

Suspended Substrate Stripline Filters and Multiplexers

50Ω

DC to 26 GHz

The Big Deal

- Low insertion loss
- Ultra-wide passband width
- Fast roll-off with wide stopband
- Good power handling and temperature stability
- Passband up to 26 GHz
- Stopband up to 26.5 GHz can extend to 40 GHz



Product Overview

Mini-Circuits' Suspended Substrate Stripline filters offer low insertion loss by implementing printed circuit board suspended between two parallel ground planes, providing high Q. Low insertion loss combined with wide stop-band makes them an excellent choice for wideband instruments and systems like ECM, ECCM, ELINT and ultra-broadband receivers.

Low pass, high pass, band pass, band stop, diplexer and multiplexer designs can be realized with this technology. Advanced filter design and construction can achieve stopband width greater than 6x the center frequency, and temperature stability will be better than other printed circuit realizations because the fields are mainly in the air rather than in a dielectric. The inside walls of the housing hold the circuit and prevent movement that could be caused by vibration or mechanical shock, making these designs excellent candidates for harsh operating environments.

Suspended substrate stripline filters can be realized in small form factors with high-quality, precise machining for applications where size is critical. Excellent repeatability across units is achieved through precise tuning and process control.

Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitters
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide, spur-free stop band results in better receiver sensitivity
High power handling	Well suited for transmitter applications
Excellent temperature stability	Ensures minimal variation in electrical performance across temperature

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



Suspended substrate stripline Diplexer

ZDSS-7G10G-S+

50Ω DC to 20000 MHz (DC-7500, 10500-20000 MHz)

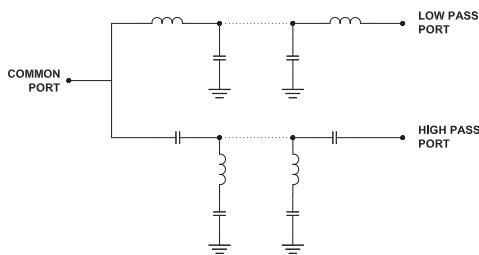
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	3 W max. @ 25°C
Permanent damage may occur if any of these limits are exceeded.	

Coaxial Connections

Common Port - SMA-Male	1
Low Pass Port - SMA-Female	2
High Pass Port - SMA-Female	3

Functional Schematic



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
1.28	1.10	.60	.288	.38	.880	.11	1.11
32.5	27.9	15.2	7.31	9.8	22.35	2.8	28.2
J	K	L	M	N	Wt.		
.100	.31	.74	.31	.36	grams		
2.54	7.8	18.8	8.0	9.1	106		

Note: Please refer to case style drawing for details

Features

- Low passband insertion loss of 1 dB typical upto 20 GHz in highpass channel.
- High rejection of 90 dB typical upto 20 GHz in lowpass channel.
- Good return loss of 12 dB typical in all the channels.

Applications

- Radar
- Test and measurement setup



Generic photo used for illustration purposes only

CASE STYLE: UQ2920

Connectors Model
SMA-M/F/F ZDSS-7G10G-S+

+RoHS Compliant

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

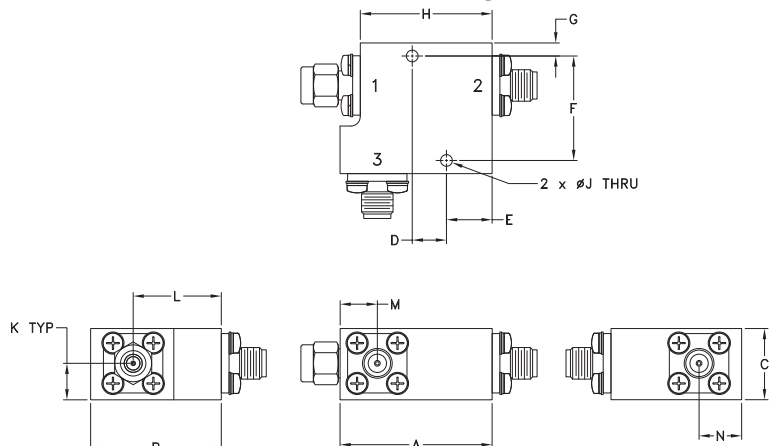
Electrical Specifications at 25°C

Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC - 7500	-	0.8	2
		High Pass	10500 - 20000	-	1.2	3
	Return Loss	Low Pass	DC - 7500	-	12	-
		High Pass	10500 - 20000	-	12	-
		Common	DC - 7500	-	12	-
			10500 - 20000	-	12	-
Stop Band Isolation	Low Pass	10500 - 13000	30	45	-	-
		13000 - 18000	60	90	-	-
	High Pass	18000 - 20000	-	90	-	-
		DC - 7500	60	90	-	-
		7500 - 8000	-	40	-	-

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)		Return Loss (dB)		
	Low Pass Port	High Pass Port	Common Port	Low Pass Port	High Pass Port
10	0.01	84.08	40.01	41.59	0.00
4000	0.19	93.67	19.30	19.58	0.07
5000	0.19	94.42	39.75	38.83	0.10
5000	0.19	94.42	39.75	38.83	0.10
7500	0.47	89.32	21.25	22.24	0.20
8000	0.60	64.67	25.57	24.14	0.44
8650	3.08	36.34	5.26	4.85	2.37
9350	21.07	3.27	7.76	0.12	9.36
9650	30.92	1.48	24.15	0.07	38.00
10000	37.52	1.21	16.98	0.14	16.12
10500	48.52	0.92	18.42	0.13	18.16
13000	82.31	0.55	16.25	0.12	14.77
18000	90.41	0.38	20.17	0.11	21.29
19000	91.86	0.53	18.18	0.01	17.29
20000	97.55	0.37	26.77	0.02	27.39

Outline Drawing



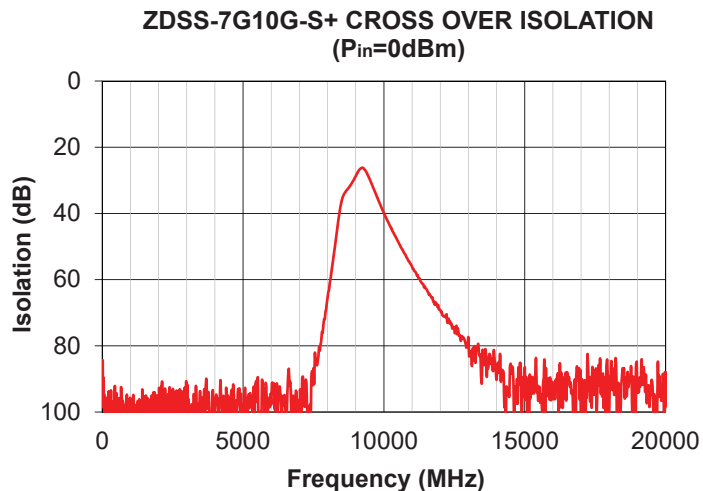
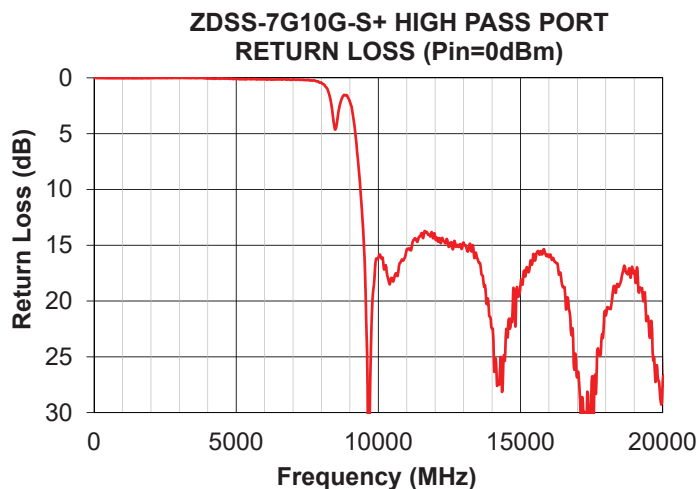
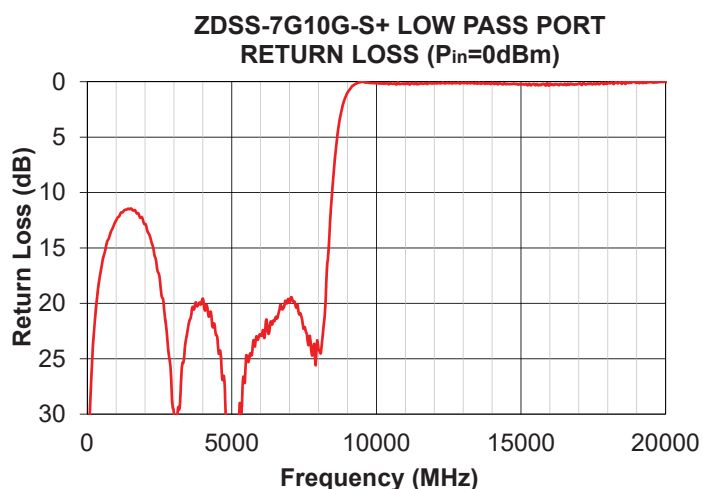
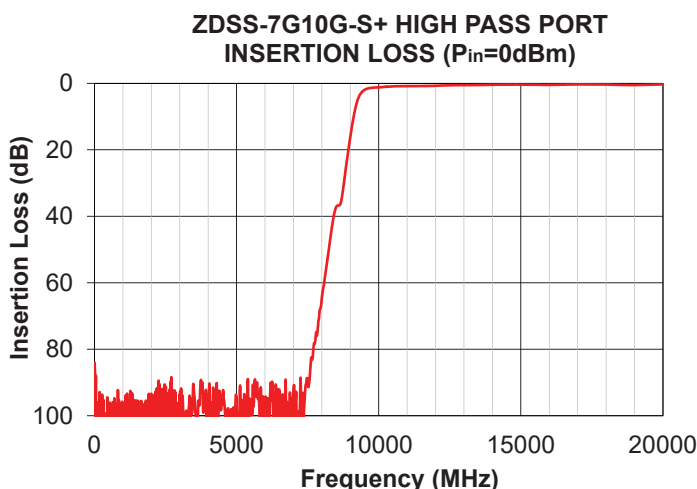
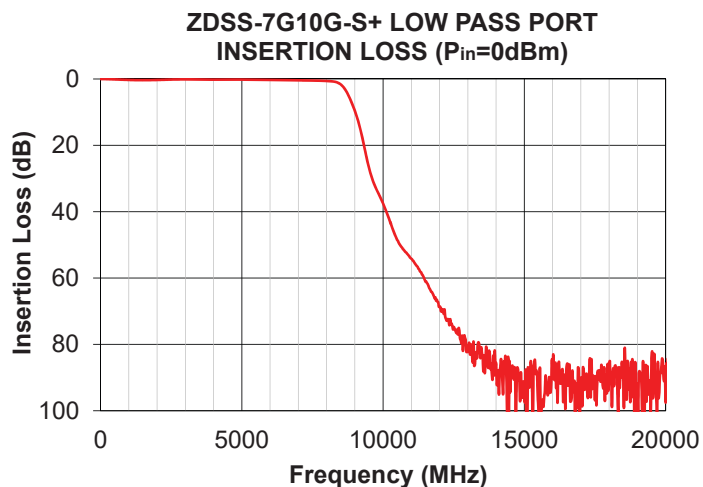
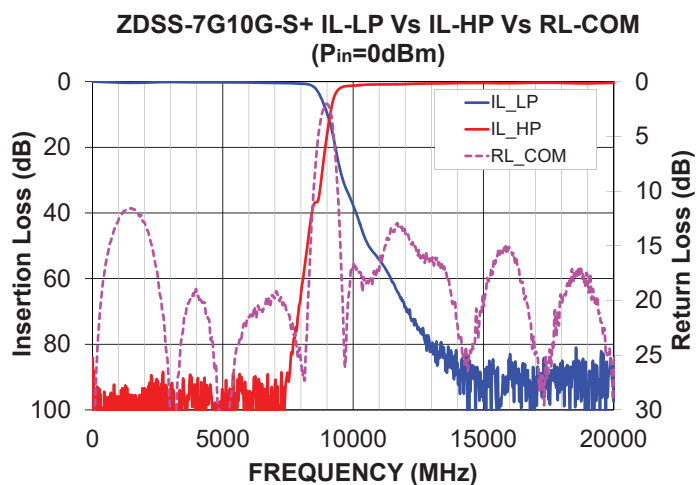
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www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

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Page 2 of 3



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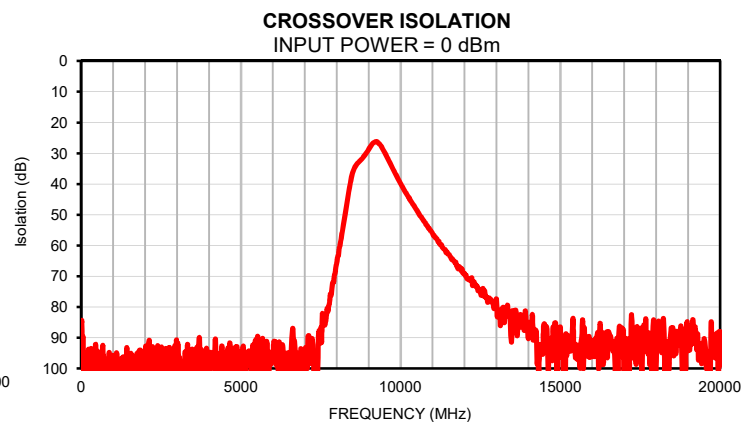
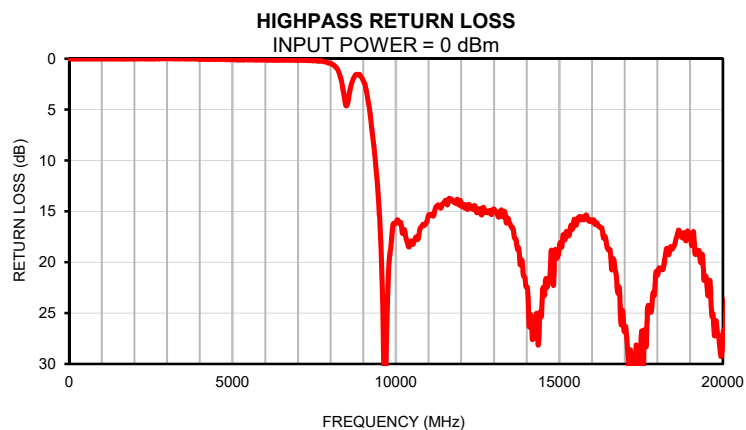
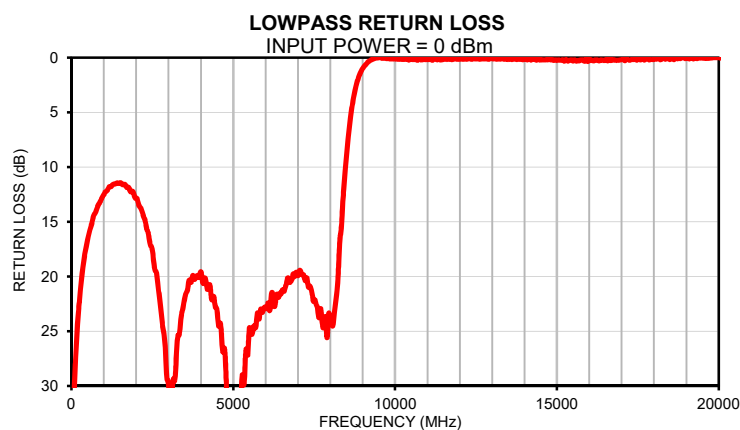
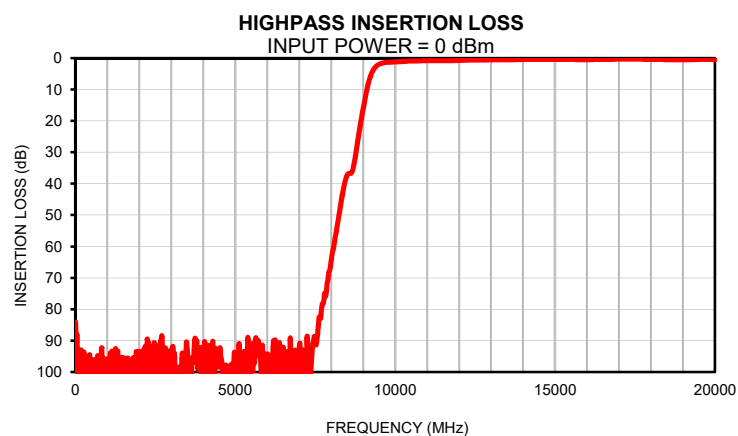
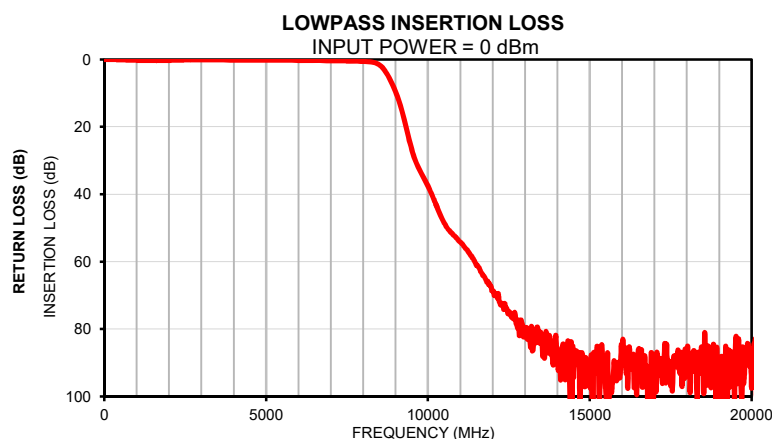
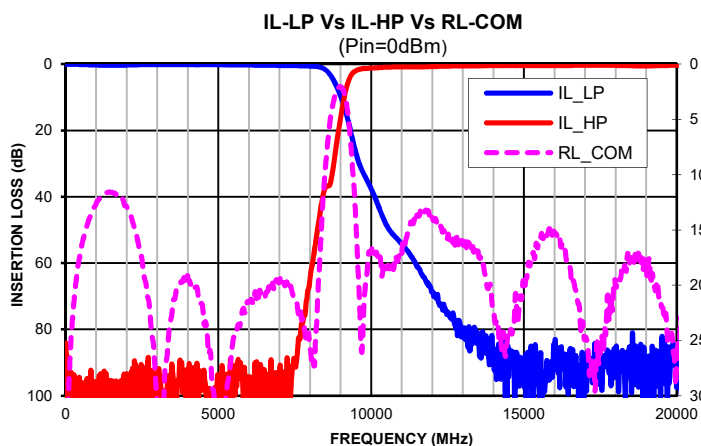
Suspended substrate stripline Diplexer

ZDSS-7G10G-S+

Typical Performance Data

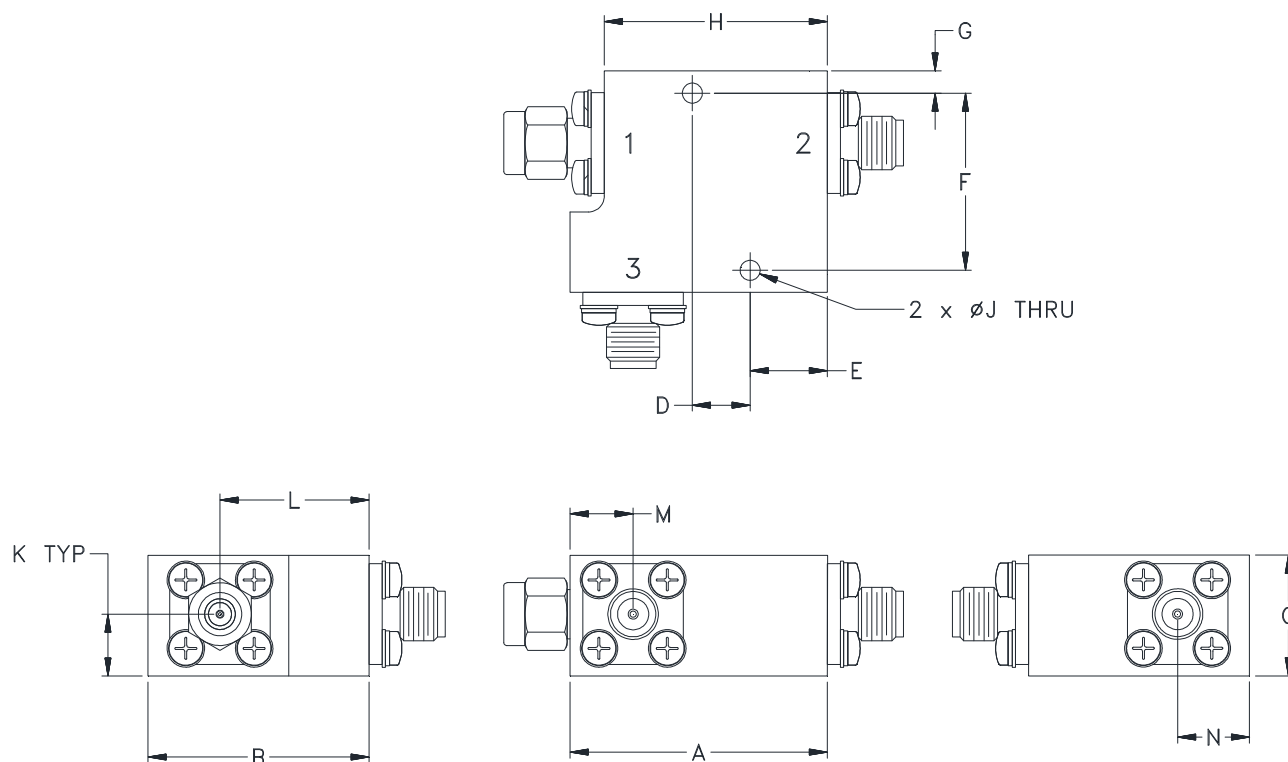
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
10	0.01	84.08	85.20	40.01	41.59	0.00
3100	0.11	93.97	118.55	33.69	31.43	0.01
3200	0.12	108.89	103.59	31.55	29.36	0.02
3300	0.13	98.83	106.56	26.78	25.34	0.01
3400	0.14	95.28	97.96	23.76	23.50	0.03
3500	0.15	92.59	100.74	22.03	22.01	0.02
3600	0.16	100.82	97.93	20.85	21.01	0.02
3700	0.17	96.70	90.07	20.17	20.53	0.03
3800	0.18	90.17	98.15	19.65	20.26	0.01
3900	0.18	95.12	100.44	19.53	19.96	0.04
4000	0.19	93.67	103.94	19.30	19.58	0.07
4100	0.19	96.36	95.93	19.95	20.36	0.06
4200	0.19	96.20	90.38	20.17	21.18	0.07
4300	0.20	90.20	95.12	20.18	21.27	0.06
4400	0.19	92.52	92.78	21.38	21.86	0.05
4500	0.19	96.58	96.49	22.44	23.09	0.04
4600	0.19	100.11	93.35	23.49	24.27	0.07
4700	0.19	97.85	108.90	26.25	26.81	0.07
5000	0.19	94.42	97.76	39.75	38.83	0.10
5200	0.20	107.61	94.74	35.77	34.66	0.10
5400	0.22	89.25	113.66	27.03	26.63	0.11
5600	0.24	97.23	108.30	24.10	25.04	0.12
5800	0.26	96.88	91.28	22.18	23.89	0.13
6000	0.28	95.75	97.80	21.53	22.85	0.12
6200	0.30	90.06	91.41	20.60	21.46	0.15
6400	0.32	92.44	95.52	20.82	21.90	0.14
6600	0.34	96.17	89.12	20.57	21.06	0.15
6800	0.37	103.43	97.67	20.11	20.36	0.16
7000	0.40	92.55	104.73	19.74	19.93	0.14
7200	0.43	98.58	98.26	19.95	20.16	0.16
7400	0.45	94.23	102.38	20.45	21.14	0.20
7500	0.47	89.32	86.78	21.25	22.24	0.20
8000	0.60	64.67	65.61	25.57	24.14	0.44
8500	1.62	37.29	36.26	9.39	8.99	4.57
8650	3.08	36.34	33.33	5.26	4.85	2.37
8700	3.76	34.58	32.79	4.36	3.93	1.95
9000	9.61	16.18	28.74	2.02	0.98	2.17
9300	19.08	4.09	26.59	6.16	0.17	7.81
9350	21.07	3.27	27.12	7.76	0.12	9.36
9600	29.74	1.60	31.78	20.23	0.07	24.29
9650	30.92	1.48	32.80	24.15	0.07	38.00
10000	37.52	1.21	39.83	16.98	0.14	16.12
10500	48.52	0.92	48.43	18.42	0.13	18.16
11000	54.18	0.83	56.05	17.24	0.15	15.37
11500	61.07	0.82	62.80	13.78	0.18	14.00
12000	68.55	0.73	69.12	13.81	0.15	14.37
12500	74.78	0.59	75.06	15.70	0.14	15.07
13000	82.31	0.55	77.42	16.25	0.12	14.77
13500	82.76	0.52	81.28	16.93	0.17	16.28
14000	85.69	0.45	90.22	22.17	0.11	22.47
14500	94.39	0.41	85.43	24.74	0.20	22.50
15000	97.00	0.42	86.48	20.18	0.26	18.58
15500	99.17	0.45	94.43	15.93	0.32	16.36
16000	87.44	0.47	96.13	15.21	0.19	16.06
16500	86.24	0.40	88.05	18.30	0.21	18.77
17000	90.55	0.35	111.70	24.87	0.18	26.86
17500	96.85	0.33	94.75	26.24	0.19	27.57
18000	90.41	0.38	99.60	20.17	0.11	21.29
18500	87.97	0.46	88.96	17.51	0.17	18.47
20000	97.55	0.37	96.22	26.77	0.02	27.39

Typical Performance Curves



Outline Dimensions

UQ2920



CASE#	A	B	C	D	E	F	G	H
UQ2920	1.28 (32.5)	1.10 (27.9)	.60 (15.2)	.288 (7.31)	.38 (9.8)	.880 (22.35)	.11 (2.8)	1.11 (28.2)

CASE#	J	K	L	M	N	WT. GRAMS
UQ2920	.100 (2.54)	.31 (7.8)	.74 (18.8)	.31 (8.0)	.36 (9.1)	106

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .100$; 3 Pl. $\pm .015$

Notes:

1. Case material: Brass.
2. Case Finish: Powder coated over silver plating.
3. Refer to the individual model data sheet for the type of connectors available.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

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
Humidity	90 to 95% RH, 40°C, 96 hours; Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103, Condition B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
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	50g, 11ms half-sine, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition A