

Triplexer

TPLX-E2485+

50 Ω (1-2485 MHz)
(1 - 460, 610-1150, 1435-2485 MHz)



CASE STYLE: HR1843

The Big Deal

- Low insertion loss
- 50 Ω Impedance
- Miniature shielded package

Product Overview

TPLX-E2485+ is a high performance 50 Ω triplexer with the lowpass channel-1 at 1-460 MHz, bandpass channel-2 at 610-1150 MHz and highpass channel-3 at 1435-2485 MHz. The channels are well isolated to minimize inter-channel interference and have minimal insertion loss through their respective bands. The triplexer is built in a shielded package, this triplexer finds its application in satellite communications.

Key Features

Feature	Advantages
Low passband insertion loss, 0.9 dB typical at lowpass and Band pass channel, 0.8 dB typical at the High pass channel	Very low insertion loss ensures less signal loss through all the channels.
Good co-channel rejection	Rejection of 20-50 dB ensures sufficient isolation between the channels
Miniature shielded package	Triplexer is designed into a surface mount package

Notes

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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



Triplexer

50Ω (1 to 2485 MHz)
(1-460, 610-1150, 1435-2485 MHz)

TPLX-E2485+



CASE STYLE: HR1843

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	2 W
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

COMMON PORT	16
CHANNEL-1	10
CHANNEL-2	6
CHANNEL-3	20
GROUND	1,2,3,4,5,7,8,9,11,12,13,14,15,17,18,19

Features

- Low insertion loss
- 50Ω Impedance
- Miniature shielded package

Applications

- Military
- Satellite communication

+RoHS Compliant

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

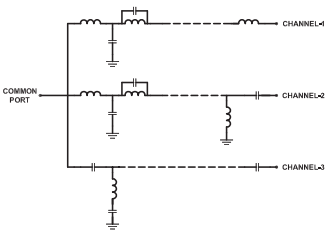
Electrical Specifications at 25°C

Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass, Channel - 1	1-460	-	0.9	1.7	dB
		Band Pass, Channel - 2	610-1150	-	0.9	1.8	
		High Pass, Channel - 3	1435-2485	-	0.8	1.7	
	Return Loss	Low Pass, Channel - 1	1-460	10	16	-	dB
		Band Pass, Channel - 2	610-1150	9	13	-	
		High Pass, Channel - 3	1435-2485	8	11	-	
		Common	1-460	10	16	-	
			610-1150	9	13	-	
			1435-2485	8	11	-	
Stop Band Isolation	Low Pass, Channel - 1	610-1150	30	38	-	dB	
		1435-2485	25	26	-		
		1-460	20	29	-		
	Band Pass, Channel - 2	1435-2485	20	54	-		
		1-460	45	37	-		
	High Pass, Channel - 3	610-1150	30	34	-		

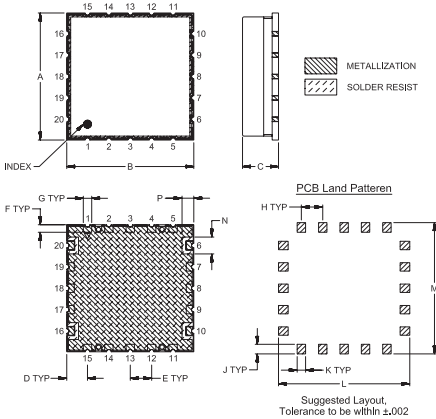
Typical Performance Data at 25°C

FREQ. (MHz)	INSERTION LOSS (dB)				RETURN LOSS (dB)		
	Low Pass Channel -1	Band Pass Channel -2	High Pass Channel -3	Common	Low Pass Channel -1	Band Pass Channel -2	High Pass Channel -3
1.00	0.09	81.12	97.78	47.10	45.95	0.05	0.05
15.00	0.11	58.07	101.23	30.55	30.59	0.04	0.05
60.00	0.20	46.11	101.17	20.12	19.96	0.04	0.04
460.00	0.82	32.61	55.01	26.30	33.46	0.22	0.09
500.00	2.82	14.63	53.85	6.64	7.05	0.58	0.11
505.00	3.66	12.76	52.69	5.35	5.64	0.72	0.11
540.00	19.99	4.53	46.44	3.17	1.25	2.97	0.12
580.00	30.78	1.04	48.10	12.03	0.72	11.44	0.14
610.00	41.74	0.58	48.68	31.55	0.57	27.36	0.15
620.00	46.93	0.57	48.14	21.69	0.54	22.60	0.16
1100.00	57.84	0.72	42.77	20.77	0.12	19.07	0.82
1150.00	58.17	0.92	41.86	15.53	0.11	15.14	0.98
1250.00	54.55	1.39	18.41	31.72	0.11	24.62	1.24
1435.00	53.28	33.81	0.76	15.91	0.16	0.55	16.38
1560.00	40.20	38.41	0.51	19.78	7.52	0.41	19.13
1800.00	58.37	41.59	0.42	18.23	0.15	0.36	18.94
1950.00	38.86	45.94	0.51	14.19	0.92	0.41	14.44
2100.00	59.70	47.21	0.53	13.52	0.16	0.43	13.50
2350.00	50.97	43.23	0.43	15.86	0.16	0.48	15.05
2485.00	46.91	41.99	0.42	16.55	0.16	0.56	15.14

Functional Schematic



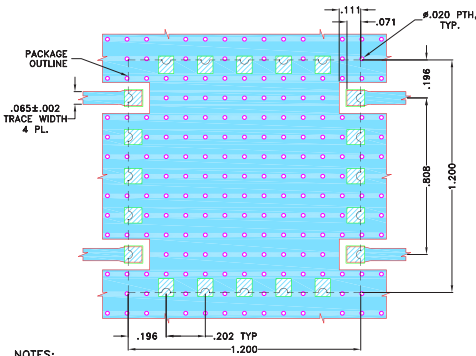
Outline Drawing



Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H
1.200	1.200	.370	.196	.202	.071	.079	.202
30.48	30.48	9.40	4.98	5.13	1.80	2.01	5.13
J	K	L	M	N	P	WT. GRAMS	
.091	.079	1.240	1.240	.159	.111	8	
2.31	2.01	31.50	31.50	4.04	2.82		

Demo Board MCL P/N: TB-767+ Suggested PCB Layout (PL-409)



- NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .030" ± .002", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Notes

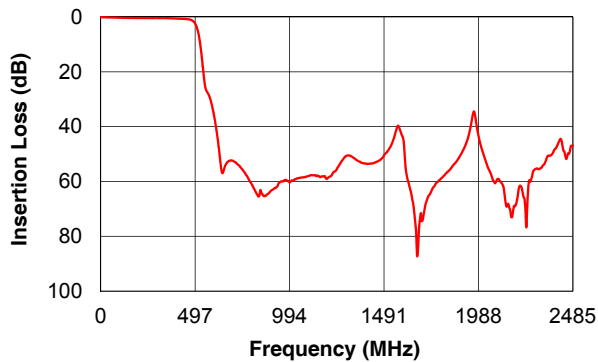
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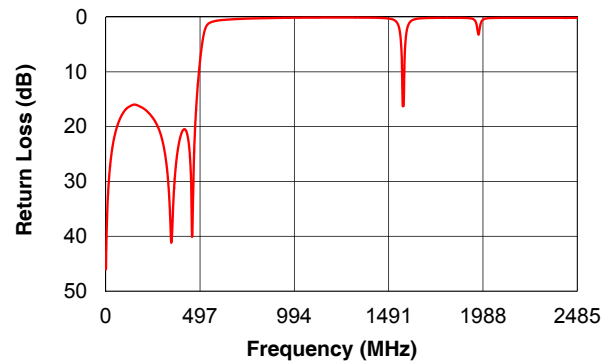
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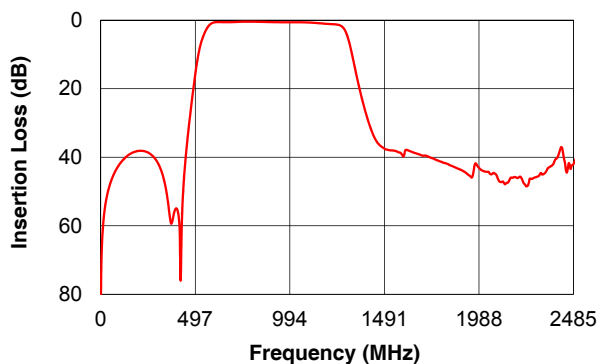
**TPLX-E2485+ LOW PASS PORT
INSERTION LOSS ($P_{in}=0\text{dBm}$)**



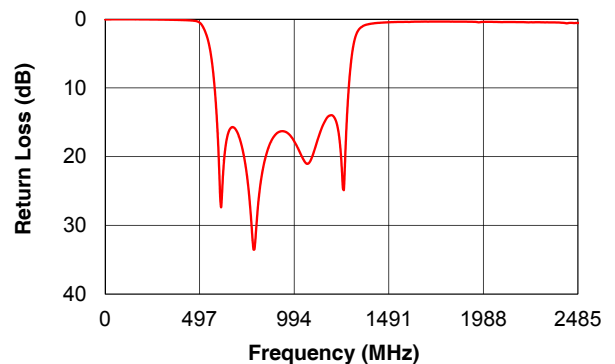
**TPLX-E2485+ LOW PASS PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**



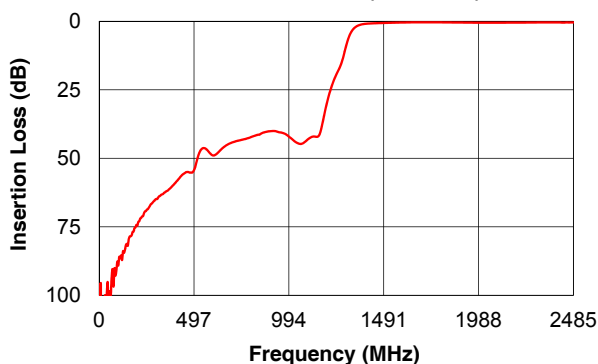
**TPLX-E2485+ BAND PASS PORT
INSERTION LOSS ($P_{in}=0\text{dBm}$)**



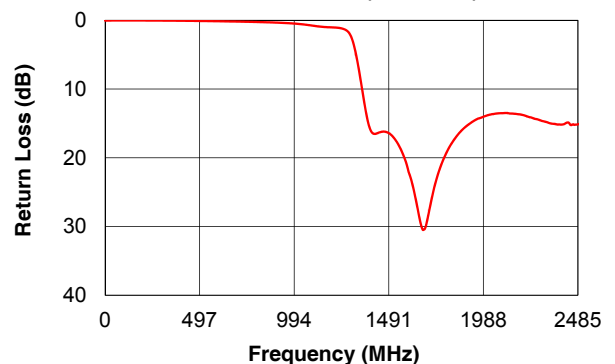
**TPLX-E2485+ BAND PASS PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**



**TPLX-E2485+ HIGH PASS PORT
INSERTION LOSS ($P_{in}=0\text{dBm}$)**



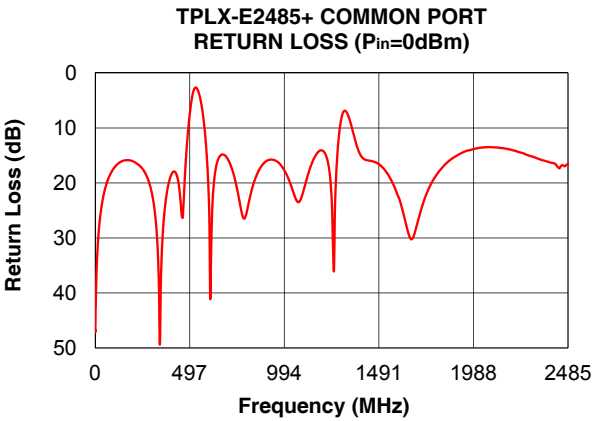
**TPLX-E2485+ HIGH PASS PORT
RETURN LOSS ($P_{in}=0\text{dBm}$)**



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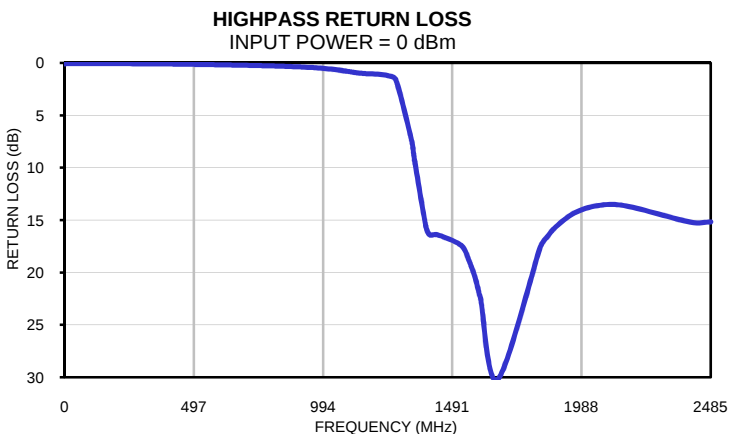
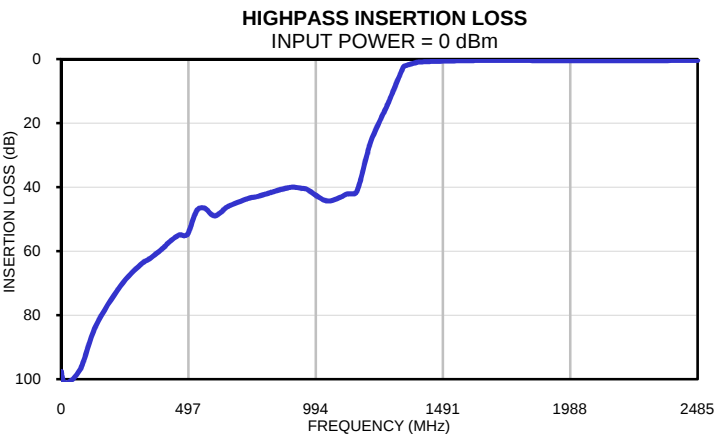
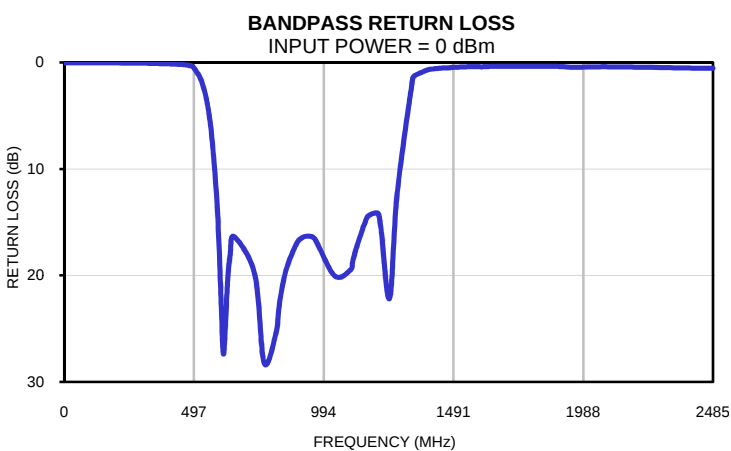
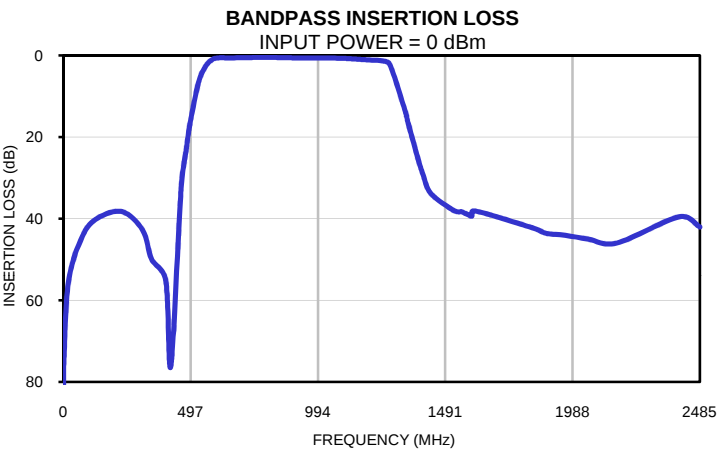
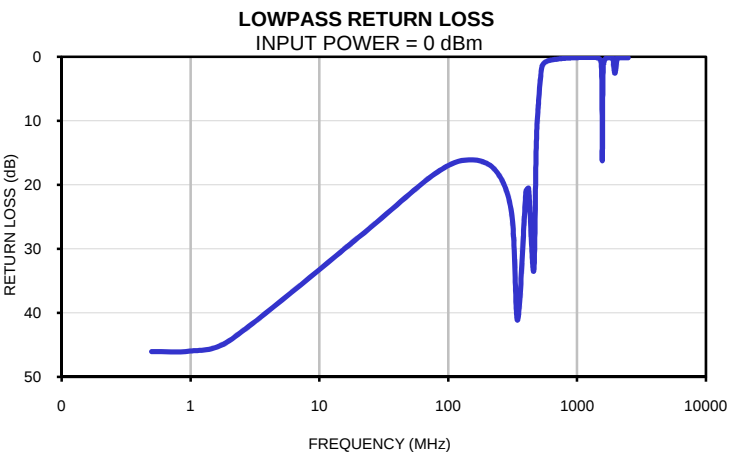
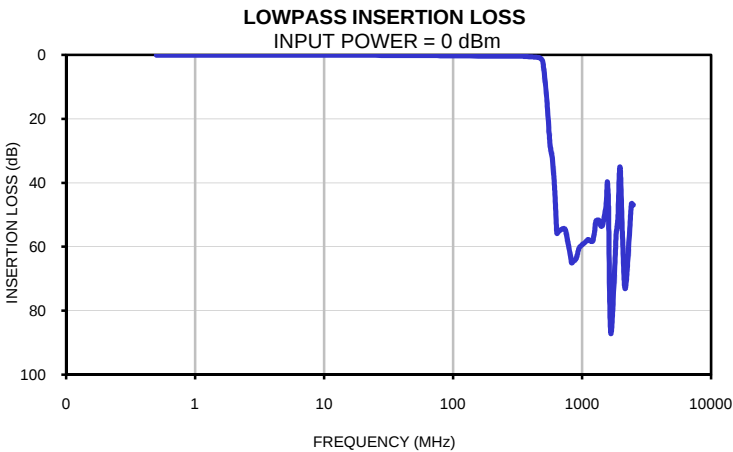
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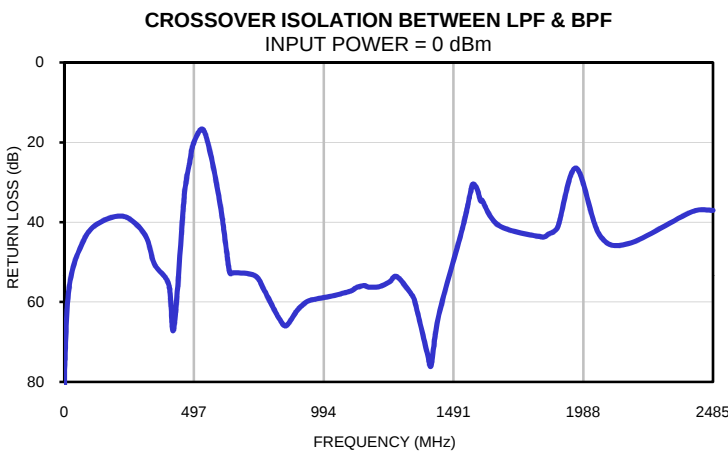
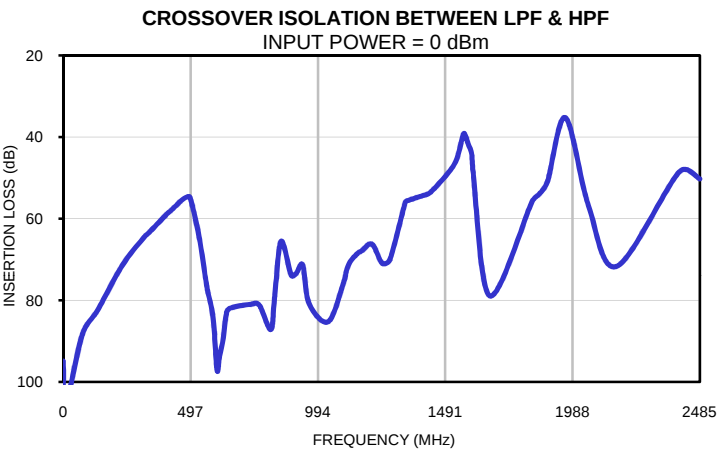
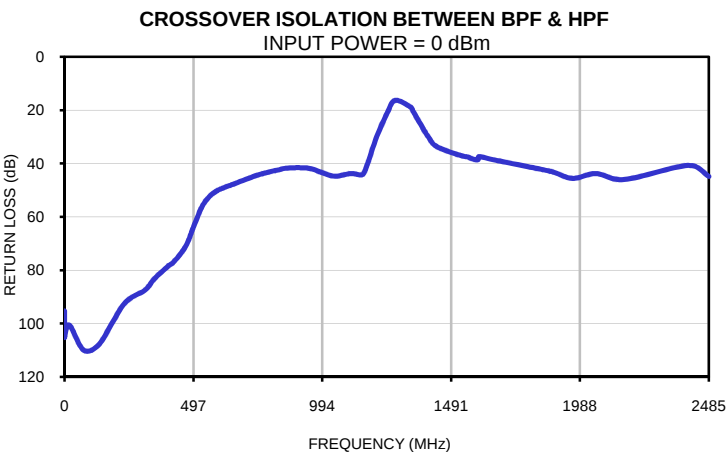
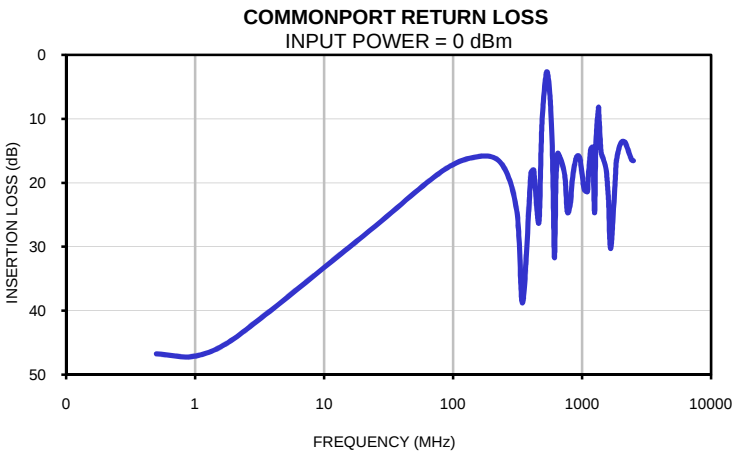
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)			Cross over isolation (dB)			RETURN LOSS (dB)			
	Lowpass port	Bandpass port	Highpass port	(between LPF and HPF)	(between BPF and HPF)	(between LPF and BPF)	Common port	Lowpass port	Bandpass port	Highpass port
0.5	0.09	89.37	108.65	94.86	95.31	85.54	46.75	46.03	0.05	0.05
1	0.09	81.12	97.78	99.04	105.07	82.23	47.10	45.95	0.05	0.05
2	0.09	75.56	98.82	101.16	104.13	75.76	44.36	44.34	0.05	0.05
20	0.12	55.57	101.38	102.95	100.63	55.63	28.32	28.26	0.04	0.04
75	0.23	44.25	96.82	88.26	110.00	44.45	18.75	18.59	0.04	0.03
135	0.33	39.83	83.45	82.28	107.62	40.15	16.14	16.14	0.04	0.03
230	0.40	38.26	71.07	71.44	92.63	38.61	16.75	17.63	0.05	0.04
310	0.41	42.80	64.21	64.92	87.49	43.27	24.31	24.48	0.08	0.05
345	0.43	49.98	62.42	62.70	83.41	50.47	38.73	41.11	0.10	0.06
400	0.59	55.04	58.92	59.11	78.43	55.60	18.50	21.13	0.14	0.07
420	0.66	76.00	57.28	57.96	77.07	66.49	18.00	20.56	0.16	0.08
460	0.82	32.61	55.01	55.58	72.23	33.20	26.30	33.46	0.22	0.09
480	1.23	23.06	55.20	54.71	68.44	25.19	14.09	14.80	0.30	0.10
495	2.21	16.61	54.57	54.75	64.47	20.31	8.15	8.66	0.47	0.11
530	13.48	6.12	47.26	64.30	56.29	16.73	2.66	1.70	2.10	0.12
560	27.36	2.25	46.59	76.39	52.32	22.92	6.07	0.89	5.90	0.13
585	32.15	0.88	48.47	84.30	50.42	30.99	14.28	0.69	13.44	0.14
600	37.37	0.63	48.98	96.99	49.66	36.92	26.49	0.61	22.12	0.15
610	41.74	0.58	48.68	93.71	49.26	41.41	31.55	0.57	27.36	0.15
625	49.91	0.57	47.77	89.21	48.69	48.97	19.60	0.53	20.65	0.16
635	55.76	0.59	47.06	83.95	48.35	52.83	17.14	0.50	18.16	0.16
650	55.29	0.60	46.09	81.94	47.80	52.65	15.42	0.46	16.35	0.17
730	54.32	0.51	43.56	80.95	44.86	53.40	18.74	0.32	19.98	0.21
765	57.64	0.47	42.98	81.11	43.81	56.95	24.54	0.28	28.20	0.23
810	63.02	0.47	41.90	87.12	42.71	62.64	23.11	0.24	25.48	0.26
825	64.96	0.49	41.54	79.28	42.43	64.34	20.98	0.23	22.48	0.27
850	64.60	0.52	40.93	65.52	41.84	65.94	18.48	0.22	19.43	0.30
890	63.83	0.58	40.15	73.83	41.60	62.28	16.29	0.19	16.98	0.33
910	62.74	0.60	40.04	73.32	41.60	60.91	15.84	0.18	16.47	0.35
935	60.91	0.62	40.34	71.31	41.70	59.72	15.78	0.17	16.30	0.39
960	59.95	0.62	40.73	80.82	42.23	59.32	16.20	0.16	16.59	0.42
1035	58.82	0.63	44.29	85.16	44.70	58.35	21.04	0.13	20.02	0.59
1095	57.98	0.71	43.01	75.45	43.89	57.30	21.40	0.12	19.50	0.80
1105	57.72	0.74	42.54	72.80	43.80	57.03	20.12	0.12	18.63	0.84
1120	57.74	0.79	42.08	70.52	43.89	56.36	18.31	0.12	17.31	0.90
1150	58.17	0.92	41.86	68.38	44.15	55.89	15.53	0.11	15.14	0.98
1165	58.13	0.99	38.86	67.84	41.18	56.27	14.67	0.12	14.40	1.01
1205	58.22	1.15	26.75	66.19	29.84	56.19	14.45	0.11	14.32	1.05
1245	55.11	1.33	19.12	70.92	21.07	55.00	24.70	0.11	22.18	1.20
1275	51.96	2.25	14.09	69.99	16.36	53.69	13.75	0.11	12.33	1.62
1335	51.58	13.67	2.61	55.96	18.89	58.58	8.27	0.12	1.47	7.39
1345	52.10	16.28	2.03	55.50	20.52	60.43	9.43	0.12	1.20	9.05
1390	53.41	26.46	0.99	54.58	28.08	72.68	14.63	0.13	0.71	15.61
1405	53.60	29.27	0.88	54.25	30.30	75.92	15.43	0.14	0.64	16.40
1435	53.28	33.81	0.76	53.41	33.63	63.20	15.91	0.16	0.55	16.38
1525	47.27	38.00	0.57	46.78	36.96	41.64	17.77	0.67	0.42	17.38
1555	41.29	38.28	0.51	40.82	37.57	32.85	19.43	4.29	0.41	18.83
1565	39.64	38.59	0.50	39.04	37.97	30.50	20.13	16.23	0.41	19.46
1580	42.18	38.98	0.48	41.52	38.45	31.54	21.35	4.33	0.40	20.55
1595	45.73	39.35	0.47	44.32	38.60	34.74	22.62	1.43	0.41	22.04
1600	50.69	38.08	0.47	48.58	37.41	34.52	23.07	1.10	0.41	22.44
1665	87.12	39.00	0.40	78.87	38.84	40.85	30.18	0.24	0.36	30.20
1830	56.25	42.18	0.44	55.79	42.03	43.73	16.96	0.16	0.37	17.54
1855	54.10	42.78	0.45	54.11	42.54	42.98	16.12	0.16	0.37	16.61
1890	50.76	43.64	0.47	50.91	43.37	41.23	15.24	0.18	0.37	15.61
1960	35.04	44.06	0.52	35.19	45.60	26.47	14.09	2.58	0.46	14.31
2050	56.67	44.98	0.53	56.70	43.78	43.14	13.51	0.18	0.41	13.59
2160	72.89	45.96	0.51	71.64	46.01	45.40	13.77	0.16	0.43	13.62
2405	46.52	39.50	0.43	48.46	40.75	37.38	16.36	0.16	0.53	15.16
2485	46.91	41.99	0.42	50.21	44.83	37.05	16.55	0.16	0.56	15.14

Typical Performance Curves

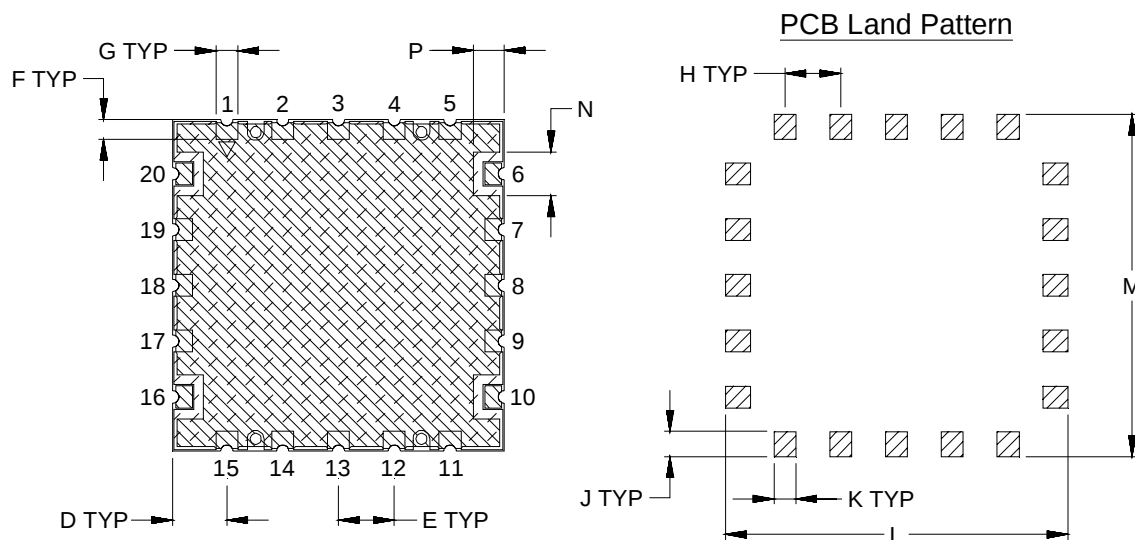
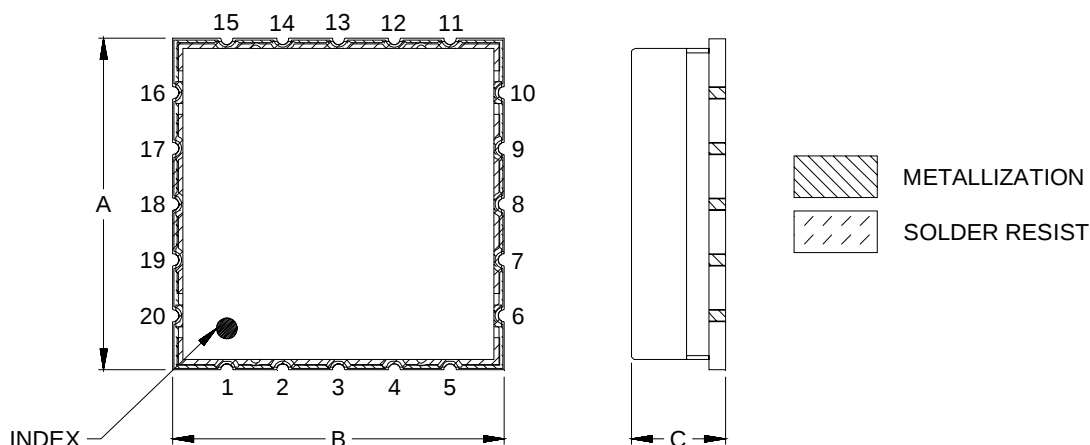


Typical Performance Curves



Outline Dimensions

HR1843



Suggested Layout,
Tolerance to be within $\pm .002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT.GRAMS
HR1843	1.200 (30.48)	1.200 (30.48)	.370 (9.40)	.196 (4.98)	.202 (5.13)	.071 (1.80)	.079 (2.01)	.202 (5.13)	.091 (2.31)	.079 (2.01)	1.240 (31.50)	1.240 (31.50)	.159 (4.04)	.111 (2.82)	8

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

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: 3-5 μ inch Gold over 120-240 μ inch Nickel plate.

For RoHS-5 Case Styles: Tin-Lead plate.



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

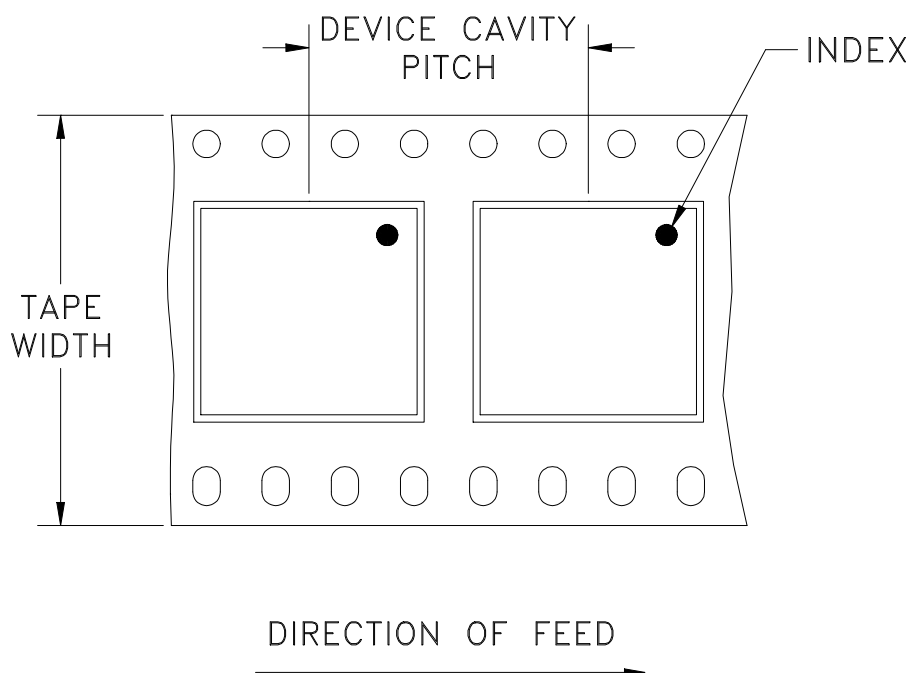


Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F80

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	40	13	100

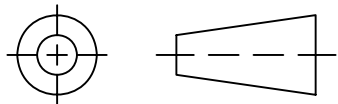
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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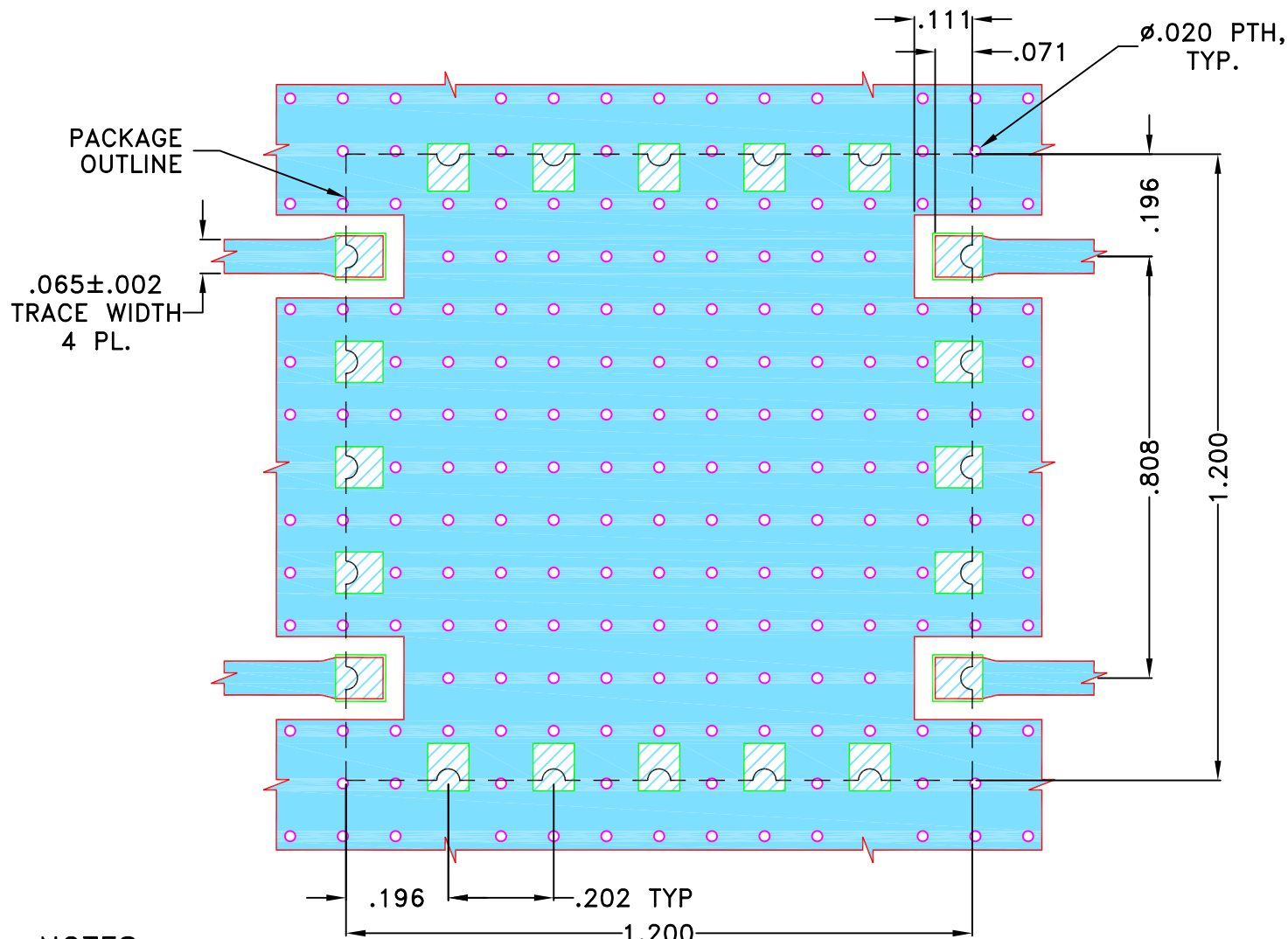
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M144572	NEW RELEASE	DEC 13	DDR	KG

**SUGGESTED MOUNTING CONFIGURATION FOR
HR1843 CASE STYLE "20FS01" PIN CODE**



NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 Oz. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES ON:
2 PL DECIMALS ±
3 PL DECIMALS ± .005"
ANGLES ±
FRACTIONS ±

INITIALS

DATE

DRAWN	DDR	26 DEC 13
CHECKED	MD	26 DEC 13
APPROVED	KR	26 DEC 13

**Mini-Circuits®**13 Neptune Avenue
Brooklyn NY 11235

PL, 20FS01, HR1843, TTP
TB-767+, 50 Ohm

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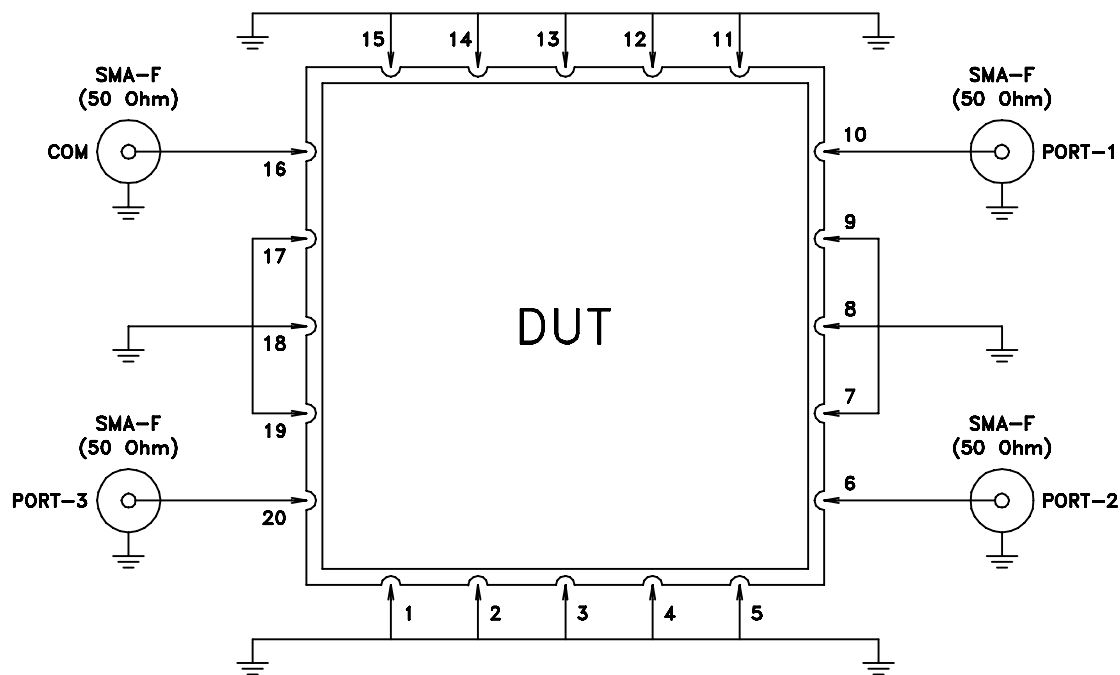
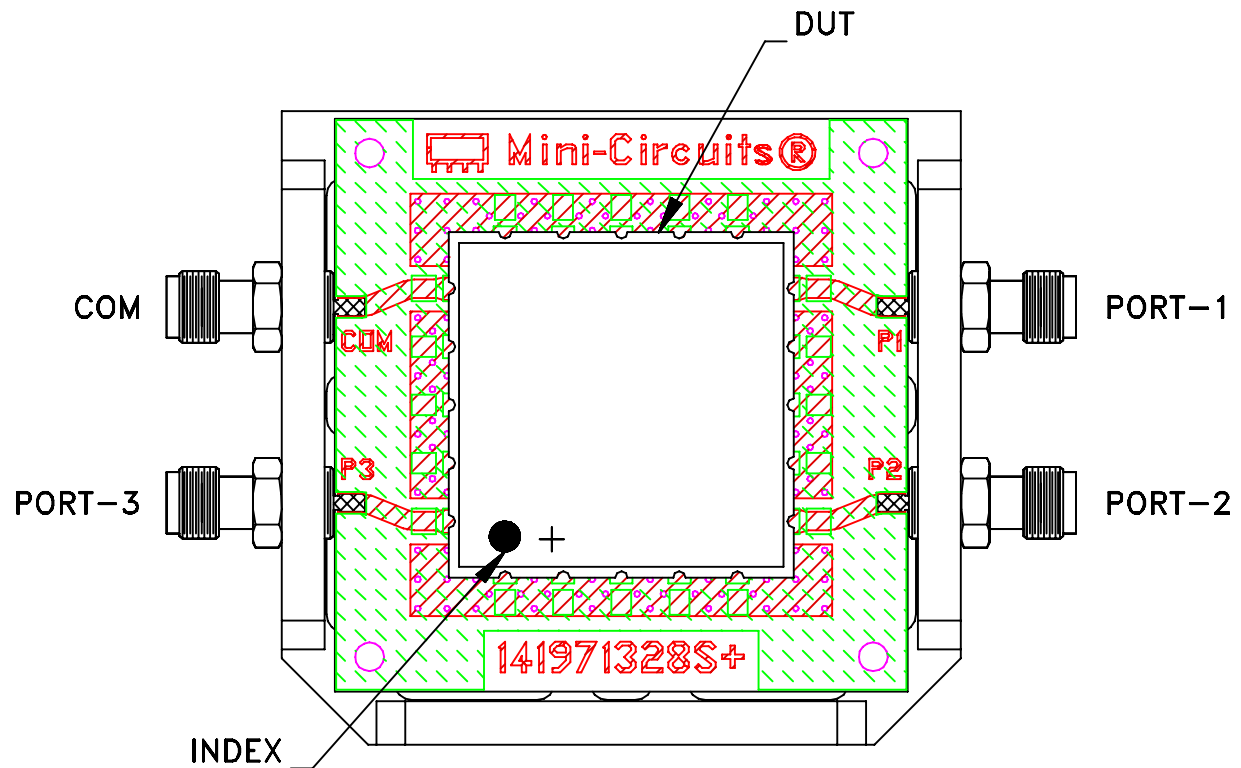
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-409	REV: OR
FILE: 98PL409	SCALE: 3:1	SHEET: 1 OF 1	

ASHEETA1.DWG REV:A DATE:01/12/95

Evaluation Board and Circuit

TB-767+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS (R04350B) OR Equivalent
Dielectric Constant= $3.48 \pm .05$, Thickness=.030 inch.

 **Mini-Circuits®**



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	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Temperature Cycling	-65° to 150°C, 100 cycles	JESD22-A104
Temperature Humidity	85°C/ 85% RH, 168 hours	JESD22-113
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS)	J-STD-020
Solderability	10X magnification, 95% coverage	JESD22-B102, Method 1: Dip and Look Test
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
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