



ULTRA-SMALL CERAMIC

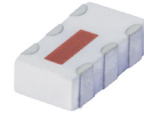
# Power Splitter/Combiner

**QCN-7+**

2 Way-90° 50Ω 425 to 675 MHz

## FEATURES

- Low insertion loss, 0.4 dB typ.
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"x0.06"x0.035"



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
- UHF

## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter                    | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range              |                 | 425  |      | 675  | MHz    |
| Insertion Loss, above 3.0 dB | 425-550         |      | 0.4  | 0.7  | dB     |
|                              | 550-675         |      | 0.6  | 1.1  |        |
| Isolation                    | 425-550         | 13   | 17   |      | dB     |
|                              | 550-675         | 11   | 17   |      |        |
| Phase Unbalance              | 425-550         |      | 2    | 8    | Degree |
|                              | 550-675         |      | 4    | 8    |        |
| Amplitude Unbalance          | 425-550         |      | 0.5  | 1.0  | dB     |
|                              | 550-675         |      | 0.5  | 1.0  |        |
| VSWR                         | 425-550         |      | 1.3  |      | (:1)   |
|                              | 550-675         |      | 1.4  |      |        |

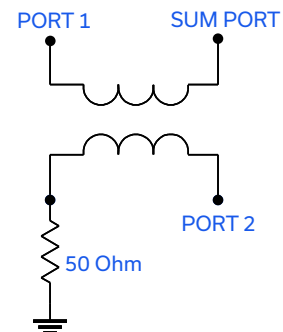
1. For applications requiring DC voltage to be applied to the RF ports, add suffix letter "D" to part no. DC resistance to ground is 100 Mohms min.

## ABSOLUTE MAXIMUM RATINGS

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

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

## ELECTRICAL SCHEMATIC (NOTE 1)



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QCN-7+

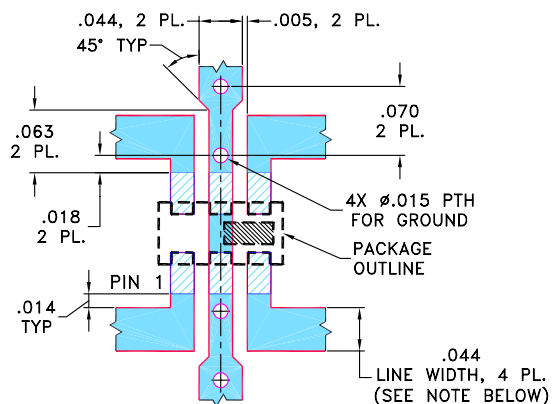
2 Way-90° 50Ω 425 to 675 MHz

## PIN CONNECTIONS

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

## PRODUCT MARKING: D

DEMO BOARD MCL P/N: TB-QCN-7D+  
SUGGESTED PCB LAYOUT (PL-131)



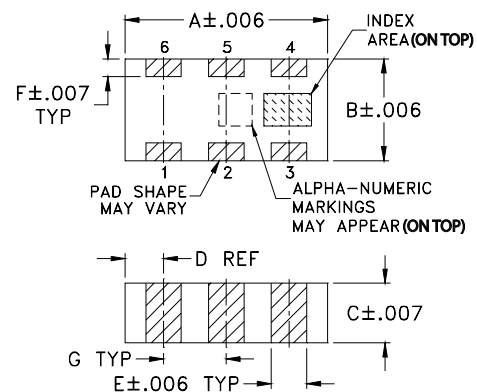
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $0.020" \pm 0.0015"$ ; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

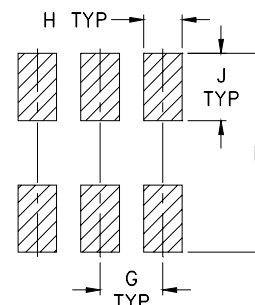
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## OUTLINE DRAWING



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

## 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 &amp; REEL INFORMATION: F75

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# Power Splitter/Combiner

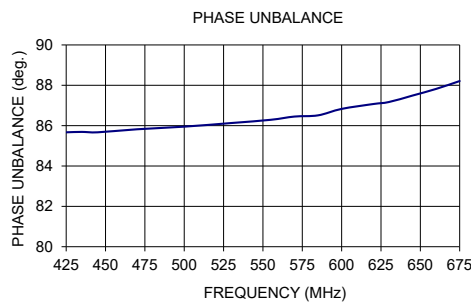
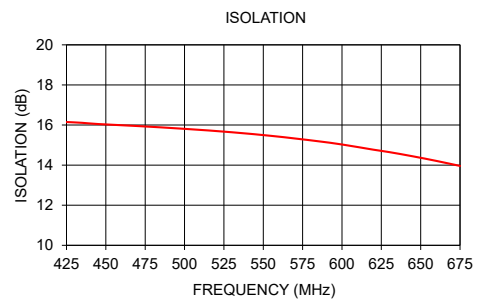
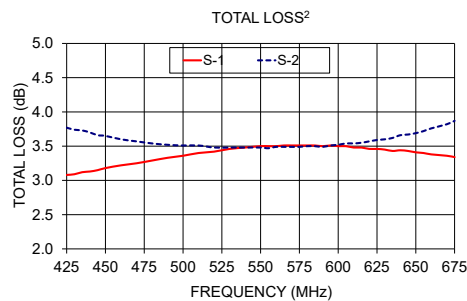
QCN-7+

2 Way-90° 50Ω 425 to 675 MHz

## TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Total Loss <sup>2</sup> (dB) |      | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR (:1) |      |      |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|-----------|------|------|
|                 | S-1                          | S-2  |                          |                |                        | S         | 1    | 2    |
| 425             | 3.08                         | 3.77 | 0.69                     | 16.15          | 85.67                  | 1.32      | 1.30 | 1.26 |
| 435             | 3.12                         | 3.73 | 0.60                     | 16.11          | 85.69                  | 1.32      | 1.30 | 1.26 |
| 445             | 3.15                         | 3.66 | 0.51                     | 16.05          | 85.67                  | 1.32      | 1.29 | 1.26 |
| 470             | 3.25                         | 3.57 | 0.31                     | 15.95          | 85.82                  | 1.32      | 1.29 | 1.26 |
| 500             | 3.36                         | 3.51 | 0.15                     | 15.81          | 85.95                  | 1.32      | 1.28 | 1.26 |
| 530             | 3.46                         | 3.48 | 0.02                     | 15.64          | 86.13                  | 1.32      | 1.28 | 1.26 |
| 555             | 3.50                         | 3.47 | 0.03                     | 15.46          | 86.29                  | 1.33      | 1.29 | 1.27 |
| 570             | 3.51                         | 3.49 | 0.02                     | 15.33          | 86.45                  | 1.34      | 1.29 | 1.27 |
| 585             | 3.51                         | 3.50 | 0.00                     | 15.19          | 86.51                  | 1.35      | 1.29 | 1.28 |
| 600             | 3.50                         | 3.52 | 0.02                     | 15.03          | 86.83                  | 1.35      | 1.30 | 1.29 |
| 620             | 3.46                         | 3.57 | 0.11                     | 14.77          | 87.07                  | 1.37      | 1.31 | 1.30 |
| 630             | 3.45                         | 3.60 | 0.15                     | 14.65          | 87.17                  | 1.38      | 1.32 | 1.31 |
| 645             | 3.43                         | 3.67 | 0.24                     | 14.44          | 87.49                  | 1.40      | 1.33 | 1.33 |
| 660             | 3.38                         | 3.76 | 0.38                     | 14.21          | 87.82                  | 1.42      | 1.34 | 1.35 |
| 675             | 3.34                         | 3.87 | 0.53                     | 13.96          | 88.21                  | 1.44      | 1.36 | 1.37 |

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



### NOTES

- 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.
- 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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