

Surface Mount Power Splitter/Combiner

CDP-2-13-75+

2 Way-0° 75Ω 5 to 1000 MHz

Features

- wideband, 5 to 1000 MHz
- low insertion loss, 0.6 dB typ.
- excellent matching return loss, 20 dB typ.
- aqueous washable

Applications

- cellular
- VHF/UHF
- communication systems
- CATV



Generic photo used for illustration purposes only

CASE STYLE: TT1491-1

+RoHS Compliant

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



Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200
13"	500

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1000	MHz
Insertion Loss Above 3.0 dB	5-50	—	0.2	0.5	dB
	50-500	—	0.6	0.7	
	500-1000	—	0.8	1.1	
Isolation	5-50	20	24	—	dB
	50-500	20	25	—	
	500-1000	18	20	—	
Phase Unbalance	5-50	—	—	2.0	Degree
	50-500	—	—	3.0	
	500-1000	—	—	5.0	
Amplitude Unbalance	5-50	—	—	0.3	dB
	50-500	—	—	0.3	
	500-1000	—	—	0.3	
VSWR (Port S)	5-50	—	1.05	1.2	:1
	50-500	—	1.10	1.3	
	500-1000	—	1.25	1.4	
VSWR (Port 1-2)	5-50	—	1.20	1.5	:1
	50-500	—	1.15	1.3	
	500-1000	—	1.10	1.3	

Maximum Ratings

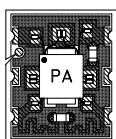
Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.
Internal Dissipation	0.125W max

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

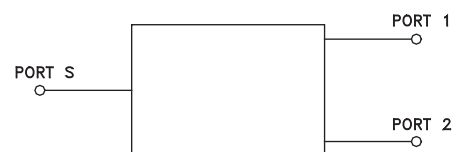
Pad Connections

Function	Pin Number
SUM PORT	1
PORT 1	3
PORT 2	4
GROUND	6
NOT USED	2,5

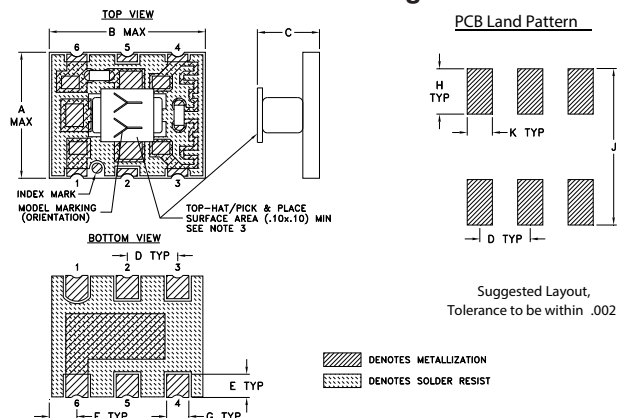
Product Marking



Electrical Schematic



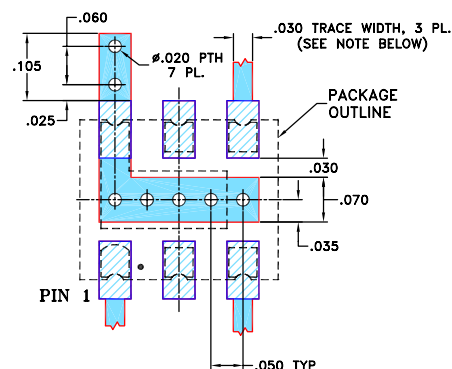
Outline Drawing



Outline Dimensions (Inch/mm)

A	B	C	D	E	F	G	H	J	K	wt.
.255	.310	.133	.100	.050	.055	.044	.090	.310	.050	grams
6.48	7.87	3.38	2.54	1.27	1.40	1.12	2.29	7.87	1.27	0.35

Demo Board MCL P/N: TB-565+ Suggested PCB Layout (PL-327)

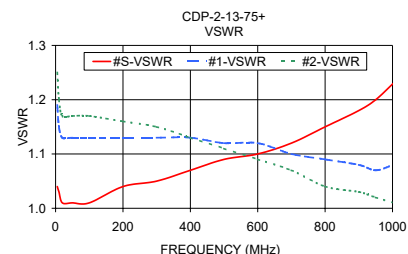
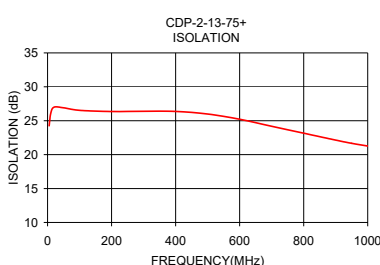
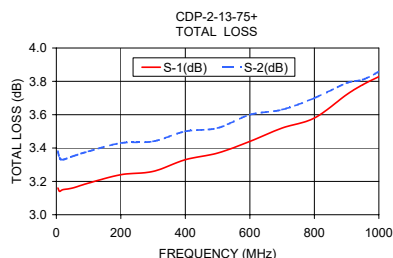


- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)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

Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
5.00	3.16	3.38	0.22	24.25	0.59	1.04	1.19	1.25
10.00	3.14	3.34	0.20	26.11	0.36	1.03	1.15	1.20
20.00	3.15	3.33	0.18	27.00	0.15	1.01	1.13	1.17
50.00	3.16	3.35	0.18	26.91	0.05	1.01	1.13	1.17
100.00	3.19	3.38	0.19	26.53	0.20	1.01	1.13	1.17
200.00	3.24	3.43	0.19	26.36	0.40	1.04	1.13	1.16
300.00	3.26	3.44	0.18	26.39	0.51	1.05	1.13	1.15
400.00	3.33	3.50	0.18	26.37	0.77	1.07	1.13	1.13
500.00	3.37	3.52	0.15	25.99	0.75	1.09	1.12	1.11
600.00	3.44	3.60	0.16	25.22	0.88	1.10	1.12	1.09
700.00	3.52	3.63	0.11	24.18	0.96	1.12	1.10	1.07
800.00	3.58	3.70	0.12	23.16	0.71	1.15	1.09	1.04
900.00	3.72	3.79	0.07	22.14	0.84	1.18	1.08	1.03
950.00	3.78	3.81	0.03	21.67	0.51	1.20	1.07	1.02
1002.00	3.83	3.86	0.03	21.25	0.17	1.23	1.08	1.01

1. Total Loss = Insertion Loss + 3dB splitter loss.



Additional 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-Circuits' 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

2 Way-0° Power Splitter/Combiner

CDP-2-13-75+

Typical Performance Data

FREQUENCY (MHz)	Total Loss ¹ (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB) 1-2	PHASE UNBALANCE (Deg)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
5.0	3.16	3.38	0.22	24.25	0.59	5.0	1.04	1.19	1.25
10.0	3.14	3.34	0.20	26.11	0.36	10.0	1.03	1.15	1.20
20.0	3.15	3.33	0.18	27.00	0.15	20.0	1.01	1.13	1.17
30.0	3.15	3.33	0.18	27.11	0.05	30.0	1.01	1.13	1.17
40.0	3.16	3.34	0.18	27.02	0.02	40.0	1.01	1.13	1.17
50.0	3.16	3.35	0.18	26.91	0.05	50.0	1.01	1.13	1.17
54.0	3.16	3.35	0.18	26.87	0.07	54.0	1.01	1.13	1.17
60.0	3.17	3.35	0.18	26.81	0.09	60.0	1.01	1.13	1.17
70.0	3.18	3.36	0.18	26.73	0.13	70.0	1.01	1.13	1.17
80.0	3.19	3.37	0.19	26.65	0.15	80.0	1.01	1.13	1.17
90.0	3.19	3.38	0.19	26.58	0.18	90.0	1.01	1.13	1.17
100.0	3.19	3.38	0.19	26.53	0.20	100.0	1.01	1.13	1.17
200.0	3.24	3.43	0.19	26.36	0.40	200.0	1.04	1.13	1.16
300.0	3.26	3.44	0.18	26.39	0.51	300.0	1.05	1.13	1.15
400.0	3.33	3.50	0.18	26.37	0.77	400.0	1.07	1.13	1.13
500.0	3.37	3.52	0.15	25.99	0.75	500.0	1.09	1.12	1.11
600.0	3.44	3.60	0.16	25.22	0.88	600.0	1.10	1.12	1.09
700.0	3.52	3.63	0.11	24.18	0.96	700.0	1.12	1.10	1.07
800.0	3.58	3.70	0.12	23.16	0.71	800.0	1.15	1.09	1.04
870.0	3.65	3.74	0.09	22.42	0.53	870.0	1.17	1.08	1.03
900.0	3.72	3.79	0.07	22.14	0.84	900.0	1.18	1.08	1.03
950.0	3.78	3.81	0.03	21.67	0.51	950.0	1.20	1.07	1.02
1002.0	3.83	3.86	0.03	21.25	0.17	1002.0	1.23	1.08	1.01

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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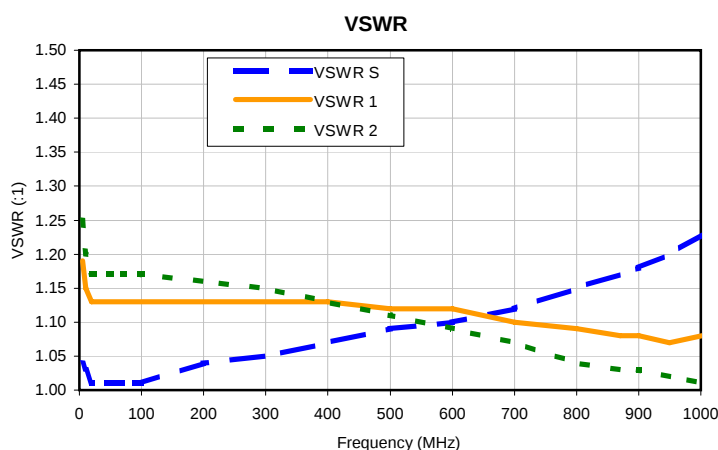
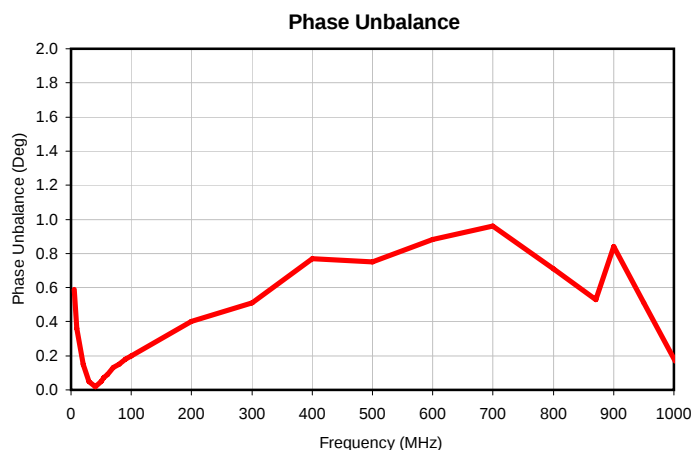
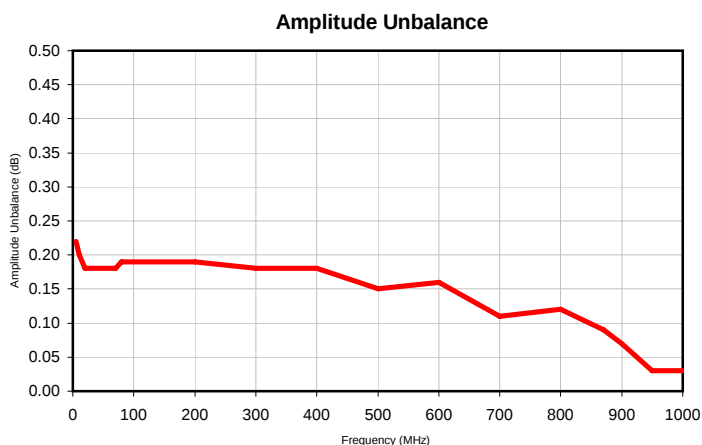
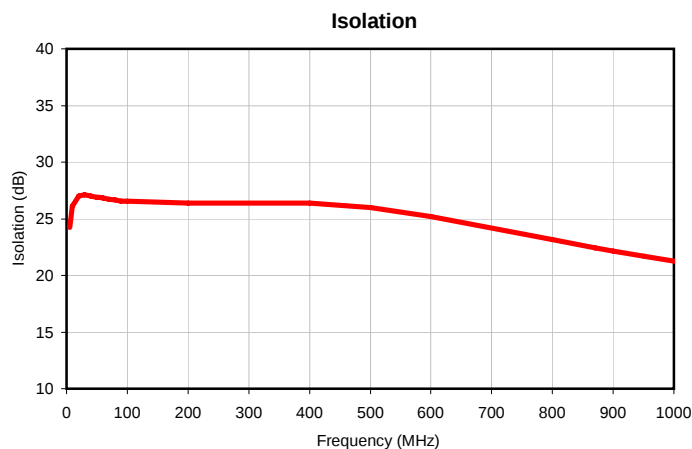
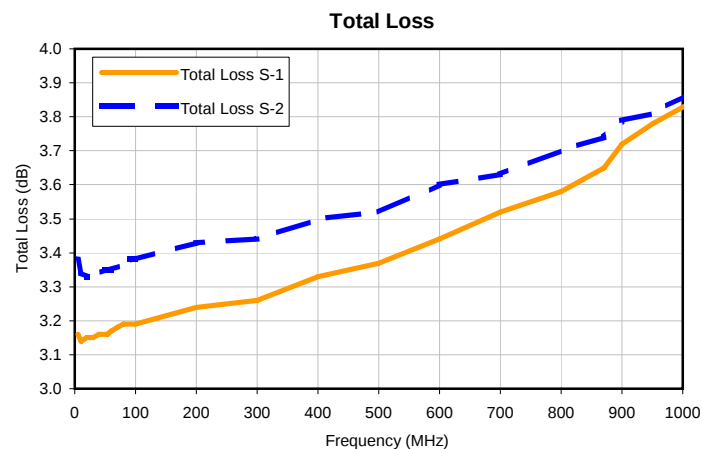
IF/RF MICROWAVE COMPONENTS

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8/31/2010
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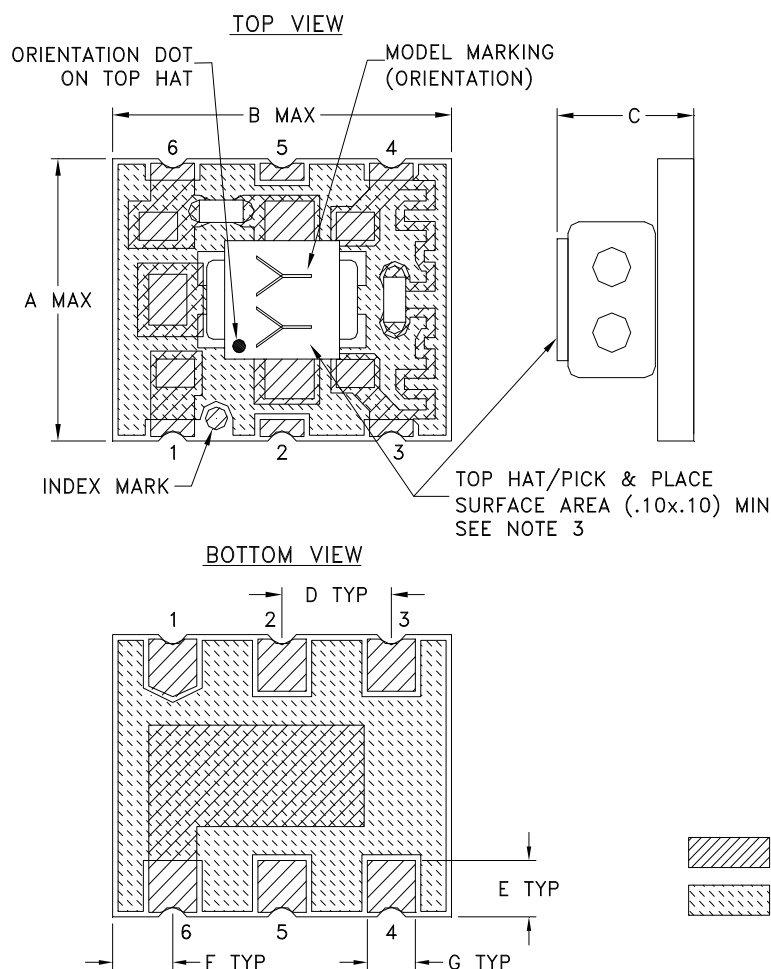
2 Way-0° Power Splitter/Combiner

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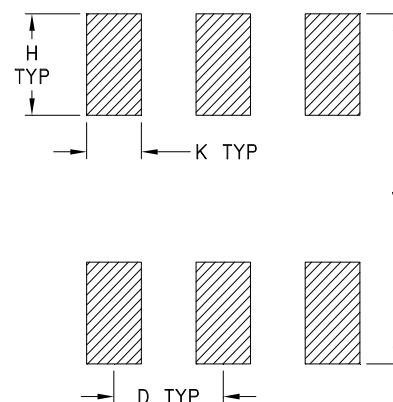
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	WT GRAMS
TT1491-1	.255 (6.48)	.310 (7.87)	.133 (3.38)	.100 (2.54)	.050 (1.27)	.055 (1.40)	.044 (1.12)	.090 (2.29)	.310 (7.87)	.050 (1.27)	.35

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Open style, Base material: Printed wiring laminate.
- Termination finish: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.
- Top-Hat total thickness: .013 inches MAX.
- Orientation Dot on Top Hat & PCB corresponds to Pin #1.



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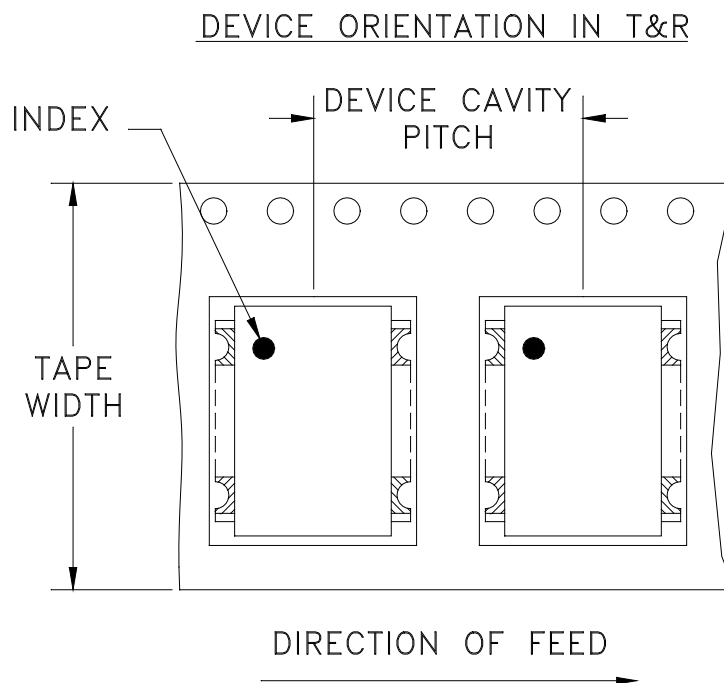


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RF/IF MICROWAVE COMPONENTS



Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500
			1000

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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REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M125940	NEW RELEASE	06/28/10	AV	JC

Technical drawing of a package outline showing dimensions and features:

- Dimensions:**
 - Overall width: $.060$
 - Overall height: $.105$
 - Top section height: $.025$
 - Bottom section height: $.030$
 - Central section height: $.070$
 - Bottom section width: $.035$
 - Pin pitch: $.050$ TYP
- Features:**
 - PIN 1:** Indicated by a circle with a dot.
 - PTH (Plated Through Hole):** $\phi .020$ PTH 7 PL.
 - TRACE WIDTH:** $.030$ TRACE WIDTH, 3 PL. (SEE NOTE BELOW)
 - PACKAGE OUTLINE:** Indicated by a dashed line.

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

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE	
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±		DRAWN	AV	06/22/10	
		CHECKED	MMG	06/28/10	
		APPROVED	JC	06/28/10	



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PL, 06SP01, 75, TT1491, TB-565+

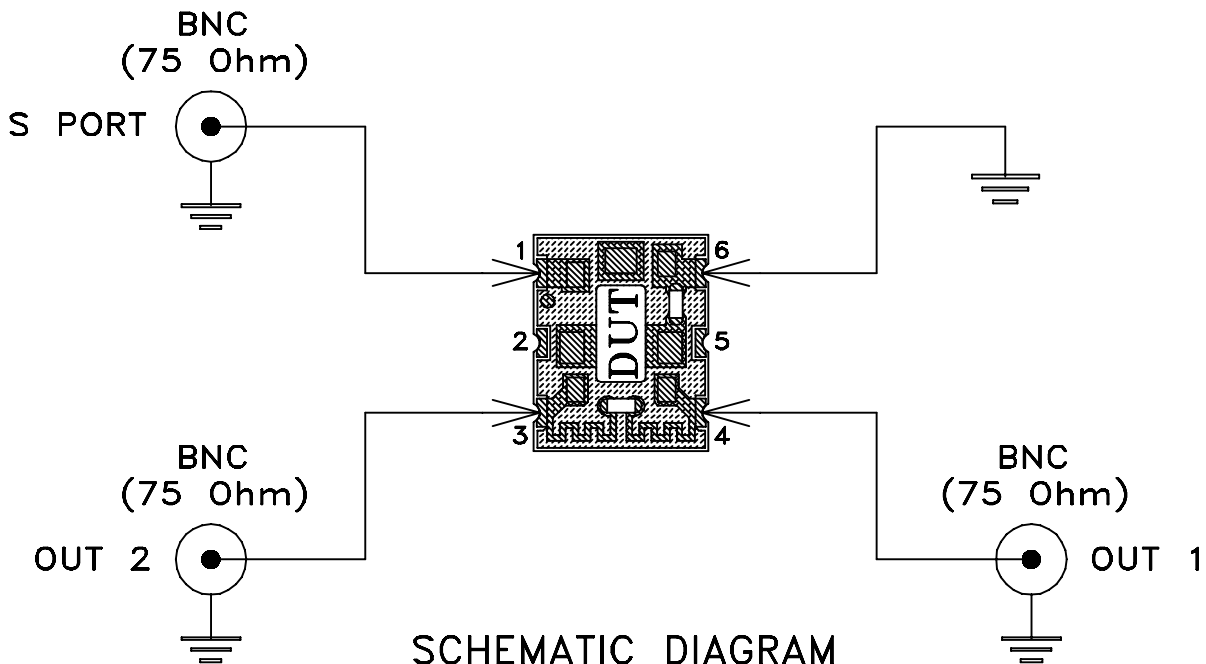
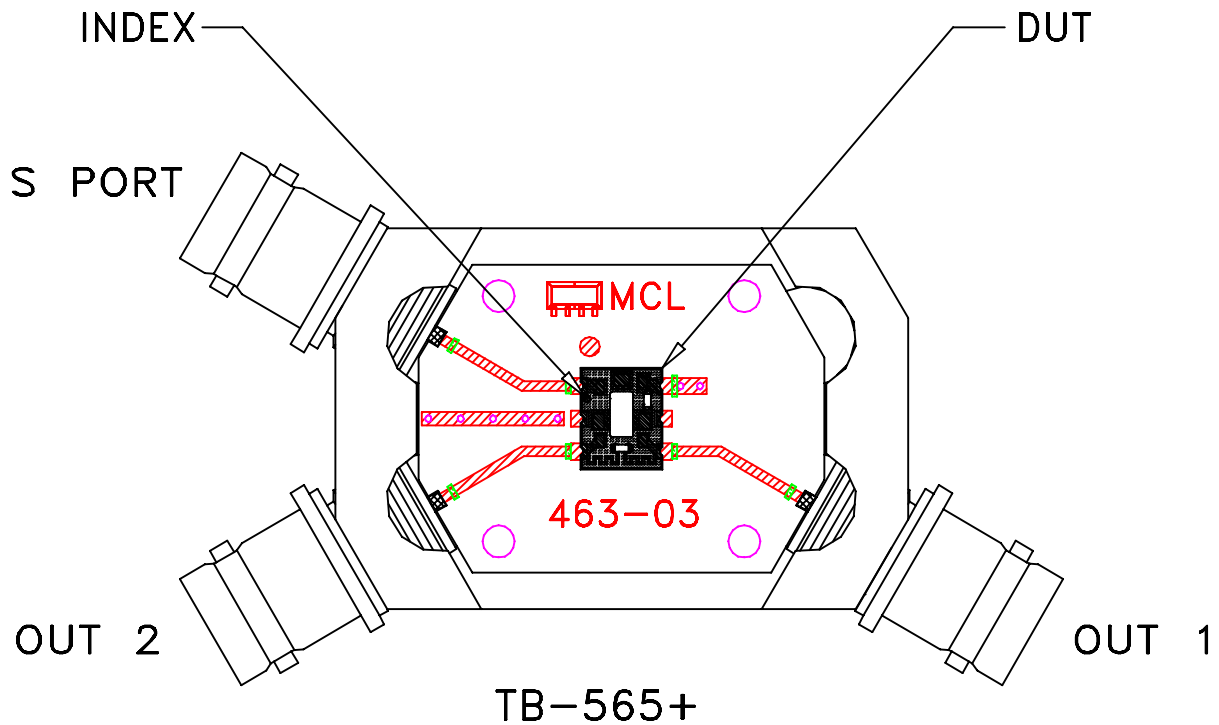
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ASHEETA1.DWG REV:A DATE:01/12/95

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-327		REV: OR
FILE: 98PL327		SCALE: 8:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



Notes:

1. 75 Ohm BNC connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, 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	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215