



Mini-Circuits®

ULTRA-SMALL CERAMIC

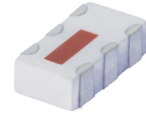
Power Splitter/Combiner

QCN-3+

2 Way-90° 50Ω 220 to 470 MHz

FEATURES

- Low insertion loss, 0.4 dB typ.
- High isolation, 25 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 web site for RoHS Compliance methodologies and qualifications

APPLICATIONS

- Balanced amplifiers
- Modulators
- VHF
- Defense communication

ELECTRICAL SPECIFICATIONS AT 25°C

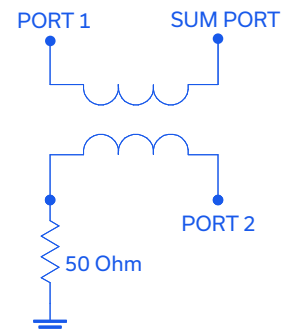
| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|------------------------------|-----------------|------|------|------|--------|
| Frequency Range | | 220 | | 470 | MHz |
| Insertion Loss, above 3.0 dB | 220-470 | | 0.6 | 0.8 | dB |
| | 270-350 | | 0.4 | 0.7 | |
| | 350-450 | | 0.6 | 0.8 | |
| Isolation | 220-470 | 18 | 24 | | dB |
| | 270-350 | 18 | 25 | | |
| | 350-450 | 20 | 30 | | |
| Phase Unbalance | 220-470 | | 1 | 8 | Degree |
| | 270-350 | | 3 | 5 | |
| | 350-450 | | 5 | 8 | |
| Amplitude Unbalance | 220-470 | | 0.5 | 1.7 | dB |
| | 270-350 | | 0.7 | 1.0 | |
| | 350-450 | | 0.5 | 1.0 | |
| VSWR | 220-470 | | 1.2 | | (:1) |
| | 270-350 | | 1.2 | | |
| | 350-450 | | 1.2 | | |

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



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211021

PAGE 1 OF 3



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Power Splitter/Combiner

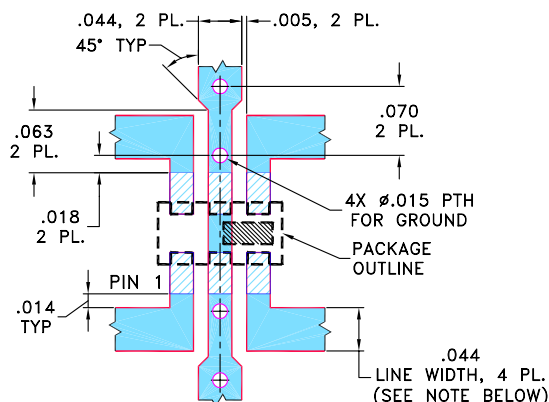
QCN-3+

PIN CONNECTIONS

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

PRODUCT MARKING: SB


DEMO BOARD MCL P/N: TB-255
SUGGESTED PCB LAYOUT (PL-131)



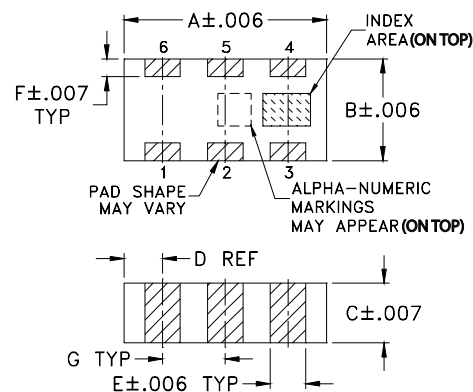
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

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

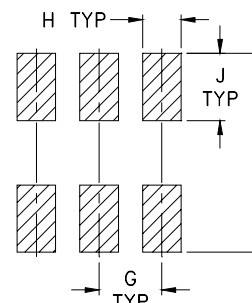
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 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 & REEL INFORMATION: F75

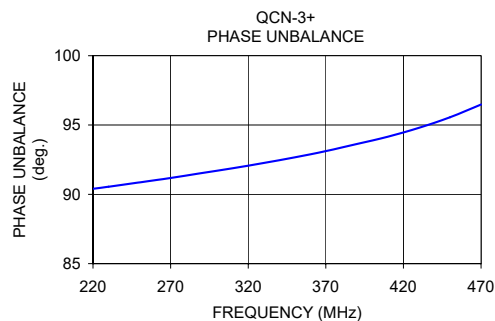
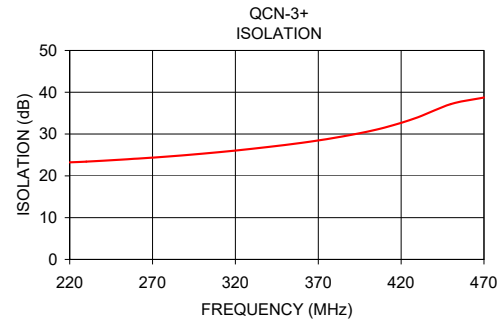
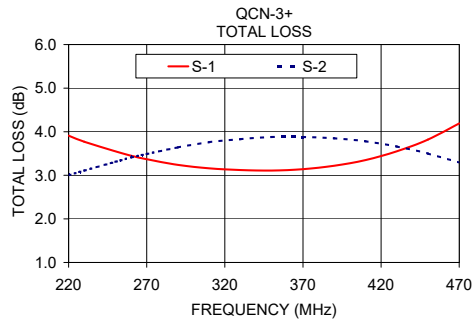




TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR (:1) | | |
|--------------------|---------------------------------|------|--------------------------------|-------------------|------------------------------|--------------|------|------|
| | S-1 | S-2 | | | | S | 1 | 2 |
| 220.00 | 3.91 | 3.00 | 0.91 | 23.23 | 90.40 | 1.07 | 1.12 | 1.07 |
| 230.00 | 3.77 | 3.11 | 0.67 | 23.41 | 90.55 | 1.06 | 1.12 | 1.06 |
| 250.00 | 3.55 | 3.31 | 0.23 | 23.85 | 90.86 | 1.05 | 1.11 | 1.06 |
| 260.00 | 3.45 | 3.41 | 0.05 | 24.11 | 91.02 | 1.05 | 1.11 | 1.05 |
| 270.00 | 3.37 | 3.49 | 0.12 | 24.37 | 91.18 | 1.04 | 1.10 | 1.05 |
| 290.00 | 3.24 | 3.64 | 0.39 | 24.96 | 91.53 | 1.04 | 1.10 | 1.04 |
| 310.00 | 3.16 | 3.76 | 0.60 | 25.67 | 91.88 | 1.03 | 1.09 | 1.03 |
| 330.00 | 3.12 | 3.83 | 0.72 | 26.46 | 92.26 | 1.03 | 1.08 | 1.03 |
| 350.00 | 3.11 | 3.88 | 0.77 | 27.38 | 92.67 | 1.04 | 1.08 | 1.02 |
| 370.00 | 3.14 | 3.88 | 0.74 | 28.47 | 93.12 | 1.05 | 1.07 | 1.02 |
| 390.00 | 3.22 | 3.85 | 0.63 | 29.82 | 93.63 | 1.07 | 1.07 | 1.02 |
| 410.00 | 3.35 | 3.78 | 0.42 | 31.55 | 94.16 | 1.09 | 1.07 | 1.01 |
| 430.00 | 3.55 | 3.66 | 0.11 | 33.99 | 94.80 | 1.11 | 1.07 | 1.01 |
| 450.00 | 3.82 | 3.50 | 0.32 | 37.16 | 95.56 | 1.14 | 1.07 | 1.02 |
| 470.00 | 4.19 | 3.29 | 0.90 | 38.74 | 96.48 | 1.17 | 1.08 | 1.02 |

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.
- 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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