

Surface Mount

Power Splitter/Combiner SXPS-4-13-75+

4 Way-0° 75Ω 5 to 1300 MHz

The Big Deal

- Wideband, 5 to 1300 MHz
- High isolation, 24 dB
- Low insertion loss, 1.5 dB
- Low unbalance, 0.25 dB, 1.0°



CASE STYLE: HF1485

Product Overview

Mini-Circuits' SXPS-4-15-75+ is a 75Ω 4-way 0° surface-mount power splitter/combiner covering the 5 to 1300 MHz frequency range, supporting bandwidth requirements for DOCSIS® 3.1 systems and equipment, as well as other broadband applications. This model can handle up to 0.25W RF input power as a splitter, and provides low insertion loss and low phase and amplitude unbalance. It comes housed in a miniature, shielded package (0.44 x 0.74 x 0.19") with wraparound terminations for excellent solderability.

Key Features

Feature	Advantages
Wideband, 5 to 1300 MHz	Suitable for many broadband applications including DOCSIS® 3.1 systems and equipment, VHF/UHF, CATV, cellular, and more.
Low insertion loss, 1.5 dB	The combination of 0.25W power handling and low insertion loss makes it a suitable candidate for distributing signals while maintaining signal power.
Good isolation, 24 dB	Minimizes interference between ports
Low unbalance: <ul style="list-style-type: none">• 0.25 dB amplitude unbalance• 1.0° phase unbalance	This model produces nearly equal output signals, making it ideal for use in parallel path/multichannel systems.
Good VSWR, 1.2:1 typ.	Provides excellent thru-path transmission with low signal reflection.

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



Power Splitter/Combiner

SXPS-4-13-75+

4 Way-0° 75Ω 5 to 1300 MHz

Maximum Ratings

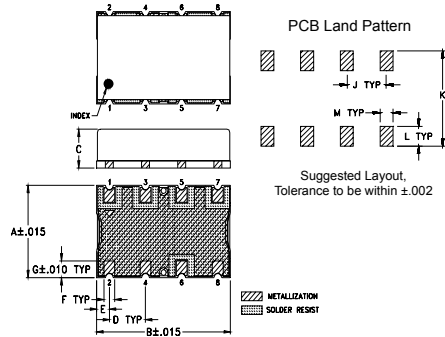
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.25W max.
Internal Dissipation	0.15W max.

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

Pin Connections

SUM PORT	6
PORT 1	1
PORT 2	3
PORT 3	5
PORT 4	7
GROUND	2,4,8

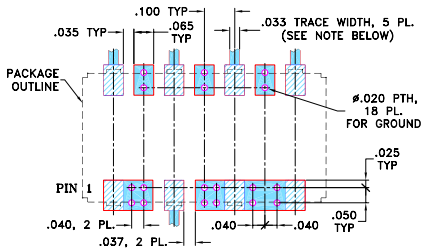
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.440	.740	.19	.200	.07	.060	.080
11.18	18.80	4.83	5.08	1.78	1.52	2.03
H	J	K	L	M	wt	
-	.200	.480	.100	.065	grams	
-	5.08	12.19	2.54	1.65	2.50	

Demo Board MCL P/N: TB-218 Suggested PCB Layout (PL-149)

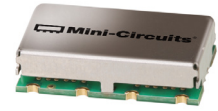


Features

- high isolation, 24 dB typ.
- excellent input matching, VSWR 1.15 typ.
- very good output matching VSWR, 1.20 typ.
- excellent amplitude unbalance, 0.25 dB typ
- aqueous washable
- shielded case

Applications

- DOCSIS 3.1 systems
- catv
- VHF/UHF
- communication systems
- instrumentation



Generic photo used for illustration purposes only

CASE STYLE: HF1485

+RoHS Compliant

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

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1300	MHz
Insertion Loss (above theoretical 6.0 dB)	5 - 1300	—	1.5	2.3	dB
	5 - 1218	—	1.2	2.1	
Isolation	5 - 1300	15	22	—	dB
	50 - 1218	18	24	—	
Phase Unbalance	5 - 1300	—	1.0	6.0	Degree
	5 - 1218	—	1.0	5.0	
Amplitude Unbalance	5 - 1300	—	0.25	0.6	dB
	5 - 1218	—	0.15	0.5	
VSWR (Port S)	5 - 1300	—	1.15	1.3	:1
VSWR (Port 1-4)	5 - 1300	—	1.5	1.95	:1
	50 - 1218	—	1.2	1.45	

Electrical Schematic



Notes

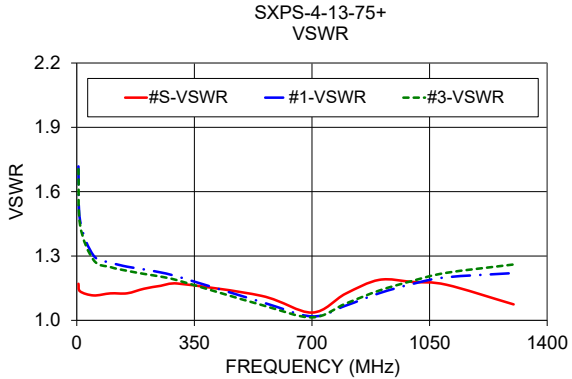
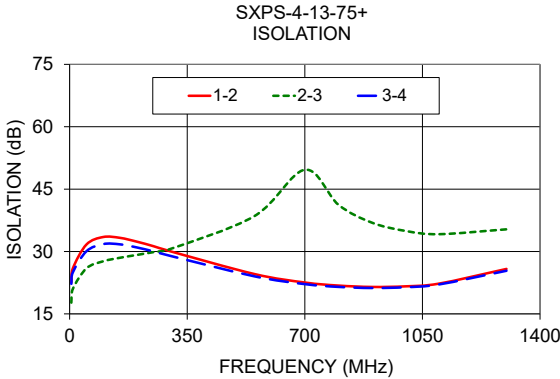
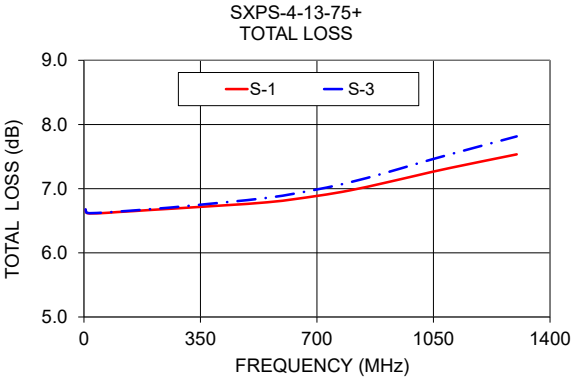
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Typical Performance Data

Freq. (MHz)	Total Loss ¹ (dB)				Amp. Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR S	VSWR 1	VSWR 2	VSWR 3	VSWR 4
	S-1	S-2	S-3	S-4		1-2	2-3	3-4						
5.0	6.67	6.68	6.68	6.68	0.01	22.52	17.71	22.23	0.01	1.17	1.72	1.72	1.71	1.70
10.0	6.62	6.62	6.62	6.63	0.01	26.03	21.09	25.07	0.03	1.13	1.46	1.46	1.44	1.44
50.0	6.62	6.63	6.62	6.63	0.01	31.68	25.95	30.06	0.04	1.12	1.30	1.30	1.28	1.28
100.0	6.63	6.65	6.64	6.65	0.01	33.49	27.65	31.79	0.09	1.13	1.27	1.27	1.25	1.25
150.0	6.65	6.66	6.66	6.67	0.02	33.28	28.50	31.72	0.14	1.13	1.25	1.25	1.23	1.23
200.0	6.67	6.68	6.68	6.68	0.01	32.37	29.18	30.98	0.20	1.15	1.24	1.24	1.22	1.22
250.0	6.68	6.70	6.70	6.70	0.02	31.27	29.86	30.02	0.25	1.16	1.22	1.22	1.20	1.20
300.0	6.70	6.72	6.72	6.72	0.03	30.05	30.62	28.94	0.31	1.17	1.20	1.20	1.19	1.19
550.0	6.79	6.82	6.86	6.83	0.07	24.58	38.52	24.03	0.56	1.11	1.09	1.09	1.07	1.08
700.0	6.89	6.93	6.99	6.93	0.10	22.54	49.66	22.16	0.73	1.04	1.02	1.00	1.01	1.01
800.0	6.97	7.03	7.10	7.02	0.13	21.81	41.23	21.49	0.78	1.12	1.07	1.06	1.08	1.05
900.0	7.09	7.15	7.24	7.13	0.15	21.48	36.92	21.22	0.84	1.19	1.13	1.12	1.14	1.10
1000.0	7.21	7.29	7.39	7.25	0.18	21.63	34.94	21.41	0.93	1.18	1.17	1.17	1.18	1.14
1100.0	7.32	7.41	7.54	7.37	0.21	22.29	34.17	22.10	1.00	1.17	1.20	1.22	1.22	1.19
1300.0	7.53	7.66	7.81	7.58	0.28	25.81	35.33	25.37	1.28	1.07	1.22	1.25	1.26	1.21

1. Total Loss = Insertion Loss + 6 dB splitter theoretical loss.



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4 Way-0° Power Splitter/Combiner

SXPS-4-13-75+

Typical Performance Data

FREQ. (MHz)	TOTAL LOSS ¹ (dB)				AMP. UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (deg.)	FREQ. (MHz)	VSWR (:1)				
	S-1	S-2	S-3	S-4		1-2	2-3	3-4			S	1	2	3	4
5	6.67	6.68	6.68	6.68	0.01	22.52	17.71	22.23	0.01	5	1.17	1.72	1.72	1.71	1.70
7	6.64	6.64	6.65	6.65	0.01	24.67	19.66	24.00	0.01	7	1.15	1.56	1.56	1.54	1.54
10	6.62	6.62	6.62	6.63	0.01	26.03	21.09	25.07	0.03	10	1.13	1.46	1.46	1.44	1.44
30	6.61	6.62	6.62	6.63	0.01	29.77	24.50	28.33	0.02	30	1.12	1.33	1.33	1.31	1.31
50	6.62	6.63	6.62	6.63	0.01	31.68	25.95	30.06	0.04	50	1.12	1.30	1.30	1.28	1.28
80	6.63	6.64	6.63	6.64	0.01	33.10	27.16	31.39	0.07	80	1.12	1.28	1.28	1.26	1.26
100	6.63	6.65	6.64	6.65	0.01	33.49	27.65	31.79	0.09	100	1.13	1.27	1.27	1.25	1.25
150	6.65	6.66	6.66	6.67	0.02	33.28	28.50	31.72	0.14	150	1.13	1.25	1.25	1.23	1.23
200	6.67	6.68	6.68	6.68	0.01	32.37	29.18	30.98	0.20	200	1.15	1.24	1.24	1.22	1.22
250	6.68	6.70	6.70	6.70	0.02	31.27	29.86	30.02	0.25	250	1.16	1.22	1.22	1.20	1.20
300	6.70	6.72	6.72	6.72	0.03	30.05	30.62	28.94	0.31	300	1.17	1.20	1.20	1.19	1.19
350	6.71	6.73	6.75	6.74	0.03	28.80	31.58	27.84	0.36	350	1.18	1.18	1.18	1.17	1.17
400	6.73	6.75	6.77	6.76	0.04	27.60	32.73	26.78	0.40	400	1.17	1.16	1.16	1.15	1.15
450	6.75	6.77	6.80	6.77	0.05	26.51	34.20	25.79	0.45	450	1.17	1.14	1.14	1.12	1.13
500	6.77	6.80	6.82	6.80	0.06	25.52	36.00	24.88	0.53	500	1.15	1.11	1.11	1.10	1.11
550	6.79	6.82	6.86	6.83	0.07	24.58	38.52	24.03	0.56	550	1.11	1.09	1.09	1.07	1.08
600	6.82	6.85	6.90	6.86	0.08	23.80	41.95	23.32	0.60	600	1.08	1.06	1.06	1.04	1.06
650	6.85	6.88	6.94	6.89	0.09	23.09	47.19	22.66	0.68	650	1.07	1.03	1.03	1.02	1.04
700	6.89	6.93	6.99	6.93	0.10	22.54	49.66	22.16	0.73	700	1.04	1.02	1.00	1.01	1.01
750	6.93	6.98	7.04	6.97	0.11	22.12	45.15	21.77	0.76	750	1.06	1.04	1.03	1.04	1.02
800	6.97	7.03	7.10	7.02	0.13	21.81	41.23	21.49	0.78	800	1.12	1.07	1.06	1.08	1.05
850	7.03	7.09	7.17	7.08	0.14	21.59	38.73	21.31	0.80	850	1.15	1.10	1.09	1.11	1.07
870	7.05	7.12	7.19	7.10	0.14	21.53	37.94	21.26	0.85	870	1.16	1.11	1.10	1.12	1.08
900	7.09	7.15	7.24	7.13	0.15	21.48	36.92	21.22	0.84	900	1.19	1.13	1.12	1.14	1.10
950	7.14	7.22	7.31	7.19	0.17	21.51	35.75	21.27	0.90	950	1.21	1.15	1.15	1.16	1.12
1000	7.21	7.29	7.39	7.25	0.18	21.63	34.94	21.41	0.93	1000	1.18	1.17	1.17	1.18	1.14
1100	7.32	7.41	7.54	7.37	0.21	22.29	34.17	22.10	1.00	1100	1.17	1.20	1.22	1.22	1.19
1200	7.43	7.53	7.67	7.47	0.24	23.63	34.49	23.39	1.14	1200	1.12	1.22	1.24	1.25	1.21
1300	7.53	7.66	7.81	7.58	0.28	25.81	35.33	25.37	1.28	1300	1.07	1.22	1.25	1.26	1.21

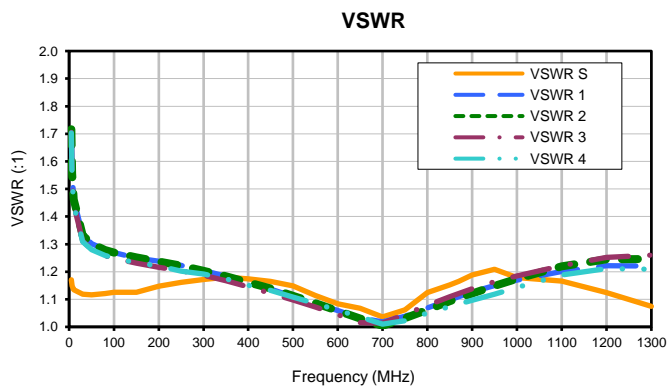
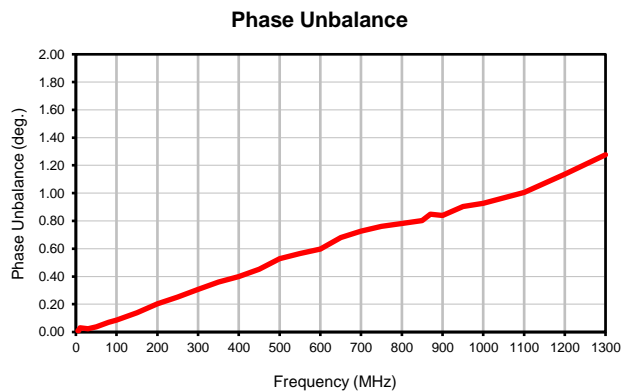
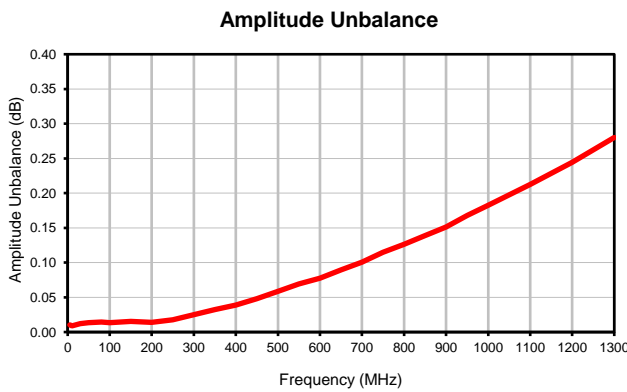
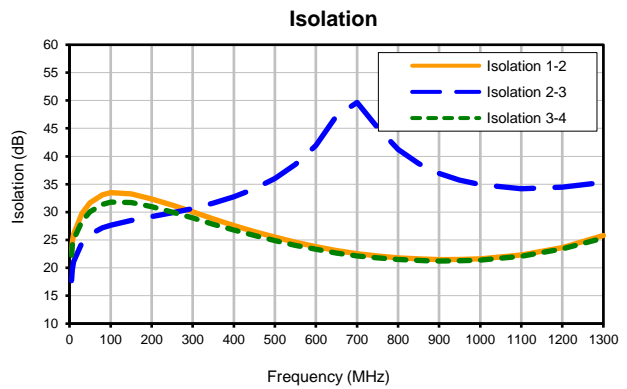
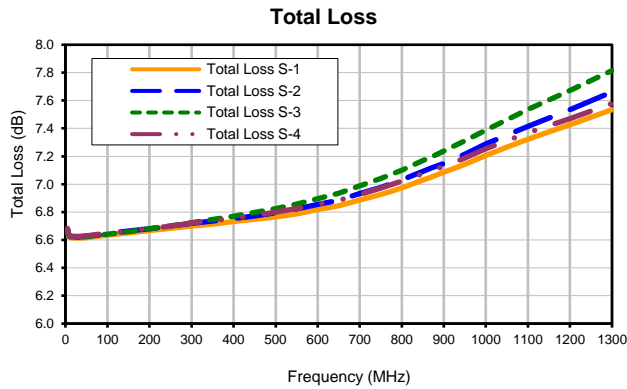
1. Total Loss = Insertion Loss + 6 dB splitter theoretical loss



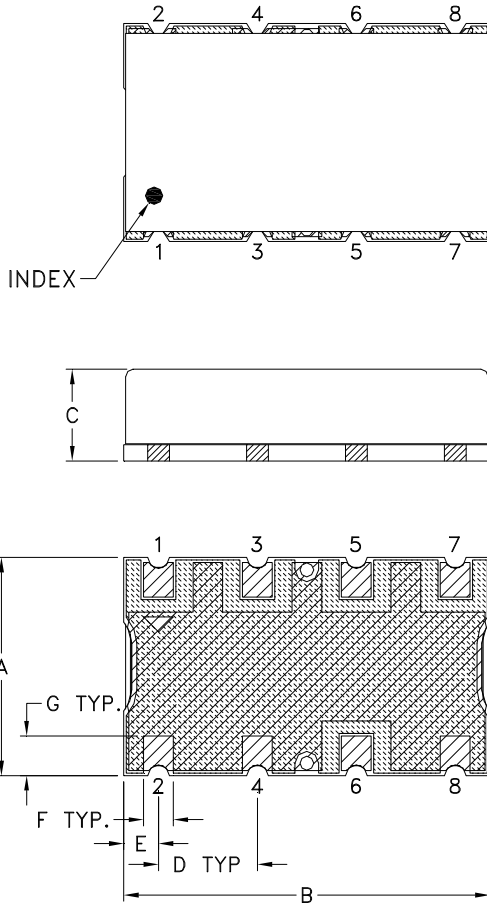
4 Way-0° Power Splitter/Combiner

SXPS-4-13-75+

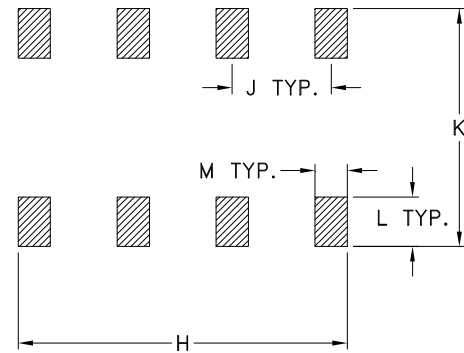
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
HF1485	.44 (11.18)	.74 (18.80)	.19 (4.83)	.200 (5.08)	.07 (1.78)	.060 (1.52)	.080 (2.03)	.665 (16.89)	.200 (5.08)	.480 (12.19)	.100 (2.54)	.065 (1.65)	2.5

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm.015$ "; 3 Pl. $\pm.01$ "

Notes:

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

For RoHS Case Styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.

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



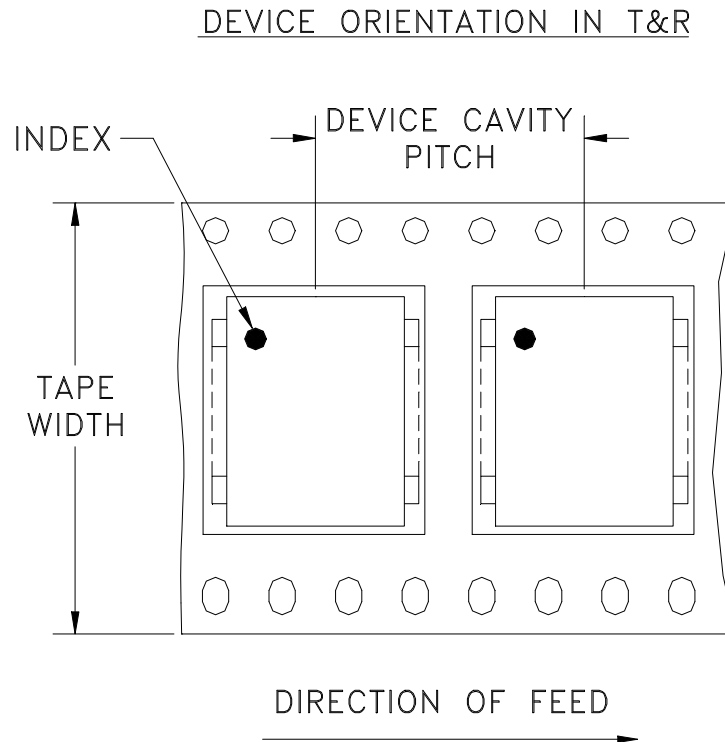
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RFIIF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F5



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	500

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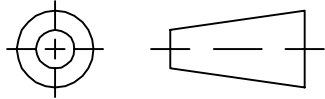
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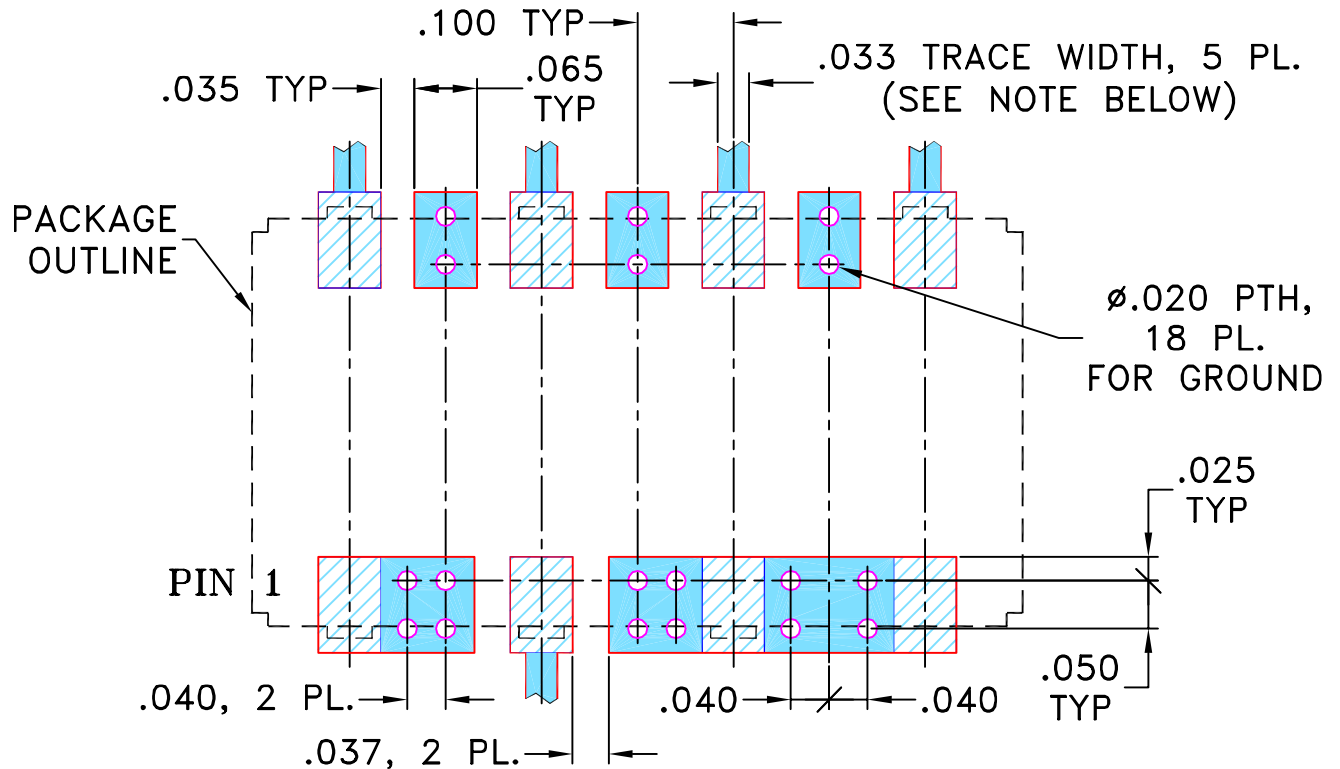
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M90087	NEW RELEASE	12/18/03	AV	HY
A	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

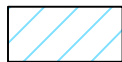
SUGGESTED MOUNTING CONFIGURATION FOR BJ360 CASE STYLE, "kb" PIN CONNECTION



- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; 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

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN AV	12/11/03
TOLERANCES ON:	CHECKED IL	12/18/03
2 PL DECIMALS ±	APPROVED HY	12/18/03
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		



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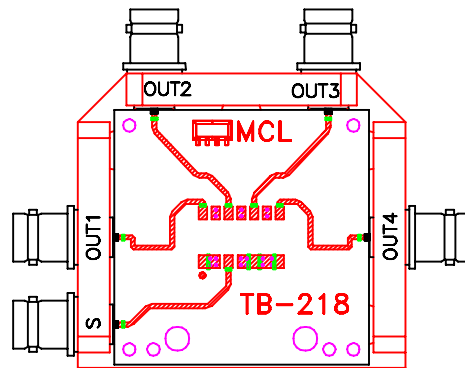
13 Neptune Avenue
Brooklyn NY 11235

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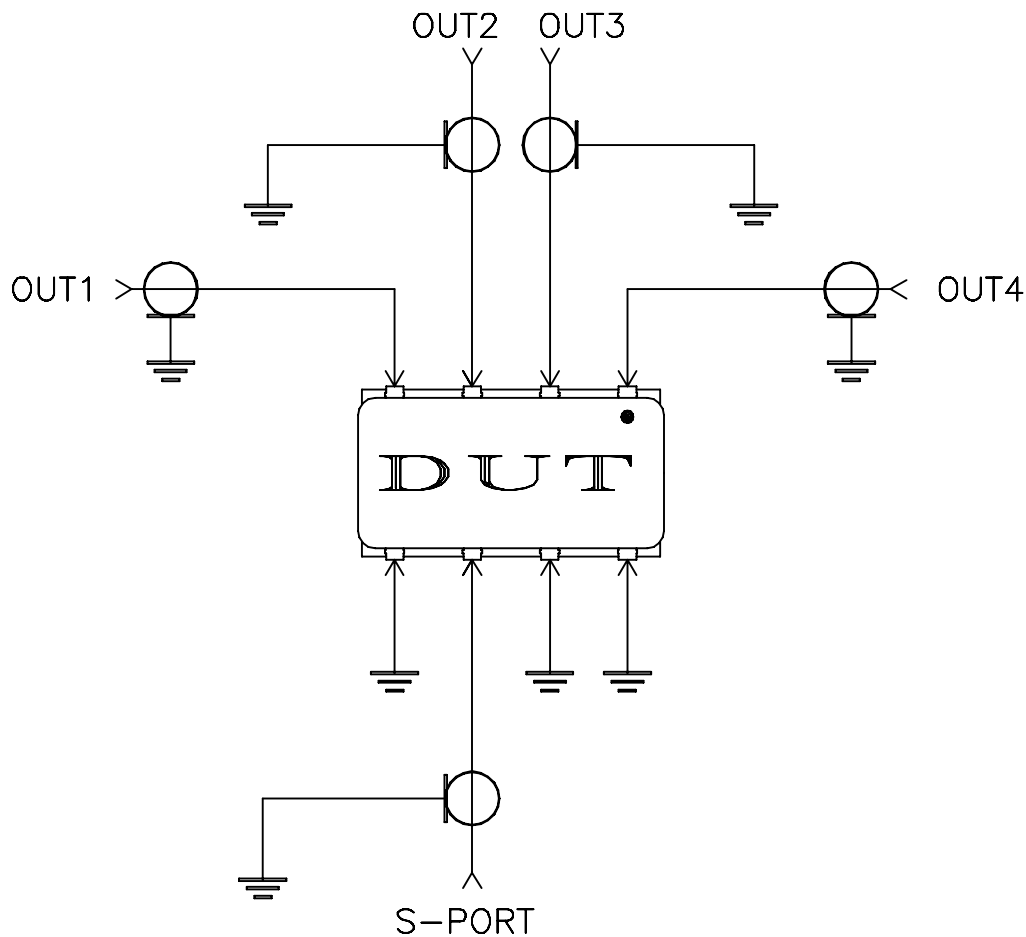
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-149	REV: A
FILE: 98PL149	SCALE: 5:1	SHEET: 1 OF 1	

Evaluation Board and Circuit




TB-218



Schematic Diagram

Notes:

1. BNC Female connectors.
2. PCB Material: Rogers 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