



## W-Band Waveguide Directional Coupler, 40 dB, Legacy Design

### Description:

**Model SWD-4040H-10-SB-MT** is a W-band, three-port waveguide directional coupler that delivers a 40 dB nominal coupling level and 30 dB minimum directivity across the full waveguide band from 75 to 110 GHz. The three-port coupler uses a traditional multi-hole and split block design to achieve a flat coupling level, high directivity, and low insertion loss. The RF ports of the coupler are WR-10 waveguides with UG-387/U-M flanges. Other standard coupling levels (3, 6, 10, 20, 30, and 40 dB) are available under different model numbers as **SWD-XX40H-10-SB-MT**, where **XX** is the desired coupling level.



### Features:

- Full Band Operation
- Low Insertion Loss
- High Directivity

### Applications:

- Test Labs
- Instrumentations
- Sub-assemblies

### Electrical Specifications:

| Parameter                 | Minimum | Typical | Maximum |
|---------------------------|---------|---------|---------|
| Frequency                 | 75 GHz  |         | 110 GHz |
| Insertion Loss*           |         | 1.5 dB  |         |
| Coupling*                 |         | 40 dB   |         |
| Directivity*              | 30 dB   | 40 dB   |         |
| Return Loss               |         | 25 dB   |         |
| Specification Temperature |         | +25 °C  |         |
| Operating Temperature     | -40 °C  |         | +85 °C  |

\* The definition of insertion loss, coupling and directivity is show below. The required termination on the waveguide port should have 30 dB return loss or better for accurate directivity measurements.

Insertion Loss =  $-10 \log_{10} [(P2+P3)/P1]$

Coupling Value =  $-10 \log_{10} [P3/P1]$

Isolation =  $-10 \log_{10} [P3/P2]$

Directivity = Isolation – Coupling Value



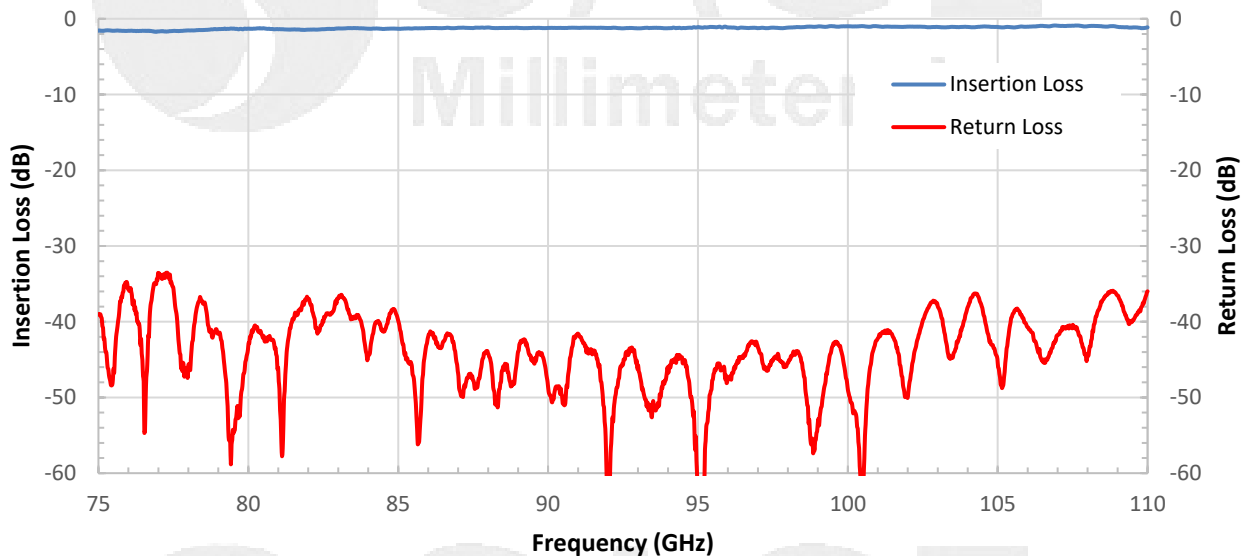


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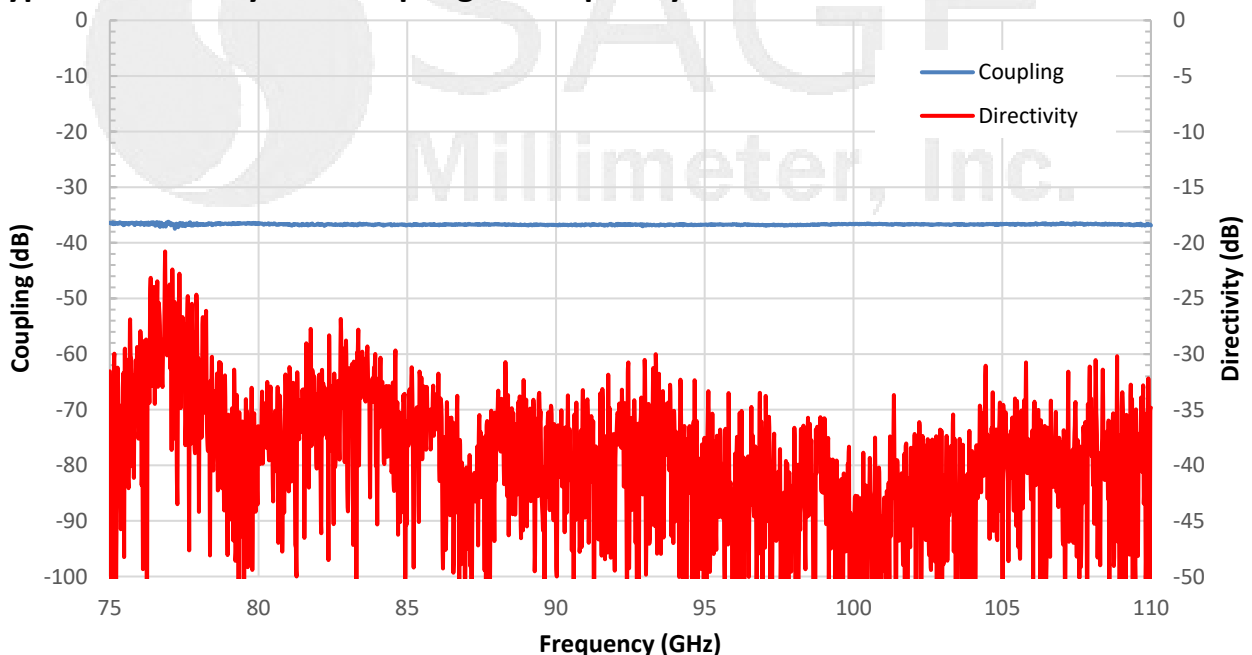
### Mechanical Specifications:

| Item     | Specification                          |
|----------|--|
| RF Ports | WR-10 Waveguide with UG-387/U-M Flange |
| Material | Brass                                  |
| Finish   | Gold Plated                            |
| Weight   | 8.7 Oz                                 |
| Outline  | WD-SB-W-MT                             |

### Typical Insertion Loss and Return Loss vs Frequency



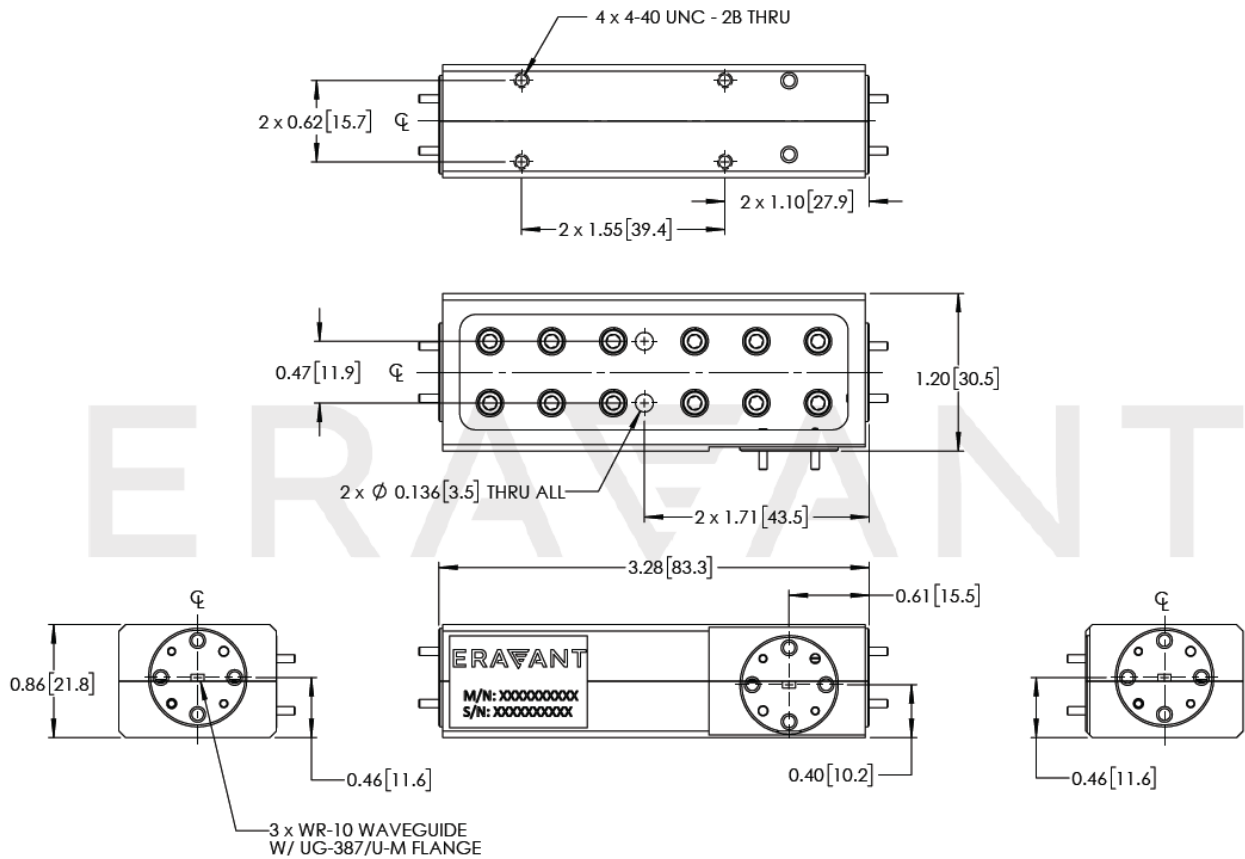
### Typical Directivity and Coupling vs Frequency



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 Phone: 424-757-0168 | Fax: 424-757-0188 | Email: sales@sagemillimeter.com

## W-Band Waveguide Directional Coupler, 40 dB, Legacy Design

**Mechanical Outline:** (Unless otherwise specified, all dimensions are in inches [millimeters])



**Note:**

- The -MT coupler series are based on a legacy Eravant design and have limited stock and availability. They are not recommended for use in high volume production applications.
- For new designs and volume needs, Eravant recommends our current standard coupler model (**SWD-4040H-10-SB**).
- The insertion loss shown includes the loss due to coupling.
- All data presented is collected from a sample lot. Actual data may vary unit to unit, slightly.
- All testing was performed under +25 °C case temperature.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

**Caution:**

- Any foreign objects in the waveguide will degrade performance and/or damage the device.

