



**THE DATASHEET OF  
QCN-45+**





ULTRA-SMALL CERAMIC

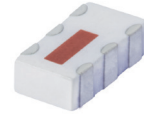
# Power Splitter/Combiner

## QCN-45+

2 Way-90° 50Ω 2500 to 4500 MHz

### FEATURES

- Low insertion loss, 0.4 dB typ.
- Wide band, 2500-4500 MHz
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"X0.06"X0.035"
- Patent pending



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

**+RoHS Compliant**

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

### APPLICATIONS

- Balanced amplifiers
- Modulators
- MMDS
- Defense communications

### ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range              |                 | 2500 |      | 4500 | MHz    |
| Insertion Loss, above 3.0 dB | 2500-3500       |      | 0.4  | 0.7  | dB     |
|                              | 3500-4500       |      | 0.5  | 0.8  |        |
| Isolation                    | 2500-3500       | 16   | 22   |      | dB     |
|                              | 3500-4500       | 15   | 19   |      |        |
| Phase Unbalance              | 2500-3500       |      | 1    | 4    | Degree |
|                              | 3500-4500       |      | 3    | 6    |        |
| Amplitude Unbalance          | 2500-3500       |      | 0.5  | 1.7  | dB     |
|                              | 3500-4500       |      | 1.0  | 2.1  |        |
| VSWR                         | 2500-3500       |      | 1.2  |      | (:1)   |
|                              | 3500-4500       |      | 1.2  |      |        |

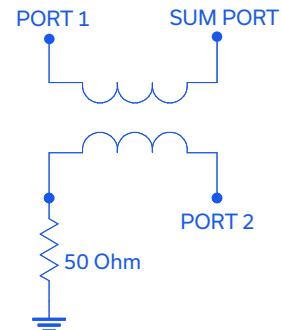
1. For applications requiring DC voltage to be applied to the RF ports, add suffix letter "D" to part no.  
DC resistance to ground is 100 Mohms min.

### MAXIMUM RATINGS

| Parameter                   | 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.

### ELECTRICAL SCHEMATIC (NOTE 1)





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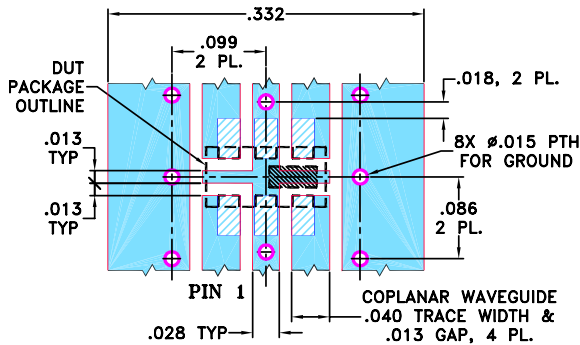
2 Way-90° 50Ω 2500 to 4500 MHz

**PIN CONNECTIONS**

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

**PRODUCT MARKING: SA**

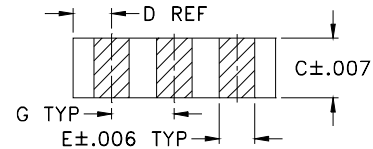
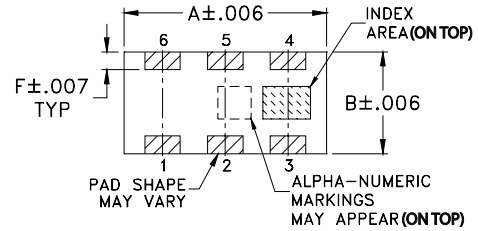
**DEMO BOARD MCL P/N: TB-405  
SUGGESTED PCB LAYOUT (PL-250)**



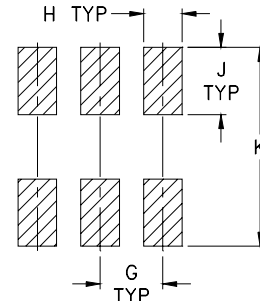
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

**OUTLINE DRAWING**



**PCB Land Pattern**



Suggested Layout,  
Tolerance to be within ±.002

**OUTLINE DIMENSIONS (Inches/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  |

**TAPE & REEL INFORMATION: F75**





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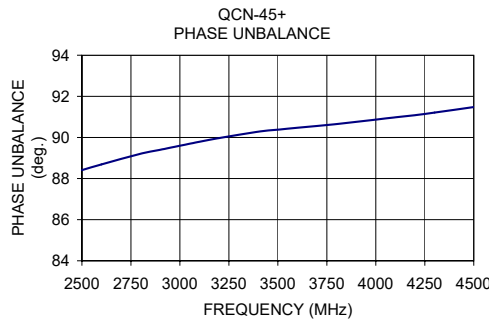
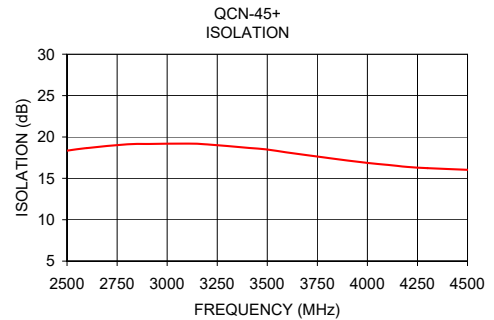
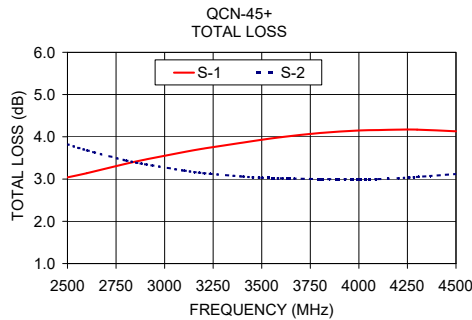
## QCN-45+

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### TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Total Loss <sup>1</sup> (dB) |      | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR (:1) |      |      |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|-----------|------|------|
|                 | S-1                          | S-2  |                          |                |                        | S         | 1    | 2    |
| 2500.00         | 3.04                         | 3.82 | 0.78                     | 18.35          | 88.41                  | 1.20      | 1.21 | 1.26 |
| 2600.00         | 3.14                         | 3.68 | 0.54                     | 18.66          | 88.69                  | 1.19      | 1.18 | 1.24 |
| 2800.00         | 3.36                         | 3.44 | 0.09                     | 19.11          | 89.21                  | 1.18      | 1.13 | 1.20 |
| 2900.00         | 3.46                         | 3.35 | 0.11                     | 19.15          | 89.40                  | 1.19      | 1.11 | 1.18 |
| 3100.00         | 3.64                         | 3.20 | 0.44                     | 19.20          | 89.79                  | 1.22      | 1.08 | 1.17 |
| 3200.00         | 3.72                         | 3.14 | 0.57                     | 19.10          | 89.97                  | 1.22      | 1.08 | 1.16 |
| 3400.00         | 3.86                         | 3.06 | 0.80                     | 18.69          | 90.28                  | 1.25      | 1.08 | 1.12 |
| 3500.00         | 3.93                         | 3.03 | 0.90                     | 18.48          | 90.38                  | 1.27      | 1.09 | 1.11 |
| 3600.00         | 3.99                         | 3.02 | 0.97                     | 18.13          | 90.47                  | 1.29      | 1.10 | 1.12 |
| 3800.00         | 4.09                         | 3.00 | 1.09                     | 17.47          | 90.65                  | 1.32      | 1.11 | 1.12 |
| 4000.00         | 4.15                         | 3.00 | 1.15                     | 16.86          | 90.87                  | 1.33      | 1.12 | 1.12 |
| 4100.00         | 4.16                         | 3.00 | 1.16                     | 16.63          | 90.98                  | 1.34      | 1.12 | 1.13 |
| 4200.00         | 4.17                         | 3.02 | 1.15                     | 16.38          | 91.08                  | 1.35      | 1.12 | 1.13 |
| 4300.00         | 4.17                         | 3.05 | 1.13                     | 16.23          | 91.21                  | 1.35      | 1.13 | 1.14 |
| 4500.00         | 4.13                         | 3.12 | 1.01                     | 16.03          | 91.48                  | 1.36      | 1.13 | 1.13 |

1. Total Loss = Insertion Loss + 3 dB 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.
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