



CERAMIC

Power Splitter/Combiner

SCG-2-242+

Mini-Circuits

2 Way-0° 50Ω 1000 to 2400 MHz

FEATURES

- Isolation resistor, external 100 ohms
- Low insertion loss, 0.8 dB typ.
- Excellent amplitude unbalance, 0.1 dB typ.
- Excellent phase unbalance, 1.5 deg. typ.
- High isolation, 15 dB typ.
- ESD non-sensitive
- Temperature stable LTCC technology
- Wrap around terminations for excellent solderability
- Low cost



Generic photo used for illustration purposes only
CASE STYLE: GE0805C-1

+RoHS Compliant

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

APPLICATIONS

- ISM
- WLAN

ELECTRICAL SPECIFICATIONS AT 25°C

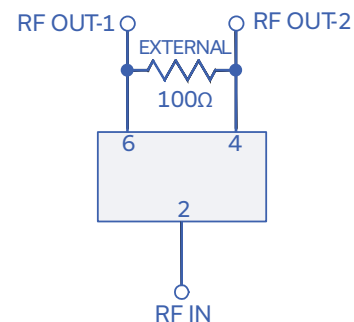
| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range | | 1000 | | 2400 | MHz |
| Insertion Loss, above 3.0 dB | 1000 - 2400 | — | 0.8 | 1.3 | dB |
| Isolation | 1000 - 2400 | 9 | 15 | — | dB |
| Phase Unbalance | 1000 - 2400 | — | 1.5 | 5.0 | Degree |
| Amplitude Unbalance | 1000 - 2400 | — | 0.1 | 0.3 | dB |
| Return Loss (Input) | 1000 - 2400 | — | 16 | — | dB |
| Return Loss (Output) | 1000 - 2400 | — | 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 100Ω resistor.
Permanent damage may occur if any of these limits are exceeded.

ELECTRICAL SCHEMATIC



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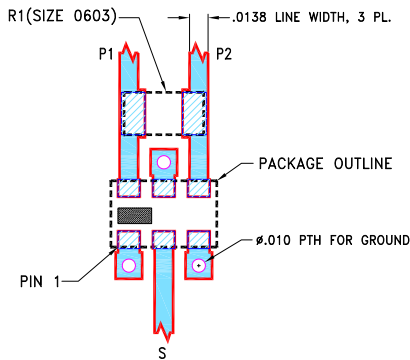
2 Way-0° 50Ω 1000 to 2400 MHz

PAD CONNECTIONS

| | |
|----------|----------------------------|
| SUM PORT | 2 |
| PORT 1 | 6 |
| PORT 2 | 4 |
| GROUND | 1,3,5 |
| PORT 1-2 | resistor external 100 ohms |

PRODUCT MARKING: PB

DEMO BOARD MCL P/N: TB-1043+
SUGGESTED PCB LAYOUT (PL-560)

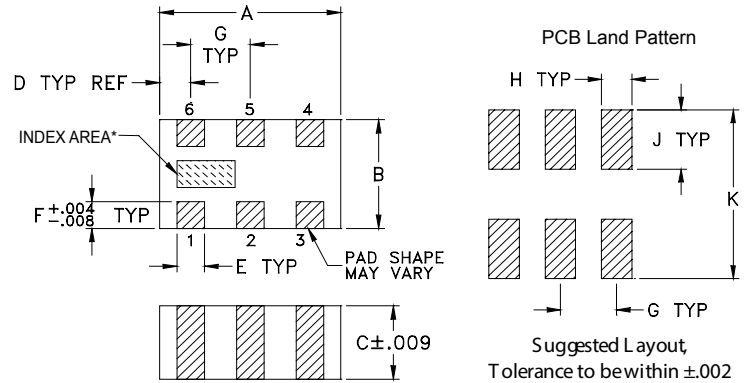


NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066±.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-1043+.
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.

OUTLINE DRAWING



*Shape of index marking may vary

OUTLINE DIMENSIONS (Inches/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 |

TAPE & REEL INFORMATION: F74



CERAMIC

Power Splitter/Combiner

SCG-2-242+

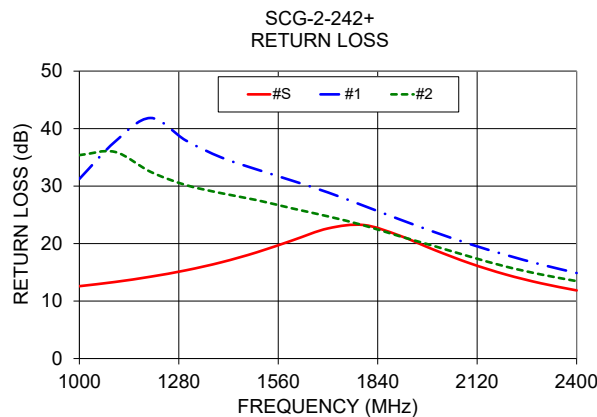
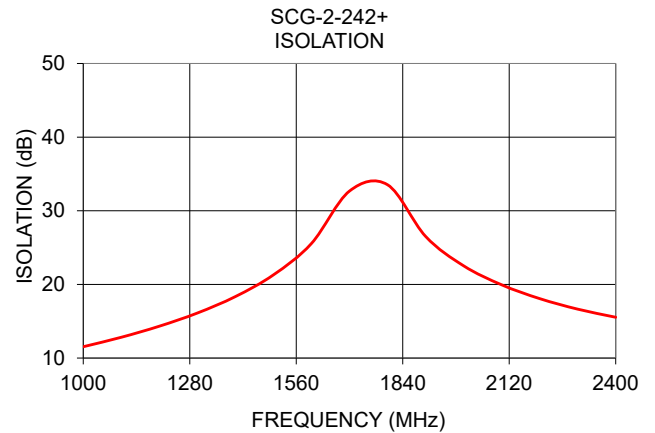
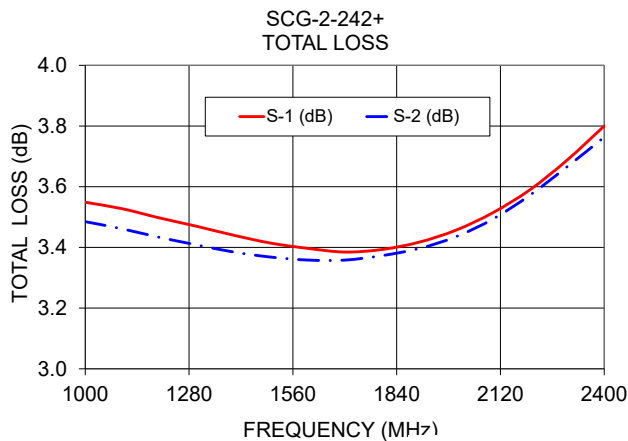
Mini-Circuits

2 Way-0° 50Ω 1000 to 2400 MHz

TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | Return Loss (dB) | | |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|------------------|-------|-------|
| | S-1 | S-2 | | | | S | 1 | 2 |
| 1000 | 3.55 | 3.48 | 0.06 | 11.54 | 0.97 | 12.59 | 31.25 | 35.39 |
| 1100 | 3.53 | 3.46 | 0.07 | 12.82 | 1.08 | 13.32 | 37.71 | 35.95 |
| 1200 | 3.50 | 3.43 | 0.06 | 14.33 | 1.15 | 14.24 | 41.85 | 32.50 |
| 1300 | 3.47 | 3.41 | 0.06 | 16.11 | 1.23 | 15.35 | 37.93 | 30.18 |
| 1400 | 3.44 | 3.38 | 0.06 | 18.35 | 1.22 | 16.75 | 34.98 | 28.76 |
| 1500 | 3.41 | 3.37 | 0.05 | 21.30 | 1.28 | 18.49 | 32.88 | 27.55 |
| 1600 | 3.40 | 3.36 | 0.04 | 25.56 | 1.32 | 20.56 | 30.93 | 26.11 |
| 1700 | 3.38 | 3.36 | 0.03 | 32.68 | 1.39 | 22.64 | 28.90 | 24.73 |
| 1800 | 3.39 | 3.37 | 0.02 | 33.53 | 1.38 | 23.24 | 26.59 | 23.18 |
| 1900 | 3.42 | 3.40 | 0.02 | 26.53 | 1.39 | 21.42 | 24.25 | 21.31 |
| 2000 | 3.46 | 3.44 | 0.02 | 22.53 | 1.37 | 18.88 | 22.00 | 19.55 |
| 2100 | 3.51 | 3.49 | 0.02 | 19.95 | 1.55 | 16.56 | 19.91 | 17.72 |
| 2200 | 3.59 | 3.57 | 0.02 | 18.07 | 1.70 | 14.63 | 18.04 | 16.01 |
| 2300 | 3.69 | 3.67 | 0.02 | 16.64 | 1.77 | 13.09 | 16.36 | 14.63 |
| 2400 | 3.80 | 3.76 | 0.04 | 15.54 | 1.89 | 11.85 | 14.88 | 13.47 |

1. Total Loss = Insertion Loss + 3dB 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.
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2 Way-0° Power Splitter/Combiner

SCG-2-242+

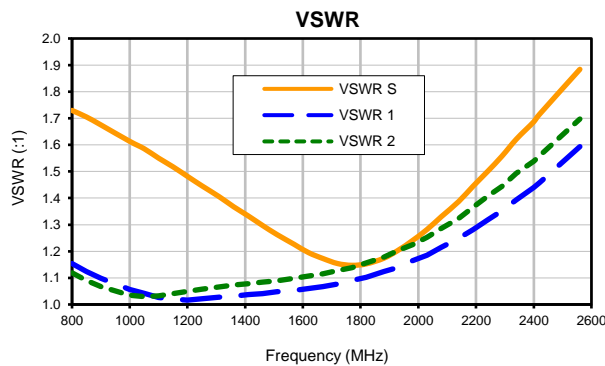
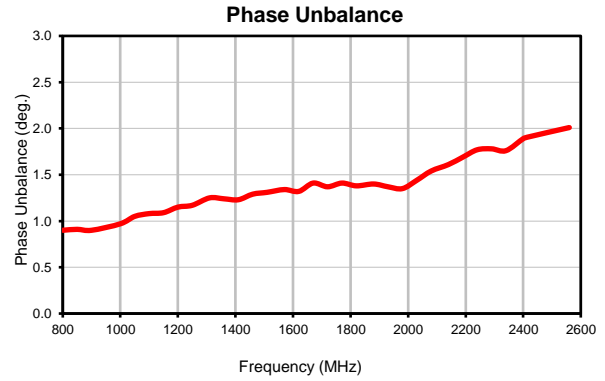
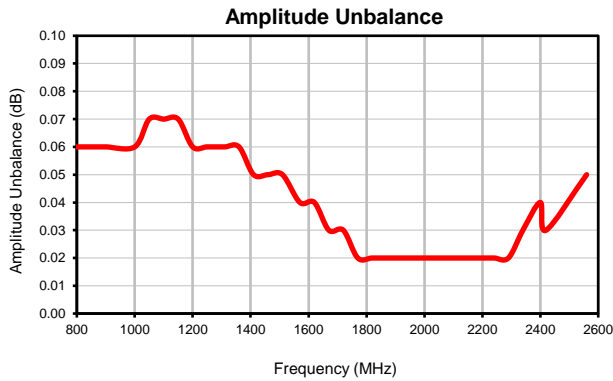
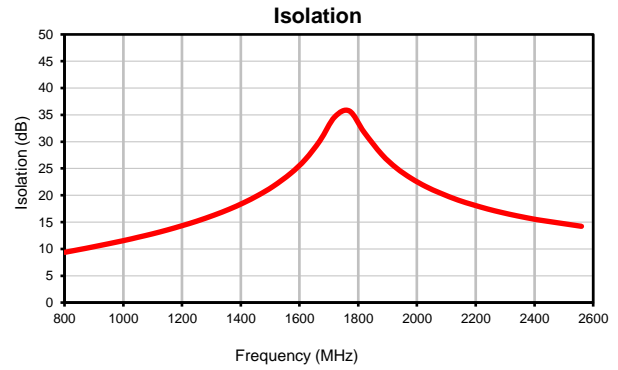
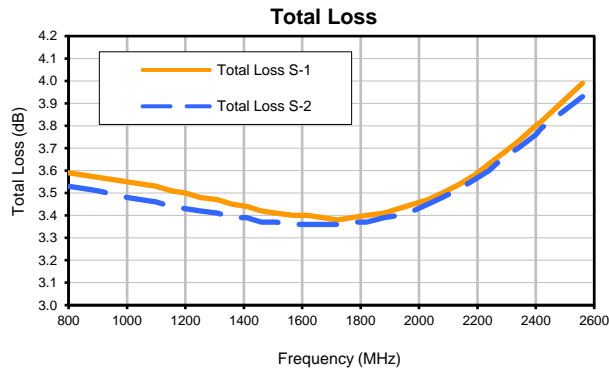
Typical Performance Data

| FREQUENCY (MHz) | TOTAL LOSS ¹ (dB) | | AMPLITUDE UNBALANCE (dB) | ISOLATION (dB) | PHASE UNBALANCE (deg.) | FREQUENCY (MHz) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|-------------------|------------------------------|--------------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 800 | 3.59 | 3.53 | 0.06 | 9.36 | 0.90 | 800 | 1.73 | 1.15 | 1.12 |
| 850 | 3.58 | 3.52 | 0.06 | 9.88 | 0.91 | 850 | 1.70 | 1.12 | 1.09 |
| 900 | 3.57 | 3.51 | 0.06 | 10.41 | 0.90 | 900 | 1.68 | 1.10 | 1.07 |
| 1000 | 3.55 | 3.48 | 0.06 | 11.54 | 0.97 | 1000 | 1.61 | 1.06 | 1.03 |
| 1050 | 3.54 | 3.47 | 0.07 | 12.17 | 1.05 | 1050 | 1.59 | 1.04 | 1.03 |
| 1100 | 3.53 | 3.46 | 0.07 | 12.82 | 1.08 | 1100 | 1.55 | 1.03 | 1.03 |
| 1150 | 3.51 | 3.44 | 0.07 | 13.54 | 1.09 | 1150 | 1.52 | 1.02 | 1.04 |
| 1200 | 3.50 | 3.43 | 0.06 | 14.33 | 1.15 | 1200 | 1.48 | 1.02 | 1.05 |
| 1250 | 3.48 | 3.42 | 0.06 | 15.17 | 1.17 | 1250 | 1.45 | 1.02 | 1.06 |
| 1310 | 3.47 | 3.41 | 0.06 | 16.32 | 1.25 | 1310 | 1.41 | 1.03 | 1.07 |
| 1360 | 3.45 | 3.39 | 0.06 | 17.39 | 1.24 | 1360 | 1.37 | 1.03 | 1.07 |
| 1410 | 3.44 | 3.39 | 0.05 | 18.61 | 1.23 | 1410 | 1.33 | 1.04 | 1.08 |
| 1460 | 3.42 | 3.37 | 0.05 | 20.02 | 1.29 | 1460 | 1.30 | 1.04 | 1.08 |
| 1510 | 3.41 | 3.37 | 0.05 | 21.66 | 1.31 | 1510 | 1.26 | 1.05 | 1.09 |
| 1570 | 3.40 | 3.36 | 0.04 | 24.09 | 1.34 | 1570 | 1.23 | 1.05 | 1.10 |
| 1620 | 3.40 | 3.36 | 0.04 | 26.69 | 1.32 | 1620 | 1.19 | 1.06 | 1.11 |
| 1670 | 3.39 | 3.36 | 0.03 | 30.21 | 1.41 | 1670 | 1.17 | 1.07 | 1.12 |
| 1720 | 3.38 | 3.36 | 0.03 | 34.62 | 1.37 | 1720 | 1.15 | 1.08 | 1.13 |
| 1770 | 3.39 | 3.37 | 0.02 | 35.72 | 1.41 | 1770 | 1.15 | 1.09 | 1.14 |
| 1820 | 3.40 | 3.37 | 0.02 | 31.77 | 1.38 | 1820 | 1.15 | 1.10 | 1.16 |
| 1880 | 3.41 | 3.39 | 0.02 | 27.63 | 1.40 | 1880 | 1.17 | 1.12 | 1.18 |
| 1930 | 3.43 | 3.40 | 0.02 | 25.09 | 1.37 | 1930 | 1.20 | 1.14 | 1.20 |
| 1980 | 3.45 | 3.42 | 0.02 | 23.18 | 1.35 | 1980 | 1.24 | 1.16 | 1.22 |
| 2030 | 3.47 | 3.45 | 0.02 | 21.64 | 1.44 | 2030 | 1.28 | 1.19 | 1.25 |
| 2080 | 3.50 | 3.48 | 0.02 | 20.40 | 1.54 | 2080 | 1.33 | 1.22 | 1.29 |
| 2140 | 3.54 | 3.52 | 0.02 | 19.11 | 1.61 | 2140 | 1.39 | 1.25 | 1.32 |
| 2190 | 3.58 | 3.56 | 0.02 | 18.25 | 1.69 | 2190 | 1.44 | 1.28 | 1.37 |
| 2240 | 3.63 | 3.60 | 0.02 | 17.46 | 1.77 | 2240 | 1.50 | 1.32 | 1.41 |
| 2290 | 3.68 | 3.66 | 0.02 | 16.78 | 1.78 | 2290 | 1.56 | 1.35 | 1.44 |
| 2340 | 3.73 | 3.70 | 0.03 | 16.18 | 1.76 | 2340 | 1.62 | 1.39 | 1.49 |
| 2400 | 3.80 | 3.76 | 0.04 | 15.54 | 1.89 | 2400 | 1.69 | 1.44 | 1.54 |
| 2420 | 3.82 | 3.79 | 0.03 | 15.36 | 1.91 | 2420 | 1.71 | 1.46 | 1.56 |
| 2560 | 3.99 | 3.93 | 0.05 | 14.22 | 2.01 | 2560 | 1.88 | 1.59 | 1.70 |

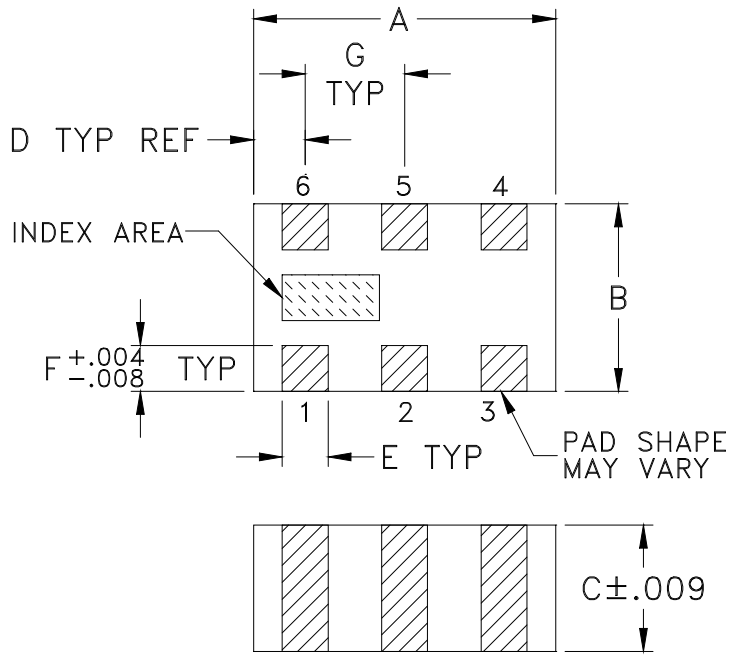
¹Total Loss = Insertion Loss + 3dB Splitter Loss



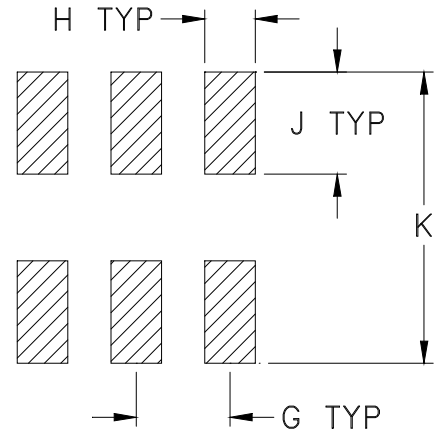
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

| 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.



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

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F74

DEVICE ORIENTATION IN T&R

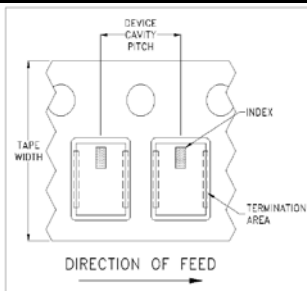


ILLUSTRATION 1

Applicable Case Styles

GE0805C-1
GE0805C-1AP
JV1210C-1
GU2939

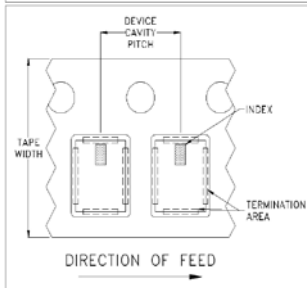


ILLUSTRATION 2

Applicable Case Styles

JV1210C
JV1210C-2
JV1210C-3
JV1210C-4
JV1210C-5
JV1210C-6
JV1210C-11

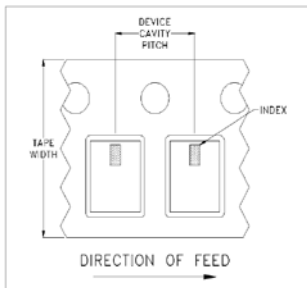


ILLUSTRATION 3

Applicable Case Styles

JC0603C-8
JV1210C-7
JV1210C-8
JV1210C-9
JV1210C-10
JV1210C-13
GE0805C-13

| Tape Width, mm | Device Cavity Pitch, mm | Real Size, inches | Devices per Reel | |
|-------------------|----------------------------|----------------------|--|------|
| 8 | 4 | 7 | Small quantity standards (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | | | 500 |
| | | | Standard | 1000 |
| | | | | 2000 |
| | | | 4000 | |

Note: Small reel availability 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



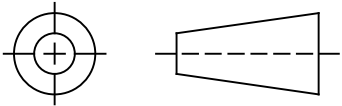
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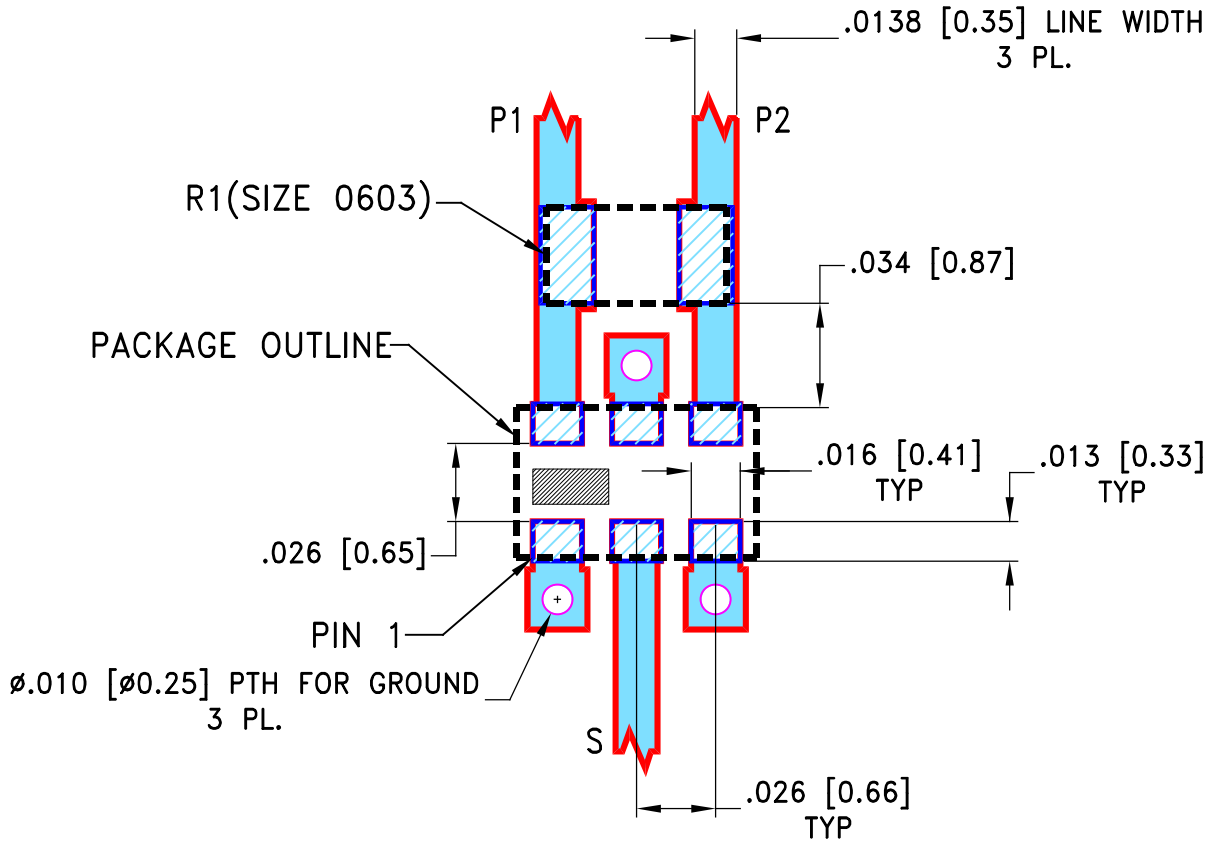
THIRD ANGLE PROJECTION



REVISIONS

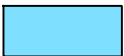
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|------------|--------------------------|----------|-----|------|
| OR | M172101 | NEW RELEASE | 02/20/19 | ITG | SL |
| A | ECO-004368 | ADDED DIMENSIONS IN [MM] | | GF | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION
FOR GE0805C-1 CASE STYLE, "06SP17" PIN CODE

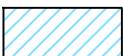


NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.0066 \pm .0007$ [.168 ± .018]. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
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3. CHIP COMPONENT FOOT PRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-1043+.
4. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).



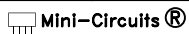
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

| UNLESS OTHERWISE SPECIFIED | INITIALS | DATE |
|------------------------------|-------------|----------|
| DIMENSIONS ARE IN INCHES[MM] | DRAWN ITG | 01/21/19 |
| TOLERANCES ON: | CHECKED GF | 01/22/19 |
| 2 PL DECIMALS ± | APPROVED SL | 02/20/19 |
| 3 PL DECIMALS ± .005 | | |
| ANGLES ± | | |
| FRACTIONS ± | | |



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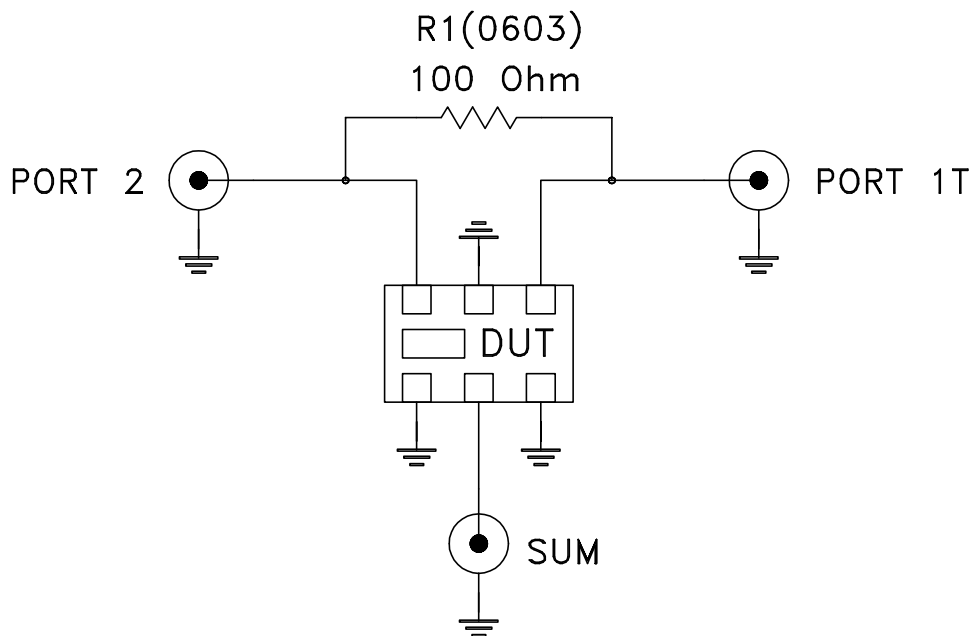
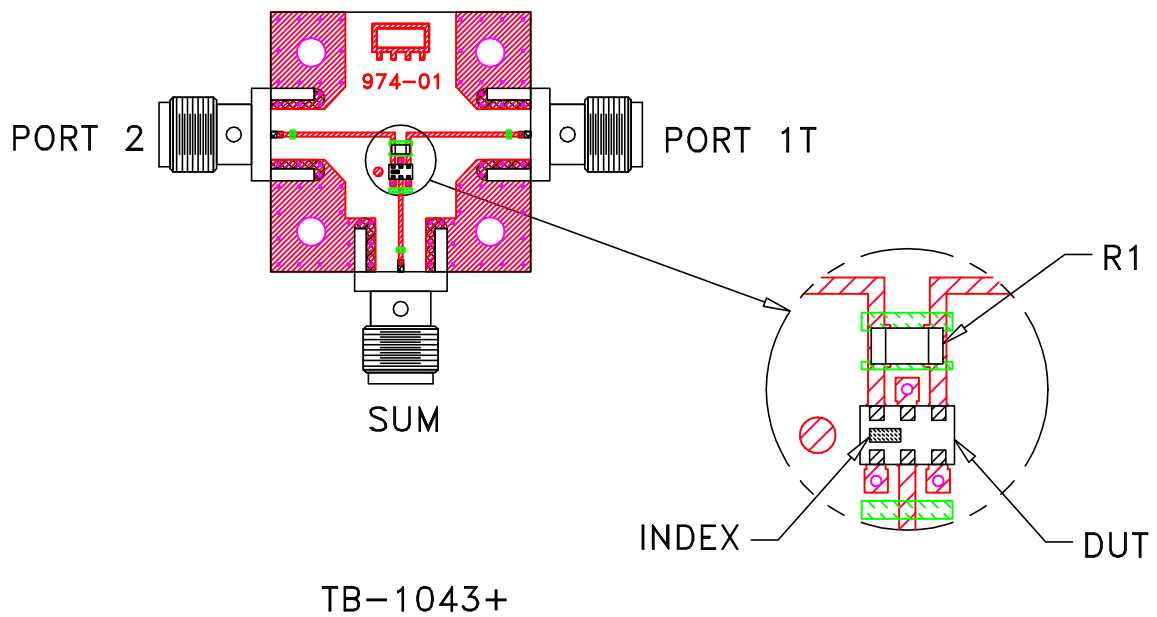
PL, 06SP17, GE0805C-1, TB-1043+



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| SIZE | CODE IDENT | DRAWING NO: | REV: |
|-------|------------|-------------|---------------|
| A | 15542 | 98-PL-560 | A |
| FILE: | 98PL560 | SCALE: 15:1 | SHEET: 1 OF 1 |


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 |