

X2 Frequency Multiplier

50Ω Output 1200 to 4400 MHz

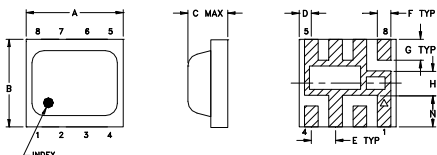
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input, 25°C	100 mW
Permanent damage may occur if any of these limits are exceeded.	

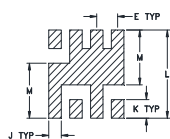
Pin Connections

INPUT	4
OUTPUT	8
50Ω TERMINATE EXT.	2
GROUND	1,3,5,6,7

Outline Drawing



PCB Metal Land Pattern

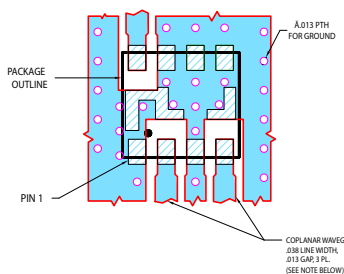


Suggested Layout,
Tolerance to be within .002

Outline Dimensions (inch)

A	B	C	D	E	F	G
.200	.180	.087	.025	.050	.028	.043
5.08	4.57	2.2098	0.64	1.27	0.71	1.09
H	J	K	L	M	N	wt
.050	.030	.043	.204	.127	0.065	grams
1.27	0.76	1.09	5.18	3.23	1.65	0.08

Demo Board MCL P/N: TB-473+ Suggested PCB Layout (PL-287)



- NOTES:
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS RO4358 WITH DIELECTRIC THICKNESS .002"±.0015". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB PACKAGE LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

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-Circuits' 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

Features

- low conversion loss, 11.0 dB typ.
- high fundamental & harmonic suppression, F1, 24 dBc typ.; F3, 30 dBc typ.; F4, 20 dBc typ.
- LTCC design
- low profile, 0.085"
- aqueous washable

Applications

- synthesizers
- local oscillators

Electrical Specifications

MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1	F2					F1		F3		F4	
	Input	Output	Min.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.
2	600-1200	1200-2400	7	13	11	14	26	18	35	22	16	11
	1200-2200	2400-4400	10	15	11	14.5	18	11	36	22	25	14

* Harmonics of input frequency below the power level of F2

Typical Performance Data

Input Frequency (MHz)	INPUT RF= 7dBm				INPUT RF= 13dBm			
	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
		F1	F3	F4		F1	F3	F4
600.00	11.07	37.78	38.89	19.27	11.42	36.83	37.22	17.78
700.00	10.62	35.69	33.05	20.55	11.38	30.55	43.10	15.17
725.00	10.96	33.61	32.98	18.42	11.82	29.27	46.76	14.44
750.00	10.81	31.77	34.21	16.56	11.53	28.24	54.28	13.86
775.00	11.11	30.55	34.97	15.48	11.73	27.98	51.80	13.59
800.00	10.80	29.63	36.19	14.47	11.25	27.69	48.85	13.72
825.00	10.56	29.39	36.48	14.11	11.05	27.58	45.69	14.42
850.00	10.45	29.55	36.57	14.68	11.26	27.56	44.52	15.79
875.00	10.06	29.91	37.08	15.22	11.19	27.21	43.53	17.71
900.00	10.20	29.93	37.43	15.88	11.71	26.98	44.51	18.04
950.00	10.39	29.32	37.16	16.42	11.85	25.83	41.50	19.39
1000.00	10.82	28.26	33.82	16.84	12.03	24.49	42.41	17.55
1100.00	11.80	27.05	29.27	19.07	11.45	23.40	42.59	25.36
1150.00	11.86	27.42	28.19	20.03	11.17	22.65	36.52	23.32
1200.00	12.57	26.52	29.22	20.14	11.57	22.07	34.21	19.68

Input Frequency (MHz)	INPUT RF= 10dBm				INPUT RF= 15dBm			
	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
		F1	F3	F4		F1	F3	F4
1200.00	11.62	24.39	34.69	18.76	11.98	20.99	32.59	22.26
1300.00	11.46	24.74	36.51	17.80	11.66	20.99	34.74	19.84
1400.00	11.53	21.40	32.39	15.23	11.19	18.65	35.06	17.29
1500.00	10.85	20.20	27.53	18.33	10.89	17.25	34.00	21.23
1600.00	10.28	20.96	28.80	23.83	10.47	17.46	49.70	20.69
1700.00	10.54	21.05	27.62	25.30	10.45	16.88	31.19	28.07
1800.00	10.48	21.09	30.11	44.00	10.93	16.93	25.40	46.31
1850.00	10.88	20.35	33.46	35.37	11.45	17.22	24.89	37.47
1900.00	11.08	19.22	52.15	31.03	11.37	17.27	28.09	33.16
1950.00	11.51	17.74	34.22	44.11	11.16	16.02	35.11	50.14
2000.00	11.71	17.28	28.56	39.52	11.37	14.87	44.49	45.20
2050.00	11.94	16.57	28.40	37.40	11.59	14.04	42.35	38.11
2100.00	12.09	16.42	30.20	39.12	11.78	13.87	39.30	38.07
2150.00	12.19	16.62	29.11	34.90	11.76	14.22	37.34	29.99
2200.00	12.36	16.51	30.27	36.11	11.50	14.00	36.61	29.03

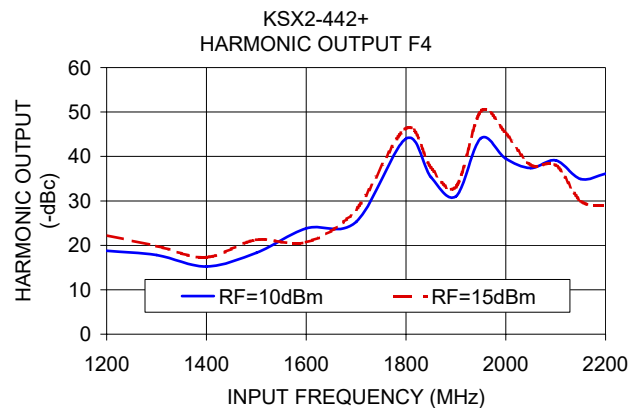
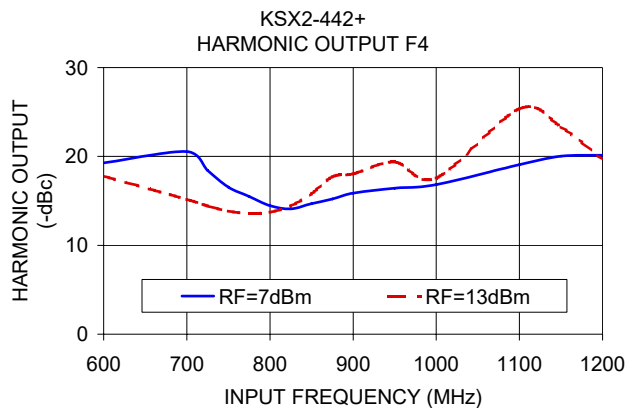
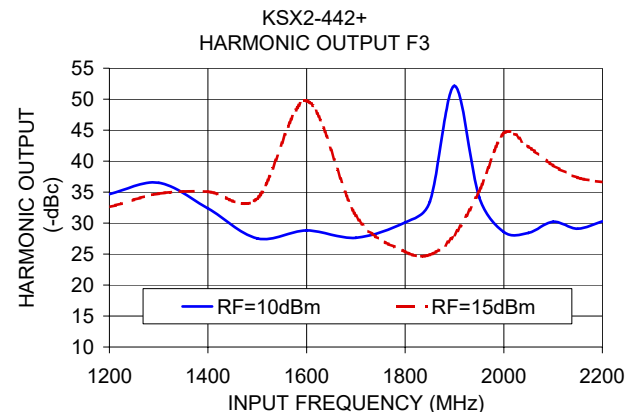
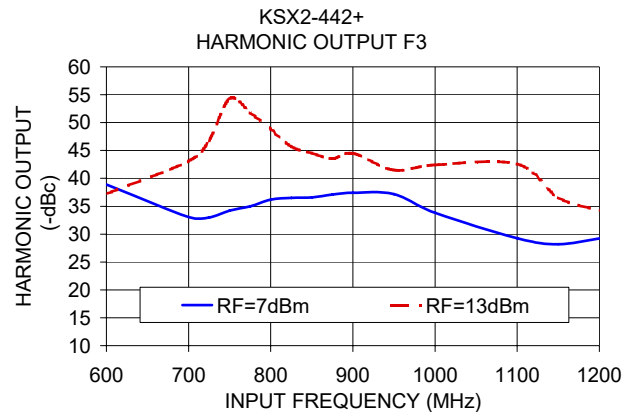
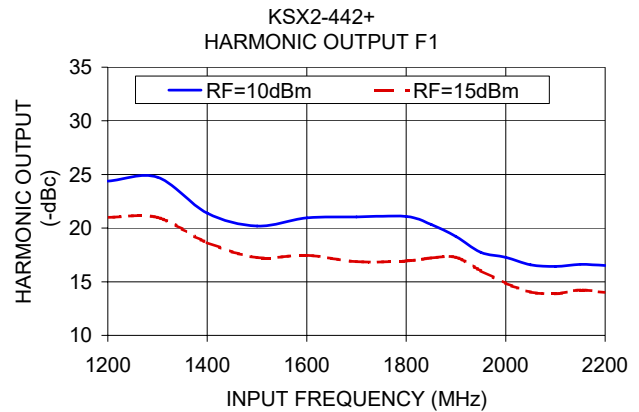
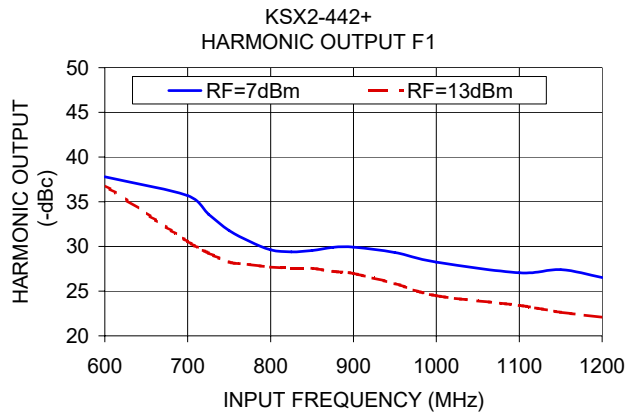
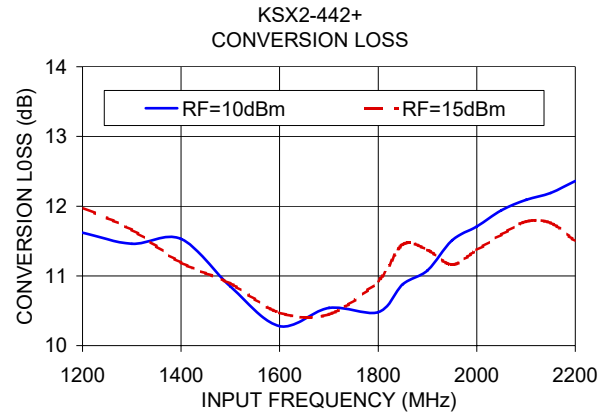
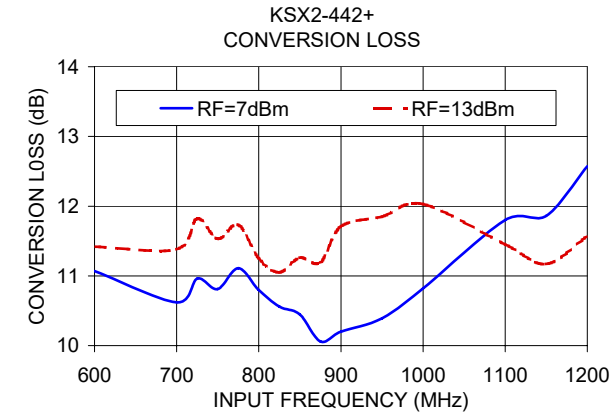
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CASE STYLE: HV1195

+RoHS Compliant

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





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