

I&Q Demodulator

50Ω 104 to 176 MHz

Maximum Ratings

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

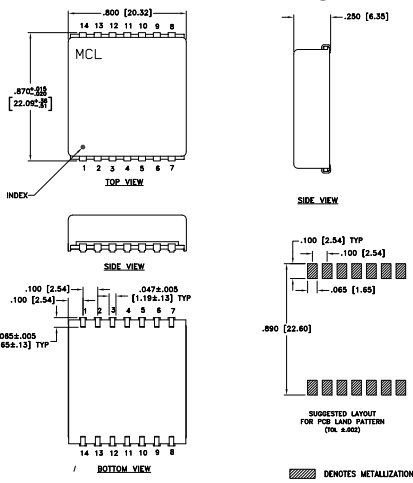
Permanent damage may occur if any of these limits are exceeded

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

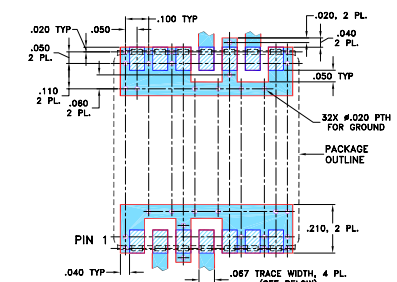
$$Q = -90^\circ \text{ for } |Q| \geq BF$$
$$Q = -90^\circ \text{ for LO} > \text{RF}$$

Outline Drawing



Weight: 4 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03 [0.76]; 3Pl.±.015 [0.381] inches

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



NOTE:

1. TRACE WIDTH IS SHOWN FOR ROGERS R4350B 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.
1. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

2. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Notes

- 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-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

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

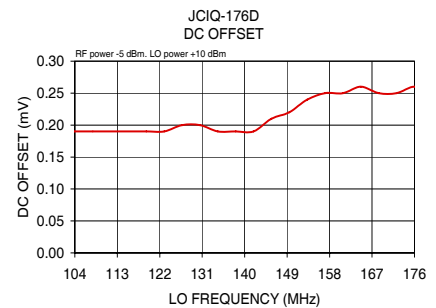
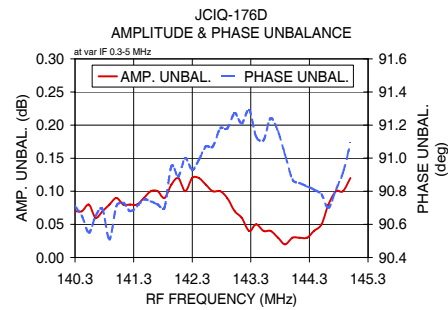
MODEL NO.	FREQUENCY (MHz)				CONVERSION LOSS (dB)			AMPLITUDE UNBALANCE (dB)		PHASE UNBALANCE (Deg.)		HARMONIC SUPPRESSION (dBc)			
	RF (SIGNAL)		LO (CARRIER)		I&Q					with reference to 90°		3X1/Q		5X1/Q	
	f _i	f _u	Min.	Max.	$\bar{x}$	σ	Max.	Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.
JCIQ-176D	104	176	DC	5	5.5	0.1	7.0	0.15	0.6	2	5	52	40	65	50

Notes:

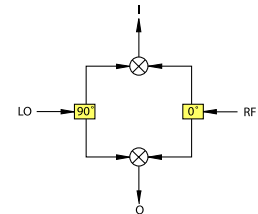
1. Operating LO Power: 10±0.5 dBm
2. 1 dB Compression at +4 dBm RF input
3. DC offset 1mV typ.
4. Conversion Loss=RF power, dBm - (I+Q) power, dBm

Typical Performance Data

Frequency (MHz) LO=140MHz RF I&Q		Conversion Loss (dB)	Amplitude Unbalance (dB)	Phase (I&Q) (deg.)	Frequency (MHz) LO RF		DC Offset (mV)
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



Generic photo used for illustration purposes only

CASE STYLE: BG291

+RoHS Compliant

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