

# Ultra-Small Ceramic Power Splitter/Combiner

## QCN-12+

2 Way-90° 50Ω 800 to 1375 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FV1206-1

### Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -55°C to 100°C |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 15W* max.      |

\* Derate linearly to 7W at 100°C ambient.  
Permanent damage may occur if any of these limits are exceeded.

### Pin Connections

|                      |     |
|----------------------|-----|
| SUM PORT             | 1   |
| PORT 1 (0°)          | 4   |
| PORT 2 (+90°)        | 6   |
| GROUND               | 2,5 |
| 50 OHM TERM EXTERNAL | 3   |

### Features

- low insertion loss, 0.4 dB typ.
- wrap-around terminal for excellent solderability
- ultra small, 0.12"X0.06"X0.035"

### Applications

- cellular
- satellite distribution
- GSM
- balanced amplifiers
- modulators

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

Available Tape and Reel at no extra cost  
Reel Size Devices/Reel  
7" 20, 50, 100, 200, 500, 1000, 3000

### Electrical Specifications

| FREQ. RANGE (MHz) | ISOLATION (dB) |      | INSERTION LOSS (dB) Avg. of Coupled Outputs ABOVE 3 dB |      | PHASE UNBALANCE (Degrees) |      | AMPLITUDE UNBALANCE (dB) |      | VSWR (:1) |
|-------------------|----------------|------|--|------|---------------------------|------|--------------------------|------|-----------|
|                   | Typ.           | Min. | Typ.   | Max. | Typ.                      | Max. | Typ.                     | Max. |           |
| 800-1375          |                |      |  |      |                           |      |                          |      |           |
| 800-1000          | 19             | 14   | 0.4  | 0.8  | 9                         | 12   | 0.4                      | 0.9  | 1.3       |
| 1000-1375         | 19             | 14   | 0.6  | 1.0  | 9                         | 13   | 0.7                      | 1.0  | 1.5       |

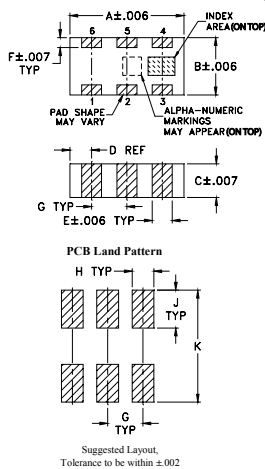
1. For applications requiring DC voltage to be applied to the RF ports, add suffix letter "D" to part no.  
DC resistance to ground is 100 Mohms min.

### Typical Performance Data

| Frequency (MHz) | Total Loss <sup>1</sup> (dB) |      | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
|                 | S-1                          | S-2  |                          |                |                        |        |        |        |
| 800.00          | 3.30                         | 3.72 | 0.42                     | 17.70          | 82.30                  | 1.26   | 1.31   | 1.31   |
| 810.00          | 3.33                         | 3.68 | 0.35                     | 17.77          | 82.27                  | 1.26   | 1.31   | 1.31   |
| 830.00          | 3.35                         | 3.60 | 0.24                     | 17.90          | 82.14                  | 1.25   | 1.31   | 1.31   |
| 870.00          | 3.46                         | 3.53 | 0.07                     | 18.29          | 82.10                  | 1.24   | 1.30   | 1.31   |
| 900.00          | 3.52                         | 3.43 | 0.08                     | 18.58          | 82.03                  | 1.22   | 1.29   | 1.31   |
| 930.00          | 3.54                         | 3.38 | 0.16                     | 18.85          | 81.82                  | 1.21   | 1.29   | 1.30   |
| 960.00          | 3.63                         | 3.36 | 0.27                     | 19.22          | 81.93                  | 1.20   | 1.28   | 1.30   |
| 990.00          | 3.63                         | 3.28 | 0.35                     | 19.52          | 81.65                  | 1.19   | 1.28   | 1.31   |
| 1040.00         | 3.72                         | 3.28 | 0.44                     | 20.15          | 81.66                  | 1.17   | 1.27   | 1.31   |
| 1100.00         | 3.73                         | 3.26 | 0.46                     | 20.91          | 81.43                  | 1.15   | 1.27   | 1.32   |
| 1160.00         | 3.69                         | 3.26 | 0.44                     | 21.62          | 81.05                  | 1.13   | 1.27   | 1.33   |
| 1220.00         | 3.68                         | 3.35 | 0.33                     | 22.25          | 81.02                  | 1.12   | 1.28   | 1.36   |
| 1280.00         | 3.61                         | 3.53 | 0.08                     | 22.51          | 80.98                  | 1.12   | 1.29   | 1.39   |
| 1340.00         | 3.45                         | 3.72 | 0.27                     | 22.12          | 80.57                  | 1.14   | 1.31   | 1.44   |
| 1375.00         | 3.39                         | 3.8  | 0.42                     | 21.66          | 80.68                  | 1.17   | 1.33   | 1.47   |

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

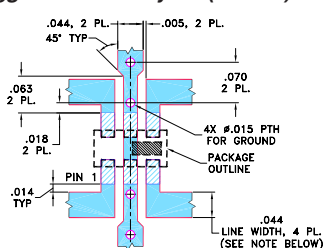
### Outline Drawing



### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E     | F    |
|------|------|------|------|-------|------|
| .126 | .063 | .035 | .024 | .022  | .011 |
| 3.20 | 1.60 | 0.89 | 0.61 | 0.56  | 0.28 |
| G    | H    | J    | K    | wt    |      |
| .039 | .024 | .042 | .123 | grams |      |
| 0.99 | 0.61 | 1.07 | 3.12 | .020  |      |

### Demo Board MCL P/N: TB-255+ Suggested PCB Layout (PL-131)

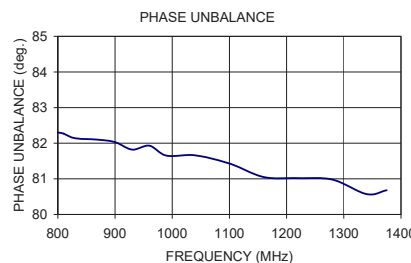
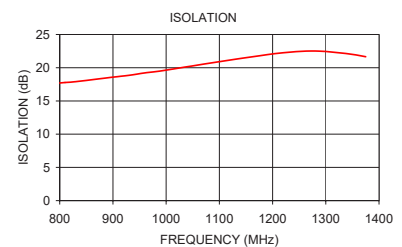
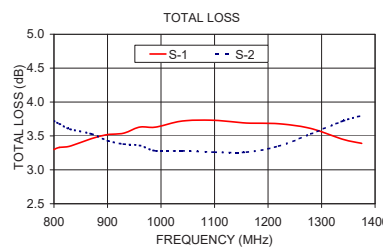


NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
  - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### 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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### electrical schematic (Note 1)

