

# Voltage Controlled Oscillator

## ZX95-1505+

5V Tuning for PLL IC's 1505 MHz

### Features

- low phase noise
- low pulling
- low pushing
- protected by US patent 6,790,049

### Applications

- r & d
- lab
- instrumentation
- wireless communications
- cellular infrastructure



CASE STYLE: GB956

| Connectors | Model        |
|------------|--------------|
| SMA        | ZX95-1505-S+ |

**+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 (MHz) | PUSHING (MHz/V) | DC OPERATING POWER |      |      |      |      |
|------------|-------------|------|--------------------|---|------|------|------|--------|-------------------|------|---------------------|---------------|-----------------------------|---------------------------------|------|----------------------------|-----------------|--------------------|------|------|------|------|
|            | Min.        | Max. |                    | Typ.  | 1    | 10   | 100  | 1000   | VOLTAGE RANGE (V) |      | SENSITIVITY (MHz/V) | PORT CAP (pF) |                             | 3 dB MODULATION BANDWIDTH (MHz) | Typ. |                            |                 | Typ.               | Max. | Typ. | Typ. | Max. |
|            | Typ.        |      |                    |   |      |      |      |        | Min.              | Max. |                     |               |                             |                                 |      |                            |                 |                    |      |      |      |      |
| ZX95-1505+ | 1505        |      | -0.5               | -85   | -111 | -132 | -150 | 1      | 3.9               | 17   | 24                  | 100           | -90                         | -19                             | -10  | 0.5                        | 0.5             | 5                  | 35   |      |      |      |

### Maximum Ratings

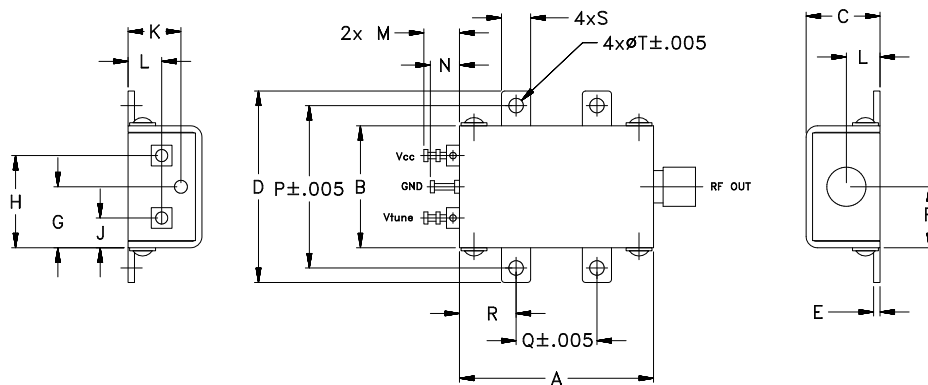
|                                      |                |
|--------------------------------------|----------------|
| Operating Temperature                | -55°C to 85°C  |
| Storage Temperature                  | -55°C to 100°C |
| Absolute Max. Supply Voltage (Vcc)   | 6V             |
| Absolute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

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



NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminals. See Application Note [AN-40-10](#).

### Outline Drawing



### Outline Dimensions (inch/mm)

| A     | B     | C     | D     | E    | F    | G    | H     | J    | K    | L    | M    | N    | P     | Q     | R    | S    | T    | wt.   |
|-------|-------|-------|-------|------|------|------|-------|------|------|------|------|------|-------|-------|------|------|------|-------|
| 1.20  | .75   | .46   | 1.18  | .04  | .38  | .38  | .57   | .18  | .33  | .21  | .22  | .18  | 1.00  | .50   | .35  | .18  | .106 | grams |
| 30.48 | 19.05 | 11.68 | 29.97 | 1.02 | 9.65 | 9.65 | 14.48 | 4.57 | 8.38 | 5.33 | 5.59 | 4.57 | 25.40 | 12.70 | 8.89 | 4.57 | 2.69 | 35.0  |

#### Notes

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 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
 C. The parts covered by this specification document 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)

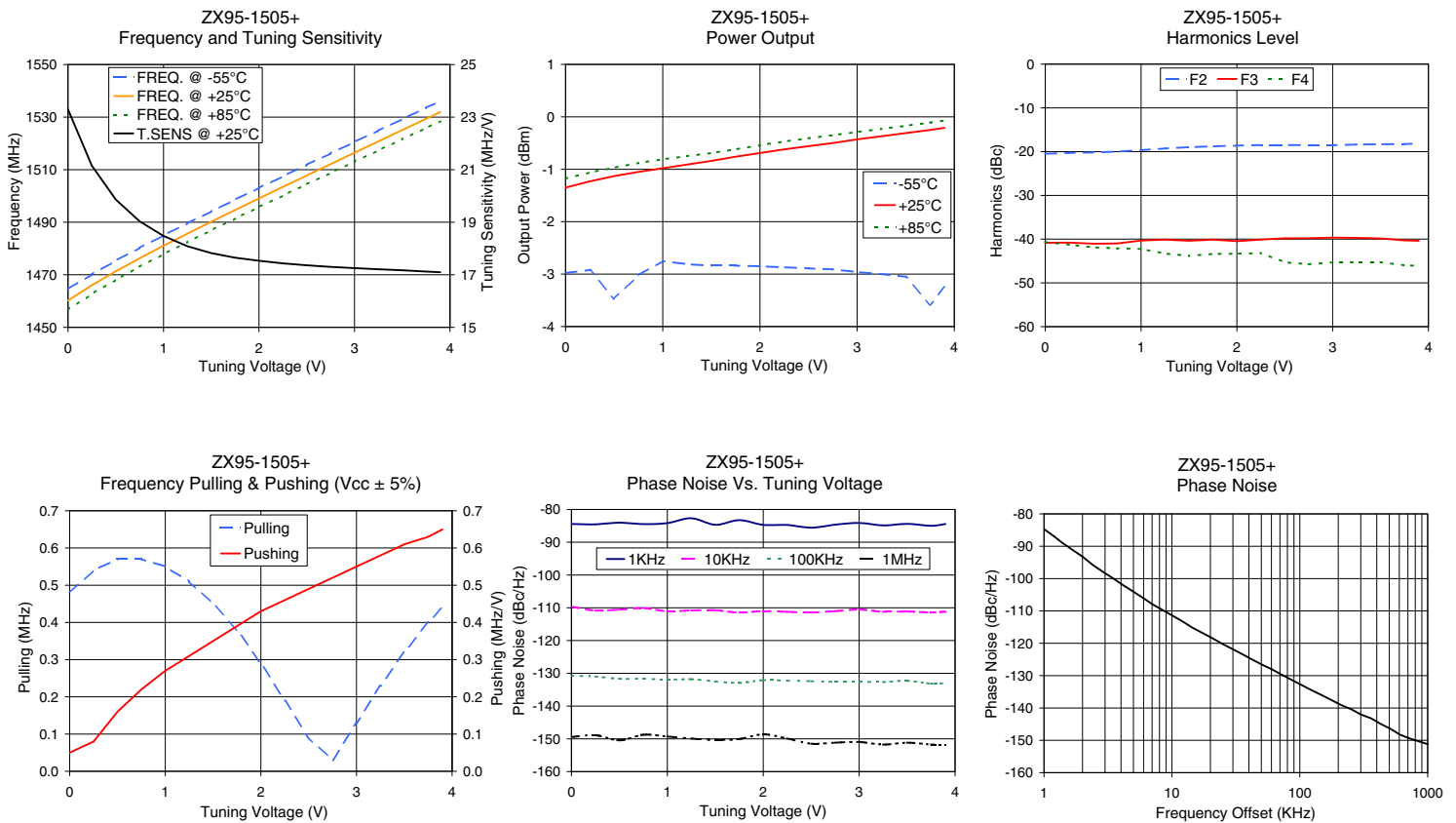


# Performance Data & Curves\*

# ZX95-1505+

| 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 1505MHz (dBc/Hz) |
|--------|-------------------|-----------------|--------|--------|--------------------|-------|-------|----------|-----------------|-------|-------|--------------------|------------------|---------------------------------|--------|--------|--------|-------------------|---------------------------------|
|        |                   | -55°C           | +25°C  | +85°C  | -55°C              | +25°C | +85°C |          | F2              | F3    | F4    |                    |                  | 1kHz                            | 10kHz  | 100kHz | 1MHz   |                   |                                 |
| 0.00   | 23.29             | 1464.6          | 1460.2 | 1456.7 | -2.98              | -1.35 | -1.18 | 24.76    | -20.5           | -40.8 | -40.7 | 0.05               | 0.48             | -84.4                           | -109.7 | -130.7 | -149.4 | 1.0               | -84.69                          |
| 0.25   | 21.15             | 1470.2          | 1466.0 | 1462.7 | -2.92              | -1.23 | -1.06 | 24.86    | -20.3           | -40.8 | -41.3 | 0.08               | 0.54             | -84.5                           | -110.9 | -131.0 | -148.9 | 2.0               | -93.21                          |
| 0.50   | 19.87             | 1475.3          | 1471.3 | 1468.1 | -3.47              | -1.13 | -0.97 | 24.95    | -20.2           | -41.0 | -41.9 | 0.16               | 0.57             | -84.0                           | -110.6 | -131.7 | -150.5 | 3.5               | -100.00                         |
| 0.75   | 19.04             | 1480.2          | 1476.3 | 1473.1 | -3.02              | -1.05 | -0.88 | 25.03    | -20.0           | -41.0 | -42.1 | 0.22               | 0.57             | -84.5                           | -110.1 | -131.7 | -148.8 | 6.0               | -106.09                         |
| 1.00   | 18.48             | 1485.0          | 1481.0 | 1477.8 | -2.75              | -0.98 | -0.81 | 25.11    | -19.7           | -40.3 | -42.2 | 0.27               | 0.55             | -84.2                           | -111.1 | -132.0 | -149.3 | 8.5               | -109.78                         |
| 1.25   | 18.09             | 1489.6          | 1485.7 | 1482.5 | -2.81              | -0.91 | -0.75 | 25.19    | -19.3           | -40.1 | -43.3 | 0.31               | 0.51             | -82.7                           | -110.8 | -131.8 | -149.9 | 10.0              | -111.33                         |
| 1.50   | 17.82             | 1494.1          | 1490.2 | 1487.0 | -2.84              | -0.84 | -0.69 | 25.26    | -19.0           | -40.4 | -43.8 | 0.35               | 0.45             | -84.7                           | -110.8 | -132.5 | -150.3 | 20.8              | -118.48                         |
| 1.75   | 17.65             | 1498.6          | 1494.6 | 1491.4 | -2.84              | -0.76 | -0.62 | 25.34    | -18.8           | -40.1 | -43.4 | 0.39               | 0.38             | -83.3                           | -111.5 | -133.0 | -150.1 | 35.5              | -123.36                         |
| 2.00   | 17.53             | 1503.0          | 1499.0 | 1495.8 | -2.85              | -0.69 | -0.54 | 25.41    | -18.6           | -40.5 | -43.4 | 0.43               | 0.29             | -84.7                           | -111.0 | -132.1 | -148.6 | 60.7              | -128.07                         |
| 2.25   | 17.43             | 1507.4          | 1503.4 | 1500.1 | -2.87              | -0.62 | -0.47 | 25.48    | -18.5           | -40.1 | -43.2 | 0.46               | 0.19             | -84.7                           | -111.2 | -132.3 | -149.9 | 86.7              | -131.36                         |
| 2.50   | 17.36             | 1511.8          | 1507.8 | 1504.4 | -2.89              | -0.56 | -0.41 | 25.56    | -18.5           | -39.8 | -45.3 | 0.49               | 0.09             | -85.6                           | -111.5 | -132.4 | -151.5 | 100.0             | -132.62                         |
| 2.75   | 17.30             | 1516.2          | 1512.1 | 1508.7 | -2.91              | -0.50 | -0.35 | 25.63    | -18.5           | -39.8 | -45.7 | 0.52               | 0.03             | -84.6                           | -111.0 | -132.6 | -151.2 | 211.6             | -139.15                         |
| 3.00   | 17.26             | 1520.5          | 1516.5 | 1513.0 | -2.96              | -0.43 | -0.29 | 25.70    | -18.5           | -39.7 | -45.3 | 0.55               | 0.13             | -84.1                           | -110.5 | -132.6 | -151.0 | 361.5             | -143.22                         |
| 3.25   | 17.21             | 1524.9          | 1520.8 | 1517.3 | -3.00              | -0.37 | -0.23 | 25.77    | -18.4           | -39.7 | -45.3 | 0.58               | 0.23             | -84.9                           | -111.2 | -132.7 | -151.8 | 507.5             | -146.38                         |
| 3.50   | 17.17             | 1529.2          | 1525.1 | 1521.6 | -3.05              | -0.31 | -0.17 | 25.85    | -18.3           | -39.8 | -45.3 | 0.61               | 0.32             | -84.4                           | -111.2 | -132.3 | -151.2 | 606.7             | -148.22                         |
| 3.75   | 17.12             | 1533.5          | 1529.4 | 1525.9 | -3.58              | -0.25 | -0.11 | 25.92    | -18.3           | -40.3 | -46.0 | 0.63               | 0.40             | -85.0                           | -111.4 | -133.1 | -151.7 | 851.6             | -150.33                         |
| 3.90   | 17.10             | 1536.1          | 1531.9 | 1528.4 | -3.25              | -0.21 | -0.07 | 25.97    | -18.2           | -40.4 | -46.1 | 0.65               | 0.44             | -84.5                           | -111.2 | -133.0 | -151.8 | 1000.0            | -151.19                         |

\*at 25°C unless mentioned otherwise



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