

Surface Mount

# Power Splitter/Combiner

SRSC-4-63+

4 Way-0° Resistive 50Ω DC to 6000 MHz

## The Big Deal

- Wideband, DC to 6000 MHz
- Low insertion loss, 0.5 dB
- Good matching VSWR, 1.3:1
- Low amplitude unbalance, 0.4 dB



CASE STYLE: CK1704-2

## Product Overview

Mini-Circuits' SRSC-4-63+ is a surface-mount 4-way 0° resistive splitter/combiner covering the DC to 6000 MHz frequency range, supporting bandwidth requirements for a wide range of RF/microwave systems. This model can handle up to 0.2W RF input power as a splitter and provides high isolation, good VSWR and low amplitude unbalance. The unit comes housed in a miniature shielded package (0.5 x 0.5 x 0.185") with wrap-around terminations for excellent solderability.

## Key Features

Feature	Advantages
Wideband, DC to 6000 MHz	Resistive design enables very wideband coverage down to DC, making the splitter/combiner suitable for a wide variety of broadband applications.
Low insertion loss, 0.5 dB (above 12 dB theoretical loss)	Supports a wide variety of power requirements. The combination of 0.2W 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.
Low amplitude unbalance, 0.4 dB	Low amplitude unbalance makes this splitter/combiner Ideal for parallel path/multichannel systems.

### 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](http://www.minicircuits.com/MCLStore/terms.jsp)



# Surface Mount Power Splitter/Combiner

## SRSC-4-63+

4 Way-0° Resistive 50Ω DC to 6000 MHz



Generic photo used for illustration purposes only  
CASE STYLE: CK1704-2

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

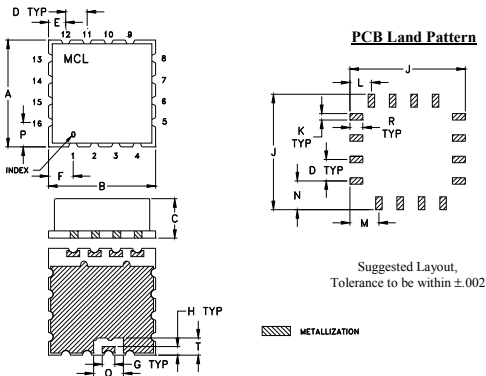
### Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.2W max.
Internal Dissipation	0.15W max.
Permanent damage may occur if any of these limits are exceeded.	

### Pin Connections

SUM PORT	10
PORT 1	1
PORT 2	2
PORT 3	3
PORT 4	4
GROUND	ALL OTHER

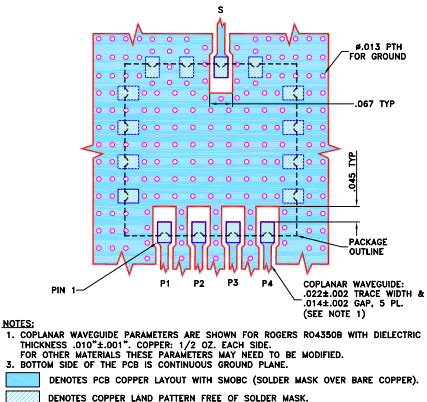
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
.500	.500	.185	.100	.080	.115	.030	.040	.540
12.70	12.70	4.70	2.54	2.03	2.92	0.76	1.02	13.72
K	L	M	N	P	Q	R	T	wt.
.030	.100	.135	.135	.115	.140	.060	.080	grams
0.76	2.54	3.43	3.43	2.92	3.56	1.52	2.03	1.0

### Demo Board MCL P/N: TB-816+ Suggested PCB Layout (PL-445)



### Features

- wideband, DC to 6000 MHz,
- good matching VSWR 1.3:1 typ.
- good amplitude unbalance, 0.4 dB typ.

### Applications

- communication systems
- CATV
- cellular, GPS, PCS
- VHF/UHF/receivers/transmitters

### Electrical Specifications at 25°C

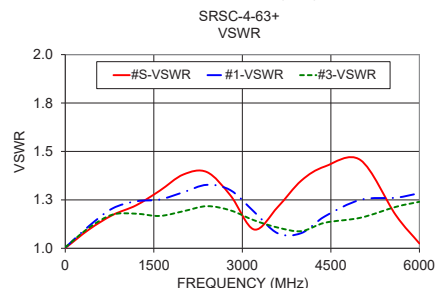
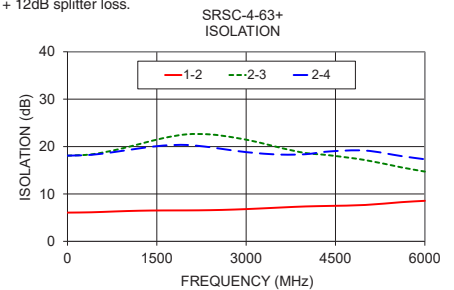
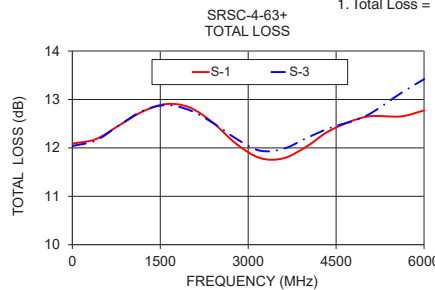
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
<b>Frequency Range</b>		DC	—	6000	MHz
<b>Insertion Loss, including 12 dB</b>	DC - 3600 3600 - 6000	11.5 11.5	12.0 12.5	13.2 14.0	dB
<b>Isolation</b>	DC - 6000	—	7	—	dB
<b>Phase Unbalance</b>	DC - 3600 3600 - 6000	— —	3 8	8 14	Degree
<b>Amplitude Unbalance</b>	DC - 3600 3600 - 6000	— —	0.4 0.7	0.8 1.2	dB
<b>VSWR (Port S)</b>	DC - 6000	—	1.35	1.65	:1
<b>VSWR (Port 1-4)</b>	DC - 6000	—	1.30	1.60	:1

This is a resistive power divider to enable frequency coverage from DC to the highest rated frequency. Since resistive power divider do not provide a high degree of isolation (basically isolation equals the insertion loss between ports).

### Typical Performance Data

Freq. (MHz)	Total Loss <sup>1</sup> (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	2-4						
1	12.09	12.08	12.04	12.04	0.05	6.06	18.08	18.09	0.30	1.00	1.00	1.00	1.01	1.01
400	12.18	12.18	12.15	12.16	0.03	6.13	18.35	18.26	0.44	1.10	1.11	1.11	1.11	1.10
800	12.47	12.50	12.47	12.49	0.04	6.31	19.27	18.87	1.25	1.17	1.21	1.19	1.17	1.17
1200	12.75	12.83	12.77	12.79	0.08	6.46	20.50	19.60	2.18	1.22	1.24	1.21	1.18	1.19
1600	12.90	13.00	12.88	12.85	0.15	6.52	21.76	20.20	3.10	1.30	1.25	1.19	1.17	1.19
2000	12.83	12.96	12.78	12.66	0.31	6.53	22.58	20.34	3.41	1.38	1.29	1.23	1.19	1.24
2400	12.52	12.72	12.51	12.29	0.43	6.58	22.56	19.85	3.28	1.39	1.33	1.28	1.22	1.28
2800	12.08	12.34	12.19	11.91	0.43	6.71	21.90	19.13	2.97	1.27	1.30	1.27	1.20	1.24
3200	11.79	12.03	11.94	11.68	0.34	6.91	20.91	18.59	3.06	1.10	1.19	1.23	1.14	1.15
3600	11.78	12.07	11.98	11.80	0.28	7.15	19.66	18.30	3.81	1.21	1.08	1.13	1.11	1.10
4000	12.03	12.39	12.20	12.13	0.36	7.37	18.63	18.39	4.85	1.35	1.08	1.12	1.09	1.11
4400	12.36	12.71	12.41	12.39	0.35	7.48	18.16	18.97	5.91	1.42	1.17	1.11	1.13	1.17
5000	12.64	12.95	12.65	12.56	0.39	7.68	17.15	19.15	7.06	1.46	1.25	1.12	1.16	1.21
5600	12.65	13.05	13.13	12.63	0.49	8.26	15.62	18.00	8.66	1.17	1.26	1.21	1.21	1.17
6000	12.77	13.11	13.42	12.73	0.68	8.55	14.72	17.32	8.39	1.02	1.28	1.29	1.24	1.18

1. Total Loss = Insertion Loss + 12dB splitter loss.



### electrical schematic



- Notes**
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROEGERS RO4350B WITH DIELECTRIC THICKNESS .017±.001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS THESE PARAMETERS MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
  3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
  4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

- Notes**
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# 4 Way-0° Power Splitter/Combiner

# SRSC-4-63+

## 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	2-4			S	1	2	3	4
1	12.09	12.08	12.04	12.04	0.05	6.06	18.08	18.09	0.30	1	1.00	1.00	1.00	1.01	1.01
5	12.07	12.07	12.04	12.04	0.04	6.06	18.06	18.07	0.10	5	1.00	1.00	1.00	1.01	1.01
10	12.07	12.06	12.03	12.04	0.03	6.06	18.06	18.06	0.11	10	1.00	1.00	1.00	1.01	1.01
50	12.06	12.06	12.03	12.02	0.03	6.06	18.04	18.04	0.12	50	1.01	1.01	1.01	1.01	1.01
70	12.06	12.06	12.03	12.03	0.04	6.06	18.04	18.04	0.07	70	1.01	1.02	1.02	1.02	1.02
100	12.05	12.05	12.03	12.03	0.02	6.06	18.04	18.04	0.12	100	1.02	1.03	1.03	1.03	1.02
200	12.08	12.08	12.05	12.05	0.03	6.07	18.10	18.07	0.22	200	1.05	1.05	1.05	1.05	1.05
400	12.18	12.18	12.15	12.16	0.03	6.13	18.35	18.26	0.44	400	1.10	1.11	1.11	1.11	1.10
600	12.32	12.32	12.30	12.32	0.02	6.21	18.76	18.54	0.79	600	1.14	1.17	1.16	1.15	1.14
800	12.47	12.50	12.47	12.49	0.04	6.31	19.27	18.87	1.25	800	1.17	1.21	1.19	1.17	1.17
1000	12.60	12.68	12.63	12.65	0.08	6.39	19.86	19.24	1.67	1000	1.20	1.23	1.20	1.18	1.19
1200	12.75	12.83	12.77	12.79	0.08	6.46	20.50	19.60	2.18	1200	1.22	1.24	1.21	1.18	1.19
1400	12.83	12.94	12.85	12.85	0.10	6.49	21.14	19.94	2.70	1400	1.26	1.25	1.20	1.17	1.19
1600	12.90	13.00	12.88	12.85	0.15	6.52	21.76	20.20	3.10	1600	1.30	1.25	1.19	1.17	1.19
1800	12.92	13.00	12.85	12.78	0.23	6.53	22.24	20.33	3.39	1800	1.34	1.26	1.21	1.18	1.21
2000	12.83	12.96	12.78	12.66	0.31	6.53	22.58	20.34	3.41	2000	1.38	1.29	1.23	1.19	1.24
2200	12.70	12.86	12.66	12.49	0.36	6.54	22.68	20.16	3.40	2200	1.40	1.31	1.24	1.21	1.27
2400	12.52	12.72	12.51	12.29	0.43	6.58	22.56	19.85	3.28	2400	1.39	1.33	1.28	1.22	1.28
2600	12.26	12.54	12.36	12.09	0.45	6.64	22.31	19.51	3.07	2600	1.35	1.33	1.30	1.21	1.27
2800	12.08	12.34	12.19	11.91	0.43	6.71	21.90	19.13	2.97	2800	1.27	1.30	1.27	1.20	1.24
3000	11.91	12.16	12.03	11.75	0.41	6.81	21.46	18.84	2.94	3000	1.17	1.26	1.25	1.17	1.20
3200	11.79	12.03	11.94	11.68	0.34	6.91	20.91	18.59	3.06	3200	1.10	1.19	1.23	1.14	1.15
3400	11.78	11.99	11.93	11.70	0.29	7.02	20.29	18.40	3.44	3400	1.12	1.12	1.18	1.12	1.11
3600	11.78	12.07	11.98	11.80	0.28	7.15	19.66	18.30	3.81	3600	1.21	1.08	1.13	1.11	1.10
3800	11.85	12.21	12.10	11.96	0.36	7.27	19.07	18.26	4.28	3800	1.29	1.05	1.13	1.09	1.09
4000	12.03	12.39	12.20	12.13	0.36	7.37	18.63	18.39	4.85	4000	1.35	1.08	1.12	1.09	1.11
4200	12.18	12.56	12.32	12.27	0.38	7.42	18.38	18.67	5.30	4200	1.40	1.12	1.10	1.11	1.15
4400	12.36	12.71	12.41	12.39	0.35	7.48	18.16	18.97	5.91	4400	1.42	1.17	1.11	1.13	1.17
4600	12.54	12.83	12.50	12.48	0.34	7.51	17.96	19.26	6.14	4600	1.47	1.20	1.13	1.15	1.19
4800	12.59	12.88	12.58	12.53	0.34	7.57	17.57	19.28	6.54	4800	1.46	1.22	1.13	1.16	1.19
5000	12.64	12.95	12.65	12.56	0.39	7.68	17.15	19.15	7.06	5000	1.46	1.25	1.12	1.16	1.21
5200	12.66	12.98	12.78	12.58	0.40	7.84	16.63	18.82	7.76	5200	1.38	1.26	1.16	1.16	1.19
5400	12.61	13.01	12.95	12.61	0.40	8.05	16.12	18.41	8.28	5400	1.29	1.25	1.20	1.18	1.18
5600	12.65	13.05	13.13	12.63	0.49	8.26	15.62	18.00	8.66	5600	1.17	1.26	1.21	1.21	1.17
5800	12.71	13.12	13.28	12.67	0.61	8.46	15.19	17.66	8.77	5800	1.11	1.29	1.25	1.22	1.16
6000	12.77	13.11	13.42	12.73	0.68	8.55	14.72	17.32	8.39	6000	1.02	1.28	1.29	1.24	1.18
6500	12.84	13.21	13.70	12.90	0.85	8.69	13.63	16.67	7.86	6500	1.02	1.18	1.23	1.14	1.18
7000	13.15	13.73	14.38	13.47	1.22	9.27	12.88	16.34	8.31	7000	1.21	1.09	1.16	1.10	1.17
7500	14.31	15.02	16.00	14.82	1.70	9.98	12.59	16.21	8.74	7500	1.73	1.28	1.33	1.44	1.31
8000	16.19	16.52	17.85	16.82	1.67	9.79	13.58	17.04	10.13	8000	2.02	1.79	1.79	2.09	1.78

<sup>1</sup> Total Loss = Insertion Loss + 12dB Splitter Loss



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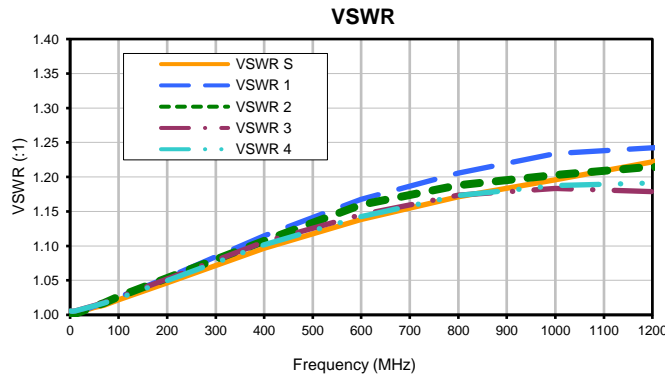
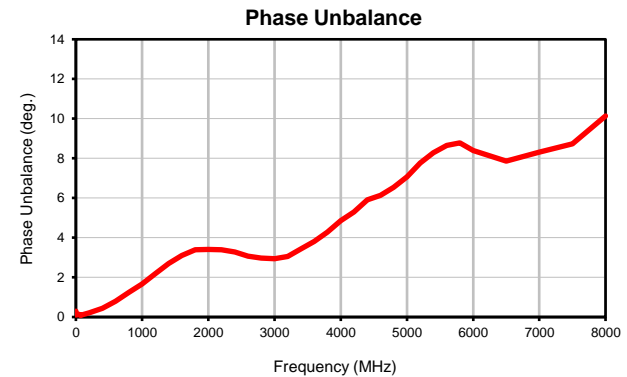
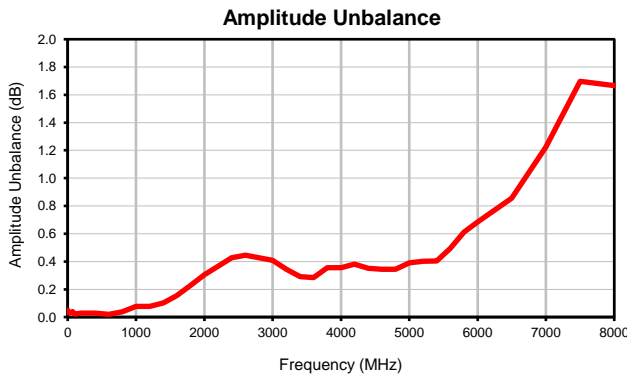
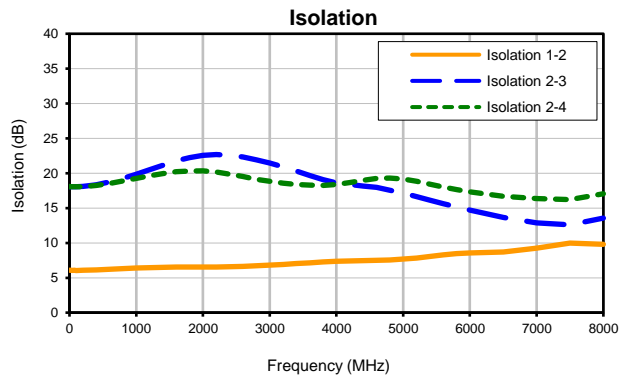
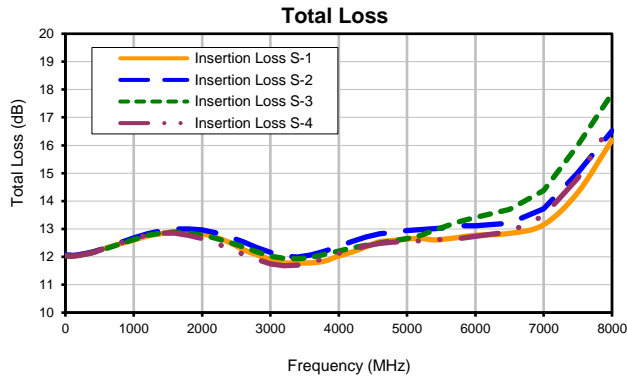
IF/RF MICROWAVE COMPONENTS

REV. OR  
 SRSC-4-63+  
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# 4 Way-0° Power Splitter/Combiner

# SRSC-4-63+

## Typical Performance Curves



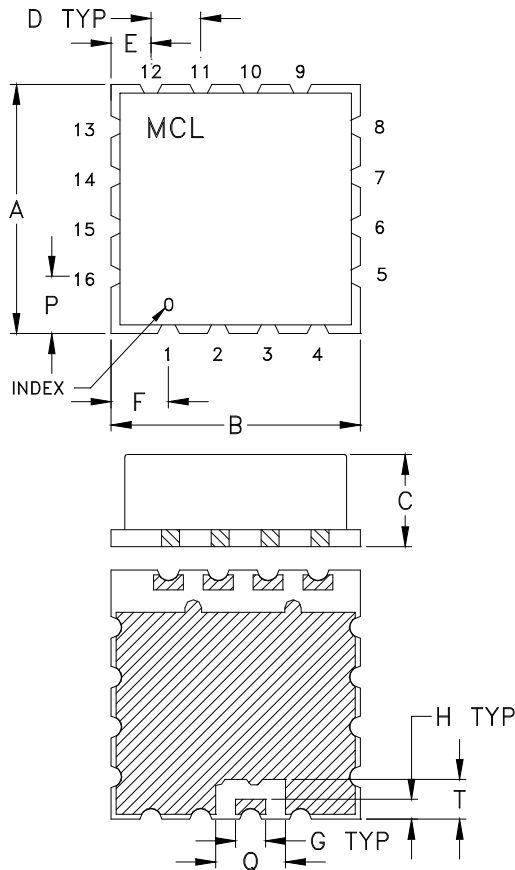
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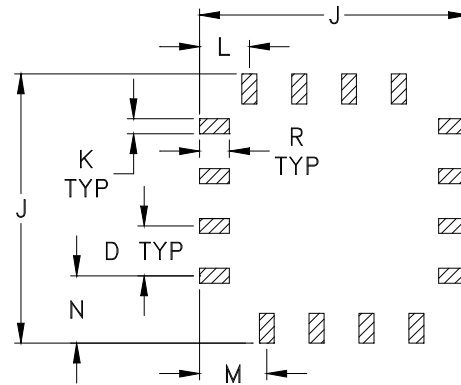
IF/RF MICROWAVE COMPONENTS

REV. OR  
SRSC-4-63+  
8/24/2016  
Page 1 of 1

### Outline Dimensions



### PCB Land Pattern



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

METALLIZATION

CASE #	A	B	C	D	E	F	G	H	J	K
CK1704-2	.500 (12.70)	.500 (12.70)	.185 (4.70)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.030 (.760)	.040 (1.02)	.540 (13.72)	.030 (.760)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CK1704-2	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.060 (1.52)	-	.080 (2.03)	1.0

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3Pl.  $\pm .015$

#### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
For RoHS Case Styles: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.



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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
				500

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



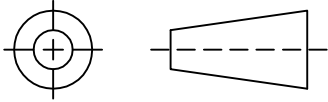
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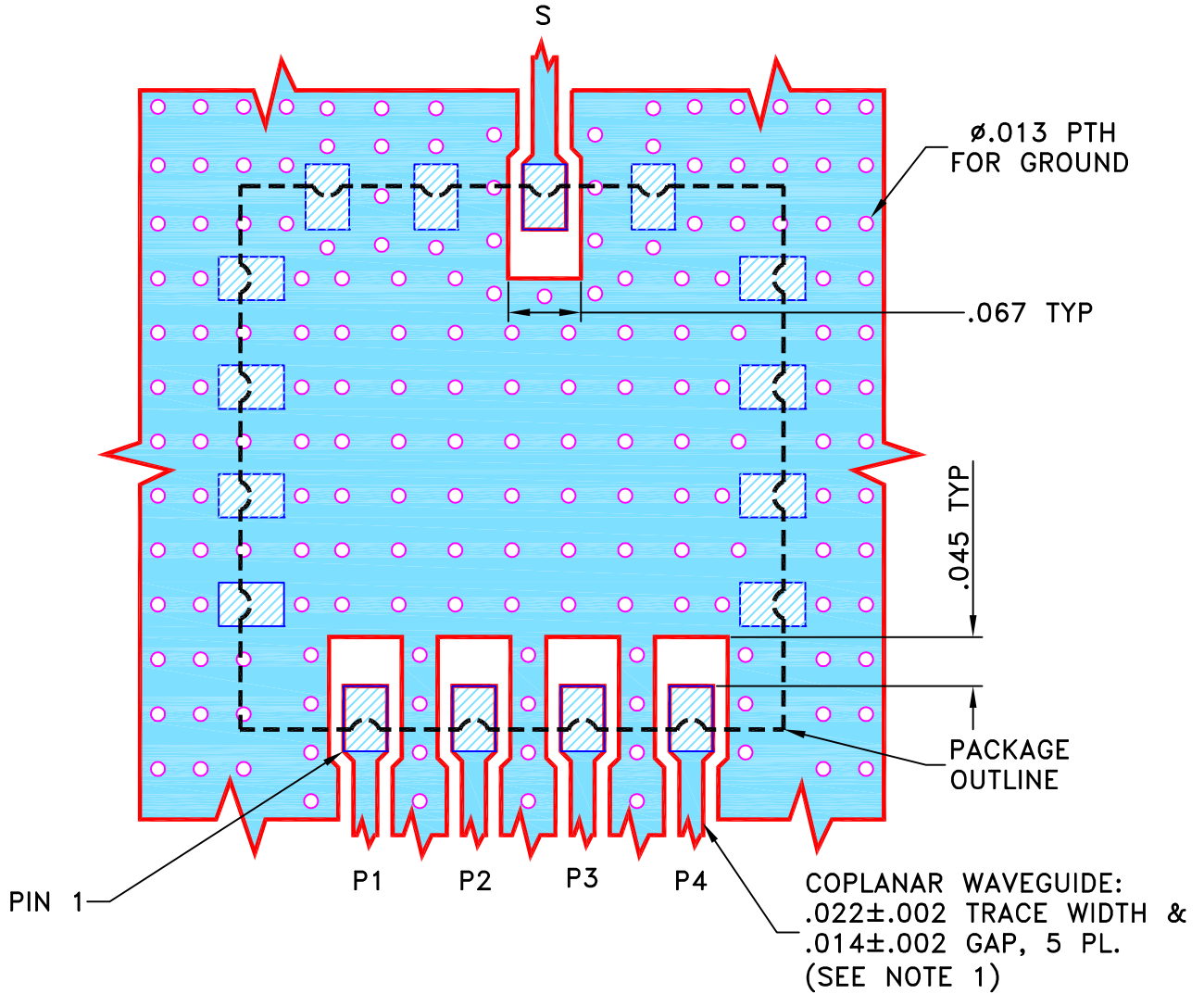
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M149695	NEW RELEASE	01/21/15	ITG	JX

SUGGESTED MOUNTING CONFIGURATION  
FOR CK1704-2 CASE STYLE, "16SP02" PIN CODE

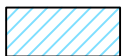


NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $.010 \pm .001$ ". COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS THESE PARAMETERS MAY NEED TO BE MODIFIED.
3. 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

ITG

01/19/15

TOLERANCES ON:

CHECKED

GF

01/21/15

2 PL DECIMALS  $\pm$

APPROVED

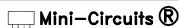
JX

01/21/15

3 PL DECIMALS  $\pm$  .005

ANGLES  $\pm$

FRACTIONS  $\pm$



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98-PL-445

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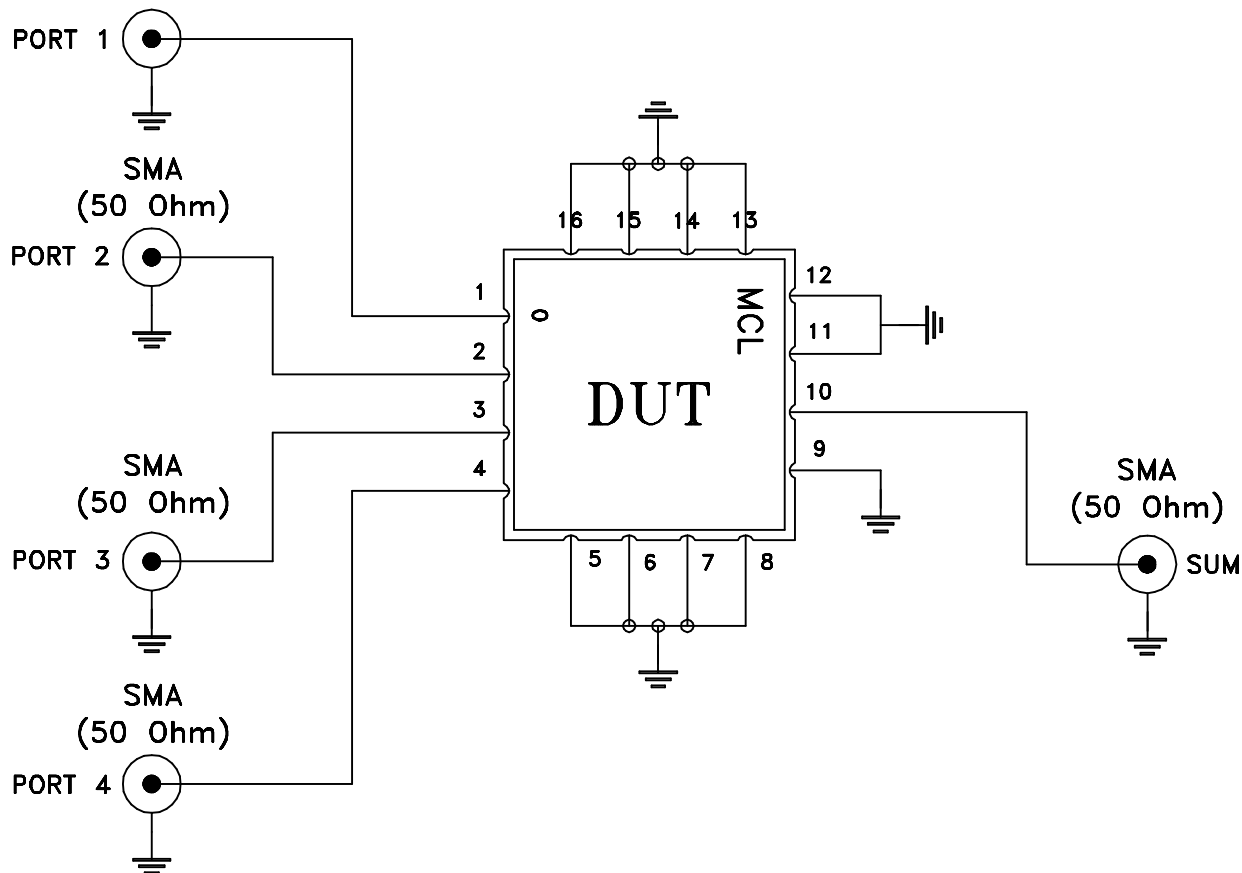
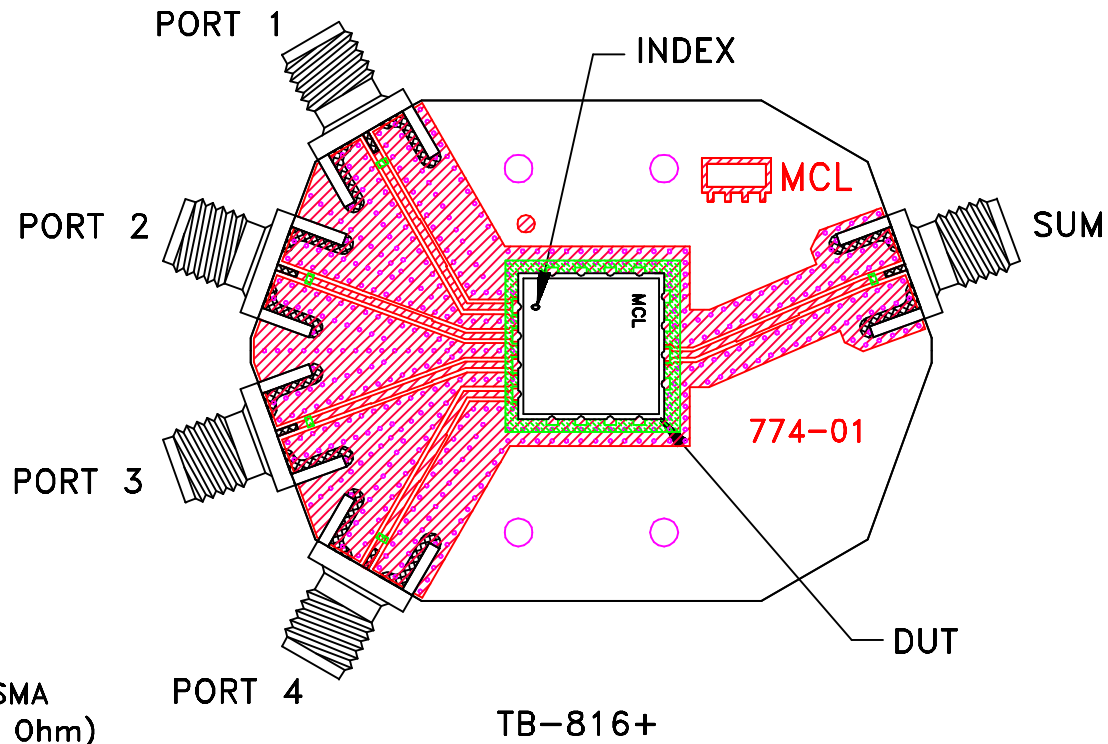
SCALE:

6:1

SHEET:


1 OF 1

# Evaluation Board and Circuit



## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent, Dielectric Constant=3.5, Thickness=.010 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	-55° 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 Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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