NON-CATALOG

*Surface Mount*

# Voltage Controlled Oscillator

# ROS-1590-319+

## 5V Tuning for PLL IC's 1590 MHz

### Features

- low phase noise
- low pushing
- low pulling
- aqueous washable

CASE STYLE: CK605

### Applications

- wireless communications
- cellular infrastructure

***+RoHS Compliant***

*The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications*

### Electrical Specifications

| MODEL NO. | FREQ. (MHz) | | POWER OUTPUT (dBm) | PHASE NOISE dBc/Hz SSB at offset frequencies,kHz Typ. | | | | TUNING VOLTAGE RANGE (V) | | SENSI-TIVITY (MHz/V) | PORT CAP (pF) | 3 dB MODULATION BANDWIDTH (MHz) | NON HARMONIC SPURIOUS (dBc) | HARMONICS (dBc) | | PULLING pk-pk @12 dBr (MHz) | PUSHING (MHz/V) | DC OPERATING POWER Vcc (volts) | DC OPERATING POWER Current (mA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Typ. | 1 | 10 | 100 | 1000 | Min. | Max. | Typ. | Typ. | Typ. | Typ. | Typ. | Max. | Typ. | Typ. | | Max. |
| ROS-1590-319+ | 1590 | | +0.5 | -86 | -112 | -132 | -151 | 1 | 3.9 | 17 | 18 | 100 | -90 | -23 | -15 | 0.4 | 0.6 | 5 | 33 |

### Pin Connections

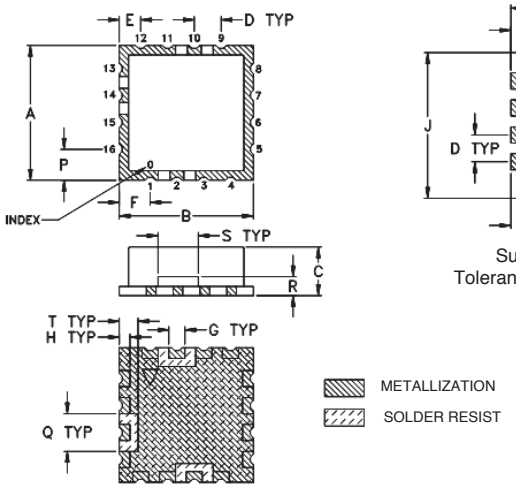
| | |
|---|---|
| RF OUT | 10 |
| VCC | 14 |
| V-TUNE | 2 |
| GROUND | 1,3,4,5,6,7,8,9,11,12,13,15,16 |

### Maximum Ratings

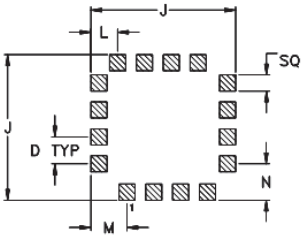
| | |
|---|---|
| Operating Temperature | -55°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Absolute Max. Supply Voltage (Vcc) | 6V |
| Absolute Max. Tuning Voltage (Vtune) | 6V |
| All specifications | 50 ohm system |

Permanent damage may occur if any of these limits are exceeded.

### Outline Drawing

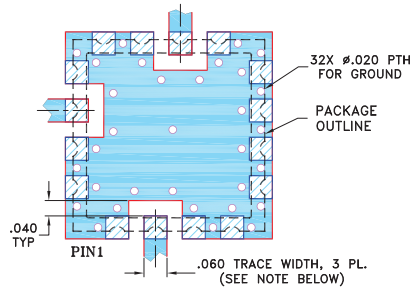



PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

### *Demo Board MCL P/N: TB-10*
### *Suggested PCB Layout (PL-012)*




NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE BOTTOM IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Outline Dimensions ( inch / mm )

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .500 | .500 | .180 | .100 | .080 | .115 | .060 | .040 | .540 | .060 | .100 | .135 | .135 | .115 | .140 | .070 | .150 | .070 | grams |
| 12.70 | 12.70 | 4.57 | 2.54 | 2.03 | 2.92 | 1.52 | 1.02 | 13.72 | 1.52 | 2.54 | 3.43 | 3.43 | 2.92 | 3.56 | 1.78 | 3.81 | 1.78 | 1.0 |






REV. C
M149087
EDR-8642/1F1
ROS-1590-319+
RAV
141228

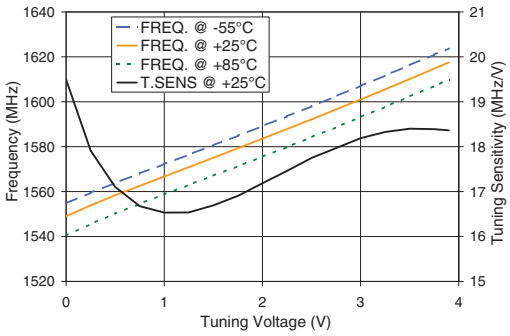
# Performance Data & Curves*

# ROS-1590-319+

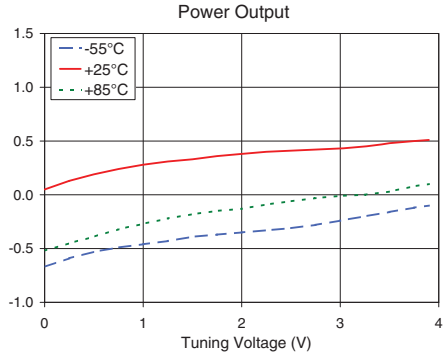
| V TUNE | TUNE SENS (MHz/V) | FREQUENCY (MHz) | | | POWER OUTPUT (dBm) | | | Icc (mA) | HARMONICS (dBc) | | | FREQ. PUSH (MHz/V) | FREQ. PULL (MHz) | PHASE NOISE (dBc/Hz) at offsets | | | | FREQ OFFSET (KHz) | PHASE NOISE at 1590 MHz (dBc/Hz) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -55°C | +25°C | +85°C | -55°C | +25°C | +85°C | | F2 | F3 | F4 | | | 1kHz | 10kHz | 100kHz | 1MHz | | |
| 0.00 | 19.50 | 1554.8 | 1549.0 | 1540.4 | -0.67 | 0.05 | -0.52 | 27.25 | -23.7 | -39.0 | -48.9 | 0.01 | 0.48 | -85.2 | -112.0 | -132.3 | -150.6 | 1.0 | -87.15 |
| 0.25 | 17.91 | 1559.5 | 1553.9 | 1545.6 | -0.59 | 0.13 | -0.45 | 27.35 | -23.6 | -38.8 | -48.1 | 0.11 | 0.50 | -86.3 | -112.6 | -132.8 | -150.9 | 2.0 | -96.07 |
| 0.50 | 17.10 | 1563.9 | 1558.4 | 1550.2 | -0.53 | 0.19 | -0.39 | 27.45 | -23.5 | -38.5 | -47.1 | 0.18 | 0.50 | -86.2 | -111.9 | -133.4 | -150.1 | 4.2 | -104.34 |
| 0.75 | 16.68 | 1568.1 | 1562.6 | 1554.6 | -0.49 | 0.24 | -0.32 | 27.53 | -23.4 | -38.6 | -46.8 | 0.24 | 0.48 | -86.8 | -112.6 | -132.6 | -151.0 | 6.0 | -107.82 |
| 1.00 | 16.53 | 1572.3 | 1566.8 | 1558.8 | -0.46 | 0.28 | -0.27 | 27.62 | -23.3 | -39.0 | -48.7 | 0.30 | 0.44 | -85.7 | -112.4 | -132.9 | -149.6 | 8.5 | -110.43 |
| 1.25 | 16.54 | 1576.4 | 1570.9 | 1563.0 | -0.43 | 0.31 | -0.22 | 27.70 | -23.3 | -39.0 | -49.0 | 0.36 | 0.38 | -86.0 | -112.4 | -133.1 | -150.3 | 10.0 | -112.74 |
| 1.50 | 16.69 | 1580.6 | 1575.1 | 1567.1 | -0.39 | 0.33 | -0.18 | 27.78 | -23.3 | -38.9 | -48.2 | 0.42 | 0.32 | -87.7 | -112.5 | -133.3 | -151.3 | 20.8 | -119.34 |
| 1.75 | 16.91 | 1584.9 | 1579.2 | 1571.3 | -0.37 | 0.36 | -0.15 | 27.87 | -23.0 | -38.7 | -47.7 | 0.47 | 0.28 | -87.1 | -112.0 | -133.2 | -150.1 | 42.5 | -125.83 |
| 2.00 | 17.19 | 1589.2 | 1583.5 | 1575.5 | -0.35 | 0.38 | -0.13 | 27.95 | -22.8 | -38.3 | -46.5 | 0.54 | 0.30 | -86.0 | -111.9 | -133.2 | -150.7 | 60.7 | -127.89 |
| 2.25 | 17.46 | 1593.5 | 1587.8 | 1579.8 | -0.33 | 0.40 | -0.09 | 28.03 | -22.6 | -37.9 | -46.9 | 0.60 | 0.32 | -85.9 | -112.3 | -132.7 | -152.1 | 86.7 | -131.89 |
| 2.50 | 17.75 | 1598.0 | 1592.1 | 1584.2 | -0.31 | 0.41 | -0.06 | 28.12 | -22.6 | -37.6 | -46.9 | 0.65 | 0.34 | -85.5 | -112.6 | -133.8 | -150.2 | 100.0 | -132.88 |
| 2.75 | 17.97 | 1602.5 | 1596.6 | 1588.7 | -0.28 | 0.42 | -0.03 | 28.21 | -22.5 | -37.5 | -47.1 | 0.70 | 0.38 | -86.2 | -112.4 | -133.8 | -150.7 | 302.4 | -141.50 |
| 3.00 | 18.19 | 1607.1 | 1601.1 | 1593.2 | -0.24 | 0.43 | -0.01 | 28.30 | -22.2 | -37.5 | -47.7 | 0.75 | 0.45 | -86.7 | -113.0 | -133.4 | -150.8 | 432.2 | -144.86 |
| 3.25 | 18.33 | 1611.7 | 1605.6 | 1597.7 | -0.20 | 0.45 | 0.00 | 28.39 | -21.9 | -37.6 | -47.2 | 0.79 | 0.50 | -84.9 | -112.0 | -133.0 | -150.9 | 507.5 | -146.81 |
| 3.50 | 18.40 | 1616.3 | 1610.2 | 1602.4 | -0.16 | 0.48 | 0.03 | 28.48 | -21.6 | -37.6 | -46.4 | 0.82 | 0.54 | -87.0 | -112.5 | -132.8 | -150.8 | 712.4 | -149.01 |
| 3.75 | 18.39 | 1621.0 | 1614.8 | 1607.0 | -0.12 | 0.50 | 0.08 | 28.58 | -21.4 | -37.1 | -45.3 | 0.85 | 0.55 | -87.7 | -112.3 | -133.2 | -151.4 | 851.6 | -151.30 |
| 3.90 | 18.36 | 1623.7 | 1617.5 | 1609.8 | -0.10 | 0.51 | 0.10 | 28.63 | -21.4 | -36.8 | -46.4 | 0.86 | 0.53 | -86.9 | -112.0 | -132.9 | -151.4 | 1000.0 | -152.76 |

*at 25°C unless mentioned otherwise

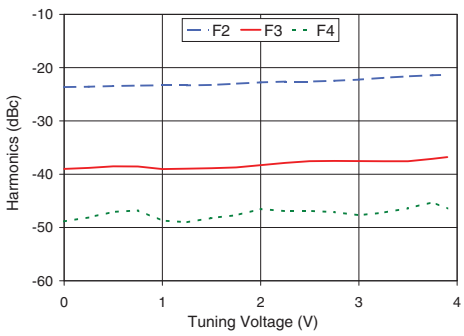
ROS-1590-319+
Frequency and Tuning Sensitivity



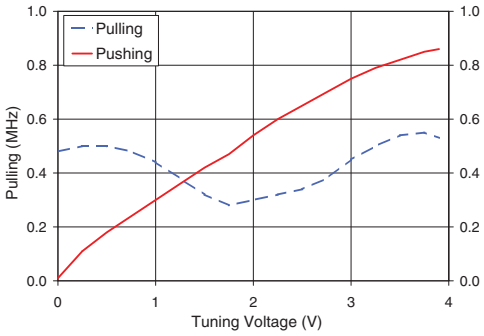

ROS-1590-319+
Power Output



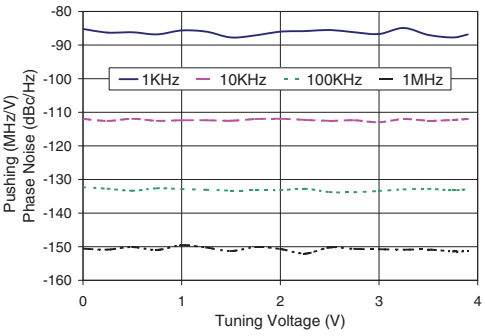

ROS-1590-319+
Harmonics Level




ROS-1590-319+
Frequency Pulling & Pushing (Vcc ± 5%)




ROS-1590-319+
Phase Noise Vs. Tuning Voltage




ROS-1590-319+
Phase Noise