



### THE BIG DEAL

- Isolation resistor, external 100 ohms
- Low insertion loss, 0.9 dB typ.
- Excellent amplitude unbalance, 0.1 dB typ.
- Excellent phase unbalance, 1.5 deg. typ.
- High isolation, 16 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 web site for RoHS Compliance methodologies and qualifications

### APPLICATIONS

- ISM
- WLAN

### PRODUCT OVERVIEW

Mini-Circuits new LTCC 0° Power Splitter, model SCG-2-422+, offers industry leading combination of operating performance and size. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

### KEY FEATURES

| Feature                  | Advantages                                                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Small Size               | Offered in the package size, SCG-2-422+ offers an industry leading combination of size, power handling, and frequency. The small footprint allows for reduced parasitics in systems with improved performance and simplified layout. |
| Wrap-Around Terminations | Provides excellent solderability and easy visual inspection.                                                                                                                                                                         |
| LTCC Construction        | Provides repeatable performance in the rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.                                                                                    |



## ELECTRICAL SPECIFICATIONS AT 25°C

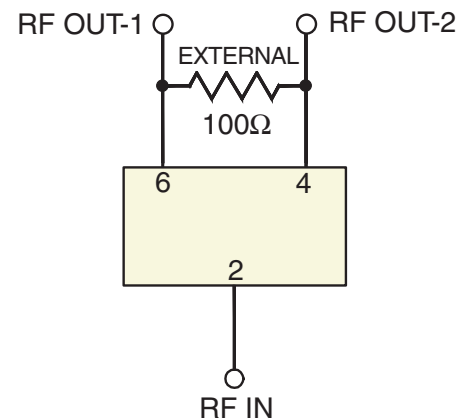
| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range              |                 | 2800 |      | 4200 | MHz    |
| Insertion Loss, above 3.0 dB | 2800 - 4200     | —    | 0.9  | 1.7  | dB     |
| Isolation                    | 2800 - 4200     | 12   | 16   | —    | dB     |
| Phase Unbalance              | 2800 - 4200     | —    | 1.5  | 9    | Degree |
| Amplitude Unbalance          | 2800 - 4200     | —    | 0.1  | 0.7  | dB     |
| Return Loss (Input)          | 2800 - 4200     | —    | 11   | —    | dB     |
| Return Loss (Output)         | 2800 - 4200     | —    | 15   | —    | 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





Mini-Circuits

CERAMIC

# Power Splitter/Combiner

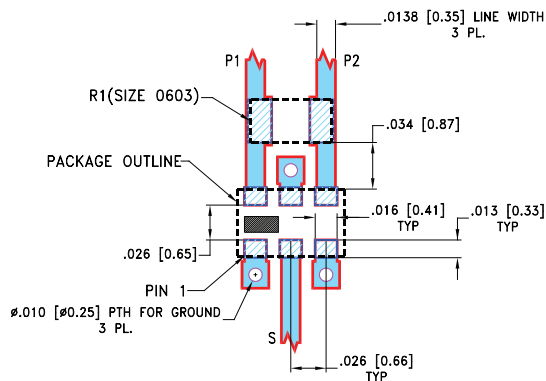
SCG-2-422+

## PAD CONNECTIONS

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

PRODUCT MARKING: SZ

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

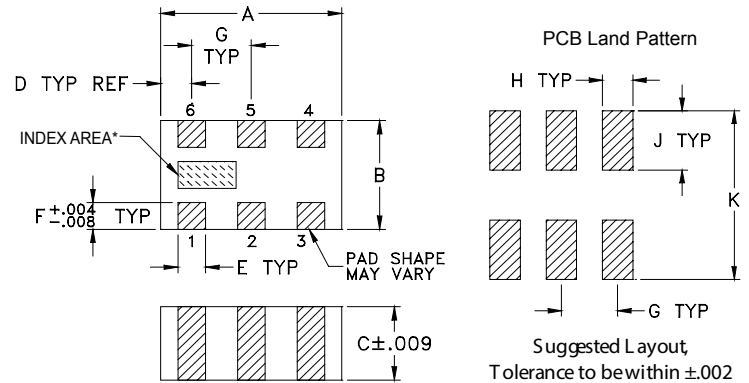


### NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .0066±.0007 [.168±.018]. 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  |      |



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CERAMIC

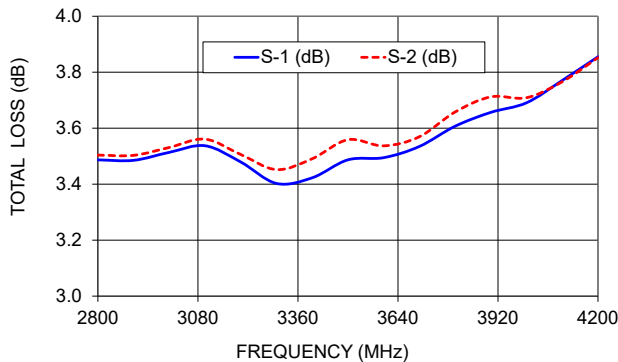
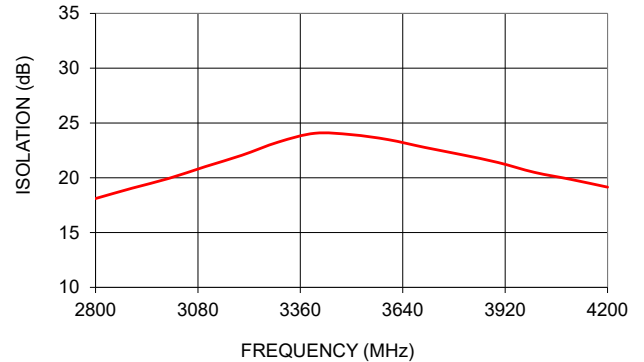
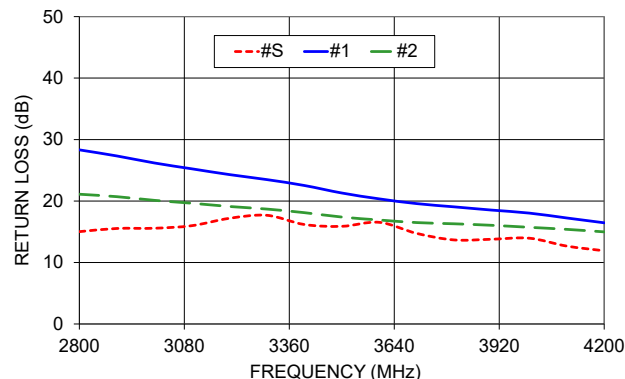
## Power Splitter/Combiner

SCG-2-422+

## TYPICAL PERFORMANCE DATA

| Frequency<br>(MHz) | Total Loss <sup>1</sup><br>(dB) |      | Amplitude<br>Unbalance<br>(dB) | Isolation<br>(dB) | Phase<br>Unbalance<br>(deg.) | Return Loss<br>(dB) |       |       |
|--------------------|---------------------------------|------|--------------------------------|-------------------|------------------------------|---------------------|-------|-------|
|                    | S-1                             | S-2  |                                |                   |                              | S                   | 1     | 2     |
| 2800               | 3.49                            | 3.50 | 0.02                           | 18.11             | 3.42                         | 15.02               | 28.32 | 21.11 |
| 2900               | 3.49                            | 3.50 | 0.02                           | 19.05             | 3.44                         | 15.54               | 27.33 | 20.71 |
| 3000               | 3.51                            | 3.53 | 0.02                           | 19.94             | 3.49                         | 15.57               | 26.19 | 20.11 |
| 3100               | 3.54                            | 3.56 | 0.02                           | 21.02             | 3.55                         | 15.99               | 25.24 | 19.64 |
| 3200               | 3.48                            | 3.51 | 0.03                           | 22.06             | 3.56                         | 17.19               | 24.30 | 19.11 |
| 3300               | 3.40                            | 3.45 | 0.05                           | 23.26             | 3.55                         | 17.68               | 23.49 | 18.69 |
| 3400               | 3.42                            | 3.49 | 0.07                           | 24.06             | 3.62                         | 16.18               | 22.53 | 18.11 |
| 3500               | 3.49                            | 3.56 | 0.07                           | 23.94             | 3.81                         | 15.89               | 21.31 | 17.40 |
| 3600               | 3.49                            | 3.54 | 0.04                           | 23.48             | 3.83                         | 16.54               | 20.35 | 16.91 |
| 3700               | 3.53                            | 3.57 | 0.03                           | 22.77             | 3.71                         | 14.73               | 19.58 | 16.49 |
| 3800               | 3.61                            | 3.66 | 0.05                           | 22.11             | 3.68                         | 13.67               | 19.05 | 16.30 |
| 3900               | 3.66                            | 3.71 | 0.06                           | 21.40             | 3.94                         | 13.79               | 18.53 | 16.05 |
| 4000               | 3.69                            | 3.71 | 0.02                           | 20.50             | 4.11                         | 13.96               | 18.04 | 15.73 |
| 4100               | 3.77                            | 3.77 | 0.00                           | 19.85             | 4.08                         | 12.67               | 17.24 | 15.39 |
| 4200               | 3.86                            | 3.85 | 0.00                           | 19.15             | 4.06                         | 11.90               | 16.46 | 14.98 |

1. Total Loss = Insertion Loss + 3dB splitter loss.

SCG-2-422+  
TOTAL LOSSSCG-2-422+  
ISOLATIONSCG-2-422+  
RETURN 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



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