

## High Power Bi-Directional Coupler, 80-520MHz

## WMHPBDC-80-520M-6dB-N

### Description

Werbel Microwave Model WMHPBDC-80-520M-6dB-N is a high-power bidirectional coupler that operates over the 80-520MHz band, covering FM radio, upper VHF and lower UHF applications. Conservatively rated for 100 watts CW. Useful for amplification and signal distribution applications including radio and television broadcasting, public safety and emergency broadcasting and distributed antenna systems. There exists a roll down of 2dB at the low frequency, making the nominal coupling value 8dB within the FM radio band. Mainline loss 1.2dB typical which includes the loss due to coupling. Typical return loss 24.9dB. Typical directivity 24.5dB.



Photo is representative.

| Specifications                                     | Min.       | Typ.    | Max. | Units |
|--|------------|---------|------|-------|
| Frequency  | 80         | --      | 520  | MHz   |
| Impedance  | --         | 50      | --   | Ohm   |
| Coupling   | 80-130MHz  | 8.0±2.0 | --   | dB    |
|  | 130-520MHz | 6.0±1.0 | --   |       |
| Frequency Sensitivity (Flatness) within 130-520MHz | --         | ±0.6    | ±1.0 | dB    |
| Mainline Loss <sup>1</sup>                         | --         | 1.3     | 1.8  | dB    |
| Directivity  | 19.0       | 24.5    | --   | dB    |
| Return Loss (In and Out)                           | 19.1       | 24.9    | --   | dB    |
| Input Power (CW) <sup>2</sup>                      | --         | --      | 100  | Watts |

### Mechanical

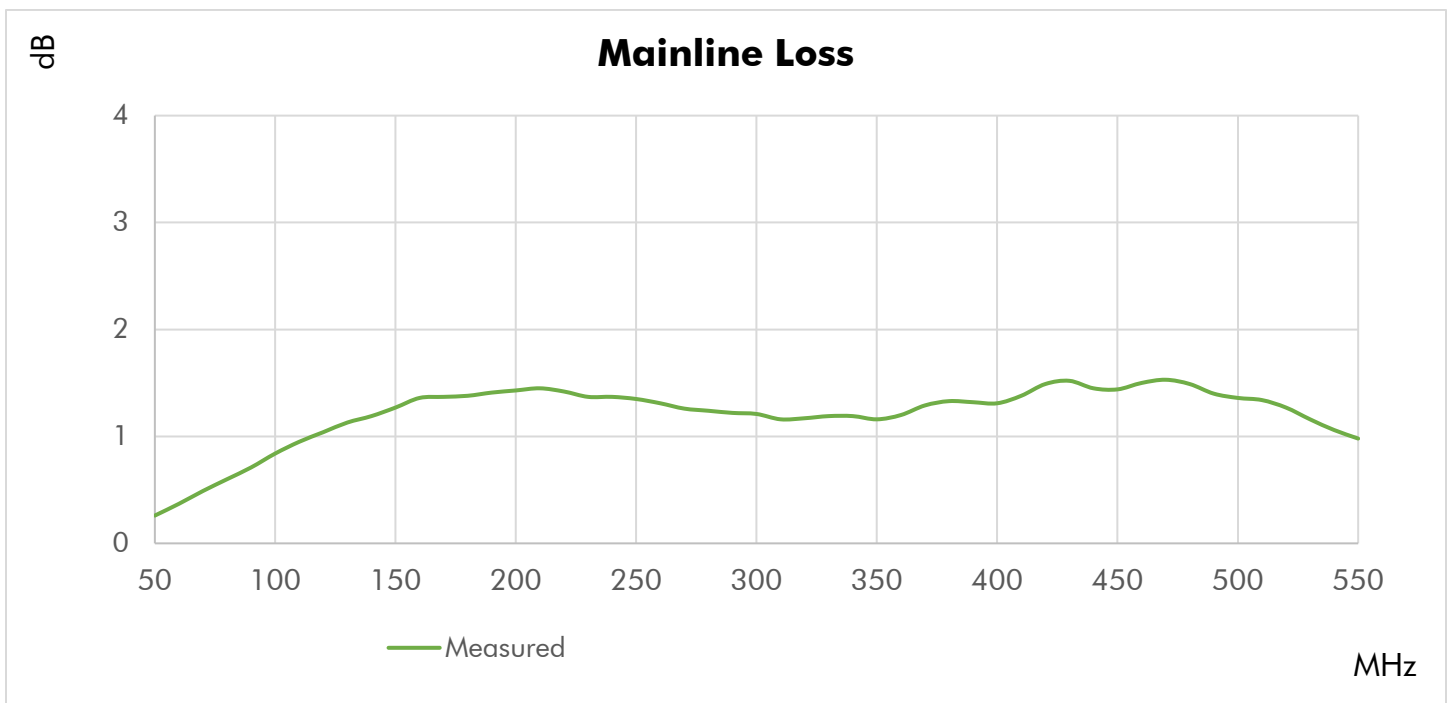
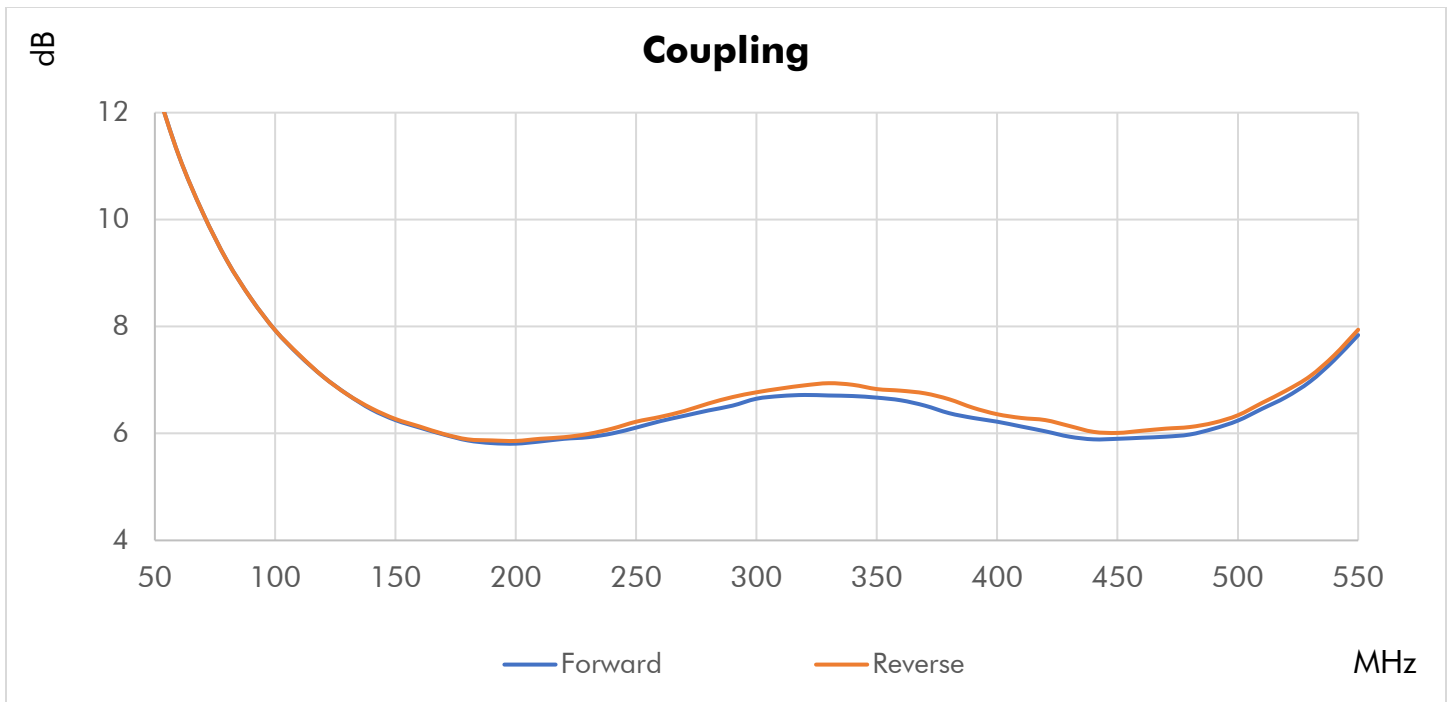
|                                    |                       |
|------------------------------------|-----------------------|
| Connector Interface                | N-Female              |
| Operating Temperature <sup>3</sup> | -40 to +65 °C         |
| Storage Temperature                | -55 to +100 °C        |
| Weight                             | 570g (20 oz)          |
| Humidity                           | 10-90% non-condensing |
| Environment                        | Indoors Use Only      |

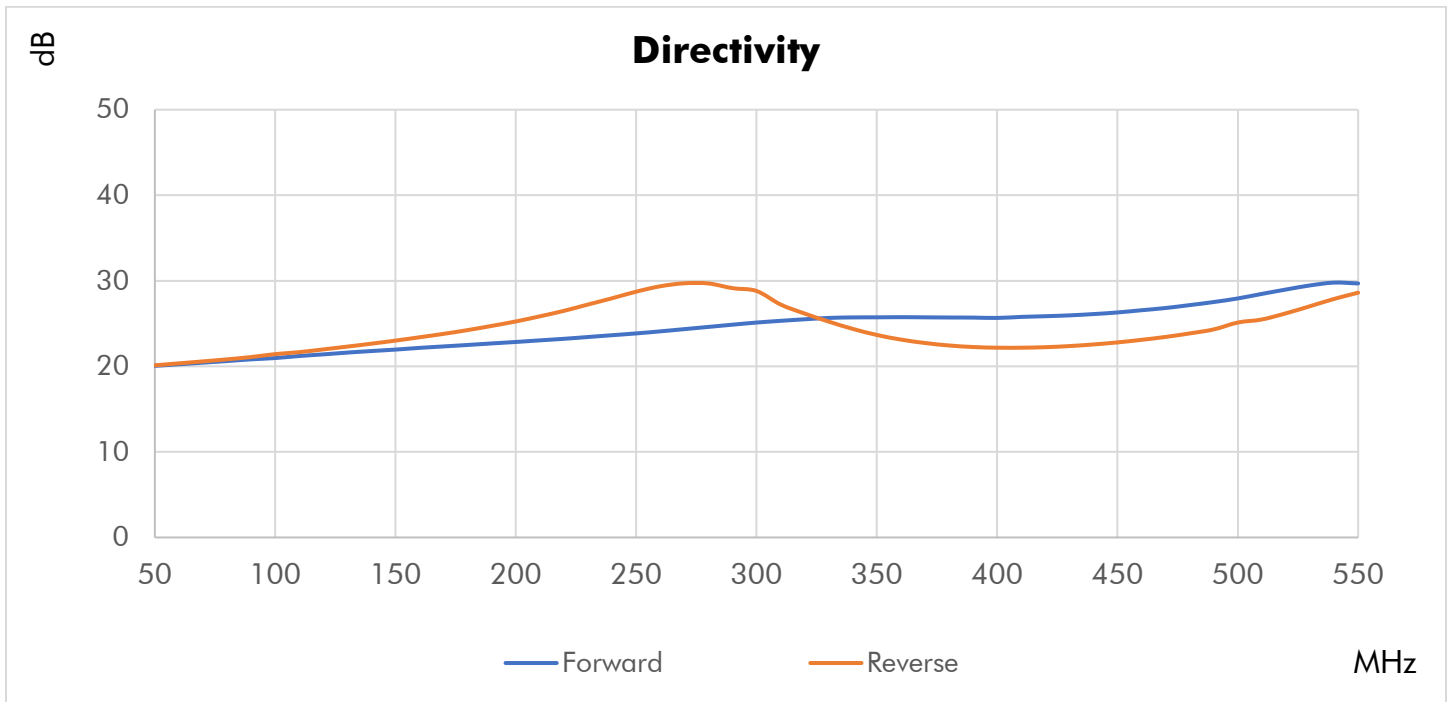
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C.
4. To the best of our knowledge at time of publication.

### Materials

|                                       |                        |
|---------------------------------------|------------------------|
| RoHS and REACH Compliant <sup>4</sup> |                        |
| Enclosure                             | Aluminum               |
| Connectors                            | Brass, Tri-Alloy Plate |
| Contacts                              | Be Cu, Gold Plated     |
| Insulators                            | PTFE                   |
| Finish                                | Green Paint            |

## Typical Performance at +25 °C

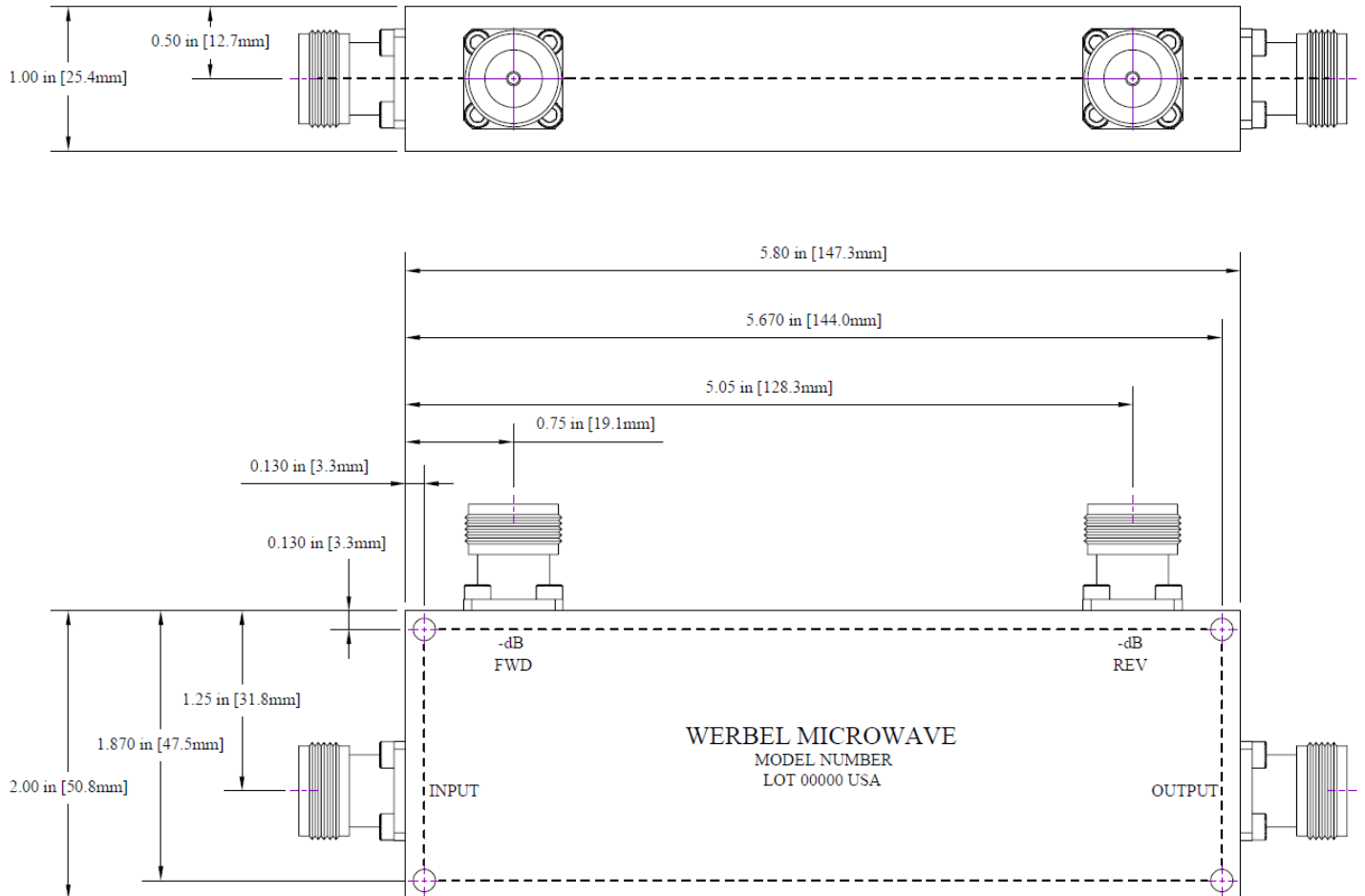




## Typical Performance Data

| Frequency (MHz) | Return Loss (dB) |       |       |       | Mainline Loss (dB) | Coupling (dB) |         |          | Directivity (dB) |      |
|-----------------|------------------|-------|-------|-------|--------------------|---------------|---------|----------|------------------|------|
|                 | In               | Out   | Fwd.  | Rev.  |                    | In-Out        | In-Fwd. | Out-Rev. | Fwd.             | Rev. |
| 80              | 22.21            | 21.51 | 24.15 | 24.23 | 0.60               | 9.23          | 9.23    | 20.62    | 20.82            |      |
| 90              | 21.76            | 21.34 | 23.81 | 23.90 | 0.71               | 8.52          | 8.52    | 20.82    | 21.09            |      |
| 100             | 21.18            | 21.51 | 23.41 | 23.62 | 0.84               | 7.93          | 7.93    | 20.97    | 21.43            |      |
| 110             | 20.83            | 21.41 | 23.33 | 23.62 | 0.95               | 7.46          | 7.47    | 21.21    | 21.66            |      |
| 120             | 20.75            | 21.19 | 23.23 | 23.74 | 1.04               | 7.06          | 7.06    | 21.40    | 21.98            |      |
| 130             | 20.82            | 20.86 | 23.32 | 24.03 | 1.13               | 6.73          | 6.73    | 21.61    | 22.31            |      |
| 140             | 20.98            | 20.79 | 23.54 | 24.18 | 1.19               | 6.45          | 6.47    | 21.79    | 22.65            |      |
| 150             | 21.03            | 20.99 | 23.58 | 24.08 | 1.27               | 6.25          | 6.27    | 21.96    | 23.01            |      |
| 160             | 21.08            | 21.36 | 23.48 | 24.04 | 1.36               | 6.11          | 6.13    | 22.16    | 23.40            |      |
| 170             | 21.21            | 21.90 | 23.43 | 24.31 | 1.37               | 5.98          | 5.99    | 22.33    | 23.80            |      |
| 180             | 21.41            | 22.15 | 23.60 | 24.84 | 1.38               | 5.87          | 5.89    | 22.50    | 24.24            |      |
| 190             | 21.91            | 22.38 | 23.94 | 25.24 | 1.41               | 5.82          | 5.87    | 22.68    | 24.73            |      |
| 200             | 22.24            | 22.24 | 23.78 | 25.24 | 1.43               | 5.81          | 5.86    | 22.85    | 25.25            |      |
| 210             | 22.59            | 22.77 | 24.12 | 25.32 | 1.45               | 5.85          | 5.90    | 23.04    | 25.85            |      |
| 220             | 22.93            | 23.80 | 24.16 | 25.78 | 1.42               | 5.90          | 5.93    | 23.22    | 26.49            |      |
| 230             | 23.03            | 24.87 | 24.34 | 26.42 | 1.37               | 5.93          | 5.99    | 23.43    | 27.23            |      |
| 240             | 23.50            | 25.91 | 24.49 | 26.77 | 1.37               | 6.00          | 6.09    | 23.64    | 27.96            |      |
| 250             | 24.13            | 26.39 | 24.68 | 27.23 | 1.35               | 6.11          | 6.22    | 23.85    | 28.73            |      |
| 260             | 25.15            | 26.77 | 24.74 | 27.91 | 1.31               | 6.23          | 6.31    | 24.09    | 29.36            |      |
| 270             | 26.00            | 27.35 | 25.01 | 28.49 | 1.26               | 6.33          | 6.42    | 24.35    | 29.71            |      |
| 280             | 26.66            | 28.07 | 25.40 | 28.58 | 1.24               | 6.43          | 6.56    | 24.61    | 29.69            |      |
| 290             | 26.72            | 28.79 | 25.67 | 28.58 | 1.22               | 6.52          | 6.68    | 24.87    | 29.14            |      |
| 300             | 26.43            | 28.69 | 26.13 | 28.29 | 1.21               | 6.65          | 6.77    | 25.12    | 28.81            |      |
| 310             | 26.06            | 28.96 | 26.00 | 28.28 | 1.16               | 6.70          | 6.84    | 25.32    | 27.23            |      |
| 320             | 25.69            | 28.02 | 26.40 | 27.71 | 1.17               | 6.72          | 6.90    | 25.50    | 26.17            |      |
| 330             | 25.80            | 26.52 | 26.85 | 26.80 | 1.19               | 6.71          | 6.94    | 25.66    | 25.23            |      |
| 340             | 25.86            | 24.95 | 27.20 | 25.86 | 1.19               | 6.70          | 6.91    | 25.72    | 24.38            |      |
| 350             | 25.83            | 23.92 | 27.44 | 25.43 | 1.16               | 6.67          | 6.83    | 25.73    | 23.67            |      |
| 360             | 25.33            | 23.20 | 27.53 | 25.05 | 1.20               | 6.62          | 6.80    | 25.75    | 23.13            |      |
| 370             | 24.37            | 22.78 | 27.56 | 24.87 | 1.29               | 6.52          | 6.75    | 25.73    | 22.73            |      |
| 380             | 23.67            | 22.68 | 27.88 | 24.54 | 1.33               | 6.38          | 6.64    | 25.71    | 22.44            |      |
| 390             | 22.92            | 22.11 | 28.04 | 24.26 | 1.32               | 6.29          | 6.48    | 25.70    | 22.26            |      |
| 400             | 22.89            | 21.64 | 28.36 | 24.23 | 1.31               | 6.22          | 6.36    | 25.66    | 22.18            |      |
| 410             | 22.97            | 21.08 | 28.40 | 24.21 | 1.38               | 6.13          | 6.29    | 25.78    | 22.18            |      |
| 420             | 23.10            | 20.82 | 28.51 | 24.50 | 1.49               | 6.04          | 6.25    | 25.86    | 22.24            |      |
| 430             | 23.21            | 21.13 | 28.59 | 24.70 | 1.52               | 5.94          | 6.14    | 25.96    | 22.37            |      |
| 440             | 22.85            | 21.25 | 28.60 | 24.99 | 1.45               | 5.89          | 6.03    | 26.11    | 22.56            |      |
| 450             | 22.76            | 21.64 | 28.61 | 25.18 | 1.44               | 5.90          | 6.01    | 26.30    | 22.80            |      |
| 460             | 22.70            | 21.55 | 28.71 | 25.41 | 1.50               | 5.92          | 6.05    | 26.56    | 23.10            |      |
| 470             | 23.08            | 21.60 | 28.95 | 25.62 | 1.53               | 5.94          | 6.09    | 26.82    | 23.44            |      |
| 480             | 23.39            | 21.72 | 29.40 | 26.14 | 1.49               | 5.98          | 6.12    | 27.16    | 23.85            |      |
| 490             | 23.72            | 22.11 | 29.53 | 26.73 | 1.40               | 6.09          | 6.20    | 27.52    | 24.32            |      |
| 500             | 24.08            | 23.16 | 29.56 | 27.32 | 1.36               | 6.24          | 6.34    | 27.94    | 25.12            |      |
| 510             | 24.52            | 23.86 | 29.57 | 27.25 | 1.34               | 6.46          | 6.57    | 28.47    | 25.48            |      |
| 520             | 25.28            | 24.65 | 29.90 | 27.54 | 1.27               | 6.68          | 6.80    | 28.98    | 26.20            |      |

## Outline Dimensions



Outline # OL-5352

Dimensions are in inches, [mm] shown for convenience.

Tolerances on 2-pl decimals:  $\pm .03$ . 3-pl decimals:  $\pm .015$ .

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