

X4 Frequency Multiplier

RKK-4-442+

50Ω Output 3600 to 4400 MHz

The Big Deal

- Broadband, output from 3600 to 4400 MHz
- Wide input power range, +19 to +23 dBm
- Low conversion loss, 24.5 dB
- Good harmonic suppression: - F3, 23 dBc; F5, 31 dBc



CASE STYLE: CK1246

Product Overview

Mini-Circuits' RKK-4-442+ frequency multiplier provides a multiplication factor of 4, converting input frequencies from 900 to 1100 MHz into output frequencies from 3600 to 4400 MHz, supporting applications including synthesizers, local oscillators, satellite up and down converters and more. This model provides an input power range from +19 to +23 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 wraparound terminations for excellent solderability.

Feature	Advantages
Low conversion loss, 24.5 dB typ.	With a low conversion loss, RKK-4-442+ produces higher output power, reducing the need for amplification.
Very good harmonic suppression <ul style="list-style-type: none">• F3, 23 dBc• F5, 31 dBc	Reduces spurious signals and the need for additional filtering.
Broadband, 3600 to 4400 MHz output	With an output frequency range spanning 3600 to 4400 MHz, this multiplier covers a wide range of applications.
Wide input power range, +19 to +23 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.
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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	24dBm
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, 27 dBc typ; F2, 35 dBc typ; F3, 23 dBc typ; F5, 31 dBc typ.
- aqueous washable

Applications

- synthesizers
- local oscillators
- satellite up and down converters

+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

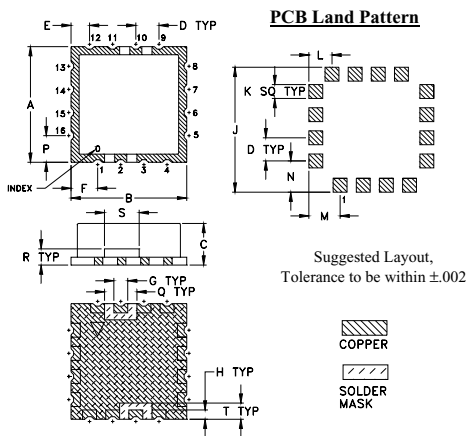
Reel Size	Devices/Reel
7"	10, 20, 50, 100
13"	200, 500

Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		4		
Frequency Range, Input (F1)	900	—	1100	MHz
Frequency Range, Output (F4)	3600	—	4400	MHz
Input Power	19	—	23	dBm
Conversion Loss	—	24.5	29	dB
Harmonic Output*	F1	23	27	dBc
	F2	21	35	
	F3	18	23	
	F5	18	31	

* Harmonics of input frequency below the power level of F4, at RF in +21dBm

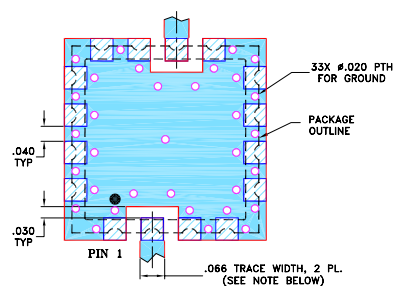
Outline Drawing



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 R04350B 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.
- Legend:
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

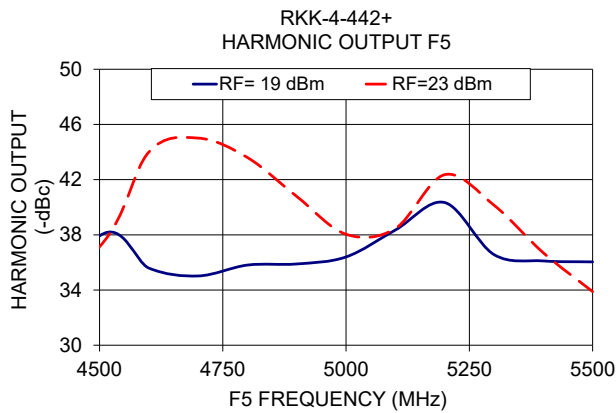
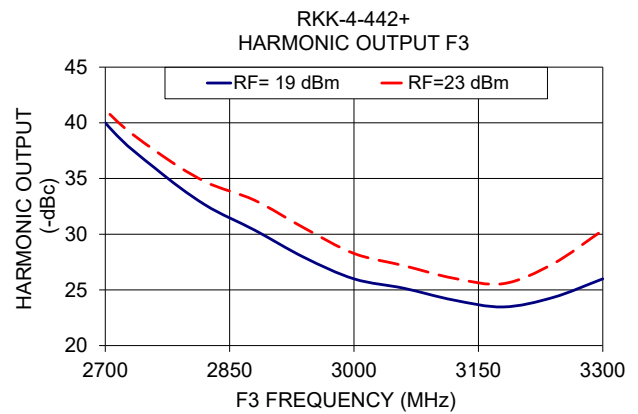
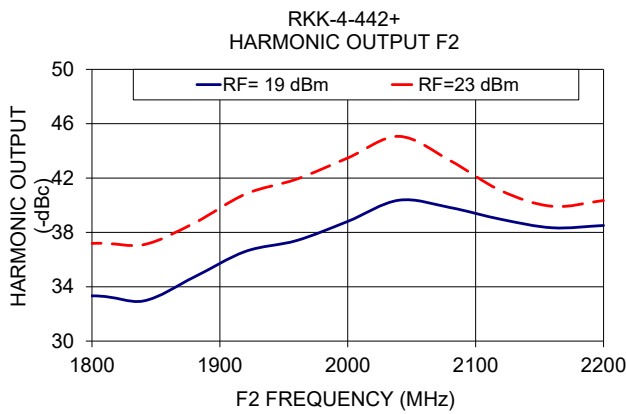
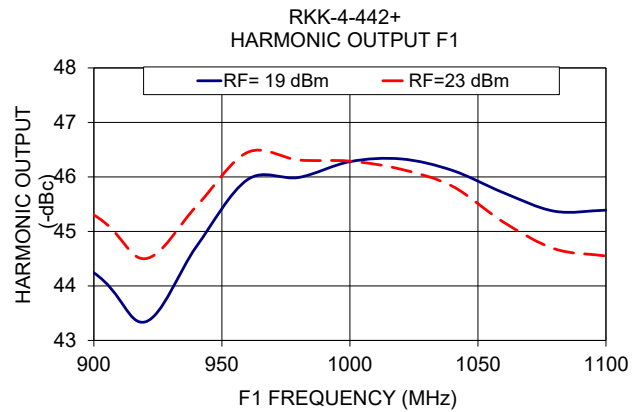
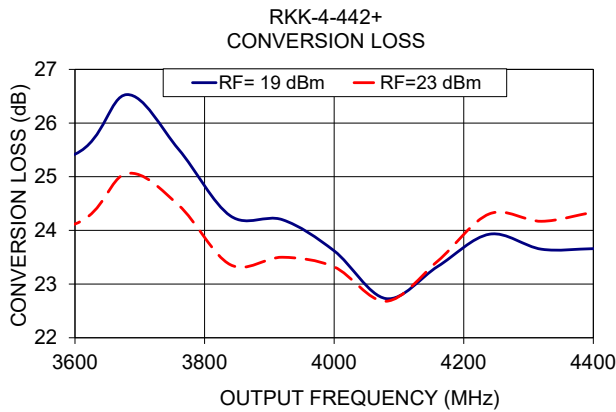
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Typical Performance Data

Input Frequency (MHz)	INPUT RF= 19dBm					INPUT RF= 23dBm				
	Conversion Loss (dB)	Harmonic Output Below F4 (-dBc)				Conversion Loss (dB)	Harmonic Output Below F4 (-dBc)			
		F4	F1	F2	F3		F5	F4	F1	F2
900.00	25.42	44.24	33.33	40.00	37.92	24.12	45.30	37.19	41.19	37.14
920.00	26.53	43.34	32.95	35.93	35.59	25.06	44.50	37.09	37.51	44.00
940.00	25.51	44.72	34.72	32.65	35.02	24.47	45.46	38.69	34.73	45.01
960.00	24.27	45.95	36.60	30.37	35.81	23.36	46.45	40.82	33.05	43.60
980.00	24.20	45.99	37.40	27.91	35.89	23.50	46.31	41.92	30.55	40.78
1000.00	23.62	46.28	38.81	25.99	36.40	23.32	46.29	43.48	28.27	38.04
1020.00	22.73	46.33	40.37	25.15	38.35	22.68	46.14	45.07	27.18	38.46
1040.00	23.33	46.12	39.83	24.09	40.34	23.43	45.83	43.29	26.05	42.36
1060.00	23.93	45.71	38.96	23.47	36.57	24.31	45.17	41.06	25.56	40.15
1080.00	23.65	45.37	38.34	24.32	36.11	24.17	44.68	39.92	27.34	36.70
1100.00	23.66	45.39	38.51	25.99	36.04	24.34	44.55	40.35	30.35	33.89





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