X2 Frequency Multiplier ZXF90-2-153-K+

50Ω Output 9 to 15 GHz

The Big Deal

- Ultra-wideband, output from 9 to 15 GHz
- Wide input power range, +16 to +22 dBm
- Low conversion loss, 15 dB
- Good fundamental and harmonic suppression: F1, 48 dBc; F3, 42 dBc
- Patented, Reflectionless Filters on Input and Output absorb and terminate out-of-band signals internally.
- Reduced need for external attenuator pads that increase over all conversion loss.



CASE STYLE: UU2776

Product Overview

Mini-Circuits' ZXF90-2-153-K+ is an ultra-wideband frequency doubler, converting input frequencies from 4.5 to 7.5 GHz into output frequencies from 9 to 15 GHz. Its wide output range makes this model ideal for a wide range of broadband systems including satellite up and down converters, defense radar and communications and more. The multiplier comes housed in a rugged, 2.92mm connectorized housing (0.68 x 0.73 x 0.36"), saving space in crowded layouts.

Key Features

Feature	Advantages
Broadband, 9 to 15 GHz output	With an output frequency range spanning 9 to 15 GHz, this multiplier supports broadband applications such as defense and instrumentation as well as a wide range of narrowband system requirements.
Low conversion loss, 15 dB typ.	With a low conversion loss, ZXF90-2-153-K+ produces higher output power, reducing the need for amplification.
Excellent fundamental and harmonic suppression: • F1, 48 dBc • F3, 42 dBc • F4, 23 dBc	Reduces spurious signals and the need for additional filtering.
Wide input power range, +16 to +22 dBm	Wide input power signal range accommodates different input signal levels while still maintaining a low conversion loss.
2.92mm-F connectorized housing	Ideal for assembled systems and lab use. High frequency connector mates with 2.92mm and SMA connectors.
Small size, 0.68 x 0.73 x 0.36"	Saves space in crowded 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.
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

X2 Frequency Multiplier

ZXF90-2-153-K+

50Ω Output 9 to 15 GHz



Generic photo used for illustration purposes only

CASE STYLE: UU2776

Connectors	Model
2.92 mm Female	ZXF90-2-153-K+

+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	24 dBm

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

Coaxial Connections

INPUT	1
OUTPUT	2

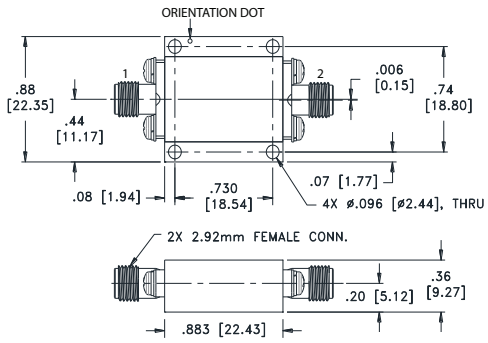
Features

- broadband
- low conversion loss, 15 dB typ.
- excellent harmonics suppression F1, 48 dBc typ F3 42 dBc typ.
- rugged construction

Applications

- synthesizers
- local oscillators
- sattelite up and down converters
- defense radar and communications
- mobile

Outline Drawing



Weight: 35 grams
Dimensions are in inches [mm]

Electrical Specifications

Parameter		Min.	Typ.	Max.	Unit
Multiplier Factor			2		
Frequency Range, Input (F1)		4.5	—	7.5	GHz
Frequency Range, Output (F2)		9	—	15	GHz
Input Power		16	—	22	dBm
Conversion Loss		—	15	22	dB
Harmonic Ouput*, dBc	F1	—	48	—	dBc
	F3	—	42	—	
	F4	—	23	—	

* Harmonics of input frequency below the power level of F2

Typical Performance Data

	INPUT RF= 16 dBm				INPUT RF= 22 dBm			
Input Frequency (GHz)	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)		
		F1	F3	F4		F1	F3	F4
4500	15.45	64.55	45.66	20.14	17.36	70.97	33.84	21.46
4600	15.00	60.07	45.58	21.43	16.63	66.38	40.19	22.07
4700	15.31	56.22	45.01	22.68	16.67	58.72	42.15	23.10
4800	15.41	53.64	44.21	24.71	16.84	55.17	41.40	24.70
4900	14.74	52.38	43.80	28.43	16.30	53.16	41.63	27.95
5000	14.29	51.24	44.01	31.29	15.81	51.87	41.13	30.61
5100	14.31	50.01	42.97	31.66	15.58	50.82	41.65	30.82
5200	15.47	48.14	41.30	28.30	16.54	48.86	41.62	27.09
5300	15.01	48.33	42.31	26.71	15.97	48.67	44.04	24.80
5400	14.45	48.79	43.12	25.40	15.30	48.95	47.36	22.87
5600	14.98	48.43	45.69	22.34	15.66	48.02	53.19	20.07
5800	14.99	49.25	47.65	21.27	15.05	48.93	51.63	20.44
6000	15.54	49.00	49.63	17.90	14.96	50.44	48.84	21.87
6200	15.86	49.62	52.37	16.69	15.53	52.19	52.03	19.37
6400	16.47	51.59	49.07	18.37	16.32	54.88	60.49	19.90
6600	16.32	55.10	48.93	21.01	15.93	59.54	60.10	22.22
6800	16.94	59.72	46.56	25.47	16.56	66.45	50.21	24.59
7000	17.81	52.40	43.84	32.17	16.40	60.54	45.82	26.63
7200	18.55	44.82	40.23	37.06	17.16	52.37	40.58	27.78
7400	18.72	39.76	38.51	43.43	17.52	45.43	37.84	35.09
7500	19.06	37.47	41.62	41.62	17.95	42.30	36.36	34.80

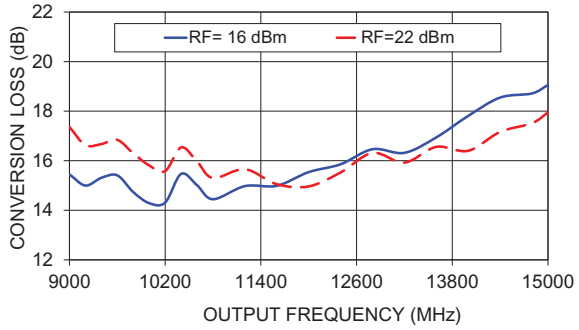
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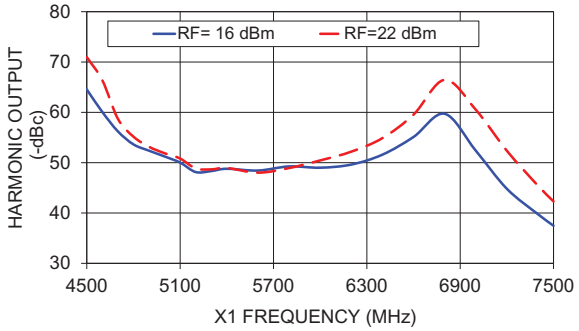
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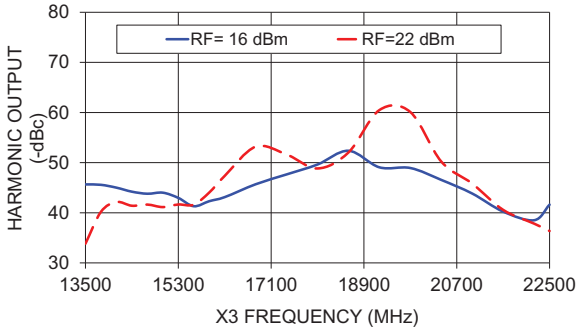
ZXF90-2-153-K+
CONVERSION LOSS



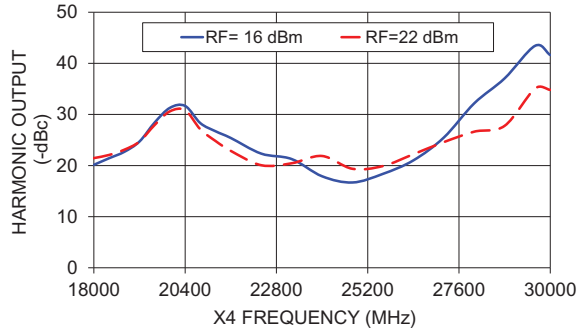
ZXF90-2-153-K+
HARMONIC OUTPUT X1



ZXF90-2-153-K+
HARMONIC OUTPUT X3



ZXF90-2-153-K+
HARMONIC OUTPUT X4



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Typical Performance Data

Frequency (MHz)				RF IN = 16dBm			
				Conversion Loss (dB)	Harmonic Output* (-dBc)		
X1 Output	X2 Output	X3 Output	X4 Output	X2 Output	X1 Output	X3 Output	X4 Output
4300	8600	12900	17200	15.68	69.07	35.91	17.94
4350	8700	13050	17400	16.00	70.68	37.59	17.85
4400	8800	13200	17600	15.96	70.36	41.04	18.48
4450	8900	13350	17800	15.97	67.16	44.33	19.23
4500	9000	13500	18000	15.45	64.55	45.66	20.14
4550	9100	13650	18200	15.36	61.99	45.44	20.58
4600	9200	13800	18400	15.00	60.07	45.58	21.43
4700	9400	14100	18800	15.31	56.22	45.01	22.68
4800	9600	14400	19200	15.41	53.64	44.21	24.71
4900	9800	14700	19600	14.74	52.38	43.80	28.43
5000	10000	15000	20000	14.29	51.24	44.01	31.29
5100	10200	15300	20400	14.31	50.01	42.97	31.66
5200	10400	15600	20800	15.47	48.14	41.30	28.30
5300	10600	15900	21200	15.01	48.33	42.31	26.71
5400	10800	16200	21600	14.45	48.79	43.12	25.40
5500	11000	16500	22000	14.49	48.80	44.62	24.02
5600	11200	16800	22400	14.98	48.43	45.69	22.34
5700	11400	17100	22800	15.21	48.48	46.73	21.76
5800	11600	17400	23200	14.99	49.25	47.65	21.27
5900	11800	17700	23600	15.02	49.45	48.55	20.07
6000	12000	18000	24000	15.54	49.00	49.63	17.90
6100	12200	18300	24400	15.98	48.61	52.36	16.54
6200	12400	18600	24800	15.86	49.62	52.37	16.69
6300	12600	18900	25200	15.75	51.05	50.19	18.20
6400	12800	19200	25600	16.47	51.59	49.07	18.37
6500	13000	19500	26000	16.09	53.36	49.46	19.12
6600	13200	19800	26400	16.32	55.10	48.93	21.01
6700	13400	20100	26800	16.70	57.40	47.91	22.80
6800	13600	20400	27200	16.94	59.72	46.56	25.47
6900	13800	20700	27600	17.54	57.23	45.16	28.42
7000	14000	21000	28000	17.81	52.40	43.84	32.17
7100	14200	21300	28400	18.51	47.99	41.95	34.45
7200	14400	21600	28800	18.55	44.82	40.23	37.06
7300	14600	21900	29200	18.83	41.88	39.10	39.39
7400	14800	22200	29600	18.72	39.76	38.51	43.43
7500	15000	22500	30000	19.06	37.47	37.72	41.62
7550	15100	22650	30200	19.01	36.74	37.36	40.28
7600	15200	22800	30400	19.06	35.85	36.50	39.93
7650	15300	22950	30600	19.71	34.46	35.07	39.28
7700	15400	23100	30800	20.42	33.13	34.04	40.81

*Harmonic Output below power level of X2 Output .

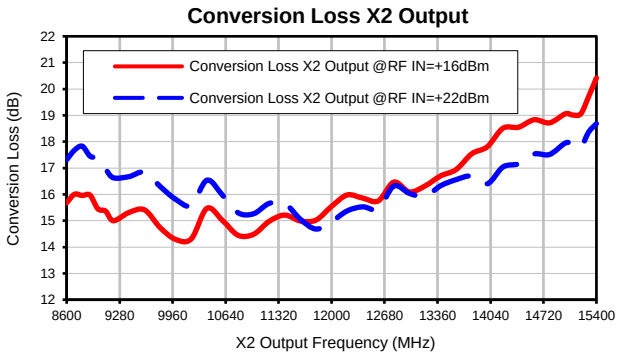
Typical Performance Data

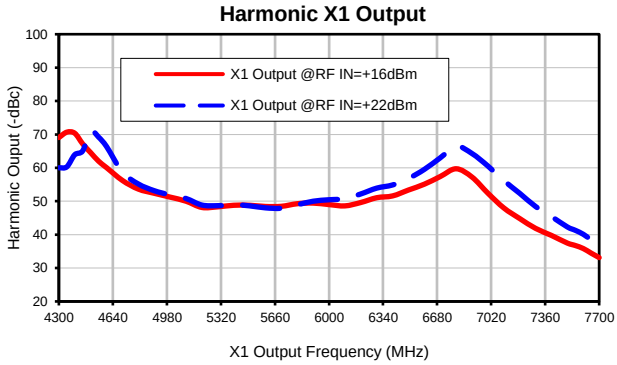
Frequency (MHz)				RF IN = 22dBm			
				Conversion Loss (dB)	Harmonic Output* (-dBc)		
X1 Output	X2 Output	X3 Output	X4 Output	X2 Output	X1 Output	X3 Output	X4 Output
4300	8600	12900	17200	17.31	60.01	27.73	21.03
4350	8700	13050	17400	17.68	60.30	27.58	20.80
4400	8800	13200	17600	17.83	63.94	30.17	20.72
4450	8900	13350	17800	17.45	65.08	31.29	21.37
4500	9000	13500	18000	17.36	70.97	33.84	21.46
4550	9100	13650	18200	16.96	69.20	38.65	21.77
4600	9200	13800	18400	16.63	66.38	40.19	22.07
4700	9400	14100	18800	16.67	58.72	42.15	23.10
4800	9600	14400	19200	16.84	55.17	41.40	24.70
4900	9800	14700	19600	16.30	53.16	41.63	27.95
5000	10000	15000	20000	15.81	51.87	41.13	30.61
5100	10200	15300	20400	15.58	50.82	41.65	30.82
5200	10400	15600	20800	16.54	48.86	41.62	27.09
5300	10600	15900	21200	15.97	48.67	44.04	24.80
5400	10800	16200	21600	15.30	48.95	47.36	22.87
5500	11000	16500	22000	15.26	48.62	50.85	21.43
5600	11200	16800	22400	15.66	48.02	53.19	20.07
5700	11400	17100	22800	15.65	47.91	53.40	19.77
5800	11600	17400	23200	15.05	48.93	51.63	20.44
5900	11800	17700	23600	14.68	50.01	50.42	21.62
6000	12000	18000	24000	14.96	50.44	48.84	21.87
6100	12200	18300	24400	15.37	50.76	48.75	20.44
6200	12400	18600	24800	15.53	52.19	52.03	19.37
6300	12600	18900	25200	15.45	53.92	56.18	19.74
6400	12800	19200	25600	16.32	54.88	60.49	19.90
6500	13000	19500	26000	16.04	56.81	69.58	20.90
6600	13200	19800	26400	15.93	59.54	60.10	22.22
6700	13400	20100	26800	16.33	62.99	54.12	23.79
6800	13600	20400	27200	16.56	66.45	50.21	24.59
6900	13800	20700	27600	16.70	64.28	48.07	25.33
7000	14000	21000	28000	16.40	60.54	45.82	26.63
7100	14200	21300	28400	17.04	56.20	42.98	26.47
7200	14400	21600	28800	17.16	52.37	40.58	27.78
7300	14600	21900	29200	17.53	48.42	38.88	30.74
7400	14800	22200	29600	17.52	45.43	37.84	35.09
7500	15000	22500	30000	17.95	42.30	36.36	34.80
7550	15100	22650	30200	17.92	41.30	37.05	33.79
7600	15200	22800	30400	17.80	40.11	37.74	32.72
7650	15300	22950	30600	18.36	38.45	40.43	31.77
7700	15400	23100	30800	18.68	36.92	42.58	31.01

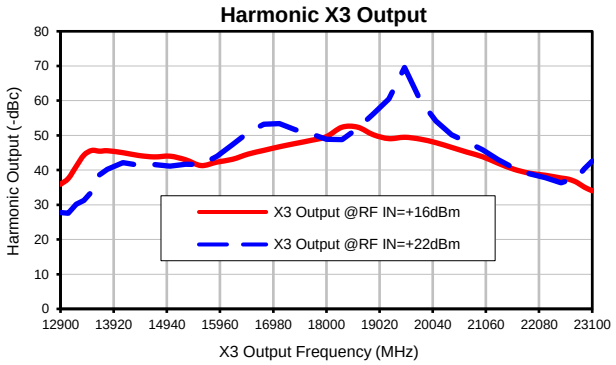
*Harmonic Output below power level of X2 Output .

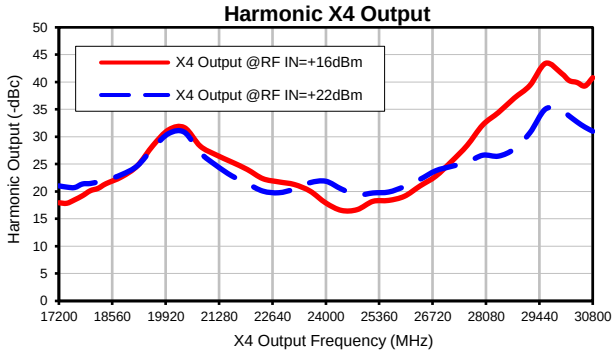
Frequency Multiplier (Doubler) ZXF90-2-153-K+

Typical Performance Curves





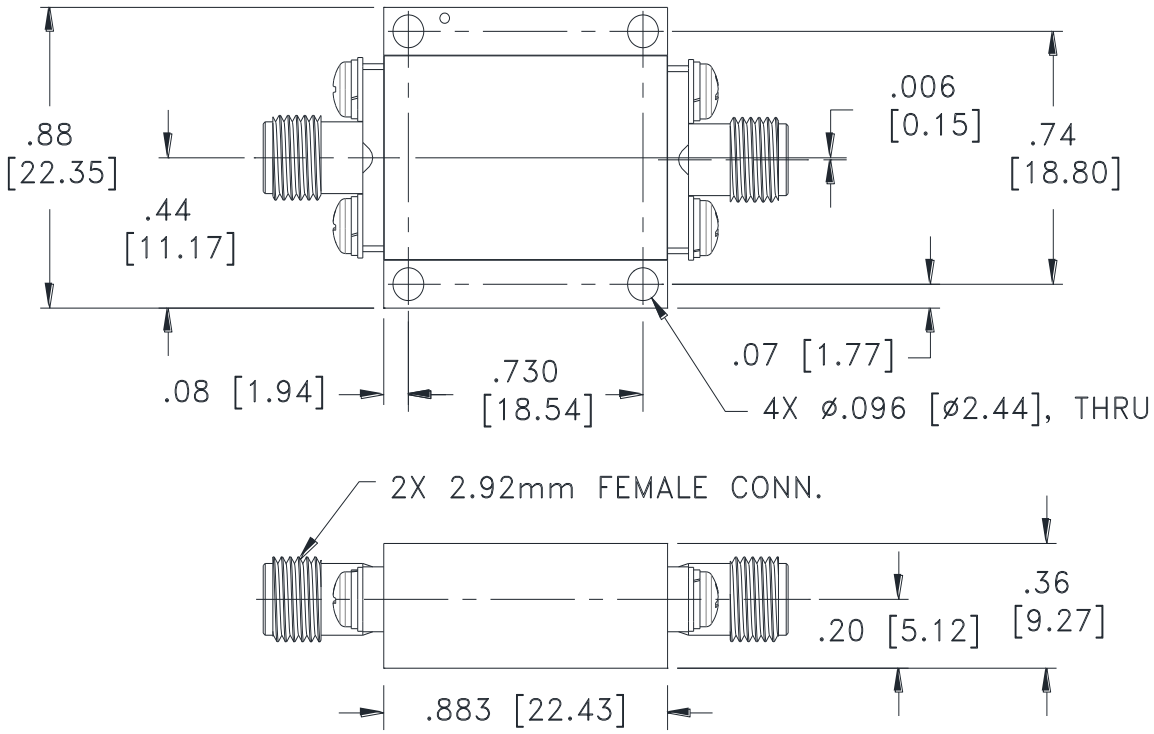




Case Style UU

Outline Dimensions

UU2776



Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

1. Case material: Brass alloy 360.
2. Case finish: Gold Plating.
3. Weight: 35 grams.

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Mini-Circuits

Environmental Specifications ENV97

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
Thermal Shock	-55° to 85°C, 25 cycles	MIL-STD-202F: Method 107G

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