

X5 Frequency Multiplier

50Ω Output 2100 to 3000 MHz

RMK-5-2251+



CASE STYLE: TT1224

The Big Deal

- Wide bandwidth, 1500 to 2250 output
- High harmonic suppression, F4, 52 dBc; F6, 56 dBc
- Small size, 0.25 x 0.31 x 0.16"

Product Overview

Mini-Circuits' RMK-5-2251+ frequency multiplier provides a multiplication factor of 5 converting input frequencies from 300 to 450 MHz into output frequencies from 1500 to 2250 MHz, supporting applications including synthesizers, local oscillators, satellite up and down converters and more. The unit supports input power of +17 dBm with conversion loss of 21 dB and excellent 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
Wide bandwidth	With an output frequency range spanning 1500-2250 MHz, this multiplier covers a wide range of applications.
Excellent harmonic suppression • F4, 52 dBc • F6, 56 dBc	Reduces spurious signals and the need for additional filtering.
Low conversion loss, 21 dB	With a low conversion loss, the unit produces higher output power signal level and less amplification may be used.
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-5-2251+ 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



X5 Frequency Multiplier

50Ω Output 1500 to 2250 MHz

RMK-5-2251+

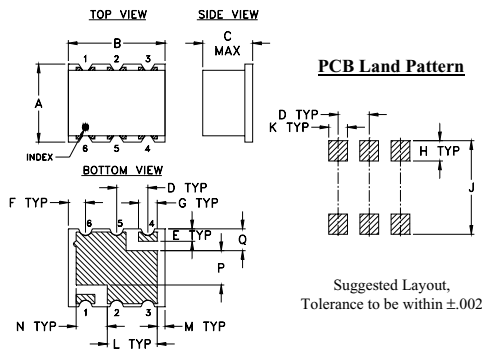
Maximum Ratings

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

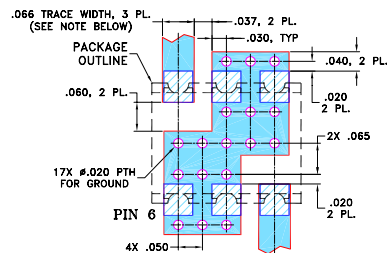
Outline Drawing



Outline Dimensions (inch/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

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Features

- low conversion loss, 21 dB typ.
- high rejection of adjacent harmonics, 56 dBc typ.
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters



CASE STYLE: TT1224

+RoHS Compliant

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

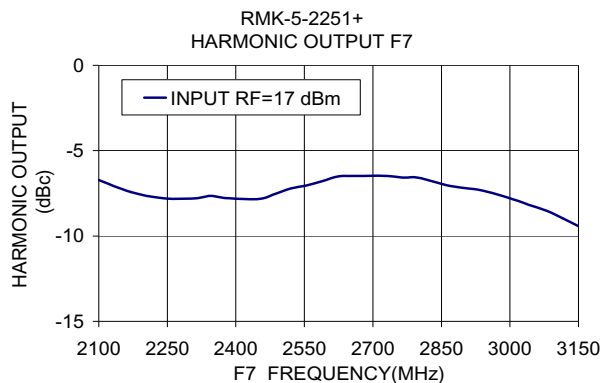
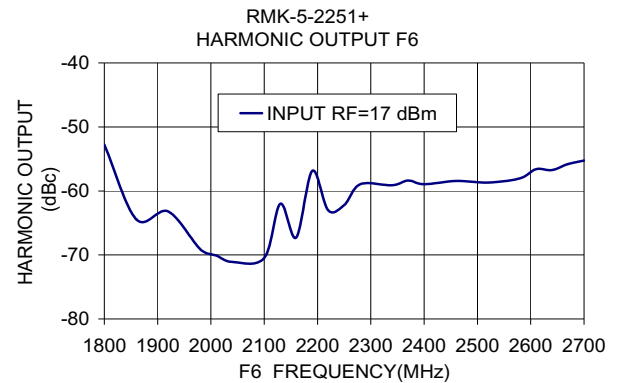
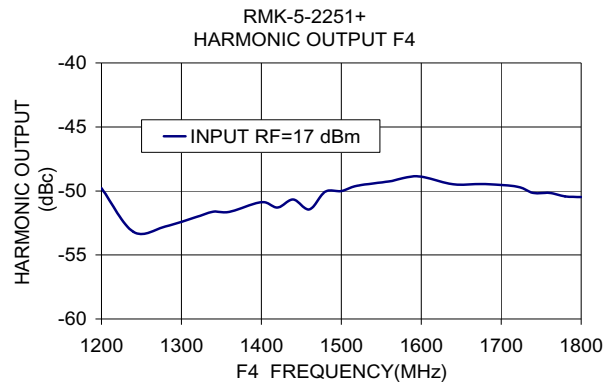
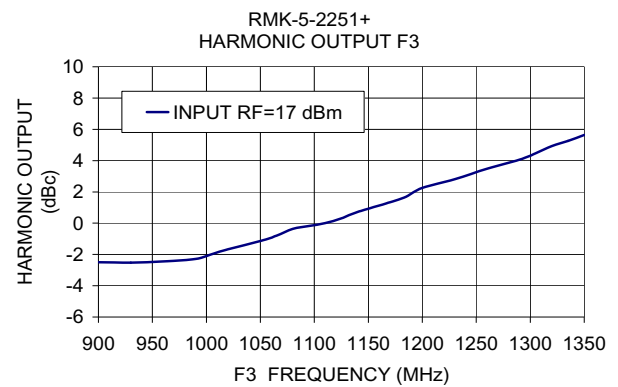
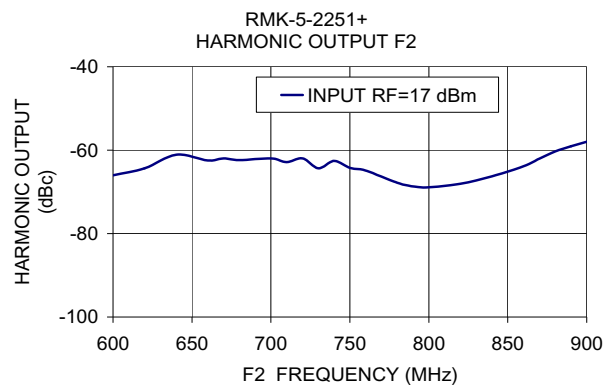
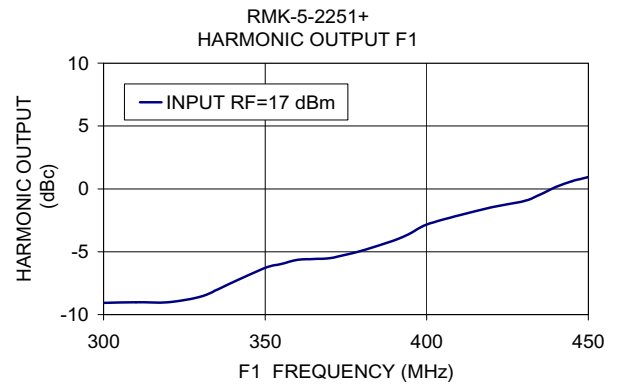
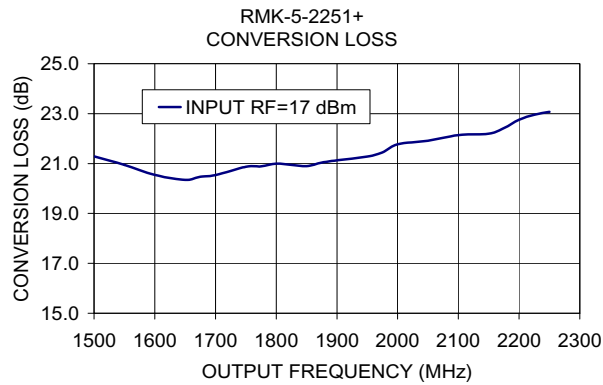
Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		5		
Frequency Range, Input (F1)	300	—	450	MHz
Frequency Range, Output (F5)	1500	—	2250	MHz
Input Power	—	17	—	dBm
Conversion Loss	—	21	24.8	dB
Harmonic Output*				-dBc
F1	-3.5	5.3	—	
F2	38	64	—	
F3	-7.6	-0.34	—	
F4	35	52	—	
F6	35	56	—	
F7	2.5	6.5	—	

* Harmonics of input frequency below the power level of F5

Typical Performance

Frequency		Harmonic Rejection Below F5, (dBc) at RF Input Power 17 dBm						
Input (MHz)	Output (MHz)	Conv. Loss (dB) F5	F1	F2	F3	F4	F6	F7
300.00	1500.00	21.29	-9.07	-66.02	-2.50	-49.79	-52.79	-6.72
310.00	1550.00	20.95	-9.02	-64.33	-2.53	-53.20	-64.41	-7.42
320.00	1600.00	20.55	-9.01	-61.09	-2.44	-52.78	-63.19	-7.78
330.00	1650.00	20.35	-8.58	-62.47	-2.29	-52.01	-69.13	-7.79
335.00	1675.00	20.47	-8.03	-61.99	-1.98	-51.61	-70.09	-7.65
340.00	1700.00	20.54	-7.43	-62.35	-1.67	-51.64	-71.09	-7.78
350.00	1750.00	20.87	-6.28	-61.96	-1.14	-50.88	-70.48	-7.83
355.00	1775.00	20.89	-5.97	-62.85	-0.80	-51.30	-62.01	-7.54
360.00	1800.00	21.00	-5.65	-61.96	-0.36	-50.66	-67.29	-7.22
365.00	1825.00	20.95	-5.57	-64.33	-0.18	-51.44	-56.87	-7.03
370.00	1850.00	20.90	-5.51	-62.59	0.00	-50.06	-63.01	-6.78
375.00	1875.00	21.04	-5.24	-64.25	0.31	-50.00	-62.20	-6.51
380.00	1900.00	21.13	-4.90	-64.89	0.71	-49.59	-58.94	-6.48
390.00	1950.00	21.28	-4.09	-67.78	1.34	-49.25	-59.11	-6.48
395.00	1975.00	21.45	-3.53	-68.70	1.69	-48.97	-58.36	-6.58
400.00	2000.00	21.77	-2.84	-68.89	2.26	-48.88	-58.96	-6.59
410.00	2050.00	21.91	-2.11	-68.06	2.81	-49.48	-58.45	-7.07
420.00	2100.00	22.14	-1.47	-66.25	3.48	-49.46	-58.71	-7.34
430.00	2150.00	22.20	-0.98	-63.87	4.06	-49.67	-58.03	-7.88
435.00	2175.00	22.42	-0.46	-62.03	4.47	-50.16	-56.62	-8.21
440.00	2200.00	22.76	0.15	-60.29	4.93	-50.15	-56.72	-8.52
445.00	2225.00	22.96	0.61	-59.06	5.26	-50.43	-55.81	-8.96
450.00	2250.00	23.07	0.94	-57.99	5.64	-50.47	-55.24	-9.43



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