

# X2 Frequency Multiplier

## AMK-2-13+

50Ω Output 20 to 1000 MHz



CASE STYLE: CD542  
PRICE: \$5.95 ea. QTY (10-49)

**+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, 500
13"	500, 1000

### Maximum Ratings

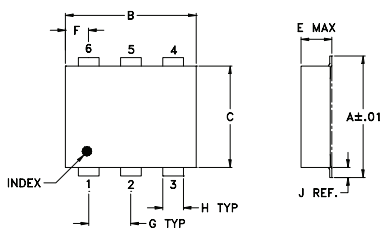
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	23 dBm

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

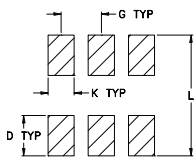
### Pin Connections

INPUT	3
OUTPUT	6
GROUND	1,4,5
NOT USED	2

### Outline Drawing



### PCB Land Pattern

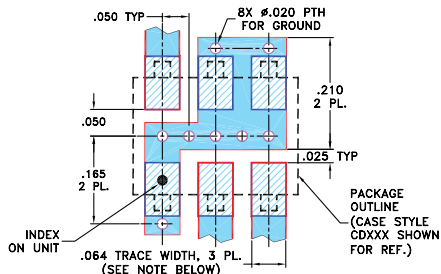


Suggested Layout  
Tolerance to be within ±.002

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.272	.310	.220	.100	.112	.055	.100
6.91	7.87	5.59	2.54	2.84	1.40	2.54
H	J	K	L			wt
.030	.026	.065	.300			grams
0.76	0.66	1.65	7.62			0.20

### Demo Board MCL P/N: TB-03 Suggested PCB Layout (PL-052)



- NOTES: 1. 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.  
2. 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

- broadband
- low conversion loss, 11.4 dB typ.
- high rejection F1 and F3, -45 dBc typ.
- low cost
- aqueous washable

### Applications

- synthesizers
- local oscillators
- satellite up and down converters

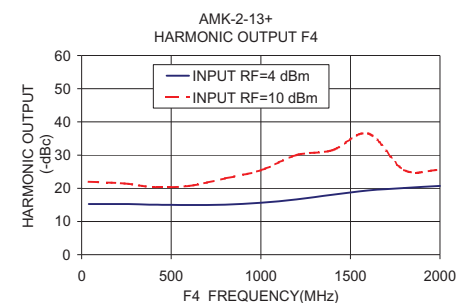
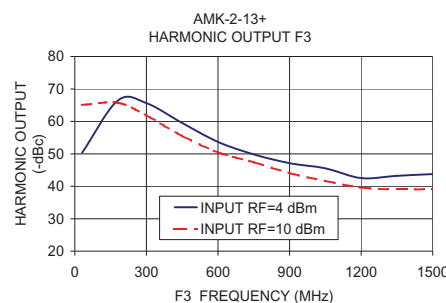
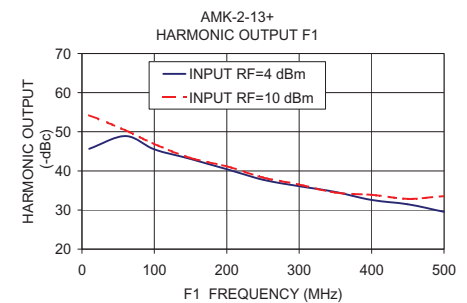
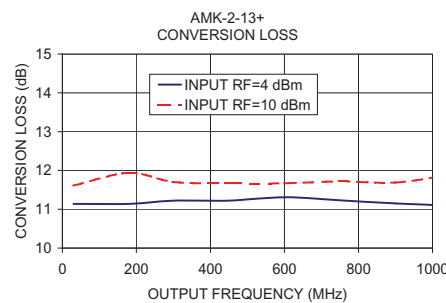
### Electrical Specifications

MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1 Input	F2 Output	Min.	Max.	Typ.	Max.	F1		F3		F4	
2	10-500	20-1000	4	10	11.4	14.5	Typ.	Min.	Typ.	Min.	Typ.	Min.
					45	20	45	25	22	12		

\* Harmonics of input frequency below the power level of F2

### Typical Performance Data

Input Frequency (MHz)	INPUT RF= 4 dBm				INPUT RF= 10 dBm			
	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
	F2	F1	F3	F4	F2	F1	F3	F4
10.00	11.14	45.65	50.28	15.24	11.61	54.24	65.09	21.97
60.00	11.14	48.90	66.44	15.25	11.94	50.38	65.74	21.45
100.00	11.22	45.52	65.65	15.06	11.70	46.86	61.85	20.36
150.00	11.22	43.05	59.50	14.95	11.67	43.30	55.49	20.72
200.00	11.31	40.43	53.67	15.06	11.67	41.16	50.45	22.99
250.00	11.23	37.72	49.84	15.65	11.72	38.29	47.40	25.43
300.00	11.15	36.08	47.09	16.63	11.69	36.49	44.07	30.03
350.00	11.09	34.61	45.52	18.06	11.88	34.46	41.61	31.49
400.00	10.99	32.56	42.50	19.34	11.97	33.87	39.61	36.48
450.00	11.16	31.45	43.20	20.09	12.21	32.85	39.01	25.48
500.00	11.41	29.56	43.75	20.71	12.72	33.56	39.13	25.56



### 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)

