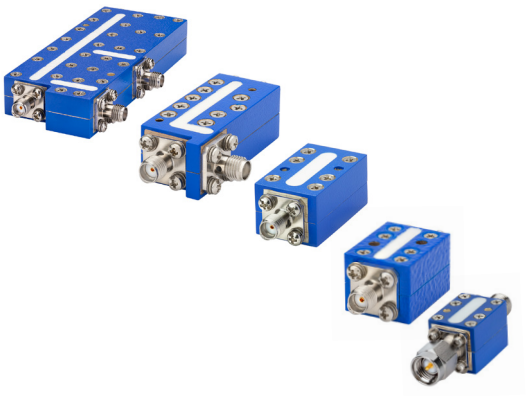
Suspended Substrate Stripline Filters and Multiplexers

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 stopband 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

Suspended substrate stripline

Diplexer

ZDSS-2R5G5G-S+

50Ω DC to 7500 MHz (DC-2500, 5100-7500 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

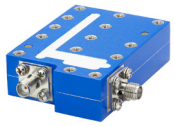
Common Port	1
Low Pass Port	2
High Pass Port	3

Features

- Low passband insertion loss
- Good return loss of 20dB typ.
- High rejection

Applications

- Wi-Fi Communication system (Extended frequency band)
- Mobile satellite
- Test and measurement setup



Generic photo used for illustration purposes only

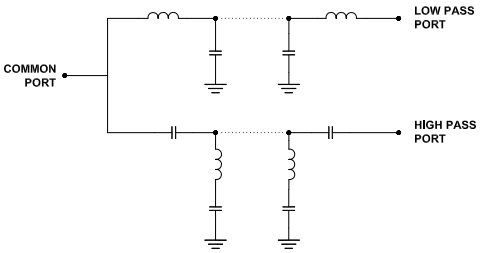
CASE STYLE: TQ2807

Connectors	Model
SMA-F	ZDSS-2R5G5G-S+

+RoHS Compliant

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

Functional Schematic



Electrical Specifications at 25°C

Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-2500	-	0.5	1.0	dB
		High Pass	5100-7500	-	0.8	1.5	
	Return Loss	Low Pass	DC-2500	14	20	-	dB
		High Pass	5100-7500	14	17	-	
		Common	DC-2500	14	20	-	
			5100-7500	14	17	-	
Stop Band Isolation		Low Pass	5100-7500	40	50	-	dB
		High Pass	DC-2500	50	65	-	

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	84.74	39.25	40.18	0.00
100	0.01	100.40	59.46	61.76	0.00
1000	0.17	103.61	23.05	22.98	0.05
2500	0.32	73.81	36.36	31.28	0.22
3000	0.47	58.57	29.24	30.82	0.29
3400	3.90	51.50	3.55	3.37	0.35
3600	9.74	31.44	1.46	0.95	0.39
3750	15.37	20.80	1.34	0.43	0.49
3850	20.32	14.58	1.66	0.28	0.69
3975	31.12	7.99	2.90	0.20	1.59
4150	34.76	3.07	7.04	0.16	4.89
5100	56.93	0.65	23.81	0.12	22.62
6000	69.58	0.53	22.99	0.15	24.66
6500	75.93	0.50	22.62	0.18	23.18
7500	85.01	0.44	25.72	0.20	26.43

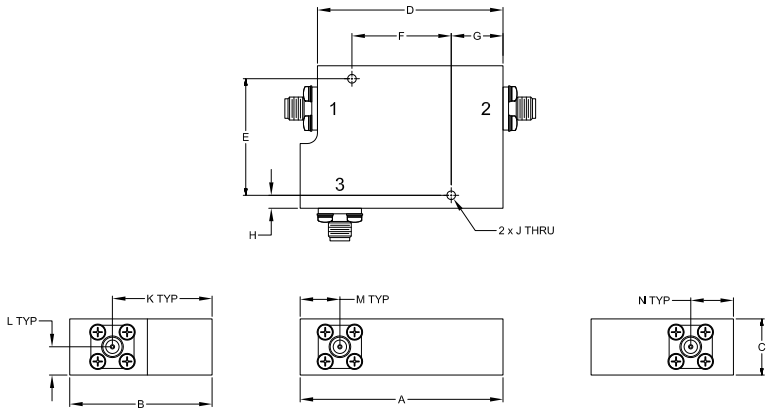
Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
2.35	**1.65**	**.65**	**2.15**	**1.350**	**1.150**	**.60**	**.15**
59.69	41.91	16.51	54.61	34.29	29.21	15.24	3.81

J	K	L	M	N	Wt.
.100	**1.16**	**.33**	**.46**	**.49**	grams
2.54	29.34	8.32	11.68	12.57	305

Note: Please refer to case style drawing for details

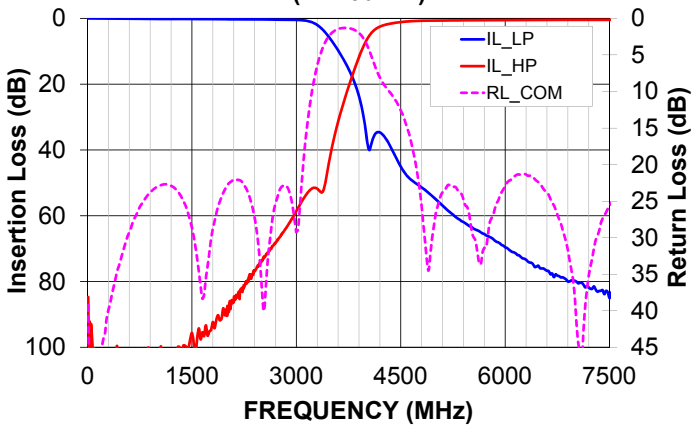
Outline Drawing



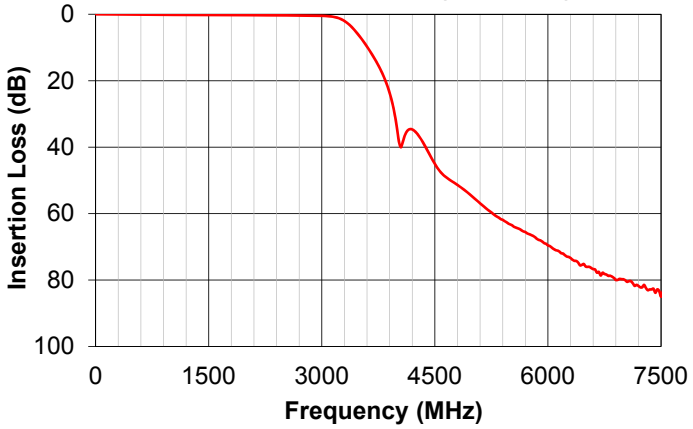
Notes

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

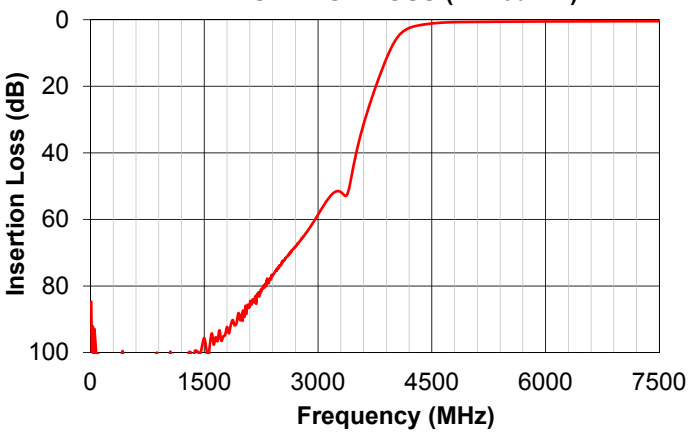
ZDSS-2R5G5G-S+ IL-LP Vs IL-HP Vs RL-COM
(Pin=0dBm)



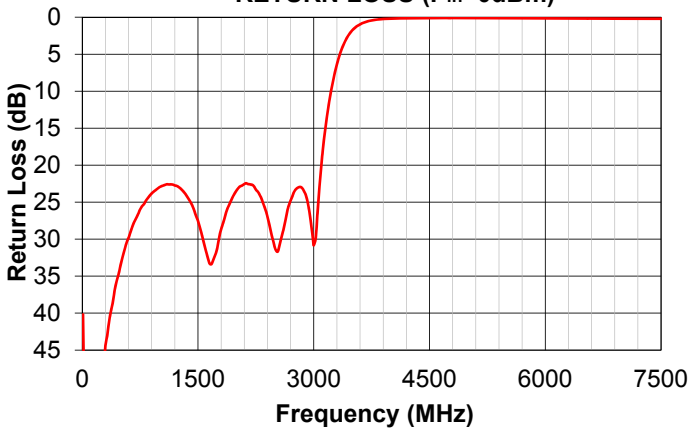
ZDSS-2R5G5G-S+ LOW PASS PORT
INSERTION LOSS (Pin=0dBm)



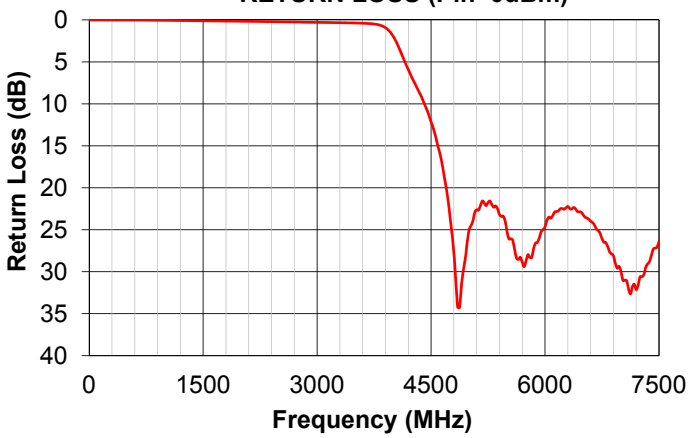
ZDSS-2R5G5G-S+ HIGH PASS PORT
INSERTION LOSS (Pin=0dBm)



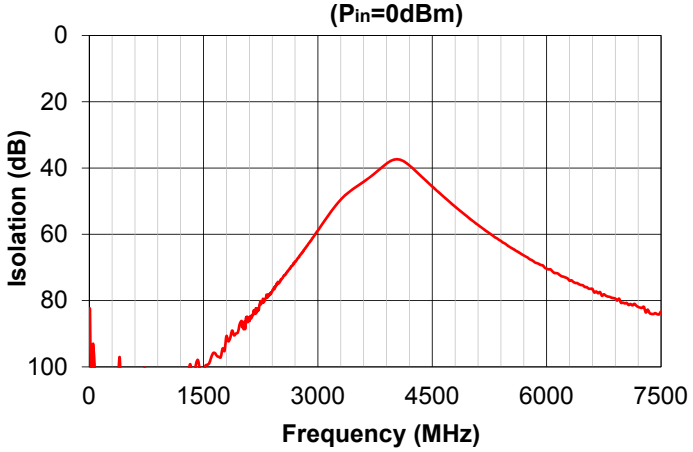
ZDSS-2R5G5G-S+ LOW PASS PORT
RETURN LOSS (Pin=0dBm)



ZDSS-2R5G5G-S+ HIGH PASS PORT
RETURN LOSS (Pin=0dBm)



ZDSS-2R5G5G-S+ CROSS OVER ISOLATION
(Pin=0dBm)



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

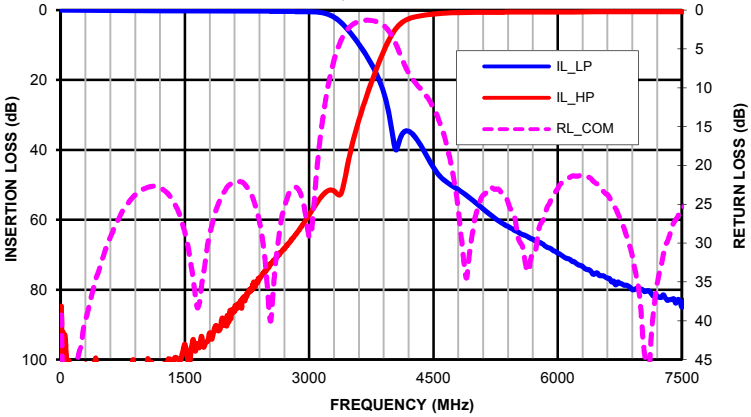
Suspended substrate stripline Diplexer ZDSS-2R5G5G-S+

Typical Performance Data

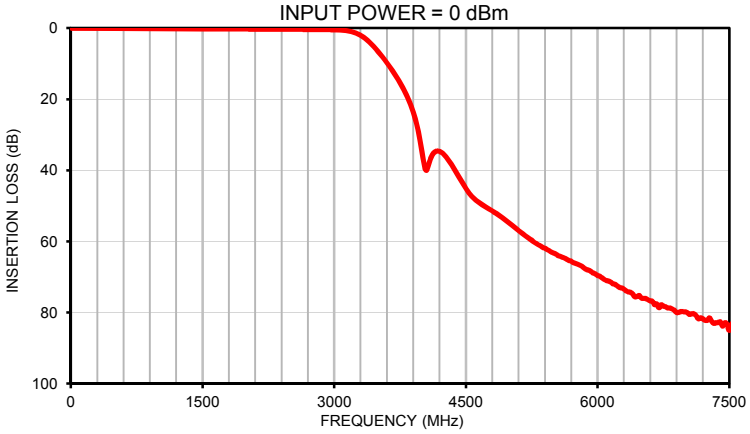
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB)	RETURN LOSS (dB)		
	Lowpass port	Highpass port	(between LPF and HPF)	Common port	Lowpass port	Highpass port
10	0.01	84.74	82.39	39.25	40.18	0.00
20	0.01	99.68	100.17	46.03	47.29	0.00
30	0.01	92.18	101.88	53.02	54.38	0.00
50	0.01	92.96	93.06	54.87	66.56	0.00
100	0.01	100.40	107.15	59.46	61.76	0.00
300	0.06	101.28	113.37	39.91	44.49	0.01
425	0.08	99.65	113.60	34.60	36.63	0.01
550	0.10	104.44	110.90	30.58	31.38	0.02
675	0.12	104.75	117.50	27.35	27.65	0.02
800	0.14	109.74	101.11	25.09	25.26	0.03
925	0.16	109.89	108.79	23.58	23.58	0.04
1000	0.17	103.61	104.61	23.05	22.98	0.05
1175	0.18	112.15	106.03	22.81	22.63	0.06
1300	0.19	99.83	102.70	23.70	23.44	0.08
1425	0.20	100.04	97.90	26.04	25.43	0.09
1550	0.20	102.10	99.37	31.22	29.41	0.10
1675	0.21	96.56	96.69	37.76	33.37	0.12
1800	0.23	92.33	90.74	28.78	28.67	0.13
1925	0.25	91.31	89.95	24.42	24.87	0.15
2050	0.28	87.41	86.76	22.42	22.85	0.16
2175	0.29	83.52	84.00	22.10	22.59	0.18
2300	0.30	79.64	80.08	23.69	24.03	0.20
2425	0.31	76.09	76.12	28.70	28.07	0.21
2500	0.32	73.81	74.36	36.36	31.28	0.22
2675	0.37	68.90	68.98	26.34	25.51	0.24
2800	0.41	65.32	65.36	22.96	23.01	0.27
2925	0.44	61.36	61.23	24.65	25.23	0.28
3000	0.47	58.57	58.84	29.24	30.82	0.29
3200	0.99	52.11	52.31	11.46	11.42	0.32
3400	3.90	51.50	47.37	3.55	3.37	0.35
3425	4.51	48.93	46.94	3.07	2.86	0.35
3550	8.10	35.61	44.92	1.69	1.29	0.38
3600	9.74	31.44	44.14	1.46	0.95	0.39
3850	20.32	14.58	39.58	1.66	0.28	0.69
3975	31.12	7.99	37.65	2.90	0.20	1.59
4150	34.76	3.07	38.33	7.04	0.16	4.89
4175	34.56	2.76	38.76	7.60	0.15	5.42
4300	37.01	1.82	41.29	9.61	0.13	7.81
4425	41.99	1.33	43.98	11.22	0.12	10.29
4550	46.77	1.02	46.65	13.73	0.11	13.54
4675	49.50	0.82	49.16	18.08	0.12	18.74
4800	51.39	0.72	51.66	25.74	0.10	27.74
4925	53.49	0.68	54.04	32.24	0.11	29.81
5050	55.92	0.65	56.30	25.02	0.11	23.98
5100	56.93	0.65	57.17	23.81	0.12	22.62
5300	60.56	0.61	60.51	23.22	0.12	22.01
5425	62.28	0.59	62.47	25.54	0.13	23.41
5550	63.98	0.56	64.26	29.99	0.13	26.07
5675	65.38	0.55	66.01	31.99	0.14	28.28
5800	66.69	0.53	67.74	27.39	0.14	28.30
5925	68.42	0.53	69.28	24.25	0.15	25.96
6000	69.58	0.53	70.38	22.99	0.15	24.66
6175	71.93	0.52	72.38	21.36	0.16	22.77
6300	73.37	0.51	73.99	21.35	0.17	22.22
6425	75.58	0.50	75.08	21.99	0.18	22.82
6500	75.93	0.50	75.89	22.62	0.18	23.18
6675	77.56	0.48	77.78	25.22	0.18	24.90
6800	78.74	0.47	78.77	28.08	0.19	26.53
7000	79.77	0.46	80.62	38.18	0.20	29.96
7500	85.01	0.44	83.34	25.72	0.20	26.43

Typical Performance Curves

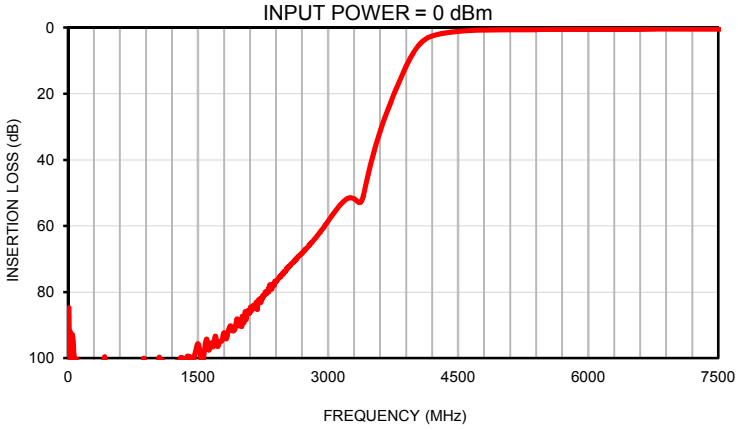
IL-LP Vs IL-HP Vs RL-COM
(Pin=0dBm)



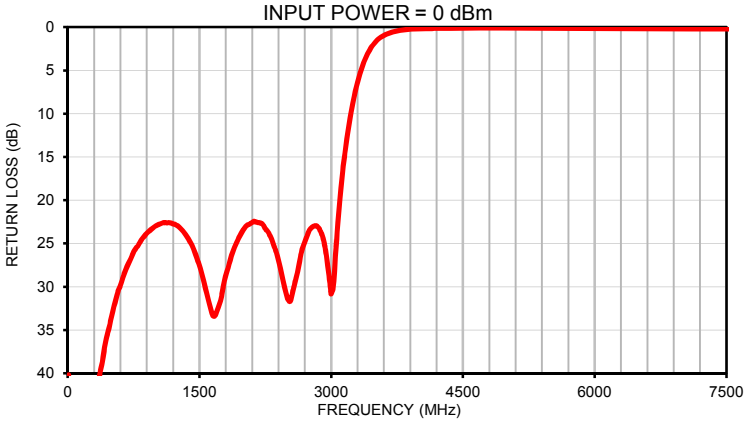
LOWPASS INSERTION LOSS
INPUT POWER = 0 dBm



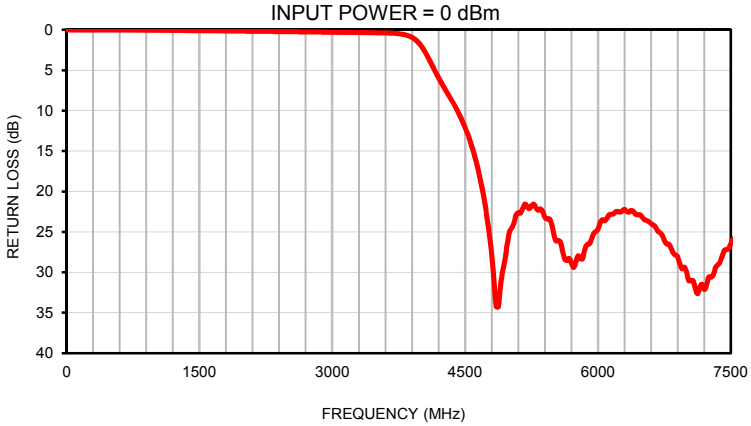
HIGHPASS INSERTION LOSS
INPUT POWER = 0 dBm



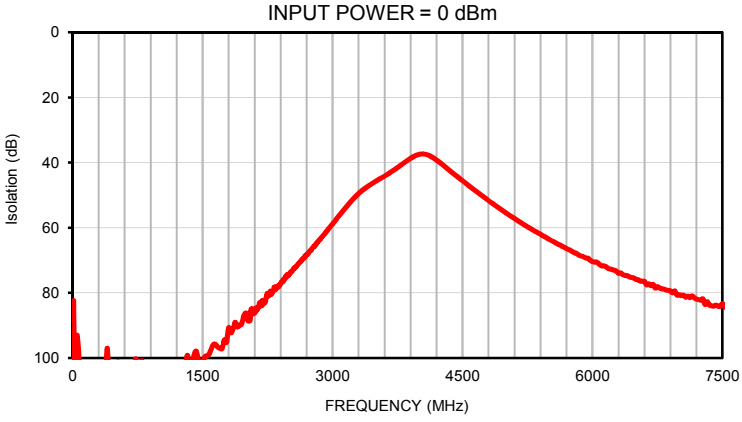
LOWPASS RETURN LOSS
INPUT POWER = 0 dBm



HIGHPASS RETURN LOSS
INPUT POWER = 0 dBm



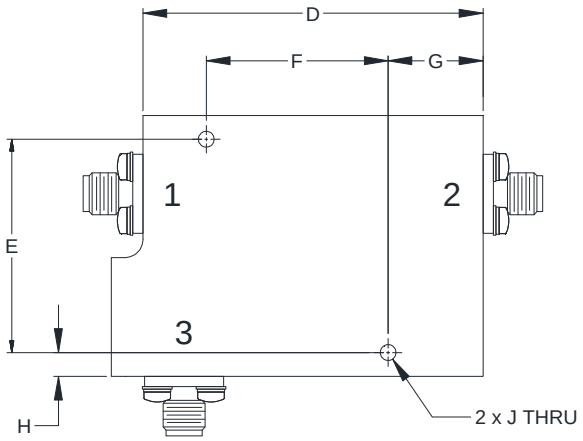
CROSSOVER ISOLATION
INPUT POWER = 0 dBm

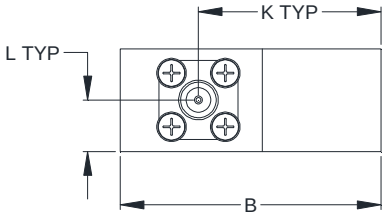


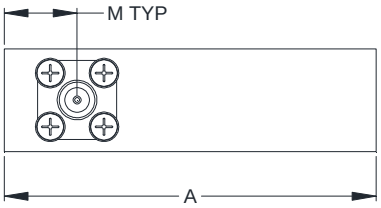
Case Style TQ

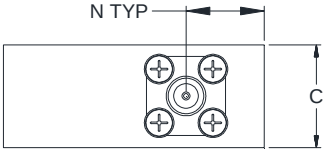
Outline Dimensions

TQ2807









CASE#	A	B	C	D	E	F	G
TQ2807	2.35 (59.69)	1.65 (41.91)	.65 (16.51)	2.15 (54.61)	1.350 (34.29)	1.150 (29.21)	.60 (15.24)

CASE#	H	J	K	L	M	N	WT. GRAMS
TQ2807	.15 (3.81)	.100 (2.54)	1.16 (29.34)	.33 (8.32)	.46 (11.68)	.49 (12.57)	305

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .100; 3 Pl. ± .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.

Mini-Circuits

Environmental Specifications ENV46

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, Condintion 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