

# X5 Frequency Multiplier

## RMK-5-112+

50Ω Output 750 to 1100 MHz

### The Big Deal

- Broadband, output from 750 to 1100 MHz
- Low conversion loss, 22 dB
- Excellent harmonic suppression:  
F4, 57 dBc; F6, 55 dBc



CASE STYLE: TTT1114

### Product Overview

Mini-Circuits' RMK-5-112+ frequency multiplier provides a multiplication factor of 5, converting input frequencies from 150 to 220 MHz into output frequencies from 750 to 1100 MHz, supporting applications including synthesizers, local oscillators, satellite up and down converters and more. This model provides an input power range from +22 to +24 dBm, low conversion loss and excellent harmonic suppression. The multiplier comes housed in a miniature, shielded surface-mount package (0.38 x 0.50 x 0.15") with wraparound terminations for excellent solderability.

### Key Features

Feature	Advantages
Low conversion loss, 22 dB typ.	With a low conversion loss, RMK-5-112+ produces higher output power, reducing the need for amplification.
Excellent harmonic suppression <ul style="list-style-type: none"><li>• F4, 57 dBc</li><li>• F6, 55 dBc</li></ul>	Reduces spurious signals and the need for additional filtering.
Broadband, 750 to 1100 MHz output	With an output frequency range spanning 750 to 1100 MHz, this multiplier covers a wide range of applications.
Low cost	Provides an easy, cost-effective solution for generating high-frequency signals from a lower frequency signal source.
Small size, 0.38 x 0.50 x 0.15"	Saves space in crowded PCB layouts.

#### 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)



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**+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	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	25 dBm

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

### Pin Connections

INPUT	2
OUTPUT	1
GROUND	3,4,5,6

### Features

- higher input power, +23 dBm
- low conversion loss, 22 dB typ.
- high adjacent harmonic rejection, F4, 57 dBc typ., F6, 55 dBc typ.
- aqueous washable

### Applications

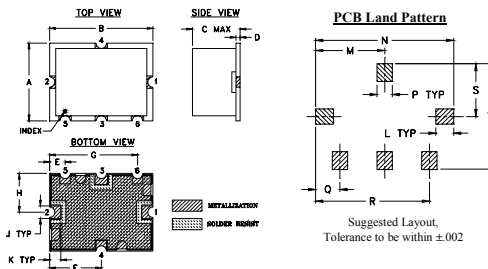
- synthesizers
- local oscillators
- satellite up and down converters

### Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		5		
Frequency Range, Input (F1)	150		220	MHz
Frequency Range, Output (F5)	750		1100	MHz
Input Power	22	—	24	dBm
Conversion Loss	—	21	25.5	dB
Harmonic Output*				dBc
F1	-2	4	—	
F2	40	62	—	
F3	-10	0	—	
F4	40	57	—	
F6	40	55	—	
F7	1	6	—	

\* Harmonics of input frequency below the power level of F5

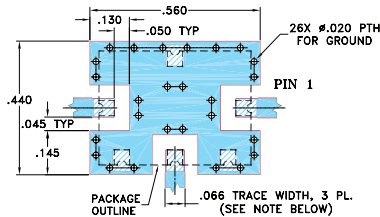
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K
.38	.50	.15	.020	.075	.250	.425	.187	.050	.050
9.65	12.70	3.81	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	GRAM	
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 RO4350B 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 FILLET 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

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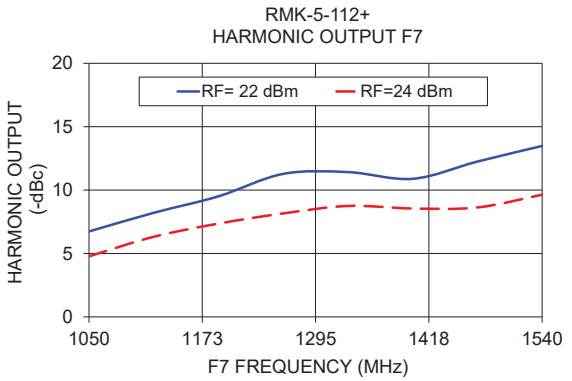
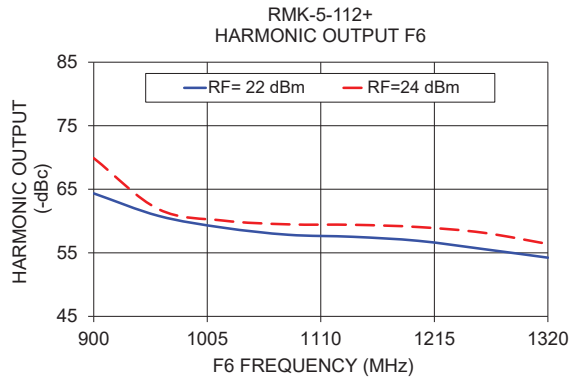
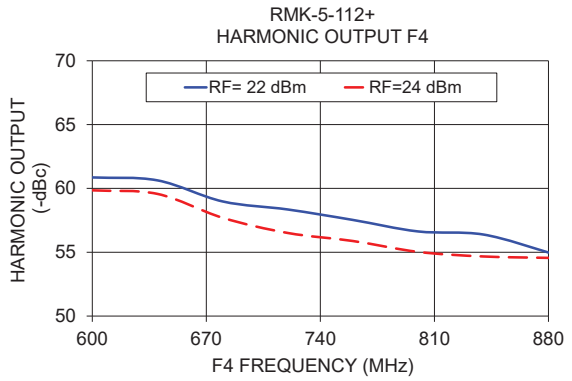
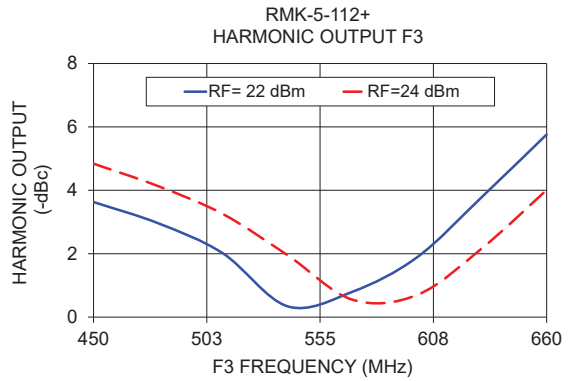
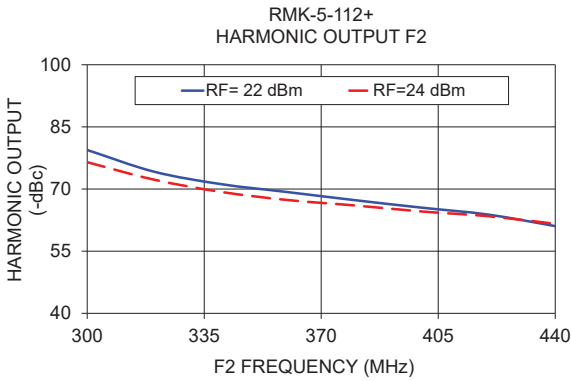
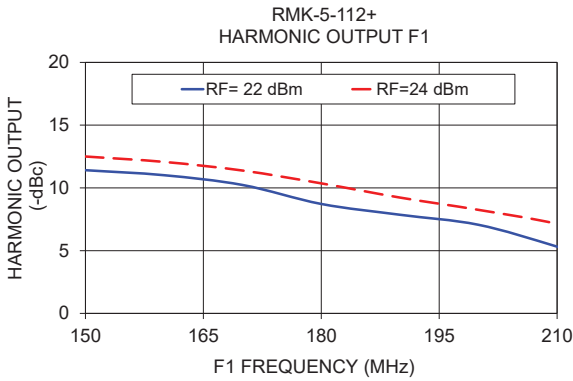
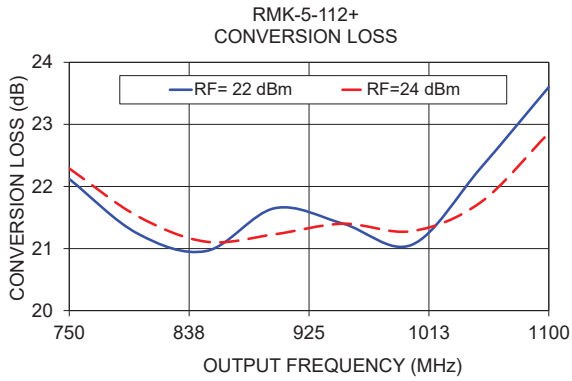


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