

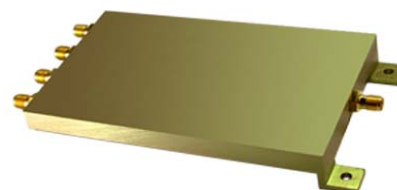
## Engineering Development Model

# Power Splitter/Combiner ZB4PD1-ED12789/1

### 4 Way-0°

#### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



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CASE STYLE : 99-01-847

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |                |      |       |            |
|---------------------------------------|----------------|------|-------|------------|
| Parameter                             |                | Min. | Typ.  | Max. Units |
| Frequency                             |                | 500  |       | 2400 MHz   |
| Isolation                             | 500 - 2400 MHz |      | 22    | dB         |
| Insertion Loss Above 6.0 dB           | 500 - 2400 MHz |      | 0.40  | dB         |
| Phase Unbalance                       | 500 - 2400 MHz |      | 1.851 | deg.       |
| Amplitude Unbalance                   | 500 - 2400 MHz |      | 0.027 | dB         |
| VSWR                                  | SUM Port       |      | 1.30  | (:1)       |
|                                       | OUT Ports      |      | 1.20  | (:1)       |

| MAXIMUM RATINGS       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |

#### Functional Diagram



# 4 Way-0° Power Splitter/Combiner ZB4PD1-ED12789/1

## Typical Performance Data

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION<br>(dB) |       |       | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR<br>(:1) |      |      |      |      |
|----------------|---------------------------------|------|------|------|------------------------|-------------------|-------|-------|---------------------------|----------------|--------------|------|------|------|------|
|                | S-1                             | S-2  | S-3  | S-4  |                        | 1-2               | 1-3   | 3-4   |                           |                | S            | 1    | 2    | 3    | 4    |
| 300.0          | 6.86                            | 6.85 | 6.82 | 6.86 | 0.04                   | 8.94              | 15.83 | 8.93  | 0.38                      | 300.0          | 2.07         | 1.28 | 1.30 | 1.29 | 1.29 |
| 350.0          | 6.61                            | 6.60 | 6.57 | 6.60 | 0.04                   | 10.06             | 16.41 | 10.05 | 0.44                      | 350.0          | 1.77         | 1.19 | 1.20 | 1.19 | 1.19 |
| 400.0          | 6.41                            | 6.41 | 6.38 | 6.41 | 0.04                   | 11.47             | 17.00 | 11.48 | 0.48                      | 400.0          | 1.51         | 1.13 | 1.15 | 1.14 | 1.13 |
| 500.0          | 6.22                            | 6.22 | 6.20 | 6.23 | 0.02                   | 15.21             | 18.32 | 15.23 | 0.60                      | 500.0          | 1.15         | 1.09 | 1.10 | 1.10 | 1.08 |
| 600.0          | 6.29                            | 6.30 | 6.28 | 6.30 | 0.02                   | 20.03             | 20.14 | 20.06 | 0.67                      | 600.0          | 1.26         | 1.11 | 1.13 | 1.13 | 1.11 |
| 700.0          | 6.39                            | 6.40 | 6.39 | 6.40 | 0.01                   | 24.91             | 22.29 | 24.97 | 0.92                      | 700.0          | 1.51         | 1.16 | 1.18 | 1.18 | 1.16 |
| 800.0          | 6.45                            | 6.46 | 6.45 | 6.46 | 0.02                   | 28.72             | 25.14 | 28.83 | 1.05                      | 800.0          | 1.59         | 1.21 | 1.22 | 1.22 | 1.21 |
| 850.0          | 6.44                            | 6.45 | 6.44 | 6.45 | 0.01                   | 30.64             | 26.86 | 30.78 | 1.13                      | 850.0          | 1.56         | 1.22 | 1.22 | 1.23 | 1.22 |
| 900.0          | 6.42                            | 6.42 | 6.41 | 6.43 | 0.02                   | 33.51             | 29.03 | 33.70 | 1.19                      | 900.0          | 1.49         | 1.22 | 1.22 | 1.23 | 1.23 |
| 950.0          | 6.41                            | 6.41 | 6.40 | 6.42 | 0.02                   | 38.55             | 31.74 | 38.91 | 1.24                      | 950.0          | 1.40         | 1.20 | 1.20 | 1.21 | 1.21 |
| 1000.0         | 6.49                            | 6.49 | 6.48 | 6.50 | 0.02                   | 50.74             | 35.19 | 53.06 | 1.24                      | 1000.0         | 1.33         | 1.18 | 1.18 | 1.19 | 1.19 |
| 1050.0         | 6.36                            | 6.37 | 6.36 | 6.38 | 0.02                   | 42.53             | 39.79 | 42.03 | 1.34                      | 1050.0         | 1.22         | 1.21 | 1.20 | 1.21 | 1.22 |
| 1100.0         | 6.31                            | 6.31 | 6.30 | 6.32 | 0.02                   | 35.73             | 46.43 | 35.43 | 1.43                      | 1100.0         | 1.17         | 1.20 | 1.20 | 1.20 | 1.22 |
| 1150.0         | 6.32                            | 6.31 | 6.30 | 6.33 | 0.03                   | 32.54             | 41.94 | 32.33 | 1.48                      | 1150.0         | 1.19         | 1.20 | 1.19 | 1.20 | 1.21 |
| 1200.0         | 6.34                            | 6.34 | 6.32 | 6.35 | 0.03                   | 31.04             | 37.51 | 30.87 | 1.52                      | 1200.0         | 1.24         | 1.19 | 1.18 | 1.19 | 1.21 |
| 1250.0         | 6.37                            | 6.36 | 6.35 | 6.38 | 0.03                   | 30.53             | 34.68 | 30.39 | 1.56                      | 1250.0         | 1.29         | 1.19 | 1.18 | 1.19 | 1.21 |
| 1300.0         | 6.38                            | 6.38 | 6.37 | 6.39 | 0.03                   | 30.55             | 32.50 | 30.43 | 1.60                      | 1300.0         | 1.31         | 1.19 | 1.18 | 1.19 | 1.21 |
| 1350.0         | 6.39                            | 6.38 | 6.37 | 6.40 | 0.03                   | 30.81             | 31.14 | 30.78 | 1.63                      | 1350.0         | 1.30         | 1.19 | 1.17 | 1.18 | 1.21 |
| 1400.0         | 6.38                            | 6.37 | 6.37 | 6.39 | 0.02                   | 31.38             | 30.33 | 31.46 | 1.68                      | 1400.0         | 1.26         | 1.18 | 1.17 | 1.17 | 1.20 |
| 1450.0         | 6.37                            | 6.36 | 6.36 | 6.38 | 0.02                   | 32.07             | 29.77 | 32.33 | 1.73                      | 1450.0         | 1.19         | 1.17 | 1.16 | 1.16 | 1.19 |
| 1500.0         | 6.36                            | 6.35 | 6.35 | 6.37 | 0.02                   | 32.62             | 29.36 | 33.07 | 1.78                      | 1500.0         | 1.12         | 1.17 | 1.15 | 1.16 | 1.19 |
| 1550.0         | 6.35                            | 6.35 | 6.35 | 6.36 | 0.02                   | 32.73             | 29.41 | 33.33 | 1.84                      | 1550.0         | 1.05         | 1.17 | 1.15 | 1.16 | 1.19 |
| 1600.0         | 6.38                            | 6.37 | 6.37 | 6.38 | 0.01                   | 32.71             | 29.84 | 33.35 | 1.86                      | 1600.0         | 1.07         | 1.18 | 1.16 | 1.16 | 1.20 |
| 1650.0         | 6.44                            | 6.40 | 6.44 | 6.42 | 0.03                   | 33.04             | 30.42 | 33.73 | 1.95                      | 1650.0         | 1.14         | 1.19 | 1.17 | 1.18 | 1.20 |
| 1700.0         | 6.51                            | 6.43 | 6.48 | 6.48 | 0.07                   | 33.85             | 31.31 | 34.52 | 2.31                      | 1700.0         | 1.19         | 1.22 | 1.17 | 1.19 | 1.21 |
| 1750.0         | 6.48                            | 6.45 | 6.46 | 6.47 | 0.03                   | 34.65             | 32.61 | 35.22 | 2.21                      | 1750.0         | 1.23         | 1.21 | 1.17 | 1.18 | 1.19 |
| 1800.0         | 6.48                            | 6.47 | 6.46 | 6.47 | 0.01                   | 34.60             | 34.64 | 34.90 | 2.22                      | 1800.0         | 1.24         | 1.19 | 1.15 | 1.16 | 1.18 |
| 1850.0         | 6.49                            | 6.49 | 6.48 | 6.49 | 0.01                   | 33.61             | 37.43 | 33.73 | 2.26                      | 1850.0         | 1.22         | 1.17 | 1.14 | 1.13 | 1.16 |
| 1900.0         | 6.49                            | 6.50 | 6.48 | 6.49 | 0.01                   | 32.22             | 42.35 | 32.25 | 2.32                      | 1900.0         | 1.17         | 1.15 | 1.11 | 1.11 | 1.14 |
| 1950.0         | 6.47                            | 6.48 | 6.47 | 6.47 | 0.01                   | 30.80             | 56.22 | 30.81 | 2.38                      | 1950.0         | 1.10         | 1.13 | 1.10 | 1.10 | 1.12 |
| 2000.0         | 6.45                            | 6.47 | 6.46 | 6.46 | 0.02                   | 29.70             | 42.52 | 29.74 | 2.44                      | 2000.0         | 1.01         | 1.12 | 1.10 | 1.09 | 1.11 |
| 2050.0         | 6.46                            | 6.48 | 6.47 | 6.46 | 0.02                   | 29.16             | 36.40 | 29.23 | 2.52                      | 2050.0         | 1.08         | 1.12 | 1.11 | 1.10 | 1.12 |
| 2100.0         | 6.48                            | 6.51 | 6.49 | 6.49 | 0.03                   | 29.00             | 32.42 | 29.08 | 2.58                      | 2100.0         | 1.16         | 1.14 | 1.13 | 1.12 | 1.13 |
| 2150.0         | 6.52                            | 6.55 | 6.52 | 6.51 | 0.03                   | 28.58             | 29.42 | 28.67 | 2.65                      | 2150.0         | 1.23         | 1.16 | 1.15 | 1.14 | 1.15 |
| 2200.0         | 6.54                            | 6.58 | 6.56 | 6.54 | 0.03                   | 27.31             | 27.10 | 27.38 | 2.69                      | 2200.0         | 1.26         | 1.18 | 1.17 | 1.16 | 1.17 |
| 2250.0         | 6.56                            | 6.59 | 6.57 | 6.55 | 0.04                   | 25.25             | 25.22 | 25.31 | 2.76                      | 2250.0         | 1.25         | 1.19 | 1.17 | 1.17 | 1.18 |
| 2300.0         | 6.56                            | 6.61 | 6.59 | 6.56 | 0.05                   | 23.01             | 23.58 | 23.05 | 2.84                      | 2300.0         | 1.21         | 1.21 | 1.19 | 1.19 | 1.20 |
| 2400.0         | 6.62                            | 6.74 | 6.74 | 6.63 | 0.12                   | 19.33             | 21.00 | 19.36 | 3.18                      | 2400.0         | 1.20         | 1.30 | 1.28 | 1.29 | 1.29 |
| 2500.0         | 7.01                            | 7.07 | 7.07 | 7.05 | 0.06                   | 17.32             | 19.09 | 17.35 | 4.51                      | 2500.0         | 1.70         | 1.54 | 1.52 | 1.53 | 1.52 |
| 2550.0         | 7.39                            | 7.37 | 7.35 | 7.42 | 0.07                   | 17.23             | 18.32 | 17.28 | 4.52                      | 2550.0         | 2.07         | 1.71 | 1.68 | 1.68 | 1.69 |
| 2600.0         | 7.82                            | 7.75 | 7.71 | 7.85 | 0.14                   | 18.02             | 17.52 | 18.09 | 4.43                      | 2600.0         | 2.46         | 1.88 | 1.83 | 1.84 | 1.86 |

<sup>1</sup> Total Loss = Insertion Loss + 6dB Splitter Loss

REV. X2

ZB4PD1-ED12789/1

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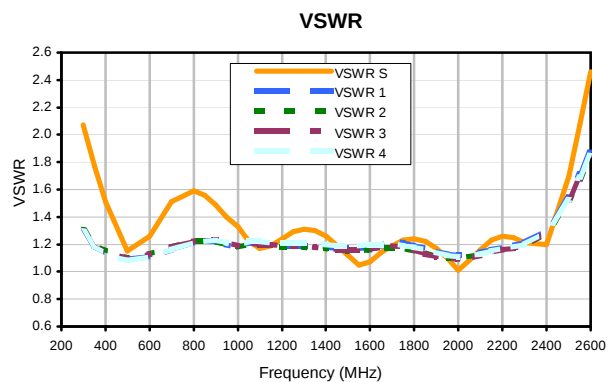
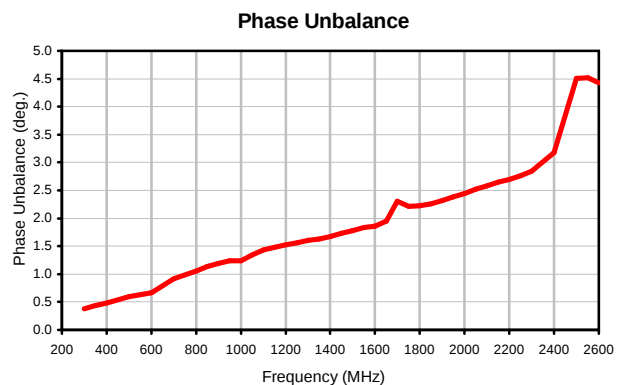
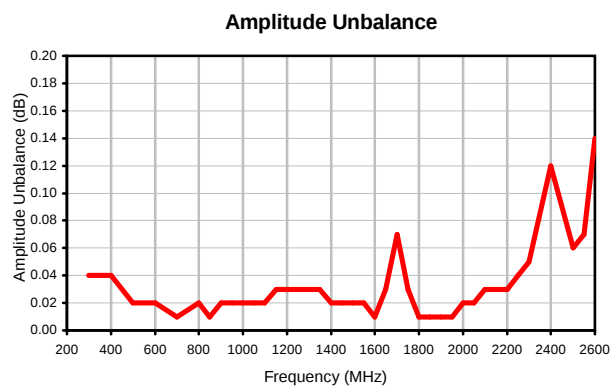
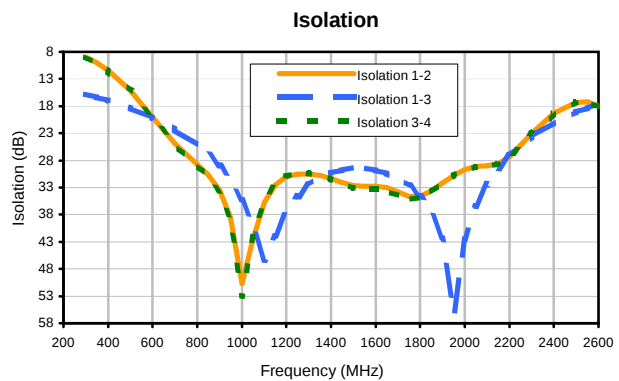
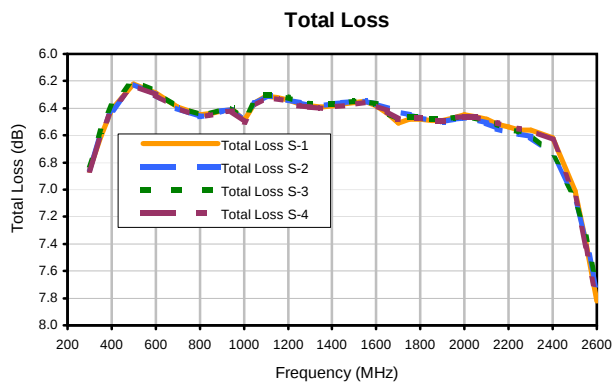
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# 4 Way-0° Power Splitter/Combiner

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## Typical Performance Curves





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 |