

# Surface Mount Voltage Controlled Oscillator

## ROS-300+

### Linear Tuning 150 to 280 MHz

#### Features

- octave band tuning
- low phase noise, -102 dBc/Hz at 10 kHz typ.
- linear tuning, 7-17 MHz/V
- excellent harmonic suppression, -28 dBc typ.
- aqueous washable

#### Applications

- test instruments-signal generators
- digital cordless phone



CASE STYLE: CK605

**+ RoHS compliant in accordance with EU Directive (2002/95/EC)**

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

#### Electrical Specifications

| FREQUENCY<br>(MHz) |      | POWER<br>OUTPUT<br>(dBm) | TUNING<br>VOLTAGE<br>(V) |      | PHASE NOISE<br>(dBc/Hz)<br>SSB at offset frequencies:<br>Typ. |           |            |          | PULLING<br>pk-pk<br>@ 12 dB <sub>r</sub><br>(MHz) | PUSHING<br>(MHz/V) | TUNING<br>SENSITIVITY<br>(MHz/V) |      | HARMONICS<br>(dBc) |      | 3 dB<br>MODULATION<br>BANDWIDTH<br>(MHz) | DC<br>OPERATING<br>POWER |  |
|--------------------|------|--------------------------|--------------------------|------|---------------------------------------------------------------|-----------|------------|----------|---------------------------------------------------|--------------------|----------------------------------|------|--------------------|------|------------------------------------------|--------------------------|--|
| Min.               | Max. | Typ.                     | Min.                     | Max. | 1<br>kHz                                                      | 10<br>kHz | 100<br>kHz | 1<br>MHz | Typ.                                              | Typ.               | Typ.                             | Typ. | Max.               | Typ. | V <sub>cc</sub><br>(volts)               | Current<br>(mA)<br>Max.  |  |
| 150                | 280  | +9.0                     | 1                        | 16   | -80                                                           | -102      | -122       | -142     | 0.5                                               | 0.3                | 7-17                             | -28  | -18                | 0.1  | 12                                       | 20                       |  |

#### Pin Connections

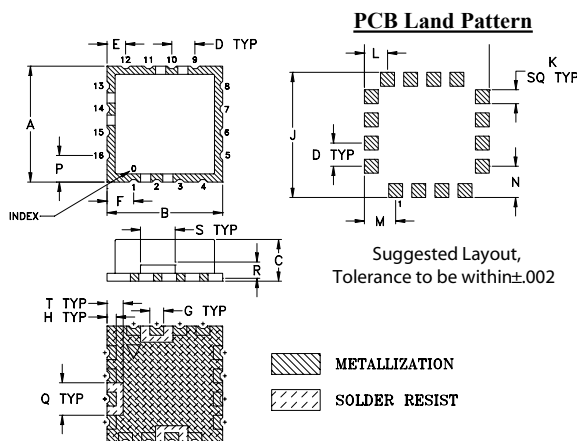
|        |                                |
|--------|--------------------------------|
| RF OUT | 10                             |
| VCC    | 14                             |
| V-TUNE | 2                              |
| GROUND | 1,3,4,5,6,7,8,9,11,12,13,15,16 |

#### Maximum Ratings

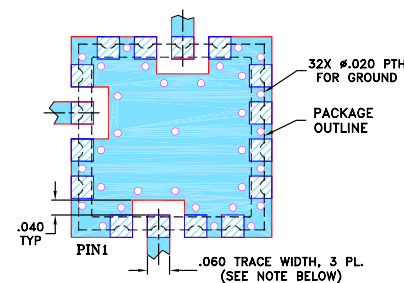
|                                      |                |
|--------------------------------------|----------------|
| Operating Temperature                | -55°C to 85°C  |
| Storage Temperature                  | -55°C to 100°C |
| Absolute Max. Supply Voltage (Vcc)   | +13V           |
| Absolute Max. Tuning Voltage (Vtune) | +18V           |

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: 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 PCB 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   |

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IF/RF MICROWAVE COMPONENTS

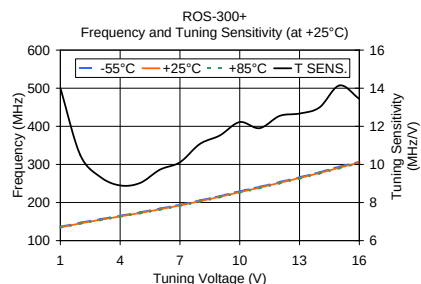
Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

For detailed performance specs  
& shipping online see web site

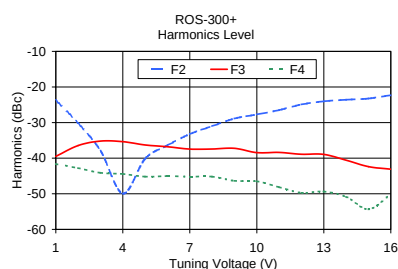
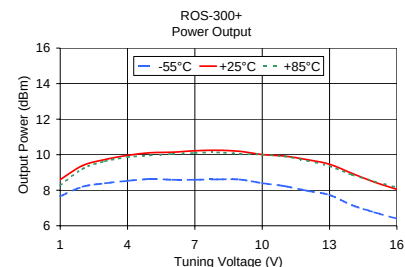
REV. E  
M151107  
EDR-4403  
ROS-300+  
MM/TD/CP/AM  
150928  
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# Performance Data & Curves

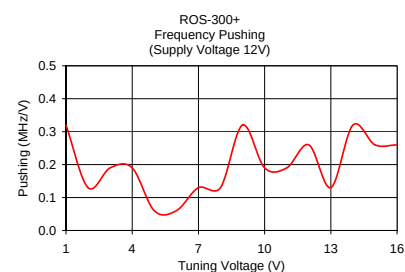
# ROS-300+



| V<br>TUNE | TUNING<br>SENS.<br>(MHz/V) | FREQUENCY (MHz) |        |        | POWER OUTPUT (dBm) |       |       |
|-----------|----------------------------|-----------------|--------|--------|--------------------|-------|-------|
|           |                            | -55°C           | +25°C  | +85°C  | -55°C              | +25°C | +85°C |
| 1.00      | 14.02                      | 136.70          | 134.78 | 133.76 | 7.66               | 8.60  | 8.27  |
| 2.00      | 10.50                      | 147.20          | 145.28 | 144.26 | 8.20               | 9.39  | 9.21  |
| 3.00      | 9.34                       | 156.48          | 154.62 | 153.54 | 8.39               | 9.73  | 9.63  |
| 4.00      | 8.90                       | 165.44          | 163.52 | 162.43 | 8.53               | 9.96  | 9.86  |
| 5.00      | 9.02                       | 174.53          | 172.54 | 171.46 | 8.63               | 10.11 | 9.96  |
| 6.00      | 9.73                       | 184.32          | 182.27 | 180.93 | 8.59               | 10.14 | 10.04 |
| 7.00      | 10.11                      | 194.43          | 192.38 | 191.10 | 8.59               | 10.22 | 10.10 |
| 8.00      | 11.07                      | 205.70          | 203.46 | 201.98 | 8.61               | 10.25 | 10.13 |
| 9.00      | 11.52                      | 217.02          | 214.98 | 213.57 | 8.60               | 10.19 | 10.05 |
| 10.00     | 12.22                      | 229.63          | 227.20 | 225.66 | 8.40               | 10.01 | 10.00 |
| 11.00     | 11.90                      | 241.41          | 239.10 | 237.57 | 8.23               | 9.92  | 9.90  |
| 12.00     | 12.54                      | 253.95          | 251.65 | 250.11 | 7.97               | 9.72  | 9.66  |
| 13.00     | 12.67                      | 266.50          | 264.32 | 262.59 | 7.73               | 9.46  | 9.35  |
| 14.00     | 12.99                      | 279.55          | 277.31 | 275.84 | 7.16               | 8.95  | 8.87  |
| 15.00     | 14.14                      | 294.08          | 291.46 | 289.73 | 6.76               | 8.46  | 8.50  |
| 16.00     | 13.44                      | 307.20          | 304.90 | 303.30 | 6.39               | 8.05  | 8.15  |



| V<br>TUNE | HARMONICS (dBc) |        |        | FREQ. PUSHING<br>(MHz/V) |
|-----------|-----------------|--------|--------|--------------------------|
|           | F2              | F3     | F4     |                          |
| 1.00      | -23.71          | -39.50 | -41.63 | 0.32                     |
| 2.00      | -30.16          | -36.45 | -42.78 | 0.13                     |
| 3.00      | -37.90          | -35.20 | -44.11 | 0.19                     |
| 4.00      | -49.94          | -35.35 | -44.42 | 0.19                     |
| 5.00      | -40.15          | -36.29 | -45.18 | 0.06                     |
| 6.00      | -36.40          | -36.79 | -45.03 | 0.06                     |
| 7.00      | -33.22          | -37.44 | -45.20 | 0.13                     |
| 8.00      | -31.00          | -37.43 | -45.19 | 0.13                     |
| 9.00      | -28.88          | -37.23 | -46.36 | 0.32                     |
| 10.00     | -27.72          | -38.45 | -46.50 | 0.19                     |
| 11.00     | -26.48          | -38.39 | -48.14 | 0.19                     |
| 12.00     | -24.91          | -38.90 | -49.73 | 0.26                     |
| 13.00     | -24.03          | -38.94 | -49.38 | 0.13                     |
| 14.00     | -23.58          | -40.56 | -50.86 | 0.32                     |
| 15.00     | -23.24          | -42.37 | -54.35 | 0.26                     |
| 16.00     | -22.31          | -43.10 | -50.14 | 0.26                     |



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