

## Directional Coupler, 6-18GHz, 10dB, SMA Female

## WMC-6-18-10dB-S

### Description

Model WMC-6-18-10dB-S from Werbel Microwave is a directional coupler that covers 6 to 18 GHz with broadband flat coupling response, high directivity, and excellent return loss performance. Coupling flatness response, also referred to as frequency sensitivity, is typically  $\pm 0.3$  dB or better across the band. Directivity 15dB typical. Return loss 18dB typical. Insertion loss 0.82dB typical. The enclosure is compact, measuring 1.00 x 0.60 x 0.38 inches, with SMA-Female connectors. The unique approach at creating a coupled line structure results in a super flat coupling response. This allows for highly accurate and dependable measurements. The device covers both X and Ku bands in one compact size enclosure. Our own design, assembled and tested in the USA.



Photo is representative.

| Specifications                | Min. | Typ.       | Max.       | Units |
|-------------------------------|------|------------|------------|-------|
| Frequency                     | 6    | --         | 18         | GHz   |
| Impedance                     | --   | 50         | --         | Ohm   |
| Coupling                      | --   | 10         | $\pm 1.25$ | dB    |
| Frequency Sensitivity         | --   | $\pm 0.30$ | $\pm 1.00$ | dB    |
| Mainline Loss <sup>1</sup>    | --   | 0.82       | 1.2        | dB    |
| Directivity                   | 12   | 15         | --         | dB    |
| Return Loss (In and Out)      | 15   | 18         | --         | dB    |
| Return Loss (Coupling)        | 14   | 16         | --         | dB    |
| Isolation                     | --   | 25         | --         | dB    |
| Input Power (CW) <sup>2</sup> | --   | --         | 50         | Watts |

### Mechanical

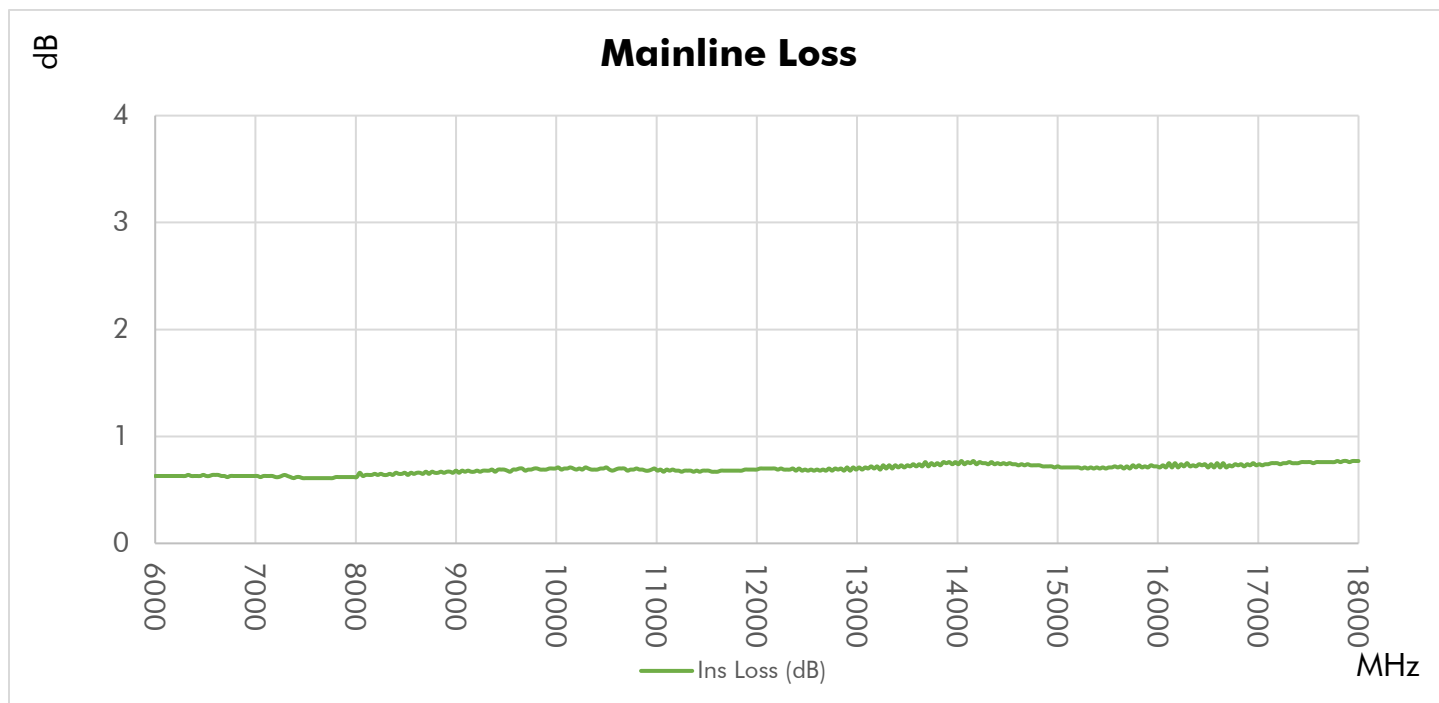
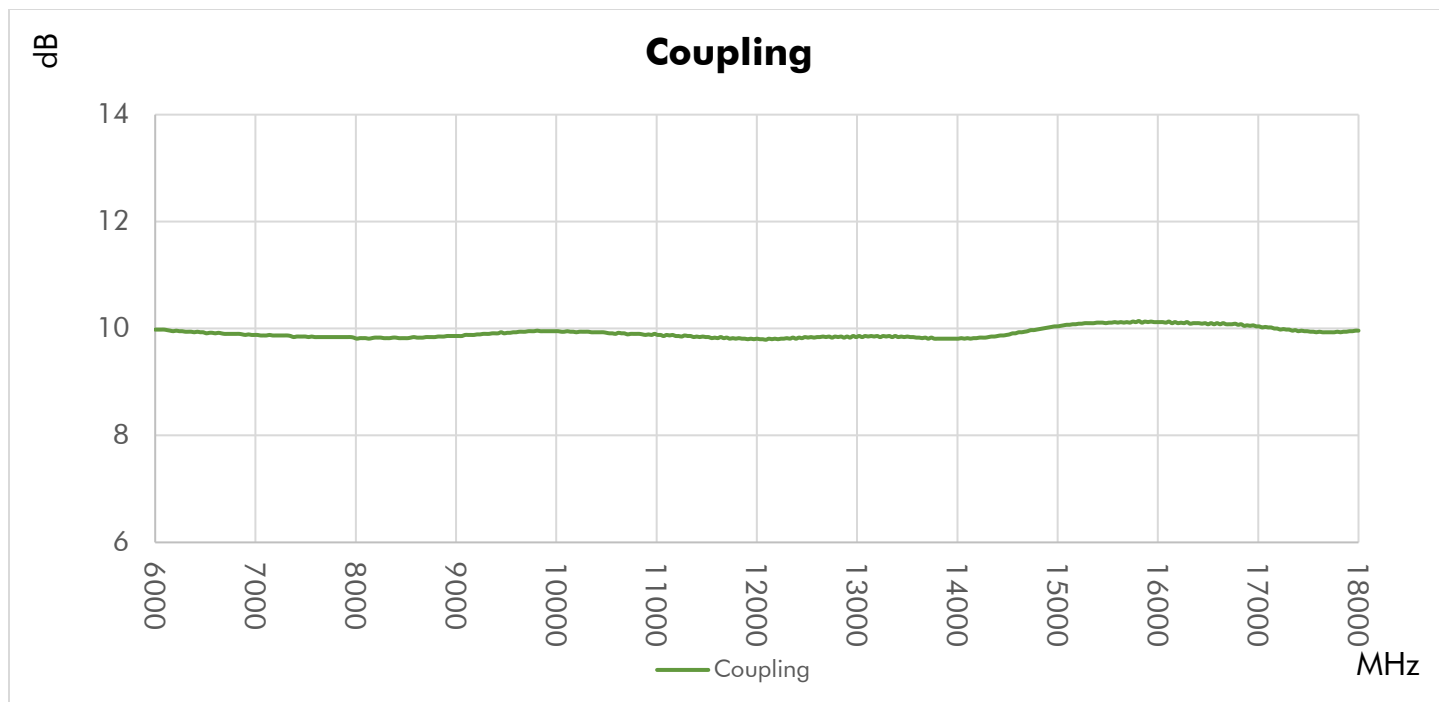
|                                    |                       |
|------------------------------------|-----------------------|
| Connector Interface                | SMA-Female            |
| Operating Temperature <sup>3</sup> | -55 to +85 °C         |
| Storage Temperature                | -55 to +100 °C        |
| Weight                             | 0.8 oz (22.7 g)       |
| Humidity                           | 10-90% non-condensing |
| Environment                        | Indoors Use Only      |

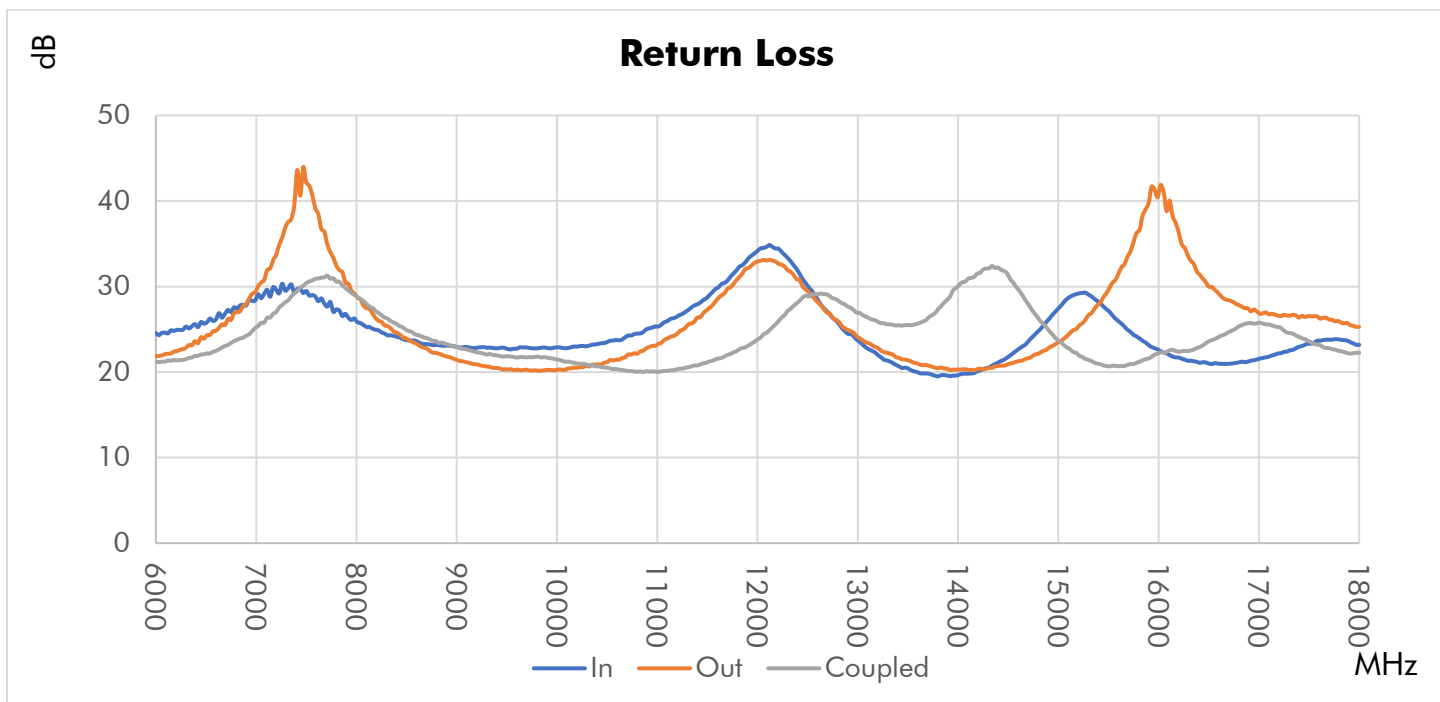
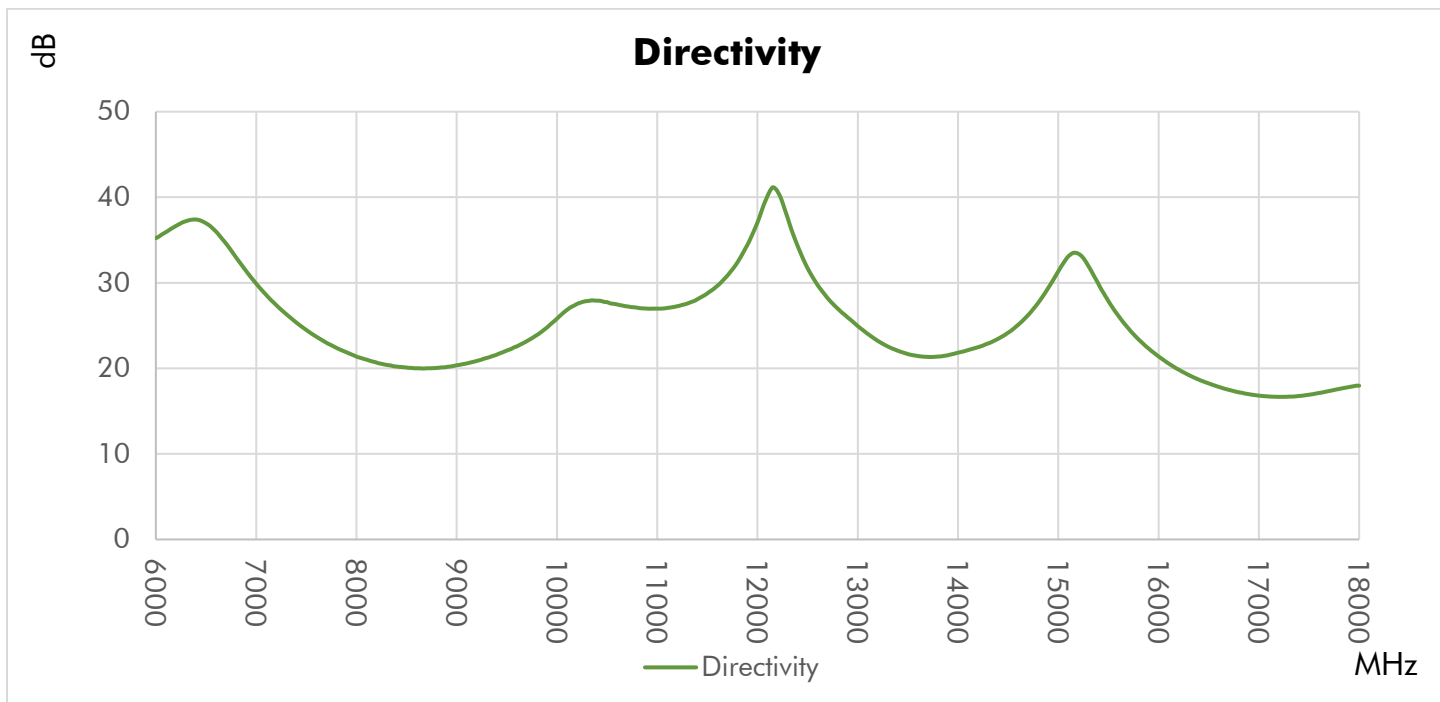
1. Mainline loss includes coupling loss.
2. All output ports should be terminated in a 50-ohm load with 1.2:1 max VSWR.
3. Electrical specifications at +25 °C only.
4. To the best of our knowledge at the time of publication

### Materials

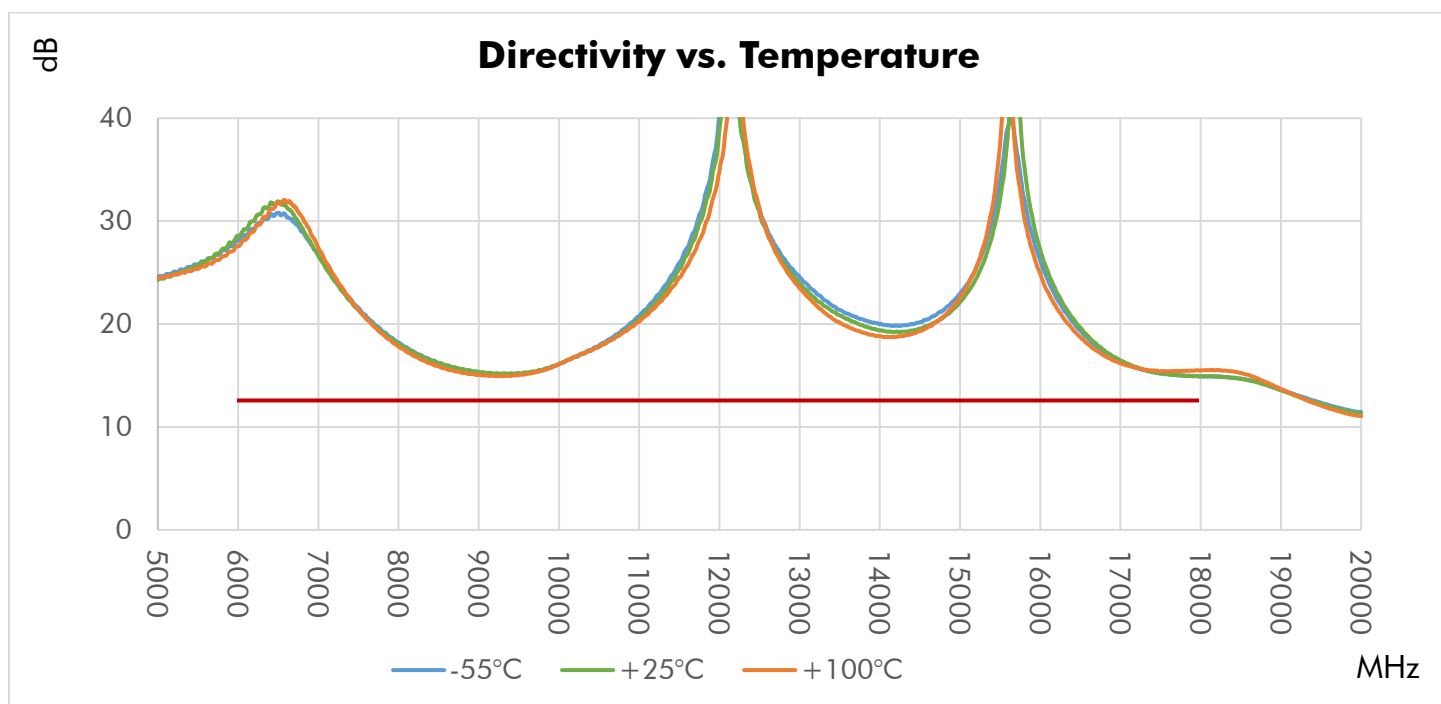
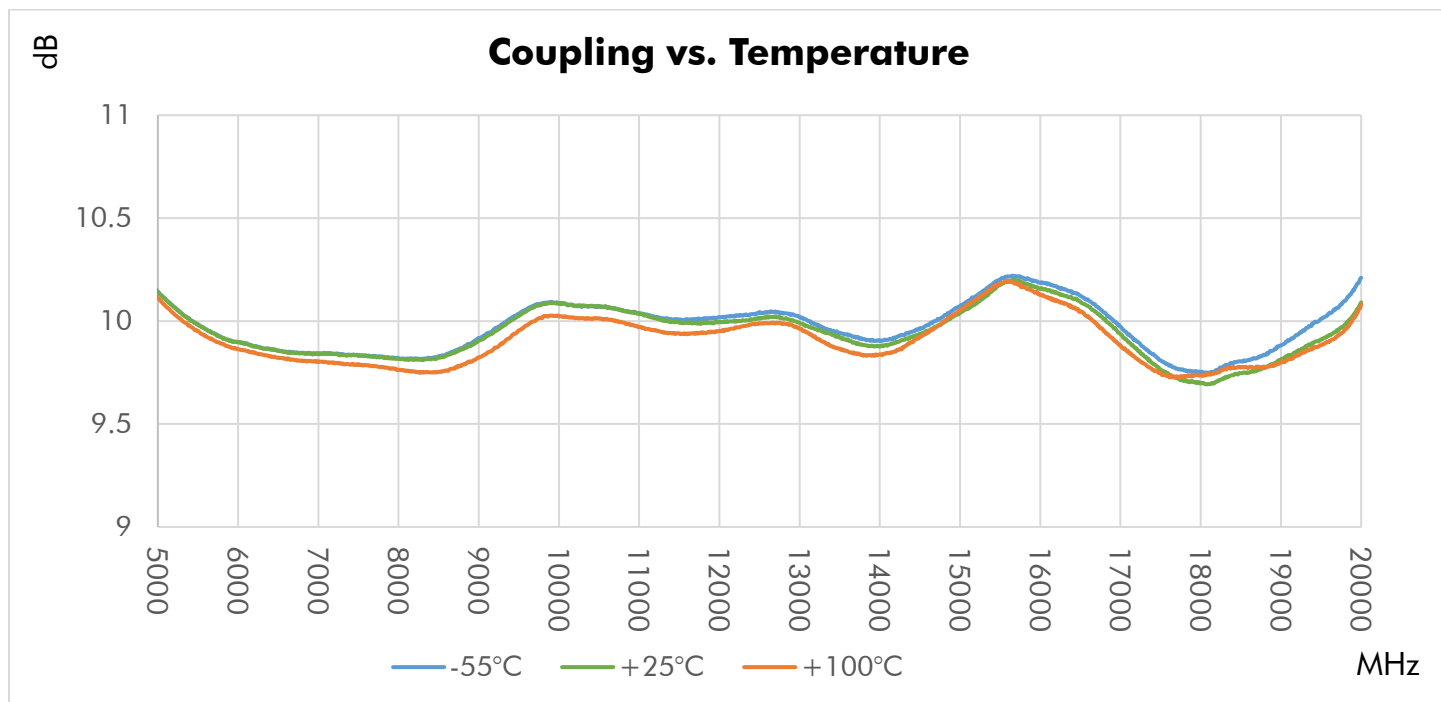
|                                       |                    |
|---------------------------------------|--------------------|
| RoHS and REACH Compliant <sup>4</sup> |                    |
| Enclosure                             | Aluminum           |
| Connectors                            | Stainless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

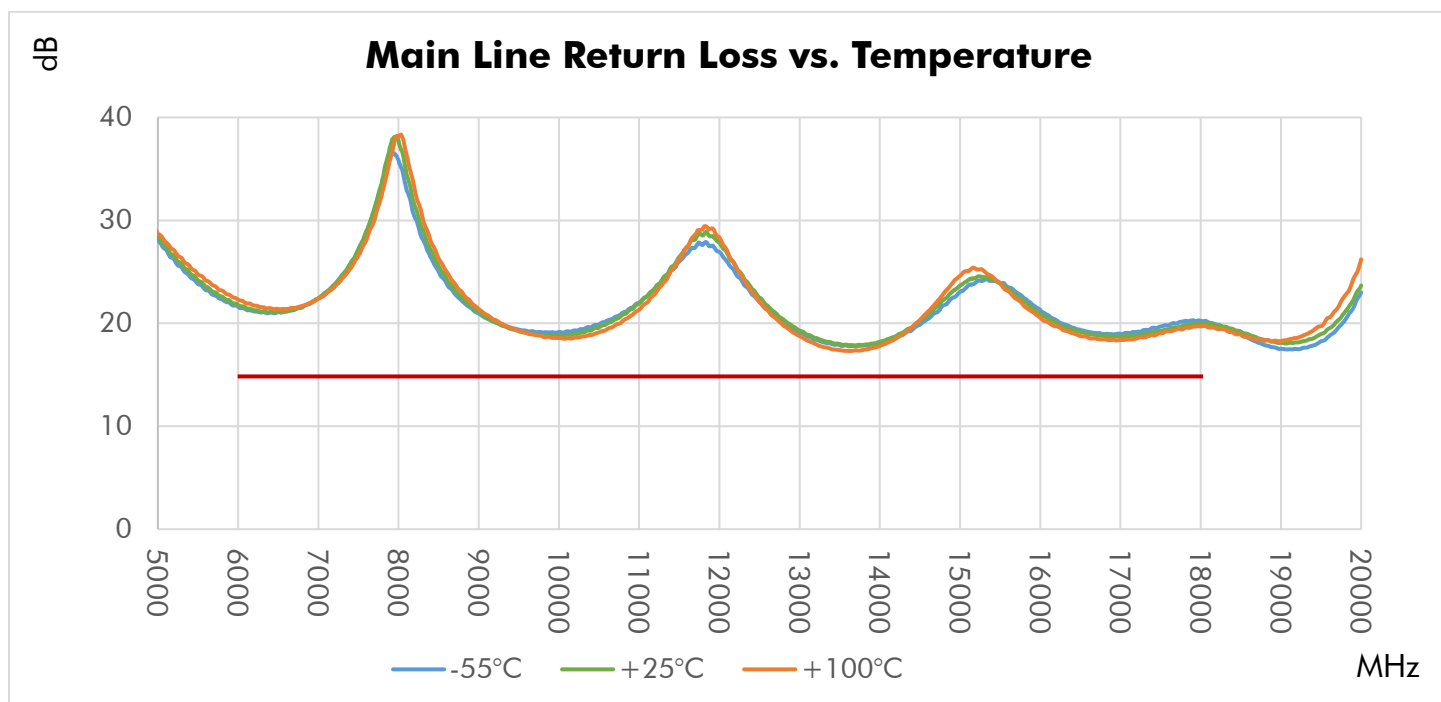
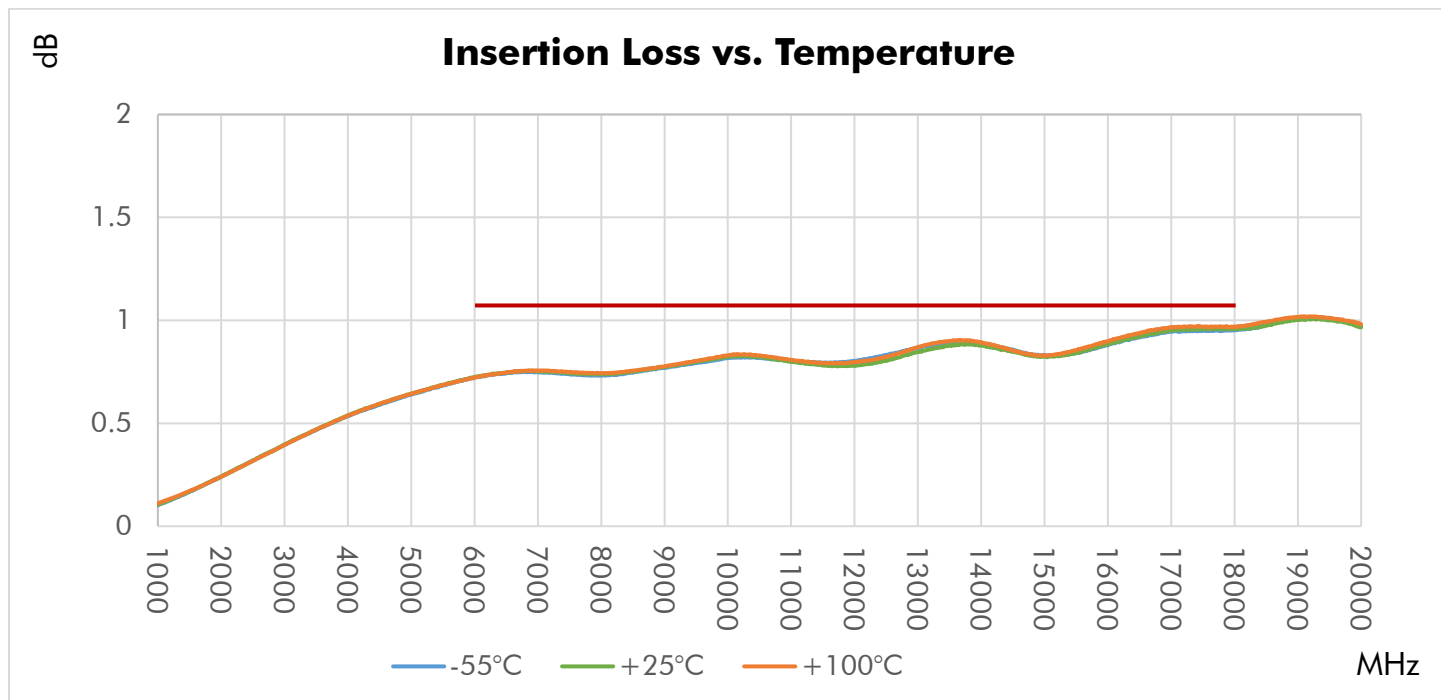
## Typical Performance at +25 °C



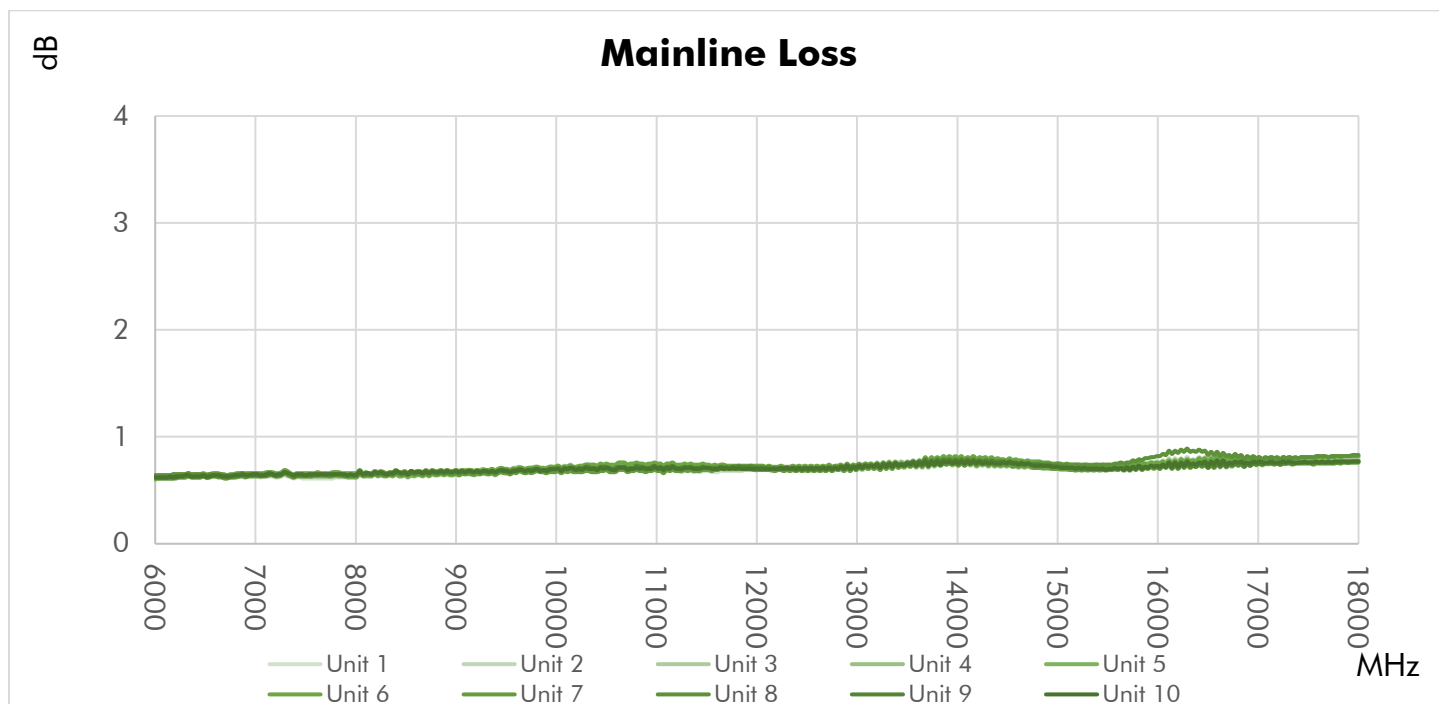
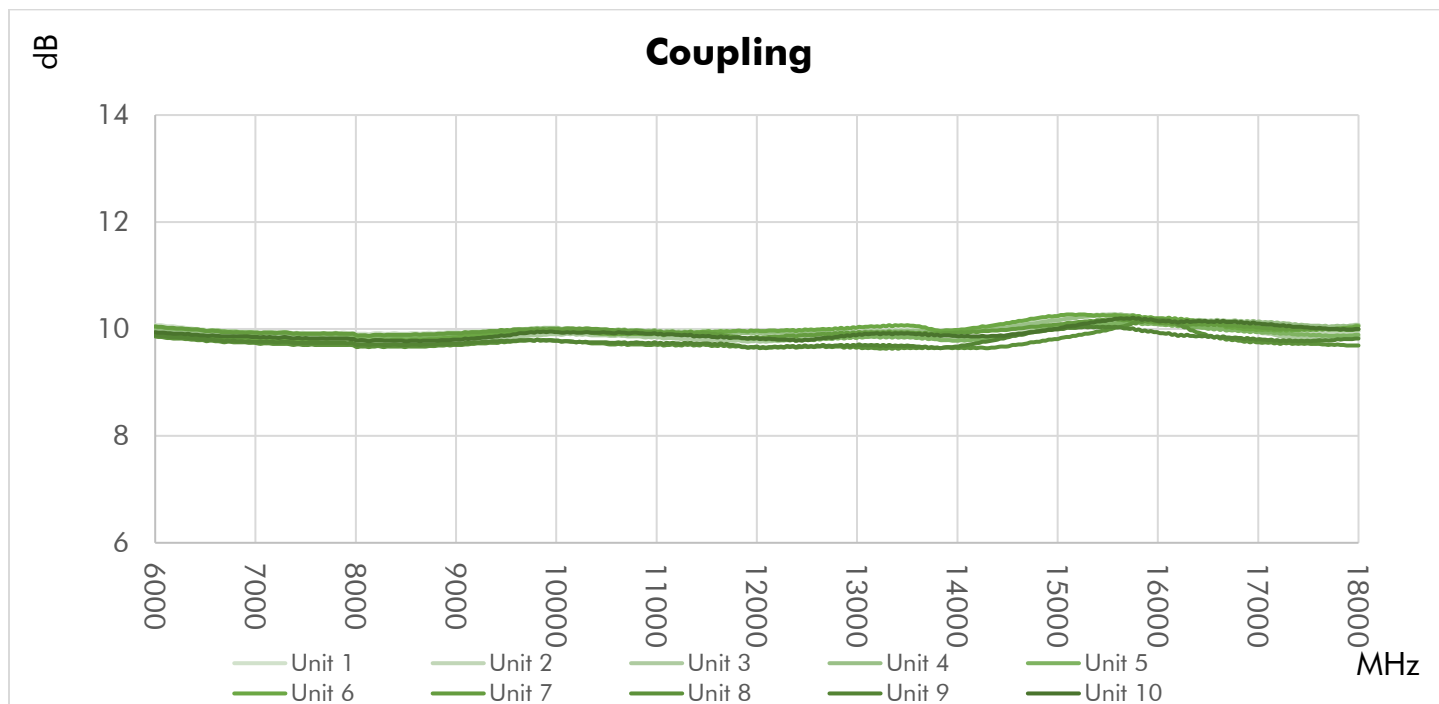


## Typical Performance Over Temperature





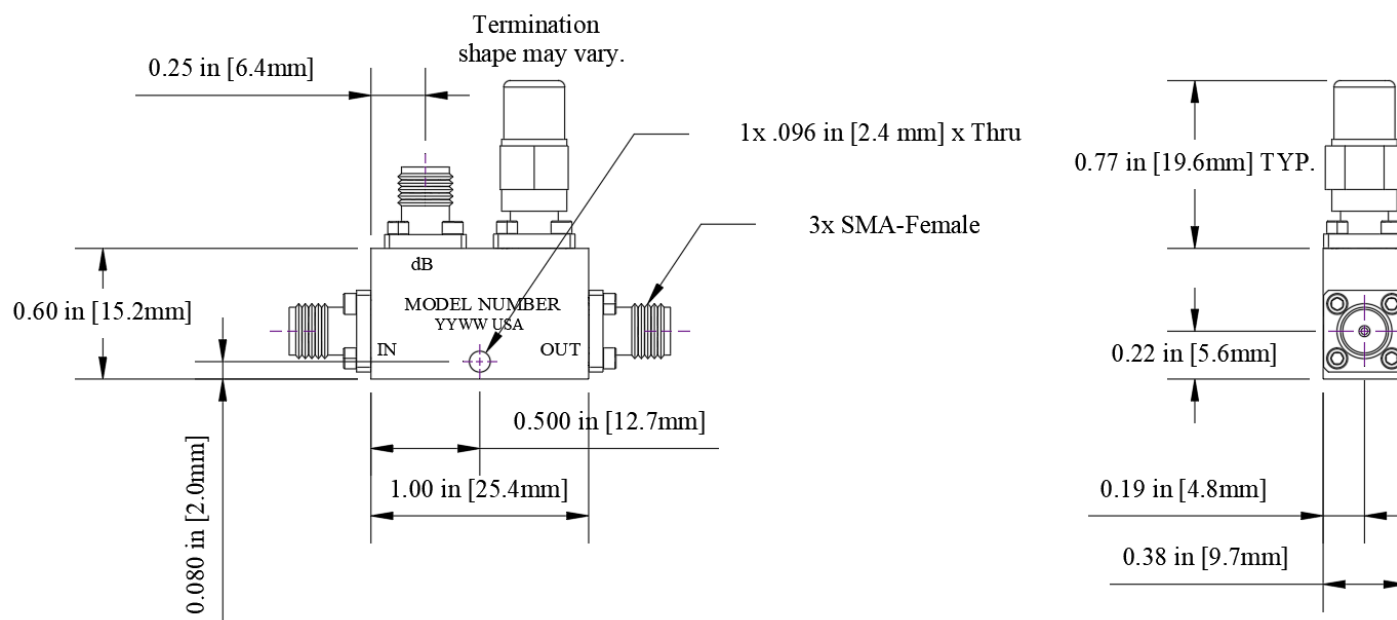
## Repeatability in Production



## 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.          |                     |
| 5000               | 26.3                | 24.1 | 17.9 | 0.6                   | 10.3             | 19.2                |
| 5500               | 25.0                | 22.8 | 17.3 | 0.7                   | 10.1             | 21.0                |
| 6000               | 24.6                | 23.4 | 18.6 | 0.7                   | 9.9              | 24.4                |
| 6500               | 25.9                | 25.2 | 21.8 | 0.7                   | 9.8              | 27.2                |
| 7000               | 31.7                | 28.6 | 25.3 | 0.7                   | 9.8              | 24.9                |
| 7500               | 42.7                | 34.4 | 28.0 | 0.7                   | 9.8              | 22.2                |
| 8000               | 32.1                | 37.7 | 30.7 | 0.7                   | 9.8              | 20.2                |
| 8500               | 26.4                | 30.2 | 28.1 | 0.7                   | 9.7              | 18.2                |
| 9000               | 24.0                | 26.5 | 23.5 | 0.8                   | 9.7              | 16.1                |
| 9500               | 23.3                | 24.7 | 21.4 | 0.7                   | 9.7              | 14.6                |
| 10000              | 23.7                | 24.4 | 21.0 | 0.8                   | 9.7              | 14.0                |
| 10500              | 25.3                | 24.8 | 21.6 | 0.8                   | 9.7              | 14.2                |
| 11000              | 27.3                | 26.6 | 23.6 | 0.8                   | 9.8              | 15.8                |
| 11500              | 30.7                | 29.3 | 26.7 | 0.8                   | 9.7              | 18.2                |
| 12000              | 32.5                | 32.7 | 28.4 | 0.8                   | 9.7              | 20.6                |
| 12500              | 27.7                | 34.8 | 27.7 | 0.8                   | 9.7              | 22.0                |
| 13000              | 23.9                | 29.4 | 27.0 | 0.8                   | 9.7              | 21.0                |
| 13500              | 21.8                | 26.3 | 28.5 | 0.8                   | 9.8              | 18.9                |
| 14000              | 20.5                | 24.6 | 31.7 | 0.8                   | 9.8              | 16.4                |
| 14500              | 20.9                | 24.6 | 28.0 | 0.8                   | 9.7              | 14.6                |
| 15000              | 22.9                | 26.0 | 21.4 | 0.8                   | 9.7              | 14.2                |
| 15500              | 28.1                | 29.5 | 18.5 | 0.8                   | 9.9              | 16.9                |
| 16000              | 32.5                | 33.4 | 17.8 | 0.8                   | 10.1             | 25.4                |
| 16500              | 26.4                | 28.8 | 19.3 | 0.8                   | 9.9              | 14.4                |
| 17000              | 21.8                | 27.2 | 21.4 | 0.8                   | 9.8              | 13.9                |
| 17500              | 19.3                | 25.0 | 19.6 | 0.9                   | 9.7              | 13.9                |
| 18000              | 18.4                | 22.0 | 18.6 | 0.9                   | 9.8              | 14.4                |
| 18500              | 17.9                | 19.2 | 21.9 | 0.9                   | 10.0             | 16.4                |
| 19000              | 17.4                | 17.7 | 31.0 | 0.9                   | 10.1             | 19.8                |
| 19500              | 17.8                | 17.5 | 19.8 | 0.9                   | 10.1             | 16.5                |
| 20000              | 21.7                | 19.7 | 16.5 | 0.9                   | 10.1             | 12.7                |

## Outline Dimensions



Outline # OL-1006

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

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

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