

# Surface Mount I&Q Demodulator

50Ω 104 to 176 MHz

## JCIQ-176D+ JCIQ-176D



CASE STYLE: BG291  
PRICE: \$ 54.95 ea. QTY (1-9)

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

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

### Maximum Ratings

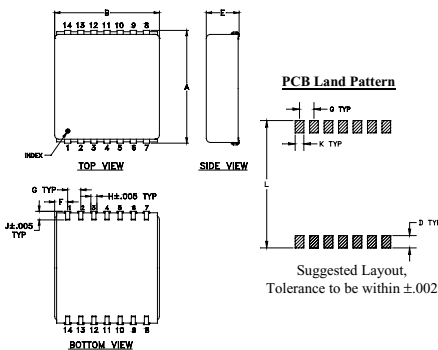
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |
| LO/RF Power           | 50mW           |
| I&Q Current           | 40mA           |

### Pin Connections

|              |                         |
|--------------|-------------------------|
| LO (carrier) | 2                       |
| RF (signal)  | 9                       |
| I (0°)(ref.) | 4                       |
| Q (90°)*     | 11                      |
| GROUND       | 1,3,5,6,7,8,10,12,13,14 |

\*Q=+90° for LO<RF  
Q=-90° for LO>RF

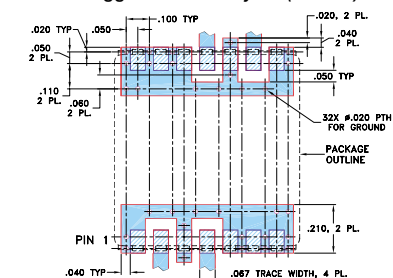
### Outline Drawing



### Outline Dimensions (inch/mm)

| A     | B     | C    | D    | E     | F    |       |
|-------|-------|------|------|-------|------|-------|
| .870  | .800  | —    | .100 | .250  | .100 |       |
| 22.09 | 20.32 | —    | 2.54 | 6.35  | 2.54 |       |
| G     | H     | J    | K    | L     |      | wt.   |
| .100  | .047  | .065 | .065 | .890  |      | grams |
| 2.54  | 1.19  | 1.65 | 1.65 | 22.60 |      | 4.0   |

### Demo Board MCL P/N: TB-21 Suggested PCB Layout (PL-209)



- NOTE:
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - 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

### Features

- shielded metal case with J-leads
- excellent 3rd & 5th order harmonic suppression
- good amplitude & phase unbalance
- aqueous washable

### Applications

- communication systems

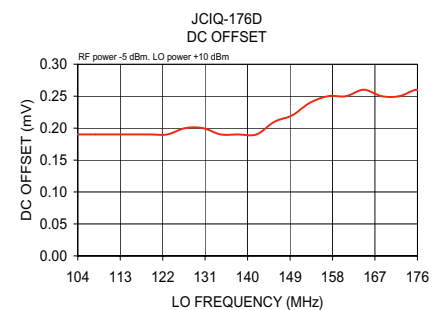
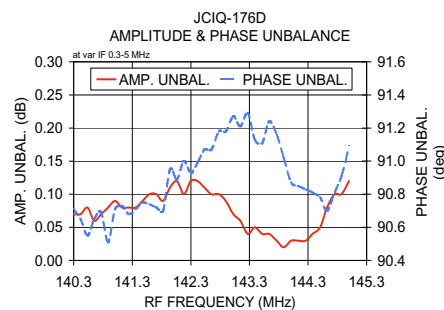
### Demodulator Electrical Specifications

| MODEL NO. | FREQUENCY (MHz) |                | CONVERSION LOSS (dB) |      |           | AMPLITUDE UNBALANCE (dB) |      | PHASE UNBALANCE (Deg.) |      | HARMONIC SUPPRESSION (dBc) |      |       |      |    |    |
|-----------|-----------------|----------------|----------------------|------|-----------|--------------------------|------|------------------------|------|----------------------------|------|-------|------|----|----|
|           | RF (SIGNAL)     |                | I&Q                  |      |           | with reference to 90°    |      | with reference to 90°  |      | 3XI/Q                      |      | 5XI/Q |      |    |    |
|           | f <sub>i</sub>  | f <sub>u</sub> | Min.                 | Max. | $\bar{x}$ | $\sigma$                 | Max. | Typ.                   | Max. | Typ.                       | Min. | Typ.  | Min. |    |    |
| JCIQ-176D | 104             | 176            | DC                   | 5    | 5.5       | 0.1                      | 7.0  | 0.15                   | 0.6  | 2                          | 5    | 52    | 40   | 65 | 50 |

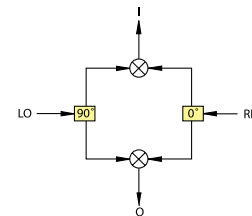
- Notes:
1. Operating LO Power: 10±0.5 dBm
  2. 1 dB Compression at +4 dBm RF input
  3. DC offset 1mV typ.
  4. Conversion Loss=RF power, dBm - (I+Q) power, dBm

### Typical Performance Data

| Frequency (MHz) | Conversion Loss (dB) |      | Amplitude Unbalance (dB) | Phase (I&Q) (deg.) | Frequency (MHz) |        | DC Offset (mV) |
|-----------------|----------------------|------|--------------------------|--------------------|-----------------|--------|----------------|
|                 | LO=140MHz RF         | I&Q  |                          |                    | LO              | RF     |                |
| 140.30          | 0.30                 | 5.67 | 0.07                     | 90.71              | 96.00           | 96.10  | 0.18           |
| 140.54          | 0.54                 | 5.61 | 0.08                     | 90.55              | 100.00          | 100.10 | 0.19           |
| 140.77          | 0.77                 | 5.56 | 0.07                     | 90.69              | 104.00          | 104.10 | 0.19           |
| 141.01          | 1.01                 | 5.55 | 0.09                     | 90.71              | 107.79          | 107.89 | 0.19           |
| 141.24          | 1.24                 | 5.57 | 0.08                     | 90.68              | 115.37          | 115.47 | 0.19           |
| 141.48          | 1.48                 | 5.55 | 0.09                     | 90.75              | 119.16          | 119.26 | 0.19           |
| 141.71          | 1.71                 | 5.55 | 0.10                     | 90.72              | 122.95          | 123.05 | 0.19           |
| 141.95          | 1.95                 | 5.54 | 0.11                     | 90.95              | 126.74          | 126.84 | 0.20           |
| 142.18          | 2.18                 | 5.55 | 0.10                     | 91.00              | 134.32          | 134.42 | 0.19           |
| 142.42          | 2.42                 | 5.54 | 0.12                     | 90.99              | 138.11          | 138.21 | 0.19           |
| 142.78          | 2.78                 | 5.55 | 0.10                     | 91.18              | 141.90          | 142.00 | 0.19           |
| 143.03          | 3.03                 | 5.55 | 0.07                     | 91.27              | 145.68          | 145.78 | 0.21           |
| 143.27          | 3.27                 | 5.55 | 0.04                     | 91.29              | 153.26          | 153.36 | 0.24           |
| 143.52          | 3.52                 | 5.56 | 0.04                     | 91.11              | 157.05          | 157.15 | 0.25           |
| 143.77          | 3.77                 | 5.56 | 0.03                     | 91.16              | 160.84          | 160.94 | 0.25           |
| 144.01          | 4.01                 | 5.55 | 0.03                     | 90.87              | 164.63          | 164.73 | 0.26           |
| 144.26          | 4.26                 | 5.56 | 0.03                     | 90.83              | 172.21          | 172.31 | 0.25           |
| 144.51          | 4.51                 | 5.56 | 0.05                     | 90.78              | 176.00          | 176.10 | 0.26           |
| 144.75          | 4.75                 | 5.55 | 0.10                     | 90.81              | 180.00          | 180.10 | 0.25           |
| 145.00          | 5.00                 | 5.56 | 0.12                     | 91.09              | 184.00          | 184.10 | 0.26           |



### I&Q demodulation block diagram



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RF/IF MICROWAVE COMPONENTS

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Free Datasheet <http://www.datasheet4u.com/>