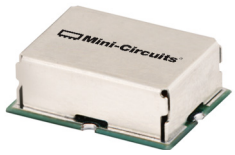
X5 Frequency Multiplier

RMK-5-571+

50Ω Output 350 to 575 MHz



CASE STYLE: TTT1114

The Big Deal

- High input power, +22 to +24 dBm
- Low conversion loss, 22 dB typ.
- Excellent harmonic suppression, F4, 43 dBc; F6, 42 dBc typ.

Product Overview

Mini-Circuits' RMK-5-571+ is a surface mount frequency multiplier with a multiplication factor of 5, converting input frequencies of 70 to 115 MHz into output frequencies of 350 to 575 MHz. It provides high input power handling with low conversion loss and excellent harmonic suppression. The multiplier comes housed in a shielded 6-lead surface-mount package (0.38 x 0.50 x 0.15") with wraparound terminations for excellent solderability.

Feature	Advantages
Low conversion loss, 22 dB typ.	Low conversion loss results in higher output signal power, reducing the need for amplification at later stages.
Excellent harmonic suppression: • F4, 40 dBc • F6, 40 dBc	Reduces spurious signals and the need for additional filtering. Reduces spectral regrowth in multiple-channel systems.
High input power +22 to +24 dBm	High input power handling accommodates high input signal levels while maintaining a low conversion loss.
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 dense circuit board layouts.

X5 Frequency Multiplier

RMK-5-571+

50Ω Output 350 to 575 MHz

CASE STYLE: TTT1114

+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

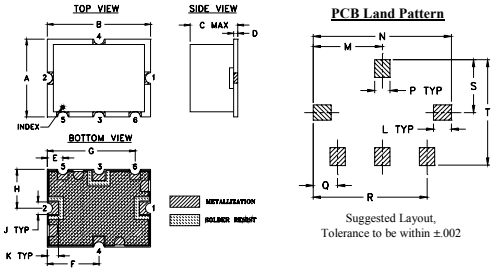
Features

- higher input power, +23 dBm
- low conversion loss, 22 dB typ.
- high adjacent harmonic rejection, F4, 43 dBc typ., F6, 42 dBc typ.
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters

Outline Drawing

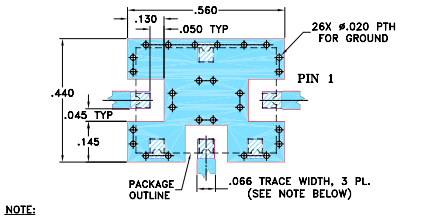


Outline Dimensions (inch / mm)

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:
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. 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.
3. 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

Electrical Specifications at 25°C

Parameter		Min.	Typ.	Max.	Unit
Multiplier Factor			5		
Frequency Range, Input (F1)			70-115		MHz
Frequency Range, Output (F5)			350-575		MHz
Input Power		22		24	dBm
Conversion Loss		—	21	25.5	dB
Harmonic Ouput*	F1	-3	2	—	dBc
	F2	40	58	—	
	F3	-9	0	—	
	F4	36	43	—	
	F6	35	42	—	
	F7	-2	4	—	

* Harmonics of input frequency below the power level of F5

Typical Performance Data

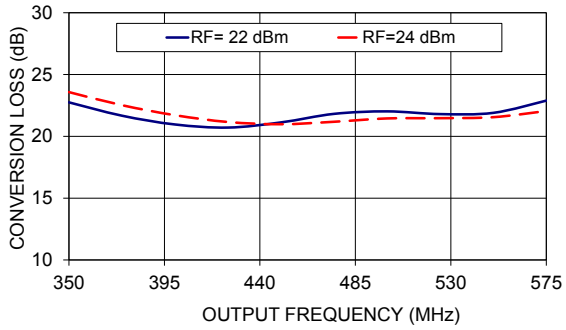
Frequency Input (MHz)	Frequency Output (MHz)	Conv. Loss (dB) F5	Harmonic Rejection Below F5 (dBc) at RF Input Power 22 dBm F1	F2	F3	F4	F6	F7
70	350	22.75	10.65	58.93	3.25	50.77	46.41	3.04
75	375	21.67	10.42	62.95	2.94	63.12	51.35	4.15
80	400	20.96	9.95	52.96	2.34	42.33	40.27	5.30
85	425	20.71	9.21	60.87	1.57	50.02	49.06	6.46
90	450	21.13	7.95	66.13	0.22	61.08	66.37	8.05
95	475	21.82	6.50	67.33	1.13	65.31	63.27	9.71
100	500	22.02	5.41	64.73	2.26	63.86	62.86	10.63
105	525	21.80	4.71	62.50	3.02	61.90	62.61	10.58
110	550	21.90	3.72	60.56	3.97	60.50	61.97	10.65
115	575	22.89	2.02	58.60	5.46	59.39	60.97	12.31

at RF Input Power 24 dBm

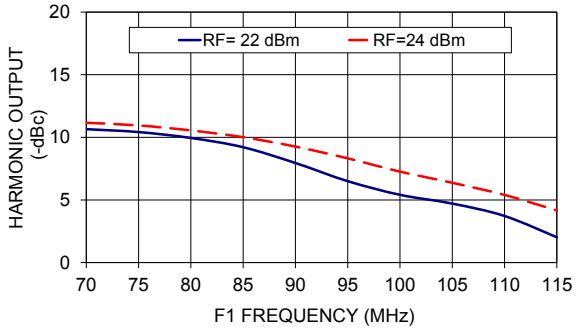
70	350	23.58	11.16	55.61	4.02	44.21	39.34	1.89
75	375	22.52	10.95	58.57	3.70	51.46	47.58	3.08
80	400	21.71	10.55	55.91	3.16	46.55	42.78	4.11
85	425	21.16	10.01	54.25	2.60	43.34	41.12	4.85
90	450	20.98	9.26	62.62	1.65	57.49	71.24	5.68
95	475	21.18	8.32	63.46	0.59	59.58	68.73	6.71
100	500	21.45	7.26	62.49	0.58	59.79	66.10	7.42
105	525	21.47	6.37	60.96	1.53	59.31	65.16	7.75
110	550	21.55	5.40	59.41	2.46	58.68	64.34	7.80
115	575	22.05	4.16	57.97	3.64	58.60	63.09	8.33

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

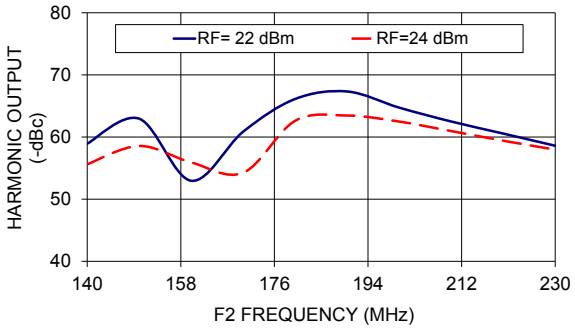
RMK-5-571+
CONVERSION LOSS



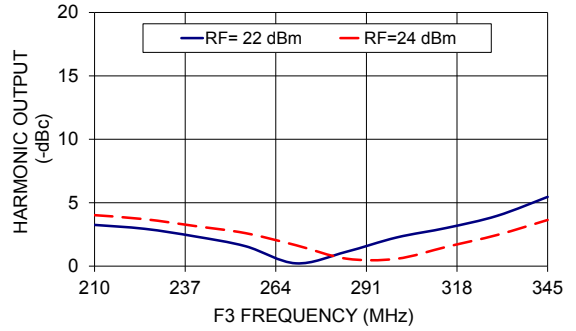
RMK-5-571+
HARMONIC OUTPUT F1



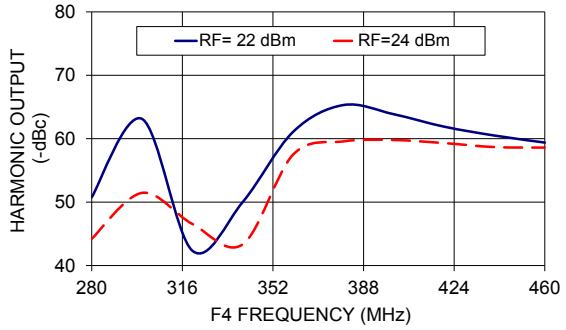
RMK-5-571+
HARMONIC OUTPUT F2



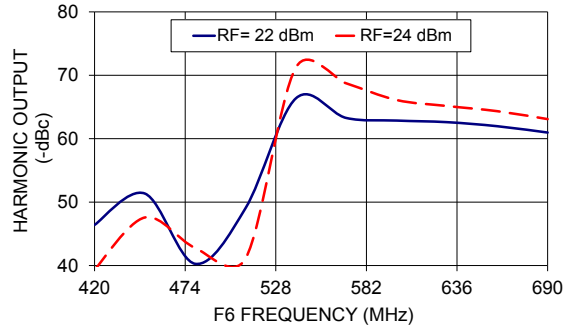
RMK-5-571+
HARMONIC OUTPUT F3



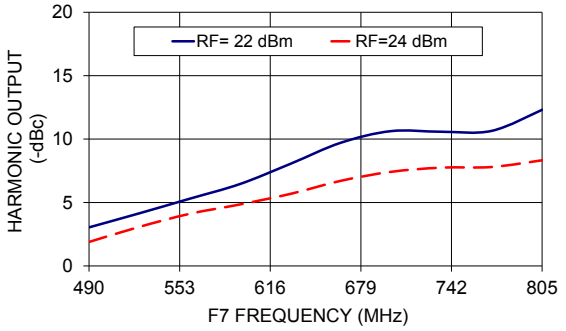
RMK-5-571+
HARMONIC OUTPUT F4



RMK-5-571+
HARMONIC OUTPUT F6



RMK-5-571+
HARMONIC OUTPUT F7



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