

# Voltage Controlled Oscillator

# ROS-369-319+

## 5V Tuning for PLL IC's 370 to 400 MHz

## Features

- linear tuning characteristics
- low phase noise
- low pulling
- aqueous washable



CASE STYLE: CK605  
PRICE: \$19.95 ea. QTY (5-49)

## Applications

- wireless communications
- PLL circuitry
- base station

**+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<br>dBc/Hz SSB at offset frequencies,kHz<br><br>Typ. |      |      |      | TUNING            |                       |               |                                 |             | NON HARMONIC SPURIOUS (dBc) | HARMONICS (dBc) |      | PULLING<br>pk-pk @12 dBr (MHz) | PUSHING (MHz/V) | DC OPERATING POWER |    |
|--------------|-------------|------|--------------------|-----------------------------------------------------------------|------|------|------|-------------------|-----------------------|---------------|---------------------------------|-------------|-----------------------------|-----------------|------|--------------------------------|-----------------|--------------------|----|
|              |             |      |                    |                                                                 |      |      |      | VOLTAGE RANGE (V) | SENSI- TIVITY (MHz/V) | PORT CAP (pF) | 3 dB MODULATION BANDWIDTH (MHz) | Vcc (volts) |                             |                 |      |                                |                 | Current (mA)       |    |
|              |             | Min. | Max.               | Typ.                                                            | 1    | 10   | 100  | 1000              | Min.                  | Max.          | Typ.                            | Typ.        | Typ.                        | Typ.            | Max. | Typ.                           | Typ.            |                    |    |
| ROS-369-319+ | 370         | 400  | +3                 | -90                                                             | -117 | -138 | -159 | 0.5               | 5                     | 15            | 50                              | 70          | -90                         | -25             | -18  | 0.1                            | 1               | 5                  | 25 |

## Pin Connections

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

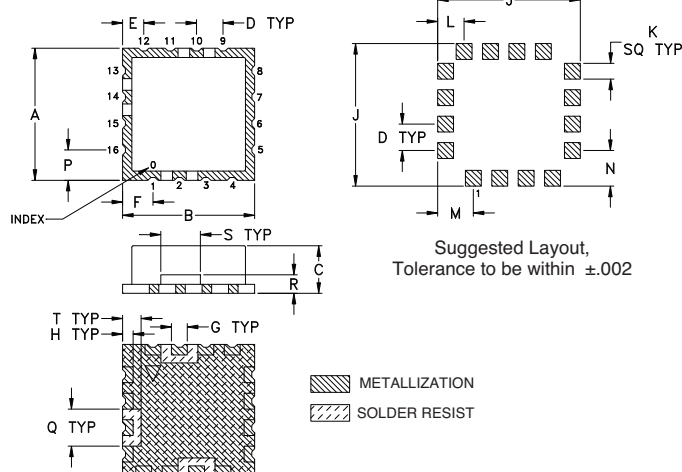
### Maximum Ratings

|                                      |                |
|--------------------------------------|----------------|
| Operating Temperature                | -55°C to 85°C  |
| Storage Temperature                  | -55°C to 100°C |
| Absolute Max. Supply Voltage (Vcc)   | 7V             |
| Absolute Max. Tuning Voltage (Vtune) | 7V             |
| All specifications                   | 50 ohm system  |

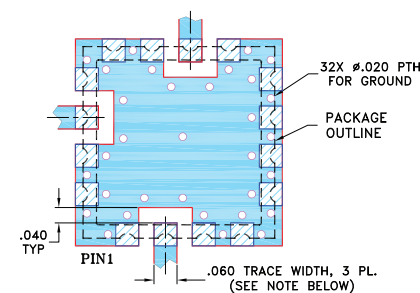
Permanent damage may occur if any of these limits are exceeded.

## Outline Drawing

## PCB Land Pattern



**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.
1. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
2. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

| 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   |



For detailed performance specs  
& shopping online see web site

P.O. Box 350166 Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine  Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

**IF/RF MICROWAVE COMPONENTS**

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REV. OR  
M107895  
EDR-7044  
ROS-369-319+  
RAV  
120910  
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# Performance Data & Curves\*

# ROS-369-319+

| V<br>TUNE | TUNE<br>SENS<br>(MHz/V) | FREQUENCY<br>(MHz) |       |       | POWER OUTPUT<br>(dBm) |       |       | Icc<br>(mA) | HARMONICS (dBc) |       |       | FREQ.<br>PUSH<br>(MHz/V) | FREQ.<br>PULL<br>(MHz) | PHASE NOISE (dBc/Hz)<br>at offsets |        |        |        | FREQ<br>OFFSET<br>(KHz) | PHASE<br>NOISE at<br>385 MHz<br>(dBc/Hz) |
|-----------|-------------------------|--------------------|-------|-------|-----------------------|-------|-------|-------------|-----------------|-------|-------|--------------------------|------------------------|------------------------------------|--------|--------|--------|-------------------------|------------------------------------------|
|           |                         | -55°C              | +25°C | +85°C | -55°C                 | +25°C | +85°C |             | F2              | F3    | F4    |                          |                        | 1kHz                               | 10kHz  | 100kHz | 1MHz   |                         |                                          |
| 0.00      | 21.39                   | 344.4              | 342.2 | 340.8 | 2.34                  | 2.20  | 1.69  | 19.18       | -20.1           | -38.7 | -35.0 | 1.16                     | 0.24                   | -86.7                              | -112.2 | -132.6 | -152.6 | 1.0                     | -90.37                                   |
| 0.25      | 19.22                   | 349.5              | 347.6 | 346.0 | 2.40                  | 2.28  | 1.89  | 19.31       | -21.3           | -36.6 | -34.0 | 1.21                     | 0.18                   | -87.6                              | -114.0 | -134.5 | -154.2 | 2.0                     | -99.89                                   |
| 0.50      | 18.16                   | 354.1              | 352.4 | 350.8 | 2.45                  | 2.33  | 2.01  | 19.42       | -22.4           | -35.3 | -33.6 | 1.23                     | 0.13                   | -89.2                              | -115.4 | -136.1 | -155.8 | 3.5                     | -107.40                                  |
| 0.75      | 17.68                   | 358.5              | 356.9 | 355.4 | 2.50                  | 2.39  | 2.08  | 19.51       | -23.4           | -34.4 | -33.2 | 1.37                     | 0.07                   | -88.9                              | -116.4 | -137.2 | -157.3 | 6.0                     | -112.41                                  |
| 1.00      | 16.84                   | 362.8              | 361.3 | 359.8 | 2.56                  | 2.50  | 2.12  | 19.53       | -23.8           | -34.5 | -32.7 | 1.39                     | 0.06                   | -88.7                              | -116.5 | -137.5 | -157.5 | 8.5                     | -116.97                                  |
| 1.25      | 16.18                   | 367.2              | 365.5 | 364.0 | 2.66                  | 2.63  | 2.15  | 19.53       | -24.0           | -34.8 | -32.3 | 1.23                     | 0.07                   | -88.3                              | -116.2 | -137.1 | -157.2 | 10.0                    | -118.57                                  |
| 1.50      | 15.78                   | 371.4              | 369.6 | 368.1 | 2.77                  | 2.73  | 2.19  | 19.53       | -24.0           | -35.5 | -32.0 | 1.12                     | 0.12                   | -88.2                              | -115.9 | -137.0 | -156.7 | 20.8                    | -125.97                                  |
| 1.75      | 15.58                   | 375.5              | 373.5 | 372.1 | 2.87                  | 2.80  | 2.18  | 19.52       | -24.0           | -36.2 | -31.8 | 1.05                     | 0.16                   | -89.4                              | -116.2 | -137.6 | -157.5 | 35.5                    | -130.80                                  |
| 2.00      | 15.52                   | 379.5              | 377.4 | 376.1 | 2.96                  | 2.83  | 2.17  | 19.51       | -24.0           | -37.0 | -31.4 | 0.98                     | 0.13                   | -89.7                              | -117.8 | -139.0 | -158.8 | 60.7                    | -134.87                                  |
| 2.25      | 15.47                   | 383.4              | 381.3 | 380.0 | 3.06                  | 2.84  | 2.17  | 19.51       | -24.2           | -38.0 | -31.5 | 0.92                     | 0.08                   | -90.7                              | -118.7 | -140.1 | -160.3 | 86.7                    | -138.62                                  |
| 2.50      | 15.37                   | 387.2              | 385.2 | 383.9 | 3.16                  | 2.83  | 2.16  | 19.51       | -24.5           | -38.6 | -31.4 | 0.90                     | 0.08                   | -89.9                              | -118.6 | -139.8 | -159.4 | 100.0                   | -139.84                                  |
| 2.75      | 15.30                   | 391.0              | 389.0 | 387.7 | 3.24                  | 2.83  | 2.18  | 19.51       | -24.9           | -39.2 | -31.6 | 0.91                     | 0.14                   | -88.9                              | -118.0 | -139.2 | -159.3 | 148.1                   | -143.32                                  |
| 3.00      | 15.21                   | 394.8              | 392.8 | 391.5 | 3.28                  | 2.82  | 2.17  | 19.52       | -25.2           | -39.4 | -31.8 | 0.94                     | 0.19                   | -90.6                              | -116.8 | -138.0 | -157.9 | 177.0                   | -144.75                                  |
| 3.25      | 15.10                   | 398.5              | 396.7 | 395.3 | 3.29                  | 2.79  | 2.18  | 19.53       | -25.4           | -39.7 | -31.9 | 0.98                     | 0.20                   | -88.7                              | -115.9 | -137.0 | -156.9 | 211.6                   | -146.39                                  |
| 3.50      | 15.04                   | 402.2              | 400.4 | 399.1 | 3.35                  | 2.75  | 2.16  | 19.54       | -25.7           | -40.0 | -31.7 | 1.03                     | 0.19                   | -88.7                              | -115.0 | -136.4 | -156.3 | 302.4                   | -149.32                                  |
| 3.75      | 14.85                   | 405.8              | 404.2 | 402.8 | 3.45                  | 2.73  | 2.18  | 19.56       | -25.9           | -40.3 | -31.6 | 1.07                     | 0.16                   | -88.8                              | -115.0 | -136.2 | -156.1 | 361.5                   | -150.42                                  |
| 4.00      | 14.66                   | 409.3              | 407.9 | 406.5 | 3.57                  | 2.72  | 2.22  | 19.57       | -26.2           | -40.3 | -31.6 | 1.11                     | 0.12                   | -88.5                              | -114.8 | -136.1 | -156.1 | 507.5                   | -153.86                                  |
| 4.25      | 14.40                   | 412.8              | 411.6 | 410.1 | 3.70                  | 2.73  | 2.26  | 19.59       | -26.6           | -39.9 | -31.7 | 1.15                     | 0.06                   | -87.9                              | -114.9 | -136.0 | -156.0 | 606.7                   | -155.55                                  |
| 4.50      | 14.13                   | 416.3              | 415.2 | 413.7 | 3.78                  | 2.72  | 2.31  | 19.60       | -27.0           | -39.6 | -31.9 | 1.18                     | 0.03                   | -88.6                              | -115.2 | -136.1 | -156.0 | 851.6                   | -158.40                                  |
| 5.00      | 13.52                   | 423.2              | 422.1 | 420.6 | 3.70                  | 2.67  | 2.34  | 19.63       | -27.8           | -38.0 | -32.1 | 1.24                     | 0.15                   | -88.4                              | -115.3 | -136.3 | -156.2 | 1000.0                  | -159.76                                  |

\*at 25°C unless mentioned otherwise

