X2 Frequency Multiplier

50Ω Output 3400 to 7200 MHz

ZX90-2-36-S+



Generic photo used for illustration purposes only

CASE STYLE: JA1242

Connectors	Model
SMA	ZX90-2-36-S+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Input Power, 25°C	23 dBm

Permanent damage may occur if any of these limits are exceeded.

Coaxial Connections

INPUT	2
OUTPUT	1

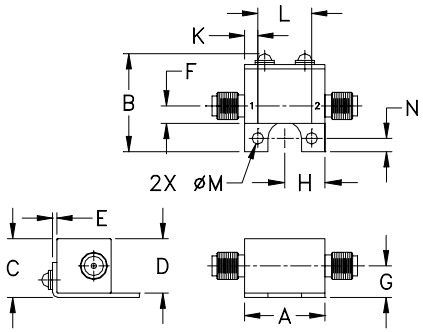
Features

- broadband
- low conversion loss, 11 dB typ.
- rugged construction
- protected by US Patent 6,790,049

Applications

- synthesizers
- local oscillators

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.74	.90	.54	.50	.04	.16	.29
18.80	22.86	13.72	12.70	1.02	4.06	7.37

H	J	K	L	M	N	wt
.37	--	.122	.496	.106	.122	grams
9.40	--	3.10	12.60	2.69	3.10	19.0

Electrical Specifications

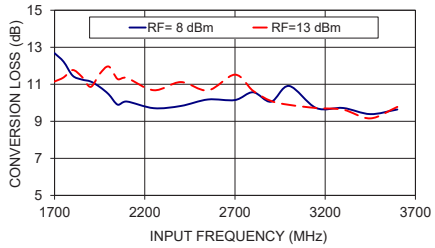
MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1	F2					F1		F3		F4	
	Input	Output	Min.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.
2	**1700-3600**	**3400-7200**	**8**	**13**	**11**	**15**	**18**	**11**	**32**	**22**	**17**	**10**
	2100-2700	4200-5400	8	13	10	14	23	14	35	22	17	10

* Harmonics of input frequency below the power level of F2

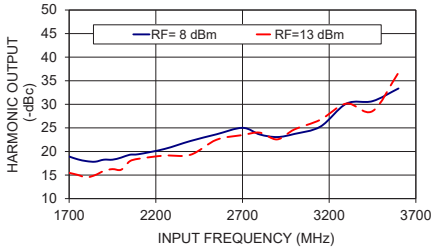
Typical Performance Data

	INPUT RF= 8 dBm				INPUT RF= 13 dBm			
Input Frequency (MHz)	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
		F1	F3	F4		F1	F3	F4
1700.00	12.68	18.93	35.89	18.96	11.15	15.47	26.66	24.11
1750.00	12.22	18.33	35.27	18.16	11.37	15.03	28.94	16.00
1800.00	11.47	17.95	45.16	18.70	11.77	14.50	33.64	13.06
1850.00	11.26	17.83	33.29	18.35	11.42	14.99	38.73	13.03
1900.00	11.15	18.26	29.79	17.36	10.86	15.86	36.04	18.11
1950.00	10.86	18.26	35.39	16.48	11.56	16.26	45.42	16.46
2000.00	10.46	18.70	38.44	17.89	11.96	16.13	42.66	13.95
2050.00	9.90	19.31	39.98	18.47	11.28	17.93	34.78	16.77
2100.00	10.07	19.42	42.00	18.43	11.35	18.45	35.13	18.82
2250.00	9.71	20.53	36.43	19.74	10.68	19.13	33.84	20.75
2400.00	9.83	22.22	40.20	18.46	11.12	19.30	30.47	14.87
2550.00	10.18	23.64	34.87	17.62	10.67	22.48	34.32	16.03
2700.00	10.15	25.01	32.22	18.45	11.52	23.48	44.56	14.58
2800.00	10.57	23.60	27.52	16.04	10.65	23.99	33.19	16.01
2900.00	10.06	23.06	31.99	16.59	10.10	22.56	55.64	15.38
3000.00	10.91	23.72	27.97	20.74	9.89	24.68	37.24	23.88
3150.00	9.72	25.28	30.62	24.35	9.72	26.74	43.78	26.57
3300.00	9.72	30.15	34.56	28.81	9.63	30.16	34.29	30.43
3450.00	9.39	30.67	35.55	25.72	9.16	28.55	34.48	30.97
3600.00	9.64	33.36	40.47	24.29	9.78	36.72	37.99	28.94

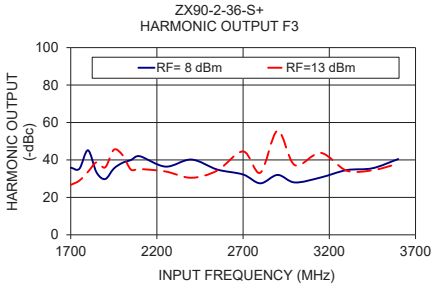
ZX90-2-36-S+
CONVERSION LOSS



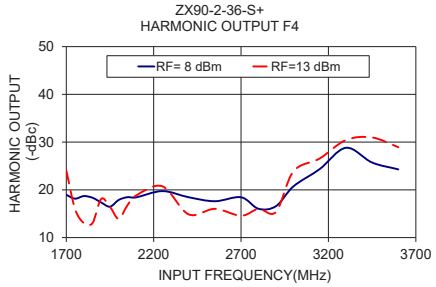
ZX90-2-36-S+
HARMONIC OUTPUT F1



ZX90-2-36-S+
HARMONIC OUTPUT F3



ZX90-2-36-S+
HARMONIC OUTPUT F4



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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Frequency Multiplier (Doubler) ZX90-2-36+

Typical Performance Data

FREQUENCY (MHz)				RF IN=+8dBm			
				CONVERSION LOSS (dB)	HARMONIC OUTPUT* (-dBc)		
X 1 OUTPUT	X 2 OUTPUT	X 3 OUTPUT	X 4 OUTPUT	X 2 OUTPUT	X 1 OUTPUT	X 3 OUTPUT	X 4 OUTPUT
1600	3200	4800	6400	13.18	17.12	23.02	21.13
1700	3400	5100	6800	12.68	18.93	35.89	18.96
1750	3500	5250	7000	12.22	18.33	35.27	18.16
1800	3600	5400	7200	11.47	17.95	45.16	18.70
1850	3700	5550	7400	11.26	17.83	33.29	18.35
1900	3800	5700	7600	11.15	18.26	29.79	17.36
1950	3900	5850	7800	10.86	18.26	35.39	16.48
2000	4000	6000	8000	10.46	18.70	38.44	17.89
2050	4100	6150	8200	9.90	19.31	39.98	18.47
2100	4200	6300	8400	10.07	19.42	42.00	18.43
2250	4500	6750	9000	9.71	20.53	36.43	19.74
2400	4800	7200	9600	9.83	22.22	40.20	18.46
2550	5100	7650	10200	10.18	23.64	34.87	17.62
2700	5400	8100	10800	10.15	25.01	32.22	18.45
2800	5600	8400	11200	10.57	23.60	27.52	16.04
2900	5800	8700	11600	10.06	23.06	31.99	16.59
3000	6000	9000	12000	10.91	23.72	27.97	20.74
3150	6300	9450	12600	9.72	25.28	30.62	24.35
3300	6600	9900	13200	9.72	30.15	34.56	28.81
3450	6900	10350	13800	9.39	30.67	35.55	25.72
3600	7200	10800	14400	9.64	33.36	40.47	24.29
3700	7400	11100	14800	9.95	26.15	32.21	27.06
3800	7600	11400	15200	9.88	28.59	28.10	21.48

*Harmonic Output below power level of X 2 Output .

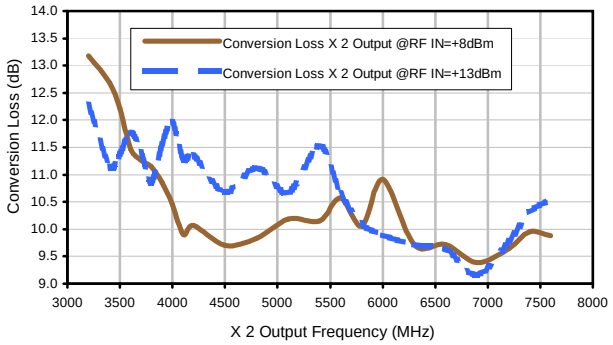
FREQUENCY (MHz)				RF IN=+13dBm			
				CONVERSION LOSS (dB)	HARMONIC OUTPUT* (-dBc)		
X 1 OUTPUT	X 2 OUTPUT	X 3 OUTPUT	X 4 OUTPUT	X 2 OUTPUT	X 1 OUTPUT	X 3 OUTPUT	X 4 OUTPUT
1600	3200	4800	6400	12.29	13.42	22.25	18.94
1700	3400	5100	6800	11.15	15.47	26.66	24.11
1750	3500	5250	7000	11.37	15.03	28.94	16.00
1800	3600	5400	7200	11.77	14.50	33.64	13.06
1850	3700	5550	7400	11.42	14.99	38.73	13.03
1900	3800	5700	7600	10.86	15.86	36.04	18.11
1950	3900	5850	7800	11.56	16.26	45.42	16.46
2000	4000	6000	8000	11.96	16.13	42.66	13.95
2050	4100	6150	8200	11.28	17.93	34.78	16.77
2100	4200	6300	8400	11.35	18.45	35.13	18.82
2250	4500	6750	9000	10.68	19.13	33.84	20.75
2400	4800	7200	9600	11.12	19.30	30.47	14.87
2550	5100	7650	10200	10.67	22.48	34.32	16.03
2700	5400	8100	10800	11.52	23.48	44.56	14.58
2800	5600	8400	11200	10.65	23.99	33.19	16.01
2900	5800	8700	11600	10.10	22.56	55.64	15.38
3000	6000	9000	12000	9.89	24.68	37.24	23.88
3150	6300	9450	12600	9.72	26.74	43.78	26.57
3300	6600	9900	13200	9.63	30.16	34.29	30.43
3450	6900	10350	13800	9.16	28.55	34.48	30.97
3600	7200	10800	14400	9.78	36.72	37.99	28.94
3700	7400	11100	14800	10.30	21.80	27.15	33.72
3800	7600	11400	15200	10.55	25.41	26.68	30.43

*Harmonic Output below power level of X 2 Output .

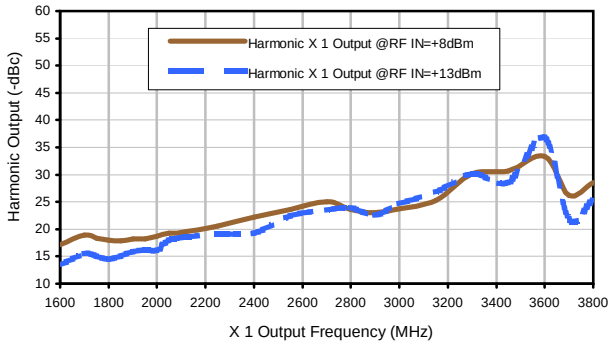
Frequency Multiplier (Doubler) ZX90-2-36+

Typical Performance Curves

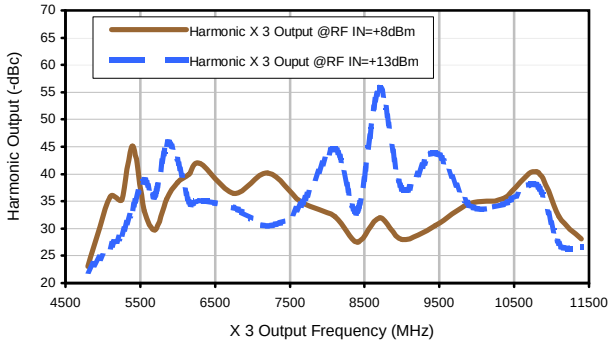
Conversion Loss X 2 Output



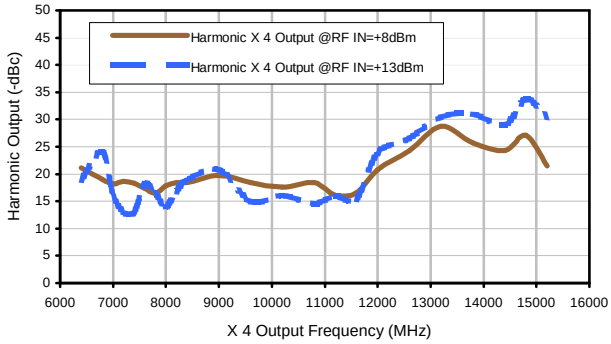
Harmonic X 1 Output



Harmonic X 3 Output



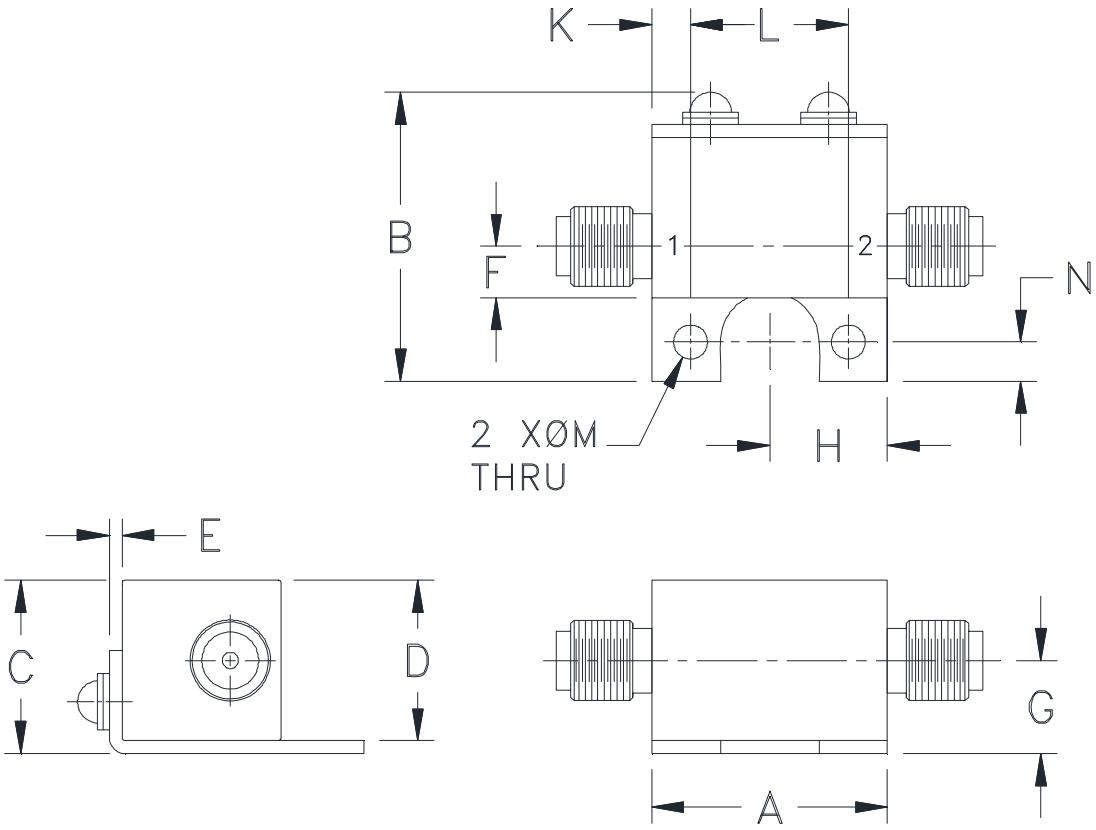
Harmonic X 4 Output



Case Style JA

JA1242

Outline Dimensions



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
JA1242	.74 (18.80)	.90 (22.86)	.54 (13.72)	.50 (12.70)	.04 (1.02)	.16 (4.06)	.29 (7.37)	.37 (9.40)	- -	.122 (3.10)	.496 (12.60)	.106 (2.69)	.122 (3.10)	19.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015.
Tolerance on hole size and interaxes dimensions to be ±.005.

Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.

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Environmental Specifications ENV28

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I

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