

# Surface Mount Power Splitter/Combiner

2 Way-90° 50Ω 880 to 1030 MHz

HPQ-10W+  
HPQ-10W



CASE STYLE: AT577

PRICE: Contact Sales Dept.

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

## Pin Connections

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

## Features

- low insertion loss, 0.28 dB typ.
- good isolation, 22 dB typ.
- excellent input & output VSWR, 1.25:1 typ.
- aqueous washable

## Applications

- cellular
- modulator
- balanced amplifiers

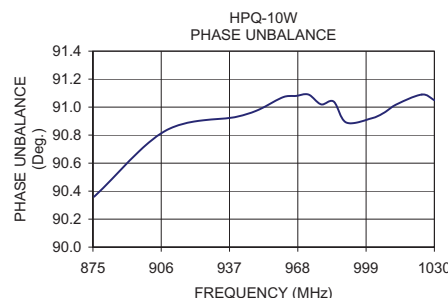
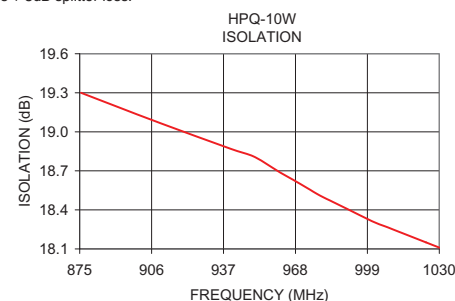
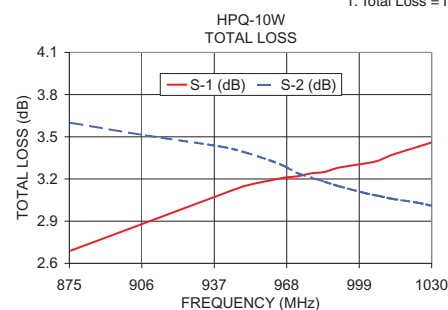
## Electrical Specifications

| FREQ.<br>RANGE<br>(MHz) | ISOLATION<br>(dB) |      | INSERTION LOSS (dB)<br>Avg. of Coupled Outputs<br>ABOVE 3 dB |      | PHASE<br>UNBALANCE<br>(Degrees) |      | AMPLITUDE<br>UNBALANCE<br>(dB) |      | VSWR<br>(:1)   |                |
|-------------------------|-------------------|------|--------------------------------------------------------------|------|---------------------------------|------|--------------------------------|------|----------------|----------------|
|                         | Typ.              | Min. | Typ.                                                         | Max. | Typ.                            | Max. | Typ.                           | Max. | S-Port<br>Typ. | Output<br>Typ. |
| 880-1030                | 22                | 16   | 0.28                                                         | 0.50 | 1.0                             | 4.0  | 0.85                           | 1.6  | 1.17           | 1.17           |

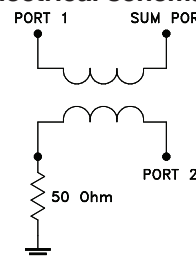
## Typical Performance Data

| Frequency<br>(MHz) | Total Loss <sup>1</sup><br>(dB) |      | Amplitude<br>Unbalance<br>(dB) | Isolation<br>(dB) | Phase<br>Unbalance<br>(deg.) | VSWR<br>S | VSWR<br>1 | VSWR<br>2 |
|--------------------|---------------------------------|------|--------------------------------|-------------------|------------------------------|-----------|-----------|-----------|
|                    | S-1                             | S-2  |                                |                   |                              |           |           |           |
| 875.55             | 2.69                            | 3.60 | 0.91                           | 19.30             | 90.36                        | 1.22      | 1.24      | 1.25      |
| 907.77             | 2.89                            | 3.51 | 0.62                           | 19.08             | 90.83                        | 1.23      | 1.25      | 1.26      |
| 940.00             | 3.09                            | 3.43 | 0.34                           | 18.87             | 90.93                        | 1.24      | 1.27      | 1.27      |
| 950.00             | 3.15                            | 3.39 | 0.24                           | 18.81             | 90.98                        | 1.24      | 1.27      | 1.27      |
| 961.14             | 3.19                            | 3.33 | 0.14                           | 18.69             | 91.07                        | 1.24      | 1.27      | 1.27      |
| 967.14             | 3.21                            | 3.29 | 0.09                           | 18.63             | 91.08                        | 1.25      | 1.28      | 1.27      |
| 972.85             | 3.22                            | 3.24 | 0.03                           | 18.57             | 91.09                        | 1.25      | 1.28      | 1.27      |
| 978.57             | 3.24                            | 3.21 | 0.03                           | 18.51             | 91.02                        | 1.25      | 1.28      | 1.28      |
| 984.28             | 3.25                            | 3.18 | 0.08                           | 18.46             | 91.04                        | 1.25      | 1.29      | 1.28      |
| 990.00             | 3.28                            | 3.15 | 0.13                           | 18.41             | 90.89                        | 1.26      | 1.29      | 1.28      |
| 1001.42            | 3.31                            | 3.10 | 0.21                           | 18.31             | 90.92                        | 1.26      | 1.29      | 1.28      |
| 1007.14            | 3.33                            | 3.08 | 0.25                           | 18.27             | 90.96                        | 1.26      | 1.30      | 1.28      |
| 1012.85            | 3.37                            | 3.06 | 0.30                           | 18.23             | 91.02                        | 1.27      | 1.30      | 1.29      |
| 1024.28            | 3.43                            | 3.03 | 0.39                           | 18.15             | 91.09                        | 1.27      | 1.31      | 1.29      |
| 1030.00            | 3.46                            | 3.01 | 0.45                           | 18.11             | 91.05                        | 1.27      | 1.31      | 1.29      |

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



## electrical schematic



For detailed performance specs  
& shopping online see web site

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RVN/TD/CP/AM  
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# 2 Way-90° Power Splitter/Combiner

# HPQ-10W

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +25°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMP.<br>UNBAL.<br>(dB) | PHASE UNBAL.<br>From 90°<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR<br>(:1) |      |      |
|----------------|---------------------------------|------|------------------------|------------------------------------|--------------------------|--------------|------|------|
|                | S-1                             | S-2  |                        |                                    |                          | S            | 1    | 2    |
| 400            | 0.82                            | 8.52 | 7.70                   | 0.55                               | 25.34                    | 1.05         | 1.04 | 1.04 |
| 500            | 1.17                            | 6.97 | 5.79                   | 0.51                               | 24.11                    | 1.07         | 1.06 | 1.07 |
| 600            | 1.57                            | 5.81 | 4.24                   | 0.40                               | 23.27                    | 1.10         | 1.08 | 1.10 |
| 700            | 1.99                            | 4.92 | 2.93                   | 0.34                               | 22.63                    | 1.13         | 1.11 | 1.14 |
| 750            | 2.21                            | 4.56 | 2.36                   | 0.25                               | 22.33                    | 1.15         | 1.12 | 1.15 |
| 800            | 2.43                            | 4.24 | 1.81                   | 0.17                               | 22.07                    | 1.16         | 1.13 | 1.17 |
| 850            | 2.65                            | 3.95 | 1.30                   | 0.12                               | 21.80                    | 1.18         | 1.14 | 1.19 |
| 860            | 2.69                            | 3.89 | 1.20                   | 0.12                               | 21.73                    | 1.18         | 1.14 | 1.19 |
| 870            | 2.73                            | 3.84 | 1.10                   | 0.09                               | 21.67                    | 1.18         | 1.15 | 1.19 |
| 880            | 2.77                            | 3.79 | 1.02                   | 0.06                               | 21.61                    | 1.19         | 1.15 | 1.20 |
| 890            | 2.82                            | 3.74 | 0.92                   | 0.06                               | 21.57                    | 1.19         | 1.15 | 1.20 |
| 900            | 2.86                            | 3.69 | 0.82                   | 0.04                               | 21.53                    | 1.19         | 1.15 | 1.20 |
| 910            | 2.91                            | 3.64 | 0.73                   | 0.02                               | 21.49                    | 1.20         | 1.16 | 1.20 |
| 920            | 2.94                            | 3.60 | 0.66                   | 0.01                               | 21.44                    | 1.20         | 1.16 | 1.21 |
| 930            | 2.99                            | 3.56 | 0.56                   | 0.01                               | 21.36                    | 1.20         | 1.16 | 1.21 |
| 940            | 3.04                            | 3.51 | 0.47                   | 0.02                               | 21.30                    | 1.21         | 1.16 | 1.21 |
| 950            | 3.08                            | 3.46 | 0.38                   | 0.06                               | 21.25                    | 1.21         | 1.17 | 1.22 |
| 960            | 3.12                            | 3.43 | 0.30                   | 0.07                               | 21.21                    | 1.21         | 1.17 | 1.22 |
| 970            | 3.17                            | 3.38 | 0.21                   | 0.10                               | 21.17                    | 1.21         | 1.17 | 1.22 |
| 980            | 3.22                            | 3.34 | 0.12                   | 0.12                               | 21.12                    | 1.22         | 1.18 | 1.23 |
| 990            | 3.26                            | 3.30 | 0.04                   | 0.13                               | 21.05                    | 1.22         | 1.18 | 1.23 |
| 1000           | 3.31                            | 3.26 | 0.04                   | 0.15                               | 20.98                    | 1.22         | 1.18 | 1.23 |
| 1010           | 3.35                            | 3.23 | 0.12                   | 0.19                               | 20.92                    | 1.23         | 1.18 | 1.23 |
| 1020           | 3.39                            | 3.19 | 0.21                   | 0.23                               | 20.88                    | 1.23         | 1.19 | 1.24 |
| 1030           | 3.44                            | 3.15 | 0.28                   | 0.25                               | 20.84                    | 1.23         | 1.19 | 1.24 |
| 1040           | 3.48                            | 3.11 | 0.37                   | 0.24                               | 20.80                    | 1.23         | 1.19 | 1.24 |
| 1050           | 3.52                            | 3.08 | 0.45                   | 0.29                               | 20.75                    | 1.24         | 1.20 | 1.25 |
| 1060           | 3.57                            | 3.05 | 0.52                   | 0.28                               | 20.68                    | 1.24         | 1.20 | 1.25 |
| 1070           | 3.61                            | 3.01 | 0.60                   | 0.28                               | 20.62                    | 1.25         | 1.20 | 1.25 |
| 1080           | 3.65                            | 2.98 | 0.67                   | 0.31                               | 20.57                    | 1.25         | 1.20 | 1.26 |
| 1090           | 3.70                            | 2.95 | 0.75                   | 0.35                               | 20.52                    | 1.25         | 1.21 | 1.26 |
| 1100           | 3.74                            | 2.92 | 0.82                   | 0.39                               | 20.48                    | 1.25         | 1.21 | 1.26 |
| 1200           | 4.17                            | 2.62 | 1.54                   | 0.64                               | 19.95                    | 1.28         | 1.24 | 1.29 |
| 1300           | 4.58                            | 2.40 | 2.19                   | 0.91                               | 19.46                    | 1.32         | 1.27 | 1.32 |
| 1400           | 4.99                            | 2.21 | 2.78                   | 1.19                               | 19.01                    | 1.35         | 1.31 | 1.34 |
| 1500           | 5.39                            | 2.05 | 3.34                   | 1.52                               | 18.60                    | 1.38         | 1.35 | 1.37 |
| 1600           | 5.78                            | 1.92 | 3.85                   | 1.92                               | 18.20                    | 1.41         | 1.38 | 1.40 |
| 1700           | 6.15                            | 1.83 | 4.33                   | 2.38                               | 17.84                    | 1.45         | 1.43 | 1.44 |
| 1800           | 6.53                            | 1.75 | 4.78                   | 2.86                               | 17.53                    | 1.48         | 1.47 | 1.47 |
| 1900           | 6.90                            | 1.69 | 5.21                   | 3.33                               | 17.23                    | 1.52         | 1.51 | 1.51 |
| 2000           | 7.25                            | 1.65 | 5.60                   | 3.88                               | 17.00                    | 1.56         | 1.56 | 1.55 |

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

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# 2 Way-90° Power Splitter/Combiner

# HPQ-10W

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = -40°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMP.<br>UNBAL.<br>(dB) | PHASE UNBAL.<br>From 90°<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR<br>(:1) |      |      |
|----------------|---------------------------------|------|------------------------|------------------------------------|--------------------------|--------------|------|------|
|                | S-1                             | S-2  |                        |                                    |                          | S            | 1    | 2    |
| 400            | 0.72                            | 8.65 | 7.93                   | 0.68                               | 26.37                    | 1.05         | 1.05 | 1.05 |
| 500            | 1.05                            | 7.07 | 6.02                   | 0.99                               | 24.93                    | 1.07         | 1.07 | 1.08 |
| 600            | 1.43                            | 5.89 | 4.46                   | 1.38                               | 23.83                    | 1.10         | 1.09 | 1.11 |
| 700            | 1.83                            | 4.98 | 3.15                   | 1.70                               | 22.98                    | 1.13         | 1.11 | 1.14 |
| 750            | 2.04                            | 4.61 | 2.57                   | 1.93                               | 22.61                    | 1.14         | 1.11 | 1.16 |
| 800            | 2.25                            | 4.28 | 2.02                   | 2.08                               | 22.27                    | 1.16         | 1.13 | 1.17 |
| 850            | 2.46                            | 3.97 | 1.51                   | 2.17                               | 21.89                    | 1.17         | 1.14 | 1.19 |
| 860            | 2.50                            | 3.91 | 1.42                   | 2.20                               | 21.80                    | 1.17         | 1.14 | 1.19 |
| 870            | 2.53                            | 3.86 | 1.32                   | 2.25                               | 21.72                    | 1.18         | 1.14 | 1.20 |
| 880            | 2.57                            | 3.80 | 1.23                   | 2.32                               | 21.65                    | 1.18         | 1.14 | 1.20 |
| 890            | 2.62                            | 3.76 | 1.14                   | 2.35                               | 21.59                    | 1.18         | 1.15 | 1.20 |
| 900            | 2.66                            | 3.71 | 1.05                   | 2.39                               | 21.53                    | 1.19         | 1.15 | 1.21 |
| 910            | 2.70                            | 3.65 | 0.95                   | 2.44                               | 21.47                    | 1.19         | 1.15 | 1.21 |
| 920            | 2.74                            | 3.61 | 0.87                   | 2.47                               | 21.40                    | 1.19         | 1.15 | 1.21 |
| 930            | 2.78                            | 3.57 | 0.78                   | 2.52                               | 21.30                    | 1.20         | 1.16 | 1.22 |
| 940            | 2.83                            | 3.52 | 0.69                   | 2.58                               | 21.23                    | 1.20         | 1.16 | 1.22 |
| 950            | 2.87                            | 3.47 | 0.60                   | 2.67                               | 21.17                    | 1.20         | 1.16 | 1.22 |
| 960            | 2.91                            | 3.43 | 0.51                   | 2.74                               | 21.11                    | 1.21         | 1.16 | 1.23 |
| 970            | 2.96                            | 3.39 | 0.43                   | 2.81                               | 21.06                    | 1.21         | 1.17 | 1.23 |
| 980            | 3.01                            | 3.35 | 0.34                   | 2.89                               | 21.01                    | 1.21         | 1.17 | 1.23 |
| 990            | 3.05                            | 3.31 | 0.25                   | 2.92                               | 20.94                    | 1.21         | 1.17 | 1.24 |
| 1000           | 3.10                            | 3.27 | 0.17                   | 2.94                               | 20.83                    | 1.22         | 1.17 | 1.24 |
| 1010           | 3.14                            | 3.23 | 0.09                   | 3.04                               | 20.76                    | 1.22         | 1.18 | 1.24 |
| 1020           | 3.18                            | 3.19 | 0.00                   | 3.15                               | 20.72                    | 1.23         | 1.18 | 1.24 |
| 1030           | 3.23                            | 3.15 | 0.07                   | 3.22                               | 20.69                    | 1.23         | 1.18 | 1.25 |
| 1040           | 3.27                            | 3.11 | 0.16                   | 3.23                               | 20.64                    | 1.23         | 1.19 | 1.25 |
| 1050           | 3.31                            | 3.08 | 0.24                   | 3.28                               | 20.60                    | 1.23         | 1.19 | 1.25 |
| 1060           | 3.36                            | 3.04 | 0.31                   | 3.33                               | 20.53                    | 1.24         | 1.19 | 1.25 |
| 1070           | 3.40                            | 3.00 | 0.40                   | 3.33                               | 20.46                    | 1.24         | 1.19 | 1.26 |
| 1080           | 3.44                            | 2.97 | 0.47                   | 3.37                               | 20.39                    | 1.24         | 1.20 | 1.26 |
| 1090           | 3.49                            | 2.94 | 0.55                   | 3.44                               | 20.34                    | 1.25         | 1.20 | 1.26 |
| 1100           | 3.52                            | 2.90 | 0.62                   | 3.49                               | 20.29                    | 1.25         | 1.20 | 1.26 |
| 1200           | 3.94                            | 2.59 | 1.35                   | 3.99                               | 19.69                    | 1.28         | 1.24 | 1.29 |
| 1300           | 4.35                            | 2.36 | 2.00                   | 4.51                               | 19.13                    | 1.31         | 1.27 | 1.32 |
| 1400           | 4.75                            | 2.15 | 2.60                   | 4.91                               | 18.64                    | 1.34         | 1.31 | 1.35 |
| 1500           | 5.14                            | 1.98 | 3.16                   | 5.53                               | 18.20                    | 1.38         | 1.35 | 1.37 |
| 1600           | 5.51                            | 1.84 | 3.67                   | 6.21                               | 17.77                    | 1.41         | 1.39 | 1.40 |
| 1700           | 5.89                            | 1.74 | 4.15                   | 7.01                               | 17.41                    | 1.44         | 1.44 | 1.44 |
| 1800           | 6.26                            | 1.66 | 4.60                   | 7.71                               | 17.08                    | 1.48         | 1.48 | 1.47 |
| 1900           | 6.62                            | 1.59 | 5.03                   | 8.46                               | 16.82                    | 1.52         | 1.53 | 1.52 |
| 2000           | 6.96                            | 1.53 | 5.42                   | 9.20                               | 16.59                    | 1.55         | 1.59 | 1.55 |

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

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# 2 Way-90° Power Splitter/Combiner

# HPQ-10W

## Typical Performance Data

TEST CONDITIONS: INPUT POWER = 0dBm @Temperature = +85°C

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      | AMP.<br>UNBAL.<br>(dB) | PHASE UNBAL.<br>From 90°<br>(deg.) | ISOLATION<br>(dB)<br>1-2 | VSWR<br>(:1) |      |      |
|----------------|---------------------------------|------|------------------------|------------------------------------|--------------------------|--------------|------|------|
|                | S-1                             | S-2  |                        |                                    |                          | S            | 1    | 2    |
| 400            | 0.82                            | 8.64 | 7.82                   | 0.66                               | 26.24                    | 1.05         | 1.04 | 1.05 |
| 500            | 1.17                            | 7.08 | 5.91                   | 0.64                               | 24.90                    | 1.07         | 1.06 | 1.08 |
| 600            | 1.56                            | 5.92 | 4.36                   | 0.51                               | 23.97                    | 1.10         | 1.08 | 1.10 |
| 700            | 1.97                            | 5.02 | 3.05                   | 0.45                               | 23.21                    | 1.13         | 1.10 | 1.13 |
| 750            | 2.19                            | 4.65 | 2.46                   | 0.34                               | 22.84                    | 1.14         | 1.11 | 1.15 |
| 800            | 2.41                            | 4.33 | 1.91                   | 0.37                               | 22.49                    | 1.16         | 1.12 | 1.17 |
| 850            | 2.62                            | 4.03 | 1.41                   | 0.41                               | 22.13                    | 1.17         | 1.14 | 1.18 |
| 860            | 2.66                            | 3.97 | 1.31                   | 0.42                               | 22.05                    | 1.17         | 1.14 | 1.18 |
| 870            | 2.70                            | 3.92 | 1.21                   | 0.39                               | 21.97                    | 1.18         | 1.14 | 1.19 |
| 880            | 2.74                            | 3.86 | 1.12                   | 0.36                               | 21.89                    | 1.18         | 1.14 | 1.19 |
| 890            | 2.78                            | 3.82 | 1.04                   | 0.34                               | 21.83                    | 1.18         | 1.15 | 1.19 |
| 900            | 2.82                            | 3.76 | 0.93                   | 0.32                               | 21.79                    | 1.18         | 1.15 | 1.20 |
| 910            | 2.87                            | 3.71 | 0.84                   | 0.30                               | 21.72                    | 1.19         | 1.15 | 1.20 |
| 920            | 2.91                            | 3.67 | 0.76                   | 0.32                               | 21.64                    | 1.19         | 1.15 | 1.20 |
| 930            | 2.95                            | 3.63 | 0.67                   | 0.31                               | 21.54                    | 1.19         | 1.16 | 1.21 |
| 940            | 3.00                            | 3.58 | 0.58                   | 0.26                               | 21.47                    | 1.20         | 1.16 | 1.21 |
| 950            | 3.04                            | 3.54 | 0.50                   | 0.19                               | 21.41                    | 1.20         | 1.16 | 1.21 |
| 960            | 3.08                            | 3.50 | 0.41                   | 0.16                               | 21.35                    | 1.20         | 1.17 | 1.21 |
| 970            | 3.13                            | 3.45 | 0.32                   | 0.12                               | 21.30                    | 1.20         | 1.17 | 1.22 |
| 980            | 3.18                            | 3.41 | 0.23                   | 0.06                               | 21.24                    | 1.21         | 1.17 | 1.22 |
| 990            | 3.22                            | 3.37 | 0.15                   | 0.03                               | 21.16                    | 1.21         | 1.17 | 1.22 |
| 1000           | 3.27                            | 3.34 | 0.07                   | 0.03                               | 21.06                    | 1.21         | 1.18 | 1.23 |
| 1010           | 3.31                            | 3.30 | 0.01                   | 0.02                               | 20.98                    | 1.22         | 1.18 | 1.23 |
| 1020           | 3.36                            | 3.26 | 0.10                   | 0.11                               | 20.93                    | 1.22         | 1.18 | 1.23 |
| 1030           | 3.41                            | 3.22 | 0.18                   | 0.15                               | 20.89                    | 1.22         | 1.18 | 1.24 |
| 1040           | 3.45                            | 3.19 | 0.26                   | 0.16                               | 20.84                    | 1.22         | 1.19 | 1.24 |
| 1050           | 3.49                            | 3.16 | 0.34                   | 0.19                               | 20.78                    | 1.23         | 1.19 | 1.24 |
| 1060           | 3.54                            | 3.12 | 0.41                   | 0.17                               | 20.71                    | 1.23         | 1.19 | 1.24 |
| 1070           | 3.58                            | 3.08 | 0.50                   | 0.16                               | 20.64                    | 1.24         | 1.20 | 1.25 |
| 1080           | 3.62                            | 3.05 | 0.57                   | 0.18                               | 20.56                    | 1.24         | 1.20 | 1.25 |
| 1090           | 3.67                            | 3.02 | 0.65                   | 0.21                               | 20.51                    | 1.24         | 1.20 | 1.25 |
| 1100           | 3.71                            | 2.99 | 0.73                   | 0.23                               | 20.45                    | 1.25         | 1.20 | 1.26 |
| 1200           | 4.14                            | 2.69 | 1.45                   | 0.48                               | 19.83                    | 1.28         | 1.24 | 1.29 |
| 1300           | 4.56                            | 2.46 | 2.11                   | 0.69                               | 19.26                    | 1.31         | 1.27 | 1.32 |
| 1400           | 4.97                            | 2.26 | 2.71                   | 0.81                               | 18.77                    | 1.34         | 1.31 | 1.35 |
| 1500           | 5.38                            | 2.11 | 3.27                   | 1.14                               | 18.33                    | 1.38         | 1.35 | 1.38 |
| 1600           | 5.77                            | 1.98 | 3.79                   | 1.52                               | 17.92                    | 1.41         | 1.39 | 1.41 |
| 1700           | 6.16                            | 1.88 | 4.28                   | 2.01                               | 17.57                    | 1.45         | 1.43 | 1.45 |
| 1800           | 6.54                            | 1.80 | 4.74                   | 2.45                               | 17.24                    | 1.49         | 1.48 | 1.49 |
| 1900           | 6.92                            | 1.74 | 5.18                   | 2.85                               | 16.99                    | 1.54         | 1.53 | 1.54 |
| 2000           | 7.27                            | 1.70 | 5.57                   | 3.25                               | 16.77                    | 1.57         | 1.58 | 1.58 |

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

REV. X2  
HPQ-10W  
100623  
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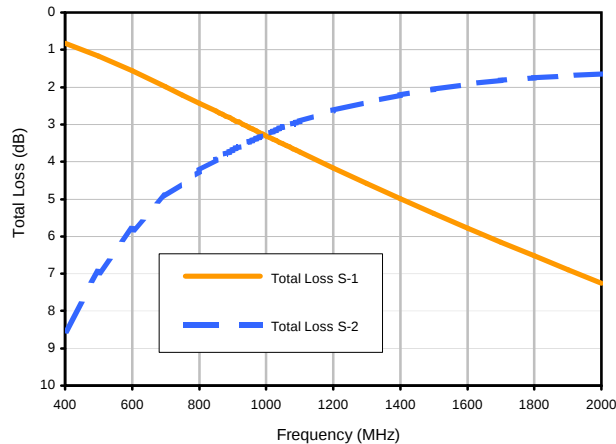


# 2 Way-90° Power Splitter/Combiner

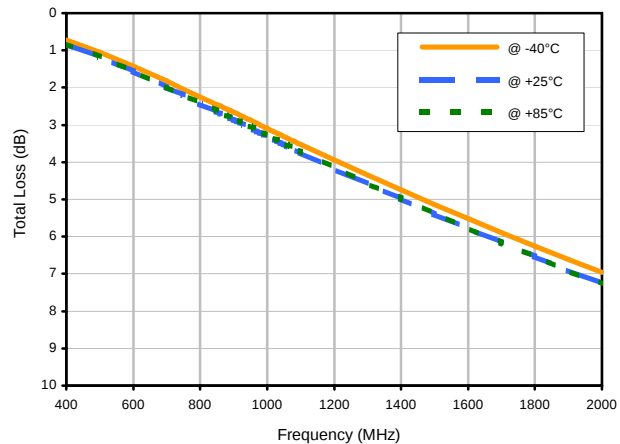
# HPQ-10W

## Typical Performance Curves

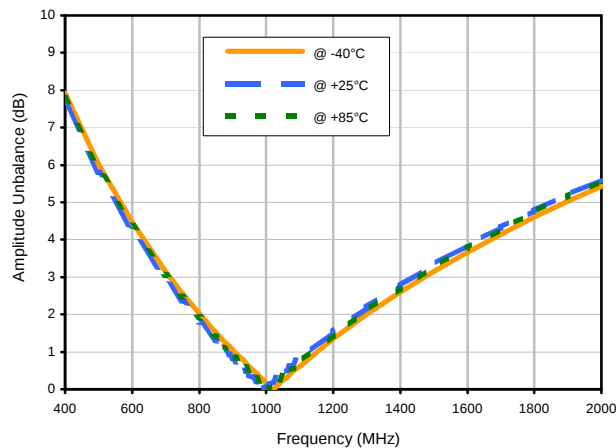
Total Loss



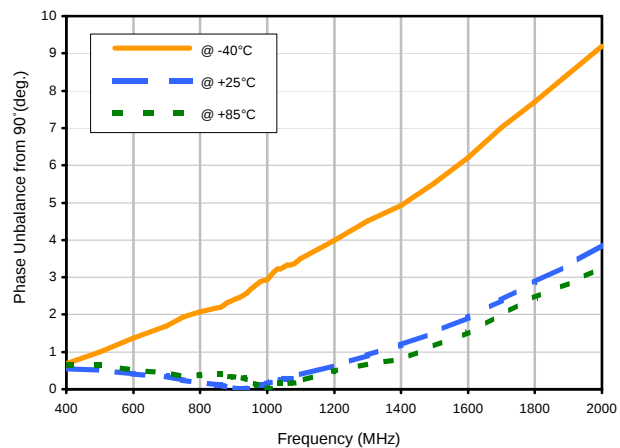
Total Loss S-1 vs. TEMPERATURE



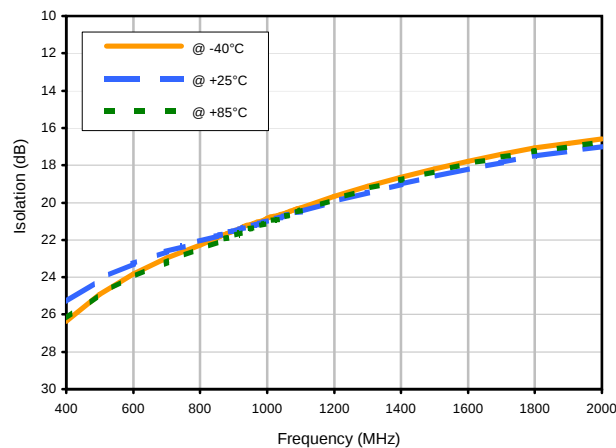
Amplitude Unbalance vs. TEMPERATURE



Phase Unbalance vs. TEMPERATURE



Isolation 1-2 vs. TEMPERATURE



REV. X2

HPQ-10W

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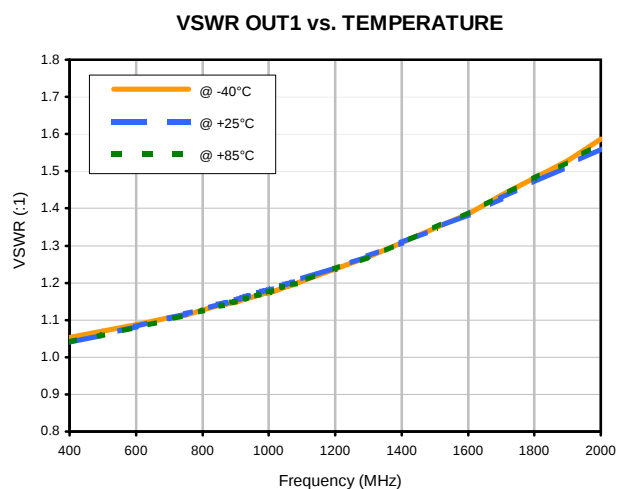
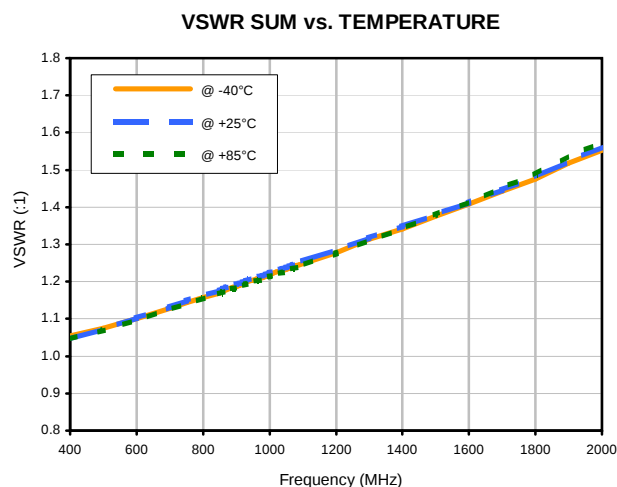
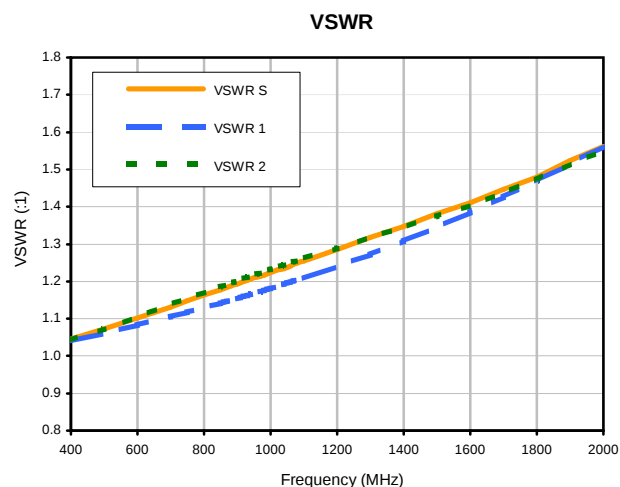
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# 2 Way-90° Power Splitter/Combiner

# HPQ-10W

## Typical Performance Curves



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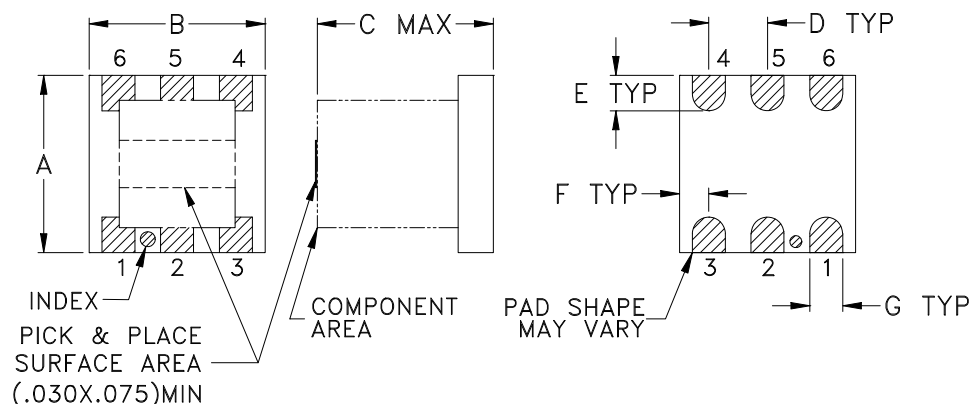
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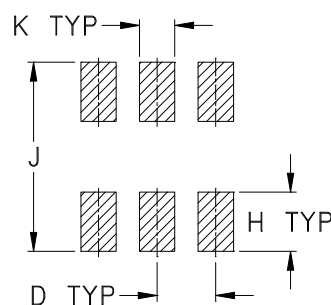
REV. X2  
HPQ-10W  
100623  
Page 2 of 2

## Outline Dimensions

AT577



## PCB Land Pattern



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

| CASE # | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L        | WT. GRAMS |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|-----------|
| AT577  | .200<br>(5.08) | .200<br>(5.08) | .200<br>(5.08) | .075<br>(1.91) | .050<br>(1.27) | .025<br>(0.64) | .026<br>(0.66) | .070<br>(1.78) | .220<br>(5.59) | .035<br>(0.89) | --<br>-- | .15       |

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

### Notes:

- Open style, ceramic base.
- Termination finish:  
For RoHS Case Style: 2-10  $\mu$  inch (.05-.25 microns) Gold over 100-300  $\mu$  inch (2.54-7.62 microns) Nickel plate.  
For RoHS-5 Case Style: Tin-Lead plate



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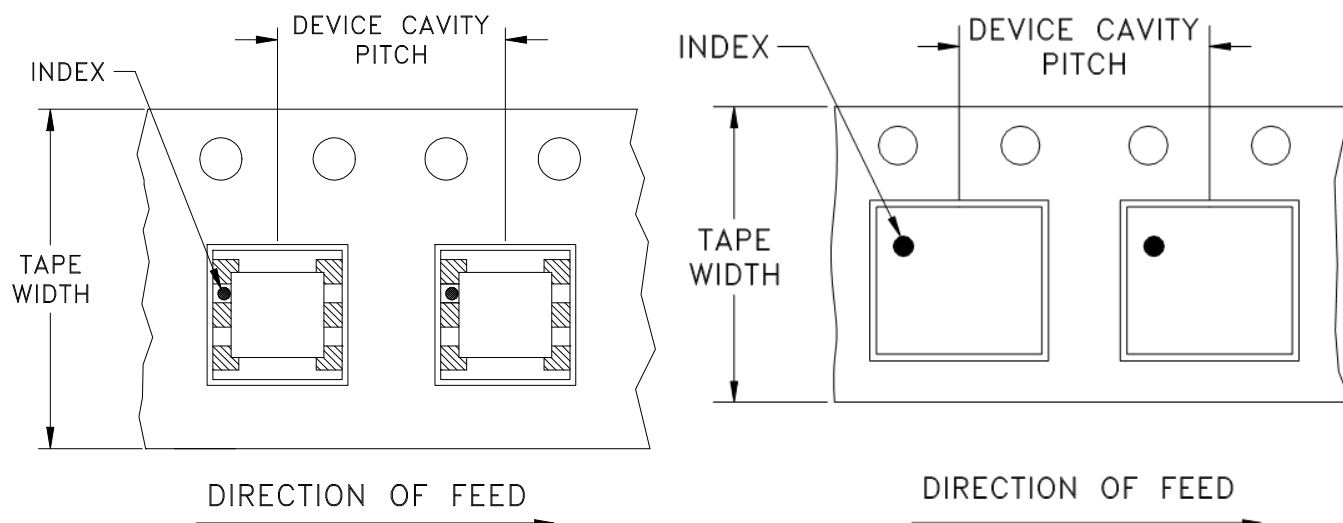


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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F73

## DEVICE ORIENTATION IN T&R



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel                    |      |
|----------------|-------------------------|-------------------|-------------------------------------|------|
| 12             | 8                       | 7                 | Small quantity standards (see note) | 20   |
|                |                         |                   |                                     | 50   |
|                |                         |                   |                                     | 100  |
|                |                         |                   |                                     | 200  |
|                |                         |                   |                                     | 500  |
|                |                         | 13                | Standard                            | 1000 |
|                |                         |                   |                                     | 2000 |

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

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)



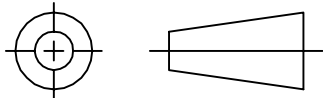
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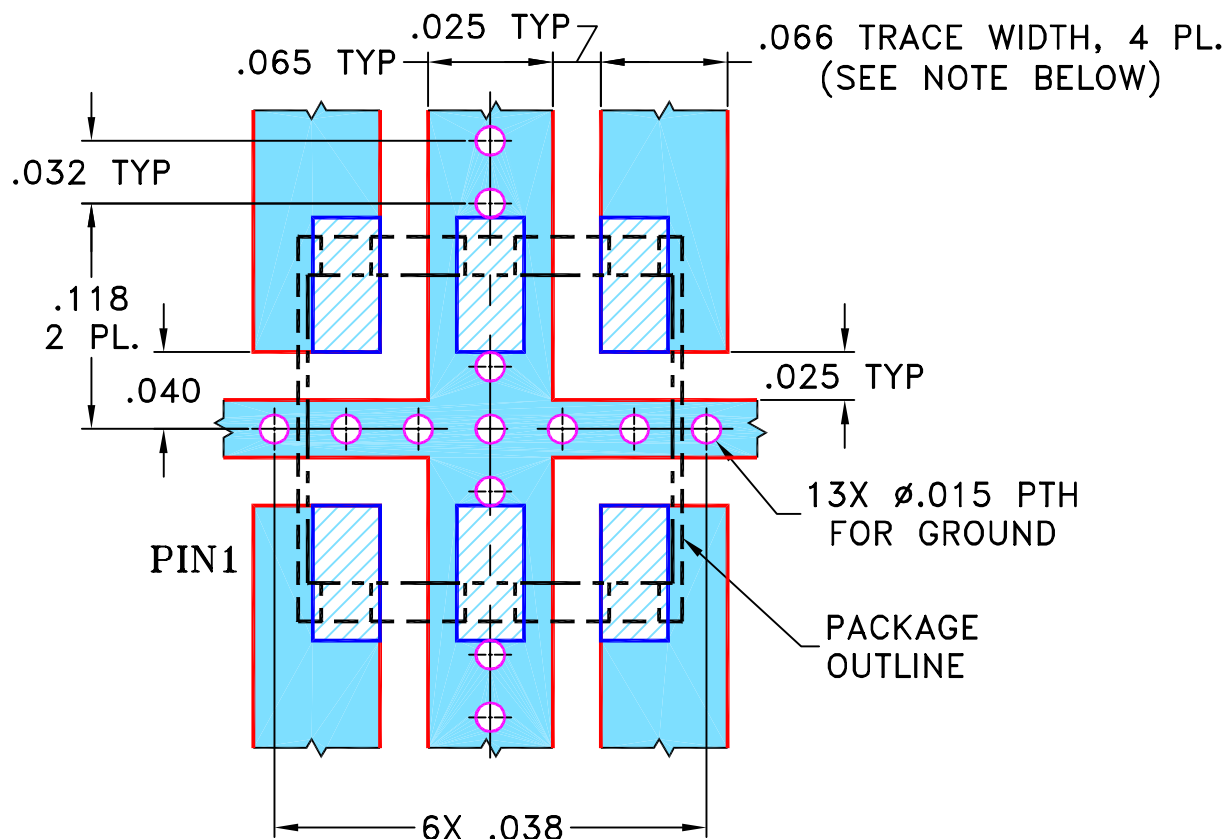
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION           | DATE     | DR  | AUTH |
|-----|---------|-----------------------|----------|-----|------|
| OR  | M83147  | NEW RELEASE           | 11/26/02 | MMG | HY   |
| A   | M102713 | ADDED "...WITH SMOBC" | 01/17/06 | MMG | IL   |
|     |         |                       |          |     |      |
|     |         |                       |          |     |      |

**SUGGESTED MOUNTING CONFIGURATION  
FOR AT577 CASE STYLE, "km" 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

## INITIALS

## DATE

DIMENSIONS ARE IN INCHES

DRAWN

MMG

11/19/02

TOLERANCES ON:

CHECKED

AV

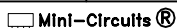
11/25/02

2 PL DECIMALS  $\pm$ 

APPROVED

HY

11/26/02

3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

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



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PL, km, AT577, HPQ, TB-43

SIZE  
ACODE IDENT  
15542DRAWING NO:  
98-PL-114REV:  
A

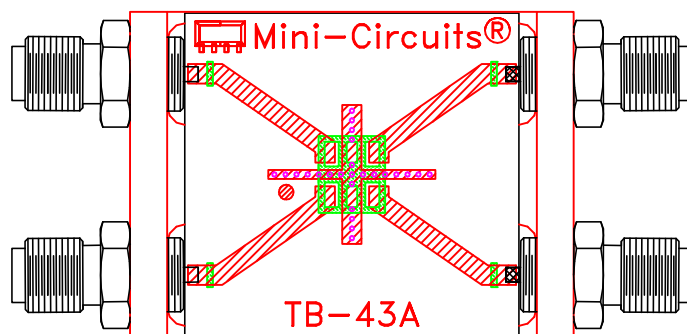
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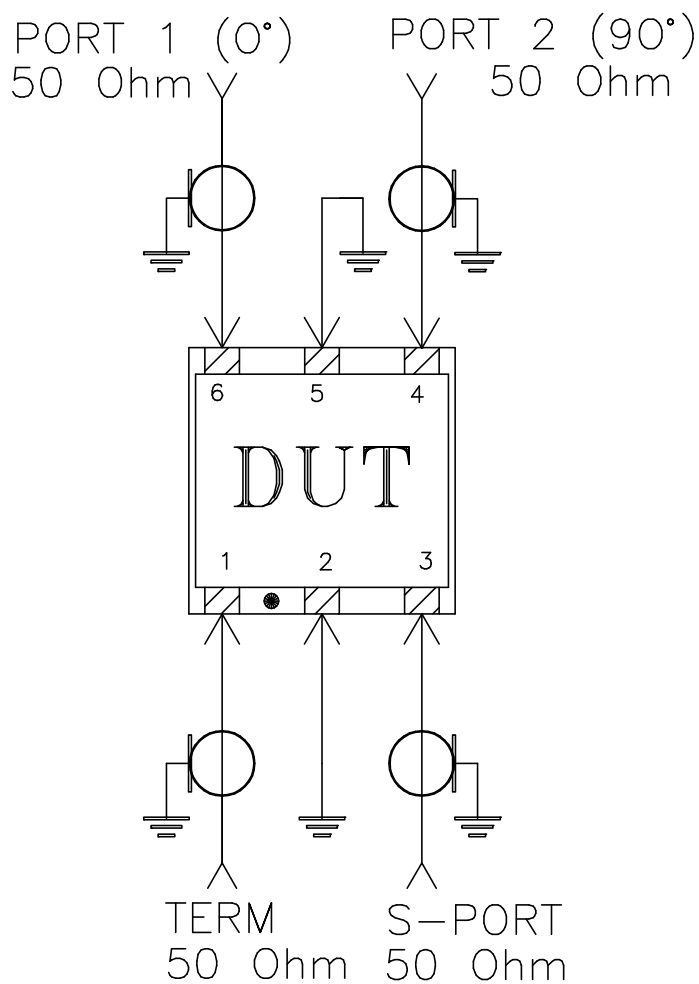
SHEET: 1 OF 1

# Evaluation Board and Circuit

For Pin Connection refer to Data Sheet of the DUT



TB-43



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                                                                              |