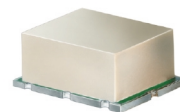


X2 Frequency Multiplier

50Ω Output 100 to 3000 MHz

SYK-2-33+



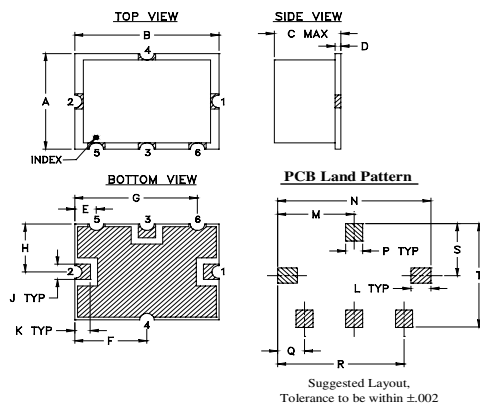
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	100 mW

Pin Connections

INPUT	2
OUTPUT	1
GROUND	4,5,6
NOT USED	3

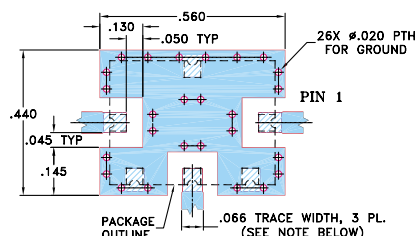
Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K
.38	.50	.23	.020	.075	.250	.425	.187	.050	.050
9.65	12.70	5.84	0.51	1.91	6.35	10.80	4.75	1.27	1.27
L	M	N	P	Q	R	S	T	wt.	
.070	.270	.540	.060	.095	.445	.208	.415	grams	
1.78	6.86	13.72	1.52	2.41	11.30	5.28	10.54	0.8	

Demo Board MCL P/N: TB-12 Suggested PCB Layout (PL-079)



- NOTE: 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. GROUND PAD SHALL BE FREE OF SOLDER MASK IF REQUIRED FOR SOLDERING.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.
■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Features

- wideband, 100 to 3000 MHz
- low conversion loss, 11.5 dB typ.
- high fundamental & harmonic suppression, F1, 30 dBc typ.; F3, 33 dBc typ.; F4, 20 dBc typ.

Applications

- synthesizers
- local oscillators

CASE STYLE: TTT167
PRICE: \$ 29.95 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

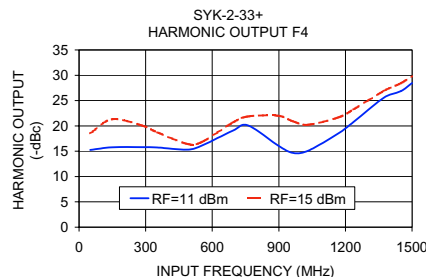
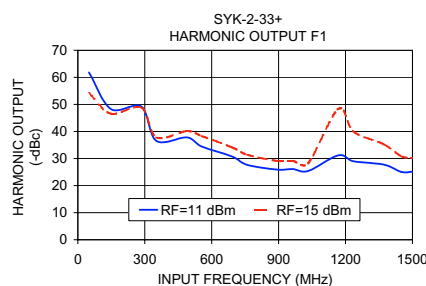
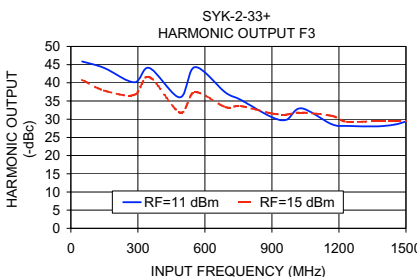
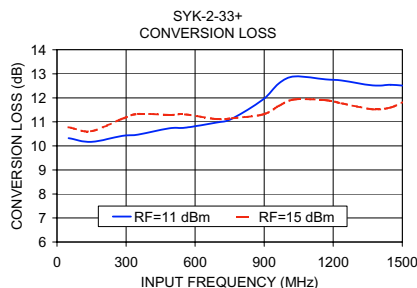
Electrical Specifications at 25°C

MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1 Input	F2 Output	Min.	Max.	Typ.	Max.	F1 Typ.	F1 Min.	F3 Typ.	F3 Min.	F4 Typ.	F4 Min.
2	50-1500	100-3000	11	15	11.5	15	30	17	33	18	20	10

* Harmonics of input frequency below the power level of F2

Typical Performance Data at 25°C

Input Frequency (MHz)	INPUT RF= 11dBm				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
50.00	10.32	61.79	45.86	15.26	10.78	54.14	40.80	18.51
148.00	10.17	48.30	44.13	15.78	10.61	46.57	37.88	21.30
284.00	10.42	49.21	40.15	15.81	11.13	48.81	36.67	20.08
352.00	10.47	36.50	44.08	15.73	11.33	37.80	41.55	18.74
488.00	10.73	37.83	36.02	15.30	11.29	40.13	31.84	16.46
556.00	10.76	34.45	44.33	16.17	11.31	38.34	37.42	16.88
692.00	10.97	30.75	37.34	19.04	11.12	34.11	33.34	20.62
760.00	11.13	27.63	35.35	20.10	11.15	31.38	33.62	21.85
896.00	11.94	25.89	30.65	16.13	11.31	29.11	31.63	22.00
964.00	12.60	26.14	29.82	14.67	11.66	29.16	31.29	20.91
1032.00	12.89	25.37	33.01	15.09	11.93	28.18	31.85	20.24
1168.00	12.77	31.16	28.60	18.53	11.90	48.30	30.89	21.67
1236.00	12.72	28.98	28.14	20.76	11.77	39.97	29.30	23.23
1372.00	12.52	27.74	28.02	25.51	11.52	35.26	29.49	26.87
1450.00	12.54	25.08	28.55	26.88	11.60	30.86	29.46	28.42
1500.00	12.51	25.11	29.38	28.47	11.82	30.22	29.60	29.82



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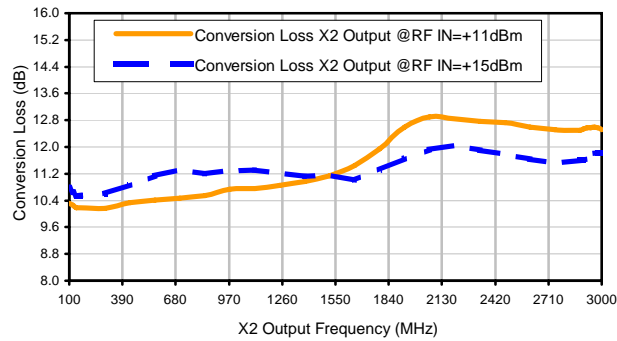
REV. OR
M117534
SYK-2-33+
ED-13376/1
W/CP
080513

Frequency Multiplier (Doubler)

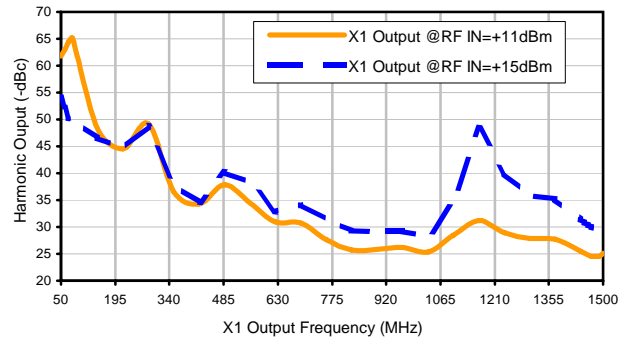
SYK-2-33+

Typical Performance Curves

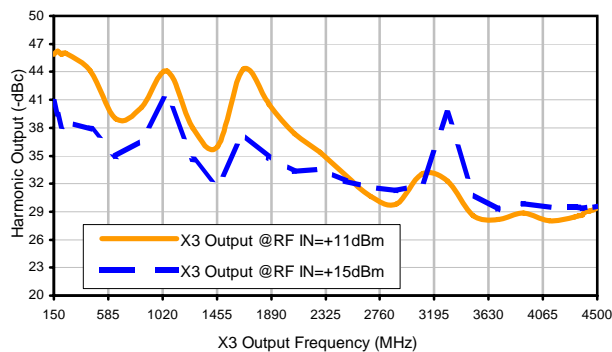
Conversion Loss X2 Output



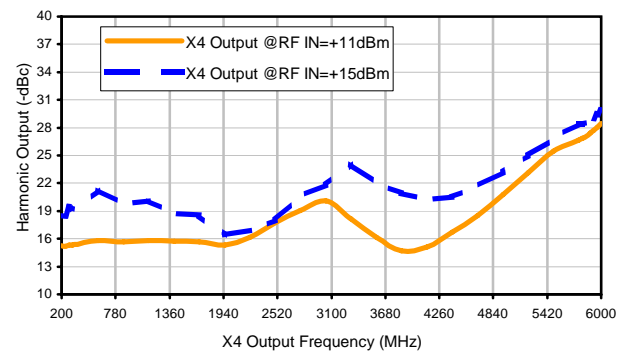
Harmonic X1 Output



Harmonic X3 Output



Harmonic X4 Output



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Frequency Multiplier (Doublers)

SYK-2-33+

Typical Performance Data

Frequency (MHz)				RF IN = 11dBm			
				Conversion Loss (dB)	Harmonic Output* (-dBc)		
X1 Output	X2 Output	X3 Output	X4 Output	X2 Output	X1 Output	X3 Output	X4 Output
50.00	100.00	150.00	200.00	10.32	61.79	45.86	15.26
60.00	120.00	180.00	240.00	10.26	62.96	46.25	15.19
70.00	140.00	210.00	280.00	10.19	64.37	45.85	15.35
80.00	160.00	240.00	320.00	10.18	65.16	45.99	15.34
148.00	296.00	444.00	592.00	10.17	48.30	44.13	15.78
216.00	432.00	648.00	864.00	10.33	44.55	38.95	15.66
284.00	568.00	852.00	1136.00	10.42	49.21	40.15	15.81
352.00	704.00	1056.00	1408.00	10.47	36.50	44.08	15.73
420.00	840.00	1260.00	1680.00	10.55	34.26	37.99	15.65
488.00	976.00	1464.00	1952.00	10.73	37.83	36.02	15.30
556.00	1112.00	1668.00	2224.00	10.76	34.45	44.33	16.17
624.00	1248.00	1872.00	2496.00	10.85	30.98	40.51	17.73
692.00	1384.00	2076.00	2768.00	10.97	30.75	37.34	19.04
760.00	1520.00	2280.00	3040.00	11.13	27.63	35.35	20.10
828.00	1656.00	2484.00	3312.00	11.44	25.68	32.90	18.13
896.00	1792.00	2688.00	3584.00	11.94	25.89	30.65	16.13
964.00	1928.00	2892.00	3856.00	12.60	26.14	29.82	14.67
1032.00	2064.00	3096.00	4128.00	12.89	25.37	33.01	15.09
1100.00	2200.00	3300.00	4400.00	12.84	28.41	32.32	16.69
1168.00	2336.00	3504.00	4672.00	12.77	31.16	28.60	18.53
1236.00	2472.00	3708.00	4944.00	12.72	28.98	28.14	20.76
1304.00	2608.00	3912.00	5216.00	12.59	27.83	28.88	23.16
1372.00	2744.00	4116.00	5488.00	12.52	27.74	28.02	25.51
1440.00	2880.00	4320.00	5760.00	12.49	25.48	28.47	26.69
1450.00	2900.00	4350.00	5800.00	12.54	25.08	28.55	26.88
1460.00	2920.00	4380.00	5840.00	12.57	24.76	28.68	27.09
1470.00	2940.00	4410.00	5880.00	12.58	24.58	28.96	27.45
1480.00	2960.00	4440.00	5920.00	12.60	24.47	29.06	27.72
1490.00	2980.00	4470.00	5960.00	12.58	24.57	29.19	28.07
1500.00	3000.00	4500.00	6000.00	12.51	25.11	29.38	28.47

*Harmonic Output below power level of X2 Output .



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Frequency Multiplier (Doublers)

SYK-2-33+

Typical Performance Data

Frequency (MHz)				RF IN = 15dBm			
				Conversion Loss (dB)	Harmonic Output* (-dBc)		
X1 Output	X2 Output	X3 Output	X4 Output	X2 Output	X1 Output	X3 Output	X4 Output
50.00	100.00	150.00	200.00	10.78	54.14	40.80	18.51
60.00	120.00	180.00	240.00	10.65	52.22	39.46	18.44
70.00	140.00	210.00	280.00	10.55	50.22	38.21	19.49
80.00	160.00	240.00	320.00	10.54	50.13	38.66	19.17
148.00	296.00	444.00	592.00	10.61	46.57	37.88	21.30
216.00	432.00	648.00	864.00	10.88	44.67	34.98	19.78
284.00	568.00	852.00	1136.00	11.13	48.81	36.67	20.08
352.00	704.00	1056.00	1408.00	11.33	37.80	41.55	18.74
420.00	840.00	1260.00	1680.00	11.20	34.68	34.53	18.55
488.00	976.00	1464.00	1952.00	11.29	40.13	31.84	16.46
556.00	1112.00	1668.00	2224.00	11.31	38.34	37.42	16.88
624.00	1248.00	1872.00	2496.00	11.22	32.81	34.80	17.99
692.00	1384.00	2076.00	2768.00	11.12	34.11	33.34	20.62
760.00	1520.00	2280.00	3040.00	11.15	31.38	33.62	21.85
828.00	1656.00	2484.00	3312.00	11.01	29.34	32.28	24.13
896.00	1792.00	2688.00	3584.00	11.31	29.11	31.63	22.00
964.00	1928.00	2892.00	3856.00	11.66	29.16	31.29	20.91
1032.00	2064.00	3096.00	4128.00	11.93	28.18	31.85	20.24
1100.00	2200.00	3300.00	4400.00	12.05	34.51	39.57	20.48
1168.00	2336.00	3504.00	4672.00	11.90	48.30	30.89	21.67
1236.00	2472.00	3708.00	4944.00	11.77	39.97	29.30	23.23
1304.00	2608.00	3912.00	5216.00	11.63	35.81	29.88	24.98
1372.00	2744.00	4116.00	5488.00	11.52	35.26	29.49	26.87
1440.00	2880.00	4320.00	5760.00	11.59	31.39	29.53	28.36
1450.00	2900.00	4350.00	5800.00	11.60	30.86	29.46	28.42
1460.00	2920.00	4380.00	5840.00	11.66	30.35	29.37	28.53
1470.00	2940.00	4410.00	5880.00	11.74	29.97	29.46	28.93
1480.00	2960.00	4440.00	5920.00	11.81	29.70	29.43	29.02
1490.00	2980.00	4470.00	5960.00	11.82	29.74	29.45	29.45
1500.00	3000.00	4500.00	6000.00	11.82	30.22	29.60	29.82

*Harmonic Output below power level of X2 Output .



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