

## Directional Coupler, 2-18GHz, 6dB, SMA Female

## WMC-2-18-6dB-S

### Description

Model WMC-2-18-6dB-S from Werbel Microwave is a directional coupler that covers 2 to 18 GHz with broadband flat coupling response, high directivity, and excellent return loss performance. Frequency sensitivity, or coupling flatness, is very good, with  $\pm 0.9$  dB typical. Directivity 21 dB typical. Return loss 17 dB typical. The aluminum enclosure measures 2.25 x 0.73 x 0.50 inches with threaded mounting holes. SMA Female connectors. The device is RoHS compliant, but Sn/Pb solder is available for military applications on special build to order. The device covers the letter bands S, C, X and Ku band all in one enclosure. Our own unique coupling design allows for excellent flatness, thereby increasing measurement accuracy. Designed, assembled, and tested in the USA.



Photo is representative.

| Specifications                   | Min. | Typ.          | Max.      | Units |
|----------------------------------|------|---------------|-----------|-------|
| Frequency                        | 2    | --            | 18        | GHz   |
| Impedance                        | --   | 50            | --        | Ohm   |
| Coupling                         | --   | $6.6 \pm 0.3$ | --        | dB    |
| Frequency Sensitivity (Flatness) | --   | $\pm 0.9$     | $\pm 1.4$ | dB    |
| Mainline Loss <sup>1</sup>       | --   | 1.8           | 2.2       | dB    |
| Directivity                      | 14.0 | 21.2          | --        | dB    |
| Return Loss (In and Out)         | 14.0 | 17.6          | --        | dB    |
| Return Loss (Coupling)           | 14.0 | 15.4          | --        | dB    |
| Isolation                        | --   | 27.8          | --        | dB    |
| Input Power (CW) <sup>2</sup>    | --   | --            | 3         | Watts |

### Mechanical

|                                    |                       |
|------------------------------------|-----------------------|
| Connector Interface                | SMA-Female            |
| Operating Temperature <sup>3</sup> | -55 to +85 °C         |
| Storage Temperature                | -55 to +100 °C        |
| Weight                             | 1.4 oz (40 g)         |
| Humidity                           | 10-90% non-condensing |
| Environment                        | Indoor Use Only       |

### Materials

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

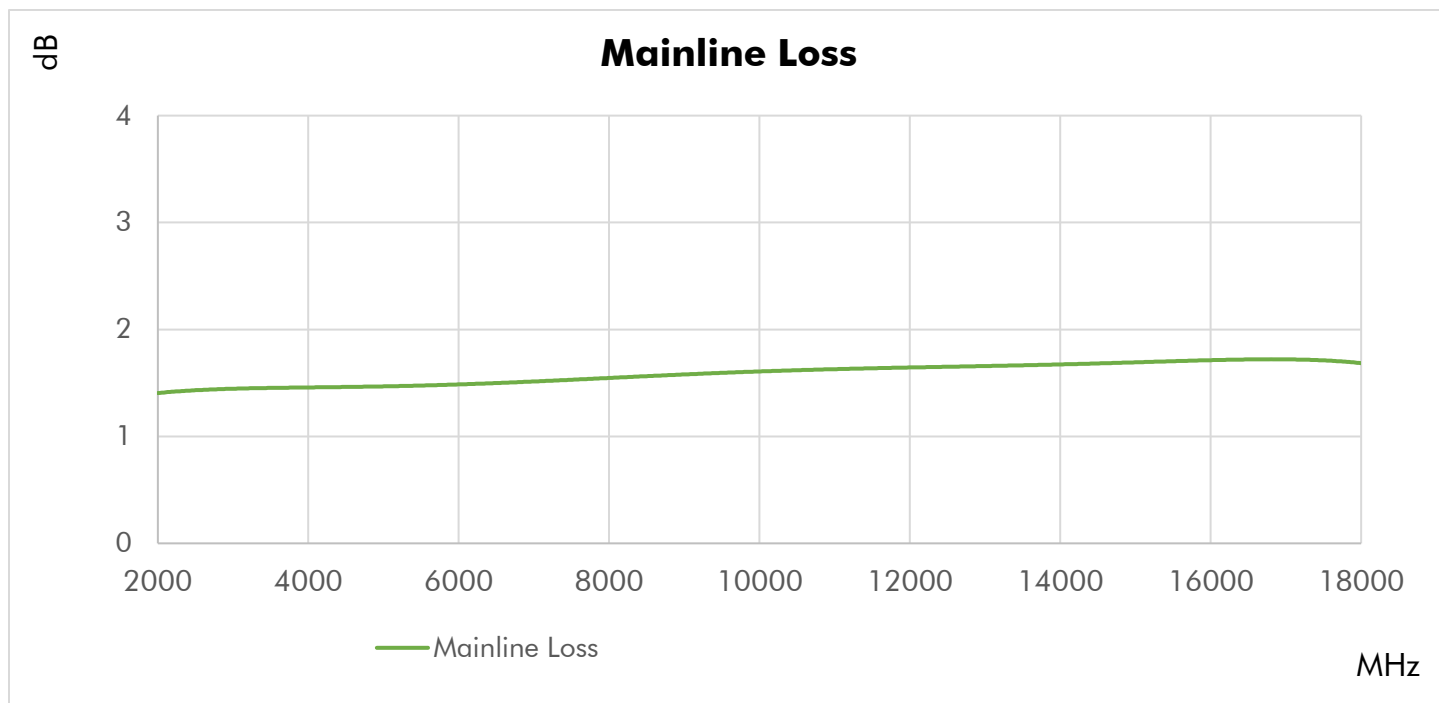
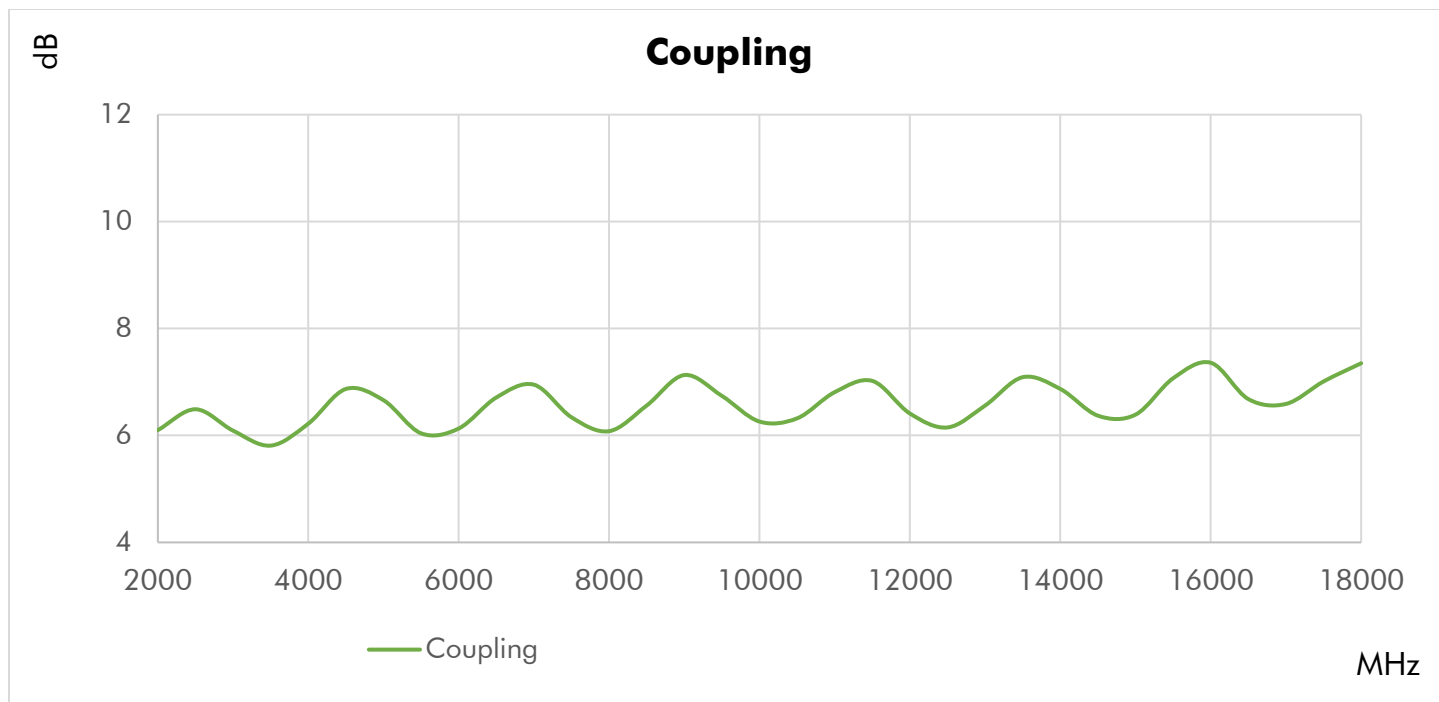
1. Mainline loss includes coupling loss.

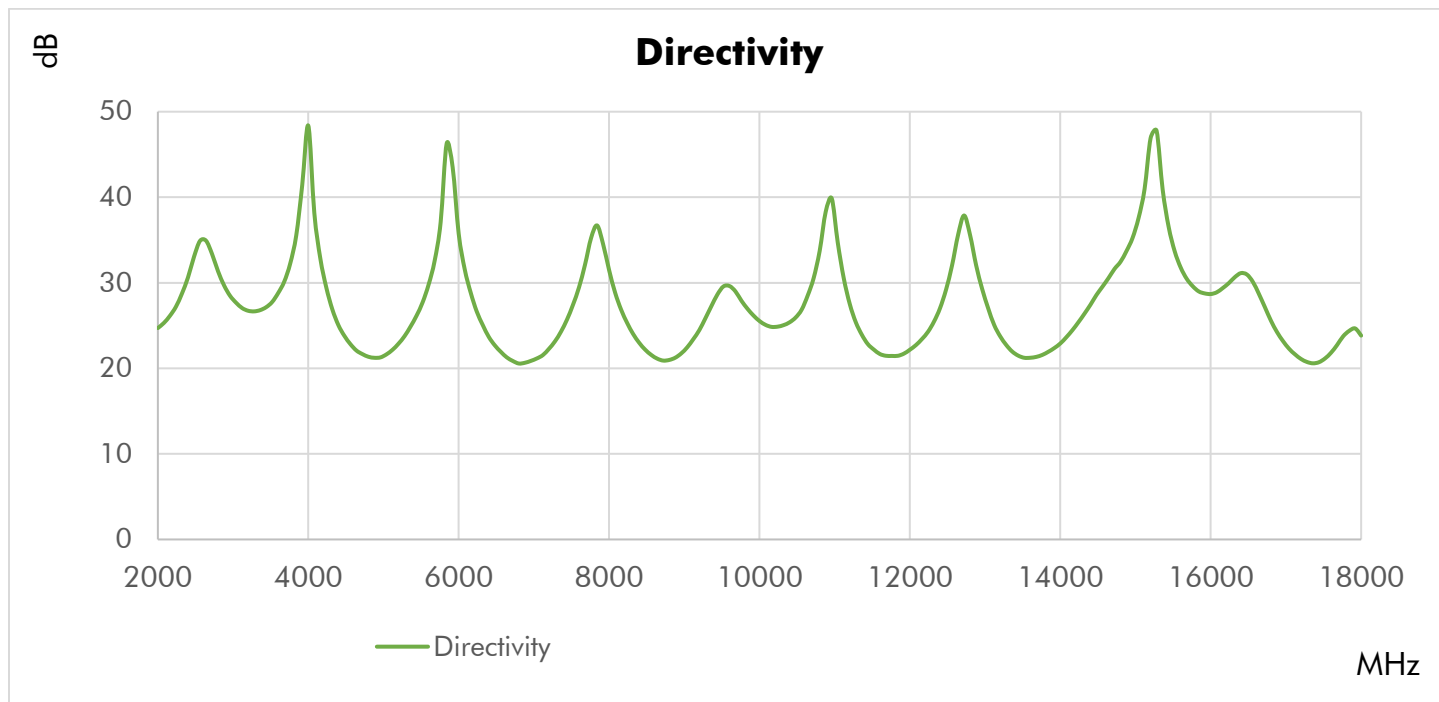
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.

3. Electrical Specifications at +25 °C.

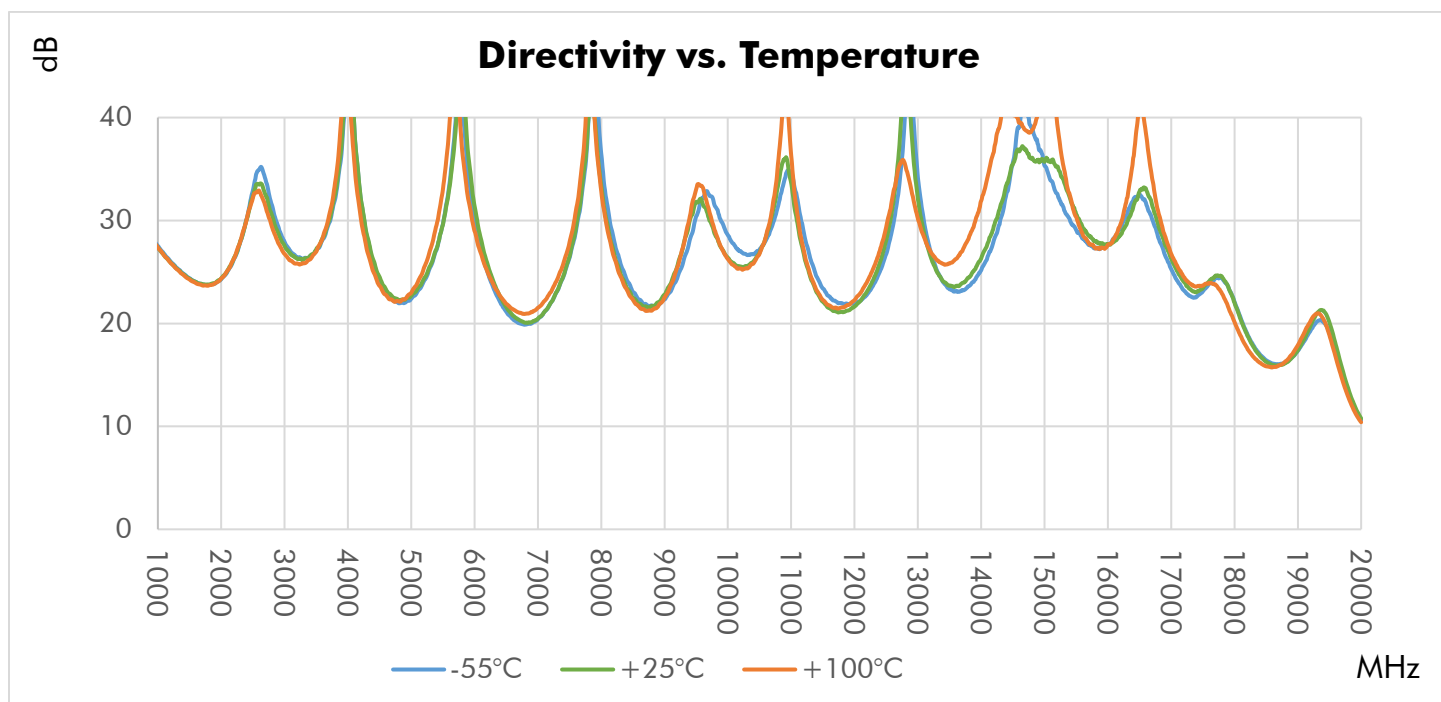
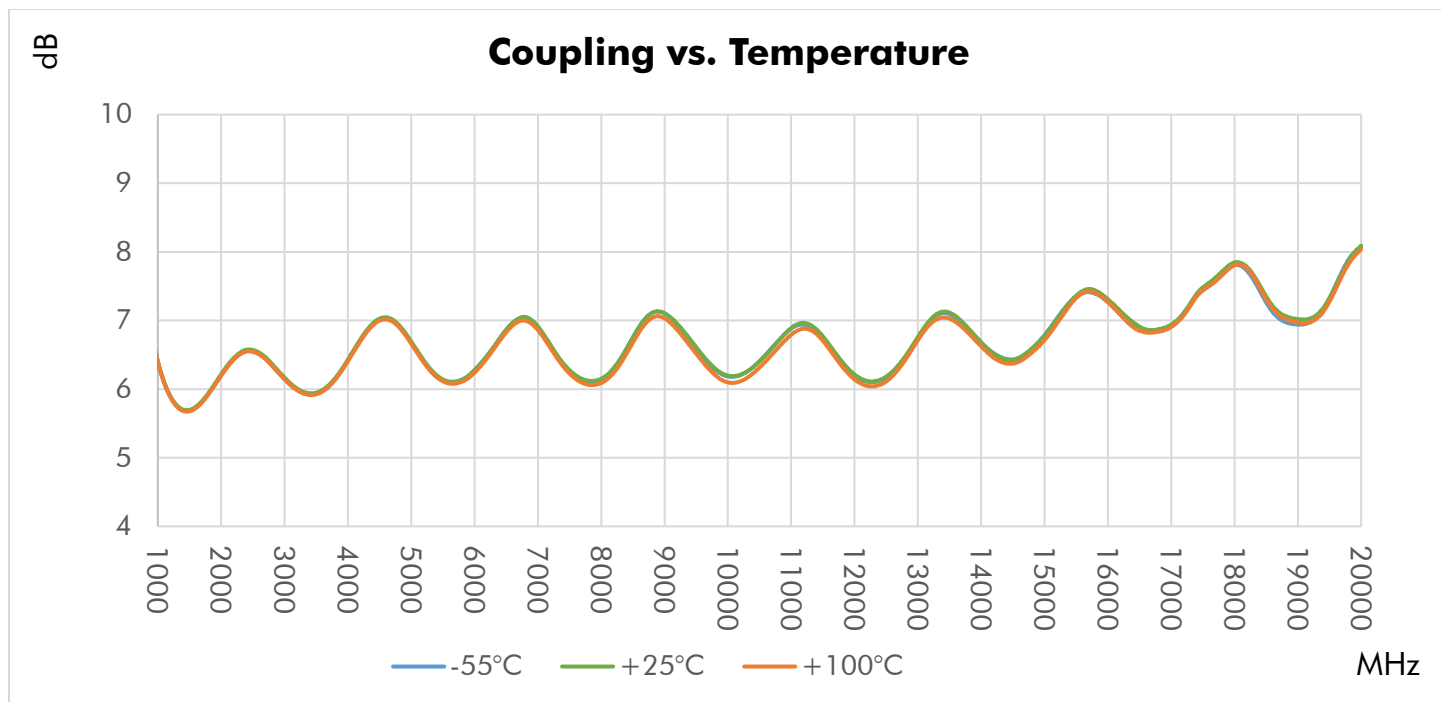
4. To the best of our knowledge at the time of publication.

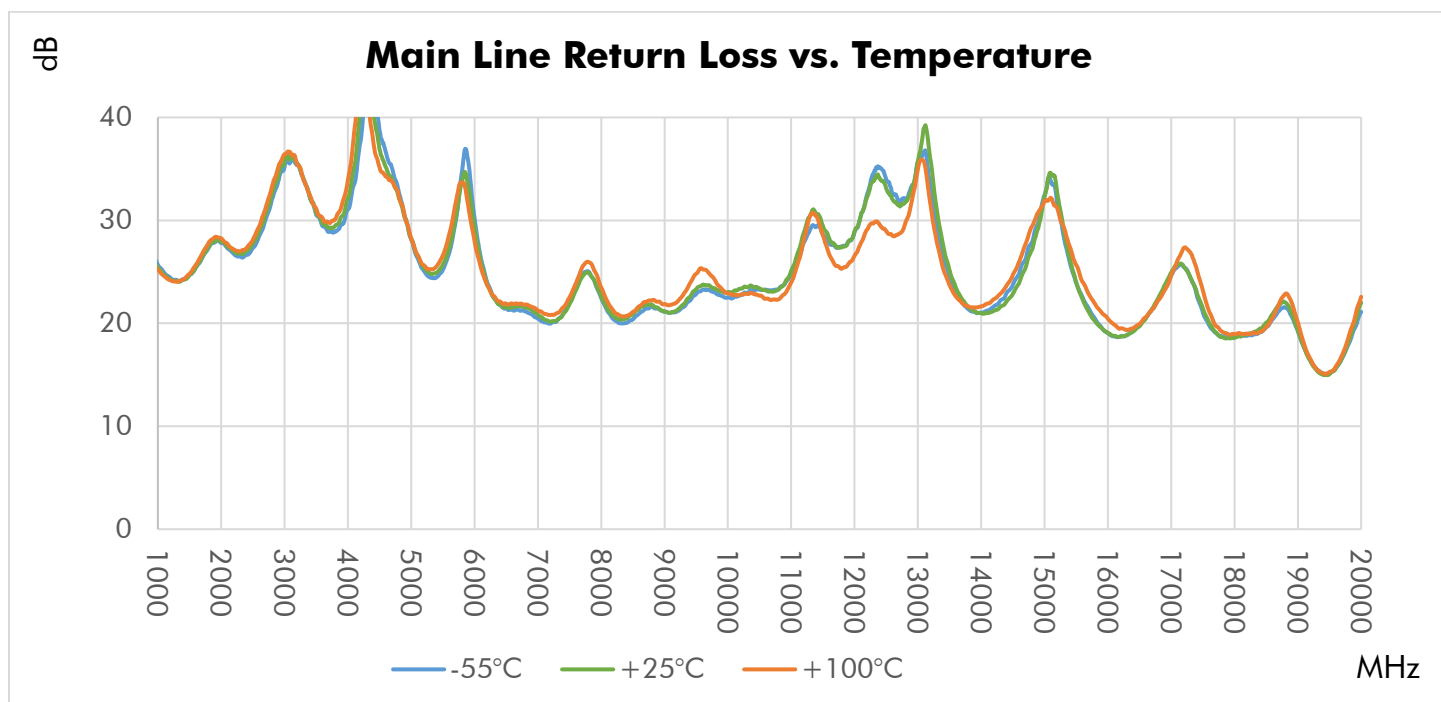
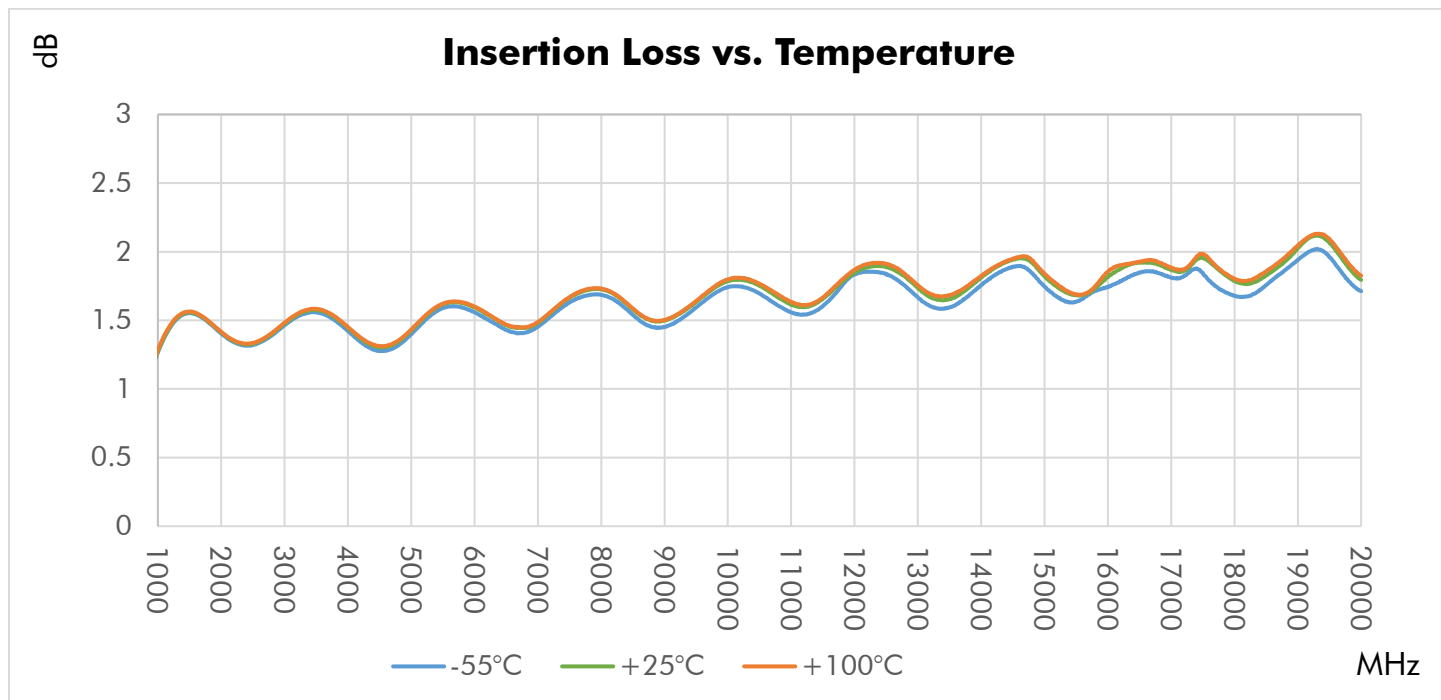
## Typical Performance at +25 °C



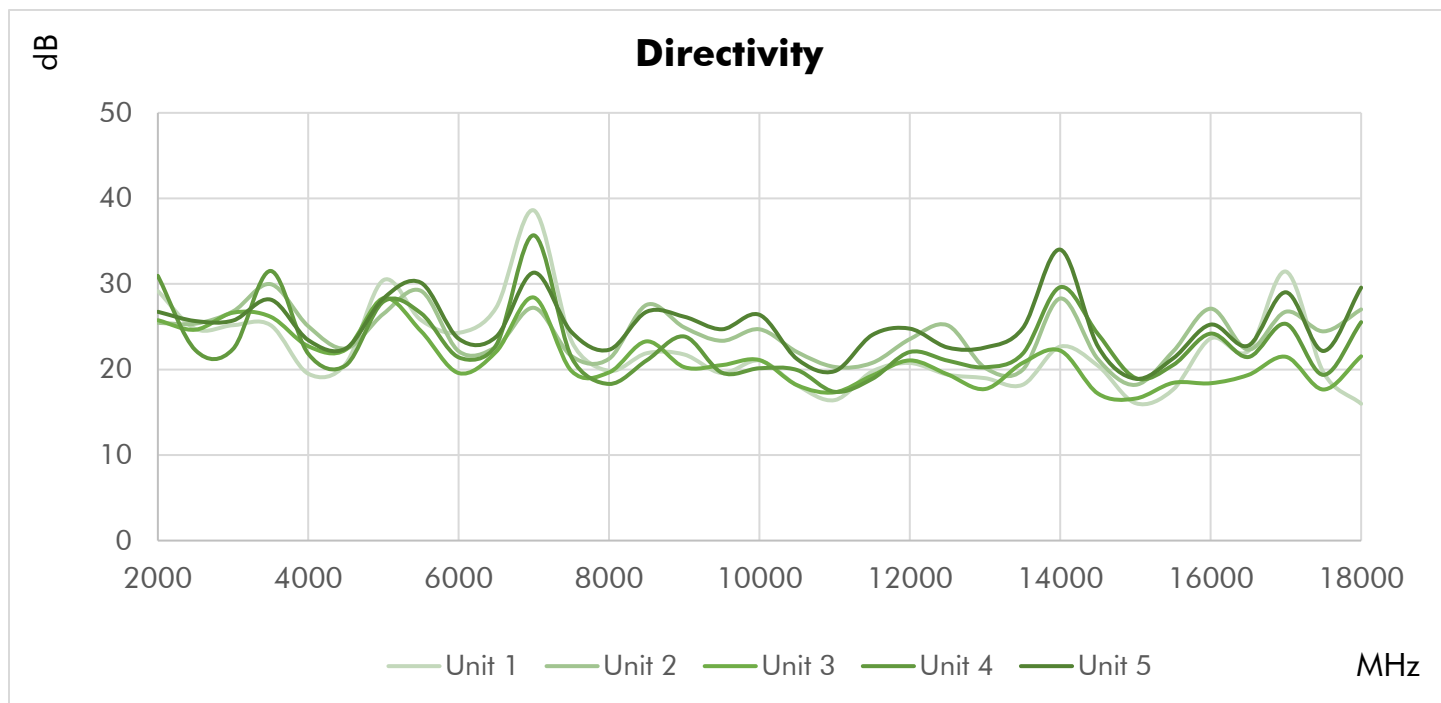
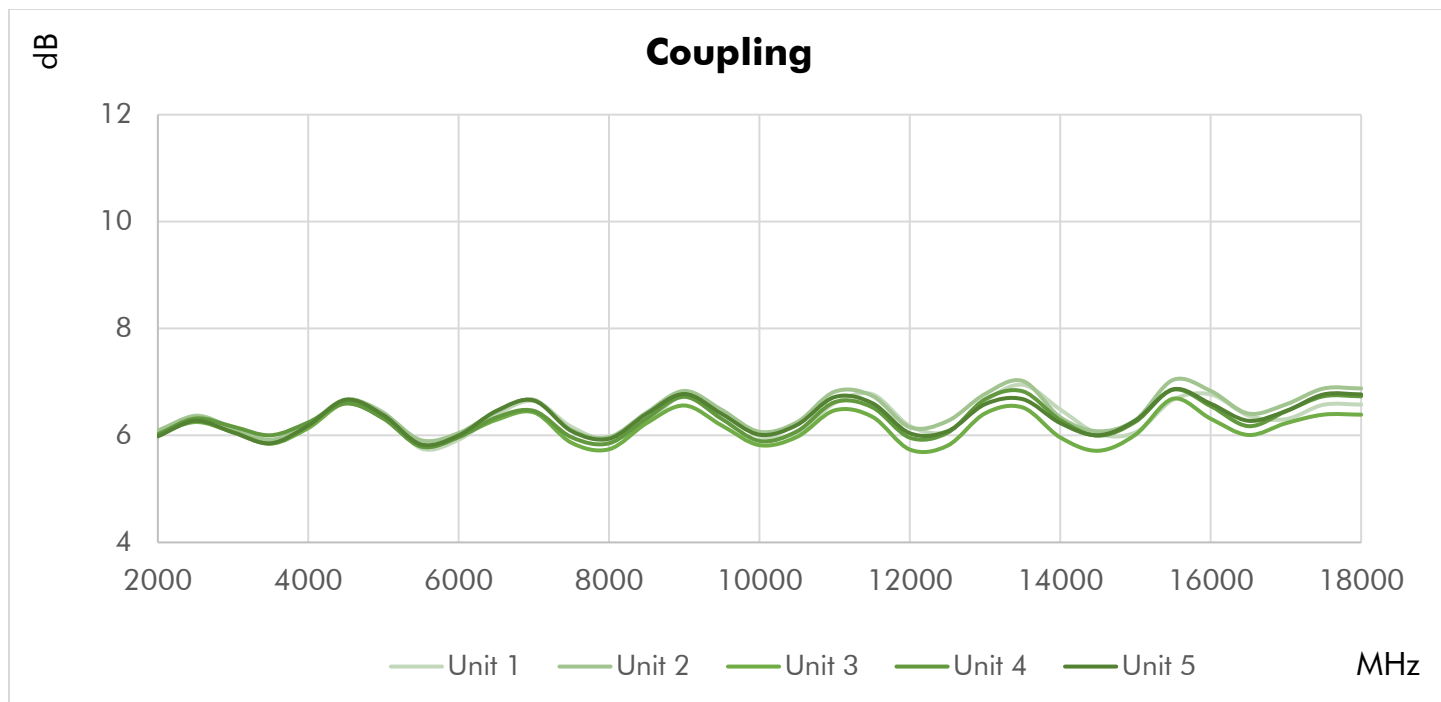


## Typical Performance Over Temperature





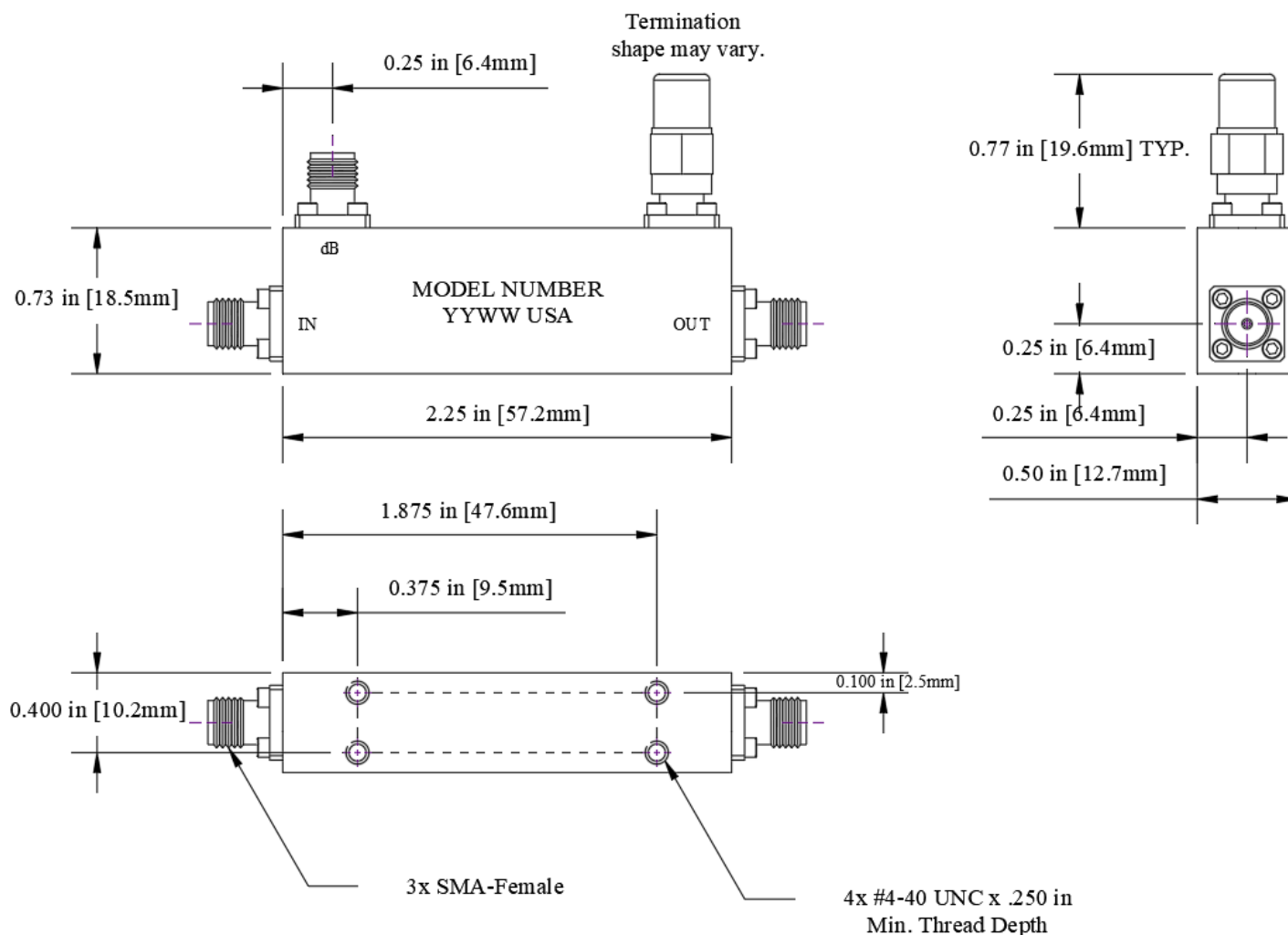
## Repeatability in Production



## Typical Performance Data

| Frequency<br>(MHz) | Return Loss<br>(dB) |       |       | Mainline Loss<br>(dB) | Coupling<br>(dB) | Directivity<br>(dB) |
|--------------------|---------------------|-------|-------|-----------------------|------------------|---------------------|
|                    | In                  | Out   | Cpl.  | In-Out                | In-Cpl.          |                     |
| 2000               | 24.32               | 23.83 | 22.34 | 1.44                  | 6.10             | 23.22               |
| 2500               | 23.00               | 22.52 | 24.93 | 1.33                  | 6.49             | 28.61               |
| 3000               | 29.23               | 24.81 | 24.41 | 1.47                  | 6.09             | 22.38               |
| 3500               | 26.06               | 24.64 | 24.88 | 1.60                  | 5.81             | 22.60               |
| 4000               | 26.99               | 25.58 | 33.78 | 1.46                  | 6.22             | 29.81               |
| 4500               | 25.73               | 22.43 | 22.00 | 1.29                  | 6.87             | 20.02               |
| 5000               | 23.63               | 20.09 | 30.66 | 1.39                  | 6.66             | 17.29               |
| 5500               | 25.93               | 23.68 | 23.07 | 1.60                  | 6.04             | 20.72               |
| 6000               | 24.51               | 23.19 | 20.21 | 1.59                  | 6.13             | 33.91               |
| 6500               | 17.69               | 18.87 | 30.03 | 1.47                  | 6.71             | 23.94               |
| 7000               | 24.50               | 23.08 | 20.73 | 1.38                  | 6.95             | 18.52               |
| 7500               | 24.10               | 27.70 | 18.58 | 1.56                  | 6.34             | 19.33               |
| 8000               | 18.72               | 19.05 | 28.63 | 1.72                  | 6.08             | 22.78               |
| 8500               | 18.76               | 20.87 | 18.10 | 1.57                  | 6.56             | 27.28               |
| 9000               | 28.61               | 34.91 | 16.34 | 1.39                  | 7.13             | 27.72               |
| 9500               | 20.44               | 19.59 | 21.86 | 1.56                  | 6.74             | 24.15               |
| 10000              | 19.73               | 18.92 | 19.03 | 1.72                  | 6.26             | 24.68               |
| 10500              | 27.90               | 26.79 | 20.10 | 1.67                  | 6.32             | 31.31               |
| 11000              | 23.48               | 25.82 | 26.80 | 1.53                  | 6.81             | 29.16               |
| 11500              | 20.45               | 19.39 | 22.47 | 1.54                  | 7.02             | 24.07               |
| 12000              | 22.10               | 21.39 | 23.72 | 1.71                  | 6.41             | 29.22               |
| 12500              | 39.11               | 32.73 | 28.36 | 1.77                  | 6.15             | 32.70               |
| 13000              | 22.67               | 22.28 | 36.04 | 1.69                  | 6.56             | 23.15               |
| 13500              | 23.09               | 20.74 | 28.43 | 1.57                  | 7.09             | 18.70               |
| 14000              | 28.40               | 23.35 | 20.62 | 1.62                  | 6.87             | 17.73               |
| 14500              | 23.06               | 21.90 | 19.43 | 1.79                  | 6.37             | 20.64               |
| 15000              | 23.55               | 24.32 | 25.79 | 1.78                  | 6.39             | 30.82               |
| 15500              | 30.27               | 28.94 | 19.13 | 1.59                  | 7.07             | 21.14               |
| 16000              | 23.98               | 22.76 | 15.32 | 1.59                  | 7.36             | 17.45               |
| 16500              | 22.52               | 29.34 | 19.40 | 1.74                  | 6.68             | 21.38               |
| 17000              | 23.55               | 22.93 | 17.23 | 1.80                  | 6.59             | 26.13               |
| 17500              | 22.20               | 19.79 | 17.12 | 1.77                  | 7.01             | 20.25               |
| 18000              | 26.82               | 31.83 | 22.01 | 1.63                  | 7.35             | 19.74               |

## Outline Dimensions



Outline # OL-1182

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

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

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