

## Surface Mount

# Voltage Controlled Oscillator

## ROS-95-419+

5V Tuning for PLL IC's 91 to 95 MHz

### Features

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

### Applications

- test instruments-signal generators
- receivers
- VHF



CASE STYLE: CK605

### +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 |      |      |      | TUNING            |      |                       |               |                                 | NON HARMONIC SPURIOUS (dBc) | HARMONICS (dBc) |      | PULLING pk-pk @12 dB <sub>r</sub> (MHz) | PUSHING (MHz/V) | DC OPERATING POWER      |              |      |
|-------------|-------------|------|--------------------|--------------------------------------------------|------|------|------|-------------------|------|-----------------------|---------------|---------------------------------|-----------------------------|-----------------|------|-----------------------------------------|-----------------|-------------------------|--------------|------|
|             |             |      |                    | Typ.                                             |      |      |      | VOLTAGE RANGE (V) |      | SENSI- TIVITY (MHz/V) | PORT CAP (pF) | 3 dB MODULATION BANDWIDTH (MHz) |                             |                 |      |                                         |                 | V <sub>cc</sub> (volts) | Current (mA) |      |
|             | Min.        | Max. |                    | 1                                                | 10   | 100  | 1000 | Min.              | Max. |                       |               | Typ.                            |                             | Typ.            | Typ. |                                         |                 |                         |              | Typ. |
| ROS-95-419+ | 91          | 95   | +5                 | -97                                              | -125 | -146 | -162 | 0.5               | 5    | 4                     | 250           | 7                               | -90                         | -19             | -11  | 0.01                                    | 0.3             | 5                       | 25           |      |

### Pin Connections

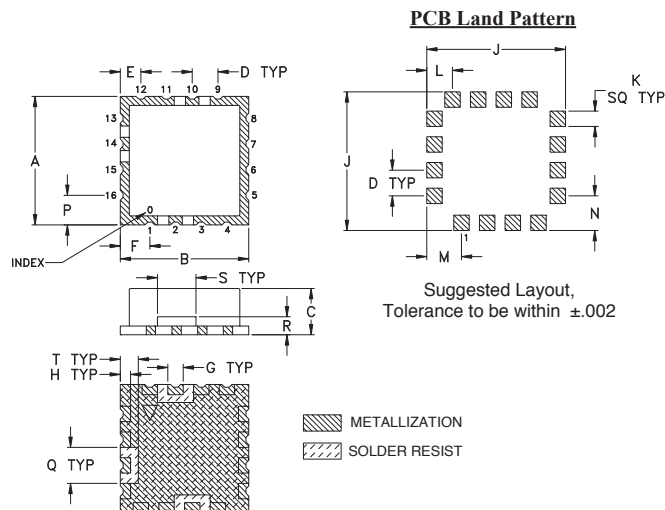
|        |                                |
|--------|--------------------------------|
| RF OUT | 10                             |
| VCC    | 14                             |
| V-TUNE | 2                              |
| GROUND | 1,3,4,5,6,7,8,9,11,12,13,15,16 |

### Maximum Ratings

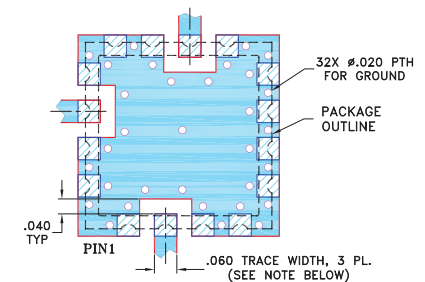
|                                      |                |
|--------------------------------------|----------------|
| Operating Temperature                | -55°C to 85°C  |
| Storage Temperature                  | -55°C to 100°C |
| Absolute Max. Supply Voltage (Vcc)   | 7V             |
| Absolute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

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

### Outline Drawing



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



#### NOTES:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS  $.030" \pm .002"$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - 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   |

#### Notes

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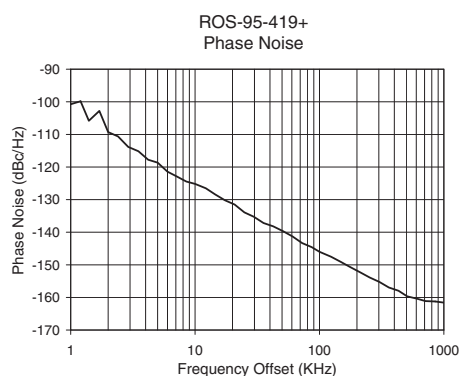
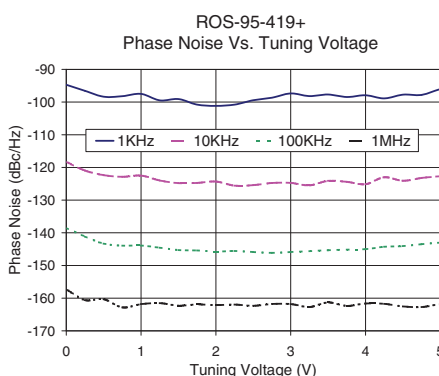
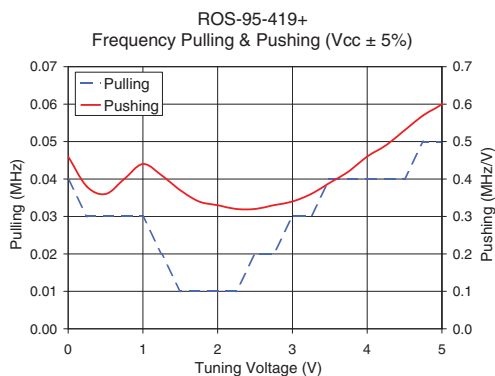
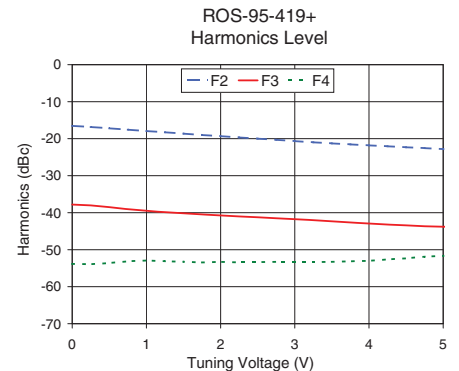
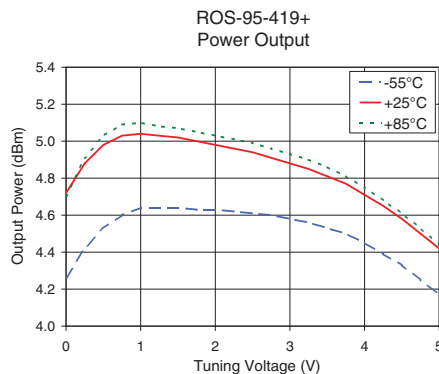
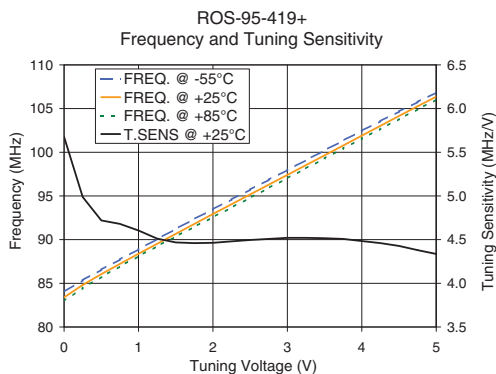
REV. A  
M151108  
EDR-6473/1  
ROS-95-419+  
RAV  
150917  
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# Performance Data & Curves\*

# ROS-95-419+

| 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>93 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      | 5.68                    | 84.0               | 83.4  | 83.0  | 4.26                  | 4.72  | 4.70  | 17.70       | -16.5           | -37.8 | -53.8 | 0.46                     | 0.04                   | -94.7                              | -118.3 | -138.5 | -157.3 | 1.0                     | -100.74                                 |
| 0.50      | 4.72                    | 86.6               | 86.1  | 85.7  | 4.53                  | 4.98  | 5.03  | 17.98       | -17.2           | -38.5 | -53.6 | 0.36                     | 0.03                   | -98.4                              | -122.4 | -143.3 | -160.3 | 2.0                     | -109.30                                 |
| 0.75      | 4.68                    | 87.7               | 87.2  | 86.9  | 4.60                  | 5.03  | 5.09  | 18.08       | -17.6           | -39.0 | -53.1 | 0.40                     | 0.03                   | -98.2                              | -122.9 | -143.9 | -162.8 | 3.5                     | -115.15                                 |
| 1.00      | 4.60                    | 88.9               | 88.4  | 88.1  | 4.64                  | 5.04  | 5.10  | 18.13       | -17.9           | -39.5 | -52.9 | 0.44                     | 0.03                   | -97.5                              | -122.5 | -143.9 | -161.8 | 6.0                     | -121.42                                 |
| 1.25      | 4.51                    | 90.1               | 89.6  | 89.2  | 4.64                  | 5.03  | 5.08  | 18.15       | -18.3           | -39.9 | -53.1 | 0.41                     | 0.02                   | -99.5                              | -124.0 | -144.6 | -161.5 | 8.5                     | -124.46                                 |
| 1.50      | 4.47                    | 91.2               | 90.7  | 90.4  | 4.64                  | 5.02  | 5.07  | 18.17       | -18.6           | -40.2 | -53.3 | 0.37                     | 0.01                   | -99.1                              | -124.8 | -145.3 | -162.3 | 10.0                    | -125.17                                 |
| 1.75      | 4.46                    | 92.4               | 91.8  | 91.5  | 4.63                  | 5.00  | 5.05  | 18.19       | -19.0           | -40.5 | -53.4 | 0.34                     | 0.01                   | -100.8                             | -124.7 | -145.4 | -161.9 | 20.8                    | -131.52                                 |
| 2.00      | 4.46                    | 93.5               | 92.9  | 92.6  | 4.63                  | 4.98  | 5.03  | 18.21       | -19.3           | -40.7 | -53.3 | 0.33                     | 0.01                   | -101.2                             | -124.3 | -145.8 | -162.1 | 35.5                    | -137.18                                 |
| 2.25      | 4.48                    | 94.6               | 94.0  | 93.7  | 4.62                  | 4.96  | 5.01  | 18.22       | -19.7           | -41.0 | -53.4 | 0.32                     | 0.01                   | -100.8                             | -125.6 | -145.6 | -162.0 | 60.7                    | -141.29                                 |
| 2.50      | 4.50                    | 95.7               | 95.2  | 94.8  | 4.61                  | 4.94  | 4.99  | 18.25       | -20.0           | -41.2 | -53.4 | 0.32                     | 0.02                   | -99.4                              | -125.4 | -145.9 | -162.3 | 86.7                    | -144.59                                 |
| 2.75      | 4.51                    | 96.9               | 96.3  | 95.9  | 4.60                  | 4.91  | 4.96  | 18.27       | -20.3           | -41.5 | -53.3 | 0.33                     | 0.02                   | -98.7                              | -124.8 | -146.1 | -161.8 | 100.0                   | -146.01                                 |
| 3.00      | 4.52                    | 98.0               | 97.4  | 97.0  | 4.58                  | 4.88  | 4.93  | 18.29       | -20.6           | -41.8 | -53.3 | 0.34                     | 0.03                   | -97.4                              | -124.7 | -145.9 | -161.8 | 148.1                   | -149.09                                 |
| 3.25      | 4.52                    | 99.1               | 98.5  | 98.2  | 4.56                  | 4.85  | 4.90  | 18.31       | -21.0           | -42.1 | -53.3 | 0.36                     | 0.03                   | -98.2                              | -125.5 | -145.6 | -162.7 | 177.0                   | -150.70                                 |
| 3.50      | 4.52                    | 100.2              | 99.7  | 99.3  | 4.53                  | 4.81  | 4.86  | 18.33       | -21.3           | -42.3 | -53.3 | 0.39                     | 0.04                   | -97.7                              | -124.1 | -145.3 | -161.3 | 211.6                   | -152.27                                 |
| 3.75      | 4.51                    | 101.3              | 100.8 | 100.4 | 4.50                  | 4.77  | 4.81  | 18.35       | -21.5           | -42.6 | -53.1 | 0.42                     | 0.04                   | -98.5                              | -124.4 | -145.2 | -162.4 | 302.4                   | -155.24                                 |
| 4.00      | 4.48                    | 102.5              | 101.9 | 101.6 | 4.45                  | 4.71  | 4.75  | 18.37       | -21.8           | -43.0 | -53.0 | 0.46                     | 0.04                   | -97.9                              | -125.1 | -145.0 | -161.6 | 361.5                   | -156.95                                 |
| 4.25      | 4.46                    | 103.6              | 103.0 | 102.7 | 4.39                  | 4.65  | 4.68  | 18.40       | -22.1           | -43.2 | -52.6 | 0.49                     | 0.04                   | -98.9                              | -123.0 | -144.3 | -161.7 | 507.5                   | -159.69                                 |
| 4.50      | 4.43                    | 104.7              | 104.2 | 103.8 | 4.33                  | 4.58  | 4.61  | 18.42       | -22.3           | -43.4 | -52.3 | 0.53                     | 0.04                   | -97.7                              | -124.1 | -144.1 | -162.5 | 600.0                   | -160.33                                 |
| 4.75      | 4.38                    | 105.8              | 105.3 | 104.9 | 4.25                  | 4.50  | 4.53  | 18.44       | -22.5           | -43.7 | -51.9 | 0.57                     | 0.05                   | -97.8                              | -123.2 | -143.5 | -162.7 | 851.6                   | -161.23                                 |
| 5.00      | 4.34                    | 106.8              | 106.4 | 106.0 | 4.17                  | 4.42  | 4.44  | 18.46       | -22.8           | -43.8 | -51.7 | 0.60                     | 0.05                   | -96.1                              | -122.7 | -143.0 | -161.9 | 1000.0                  | -161.60                                 |

\*at 25°C unless mentioned otherwise



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