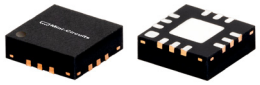
*MMIC Surface Mount*

# Power Splitter/Combiner

## WP4R1+

4 Way-0° 50Ω 2000 to 3000 MHz



*Generic photo used for illustration purposes only*

CASE STYLE: DQ1225

**+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, 2000 |

### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -65°C to 150°C |
| Power Input (as a splitter) | 1.5W max. |
| Internal Dissipation | 0.375W max. |

Permanent damage may occur if any of these limits are exceeded.

### Pad Connections

| | |
|---|---|
| SUM PORT | 2 |
| PORT 1 | 12 |
| PORT 2 | 10 |
| PORT 3 | 6 |
| PORT 4 | 4 |
| GROUND | 1,3,5,7,8,9,11, paddle |

### Product Marking

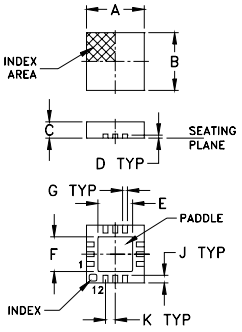

### Features

- excellent isolation, 24 dB typ.
- good phase unbalance 2 deg. typ.
- good amplitude unbalance, 0.15 dB typ.
- small size, .118" x .118" x .035"
- high ESD level
- aqueous washable

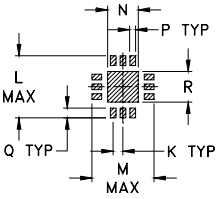
### Applications

- WLAN
- WIMAX
- ISM
- radar

### Outline Drawing




**PCB Land Pattern**



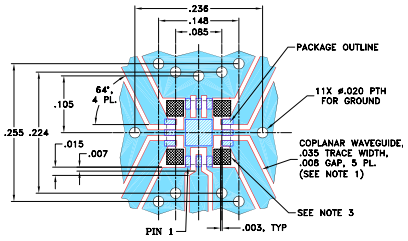

Suggested Layout,
Tolerance to be within ±.002

### Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G | H | J |
|---|---|---|---|---|---|---|---|---|
| .118 | .118 | .035 | .008 | .057 | .057 | .009 | --- | .016 |
| 3.00 | 3.00 | 0.89 | 0.20 | 1.45 | 1.45 | 0.23 | --- | 0.41 |

| K | L | M | N | P | Q | R | wt |
|---|---|---|---|---|---|---|---|
| .020 | .127 | .127 | .049 | .010 | .020 | .049 | grams |
| 0.51 | 3.23 | 3.23 | 1.24 | 0.25 | 0.51 | 1.24 | 0.02 |

### *Demo Board MCL P/N: TB-395+*
### *Suggested PCB Layout (PL-259)*




NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. SIGNAL TRACES ARE NOT ALLOWED INSIDE HATCHED AREAS (APPROX. .030 X .030) AT 4 PLACES AS SHOWN.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Electrical Specifications

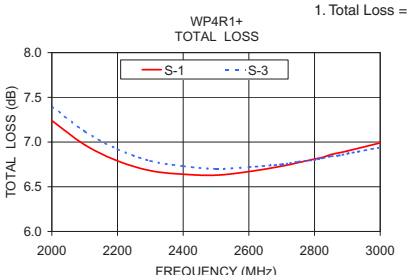
| FREQ. RANGE (MHz) | ISOLATION (dB) | | INSERTION LOSS* (dB) ABOVE 6.0 dB | | PHASE UNBALANCE (Degrees) | AMPLITUDE UNBALANCE (dB) | VSWR (:1) Typ. | |
|---|---|---|---|---|---|---|---|---|
| $f_L$-$f_U$ | Typ. | Min. | Typ. | Max. | Max. | Max. | Port S | Ports 1,2,3,4 |
| 2000-3000 | 24 | 16 | 0.7 | 2.1 | 7 | 0.5 | 1.6 | 1.35 |

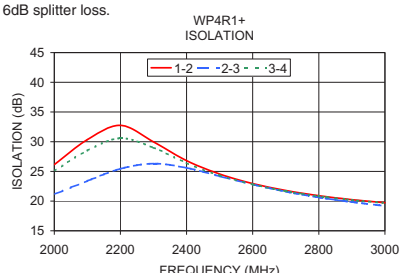
* Includes fixture loss, 0.2 dB typ.

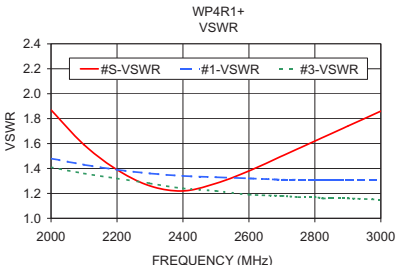
### Typical Performance Data

| Freq. (MHz) | Total Loss[1] (dB) | | | | Amp. Unbal. (dB) | Isolation (dB) | | | Phase Unbal. (deg.) | VSWR S | VSWR 1 | VSWR 2 | VSWR 3 | VSWR 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 | S-2 | S-3 | S-4 | | 1-2 | 2-3 | 3-4 | | | | | | |
| 2000.00 | 7.24 | 7.42 | 7.40 | 7.23 | 0.19 | 26.14 | 21.14 | 25.08 | 1.94 | 1.87 | 1.48 | 1.40 | 1.41 | 1.42 |
| 2100.00 | 6.97 | 7.14 | 7.12 | 6.97 | 0.17 | 30.35 | 23.40 | 28.53 | 1.49 | 1.59 | 1.43 | 1.35 | 1.36 | 1.38 |
| 2200.00 | 6.79 | 6.94 | 6.92 | 6.79 | 0.15 | 32.75 | 25.44 | 30.58 | 1.06 | 1.39 | 1.39 | 1.31 | 1.32 | 1.34 |
| 2300.00 | 6.68 | 6.81 | 6.79 | 6.69 | 0.13 | 29.97 | 26.31 | 28.98 | 0.68 | 1.26 | 1.36 | 1.26 | 1.28 | 1.31 |
| 2400.00 | 6.64 | 6.74 | 6.73 | 6.64 | 0.11 | 26.81 | 25.59 | 26.40 | 0.79 | 1.22 | 1.34 | 1.23 | 1.24 | 1.29 |
| 2500.00 | 6.63 | 6.72 | 6.70 | 6.64 | 0.09 | 24.56 | 24.19 | 24.33 | 1.19 | 1.28 | 1.33 | 1.20 | 1.22 | 1.28 |
| 2600.00 | 6.67 | 6.74 | 6.72 | 6.68 | 0.07 | 22.95 | 22.80 | 22.80 | 1.57 | 1.38 | 1.32 | 1.18 | 1.19 | 1.27 |
| 2700.00 | 6.73 | 6.78 | 6.75 | 6.73 | 0.05 | 21.79 | 21.60 | 21.67 | 1.94 | 1.50 | 1.31 | 1.17 | 1.18 | 1.27 |
| 2750.00 | 6.77 | 6.81 | 6.78 | 6.77 | 0.04 | 21.32 | 21.09 | 21.23 | 2.12 | 1.56 | 1.31 | 1.16 | 1.17 | 1.27 |
| 2800.00 | 6.81 | 6.83 | 6.80 | 6.81 | 0.03 | 20.91 | 20.63 | 20.82 | 2.30 | 1.62 | 1.31 | 1.15 | 1.17 | 1.27 |
| 2825.00 | 6.83 | 6.85 | 6.82 | 6.83 | 0.03 | 20.73 | 20.42 | 20.65 | 2.39 | 1.65 | 1.31 | 1.15 | 1.16 | 1.27 |
| 2850.00 | 6.86 | 6.87 | 6.84 | 6.85 | 0.03 | 20.55 | 20.21 | 20.48 | 2.46 | 1.68 | 1.31 | 1.15 | 1.16 | 1.27 |
| 2875.00 | 6.88 | 6.89 | 6.85 | 6.87 | 0.04 | 20.40 | 20.02 | 20.32 | 2.56 | 1.71 | 1.31 | 1.15 | 1.16 | 1.27 |
| 2900.00 | 6.90 | 6.91 | 6.87 | 6.89 | 0.04 | 20.24 | 19.84 | 20.17 | 2.64 | 1.74 | 1.31 | 1.14 | 1.16 | 1.27 |
| 3000.00 | 6.99 | 6.99 | 6.94 | 6.98 | 0.05 | 19.72 | 19.18 | 19.66 | 2.96 | 1.86 | 1.31 | 1.14 | 1.15 | 1.27 |

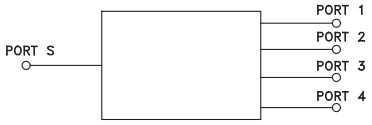
1. Total Loss = Insertion Loss + 6dB splitter loss.




### electrical schematic




**ESD Rating**

Human Body Model (HBM): Class 1A (250 to < 500v) in accordance with ANSI/ESD STM 5.1 - 2001
Machine Model (MM): Class M2 (100V to < 250V) in accordance with ANSI/ESD STM 5.2 - 1999

**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