X3 Frequency Multiplier

RMK-3-332+

50Ω Output 2100 to 3300 MHz

CASE STYLE: TT1224

The Big Deal

- Wideband, 2100 to 3300 MHz output
- Wide input power range, +10 to +15 dBm
- Low conversion loss, 15 dB typ.
- Excellent harmonic suppression, 40 dBc typ.

Product Overview

Mini-Circuits' RMK-3-332+ is a surface mount frequency multiplier with a multiplication factor of 3, converting input frequencies of 700 to 1100 MHz into output frequencies of 2100 to 3300 MHz. It provides a wide input power range, low conversion loss and excellent suppression of adjacent harmonics. 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
Wideband, 2100 – 3300 MHz output	With an output frequency range spanning 2100 to 3300 MHz, this multiplier covers a wide range of applications.
Low conversion loss, 15 dB typ.	Low conversion loss results in higher output signal power, reducing the need for amplification at later stages.
Excellent harmonic suppression: • F2, 40 dBc typ. • F3, 37 dBc typ.	Reduces spurious signals and the need for additional filtering. Helps avoid spectral regrowth in multiple-channel systems.
Wide input power range, +10 to +15 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, 0.25 x 0.31 x 0.16"	Saves space in dense circuit board layouts.

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PRICE: $8.95 ea. QTY (10-49)

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

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

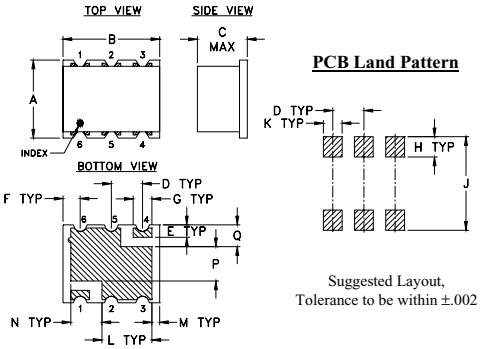
Features

- low input power, +10 dBm
- low conversion loss, 15 dB typ.
- high rejection of adjacent harmonics, 40 dBc typ.
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters

Outline Drawing

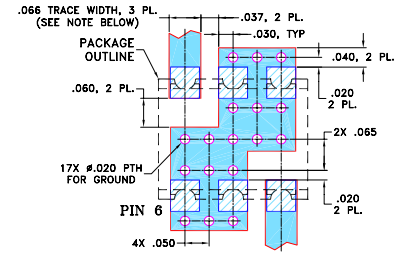


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
.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

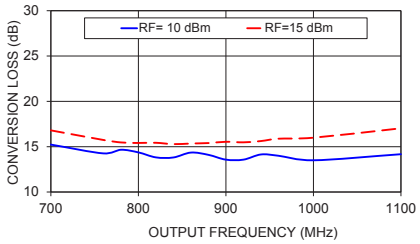
Parameter		Min.	Typ.	Max.	Unit
Multiplier Factor			3		
Frequency Range, Input (F1)		700		1100	MHz
Frequency Range, Output (F3)		2100		3300	MHz
Input Power		10		15	dBm
Conversion Loss			15.6	20	dB
Harmonic Ouput*	F1	-3	3		dBc
	F2	25	40		
	F4	24	37		

* Harmonics of input frequency below the power level of F3

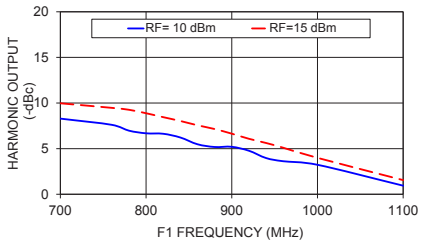
Typical Performance Data

Input Frequency (MHz)	INPUT RF= 10 dBm Conversion Loss (dB) F3	Harmonic Output Below F3 (dBc) F1	F2	F4	INPUT RF= 15dBm Conversion Loss (dB) F3	Harmonic Output Below F3 (dBc) F1	F2	F4
700	15.23	8.29	34.75	30.69	16.80	9.97	37.49	31.86
760	14.26	7.61	37.07	34.81	15.74	9.47	38.29	35.95
780	14.66	6.97	39.19	36.81	15.47	9.26	41.87	41.30
800	14.37	6.68	45.91	42.27	15.41	8.88	48.74	52.41
820	13.82	6.63	50.71	47.51	15.43	8.45	50.06	55.73
840	13.81	6.22	51.23	49.55	15.28	8.03	50.69	48.69
860	14.35	5.48	50.58	50.68	15.35	7.56	54.99	54.91
880	14.10	5.18	50.70	53.46	15.40	7.15	49.07	49.70
900	13.57	5.20	66.29	72.85	15.54	6.64	61.36	63.84
920	13.57	4.77	69.31	80.23	15.48	6.08	66.64	70.85
940	14.14	3.97	73.17	78.32	15.62	5.62	74.28	94.06
960	14.00	3.62	70.78	74.62	15.88	5.10	75.81	83.07
1000	13.50	3.23	69.53	73.79	15.99	3.99	74.14	77.51
1100	14.17	0.94	66.64	75.41	17.03	1.55	69.48	74.88

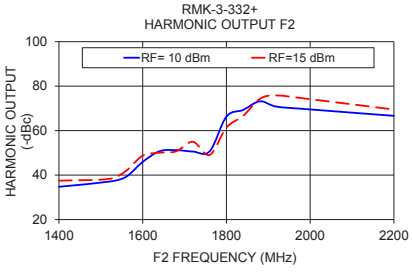
RMK-3-332+
CONVERSION LOSS



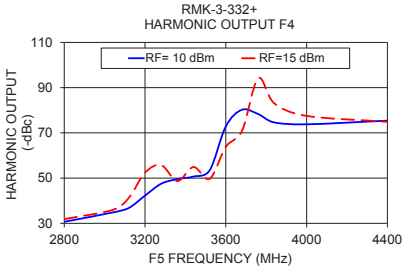
RMK-3-332+
HARMONIC OUTPUT F1



RMK-3-332+
HARMONIC OUTPUT F2



RMK-3-332+
HARMONIC OUTPUT F4



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.
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