*Surface Mount*

# Power Splitter/Combiner

# SCQA-4-13+

## 4 Way Quadrifilar 50Ω 600 to 1000 MHz

*Generic photo used for illustration purposes only*

CASE STYLE: CK1704

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

### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 1W max. |
| Internal Dissipation | 0.20W max. |

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

### Pin Connections

| | |
|---|---|
| SUM PORT | 10 |
| PORT 1 (0°) | 1 |
| PORT 2 (90°) | 2 |
| PORT 3 (180°) | 3 |
| PORT 4 (270°) | 4 |
| GROUND | 5,6,7,8,9,11,12 |

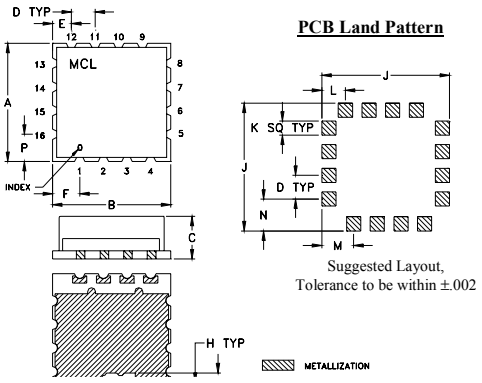
### Features

- good isolation, 20 dB typ.
- good phase unbalance, 5 deg.
- good matching VSWR, 1.2:1 typ.

### Applications

- cellular
- GSM
- PDC
- CDMA

### Outline Drawing

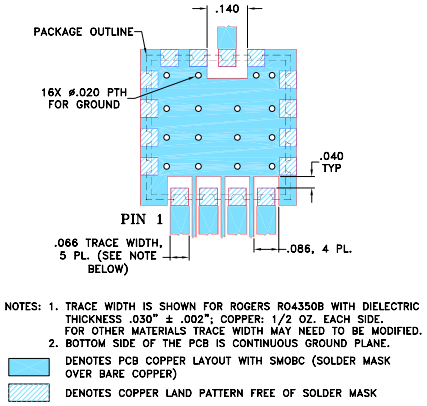



### Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G | H | J |
|---|---|---|---|---|---|---|---|---|
| .500 | .500 | .180 | .100 | .080 | .115 | .060 | .040 | .540 |
| 12.70 | 12.70 | 4.57 | 2.54 | 2.03 | 2.92 | 1.52 | 1.02 | 13.72 |

| K | L | M | N | P | Q | T | wt. |
|---|---|---|---|---|---|---|---|
| .060 | .100 | .135 | .135 | .115 | .140 | .080 | grams |
| 1.52 | 2.54 | 3.43 | 3.43 | 2.92 | 3.56 | 2.03 | 1.0 |

### Demo Board MCL P/N: TB-652+
### Suggested PCB Layout (PL-368)




NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; 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

### Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Frequency Range** | | 600 | — | 1000 | MHz |
| **Insertion Loss Above 6.0 dB** | 600-1000 | — | 1.5 | 2.8 | dB |
| **Isolation** | 600-1000 | 14 | 20 | — | dB |
| **Phase Unbalance*** | 600-1000 | — | 5.0 | 10.0 | Degree |
| **Amplitude Unbalance** | 600-1000 | — | 0.8 | 1.4 | dB |
| **VSWR (Port S)** | 600-1000 | — | 1.5 | 1.9 | :1 |
| **VSWR (Port 1-4)** | 600-1000 | — | 1.2 | 1.5 | :1 |

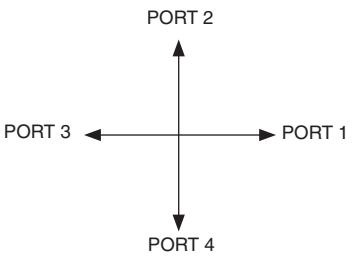
*Phase Unbalance is referenced insertion phase at 0° port.

### Typical Performance Data

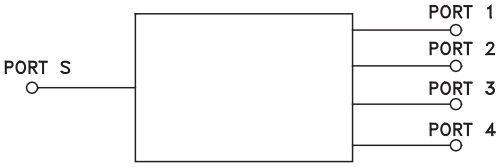
| Freq. (MHz) | Total Loss[1] (dB) | Amp. Unbal. (dB) | Insertion Phase (deg) | Phase Unbalance (deg.) | | | | Isolation (dB) | | | VSWR S | VSWR 1 | VSWR 2 | VSWR 3 | VSWR 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 | | S-1 | 0° | 90° | 180° | 270° | 1-2 | 2-3 | 3-4 | | | | | |
| 600.0 | 7.92 | 0.99 | -28.11 | 0.00 | 91.06 | 179.43 | 268.31 | 20.94 | 24.31 | 40.32 | 1.55 | 1.10 | 1.10 | 1.22 | 1.25 |
| 650.0 | 7.70 | 0.50 | -56.53 | 0.00 | 91.45 | 182.06 | 270.67 | 22.04 | 26.35 | 35.99 | 1.58 | 1.13 | 1.16 | 1.21 | 1.24 |
| 700.0 | 7.61 | 0.25 | -84.13 | 0.00 | 91.87 | 183.70 | 272.08 | 20.95 | 26.66 | 28.17 | 1.56 | 1.17 | 1.23 | 1.18 | 1.22 |
| 720.0 | 7.59 | 0.30 | -94.99 | 0.00 | 92.04 | 184.07 | 272.32 | 20.38 | 26.42 | 26.48 | 1.55 | 1.17 | 1.25 | 1.17 | 1.22 |
| 740.0 | 7.58 | 0.42 | -105.81 | 0.00 | 92.20 | 184.30 | 272.45 | 19.85 | 26.13 | 25.15 | 1.53 | 1.18 | 1.27 | 1.15 | 1.21 |
| 760.0 | 7.58 | 0.53 | -116.56 | 0.00 | 92.38 | 184.39 | 272.42 | 19.38 | 25.84 | 24.09 | 1.51 | 1.17 | 1.28 | 1.13 | 1.20 |
| 780.0 | 7.59 | 0.61 | -127.27 | 0.00 | 92.58 | 184.35 | 272.26 | 18.99 | 25.61 | 23.23 | 1.49 | 1.17 | 1.29 | 1.11 | 1.19 |
| 800.0 | 7.60 | 0.68 | -137.96 | 0.00 | 92.76 | 184.19 | 272.01 | 18.68 | 25.44 | 22.53 | 1.47 | 1.16 | 1.29 | 1.09 | 1.19 |
| 820.0 | 7.61 | 0.73 | -148.66 | 0.00 | 92.94 | 183.98 | 271.67 | 18.43 | 25.36 | 21.95 | 1.45 | 1.15 | 1.30 | 1.07 | 1.18 |
| 840.0 | 7.64 | 0.75 | -159.39 | 0.00 | 93.11 | 183.69 | 271.24 | 18.25 | 25.41 | 21.47 | 1.42 | 1.14 | 1.29 | 1.05 | 1.17 |
| 860.0 | 7.67 | 0.75 | -170.15 | 0.00 | 93.27 | 183.35 | 270.95 | 18.11 | 25.53 | 21.05 | 1.41 | 1.12 | 1.29 | 1.03 | 1.16 |
| 880.0 | 7.71 | 0.73 | 179.02 | 0.00 | 93.47 | 177.06 | 270.21 | 18.00 | 25.72 | 20.67 | 1.39 | 1.11 | 1.28 | 1.02 | 1.15 |
| 900.0 | 7.76 | 0.69 | 168.13 | 0.00 | 93.66 | 182.51 | 269.61 | 17.92 | 25.97 | 20.31 | 1.38 | 1.09 | 1.26 | 1.02 | 1.15 |
| 960.0 | 7.98 | 0.45 | 134.81 | 0.00 | 94.20 | 181.03 | 267.56 | 17.65 | 26.92 | 19.22 | 1.38 | 1.09 | 1.21 | 1.07 | 1.14 |
| 1000.0 | 8.25 | 0.72 | 111.86 | 0.00 | 94.63 | 179.90 | 265.97 | 17.18 | 27.20 | 18.26 | 1.42 | 1.13 | 1.17 | 1.10 | 1.16 |

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

### Phase Diagram




### Electrical Configuration




Notes
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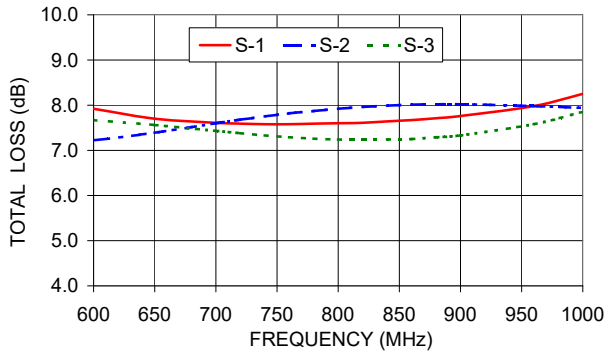
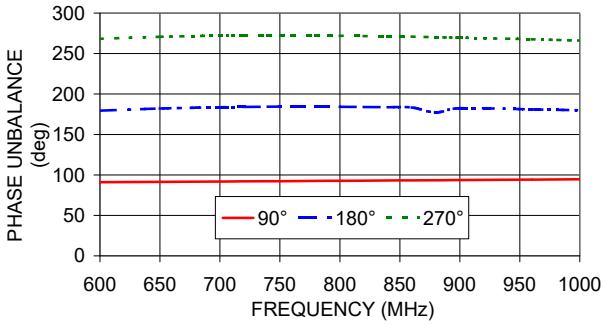
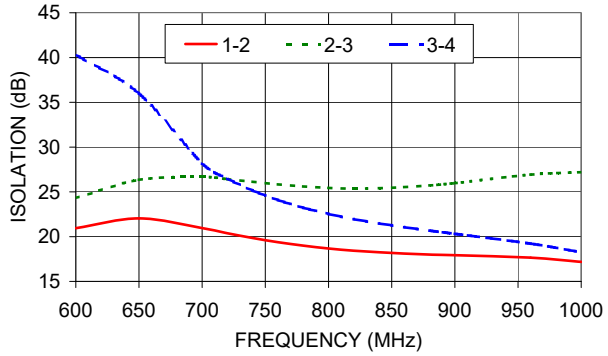
SCQA-4-13+
TOTAL LOSS



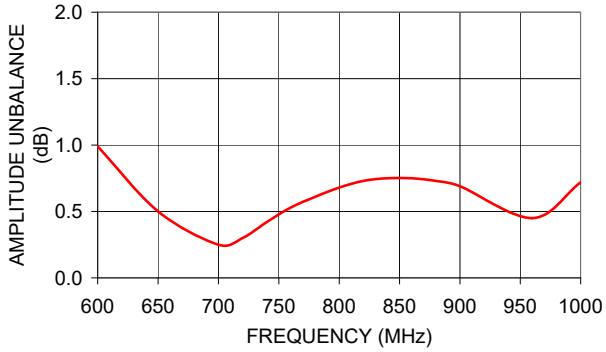

SCQA-4-13+
PHASE UNBALANCE
(referenced to insertion phase at 0° port)




SCQA-4-13+
ISOLATION




SCQA-4-13+
AMPLITUDE UNBALANCE




SCQA-4-13+
VSWR