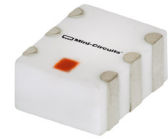


# 2 Way-90° Power Splitter

QCV-271+

50Ω 150 to 265 MHz



CASE STYLE: JV1210C-1

## The Big Deal

- High Power handling (10W)
- Low Unbalance, 0.5 dB & 4 deg. typ.
- Industry leading combination of size/bandwidth

## Product Overview

Mini-Circuits new 90° Power Splitter, model QCV-271+, offers an industry leading combination of operating bandwidth and size; supporting nearly an octave band in a miniature EIA-1210 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-1210 package size, the QCV-271+ offers an industry leading combination of size, bandwidth and frequency. The small footprint (3.2mm x 2.0mm) allows for reduced parasitics in systems with improved performance and simplified layout. |
| Low Phase and Amplitude Unbalance | Supporting 4 deg. and 0.5 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 10W, the LTCC construction of the QCV-271+ makes this 90° hybrid a robust, rugged product that can be used effectively in either the transmit or receive paths.  |

### Notes

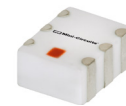
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# Power Splitter/Combiner

## QCV-271+

2 Way-90° 50Ω 150 to 265 MHz



Generic photo used for illustration purposes only  
CASE STYLE: JV1210C-1

### Maximum Ratings

|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -55°C to 100°C |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 10W* max.      |

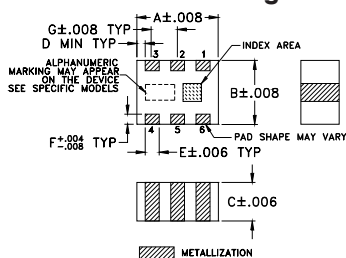
\* Derate linearly to 3W at 100°C ambient.  
Permanent damage may occur if any of these limits are exceeded.

### Pin Connections

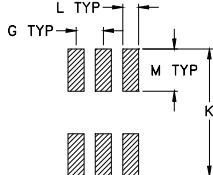
|                      |     |
|----------------------|-----|
| SUM PORT             | 1   |
| PORT 1 (0°)          | 4   |
| PORT 2 (+90°)        | 6   |
| GROUND               | 2,5 |
| 50 OHM TERM EXTERNAL | 3   |

Product Marking: CE

### Outline Drawing



### PCB Land Pattern

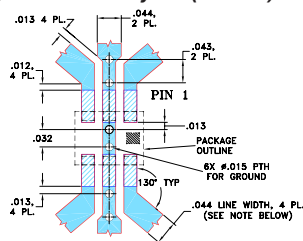


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E    | F     | G    |
|------|------|------|------|------|-------|------|
| .126 | .098 | .059 | .004 | .022 | .016  | .039 |
| 3.2  | 2.5  | 1.50 | 0.1  | 0.56 | 0.4   | 1.0  |
| H    | J    | K    | L    | M    | wt    |      |
| -    | -    | .177 | .024 | .059 | grams |      |
| -    | -    | 4.5  | 0.6  | 1.5  | 0.03  |      |

### Demo Board MCL P/N: TB-610+ Suggested PCB Layout (PL-340)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020 ± 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.

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### Features

- low insertion loss, 0.5 dB typ.
- high isolation, 20 dB typ.
- ultra small size, 0.12x0.10x.059"
- wrap-around terminal for excellent solderability

### Applications

- I&Q modulators
- image reject mixers
- balanced amplifiers
- marine radio

### +RoHS Compliant

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



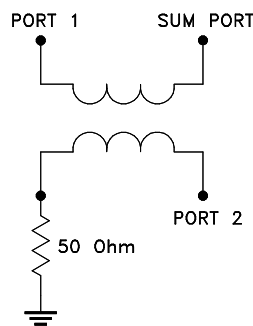
Available Tape and Reel at no extra cost

|           |                                   |
|-----------|-----------------------------------|
| Reel Size | Devices/Reel                      |
| 7"        | 20, 50, 100, 200, 500, 1000, 2000 |

### Electrical Specifications at 25°C

| Parameter   | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|---|-----------------|------|------|------|--------|
| Frequency Range                                       |                 | 150  |      | 265  | MHz    |
| Insertion Loss<br>(avg of coupled outputs above 3 dB) | 150-185         | —    | 0.4  | 0.7  | dB     |
|   | 185-230         | —    | 0.5  | 0.8  |        |
|   | 230-265         | —    | 0.9  | 1.0  |        |
| Isolation   | 150-185         | 16   | 18   | —    | dB     |
|   | 185-230         | 16   | 17   | —    |        |
|   | 230-265         | 14   | 16   | —    |        |
| Phase Unbalance                                       | 150-185         | —    | 3.5  | 8    | Degree |
|   | 185-230         | —    | 3.2  | 8    |        |
|   | 230-265         | —    | 2.0  | 8    |        |
| Amplitude Unbalance                                   | 150-185         | —    | 1.0  | 1.4  | dB     |
|   | 185-230         | —    | 0.4  | 0.6  |        |
|   | 230-265         | —    | 0.7  | 1.4  |        |
| VSWR (Port S)   | 150-185         | —    | 1.2  | 1.4  | :1     |
|   | 185-230         | —    | 1.2  | 1.4  |        |
|   | 230-265         | —    | 1.3  | 1.5  |        |
| VSWR (Port 1-2)                                       | 150-185         | —    | 1.18 | 1.3  | :1     |
|   | 185-230         | —    | 1.21 | 1.4  |        |
|   | 230-265         | —    | 1.34 | 1.5  |        |

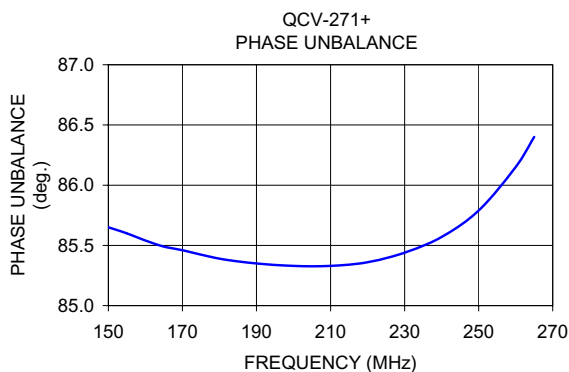
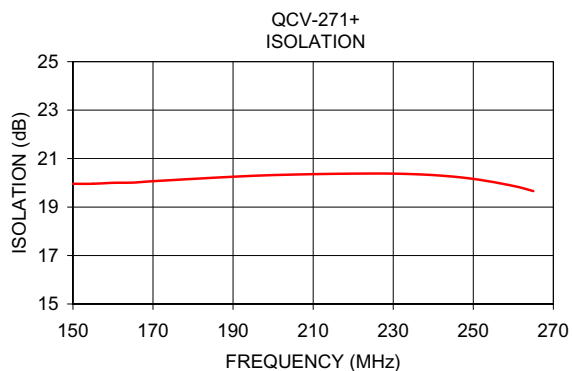
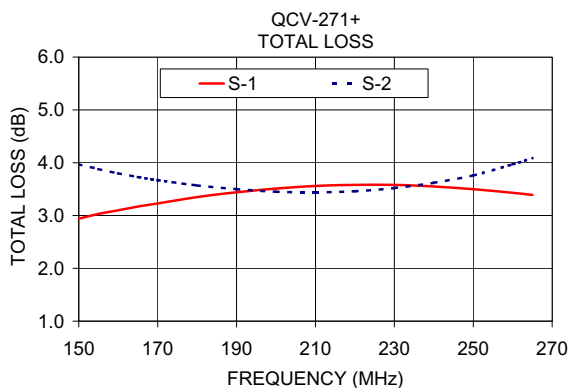
### Electrical Schematic



## Typical Performance Data

| Frequency (MHz) | Total Loss <sup>1</sup> (dB) |      | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
|                 | S-1                          | S-2  |                          |                |                        |        |        |        |
| 150.00          | 2.94                         | 3.97 | 1.02                     | 19.96          | 85.65                  | 1.17   | 1.21   | 1.18   |
| 155.00          | 3.03                         | 3.88 | 0.85                     | 19.96          | 85.60                  | 1.17   | 1.21   | 1.18   |
| 160.00          | 3.10                         | 3.80 | 0.70                     | 20.00          | 85.54                  | 1.17   | 1.21   | 1.18   |
| 165.00          | 3.17                         | 3.73 | 0.56                     | 20.01          | 85.49                  | 1.17   | 1.21   | 1.18   |
| 170.00          | 3.23                         | 3.67 | 0.43                     | 20.07          | 85.46                  | 1.16   | 1.21   | 1.18   |
| 180.00          | 3.35                         | 3.57 | 0.22                     | 20.16          | 85.39                  | 1.16   | 1.22   | 1.19   |
| 190.00          | 3.44                         | 3.50 | 0.06                     | 20.25          | 85.35                  | 1.16   | 1.22   | 1.19   |
| 200.00          | 3.51                         | 3.45 | 0.05                     | 20.32          | 85.33                  | 1.16   | 1.22   | 1.20   |
| 210.00          | 3.56                         | 3.44 | 0.11                     | 20.36          | 85.33                  | 1.17   | 1.23   | 1.21   |
| 220.00          | 3.58                         | 3.46 | 0.12                     | 20.38          | 85.36                  | 1.18   | 1.24   | 1.23   |
| 230.00          | 3.58                         | 3.52 | 0.06                     | 20.38          | 85.44                  | 1.20   | 1.25   | 1.25   |
| 240.00          | 3.55                         | 3.62 | 0.06                     | 20.32          | 85.57                  | 1.22   | 1.26   | 1.28   |
| 250.00          | 3.50                         | 3.76 | 0.26                     | 20.16          | 85.79                  | 1.26   | 1.28   | 1.31   |
| 260.00          | 3.43                         | 3.97 | 0.53                     | 19.87          | 86.15                  | 1.30   | 1.31   | 1.35   |
| 265.00          | 3.39                         | 4.09 | 0.70                     | 19.66          | 86.40                  | 1.33   | 1.32   | 1.38   |

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




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