

2 Way-90° Power Splitter

QCS-722+

50Ω 4000 to 7200 MHz



CASE STYLE: GE0805C-1

The Big Deal

- High Power handling (8W)
- Low Unbalance, 0.2 dB & 2 deg. typ.
- Industry leading combination of size/bandwidth

Product Overview

Mini-Circuits new 90° Power Splitter, model: QCS-722+, offers an industry leading combination of operating bandwidth and size; supporting nearly an octave band in a miniature EIA-0805 form factor. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

Key Features

| Feature | Advantages |
|-----------------------------------|--|
| Small Size | Offered in the EIA-0805 package size, the QCS-722+ offers an industry leading combination of size, bandwidth and frequency. The small footprint (2.0mm x 1.25mm) allows for reduced parasitics in systems with improved performance and simplified layout. |
| Low Phase and Amplitude Unbalance | Supporting 2 deg. and 0.2 dB unbalance make this 90° hybrid applicable for use in higher level integrated components such as image reject mixers, single sideband modulators, phase shifters, variable attenuators, and balance amplifiers. |
| High Power Handling | Capable of operating up to 8W, the LTCC construction of the QCS-722+ makes this 90° hybrid a robust, rugged product that can be used effectively in either the transmit or receive paths. |



ISO 9001 ISO 14001 AS 9100 CERTIFIED

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IF/RF MICROWAVE COMPONENTS

For detailed performance specs
& shopping online see web site

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Power Splitter/Combiner

QCS-722+

2 Way-90° 50Ω 4000 to 7200 MHz



CASE STYLE: GE0805C-1
PRICE: \$3.99 ea. QTY (20)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify 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

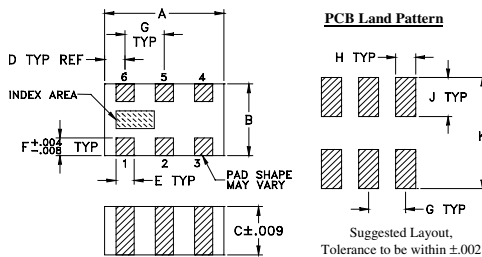
| | |
|-----------------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 15W* max. |

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

Pin Connections

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

Outline Drawing



Outline Dimensions (inch/mm)

| | | | | | | |
|------|------|------|------|------|-------|--|
| A | B | C | D | E | F | |
| .079 | .049 | .033 | .014 | .012 | .012 | |
| 2.01 | 1.24 | 0.84 | 0.36 | 0.30 | 0.30 | |
| G | H | J | K | | wt | |
| .026 | .014 | .039 | .110 | | grams | |
| 0.66 | 0.36 | 1.00 | 2.80 | | .008 | |

Features

- Low insertion loss, 0.6 dB typ.
- High isolation, 17 dB typ.
- Miniature size, 0.079"x0.049"x0.033"
- LTCC construction
- High power

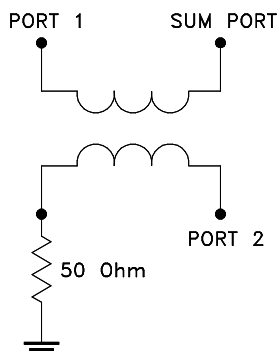
Applications

- Balanced amplifiers
- Modulators
- DCS, PCS, UMTS
- WiMax
- WiFi • ISM
- Phase Shifter
- Attenuator
- Point to Point

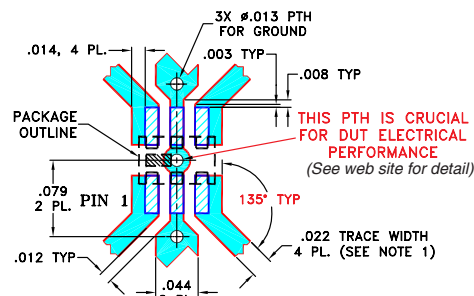
Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--|-----------------|------|------|------|--------|
| Frequency | | 4000 | | 7200 | MHz |
| Insertion Loss (Avg. Of Coupled Outputs) above 3 dB | 4000-4500 | | 0.5 | 0.8 | dB |
| | 4500-5100 | | 0.5 | 0.9 | |
| | 5100-5700 | | 0.6 | 0.9 | |
| | 5700-5900 | | 0.6 | 0.9 | |
| | 5900-6400 | | 0.7 | 0.9 | |
| | 6400-7200 | | 0.7 | 0.9 | |
| Isolation | 4000-4500 | 14 | 18 | | dB |
| | 4500-5100 | 14 | 18 | | |
| | 5100-5700 | 15 | 21 | | |
| | 5700-5900 | 17 | 23 | | |
| | 5900-6400 | 18 | 25 | | |
| | 6400-7200 | 17 | 25 | | |
| Phase Unbalance | 4000-4500 | | 2.0 | 7.0 | Degree |
| | 4500-5100 | | 2.0 | 7.0 | |
| | 5100-5700 | | 2.0 | 7.0 | |
| | 5700-5900 | | 2.0 | 7.0 | |
| | 5900-6400 | | 2.0 | 7.0 | |
| | 6400-7200 | | 2.0 | 8.0 | |
| Amplitude Unbalance | 4000-4500 | | 0.4 | 1.2 | dB |
| | 4500-5100 | | 0.5 | 0.7 | |
| | 5100-5700 | | 0.2 | 0.6 | |
| | 5700-5900 | | 0.2 | 0.6 | |
| | 5900-6400 | | 0.2 | 0.6 | |
| | 6400-7200 | | 0.5 | 1.0 | |
| VSWR | 4000-7200 | | 1.2 | | :1 |

Electrical Schematic



Demo Board MCL P/N: TB-489-722+ Suggested PCB Layout (PL-304)



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001"; 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



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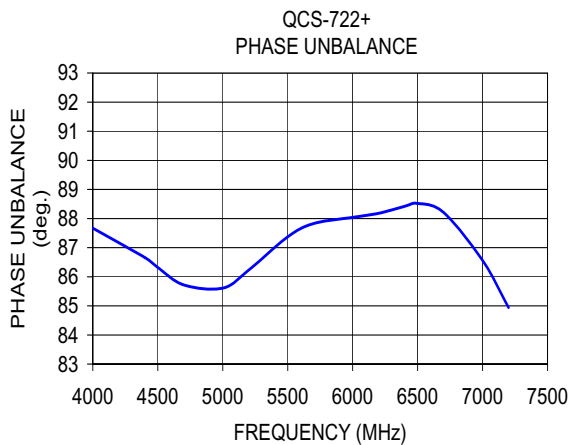
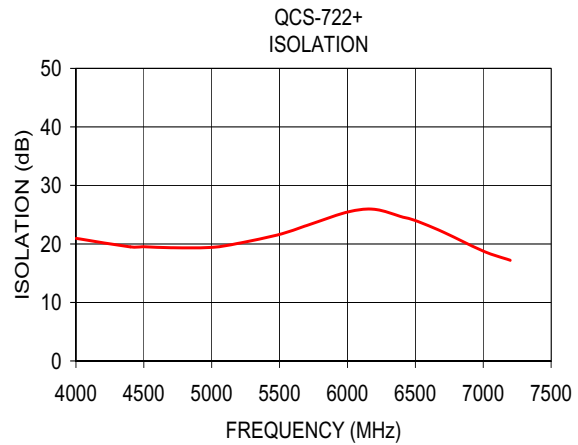
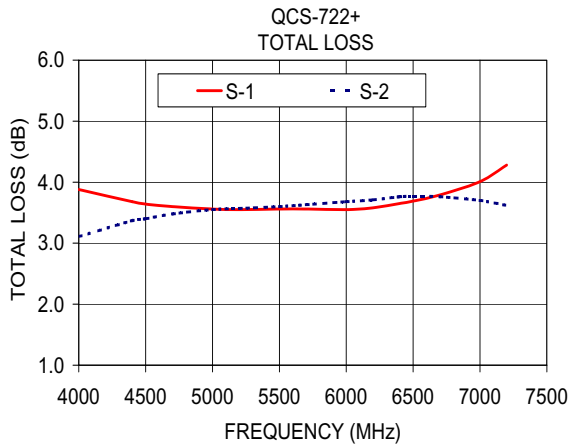
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Typical Performance Data

| Frequency (MHz) | Total Loss' (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
| | S-1 | S-2 | | | | | | |
| 4000.00 | 3.88 | 3.11 | 0.77 | 20.95 | 87.67 | 1.16 | 1.22 | 1.18 |
| 4400.00 | 3.68 | 3.37 | 0.31 | 19.50 | 86.66 | 1.20 | 1.28 | 1.24 |
| 4500.00 | 3.64 | 3.40 | 0.24 | 19.53 | 86.32 | 1.20 | 1.28 | 1.23 |
| 4700.00 | 3.60 | 3.48 | 0.12 | 19.36 | 85.72 | 1.22 | 1.28 | 1.22 |
| 5000.00 | 3.56 | 3.55 | 0.01 | 19.42 | 85.61 | 1.22 | 1.30 | 1.21 |
| 5200.00 | 3.55 | 3.57 | 0.02 | 20.11 | 86.23 | 1.21 | 1.29 | 1.19 |
| 5500.00 | 3.56 | 3.60 | 0.04 | 21.64 | 87.37 | 1.19 | 1.22 | 1.21 |
| 5700.00 | 3.56 | 3.63 | 0.07 | 23.15 | 87.83 | 1.20 | 1.18 | 1.24 |
| 6000.00 | 3.55 | 3.68 | 0.13 | 25.45 | 88.04 | 1.20 | 1.15 | 1.26 |
| 6200.00 | 3.58 | 3.71 | 0.13 | 25.92 | 88.18 | 1.22 | 1.15 | 1.27 |
| 6400.00 | 3.65 | 3.76 | 0.11 | 24.64 | 88.42 | 1.23 | 1.19 | 1.27 |
| 6500.00 | 3.69 | 3.77 | 0.08 | 23.99 | 88.52 | 1.24 | 1.22 | 1.26 |
| 6700.00 | 3.79 | 3.76 | 0.02 | 22.07 | 88.21 | 1.25 | 1.31 | 1.26 |
| 7000.00 | 4.01 | 3.70 | 0.31 | 18.77 | 86.56 | 1.28 | 1.45 | 1.30 |
| 7200.00 | 4.28 | 3.62 | 0.66 | 17.20 | 84.94 | 1.31 | 1.56 | 1.33 |

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



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