

## Voltage Controlled Oscillator

ROS-4000-419+

Linear Tuning 3850 to 4000 MHz

## Features

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

## Applications

- wireless communications
- WiMAX



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 dBc (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.            | Max.               |    |
| ROS-4000-419+ | 3850        | 4000 | +5                 | -72                                              | -96 | -117 | -137 | 0.5               | 10                    | 26-36         | 50                              | 13          | -90                         | -26             | -15  | 3                            | 2.5             | 5                  | 40 |

## Pin Connections

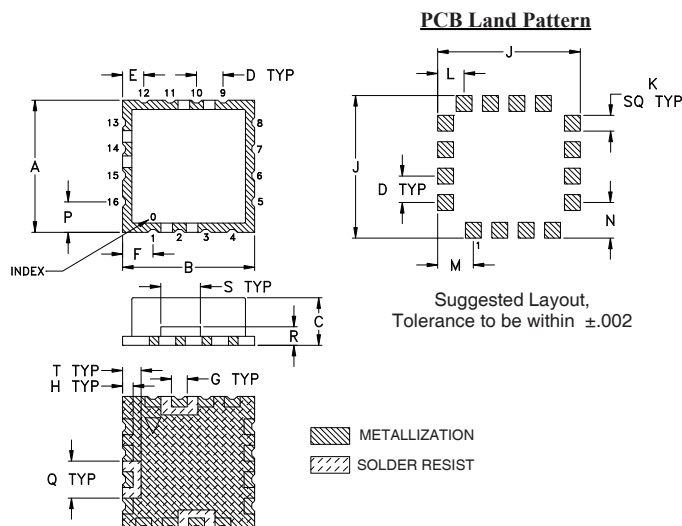
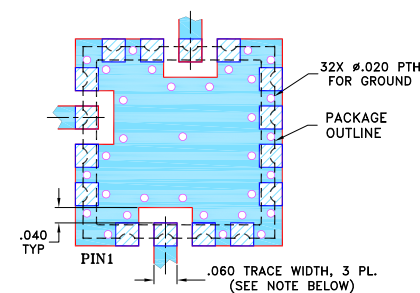
|        |                                |
|--------|--------------------------------|
| RF OUT | 10                             |
| VCC    | 14                             |
| V-TUNE | 2                              |
| GROUND | 1,3,4,5,6,7,8,9,11,12,13,15,16 |

## 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) | 12V            |
| 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" ± .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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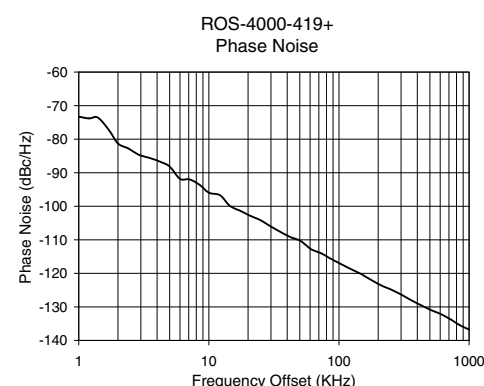
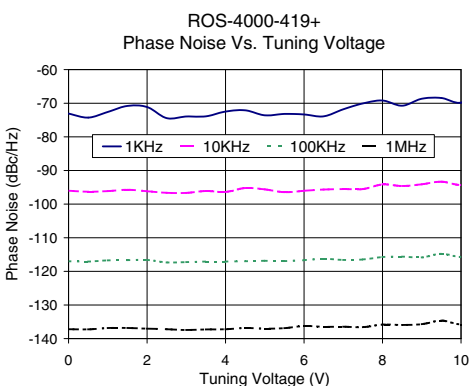
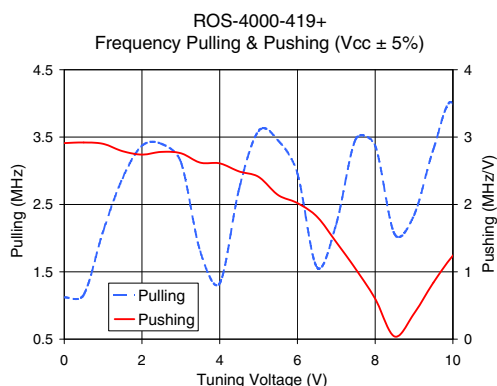
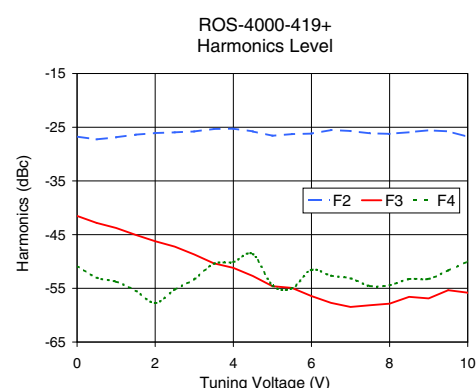
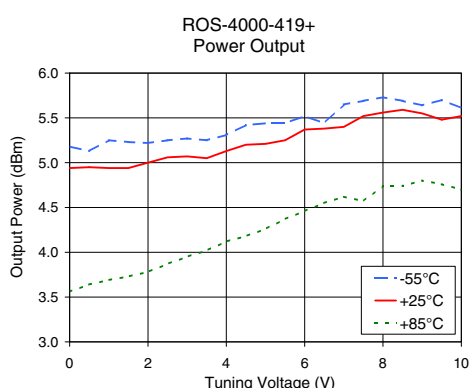
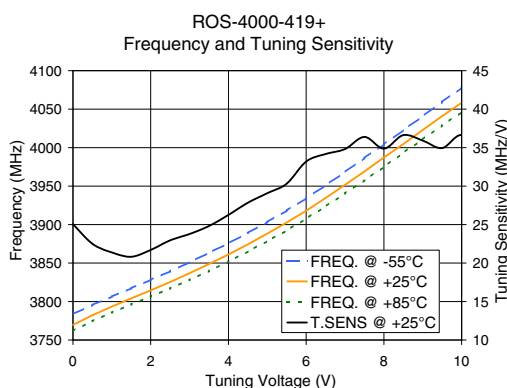
# NON-CATALOG

## Performance Data & Curves\*

## ROS-4000-419+

| 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>3925 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      | 25.05                   | 3783.5             | 3769.7 | 3761.9 | 5.18                  | 4.94  | 3.56  | 34.10       | -26.7           | -41.5 | -50.9 | 2.91                     | 1.12                   | -73.1                              | -96.0 | -117.0 | -137.2 | 1.0                     | -73.30                                    |
| 0.50      | 22.50                   | 3795.5             | 3782.2 | 3774.5 | 5.13                  | 4.95  | 3.64  | 34.14       | -27.3           | -42.8 | -53.0 | 2.92                     | 1.16                   | -74.3                              | -96.3 | -117.1 | -137.3 | 2.0                     | -81.28                                    |
| 1.00      | 21.38                   | 3806.4             | 3793.5 | 3785.7 | 5.25                  | 4.94  | 3.69  | 34.17       | -26.9           | -43.8 | -53.8 | 2.90                     | 2.10                   | -72.6                              | -96.1 | -116.7 | -136.9 | 3.5                     | -85.58                                    |
| 1.50      | 20.82                   | 3817.3             | 3804.2 | 3796.3 | 5.23                  | 4.94  | 3.73  | 34.21       | -26.4           | -45.0 | -55.4 | 2.79                     | 2.89                   | -70.8                              | -95.7 | -116.7 | -136.8 | 6.0                     | -91.83                                    |
| 2.00      | 21.71                   | 3828.2             | 3814.6 | 3806.5 | 5.22                  | 5.00  | 3.78  | 34.24       | -26.1           | -46.2 | -57.7 | 2.74                     | 3.37                   | -71.1                              | -96.2 | -116.6 | -137.1 | 8.5                     | -93.62                                    |
| 2.50      | 22.95                   | 3839.3             | 3825.4 | 3817.0 | 5.25                  | 5.06  | 3.87  | 34.26       | -26.0           | -47.2 | -55.2 | 2.78                     | 3.40                   | -74.4                              | -96.7 | -117.3 | -137.2 | 10.0                    | -95.95                                    |
| 3.00      | 23.78                   | 3851.0             | 3836.9 | 3828.2 | 5.27                  | 5.07  | 3.95  | 34.29       | -25.8           | -48.7 | -53.3 | 2.76                     | 3.13                   | -73.9                              | -96.7 | -117.3 | -137.4 | 20.8                    | -102.85                                   |
| 3.50      | 24.82                   | 3863.4             | 3848.8 | 3839.7 | 5.25                  | 5.05  | 4.02  | 34.33       | -25.3           | -50.3 | -50.4 | 2.62                     | 1.80                   | -73.9                              | -96.1 | -117.1 | -137.3 | 35.5                    | -107.67                                   |
| 4.00      | 26.26                   | 3875.7             | 3861.2 | 3851.9 | 5.31                  | 5.13  | 4.12  | 34.37       | -25.3           | -51.2 | -50.1 | 2.61                     | 1.33                   | -72.5                              | -96.4 | -117.1 | -137.2 | 60.7                    | -112.75                                   |
| 4.50      | 27.84                   | 3889.0             | 3874.3 | 3865.1 | 5.42                  | 5.20  | 4.18  | 34.41       | -25.8           | -52.7 | -48.6 | 2.49                     | 2.73                   | -72.1                              | -95.2 | -117.0 | -136.8 | 86.7                    | -115.66                                   |
| 5.00      | 29.08                   | 3903.4             | 3888.2 | 3878.5 | 5.44                  | 5.21  | 4.26  | 34.45       | -26.6           | -54.6 | -54.5 | 2.41                     | 3.59                   | -73.6                              | -95.6 | -116.9 | -137.1 | 100.0                   | -116.92                                   |
| 6.00      | 33.19                   | 3934.3             | 3917.9 | 3907.8 | 5.52                  | 5.37  | 4.46  | 34.52       | -26.2           | -56.4 | -51.6 | 2.02                     | 2.96                   | -73.3                              | -96.0 | -116.7 | -136.2 | 148.1                   | -120.21                                   |
| 6.50      | 34.17                   | 3951.1             | 3934.5 | 3923.5 | 5.44                  | 5.38  | 4.55  | 34.55       | -25.5           | -57.7 | -52.6 | 1.82                     | 1.57                   | -73.9                              | -95.7 | -116.3 | -136.5 | 177.0                   | -121.98                                   |
| 7.00      | 34.81                   | 3968.2             | 3951.6 | 3940.4 | 5.65                  | 5.40  | 4.62  | 34.59       | -25.7           | -58.5 | -53.1 | 1.44                     | 2.21                   | -71.8                              | -95.5 | -116.6 | -136.5 | 211.6                   | -123.60                                   |
| 7.50      | 36.39                   | 3986.6             | 3969.0 | 3957.7 | 5.69                  | 5.52  | 4.57  | 34.60       | -26.1           | -58.2 | -54.6 | 1.04                     | 3.47                   | -70.1                              | -95.5 | -116.5 | -136.6 | 302.4                   | -126.37                                   |
| 8.00      | 34.88                   | 4004.2             | 3987.2 | 3975.0 | 5.73                  | 5.56  | 4.74  | 34.60       | -26.2           | -57.9 | -54.4 | 0.60                     | 3.37                   | -69.2                              | -94.2 | -115.7 | -135.8 | 361.5                   | -128.09                                   |
| 8.50      | 36.62                   | 4022.8             | 4004.7 | 3993.3 | 5.69                  | 5.59  | 4.74  | 34.60       | -25.9           | -56.6 | -53.3 | 0.04                     | 2.06                   | -70.7                              | -94.6 | -115.6 | -136.0 | 507.5                   | -130.92                                   |
| 9.00      | 35.91                   | 4040.9             | 4023.0 | 4010.8 | 5.64                  | 5.55  | 4.80  | 34.56       | -25.6           | -56.9 | -53.2 | 0.38                     | 2.34                   | -68.7                              | -94.1 | -115.9 | -135.7 | 606.7                   | -132.12                                   |
| 9.50      | 34.94                   | 4059.4             | 4040.9 | 4028.9 | 5.70                  | 5.48  | 4.76  | 34.53       | -25.8           | -55.4 | -51.7 | 0.84                     | 3.32                   | -68.5                              | -93.3 | -114.8 | -134.6 | 851.6                   | -135.48                                   |
| 10.00     | 36.62                   | 4077.8             | 4058.4 | 4046.3 | 5.61                  | 5.52  | 4.70  | 34.45       | -26.8           | -55.8 | -50.0 | 1.24                     | 4.00                   | -69.8                              | -94.3 | -115.7 | -135.8 | 1000.0                  | -136.75                                   |

\*at 25°C unless mentioned otherwise



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