

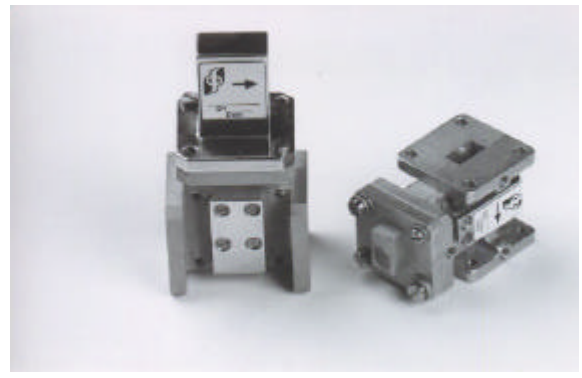
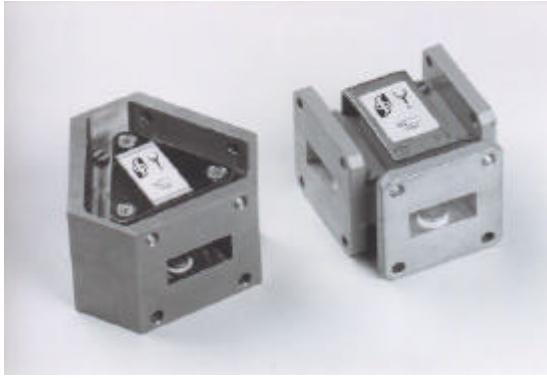


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## 1. Isolators & Circulators for General Use

### 1.1. Broad Bandwidth Isolators and Circulators (Y & T - junction)

Frequency range GHz	Model	Bandwidth %	Insertion loss (Typ*/Max) dB	Isolation (Typ*/ Min) dB	VSWR (Typ*/Max)
3.95 to 5.85	3□WY49-1	Full	0.3/0.5	20/18	1.22/1.3
5.85 to 8.2	3□WY70-1	Full	0.3/0.5	20/18	1.22/1.3
7.05 to 10.0	3□WY85-1	Full	0.3/0.5	20/18	1.22/1.3
8.2 to 12.4	4□WY10-1	Full	0.3/0.5	20/18	1.22/1.3
12.4 to 18.0	4□WY15-1	Full	0.3/0.5	20/18	1.22/1.3
18.0 to 26.5	4□WY22-1	Full	0.35/0.5	20/18	1.22/1.3

Note. \* - Typical performance at (+ 25 ± 10) °C. Max and Min values within temperature ranges (-30 to +70) °C.

### 1.2. Low Loss Isolators and Circulators (T - junction)

Frequency range GHz	Model	Bandwidth %	Insertion loss dB	Isolation dB	VSWR
3.7 to 4.2	3□WN40-2	Full	0.15	25	1.13
5.92 to 6.43	3□WN62-2	Full	0.15	25	1.13
6.42 to 7.13	3□WN68-2	Full	0.15	25	1.13
7.12 to 7.73	3□WN70-2	Full	0.15	25	1.13
7.72 to 8.4	3□WN80-2	Full	0.15	25	1.13
10.7 to 11.7	4□WN11-2	Full	0.15	25	1.13
10.7 to 12.5	4□WN12-2	Full	0.2	25	1.13
14.0 to 14.5	4□WN14-2	Full	0.2	25	1.13
17.7 to 19.7	4□WN18-2	Full	0.2	25	1.13
21,2 to 24.5	4□WN23-2	Full	0.2	23	1.16
24.5 to 26.5	4□WN25-2	Full	0.2	23	1.16

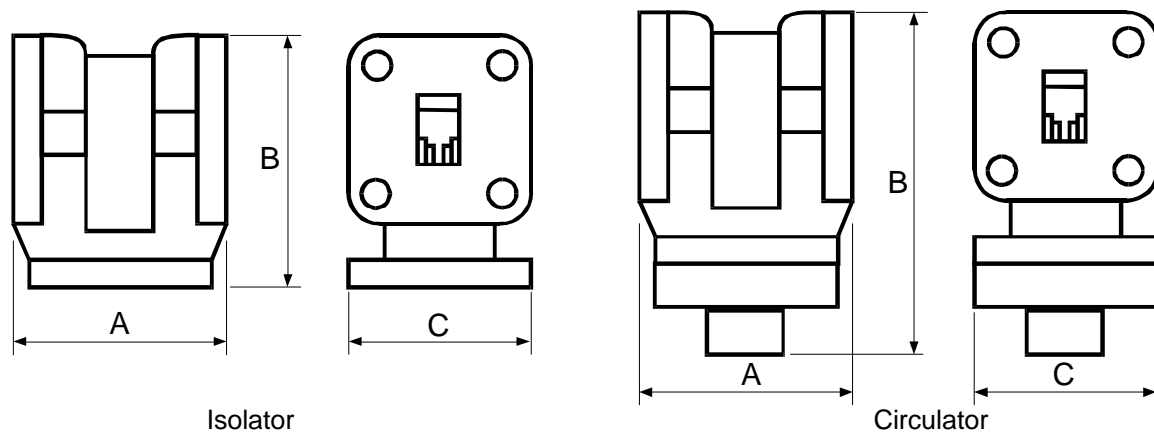
Note. Operating temperature range (0 to +50)°C

## 2. Cryogenic (4 to 77 K) Isolators and Circulators (T - junction)

Frequency range GHz	Model	Bandwidth %	Insertion loss dB	Isolation dB	VSWR
8.2 to 12.4	4□WC10-1	15	0.2	20	1.22
12.4 to 18.0	4□WC15-1	15	0.2	20	1.22
12.4 to 18.0	4□WC15-2	Full	0.3	20	1.22
18.0 to 26.5	4□WC22-1	15	0.2	20	1.22

Note. In blank □: I - Isolator, C- Circulator

Outlines (all dimensions are in millimeters)



### 1.1. Broad Bandwidth Isolators and Circulators (Y & T - junction)

Model	A	B	C	Waveguide
3□WY49-1	100	110	60	WR-187
3□WY70-1	70	79	54	WR-137
3□WY85-1	68	65	47	WR-112
4□WY10-1	50	55	42	WR-90
4□WY15-1	40	48	35	WR-62
4□WY22-1	32	39	29	WR-42

### 1.2. Low Loss Isolators and Circulators (T - junction)

Model	A	B	C	Waveguide
3□WN40-2	120	128	63	WR-229
3□WN62-2	90	85	53	WR-137
3□WN68-2	90	85	53	WR-137
3□WN70-2	68	65	47	WR-112
3□WN80-2	68	65	47	WR-112
4□WN11-2	50	55	42	WR-90
4□WN12-2	45	45	38.5	WR-75
4□WN14-2	40	48	35	WR-62
4□WN18-2	32	39	22.5	WR-42
4□WN23-2	32	39	22.5	WR-42
4□WN25-2	32	39	22.5	WR-42

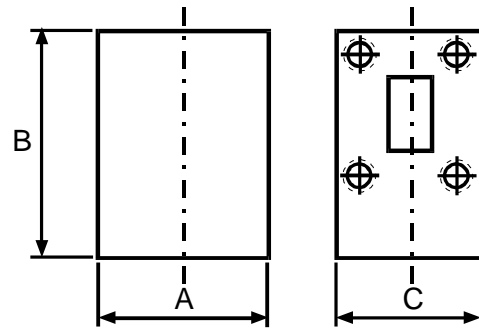
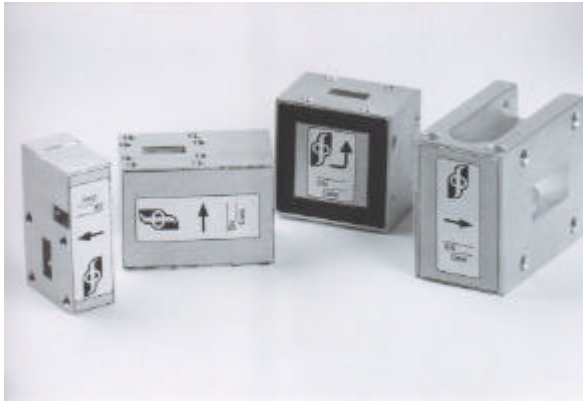
### 2. Cryogenic (4 to 77 K) Isolators and Circulators (T - junction)

Model	A	B	C	Waveguide
4□WC10-1	55	51	43	WR-90
4□WC15-1	40.5	32	33.5	WR-62
4□WC15-2	40.5	32	33.5	WR-62
4□WC22-1	32	39	23	WR-42

Note. Dimensions are given for circulators. Isolators dimensions are defined by connected load, which depends on absorbed power.

Note. In blank □: I - Isolator, C- Circulator

## 3. Isolators and Circulators for Communication Equipment



## 3.1. Standard Isolators and Circulators

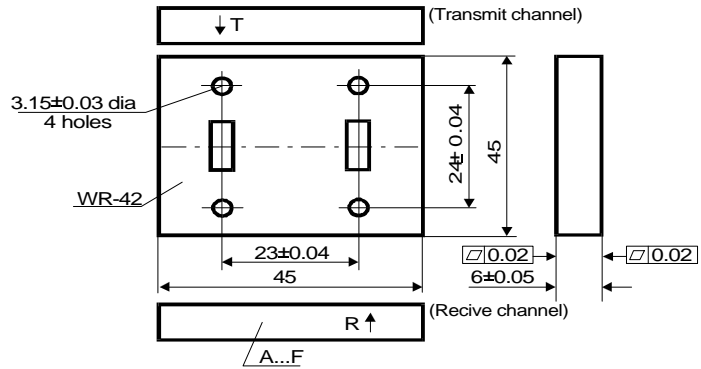
Frequency range GHz	Model	Bandwidth %	Insertion loss dB	Isolation dB	VSWR
8.7 to 9.7	3IWN87-1	Full	0.3	20	1.2
10.7 to 11.2	4IWN11-1	Full	0.3	20	1.2
10.7 to 11.7	4IWN11-5	Full	0.3	20	1.2
11.2 to 11.7	4IWN11-2	Full	0.3	20	1.2
11.7 to 12.7	4IWN12-5	Full	0.3	20	1.2
14.0 to 14.5	4IWN14-5	Full	0.3	20	1.2
14.0 to 14.5	4IWN14-6	Full	0.3	20	1.3
17.7 to 19.7	4IWN18-4	Full	0.3	20	1.2
20.6 to 21.4	4IWN21-1H	Full	0.2	20	1.22
21.2 to 24.5	4IWN22-3	Full	0.3	20	1.2
21.2 to 23.6	4IWN22-5	Full	0.3	20	1.2
21.2 to 23.6	4IWN23-1	Full	0.3	20	1.2
21.2 to 23.8	4IWN23-5	Full	0.25	24	1.14
24.0 to 26.5	4IWN25-2	Full	0.3	20	1.2
21.0 to 23.6	4CWN22-2	Full	0.3	23	1.16
21.2 to 24.5	4CWN22-3	Full	0.3	23	1.16

Note. Operating temperature range (0 to +50)°C

## Outlines (all dimensions are in millimeters)

Model	A	B	C	Waveguide	Flange
3IWN87-1	25.4	70	45	WR-90	Standard
4IWN11-1	11.7	50	38	WR-75	UBR-120
4IWN11-5	25.4	44	38.5	WR-75	Standard
4IWN11-2	11.7	50	38	WR-75	UBR-120
4IWN12-5	25.4	44	38.5	WR-75	Standard
4IWN14-5	25.4	44	38.5	WR-75	Standard
4IWN14-6	9	50	38.5	WR-75	Standard
4IWN18-4	12.7	38.1	12.5	WR-42	UG-595/U
4IWN21-1H	12.0	37.8	33.2	WR-51	Standard
4IWN22-3	22.2	38.1	22.5	WR-42	UG-595/U
4IWN22-5	12.7	38.1	22.5	WR-42	UG-595/U
4IWN23-1	27.9	38.1	22.5	WR-42	UG-595/U
4IWN23-5	32	38.1	22.5	WR-42	UG-595/U
4IWN25-2	12.7	38.1	22.5	WR-42	UG-595/U
4CWN22-2	22.2	31.8	22.5	WR-42	UG-595/U
4CWN22-3	25.4	29.2	22.5	WR-42	UG-595/U

3.2. 1/4" Slim Line Isolators (Customized)



Broadband Isolator with Receive Channel

Frequency range GHz	Model	Loss dB max	Isolation dB min	VSWR max	Power W
20.5 to 24.0	4IWL-22X	0.6	15	1.4	2
24.0 to 26.5	4IWL-25X				

Isolator with Receive Channel

Frequency range GHz	Model	Loss dB max	Isolation dB min	VSWR max	Power W	Extended receiving frequency range	
						Frequency GHz	Isolation dB min
22.43 to 23.03	4IWL23-A	0.6	18	1.3	2	23.03 to 26.04	10
23.0 to 23.6	4IWL23-D	0.6	18	1.3	2	23.6 to 26.6	10
21.2 to 21.6	4IWL23-C	0.6	18	1.3	2	18.19 to 21.2	10
21.7 to 22.4	4IWL23-D	0.6	18	1.3	2	18.75 to 21.76	10
23.0 to 23.6	4IWL23-E	0.6	18	1.3	2	23.6 to 26.1	10
22.0 to 22.6	4IWL23-F	0.6	18	1.3	2	19.9 to 22.0	10
25.475 to 26.075	4IWL26-A	0.6	18	1.3	2	26.075 to 28.5	10
25.95 to 26.55	4IWL26-B	0.6	18	1.3	2	26.55 to 28.5	10
24.475 to 25.075	4IWL26-C	0.6	18	1.3	2	21.471 to 24.478	10
25.95 to 26.55	4IWL26-D	0.6	18	1.3	2	21.325 to 24.93	10

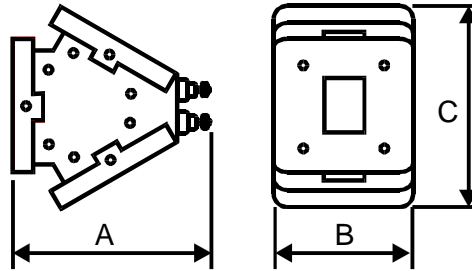
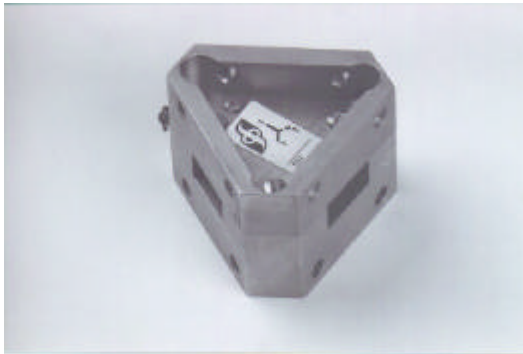
Double Isolators

Frequency GHz	Model	Channel	Loss dB max	Isolation dB min	VSWR max	Power W	Extended receiving frequency range	
							Frequency GHz	Isolation dB min
21.2 to 21.8	4IWD-23A	T	0.5	18	1.3	2	23.03 to 26.04	10
22.43 to 23.03		R	0.6					
21.76 to 22.36	4IWD-23B	T	0.5	18	1.3	2	23.6 to 26.6	10
23.0 to 23.6		R	0.6					
22.43 to 23.1	4IWD-23C	T	0.5	18	1.3	2	18.19 to 21.2	10
21.2 to 21.8		R	0.6					
23.0 to 23.6	4IWD-23D	T	0.5	18	1.3	2	18.75 to 21.76	10
21.7 to 22.4		R	0.6					
22.0 to 22.6	4IWD-23E	T	0.5	18	1.3	2	23.6 to 26.1	10
23.0 to 23.6		R	0.6					
23.0 to 23.6	4IWD-23F	T	0.5	18	1.3	2	19.9 to 22.0	10
22.0 to 22.6		R	0.6					
24.475 to 25.075	4IWD-26A	T	0.5	18	1.3	2	26.075 to 28.5	10
25.475 to 26.075		R	0.6					
24.91 to 25.53	4IWD-26B	T	0.5	18	1.3	2	26.55 to 28.5	10
25.95 to 26.55		R	0.6					
25.475 to 26.075	4IWD-26C	T	0.5	18	1.3	2	21.471 to 24.475	10
24.475 to 25.075		R	0.6					
25.95 to 26.55	4IWD-26D	T	0.5	18	1.3	2	21.326 to 24.93	10
24.93 to 25.53		R	0.6					

Notes. Temperature range for all slim line isolators: (-30 to +70) °C. Waveguide type WR-42

## 1. Ferrite Switches

### 1.1. Latching Switches



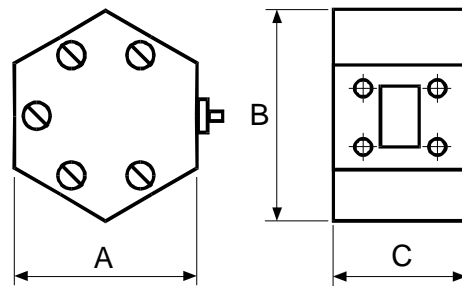
Frequency range GHz	Model	Band width %	Insertion loss (Typ*/Max) dB	Isolation (Typ*/ Min) dB	VSWR (Typ*/Max)	Average power W	Switch time $\mu$ s	Switch energy $\mu$ J
8.2 to 12.4	4SWS10-1	5	0.2/0.25	30/25	1.1/1.15	5	2.0	200
8.2 to 12.4	4SWS10-2	10	0.2/0.25	25/20	1.15/1.22	5	2.0	200
8.2 to 12.4	4SWS10-3	15	0.2/0.25	23/20	1.19/1.22	5	2.0	200
8.2 to 12.4	4SWS10-4	5	0.25/0.3	25/20	1.15/1.22	100	2.0	200
8.2 to 12.4	4SWS10-5	10	0.3/0.35	23/20	1.19/1.22	100	2.0	200
8.2 to 12.4	4SWS10-6	15	0.3/0.35	20/18	1.22/1.3	100	2.0	200
12.4 to 18.0	4SWS15-1	5	0.2/0.25	30/25	1.1/1.15	20	2.0	180
12.4 to 18.0	4SWS15-2	10	0.2/0.25	25/20	1.15/1.22	20	2.0	180
12.4 to 18.0	4SWS15-3	15	0.25/0.3	20/18	1.22/1.3	20	2.0	180
18.0 to 26.5	4SWS22-1	5	0.2/0.25	25/20	1.15/1.22	3	2.0	180
18.0 to 26.5	4SWS22-2	10	0.25/0.3	20/18	1.22/1.3	3	2.0	180
18.0 to 26.5	4SWS22-3	15	0.3/0.35	20/18	1.22/1.3	3	2.0	150

Note. \* - Typical performance at  $(+ 25 \pm 10)$  °C. Max and Min values within temperature ranges (0 to +50) °C. Some devices can be delivered in T-junction configuration.

### Outlines (all dimensions are in millimeters)

Model	A	B	C	Waveguide
4SWS10-1	61	66	42	WR-90
4SWS10-2	61	66	42	WR-90
4SWS10-3	61	66	42	WR-90
4SWS10-4	61	66	42	WR-90
4SWS10-5	61	66	42	WR-90
4SWS10-6	61	66	42	WR-90
4SWS15-1	58	60	36	WR-62
4SWS15-2	58	60	36	WR-62
4SWS15-3	58	60	36	WR-62
4SWS22-1	39	40	24	WR-42
4SWS22-2	39	40	24	WR-42
4SWS22-3	39	40	24	WR-42

## 1.2. Switches for General Use



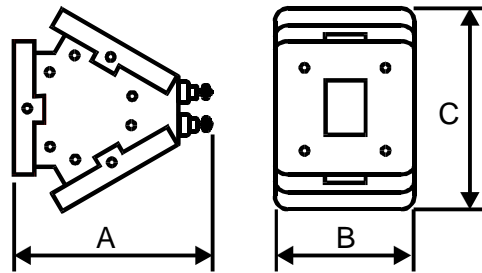
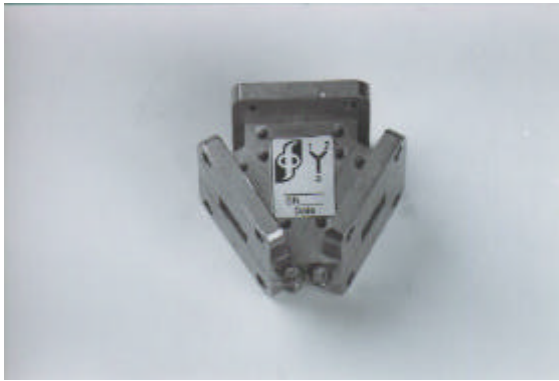
Frequency range GHz	Model	Band width %	Insertion loss (Typ*/Max) dB	Isolation (Typ*/Min) dB	VSWR (Typ*/Max)	Average power W	Switch time ms	Switch energy V/A
7.05 to 10.0	3SWY85-1	10	0.2/0.25	25/20	1.13/1.22	150	5	27/4
7.05 to 10.0	3SWY85-2	15	0.25/0.3	23/18	1.18/1.3	150	5	27/4
7.05 to 10.0	3SWY85-3	20	0.3/0.35	20/18	1.22/1.3	150	5	27/4
8.2 to 12.4	4SWY10-1	10	0.2/0.25	25/20	1.13/1.22	30	2.5	27/4
8.2 to 12.4	4SWY10-2	15	0.25/0.3	23/20	1.18/1.22	30	2.5	27/4
8.2 to 12.4	4SWY10-3	20	0.3/0.35	20/18	1.22/1.3	30	2.5	27/4
10.0 to 15.0	4SWY13-1	10	0.2/0.25	30/25	1.09/1.13	100	2.5	27/3
10.0 to 15.0	4SWY13-2	15	0.25/0.3	25/20	1.13/1.22	100	2.5	27/3
10.0 to 15.0	4SWY13-3	20	0.3/0.35	23/20	1.13/1.22	100	2.5	27/3
18.0 to 26.5	4SWY22-1	10	0.2/0.25	30/25	1.09/1.13	100	2.5	27/3
18.0 to 26.5	4SWY22-2	15	0.25/0.3	25/20	1.13/1.22	100	2.5	27/3
18.0 to 26.5	4SWY22-3	20	0.3/0.35	23/20	1.18/1.22	100	2.5	27/3

Note. \* - Typical performance at (+ 25 ± 10) °C. Max and Min values within temperature ranges (-60 to +85) °C.

## Outlines (all dimensions are in millimeters)

Model	A	B	C	Waveguide
3SWY85-1	70	68	58	WR-112
3SWY85-2	70	68	58	WR-112
3SWY85-3	70	68	58	WR-112
4SWY10-1	52	50	50	WR-90
4SWY10-2	52	50	50	WR-90
4SWY10-3	52	50	50	WR-90
4SWY13-1	61	53	48	WR-75
4SWY13-2	61	53	48	WR-75
4SWY13-3	61	53	48	WR-75
4SWY22-1	54	48	48	WR-42
4SWY22-2	54	48	48	WR-42
4SWY22-3	54	48	48	WR-42

## 2. Ferrite Cryogenic (20 K) Latching Switches



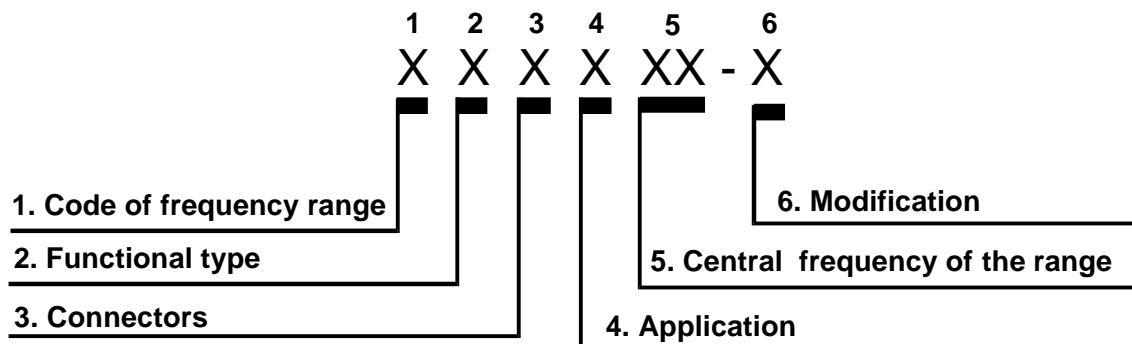
Frequency range GHz	Model	Band width %	Insertion loss (Typ*/Max) dB	Isolation (Typ*/Min) dB	VSWR (Typ*/Max)	Average power W	Switch time $\mu$ s	Switch energy $\mu$ J
8.2 to 12.4	4SWC10-1	5	0.15	25	1.15	0.2	2.0	200
8.2 to 12.4	4SWC10-2	10	0.2	20	1.22	0.2	2.0	200
12.4 to 18.0	4SWC15-1	5	0.2	25	1.15	0.2	2.0	180
12.4 to 18.0	4SWC15-2	10	0.2	20	1.22	0.2	2.0	180
18.0 to 26.5	4SWC22-1	5	0.2	25	1.15	0.2	2.0	180
18.0 to 26.5	4SWC22-2	10	0.2	20	1.22	0.2	2.0	180

## Outlines (all dimensions are in millimeters)

Model	A	B	C	Waveguide
4SWC10-1	61	66	42	WR-90
4SWC10-2	61	66	42	WR-90
4SWC15-1	58	60	36	WR-62
4SWC15-2	58	60	36	WR-62
4SWC22-1	39	40	24	WR-42
4SWC22-2	39	40	24	WR-42

Microwave Waveguide Device model numbering system describes many options. Adapting our basic catalog models to your specific needs will frequently result in lower costs and prompt delivery.

**Product identification**



**1. Code of frequency range and its Central frequency**

1		5
Code of frequency range	Frequency range	Central frequency of the range
0	1 to 9 MHz	XX · 0.1 MHz
1	10 to 99 MHz	XX · 1 MHz
2	100 to 999 MHz	XX · 10 MHz
3	1 to 9 GHz	XX · 100 MHz
4	10 to 99 GHz	XX · 1 GHz
5	Over 100 GHz	XX · 10 GHz

**2. Functional type**

Code of the type	Product type
I	Isolator
C	Circulator
S	Switch

**3. Connectors**

Code of connectors	Type
W	Waveguide

**4. Application**

Code of application	Application
C	Cryogenic
F	Faraday rotational
H	High power
L	Slim line
N	Low loss
S	Narrow band
U	Super high power
Y	Broad bandwidth

**5. Central frequency of the range**

**6. Modification**