

# Power Splitter/Combiner

8 Way-0° 50Ω 500 to 5000 MHz

## ZN8PD1-53-S+



Generic photo used for illustration purposes only

CASE STYLE: JN1359

| Connectors | Model        |
|------------|--------------|
| SMA        | ZN8PD1-53-S+ |

**+RoHS Compliant**

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

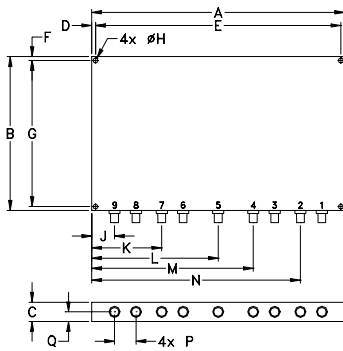
### Maximum Ratings

|                                                                 |                           |
|-----------------------------------------------------------------|---------------------------|
| Operating Temperature                                           | -55°C to 100°C            |
| Storage Temperature                                             | -55°C to 100°C            |
| Power Input (as a splitter)                                     | 10W max.                  |
| Internal Dissipation                                            | 1.5W max.                 |
| DC Current                                                      | 1.6A(200mA for each port) |
| Permanent damage may occur if any of these limits are exceeded. |                           |

### Coaxial Connections

|          |   |
|----------|---|
| SUM PORT | 5 |
| PORT 1   | 1 |
| PORT 2   | 2 |
| PORT 3   | 3 |
| PORT 4   | 4 |
| PORT 5   | 6 |
| PORT 6   | 7 |
| PORT 7   | 8 |
| PORT 8   | 9 |

### Outline Drawing



### Outline Dimensions (inch/mm)

| A      | B      | C      | D      | E      | F     | G      | H     |
|--------|--------|--------|--------|--------|-------|--------|-------|
| 8.25   | 5.00   | .63    | .13    | 8.000  | .13   | 4.750  | .156  |
| 209.55 | 127.00 | 16.00  | 3.30   | 203.20 | 3.30  | 120.65 | 3.96  |
| J      | K      | L      | M      | N      | P     | Q      | wt    |
| .74    | 2.28   | 4.13   | 5.27   | 6.81   | .70   | .31    | grams |
| 18.80  | 57.91  | 104.90 | 133.86 | 172.97 | 17.78 | 7.87   | 720   |

### Features

- wideband, 500 to 5000 MHz
- high isolation, 20 dB typ.
- good input matching VSWR, 1.3:1 typ.
- good output matching VSWR, 1.2:1 typ.
- up to 10W power input as splitter

### Applications

- UHF TV
- cellular/ISM/GSM
- satellite distribution
- GPS/L-BAND (MARSAT)
- PCS/DCS/UMTS
- ISM
- MMDS
- SATCOM
- WiMax

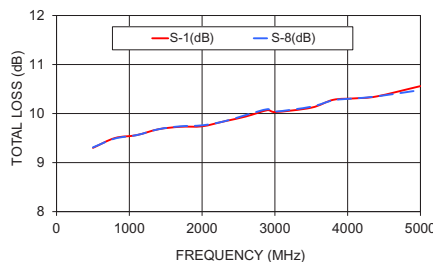
### Electrical Specifications

| FREQ. RANGE (MHz) | ISOLATION (dB) | INSERTION LOSS (dB) ABOVE 9.0 dB | PHASE UNBALANCE (Degrees) | AMPLITUDE UNBALANCE (dB) | VSWR (:1)       |
|-------------------|----------------|----------------------------------|---------------------------|--------------------------|-----------------|
| $f_L$ - $f_U$     | Typ. Min.      | Typ. Max.                        | Max.                      | Max.                     | S Typ. OUT Typ. |
| 500-5000          | 20 17          | 1.5 2.0                          | 14                        | 0.5                      | 1.3 1.2         |

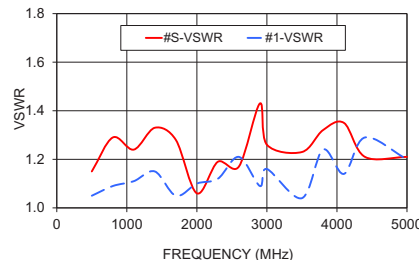
### Typical Performance Data

| Freq. (MHz) | Total Loss <sup>1</sup> (dB) |       |       |       |       |       | Amplitude Unbalance (dB) | Isolation (dB) |       |       |       | Phase Unbalance (deg.) | VSWR |      |      |
|-------------|------------------------------|-------|-------|-------|-------|-------|--------------------------|----------------|-------|-------|-------|------------------------|------|------|------|
|             | S-1                          | S-2   | S-3   | S-4   | S-6   | S-8   |                          | 1-2            | 2-3   | 3-4   | 6-7   |                        | S    | 1    | 8    |
| 500.00      | 9.30                         | 9.29  | 9.30  | 9.29  | 9.30  | 9.31  | 0.03                     | 22.56          | 21.73 | 22.47 | 21.69 | 0.80                   | 1.15 | 1.05 | 1.05 |
| 800.00      | 9.50                         | 9.50  | 9.51  | 9.51  | 9.51  | 9.49  | 0.02                     | 22.64          | 23.22 | 23.18 | 37.67 | 1.27                   | 1.29 | 1.09 | 1.09 |
| 1100.00     | 9.56                         | 9.56  | 9.61  | 9.60  | 9.61  | 9.56  | 0.05                     | 25.77          | 27.00 | 24.91 | 26.95 | 1.63                   | 1.24 | 1.11 | 1.11 |
| 1400.00     | 9.68                         | 9.69  | 9.67  | 9.66  | 9.66  | 9.68  | 0.06                     | 21.57          | 27.65 | 22.52 | 27.60 | 1.96                   | 1.33 | 1.15 | 1.15 |
| 1700.00     | 9.73                         | 9.75  | 9.75  | 9.72  | 9.75  | 9.74  | 0.05                     | 45.12          | 33.15 | 33.94 | 32.54 | 2.06                   | 1.28 | 1.05 | 1.06 |
| 2000.00     | 9.74                         | 9.75  | 9.76  | 9.73  | 9.76  | 9.76  | 0.04                     | 27.61          | 38.94 | 26.96 | 40.33 | 3.01                   | 1.06 | 1.10 | 1.11 |
| 2300.00     | 9.84                         | 9.85  | 9.91  | 9.89  | 9.90  | 9.84  | 0.09                     | 37.25          | 33.82 | 27.17 | 34.21 | 3.29                   | 1.19 | 1.12 | 1.11 |
| 2600.00     | 9.94                         | 9.94  | 9.92  | 9.89  | 9.92  | 9.97  | 0.08                     | 29.34          | 32.30 | 31.94 | 32.62 | 3.43                   | 1.17 | 1.21 | 1.22 |
| 2900.00     | 10.07                        | 10.05 | 10.14 | 10.10 | 10.13 | 10.09 | 0.09                     | 22.25          | 33.06 | 20.62 | 32.79 | 3.49                   | 1.43 | 1.09 | 1.11 |
| 3000.00     | 10.03                        | 10.02 | 10.07 | 10.04 | 10.06 | 10.04 | 0.05                     | 22.73          | 32.06 | 22.17 | 32.25 | 4.17                   | 1.26 | 1.16 | 1.18 |
| 3500.00     | 10.12                        | 10.10 | 10.09 | 10.07 | 10.08 | 10.14 | 0.08                     | 22.67          | 36.22 | 23.83 | 36.77 | 4.48                   | 1.23 | 1.04 | 1.07 |
| 3800.00     | 10.28                        | 10.25 | 10.17 | 10.14 | 10.18 | 10.27 | 0.14                     | 25.72          | 33.18 | 29.50 | 33.37 | 4.85                   | 1.32 | 1.24 | 1.21 |
| 4100.00     | 10.31                        | 10.29 | 10.33 | 10.28 | 10.31 | 10.31 | 0.06                     | 32.70          | 30.12 | 34.08 | 30.77 | 5.81                   | 1.35 | 1.14 | 1.12 |
| 4400.00     | 10.35                        | 10.32 | 10.36 | 10.33 | 10.36 | 10.35 | 0.06                     | 29.63          | 33.66 | 26.58 | 33.31 | 5.74                   | 1.21 | 1.29 | 1.23 |
| 5000.00     | 10.56                        | 10.42 | 10.58 | 10.54 | 10.57 | 10.48 | 0.16                     | 28.03          | 24.18 | 21.35 | 24.12 | 5.76                   | 1.21 | 1.20 | 1.15 |

ZN8PD1-53-S+  
TOTAL LOSS

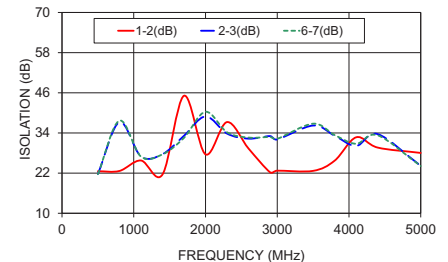


ZN8PD1-53-S+  
VSWR

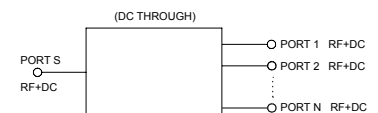


1. Total Loss = Insertion Loss + 9dB splitter loss.

ZN8PD1-53-S+  
ISOLATION



### electrical schematic



### Notes

- 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.
- 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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M171494  
ZN8PD1-53-S+  
ED-13413/1  
HY/CP/AM  
200811

# 8 Way-0° Power Splitter/Combiner

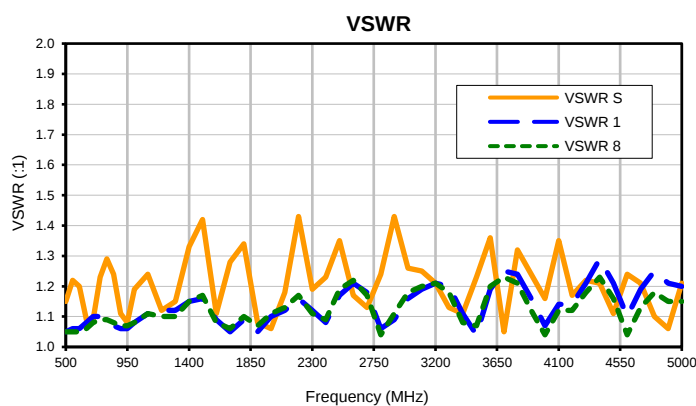
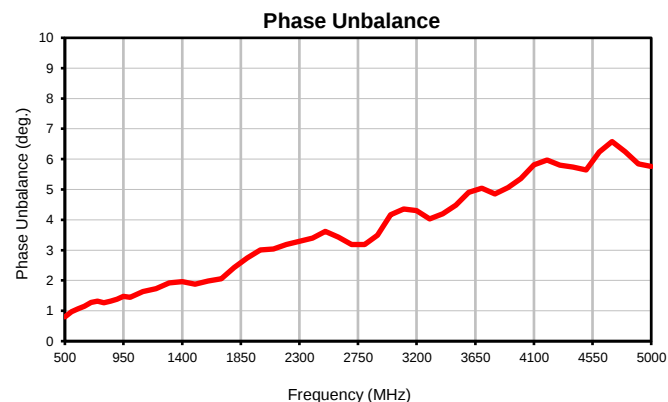
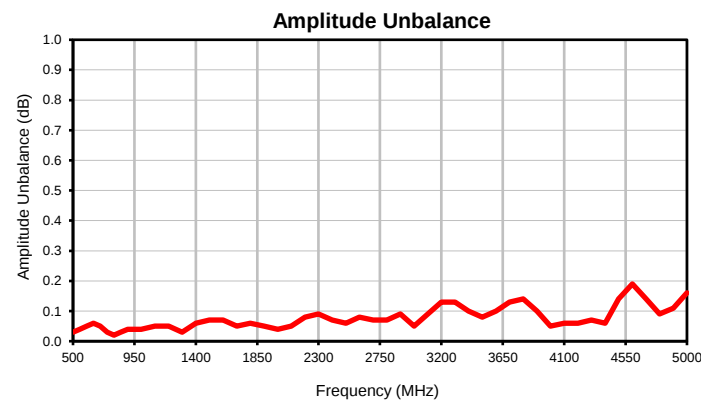
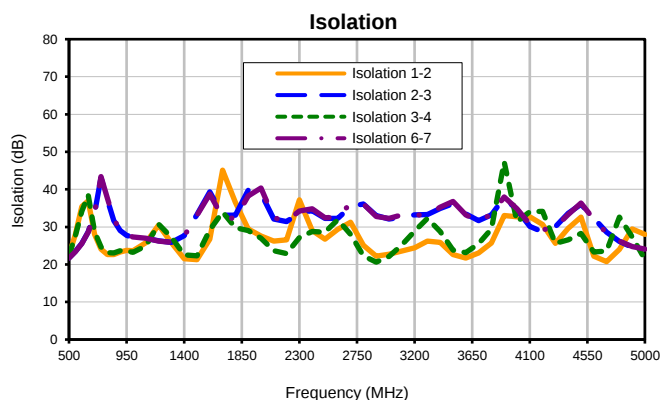
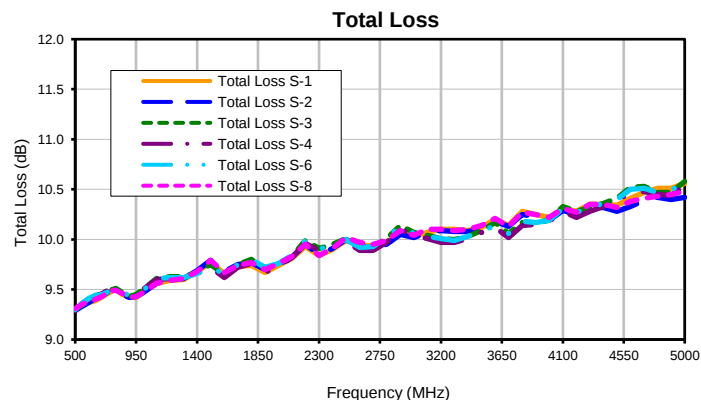
**ZN8PD1-53-S+**

## Typical Performance Data

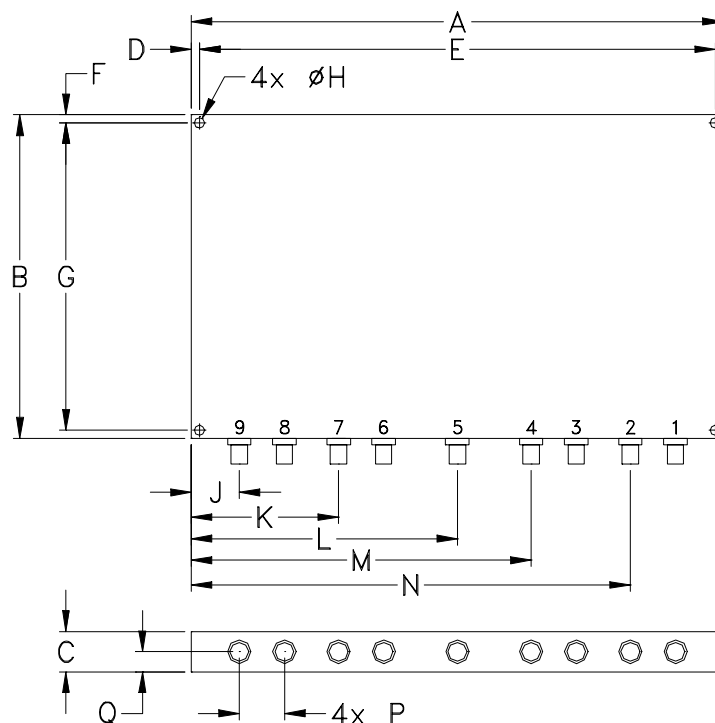
| FREQ.<br><br>(MHz) | TOTAL LOSS <sup>1</sup> |       |       |       |       |       | AMP.<br>UNBAL.<br><br>(dB) | ISOLATION |       |       |       | PHASE<br>UNBAL.<br><br>(deg.) | FREQ.<br><br>(MHz) | VSWR |      |      |
|--------------------|-------------------------|-------|-------|-------|-------|-------|----------------------------|-----------|-------|-------|-------|-------------------------------|--------------------|------|------|------|
|                    | (dB)                    |       |       |       |       |       |                            | (dB)      |       |       |       |                               |                    | (:1) |      |      |
|                    | S-1                     | S-2   | S-3   | S-4   | S-6   | S-8   |                            | 1-2       | 2-3   | 3-4   | 6-7   |                               |                    | S    | 1    | 8    |
| 500                | 9.30                    | 9.29  | 9.30  | 9.29  | 9.30  | 9.31  | 0.03                       | 22.56     | 21.73 | 22.47 | 21.69 | 0.80                          | 500                | 1.15 | 1.05 | 1.05 |
| 550                | 9.34                    | 9.33  | 9.34  | 9.36  | 9.36  | 9.35  | 0.04                       | 28.05     | 23.45 | 27.64 | 23.42 | 0.97                          | 550                | 1.22 | 1.06 | 1.05 |
| 600                | 9.37                    | 9.37  | 9.40  | 9.40  | 9.41  | 9.38  | 0.05                       | 35.45     | 25.59 | 34.15 | 25.56 | 1.07                          | 600                | 1.20 | 1.06 | 1.05 |
| 650                | 9.39                    | 9.41  | 9.44  | 9.43  | 9.44  | 9.40  | 0.06                       | 36.99     | 28.69 | 38.51 | 28.64 | 1.15                          | 650                | 1.09 | 1.08 | 1.06 |
| 700                | 9.43                    | 9.44  | 9.45  | 9.46  | 9.45  | 9.43  | 0.05                       | 27.98     | 33.75 | 28.70 | 33.70 | 1.28                          | 700                | 1.09 | 1.10 | 1.08 |
| 750                | 9.47                    | 9.48  | 9.49  | 9.50  | 9.48  | 9.49  | 0.03                       | 24.05     | 43.06 | 24.68 | 43.41 | 1.32                          | 750                | 1.23 | 1.10 | 1.09 |
| 800                | 9.50                    | 9.50  | 9.51  | 9.51  | 9.51  | 9.49  | 0.02                       | 22.64     | 37.22 | 23.18 | 37.67 | 1.27                          | 800                | 1.29 | 1.09 | 1.09 |
| 850                | 9.45                    | 9.45  | 9.47  | 9.46  | 9.47  | 9.46  | 0.03                       | 22.60     | 31.64 | 23.09 | 31.98 | 1.32                          | 850                | 1.24 | 1.07 | 1.08 |
| 900                | 9.42                    | 9.42  | 9.43  | 9.44  | 9.44  | 9.42  | 0.04                       | 23.31     | 29.07 | 23.63 | 29.23 | 1.38                          | 900                | 1.11 | 1.06 | 1.07 |
| 950                | 9.42                    | 9.43  | 9.45  | 9.44  | 9.45  | 9.43  | 0.04                       | 23.71     | 27.72 | 23.62 | 27.87 | 1.48                          | 950                | 1.08 | 1.06 | 1.07 |
| 1000               | 9.47                    | 9.47  | 9.50  | 9.50  | 9.49  | 9.47  | 0.04                       | 23.66     | 27.26 | 23.23 | 27.30 | 1.45                          | 1000               | 1.19 | 1.08 | 1.08 |
| 1100               | 9.56                    | 9.56  | 9.61  | 9.60  | 9.61  | 9.56  | 0.05                       | 25.77     | 27.00 | 24.91 | 26.95 | 1.63                          | 1100               | 1.24 | 1.11 | 1.11 |
| 1200               | 9.59                    | 9.60  | 9.63  | 9.61  | 9.62  | 9.59  | 0.05                       | 30.45     | 26.28 | 30.70 | 26.23 | 1.73                          | 1200               | 1.12 | 1.12 | 1.10 |
| 1300               | 9.60                    | 9.61  | 9.63  | 9.61  | 9.62  | 9.61  | 0.03                       | 25.76     | 25.91 | 27.21 | 25.88 | 1.92                          | 1300               | 1.15 | 1.12 | 1.10 |
| 1400               | 9.68                    | 9.69  | 9.67  | 9.66  | 9.66  | 9.68  | 0.06                       | 21.57     | 27.65 | 22.52 | 27.60 | 1.96                          | 1400               | 1.33 | 1.15 | 1.15 |
| 1500               | 9.77                    | 9.79  | 9.75  | 9.72  | 9.73  | 9.79  | 0.07                       | 21.30     | 33.33 | 22.30 | 33.14 | 1.88                          | 1500               | 1.42 | 1.16 | 1.17 |
| 1600               | 9.66                    | 9.68  | 9.65  | 9.62  | 9.65  | 9.67  | 0.07                       | 26.74     | 39.38 | 29.24 | 38.78 | 1.98                          | 1600               | 1.11 | 1.09 | 1.08 |
| 1700               | 9.73                    | 9.75  | 9.75  | 9.72  | 9.75  | 9.74  | 0.05                       | 45.12     | 33.15 | 33.94 | 32.54 | 2.06                          | 1700               | 1.28 | 1.05 | 1.06 |
| 1800               | 9.74                    | 9.77  | 9.80  | 9.76  | 9.80  | 9.77  | 0.06                       | 36.53     | 33.10 | 29.83 | 32.23 | 2.43                          | 1800               | 1.34 | 1.09 | 1.10 |
| 1900               | 9.67                    | 9.70  | 9.71  | 9.67  | 9.72  | 9.70  | 0.05                       | 29.50     | 39.81 | 29.04 | 38.27 | 2.74                          | 1900               | 1.08 | 1.05 | 1.07 |
| 2000               | 9.74                    | 9.75  | 9.76  | 9.73  | 9.76  | 9.76  | 0.04                       | 27.61     | 38.94 | 26.96 | 40.33 | 3.01                          | 2000               | 1.06 | 1.10 | 1.11 |
| 2100               | 9.81                    | 9.82  | 9.83  | 9.82  | 9.84  | 9.83  | 0.05                       | 26.26     | 32.11 | 23.68 | 32.42 | 3.04                          | 2100               | 1.18 | 1.12 | 1.13 |
| 2200               | 9.93                    | 9.95  | 9.99  | 9.96  | 9.99  | 9.95  | 0.08                       | 26.60     | 31.45 | 22.93 | 31.57 | 3.19                          | 2200               | 1.43 | 1.16 | 1.17 |
| 2300               | 9.84                    | 9.85  | 9.91  | 9.89  | 9.90  | 9.84  | 0.09                       | 37.25     | 33.82 | 27.17 | 34.21 | 3.29                          | 2300               | 1.19 | 1.12 | 1.11 |
| 2400               | 9.90                    | 9.91  | 9.95  | 9.93  | 9.95  | 9.91  | 0.07                       | 29.07     | 34.29 | 28.78 | 34.86 | 3.40                          | 2400               | 1.23 | 1.08 | 1.09 |
| 2500               | 9.99                    | 10.00 | 10.01 | 9.98  | 10.00 | 10.02 | 0.06                       | 26.74     | 32.23 | 28.57 | 32.43 | 3.62                          | 2500               | 1.35 | 1.17 | 1.19 |
| 2600               | 9.94                    | 9.94  | 9.92  | 9.89  | 9.92  | 9.97  | 0.08                       | 29.34     | 32.30 | 31.94 | 32.62 | 3.43                          | 2600               | 1.17 | 1.21 | 1.22 |
| 2700               | 9.94                    | 9.93  | 9.93  | 9.89  | 9.93  | 9.95  | 0.07                       | 31.23     | 35.39 | 28.02 | 36.31 | 3.19                          | 2700               | 1.13 | 1.18 | 1.17 |
| 2800               | 9.97                    | 9.95  | 10.01 | 9.97  | 10.02 | 9.99  | 0.07                       | 25.07     | 36.08 | 22.30 | 36.10 | 3.19                          | 2800               | 1.24 | 1.06 | 1.04 |
| 2900               | 10.07                   | 10.05 | 10.14 | 10.10 | 10.13 | 10.09 | 0.09                       | 22.25     | 33.06 | 20.62 | 32.79 | 3.49                          | 2900               | 1.43 | 1.09 | 1.11 |
| 3000               | 10.03                   | 10.02 | 10.07 | 10.04 | 10.06 | 10.04 | 0.05                       | 22.73     | 32.06 | 22.17 | 32.25 | 4.17                          | 3000               | 1.26 | 1.16 | 1.18 |
| 3100               | 10.07                   | 10.07 | 10.04 | 10.01 | 10.03 | 10.10 | 0.09                       | 23.54     | 32.65 | 25.19 | 33.22 | 4.36                          | 3100               | 1.25 | 1.19 | 1.20 |
| 3200               | 10.10                   | 10.09 | 10.01 | 9.97  | 10.01 | 10.10 | 0.13                       | 24.43     | 33.18 | 28.87 | 33.25 | 4.30                          | 3200               | 1.21 | 1.21 | 1.21 |
| 3300               | 10.10                   | 10.08 | 10.00 | 9.97  | 9.99  | 10.09 | 0.13                       | 26.23     | 33.33 | 32.28 | 33.14 | 4.03                          | 3300               | 1.13 | 1.20 | 1.18 |
| 3400               | 10.09                   | 10.08 | 10.03 | 10.01 | 10.03 | 10.10 | 0.10                       | 25.89     | 34.91 | 28.74 | 35.29 | 4.20                          | 3400               | 1.11 | 1.11 | 1.08 |
| 3500               | 10.12                   | 10.10 | 10.09 | 10.07 | 10.08 | 10.14 | 0.08                       | 22.67     | 36.22 | 23.83 | 36.77 | 4.48                          | 3500               | 1.23 | 1.04 | 1.07 |
| 3600               | 10.20                   | 10.18 | 10.17 | 10.12 | 10.14 | 10.21 | 0.10                       | 21.67     | 33.49 | 23.14 | 33.25 | 4.91                          | 3600               | 1.36 | 1.19 | 1.20 |
| 3700               | 10.14                   | 10.13 | 10.06 | 10.02 | 10.06 | 10.13 | 0.13                       | 23.10     | 31.64 | 25.54 | 31.50 | 5.04                          | 3700               | 1.05 | 1.25 | 1.23 |
| 3800               | 10.28                   | 10.25 | 10.17 | 10.14 | 10.18 | 10.27 | 0.14                       | 25.72     | 33.18 | 29.50 | 33.37 | 4.85                          | 3800               | 1.32 | 1.24 | 1.21 |
| 3900               | 10.25                   | 10.23 | 10.17 | 10.15 | 10.17 | 10.25 | 0.10                       | 33.03     | 37.81 | 47.30 | 37.94 | 5.06                          | 3900               | 1.24 | 1.16 | 1.12 |
| 4000               | 10.22                   | 10.19 | 10.19 | 10.18 | 10.19 | 10.22 | 0.05                       | 32.70     | 34.56 | 31.31 | 34.82 | 5.36                          | 4000               | 1.16 | 1.07 | 1.04 |
| 4100               | 10.31                   | 10.29 | 10.33 | 10.28 | 10.31 | 10.31 | 0.06                       | 32.70     | 30.12 | 34.08 | 30.77 | 5.81                          | 4100               | 1.35 | 1.14 | 1.12 |
| 4200               | 10.28                   | 10.25 | 10.28 | 10.22 | 10.27 | 10.27 | 0.06                       | 30.61     | 28.73 | 34.17 | 29.21 | 5.97                          | 4200               | 1.17 | 1.14 | 1.12 |
| 4300               | 10.35                   | 10.31 | 10.32 | 10.28 | 10.32 | 10.35 | 0.07                       | 25.63     | 30.02 | 25.59 | 30.00 | 5.80                          | 4300               | 1.22 | 1.21 | 1.18 |
| 4400               | 10.35                   | 10.32 | 10.36 | 10.33 | 10.36 | 10.35 | 0.06                       | 29.63     | 33.66 | 26.58 | 33.31 | 5.74                          | 4400               | 1.21 | 1.29 | 1.23 |
| 4500               | 10.34                   | 10.28 | 10.41 | 10.38 | 10.40 | 10.32 | 0.14                       | 32.58     | 36.03 | 28.24 | 36.35 | 5.64                          | 4500               | 1.11 | 1.21 | 1.16 |
| 4600               | 10.41                   | 10.33 | 10.52 | 10.48 | 10.50 | 10.38 | 0.19                       | 22.21     | 32.32 | 23.35 | 32.01 | 6.23                          | 4600               | 1.24 | 1.10 | 1.04 |
| 4700               | 10.47                   | 10.39 | 10.53 | 10.48 | 10.51 | 10.41 | 0.14                       | 20.75     | 28.62 | 23.54 | 28.35 | 6.58                          | 4700               | 1.21 | 1.19 | 1.13 |
| 4800               | 10.51                   | 10.42 | 10.47 | 10.45 | 10.47 | 10.43 | 0.09                       | 24.01     | 26.11 | 32.60 | 26.20 | 6.25                          | 4800               | 1.10 | 1.25 | 1.18 |
| 4900               | 10.51                   | 10.40 | 10.47 | 10.44 | 10.49 | 10.45 | 0.11                       | 29.44     | 24.57 | 27.33 | 24.77 | 5.84                          | 4900               | 1.06 | 1.21 | 1.15 |
| 5000               | 10.56                   | 10.42 | 10.58 | 10.54 | 10.57 | 10.48 | 0.16                       | 28.03     | 24.18 | 21.35 | 24.12 | 5.76                          | 5000               | 1.21 | 1.20 | 1.15 |

<sup>1</sup>Total Loss = Insertion Loss + 9dB Splitter Loss

## Typical Performance Curves



### Outline Dimensions



| CASE #. | A                | B                | C              | D             | E                 | F             | G                 | H              | J              | K               | L                | M                | N                |
|---------|------------------|------------------|----------------|---------------|-------------------|---------------|-------------------|----------------|----------------|-----------------|------------------|------------------|------------------|
| JN1359  | 8.25<br>(209.55) | 5.00<br>(127.00) | .63<br>(16.00) | .13<br>(3.30) | 8.000<br>(203.20) | .13<br>(3.30) | 4.750<br>(120.65) | .156<br>(3.96) | .74<br>(18.80) | 2.28<br>(57.91) | 4.13<br>(104.90) | 5.27<br>(133.86) | 6.81<br>(172.97) |

| CASE #. | P              | Q             | WT, GRAM |
|---------|----------------|---------------|----------|
| JN1359  | .70<br>(17.78) | .31<br>(7.87) | 720      |

Dimensions are in inches (mm). Tolerances: 2Pl.  $\pm .03$ ; 3Pl.  $\pm .015$

#### Notes:

- Case material: Aluminum alloy.
- Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.



INTERNET <http://www.minicircuits.com>

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Mini-Circuits ISO 9001 & ISO 14001 Certified



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      | -55° to 100°C<br>Ambient Environment                                                   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| 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           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |