

# X3 Frequency Multiplier

50Ω Output 6600 to 12000 MHz

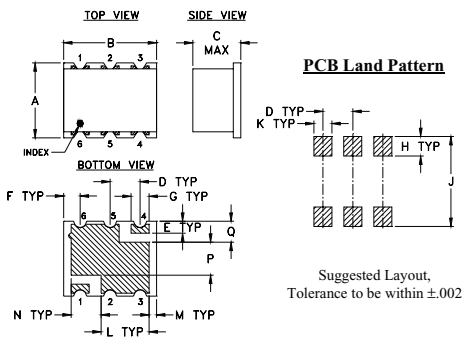
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| RF Input Power                                                  | 17 dBm         |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|        |         |
|--------|---------|
| INPUT  | 1       |
| OUTPUT | 4       |
| GROUND | 2,3,5,6 |

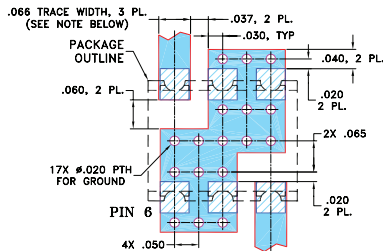
## Outline Drawing



## Outline Dimensions (inch)

| A    | B    | C    | D    | E    | F    | G    | H     |
|------|------|------|------|------|------|------|-------|
| .25  | .31  | .16  | .100 | .040 | .055 | .060 | .065  |
| 6.35 | 7.87 | 4.06 | 2.54 | 1.02 | 1.40 | 1.52 | 1.65  |
| J    | K    | L    | M    | N    | P    | Q    | wt.   |
| .300 | .060 | .160 | .025 | .100 | .110 | .070 | grams |
| 7.62 | 1.52 | 4.06 | 0.64 | 2.54 | 2.79 | 1.78 | 0.16  |

## Demo Board MCL P/N: TB-393 Suggested PCB Layout (PL-258)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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.
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
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## Features

- broadband
- high rejection F2, -33 dBc typ.; F4, -45 dBc typ.
- low cost
- aqueous washable

## Applications

- synthesizers
- local oscillators
- satellite up and down converters

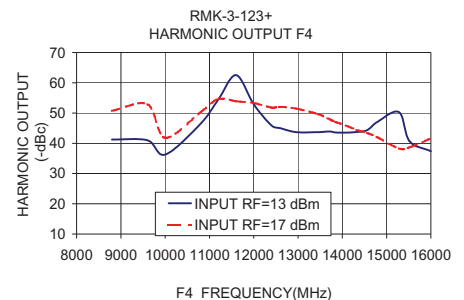
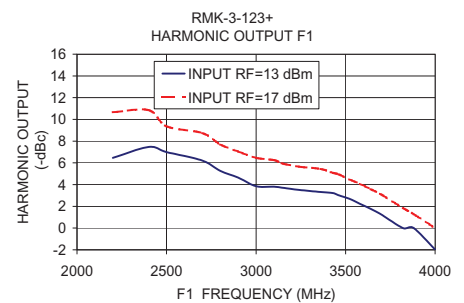
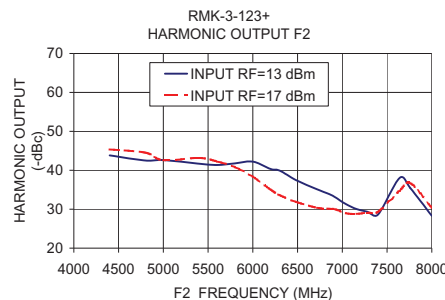
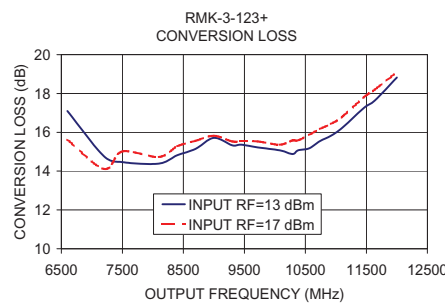
## Electrical Specifications

| MULTIPLICATION FACTOR | FREQUENCY (MHz) |            | INPUT POWER (dBm) |      | CONVERSION LOSS (dB) | *HARMONIC OUTPUT (dBC) |              |              |
|-----------------------|-----------------|------------|-------------------|------|----------------------|------------------------|--------------|--------------|
|                       | F1 Input        | F3 Output  | Min.              | Max. |                      | F1 Typ. Min.           | F2 Typ. Min. | F4 Typ. Min. |
| 3                     | 2200-4000       | 6600-12000 | 13                | 17   | 15.5 21              | 5 -5                   | 33 22        | 45 24        |

\* Harmonics of input frequency below the power level of F3

## Typical Performance Data

| INPUT RF= 13 dBm      |                      |                                 |       |       | INPUT RF= 17 dBm     |                                 |       |       |  |
|-----------------------|----------------------|---------------------------------|-------|-------|----------------------|---------------------------------|-------|-------|--|
| Input Frequency (MHz) | Conversion Loss (dB) | Harmonic Output Below F3 (-dBc) |       |       | Conversion Loss (dB) | Harmonic Output Below F3 (-dBc) |       |       |  |
|                       | F3                   | F1                              | F2    | F4    | F3                   | F1                              | F2    | F4    |  |
| 2200.00               | 17.10                | 6.46                            | 43.81 | 41.26 | 15.62                | 10.66                           | 45.36 | 50.70 |  |
| 2400.00               | 14.76                | 7.47                            | 42.53 | 40.96 | 14.11                | 10.86                           | 44.54 | 52.89 |  |
| 2500.00               | 14.46                | 7.00                            | 42.64 | 36.29 | 15.01                | 9.37                            | 42.60 | 41.84 |  |
| 2700.00               | 14.39                | 6.21                            | 41.67 | 46.46 | 14.73                | 8.74                            | 43.18 | 50.24 |  |
| 2800.00               | 14.82                | 5.27                            | 41.35 | 54.46 | 15.28                | 7.70                            | 42.28 | 54.65 |  |
| 2900.00               | 15.15                | 4.65                            | 41.77 | 62.55 | 15.56                | 7.05                            | 40.84 | 53.91 |  |
| 3000.00               | 15.71                | 3.85                            | 42.22 | 52.88 | 15.82                | 6.46                            | 38.36 | 53.31 |  |
| 3100.00               | 15.33                | 3.81                            | 40.33 | 45.93 | 15.53                | 6.25                            | 35.03 | 51.83 |  |
| 3150.00               | 15.36                | 3.71                            | 39.92 | 44.99 | 15.55                | 5.93                            | 33.63 | 52.04 |  |
| 3240.00               | 15.22                | 3.51                            | 37.49 | 43.68 | 15.53                | 5.65                            | 31.88 | 51.49 |  |
| 3360.00               | 15.07                | 3.32                            | 35.11 | 43.68 | 15.36                | 5.45                            | 30.38 | 49.72 |  |
| 3430.00               | 14.88                | 3.22                            | 33.83 | 43.88 | 15.58                | 5.07                            | 30.14 | 47.92 |  |
| 3460.00               | 15.07                | 3.03                            | 33.08 | 43.58 | 15.58                | 4.96                            | 30.01 | 47.07 |  |
| 3520.00               | 15.17                | 2.71                            | 31.33 | 43.53 | 15.86                | 4.48                            | 28.99 | 45.90 |  |
| 3580.00               | 15.55                | 2.23                            | 30.04 | 43.74 | 16.17                | 4.07                            | 28.81 | 44.40 |  |
| 3640.00               | 15.82                | 1.77                            | 29.35 | 44.29 | 16.43                | 3.58                            | 29.12 | 43.44 |  |
| 3700.00               | 16.22                | 1.25                            | 28.63 | 47.10 | 16.79                | 3.08                            | 29.36 | 41.94 |  |
| 3820.00               | 17.26                | -0.08                           | 38.02 | 50.31 | 17.81                | 1.85                            | 34.73 | 38.30 |  |
| 3880.00               | 17.64                | -0.56                           | 35.44 | 40.65 | 18.20                | 1.29                            | 36.72 | 38.63 |  |
| 4000.00               | 18.82                | -1.97                           | 28.32 | 37.36 | 19.11                | -0.09                           | 30.37 | 41.63 |  |



Generic photo used for illustration purposes only  
CASE STYLE: TT1224

### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

| Reel Size | Devices/Reel         |
|-----------|----------------------|
| 7"        | 10, 20, 50, 100, 200 |
| 13"       | 500                  |



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