

Surface Mount

Power Splitter/Combiner

SBTC-2-22-75L+

2 Way-0° 75Ω 500 to 2150 MHz

Features

- low insertion loss, 1.5 dB typ.
- excellent isolation 25 dB typ.
- very good phase unbalance, 1 deg. typ.
- small size, 0.166"x0.150"x0.155"
- temperature stable LTCC base
- small size
- low cost
- aqueous washable
- protected by US patent 6,963,255

Applications

- internet over satellite modems
- VSAT
- L-Band

For Model
without Leads see
[SBTC-2-22-75+](#)



Generic photo used for illustration purposes only

CASE STYLE: AT1029

+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"	20, 50, 100, 200, 500
13"	1000, 2000

Electrical Specifications

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		500		2150	MHz
Insertion Loss Above 3.0 dB	500 - 2150	—	1.9	2.5	dB
	700 - 1500	—	0.9	1.6	
	950 - 2150	—	1.9	2.5	
Isolation	500 - 2150	16	28	—	dB
	700 - 1500	16	28	—	
	950 - 2150	16	25	—	
Phase Unbalance	500 - 2150	—	2	7	Degree
	700 - 1500	—	1	4	
	950 - 2150	—	2	7	
Amplitude Unbalance	500 - 2150	—	0.7	1.2	dB
	700 - 1500	—	0.4	0.8	
	950 - 2150	—	0.7	1.2	
VSWR (Port-S)	500 - 2150	—	1.8	2.2	:1
	700 - 1500	—	1.2	1.5	
	950 - 2150	—	1.8	2.2	
VSWR (Port 1-2)	500 - 2150	—	1.4	2.2	:1
	700 - 1500	—	1.2	1.6	
	950 - 2150	—	1.4	2.2	

Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.125W max

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

Pin Connections

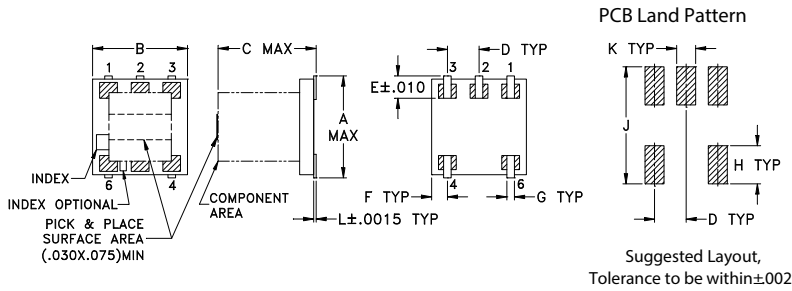
Function	Pin Number
SUM PORT	6
PORT 1	3
PORT 2	4
GROUND	1,2
NOT USED	5

Electrical Schematic



SBTC-2-22-75L+

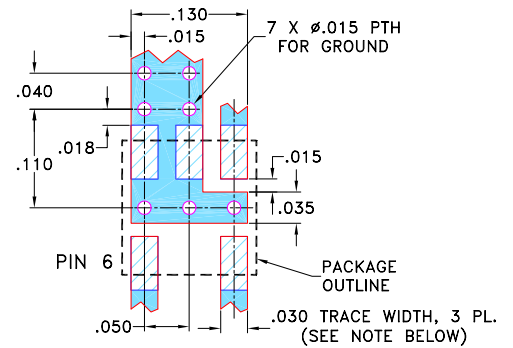
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K	L	wt
.166	.150	.155	.050	.037	.025	.012	.060	.184	.030	.004	grams
4.22	3.81	3.94	1.27	0.94	0.64	0.30	1.52	4.67	0.76	0.10	0.10

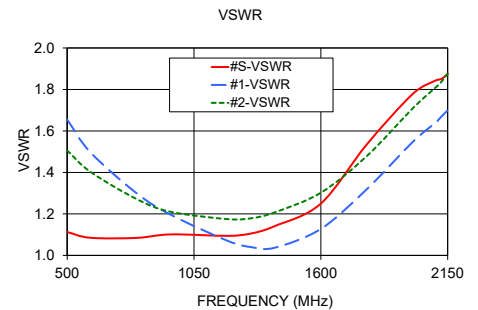
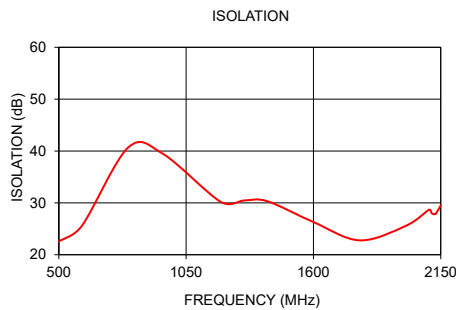
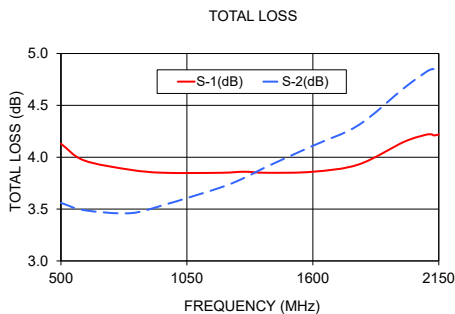
Demo Board MCL P/N: TB-277 Suggested PCB Layout (PL-153)



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						
500	4.13	3.56	0.57	22.55	1.86	1.11	1.65	1.51
600	3.97	3.49	0.48	25.60	0.96	1.08	1.50	1.40
800	3.88	3.46	0.42	40.69	0.05	1.08	1.30	1.27
950	3.85	3.54	0.31	39.45	0.38	1.10	1.20	1.21
1200	3.85	3.71	0.14	30.18	0.29	1.09	1.07	1.17
1300	3.86	3.80	0.05	30.46	0.36	1.11	1.04	1.18
1400	3.85	3.91	0.06	30.33	0.40	1.14	1.04	1.21
1600	3.86	4.11	0.25	26.30	0.53	1.25	1.13	1.30
1800	3.93	4.31	0.38	22.77	0.72	1.54	1.32	1.48
2000	4.15	4.67	0.52	25.59	0.20	1.78	1.55	1.71
2100	4.22	4.83	0.61	28.68	0.41	1.84	1.64	1.81
2110	4.22	4.84	0.62	28.05	0.45	1.85	1.65	1.82
2120	4.22	4.85	0.63	27.82	0.48	1.85	1.67	1.83
2130	4.21	4.85	0.64	27.98	0.51	1.86	1.68	1.85
2150	4.22	4.87	0.65	29.51	0.62	1.88	1.70	1.88

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



Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- 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

SBTC-2-22-75L+

Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS ¹		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR		
	(dB)						(:1)		
	S-1	S-2					S	1	2
400.0	4.40	3.69	0.71	19.95	2.59	400.0	1.19	1.86	1.63
500.0	4.13	3.56	0.57	22.55	1.86	500.0	1.11	1.65	1.51
550.0	4.05	3.49	0.55	24.19	1.49	550.0	1.09	1.57	1.45
600.0	3.97	3.49	0.48	25.60	0.96	600.0	1.08	1.50	1.40
650.0	3.93	3.47	0.46	28.13	0.96	650.0	1.08	1.44	1.35
700.0	3.90	3.44	0.45	30.00	0.29	700.0	1.08	1.39	1.32
750.0	3.88	3.49	0.39	33.60	0.28	750.0	1.08	1.34	1.29
800.0	3.88	3.46	0.42	40.69	0.05	800.0	1.08	1.30	1.27
850.0	3.85	3.51	0.35	42.44	0.21	850.0	1.09	1.26	1.25
900.0	3.88	3.51	0.36	40.49	0.17	900.0	1.10	1.23	1.23
950.0	3.85	3.54	0.31	39.45	0.38	950.0	1.10	1.20	1.21
1000.0	3.87	3.56	0.30	33.22	0.30	1000.0	1.10	1.17	1.20
1100.0	3.86	3.63	0.23	30.81	0.30	1100.0	1.10	1.11	1.18
1200.0	3.85	3.71	0.14	30.18	0.29	1200.0	1.09	1.07	1.17
1300.0	3.86	3.80	0.05	30.46	0.36	1300.0	1.11	1.04	1.18
1400.0	3.85	3.91	0.06	30.33	0.40	1400.0	1.14	1.04	1.21
1500.0	3.85	4.00	0.15	28.78	0.44	1500.0	1.19	1.07	1.24
1600.0	3.86	4.11	0.25	26.30	0.53	1600.0	1.25	1.13	1.30
1700.0	3.87	4.20	0.33	23.88	0.70	1700.0	1.37	1.21	1.38
1800.0	3.93	4.31	0.38	22.77	0.72	1800.0	1.54	1.32	1.48
1900.0	4.04	4.48	0.44	23.33	0.59	1900.0	1.69	1.44	1.60
2000.0	4.15	4.67	0.52	25.59	0.20	2000.0	1.78	1.55	1.71
2100.0	4.22	4.83	0.61	28.68	0.41	2100.0	1.84	1.64	1.81
2110.0	4.22	4.84	0.62	28.05	0.45	2110.0	1.85	1.65	1.82
2120.0	4.22	4.85	0.63	27.82	0.48	2120.0	1.85	1.67	1.83
2130.0	4.21	4.85	0.64	27.98	0.51	2130.0	1.86	1.68	1.85
2140.0	4.22	4.86	0.64	28.54	0.56	2140.0	1.86	1.69	1.86
2150.0	4.22	4.87	0.65	29.51	0.62	2150.0	1.88	1.70	1.88
2175.0	4.25	4.93	0.68	30.59	0.83	2175.0	1.91	1.72	1.89
2200.0	4.25	4.97	0.72	26.46	0.84	2200.0	1.93	1.74	1.90

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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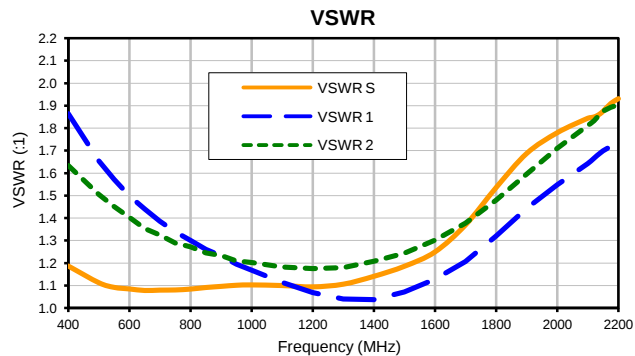
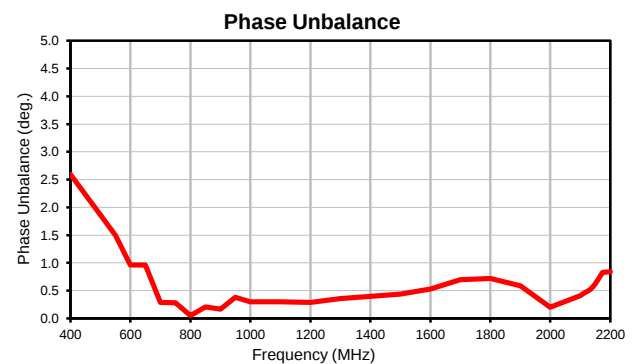
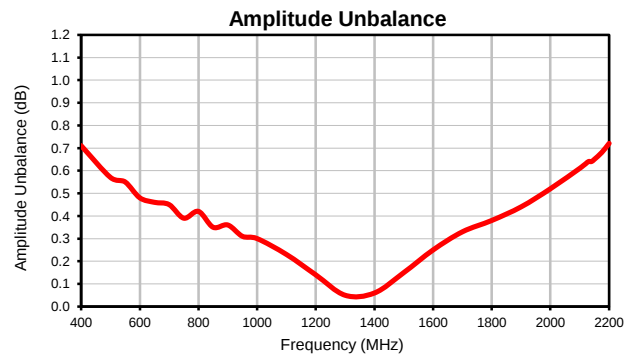
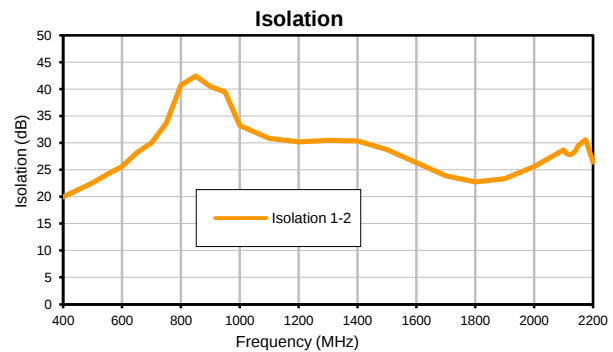
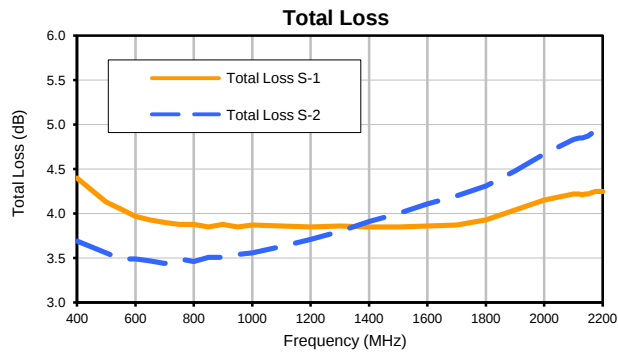
IF/RF MICROWAVE COMPONENTS

REV. OR
 SBTC-2-22-75L+
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2 Way-0° Power Splitter/Combiner

SBTC-2-22-75L+

Typical Performance Curves



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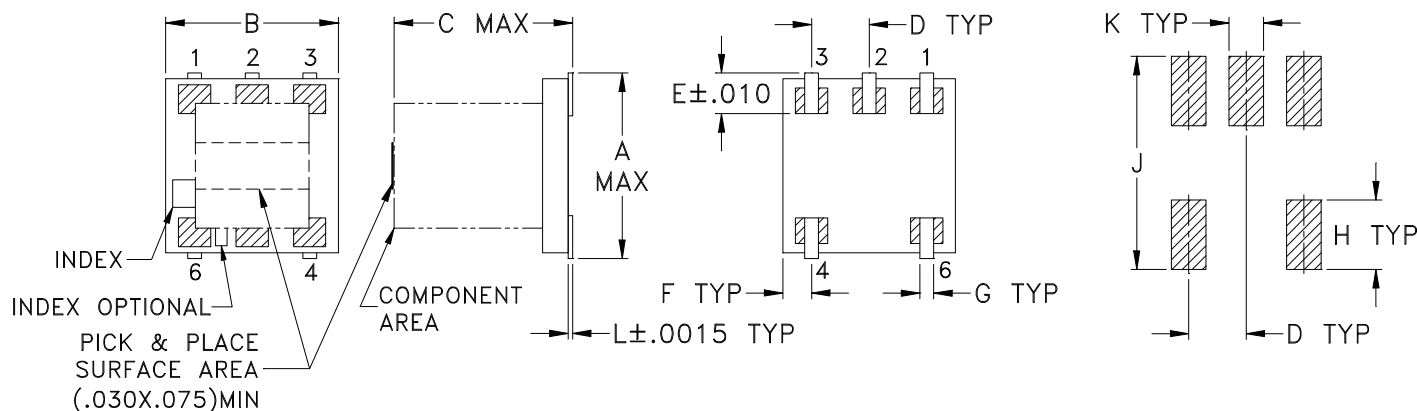
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Outline Dimensions

AT1029

PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT1029	.166 (4.22)	.150 (3.81)	.155 (3.94)	.050 (1.27)	.037 (0.94)	.025 (0.64)	.012 (0.30)	.060 (1.52)	.184 (4.67)	.030 (0.76)	.004 (0.10)	.10

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

Notes:

- Open style, ceramic base.
- Termination finish:
For RoHS Case Styles: Tin plate.
For RoHS-5 Case Styles: Tin-Lead plate.



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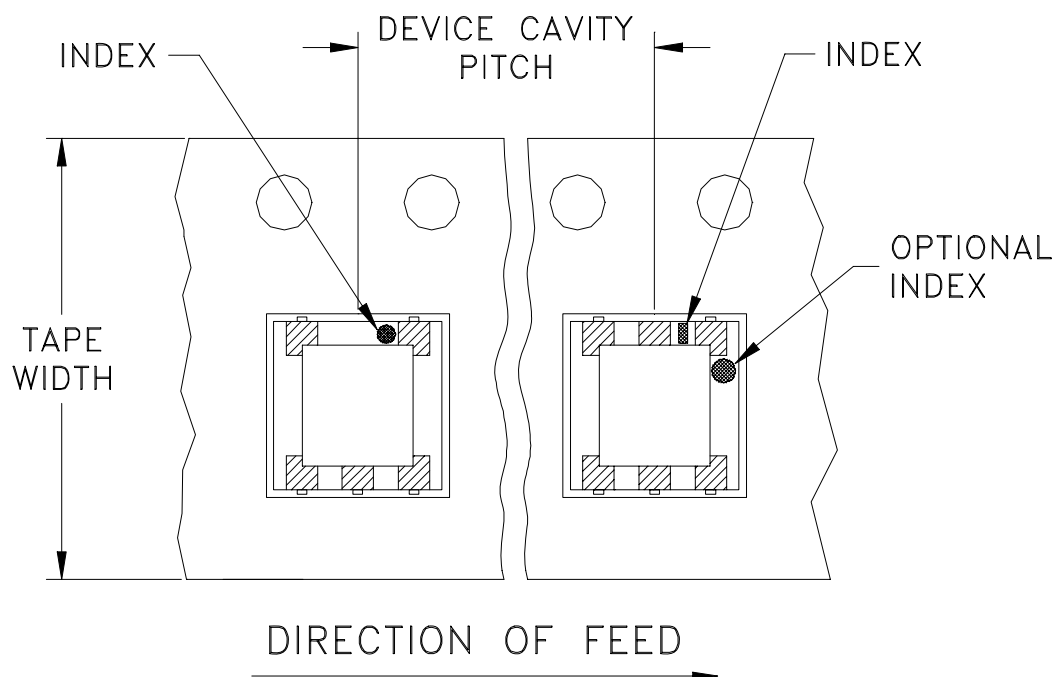


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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F76

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
12	8	7	20
			50
			100
			200
			500
		13	1000
			2000

Note: Please consult individual model data sheet to determine device per reel availability.

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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



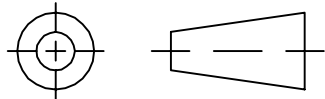
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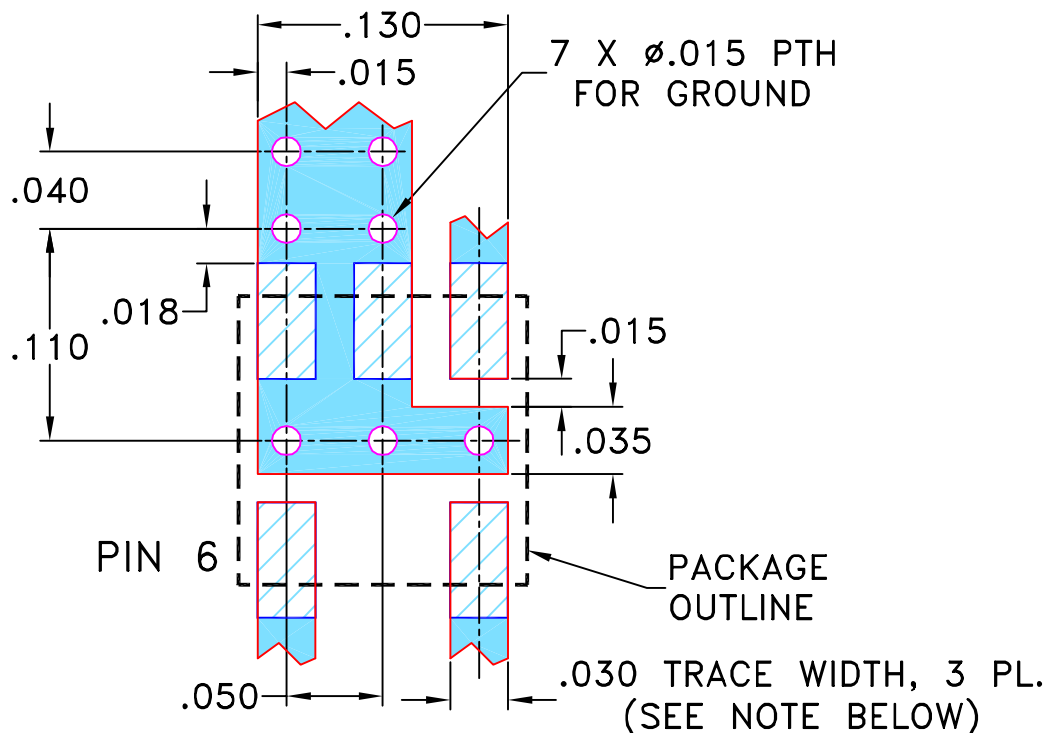
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M90457	NEW RELEASE	01/16/04	AV	WP
A	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR
AT1029 CASE STYLE, "nc" PIN CONNECTION

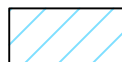


NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" $\pm$ 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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

01/07/04

TOLERANCES ON:

CHECKED

IL

01/16/04

2 PL DECIMALS $\pm$

APPROVED

WP

01/16/04

3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

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



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Brooklyn NY 11235

PL, nc, 75, AT1029, SBTC, TB-277

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-153

REV:

A

FILE:

98PL153

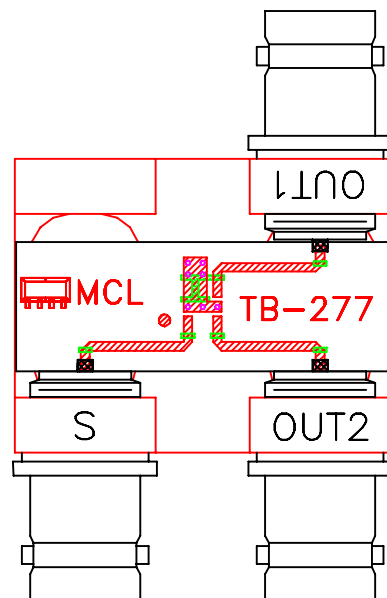
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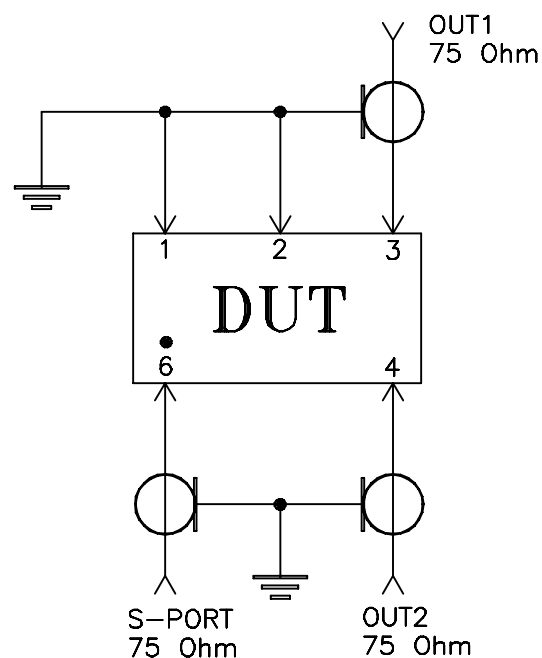
SHEET:

1 OF 1

Evaluation Board and Circuit



TB-277



Schematic Diagram

Notes:

1. 75 Ohm BNC Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

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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