

Surface Mount

# Power Splitter/Combiner

2 Way-90° 50Ω 16 to 30 MHz

**JYPQ-30+**  
**JYPQ-30**



Generic photo used for illustration purposes only  
CASE STYLE: BJ293

**+RoHS Compliant**

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

| Reel Size | Devices/Reel         |
|-----------|----------------------|
| 7"        | 10, 20, 50, 100, 200 |
| 13"       | 500                  |

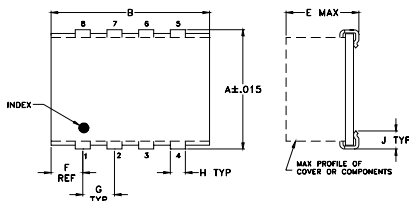
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -55°C to 100°C |
| Power Input (as a splitter)                                     | 1W max.        |
| Permanent damage may occur if any of these limits are exceeded. |                |

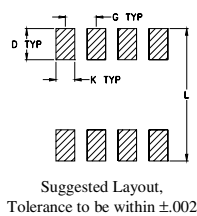
## Pin Connections

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

## Outline Drawing



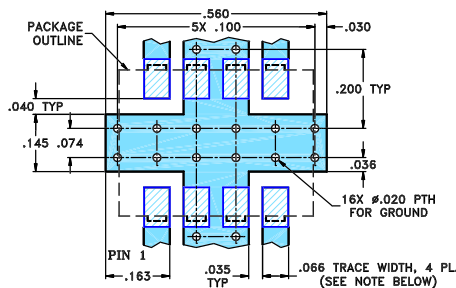
### PCB Land Pattern



## Outline Dimensions (inch)

| A     | B     | C  | D    | E    | F    | G    | H    | J    | K    | L     | wt    |
|-------|-------|----|------|------|------|------|------|------|------|-------|-------|
| .395  | .500  | -- | .100 | .230 | .100 | .100 | .047 | .065 | .065 | .425  | grams |
| 10.03 | 12.70 | -- | 2.54 | 5.84 | 2.54 | 2.54 | 1.19 | 1.65 | 1.65 | 10.80 | 0.80  |

## Demo Board MCL P/N: TB-216 Suggested PCB Layout (PL-100)



- NOTE:**
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS .030" ± .002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT  
 DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

### 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.
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## Features

- low insertion loss, 0.2 dB typ.
- good isolation, 28 dB typ.

## Applications

- HF
- radio communication
- instrumentation
- modulators

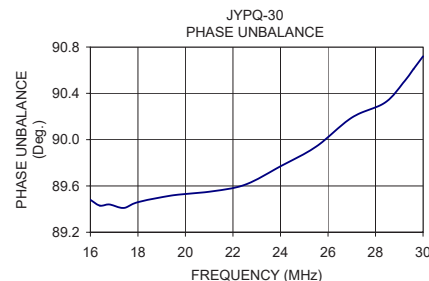
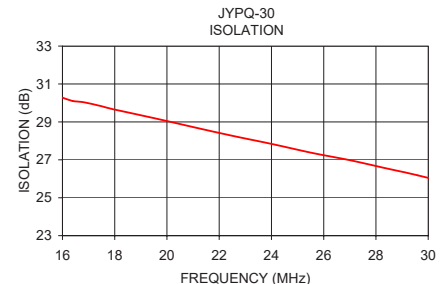
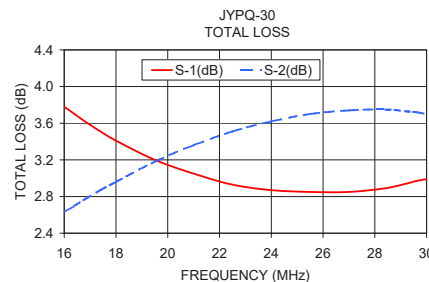
## Electrical Specifications

| FREQ. RANGE (MHz) | ISOLATION (dB) |      | INSERTION LOSS (dB)<br>Avg. of Coupled Outputs<br>ABOVE 3 dB |      | PHASE UNBALANCE (Degrees) | AMPLITUDE UNBALANCE (dB) |
|-------------------|----------------|------|--------------------------------------------------------------|------|---------------------------|--------------------------|
| $f_L$ - $f_U$     | Typ.           | Min. | Typ.                                                         | Max. | Max.                      | Max.                     |
| 16-30             | 28             | 20   | 0.2                                                          | 0.7  | 3                         | 1.5                      |

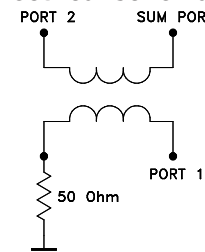
## Typical Performance Data

| 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  |                          |                |                        |        |        |        |
| 16.00           | 3.78                         | 2.63 | 1.15                     | 30.28          | 89.48                  | 1.15   | 1.04   | 1.14   |
| 16.40           | 3.70                         | 2.70 | 1.00                     | 30.10          | 89.43                  | 1.15   | 1.04   | 1.14   |
| 16.80           | 3.62                         | 2.77 | 0.85                     | 30.04          | 89.44                  | 1.15   | 1.04   | 1.15   |
| 17.40           | 3.51                         | 2.87 | 0.64                     | 29.86          | 89.41                  | 1.15   | 1.04   | 1.15   |
| 18.00           | 3.41                         | 2.96 | 0.45                     | 29.65          | 89.46                  | 1.15   | 1.04   | 1.15   |
| 19.50           | 3.20                         | 3.18 | 0.03                     | 29.20          | 89.52                  | 1.16   | 1.04   | 1.15   |
| 21.00           | 3.05                         | 3.36 | 0.31                     | 28.73          | 89.55                  | 1.16   | 1.05   | 1.16   |
| 22.50           | 2.93                         | 3.51 | 0.58                     | 28.27          | 89.61                  | 1.17   | 1.05   | 1.16   |
| 24.00           | 2.87                         | 3.62 | 0.75                     | 27.84          | 89.77                  | 1.18   | 1.05   | 1.17   |
| 25.50           | 2.85                         | 3.70 | 0.86                     | 27.38          | 89.94                  | 1.19   | 1.05   | 1.18   |
| 27.00           | 2.85                         | 3.74 | 0.89                     | 26.98          | 90.19                  | 1.20   | 1.06   | 1.18   |
| 28.40           | 2.89                         | 3.75 | 0.87                     | 26.55          | 90.32                  | 1.21   | 1.06   | 1.19   |
| 29.20           | 2.94                         | 3.73 | 0.79                     | 26.31          | 90.50                  | 1.21   | 1.06   | 1.20   |
| 29.60           | 2.97                         | 3.72 | 0.75                     | 26.18          | 90.61                  | 1.22   | 1.06   | 1.20   |
| 30.00           | 2.99                         | 3.70 | 0.70                     | 26.05          | 90.72                  | 1.22   | 1.07   | 1.21   |

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



## electrical schematic



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200428  
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# 2 Way-90° Power Splitter/Combiner

**JYPQ-30+**

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = +25°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |      |      | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR |           |      |
|----------------|-------------------------|------|------|------------------------|---------------------------|--------------------------|------|-----------|------|
|                | S-1                     | S-2  | AVG. |                        |                           |                          | S    | (:1)<br>1 | 2    |
| 10             | 5.56                    | 1.52 | 3.54 | 4.04                   | 89.35                     | 39.77                    | 1.03 | 1.06      | 1.03 |
| 11             | 5.07                    | 1.75 | 3.41 | 3.32                   | 89.34                     | 39.86                    | 1.03 | 1.06      | 1.03 |
| 12             | 4.66                    | 1.96 | 3.31 | 2.70                   | 89.30                     | 40.01                    | 1.03 | 1.07      | 1.03 |
| 13             | 4.31                    | 2.16 | 3.24 | 2.15                   | 89.29                     | 40.30                    | 1.03 | 1.07      | 1.03 |
| 14             | 4.01                    | 2.35 | 3.18 | 1.66                   | 89.27                     | 40.67                    | 1.03 | 1.07      | 1.03 |
| 15             | 3.76                    | 2.52 | 3.14 | 1.24                   | 89.26                     | 41.02                    | 1.03 | 1.07      | 1.03 |
| 16             | 3.55                    | 2.69 | 3.12 | 0.86                   | 89.28                     | 41.53                    | 1.03 | 1.07      | 1.03 |
| 17             | 3.38                    | 2.84 | 3.11 | 0.54                   | 89.28                     | 42.30                    | 1.04 | 1.07      | 1.03 |
| 18             | 3.24                    | 2.97 | 3.11 | 0.27                   | 89.27                     | 43.14                    | 1.04 | 1.08      | 1.03 |
| 19             | 3.12                    | 3.09 | 3.10 | 0.03                   | 89.28                     | 44.28                    | 1.04 | 1.08      | 1.03 |
| 20             | 3.03                    | 3.19 | 3.11 | 0.16                   | 89.31                     | 45.18                    | 1.04 | 1.08      | 1.03 |
| 21             | 2.96                    | 3.27 | 3.12 | 0.31                   | 89.33                     | 45.96                    | 1.04 | 1.08      | 1.03 |
| 22             | 2.92                    | 3.33 | 3.13 | 0.41                   | 89.37                     | 46.28                    | 1.05 | 1.08      | 1.03 |
| 23             | 2.89                    | 3.36 | 3.13 | 0.47                   | 89.41                     | 45.22                    | 1.05 | 1.08      | 1.04 |
| 24             | 2.89                    | 3.38 | 3.14 | 0.49                   | 89.44                     | 43.45                    | 1.05 | 1.08      | 1.04 |
| 25             | 2.91                    | 3.37 | 3.14 | 0.46                   | 89.52                     | 41.16                    | 1.06 | 1.09      | 1.04 |
| 26             | 2.95                    | 3.34 | 3.14 | 0.39                   | 89.61                     | 38.80                    | 1.06 | 1.09      | 1.05 |
| 27             | 3.02                    | 3.28 | 3.15 | 0.26                   | 89.72                     | 36.55                    | 1.07 | 1.09      | 1.05 |
| 28             | 3.12                    | 3.21 | 3.16 | 0.09                   | 89.83                     | 34.46                    | 1.08 | 1.10      | 1.06 |
| 29             | 3.26                    | 3.10 | 3.18 | 0.16                   | 90.01                     | 32.43                    | 1.09 | 1.10      | 1.07 |
| 30             | 3.44                    | 2.97 | 3.21 | 0.47                   | 90.21                     | 30.50                    | 1.11 | 1.11      | 1.08 |
| 31             | 3.66                    | 2.82 | 3.24 | 0.84                   | 90.47                     | 28.60                    | 1.12 | 1.11      | 1.10 |
| 32             | 3.96                    | 2.64 | 3.30 | 1.32                   | 90.85                     | 26.77                    | 1.14 | 1.12      | 1.12 |
| 33             | 4.34                    | 2.44 | 3.39 | 1.90                   | 91.31                     | 24.98                    | 1.17 | 1.14      | 1.14 |
| 34             | 4.82                    | 2.22 | 3.52 | 2.60                   | 92.01                     | 23.20                    | 1.20 | 1.15      | 1.17 |
| 35             | 5.46                    | 1.99 | 3.73 | 3.47                   | 92.96                     | 21.47                    | 1.24 | 1.18      | 1.21 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss

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# 2 Way-90° Power Splitter/Combiner

**JYPQ-30+**

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = -40°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |      |      | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR |           |      |
|----------------|-------------------------|------|------|------------------------|---------------------------|--------------------------|------|-----------|------|
|                | S-1                     | S-2  | AVG. |                        |                           |                          | S    | (:1)<br>1 | 2    |
| 10             | 5.56                    | 1.50 | 3.53 | 4.06                   | 89.39                     | 39.74                    | 1.03 | 1.06      | 1.03 |
| 11             | 5.07                    | 1.72 | 3.40 | 3.35                   | 89.38                     | 39.75                    | 1.03 | 1.06      | 1.03 |
| 12             | 4.66                    | 1.93 | 3.29 | 2.73                   | 89.35                     | 39.77                    | 1.04 | 1.07      | 1.03 |
| 13             | 4.31                    | 2.13 | 3.22 | 2.18                   | 89.34                     | 39.88                    | 1.04 | 1.07      | 1.03 |
| 14             | 4.01                    | 2.31 | 3.16 | 1.70                   | 89.30                     | 40.00                    | 1.04 | 1.07      | 1.03 |
| 15             | 3.76                    | 2.49 | 3.13 | 1.27                   | 89.27                     | 40.17                    | 1.04 | 1.08      | 1.03 |
| 16             | 3.54                    | 2.65 | 3.10 | 0.89                   | 89.28                     | 40.34                    | 1.04 | 1.08      | 1.03 |
| 17             | 3.37                    | 2.81 | 3.09 | 0.56                   | 89.28                     | 40.64                    | 1.05 | 1.08      | 1.03 |
| 18             | 3.22                    | 2.94 | 3.08 | 0.28                   | 89.27                     | 40.99                    | 1.05 | 1.08      | 1.03 |
| 19             | 3.11                    | 3.06 | 3.08 | 0.05                   | 89.27                     | 41.40                    | 1.05 | 1.09      | 1.03 |
| 20             | 3.02                    | 3.16 | 3.09 | 0.14                   | 89.29                     | 41.44                    | 1.05 | 1.09      | 1.03 |
| 21             | 2.95                    | 3.24 | 3.10 | 0.29                   | 89.31                     | 41.47                    | 1.06 | 1.09      | 1.04 |
| 22             | 2.90                    | 3.30 | 3.10 | 0.40                   | 89.34                     | 41.38                    | 1.06 | 1.09      | 1.04 |
| 23             | 2.87                    | 3.33 | 3.10 | 0.46                   | 89.39                     | 40.72                    | 1.06 | 1.10      | 1.04 |
| 24             | 2.87                    | 3.35 | 3.11 | 0.48                   | 89.39                     | 39.83                    | 1.07 | 1.10      | 1.04 |
| 25             | 2.89                    | 3.34 | 3.12 | 0.45                   | 89.44                     | 38.58                    | 1.07 | 1.10      | 1.04 |
| 26             | 2.93                    | 3.31 | 3.12 | 0.38                   | 89.51                     | 37.02                    | 1.08 | 1.10      | 1.05 |
| 27             | 3.00                    | 3.26 | 3.13 | 0.26                   | 89.63                     | 35.38                    | 1.08 | 1.11      | 1.05 |
| 28             | 3.09                    | 3.18 | 3.13 | 0.09                   | 89.73                     | 33.68                    | 1.09 | 1.11      | 1.06 |
| 29             | 3.22                    | 3.08 | 3.15 | 0.14                   | 89.89                     | 31.92                    | 1.10 | 1.11      | 1.07 |
| 30             | 3.39                    | 2.95 | 3.17 | 0.44                   | 90.08                     | 30.17                    | 1.11 | 1.12      | 1.08 |
| 31             | 3.61                    | 2.80 | 3.20 | 0.81                   | 90.29                     | 28.39                    | 1.13 | 1.13      | 1.09 |
| 32             | 3.90                    | 2.62 | 3.26 | 1.28                   | 90.62                     | 26.65                    | 1.14 | 1.13      | 1.11 |
| 33             | 4.26                    | 2.42 | 3.34 | 1.84                   | 91.05                     | 24.90                    | 1.17 | 1.14      | 1.13 |
| 34             | 4.73                    | 2.19 | 3.46 | 2.54                   | 91.70                     | 23.14                    | 1.19 | 1.16      | 1.15 |
| 35             | 5.35                    | 1.96 | 3.65 | 3.39                   | 92.55                     | 21.43                    | 1.23 | 1.18      | 1.19 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss

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# 2 Way-90° Power Splitter/Combiner

**JYPQ-30+**

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = -10dBm @Temperature = +85°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |      |      | AMP.<br>UNBAL.<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR |           |      |
|----------------|-------------------------|------|------|------------------------|---------------------------|--------------------------|------|-----------|------|
|                | S-1                     | S-2  | AVG. |                        |                           |                          | S    | (:1)<br>1 | 2    |
| 10             | 5.56                    | 1.52 | 3.54 | 4.04                   | 89.45                     | 38.56                    | 1.03 | 1.07      | 1.03 |
| 11             | 5.08                    | 1.75 | 3.41 | 3.33                   | 89.44                     | 38.66                    | 1.03 | 1.07      | 1.03 |
| 12             | 4.66                    | 1.96 | 3.31 | 2.70                   | 89.43                     | 38.85                    | 1.03 | 1.07      | 1.03 |
| 13             | 4.31                    | 2.15 | 3.23 | 2.16                   | 89.43                     | 39.24                    | 1.03 | 1.07      | 1.03 |
| 14             | 4.02                    | 2.34 | 3.18 | 1.68                   | 89.43                     | 39.64                    | 1.03 | 1.07      | 1.03 |
| 15             | 3.77                    | 2.52 | 3.14 | 1.25                   | 89.41                     | 40.15                    | 1.03 | 1.07      | 1.03 |
| 16             | 3.56                    | 2.68 | 3.12 | 0.88                   | 89.42                     | 40.86                    | 1.03 | 1.07      | 1.03 |
| 17             | 3.39                    | 2.84 | 3.12 | 0.55                   | 89.45                     | 41.86                    | 1.03 | 1.07      | 1.02 |
| 18             | 3.25                    | 2.97 | 3.11 | 0.28                   | 89.45                     | 42.93                    | 1.03 | 1.07      | 1.03 |
| 19             | 3.13                    | 3.08 | 3.11 | 0.05                   | 89.46                     | 44.77                    | 1.03 | 1.07      | 1.03 |
| 20             | 3.04                    | 3.18 | 3.11 | 0.14                   | 89.50                     | 46.89                    | 1.03 | 1.07      | 1.03 |
| 21             | 2.98                    | 3.26 | 3.12 | 0.28                   | 89.54                     | 49.74                    | 1.03 | 1.07      | 1.03 |
| 22             | 2.93                    | 3.32 | 3.13 | 0.39                   | 89.55                     | 53.44                    | 1.03 | 1.07      | 1.03 |
| 23             | 2.91                    | 3.36 | 3.13 | 0.45                   | 89.64                     | 51.70                    | 1.04 | 1.07      | 1.03 |
| 24             | 2.91                    | 3.37 | 3.14 | 0.46                   | 89.65                     | 47.10                    | 1.04 | 1.07      | 1.04 |
| 25             | 2.93                    | 3.36 | 3.14 | 0.43                   | 89.73                     | 43.04                    | 1.05 | 1.08      | 1.04 |
| 26             | 2.98                    | 3.33 | 3.15 | 0.35                   | 89.83                     | 39.81                    | 1.06 | 1.08      | 1.05 |
| 27             | 3.06                    | 3.28 | 3.17 | 0.22                   | 89.97                     | 37.06                    | 1.06 | 1.08      | 1.06 |
| 28             | 3.16                    | 3.19 | 3.18 | 0.03                   | 90.11                     | 34.68                    | 1.07 | 1.08      | 1.07 |
| 29             | 3.30                    | 3.09 | 3.19 | 0.21                   | 90.30                     | 32.48                    | 1.09 | 1.08      | 1.08 |
| 30             | 3.48                    | 2.96 | 3.22 | 0.52                   | 90.54                     | 30.44                    | 1.10 | 1.09      | 1.09 |
| 31             | 3.73                    | 2.80 | 3.26 | 0.93                   | 90.82                     | 28.48                    | 1.12 | 1.10      | 1.11 |
| 32             | 4.03                    | 2.62 | 3.33 | 1.41                   | 91.24                     | 26.61                    | 1.15 | 1.11      | 1.13 |
| 33             | 4.42                    | 2.42 | 3.42 | 2.00                   | 91.77                     | 24.79                    | 1.18 | 1.13      | 1.16 |
| 34             | 4.93                    | 2.20 | 3.56 | 2.73                   | 92.56                     | 23.01                    | 1.21 | 1.15      | 1.19 |
| 35             | 5.60                    | 1.98 | 3.79 | 3.62                   | 93.62                     | 21.28                    | 1.26 | 1.17      | 1.23 |

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss

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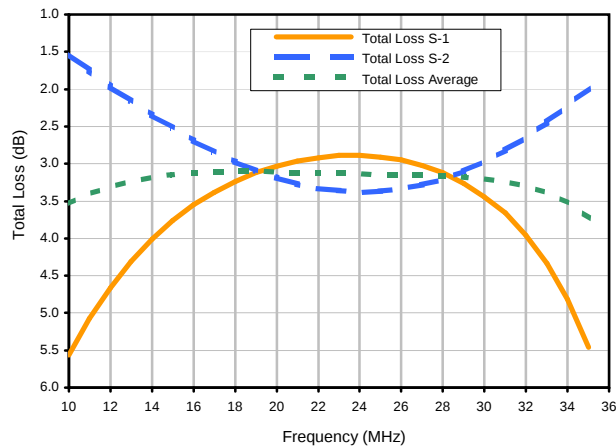


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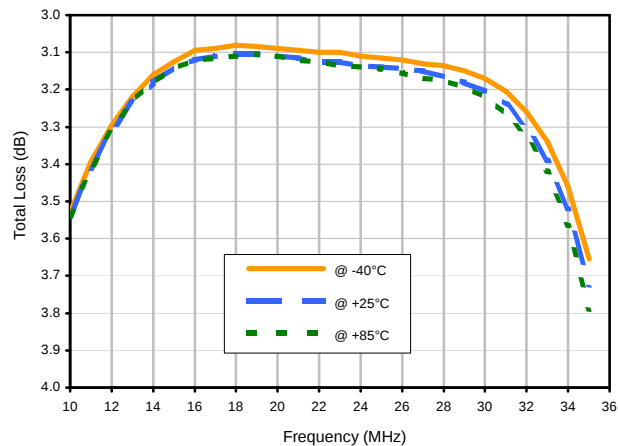
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## Typical Performance Curves

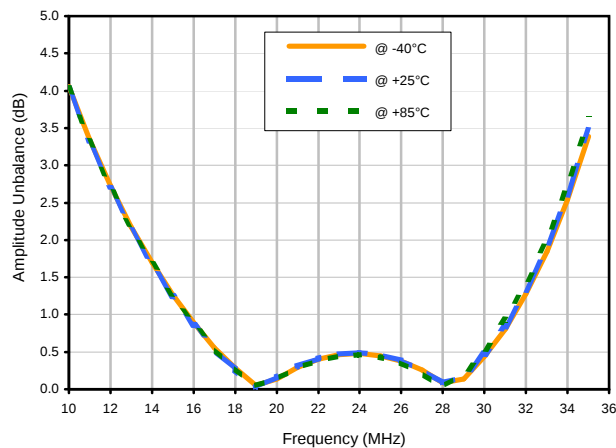
Total Loss



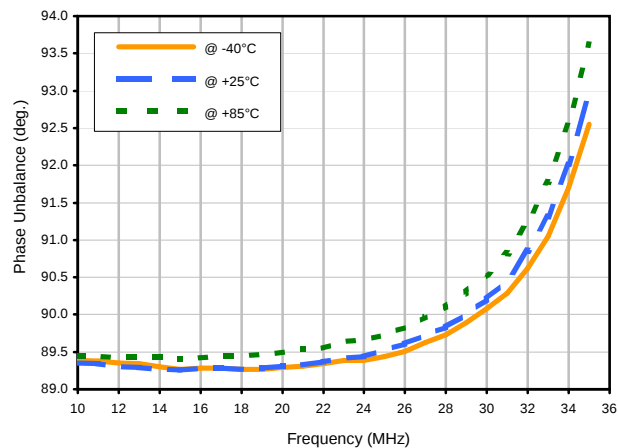
Average Total Loss vs. TEMPERATURE



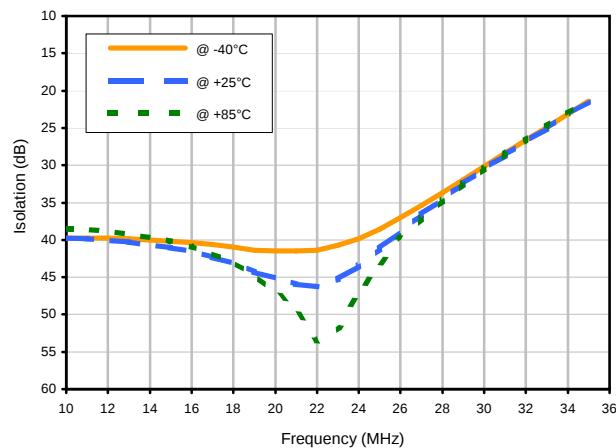
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE



Isolation 1-2 vs. TEMPERATURE



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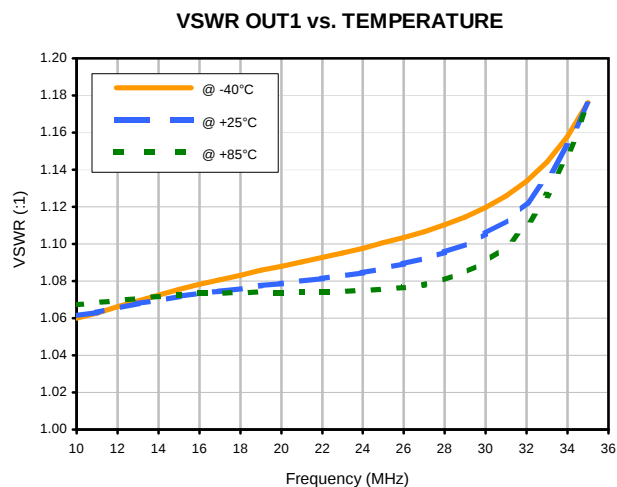
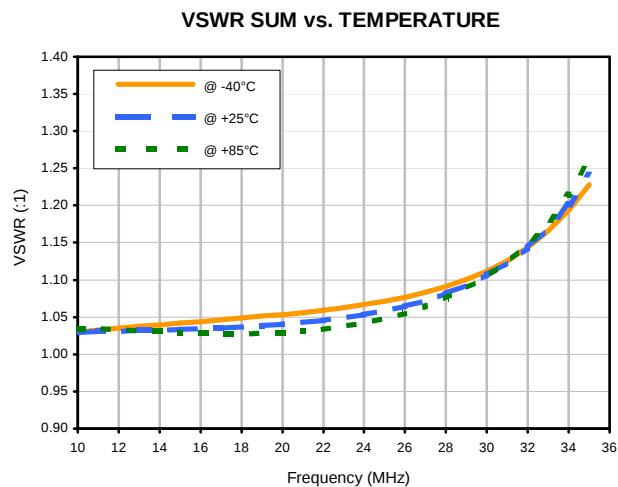
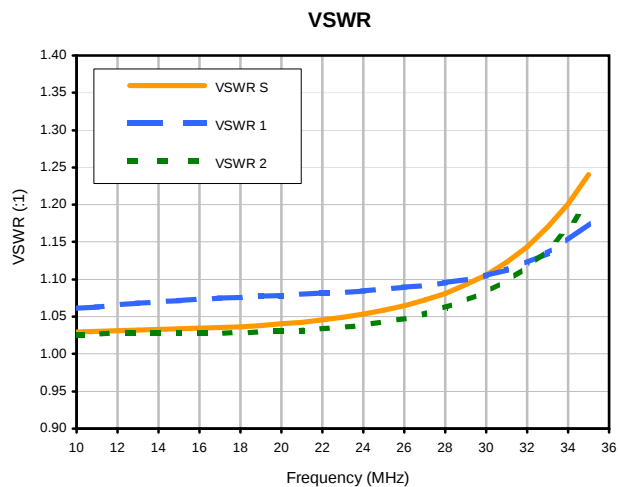
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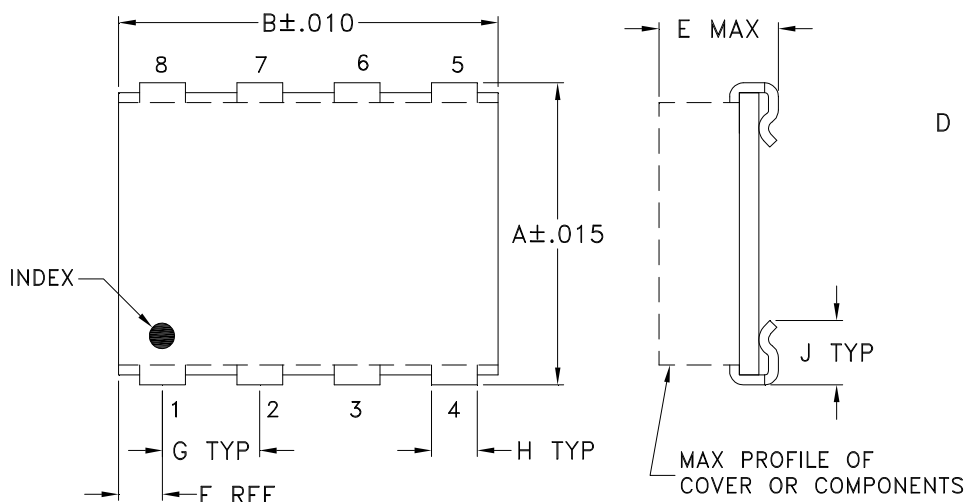


## Typical Performance Curves

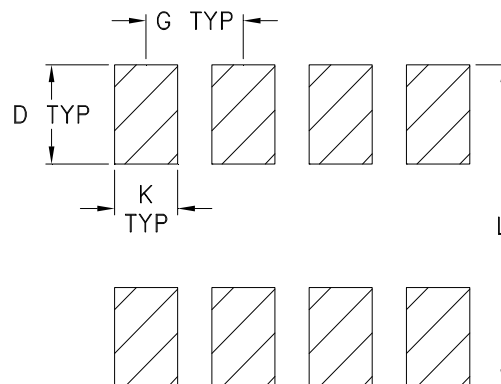


## Outline Dimensions

**BJ293**  
**BJ398**



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| CASE# | A               | B               | C        | D              | E              | F              | G              | H              | J              | K              | L               | WT.<br>GRAMS |
|-------|-----------------|-----------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|--------------|
| BJ293 | .395<br>(10.03) | .500<br>(12.70) | --<br>-- | .100<br>(2.54) | .230<br>(5.84) | .100<br>(2.54) | .100<br>(2.54) | .047<br>(1.19) | .065<br>(1.65) | .065<br>(1.65) | .425<br>(10.80) | .80          |
| BJ398 | .305<br>(7.75)  | .390<br>(9.91)  | --<br>-- | .100<br>(2.54) | .105<br>(2.67) | .045<br>(1.14) | .100<br>(2.54) | .047<br>(1.19) | .065<br>(1.65) | .065<br>(1.65) | .325<br>(8.26)  | .20          |

Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .01$ ; 3Pl.  $\pm .005$

### Notes:

- Case material: Plastic.
- Base material: Printed wiring laminate.
- Termination finish:
  - For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



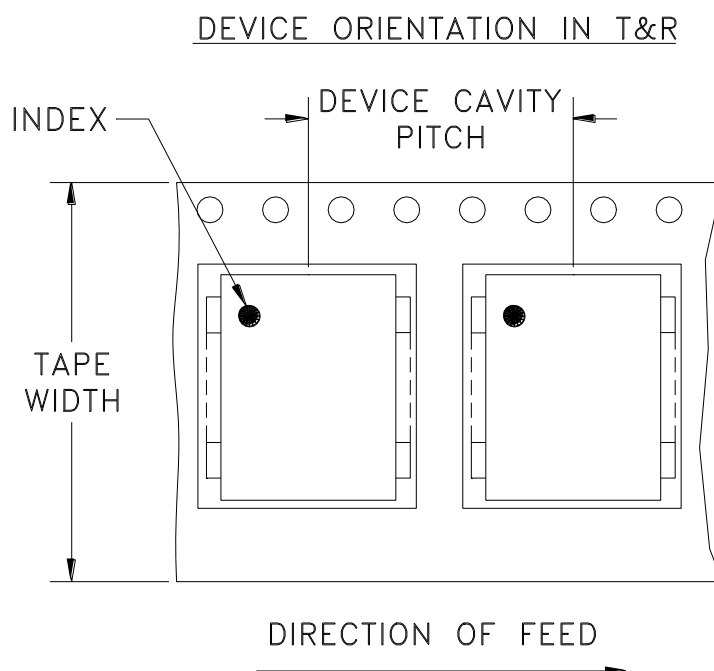
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# Tape & Reel Packaging TR-F10



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 24                | 16                         | 7                    | 10,20,50,100,200 |
|                   |                            | 13                   | 500              |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)

Note: Please consult individual model data sheet to determine device per reel availability.



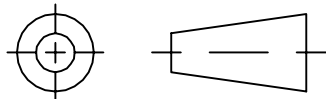
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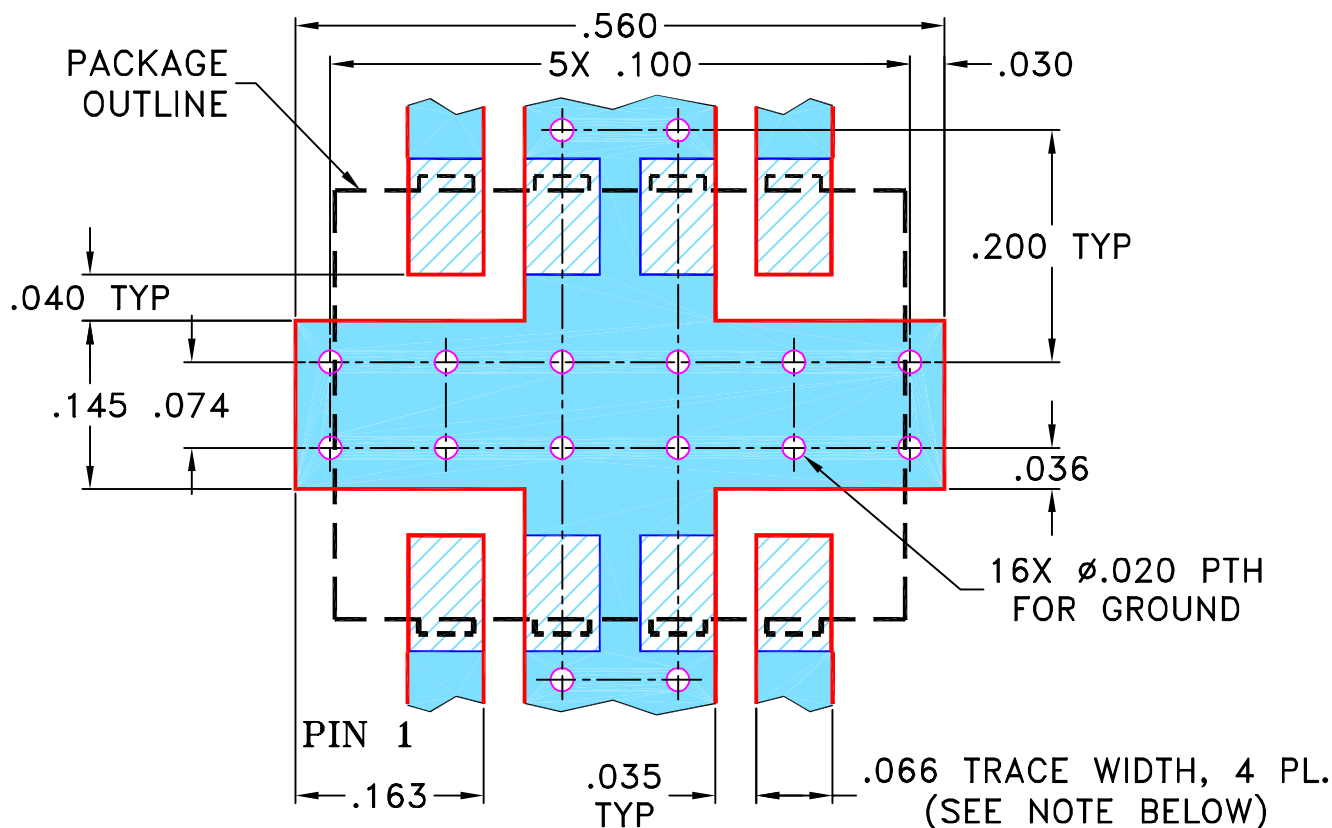
## THIRD ANGLE PROJECTION



## REVISIONS

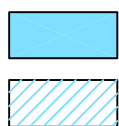
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|-----|---------|---------------------------------------|----------|-----|------|
| OR  | M82549  | NEW RELEASE                           | 11/15/02 | MMG | HY   |
| A   | M102713 | MODIFIED NOTES, ADDED "...WITH SMOBC" | 01/16/06 | GT  | IL   |
|     |         |                                       |          |     |      |
|     |         |                                       |          |     |      |

**SUGGESTED MOUNTING CONFIGURATION  
FOR BJ293 CASE STYLE, "kx" PIN CONNECTION.**



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .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

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES ON:  
2 PL DECIMALS  $\pm$   
3 PL DECIMALS  $\pm$  .005  
ANGLES  $\pm$   
FRACTIONS  $\pm$

INITIALS

DATE

DRAWN

MMG

11/05/02

CHECKED

AV

11/14/02

APPROVED

HY

11/15/02

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ASHEETA1.DWG REV:A DATE:01/12/95



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Brooklyn NY 11235

PL, kx, BJ293, JYPQ, TB-216

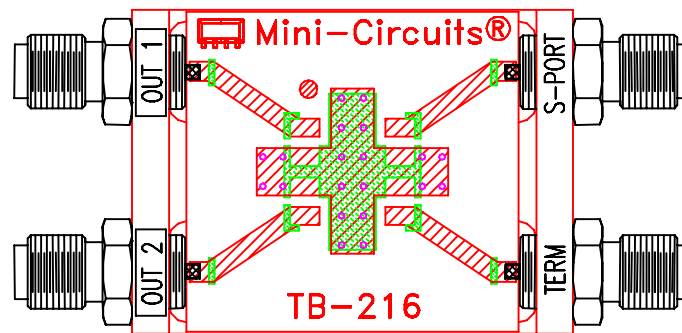
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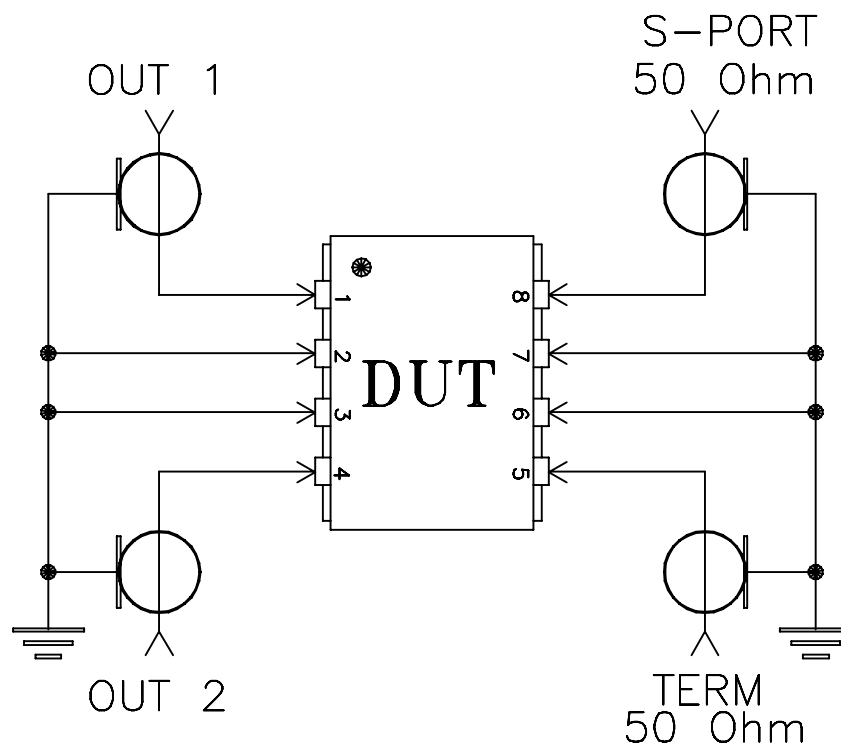
SCALE: 6:1

SHEET: 1 OF 1

# Evaluation Board and Circuit



TB-216



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -40° to 85°C<br>Ambient Environment                                                                                                                             | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |