WINSOURCE ELECTRONICS

THE DATASHEET OF

RMK-3-31+

X3 Frequency Multiplier

RMK-3-31+

50Ω Output 27 to 36 MHz

The Big Deal

- Low conversion loss, 14 dB
- Wide input power range, +12 to +17 dBm
- Excellent harmonic suppression: F2 & F4, 60 dBc



CASE STYLE: TT1224

Product Overview

Mini-Circuits' RMK-3-31+ frequency multiplier provides a multiplication factor of 3 converting input frequencies from 9 to 12 MHz into output frequencies from 27 to 36 MHz, supporting applications including synthesizers, local oscillators, transceiver chains, satellite up and down converters and more. It provides an input power range from +12 to +17 dBm, low conversion loss, and good harmonic suppression. The multiplier comes housed in a miniature surface mount package (0.25 x 0.31 x 0.16") ideal for dense circuit board layouts.

Key Features

Feature	Advantages
Low conversion loss, 14 dB typ.	With a low conversion loss, RMK-3-31+ produces higher output power, reducing the need for amplification.
Excellent harmonic suppression • F2, 60 dBc • F4, 60 dBc	Reduces spurious signals and the need for additional filtering.
Wide input power range, +12 to +17 dBm	Wide input power signal range accommodates different input signal levels while still 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	Measuring only 0.25 x 0.31 x 0.16", the RMK-3-31+ 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

X3 Frequency Multiplier

RMK-3-31+

50Ω Output 27 to 36 MHz



Generic photo used for illustration purposes only

CASE STYLE: TT1224

+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	20 dBm

Pin Connections

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

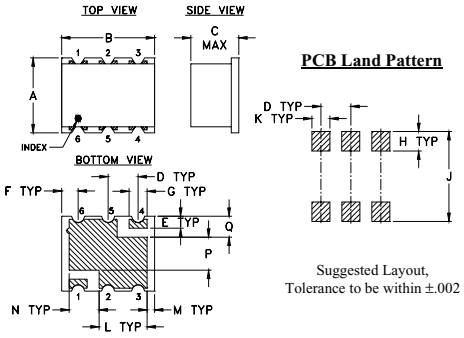
Features

- broadband
- low conversion loss, 14 dB typ.
- high rejection F2, -60 dBc typ.; F4, -60 dBc typ.
- low cost
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters
- mobile radio

Outline Drawing

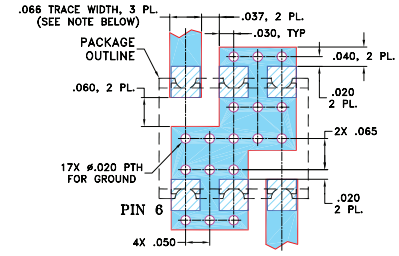


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
.25	.31	.16	.100	.040	.055	.060	.065
6.35	7.87	4.06	2.54	1.02	1.40	1.52	1.65

J	K	L	M	N	P	Q	wt.
.300	.060	.160	.025	.100	.110	.070	grams
7.62	1.52	4.06	0.64	2.54	2.79	1.78	0.16

Demo Board MCL P/N: TB-393
Suggested PCB Layout (PL-258)



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

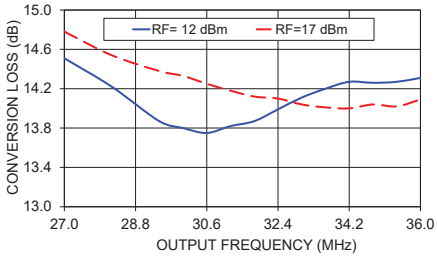
Electrical Specifications at 25°C

Parameter		Min.	Typ.	Max.	Unit
Multiplier Factor			3		
Frequency Range, Input (F1)		9	—	12	MHz
Frequency Range, Output (F3)		27	—	36	MHz
Input Power		12	—	17	dBm
Conversion Loss		—	14	17	dB
Harmonic Ouput*	F1	-7	4	—	-dBc
	F2	40	60	—	
	F4	40	60	—	

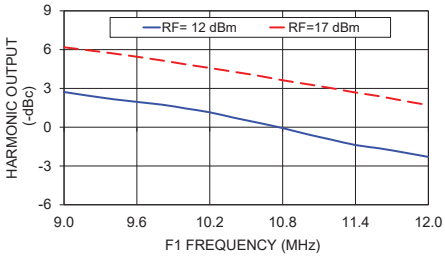
Typical Performance Data

	INPUT RF= 12 dBm				INPUT RF= 17 dBm			
Input Frequency (MHz)	Conversion Loss (dB)	Harmonic Output Below F3 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F3 (-dBc)		
	F3	F1	F2	F4	F3	F1	F2	F4
9.00	14.51	2.72	65.74	63.66	14.78	6.18	65.14	61.05
9.40	14.22	2.17	63.77	62.13	14.54	5.71	64.06	60.55
9.80	13.87	1.75	62.94	61.28	14.38	5.17	62.19	59.92
10.00	13.80	1.45	62.73	61.01	14.33	4.86	61.38	59.62
10.40	13.82	0.73	62.36	60.95	14.18	4.28	60.07	59.36
10.80	13.99	0.07	61.91	60.99	14.10	3.63	59.22	59.21
11.00	14.11	-0.54	61.57	61.02	14.04	3.33	59.05	59.32
11.40	14.27	-1.38	61.00	61.15	14.00	2.68	59.13	59.75
11.80	14.27	-1.96	60.69	61.34	14.02	2.03	59.44	60.20
12.00	14.31	-2.30	60.48	61.41	14.09	1.71	59.46	60.32

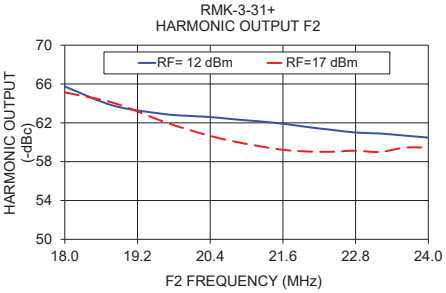
RMK-3-31+
CONVERSION LOSS



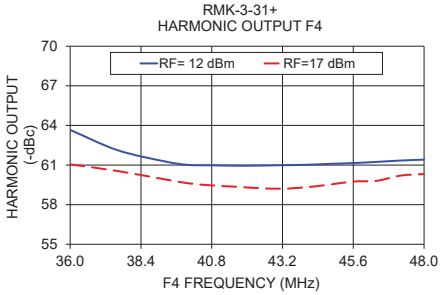
RMK-3-31+
HARMONIC OUTPUT F1



RMK-3-31+
HARMONIC OUTPUT F2



RMK-3-31+
HARMONIC OUTPUT F4



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