*Surface Mount*

# Power Splitter/Combiner

# QCC-20+

## 2 Way-90° 50Ω 1200 to 2200 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: GF981

***+RoHS Compliant***

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

### Maximum Ratings

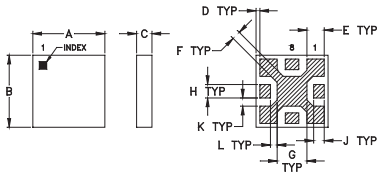
| | |
|---|---|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 17.5W* max. |

* Derate linearly to 3.5W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

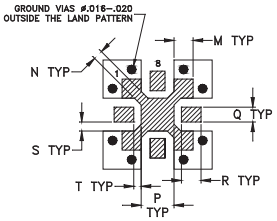
### Pin Connections

| | |
|---|---|
| SUM PORT | 2 |
| PORT 1 (0°) | 8 |
| PORT 2 (+90°) | 4 |
| GROUND | 1,3,5,7 |
| 50 OHM TERM EXTERNAL | 6 |

### Outline Drawing




**PCB Land Pattern**



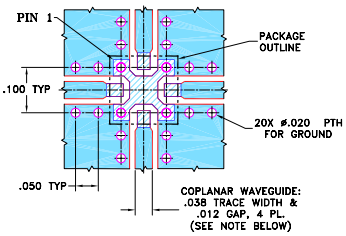

Suggested Layout,
Tolerance to be within ±.002

### Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G | H | J |
|---|---|---|---|---|---|---|---|---|
| .150 | .150 | .032 | .008 | .036 | .018 | .062 | .028 | .022 |
| 3.81 | 3.81 | 0.81 | 0.20 | 0.91 | 0.46 | 1.57 | 0.71 | 0.56 |

| K | L | M | N | P | Q | R | S | T | wt |
|---|---|---|---|---|---|---|---|---|---|
| .017 | .014 | .036 | .018 | .062 | .028 | .037 | .017 | .014 | grams |
| 0.43 | 0.36 | 0.91 | 0.46 | 1.57 | 0.71 | 0.94 | 0.43 | 0.36 | 0.05 |

***Demo Board MCL P/N: TB-302+***
***Suggested PCB Layout (PL-128)***




NOTES: 1.COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 0.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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

### Features

- low insertion loss, 0.4 dB typ.
- high isolation, 25 dB typ.
- LTCC construction
- excellent temperature stability
- small size, 0.15" X 0.15"
- aqueous washable
- protected by U.S. Patent 7,030,713

### Applications

- WCDMA
- defense
- PCS
- radar
- DECT
- PHS

### Electrical Specifications

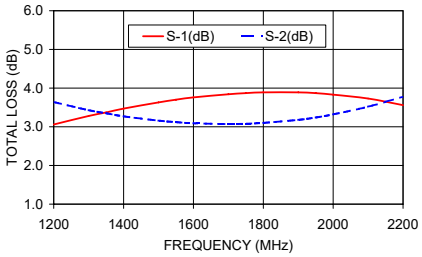
| FREQ. RANGE (MHz) | ISOLATION (dB) | | INSERTION LOSS (dB) Avg. of Coupled Outputs ABOVE 3 dB | | PHASE UNBALANCE (Degrees) | | AMPLITUDE UNBALANCE (dB) | |
|---|---|---|---|---|---|---|---|---|
| $f_L$-$f_U$ | Typ. | Min. | Typ. | Max. | Typ. | Max. | Typ. | Max. |
| **1200-2200** | | | | | | | | |
| 1200-1400 | 32 | 24 | 0.4 | 0.6 | 1 | 3 | 0.4 | 1.0 |
| 1400-1800 | 35 | 20 | 0.4 | 0.7 | 1 | 3 | 0.5 | 0.85 |
| 1800-2200 | 23 | 16 | 0.6 | 0.9 | 1 | 5 | 0.5 | 0.9 |

### Typical Performance Data

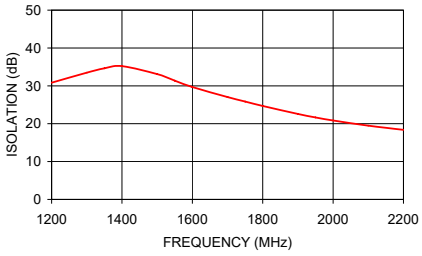
| Frequency (MHz) | Total Loss[1] (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|---|---|---|---|---|---|---|---|---|
| | S-1 | S-2 | | | | | | |
| 1200.00 | 3.06 | 3.64 | 0.58 | 30.83 | 90.74 | 1.03 | 1.16 | 1.19 |
| 1300.00 | 3.28 | 3.43 | 0.16 | 33.49 | 91.05 | 1.01 | 1.18 | 1.20 |
| 1350.00 | 3.37 | 3.35 | 0.03 | 34.64 | 91.20 | 1.02 | 1.19 | 1.20 |
| 1400.00 | 3.47 | 3.27 | 0.20 | 35.21 | 91.33 | 1.04 | 1.19 | 1.20 |
| 1500.00 | 3.63 | 3.16 | 0.47 | 33.11 | 91.51 | 1.08 | 1.21 | 1.21 |
| 1550.00 | 3.70 | 3.12 | 0.58 | 31.38 | 91.57 | 1.10 | 1.22 | 1.21 |
| 1600.00 | 3.76 | 3.09 | 0.67 | 29.70 | 91.60 | 1.12 | 1.24 | 1.22 |
| 1700.00 | 3.84 | 3.07 | 0.77 | 27.04 | 91.58 | 1.15 | 1.27 | 1.23 |
| 1750.00 | 3.87 | 3.08 | 0.79 | 25.86 | 91.55 | 1.17 | 1.28 | 1.24 |
| 1800.00 | 3.89 | 3.10 | 0.79 | 24.69 | 91.48 | 1.18 | 1.29 | 1.25 |
| 1900.00 | 3.89 | 3.18 | 0.71 | 22.58 | 91.25 | 1.23 | 1.31 | 1.28 |
| 1950.00 | 3.87 | 3.24 | 0.63 | 21.66 | 91.11 | 1.25 | 1.32 | 1.30 |
| 2000.00 | 3.83 | 3.32 | 0.52 | 20.85 | 90.94 | 1.27 | 1.33 | 1.32 |
| 2100.00 | 3.73 | 3.52 | 0.21 | 19.49 | 90.53 | 1.31 | 1.35 | 1.35 |
| 2200.00 | 3.56 | 3.78 | 0.22 | 18.38 | 90.13 | 1.33 | 1.37 | 1.40 |

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

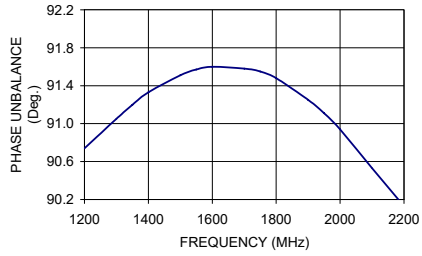
QCC-20+
TOTAL LOSS



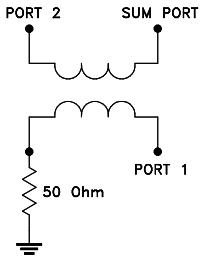

QCC-20+
ISOLATION




QCC-20+
PHASE UNBALANCE




### electrical schematic




Notes

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