

Waveguide Directional Couplers, SWD Series

FEATURES:

- ◆ Frequency coverage: 18 to 170 GHz
- ◆ Waveguide or split block configurations
- ◆ Low insertion loss and high directivity
- ◆ Directional, bi-directional and dual directional types
- ◆ Instrumentation grade



APPLICATIONS:

- ◆ Test labs
- ◆ Instrumentation
- ◆ Subassemblies

DESCRIPTION:

SWD series waveguide directional couplers feature low insertion loss, a flat coupling level and high directivity. The below standard models cover 18 to 110 GHz, however, additional models are offered for frequencies up to 170 GHz. Mechanically, they are constructed as either waveguides or split blocks. While the waveguide version offers the advantage being light weight with a flexible coupling arm orientation, the split block version offers a compact size and higher directivity. SAGE Millimeter offers three types of couplers: standard directional (3 ports), bi-directional (4 ports) and dual directional (4 ports). Their schematics are illustrated on the next page. Always check the website or contact the factory for custom models.

CATALOG MODELS (Split Block Version):

Band	Model Number ^{1,2,3}	Waveguide	Frequency Range (GHz)	Coupling (dB)	Insertion Loss (dB) ⁴	Directivity (dB) ⁵	VSWR	Outline	Feature
K	SWD-CC40H-42-BB	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.50	30	1.1:1	WD-BB-K	4 Ports, HB
K	SWD-CC40H-42-DB	WR-42	18.0 to 26.5	10, 20	0.50	30	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	30	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	35	1.1:1	WD-BB-A	4 Ports, HB
Ka	SWD-CC40H-28-DB	WR-28	26.5 to 40.0	10, 20	0.50	35	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	35	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	0.70	35	1.1:1	WD-BB-Q	4 Ports, HB
Q	SWD-CC40H-22-DB	WR-22	33.0 to 50.0	10, 20	0.70	35	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	0.70	35	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	0.70	35	1.1:1	WD-BB-U	4 Ports, HB
U	SWD-CC40H-19-DB	WR-19	40.0 to 60.0	10, 20	0.70	35	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	0.70	35	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	30	1.1:1	WD-BB-V	4 Ports, HB
V	SWD-CC40H-15-DB	WR-15	50.0 to 75.0	10, 20	0.70	30	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	30	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	30	1.1:1	WD-BB-E	4 Ports, HB
E	SWD-CC40H-12-DB	WR-12	60.0 to 90.0	10, 20	0.80	30	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	30	1.1:1	WD-SB-E	3 Ports, HB
W	SWD-CC40H-10-BB	WR-10	75.0 to 110.0	3, 6, 10, 20, 30	1.00	30	1.1:1	WD-BB-W	4 Ports, HB
W	SWD-CC40H-10-DB	WR-10	75.0 to 110.0	10, 20	1.00	30	1.1:1	WD-DB-W	4 Ports, HB
W	SWD-CC40H-10-SB	WR-10	75.0 to 110.0	3, 6, 10, 20, 30	1.00	30	1.1:1	WD-SB-W	3 Ports, HB

- Note:
- 1) "CC" is the coupling factor in dB. For example, SWD-1020H-28-SB is a 10 dB standard directional coupler.
 - 2) "H" is the coupling port bend option. There is no E bend option for the split block 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, a 3 dB standard directional coupler, model number SWD-0340H-28-SB, has a 4.5 dB total power loss.
 - 5) The directivity of "-BB" models is dependent on the load's VSWR.

CATALOG MODELS (Waveguide Version):

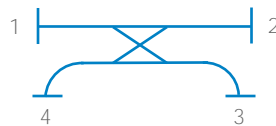
Band	Model Number ^{1,2,3}	Waveguide	Frequency (GHz)	Coupling (dB)	Insertion Loss (dB) ⁴	Directivity (dB) ⁵	VSWR	Outline	Feature
K	SWD-CC30H-42-BW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-BH-K	4 Ports, HB
K	SWD-CC30H-42-SW	WR-42	18.0 to 26.5	3, 6, 10, 20, 30	0.60	30	1.15:1	WD-SH-K	3 Ports, 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 110.0	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 110.0	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 110.0	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 110.0	3, 6, 10, 20, 30	1.20	30	1.20:1	WD-SE-W	3 Ports, EB

- Note:
- 1) "CC" is the coupling factor in dB. For example, SWD-1020H-28-SW is a 10 dB standard directional coupler.
 - 2) "H" OR "E" are the coupling port bend option. There is no E bend option for the split block configuration.
 - 3) "-BW" is a bi-directional, 4-port coupler and "-SW" is a standard, 3-port directional coupler. "-DW" is offered as a non-catalog model.
 - 4) Insertion loss is the power loss on top of the coupling loss. For example, a 3 dB standard directional coupler, model number SWD-0340H-28-SW, has a 4.5 dB total power loss.
 - 5) The directivity of "-BB" models is dependent on the load's VSWR.

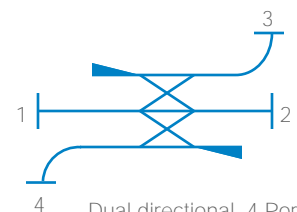
SCHEMATICS:



Standard Directional, 3 Ports



Bi-directional, 4 Ports



Dual directional, 4 Ports