

Ultra-Small Ceramic Power Splitter/Combiner

SCG-3-162+

3 Way-0° 50Ω 900 to 1600 MHz

Features

- Isolation resistor, external 150 ohms
- Low insertion loss, 1.2 dB typ.
- Excellent amplitude unbalance, 0.2 dB typ.
- Excellent phase unbalance, 5 deg. typ.
- High isolation, 18 dB typ.
- ESD non-sensitive
- Temperature stable LTCC technology
- Wrap around terminations for excellent solderability
- Low cost



CASE STYLE: GE0805C-1

+RoHS Compliant

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

Applications

- ISM
- GPS



Available Tape and Reel
at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000, 4000

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		900		1600	MHz
Insertion Loss, above 4.8 dB	900 - 1600	—	1.2	1.8	dB
Isolation	900 - 1600	11.5	18	—	dB
Phase Unbalance	900 - 1600	—	5.0	8.5	Degree
Amplitude Unbalance	900 - 1600	—	0.2	0.8	dB
Return Loss (Input)	900 - 1600	—	12	—	dB
Return Loss (Output)	900 - 1600	—	20	—	dB

Maximum Ratings

Parameter	Ratings
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	2W* max.

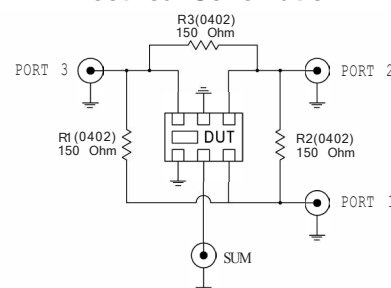
* Derate linearly to 0.7W at 100°C ambient, power input as combiner is limited by rating of external resistor 150Ω resistor.

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

Pad Connections

Function	Pad Number
SUM PORT	2
PORT 1	6
PORT 2	4
PORT 3	3
GROUND	1,5
PORT 1-2, 2-3, 1-3	resistor external 150 ohms

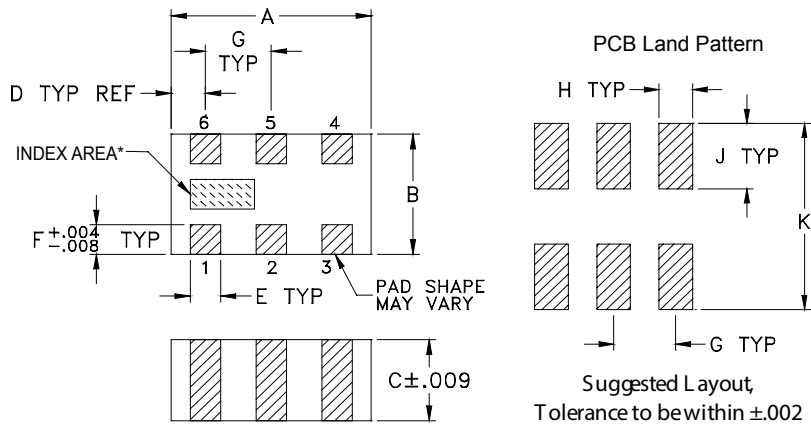
Electrical Schematic



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. OR
M171884
SCG-3-162+
SL/CP/AM
190404
Page 1 of 3

Outline Drawing

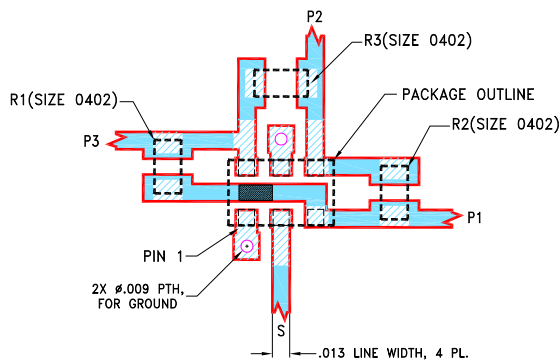


*Shape of index marking may vary

Outline Dimensions (inch/mm)

A	B	C	D	E	F
.079	.049	.033	.014	.012	.012
2.01	1.24	0.84	0.36	0.30	0.30
G	H	J	K	wt	
.026	.014	.039	.110	grams	
0.66	0.36	1.00	2.80	.008	

Demo Board MCL P/N: TB-1044+
Suggested PCB Layout (PL-622)



NOTES:

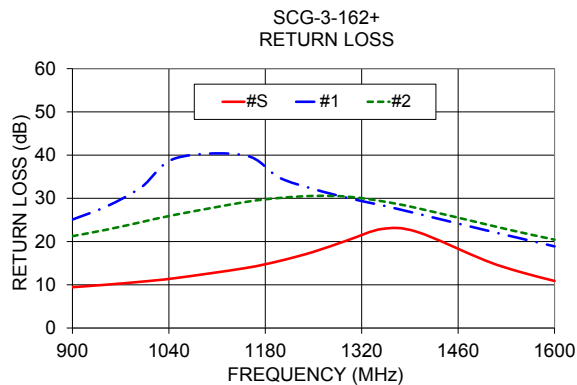
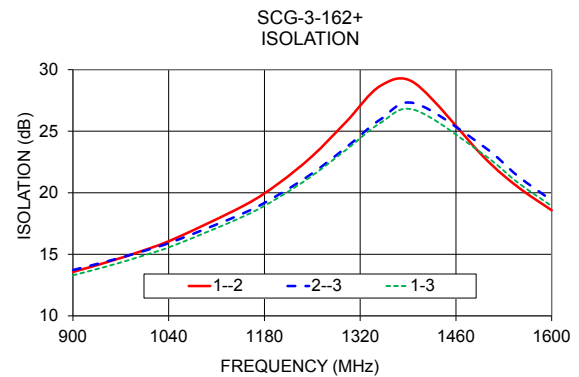
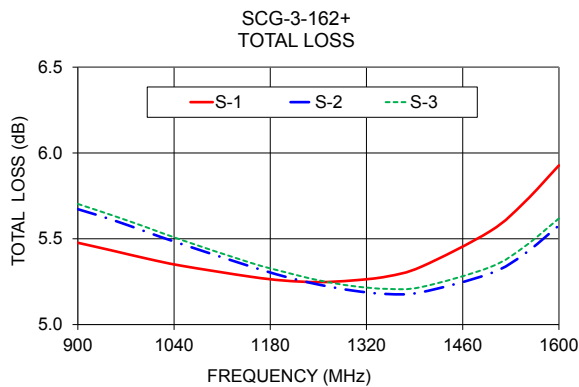
1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066 $\pm$.0007, COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. UNIT FOOT PRINT IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE GE0805C-1 RECOMMENDATIONS.
3. CHIP COMPONENT FOOT PRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-1044+.
4. 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.

Typical Performance Data

Freq. (MHz)	Total Loss ¹ (dB)			Amp. Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	Return Loss (dB)		
	S-1	S-2	S-3		1-2	1-3	2-3		S	1	2
900	5.48	5.67	5.70	0.23	13.57	13.29	13.72	0.56	9.44	25.09	21.25
950	5.43	5.61	5.64	0.21	14.36	14.03	14.43	0.81	10.04	28.16	22.77
1000	5.38	5.54	5.57	0.18	15.26	14.84	15.21	1.05	10.72	32.58	24.50
1050	5.34	5.47	5.49	0.15	16.30	15.77	16.11	1.27	11.56	39.29	26.23
1150	5.28	5.34	5.36	0.08	18.96	18.10	18.35	1.77	13.84	39.97	29.12
1200	5.26	5.28	5.31	0.05	20.73	19.59	19.82	2.04	15.49	34.82	30.08
1250	5.25	5.23	5.26	0.02	22.98	21.40	21.58	2.28	17.62	32.16	30.56
1300	5.26	5.20	5.22	0.06	25.79	23.52	23.70	2.54	20.33	30.07	30.38
1350	5.28	5.18	5.21	0.10	28.70	25.69	25.97	2.85	22.93	28.36	29.31
1400	5.34	5.19	5.22	0.15	28.90	26.72	27.26	3.14	22.27	26.49	27.76
1500	5.54	5.30	5.34	0.25	22.94	23.13	23.78	3.74	15.59	22.63	24.01
1550	5.71	5.41	5.45	0.30	20.50	20.85	21.38	4.05	12.97	20.75	22.16
1600	5.93	5.58	5.62	0.35	18.58	18.93	19.38	4.42	10.89	18.89	20.44

1. Total Loss = Insertion Loss + 4.8dB splitter loss.

**Additional 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



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		1-2	1-3	2-3			S	1	2	3
500	5.82	6.03	6.08	0.27	9.04	9.04	9.50	1.11	500	2.62	1.67	1.69	1.66
520	5.80	6.02	6.07	0.27	9.22	9.21	9.68	1.07	520	2.59	1.63	1.65	1.62
540	5.78	6.01	6.06	0.28	9.40	9.38	9.87	1.01	540	2.57	1.59	1.61	1.59
560	5.77	6.00	6.05	0.28	9.60	9.57	10.06	0.94	560	2.54	1.55	1.58	1.55
580	5.75	5.99	6.04	0.29	9.79	9.75	10.25	0.84	580	2.52	1.51	1.55	1.52
600	5.73	5.97	6.02	0.29	9.98	9.93	10.43	0.81	600	2.49	1.48	1.52	1.49
620	5.71	5.96	6.01	0.29	10.18	10.12	10.63	0.74	620	2.47	1.45	1.49	1.46
640	5.70	5.95	5.99	0.29	10.38	10.32	10.82	0.71	640	2.44	1.42	1.46	1.43
660	5.68	5.93	5.97	0.29	10.59	10.52	11.02	0.63	660	2.41	1.39	1.43	1.40
680	5.66	5.91	5.96	0.29	10.80	10.71	11.21	0.54	680	2.38	1.36	1.40	1.38
700	5.65	5.89	5.94	0.29	11.02	10.92	11.42	0.48	700	2.35	1.33	1.38	1.36
720	5.64	5.88	5.92	0.28	11.24	11.13	11.62	0.38	720	2.32	1.30	1.35	1.33
740	5.62	5.86	5.90	0.28	11.46	11.34	11.83	0.32	740	2.29	1.28	1.33	1.31
760	5.60	5.84	5.88	0.27	11.70	11.56	12.04	0.22	760	2.26	1.25	1.31	1.29
780	5.58	5.81	5.86	0.27	11.94	11.78	12.26	0.23	780	2.23	1.23	1.29	1.27
800	5.57	5.79	5.83	0.26	12.18	12.02	12.49	0.20	800	2.20	1.21	1.27	1.25
820	5.55	5.77	5.81	0.26	12.45	12.26	12.72	0.24	820	2.16	1.19	1.25	1.23
840	5.53	5.75	5.79	0.25	12.71	12.51	12.96	0.33	840	2.13	1.17	1.23	1.22
860	5.52	5.72	5.76	0.24	12.99	12.76	13.21	0.39	860	2.09	1.15	1.22	1.20
880	5.50	5.70	5.73	0.23	13.27	13.02	13.46	0.51	880	2.05	1.13	1.20	1.19
900	5.48	5.67	5.70	0.23	13.57	13.29	13.72	0.56	900	2.02	1.12	1.19	1.17
920	5.46	5.65	5.68	0.22	13.88	13.58	14.00	0.67	920	1.98	1.10	1.18	1.16
940	5.44	5.62	5.65	0.21	14.20	13.87	14.28	0.75	940	1.94	1.09	1.16	1.15
960	5.42	5.60	5.62	0.20	14.54	14.18	14.58	0.85	960	1.90	1.07	1.15	1.14
980	5.40	5.57	5.59	0.19	14.89	14.50	14.89	0.94	980	1.86	1.06	1.14	1.12
1000	5.38	5.54	5.57	0.18	15.26	14.84	15.21	1.05	1000	1.82	1.05	1.13	1.11
1020	5.37	5.51	5.54	0.17	15.66	15.20	15.56	1.15	1020	1.78	1.04	1.12	1.11
1040	5.35	5.48	5.51	0.16	16.08	15.57	15.92	1.23	1040	1.74	1.03	1.11	1.10
1060	5.34	5.46	5.48	0.15	16.53	15.98	16.30	1.31	1060	1.70	1.02	1.10	1.09
1080	5.32	5.43	5.45	0.13	17.01	16.40	16.71	1.43	1080	1.66	1.01	1.09	1.08
1100	5.31	5.40	5.43	0.12	17.51	16.85	17.15	1.52	1100	1.62	1.00	1.09	1.08
1120	5.30	5.38	5.40	0.10	18.06	17.33	17.61	1.62	1120	1.57	1.01	1.08	1.07
1140	5.28	5.35	5.37	0.09	18.64	17.83	18.09	1.72	1140	1.53	1.02	1.07	1.07
1160	5.27	5.33	5.35	0.08	19.29	18.38	18.63	1.83	1160	1.49	1.02	1.07	1.07
1180	5.26	5.30	5.33	0.06	19.98	18.96	19.20	1.92	1180	1.45	1.03	1.07	1.06
1200	5.26	5.28	5.31	0.05	20.73	19.59	19.82	2.04	1200	1.40	1.04	1.06	1.06
1220	5.25	5.26	5.29	0.04	21.57	20.28	20.48	2.14	1220	1.36	1.04	1.06	1.06
1240	5.25	5.24	5.26	0.02	22.48	21.01	21.20	2.21	1240	1.32	1.05	1.06	1.06
1260	5.25	5.23	5.25	0.03	23.51	21.80	21.99	2.34	1260	1.28	1.05	1.06	1.06
1280	5.25	5.21	5.24	0.04	24.61	22.64	22.82	2.42	1280	1.25	1.06	1.06	1.06
1300	5.26	5.20	5.22	0.06	25.79	23.52	23.70	2.54	1300	1.21	1.06	1.06	1.06
1320	5.26	5.19	5.22	0.08	27.04	24.43	24.62	2.64	1320	1.18	1.07	1.06	1.07
1340	5.28	5.18	5.21	0.09	28.21	25.29	25.54	2.79	1340	1.16	1.08	1.07	1.07
1360	5.29	5.18	5.21	0.11	29.09	26.05	26.37	2.89	1360	1.15	1.08	1.07	1.08
1380	5.31	5.18	5.21	0.13	29.35	26.56	26.99	3.02	1380	1.15	1.09	1.08	1.09
1400	5.34	5.19	5.22	0.15	28.90	26.72	27.26	3.14	1400	1.17	1.10	1.09	1.09
1420	5.37	5.20	5.23	0.17	27.90	26.49	27.17	3.27	1420	1.20	1.11	1.09	1.10
1440	5.40	5.22	5.25	0.18	26.65	25.90	26.62	3.41	1440	1.24	1.12	1.10	1.11
1460	5.44	5.24	5.27	0.20	25.33	25.05	25.74	3.52	1460	1.28	1.13	1.11	1.12
1480	5.49	5.26	5.30	0.22	24.08	24.10	24.78	3.65	1480	1.34	1.14	1.12	1.14
1500	5.54	5.30	5.34	0.25	22.94	23.13	23.78	3.74	1500	1.40	1.16	1.13	1.15
1520	5.61	5.34	5.38	0.27	21.89	22.18	22.79	3.88	1520	1.47	1.18	1.15	1.16
1540	5.67	5.39	5.42	0.28	20.94	21.28	21.84	4.03	1540	1.54	1.19	1.16	1.18
1560	5.75	5.44	5.48	0.31	20.06	20.41	20.94	4.14	1560	1.62	1.21	1.18	1.19
1580	5.84	5.51	5.54	0.33	19.28	19.64	20.13	4.28	1580	1.71	1.23	1.19	1.21
1600	5.93	5.58	5.62	0.35	18.58	18.93	19.38	4.42	1600	1.80	1.26	1.21	1.23
1620	6.03	5.66	5.70	0.37	17.92	18.25	18.68	4.52	1620	1.90	1.28	1.23	1.26
1640	6.14	5.75	5.79	0.39	17.32	17.64	18.03	4.69	1640	2.01	1.31	1.25	1.28
1660	6.26	5.85	5.89	0.41	16.77	17.06	17.44	4.80	1660	2.13	1.33	1.27	1.30
1680	6.39	5.95	6.00	0.44	16.27	16.54	16.89	4.96	1680	2.25	1.36	1.29	1.32
1700	6.53	6.07	6.11	0.46	15.82	16.06	16.39	5.09	1700	2.39	1.39	1.31	1.34
1720	6.68	6.19	6.24	0.49	15.40	15.62	15.93	5.23	1720	2.53	1.43	1.34	1.37
1740	6.83	6.33	6.37	0.51	15.01	15.20	15.51	5.38	1740	2.69	1.46	1.36	1.40
1760	7.00	6.47	6.52	0.53	14.66	14.82	15.10	5.53	1760	2.86	1.49	1.39	1.43
1780	7.17	6.61	6.66	0.55	14.34	14.49	14.75	5.67	1780	3.04	1.53	1.41	1.45
1800	7.34	6.77	6.82	0.57	14.05	14.17	14.42	5.84	1800	3.23	1.57	1.44	1.48

¹Total Loss = Insertion Loss + 4.8dB Splitter Loss

ISO 9001 ISO 14001 AS 9100 CERTIFIED

minicircuits.com

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

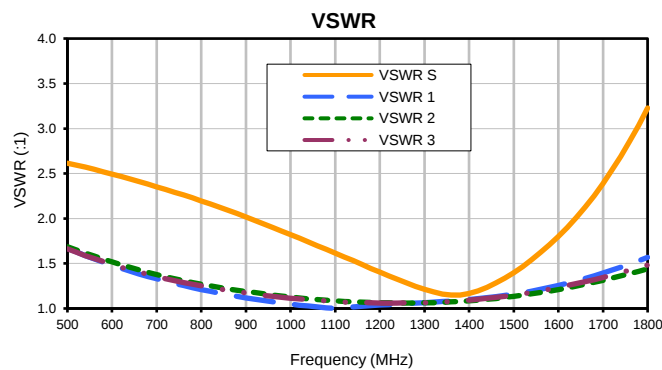
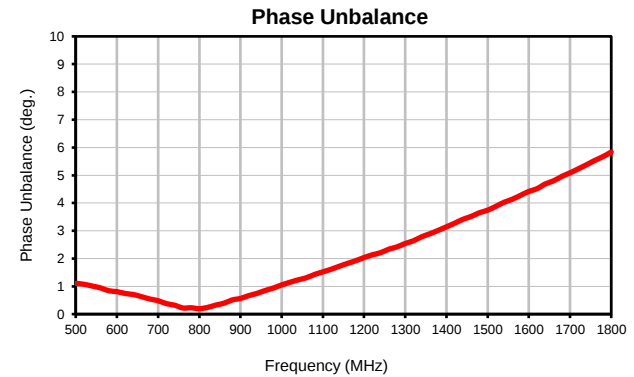
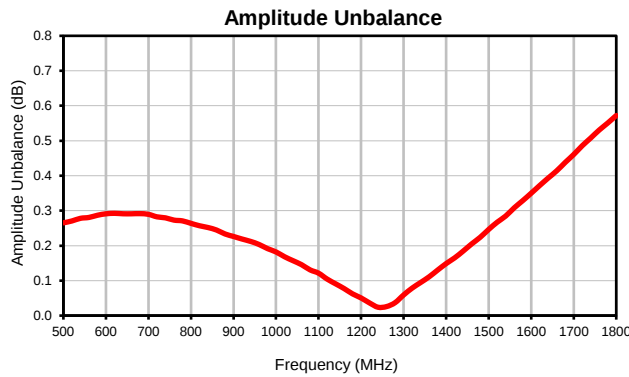
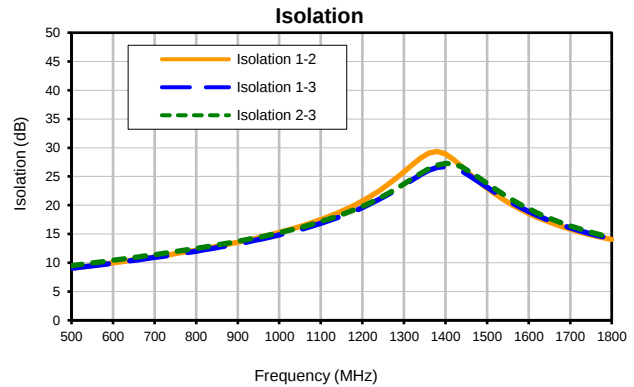
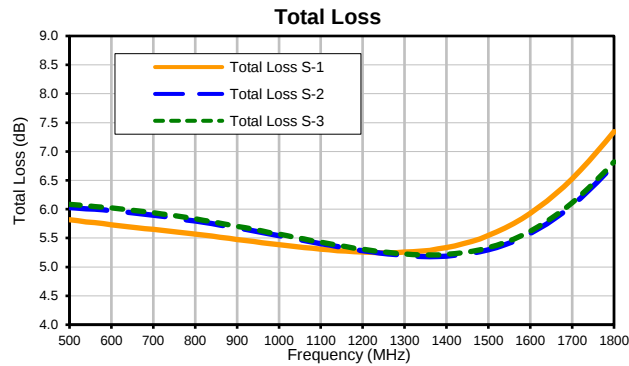


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

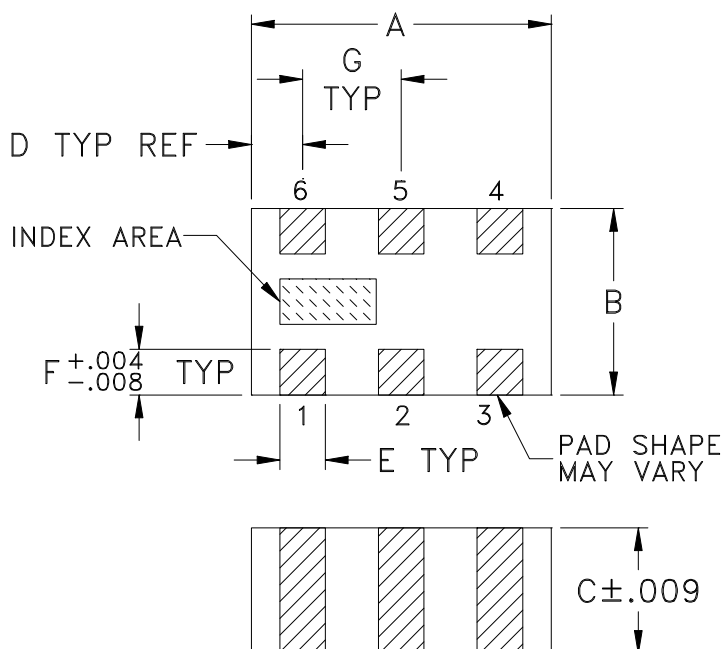
IF/RF MICROWAVE COMPONENTS

 REV. OR
 SCG-3-162+
 3/8/2019
 Page 1 of 1

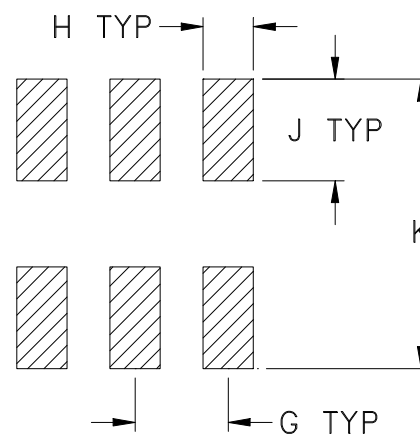
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
GE0805C-1	.079 (2.00)	.049 (1.25)	.033 (0.84)	.014 (0.35)	.012 (0.30)	.012 (0.30)	.026 (0.65)	.014 (0.35)	.039 (1.00)	.110 (2.80)	.008

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

Notes:

- Open style, ceramic base.
- Termination finish: For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
For RoHS-5 Case Style: Tin-lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R

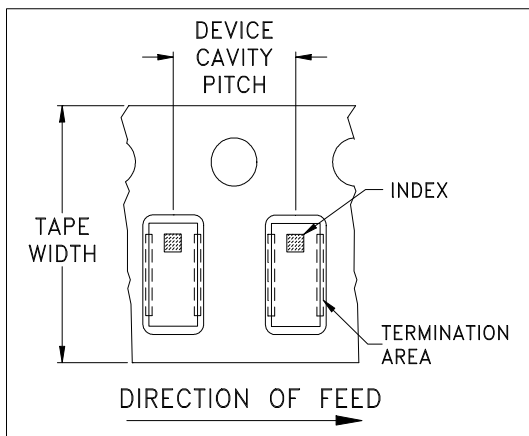


ILLUSTRATION 1

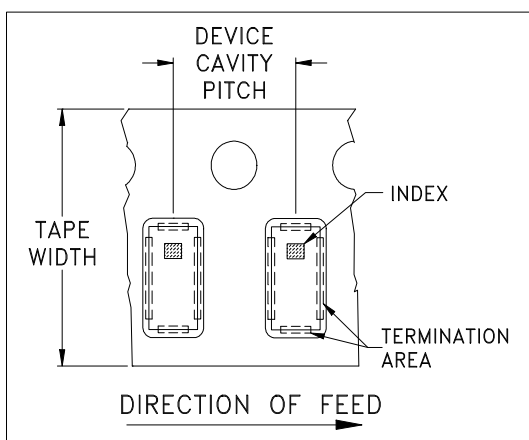


ILLUSTRATION 2

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	4000

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



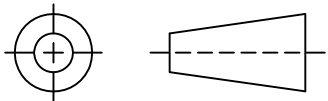
INTERNET <http://www.minicircuits.com>

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

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

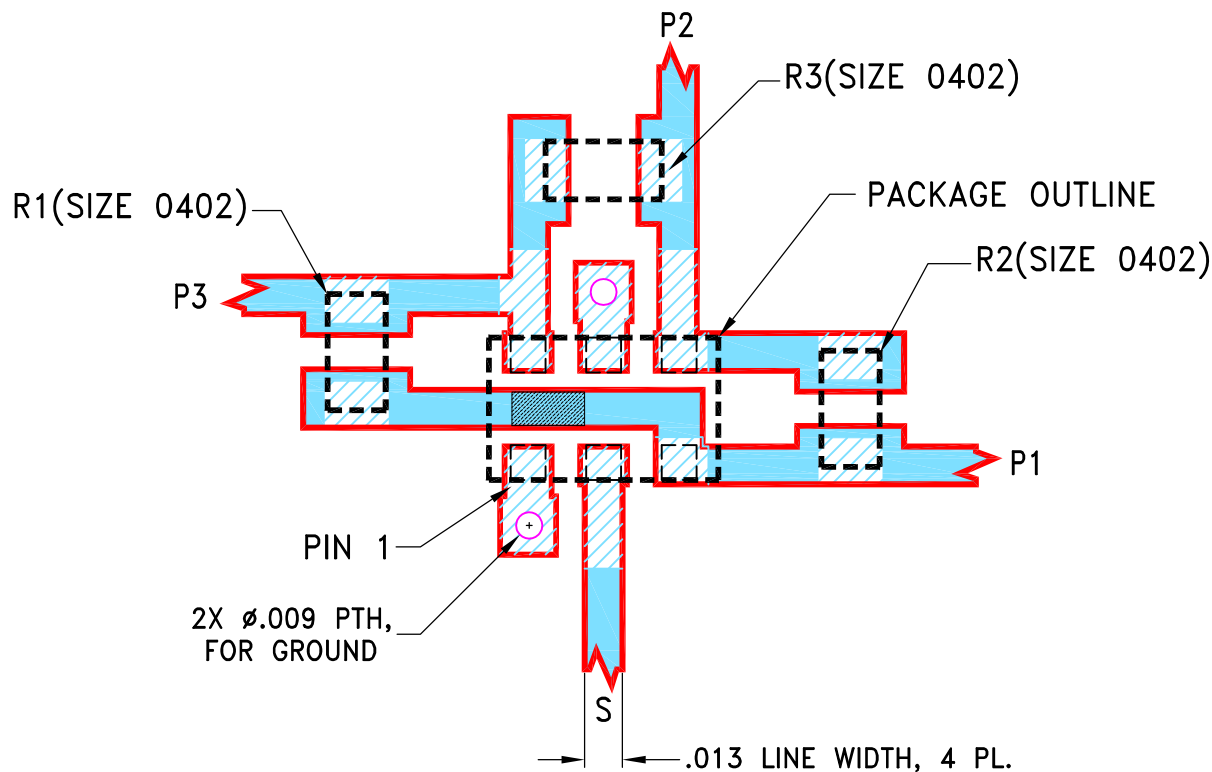
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M173102	NEW RELEASE	03/12/19	ITG	SL

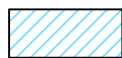
SUGGESTED MOUNTING CONFIGURATION
FOR GE0805C-1 CASE STYLE, "06SP18" PIN CODE

**NOTES:**

1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.0066 \pm .0007$. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. UNIT FOOT PRINT IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE GE0805C-1 RECOMMENDATIONS.
3. CHIP COMPONENT FOOT PRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-1044+.
4. 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 $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

ITG

03/07/19

CHECKED

GF

03/12/19

APPROVED

SL

03/12/19

**Mini-Circuits®**13 Neptune Avenue
Brooklyn NY 11235

PL, 06SP18, GE0805C-1, TB-1044+

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-622

REV:

OR

FILE:

98PL622

SCALE:

15:1

SHEET:

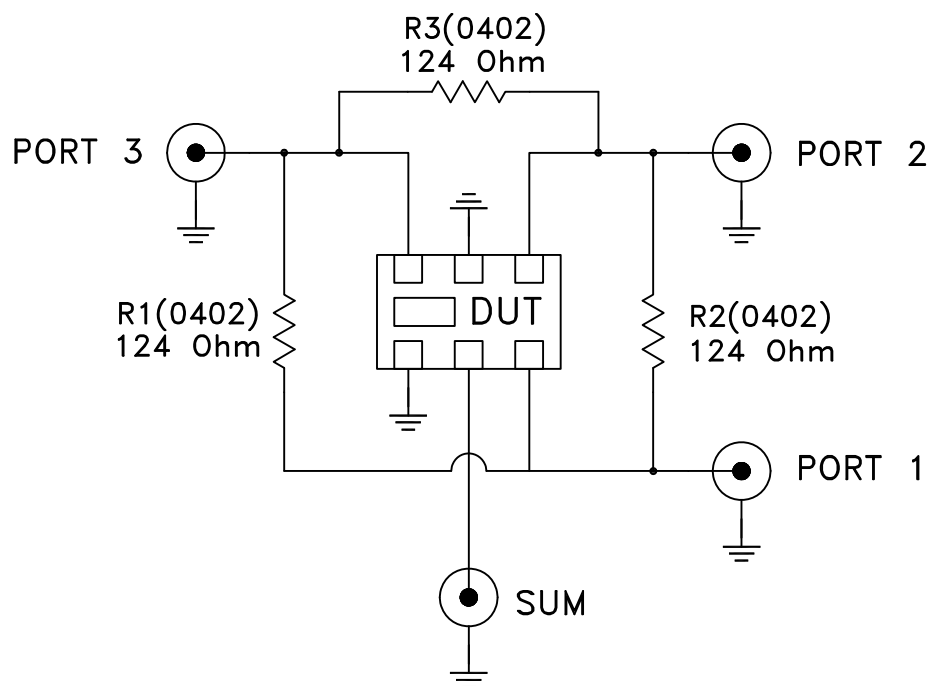
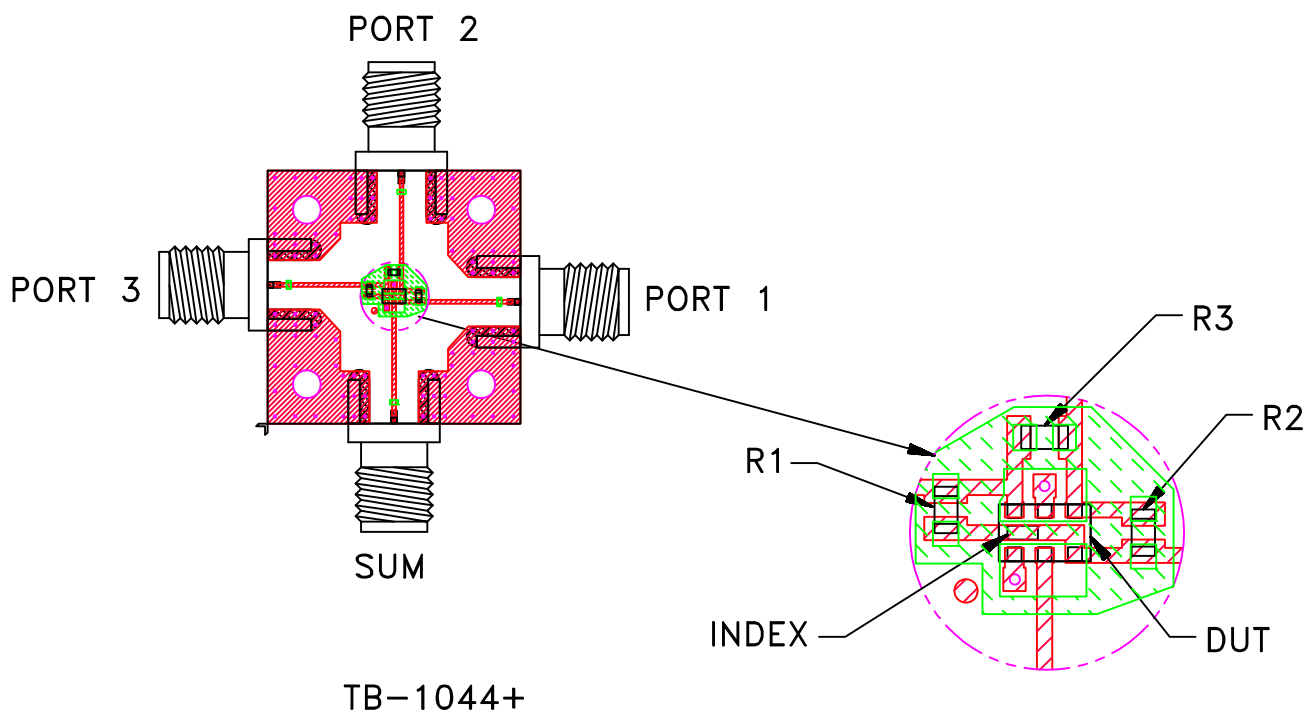
1 OF 1

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.0066 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 100°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
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, Para 4.2.5, Test S, 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