X2 Frequency Multiplier

50Ω Output 1000 to 2200 MHz

ZX90-2-11-S+

Generic photo used for illustration purposes only

CASE STYLE: JA1242

Connectors	Model
SMA	ZX90-2-11-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

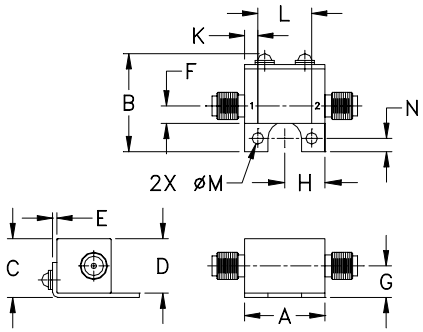
Features

- broadband
- low conversion loss, 10.5 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

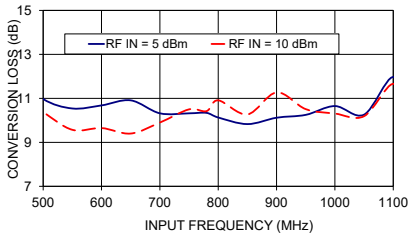
MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F1	F2					F1		F3		F4	
	Input	Output	Min.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.
2	**500-1100**	**1000-2200**	**5**	**10**	**10.5**	**13.5**	**27**	**21**	**34**	**25**	**21**	**12**
	550-750	1100-1500	5	10	10.0	13.5	30	21	34	25	21	12

* Harmonics of input frequency below the power level of F2

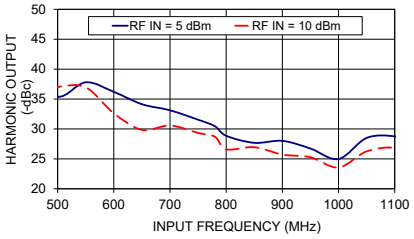
Typical Performance Data

Input Frequency (MHz)	INPUT RF= 5 dBm				INPUT RF= 10 dBm			
	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
		F1	F3	F4		F1	F3	F4
500	10.97	35.40	36.29	18.22	10.38	37.01	33.95	15.69
550	10.54	37.80	40.50	21.45	9.57	36.95	39.73	17.75
600	10.68	36.20	41.69	30.06	9.65	32.62	45.38	15.36
650	10.91	34.14	43.30	26.98	9.40	29.85	42.77	16.72
700	10.32	33.12	41.66	24.46	9.90	30.58	57.35	17.75
750	10.32	31.55	39.36	22.36	10.50	29.34	58.89	17.00
780	10.34	30.45	39.07	22.12	10.42	28.69	43.80	18.01
800	10.13	28.86	37.56	22.27	10.91	26.60	38.56	18.27
850	9.83	27.68	33.80	19.92	10.27	26.95	33.58	23.87
900	10.12	28.01	37.54	20.74	11.27	25.72	32.38	15.46
950	10.25	26.73	40.97	27.76	10.51	25.27	38.76	26.46
1000	10.65	24.98	35.69	35.91	10.31	23.56	47.02	37.48
1050	10.26	28.50	38.88	41.83	10.19	26.25	44.99	47.45
1100	11.97	28.75	36.89	22.73	11.66	26.83	42.54	26.84

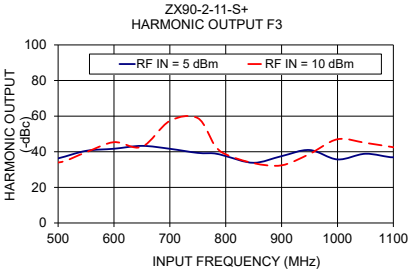
ZX90-2-11-S+
CONVERSION LOSS



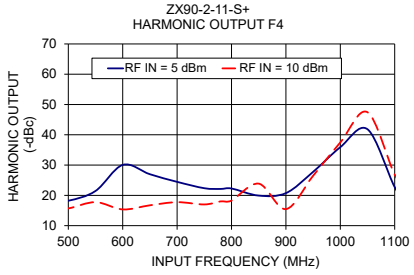
ZX90-2-11-S+
HARMONIC OUTPUT F1



ZX90-2-11-S+
HARMONIC OUTPUT F3



ZX90-2-11-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

REV. C
ECO-012107
ZX90-2-11-S+
ED-12886/2
DY/CP/AM
220302

Frequency Multiplier (Doubler) ZX90-2-11+

Typical Performance Data

FREQUENCY (MHz)				RF IN=+5dBm			
				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
450	900	1350	1800	12.17	39.39	33.06	17.25
500	1000	1500	2000	10.97	35.40	36.29	18.22
550	1100	1650	2200	10.54	37.80	40.50	21.45
600	1200	1800	2400	10.68	36.20	41.69	30.06
650	1300	1950	2600	10.91	34.14	43.30	26.98
700	1400	2100	2800	10.32	33.12	41.66	24.46
750	1500	2250	3000	10.32	31.55	39.36	22.36
780	1560	2340	3120	10.34	30.45	39.07	22.12
800	1600	2400	3200	10.13	28.86	37.56	22.27
850	1700	2550	3400	9.83	27.68	33.80	19.92
900	1800	2700	3600	10.12	28.01	37.54	20.74
950	1900	2850	3800	10.25	26.73	40.97	27.76
1000	2000	3000	4000	10.65	24.98	35.69	35.91
1050	2100	3150	4200	10.26	28.50	38.88	41.83
1100	2200	3300	4400	11.97	28.75	36.89	22.73
1125	2250	3375	4500	10.14	27.51	39.58	16.75
1150	2300	3450	4600	11.29	28.04	38.41	16.09

*Harmonic Output below power level of X 2 Output .

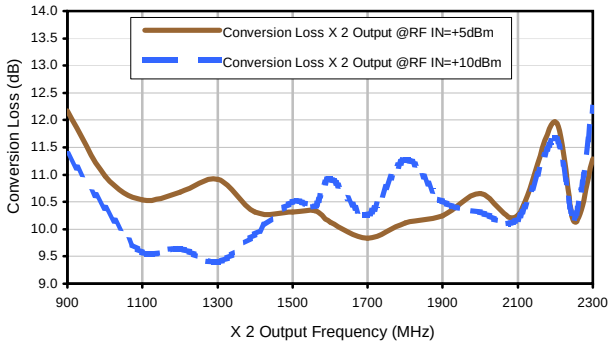
FREQUENCY (MHz)				RF IN=+10dBm			
				CONVERSION LOSS (dB)	HARMONIC OUTPUT* (-dBc)		
X 1 OUTPUT	X 2 OUTPUT	X 3 OUTPUT	X 4 OUTPUT	X 2 OUTPUT	X 1 OUTPUT	X 3 OUTPUT	X 4 OUTPUT
450	900	1350	1800	11.37	35.53	36.16	14.51
500	1000	1500	2000	10.38	37.01	33.95	15.69
550	1100	1650	2200	9.57	36.95	39.73	17.75
600	1200	1800	2400	9.65	32.62	45.38	15.36
650	1300	1950	2600	9.40	29.85	42.77	16.72
700	1400	2100	2800	9.90	30.58	57.35	17.75
750	1500	2250	3000	10.50	29.34	58.89	17.00
780	1560	2340	3120	10.42	28.69	43.80	18.01
800	1600	2400	3200	10.91	26.60	38.56	18.27
850	1700	2550	3400	10.27	26.95	33.58	23.87
900	1800	2700	3600	11.27	25.72	32.38	15.46
950	1900	2850	3800	10.51	25.27	38.76	26.46
1000	2000	3000	4000	10.31	23.56	47.02	37.48
1050	2100	3150	4200	10.19	26.25	44.99	47.45
1100	2200	3300	4400	11.66	26.83	42.54	26.84
1125	2250	3375	4500	10.21	24.96	41.30	21.28
1150	2300	3450	4600	12.23	26.02	39.44	16.64

*Harmonic Output below power level of X 2 Output .

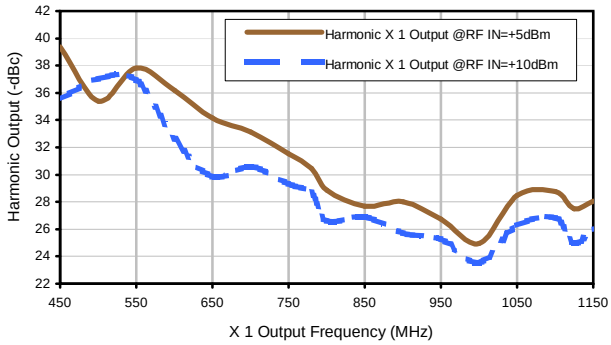
Frequency Multiplier (Doubler) ZX90-2-11+

Typical Performance Curves

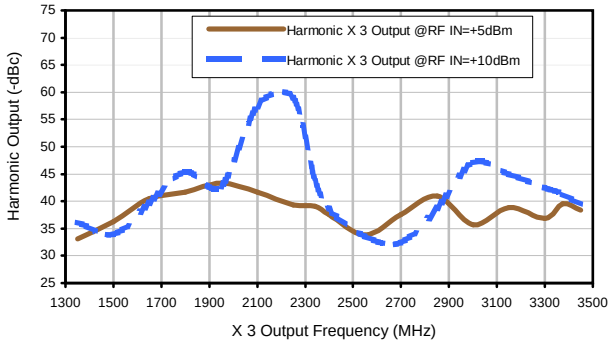
Conversion Loss X 2 Output



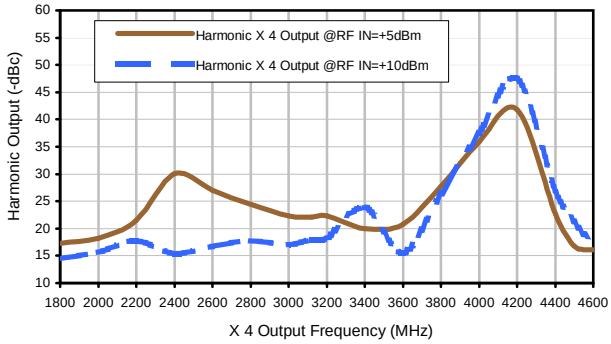
Harmonic X 1 Output



Harmonic X 3 Output



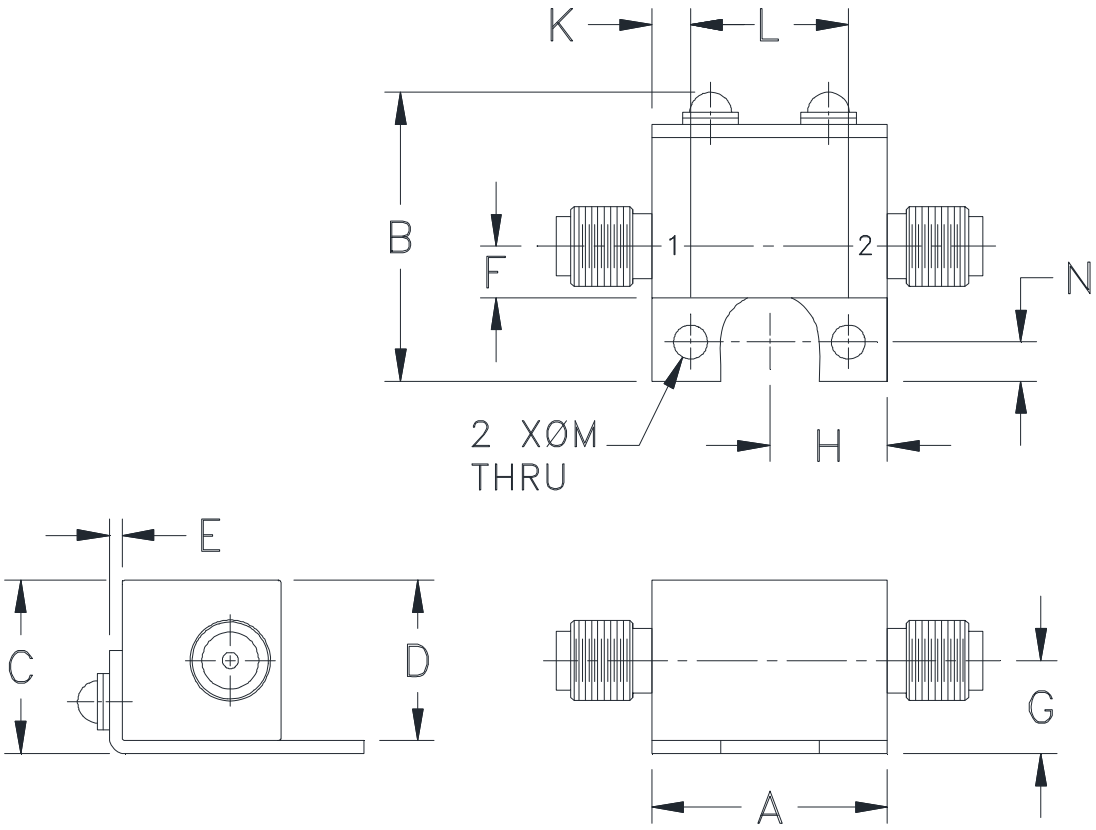
Harmonic X 4 Output



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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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
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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