

# X3 Frequency Multiplier

## RMK-3-33+

50Ω    Output 2100 to 3000 MHz



CASE STYLE: TT1224

### The Big Deal

- Broadband, for 2.1 to 3.0 GHz signal production
- Wide input power range, +12 to +17 dBm
- Low conversion loss, 14.1 dB typ.
- Good harmonic suppression: F2, 47.5 dBc; F4, 43.5 dBc

### Product Overview

Mini-Circuits' RMK-3-33+ frequency multiplier provides a multiplication factor of 3 converting input frequencies from 700 to 1000 MHz into output frequencies from 2100 to 3000 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.

Feature	Advantages
Low conversion loss, 14.1 dB typ.	With a low conversion loss, RMK-3-33+ produces higher output power, reducing the need for amplification.
Very good harmonic suppression <ul style="list-style-type: none"><li>• F2, 47.5 dBc</li><li>• F4, 43.5 dBc</li></ul>	Reduces spurious signals and the need for additional filtering.
Broadband	With an output frequency range spanning 2100 to 3000 MHz, this multiplier covers a wide range of applications.
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-3-33+ 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"	20, 50, 100, 200
13"	500, 1000

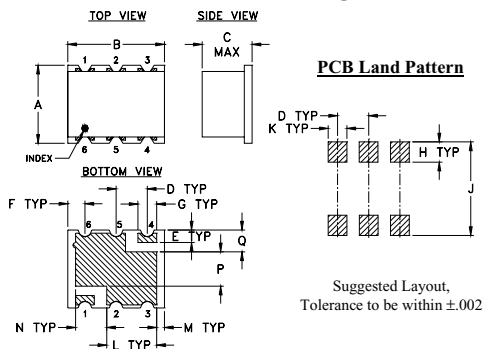
### Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	20 dBm
Permanent damage may occur if any of these limits are exceeded.	

### Pin Connections

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

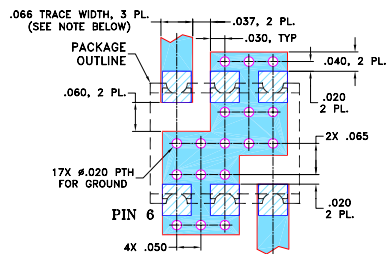
### Outline Drawing



### Outline Dimensions (inch)

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)



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### Features

- broadband
- low conversion loss, 14.1 dB typ.
- high rejection F2, 47.5 dBc typ; F4, 43.5 dBc typ
- low cost
- aqueous washable

### Applications

- synthesizers
- local oscillators
- satellite up and down converters

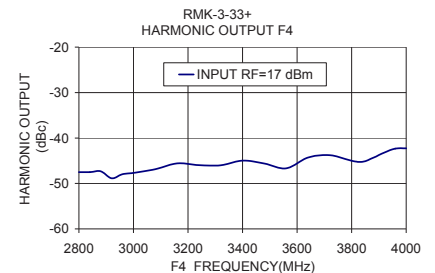
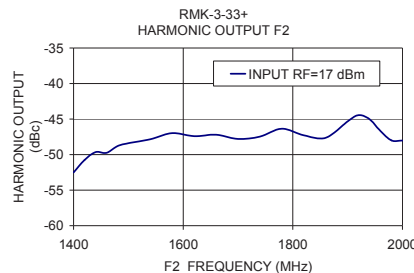
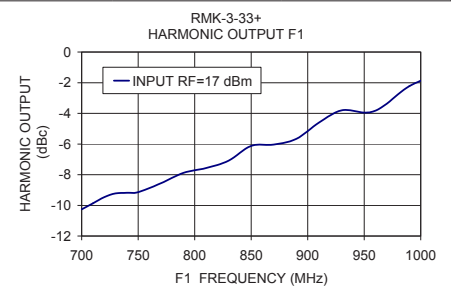
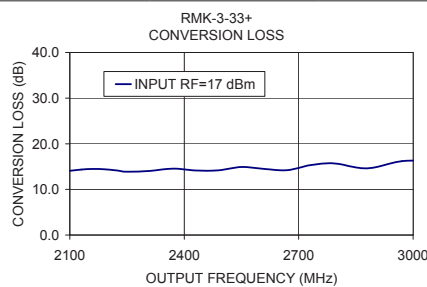
### Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		3		
Frequency Range, Input (F1)	700	—	1000	MHz
Frequency Range, Output (F3)	2100	—	3000	MHz
Input Power	12	—	17	dBm
Conversion Loss		14.1	18.5	dB
Harmonic Output*	F1	-5	4.5	—
	F2	32	47.5	—
	F4	30	43.5	—

\* Harmonics of input frequency below the power level of F3

### Typical Performance

Frequency		Conv. Loss (dB) F3	Harmonic Rejection Below F3, (dBc) at RF Input Power 17 dBm		
Input (MHz)	Output (MHz)		F1	F2	F4
700.00	2100.00	14.08	-10.26	-52.50	-47.53
750.00	2250.00	13.88	-9.14	-48.39	-47.66
770.00	2310.00	14.05	-8.56	-47.83	-46.87
810.00	2430.00	14.14	-7.57	-47.40	-45.98
850.00	2550.00	14.91	-6.12	-47.79	-44.96
910.00	2730.00	15.31	-4.60	-47.29	-44.31
950.00	2850.00	14.81	-3.95	-45.32	-45.02
960.00	2880.00	14.62	-3.82	-44.44	-45.22
980.00	2940.00	15.69	-2.75	-46.68	-43.21
1000.00	3000.00	16.31	-1.87	-48.02	-42.27



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