



**SURFACE MOUNT**

# Power Splitter/Combiner

## SCA-4-132+

4 Way-0° 50Ω 5 to 1300 MHz

### THE BIG DEAL

- Wideband, 5 to 1300 MHz
- High isolation, 25 dB
- Good matching VSWR, 1.2:1
- Excellent amplitude unbalance, 0.3 dB



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

### PRODUCT OVERVIEW

Mini-Circuits' SCA-4-132+ is a surface-mount 4-way 0° splitter/combiner covering the 5 to 1300 MHz frequency range, supporting bandwidth requirements for cellular, UHF/VHF receivers/transmitters and more. This model can handle up to 0.5W RF input power as a splitter and provides high isolation, good VSWR and low amplitude unbalance. The unit comes housed in a miniature plastic package (0.35 x 0.28 x 0.20") mounted on a 10-lead ceramic base with wrap-around terminations for excellent solderability.

### KEY FEATURES

Feature	Advantages
Wideband, 5 to 1300 MHz	Suitable for many broadband applications.
Low insertion loss, 1.2 dB	The combination of 0.5W power handling and low insertion loss makes this model a suitable candidate for distributing signals while maintaining excellent transmission of signal power.
Good matching VSWR, 1.2:1	Provides excellent thru-path transmission with low signal reflection.
High isolation, 25 dB	Minimizes interference between input ports.
Low amplitude unbalance, 0.3 dB	Low amplitude unbalance makes this splitter/combiner Ideal for parallel path/multichannel systems.





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

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5		1300	MHz
Insertion Loss, above 6.0 dB	5-500		0.8	1.5	dB
	500-1000		1.2	2.4	
	1000-1300		2.0	2.8	
Isolation	5-1000	15	21		dB
	1000-1300	13	18		
Phase Unbalance	5-500		2.0	5	Degree
	500-1000		4.0	11	
	1000-1300		8.0	15	
Amplitude Unbalance	5-1000		0.5	0.9	dB
	1000-1300		0.7	1.2	
VSWR (Port S)	5-500		1.22	1.32	:1
	500-1300		1.28	1.49	
VSWR (Port 1-4)	5-500		1.57	1.79	:1
	500-1300		1.40	1.65	

1. Tested on Evaluation Board TB-SCA-4-132+

### 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





# SURFACE MOUNT

# Power Splitter/Combiner

# SCA-4-132+

Mini-Circuits

4 Way-0° 50Ω 5 to 1300 MHz

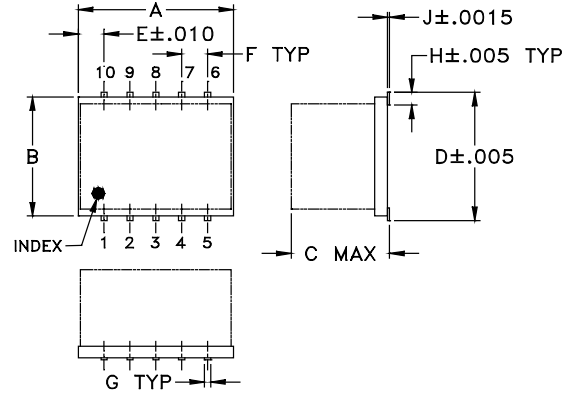
### PIN CONNECTIONS

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

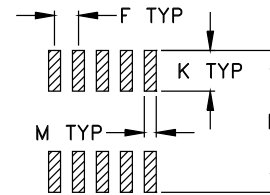
**\*PRODUCT MARKING:** SCA-4-132

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

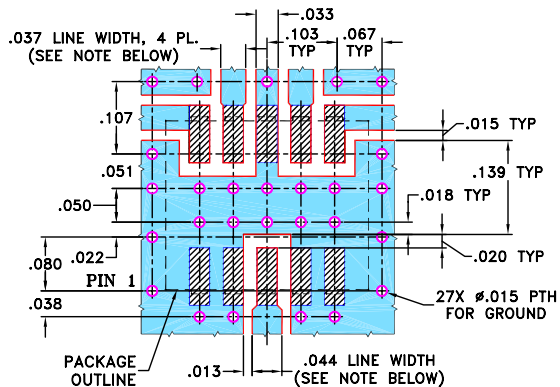
### OUTLINE DRAWING



### PCB Land Pattern



### EVALUATION BOARD MCL P/N: TB-SCA-4-132+ SUGGESTED PCB LAYOUT (PL-124)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350 WITH DIELECTRIC THICKNESS 0.020" ± 0.0015", 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 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

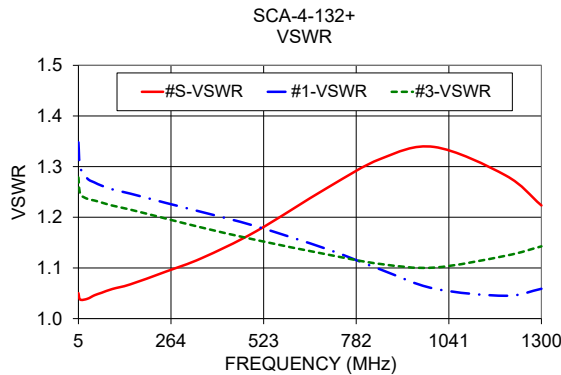
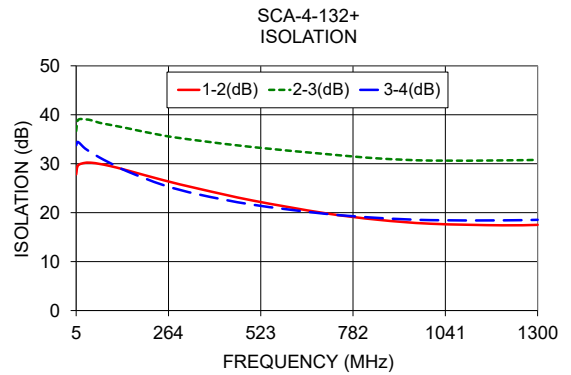
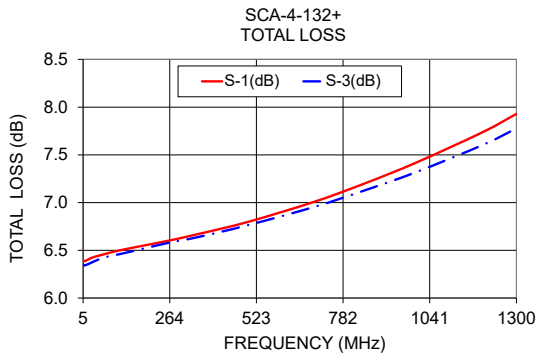
**SCA-4-132+**

4 Way-0° 50Ω 5 to 1300 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
5	6.40	6.23	6.35	6.50	0.27	27.82	36.68	33.76	0.60	1.05	1.35	1.30	1.28	1.33
10	6.39	6.23	6.34	6.49	0.26	29.62	38.90	34.44	0.27	1.04	1.30	1.25	1.25	1.29
30	6.42	6.26	6.37	6.53	0.27	30.18	39.07	33.10	0.16	1.04	1.28	1.23	1.24	1.28
50	6.44	6.29	6.40	6.56	0.27	30.18	38.82	32.17	0.20	1.05	1.27	1.23	1.23	1.27
70	6.46	6.31	6.43	6.58	0.27	29.96	38.36	31.29	0.19	1.05	1.26	1.22	1.23	1.27
100	6.49	6.34	6.45	6.61	0.27	29.53	37.94	30.15	0.28	1.06	1.26	1.22	1.22	1.26
150	6.52	6.37	6.49	6.65	0.28	28.61	37.22	28.39	0.32	1.07	1.25	1.21	1.22	1.25
250	6.59	6.45	6.57	6.72	0.28	26.62	35.74	25.63	0.50	1.09	1.23	1.20	1.20	1.23
350	6.67	6.52	6.64	6.80	0.28	24.87	34.71	23.70	0.63	1.12	1.21	1.19	1.18	1.21
500	6.80	6.63	6.77	6.94	0.30	22.48	33.40	21.63	0.85	1.17	1.18	1.18	1.16	1.17
700	7.01	6.82	6.96	7.14	0.31	19.93	32.01	19.80	1.16	1.26	1.14	1.15	1.13	1.11
850	7.21	6.99	7.13	7.30	0.32	18.56	31.09	18.94	1.37	1.32	1.10	1.12	1.11	1.06
1000	7.42	7.17	7.32	7.49	0.32	17.74	30.64	18.47	1.65	1.34	1.06	1.09	1.10	1.03
1200	7.74	7.47	7.60	7.76	0.29	17.42	30.68	18.43	2.06	1.28	1.04	1.10	1.12	1.07
1300	7.93	7.65	7.78	7.91	0.28	17.51	30.78	18.54	2.29	1.22	1.06	1.13	1.14	1.10

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



- 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# 4 Way-0° Power Splitter/Combiner

# SCA-4-132+

## 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	2-3	3-4			S	1	2	3	4
1	6.65	6.37	6.57	6.80	0.43	20.18	28.95	26.37	1.75	1	1.17	1.84	1.72	1.61	1.73
3	6.43	6.25	6.38	6.55	0.30	25.43	34.16	31.79	0.93	3	1.07	1.43	1.37	1.34	1.40
5	6.40	6.23	6.35	6.50	0.27	27.82	36.68	33.76	0.60	5	1.05	1.35	1.30	1.28	1.33
7	6.39	6.23	6.34	6.49	0.27	28.92	38.06	34.33	0.43	7	1.04	1.32	1.27	1.26	1.30
9	6.39	6.23	6.34	6.49	0.26	29.47	38.69	34.46	0.31	9	1.04	1.30	1.26	1.25	1.29
10	6.39	6.23	6.34	6.49	0.26	29.62	38.90	34.44	0.27	10	1.04	1.30	1.25	1.25	1.29
20	6.41	6.25	6.36	6.51	0.26	30.09	39.34	33.76	0.16	20	1.04	1.28	1.24	1.24	1.28
30	6.42	6.26	6.37	6.53	0.27	30.18	39.07	33.10	0.16	30	1.04	1.28	1.23	1.24	1.28
40	6.43	6.28	6.39	6.55	0.27	30.22	38.93	32.62	0.18	40	1.04	1.27	1.23	1.23	1.28
50	6.44	6.29	6.40	6.56	0.27	30.18	38.82	32.17	0.20	50	1.05	1.27	1.23	1.23	1.27
60	6.45	6.30	6.42	6.57	0.27	30.10	38.63	31.72	0.20	60	1.05	1.27	1.22	1.23	1.27
70	6.46	6.31	6.43	6.58	0.27	29.96	38.36	31.29	0.19	70	1.05	1.26	1.22	1.23	1.27
80	6.47	6.32	6.43	6.59	0.27	29.83	38.18	30.90	0.19	80	1.05	1.26	1.22	1.23	1.27
90	6.48	6.33	6.44	6.60	0.27	29.69	37.98	30.52	0.22	90	1.06	1.26	1.22	1.22	1.27
100	6.49	6.34	6.45	6.61	0.27	29.53	37.94	30.15	0.28	100	1.06	1.26	1.22	1.22	1.26
150	6.52	6.37	6.49	6.65	0.28	28.61	37.22	28.39	0.32	150	1.07	1.25	1.21	1.22	1.25
200	6.56	6.41	6.53	6.69	0.27	27.62	36.46	26.90	0.43	200	1.08	1.24	1.20	1.21	1.24
250	6.59	6.45	6.57	6.72	0.28	26.62	35.74	25.63	0.50	250	1.09	1.23	1.20	1.20	1.23
300	6.63	6.48	6.60	6.76	0.28	25.76	35.27	24.61	0.60	300	1.11	1.22	1.19	1.19	1.22
350	6.67	6.52	6.64	6.80	0.28	24.87	34.71	23.70	0.63	350	1.12	1.21	1.19	1.18	1.21
400	6.71	6.56	6.68	6.84	0.29	24.01	34.18	22.91	0.69	400	1.14	1.20	1.19	1.17	1.20
450	6.75	6.60	6.72	6.89	0.30	23.21	33.75	22.22	0.78	450	1.15	1.19	1.18	1.16	1.18
500	6.80	6.63	6.77	6.94	0.30	22.48	33.40	21.63	0.85	500	1.17	1.18	1.18	1.16	1.17
550	6.85	6.68	6.81	6.98	0.30	21.79	33.00	21.09	0.92	550	1.19	1.17	1.17	1.15	1.16
600	6.90	6.72	6.86	7.03	0.31	21.11	32.66	20.60	0.99	600	1.21	1.16	1.17	1.14	1.14
650	6.96	6.77	6.91	7.08	0.31	20.48	32.26	20.17	1.06	650	1.23	1.15	1.16	1.13	1.13
700	7.01	6.82	6.96	7.14	0.31	19.93	32.01	19.80	1.16	700	1.26	1.14	1.15	1.13	1.11
750	7.08	6.87	7.01	7.19	0.32	19.42	31.65	19.47	1.22	750	1.28	1.12	1.14	1.12	1.10
800	7.14	6.93	7.07	7.25	0.32	18.97	31.36	19.18	1.29	800	1.30	1.11	1.13	1.11	1.08
850	7.21	6.99	7.13	7.30	0.32	18.56	31.09	18.94	1.37	850	1.32	1.10	1.12	1.11	1.06
900	7.27	7.04	7.19	7.37	0.32	18.23	30.94	18.74	1.48	900	1.33	1.08	1.10	1.10	1.05
950	7.35	7.11	7.25	7.43	0.32	17.95	30.75	18.58	1.56	950	1.34	1.07	1.09	1.10	1.04
1000	7.42	7.17	7.32	7.49	0.32	17.74	30.64	18.47	1.65	1000	1.34	1.06	1.09	1.10	1.03
1100	7.57	7.31	7.46	7.62	0.31	17.47	30.55	18.38	1.85	1100	1.32	1.04	1.08	1.11	1.04
1200	7.74	7.47	7.60	7.76	0.29	17.42	30.68	18.43	2.06	1200	1.28	1.04	1.10	1.12	1.07
1300	7.93	7.65	7.78	7.91	0.28	17.51	30.78	18.54	2.29	1300	1.22	1.06	1.13	1.14	1.10
1400	8.16	7.87	7.98	8.10	0.28	17.75	30.57	18.65	2.68	1400	1.17	1.08	1.17	1.16	1.12
1500	8.43	8.14	8.23	8.33	0.28	18.12	29.90	18.70	3.13	1500	1.16	1.10	1.20	1.18	1.14
1600	8.76	8.48	8.54	8.61	0.27	18.70	28.75	18.66	3.66	1600	1.20	1.12	1.24	1.19	1.16

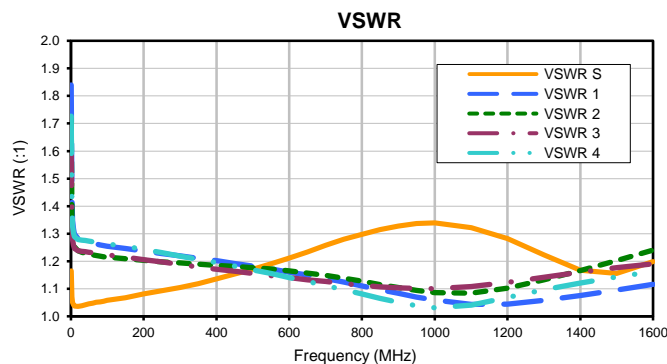
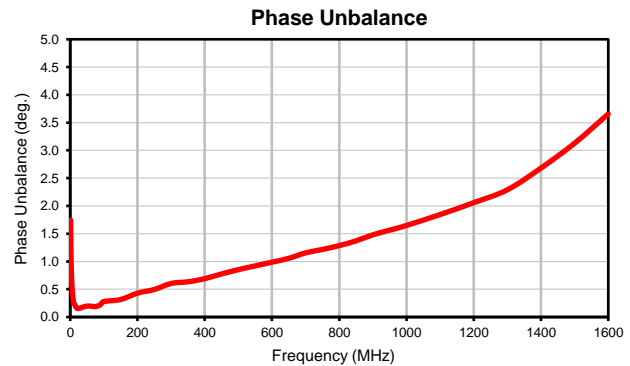
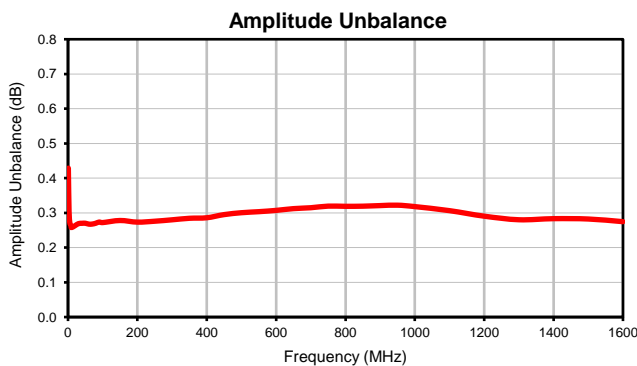
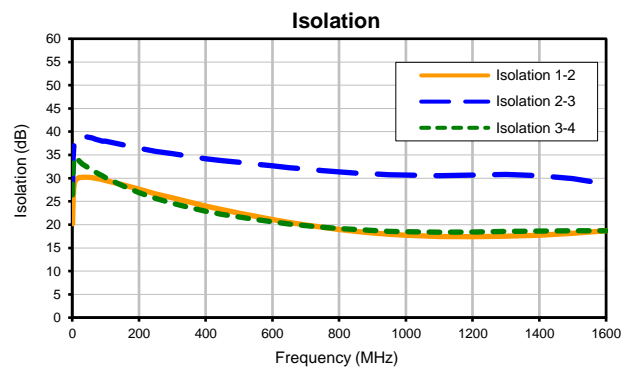
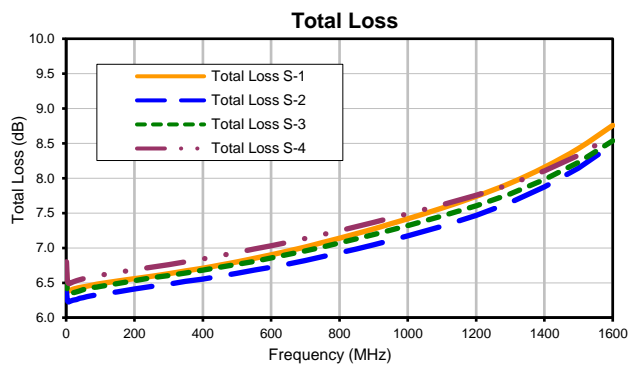
<sup>1</sup>Total Loss = Insertion Loss + 6dB Splitter Loss



# 4 Way-0° Power Splitter/Combiner

# SCA-4-132+

## Typical Performance Curves



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

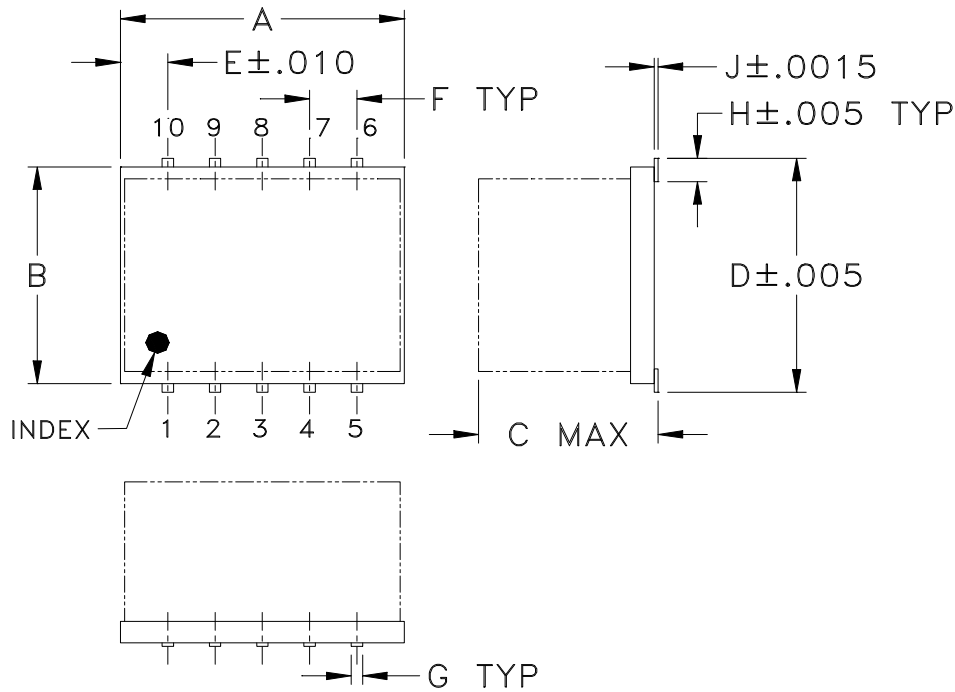


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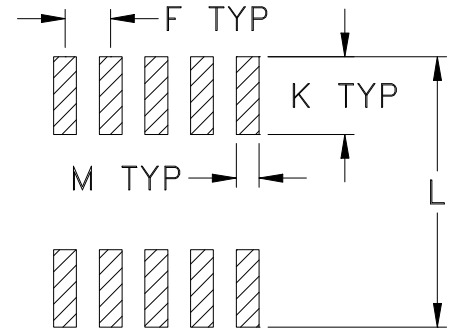
IF/RF MICROWAVE COMPONENTS

REV. OR  
SCA-4-132+  
1/4/2017  
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.



INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

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Mini-Circuits ISO 9001 & ISO 14001 Certified

# 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)



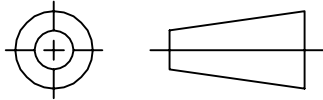
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THIRD ANGLE PROJECTION

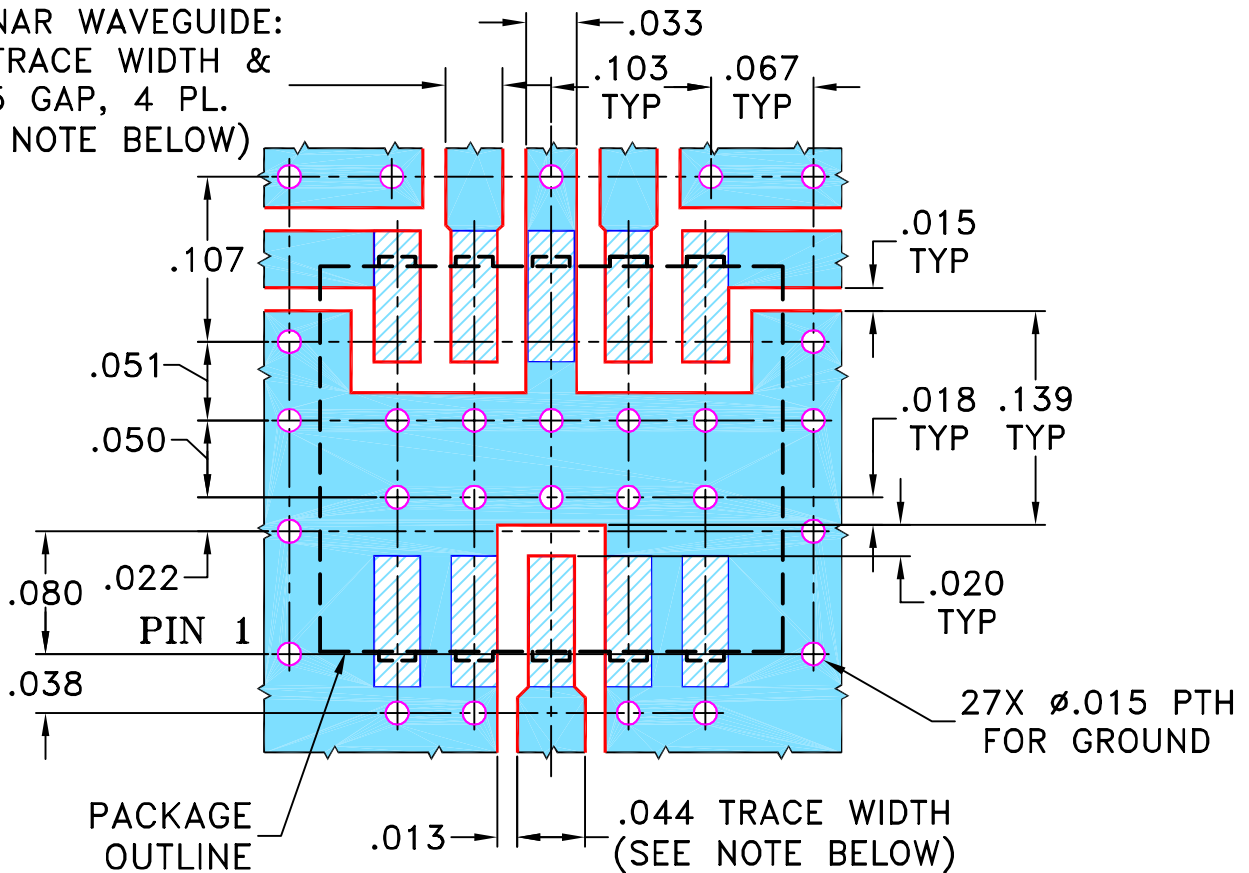


REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M84016	NEW RELEASE	01/03/03	MMG	WP
A	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
B	M102713	ADDED "...WITH SMOBC"	01/16/06	GF	IL

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

COPLANAR WAVEGUIDE:  
.037 TRACE WIDTH &  
.015 GAP, 4 PL.  
(SEE NOTE BELOW)



NOTES: 1.COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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	01/03/03
	CHECKED	AV	01/03/03
	APPROVED	WP	01/03/03



Mini-Circuits®

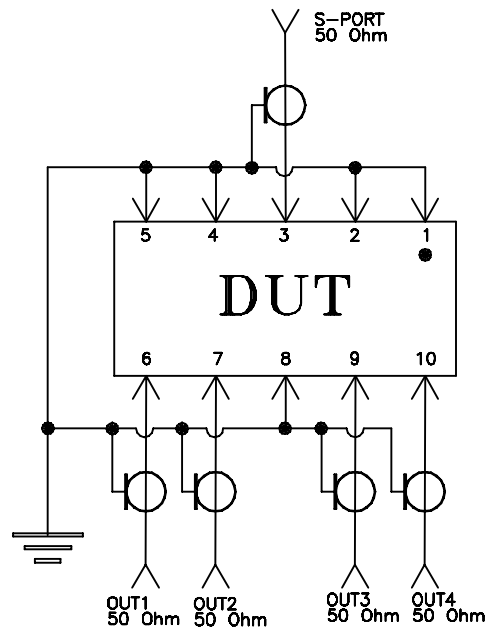
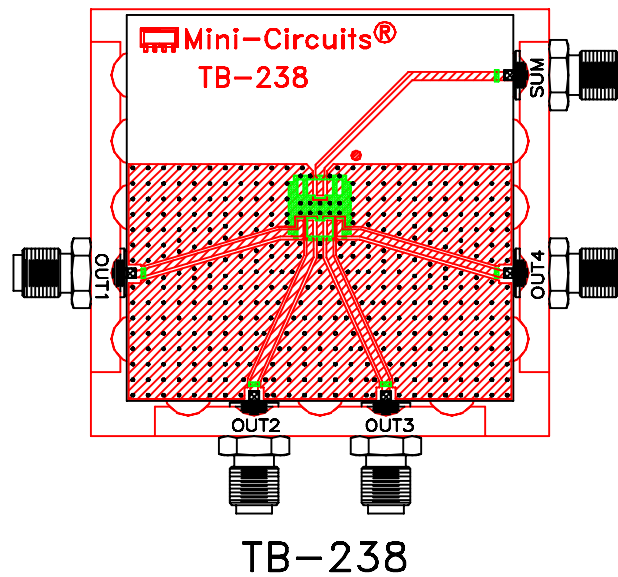
13 Neptune Avenue  
Brooklyn NY 11235

PL, ny, DZ943, SCA-4-10, TB-238

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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-124	REV: B
FILE: 98PL124	SCALE: 8:1	SHEET: 1 OF 1	


# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.020 inch.

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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