Stripline Surface Mount

# Bi-Directional Coupler

# MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.08 | -32.94 | -32.94 | 25.07 | -35.80 | -34.54 | -38.45 | -39.35 |
| 235 | -0.09 | -31.92 | -31.93 | 23.55 | -34.01 | -34.05 | -38.02 | -37.16 |
| 240 | -0.09 | -31.81 | -31.81 | 23.30 | -33.94 | -34.13 | -38.12 | -36.92 |
| 245 | -0.08 | -31.69 | -31.70 | 23.13 | -34.05 | -34.44 | -38.29 | -36.84 |
| 250 | -0.09 | -31.59 | -31.59 | 22.94 | -34.10 | -34.61 | -38.39 | -36.79 |
| 255 | -0.09 | -31.49 | -31.49 | 22.82 | -34.22 | -34.83 | -38.68 | -36.62 |
| 260 | -0.09 | -31.40 | -31.40 | 22.66 | -34.34 | -35.23 | -39.06 | -36.66 |
| 265 | -0.09 | -31.31 | -31.31 | 22.57 | -34.61 | -35.59 | -39.52 | -36.73 |
| 270 | -0.09 | -31.22 | -31.22 | 22.45 | -34.96 | -36.11 | -40.39 | -36.76 |
| 275 | -0.09 | -31.14 | -31.15 | 22.33 | -35.27 | -36.63 | -40.99 | -36.92 |
| 280 | -0.09 | -31.07 | -31.07 | 22.26 | -35.54 | -37.27 | -41.67 | -36.98 |
| 290 | -0.10 | -30.93 | -30.93 | 22.10 | -36.04 | -37.99 | -42.59 | -37.02 |
| 300 | -0.10 | -30.81 | -30.82 | 21.98 | -36.25 | -38.64 | -42.75 | -37.01 |
| 310 | -0.10 | -30.71 | -30.72 | 21.90 | -36.51 | -39.25 | -42.98 | -37.16 |
| 320 | -0.11 | -30.63 | -30.63 | 21.86 | -36.88 | -40.27 | -43.51 | -37.47 |
| 330 | -0.11 | -30.55 | -30.56 | 21.73 | -37.23 | -41.41 | -44.44 | -37.75 |
| 340 | -0.10 | -30.50 | -30.50 | 21.63 | -37.62 | -42.49 | -44.91 | -38.13 |
| 350 | -0.10 | -30.46 | -30.46 | 21.51 | -37.85 | -43.49 | -44.64 | -38.33 |
| 360 | -0.10 | -30.43 | -30.44 | 21.40 | -38.36 | -45.14 | -46.00 | -38.73 |
| 370 | -0.11 | -30.43 | -30.43 | 21.33 | -38.88 | -47.43 | -47.94 | -39.20 |
| 380 | -0.11 | -30.44 | -30.44 | 21.29 | -39.19 | -49.58 | -50.02 | -39.62 |
| 390 | -0.11 | -30.47 | -30.47 | 21.22 | -39.14 | -50.08 | -49.37 | -40.10 |
| 400 | -0.11 | -30.51 | -30.51 | 21.20 | -39.03 | -48.64 | -47.56 | -40.01 |
| 410 | -0.12 | -30.56 | -30.57 | 21.17 | -38.73 | -46.48 | -45.43 | -40.08 |
| 420 | -0.12 | -30.64 | -30.64 | 21.08 | -38.35 | -44.57 | -44.02 | -39.91 |
| 430 | -0.12 | -30.72 | -30.73 | 20.94 | -37.90 | -42.81 | -42.49 | -39.49 |
| 440 | -0.12 | -30.82 | -30.83 | 20.76 | -37.18 | -40.79 | -40.90 | -38.96 |
| 450 | -0.12 | -30.94 | -30.95 | 20.47 | -36.24 | -39.33 | -39.41 | -38.24 |
| 460 | -0.12 | -31.09 | -31.10 | 20.20 | -35.59 | -38.19 | -38.59 | -37.65 |
| 470 | -0.12 | -31.24 | -31.25 | 19.93 | -34.94 | -37.04 | -37.77 | -37.05 |
| 480 | -0.13 | -31.42 | -31.42 | 19.63 | -34.26 | -36.02 | -37.07 | -36.40 |
| 485 | -0.13 | -31.52 | -31.52 | 19.48 | -33.85 | -35.42 | -36.58 | -35.91 |
| 490 | -0.13 | -31.62 | -31.62 | 19.32 | -33.43 | -34.82 | -36.09 | -35.42 |
| 495 | -0.14 | -31.73 | -31.73 | 19.13 | -32.91 | -34.17 | -35.38 | -34.84 |
| 500 | -0.14 | -31.83 | -31.84 | 18.93 | -32.39 | -33.52 | -34.66 | -34.26 |
| 505 | -0.14 | -31.95 | -31.96 | 18.72 | -31.85 | -32.87 | -33.92 | -33.63 |
| 510 | -0.14 | -32.07 | -32.08 | 18.51 | -31.30 | -32.22 | -33.17 | -33.00 |
| 515 | -0.14 | -32.20 | -32.21 | 18.29 | -30.77 | -31.62 | -32.53 | -32.39 |
| 520 | -0.14 | -32.33 | -32.34 | 18.07 | -30.23 | -31.02 | -31.89 | -31.77 |
| 525 | -0.14 | -32.47 | -32.48 | 17.81 | -29.73 | -30.47 | -31.29 | -31.22 |
| 530 | -0.14 | -32.61 | -32.62 | 17.55 | -29.23 | -29.92 | -30.68 | -30.67 |

Stripline Surface Mount

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.08 | -32.94 | -32.94 | 25.01 | -34.54 | -35.80 | -39.35 | -38.45 |
| 235 | -0.08 | -31.93 | -31.92 | 23.94 | -34.05 | -34.01 | -37.16 | -38.02 |
| 240 | -0.08 | -31.81 | -31.81 | 23.78 | -34.13 | -33.94 | -36.92 | -38.12 |
| 245 | -0.08 | -31.70 | -31.69 | 23.70 | -34.44 | -34.05 | -36.84 | -38.29 |
| 250 | -0.08 | -31.59 | -31.59 | 23.58 | -34.61 | -34.10 | -36.79 | -38.39 |
| 255 | -0.08 | -31.49 | -31.49 | 23.51 | -34.83 | -34.22 | -36.62 | -38.68 |
| 260 | -0.08 | -31.40 | -31.40 | 23.45 | -35.23 | -34.34 | -36.66 | -39.06 |
| 265 | -0.09 | -31.31 | -31.31 | 23.41 | -35.59 | -34.61 | -36.73 | -39.52 |
| 270 | -0.09 | -31.22 | -31.22 | 23.32 | -36.11 | -34.96 | -36.76 | -40.39 |
| 275 | -0.09 | -31.15 | -31.14 | 23.29 | -36.63 | -35.27 | -36.92 | -40.99 |
| 280 | -0.09 | -31.07 | -31.07 | 23.23 | -37.27 | -35.54 | -36.98 | -41.67 |
| 290 | -0.09 | -30.93 | -30.93 | 23.10 | -37.99 | -36.04 | -37.02 | -42.59 |
| 300 | -0.09 | -30.82 | -30.81 | 23.04 | -38.64 | -36.25 | -37.01 | -42.75 |
| 310 | -0.10 | -30.72 | -30.71 | 22.92 | -39.25 | -36.51 | -37.16 | -42.98 |
| 320 | -0.10 | -30.63 | -30.63 | 22.84 | -40.27 | -36.88 | -37.47 | -43.51 |
| 330 | -0.10 | -30.56 | -30.55 | 22.68 | -41.41 | -37.23 | -37.75 | -44.44 |
| 340 | -0.10 | -30.50 | -30.50 | 22.51 | -42.49 | -37.62 | -38.13 | -44.91 |
| 350 | -0.10 | -30.46 | -30.46 | 22.36 | -43.49 | -37.85 | -38.33 | -44.64 |
| 360 | -0.10 | -30.44 | -30.43 | 22.27 | -45.14 | -38.36 | -38.73 | -46.00 |
| 370 | -0.10 | -30.43 | -30.43 | 22.23 | -47.43 | -38.88 | -39.20 | -47.94 |
| 380 | -0.11 | -30.44 | -30.44 | 22.21 | -49.58 | -39.19 | -39.62 | -50.02 |
| 390 | -0.11 | -30.47 | -30.47 | 22.15 | -50.08 | -39.14 | -40.10 | -49.37 |
| 400 | -0.11 | -30.51 | -30.51 | 22.12 | -48.64 | -39.03 | -40.01 | -47.56 |
| 410 | -0.11 | -30.57 | -30.56 | 22.02 | -46.48 | -38.73 | -40.08 | -45.43 |
| 420 | -0.11 | -30.64 | -30.64 | 21.92 | -44.57 | -38.35 | -39.91 | -44.02 |
| 430 | -0.12 | -30.73 | -30.72 | 21.76 | -42.81 | -37.90 | -39.49 | -42.49 |
| 440 | -0.12 | -30.83 | -30.82 | 21.50 | -40.79 | -37.18 | -38.96 | -40.90 |
| 450 | -0.12 | -30.95 | -30.94 | 21.22 | -39.33 | -36.24 | -38.24 | -39.41 |
| 460 | -0.12 | -31.10 | -31.09 | 20.95 | -38.19 | -35.59 | -37.65 | -38.59 |
| 470 | -0.12 | -31.25 | -31.24 | 20.67 | -37.04 | -34.94 | -37.05 | -37.77 |
| 480 | -0.12 | -31.42 | -31.42 | 20.32 | -36.02 | -34.26 | -36.40 | -37.07 |
| 485 | -0.13 | -31.52 | -31.52 | 20.15 | -35.42 | -33.85 | -35.91 | -36.58 |
| 490 | -0.13 | -31.62 | -31.62 | 19.97 | -34.82 | -33.43 | -35.42 | -36.09 |
| 495 | -0.13 | -31.73 | -31.73 | 19.75 | -34.17 | -32.91 | -34.84 | -35.38 |
| 500 | -0.13 | -31.84 | -31.83 | 19.52 | -33.52 | -32.39 | -34.26 | -34.66 |
| 505 | -0.13 | -31.96 | -31.95 | 19.28 | -32.87 | -31.85 | -33.63 | -33.92 |
| 510 | -0.13 | -32.08 | -32.07 | 19.04 | -32.22 | -31.30 | -33.00 | -33.17 |
| 515 | -0.14 | -32.21 | -32.20 | 18.77 | -31.62 | -30.77 | -32.39 | -32.53 |
| 520 | -0.14 | -32.34 | -32.33 | 18.50 | -31.02 | -30.23 | -31.77 | -31.89 |
| 525 | -0.14 | -32.48 | -32.47 | 18.19 | -30.47 | -29.73 | -31.22 | -31.29 |
| 530 | -0.14 | -32.62 | -32.61 | 17.87 | -29.92 | -29.23 | -30.67 | -30.68 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.06 | -32.95 | -32.94 | 25.20 | -39.35 | -38.45 | -34.54 | -35.80 |
| 235 | -0.07 | -31.93 | -31.92 | 23.62 | -37.16 | -38.02 | -34.05 | -34.01 |
| 240 | -0.07 | -31.82 | -31.80 | 23.38 | -36.92 | -38.12 | -34.13 | -33.94 |
| 245 | -0.07 | -31.70 | -31.69 | 23.16 | -36.84 | -38.29 | -34.44 | -34.05 |
| 250 | -0.07 | -31.60 | -31.58 | 23.02 | -36.79 | -38.39 | -34.61 | -34.10 |
| 255 | -0.07 | -31.50 | -31.48 | 22.83 | -36.62 | -38.68 | -34.83 | -34.22 |
| 260 | -0.07 | -31.41 | -31.39 | 22.72 | -36.66 | -39.06 | -35.23 | -34.34 |
| 265 | -0.07 | -31.32 | -31.30 | 22.58 | -36.73 | -39.52 | -35.59 | -34.61 |
| 270 | -0.07 | -31.23 | -31.22 | 22.46 | -36.76 | -40.39 | -36.11 | -34.96 |
| 275 | -0.08 | -31.15 | -31.14 | 22.38 | -36.92 | -40.99 | -36.63 | -35.27 |
| 280 | -0.08 | -31.08 | -31.06 | 22.28 | -36.98 | -41.67 | -37.27 | -35.54 |
| 290 | -0.08 | -30.94 | -30.93 | 22.13 | -37.02 | -42.59 | -37.99 | -36.04 |
| 300 | -0.08 | -30.82 | -30.81 | 21.99 | -37.01 | -42.75 | -38.64 | -36.25 |
| 310 | -0.09 | -30.72 | -30.71 | 21.91 | -37.16 | -42.98 | -39.25 | -36.51 |
| 320 | -0.09 | -30.64 | -30.62 | 21.86 | -37.47 | -43.51 | -40.27 | -36.88 |
| 330 | -0.09 | -30.57 | -30.55 | 21.71 | -37.75 | -44.44 | -41.41 | -37.23 |
| 340 | -0.09 | -30.51 | -30.49 | 21.63 | -38.13 | -44.91 | -42.49 | -37.62 |
| 350 | -0.09 | -30.47 | -30.45 | 21.48 | -38.33 | -44.64 | -43.49 | -37.85 |
| 360 | -0.09 | -30.44 | -30.43 | 21.40 | -38.73 | -46.00 | -45.14 | -38.36 |
| 370 | -0.09 | -30.44 | -30.42 | 21.34 | -39.20 | -47.94 | -47.43 | -38.88 |
| 380 | -0.09 | -30.45 | -30.44 | 21.29 | -39.62 | -50.02 | -49.58 | -39.19 |
| 390 | -0.10 | -30.48 | -30.46 | 21.29 | -40.10 | -49.37 | -50.08 | -39.14 |
| 400 | -0.10 | -30.52 | -30.50 | 21.23 | -40.01 | -47.56 | -48.64 | -39.03 |
| 410 | -0.10 | -30.58 | -30.56 | 21.19 | -40.08 | -45.43 | -46.48 | -38.73 |
| 420 | -0.10 | -30.65 | -30.63 | 21.09 | -39.91 | -44.02 | -44.57 | -38.35 |
| 430 | -0.10 | -30.74 | -30.72 | 20.93 | -39.49 | -42.49 | -42.81 | -37.90 |
| 440 | -0.10 | -30.84 | -30.82 | 20.76 | -38.96 | -40.90 | -40.79 | -37.18 |
| 450 | -0.10 | -30.96 | -30.94 | 20.50 | -38.24 | -39.41 | -39.33 | -36.24 |
| 460 | -0.11 | -31.11 | -31.09 | 20.23 | -37.65 | -38.59 | -38.19 | -35.59 |
| 470 | -0.11 | -31.25 | -31.24 | 19.95 | -37.05 | -37.77 | -37.04 | -34.94 |
| 480 | -0.11 | -31.43 | -31.41 | 19.66 | -36.40 | -37.07 | -36.02 | -34.26 |
| 485 | -0.12 | -31.53 | -31.51 | 19.50 | -35.91 | -36.58 | -35.42 | -33.85 |
| 490 | -0.12 | -31.63 | -31.61 | 19.34 | -35.42 | -36.09 | -34.82 | -33.43 |
| 495 | -0.12 | -31.74 | -31.72 | 19.15 | -34.84 | -35.38 | -34.17 | -32.91 |
| 500 | -0.12 | -31.85 | -31.83 | 18.95 | -34.26 | -34.66 | -33.52 | -32.39 |
| 505 | -0.12 | -31.97 | -31.95 | 18.74 | -33.63 | -33.92 | -32.87 | -31.85 |
| 510 | -0.12 | -32.09 | -32.07 | 18.52 | -33.00 | -33.17 | -32.22 | -31.30 |
| 515 | -0.12 | -32.22 | -32.20 | 18.30 | -32.39 | -32.53 | -31.62 | -30.77 |
| 520 | -0.12 | -32.34 | -32.32 | 18.07 | -31.77 | -31.89 | -31.02 | -30.23 |
| 525 | -0.13 | -32.49 | -32.46 | 17.81 | -31.22 | -31.29 | -30.47 | -29.73 |
| 530 | -0.13 | -32.63 | -32.60 | 17.55 | -30.67 | -30.68 | -29.92 | -29.23 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = -55°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.07 | -32.94 | -32.95 | 24.79 | -38.45 | -39.35 | -35.80 | -34.54 |
| 235 | -0.07 | -31.92 | -31.93 | 23.88 | -38.02 | -37.16 | -34.01 | -34.05 |
| 240 | -0.07 | -31.80 | -31.82 | 23.72 | -38.12 | -36.92 | -33.94 | -34.13 |
| 245 | -0.07 | -31.69 | -31.70 | 23.60 | -38.29 | -36.84 | -34.05 | -34.44 |
| 250 | -0.07 | -31.58 | -31.60 | 23.45 | -38.39 | -36.79 | -34.10 | -34.61 |
| 255 | -0.08 | -31.48 | -31.50 | 23.36 | -38.68 | -36.62 | -34.22 | -34.83 |
| 260 | -0.08 | -31.39 | -31.41 | 23.30 | -39.06 | -36.66 | -34.34 | -35.23 |
| 265 | -0.08 | -31.30 | -31.32 | 23.26 | -39.52 | -36.73 | -34.61 | -35.59 |
| 270 | -0.08 | -31.22 | -31.23 | 23.22 | -40.39 | -36.76 | -34.96 | -36.11 |
| 275 | -0.08 | -31.14 | -31.15 | 23.15 | -40.99 | -36.92 | -35.27 | -36.63 |
| 280 | -0.08 | -31.06 | -31.08 | 23.09 | -41.67 | -36.98 | -35.54 | -37.27 |
| 290 | -0.08 | -30.93 | -30.94 | 22.95 | -42.59 | -37.02 | -36.04 | -37.99 |
| 300 | -0.09 | -30.81 | -30.82 | 22.87 | -42.75 | -37.01 | -36.25 | -38.64 |
| 310 | -0.09 | -30.71 | -30.72 | 22.81 | -42.98 | -37.16 | -36.51 | -39.25 |
| 320 | -0.09 | -30.62 | -30.64 | 22.75 | -43.51 | -37.47 | -36.88 | -40.27 |
| 330 | -0.09 | -30.55 | -30.57 | 22.64 | -44.44 | -37.75 | -37.23 | -41.41 |
| 340 | -0.09 | -30.49 | -30.51 | 22.45 | -44.91 | -38.13 | -37.62 | -42.49 |
| 350 | -0.09 | -30.45 | -30.47 | 22.25 | -44.64 | -38.33 | -37.85 | -43.49 |
| 360 | -0.09 | -30.43 | -30.44 | 22.18 | -46.00 | -38.73 | -38.36 | -45.14 |
| 370 | -0.10 | -30.42 | -30.44 | 22.16 | -47.94 | -39.20 | -38.88 | -47.43 |
| 380 | -0.10 | -30.44 | -30.45 | 22.13 | -50.02 | -39.62 | -39.19 | -49.58 |
| 390 | -0.10 | -30.46 | -30.48 | 22.07 | -49.37 | -40.10 | -39.14 | -50.08 |
| 400 | -0.10 | -30.50 | -30.52 | 22.00 | -47.56 | -40.01 | -39.03 | -48.64 |
| 410 | -0.11 | -30.56 | -30.58 | 21.93 | -45.43 | -40.08 | -38.73 | -46.48 |
| 420 | -0.11 | -30.63 | -30.65 | 21.88 | -44.02 | -39.91 | -38.35 | -44.57 |
| 430 | -0.11 | -30.72 | -30.74 | 21.69 | -42.49 | -39.49 | -37.90 | -42.81 |
| 440 | -0.11 | -30.82 | -30.84 | 21.46 | -40.90 | -38.96 | -37.18 | -40.79 |
| 450 | -0.11 | -30.94 | -30.96 | 21.16 | -39.41 | -38.24 | -36.24 | -39.33 |
| 460 | -0.12 | -31.09 | -31.11 | 20.87 | -38.59 | -37.65 | -35.59 | -38.19 |
| 470 | -0.12 | -31.24 | -31.25 | 20.57 | -37.77 | -37.05 | -34.94 | -37.04 |
| 480 | -0.12 | -31.41 | -31.43 | 20.28 | -37.07 | -36.40 | -34.26 | -36.02 |
| 485 | -0.12 | -31.51 | -31.53 | 20.10 | -36.58 | -35.91 | -33.85 | -35.42 |
| 490 | -0.12 | -31.61 | -31.63 | 19.92 | -36.09 | -35.42 | -33.43 | -34.82 |
| 495 | -0.12 | -31.72 | -31.74 | 19.70 | -35.38 | -34.84 | -32.91 | -34.17 |
| 500 | -0.12 | -31.83 | -31.85 | 19.48 | -34.66 | -34.26 | -32.39 | -33.52 |
| 505 | -0.13 | -31.95 | -31.97 | 19.24 | -33.92 | -33.63 | -31.85 | -32.87 |
| 510 | -0.13 | -32.07 | -32.09 | 19.00 | -33.17 | -33.00 | -31.30 | -32.22 |
| 515 | -0.13 | -32.20 | -32.22 | 18.74 | -32.53 | -32.39 | -30.77 | -31.62 |
| 520 | -0.13 | -32.32 | -32.34 | 18.47 | -31.89 | -31.77 | -30.23 | -31.02 |
| 525 | -0.13 | -32.46 | -32.49 | 18.16 | -31.29 | -31.22 | -29.73 | -30.47 |
| 530 | -0.13 | -32.60 | -32.63 | 17.85 | -30.68 | -30.67 | -29.23 | -29.92 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.10 | -32.93 | -32.92 | 24.46 | -40.43 | -40.63 | -40.56 | -39.31 |
| 235 | -0.11 | -31.92 | -31.91 | 24.35 | -40.49 | -40.56 | -40.02 | -39.88 |
| 240 | -0.10 | -31.80 | -31.80 | 24.26 | -40.36 | -40.47 | -39.78 | -39.76 |
| 245 | -0.10 | -31.70 | -31.69 | 24.22 | -40.44 | -40.53 | -40.03 | -39.83 |
| 250 | -0.11 | -31.59 | -31.59 | 24.17 | -40.60 | -40.58 | -40.16 | -39.85 |
| 255 | -0.11 | -31.49 | -31.49 | 24.16 | -40.78 | -40.61 | -40.56 | -39.80 |
| 260 | -0.11 | -31.40 | -31.40 | 24.14 | -40.93 | -40.76 | -41.20 | -39.87 |
| 265 | -0.11 | -31.31 | -31.31 | 24.15 | -41.12 | -40.82 | -41.65 | -39.85 |
| 270 | -0.11 | -31.23 | -31.23 | 24.18 | -41.32 | -40.63 | -42.08 | -39.72 |
| 275 | -0.12 | -31.15 | -31.15 | 24.14 | -41.36 | -40.61 | -42.13 | -39.89 |
| 280 | -0.12 | -31.08 | -31.07 | 24.18 | -41.46 | -40.58 | -42.25 | -39.90 |
| 290 | -0.12 | -30.95 | -30.94 | 24.20 | -41.46 | -40.38 | -42.24 | -40.02 |
| 300 | -0.12 | -30.83 | -30.83 | 24.27 | -41.38 | -40.42 | -42.46 | -40.36 |
| 310 | -0.13 | -30.74 | -30.73 | 24.27 | -41.13 | -40.31 | -42.51 | -40.74 |
| 320 | -0.13 | -30.65 | -30.65 | 24.21 | -40.54 | -40.20 | -42.32 | -40.84 |
| 330 | -0.13 | -30.58 | -30.57 | 24.01 | -39.80 | -39.65 | -41.76 | -40.63 |
| 340 | -0.13 | -30.52 | -30.52 | 23.84 | -39.21 | -39.09 | -40.77 | -40.49 |
| 350 | -0.13 | -30.49 | -30.48 | 23.57 | -38.46 | -38.51 | -39.82 | -40.01 |
| 360 | -0.14 | -30.47 | -30.46 | 23.35 | -38.25 | -38.23 | -39.97 | -39.71 |
| 370 | -0.14 | -30.47 | -30.46 | 23.20 | -38.23 | -38.13 | -40.34 | -39.44 |
| 380 | -0.14 | -30.48 | -30.48 | 23.05 | -38.09 | -37.78 | -40.60 | -39.12 |
| 390 | -0.15 | -30.51 | -30.51 | 22.84 | -37.39 | -37.04 | -39.88 | -38.55 |
| 400 | -0.15 | -30.55 | -30.55 | 22.68 | -36.48 | -35.93 | -38.53 | -37.44 |
| 410 | -0.15 | -30.62 | -30.61 | 22.48 | -35.29 | -34.83 | -36.93 | -36.33 |
| 420 | -0.15 | -30.69 | -30.69 | 22.17 | -34.16 | -33.81 | -35.61 | -35.28 |
| 430 | -0.16 | -30.78 | -30.77 | 21.82 | -33.23 | -32.97 | -34.40 | -34.33 |
| 440 | -0.16 | -30.88 | -30.88 | 21.40 | -32.42 | -32.10 | -33.31 | -33.51 |
| 450 | -0.16 | -31.01 | -31.00 | 20.92 | -31.66 | -31.47 | -32.42 | -32.73 |
| 460 | -0.16 | -31.16 | -31.15 | 20.50 | -31.19 | -31.07 | -32.03 | -32.21 |
| 470 | -0.16 | -31.31 | -31.30 | 20.08 | -30.71 | -30.66 | -31.63 | -31.69 |
| 480 | -0.17 | -31.49 | -31.48 | 19.64 | -30.34 | -30.28 | -31.41 | -31.27 |
| 485 | -0.17 | -31.59 | -31.58 | 19.42 | -30.13 | -30.03 | -31.23 | -31.01 |
| 490 | -0.17 | -31.69 | -31.68 | 19.20 | -29.91 | -29.77 | -31.05 | -30.74 |
| 495 | -0.17 | -31.81 | -31.80 | 18.95 | -29.61 | -29.46 | -30.71 | -30.42 |
| 500 | -0.17 | -31.92 | -31.91 | 18.70 | -29.31 | -29.14 | -30.37 | -30.09 |
| 505 | -0.18 | -32.04 | -32.03 | 18.45 | -28.98 | -28.80 | -29.96 | -29.75 |
| 510 | -0.18 | -32.16 | -32.15 | 18.19 | -28.64 | -28.46 | -29.55 | -29.40 |
| 515 | -0.18 | -32.29 | -32.28 | 17.91 | -28.28 | -28.14 | -29.18 | -29.07 |
| 520 | -0.18 | -32.42 | -32.41 | 17.63 | -27.92 | -27.82 | -28.80 | -28.73 |
| 525 | -0.18 | -32.57 | -32.55 | 17.34 | -27.60 | -27.52 | -28.44 | -28.44 |
| 530 | -0.18 | -32.71 | -32.69 | 17.05 | -27.28 | -27.21 | -28.07 | -28.15 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.10 | -32.92 | -32.93 | 24.73 | -40.63 | -40.43 | -39.31 | -40.56 |
| 235 | -0.10 | -31.91 | -31.92 | 24.46 | -40.56 | -40.49 | -39.88 | -40.02 |
| 240 | -0.10 | -31.80 | -31.80 | 24.39 | -40.47 | -40.36 | -39.76 | -39.78 |
| 245 | -0.10 | -31.69 | -31.70 | 24.37 | -40.53 | -40.44 | -39.83 | -40.03 |
| 250 | -0.10 | -31.59 | -31.59 | 24.37 | -40.58 | -40.60 | -39.85 | -40.16 |
| 255 | -0.10 | -31.49 | -31.49 | 24.37 | -40.61 | -40.78 | -39.80 | -40.56 |
| 260 | -0.11 | -31.40 | -31.40 | 24.40 | -40.76 | -40.93 | -39.87 | -41.20 |
| 265 | -0.11 | -31.31 | -31.31 | 24.43 | -40.82 | -41.12 | -39.85 | -41.65 |
| 270 | -0.11 | -31.23 | -31.23 | 24.40 | -40.63 | -41.32 | -39.72 | -42.08 |
| 275 | -0.11 | -31.15 | -31.15 | 24.45 | -40.61 | -41.36 | -39.89 | -42.13 |
| 280 | -0.11 | -31.07 | -31.08 | 24.46 | -40.58 | -41.46 | -39.90 | -42.25 |
| 290 | -0.12 | -30.94 | -30.95 | 24.48 | -40.38 | -41.46 | -40.02 | -42.24 |
| 300 | -0.12 | -30.83 | -30.83 | 24.45 | -40.42 | -41.38 | -40.36 | -42.46 |
| 310 | -0.13 | -30.73 | -30.74 | 24.48 | -40.31 | -41.13 | -40.74 | -42.51 |
| 320 | -0.13 | -30.65 | -30.65 | 24.41 | -40.20 | -40.54 | -40.84 | -42.32 |
| 330 | -0.13 | -30.57 | -30.58 | 24.17 | -39.65 | -39.80 | -40.63 | -41.76 |
| 340 | -0.13 | -30.52 | -30.52 | 23.93 | -39.09 | -39.21 | -40.49 | -40.77 |
| 350 | -0.13 | -30.48 | -30.49 | 23.68 | -38.51 | -38.46 | -40.01 | -39.82 |
| 360 | -0.13 | -30.46 | -30.47 | 23.53 | -38.23 | -38.25 | -39.71 | -39.97 |
| 370 | -0.14 | -30.46 | -30.47 | 23.39 | -38.13 | -38.23 | -39.44 | -40.34 |
| 380 | -0.14 | -30.48 | -30.48 | 23.28 | -37.78 | -38.09 | -39.12 | -40.60 |
| 390 | -0.14 | -30.51 | -30.51 | 23.06 | -37.04 | -37.39 | -38.55 | -39.88 |
| 400 | -0.15 | -30.55 | -30.55 | 22.89 | -35.93 | -36.48 | -37.44 | -38.53 |
| 410 | -0.15 | -30.61 | -30.62 | 22.64 | -34.83 | -35.29 | -36.33 | -36.93 |
| 420 | -0.15 | -30.69 | -30.69 | 22.32 | -33.81 | -34.16 | -35.28 | -35.61 |
| 430 | -0.15 | -30.77 | -30.78 | 21.93 | -32.97 | -33.23 | -34.33 | -34.40 |
| 440 | -0.15 | -30.88 | -30.88 | 21.47 | -32.10 | -32.42 | -33.51 | -33.31 |
| 450 | -0.15 | -31.00 | -31.01 | 20.99 | -31.47 | -31.66 | -32.73 | -32.42 |
| 460 | -0.16 | -31.15 | -31.16 | 20.56 | -31.07 | -31.19 | -32.21 | -32.03 |
| 470 | -0.16 | -31.30 | -31.31 | 20.13 | -30.66 | -30.71 | -31.69 | -31.63 |
| 480 | -0.16 | -31.48 | -31.49 | 19.69 | -30.28 | -30.34 | -31.27 | -31.41 |
| 485 | -0.17 | -31.58 | -31.59 | 19.47 | -30.03 | -30.13 | -31.01 | -31.23 |
| 490 | -0.17 | -31.68 | -31.69 | 19.24 | -29.77 | -29.91 | -30.74 | -31.05 |
| 495 | -0.17 | -31.80 | -31.81 | 18.99 | -29.46 | -29.61 | -30.42 | -30.71 |
| 500 | -0.17 | -31.91 | -31.92 | 18.74 | -29.14 | -29.31 | -30.09 | -30.37 |
| 505 | -0.17 | -32.03 | -32.04 | 18.48 | -28.80 | -28.98 | -29.75 | -29.96 |
| 510 | -0.17 | -32.15 | -32.16 | 18.21 | -28.46 | -28.64 | -29.40 | -29.55 |
| 515 | -0.18 | -32.28 | -32.29 | 17.92 | -28.14 | -28.28 | -29.07 | -29.18 |
| 520 | -0.18 | -32.41 | -32.42 | 17.63 | -27.82 | -27.92 | -28.73 | -28.80 |
| 525 | -0.18 | -32.55 | -32.57 | 17.33 | -27.52 | -27.60 | -28.44 | -28.44 |
| 530 | -0.18 | -32.69 | -32.71 | 17.02 | -27.21 | -27.28 | -28.15 | -28.07 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.09 | -32.94 | -32.93 | 24.50 | -39.31 | -40.56 | -40.63 | -40.43 |
| 235 | -0.10 | -31.93 | -31.92 | 24.40 | -39.88 | -40.02 | -40.56 | -40.49 |
| 240 | -0.10 | -31.81 | -31.81 | 24.28 | -39.76 | -39.78 | -40.47 | -40.36 |
| 245 | -0.10 | -31.70 | -31.70 | 24.24 | -39.83 | -40.03 | -40.53 | -40.44 |
| 250 | -0.10 | -31.60 | -31.59 | 24.25 | -39.85 | -40.16 | -40.58 | -40.60 |
| 255 | -0.10 | -31.50 | -31.50 | 24.18 | -39.80 | -40.56 | -40.61 | -40.78 |
| 260 | -0.10 | -31.40 | -31.40 | 24.18 | -39.87 | -41.20 | -40.76 | -40.93 |
| 265 | -0.11 | -31.32 | -31.32 | 24.18 | -39.85 | -41.65 | -40.82 | -41.12 |
| 270 | -0.11 | -31.24 | -31.24 | 24.17 | -39.72 | -42.08 | -40.63 | -41.32 |
| 275 | -0.11 | -31.16 | -31.16 | 24.19 | -39.89 | -42.13 | -40.61 | -41.36 |
| 280 | -0.11 | -31.09 | -31.08 | 24.23 | -39.90 | -42.25 | -40.58 | -41.46 |
| 290 | -0.11 | -30.95 | -30.95 | 24.23 | -40.02 | -42.24 | -40.38 | -41.46 |
| 300 | -0.12 | -30.84 | -30.83 | 24.29 | -40.36 | -42.46 | -40.42 | -41.38 |
| 310 | -0.12 | -30.74 | -30.74 | 24.31 | -40.74 | -42.51 | -40.31 | -41.13 |
| 320 | -0.12 | -30.66 | -30.65 | 24.21 | -40.84 | -42.32 | -40.20 | -40.54 |
| 330 | -0.13 | -30.59 | -30.58 | 24.05 | -40.63 | -41.76 | -39.65 | -39.80 |
| 340 | -0.13 | -30.53 | -30.53 | 23.86 | -40.49 | -40.77 | -39.09 | -39.21 |
| 350 | -0.13 | -30.49 | -30.49 | 23.57 | -40.01 | -39.82 | -38.51 | -38.46 |
| 360 | -0.13 | -30.47 | -30.47 | 23.39 | -39.71 | -39.97 | -38.23 | -38.25 |
| 370 | -0.13 | -30.47 | -30.47 | 23.23 | -39.44 | -40.34 | -38.13 | -38.23 |
| 380 | -0.13 | -30.49 | -30.48 | 23.09 | -39.12 | -40.60 | -37.78 | -38.09 |
| 390 | -0.14 | -30.52 | -30.51 | 22.95 | -38.55 | -39.88 | -37.04 | -37.39 |
| 400 | -0.14 | -30.56 | -30.56 | 22.74 | -37.44 | -38.53 | -35.93 | -36.48 |
| 410 | -0.14 | -30.62 | -30.62 | 22.53 | -36.33 | -36.93 | -34.83 | -35.29 |
| 420 | -0.15 | -30.70 | -30.70 | 22.20 | -35.28 | -35.61 | -33.81 | -34.16 |
| 430 | -0.15 | -30.78 | -30.78 | 21.84 | -34.33 | -34.40 | -32.97 | -33.23 |
| 440 | -0.15 | -30.89 | -30.89 | 21.44 | -33.51 | -33.31 | -32.10 | -32.42 |
| 450 | -0.15 | -31.01 | -31.01 | 20.98 | -32.73 | -32.42 | -31.47 | -31.66 |
| 460 | -0.16 | -31.16 | -31.16 | 20.55 | -32.21 | -32.03 | -31.07 | -31.19 |
| 470 | -0.16 | -31.31 | -31.31 | 20.12 | -31.69 | -31.63 | -30.66 | -30.71 |
| 480 | -0.16 | -31.49 | -31.50 | 19.69 | -31.27 | -31.41 | -30.28 | -30.34 |
| 485 | -0.17 | -31.59 | -31.60 | 19.47 | -31.01 | -31.23 | -30.03 | -30.13 |
| 490 | -0.17 | -31.69 | -31.70 | 19.24 | -30.74 | -31.05 | -29.77 | -29.91 |
| 495 | -0.17 | -31.81 | -31.81 | 19.00 | -30.42 | -30.71 | -29.46 | -29.61 |
| 500 | -0.17 | -31.92 | -31.92 | 18.75 | -30.09 | -30.37 | -29.14 | -29.31 |
| 505 | -0.17 | -32.04 | -32.04 | 18.49 | -29.75 | -29.96 | -28.80 | -28.98 |
| 510 | -0.17 | -32.16 | -32.16 | 18.22 | -29.40 | -29.55 | -28.46 | -28.64 |
| 515 | -0.17 | -32.29 | -32.29 | 17.94 | -29.07 | -29.18 | -28.14 | -28.28 |
| 520 | -0.17 | -32.42 | -32.42 | 17.66 | -28.73 | -28.80 | -27.82 | -27.92 |
| 525 | -0.18 | -32.57 | -32.57 | 17.36 | -28.44 | -28.44 | -27.52 | -27.60 |
| 530 | -0.18 | -32.71 | -32.71 | 17.06 | -28.15 | -28.07 | -27.21 | -27.28 |

Stripline Surface Mount

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +25°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.10 | -32.93 | -32.94 | 24.52 | -40.56 | -39.31 | -40.43 | -40.63 |
| 235 | -0.11 | -31.92 | -31.93 | 24.37 | -40.02 | -39.88 | -40.49 | -40.56 |
| 240 | -0.11 | -31.81 | -31.81 | 24.27 | -39.78 | -39.76 | -40.36 | -40.47 |
| 245 | -0.11 | -31.70 | -31.70 | 24.24 | -40.03 | -39.83 | -40.44 | -40.53 |
| 250 | -0.11 | -31.59 | -31.60 | 24.16 | -40.16 | -39.85 | -40.60 | -40.58 |
| 255 | -0.11 | -31.50 | -31.50 | 24.17 | -40.56 | -39.80 | -40.78 | -40.61 |
| 260 | -0.11 | -31.40 | -31.40 | 24.19 | -41.20 | -39.87 | -40.93 | -40.76 |
| 265 | -0.12 | -31.32 | -31.32 | 24.21 | -41.65 | -39.85 | -41.12 | -40.82 |
| 270 | -0.12 | -31.24 | -31.24 | 24.25 | -42.08 | -39.72 | -41.32 | -40.63 |
| 275 | -0.12 | -31.16 | -31.16 | 24.25 | -42.13 | -39.89 | -41.36 | -40.61 |
| 280 | -0.12 | -31.08 | -31.09 | 24.25 | -42.25 | -39.90 | -41.46 | -40.58 |
| 290 | -0.12 | -30.95 | -30.95 | 24.28 | -42.24 | -40.02 | -41.46 | -40.38 |
| 300 | -0.13 | -30.83 | -30.84 | 24.24 | -42.46 | -40.36 | -41.38 | -40.42 |
| 310 | -0.13 | -30.74 | -30.74 | 24.30 | -42.51 | -40.74 | -41.13 | -40.31 |
| 320 | -0.13 | -30.65 | -30.66 | 24.30 | -42.32 | -40.84 | -40.54 | -40.20 |
| 330 | -0.14 | -30.58 | -30.59 | 24.13 | -41.76 | -40.63 | -39.80 | -39.65 |
| 340 | -0.14 | -30.53 | -30.53 | 23.84 | -40.77 | -40.49 | -39.21 | -39.09 |
| 350 | -0.14 | -30.49 | -30.49 | 23.57 | -39.82 | -40.01 | -38.46 | -38.51 |
| 360 | -0.14 | -30.47 | -30.47 | 23.42 | -39.97 | -39.71 | -38.25 | -38.23 |
| 370 | -0.14 | -30.47 | -30.47 | 23.29 | -40.34 | -39.44 | -38.23 | -38.13 |
| 380 | -0.15 | -30.48 | -30.49 | 23.18 | -40.60 | -39.12 | -38.09 | -37.78 |
| 390 | -0.15 | -30.51 | -30.52 | 22.95 | -39.88 | -38.55 | -37.39 | -37.04 |
| 400 | -0.15 | -30.56 | -30.56 | 22.76 | -38.53 | -37.44 | -36.48 | -35.93 |
| 410 | -0.15 | -30.62 | -30.62 | 22.50 | -36.93 | -36.33 | -35.29 | -34.83 |
| 420 | -0.16 | -30.70 | -30.70 | 22.25 | -35.61 | -35.28 | -34.16 | -33.81 |
| 430 | -0.16 | -30.78 | -30.78 | 21.86 | -34.40 | -34.33 | -33.23 | -32.97 |
| 440 | -0.16 | -30.89 | -30.89 | 21.40 | -33.31 | -33.51 | -32.42 | -32.10 |
| 450 | -0.16 | -31.01 | -31.01 | 20.92 | -32.42 | -32.73 | -31.66 | -31.47 |
| 460 | -0.17 | -31.16 | -31.16 | 20.48 | -32.03 | -32.21 | -31.19 | -31.07 |
| 470 | -0.17 | -31.31 | -31.31 | 20.04 | -31.63 | -31.69 | -30.71 | -30.66 |
| 480 | -0.17 | -31.50 | -31.49 | 19.62 | -31.41 | -31.27 | -30.34 | -30.28 |
| 485 | -0.18 | -31.60 | -31.59 | 19.39 | -31.23 | -31.01 | -30.13 | -30.03 |
| 490 | -0.18 | -31.70 | -31.69 | 19.15 | -31.05 | -30.74 | -29.91 | -29.77 |
| 495 | -0.18 | -31.81 | -31.81 | 18.91 | -30.71 | -30.42 | -29.61 | -29.46 |
| 500 | -0.18 | -31.92 | -31.92 | 18.67 | -30.37 | -30.09 | -29.31 | -29.14 |
| 505 | -0.18 | -32.04 | -32.04 | 18.41 | -29.96 | -29.75 | -28.98 | -28.80 |
| 510 | -0.18 | -32.16 | -32.16 | 18.14 | -29.55 | -29.40 | -28.64 | -28.46 |
| 515 | -0.18 | -32.29 | -32.29 | 17.87 | -29.18 | -29.07 | -28.28 | -28.14 |
| 520 | -0.18 | -32.42 | -32.42 | 17.59 | -28.80 | -28.73 | -27.92 | -27.82 |
| 525 | -0.19 | -32.57 | -32.57 | 17.29 | -28.44 | -28.44 | -27.60 | -27.52 |
| 530 | -0.19 | -32.71 | -32.71 | 16.98 | -28.07 | -28.15 | -27.28 | -27.21 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration A.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.11 | -32.88 | -32.88 | 22.55 | -33.14 | -33.03 | -32.09 | -31.64 |
| 235 | -0.13 | -31.89 | -31.88 | 23.15 | -31.86 | -31.89 | -30.88 | -30.77 |
| 240 | -0.13 | -31.78 | -31.77 | 23.22 | -31.88 | -31.85 | -30.81 | -30.73 |
| 245 | -0.12 | -31.67 | -31.66 | 23.31 | -31.86 | -31.78 | -30.89 | -30.80 |
| 250 | -0.13 | -31.57 | -31.56 | 23.45 | -31.96 | -31.84 | -30.98 | -30.85 |
| 255 | -0.13 | -31.47 | -31.46 | 23.57 | -32.04 | -31.92 | -31.16 | -30.99 |
| 260 | -0.13 | -31.38 | -31.37 | 23.74 | -32.22 | -32.00 | -31.39 | -31.12 |
| 265 | -0.13 | -31.29 | -31.28 | 23.94 | -32.32 | -32.09 | -31.56 | -31.24 |
| 270 | -0.14 | -31.21 | -31.20 | 24.10 | -32.41 | -32.11 | -31.67 | -31.40 |
| 275 | -0.14 | -31.14 | -31.12 | 24.27 | -32.57 | -32.22 | -31.82 | -31.63 |
| 280 | -0.14 | -31.06 | -31.05 | 24.48 | -32.78 | -32.31 | -32.03 | -31.89 |
| 290 | -0.14 | -30.93 | -30.92 | 24.93 | -33.31 | -32.83 | -32.64 | -32.64 |
| 300 | -0.15 | -30.82 | -30.81 | 25.47 | -34.40 | -33.70 | -33.67 | -33.78 |
| 310 | -0.15 | -30.72 | -30.71 | 26.01 | -35.96 | -34.79 | -35.02 | -35.27 |
| 320 | -0.15 | -30.64 | -30.63 | 26.43 | -37.56 | -35.89 | -36.48 | -36.75 |
| 330 | -0.15 | -30.57 | -30.56 | 26.57 | -39.49 | -36.78 | -37.77 | -38.29 |
| 340 | -0.15 | -30.52 | -30.51 | 26.71 | -41.59 | -37.60 | -38.76 | -39.95 |
| 350 | -0.15 | -30.48 | -30.47 | 26.66 | -43.33 | -38.20 | -39.55 | -41.12 |
| 360 | -0.16 | -30.46 | -30.45 | 26.54 | -43.47 | -38.47 | -40.29 | -41.66 |
| 370 | -0.16 | -30.46 | -30.45 | 26.46 | -42.24 | -38.41 | -40.17 | -41.16 |
| 380 | -0.16 | -30.48 | -30.47 | 26.27 | -40.37 | -37.79 | -39.48 | -39.85 |
| 390 | -0.17 | -30.51 | -30.50 | 25.97 | -38.11 | -36.43 | -37.71 | -38.08 |
| 400 | -0.17 | -30.56 | -30.55 | 25.61 | -36.02 | -34.93 | -35.72 | -35.96 |
| 410 | -0.17 | -30.62 | -30.61 | 25.11 | -34.08 | -33.45 | -33.92 | -34.16 |
| 420 | -0.18 | -30.70 | -30.69 | 24.52 | -32.45 | -32.13 | -32.46 | -32.69 |
| 430 | -0.18 | -30.79 | -30.78 | 23.85 | -31.17 | -31.03 | -31.24 | -31.47 |
| 440 | -0.18 | -30.90 | -30.88 | 23.12 | -30.12 | -29.98 | -30.17 | -30.45 |
| 450 | -0.18 | -31.02 | -31.01 | 22.34 | -29.21 | -29.18 | -29.27 | -29.55 |
| 460 | -0.19 | -31.18 | -31.17 | 21.70 | -28.58 | -28.59 | -28.74 | -28.94 |
| 470 | -0.19 | -31.34 | -31.32 | 21.05 | -27.95 | -27.99 | -28.21 | -28.32 |
| 480 | -0.20 | -31.52 | -31.51 | 20.42 | -27.49 | -27.48 | -27.84 | -27.81 |
| 485 | -0.20 | -31.62 | -31.61 | 20.10 | -27.25 | -27.21 | -27.63 | -27.55 |
| 490 | -0.20 | -31.72 | -31.71 | 19.78 | -27.01 | -26.93 | -27.42 | -27.29 |
| 495 | -0.21 | -31.84 | -31.82 | 19.46 | -26.72 | -26.63 | -27.12 | -27.01 |
| 500 | -0.21 | -31.95 | -31.93 | 19.13 | -26.43 | -26.33 | -26.82 | -26.73 |
| 505 | -0.21 | -32.08 | -32.06 | 18.80 | -26.13 | -26.04 | -26.51 | -26.45 |
| 510 | -0.21 | -32.20 | -32.18 | 18.46 | -25.83 | -25.75 | -26.19 | -26.16 |
| 515 | -0.21 | -32.33 | -32.32 | 18.12 | -25.52 | -25.48 | -25.92 | -25.89 |
| 520 | -0.21 | -32.46 | -32.45 | 17.78 | -25.21 | -25.20 | -25.64 | -25.62 |
| 525 | -0.22 | -32.61 | -32.60 | 17.44 | -24.95 | -24.95 | -25.38 | -25.40 |
| 530 | -0.22 | -32.75 | -32.74 | 17.09 | -24.68 | -24.69 | -25.11 | -25.17 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration B.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.11 | -32.88 | -32.88 | 22.92 | -33.03 | -33.14 | -31.64 | -32.09 |
| 235 | -0.12 | -31.88 | -31.89 | 23.39 | -31.89 | -31.86 | -30.77 | -30.88 |
| 240 | -0.12 | -31.77 | -31.78 | 23.49 | -31.85 | -31.88 | -30.73 | -30.81 |
| 245 | -0.12 | -31.66 | -31.67 | 23.61 | -31.78 | -31.86 | -30.80 | -30.89 |
| 250 | -0.12 | -31.56 | -31.57 | 23.74 | -31.84 | -31.96 | -30.85 | -30.98 |
| 255 | -0.12 | -31.46 | -31.47 | 23.91 | -31.92 | -32.04 | -30.99 | -31.16 |
| 260 | -0.12 | -31.37 | -31.38 | 24.10 | -32.00 | -32.22 | -31.12 | -31.39 |
| 265 | -0.13 | -31.28 | -31.29 | 24.31 | -32.09 | -32.32 | -31.24 | -31.56 |
| 270 | -0.13 | -31.20 | -31.21 | 24.46 | -32.11 | -32.41 | -31.40 | -31.67 |
| 275 | -0.13 | -31.12 | -31.14 | 24.63 | -32.22 | -32.57 | -31.63 | -31.82 |
| 280 | -0.13 | -31.05 | -31.06 | 24.78 | -32.31 | -32.78 | -31.89 | -32.03 |
| 290 | -0.13 | -30.92 | -30.93 | 25.16 | -32.83 | -33.31 | -32.64 | -32.64 |
| 300 | -0.14 | -30.81 | -30.82 | 25.60 | -33.70 | -34.40 | -33.78 | -33.67 |
| 310 | -0.14 | -30.71 | -30.72 | 25.91 | -34.79 | -35.96 | -35.27 | -35.02 |
| 320 | -0.14 | -30.63 | -30.64 | 26.17 | -35.89 | -37.56 | -36.75 | -36.48 |
| 330 | -0.15 | -30.56 | -30.57 | 26.19 | -36.78 | -39.49 | -38.29 | -37.77 |
| 340 | -0.15 | -30.51 | -30.52 | 26.18 | -37.60 | -41.59 | -39.95 | -38.76 |
| 350 | -0.14 | -30.47 | -30.48 | 26.12 | -38.20 | -43.33 | -41.12 | -39.55 |
| 360 | -0.15 | -30.45 | -30.46 | 26.06 | -38.47 | -43.47 | -41.66 | -40.29 |
| 370 | -0.15 | -30.45 | -30.46 | 25.98 | -38.41 | -42.24 | -41.16 | -40.17 |
| 380 | -0.16 | -30.47 | -30.48 | 25.85 | -37.79 | -40.37 | -39.85 | -39.48 |
| 390 | -0.16 | -30.50 | -30.51 | 25.55 | -36.43 | -38.11 | -38.08 | -37.71 |
| 400 | -0.16 | -30.55 | -30.56 | 25.23 | -34.93 | -36.02 | -35.96 | -35.72 |
| 410 | -0.16 | -30.61 | -30.62 | 24.80 | -33.45 | -34.08 | -34.16 | -33.92 |
| 420 | -0.17 | -30.69 | -30.70 | 24.25 | -32.13 | -32.45 | -32.69 | -32.46 |
| 430 | -0.17 | -30.78 | -30.79 | 23.64 | -31.03 | -31.17 | -31.47 | -31.24 |
| 440 | -0.17 | -30.88 | -30.90 | 22.93 | -29.98 | -30.12 | -30.45 | -30.17 |
| 450 | -0.18 | -31.01 | -31.02 | 22.22 | -29.18 | -29.21 | -29.55 | -29.27 |
| 460 | -0.18 | -31.17 | -31.18 | 21.63 | -28.59 | -28.58 | -28.94 | -28.74 |
| 470 | -0.18 | -31.32 | -31.34 | 21.03 | -27.99 | -27.95 | -28.32 | -28.21 |
| 480 | -0.19 | -31.51 | -31.52 | 20.45 | -27.48 | -27.49 | -27.81 | -27.84 |
| 485 | -0.19 | -31.61 | -31.62 | 20.15 | -27.21 | -27.25 | -27.55 | -27.63 |
| 490 | -0.19 | -31.71 | -31.72 | 19.85 | -26.93 | -27.01 | -27.29 | -27.42 |
| 495 | -0.20 | -31.82 | -31.84 | 19.54 | -26.63 | -26.72 | -27.01 | -27.12 |
| 500 | -0.20 | -31.93 | -31.95 | 19.22 | -26.33 | -26.43 | -26.73 | -26.82 |
| 505 | -0.20 | -32.06 | -32.08 | 18.89 | -26.04 | -26.13 | -26.45 | -26.51 |
| 510 | -0.20 | -32.18 | -32.20 | 18.56 | -25.75 | -25.83 | -26.16 | -26.19 |
| 515 | -0.20 | -32.32 | -32.33 | 18.22 | -25.48 | -25.52 | -25.89 | -25.92 |
| 520 | -0.20 | -32.45 | -32.46 | 17.88 | -25.20 | -25.21 | -25.62 | -25.64 |
| 525 | -0.21 | -32.60 | -32.61 | 17.52 | -24.95 | -24.95 | -25.40 | -25.38 |
| 530 | -0.21 | -32.74 | -32.75 | 17.16 | -24.69 | -24.68 | -25.17 | -25.11 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration C.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.11 | -32.89 | -32.89 | 22.58 | -31.64 | -32.09 | -33.03 | -33.14 |
| 235 | -0.12 | -31.89 | -31.89 | 23.13 | -30.77 | -30.88 | -31.89 | -31.86 |
| 240 | -0.12 | -31.78 | -31.78 | 23.20 | -30.73 | -30.81 | -31.85 | -31.88 |
| 245 | -0.12 | -31.67 | -31.67 | 23.33 | -30.80 | -30.89 | -31.78 | -31.86 |
| 250 | -0.12 | -31.57 | -31.57 | 23.47 | -30.85 | -30.98 | -31.84 | -31.96 |
| 255 | -0.12 | -31.47 | -31.47 | 23.60 | -30.99 | -31.16 | -31.92 | -32.04 |
| 260 | -0.13 | -31.38 | -31.38 | 23.80 | -31.12 | -31.39 | -32.00 | -32.22 |
| 265 | -0.13 | -31.30 | -31.30 | 23.93 | -31.24 | -31.56 | -32.09 | -32.32 |
| 270 | -0.13 | -31.22 | -31.21 | 24.12 | -31.40 | -31.67 | -32.11 | -32.41 |
| 275 | -0.13 | -31.14 | -31.14 | 24.33 | -31.63 | -31.82 | -32.22 | -32.57 |
| 280 | -0.13 | -31.07 | -31.07 | 24.55 | -31.89 | -32.03 | -32.31 | -32.78 |
| 290 | -0.14 | -30.94 | -30.93 | 24.98 | -32.64 | -32.64 | -32.83 | -33.31 |
| 300 | -0.14 | -30.82 | -30.82 | 25.52 | -33.78 | -33.67 | -33.70 | -34.40 |
| 310 | -0.15 | -30.73 | -30.72 | 26.04 | -35.27 | -35.02 | -34.79 | -35.96 |
| 320 | -0.15 | -30.65 | -30.65 | 26.43 | -36.75 | -36.48 | -35.89 | -37.56 |
| 330 | -0.15 | -30.58 | -30.58 | 26.57 | -38.29 | -37.77 | -36.78 | -39.49 |
| 340 | -0.15 | -30.52 | -30.52 | 26.73 | -39.95 | -38.76 | -37.60 | -41.59 |
| 350 | -0.15 | -30.48 | -30.49 | 26.65 | -41.12 | -39.55 | -38.20 | -43.33 |
| 360 | -0.15 | -30.47 | -30.47 | 26.62 | -41.66 | -40.29 | -38.47 | -43.47 |
| 370 | -0.16 | -30.46 | -30.47 | 26.52 | -41.16 | -40.17 | -38.41 | -42.24 |
| 380 | -0.16 | -30.48 | -30.49 | 26.34 | -39.85 | -39.48 | -37.79 | -40.37 |
| 390 | -0.17 | -30.51 | -30.52 | 26.10 | -38.08 | -37.71 | -36.43 | -38.11 |
| 400 | -0.17 | -30.56 | -30.56 | 25.69 | -35.96 | -35.72 | -34.93 | -36.02 |
| 410 | -0.17 | -30.62 | -30.62 | 25.16 | -34.16 | -33.92 | -33.45 | -34.08 |
| 420 | -0.17 | -30.70 | -30.70 | 24.58 | -32.69 | -32.46 | -32.13 | -32.45 |
| 430 | -0.18 | -30.79 | -30.80 | 23.88 | -31.47 | -31.24 | -31.03 | -31.17 |
| 440 | -0.18 | -30.90 | -30.90 | 23.16 | -30.45 | -30.17 | -29.98 | -30.12 |
| 450 | -0.18 | -31.02 | -31.03 | 22.41 | -29.55 | -29.27 | -29.18 | -29.21 |
| 460 | -0.19 | -31.18 | -31.19 | 21.75 | -28.94 | -28.74 | -28.59 | -28.58 |
| 470 | -0.19 | -31.33 | -31.34 | 21.08 | -28.32 | -28.21 | -27.99 | -27.95 |
| 480 | -0.19 | -31.52 | -31.52 | 20.47 | -27.81 | -27.84 | -27.48 | -27.49 |
| 485 | -0.20 | -31.62 | -31.63 | 20.16 | -27.55 | -27.63 | -27.21 | -27.25 |
| 490 | -0.20 | -31.72 | -31.73 | 19.84 | -27.29 | -27.42 | -26.93 | -27.01 |
| 495 | -0.20 | -31.84 | -31.84 | 19.50 | -27.01 | -27.12 | -26.63 | -26.72 |
| 500 | -0.20 | -31.95 | -31.95 | 19.15 | -26.73 | -26.82 | -26.33 | -26.43 |
| 505 | -0.21 | -32.07 | -32.08 | 18.83 | -26.45 | -26.51 | -26.04 | -26.13 |
| 510 | -0.21 | -32.19 | -32.20 | 18.50 | -26.16 | -26.19 | -25.75 | -25.83 |
| 515 | -0.21 | -32.33 | -32.33 | 18.16 | -25.89 | -25.92 | -25.48 | -25.52 |
| 520 | -0.21 | -32.46 | -32.46 | 17.81 | -25.62 | -25.64 | -25.20 | -25.21 |
| 525 | -0.22 | -32.61 | -32.61 | 17.46 | -25.40 | -25.38 | -24.95 | -24.95 |
| 530 | -0.22 | -32.75 | -32.75 | 17.11 | -25.17 | -25.11 | -24.69 | -24.68 |

# Bi-Directional Coupler MBDA-30-451HP+

## Typical Performance Data

Test Conditions: Input Power = +5 dbm, Temperature = +105°C, Configuration D.

| Freq. (MHz) | I. Loss (dB) | Coupling (dB) | | Directivity (dB) | Return Loss (dB) | | | |
|---|---|---|---|---|---|---|---|---|
| | In - Out | In - Fwd | Out - Rev | In - Fwd | In | Out | Fwd | Rev |
| 200 | -0.12 | -32.89 | -32.89 | 22.78 | -32.09 | -31.64 | -33.14 | -33.03 |
| 235 | -0.13 | -31.89 | -31.89 | 23.32 | -30.88 | -30.77 | -31.86 | -31.89 |
| 240 | -0.13 | -31.78 | -31.78 | 23.34 | -30.81 | -30.73 | -31.88 | -31.85 |
| 245 | -0.13 | -31.67 | -31.67 | 23.45 | -30.89 | -30.80 | -31.86 | -31.78 |
| 250 | -0.13 | -31.57 | -31.57 | 23.54 | -30.98 | -30.85 | -31.96 | -31.84 |
| 255 | -0.13 | -31.47 | -31.47 | 23.68 | -31.16 | -30.99 | -32.04 | -31.92 |
| 260 | -0.14 | -31.38 | -31.38 | 23.90 | -31.39 | -31.12 | -32.22 | -32.00 |
| 265 | -0.14 | -31.30 | -31.30 | 24.06 | -31.56 | -31.24 | -32.32 | -32.09 |
| 270 | -0.14 | -31.21 | -31.22 | 24.26 | -31.67 | -31.40 | -32.41 | -32.11 |
| 275 | -0.14 | -31.14 | -31.14 | 24.40 | -31.82 | -31.63 | -32.57 | -32.22 |
| 280 | -0.14 | -31.07 | -31.07 | 24.61 | -32.03 | -31.89 | -32.78 | -32.31 |
| 290 | -0.15 | -30.93 | -30.94 | 24.91 | -32.64 | -32.64 | -33.31 | -32.83 |
| 300 | -0.15 | -30.82 | -30.82 | 25.38 | -33.67 | -33.78 | -34.40 | -33.70 |
| 310 | -0.15 | -30.72 | -30.73 | 25.76 | -35.02 | -35.27 | -35.96 | -34.79 |
| 320 | -0.16 | -30.65 | -30.65 | 26.05 | -36.48 | -36.75 | -37.56 | -35.89 |
| 330 | -0.16 | -30.58 | -30.58 | 26.15 | -37.77 | -38.29 | -39.49 | -36.78 |
| 340 | -0.16 | -30.52 | -30.52 | 26.07 | -38.76 | -39.95 | -41.59 | -37.60 |
| 350 | -0.16 | -30.49 | -30.48 | 25.94 | -39.55 | -41.12 | -43.33 | -38.20 |
| 360 | -0.16 | -30.47 | -30.47 | 25.91 | -40.29 | -41.66 | -43.47 | -38.47 |
| 370 | -0.17 | -30.47 | -30.46 | 25.83 | -40.17 | -41.16 | -42.24 | -38.41 |
| 380 | -0.17 | -30.49 | -30.48 | 25.69 | -39.48 | -39.85 | -40.37 | -37.79 |
| 390 | -0.17 | -30.52 | -30.51 | 25.44 | -37.71 | -38.08 | -38.11 | -36.43 |
| 400 | -0.18 | -30.56 | -30.56 | 25.05 | -35.72 | -35.96 | -36.02 | -34.93 |
| 410 | -0.18 | -30.62 | -30.62 | 24.64 | -33.92 | -34.16 | -34.08 | -33.45 |
| 420 | -0.18 | -30.70 | -30.70 | 24.18 | -32.46 | -32.69 | -32.45 | -32.13 |
| 430 | -0.19 | -30.80 | -30.79 | 23.56 | -31.24 | -31.47 | -31.17 | -31.03 |
| 440 | -0.19 | -30.90 | -30.90 | 22.87 | -30.17 | -30.45 | -30.12 | -29.98 |
| 450 | -0.19 | -31.03 | -31.02 | 22.14 | -29.27 | -29.55 | -29.21 | -29.18 |
| 460 | -0.20 | -31.19 | -31.18 | 21.54 | -28.74 | -28.94 | -28.58 | -28.59 |
| 470 | -0.20 | -31.34 | -31.33 | 20.94 | -28.21 | -28.32 | -27.95 | -27.99 |
| 480 | -0.20 | -31.52 | -31.52 | 20.37 | -27.84 | -27.81 | -27.49 | -27.48 |
| 485 | -0.21 | -31.63 | -31.62 | 20.08 | -27.63 | -27.55 | -27.25 | -27.21 |
| 490 | -0.21 | -31.73 | -31.72 | 19.78 | -27.42 | -27.29 | -27.01 | -26.93 |
| 495 | -0.21 | -31.84 | -31.84 | 19.47 | -27.12 | -27.01 | -26.72 | -26.63 |
| 500 | -0.21 | -31.95 | -31.95 | 19.16 | -26.82 | -26.73 | -26.43 | -26.33 |
| 505 | -0.22 | -32.08 | -32.07 | 18.82 | -26.51 | -26.45 | -26.13 | -26.04 |
| 510 | -0.22 | -32.20 | -32.19 | 18.48 | -26.19 | -26.16 | -25.83 | -25.75 |
| 515 | -0.22 | -32.33 | -32.33 | 18.16 | -25.92 | -25.89 | -25.52 | -25.48 |
| 520 | -0.22 | -32.46 | -32.46 | 17.83 | -25.64 | -25.62 | -25.21 | -25.20 |
| 525 | -0.22 | -32.61 | -32.61 | 17.48 | -25.38 | -25.40 | -24.95 | -24.95 |
| 530 | -0.22 | -32.75 | -32.75 | 17.12 | -25.11 | -25.17 | -24.68 | -24.69 |