

Waveguide Circulators, Isolators



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Ferrite Domen Co. presents a broad range of waveguide ferrite circulators and isolators for use in military, commercial and scientific applications here. We design and manufacture devices from 1.7 to 170 GHz. These ones feature low insertion loss, high isolation, wide spectrum operating power and temperature range.

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1. Broad Bandwidth Circulators and Isolators (Y & T - junction) 3.95 to 26.5 GHz

Frequency range GHz	Model	Bandwidth	Insertion loss dB, max	Isolation dB, min	VSWR max	Operating temperature °C
3.95 - 5.85	3□WY49-1	Full	0.3	20	1.22	+ 25
			0.5	18	1.3	-30 to +70
5.85 - 8.2	3□WY70-1	Full	0.3	20	1.22	+ 25
			0.5	18	1.3	-30 to +70
7.05 - 10.0	3□WY85-1	Full	0.3	20	1.22	+ 25
			0.5	18	1.3	-30 to +70
8.2 - 12.4	4□WY10-1	Full	0.3	20	1.22	+ 25
			0.5	18	1.3	-30 to +70
8.0 - 18	4CWY13-1	Full	0.7	13	1.6	-30 to +70
12.4 - 18.0	4□WY15-1	Full	0.3	20	1.22	+ 25
			0.5	18	1.3	-30 to +70
18.0 - 26.5	4□WY22-1	Full	0.35	20	1.22	+ 25
			0.5	18	1.3	-30 to +70

2. Low Loss Circulators and Isolators (T - junction) 3.7 to 26.5 GHz

Frequency range GHz	Model	Bandwidth	Insertion loss dB, max	Isolation dB, min	VSWR max
3.7 - 4.2	3□WN40-2	Full	0.15	25	1.13
5.92 - 6.43	3□WN62-2	Full	0.15	25	1.13
6.42 - 7.13	3□WN68-2	Full	0.15	25	1.13
7.12 - 7.73	3□WN70-2	Full	0.15	25	1.13
7.72 - 8.4	3□WN80-2	Full	0.15	25	1.13
10.7 - 11.7	4□WN11-2	Full	0.15	25	1.13
10.7 - 12.5	4□WN12-2	Full	0.2	25	1.13
14.0 - 14.5	4□WN14-2	Full	0.2	25	1.13
17.7 - 19.7	4□WN18-2	Full	0.2	25	1.13
21.2 - 24.5	4□WN23-2	Full	0.2	23	1.16
24.5 - 26.5	4□WN25-2	Full	0.2	23	1.16

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



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

At ordering please specify type of device in the model number (see page 2-18).

Package Size (mm)

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

Model	L	W	H	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
4CWY13-1	78	67.7	35	Single-ridge
4□WY15-1	40	48	35	WR-62
4□WY22-1	32	39	29	WR-42

2. Low Loss Circulators and Isolators (T - junction)

Model	L	W	H	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

Note!

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



Dimensions and flange types are specified by agreement with customer.

3. Low Loss Circulators and Isolators for Communication Equipment (cm-wave) 8.7 to 24.5 GHz



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

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

Package Size (mm)

Model	L	W	H	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	
4IWN14-6	9	50	38.5	WR-75	
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	
4IWN23-1	27.9	38.1	22.5	WR-42	
4IWN23-5	32	38.1	22.5	WR-42	
4IWN25-2	12.7	38.1	22.5	WR-42	
4CWN22-2	22.2	31.8	22.5	WR-42	
4CWN22-3	25.4	29.2	22.5	WR-42	



Dimensions and flange types are specified by agreement with customer.



**4. Low Loss Circulators and Isolators for Communication Equipment (mm-wave)
26.5 to 170 GHz**

Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Operating temperature °C
26.5 - 40	4□WN[26-40]-1	20	0.3	20	1.25	+25
			0.4	18	1.3	-30 to +85
26.5 - 40	4□WN[26-40]-2	15	0.2	20	1.2	+25
			0.25	18	1.25	-30 to +85
33 - 50	4□WN[33-50]-1	15	0.3	20	1.25	+25
			0.4	18	1.3	-30 to +85
40 - 60	4□WN[40-50]-1	10	0.3	20	1.25	+25
			0.3	18	1.3	-30 to +85
50 - 75	4□WN[50-75]-1	5	0.4	20	1.25	+25
			0.4	18	1.3	-30 to +85
60 - 90	4□WN[60-90]-1	5	0.4	20	1.25	+25
			0.4	18	1.3	-30 to +85
75 - 99	4□WN[75-99]-1	3.5	0.4	20	1.25	+25
			0.4	18	1.3	-30 to +85
90 - 99	4□WN[90-99]-1	3	0.7	20	1.25	+25
			0.7	18	1.3	(-10 to +70)
100 - 110	5□WN[10-11]-1	3.5	0.4	20	1.25	+25
			0.4	18	1.3	(-10 to +70)
100 - 140	5□WN[10-14]-1	3	0.7	20	1.25	+25
			0.7	18	1.3	(-10 to +70)
110 - 170	5□WN[11-17]-1	2	0.8	18	1.3	+25
			0.8	18	1.3	(-10 to +70)

Notes. Average power: for isolators - 1 W, for circulator - 2 W.



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

At ordering please specify type of device in the model number (see page 2-18).



[X-X] - Group of Models, each for a definite central frequency of the range. While ordering a particular Model, central frequency of the range should be stated (see "Device Application. How to Order", page 2-18).

**5. Low Loss Circulators and Isolators for General Use (mm-wave)
26.5 to 40 GHz**

Frequency range GHz	Model	Bandwidth	Insertion loss dB, max	Isolation dB, min	VSWR max
26.5 to 40	4□WY33-1	Full	0.6	15	1.45
26 to 30	4□WN28-2		0.3	20	1.2
37 to 40	4□WN38-2		0.3	20	1.2

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

Package Size (mm)

4. Low Loss Circulators and Isolators for Communication Equipment (mm-wave)

Isolator	Circulator	L	W	H	Waveguide	Flange
4IWN[26-40]-1		15	32	20	WR-28	UG-599/U
	4CWN[26-40]-1	19.1	25	20		
4IWN[26-40]-2		15	32	20		
	4CWN[26-40]-2	19.1	25	20		
4IWN[33-50]-1		15	32	20	WR-22	UG-599/U
	4CWN[33-50]-1	19.1	25	20		
4IWN[40-50]-1		15	32	31	WR-19	UG-383/U
	4CWN[40-50]-1	34	34	31		
4IWN[50-75]-1		19.1	32	21	WR-15	UG-385/U
	4CWN[50-75]-1	19.1	25	23		
4IWN[60-90]-1		13	25	22	WR-12	UG-387/U
	4CWN[60-90]-1	25	25	23		
4IWN[75-99]-1		12	25	22	WR-10	UG-387/U
	4CWN[75-99]-1	25	25	23		
4IWN[90-99]-1		12	25	22		
	4CWN[90-99]-1	25	25	23		
5IWN[10-11]-1		12	25	22	WR-8	UG-387/U
	5CWN[10-11]-1	25	25	23		
5IWN[10-14]-1		12	25	22	WR-8	UG-387/U
	5CWN[10-14]-1	25	25	23		
5IWN[11-17]-1		12	25	22	WR-6	UG-387/U
	5CWN[11-17]-1	25	25	23		

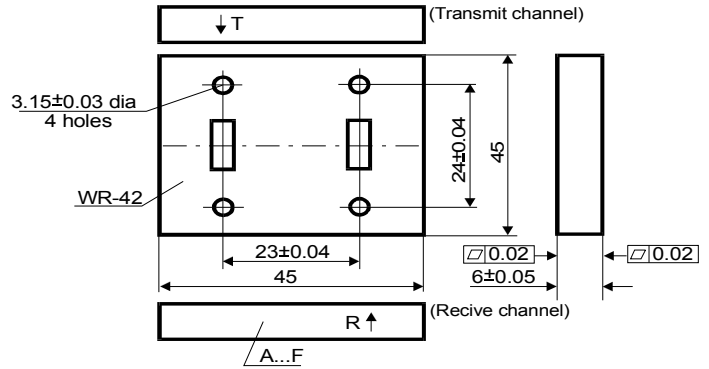
5. Low Loss Circulators and Isolators for General Use (mm-wave)

Isolator	Circulator	L	W	H	Waveguide	Flange
4IWY33-1		12.7	32	20	WR-28	UG-599/U
	4CWY33-1	19.05	25	20		
4IWN28-2		12.7	32	20		
	4CWN28-2	25.4	25.4	20		
4IWN38-2		12.7	32	20		
	4CWN38-2	25.4	25.4	20		



Dimensions and flange types are specified by agreement with customer.

6. 1/4" Slim Line Isolators



6.1. Broadband Isolator with Receive Channel
20.5 to 26.5 GHz

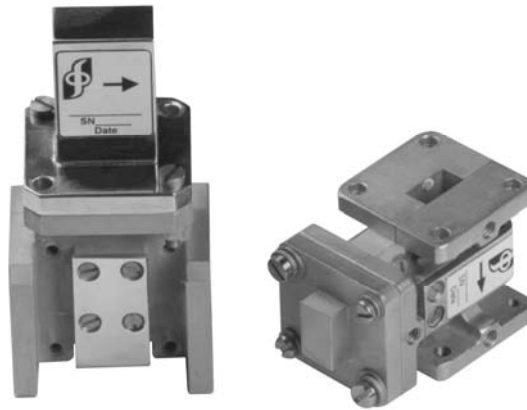
Frequency range GHz	Model	Insertion loss dB, max	Isolation dB, min	VSWR max	Power W	Extended receiving frequency range	
						Frequency GHz	Isolation dB min
20.5 - 24.0	4IWL-22X	0.6	15	1.4	2	—	—
24.0 - 26.5	4IWL-25X	0.6	15	1.4	2	—	—
22.43 - 23.03	4IWL23-A	0.6	18	1.3	2	23.03 - 26.04	10
23.0 - 23.6	4IWL23-D	0.6	18	1.3	2	23.6 - 26.6	10
21.2 - 21.6	4IWL23-C	0.6	18	1.3	2	18.19 - 21.2	10
21.7 - 22.4	4IWL23-D	0.6	18	1.3	2	18.75 - 21.76	10
23.0 - 23.6	4IWL23-E	0.6	18	1.3	2	23.6 - 26.1	10
22.0 - 22.6	4IWL23-F	0.6	18	1.3	2	19.9 - 22.0	10
25.475 - 26.075	4IWL26-A	0.6	18	1.3	2	26.075 - 28.5	10
25.95 - 26.55	4IWL26-B	0.6	18	1.3	2	26.55 - 28.5	10
24.475 - 25.075	4IWL26-C	0.6	18	1.3	2	21.471 - 24.478	10
25.95 - 26.55	4IWL26-D	0.6	18	1.3	2	21.325 - 24.93	10

6.2. Double Isolators
21.2 to 25.53 GHz

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

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

7. Cryogenic (4 to 77 K) T - junction Waveguide Circulators and Isolators (cm-wave) 8.2 to 26.5 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max
8.2 - 9.9	3□WC[80-90]-1	15	0.2	20	1.22
10 - 12.4	4□WC[10-12]-1	15	0.2	20	1.22
12.4 - 18.0	4□WC[12-18]-1	15	0.2	20	1.22
12.4 - 18.0	4□WC15-2	Full	0.3	20	1.22
18.0 - 26.5	4□WC[18-26]-1	15	0.2	20	1.22



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

At ordering please specify type of device in the model number (see page 2-18).



[X-X] - Group of Models, each for a definite central frequency of the range. While ordering a particular Model, central frequency of the range should be stated (see "Device Application. How to Order", page 2-18).

Package Size (mm)

Model	L	W	H	Waveguide
3□WC[80-90]-1	55	51	43	WR-90
4□WC[10-12]-1	40.5	32	33.5	WR-62
4□WC[12-18]-1	40.5	32	33.5	WR-62
4□WC15-2	40.5	32	33.5	WR-62
4□WC[18-26]-1	32	39	23	WR-42

Note!

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

8. Cryogenic (4 to 77 K) Waveguide Circulators and Isolators (mm-wave)
26.5 to 150 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max
26.5 - 40	4□WC[26-40]-1	12	0.3	20	1.3
33 - 50	4□WC[33-50]-1	8	0.4	20	1.3
40 - 60	4□WC[40-60]-1	5	0.4	20	1.3
50 - 75	4□WC[50-75]-1	5	0.4	20	1.3
60 - 90	4□WC[60-90]-1	4	0.5	20	1.3
75 - 99	4□WC[75-99]-1	3	0.5	20	1.3
90 - 99	4□WC[90-99]-1	2	0.6	20	1.3
100 - 110	5□WC[10-11]-1	3	0.5	20	1.3
100 - 140	5□WC[10-14]-1	2	0.6	20	1.3
110 - 150	5□WC[11-15]-1	2	0.8	20	1.3

! In blank □: I - Isolator, C- Circulator.
At ordering please specify type of device in the model number (see page 2-18).

! [X-X] - Group of Models, each for a definite central frequency of the range. While ordering a particular Model, central frequency of the range should be stated (see "Device Application. How to Order", page 2-18).

Package Size (mm)

Isolator	Circulator	L	W	H	Waveguide	Flange
4IWC[26-40]-1	4CWC[26-40]-1	15	32	22	WR-28	UG-599/U
		19.1	25	22		
4IWC[33-50]-1	4CWC[33-50]-1	15	32	22	WR-22	UG-599/U
		19.1	25	22		
4IWC[40-60]-1	4CWC[40-60]-1	15	32	31	WR-19	UG-383/U
		34	34	31		
4IWC[50-75]-1	4CWC[50-75]-1	19.1	32	21	WR-15	UG-385/U
		19.1	25	23		
4IWC[60-90]-1	4CWC[60-90]-1	13	25	22	WR-12	UG-387/U
		25	25	23		
4IWC[75-99]-1	4CWC[75-99]-1	12	25	22	WR-10	UG-387/U
		25	25	23		
4IWC[90-99]-1	4CWC[90-99]-1	12	25	22		
		25	25	23		
5IWC[10-11]-1	5CWC[10-11]-1	12	25	22	WR-8	UG-387/U
		25	25	23		
5IWC[10-14]-1	5CWC[10-14]-1	12	25	22		
		25	25	23		
5IWC[11-15]-1	5CWC[11-15]-1	12	25	22	WR-6	UG-387/U
		25	25	23		

! Dimensions and flange types are specified by agreement with customer.

9. Broad Bandwidth (Faraday Rotational) Isolators (mm-wave) 26.5 to 170 GHz



Frequency range GHz	Model	Bandwidth	Insertion loss dB, max	Isolation dB, min	VSWR max
26.5 - 40	4IWF33-1	Full	1.5	25	1.4
33 - 50	4IWF42-1	Full	1.8	25	1.4
40 - 60	4IWF50-1	Full	1.8	25	1.45
50 - 75	4IWF63-1	Full	1.8	25	1.45
60 - 90	4IWF75-1	Full	2.0	25	1.5
75 - 110	4IWF93-1	Full	2.5	25	1.5
90 - 140	5IWF12-1	Full	3.0	25	1.5
110 -170	5IWF14-1	Full	3.5	25	1.5

Notes. Operating power 0.5 W. Operating temperature (0 to + 50) °C.

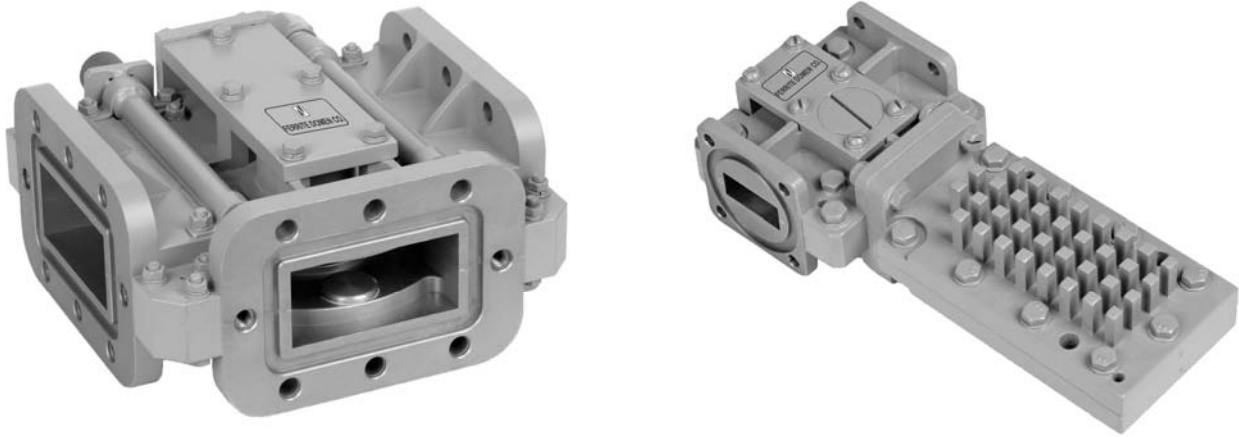
Package Size (mm)

Model	L	Diameter	Waveguide	Flange
4IWF33-1	70	30	WR-28	UG-599/U
4IWF42-1	60	30	WR-22	UG-383/U
4IWF50-1	60	30	WR-19	UG-383/U
4IWF63-1	50	30	WR-15	UG-385/U
4IWF75-1	50	25	WR-12	UG-387/U
4IWF93-1	50	25	WR-10	UG-387/U
5IWF12-1	50	25	WR-8	UG-387/U
5IWF14-1	50	25	WR-6	UG-387/U



Dimensions and flange types are specified by agreement with customer.

10. High Power Waveguide Y-junction Circulators and Isolators (cm-wave) 2.2 to 12.4 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss (Typ*/Max) dB	Isolation (Typ*/Min) dB	VSWR (Typ*/Max)	Power, kW	
						Average	Peak
2.20 - 3.30	3IWH28-1	10	0.25/0.3	23/20	1.17/1.2	0.8	3
2.20 - 3.30	3CWH28-1	10	0.25/0.3	23/20	1.17/1.2	0.8	-
2.20 - 3.30	3IWH28-2	10	0.3/0.45	23/20	1.17/1.2	5	500
2.60 - 3.45	3CWH30-1	10	0.25/0.3	23/20	1.17/1.2	3	170
2.60 - 3.45	3CWH30-2	10	0.35/0.4	23/20	1.17/1.2	5	300
4.40 - 7.05	3CWH57-1	10	0.2/0.3	23/20	1.17/1.2	2	300
5.85 - 8.20	3IWH70-1	10	0.25/0.3	23/20	1.17/1.2	2	300
5.85 - 8.20	3CWH70-1	10	0.25/0.3	23/20	1.17/1.2	2	150
7.05 - 10.0	3CWH90-1	15	0.3/0.35	23/20	1.17/1.2	1.5	30
7.05 - 10.0	3CWH90-2	15	0.2/0.25	23/20	1.17/1.2	2	-
7.05 - 10.0	3CWH90-3	15	0.3/0.35	23/20	1.17/1.2	1.8	30
8.2 - 12.4	4CWH10-5	15	0.2/0.25	23/20	1.17/1.2	0.4	200
8.2 - 12.4	4CWH10-6	15	0.2/0.25	23/20	1.17/1.2	1.0	-
8.2 - 12.4	4CWH10-7	15	0.2/0.25	23/20	1.17/1.2	1.5	4.5

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



Liquid or forced air cooling is optional on customer's request.

Package Size (mm)

Model	L	W	H	Waveguide
3IWH28-1	530	215	100	WR-340
3CWH28-1	210	215	100	
3IWH28-2	435	217	142	
3CWH30-1	180	182	154	WR-284
3CWH30-2	160	180	100	
3CWH57-1	102	90	41	WR-159
3IWH70-1	81	161	45	WR-137
3CWH70-1	81	70	45	
3CWH90-1	74	65	55	WR-112
3CWH90-2	70	83	47	
3CWH90-3	70	83	47	
4CWH10-5	56	73	42	WR-90
4CWH10-6	70	70	44	
4CWH10-7	56	66	42	



Dimensions and flange types are specified by agreement with customer.

11. High Power Y-junction Circulators and Isolators (mm-wave) 26.5 to 60 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Power, kW	
						Average	Peak
26.5 - 40	4IWH[26-40]-5	15	0.2	23	1.2	0.2	2
26.5 - 40	4IWH[26-40]-6	15	0.2	23	1.2	0.25	-
26.5 - 40	4CWH[26-40]-5	10	0.25	20	1.2	0.2	2
26.5 - 40	4CWH[26-40]-6	10	0.25	20	1.2	0.25	-
33 - 50	4IWH[33-50]-3	6	0.3	20	1.25	0.1	1
33 - 50	4IWH[33-50]-4	6	0.3	20	1.25	0.15	-
33 - 50	4CWH[33-50]-2	8	0.4	20	1.3	0.05	2
33 - 50	4CWH[33-50]-4	5	0.3	20	1.3	0.15	-
40 - 60	4IWH[40-60]-2	8	0.4	20	1.35	0.05	1.5
40 - 60	4IWH[33-50]-3	5	0.4	20	1.3	0.08	-
40 - 60	4CWH[33-50]-2	5	0.5	18	1.35	0.05	1.5
40 - 60	4CWH[33-50]-3	5	0.5	18	1.35	0.08	-

Notes. Reflected power 10%. Devices require a forced air cooling. Operating temperature (+ 5 to + 50) °C.



[X-X] - Group of Models, each for a definite central frequency of the range. While ordering a particular Model, central frequency of the range should be stated (see "Device Application. How to Order", page 2-18).

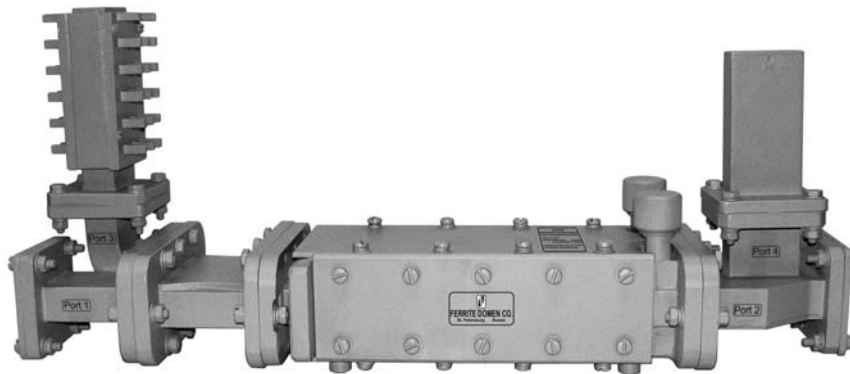
Package Size (mm)

Model	L	W	H	Waveguide
4IWH[26-40]-5	45	150	45	WR-28
4IWH[26-40]-6	45	150	45	
4CWH[26-40]-5	30	35	40	
4CWH[26-40]-6	30	35	40	
4IWH[33-50]-3	50	200	50	WR-22
4IWH[33-50]-4	45	150	45	
4CWH[33-50]-2	28	35	40	
4CWH[33-50]-4	28	35	40	
4IWH[40-60]-2	50	200	50	WR-19
4IWH[33-50]-3	50	200	50	
4CWH[33-50]-2	28	32	38	
4CWH[33-50]-3	28	32	38	



Dimensions and flange types are specified by agreement with customer.

12. 4-port Phase Shift Waveguide Circulators and Isolators (cm-wave) 1.7 to 22 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Power, kW	
						Average	Peak
1.7 - 2.6	3CWP21-1	10	0.9	24	1.1	22	3600
2.2 - 3.3	3CWP28-1	10	0.4	22	1.15	15	2200
2.6 - 3.95	3CWP33-1	10	0.35	20	1.15	30	1500
3.3 - 4.4	3IWP39-1	10	0.6	20	1.15	30	4000
3.95 - 5.85	3CWP49-1	10	0.4	20	1.15	16	1500
3.95 - 5.85	3IWP49-1	5	0.4	20	1.15	20	-
3.95 - 5.85	3CWP49-2	10	0.4	20	1.1	8	-
4.9 - 7.05	3IWP60-1	10	0.4	23	1.1	10	-
4.9 - 7.05	3CWP60-1	10	0.23	20	1.15	5	-
5.85 - 8.2	3CWP70-1	10	0.3	20	1.15	10	-
5.85 - 8.2	3IWP70-1	10	0.3	20	1.15	10	-
7.05 - 10.0	3CWP90-1	10	0.4	20	1.15	5	50
8.2 - 12.4	4CWP10-1	10	0.3	20	1.15	3	30
8.2 - 12.4	4IWP10-1	10	0.3	20	1.15	3	30
8.2 - 12.4	4CWP10-2	10	0.4	20	1.15	10	200
8.2 - 12.4	4CWP10-3	10	0.4	20	1.15	1	120
10 - 15	4CWP13-1	10	0.4	20	1.12	1	150
12.4 - 18.0	4CWP15-1	10	0.4	20	1.15	1.3	33
12.4 - 18.0	4CWP15-2	10	0.3	22	1.15	2	-
15.0 - 22.0	4CWP19-1	10	0.3	20	1.15	1.3	-



Liquid or forced air cooling is optional on customer's request.

12. 4-port Phase Shift Waveguide Circulators and Isolators

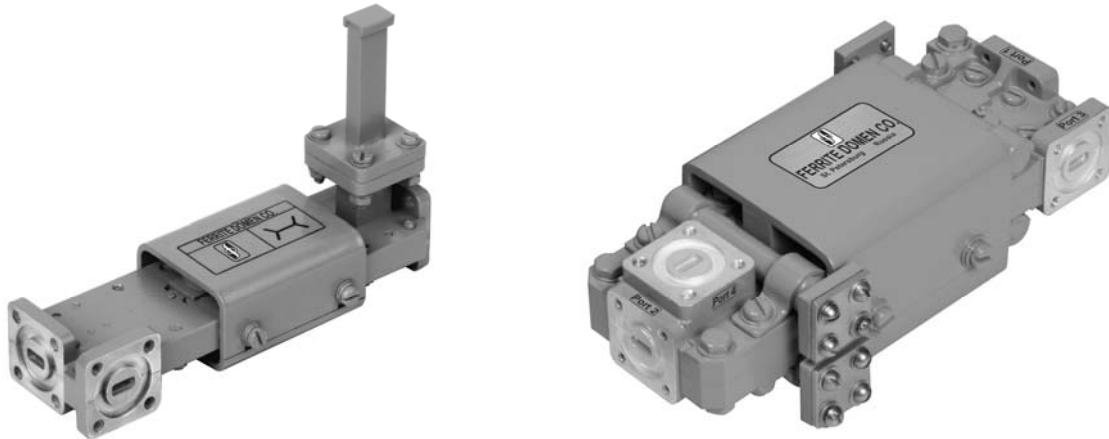
Package Size (mm)

Model	L	W	H	Waveguide
3CWP21-1	1730	438	630	WR-430
3CWP28-1	444	170	380	WR-340
3CWP33-1	900	278	290	WR-284
3IWP39-1	1028	280	312	WR-229
3CWP49-1	625	109	190	WR-187
3IWP49-1	1470	425	310	WR-187
3CWP49-2	655	166	130	WR-187
3IWP60-1	590	170	105	WR-159
3CWP60-1	440	130	95	WR-159
3CWP70-1	455	112	170	WR-137
3IWP70-1	680	175	160	WR-137
3CWP90-1	372	110	80	WR-112
4CWP10-1	337	72	164	WR-90
4IWP10-1	340	74	80	WR-90
4CWP10-2	425	77.5	126.6	WR-90
4CWP10-3	210	65	57	WR-90
4CWP13-1	238	63	62	WR-75
4CWP15-1	250	74	65	WR-62
4CWP15-2	250	168	119	WR-62
4CWP19-1	338	74.5	53	WR-51



Dimensions and flange types are specified by agreement with customer.

13. 4-port Phase Shift Waveguide Circulators and Isolators (mm-wave) 26.5 to 60 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Power, kW	
						Average	Peak
26.5 - 40	4IWP[26-40]-3	10	0.4	22	1.25	1	100
26.5 - 40	4IWP[26-40]-5	6	0.3	22	1.2	2	70
26.5 - 40	4IWP[26-40]-6	6	0.3	22	1.2	2.5	-
26.5 - 40	4IWP[26-40]-7*	10	0.2	24	1.22	0.3	2.5
26.5 - 40	4CWP[26-40]-3	5	0.4	20	1.2	1	100
26.5 - 40	4CWP[26-40]-4	5	0.4	20	1.2	1.5	70
26.5 - 40	4CWP[26-40]-5	5	0.4	20	1.2	2	70
26.5 - 40	4CWP[26-40]-6	5	0.4	20	1.2	2.5	-
33 - 50	4IWP[33-50]-2	6	0.5	20	1.3	0.5	10
33 - 50	4IWP[33-50]-3	6	0.5	20	1.3	1	-
33 - 50	4CWP[33-50]-2	5	0.6	18	1.3	0.5	10
33 - 50	4CWP[33-50]-3	5	0.6	18	1.3	1	-
40 - 60	4IWP[40-60]-2	6	0.55	20	1.35	0.3	5
40 - 60	4IWP[40-60]-3	6	0.55	20	1.35	0.7	-
40 - 60	4CWP[40-60]-2	5	0.6	18	1.35	0.3	5
40 - 60	4CWP[40-60]-3	5	0.6	18	1.35	0.7	-

Notes. Reflected power 10 %. Operating temperature (+5 to +50) °C. All devices have a liquid cooling, except Model - *.



[X-X] - Group of Models, each for a definite central frequency of the range. While ordering a particular Model, central frequency of the range should be stated (see "Device Application. How to Order", page 2-18).

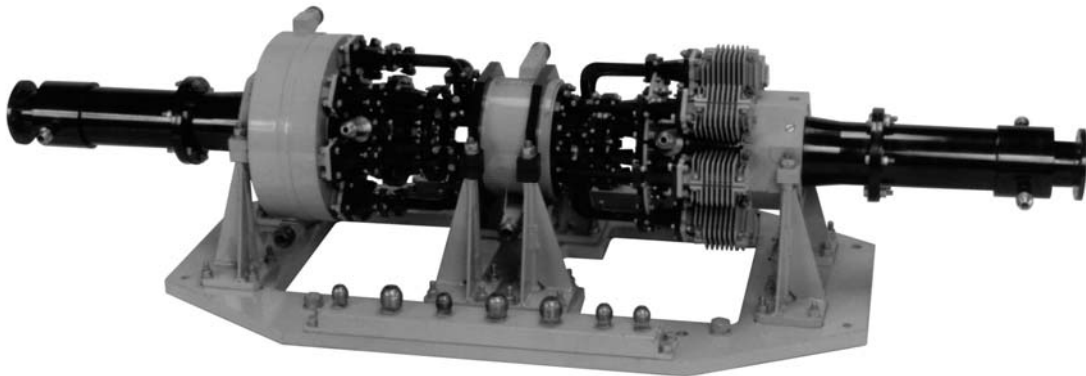
Package Size (mm)

Model	L	W	H	Waveguide
4IWP[26-40]-3	200	85	100	WR-28
4IWP[26-40]-5	200	85	90	
4IWP[26-40]-6	200	85	90	
4IWP[26-40]-7	119	42.6	77	
4CWP[26-40]-3	200	85	60	
4CWP[26-40]-4	200	85	60	
4CWP[26-40]-5	200	85	60	
4CWP[26-40]-6	200	85	60	
4IWP[33-50]-2	190	85	100	WR-22
4IWP[33-50]-3	190	85	90	
4CWP[33-50]-2	190	85	60	
4CWP[33-50]-3	190	85	60	
4IWP[40-60]-2	180	85	90	WR-19
4IWP[40-60]-3	180	85	90	
4CWP[40-60]-2	180	85	60	
4CWP[40-60]-3	180	85	60	



Dimensions and flange types are specified by agreement with customer.

14. Ultra High Power Waveguide Isolators (mm-wave) 33 to 37 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Power, kW	
						Average	Peak
33 - 37	4IWU35-2	10	1.5	20	1.25	10	100
33 - 37	4IWU35-4	6	1.7	20	1.25	20	
33 - 37	4IWU35-5	10	1.5	20	1.25	3	300

Notes. Reflected power 10 %. All devices have a liquid cooling. Operating temperature (+5 to +50) °C.

Package Size (mm)

Model	L	W	H	Waveguide diameter
4IWU35-2	1500	400	480	40
4IWU35-4	700	500	450	
4IWU35-5	1500	400	480	



Dimensions and flange types are specified by agreement with customer.

15. Circulators and Isolators for Space Application 3.4 to 9 GHz



Frequency range GHz	Model	Bandwidth %	Insertion loss dB, max	Isolation dB, min	VSWR max	Average power W	Reflected power W
3.4-3.9	3CWN36.5-1	14.0	0.2	20	1.2	100	10
7.2-7.8	3CWN75-1	8	0.2	20	1.2	90	9
7.4-7.7	3IWN75-1	4.0	0.2	20	1.2	120	12
8.025-8.4	3IWN85-1	5.0	0.2	20	1.2	20	2
8.025-9.0		11.5	3.0	15	1.5	20	2
8.025-8.4	3IWN85-2	5.0	0.2	20	1.2	20	2
8.025-9.0		11.5	3.0	15	1.5	20	2

Note. RFI leakage: -60dB

Environmental Specifications

Operating temperature: -60 to +90 °C

Low frequency sine vibration up to 30g

High mechanical shock resistance up to 500G

Humidity: 100 %

Minimum time to failure 100000 hours

Package Size (mm)

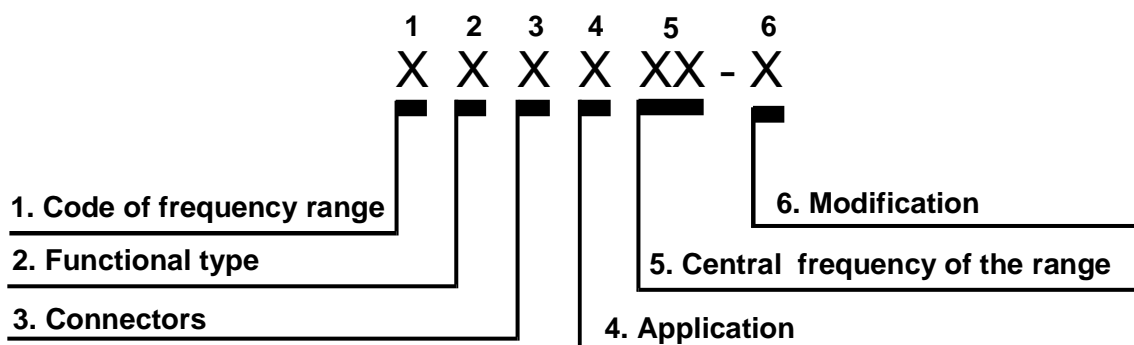
Model	L	W	H	Waveguide	Max weight, kg
3CWN36.5-1	140	115	37	WR-229	0.9
3CWN75-1	105	68	38	WR-112	0.55
3IWN75-1	166.7	68	38	WR-112	0.85
3IWN85-1	131	50	42	WR-90	0.42
3IWN85-2	131	50	42	WR-90	0.42



Dimensions and flange types are specified by agreement with customer.

Waveguide circulator and isolator 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 Code of frequency range	Frequency range	5 Central frequency of the range
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
□	Circulator or Isolator
S	Switch

3. Connectors

Code of connectors	Type
W	Waveguide

4. Application

Code of application	Application
C	Cryogenic
D	Double Isolator
F	Faraday rotational
H	High power
L	Slim line
N	Low loss
P	4-port Phase Shift
S	Narrow band
U	Super high power
Y	Broad bandwidth

5. Central frequency of the range

6. Modification