

# Up Converter Frequency Mixer

## HJK-U232H+

Level 17 (LO Power +17 dBm) 850 to 2360 MHz



Generic photo used for illustration purposes only

CASE STYLE: TTT881

**+RoHS Compliant**

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



Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200
13"	500

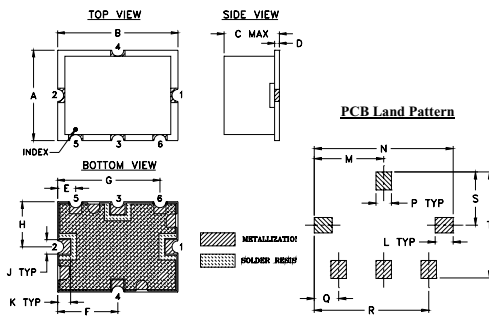
### Maximum Ratings

Operating Temperature	-20°C to 85°C
Storage Temperature	-55°C to 100°C
LO Power	+19dBm
IF Power	+20dBm
Permanent damage may occur if any of these limits are exceeded.	

### Pin Connections

LO	2
IF (IN)	3
RF (OUT)	1
GROUND	4,5,6

### Outline Drawing

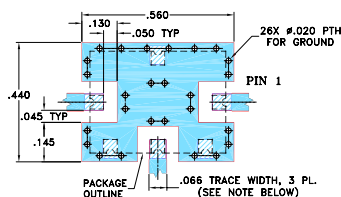


Suggested Layout, Tolerance to be within ±.002

### 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:
- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - 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 TILLET AND CONNECTION AT GROUND PADS.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER). SEE NOTE 2.
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Features

- up converter mixer
- very high IP3, 31 dBm typ.
- excellent L-R isolation, 46 dB typ; L-I isolation, 35 dB typ.
- protected by US Patent 6,807,407

### Applications

- base stations
- communication systems
- cellular
- mobile satellite
- GPS
- fixed microwave

### Electrical Specifications

FREQUENCY (MHz)			CONVERSION LOSS (dB)			LO-IF (IN) ISOLATION (dB)		LO-RF (OUT) ISOLATION (dB)		IP3 at center band (dBm)
IF (IN)	LO	RF (OUT)	Typ.	σ*	Max.	Typ.	Min.	Typ.	Min.	Typ.
850-1850	370-510	1220-2360	6.8	0.1	8.8	35	28	46	40	31

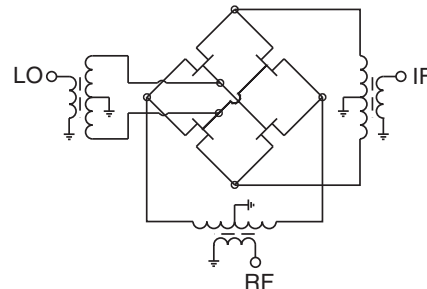
1 dB COMPR. +20 dBm typ.

\* σ is a standard deviation.

### Typical Performance Data

Frequency (MHz)			Conversion Loss (dB)	Isolation L-I (dB)	Isolation L-R (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)	IP3 (dBm)
IF (IN)	LO	RF (OUT)	+17dBm	+17dBm	+17dBm	+17dBm	+17dBm	+17dBm
850.00	370.00	1220.00	7.23	36.84	48.48	2.40	3.96	28.09
910.00	380.00	1290.00	7.24	36.40	48.08	2.22	3.40	29.57
1030.00	400.00	1430.00	7.05	35.53	47.30	2.28	2.33	32.57
1071.00	405.50	1476.50	7.14	35.32	47.10	2.06	2.10	34.48
1112.00	411.00	1523.00	6.98	35.16	46.98	2.11	1.90	37.69
1194.00	422.00	1616.00	7.00	34.92	46.68	1.90	1.57	37.65
1276.00	433.00	1709.00	6.99	34.84	46.56	1.66	1.33	34.59
1358.00	444.00	1802.00	6.96	34.88	46.38	1.51	1.23	34.25
1440.00	455.00	1895.00	6.65	35.03	46.34	1.45	1.28	34.00
1481.00	460.50	1941.50	6.60	35.13	46.37	1.48	1.35	33.57
1563.00	471.50	2034.50	6.45	35.37	46.52	1.46	1.55	31.93
1645.00	482.50	2127.50	6.53	35.65	46.82	1.52	1.79	30.58
1768.00	499.00	2267.00	6.97	36.15	47.25	1.71	2.15	29.44
1809.00	504.50	2313.50	7.13	36.32	47.38	1.83	2.25	29.11
1850.00	510.00	2360.00	7.43	36.50	47.46	1.97	2.35	29.07

### Electrical Schematic



#### 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)

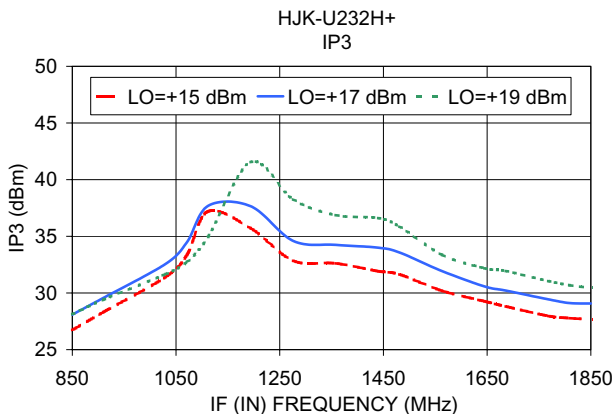
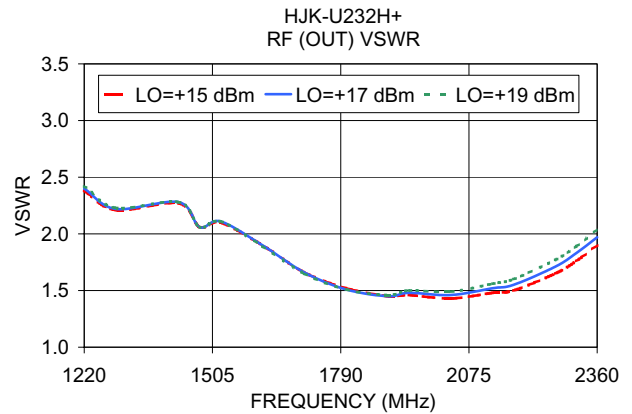
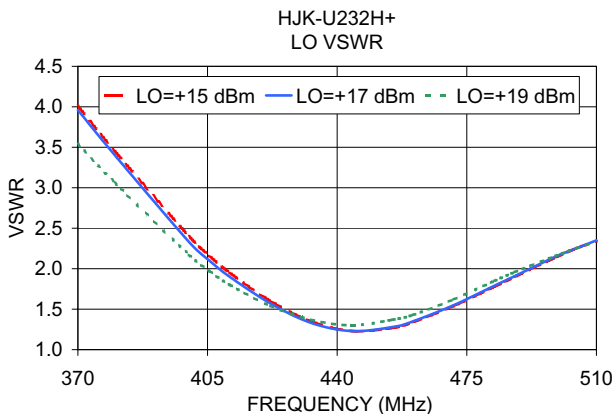
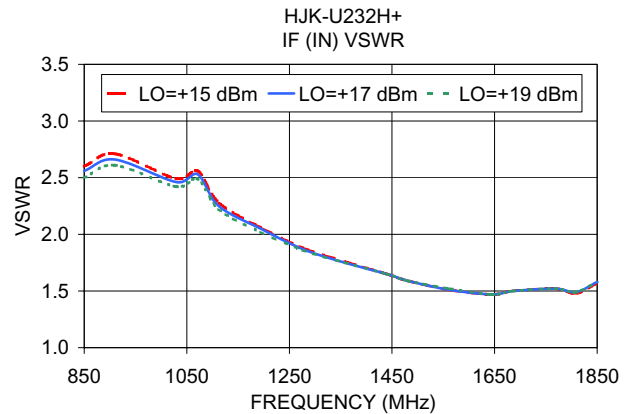
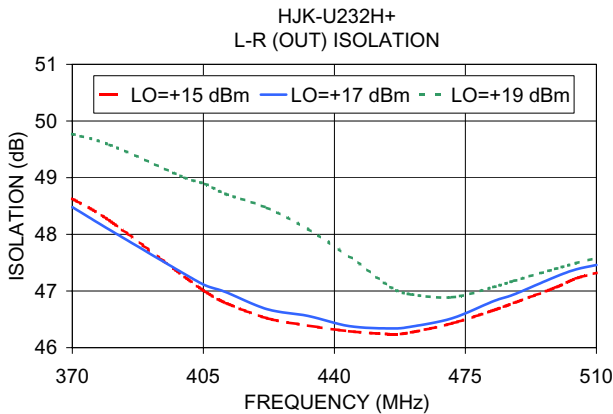
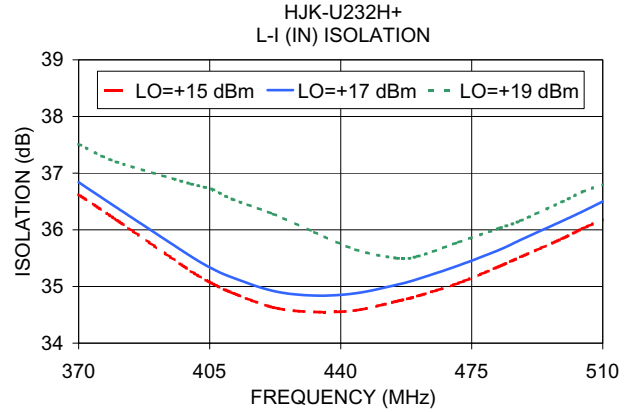
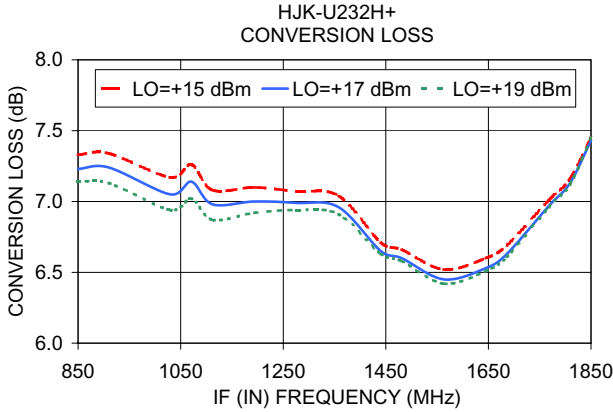
**Mini-Circuits**

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. A  
M151107  
HJK-U232H+  
ED-12998/1  
WL/AM  
200819  
Page 1 of 2

# Performance Charts

# HJK-U232H+



**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](http://www.minicircuits.com/MCLStore/terms.jsp)

