

# Plug-In I&Q Demodulator

## MIQA-21D+

50Ω

20 to 23 MHz



Generic photo used for illustration purposes only

CASE STYLE: A06

**+RoHS Compliant**

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

### Pin Connections

LO (carrier)	1
RF (signal)	8
I (0°)(ref.)	7
Q (90°)*	4
NOT USED	2
GROUND	3,5,6
CASE GROUND	3,5,6

\* Q=+90° for LO<RF  
Q=-90° for LO>RF

### Features

- hermetically sealed metal case
- excellent 3rd and 5th order harmonic suppression
- good amplitude and phase unbalance

### Applications

- radar and communication systems
- military, hi-rel applications

### Demodulator Electrical Specifications

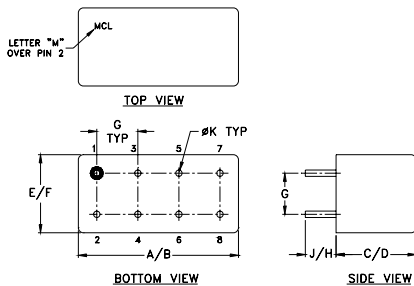
FREQUENCY (MHz)				CONVERSION LOSS (dB)			AMPLITUDE UNBALANCE (dB)		PHASE UNBALANCE (Deg.)		HARMONIC SUPPRESSION (dBc)					
RF (SIGNAL)		LO (CARRIER)		I&Q		$\bar{x}$	$\sigma$	Max.	Typ.	Max.	with reference to 90°		3XI/Q		5XI/Q	
$f_L$	$f_U$	Min.	Max.	Min.	Max.						Typ.	Min.	Typ.	Min.	Typ.	Min.
20	23	DC	3	6.1	0.15	7.0	0.15	0.6	0.7	3.0	64	35	67	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

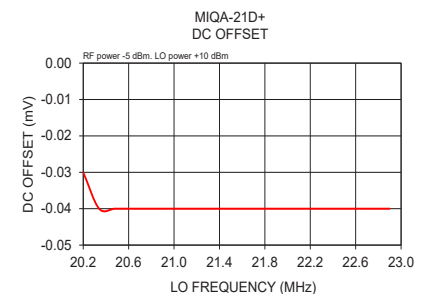
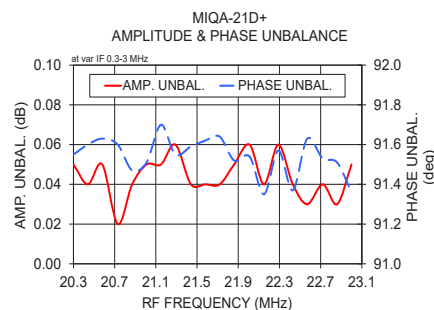
Frequency (MHz)	Conversion Loss (dB)	Amplitude Unbalance (dB)	Phase (I&Q) (deg.)	Frequency (MHz)		DC Offset (mV)
				LO	RF	
20.30	0.30	5.91	91.55	20.20	20.30	-0.03
20.44	0.44	5.91	91.60	20.34	20.44	-0.04
20.58	0.58	5.94	91.63	20.48	20.58	-0.04
20.73	0.73	5.95	91.60	20.63	20.73	-0.04
20.87	0.87	5.94	91.47	20.77	20.87	-0.04
21.01	1.01	5.89	91.51	20.91	21.01	-0.04
21.15	1.15	5.91	91.70	21.05	21.15	-0.04
21.29	1.29	5.93	91.55	21.19	21.29	-0.04
21.44	1.44	5.95	91.59	21.34	21.44	-0.04
21.58	1.58	5.94	91.62	21.48	21.58	-0.04
21.72	1.72	5.91	91.64	21.62	21.72	-0.04
21.86	1.86	5.91	91.52	21.76	21.86	-0.04
22.01	2.01	5.90	91.54	21.91	22.01	-0.04
22.15	2.15	5.91	91.35	22.05	22.15	-0.04
22.29	2.29	5.92	91.57	22.19	22.29	-0.04
22.43	2.43	5.92	91.37	22.33	22.43	-0.04
22.57	2.57	5.94	91.63	22.47	22.57	-0.04
22.72	2.72	5.95	91.53	22.62	22.72	-0.04
22.86	2.86	5.92	91.51	22.76	22.86	-0.04
23.00	3.00	5.92	91.36	22.90	23.00	-0.04

### Outline Drawing

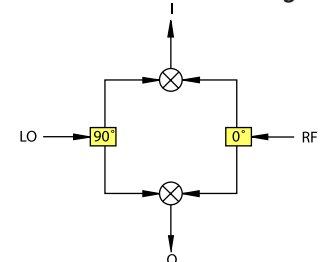


### Outline Dimensions (inch/mm)

A	B	C	D	E	F
.770	.800	.285	.310	.370	.400
19.56	20.32	7.24	7.87	9.40	10.16
G	H	J	K		wt
.200	.20	.14	.031		grams
5.08	5.08	3.56	0.79		5.2



### I&Q demodulation block diagram



### Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)



# I&Q Demodulator

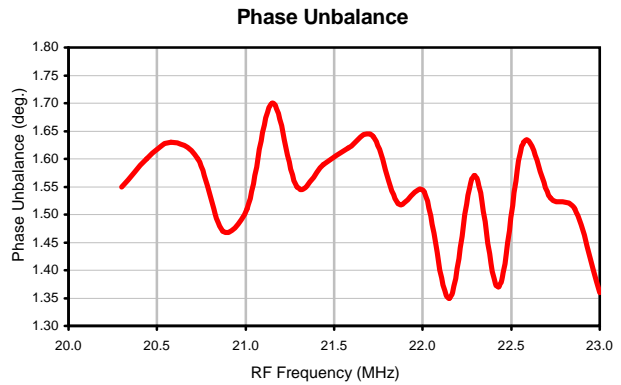
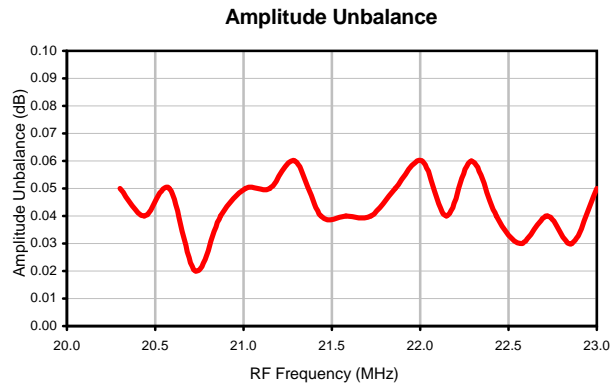
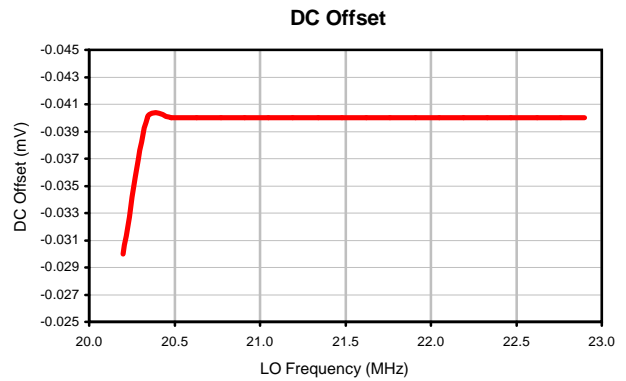
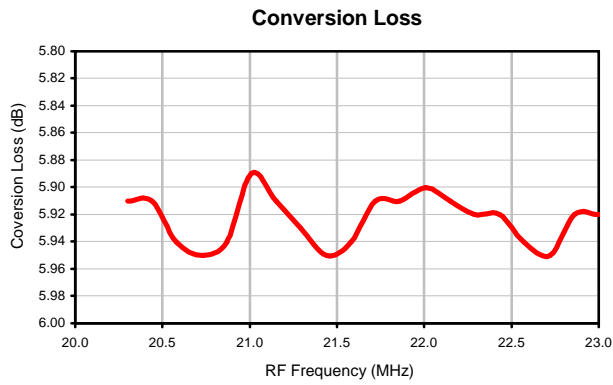
# MIQA-21D+

## Typical Performance Data

FREQUENCY LO=20MHz (MHz)		CONVERSION LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE (I&Q) (deg.)	FREQUENCY (MHz)		DC OFFSET (mV)
RF	I&Q				LO	RF	
20.30	0.30	5.91	0.05	91.55	20.20	20.30	-0.03
20.44	0.44	5.91	0.04	91.60	20.34	20.44	-0.04
20.58	0.58	5.94	0.05	91.63	20.48	20.58	-0.04
20.73	0.73	5.95	0.02	91.60	20.63	20.73	-0.04
20.87	0.87	5.94	0.04	91.47	20.77	20.87	-0.04
21.01	1.01	5.89	0.05	91.51	20.91	21.01	-0.04
21.15	1.15	5.91	0.05	91.70	21.05	21.15	-0.04
21.29	1.29	5.93	0.06	91.55	21.19	21.29	-0.04
21.44	1.44	5.95	0.04	91.59	21.34	21.44	-0.04
21.58	1.58	5.94	0.04	91.62	21.48	21.58	-0.04
21.72	1.72	5.91	0.04	91.64	21.62	21.72	-0.04
21.86	1.86	5.91	0.05	91.52	21.76	21.86	-0.04
22.01	2.01	5.90	0.06	91.54	21.91	22.01	-0.04
22.15	2.15	5.91	0.04	91.35	22.05	22.15	-0.04
22.29	2.29	5.92	0.06	91.57	22.19	22.29	-0.04
22.43	2.43	5.92	0.04	91.37	22.33	22.43	-0.04
22.57	2.57	5.94	0.03	91.63	22.47	22.57	-0.04
22.72	2.72	5.95	0.04	91.53	22.62	22.72	-0.04
22.86	2.86	5.92	0.03	91.51	22.76	22.86	-0.04
23.00	3.00	5.92	0.05	91.36	22.90	23.00	-0.04



## Typical Performance Curves

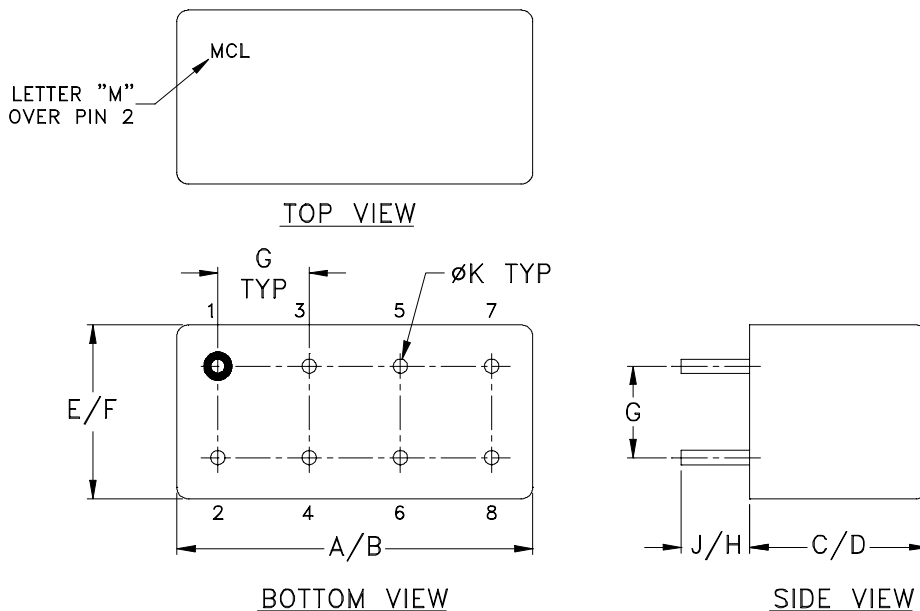


# Case Style

# A

A01  
A04  
A05  
A06

## Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01			.385 (9.78)	.400 (10.16)							5.2
A04	.770 (19.56)	.800 (20.32)	.200 (5.08)	.210 (5.33)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	3.7
A05			.240 (6.10)	.250 (6.35)							3.7
A06			.285 (7.24)	.310 (7.87)							5.2

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

### Notes:

- Header material: C.R.S.  
Pin material: #52 alloy.  
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Insulated spacer available. Request P/N B14-045-01.
- Tolerance on pin diameter  $\pm .005$  inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D