COAXIAL

X2 Frequency Multiplier ZXF90-2-44-K+

50Ω Output 12.4 to 40 GHz

THE BIG DEAL

- Ultra-wideband, output from 12.4 to 40 GHz
- Wide input power range, +12 to +18 dBm
- Low conversion loss, 15 dB typ.
- Rugged construction
- Small case size
- Good fundamental and harmonic suppression: F1, 25 dBc; F3, 28 dBc; F4, 18 dBc typ.

Generic photo used for illustration purposes only

Model No.	ZXF90-2-44-K+
Case Style	UK2938-2
Connectors	2.92mm Female

+RoHS Compliant

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

APPLICATIONS

- Synthesizers
- Local Oscillators
- 5G mmW
- Ka/Ku band satellite transceivers

PRODUCT OVERVIEW

Mini-Circuits' ZXF90-2-44-K+ is an ultra-wideband frequency doubler, converting input frequencies from 6.2 to 20 GHz into output frequencies from 12.4 to 40 GHz. Its wide output range makes this model suitable for broadband systems, as well as a wide variety of narrowband applications. The multiplier comes in a rugged, small form factor (0.56 x 0.56 x 0.34") 2.92mm connectorized housing, saving space in crowded layouts.

KEY FEATURES

Feature	Advantages
Broadband, 12.4 to 40 GHz output	With an output frequency range spanning 12.4 to 40 GHz, this multiplier supports broadband applications, such as defense and instrumentation as well as a wide range of narrowband system requirements including 5G.
Low conversion loss, 15 dB typ.	With a low conversion loss, ZXF90-2-44-K+ reduces the need for post amplification.
Excellent fundamental and harmonic suppression: • F1, 25 dBc • F3, 28 dBc • F4, 18 dBc	Reduces spurious signals and the need for additional filtering.
Wide input power range, +12 to +18 dBm	Wide input power signal range accommodates different input signal levels, while still maintaining a low conversion loss.

X2 Frequency Multiplier ZXF90-2-44-K+

ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter		Input Frequency (GHz)	Min.	Typ.	Max.	Unit
Multiplier Factor				2		
Frequency Range, Input (F1)			6.2		20	GHz
Frequency Range, Output (F2)			12.4		40	GHz
Input Power			12		18	dBm
Conversion Loss		6.2 - 16		14	20	dB
		16 - 20		16	23	
Harmonic Output[2]	F1	6.2 - 20		25		dBc
	F3	6.2 - 16		28		
	F4	6.2 - 12		18		

1. Measured with input power at +15 dBm.
2. Harmonics of input frequency below the power of F2.

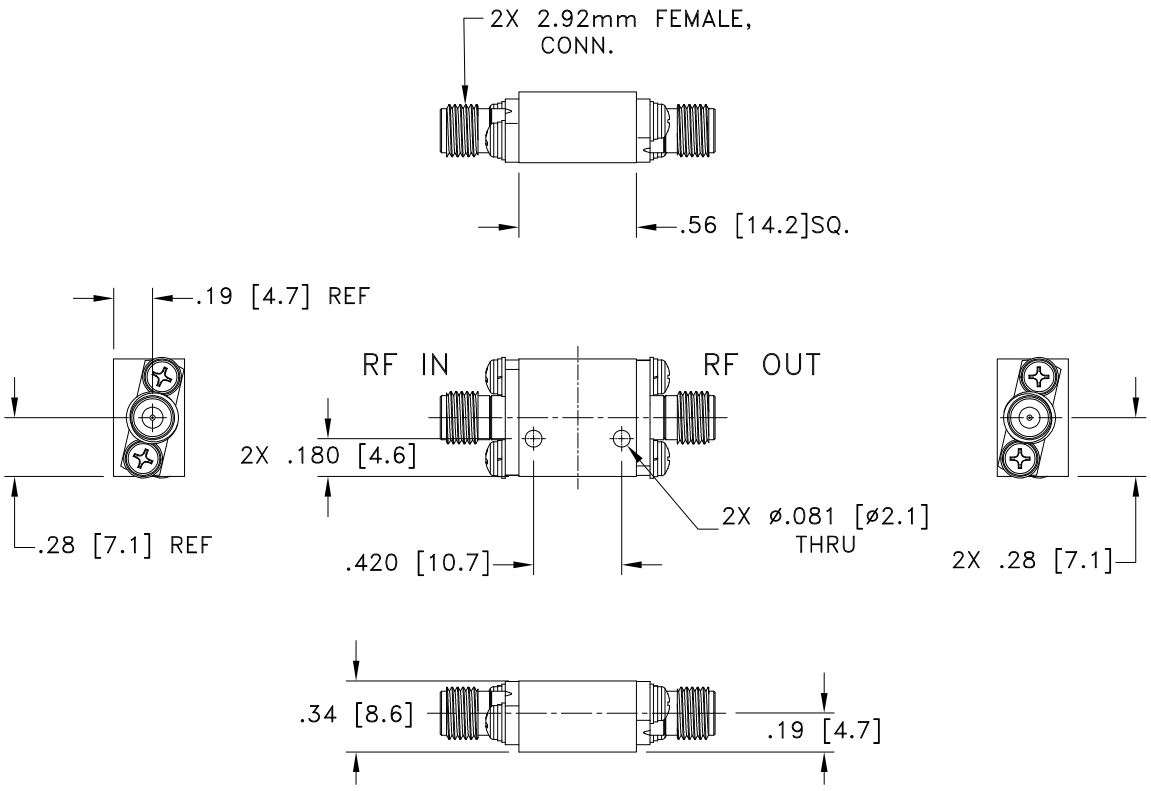
ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Input RF Power	21dBm

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

X2 Frequency Multiplier ZXF90-2-44-K+

OUTLINE DRAWING



Weight: 20 grams;

Dimensions are in inches **[mm]**. Tolerances: 2 Pl.±.03; 3 Pl. ±.015

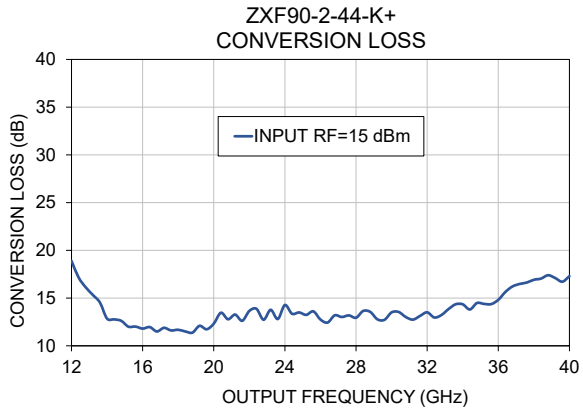
COAXIAL CONNECTIONS

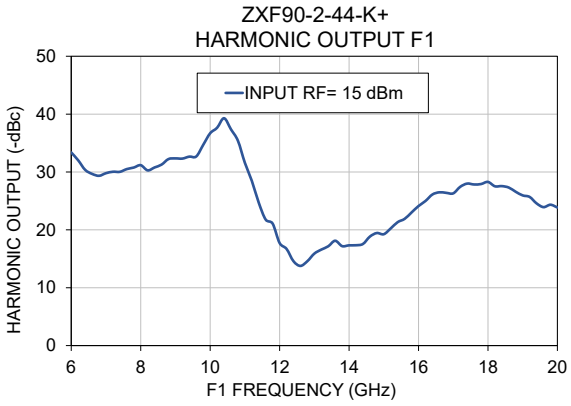
Input	2.92mm Female
Output	2.92mm Female

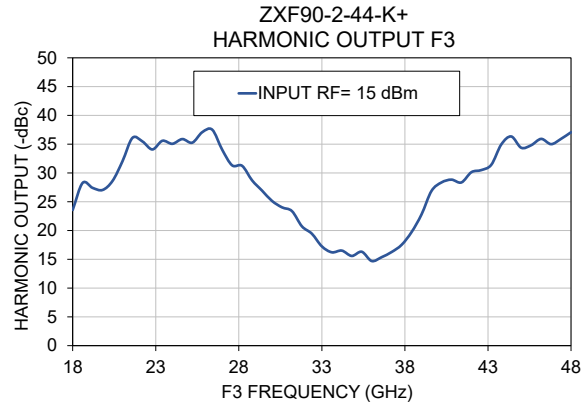
X2 Frequency Multiplier ZXF90-2-44-K+

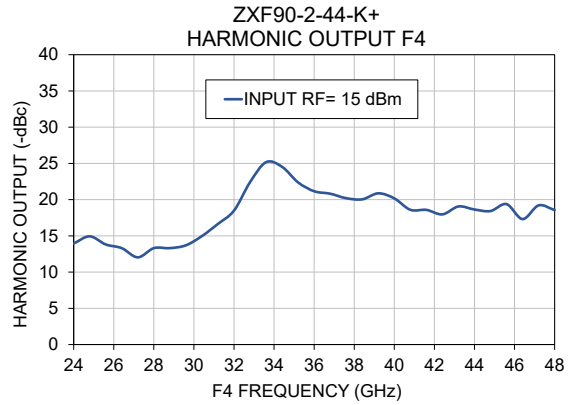
TYPICAL PERFORMANCE DATA/CURVES

INPUT RF= 15 dBm				
Input Frequency (GHz)	Conversion Loss (dB)	Harmonic Output Below F2 (dBc)		
	F2	F1	F3	F4
6.0	18.89	33.37	23.57	13.95
7.0	12.85	29.79	32.04	13.31
8.0	11.80	31.18	35.07	18.48
9.0	11.68	32.35	34.04	21.16
10.0	12.32	36.69	25.14	20.17
11.0	13.65	31.59	17.25	18.64
12.0	14.27	17.73	14.70	18.56
13.0	12.75	15.89	22.81	-
14.0	12.94	17.32	30.13	-
15.0	13.50	19.25	34.38	-
16.0	13.51	24.11	37.08	-
17.0	14.35	26.31	-	-
18.0	14.82	28.28	-	-
19.0	16.92	25.96	-	-
20.0	17.30	23.87	-	-









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

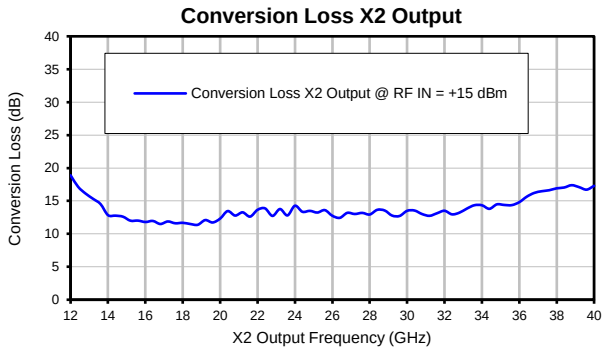
Frequency Multiplier (Doubler) ZXF90-2-44-K+

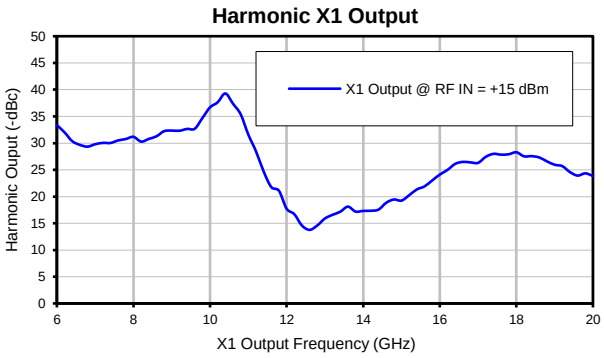
Typical Performance Data

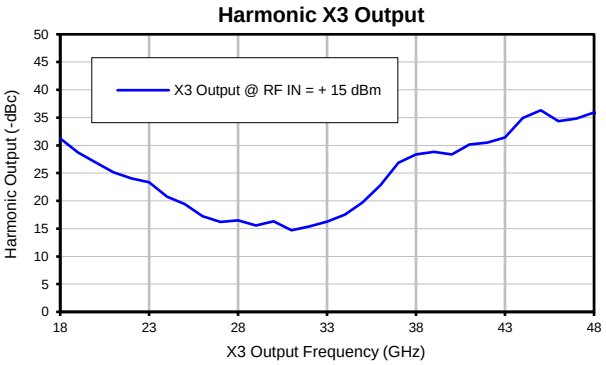
Frequency (GHz)				RF IN = +15 dBm			
				Conversion Loss (dB)	Harmonic Output* (-dBc)		
X1 Output	X2 Output	X3 Output	X4 Output	X2 Output	X1 Output	X3 Output	X4 Output
6.0	12.0	18.0	24.0	18.89	33.37	23.57	13.95
6.2	12.4	18.6	24.8	17.15	32.02	28.27	14.93
6.4	12.8	19.2	25.6	16.12	30.37	27.41	13.81
6.6	13.2	19.8	26.4	15.33	29.67	27.05	13.30
6.8	13.6	20.4	27.2	14.53	29.34	28.62	12.04
7.0	14.0	21.0	28.0	12.85	29.79	32.04	13.31
7.2	14.4	21.6	28.8	12.77	30.04	36.10	13.31
7.4	14.8	22.2	29.6	12.61	30.03	35.48	13.70
7.6	15.2	22.8	30.4	12.00	30.50	34.09	14.97
7.8	15.6	23.4	31.2	12.01	30.77	35.59	16.65
8.0	16.0	24.0	32.0	11.80	31.18	35.07	18.48
8.2	16.4	24.6	32.8	11.96	30.28	35.89	22.41
8.4	16.8	25.2	33.6	11.50	30.78	35.27	25.17
8.6	17.2	25.8	34.4	11.88	31.27	37.08	24.52
8.8	17.6	26.4	35.2	11.61	32.23	37.52	22.37
9.0	18.0	27.0	36.0	11.68	32.35	34.04	21.16
9.2	18.4	27.6	36.8	11.50	32.31	31.32	20.82
9.4	18.8	28.2	37.6	11.38	32.65	31.24	20.20
9.6	19.2	28.8	38.4	12.09	32.68	28.72	20.04
9.8	19.6	29.4	39.2	11.73	34.69	26.94	20.87
10.0	20.0	30.0	40.0	12.32	36.69	25.14	20.17
10.2	20.4	30.6	40.8	13.46	37.64	24.03	18.59
10.4	20.8	31.2	41.6	12.78	39.29	23.37	18.59
10.6	21.2	31.8	42.4	13.27	37.37	20.73	17.97
10.8	21.6	32.4	43.2	12.62	35.40	19.44	19.06
11.0	22.0	33.0	44.0	13.65	31.59	17.25	18.64
11.2	22.4	33.6	44.8	13.87	28.47	16.22	18.43
11.4	22.8	34.2	45.6	12.73	24.69	16.51	19.38
11.6	23.2	34.8	46.4	13.77	21.77	15.59	17.31
11.8	23.6	35.4	47.2	12.81	21.08	16.31	19.21
12.0	24.0	36.0	48.0	14.27	17.73	14.70	18.56
12.2	24.4	36.6	--	13.36	16.71	15.37	--
12.4	24.8	37.2	--	13.49	14.58	16.27	--
12.6	25.2	37.8	--	13.24	13.77	17.51	--
12.8	25.6	38.4	--	13.61	14.59	19.73	--
13.0	26.0	39.0	--	12.75	15.89	22.81	--
13.2	26.4	39.6	--	12.44	16.59	26.88	--
13.4	26.8	40.2	--	13.19	17.16	28.35	--
13.6	27.2	40.8	--	13.02	18.12	28.84	--
13.8	27.6	41.4	--	13.18	17.19	28.36	--
14.0	28.0	42.0	--	12.94	17.32	30.13	--
14.2	28.4	42.6	--	13.65	17.34	30.51	--
14.4	28.8	43.2	--	13.55	17.56	31.43	--
14.6	29.2	43.8	--	12.78	18.83	34.96	--
14.8	29.6	44.4	--	12.72	19.45	36.34	--
15.0	30.0	45.0	--	13.50	19.25	34.38	--
15.2	30.4	45.6	--	13.54	20.25	34.82	--
15.4	30.8	46.2	--	13.01	21.33	35.92	--
15.6	31.2	46.8	--	12.74	21.90	35.01	--
15.8	31.6	47.4	--	13.13	23.00	35.93	--
16.0	32.0	48.0	--	13.51	24.11	37.08	--
16.2	32.4	--	--	12.97	24.98	--	--
16.4	32.8	--	--	13.22	26.11	--	--
16.6	33.2	--	--	13.85	26.49	--	--
16.8	33.6	--	--	14.35	26.39	--	--
17.0	34.0	--	--	14.35	26.31	--	--
17.2	34.4	--	--	13.80	27.43	--	--
17.4	34.8	--	--	14.48	27.99	--	--
17.6	35.2	--	--	14.39	27.84	--	--
17.8	35.6	--	--	14.37	27.92	--	--
18.0	36.0	--	--	14.82	28.28	--	--
18.2	36.4	--	--	15.65	27.53	--	--
18.4	36.8	--	--	16.22	27.56	--	--
18.6	37.2	--	--	16.48	27.31	--	--
18.8	37.6	--	--	16.63	26.58	--	--
19.0	38.0	--	--	16.92	25.96	--	--
19.2	38.4	--	--	17.04	25.69	--	--
19.4	38.8	--	--	17.39	24.58	--	--
19.6	39.2	--	--	17.10	23.93	--	--
19.8	39.6	--	--	16.72	24.34	--	--
20.0	40.0	--	--	17.30	23.87	--	--

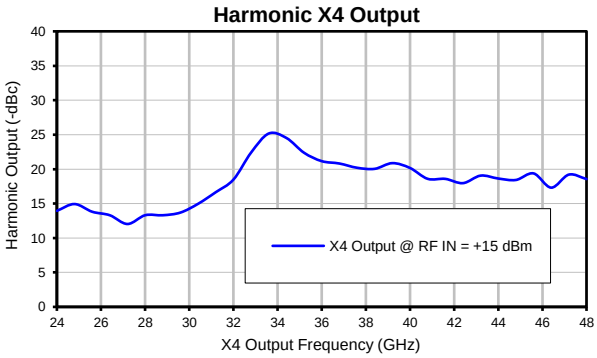
*Harmonic Output below power level of X2 Output .

Typical Performance Curves





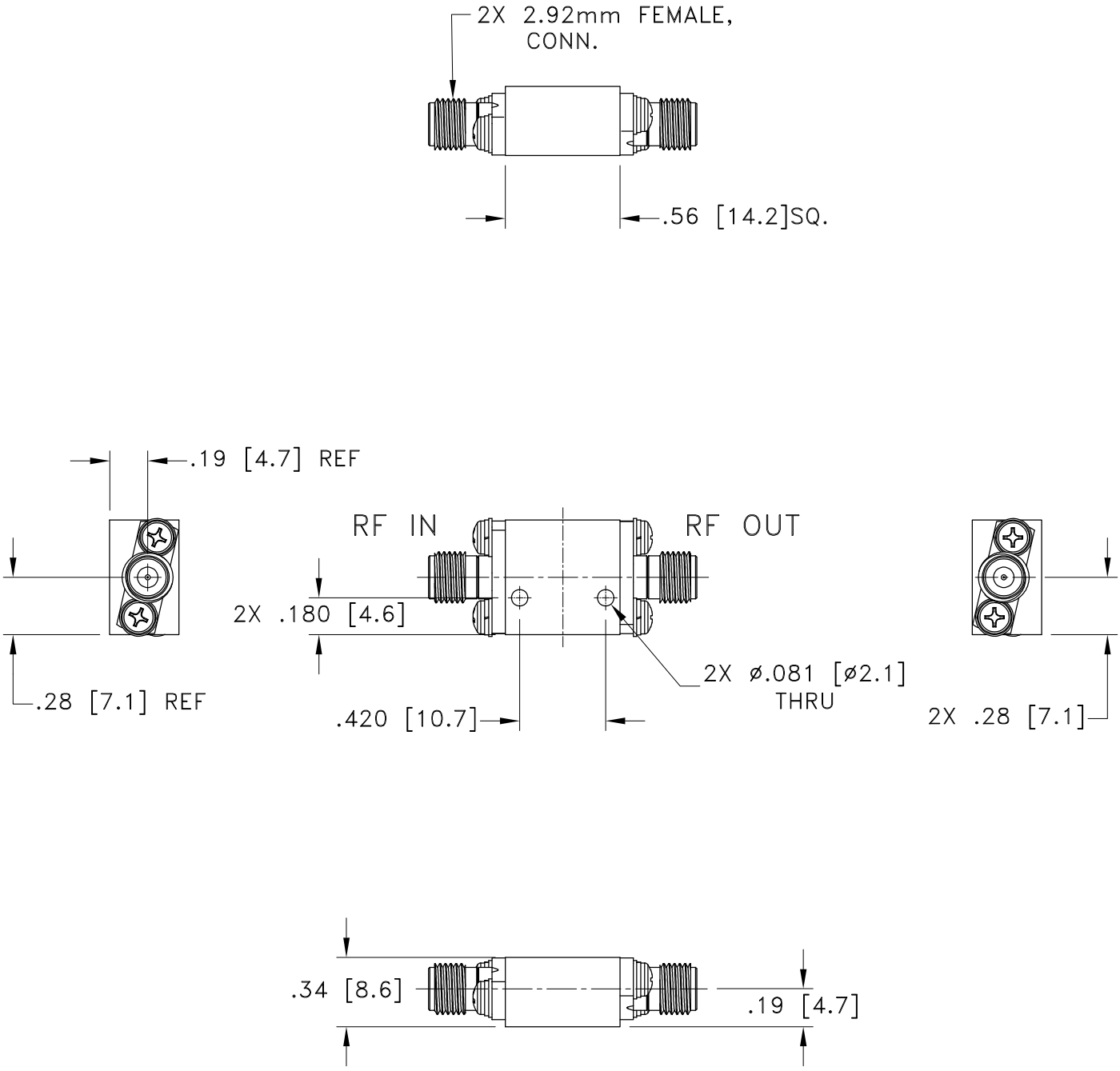




Case Style UK

Outline Dimensions

UK2938-2



Weight: 20 grams;

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

Notes:

1. Case material: Brass.
2. Case Finish: Gold plate.

Mini-Circuits

Environmental Specifications ENV122

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	-40° to +85° 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