# SWD-402040H-28-DB

Rev 1.0

**Ka-Band Waveguide Dual-Directional Coupler, 40 dB Forward, 20 dB Reverse Coupling**

## Description:

**Model SWD-402040H-28-DB** is a Ka band, four-port waveguide dual-directional coupler that delivers 40 dB nominal forward coupling, 20 dB reverse coupling, and 40 dB typical directivity across the full waveguide band from 26.5 to 40 GHz. The dual-directional coupler uses a traditional multi-hole and split block design to achieve a flat coupling level, high directivity, and low insertion loss. The waveguide interface of the coupler is WR-28 waveguides with UG-599/U flanges. Other coupling levels including custom coupling levels and asymmetrical forward/reverse coupling levels are available under different model numbers.

## Features:

- Asymmetrical Forward/Reverse Coupling
- Full Band Operation
- Low Insertion Loss
- High Directivity
- Flat Coupling Level Across the Band

## Applications:

- Test Labs
- Instrumentations
- Sub-assemblies

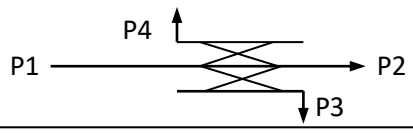
## Electrical Specifications:

| Parameter | Minimum | Typical | Maximum |
|---|---|---|---|
| Frequency | 26.5 GHz | | 40 GHz |
| Insertion Loss* | | 1.0 dB | |
| Forward Coupling* | | 40 dB | |
| Reverse Coupling* | | 20 dB | |
| Directivity* | | 40 dB | |
| Main Line Return Loss | | 25 dB | |
| Coupling Port Return Loss | | 25 dB | |
| Specification Temperature | | +25 ˚C | |
| Operating Temperature | -40 ˚C | | +85 ˚C |

*The definition of the insertion loss, coupling and directivity is shown as following. The required termination on the waveguide port is 30 dB or better for accurate measurement.

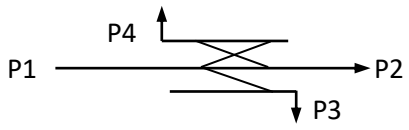
* The actual directivity and return loss are higher than shown due to the limitations of the network analyzer's dynamic range.

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 P1 and P4 are terminated.

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





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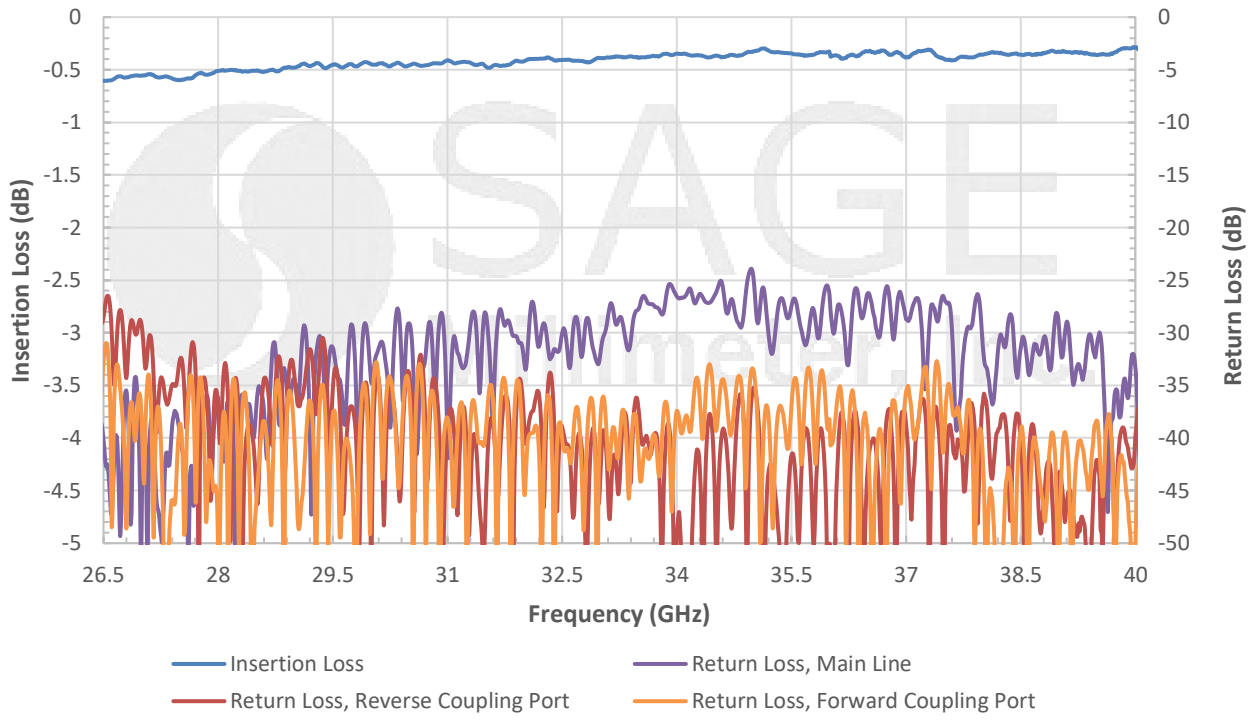
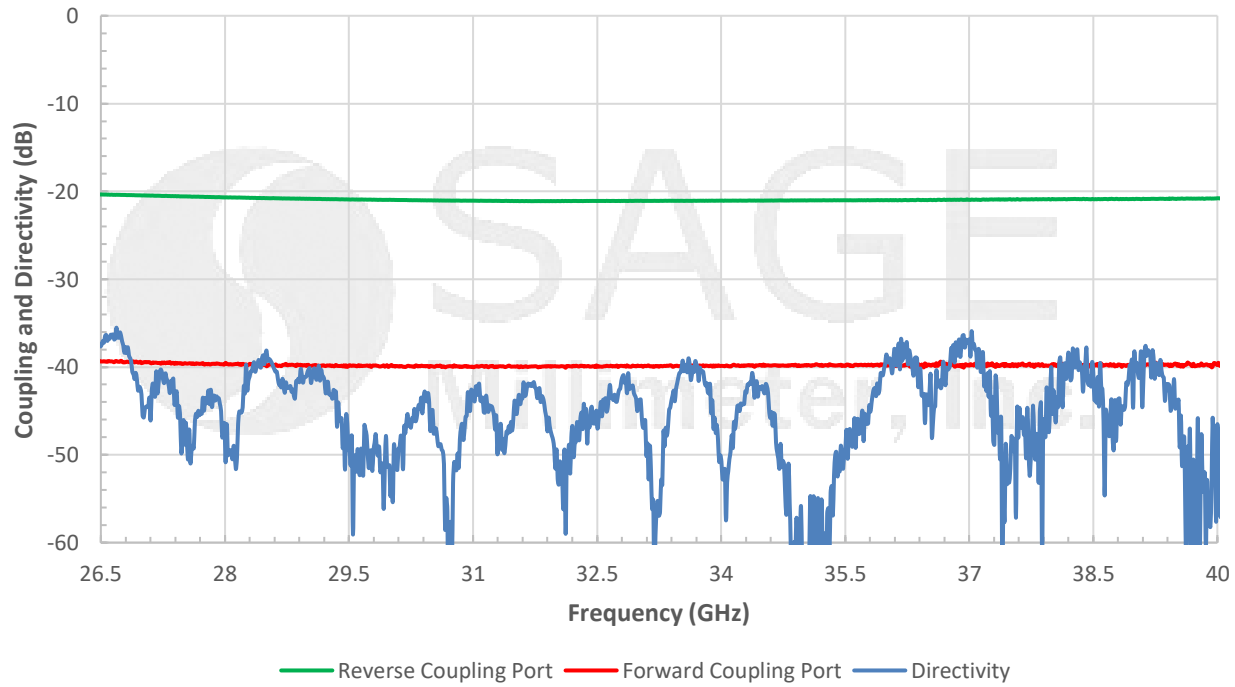
**Ka-Band Waveguide Dual-Directional Coupler, 40 dB Forward, 20 dB Reverse Coupling**

## Typical Measured Insertion Loss and Return Loss vs Frequency




## Typical Measured Coupling and Directivity vs Frequency

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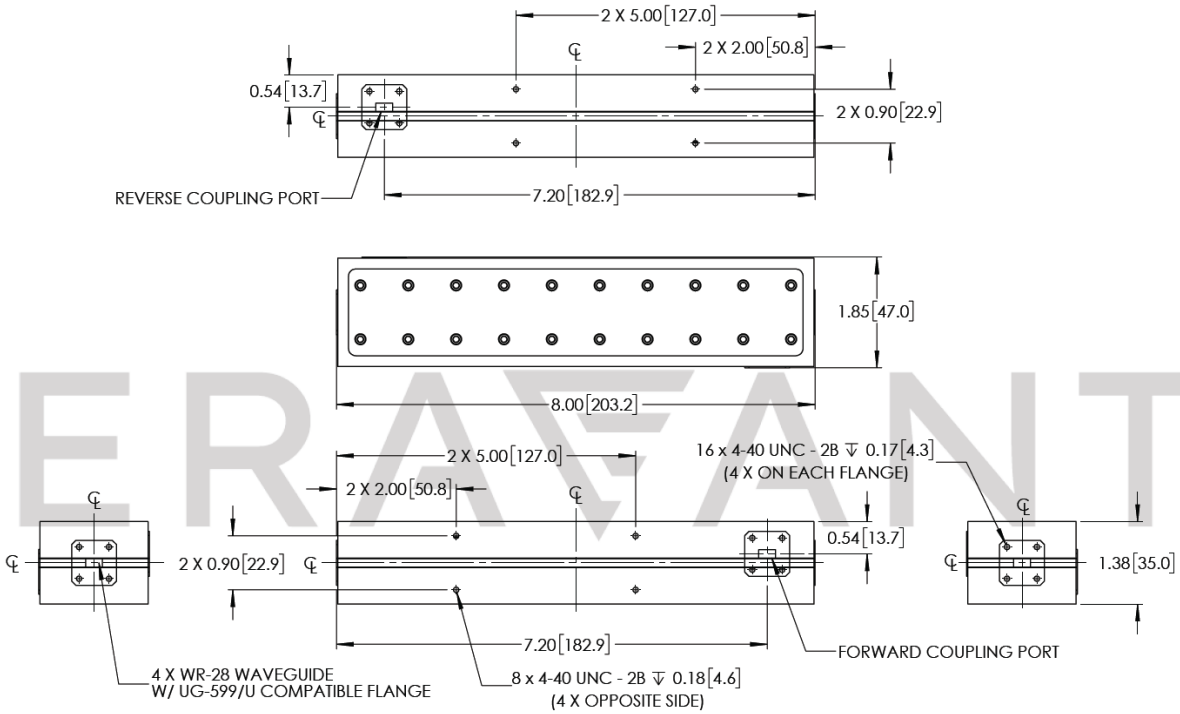
## Mechanical Specifications:

| Item | Specification |
|---|---|
| Waveguide Ports | WR-28 Waveguide with UG-599/U Compatible Flange |
| Material | Brass |
| Finish | Gold Plated |
| Weight | 3.2 lbs. |
| Outline | WD-DB-A |

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




**Note:**

- All data presented is collected from a sample lot. Actual data may vary unit to unit.
- All testing was performed under +25 ˚C case temperature.
- Eravant reserves the right to change the information presented without notice.

**Caution:**

- Any foreign objects in the waveguide will cause performance degradation and possible device damage.

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