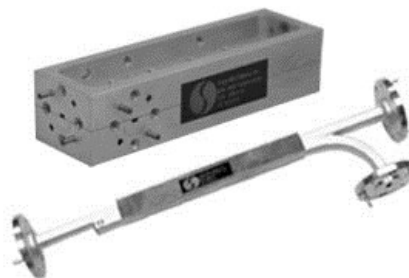


## Waveguide Directional Couplers, SWD Series

### FEATURES:

- ◆ Frequency coverage: 18 to 110 GHz
- ◆ Waveguide or split block configurations
- ◆ Low insertion loss and high directivity
- ◆ Directional, Bi-directional and dual directional types
- ◆ Instrumentation grade



### APPLICATIONS:

- ◆ Test labs
- ◆ Instrumentations
- ◆ Sub-assemblies

### DESCRIPTION:

**SWD series** waveguide directional couplers are traditional multi-hole directional couplers. These types of couplers feature low insertion loss, flat coupling level and high directivity crossing entire waveguide bands in the frequency range of 18 to 110 GHz in seven waveguide bands. Mechanically, they are constructed in two configurations, waveguide and split block. While the waveguide version offers the advantage of light weight and flex coupling arm orientation, the split block version offers compact size and higher directivity. Furthermore, Sage Millimeter offers three type couplers, namely, standard directional (3 ports), bi-directional (4 ports) and dual directional (4 ports). Their schematics are illustrated in the next page for reference.

### CATALOG MODELS: (Block Version)

Band	Model Number <sup>1,2,3</sup>	Waveguide	Frequency Range (GHz)	Coupling (dB)	Insertion Loss (dB) <sup>4</sup>	Directivity (dB) <sup>5</sup>	VSWR	Outline	Feature
K	SWD-CC40H-42-BB	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.50	40	1.1:1	WD-BB-K	4 Ports, HB
K	SWD-CC40H-42-DB	WR-42	18.0 to 26.5	10, 20	0.70	40	1.1:1	WD-DB-K	4 Ports, HB
K	SWD-CC40H-42-SB	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.50	40	1.1:1	WD-SB-K	3 Ports, HB
Ka	SWD-CC40H-28-BB	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.50	40	1.1:1	WD-BB-A	4 Ports, HB
Ka	SWD-CC40H-28-DB	WR-28	26.5 to 40.0	10, 20	0.70	40	1.1:1	WD-DB-A	4 Ports, HB
Ka	SWD-CC40H-28-SB	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.50	40	1.1:1	WD-SB-A	3 Ports, HB
Q	SWD-CC40H-22-BB	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.60	40	1.1:1	WD-BB-Q	4 Ports, HB
Q	SWD-CC40H-22-DB	WR-22	33.0 to 50.0	10, 20	0.90	40	1.1:1	WD-DB-Q	4 Ports, HB
Q	SWD-CC40H-22-SB	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.60	40	1.1:1	WD-SB-Q	3 Ports, HB
U	SWD-CC40H-19-BB	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.60	40	1.1:1	WD-BB-U	4 Ports, HB
U	SWD-CC40H-19-DB	WR-19	40.0 to 60.0	10, 20	0.90	40	1.1:1	WD-DB-U	4 Ports, HB
U	SWD-CC40H-19-SB	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.60	40	1.1:1	WD-SB-U	3 Ports, HB
V	SWD-CC40H-15-BB	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.70	40	1.1:1	WD-BB-V	4 Ports, HB
V	SWD-CC40H-15-DB	WR-15	50.0 to 75.0	10, 20	1.00	40	1.1:1	WD-DB-V	4 Ports, HB
V	SWD-CC40H-15-SB	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.70	40	1.1:1	WD-SB-V	3 Ports, HB
E	SWD-CC40H-12-BB	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	0.80	40	1.1:1	WD-BB-E	4 Ports, HB
E	SWD-CC40H-12-DB	WR-12	60.0 to 90.0	10, 20	1.20	40	1.1:1	WD-DB-E	4 Ports, HB
E	SWD-CC40H-12-SB	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	0.80	40	1.1:1	WD-SB-E	3 Ports, HB
W	SWD-CC40H-10-BB	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.00	40	1.1:1	WD-BB-W	4 Ports, HB
W	SWD-CC40H-10-DB	WR-10	75.0 to 110	10, 20	1.50	40	1.1:1	WD-DB-W	4 Ports, HB
W	SWD-CC40H-10-SB	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.00	40	1.1:1	WD-SB-W	3 Ports, HB

- Note:
- 1) The "CC" in the model number is the coupling factor in dB. For example, SWD-1020H-28-SB is a 10 dB standard directional coupler.
  - 2) The "H" is the coupling port bend option. There is no E bend option in block version configuration.
  - 3) "-BB" is a bi-directional 4 port coupler, "-DB" is a dual directional 4 port coupler and "-SB" is a standard 3 port directional coupler.
  - 4) Insertion loss is the power loss on top of the coupling loss. For example, 3 dB standard directional coupler with model number SWD-0340H-28-SB has 3.5 dB total power loss.
  - 5) The directivity of "-BB" type is load VSWR depended.

CATALOG MODELS: (Waveguide Version)

Band	Model Number <sup>1, 2, 3</sup>	Waveguide	Frequency (GHz)	Coupling (dB)	Insertion Loss (dB) <sup>4</sup>	Directivity (dB) <sup>5</sup>	VSWR	Outline	Feature
K	SWD-CC30H-42-BW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-BH-K	4 Ports, HB
K	SWD-CC30H-42-SW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-SH-K	3 Ports, HB
K	SWD-CC30E-42-BW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-BE-K	4 Ports, EB
K	SWD-CC30E-42-SW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-SE-K	3 Ports, EB
Ka	SWD-CC30H-28-BW	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-BH-A	4 Ports, HB
Ka	SWD-CC30H-28-SW	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-SH-A	3 Ports, HB
Ka	SWD-CC30E-28-BW	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-BE-A	4 Ports, EB
Ka	SWD-CC30E-28-SW	WR-28	26.5 to 40.0	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-SE-A	3 Ports, EB
Q	SWD-CC30H-22-BW	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.70	30	1.15:1	WD-BH-Q	4 Ports, HB
Q	SWD-CC30H-22-SW	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.70	30	1.15:1	WD-SH-Q	3 Ports, HB
Q	SWD-CC30E-22-BW	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-BE-Q	4 Ports, EB
Q	SWD-CC30E-22-SW	WR-22	33.0 to 50.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-SE-Q	3 Ports, EB
U	SWD-CC30H-19-BW	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-BH-U	4 Ports, HB
U	SWD-CC30H-19-SW	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-SH-U	3 Ports, HB
U	SWD-CC30E-19-BW	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-BE-U	4 Ports, EB
U	SWD-CC30E-19-SW	WR-19	40.0 to 60.0	3, 6, 10, 20, 30	0.70	30	1.18:1	WD-SE-U	3 Ports, EB
V	SWD-CC30H-15-BW	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.80	30	1.20:1	WD-BH-V	4 Ports, HB
V	SWD-CC30H-15-SW	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.80	30	1.20:1	WD-SH-V	3 Ports, HB
V	SWD-CC30E-15-BW	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.80	30	1.20:1	WD-BE-V	4 Ports, EB
V	SWD-CC30E-15-SW	WR-15	50.0 to 75.0	3, 6, 10, 20, 30	0.80	30	1.20:1	WD-SE-V	3 Ports, EB
E	SWD-CC30H-12-BW	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	1.00	30	1.20:1	WD-BH-E	4 Ports, HB
E	SWD-CC30H-12-SW	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	1.00	30	1.20:1	WD-SH-E	3 Ports, HB
E	SWD-CC30E-12-BW	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	1.00	30	1.20:1	WD-BE-E	4 Ports, EB
E	SWD-CC30E-12-SW	WR-12	60.0 to 90.0	3, 6, 10, 20, 30	1.00	30	1.20:1	WD-SE-E	3 Ports, EB
W	SWD-CC30H-10-BW	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.20	30	1.20:1	WD-BH-W	4 Ports, HB
W	SWD-CC30H-10-SW	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.20	30	1.20:1	WD-SH-W	3 Ports, HB
W	SWD-CC30E-10-BW	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.20	30	1.20:1	WD-BE-W	4 Ports, EB
W	SWD-CC30E-10-SW	WR-10	75.0 to 110	3, 6, 10, 20, 30	1.20	30	1.20:1	WD-SE-W	3 Ports, EB

- Note:
- 1) The "CC" in the model number is the coupling factor in dB. For example, SWD-1020H-28-SW is a 10 dB standard directional coupler.
  - 2) The "H" OR "E" are the coupling port bend option. There is no E bend option in block version configuration.
  - 3) "-BW" is a bi-directional 4 port coupler and "-SW" is a standard 3 port directional coupler. "-DW" is offered as non catalog model.
  - 4) Insertion loss is the power loss on top of the coupling loss. For example, 3 dB standard directional coupler with model number SWD-0340H-28-SB has 3.5 dB total power loss.
  - 5) The directivity of "-BW" type is load VSWR depended.

SCHEMATICS:

