

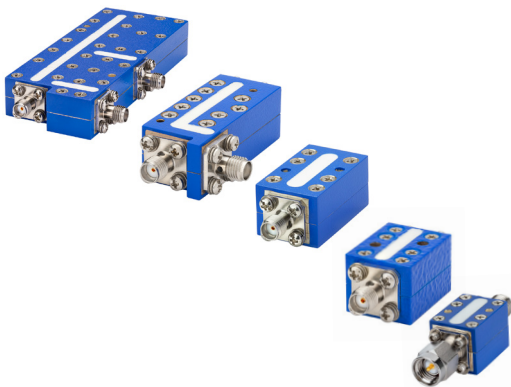
Suspended Substrate Stripline Filters and Multiplexers

50Ω

DC to 40 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 40 GHz
- Stopband up 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-5G6G-S+

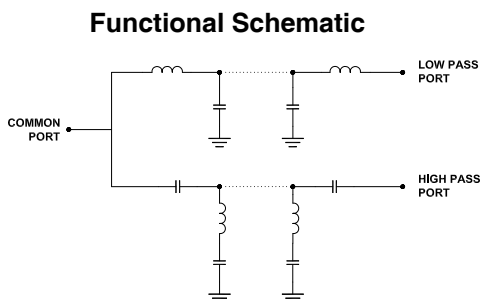
50Ω DC to 20000 MHz (DC-5000, 6000-20000 MHz)

Maximum Ratings

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

Coaxial Connections

Common Port	1
Low Pass Port	2
High Pass Port	3



Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J	K	L
1.77	.75	.60	.30	1.63	.61	1.47	.45	.26	.76	1.000
44.96	19.05	15.24	7.62	41.40	15.49	37.34	11.43	6.60	19.30	25.40
M	N	P	Q	R	S	T	U	WT		
.65	.540	.100	.19	1.181	.21	.440	.079	grams		
16.51	13.72	2.54	4.83	30.00	5.21	11.18	2.00	105		

Note: Please refer to case style drawing for details

Features

- Low passband insertion loss
- Good flatness
- High rejection
- Connectorized package

Applications

- Radar
- Test and measurement setup



Generic photo used for illustration purposes only

CASE STYLE: QH2362

Connectors	Model
SMA-F	ZDSS-5G6G-S+

+RoHS Compliant

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

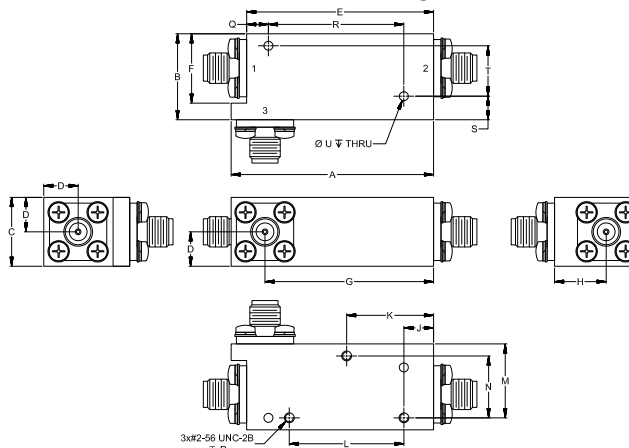
Electrical Specifications at 25°C

Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-5000	-	1.5	2.0	dB
		High Pass	6000-20000	-	2.5	3.0	
	Return Loss	Low Pass	DC-5000	-	10	-	dB
		High Pass	6000-20000	-	8	-	
			DC-5000	-	10	-	
		Common	6000-20000	-	8	-	
Stop Band Isolation		Low Pass	6000-7200	20	30	-	dB
			7200-10000	60	80	-	
			10000-20000	-	90	-	
		High Pass	DC-4000	40	50	-	dB
			4000-5000	20	30	-	

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	81.59	43.99	44.47	0.00
2500	0.59	63.37	13.14	12.85	0.14
4000	0.68	53.55	17.33	18.05	0.26
5000	1.09	35.20	24.68	22.57	0.65
5075	1.22	30.65	23.09	19.95	0.81
5200	1.78	21.16	14.68	12.71	1.48
5300	3.34	12.75	9.39	7.45	3.98
5725	18.38	3.00	9.02	1.03	11.55
5775	21.29	2.70	9.35	0.84	10.26
5975	30.87	2.00	11.14	0.55	10.60
6000	32.01	1.92	11.53	0.53	10.99
7200	73.53	0.83	17.00	0.30	16.74
10000	95.22	0.83	10.18	0.26	10.25
15000	99.02	0.80	10.18	0.12	10.39
20000	101.08	0.61	13.04	0.31	12.27

Outline Drawing



Notes

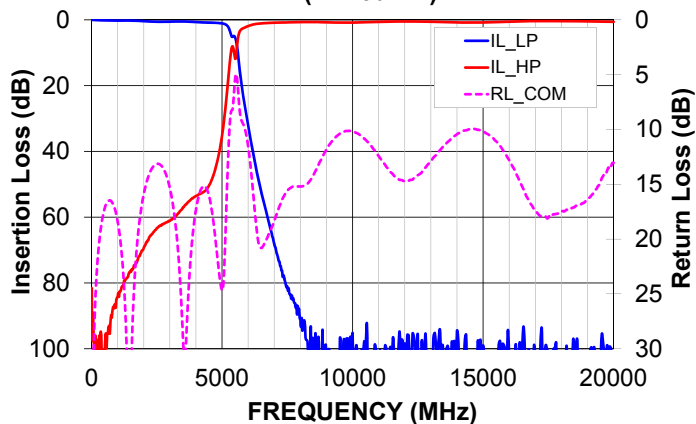
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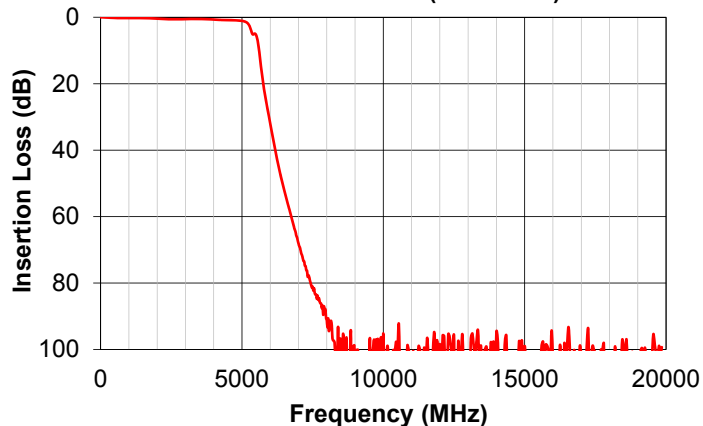
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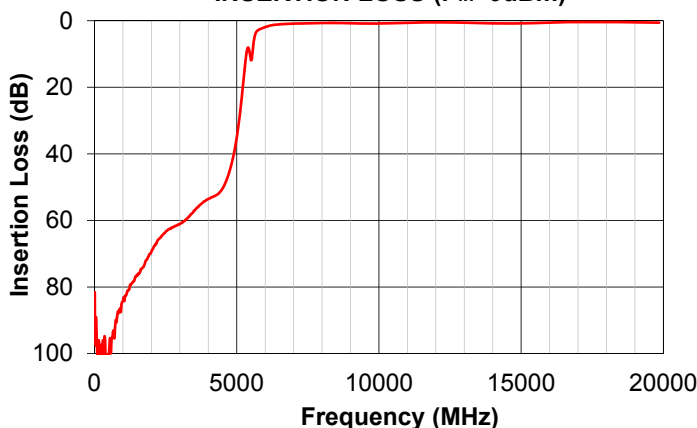
ZDSS-5G6G-S+ IL-LP Vs IL-HP Vs RL-COM (Pin=0dBm)



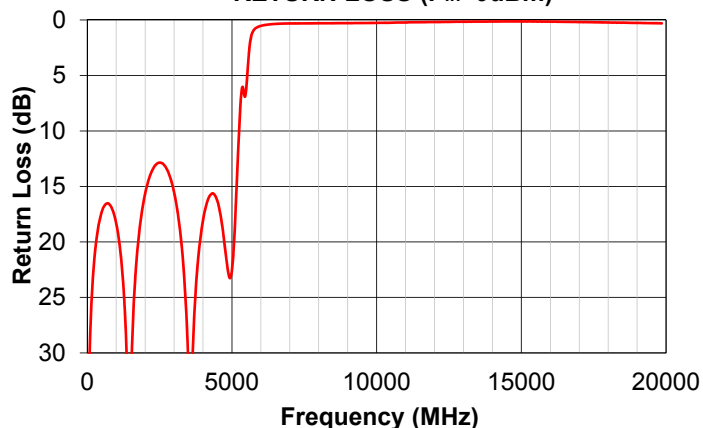
ZDSS-5G6G-S+ LOW PASS PORT INSERTION LOSS (Pin=0dBm)



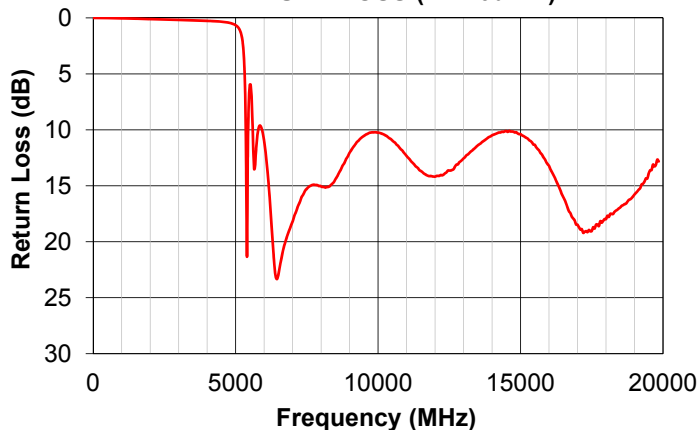
ZDSS-5G6G-S+ HIGH PASS PORT INSERTION LOSS (Pin=0dBm)



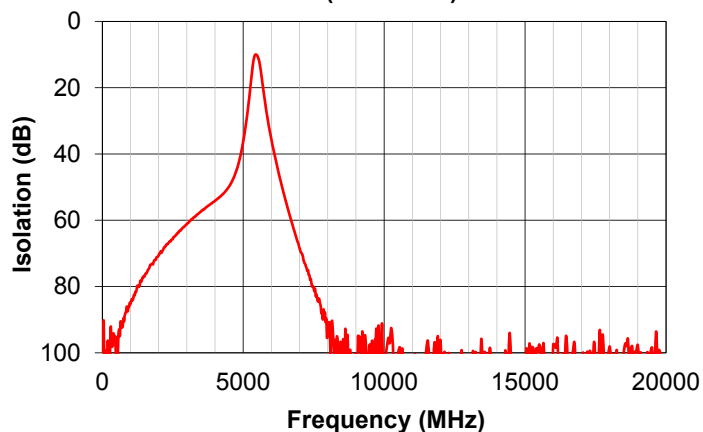
ZDSS-5G6G-S+ LOW PASS PORT RETURN LOSS (Pin=0dBm)



ZDSS-5G6G-S+ HIGH PASS PORT RETURN LOSS (Pin=0dBm)



ZDSS-5G6G-S+ CROSS OVER ISOLATION (Pin=0dBm)



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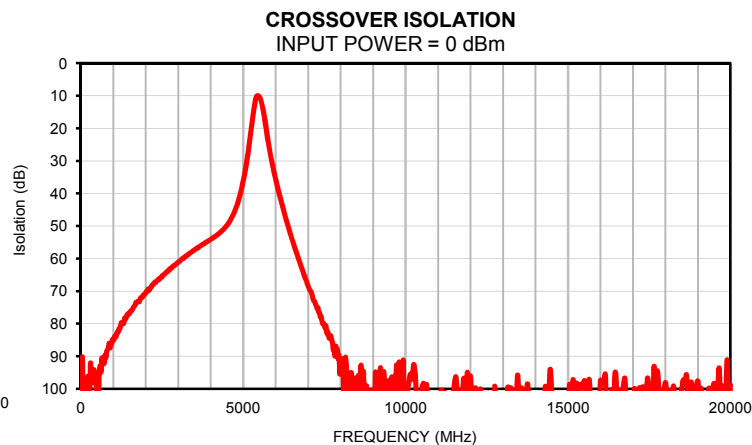
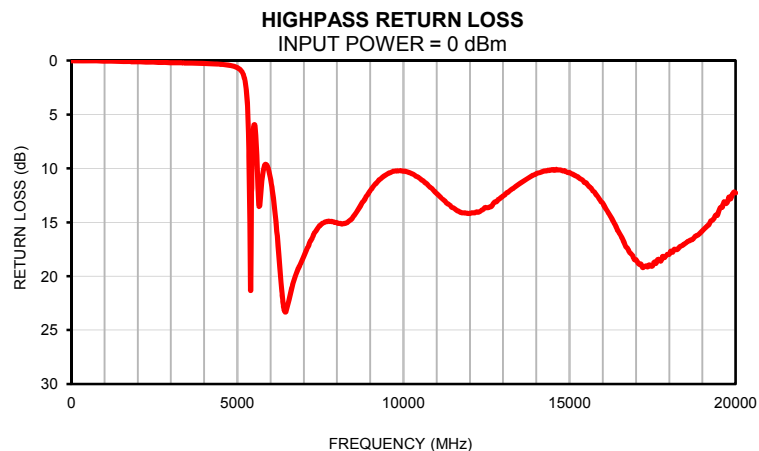
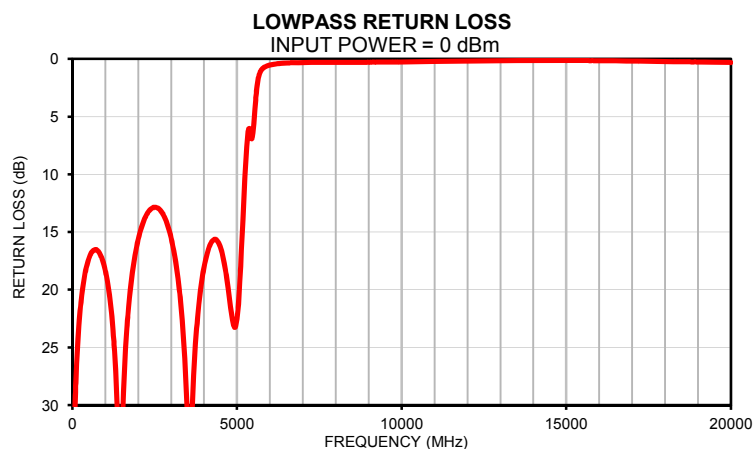
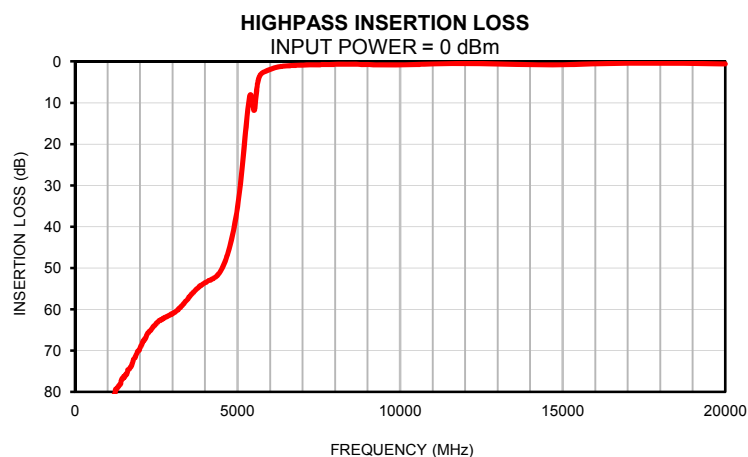
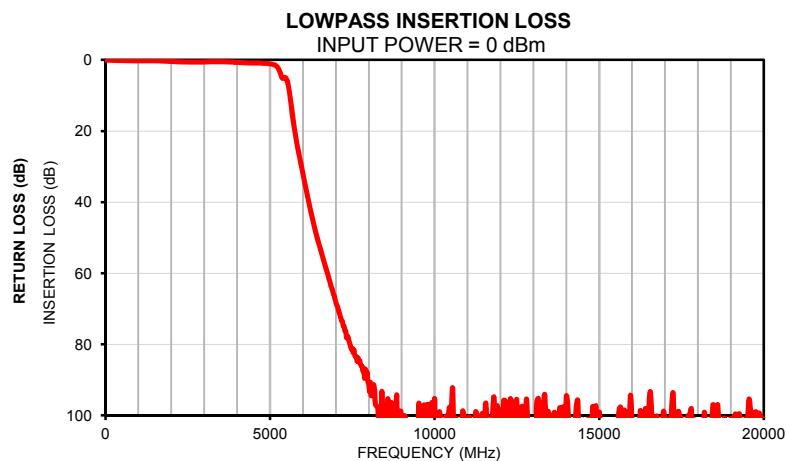
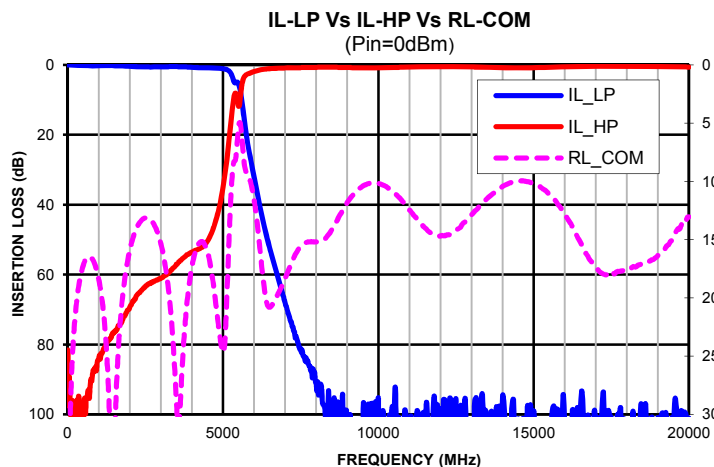
Typical Performance Data

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	81.59	92.20	43.99	44.47	0.00
20	0.01	94.20	93.75	42.92	42.22	0.01
30	0.01	94.32	91.82	39.45	39.18	0.00
50	0.02	89.08	90.24	33.92	34.30	0.00
75	0.02	95.43	102.87	31.13	31.09	0.00
100	0.03	100.21	105.77	28.60	28.60	0.00
125	0.04	101.31	100.96	26.83	26.80	0.00
150	0.05	96.02	99.22	25.26	25.29	0.00
175	0.06	99.89	102.87	24.06	24.08	0.01
200	0.07	103.48	96.32	23.02	23.05	0.01
250	0.09	97.33	101.36	21.39	21.45	0.01
300	0.12	96.00	92.18	20.14	20.19	0.01
350	0.14	94.93	98.15	19.11	19.18	0.01
400	0.15	106.29	94.14	18.32	18.40	0.01
500	0.19	101.10	105.49	17.24	17.31	0.01
1000	0.24	84.21	85.27	18.36	18.31	0.04
1500	0.24	76.29	76.96	34.92	34.09	0.07
2000	0.41	69.36	70.62	15.90	15.65	0.11
2500	0.59	63.37	65.67	13.14	12.85	0.14
3000	0.56	61.09	61.09	15.35	15.51	0.18
3500	0.50	57.05	57.37	28.83	31.38	0.22
4000	0.68	53.55	54.13	17.33	18.05	0.26
4500	0.85	50.44	49.81	16.02	16.32	0.34
5000	1.09	35.20	36.33	24.68	22.57	0.65
5075	1.22	30.65	32.36	23.09	19.95	0.81
5200	1.78	21.16	24.10	14.68	12.71	1.48
5300	3.34	12.75	16.24	9.39	7.45	3.98
5500	5.36	11.83	10.38	5.38	6.03	5.97
5725	18.38	3.00	21.31	9.02	1.03	11.55
5775	21.29	2.70	24.40	9.35	0.84	10.26
5975	30.87	2.00	34.58	11.14	0.55	10.60
6000	32.01	1.92	35.67	11.53	0.53	10.99
6500	52.22	1.09	53.93	20.81	0.35	22.96
6750	60.24	0.96	61.37	19.77	0.33	19.96
7000	68.13	0.88	68.36	18.35	0.31	18.18
7200	73.53	0.83	73.23	17.00	0.30	16.74
7500	81.12	0.79	80.53	15.62	0.30	15.27
7750	85.62	0.75	85.87	15.19	0.30	14.90
8000	91.14	0.70	90.76	15.20	0.30	15.06
8500	97.18	0.67	103.85	14.17	0.29	14.42
9000	108.95	0.76	112.74	11.82	0.28	12.05
9500	103.47	0.84	97.52	10.41	0.27	10.54
10000	95.22	0.83	101.47	10.18	0.26	10.25
11000	126.77	0.62	107.14	12.44	0.22	12.33
12000	98.49	0.51	96.18	14.70	0.18	14.18
12000	98.49	0.51	96.18	14.70	0.18	14.18
13000	106.24	0.59	106.43	12.87	0.15	12.56
14000	94.75	0.79	102.12	10.43	0.14	10.49
15000	99.02	0.80	108.52	10.18	0.12	10.39
15500	110.03	0.70	97.50	11.08	0.13	11.34
16000	102.40	0.56	97.42	12.79	0.15	13.22
16500	99.04	0.45	99.76	15.22	0.16	16.00
17000	101.60	0.40	117.36	17.40	0.18	18.48
17500	100.96	0.40	102.76	18.05	0.20	19.04
18000	104.93	0.42	98.10	17.50	0.22	17.98
18500	99.17	0.43	99.82	17.09	0.24	16.93
19000	100.91	0.46	97.74	16.36	0.27	15.77
19500	102.39	0.52	98.45	14.77	0.28	13.89
19750	98.97	0.57	99.20	13.77	0.29	13.13
20000	101.08	0.61	98.78	13.04	0.31	12.27

Suspended substrate stripline Diplexer

ZDSS-5G6G+

Typical Performance Curves



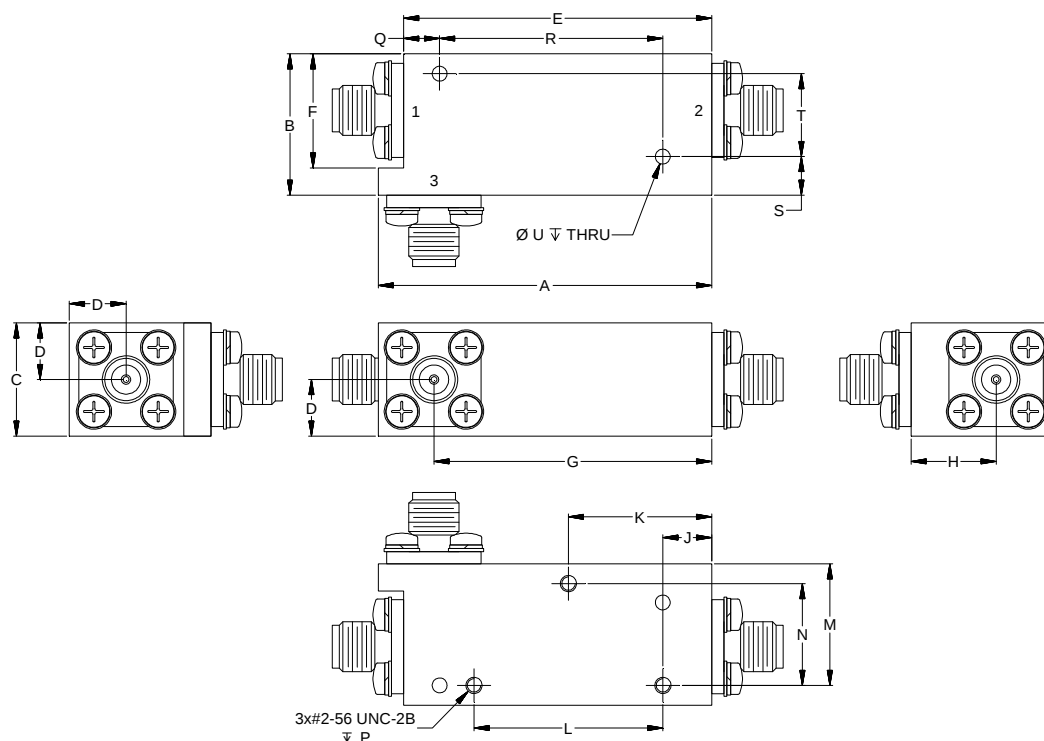
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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV. OR
ZDSS-5G6G-S+
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Outline Dimensions

QH2362



CASE#	A	B	C	D	E	F	G	H	J	K
QH2362	1.77 (44.96)	.75 (19.05)	.60 (15.24)	.30 (7.62)	1.63 (41.40)	.61 (15.49)	1.47 (37.34)	.45 (11.43)	.26 (6.60)	.76 (19.30)

CASE#	L	M	N	P	Q	R	S	T	U	WT.GRAMS
QH2362	1.000 (25.40)	.65 (16.51)	.540 (13.72)	.100 (2.54)	.19 (4.83)	1.181 (30.00)	.21 (5.21)	.440 (11.18)	.079 (2.00)	105

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .05$; 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.



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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