

# High IP3 Frequency Mixer

## HJK-151MH+

Level13 (LO Power +13dBm) 100 to 150 MHz



CASE STYLE: TTT881  
PRICE: \$8.95 ea. QTY (10)

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

### Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| LO Power              | +19 dBm        |
| RF Power              | +20 dBm        |

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

### Pin Connections

|        |       |
|--------|-------|
| LO     | 2     |
| RF     | 1     |
| IF     | 3     |
| GROUND | 4,5,6 |

### Features

- high IP2, 60 dBm typ.
- high IP3, 30 dBm typ.
- excellent L-R isolation, 55 dB typ.; L-I isolation, 50 dB typ.
- compression, 3 dB higher than LO power
- protected by US Patent 6,807,407

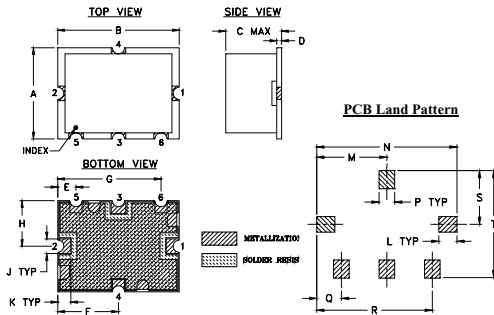
### Applications

- amateur radio
- mobile radio
- paging
- non-geostationary mobile

### Electrical Specifications at 25°C

| Parameter                    | Min. | Typ. | Max. | Unit |
|------------------------------|------|------|------|------|
| Frequency Range, RF          | 100  |      | 150  | MHz  |
| Frequency Range, LO          | 130  |      | 180  | MHz  |
| Frequency Range, IF          | 10   |      | 100  | MHz  |
| Conversion Loss              | —    | 6.8  | 8.2  | dB   |
| LO to RF Isolation           | 40   | 55   | —    | dB   |
| LO to IF Isolation           | 38   | 50   | —    | dB   |
| IP2                          | —    | 60   | —    | dBm  |
| IP3                          | —    | 30   | —    | dBm  |
| RF Input at 1 dB Compression | —    | +16  | —    | dBm  |

### Outline Drawing

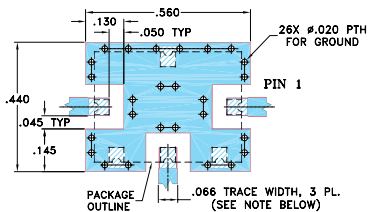


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch)

| A    | B     | C     | D    | E    | F     | G     | H     | J    | K    |
|------|-------|-------|------|------|-------|-------|-------|------|------|
| .38  | .50   | .23   | .020 | .075 | .250  | .425  | .187  | .050 | .050 |
| 9.65 | 12.70 | 5.84  | 0.51 | 1.91 | 6.35  | 10.80 | 4.75  | 1.27 | 1.27 |
| L    | M     | N     | P    | Q    | R     | S     | T     | wt.  |      |
| .070 | .270  | .540  | .060 | .095 | .445  | .208  | .415  |      |      |
| 1.78 | 6.86  | 13.72 | 1.52 | 2.41 | 11.30 | 5.28  | 10.54 |      | 0.8  |

### Demo Board MCL P/N: TB-12 Suggested PCB Layout (PL-079)

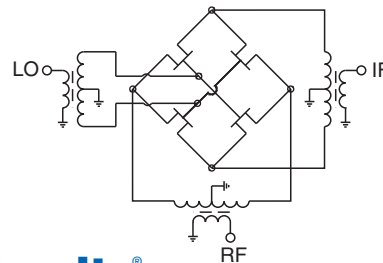


- NOTE:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .039" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  2. THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
  3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.

### Typical Performance Data

| Frequency<br>MHz | Conversion<br>Loss<br>(dB) | Isolation<br>L-R<br>(dB) | Isolation<br>L-I<br>(dB) | VSWR<br>RF Port<br>(:1) | VSWR<br>LO Port<br>(:1) | IP3 (dBm) |       | IP2 (dBm) |    |
|------------------|----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|-----------|-------|-----------|----|
|                  |                            |                          |                          |                         |                         | LO        | LO    | LO        | LO |
| 100.1            | 130.10                     | 6.60                     | 57.67                    | 52.33                   | 2.21                    | 4.01      | 27.33 | 59.95     |    |
| 102.1            | 132.10                     | 6.62                     | 58.25                    | 51.94                   | 2.23                    | 4.02      | 27.87 | 64.91     |    |
| 104.1            | 134.10                     | 6.65                     | 58.68                    | 51.53                   | 2.25                    | 4.03      | 28.85 | 69.94     |    |
| 106.1            | 136.10                     | 6.67                     | 58.85                    | 51.19                   | 2.27                    | 4.04      | 30.40 | 77.94     |    |
| 108.1            | 138.10                     | 6.68                     | 58.74                    | 50.92                   | 2.29                    | 4.05      | 31.56 | 69.41     |    |
| 110.1            | 140.10                     | 6.68                     | 58.53                    | 50.67                   | 2.32                    | 4.07      | 31.78 | 65.32     |    |
| 112.1            | 142.10                     | 6.68                     | 58.27                    | 50.44                   | 2.33                    | 4.08      | 31.29 | 64.56     |    |
| 114.1            | 144.10                     | 6.68                     | 57.93                    | 50.25                   | 2.34                    | 4.09      | 30.75 | 62.36     |    |
| 116.1            | 146.10                     | 6.67                     | 57.61                    | 50.14                   | 2.35                    | 4.10      | 31.49 | 61.91     |    |
| 118.1            | 148.10                     | 6.66                     | 57.21                    | 50.06                   | 2.36                    | 4.11      | 31.50 | 61.34     |    |
| 120.1            | 150.10                     | 6.65                     | 56.81                    | 50.03                   | 2.38                    | 4.13      | 32.71 | 60.17     |    |
| 122.1            | 152.10                     | 6.65                     | 56.37                    | 50.02                   | 2.39                    | 4.14      | 32.78 | 58.77     |    |
| 124.1            | 154.10                     | 6.64                     | 55.90                    | 50.02                   | 2.40                    | 4.16      | 33.52 | 58.73     |    |
| 126.1            | 156.10                     | 6.66                     | 55.45                    | 49.99                   | 2.42                    | 4.17      | 32.93 | 58.21     |    |
| 128.1            | 158.10                     | 6.67                     | 55.05                    | 49.96                   | 2.43                    | 4.18      | 32.57 | 57.27     |    |
| 130.1            | 160.10                     | 6.68                     | 54.66                    | 49.90                   | 2.44                    | 4.20      | 32.42 | 56.94     |    |
| 132.1            | 162.10                     | 6.68                     | 54.28                    | 49.82                   | 2.46                    | 4.23      | 31.57 | 56.93     |    |
| 134.1            | 164.10                     | 6.68                     | 53.93                    | 49.75                   | 2.49                    | 4.23      | 31.71 | 56.29     |    |
| 146.1            | 176.10                     | 6.78                     | 51.22                    | 49.35                   | 2.70                    | 4.32      | 30.33 | 55.60     |    |
| 150.1            | 180.10                     | 6.87                     | 50.19                    | 49.43                   | 2.79                    | 4.34      | 30.82 | 54.33     |    |

### Electrical Schematic



For detailed performance specs  
& shipping online see web site

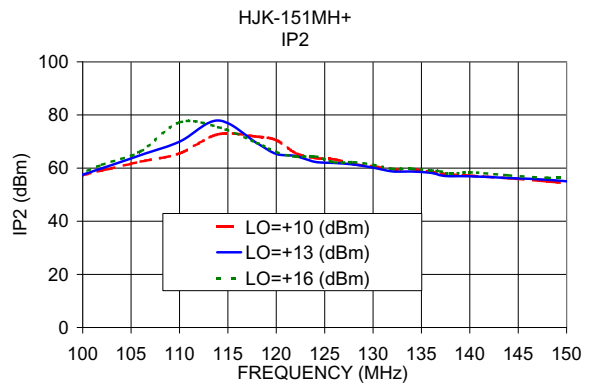
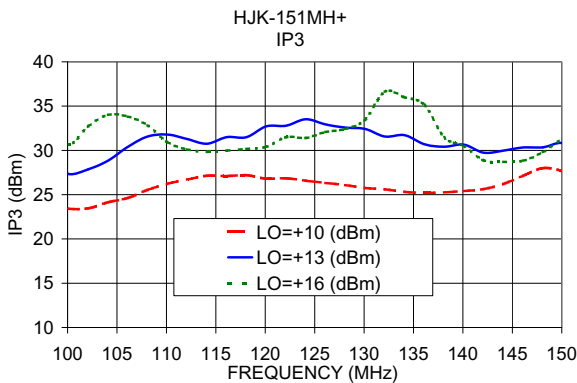
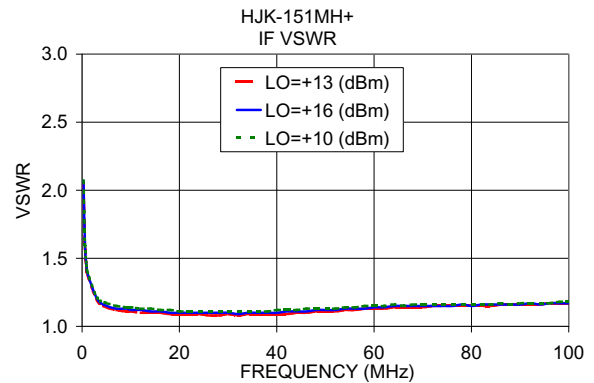
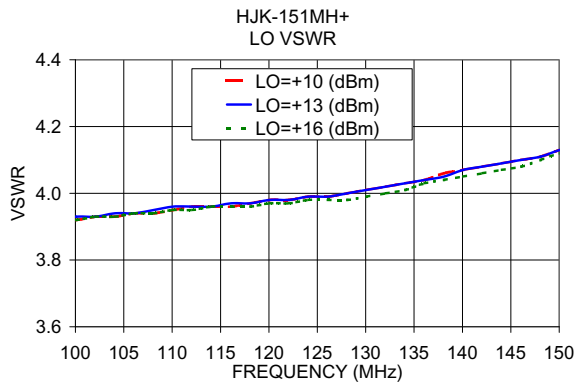
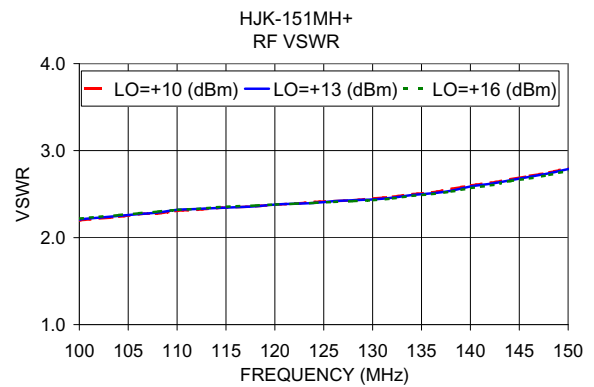
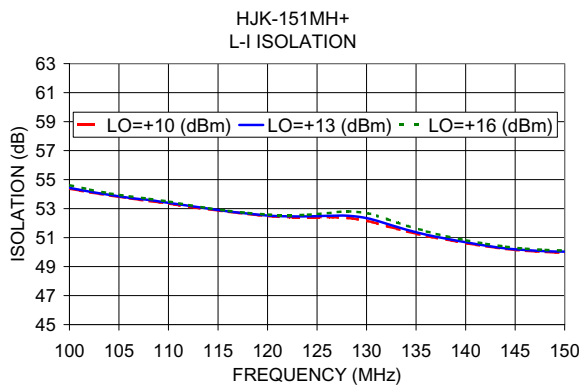
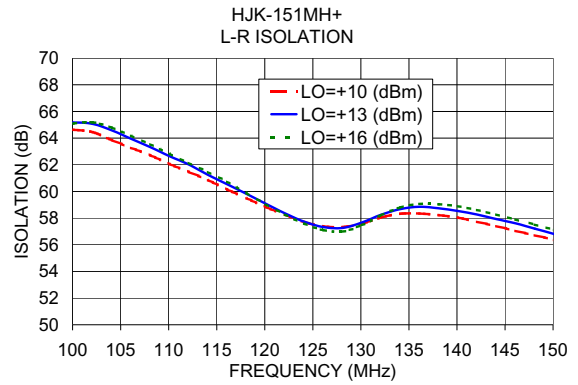
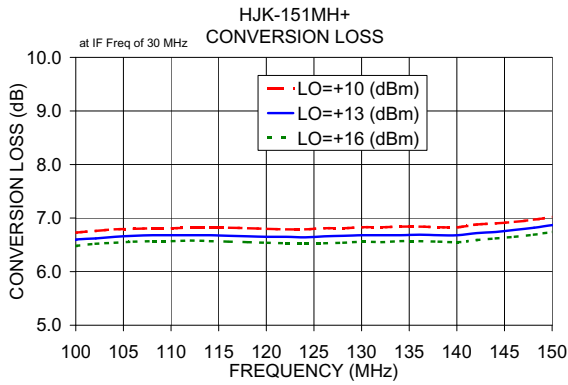


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