

## V-Band Waveguide Bi-Directional Coupler, 10 dB, 50 to 85 GHz

### Description:

**Model SWD-5038531040H-15-BB** is a V band, four-port waveguide bi-directional coupler that delivers a 10 dB nominal coupling level and 30 dB minimum directivity across the full waveguide band from 50 to 85 GHz. The four-port coupler uses a traditional multi-hole and split block design to achieve a flat coupling level, high directivity, and low insertion loss. The interfaces of the coupler are WR-15 waveguides with UG-385/U flanges. Custom coupling levels are available under different model numbers.



### Features:

- Broad Band Operation
- Low Insertion Loss
- High Directivity

### Applications:

- Test Labs
- Instrumentation
- Sub-assemblies

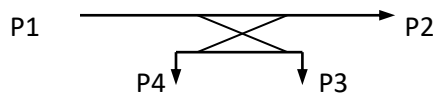
### Electrical Specifications:

| Parameter                 | Minimum | Typical | Maximum |
|---------------------------|---------|---------|---------|
| Frequency                 | 50 GHz  |         | 85 GHz* |
| Insertion Loss**          |         | 0.7 dB  |         |
| Coupling**                |         | 10 dB   |         |
| Directivity**             | 30 dB   | 40 dB   |         |
| Return Loss               |         | 20 dB   |         |
| Specification Temperature |         | +25°C   |         |
| Operating Temperature     | -40°C   |         | +85°C   |

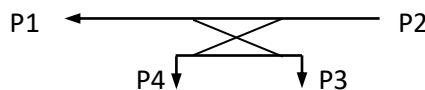
\* The maximum operation frequency can reach higher with small performance degradation.

\*\* The definition of the insertion loss, coupling and directivity is shown below.

Insertion Loss =  $-10 \log_{10} [(P2+P3)/P1]$  when P4 is terminated.  
Coupling Value =  $-10 \log_{10} [P3/P1]$  when P4 is terminated.  
or  $-10 \log_{10} [P4/P2]$  when P3 is terminated.

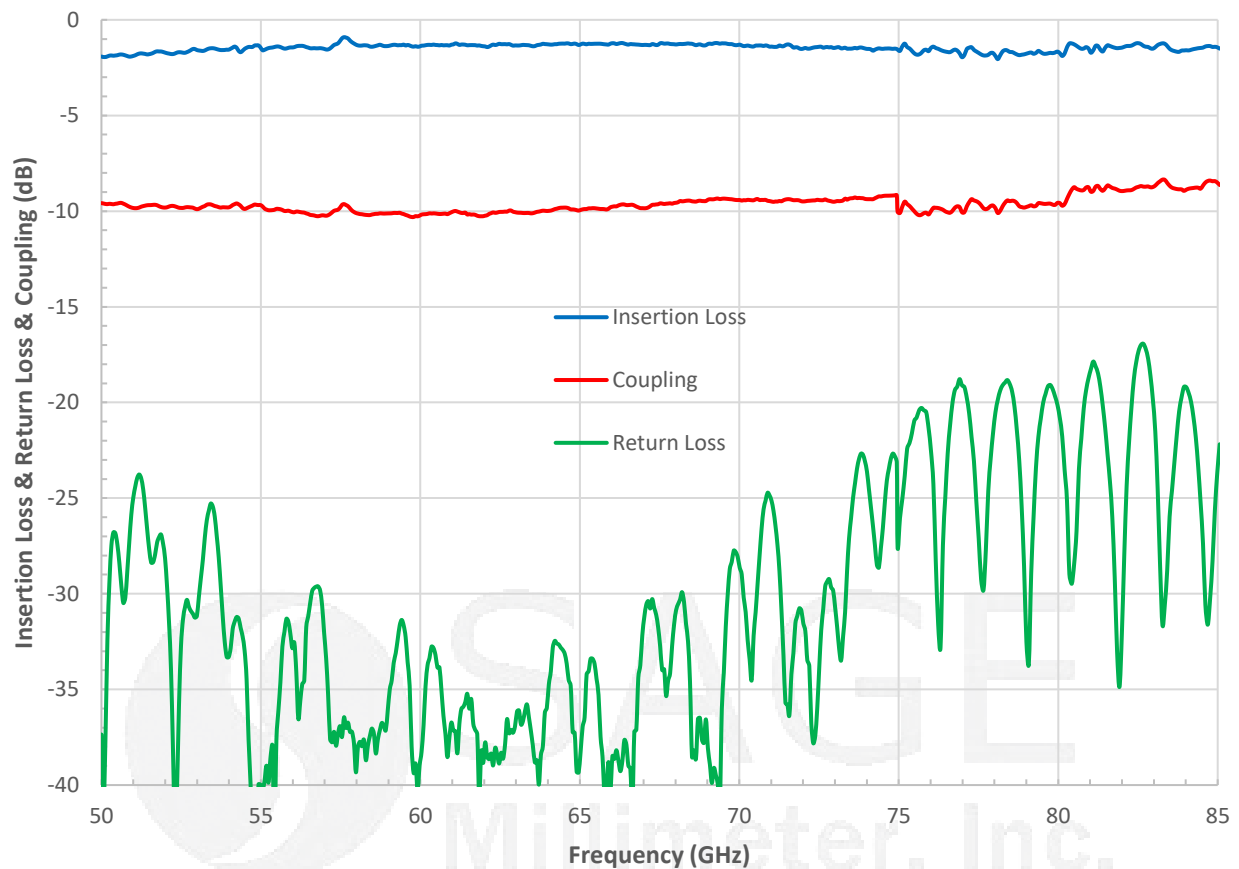


Directivity =  $-10 \log_{10} [P3/P2]$  when P4 is terminated.  
Directivity =  $-10 \log_{10} [P4/P1]$  when P3 is terminated.



**V-Band Waveguide Bi-Directional Coupler, 10 dB, 50 to 85 GHz****Mechanical Specifications:**

| Item          | Specification                        |
|---------------|--------------------------------------|
| Through Ports | WR-15 Waveguide with UG-385/U Flange |
| Coupled Port  | WR-15 Waveguide with UG-385/U Flange |
| Size          | 3.60" (L) X 0.95" (W) x 0.83" (H)    |
| Material      | Brass                                |
| Finish        | Gold Plated                          |
| Weight        | 7.5 Oz                               |
| Outline       | WD-BB-V                              |

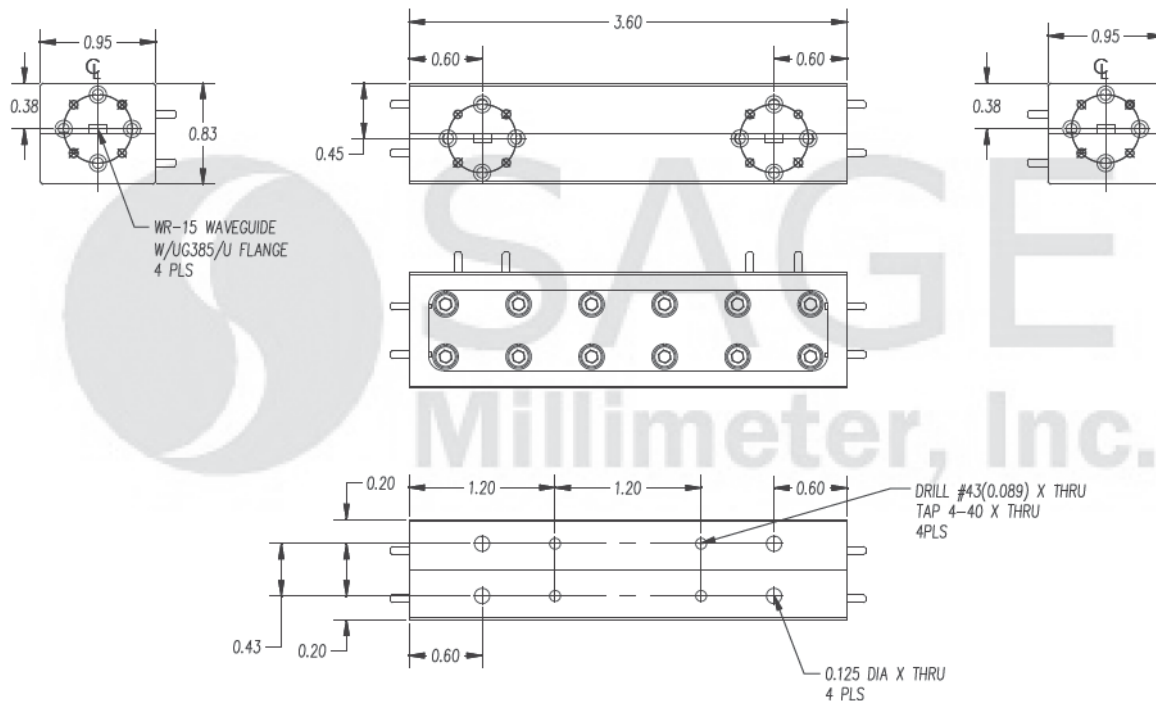
**Typical Performance vs. Frequency**

\*Insertion loss includes circuit loss



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



**Note:**

- 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.
- The insertion loss shown includes the loss due to coupling.
- 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.