



## SURFACE MOUNT

# Power Splitter/Combiner **SCA-4-10-75+**

4 Way-0° 75Ω 10 to 1000 MHz

### FEATURES

- Wideband, 10-1000 MHz
- High isolation, 25 dB typ.
- Good amplitude unbalance, 0.5 dB typ.



Generic photo used for illustration purposes only

CASE STYLE: DZ943

### +RoHS Compliant

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

### APPLICATIONS

- Cellular
- UHF/VHF receivers/transmitters

### ELECTRICAL SPECIFICATIONS AT 25°C<sup>1</sup>

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		10		1000	MHz
Insertion Loss, above 6.0 dB	10-400		1.2	2.3	dB
	400-650		1.5	2.2	
	650-1000		2.0	2.5	
Isolation	10-400	22	30		dB
	400-650	18	25		
	650-1000	15	20		
Phase Unbalance	10-400			6	Degree
	400-650			9	
	650-1000			10	
Amplitude Unbalance	10-400			1.2	dB
	400-650			0.9	
	650-1000			0.9	

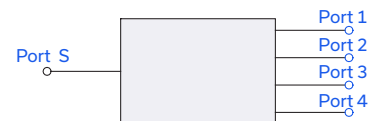
1. Tested on Evaluation Board TB-SCA-4-10-75+

### 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	0.375W max.

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

### ELECTRICAL SCHEMATIC





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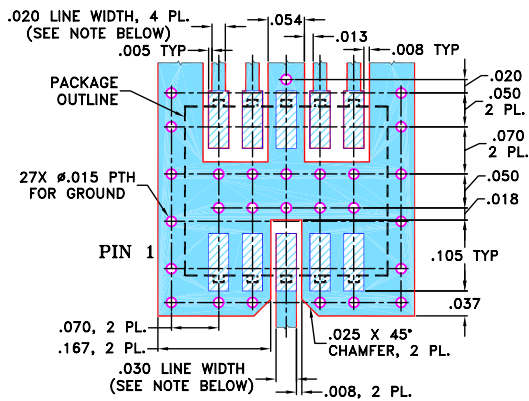
**PIN CONNECTIONS**

SUM PORT (PORT S)	3
PORT 1	6
PORT 2	7
PORT 3	9
PORT 4	10
GROUND	1,2,4,5,8

**\*PRODUCT MARKING:** SCA-4-10-75

\*Marking may contain other features or characters for internal lot control

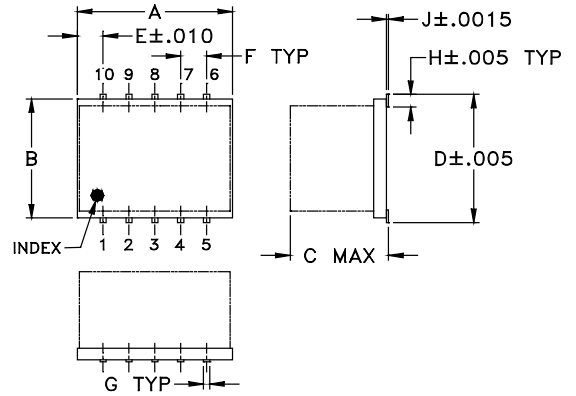
**EVALUATION BOARD MCL P/N: TB-SCA-4-10-75+  
SUGGESTED PCB LAYOUT (PL-133)**



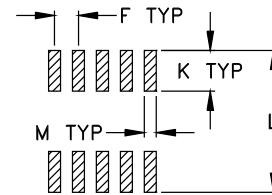
**NOTE:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350 WITH DIELECTRIC THICKNESS 0.030" ± 0.002", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

**OUTLINE DRAWING**



**PCB Land Pattern**



**OUTLINE DIMENSIONS (Inches/mm)**

A	B	C	D	E	F	G
.30	.250	.190	.266	.050	.050	.012
7.62	6.35	4.83	6.76	1.27	1.27	0.30
H	J	K	L	M		wt
.029	.004	.085	.296	.030		grams
0.74	0.10	2.16	7.52	0.76		0.5

**TAPE & REEL INFORMATION: F34**





# SURFACE MOUNT

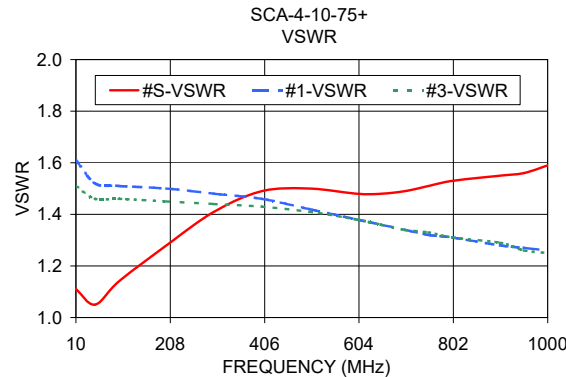
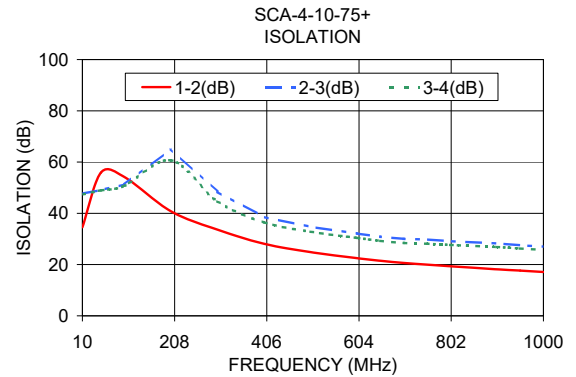
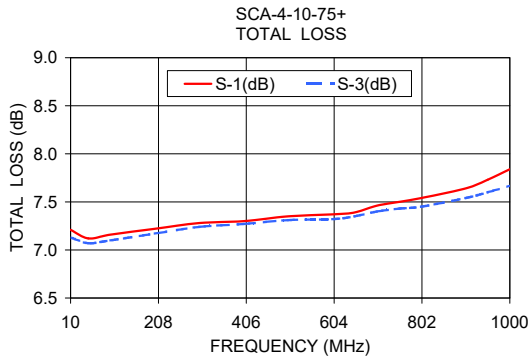
# Power Splitter/Combiner SCA-4-10-75+

4 Way-0° 75Ω 10 to 1000 MHz

### TYPICAL PERFORMANCE DATA

Frequency (MHz)	Total Loss <sup>1</sup> (dB)				Amplitude Unbalance (dB)	Isolation (dB)			Phase Unbalance (deg.)	VSWR (:1)				
	S-1	S-2	S-3	S-4		1-2	1-3	2-3		S	1	2	3	4
10.00	7.21	6.78	7.13	7.53	0.74	34.55	47.68	47.34	1.86	1.11	1.61	1.48	1.51	1.64
50.00	7.12	6.75	7.07	7.43	0.68	55.90	49.10	48.97	0.85	1.05	1.52	1.42	1.46	1.57
100.00	7.16	6.77	7.10	7.48	0.71	54.20	51.26	50.69	0.94	1.14	1.51	1.43	1.46	1.55
200.00	7.22	6.87	7.17	7.53	0.66	40.79	65.07	60.68	1.45	1.28	1.50	1.44	1.45	1.52
300.00	7.28	6.95	7.24	7.56	0.61	33.63	48.42	44.66	2.13	1.41	1.48	1.45	1.44	1.49
400.00	7.30	7.01	7.27	7.56	0.55	28.11	38.54	36.47	2.40	1.49	1.46	1.46	1.43	1.45
500.00	7.35	7.03	7.31	7.59	0.56	24.85	34.71	32.80	2.83	1.50	1.42	1.44	1.41	1.41
600.00	7.37	7.02	7.32	7.60	0.58	22.50	32.13	30.41	2.98	1.48	1.38	1.40	1.38	1.36
650.00	7.39	7.04	7.35	7.63	0.59	21.50	30.85	29.23	3.11	1.48	1.36	1.39	1.36	1.34
700.00	7.46	7.11	7.40	7.67	0.56	20.63	30.04	28.44	3.53	1.49	1.34	1.37	1.34	1.33
750.00	7.50	7.14	7.43	7.70	0.56	19.98	29.78	28.11	3.53	1.51	1.32	1.34	1.33	1.31
800.00	7.54	7.15	7.45	7.75	0.59	19.37	29.15	27.66	3.59	1.53	1.31	1.32	1.31	1.30
900.00	7.64	7.26	7.54	7.82	0.56	18.17	28.23	26.83	4.14	1.55	1.28	1.27	1.29	1.29
950.00	7.73	7.31	7.60	7.88	0.57	17.63	27.54	26.25	4.30	1.56	1.27	1.25	1.26	1.29
1000.00	7.84	7.40	7.67	7.98	0.57	17.09	26.99	25.74	4.59	1.59	1.26	1.24	1.25	1.29

1. Total Loss = Insertion Loss + 6.0 dB splitter loss.



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  - 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.
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# 4 Way-0° Power Splitter/Combiner

# SCA-4-10-75+

## Typical Performance Data

FREQ. (MHz)	TOTAL LOSS <sup>1</sup> (dB)				AMP. UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (deg.)	FREQ. (MHz)	VSWR (:1)				
	S-1	S-2	S-3	S-4		1-2	1-3	2-3			S	1	2	3	4
10.0	7.21	6.78	7.13	7.53	0.74	34.55	47.68	47.34	1.86	10.0	1.11	1.61	1.48	1.51	1.64
20.0	7.12	6.73	7.07	7.44	0.71	39.97	49.71	49.42	1.17	20.0	1.03	1.55	1.43	1.47	1.59
30.0	7.10	6.74	7.07	7.41	0.67	44.36	52.11	51.64	0.88	30.0	1.02	1.53	1.43	1.47	1.57
40.0	7.14	6.76	7.09	7.45	0.70	50.25	51.05	50.62	0.72	40.0	1.03	1.53	1.42	1.46	1.57
50.0	7.12	6.75	7.07	7.43	0.68	55.90	49.10	48.97	0.85	50.0	1.05	1.52	1.42	1.46	1.57
60.0	7.12	6.77	7.11	7.44	0.67	57.22	47.96	47.55	0.77	60.0	1.06	1.53	1.42	1.46	1.57
70.0	7.15	6.77	7.09	7.47	0.70	59.48	48.21	47.92	0.80	70.0	1.08	1.52	1.42	1.45	1.56
80.0	7.14	6.77	7.09	7.44	0.67	61.61	49.98	49.57	1.04	80.0	1.10	1.51	1.42	1.45	1.56
90.0	7.16	6.81	7.13	7.47	0.66	57.92	50.92	51.12	0.71	90.0	1.11	1.51	1.42	1.46	1.56
100.0	7.16	6.77	7.10	7.48	0.71	54.20	51.26	50.69	0.94	100.0	1.14	1.51	1.43	1.46	1.55
150.0	7.22	6.83	7.15	7.53	0.70	46.44	55.42	55.32	1.21	150.0	1.21	1.50	1.43	1.45	1.54
200.0	7.22	6.87	7.17	7.53	0.66	40.79	65.07	60.68	1.45	200.0	1.28	1.50	1.44	1.45	1.52
250.0	7.23	6.91	7.20	7.53	0.62	36.85	55.84	51.75	1.84	250.0	1.35	1.49	1.45	1.44	1.51
275.0	7.25	6.94	7.22	7.52	0.58	34.48	48.29	45.38	2.08	275.0	1.39	1.49	1.46	1.46	1.51
300.0	7.28	6.95	7.24	7.56	0.61	33.63	48.42	44.66	2.13	300.0	1.41	1.48	1.45	1.44	1.49
325.0	7.32	7.00	7.27	7.58	0.59	31.80	43.90	41.54	2.29	325.0	1.44	1.48	1.46	1.45	1.49
350.0	7.30	6.98	7.26	7.56	0.58	30.57	41.89	39.62	2.28	350.0	1.45	1.46	1.46	1.44	1.47
375.0	7.30	6.99	7.26	7.56	0.57	29.52	41.29	38.95	2.41	375.0	1.48	1.46	1.46	1.44	1.46
400.0	7.30	7.01	7.27	7.56	0.55	28.11	38.54	36.47	2.40	400.0	1.49	1.46	1.46	1.43	1.45
425.0	7.30	7.00	7.28	7.56	0.55	27.37	37.95	35.86	2.58	425.0	1.49	1.45	1.46	1.43	1.44
450.0	7.35	7.04	7.30	7.60	0.57	26.35	36.63	34.59	2.63	450.0	1.49	1.44	1.45	1.43	1.43
475.0	7.33	7.03	7.32	7.58	0.55	25.55	35.48	33.58	3.03	475.0	1.50	1.43	1.45	1.41	1.42
500.0	7.35	7.03	7.31	7.59	0.56	24.85	34.71	32.80	2.83	500.0	1.50	1.42	1.44	1.41	1.41
525.0	7.36	7.02	7.31	7.59	0.56	24.17	33.84	32.06	3.03	525.0	1.50	1.40	1.43	1.41	1.39
550.0	7.36	7.01	7.31	7.59	0.59	23.54	33.26	31.51	2.92	550.0	1.50	1.41	1.42	1.39	1.39
575.0	7.35	7.01	7.30	7.59	0.57	22.92	32.37	30.70	3.11	575.0	1.49	1.39	1.42	1.39	1.37
600.0	7.37	7.02	7.32	7.60	0.58	22.50	32.13	30.41	2.98	600.0	1.48	1.38	1.40	1.38	1.36
625.0	7.39	7.06	7.35	7.62	0.56	21.86	31.45	29.78	3.12	625.0	1.50	1.37	1.39	1.36	1.35
650.0	7.39	7.04	7.35	7.63	0.59	21.50	30.85	29.23	3.11	650.0	1.48	1.36	1.39	1.36	1.34
675.0	7.43	7.08	7.38	7.65	0.57	21.11	30.87	29.12	3.31	675.0	1.49	1.34	1.37	1.35	1.33
700.0	7.46	7.11	7.40	7.67	0.56	20.63	30.04	28.44	3.53	700.0	1.49	1.34	1.37	1.34	1.33
750.0	7.50	7.14	7.43	7.70	0.56	19.98	29.78	28.11	3.53	750.0	1.51	1.32	1.34	1.33	1.31
800.0	7.54	7.15	7.45	7.75	0.59	19.37	29.15	27.66	3.59	800.0	1.53	1.31	1.32	1.31	1.30
850.0	7.61	7.23	7.52	7.80	0.57	18.70	28.59	27.23	3.81	850.0	1.53	1.29	1.29	1.30	1.29
875.0	7.65	7.24	7.53	7.83	0.58	18.42	28.36	26.90	3.96	875.0	1.54	1.29	1.30	1.28	1.29
900.0	7.64	7.26	7.54	7.82	0.56	18.17	28.23	26.83	4.14	900.0	1.55	1.28	1.27	1.29	1.29
925.0	7.69	7.28	7.57	7.85	0.57	17.84	27.85	26.45	4.33	925.0	1.57	1.29	1.28	1.28	1.29
950.0	7.73	7.31	7.60	7.88	0.57	17.63	27.54	26.25	4.30	950.0	1.56	1.27	1.25	1.26	1.29
975.0	7.80	7.36	7.65	7.94	0.58	17.41	27.49	26.24	4.50	975.0	1.59	1.29	1.27	1.27	1.30
1000.0	7.84	7.40	7.67	7.98	0.57	17.09	26.99	25.74	4.59	1000.0	1.59	1.26	1.24	1.25	1.29

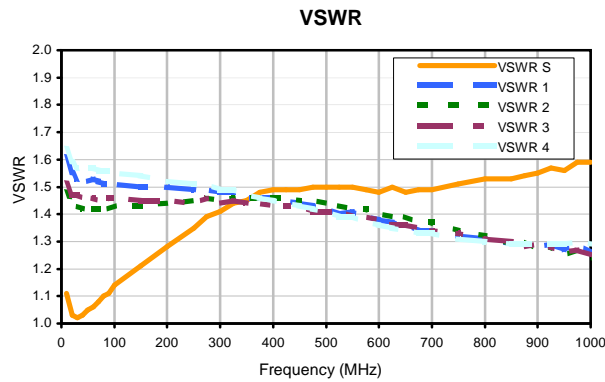
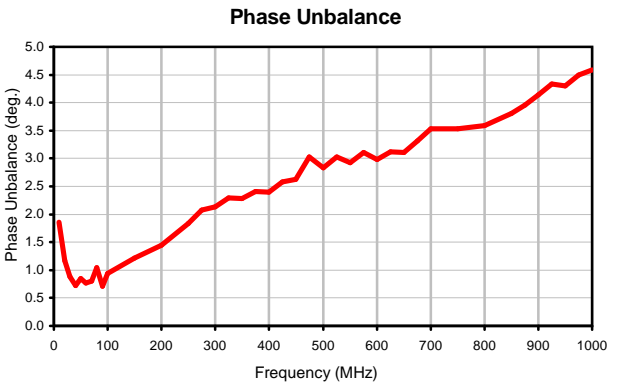
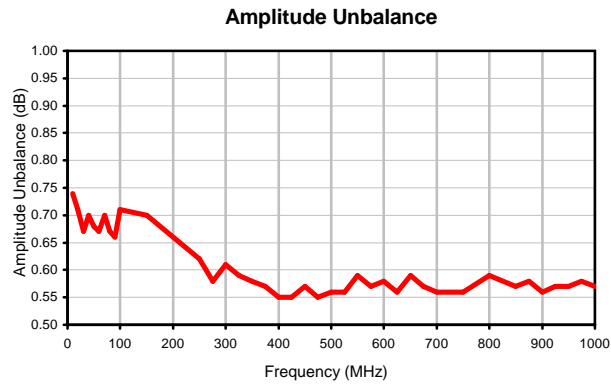
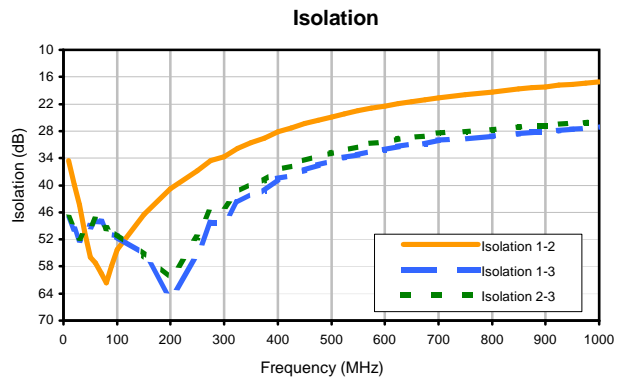
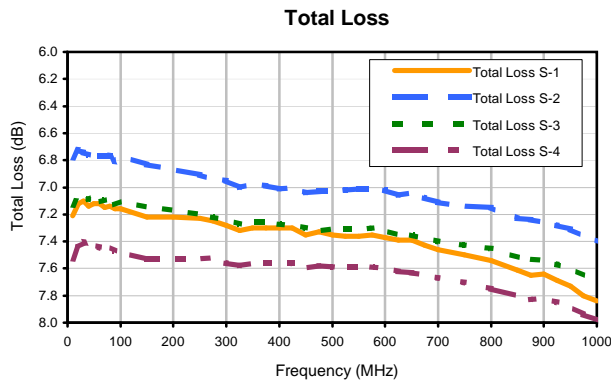
<sup>1</sup> Total Loss = Insertion Loss+ 6dB Splitter Loss



# 4 Way-0° Power Splitter/Combiner

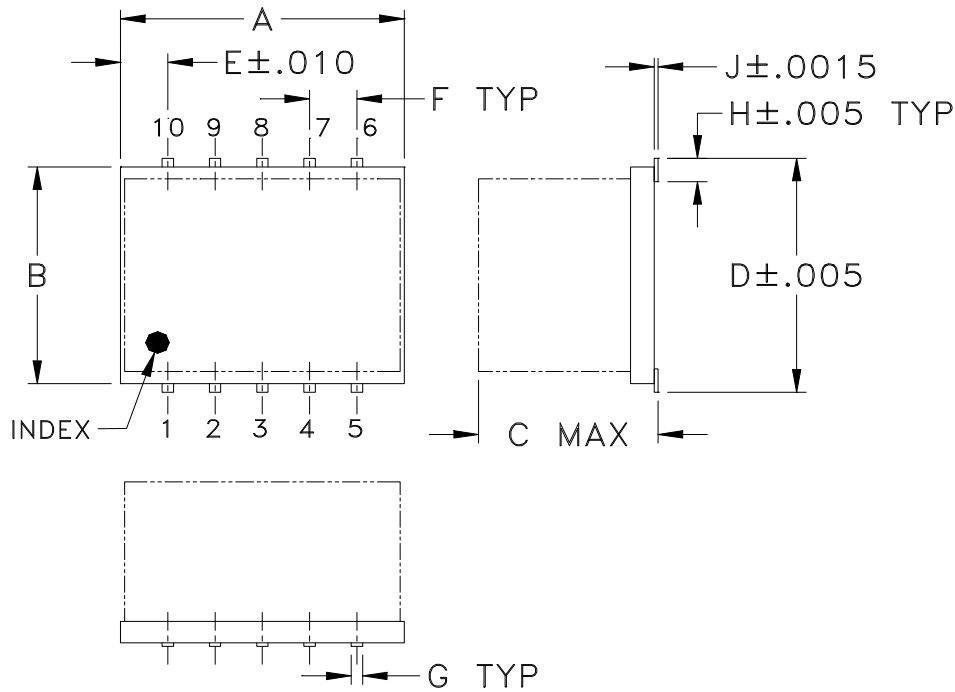
# SCA-4-10-75+

## Typical Performance Curves

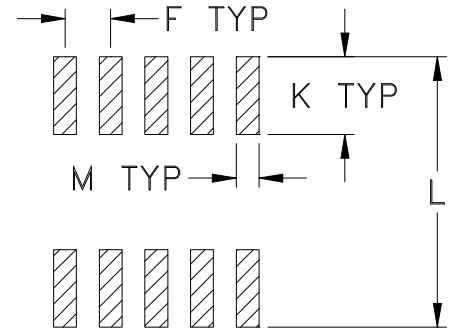


REV. X2  
SCA-4-10-75+  
100627  
Page 1 of 1

### 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
DZ943	.30 (7.62)	.250 (6.35)	.190 (4.83)	.266 (6.76)	.050 (1.27)	.050 (1.27)	.012 (0.30)	.029 (0.74)	.004 (0.10)	.085 (2.16)	.296 (7.52)	.030 (0.76)	0.5

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

#### Notes:

- Case material: Plastic.
- Base: Ceramic.
- Termination finish:
  - For RoHS Case Styles: Tin plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



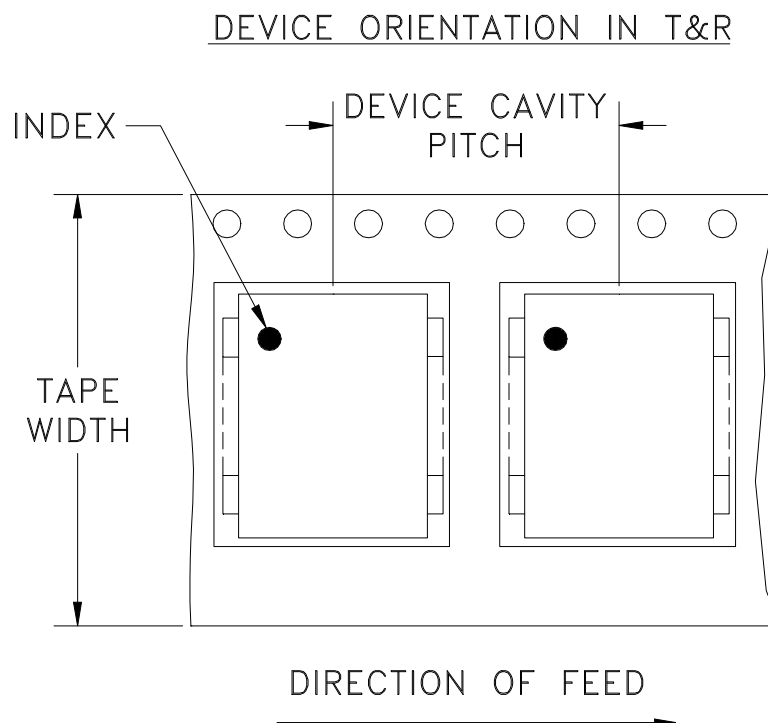
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# Tape & Reel Packaging TR-F34



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
				100
				200
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.  
Refer to pricing and availability on individual model dashboard.

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



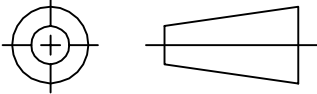
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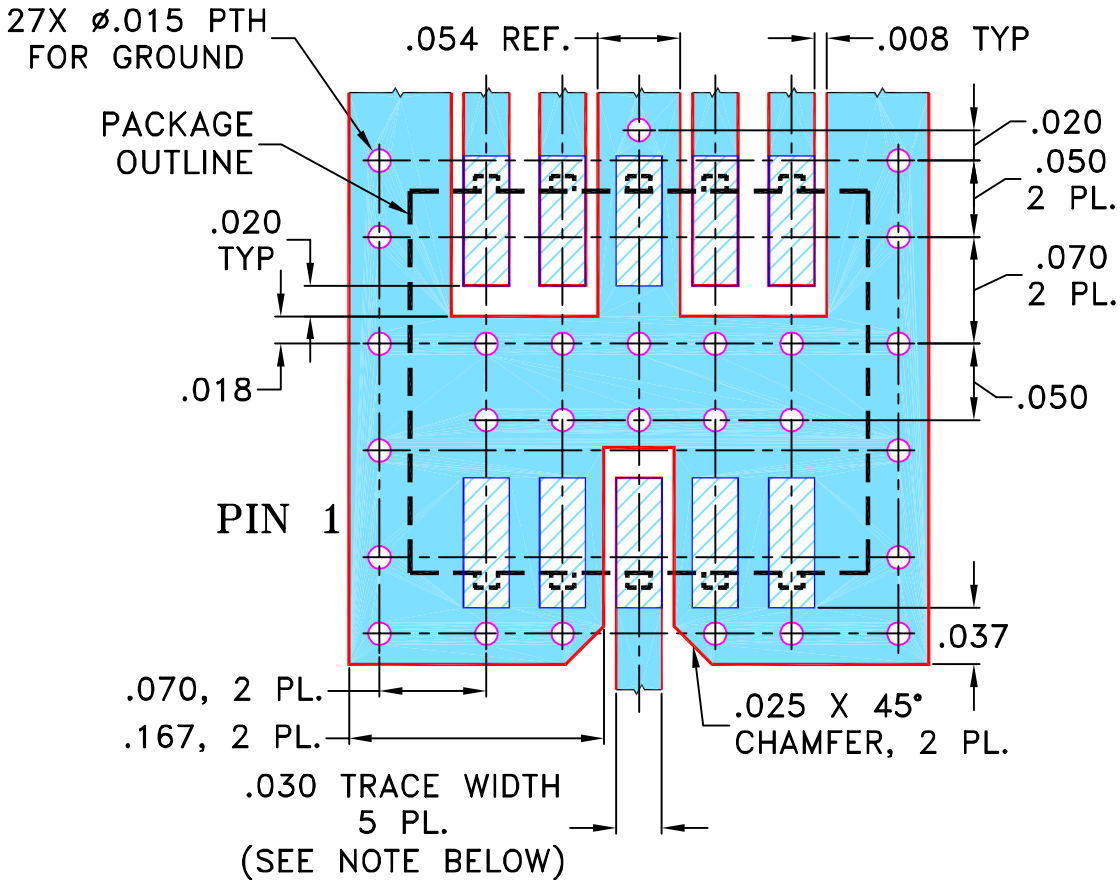
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M87224	NEW RELEASE	05/22/03	MMG	WP
A	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
B	M102713	CORRECTED TRACE WIDTH, ADDED "...WITH SMOBC"	01/16/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION  
FOR DZ943 CASE STYLE, "ny" PIN CONNECTION.



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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 TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	MMG	05/21/03
	CHECKED	AV	05/22/03
	APPROVED	WP	05/22/03

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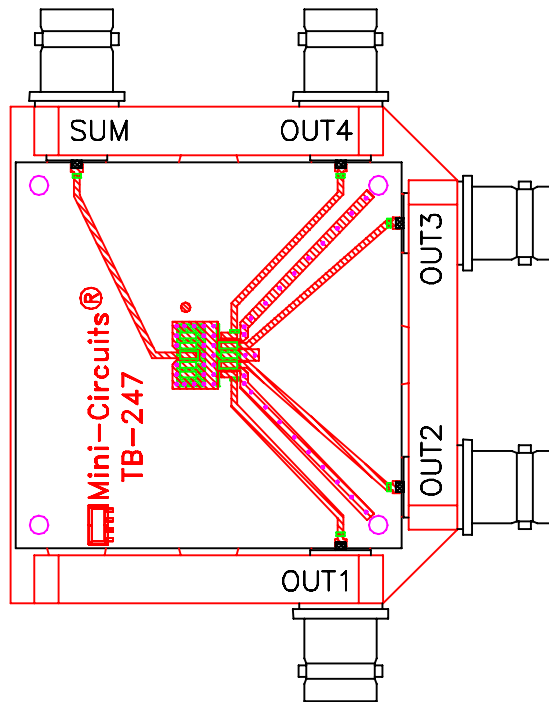
PL, ny, 75, DZ943, SCA, TB-247

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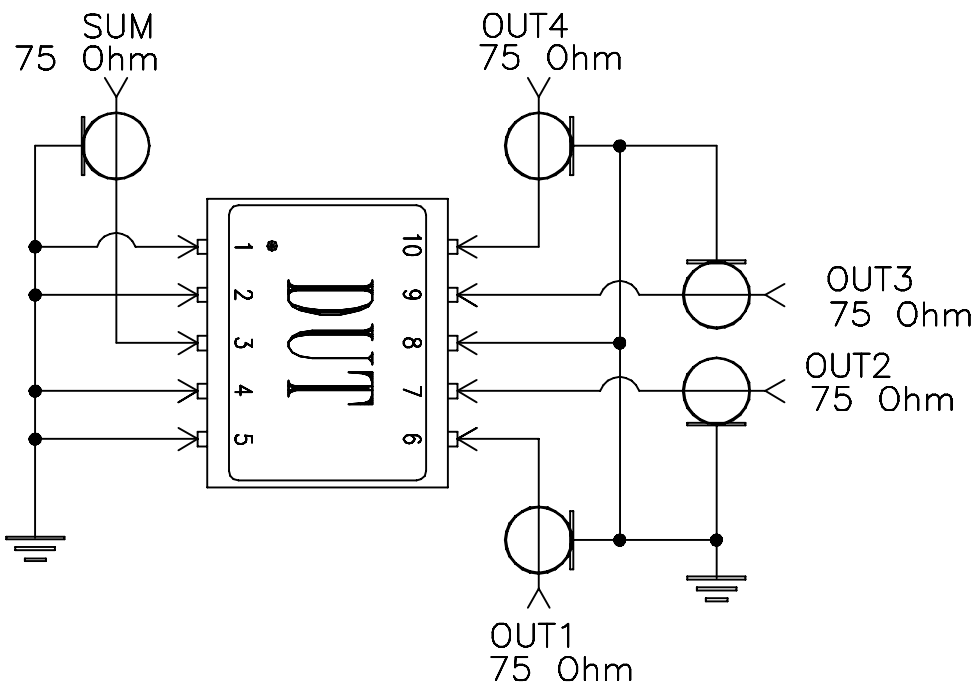
SIZE	CODE IDENT	DRAWING NO:	REV:
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FILE:	98PL133	SCALE:	8:1
		SHEET:	1 OF 1



# Evaluation Board and Circuit



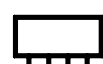
TB-247



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
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, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
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