

# Frequency Mixer

## Level 20 (LO Power +20 dBm) 1090 to 1950 MHz

## HJK-20VH+ HJK-20VH



CASE STYLE: TTT167  
PRICE: \$ 24.95 ea. QTY (1-9)

### Features

- high IP3, up to 30 dBm typ.
- low spurious
- 2RF-LO, -73 dBc typ.
- 2LO-2RF, -73 dBc typ.

### Applications

- for cable tv up converter (second mixer)
- communication systems

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

See our web site for RoHS Compliance methodologies and qualifications.

### Mixer Electrical Specifications (T<sub>AMB</sub>=25°C)

| FREQUENCY<br>(MHz) |           |         | CONVERSION LOSS<br>(dB) |     |                |      | SECOND<br>ORDER I.M.<br>(Note 1)<br>(dBc)<br>Max. |         | IP3@<br>center<br>band<br>(dBm) | LO-RF<br>ISOLATION<br>(dB) |      | LO-IF<br>ISOLATION<br>(dB) |      | E<br>FACTOR |
|--------------------|-----------|---------|-------------------------|-----|----------------|------|---------------------------------------------------|---------|---------------------------------|----------------------------|------|----------------------------|------|-------------|
| RF                 | LO        | IF      | Mid-Band<br>m           |     | Total<br>Range |      | 2RF-LO                                            | 2LO-2RF | Typ.                            | Typ.                       | Min. | Typ.                       | Min. |             |
|                    |           |         | x                       | σ   | Max.           | Max. |                                                   |         |                                 |                            |      |                            |      |             |
| 1090.00            | 1167-1950 | 77-870  | 7.2                     | 0.2 | —              | 8.5  | —                                                 | —       | 30                              | 32                         | 26   | 34                         | 28   | 0.9         |
| 1090.00            | 1183-1590 | 93-500  |                         |     | —              |      | -73                                               | -73     |                                 |                            |      |                            |      |             |
| 1090.00            | 1590-1800 | 500-710 |                         |     | —              |      | -73                                               |         |                                 |                            |      |                            |      |             |
| 1090.00            | 1800-1900 | 710-810 |                         |     | —              |      | -68                                               |         |                                 |                            |      |                            |      |             |
| 1090.00            | 1900-1950 | 810-860 |                         |     | —              |      | -65                                               |         |                                 |                            |      |                            |      |             |

1 dB COMP.: +15 dBm typ. m = mid band [2f<sub>l</sub> to f<sub>h</sub>/2] E = [IP3(dBm)-LO Power (dBm)]/10

Note 1. Measured at -14 dBm RF. High order spurious 3RF-2LO, 4RF-2LO, 4RF-3LO, 3RF-2LO, 3RF-2LO (dBc) typ. < -80 dBc

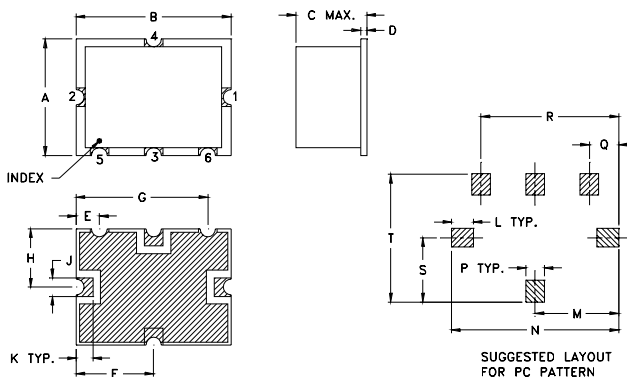
### Pin Connections

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

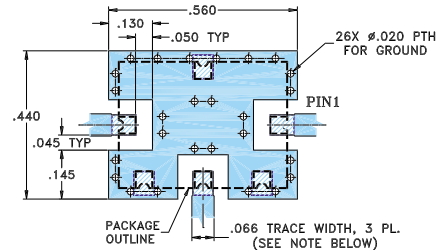
### Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -20°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| LO Power              | +22 dBm        |

### Outline Drawing



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



- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. IF YOUR PCB DESIGN RULES ALLOW, GROUND VIAS SHOULD BE PLACED UNDER THE LAND PATTERN FOR BETTER RF PERFORMANCE. OTHERWISE GROUND VIAS SHOULD BE PLACED AS CLOSE TO LAND PATTERN AS POSSIBLE.  
3. GROUND PAD SHALL BE FREE OF SOLDERMASK IF REQUIRED FOR SOLDERING.

■ DENOTES PCB COPPER LAYOUT

■ 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.   |
|------|-------|------|------|------|------|-------|------|------|------|------|------|-------|------|------|-------|------|-------|-------|
| .375 | .500  | .23  | .020 | .075 | .250 | .425  | .187 | .050 | .050 | .070 | .270 | .540  | .060 | .095 | .445  | .208 | .415  | grams |
| 9.53 | 12.70 | 5.84 | 0.51 | 1.91 | 6.35 | 10.80 | 4.75 | 1.27 | 1.27 | 1.78 | 6.86 | 13.72 | 1.52 | 2.41 | 11.30 | 5.28 | 10.54 | 0.8   |

# HJK-20VH+ HJK-20VH

Typical Performance Data

| FREQ.     |           | Conv. Loss<br>(dB)<br>LO<br>+20 dBm | Isol. L-R<br>(dB)<br>LO<br>+20 dBm | Isol. L-I<br>(dB)<br>LO<br>+20 dBm | VSWR LO port<br>(:1)<br>LO<br>+20 dBm | VSWR RF port<br>(:1)<br>LO<br>+20 dBm | 2RF-LO<br>(dBc)<br>LO<br>+20 dBm | 2LO-2RF<br>(dBc)<br>LO<br>+20 dBm |
|-----------|-----------|-------------------------------------|------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-----------------------------------|
| RF<br>MHz | LO<br>MHz |                                     |                                    |                                    |                                       |                                       |                                  |                                   |
| 1090.00   | 1167.00   | 7.16                                | 38.28                              | 31.98                              | 9.53                                  | 1.99                                  | 77.16                            | 78.82                             |
| 1090.00   | 1183.00   | 7.20                                | 38.91                              | 32.74                              | 6.39                                  | 2.05                                  | 78.68                            | 81.18                             |
| 1090.00   | 1590.00   | 7.56                                | 31.65                              | 42.35                              | 2.80                                  | 1.80                                  | 78.63                            | 78.59                             |
| 1090.00   | 1800.00   | 7.51                                | 32.26                              | 39.17                              | 3.87                                  | 1.86                                  | 82.75                            | 78.24                             |
| 1090.00   | 1900.00   | 7.51                                | 33.41                              | 33.35                              | 4.61                                  | 1.81                                  | 79.43                            | 73.96                             |
| 1090.00   | 1950.00   | 7.43                                | 34.22                              | 31.76                              | 3.76                                  | 1.75                                  | 70.63                            | 68.00                             |

## Performance Charts

