

## Bi-Directional Coupler

## PDC-ED12628/2

### 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 : A01

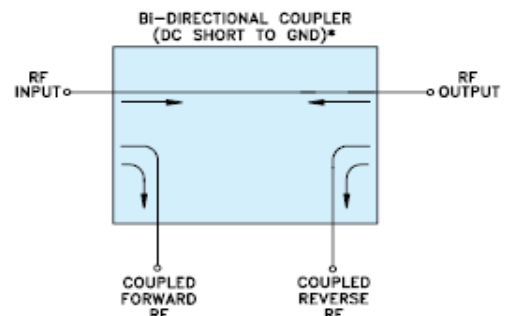
| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |             |      |         |      |       |
|---------------------------------------|-------------|------|---------|------|-------|
| Parameter                             |             | Min. | Typ.    | Max. | Units |
| Frequency                             |             | 5    |         | 200  | MHz   |
| Coupling                              | Nominal     |      | 19.50   |      | dB    |
|                                       | Flatness    |      | ± 0.545 |      | dB    |
| Mainline Loss **                      | 5-50 MHz    |      | 0.10    |      | dB    |
|                                       | 50-100 MHz  |      | 0.20    |      | dB    |
|                                       | 100-200 MHz |      | 0.30    |      | dB    |
| Directivity                           | 5-50 MHz    |      | 30      |      | dB    |
|                                       | 50-100 MHz  |      | 30      |      | dB    |
|                                       | 100-200 MHz |      | 25      |      | dB    |
| VSWR                                  | 5-200 MHz   |      | 1.15    |      | (:1)  |
| RF Power Input                        | 5-200 MHz   |      |         | 5    | W     |

**Note:** \*\* Mainline loss includes theoretical coupled power loss of 0.049dB at 19.5dB coupling.

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

| PIN CONNECTIONS |         |
|-----------------|---------|
| INPUT           | 1       |
| OUTPUT          | 4       |
| COUPLED FORWARD | 3       |
| COUPLED REVERSE | 6       |
| NOT USED        | 2,5,7,8 |

### Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.

# Directional Coupler

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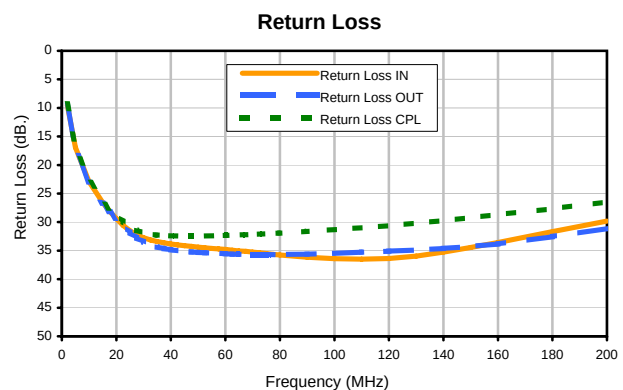
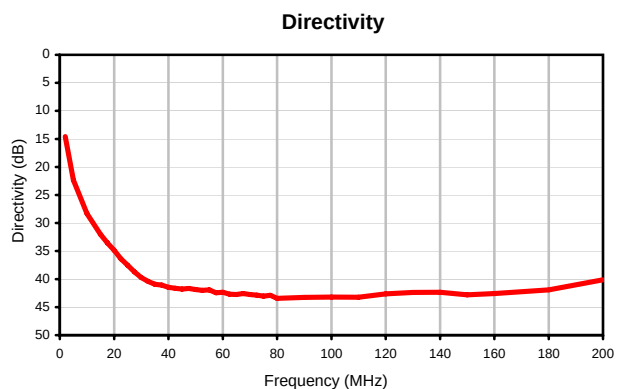
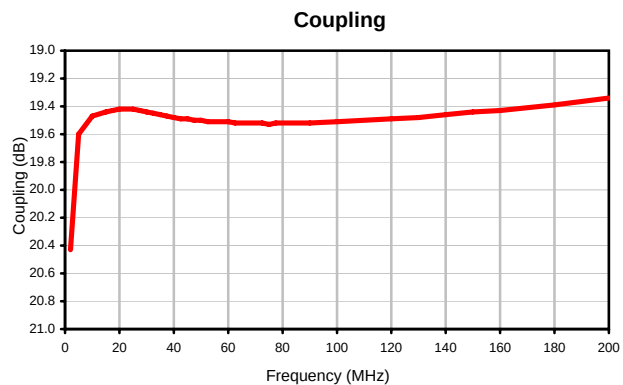
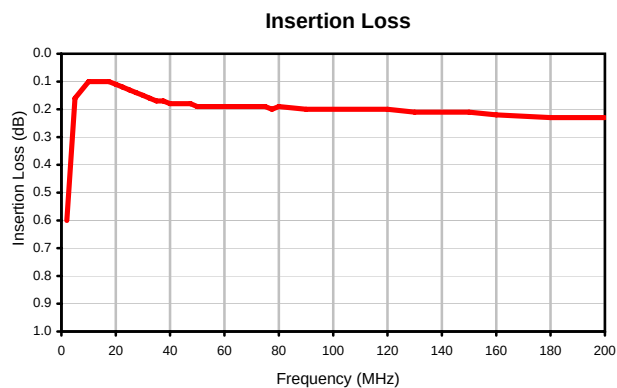
## Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | COUPLING<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |       |       |
|--------------------|---------------------------|------------------|---------------------|-------------|-------|-------|
|                    |                           |                  |                     | IN          | OUT   | CPL   |
| 2.0                | 0.60                      | 20.43            | 14.58               | 9.46        | 9.55  | 9.29  |
| 5.0                | 0.16                      | 19.60            | 22.34               | 16.93       | 17.03 | 16.72 |
| 10.0               | 0.10                      | 19.47            | 28.34               | 22.93       | 23.02 | 22.69 |
| 15.0               | 0.10                      | 19.44            | 32.05               | 26.61       | 26.70 | 26.31 |
| 17.5               | 0.10                      | 19.43            | 33.54               | 28.07       | 28.17 | 27.68 |
| 20.0               | 0.11                      | 19.42            | 34.87               | 29.41       | 29.51 | 28.87 |
| 22.5               | 0.12                      | 19.42            | 36.38               | 30.58       | 30.75 | 29.90 |
| 25.0               | 0.13                      | 19.42            | 37.54               | 31.54       | 31.85 | 30.80 |
| 27.5               | 0.14                      | 19.43            | 38.73               | 32.23       | 32.75 | 31.44 |
| 30.0               | 0.15                      | 19.44            | 39.73               | 32.74       | 33.47 | 31.87 |
| 32.5               | 0.16                      | 19.45            | 40.41               | 33.13       | 34.01 | 32.14 |
| 35.0               | 0.17                      | 19.46            | 40.92               | 33.40       | 34.36 | 32.28 |
| 37.5               | 0.17                      | 19.47            | 41.08               | 33.64       | 34.64 | 32.36 |
| 40.0               | 0.18                      | 19.48            | 41.47               | 33.84       | 34.83 | 32.41 |
| 42.5               | 0.18                      | 19.49            | 41.65               | 33.99       | 35.02 | 32.43 |
| 45.0               | 0.18                      | 19.49            | 41.77               | 34.14       | 35.14 | 32.45 |
| 47.5               | 0.18                      | 19.50            | 41.68               | 34.25       | 35.22 | 32.44 |
| 50.0               | 0.19                      | 19.50            | 41.87               | 34.40       | 35.30 | 32.40 |
| 52.5               | 0.19                      | 19.51            | 42.00               | 34.50       | 35.36 | 32.43 |
| 55.0               | 0.19                      | 19.51            | 41.93               | 34.61       | 35.43 | 32.39 |
| 57.5               | 0.19                      | 19.51            | 42.43               | 34.71       | 35.46 | 32.35 |
| 60.0               | 0.19                      | 19.51            | 42.35               | 34.77       | 35.53 | 32.34 |
| 62.5               | 0.19                      | 19.52            | 42.69               | 34.93       | 35.63 | 32.31 |
| 65.0               | 0.19                      | 19.52            | 42.74               | 35.05       | 35.65 | 32.27 |
| 67.5               | 0.19                      | 19.52            | 42.57               | 35.13       | 35.66 | 32.20 |
| 70.0               | 0.19                      | 19.52            | 42.75               | 35.26       | 35.67 | 32.14 |
| 72.5               | 0.19                      | 19.52            | 42.87               | 35.36       | 35.69 | 32.11 |
| 75.0               | 0.19                      | 19.53            | 43.04               | 35.52       | 35.69 | 32.04 |
| 77.5               | 0.20                      | 19.52            | 42.90               | 35.65       | 35.72 | 31.96 |
| 80.0               | 0.19                      | 19.52            | 43.44               | 35.76       | 35.66 | 31.93 |
| 90.0               | 0.20                      | 19.52            | 43.26               | 36.16       | 35.62 | 31.61 |
| 100.0              | 0.20                      | 19.51            | 43.21               | 36.40       | 35.49 | 31.31 |
| 110.0              | 0.20                      | 19.50            | 43.25               | 36.50       | 35.27 | 30.97 |
| 120.0              | 0.20                      | 19.49            | 42.64               | 36.39       | 35.10 | 30.62 |
| 130.0              | 0.21                      | 19.48            | 42.38               | 35.96       | 34.89 | 30.19 |
| 140.0              | 0.21                      | 19.46            | 42.36               | 35.26       | 34.62 | 29.73 |
| 150.0              | 0.21                      | 19.44            | 42.80               | 34.44       | 34.27 | 29.21 |
| 160.0              | 0.22                      | 19.43            | 42.59               | 33.57       | 33.82 | 28.71 |
| 180.0              | 0.23                      | 19.39            | 41.93               | 31.67       | 32.53 | 27.66 |
| 200.0              | 0.23                      | 19.34            | 40.12               | 29.83       | 31.11 | 26.46 |

# Directional Coupler

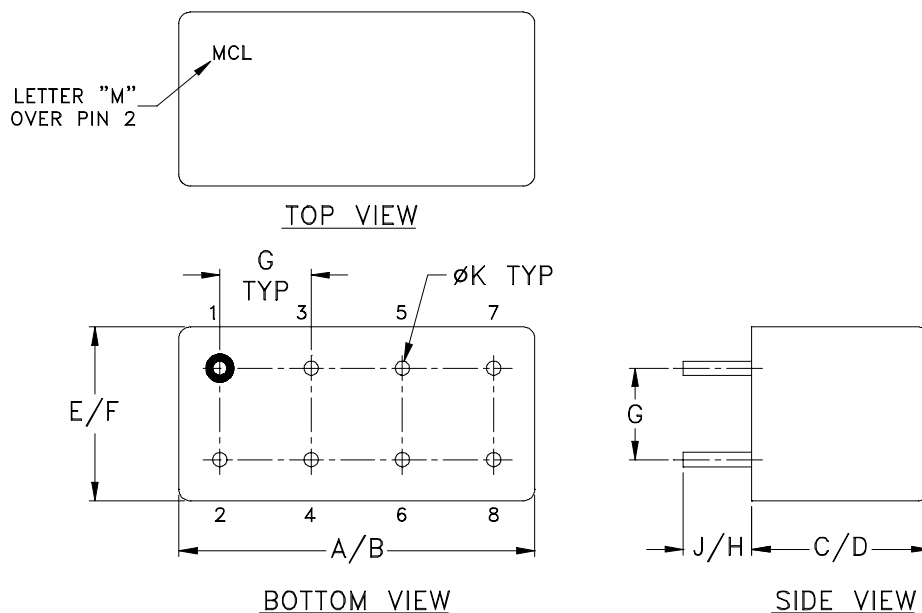
## Typical Performance Curves

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A01  
A04  
A05  
A06

## Outline Dimensions



| CASE# | A               | B               | C              | D               | E              | F               | G              | H             | J             | K             | WT,<br>GRAM |
|-------|-----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|---------------|---------------|---------------|-------------|
| A01   |                 |                 | .385<br>(9.78) | .400<br>(10.16) |                |                 |                |               |               |               | 5.2         |
| A04   | .770<br>(19.56) | .800<br>(20.32) | .200<br>(5.08) | .210<br>(5.33)  | .370<br>(9.40) | .400<br>(10.16) | .200<br>(5.08) | .20<br>(5.08) | .14<br>(3.56) | .031<br>(.79) | 3.7         |
| A05   |                 |                 | .240<br>(6.10) | .250<br>(6.35)  |                |                 |                |               |               |               | 3.7         |
| A06   |                 |                 | .285<br>(7.24) | .310<br>(7.87)  |                |                 |                |               |               |               | 5.2         |

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

### Notes:

- Header material: C.R.S.  
Pin material: #52 alloy.  
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Insulated spacer available. Request P/N B14-045-01.
- Tolerance on pin diameter  $\pm .005$  inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.



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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          | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| 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                                                                 |
| Moisture Resistance            | 10 cycles, 24 hours per cycle                                                                                                                                   | MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Resistance to Solder Heat      | 260°C for 10 seconds                                                                                                                                            | MIL-STD-202, Method 210, Condition B                                                                 |
| 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                                                                              |
| Terminal Strength              | 4 1/2 Pound Pull                                                                                                                                                | MIL-STD-202, Method 211, Condition A                                                                 |



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| Specification       | Test/Inspection Condition | Reference/Spec                       |
|---------------------|---------------------------|--------------------------------------|
| Gross Leak          | 125°C Bubble Test         | MIL-STD-202, Method 112, Condition D |
| Barometric Pressure | 100,000 Feet              | MIL-STD-202, Method 105, Condition D |