

# Directional Coupler

# TCD-13-4

## Typical Performance Data

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

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | COUPLING<br>LOSS<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |             |       |
|--------------------|---------------------------|--------------------------|---------------------|-------------|-------------|-------|
|                    |                           |                          |                     | IN          | (dB)<br>OUT | CPL   |
| 5                  | 0.67                      | 12.85                    | 20.89               | 22.16       | 28.58       | 23.85 |
| 10                 | 0.66                      | 12.85                    | 20.95               | 22.47       | 30.10       | 24.22 |
| 20                 | 0.64                      | 12.85                    | 21.07               | 23.09       | 33.13       | 24.95 |
| 50                 | 0.66                      | 12.87                    | 21.08               | 23.36       | 34.31       | 25.30 |
| 100                | 0.67                      | 12.90                    | 20.93               | 23.50       | 33.60       | 25.43 |
| 150                | 0.69                      | 12.91                    | 20.68               | 23.56       | 32.28       | 25.41 |
| 200                | 0.70                      | 12.92                    | 20.32               | 23.56       | 31.05       | 25.28 |
| 250                | 0.71                      | 12.92                    | 19.93               | 23.44       | 29.95       | 25.06 |
| 300                | 0.73                      | 12.92                    | 19.46               | 23.34       | 28.96       | 24.79 |
| 350                | 0.74                      | 12.92                    | 18.99               | 23.24       | 28.04       | 24.54 |
| 400                | 0.75                      | 12.91                    | 18.48               | 23.12       | 27.20       | 24.28 |
| 450                | 0.76                      | 12.89                    | 17.98               | 22.94       | 26.55       | 24.01 |
| 500                | 0.78                      | 12.88                    | 17.46               | 22.76       | 26.05       | 23.74 |
| 550                | 0.80                      | 12.86                    | 16.94               | 22.61       | 25.51       | 23.50 |
| 600                | 0.82                      | 12.83                    | 16.39               | 22.50       | 25.02       | 23.27 |
| 650                | 0.84                      | 12.80                    | 15.89               | 22.30       | 24.60       | 23.03 |
| 700                | 0.86                      | 12.77                    | 15.39               | 22.12       | 24.29       | 22.82 |
| 750                | 0.88                      | 12.74                    | 14.89               | 21.96       | 23.98       | 22.66 |
| 800                | 0.91                      | 12.71                    | 14.41               | 21.88       | 23.70       | 22.51 |
| 850                | 0.94                      | 12.67                    | 13.96               | 21.82       | 23.41       | 22.37 |
| 900                | 0.96                      | 12.63                    | 13.52               | 21.68       | 23.21       | 22.27 |
| 950                | 0.99                      | 12.58                    | 13.12               | 21.60       | 23.02       | 22.19 |
| 1000               | 1.03                      | 12.53                    | 12.73               | 21.55       | 22.77       | 22.13 |
| 1050               | 1.06                      | 12.48                    | 12.35               | 21.55       | 22.60       | 22.09 |
| 1100               | 1.09                      | 12.42                    | 12.02               | 21.57       | 22.48       | 22.08 |
| 1200               | 1.17                      | 12.30                    | 11.37               | 21.60       | 22.15       | 22.13 |
| 1300               | 1.26                      | 12.17                    | 10.85               | 21.84       | 21.86       | 22.29 |
| 1400               | 1.36                      | 12.03                    | 10.38               | 22.09       | 21.49       | 22.54 |
| 1500               | 1.48                      | 11.88                    | 10.03               | 22.45       | 21.09       | 22.88 |
| 1600               | 1.61                      | 11.74                    | 9.74                | 22.92       | 20.64       | 23.35 |
| 1700               | 1.77                      | 11.62                    | 9.52                | 23.52       | 20.09       | 23.89 |
| 1800               | 1.95                      | 11.51                    | 9.40                | 24.05       | 19.42       | 24.57 |
| 1900               | 2.14                      | 11.42                    | 9.35                | 24.64       | 18.70       | 25.37 |
| 2000               | 2.36                      | 11.37                    | 9.33                | 25.00       | 18.00       | 26.16 |
| 2250               | 2.98                      | 11.43                    | 9.69                | 23.70       | 16.16       | 27.33 |
| 2500               | 3.63                      | 11.83                    | 10.38               | 20.52       | 14.51       | 26.34 |
| 2750               | 4.20                      | 12.56                    | 11.18               | 17.88       | 13.31       | 24.90 |
| 3000               | 4.70                      | 13.51                    | 11.43               | 16.21       | 12.61       | 23.83 |
| 3250               | 5.11                      | 14.54                    | 11.03               | 15.33       | 12.32       | 21.62 |
| 3500               | 5.47                      | 15.54                    | 10.39               | 14.92       | 12.46       | 18.16 |
| 3750               | 5.87                      | 16.20                    | 10.74               | 14.39       | 12.97       | 14.73 |
| 4000               | 6.33                      | 16.39                    | 11.78               | 13.43       | 13.70       | 11.94 |
| 4250               | 6.93                      | 15.99                    | 12.11               | 11.89       | 14.97       | 9.88  |
| 4500               | 7.78                      | 15.44                    | 11.30               | 10.25       | 15.57       | 8.43  |
| 4750               | 8.81                      | 14.76                    | 9.87                | 8.83        | 15.23       | 7.57  |
| 5000               | 10.05                     | 14.15                    | 9.06                | 7.77        | 14.23       | 7.07  |
| 5250               | 11.56                     | 13.60                    | 9.04                | 7.15        | 12.79       | 6.91  |
| 5500               | 13.10                     | 13.12                    | 9.02                | 6.81        | 11.54       | 7.00  |
| 5750               | 14.61                     | 12.76                    | 9.02                | 6.99        | 10.58       | 7.33  |
| 6000               | 16.01                     | 12.25                    | 9.46                | 6.94        | 9.87        | 7.58  |
| 6250               | 17.21                     | 12.27                    | 9.16                | 7.35        | 9.34        | 7.69  |
| 6500               | 18.15                     | 12.00                    | 8.68                | 7.29        | 8.86        | 7.83  |
| 6750               | 18.78                     | 11.97                    | 7.26                | 7.33        | 8.70        | 7.55  |
| 7000               | 19.00                     | 12.48                    | 5.59                | 7.21        | 8.60        | 7.21  |

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# Directional Coupler

# TCD-13-4

## Typical Performance Data

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

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | COUPLING<br>LOSS<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |       |       |
|--------------------|---------------------------|--------------------------|---------------------|-------------|-------|-------|
|                    |                           |                          |                     | IN          | OUT   | CPL   |
| 5                  | 0.85                      | 12.98                    | 20.57               | 18.70       | 21.53 | 20.32 |
| 10                 | 0.77                      | 12.91                    | 20.59               | 20.08       | 24.23 | 21.76 |
| 20                 | 0.62                      | 12.79                    | 20.63               | 22.84       | 29.63 | 24.64 |
| 50                 | 0.56                      | 12.76                    | 20.91               | 24.64       | 33.84 | 26.61 |
| 100                | 0.57                      | 12.78                    | 20.70               | 24.59       | 33.93 | 26.53 |
| 150                | 0.58                      | 12.78                    | 20.48               | 24.51       | 33.02 | 26.48 |
| 200                | 0.59                      | 12.77                    | 20.30               | 24.43       | 30.85 | 26.24 |
| 250                | 0.60                      | 12.76                    | 19.87               | 24.02       | 29.51 | 25.64 |
| 300                | 0.61                      | 12.75                    | 19.54               | 23.92       | 28.49 | 25.31 |
| 350                | 0.62                      | 12.74                    | 19.09               | 23.58       | 27.44 | 24.76 |
| 400                | 0.63                      | 12.73                    | 18.65               | 23.33       | 26.61 | 24.37 |
| 450                | 0.65                      | 12.70                    | 18.20               | 22.91       | 25.77 | 23.88 |
| 500                | 0.66                      | 12.68                    | 17.70               | 22.60       | 25.18 | 23.53 |
| 550                | 0.68                      | 12.66                    | 17.27               | 22.34       | 24.52 | 23.10 |
| 600                | 0.69                      | 12.62                    | 16.78               | 22.11       | 23.95 | 22.74 |
| 650                | 0.71                      | 12.59                    | 16.32               | 21.74       | 23.44 | 22.46 |
| 700                | 0.73                      | 12.56                    | 15.81               | 21.46       | 23.09 | 22.15 |
| 750                | 0.75                      | 12.52                    | 15.37               | 21.25       | 22.75 | 21.91 |
| 800                | 0.77                      | 12.48                    | 14.93               | 21.00       | 22.31 | 21.67 |
| 850                | 0.80                      | 12.43                    | 14.51               | 20.82       | 21.95 | 21.47 |
| 900                | 0.82                      | 12.38                    | 14.09               | 20.52       | 21.60 | 21.26 |
| 950                | 0.85                      | 12.32                    | 13.65               | 20.34       | 21.36 | 21.13 |
| 1000               | 0.88                      | 12.27                    | 13.29               | 20.32       | 21.17 | 20.94 |
| 1050               | 0.91                      | 12.22                    | 12.93               | 20.23       | 20.98 | 20.76 |
| 1100               | 0.94                      | 12.15                    | 12.58               | 20.19       | 20.88 | 20.71 |
| 1200               | 1.01                      | 12.03                    | 11.93               | 20.11       | 20.61 | 20.50 |
| 1300               | 1.10                      | 11.90                    | 11.27               | 20.06       | 20.23 | 20.81 |
| 1400               | 1.20                      | 11.75                    | 10.77               | 20.13       | 19.86 | 20.89 |
| 1500               | 1.31                      | 11.60                    | 10.32               | 20.08       | 19.37 | 21.18 |
| 1600               | 1.44                      | 11.45                    | 9.98                | 20.91       | 19.33 | 21.56 |
| 1700               | 1.60                      | 11.32                    | 9.76                | 21.11       | 18.84 | 21.93 |
| 1800               | 1.78                      | 11.20                    | 9.60                | 21.64       | 18.39 | 22.47 |
| 1900               | 1.98                      | 11.10                    | 9.49                | 22.03       | 17.78 | 22.92 |
| 2000               | 2.20                      | 11.04                    | 9.48                | 22.64       | 17.27 | 23.33 |
| 2250               | 2.87                      | 11.12                    | 9.88                | 21.79       | 15.15 | 24.20 |
| 2500               | 3.56                      | 11.58                    | 10.96               | 19.57       | 13.51 | 23.19 |
| 2750               | 4.14                      | 12.43                    | 12.38               | 17.09       | 12.04 | 22.41 |
| 3000               | 4.55                      | 13.52                    | 12.81               | 15.76       | 11.49 | 22.47 |
| 3250               | 4.85                      | 14.70                    | 11.56               | 15.20       | 11.24 | 23.98 |
| 3500               | 5.11                      | 15.79                    | 10.21               | 15.16       | 11.30 | 20.38 |
| 3750               | 5.39                      | 16.40                    | 10.31               | 15.08       | 11.83 | 15.71 |
| 4000               | 5.75                      | 16.42                    | 11.64               | 14.03       | 12.63 | 12.16 |
| 4250               | 6.23                      | 15.79                    | 12.87               | 12.54       | 14.42 | 9.96  |
| 4500               | 7.04                      | 15.12                    | 12.85               | 10.39       | 15.96 | 8.31  |
| 4750               | 8.00                      | 14.24                    | 11.18               | 8.81        | 16.61 | 7.31  |
| 5000               | 9.19                      | 13.73                    | 9.62                | 7.58        | 15.81 | 6.79  |
| 5250               | 10.51                     | 13.14                    | 9.34                | 6.97        | 14.10 | 6.56  |
| 5500               | 11.98                     | 12.57                    | 9.47                | 6.49        | 12.27 | 6.69  |
| 5750               | 13.64                     | 12.22                    | 9.22                | 6.64        | 11.16 | 6.82  |
| 6000               | 15.28                     | 11.95                    | 8.97                | 6.65        | 10.16 | 7.12  |
| 6250               | 16.41                     | 11.72                    | 9.48                | 6.93        | 9.49  | 7.29  |
| 6500               | 17.14                     | 11.47                    | 8.33                | 6.86        | 8.83  | 7.26  |
| 6750               | 17.71                     | 11.37                    | 6.80                | 6.88        | 8.66  | 7.07  |
| 7000               | 17.80                     | 12.09                    | 5.24                | 6.60        | 8.79  | 6.85  |

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# Directional Coupler

# TCD-13-4

## Typical Performance Data

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

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | COUPLING<br>LOSS<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |       |       |
|--------------------|---------------------------|--------------------------|---------------------|-------------|-------|-------|
|                    |                           |                          |                     | IN          | OUT   | CPL   |
| 5                  | 0.82                      | 13.02                    | 21.63               | 20.81       | 26.82 | 22.79 |
| 10                 | 0.81                      | 13.02                    | 21.59               | 20.98       | 27.50 | 22.99 |
| 20                 | 0.80                      | 13.02                    | 21.50               | 21.33       | 28.86 | 23.39 |
| 50                 | 0.81                      | 13.04                    | 21.24               | 21.35       | 29.70 | 23.38 |
| 100                | 0.82                      | 13.07                    | 21.10               | 21.70       | 29.35 | 23.75 |
| 150                | 0.83                      | 13.09                    | 20.81               | 21.99       | 28.62 | 23.95 |
| 200                | 0.85                      | 13.11                    | 20.20               | 21.96       | 28.69 | 23.80 |
| 250                | 0.85                      | 13.12                    | 19.81               | 22.13       | 28.44 | 23.96 |
| 300                | 0.87                      | 13.13                    | 19.28               | 22.12       | 27.91 | 23.79 |
| 350                | 0.88                      | 13.14                    | 18.70               | 22.07       | 27.51 | 23.67 |
| 400                | 0.89                      | 13.15                    | 18.14               | 22.11       | 27.00 | 23.59 |
| 450                | 0.91                      | 13.15                    | 17.58               | 22.04       | 26.54 | 23.41 |
| 500                | 0.93                      | 13.15                    | 16.99               | 21.99       | 26.27 | 23.28 |
| 550                | 0.94                      | 13.16                    | 16.43               | 21.98       | 25.90 | 23.17 |
| 600                | 0.96                      | 13.15                    | 15.85               | 21.97       | 25.55 | 23.06 |
| 650                | 0.98                      | 13.15                    | 15.32               | 21.86       | 25.28 | 22.95 |
| 700                | 1.00                      | 13.14                    | 14.79               | 21.76       | 25.04 | 22.83 |
| 750                | 1.02                      | 13.13                    | 14.28               | 21.66       | 24.78 | 22.75 |
| 800                | 1.05                      | 13.11                    | 13.78               | 21.67       | 24.56 | 22.67 |
| 850                | 1.07                      | 13.08                    | 13.34               | 21.71       | 24.36 | 22.61 |
| 900                | 1.09                      | 13.06                    | 12.92               | 21.70       | 24.24 | 22.58 |
| 950                | 1.13                      | 13.02                    | 12.54               | 21.72       | 24.11 | 22.53 |
| 1000               | 1.16                      | 12.99                    | 12.20               | 21.78       | 23.87 | 22.52 |
| 1050               | 1.19                      | 12.95                    | 11.86               | 21.81       | 23.67 | 22.51 |
| 1100               | 1.22                      | 12.90                    | 11.56               | 21.82       | 23.43 | 22.52 |
| 1200               | 1.30                      | 12.80                    | 10.98               | 21.77       | 22.88 | 22.59 |
| 1300               | 1.38                      | 12.69                    | 10.53               | 22.02       | 22.48 | 22.59 |
| 1400               | 1.48                      | 12.57                    | 10.11               | 22.08       | 21.89 | 22.68 |
| 1500               | 1.59                      | 12.45                    | 9.77                | 22.29       | 21.43 | 22.94 |
| 1600               | 1.71                      | 12.33                    | 9.47                | 22.58       | 21.03 | 23.30 |
| 1700               | 1.85                      | 12.23                    | 9.19                | 22.96       | 20.56 | 23.73 |
| 1800               | 2.00                      | 12.14                    | 9.00                | 23.16       | 19.90 | 24.17 |
| 1900               | 2.17                      | 12.05                    | 8.89                | 23.42       | 19.28 | 24.97 |
| 2000               | 2.35                      | 11.99                    | 8.70                | 23.39       | 18.67 | 25.87 |
| 2250               | 2.85                      | 11.98                    | 8.50                | 22.58       | 17.43 | 27.41 |
| 2500               | 3.41                      | 12.17                    | 8.48                | 20.42       | 16.14 | 26.76 |
| 2750               | 3.99                      | 12.58                    | 8.59                | 17.86       | 14.97 | 23.82 |
| 3000               | 4.57                      | 13.16                    | 8.94                | 15.96       | 14.16 | 21.39 |
| 3250               | 5.14                      | 13.84                    | 9.55                | 14.71       | 13.43 | 19.24 |
| 3500               | 5.70                      | 14.55                    | 10.58               | 13.86       | 12.88 | 17.50 |
| 3750               | 6.25                      | 15.18                    | 12.62               | 13.49       | 12.58 | 15.51 |
| 4000               | 6.81                      | 15.59                    | 15.02               | 13.08       | 12.59 | 13.55 |
| 4250               | 7.48                      | 15.63                    | 15.37               | 11.93       | 12.57 | 11.45 |
| 4500               | 8.21                      | 15.41                    | 12.34               | 10.81       | 12.57 | 9.71  |
| 4750               | 9.02                      | 14.90                    | 9.91                | 9.58        | 12.45 | 8.33  |
| 5000               | 9.91                      | 14.48                    | 7.82                | 8.48        | 12.66 | 7.41  |
| 5250               | 10.87                     | 13.93                    | 6.76                | 7.71        | 12.38 | 6.78  |
| 5500               | 12.03                     | 13.42                    | 6.17                | 7.16        | 12.02 | 6.51  |
| 5750               | 13.36                     | 13.12                    | 5.97                | 6.92        | 11.48 | 6.62  |
| 6000               | 14.61                     | 12.54                    | 6.46                | 6.86        | 10.88 | 6.88  |
| 6250               | 16.21                     | 11.98                    | 7.72                | 6.90        | 10.64 | 7.19  |
| 6500               | 17.77                     | 11.10                    | 8.78                | 7.37        | 10.10 | 7.75  |
| 6750               | 19.70                     | 10.46                    | 11.16               | 8.39        | 9.99  | 8.34  |
| 7000               | 22.04                     | 9.51                     | 15.07               | 8.79        | 9.48  | 8.50  |

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