

# X2 Frequency Multiplier

## ZXF90-2-24-K+

50Ω Output 12 to 20 GHz

### The Big Deal

- Ultra-wideband, output from 12 to 20 GHz
- Wide input power range, +16 to +22 dBm
- Low conversion loss, 17 dB
- Good fundamental and harmonic suppression:  
F1, 35 dBc; F3, 38 dBc
- Patented, Reflectionless Filters on Input and Output absorb and terminate out-of-band signals internally.
- Reduced need for external attenuator pads that increase overall conversion loss.



CASE STYLE: UU2776

### Product Overview

Mini-Circuits' ZXF90-2-24-K+ is an ultra-wideband frequency doubler, converting input frequencies from 6 to 10 GHz into output frequencies from 12 to 20 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, 12 to 20 GHz output	With an output frequency range spanning 12 to 20 GHz, this multiplier supports broadband applications such as defense and instrumentation as well as a wide range of narrowband system requirements.
Low conversion loss, 17 dB typ.	With a low conversion loss, ZXF90-2-24-K+ produces higher output power, reducing the need for amplification.
Excellent fundamental and harmonic suppression: <ul style="list-style-type: none"><li>• F1, 35 dBc</li><li>• F3, 38 dBc</li><li>• F4, 20 dBc</li></ul>	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

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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](http://www.minicircuits.com/MCLStore/terms.jsp)



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## ZXF90-2-24-K+



Generic photo used for illustration purposes only

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Connectors	Model
2.92 mm Female	ZXF90-2-24-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, 17 dB typ.
- excellent harmonics suppression F1, 35 dBc typ F3 38 dBc typ.
- rugged construction

### Applications

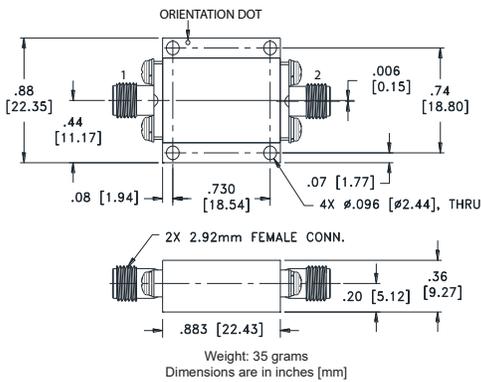
- synthesizers
- local oscillators
- satellite up and down converters
- defense radar and communications
- mobile
- fixed microwave

### Electrical Specifications

Parameter	Min.	Typ.	Max.	Unit
Multiplier Factor		2		
Frequency Range, Input (F1)	6	—	10	GHz
Frequency Range, Output (F2)	12	—	20	GHz
Input Power	16	—	22	dBm
Conversion Loss	—	17	23	dB
Harmonic Output*, dBc				dBc
F1	—	35	—	
F3	—	38	—	
F4	—	20	—	

\* Harmonics of input frequency below the power level of F2

### Outline Drawing



### Typical Performance Data

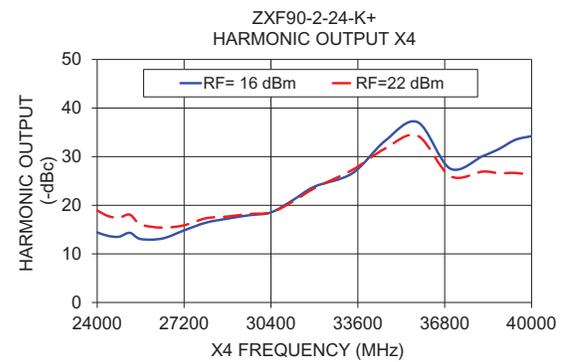
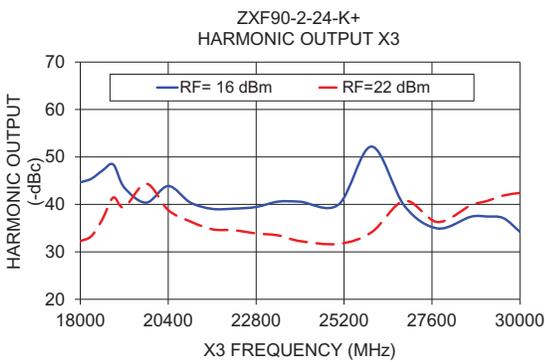
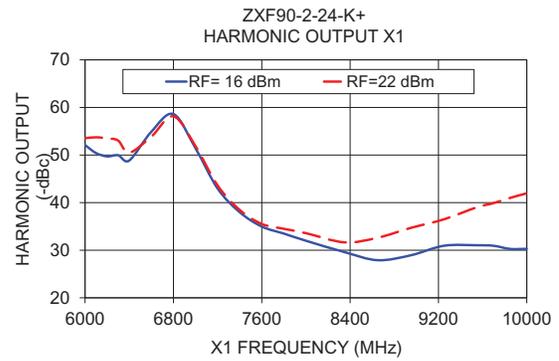
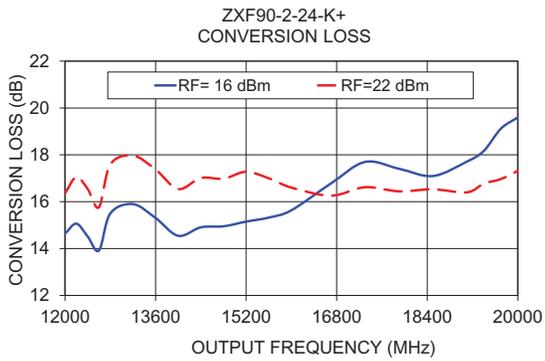
Input Frequency (GHz)	INPUT RF= 16 dBm					INPUT RF= 22 dBm			
	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			
		F1	F3	F4		F1	F3	F4	
6000	14.63	52.09	44.64	14.42	16.36	53.55	32.26	18.92	
6100	15.06	50.41	45.40	13.70	17.06	53.72	33.30	17.78	
6200	14.52	49.71	47.10	13.52	16.55	53.51	36.81	17.42	
6300	13.92	49.95	48.41	14.33	15.76	53.03	41.45	18.08	
6400	15.50	48.84	43.56	13.05	17.59	50.49	39.38	16.07	
6600	15.90	54.89	40.37	13.16	17.97	53.86	44.37	15.39	
6800	15.31	58.61	43.88	14.83	17.38	58.14	38.80	15.88	
7000	14.55	51.43	40.41	16.41	16.54	51.87	36.41	17.32	
7200	14.91	42.97	39.05	17.25	17.01	43.61	34.75	17.68	
7400	14.95	38.00	39.11	17.95	16.98	38.48	34.54	18.21	
7600	15.15	34.98	39.45	18.53	17.28	35.52	33.88	18.52	
7800	15.32	33.50	40.59	21.02	17.00	34.50	33.47	20.74	
8000	15.63	31.99	40.57	23.82	16.60	33.58	32.26	23.50	
8350	16.78	29.60	39.96	26.59	16.26	31.65	31.67	27.28	
8650	17.70	27.90	52.20	33.24	16.62	32.63	34.12	31.66	
8950	17.41	28.94	39.66	37.11	16.44	34.69	40.76	34.31	
9250	17.10	30.94	34.94	27.55	16.53	36.50	36.28	26.01	
9550	17.71	31.04	37.38	30.11	16.40	39.04	39.76	26.92	
9700	18.17	30.93	37.44	31.58	16.77	39.90	40.72	26.60	
9850	19.12	30.27	37.10	33.47	16.97	41.00	41.88	26.66	
10000	19.60	30.29	34.23	34.23	17.31	41.96	42.43	26.22	

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