

WAVEGUIDE ISOLATORS & CIRCULATORS

SECTION IV

DESCRIPTION	PAGE
NOTES FOR WAVEGUIDE DEVICES	39
WAVEGUIDE ISOLATORS AND CIRCULATORS WR-90, WR-75, WR-62, WR-51 (8.2 to 22GHz)	40
WAVEGUIDE ISOLATORS AND CIRCULATORS WR-42 (18 to 26.5GHz).....	41
WAVEGUIDE ISOLATORS AND CIRCULATORS WR-34 (22 to 33GHz).....	42
WAVEGUIDE ISOLATORS AND CIRCULATORS WR-28 (26.5 to 40GHz).....	43
CUSTOM DESIGN WAVEGUIDE DEVICES	44

NOTES FOR WAVEGUIDE DEVICES

DORADO waveguide isolators and circulators are designed for a wide range of high performance applications at a low cost. These devices operate at frequencies from 1.70 to 110GHz. All units have standard flanges associated with the particular waveguide size.

- **Features.**
 - Custom design
 - Wide range of standard products
 - High Performance
 - All standard flange types are available
- **Frequency range.**
 - Standard frequency range of 1.70 to 110GHz
 - Non standard waveguide bands can be offered.
- **Waveguide and Flanges**
 - Standard waveguide size from WR-430 to WR-10
 - Standard EIA flanges with the particular waveguide sizes
 - Other waveguide and flange types available
- **Temperature range.**
 - Standard temperature range –30 to +70°C
 - Electrical parameters perform at the standard operating temperature range.
 - Other temperature ranges are available (Please contact DORADO)
- **Materials and Plating.**
 - Clear anodized aluminum or silver plated brass
 - Painting available on request
- **Mechanical mounting.**
 - The gap between the ferrite waveguide device and the adjacent device to which it is to be connected must be tightly controlled. This becomes very critical at the higher frequencies.
- **Custom features.**
 - DORADO has the ability to provide a wide range of solutions to meet most applications

WAVEGUIDE ISOLATORS & CIRCULATORS WR-90, WR-75, WR-62, WR-51 (8.2 to 22GHz)

FREQ. RANGE, (GHz)	MODEL NUMBER	BAND WIDTH (%)	INS. LOSS dB (MAX)	ISOLATION dB (MIN)	VSWR (MAX)	FORWARD POWER (W)	LOAD POWER (W)	DIMENSIONS (mm)			FLANGE
								W	L	H	
STANDARD WAVEGUIDE ISOLATORS, WR-90											
8.2-9.6	3IWN89-1	full	0.20	20	1.20	10	0.5, 2.0	31.75	69.85	41.40	UBR-100
8.5-9.6	3IWN90-1	full	0.20	22	1.18	10	0.5, 2.0	31.75	69.85	41.40	UBR-100
9.0-10.0	3IWN95-2	full	0.20	22	1.18	10	0.5, 2.0	31.75	69.85	41.40	UBR-100
10.4-11.0	4IWN11-1	full	0.20	22	1.18	10	0.5, 2.0	31.75	69.85	41.40	UBR-100
8.2-12.4	3IWN(xx)-1Y	10%	0.20	20	1.22	10	0.5, 2.0	31.75	69.85	41.40	UBR-100
8.5-10.5	3IWN(xx)-1B	8%	0.50	18	1.20	10	0.5	35.20	41.40	41.40	UBR-100
8.2-12.4	4IWY10-1**	full**	0.50	17	1.35	10	0.5	TBD	TBD	TBD	TBD
STANDARD WAVEGUIDE CIRCULATORS, WR-90											
8.2-9.6	3CWN89-2	full	0.20	20	1.20	10		60.00	50.50	41.00	UBR-100
9.0-10.0	3CWN95-2	full	0.20	22	1.18	10		50.00	55.00	42.20	UBR-100
9.5-10.0	4CWN10-2	full	0.20	22	1.18	10		50.00	55.00	42.20	UBR-100
10.4-11.8	4CWN11-1	full	0.25	20	1.20	10		50.00	55.00	42.20	UBR-100
8.2-12.4	3CWN(xx)-1Y	10%	0.20	20	1.20	10		50.00	55.00	42.20	UBR-100
8.2-12.4	3CWN(xx)-2Y	10%	0.20	20	1.20	10		60.00	50.50	41.00	UBR-100
8.2-12.4	4CWY10-1**	full**	0.50	17	1.35	5		TBD	TBD	TBD	TBD
STANDARD WAVEGUIDE ISOLATORS, WR-75											
10.5-11.5	4IWN11-3	full	0.20	20	1.22	10	0.5, 2.0	38.10	76.20	38.10	UBR-120
11.5-12.6	4IWN12-6	full	0.20	20	1.22	10	0.5, 2.0	38.10	76.20	38.10	UBR-120
12.75-13.5	4IWN13-1D	full	0.20	20	1.22	10	0.5, 2.0	38.10	76.20	38.10	UBR-120
13.0-14.5	4IWN14-1D	full	0.20	20	1.22	10	0.5, 2.0	38.10	76.20	38.10	UBR-120
10.0-15.0	4IWN(xx)-1X	7%	0.20	20	1.22	10	0.5, 2.0	38.10	76.20	38.10	UBR-120
10.0-15.0	4IWY13-1	full	0.50	18	1.35	5	0.5, 2.0	38.10	76.20	38.10	UBR-120
STANDARD WAVEGUIDE CIRCULATORS, WR-75											
10.5-11.5	4CWN11-3	full	0.25	20	1.22	10		44.45	44.45	38.10	UBR-120
11.5-12.6	4CWN12-1	full	0.25	20	1.22	10		44.45	44.45	38.10	UBR-120
12.75-13.5	4CWN13-3	full	0.25	20	1.22	10		44.45	44.45	38.10	UBR-120
13.0-14.5	4CWN14-2	full	0.25	20	1.22	10		44.45	44.45	38.10	UBR-120
10.0-15.0	4CWN(xx)-1X	7%	0.25	20	1.22	10		44.45	44.45	38.10	UBR-120
STANDARD WAVEGUIDE ISOLATORS, WR-62											
12.7-15.2	4IWN14-6	full	0.40	20	1.22	5	0.5, 2.0	35.00	50.80	33.26	UBR-140
12.7-15.2	4IWN14-8B	full	0.50	18	1.30	5	0.5, 2.0	35.00	41.00	33.32	UBR-140
16.0-17.0	4IWN16-2	full	0.25	20	1.22	5	0.5, 2.0	35.00	50.80	33.26	UBR-140
12.4-18.0	4IWN(xx)-1Y	10%	0.30	20	1.22	5	0.5, 2.0	35.00	50.80	33.26	UBR-140
12.4-18.0	4IWY15-1**	full**	0.50	18	1.35	5	0.5	35.00	50.80	33.26	UBR-140
STANDARD WAVEGUIDE CIRCULATORS, WR-62											
14.0-15.3	4CWN15-3	full	0.20	21	1.20	5		33.32	45.72	33.30	UBR-140
12.4-18.0	4CWN(xx)-1Y	10%	0.30	20	1.22	5		TBD	TBD	TBD	TBD
12.4-18.0	4CWY15-1**	full**	0.50	18	1.35	5		33.32	45.72	33.30	UBR-140
STANDARD WAVEGUIDE ISOLATORS, WR-51											
17.7-21.2	4IWN19-1C	full	0.30	19	1.30	5	0.5, 2.0	20.32	50.80	33.26	UBR-180
18.5-22.0	4IWN20-1C	full	0.30	19	1.30	5	0.5, 2.0	20.32	50.80	33.26	UBR-180
15.0-22.0	4IWN(xx)-1X	10%	0.30	20	1.22	5	0.5, 2.0	TBD	TBD	TBD	TBD
STANDARD WAVEGUIDE CIRCULATORS, WR-51											
17.3-19.7	4CWN19-1	full	0.30	20	1.22	5		40.60	40.60	31.00	UBR-180
18.5-22.0	4CWN20-1	full	0.30	19	1.30	5		40.60	40.60	31.00	UBR-180
15.0-22.0	4CWN(xx)-1X	10%	0.30	20	1.20	5		TBD	TBD	TBD	TBD

NOTES:

1. OPERATING TEMPERATURE RANGE FOR ALL DEVICES IS -30° to +70° C EXCEPT:** - +15° to +35° C
2. (xx) IDENTIFIES THE CENTER FREQUENCY OF THE DEVICE IN GHz
3. LOAD POWER RATING CAN BE 0.5W OR 2W - SPECIFY HIGHER POWER RATING IF REQUIRED
4. FIG. 38 SHOWS THE SKETCH OF THE CIRCULATORS AND FIG. 39 SHOWS THE SKETCH OF THE ISOLATORS
5. CIRCULATION IS CLOCKWISE UNLESS OTHERWISE SPECIFIED

WAVEGUIDE ISOLATORS & CIRCULATORS WR-42 (17.7 to 26.5GHz)

FREQ. RANGE, (GHz)	MODEL NUMBER	BAND WIDTH (%)	INS. LOSS dB (MAX)	ISOLATION dB (MIN)	VSWR (MAX)	FORWARD POWER (W)	LOAD POWER (W)	DIMENSIONS (mm)			FLANGE
								W	L	H	
STANDARD WAVEGUIDE ISOLATORS, WR-42											
17.7-19.7	4IWN18-1	full	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
18.0-21.0	4IWN19-2	full	0.35	18	1.25	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
18.4-19.1	4IWN19-1	full	0.25	20	1.18	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
18.6-21.6	4IWN20-1	full	0.35	18	1.25	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
21.2-23.6	4IWN22-4	full	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
21.2-23.6	4IWN22-6*	full*	0.30	20	1.22	5	0.5	31.75	31.75	22.22	UG595/U
21.2-24.25	4IWN23-4	full	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
23.0-25.0	4IWN24-1	full	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
23.0-26.5	4IWN25-7	full	0.40	18	1.30	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
24.0-26.0	4IWN25-5	full	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
24.0-26.5	4IWN26-7S	full	0.30	20	1.25	5	0.5, 2.0	12.70	33.02	22.22	UG595/U
24.5-26.5	4IWN25-1B	full	0.30	20	1.25	5	0.5, 2.0	27.94	38.10	22.22	UG595/U
26.1-27.1	4IWN25-004	full	0.30	20	1.22	5	0.5, 2.0	27.94	38.10	22.22	UG595/U
18.0-26.5	4IWN(xx)-1Y	10%	0.30	20	1.22	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
18.0-26.5	4IWN(xx)-2Y	15%	0.30	20	1.25	5	0.5, 2.0	22.22	38.10	22.22	UG595/U
18.0-26.5	4IWN(xx)-3Y	20%	0.40	18	1.30	5	0.5	22.22	38.10	22.22	UG595/U
18.0-26.5	4IWN(xx)-4Y	25%	0.45	17	1.35	5	0.5	22.22	38.10	22.22	UG595/U
18.0-26.5	4IWN(xx)-5Y*	10%*	0.30	20	1.22	5	0.5	31.75	31.75	22.22	UG595/U
24.0-27.1	4IWN(xx)-6Y	10%	0.30	20	1.22	5	0.5, 2.0	27.94	38.10	22.22	UG595/U
18.5-26.5	4IWN(xx)-1S	10%	0.30	18	1.30	2	0.5, 2.0	12.70	38.10	22.22	UG595/U
19.0-26.5	4IWN(xx)-2S	15%	0.40	18	1.35	2	0.5, 2.0	12.70	38.10	22.22	UG595/U
18.0-26.5	4IWY22-1**	full**	0.50	16	1.40	2	0.5	22.22	38.10	22.22	UG595/U
STANDARD WAVEGUIDE CIRCULATORS, WR-42											
17.7-19.7	4CWN18-1B	full	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
21.2-23.6	4CWN22-4	full	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
21.2-24.25	4CWN22-3	full	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
24.0-26.0	4CWN25-3	full	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
24.0-26.5	4CWN25-2	full	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
24.0-27.0	4CWN26-2	full	0.35	18	1.30	5		22.22	31.75	22.22	UG595/U
24.5-26.5	4CWN25-4	full	0.30	20	1.25	5		22.22	31.75	22.22	UG595/U
18.0-26.5	4CWN(xx)-1Y	10%	0.30	20	1.22	5		22.22	31.75	22.22	UG595/U
18.0-26.5	4CWN(xx)-2Y	15%	0.30	20	1.25	5		22.22	31.75	22.22	UG595/U
18.0-26.5	4CWN(xx)-3Y	20%	0.40	18	1.30	5		22.22	31.75	22.22	UG595/U
18.0-26.5	4CWN(xx)-4Y	25%	0.45	17	1.35	5		22.22	31.75	22.22	UG595/U
18.0-26.5	4CWN(xx)-5Y	10%	0.30	20	1.22	5		25.40	29.21	22.22	UG595/U
18.0-26.5	4CWY22-1**	full**	0.50	16	1.40	5		22.22	31.75	22.22	UG595/U

NOTES:

1. OPERATING TEMPERATURE RANGE FOR ALL DEVICES IS -30° to +70° C EXCEPT: ** - +15° to +35° C
2. (xx) IDENTIFIES THE CENTER FREQUENCY OF THE DEVICE IN GHz
3. * - RIGHT ANGLE H-PLANE ISOLATORS (ANGLE BETWEEN INPUT AND OUTPUT IS 90°). FIG. 41
4. MODIFIED VERSIONS OF ALL DEVICES ARE AVAILABLE
5. LOAD POWER RATING CAN BE 0.5W OR 2W - SPECIFY HIGHER POWER RATING IF REQUIRED
6. FIG. 38 SHOWS THE SKETCH OF THE CIRCULATORS AND FIG. 39 SHOWS THE SKETCH OF THE ISOLATORS
7. CIRCULATION IS CLOCKWISE UNLESS OTHERWISE SPECIFIED

WAVEGUIDE ISOLATORS & CIRCULATORS WR-34 (22 to 33GHz)

FREQ. RANGE, (GHz)	MODEL NUMBER	BAND WIDTH (%)	INS. LOSS dB (MAX)	ISOLATION dB (MIN)	VSWR (MAX)	FORWARD POWER (W)	LOAD POWER (W)	DIMENSIONS (mm)			FLANGE
								W	L	H	
STANDARD WAVEGUIDE ISOLATORS, WR-34											
24.4-26.5	4IWN25-6	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
24.4-26.5	4IWN25-3H	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UBR-260
25.0-27.5	4IWN26-4	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
26.2-26.7	4IWN26-3I	full	0.25	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UBR-260
26.2-26.7	4IWN26-6	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
27.3-31.3	4IWN30-5	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
27.4-31.3	4IWN30-2	full	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UBR-260
30.0-31.0	4IWN31-5	full	0.25	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWN(xx)-1X	10%	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWN(xx)-2X	15%	0.30	20	1.25	2	0.5, 2.0	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWN(xx)-3X	20%	0.40	18	1.30	2	0.5	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWN(xx)-4X	25%	0.45	16	1.40	2	0.5	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWN(xx)-5X	10%	0.30	20	1.22	2	0.5, 2.0	15.00	38.00	22.22	UBR-260
22.0-33.0	4IWN(xx)-6X	15%	0.30	20	1.25	2	0.5, 2.0	15.00	38.00	22.22	UBR-260
22.0-33.0	4IWN(xx)-7X	20%	0.40	18	1.30	2	0.5	15.00	38.00	22.22	UBR-260
22.0-33.0	4IWN(xx)-9X	25%	0.45	16	1.40	2	0.5	15.00	38.00	22.22	UBR-260
25.2-32.0	4IWN(xx)-3S	7%	0.30	18	1.30	2	0.5, 2.0	9.53	39.75	22.22	UG1530/U
25.2-32.0	4IWN(xx)-4S	7%	0.30	18	1.30	2	0.5, 2.0	9.53	39.75	22.22	UBR-260
22.0-33.0	4IWY27-1**	full**	0.50	16	1.40	2	0.5	15.00	38.00	22.22	UG1530/U
22.0-33.0	4IWY27-2**	full**	0.50	16	1.40	2	0.5	15.00	38.00	22.22	UBR-260
STANDARD WAVEGUIDE CIRCULATORS, WR-34											
22.0-27.5	4CWB25-1*	full*	0.50	18	1.30	2		22.22	25.40	22.22	UG1530/U
24.0-27.0	4CWN26-3	full	0.30	18	1.25	2		22.22	25.40	22.22	UBR-260
24.0-31.3	4CWB28-1	full	0.35	17	1.30	2		22.22	25.40	22.22	UG1530/U
24.3-27.5	4CWN26-1	full	0.30	20	1.22	2		22.22	25.40	22.22	UG1530/U
25.4-31.3	4CWN27-1	full	0.30	18	1.30	2		22.22	25.40	22.22	UG1530/U
27.5-33.0	4CWB30-1*	full*	0.50	18	1.30	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWN(xx)-1X	10%	0.30	20	1.22	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWN(xx)-2X	15%	0.30	18	1.25	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWN(xx)-3X	20%	0.40	17	1.30	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWN(xx)-4X	25%	0.45	16	1.40	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWN(xx)-5X	10%	0.30	20	1.22	2		22.22	25.40	22.22	UBR-260
22.0-33.0	4CWN(xx)-6X	15%	0.30	18	1.25	2		22.22	25.40	22.22	UBR-260
22.0-33.0	4CWN(xx)-7X	20%	0.40	17	1.30	2		22.22	25.40	22.22	UBR-260
22.0-33.0	4CWN(xx)-8X	25%	0.45	16	1.40	2		22.22	25.40	22.22	UBR-260
22.0-33.0	4CWY27-1**	full**	0.50	16	1.40	2		22.22	25.40	22.22	UG1530/U
22.0-33.0	4CWY27-2**	full**	0.50	16	1.40	2		22.22	25.40	22.22	UBR-260

NOTES:

1. OPERATING TEMPERATURE RANGE FOR ALL DEVICES IS -30° to +70° C EXCEPT:
* - -10° to +50° C
** - +15° to +35° C
2. (xx) IDENTIFIES THE CENTER FREQUENCY OF THE DEVICE IN GHz
3. MODIFIED VERSIONS OF ALL DEVICES ARE AVAILABLE
4. LOAD POWER RATING CAN BE 0.5W OR 2W - SPECIFY HIGHER POWER RATING IF REQUIRED
5. FIG. 38 SHOWS THE SKETCH OF THE CIRCULATORS AND FIG. 39 SHOWS THE SKETCH OF THE ISOLATORS
6. CIRCULATION IS CLOCKWISE UNLESS OTHERWISE SPECIFIED

WAVEGUIDE ISOLATORS & CIRCULATORS WR-28 (26.5 to 40GHz)

FREQ. RANGE, (GHz)	MODEL NUMBER	BAND WIDTH (%)	INS. LOSS dB (MAX)	ISOLATION dB (MIN)	VSWR (MAX)	FORWARD POWER (W)	LOAD POWER (W)	DIMENSIONS (mm)			FLANGE
								W	L	H	
STANDARD WAVEGUIDE ISOLATORS, WR-28											
26.5-36.5	4IWB30-1*	full*	0.45	16	1.40	2	0.5	12.70	31.75	19.05	UG599/U
27.0-33.0	4IWB31-2*	full*	0.40	17	1.35	2	0.5	12.70	31.75	19.05	UG599/U
27.0-29.0	4IWN28-6	Full	0.30	18	1.25	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
27.0-32.0	4IWN30-1A	Full	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
27.5-30.0	4IWN29-1	Full	0.25	20	1.25	2	0.5, 2.0	24.50	38.10	19.05	UG599/U
30.0-32.0	4IWN31-1	Full	0.30	18	1.25	2	0.5, 2.0	19.05	30.48	19.05	UG599/U
32.0-34.0	4IWN33-1A	Full	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
33.0-35.0	4IWN34-5A	Full	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
35.0-37.0	4IWN36-2	full	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
36.0-38.0	4IWN37-1	full	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
36.1-39.9	4IWN38-2	full	0.40	18	1.30	2	0.5	12.70	31.75	19.05	UG599/U
37.0-40.0	4IWN39-2	full	0.30	20	1.30	2	0.5, 2.0	13.00	31.75	19.05	UG599/U
37.5-38.5	4IWN38-1	full	0.25	20	1.25	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
38.0-40.0	4IWN39-6	full	0.30	18	1.25	2	0.5, 2.0	19.05	30.48	19.05	UG599/U
26.5-40.0	4IWN(xx)-1Y	10%	0.30	18	1.30	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
26.5-40.0	4IWN(xx)-2Y	15%	0.30	18	1.35	2	0.5, 2.0	12.70	31.75	19.05	UG599/U
26.5-40.0	4IWN(xx)-3Y	20%	0.40	17	1.35	2	0.5	12.70	31.75	19.05	UG599/U
26.5-40.0	4IWN(xx)-4Y	25%	0.45	16	1.40	2	0.5	12.70	31.75	19.05	UG599/U
26.5-40.0	4IWN(xx)-5S	10%	0.30	18	1.30	2	0.5, 2.0	9.53	31.75	19.05	UG599/U
26.5-40.0	4IWN(xx)-2B	7%	0.30	18	1.30	2	0.5, 2.0	12.70	25.40	19.05	UG599/U
26.5-40.0	4IWN(xx)-3B	5%	0.30	18	1.30	2	0.5, 2.0	10.00	25.40	19.05	UG599/U
26.5-40.0	4IWN(xx)-2H**	8%**	0.15	27	1.10	0.5	0.5	TBD	TBD	TBD	UG599/U
26.5-40.0	4IWY33-1**	full**	0.50	16	1.40	2	0.5	12.70	31.75	19.05	UG599/U
STANDARD WAVEGUIDE CIRCULATORS, WR-28											
26.5-33.0	4CWB29-1*	full*	0.50	16	1.40	2		19.05	25.40	19.05	UG599/U
27.0-32.0	4CWN28-1	full	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
30.0-36.0	4CWN33-1A*	full*	0.50	16	1.40	2		19.05	25.40	19.05	UG599/U
32.0-34.0	4CWN33-1	full	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
34.0-36.0	4CWN35-3	full	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
36.0-40.0	4CWN37-3*	full*	0.50	17	1.35	2		19.05	25.40	19.05	UG599/U
37.0-40.0	4CWN38-2	full	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
26.5-40.0	4CWN(xx)-1Y	10%	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
26.5-40.0	4CWN(xx)-2Y	15%	0.30	18	1.30	2		19.05	25.40	19.05	UG599/U
26.5-40.0	4CWN(xx)-3Y	20%	0.40	17	1.35	2		19.05	25.40	19.05	UG599/U
26.5-40.0	4CWN(xx)-4Y	25%	0.45	16	1.40	2		19.05	25.40	19.05	UG599/U
26.5-40.0	4CWY33-1**	full**	0.50	16	1.40	2		19.05	25.40	19.05	UG599/U

NOTES:

1. OPERATING TEMPERATURE RANGE FOR ALL DEVICES IS -30° to +70° C EXCEPT:
* - -10° to +50° C
** - +15° to +35° C
2. (xx) IDENTIFIES THE CENTER FREQUENCY OF THE DEVICE IN GHz
3. MODIFIED VERSIONS OF ALL DEVICES ARE AVAILABLE
4. LOAD POWER RATING CAN BE 0.5W OR 2W - SPECIFY HIGHER POWER RATING IF REQUIRED
5. FIG. 38 SHOWS THE SKETCH OF THE CIRCULATORS AND FIG. 39 SHOWS THE SKETCH OF THE ISOLATORS
6. CIRCULATION IS CLOCKWISE UNLESS OTHERWISE SPECIFIED

CUSTOM DESIGN WAVEGUIDE ISOLATORS AND CIRCULATORS

Cryogenic Isolators and Circulators IN WAVEGUIDE CIRCUITS (8.2 to 50GHz)

The Dorado Cryogenic waveguide isolators and circulators operate over the frequency range of 8.2 to 50GHz with up to 15% bandwidth. These units are specified to meet all electrical specifications for temperatures from -269°C to +50°C. Typical maximum insertion loss varies between 0.2 and 0.4dB depending on bandwidth. Full waveguide bandwidth devices are also offered that operate at these cryogenic temperatures with increased insertion loss. Standard EIA waveguide flanges or special flanges to the customer's requirement are available.

Isolation will be a minimum of 20dB and the maximum VSWR will be 1.30:1

Faraday Rotation Isolators (18 to 110GHz)

The waveguide Faraday isolators operate over the full waveguide band for all waveguide sizes from 18 GHz to 170GHz. All models will have a minimum isolation of 20dB across the 40% bandwidth. Insertion loss and VSWR varies with the waveguide band. The operating temperature range for all Faraday Isolators will be -30°C to +70°C.

The maximum power handling is 0.5 Watts

High Power Isolators and Circulators

Dorado has designed and built hundreds of different types of waveguide isolators and circulators for frequencies from 1.7GHz (WR-430) to 60GHz (WR-19). Power handling is usually limited by waveguide size with a capability of up to 5 megawatts at the lowest frequency to up to 500 Watts at 60GHz in both peak and average power. The devices are available in Y-Junction two port isolators and three port circulators. The Differential Phase shift type isolators and circulators are configured as two, three or four port type devices for handling the higher powers. Cooling may be conductive, forced air or liquid depending on environment and power level conditions. Power handling of the loads for isolators can be specified up to 100% of the forward power.

All high power isolators and circulators are built to the customer's requirements

High Performance Waveguide Isolators and Circulators

A wide range of high performance waveguide isolators and circulators have been designed and built to meet very special and difficult requirements. Dorado Has developed manufacturing techniques for obtaining extremely low insertion losses of under 0.1dB and multiple circuits for high isolation as examples.

Special waveguide isolators and circulators are available for all frequencies up to 100GHz

Figures

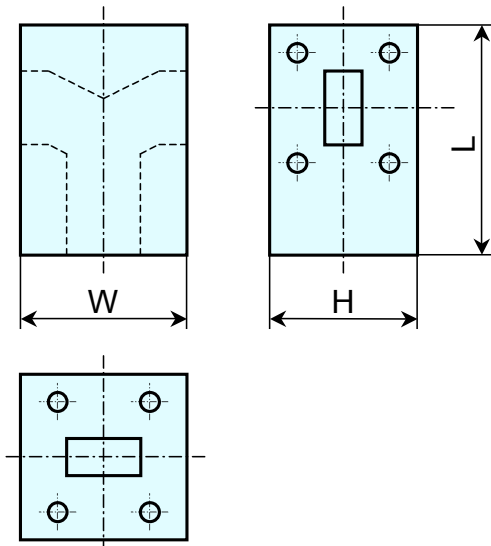


Fig. 38 Waveguide Circulator

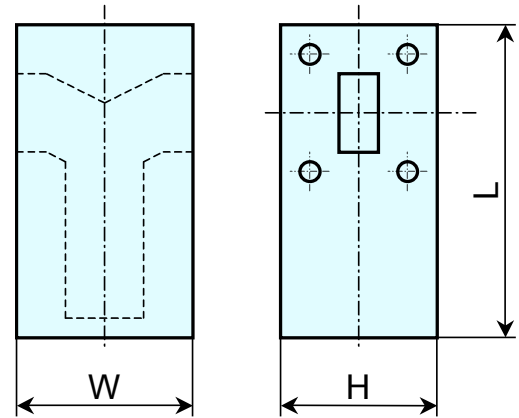


Fig. 39 Waveguide Isolator

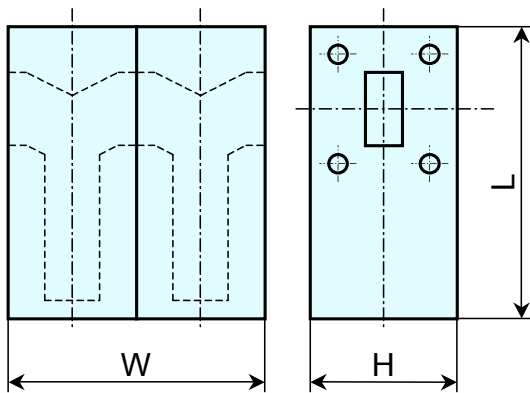


Fig. 40 Dual Junction Waveguide Isolator

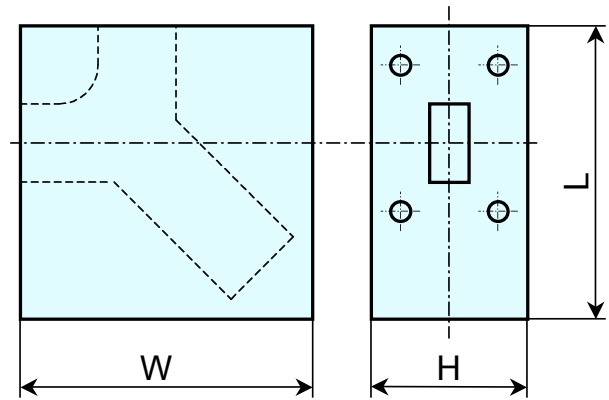


Fig. 41 Right Angle Waveguide Isolator