WINSOURCE ELECTRONICS

THE DATASHEET OF

RMK-3-93+

X3 Frequency Multiplier

RMK-3-93+

50Ω Output 5400 to 9000 MHz

The Big Deal

- Broadband tripler for 5.4-9 GHz signal production
- High rejection of F2 and F4 (-55 dBc typ)
- Low conversion loss, 15 dB typ
- Outstanding performance at a low price



CASE STYLE: TT1224

Product Overview

The RMK-3-93+ is a broadband frequency tripler offering excellent performance for C- to X-band signals. The aqueous washable and RoHS-compliant package features rugged, wire-welded construction, in a small 0.25” x 0.31” x 0.16” plastic case.

Key Features

Feature	Advantages
Broad bandwidth	Ideal for satellite up- and down-converters and line-of-sight communication links, as well as items operating in the 8.5-9.0 GHz radiolocation band
High rejection of F2 and F4	Proprietary internal circuitry achieves high harmonic suppression, keeping filtering requirements to a minimum
Low conversion loss	High output reduces external gain requirements after frequency tripling.
Low price	Practical, low cost solution for providing high frequency sources from lower frequency VCOs and synthesizers.

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

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RMK-3-93+

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Generic photo used for illustration purposes only

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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	17 dBm

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

Pin Connections

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

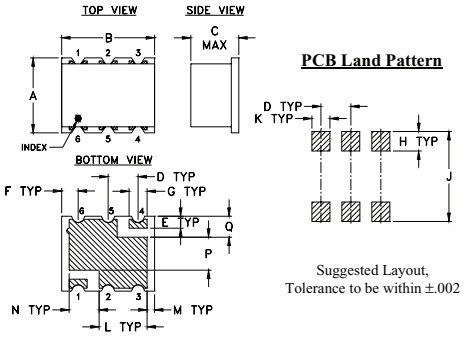
Features

- broadband
- high rejection F2 & F4, -55 dBc typ.
- low cost
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters

Outline Drawing

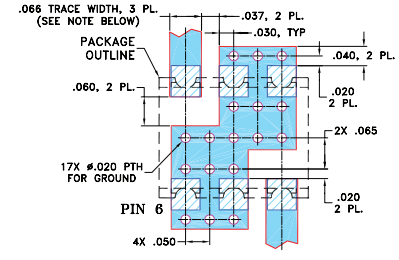


Outline Dimensions (inch / mm)

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

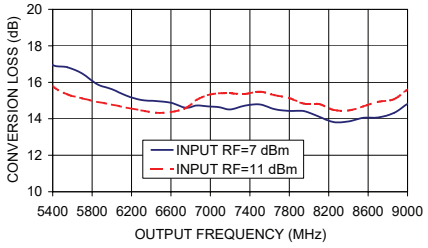
MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1 Input	F3 Output	Min.	Max.	Typ.	Max.	F1 Typ.	F1 Min.	F2 Typ.	F2 Min.	F4 Typ.	F4 Min.
3	1800-3000	5400-9000	7	11	15	19.5	6	-6	55	35	55	35

* Harmonics of input frequency below the power level of F3

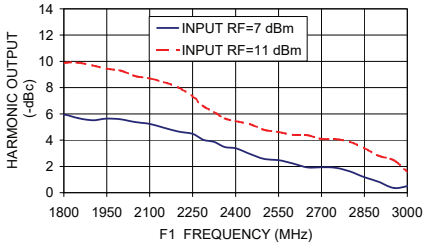
Typical Performance Data

Input Frequency (MHz)	INPUT RF= 7 dBm Conversion Loss (dB)	Harmonic Output Below F3 (-dBc) F1	F2	F4	INPUT RF= 11 dBm Conversion Loss (dB)	Harmonic Output Below F3 (-dBc) F1	F2	F4
1800.00	16.94	5.94	64.33	62.56	15.79	9.86	73.68	61.49
1900.00	16.48	5.52	63.05	58.30	15.12	9.69	73.46	60.98
2000.00	15.62	5.58	65.59	58.27	14.78	9.29	72.77	61.61
2100.00	15.03	5.24	67.56	57.08	14.46	8.70	70.70	60.24
2200.00	14.88	4.66	65.40	54.92	14.37	8.01	67.50	60.03
2287.50	14.73	4.02	64.99	54.30	15.04	6.58	66.22	58.98
2325.00	14.68	3.86	66.04	54.86	15.30	6.15	66.18	58.85
2400.00	14.51	3.38	67.92	55.19	15.39	5.45	65.72	57.81
2450.00	14.72	2.95	67.05	54.79	15.36	5.22	64.01	57.96
2500.00	14.79	2.57	65.67	53.79	15.49	4.78	62.00	57.62
2550.00	14.53	2.48	66.05	53.40	15.30	4.62	60.87	57.76
2600.00	14.43	2.23	66.21	52.72	15.14	4.40	60.52	57.74
2650.00	14.42	1.93	68.53	51.96	14.83	4.38	62.14	59.76
2700.00	14.12	1.94	71.91	52.32	14.81	4.09	65.47	62.24
2750.00	13.82	1.89	67.73	52.40	14.49	4.08	68.87	63.23
2800.00	13.85	1.62	62.77	52.06	14.45	3.86	69.45	62.33
2850.00	14.05	1.18	59.98	51.75	14.68	3.39	67.86	60.15
2900.00	14.07	0.82	58.96	51.55	14.93	2.81	66.70	58.49
2955.00	14.33	0.35	57.62	50.67	15.08	2.45	66.24	57.64
3010.00	14.90	0.57	56.61	49.65	15.68	1.47	65.11	56.28

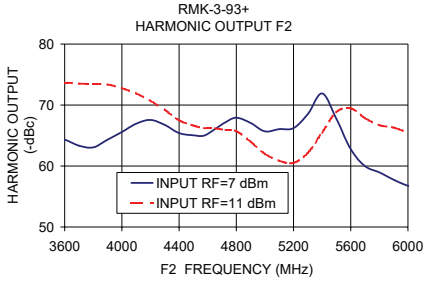
RMK-3-93+
CONVERSION LOSS



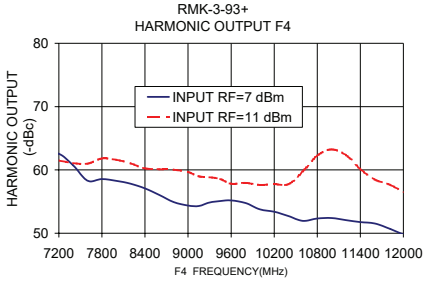
RMK-3-93+
HARMONIC OUTPUT F1



RMK-3-93+
HARMONIC OUTPUT F2



RMK-3-93+
HARMONIC OUTPUT F4



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