

X4 Frequency Multiplier

RKK-4-252+

50Ω Output 1720 to 2520 MHz

The Big Deal

- Broadband, output from 1720 to 2520 MHz
- Low conversion loss, 25 dB
- Good harmonic suppression: F3, 30 dBc; F5, 35 dBc



CASE STYLE: CK1246

Product Overview

Mini-Circuits' RKK-4-252+ frequency multiplier provides a multiplication factor of 4, converting input frequencies from 430 to 630 MHz into output frequencies from 1720 to 2520 MHz, supporting applications including synthesizers, local oscillators, satellite up and down converters and more. This model provides an input power range from +16 to +19 dBm, low conversion loss and good harmonic suppression. The multiplier comes housed in a miniature, shielded surface-mount package (0.50 x 0.50 x 0.18") with wrap-around terminations for excellent solderability.

Key Features

Feature	Advantages
Low conversion loss, 25 dB typ.	With a low conversion loss, RKK-4-252+ produces higher output power, reducing the need for amplification.
Very good harmonic suppression <ul style="list-style-type: none">• F3, 30 dBc• F5, 35 dBc	Reduces spurious signals and the need for additional filtering.
Broadband, 1720 to 2520 MHz output	With an output frequency range spanning 1720 to 2520 MHz, this multiplier covers a wide range of applications.
Input power range from +16 to +19 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, 0.50 x 0.50 x 0.18"	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



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Generic photo used for illustration purposes only

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Maximum Ratings

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

Pin Connections

INPUT	2
OUTPUT	10
GROUND	1,3,4,5,6,7,8,9,11,12,13,14,15,16

Features

- broadband
- high rejection F1, 33 dBc typ; F2, 32 dBc typ; F3, 30 dBc typ; F5, 35 dBc typ.
- aqueous washable

Applications

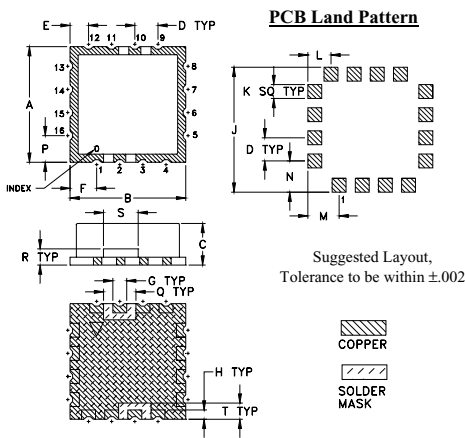
- synthesizers
- local oscillators
- satellite up and down converters
- radio astronomy
- private and public land mobil

+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
13"	200, 500

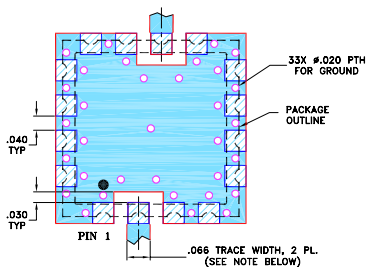
Outline Drawing



Outline Dimensions (Inch/mm)

A	B	C	D	E	F	G	H	J	K
.500	.500	.180	.100	.080	.115	.060	.040	.540	.060
12.70	12.70	4.57	2.54	2.03	2.92	1.52	1.02	13.72	1.52
L	M	N	P	Q	R	S	T	wt.	
.100	.135	.135	.115	.140	.070	.150	.070	grams	
2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.78	1.0	

Demo Board MCL P/N: TB-435+ Suggested PCB Layout (PL-267)



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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Electrical Specifications

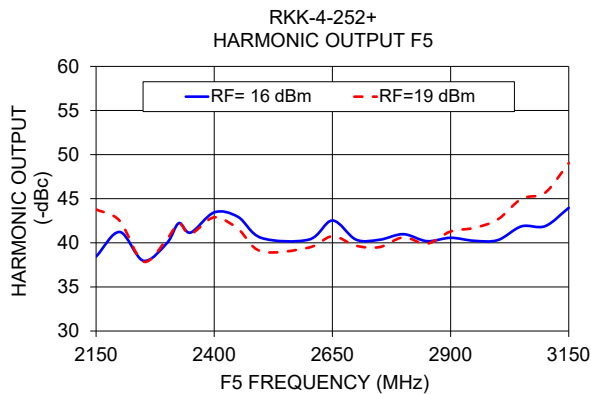
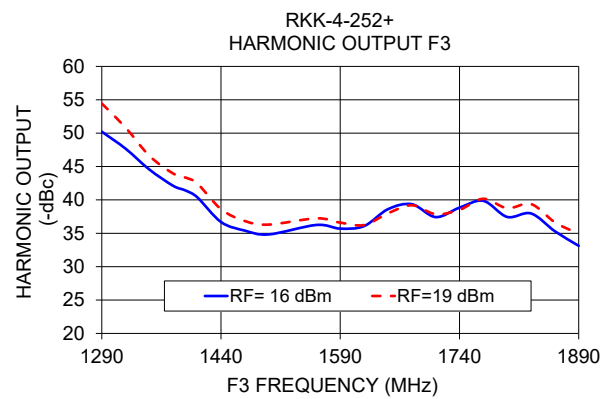
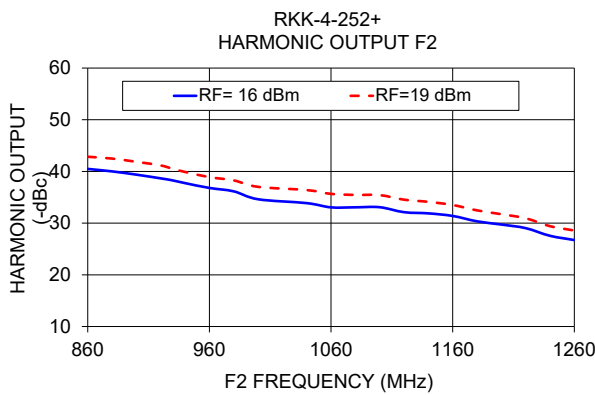
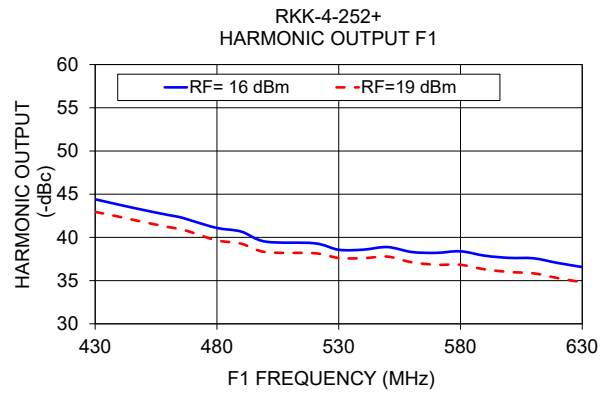
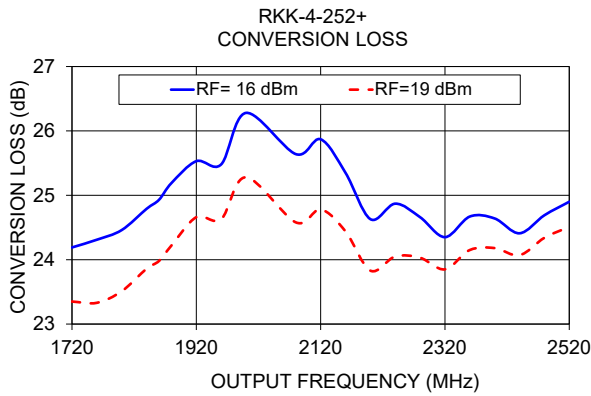
Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		4		
Frequency Range, Input (F1)	430	—	630	GHz
Frequency Range, Output (F4)	1720	—	2520	GHz
Input Power	16	—	19	dBm
Conversion Loss	—	25	30	dB
Harmonic Output	F1	22	33	dBc
	F2	20	32	
	F3	20	30	
	F5	25	35	

* Harmonics of input frequency below the power level of F4.

Typical Performance Data

Input Frequency (MHz)	INPUT RF= 16Bm					INPUT RF= 19dBm				
	Conversion Loss (dB)	Harmonic Output Below F4 (-dBc)				Conversion Loss (dB)	Harmonic Output Below F4 (-dBc)			
		F4	F1	F2	F3		F5	F4	F1	F2
430	24.19	44.41	40.49	50.22	38.44	23.35	42.95	42.84	54.44	43.79
440	24.31	43.77	40.01	47.67	41.23	23.33	42.38	42.49	50.83	42.49
450	24.46	43.16	39.38	44.54	37.97	23.51	41.76	41.86	46.59	37.87
460	24.79	42.59	38.66	42.10	39.98	23.86	41.20	41.16	43.94	40.44
465	24.93	42.33	38.26	41.43	42.23	23.98	40.95	40.50	43.36	42.21
470	25.19	41.90	37.74	40.41	41.16	24.22	40.55	39.90	42.49	41.01
480	25.53	41.09	36.81	36.69	43.45	24.66	39.65	38.90	38.62	42.89
490	25.48	40.67	36.15	35.40	42.95	24.63	39.27	38.27	36.84	41.59
500	26.28	39.51	34.62	34.83	40.55	25.28	38.30	37.02	36.30	39.02
520	25.64	39.32	33.87	36.25	40.36	24.58	38.17	36.40	37.24	39.46
530	25.87	38.57	33.05	35.70	42.53	24.78	37.62	35.66	36.60	40.74
540	25.35	38.58	33.06	36.08	40.36	24.44	37.59	35.46	36.24	39.67
550	24.63	38.88	33.08	38.61	40.35	23.83	37.78	35.42	37.99	39.52
560	24.87	38.31	32.12	39.36	40.98	24.05	37.12	34.54	39.20	40.62
570	24.66	38.21	31.89	37.43	40.19	24.03	36.84	34.12	37.87	39.90
580	24.35	38.39	31.39	38.84	40.57	23.85	36.83	33.51	38.51	41.29
590	24.67	37.88	30.35	39.86	40.23	24.15	36.30	32.47	40.17	41.69
600	24.64	37.63	29.73	37.45	40.31	24.18	36.00	31.73	38.76	42.66
610	24.41	37.58	29.03	37.97	41.87	24.07	35.84	30.94	39.38	44.99
620	24.69	37.04	27.55	35.31	41.89	24.34	35.29	29.41	36.65	45.68
630	24.90	36.57	26.73	33.12	43.96	24.51	34.81	28.57	34.91	49.04





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