | | |
|---|---|---|---|---|
| **Parameter** | **Min.** | **Typ.** | **Max.** | **Units** |
| **Frequency** | 2388 | | 2526 | MHz |
| **Tuning Voltage** | 0 | | 14 | V |
| **Power Output** | | -1.5 | | dBm |
| **Phase Noise** | | | | |
| **at 1 kHz offset** | | -70 | | dBc/Hz |
| **at 10 KHz offset** | | -96 | | dBc/Hz |
| **at 100 KHz offset** | | -115 | | dBc/Hz |
| **at 1000 kHz offset** | | -134 | | dBc/Hz |
| **Pulling at 12 dBr PK-PK all phases** | | 4.1 | | MHz |
| **Pushing at Vcc=5V±0.25V** | | 1 | | MHz/V |
| **Tuning Sensitivity** | | 12 - 18 | | MHz/V |
| **Harmonic Suppression** | | -19 | -11 | dBc |
| **3 dB Modulation Bandwidth** | | 3500 | | kHz |
| **Supply Voltage** | | 12 | | V |
| **Supply Current** | | | 25 | mA |

| MAXIMUM RATINGS | |
|---|---|
| **Operating Temperature** | -55°C to 85°C |
| **Storage Temperature** | -55°C to 100°C |
| **Absolute Supply Voltage (Vcc)** | +14V |
| **Absolute Tuning Voltage (Vtune)** | +16V |

| PIN CONNECTIONS | |
|---|---|
| **RF OUT** | 10 |
| **VCC** | 14 |
| **V-TUNE** | 8 |
| **GROUND** | 3,4,5,6,7 |

# Voltage Controlled Oscillator POS-EDR5189

## *Typical Performance Data*

| V TUNE | TUNE SENS (MHz/V) | FREQUENCY (MHz) | | | POWER OUTPUT (dBm) | | | HARMONICS (dBc) | | | FREQ. PUSH (MHz/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -55ºC | +25ºC | +85ºC | -55ºC | +25ºC | +85ºC | F2 | F3 | F4 | |
| 0.5 | 16.11 | 2398.3 | 2367.4 | 2341.7 | -0.37 | -0.89 | -3.31 | -18.3 | -29.2 | -58.8 | 1.28 |
| 1.0 | 13.89 | 2405.1 | 2374.4 | 2348.6 | -0.37 | -0.91 | -3.18 | -18.4 | -29.1 | -56.3 | 1.29 |
| 1.5 | 13.03 | 2411.5 | 2380.9 | 2355.0 | -0.36 | -0.94 | -3.11 | -18.7 | -29.7 | -55.0 | 1.32 |
| 2.0 | 13.09 | 2417.7 | 2387.4 | 2361.1 | -0.36 | -0.95 | -3.05 | -18.8 | -29.3 | -54.6 | 1.37 |
| 2.5 | 12.68 | 2424.0 | 2393.8 | 2367.1 | -0.38 | -0.90 | -3.04 | -18.8 | -28.8 | -53.9 | 1.32 |
| 3.0 | 12.33 | 2430.3 | 2399.9 | 2373.3 | -0.42 | -0.89 | -3.09 | -18.8 | -29.1 | -53.7 | 1.33 |
| 3.5 | 12.86 | 2436.8 | 2406.4 | 2379.9 | -0.47 | -0.97 | -3.12 | -19.3 | -29.4 | -53.4 | 1.37 |
| 4.0 | 13.25 | 2443.3 | 2413.0 | 2386.6 | -0.53 | -1.04 | -3.10 | -19.7 | -30.2 | -53.8 | 1.37 |
| 4.5 | 13.55 | 2450.1 | 2419.8 | 2393.4 | -0.59 | -1.08 | -3.07 | -19.7 | -31.0 | -56.3 | 1.36 |
| 5.0 | 14.02 | 2456.9 | 2426.8 | 2400.3 | -0.62 | -1.10 | -3.03 | -19.3 | -31.3 | -53.8 | 1.36 |
| 5.5 | 14.34 | 2463.9 | 2433.9 | 2407.5 | -0.64 | -1.11 | -3.04 | -19.1 | -31.7 | -51.9 | 1.37 |
| 6.0 | 14.89 | 2471.2 | 2441.4 | 2414.8 | -0.71 | -1.08 | -3.03 | -19.4 | -32.9 | -49.2 | 1.38 |
| 6.5 | 14.88 | 2478.9 | 2448.8 | 2422.3 | -0.76 | -1.04 | -3.01 | -19.8 | -34.7 | -47.6 | 1.33 |
| 7.0 | 15.21 | 2486.7 | 2456.4 | 2430.1 | -0.81 | -1.08 | -3.00 | -19.9 | -35.3 | -47.0 | 1.37 |
| 7.5 | 16.09 | 2494.7 | 2464.5 | 2438.1 | -0.87 | -1.14 | -2.97 | -19.6 | -36.7 | -45.9 | 1.38 |
| 8.0 | 16.49 | 2502.9 | 2472.7 | 2446.3 | -0.91 | -1.15 | -2.91 | -19.9 | -38.8 | -47.5 | 1.38 |
| 8.5 | 16.97 | 2511.4 | 2481.2 | 2454.7 | -0.89 | -1.09 | -2.83 | -20.8 | -37.2 | -48.4 | 1.39 |
| 9.0 | 17.45 | 2520.0 | 2489.9 | 2463.3 | -0.92 | -1.03 | -2.72 | -22.0 | -39.1 | -48.1 | 1.39 |
| 9.5 | 17.98 | 2528.9 | 2498.9 | 2471.8 | -0.97 | -1.01 | -2.64 | -21.1 | -37.3 | -45.9 | 1.41 |
| 10.0 | 18.34 | 2537.9 | 2508.1 | 2480.8 | -1.02 | -1.00 | -2.64 | -20.5 | -39.3 | -44.1 | 1.42 |
| 10.5 | 18.40 | 2547.0 | 2517.3 | 2489.8 | -1.10 | -0.95 | -2.64 | -21.0 | -39.6 | -43.4 | 1.42 |
| 11.0 | 18.67 | 2556.2 | 2526.6 | 2499.0 | -1.16 | -0.96 | -2.59 | -21.4 | -42.1 | -45.0 | 1.46 |
| 11.5 | 18.92 | 2565.3 | 2536.1 | 2508.2 | -1.17 | -1.07 | -2.50 | -21.2 | -43.4 | -46.0 | 1.46 |
| 12.0 | 18.95 | 2574.6 | 2545.6 | 2517.5 | -1.19 | -1.21 | -2.43 | -20.9 | -41.9 | -44.4 | 1.48 |
| 12.5 | 19.05 | 2584.0 | 2555.1 | 2527.0 | -1.22 | -1.28 | -2.37 | -21.2 | -41.8 | -41.6 | 1.49 |
| 13.0 | 18.91 | 2593.5 | 2564.5 | 2536.5 | -1.21 | -1.31 | -2.34 | -20.9 | -41.2 | -39.7 | 1.49 |
| 13.5 | 18.72 | 2603.0 | 2573.9 | 2546.0 | -1.20 | -1.29 | -2.37 | -19.9 | -42.6 | -39.6 | 1.49 |
| 14.0 | 18.30 | 2612.4 | 2583.1 | 2555.4 | -1.20 | -1.26 | -2.34 | -19.3 | -44.9 | -37.8 | 1.50 |

| FREQ OFFSET (KHz) | PHASE NOISE (dBc/Hz) |
|---|---|
| 1 | -70 |
| 10 | -96 |
| 100 | -115 |
| 1000 | -134 |

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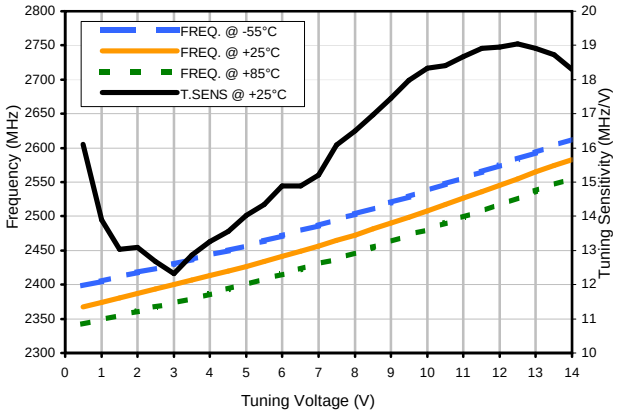
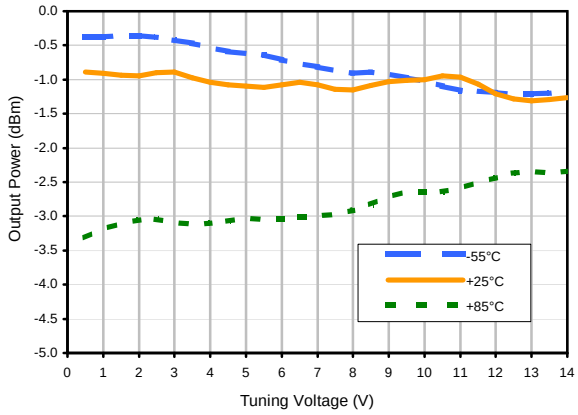
## *Typical Performance Data*

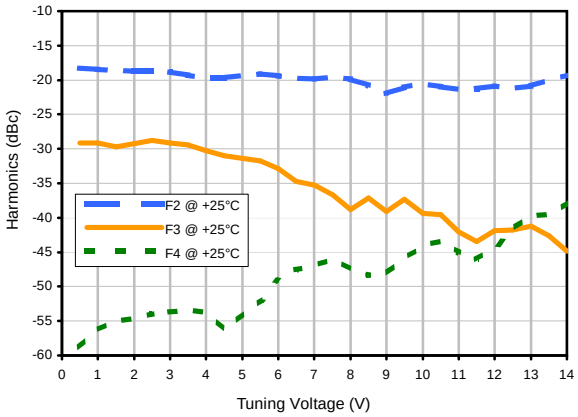
**Frequency and Tuning Sensitivity**



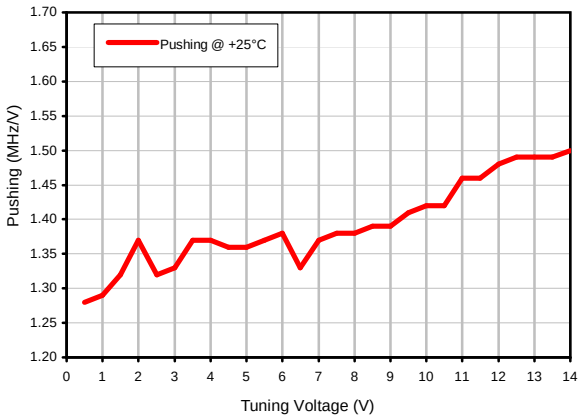

**Power Output**



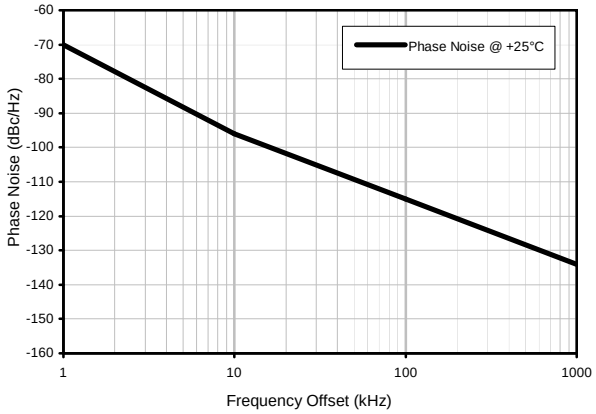

**Harmonics Level**




**Frequency Pushing**



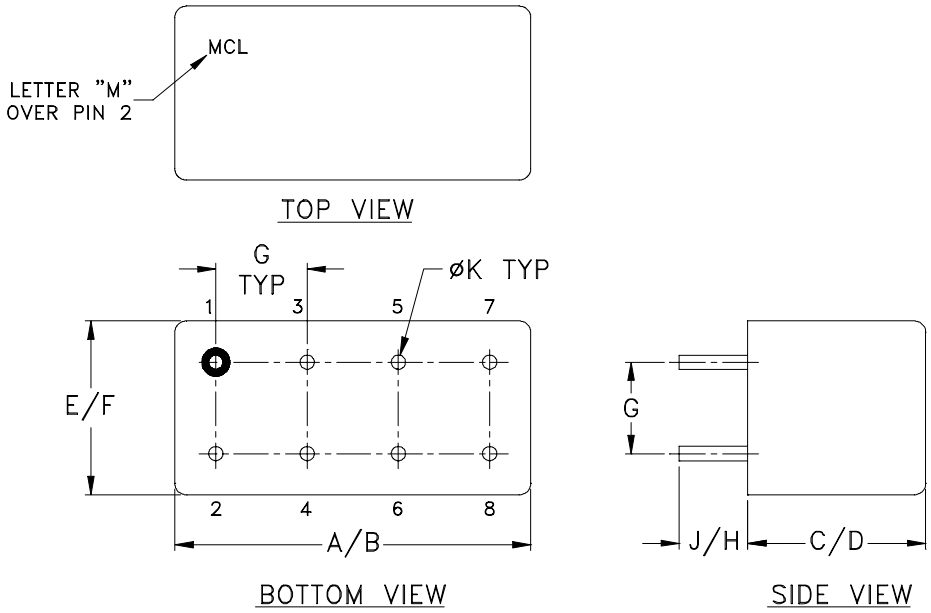

**Phase Noise**



# Case Style A

**A01**
**A04**
**A05**
**A06**

## Outline Dimensions




| CASE# | A | B | C | D | E | F | G | H | J | K | WT, GRAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A01 | .770 (19.56) | .800 (20.32) | .385 (9.78) | .400 (10.16) | .370 (9.40) | .400 (10.16) | .200 (5.08) | .20 (5.08) | .14 (3.56) | .031 (.79) | 5.2 |
| A04 | | | .200 (5.08) | .210 (5.33) | | | | | | | 3.7 |
| A05 | | | .240 (6.10) | .250 (6.35) | | | | | | | 3.7 |
| A06 | | | .285 (7.24) | .310 (7.87) | | | | | | | 5.2 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015**

### Notes:

1. Header material: C.R.S.
   Pin material: #52 alloy.
   Cover material: Cupro-Nickel.
2. Pin finish: Electro Tin-Silver.
3. Insulated spacer available. Request P/N B14-045-01.
4. Tolerance on pin diameter +/-.005 inch.
5. Glass meniscus 0.015 inch max.
6. Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.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# Environmental Specifications ENV01

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|---|---|---|
| Operating Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition A |
| Moisture Resistance | 10 cycles, 24 hours per cycle | MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours |
| Solderability | 10X Magnification | J-STD-002, 95% Coverage |
| Resistance to Solder Heat | 260°C for 10 seconds | MIL-STD-202, Method 210, Condition B |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |
| Terminal Strength | 4 1/2 Pound Pull | MIL-STD-202, Method 211, Condition A |


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| Specification | Test/Inspection Condition | Reference/Spec |
|---|---|---|
| Gross Leak | 125°C Bubble Test | MIL-STD-202, Method 112, Condition D |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |



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