

Dinesh Micro Waves & Electronics

Wave Guide Components

RECTANGULAR WAVE GUIDES

Dinesh Microwaves and Electronics manufacturers of high power waveguide in the microwaves industry, this experience had resulted in designing, manufacturing and testing techniques that pretend the current state-of – the – art. Transition adapters are RF and Microwave components used to connect waveguide components of different cross section sizes. Bend assemblies are waveguide components used to change the direction of electric and magnetic field lines inside waveguide systems. Twist assemblies are waveguide components used to change the polarization the radar waves inside the waveguide. Straight section assemblies are send to straight the transmission between waveguides and offset section assemblies are used to connect two non aligned waveguides. Custom assemblies are made according to customer instructions; Attenuators are waveguide components used to reduce the power level of a signal by a certain amount of gain, with little or no reflection. The output signal is reduced with respect to the input. Bulk head feed through are straight wave guide sections with a large flange used to attach the unit to a panel or bulkhead. They are designed to support a waveguide section through a bulkhead and to seal the opening. Bulkhead feed through can be used for extending waveguide through a pressurized wall or cabinet. Circulators are passive devices consisting of three or more ports that allow the signal entering each port to pass to the port adjacent to it either clock wise or counter clock wise, but not to the port in the other direction. Couplers are RF circuits used to sample the RF frequency transmissions by means of coupling (combining)signals asymmetrically. Drivers are circuits that accept an input signal and deliver multiple outputs equal in phase and amplitude. Combiners are devices that accept several input signals and produce a combined output signal. In hybrid varieties, the signal is split into different phases with equal amplitude.

Flanges are used to connect waveguide sections to one another or to terminate waveguides. Isolators permit signals to pass in one direction while providing high isolation to reflect energy in the reverse direction. Phase shifters are two port waveguide modules used to alter the phase of an output signal in response to an external signal. A variable phase shifter changes the output signal phase by applying a variable control signal. There are two board types of variable phase shifters of analog and digital. Analog phase shifters change the outputphase by means of analog signal only usually y voltages and digital phase shifter uses a digital signal to change the output phase. Polarizer's change wave polarization, the orientation means time varying direction and amplitude of the electric field vector. Pressurizing sections are wave guide components used to inject to measure air or gases in a waveguide system. Normally they have a pressure gauge attached to the unit.

Pressure windows are components used to seal waveguides at high pressure to keep contaminations out. RF rotary joints or rotating couplers are devices used to transmit microwave energy from stationary lines to rotating lines. Sliding short circuits are used in a variety of microwave techniques that can be used with wave guide tees as a variable shunt for tuning or impedance matching applications. They are also necessary to tuning high performance reflect meters systems. In additipo they are valuable for establishing reference impedance for the calibration and error analysis of waveguide measurement

systems. Waveguide allow one signal line to branch into two or more lines. Tuners of waveguide components used to match the load impedance with the source impedance, tuners minimize the amount of reflectpower which results in the most efficient coupling of power to the load. Amplifiers are devices that take in a weak electric signal and send out a stronger one and used to boost signal in many electronics devices in telecommunications and radios.

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Waveguide Size	Frequency Range (GHz)	Material	Outside Dimensions (Nominal)	Wall thickness	Theoretical Ins. Loss dB/100 ft.
WR19	40.00-60.00	Copper	.268x.174	.040	34.00
WR-22	33.00-50.00	Copper	.304x.195	.040	26.00
WR-28	26.50-40.00	Copper Brass	.360x.220	.040	22.00 27.00
WR34	22.00-33.00	Copper Brass	.420x.250	.040	18.00 22.50
WR-42	18.00-26.50	Copper Brass	.500x.250	.040	14.00 17.50
WR-51	15.00-22.00	Copper Brass	.590x.335	.040	10.00 12.50
WR-62	12.40-18.00	Copper Brass	.702x.391	.040	6.50 8.20
WR-75	10.00-15.00	Copper Brass	.850x.475	.040	5.25 6.50
WR-90	8.20-12.40	Copper Brass	1.000x.500	.050	4.12 5.50
WR-112	7.05-10.00	Copper Brass	1.250x.625	.064	2.75 3.50
WR-137	5.85-8.20	Copper Brass	1.500x.750	.064	2.00 2.50
WR-159	4.90-7.05	Copper Brass	1.718x-923	.064	1.50 2.10
WR-187	3.95-5.85	Copper Brass	2.000x1.000	.064	1.40 1.75
WR-229	3.30-4.90	Copper Brass	2.418x1.273	.064	.93 1.35
WR-284	2.60-3.95	Copper Brass	3.000x1.500	.080	.73 .95
WR-340	2.20-3.30	Brass	3.560x1.860	.080	.68

Waveguide Size	Frequency Range (GHz)	Material	Outside Dimensions (Nominal)	Wall thickness	Theoretical Ins. Loss dB/100 ft.
WR-430	1.70-2.60	Brass	4.460x2.310	.080	.45

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PASSIVE WAVE GUIDE COMPONENTS

Waveguide Bends, Straight Sections and Twists

Salient Features

1. Minimum insertion loss
2. Low VSWR
3. Any length and rotation angle
4. Precise Construction

Product Description

Waveguide Straight Sections Dinesh Micro waves and Electronics produces straight sections with different lengths and flanges as per system / customer requirements. Typical VSWR is 1.04 Covering the frequency Range of 2 to 40 GHz in various Frequency bands. Waveguide Bends E plane, and H plane bends are available with angles of 30°, 45°, 60° and 90°. Typical VSWR 1.05 Covering the frequency range of 2 to 40 GHz in various wave guide bands. Waveguide Twist Twists allow changing the orientation in a waveguide. Twists are available with angles of 45° in left or right hand twist or standard 90°. Covering the frequency range of 2 to 40 GHz in various wave guide bands.



Special Features

Typical VSWR is 1.05 over full band. Covering the frequency range of 2 to 40 GHz in various Frequency bands.

Specifications

FREQ	S	C	J	X	Ku
BAND	WR 2 84	WR 229	WR 137	WR 90	WR 62
Model No.	XX 284X	XX 229X	XX 137X	XX 90 X	XX 62X

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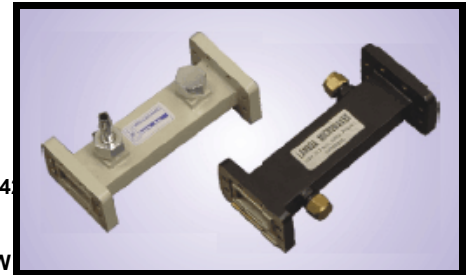
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Pressurizing Sections are used where air or other gases are to be introduced into the waveguide system. Stainless Steel Schrader valves (tire valves") are used as inlets for air/gases. Pressure Gauges in either 0-15 p.s.i or 0-30 p.s.i. ranges to monitor internal pressure. Units are 1.10 max. VSWR.

Specifications

FREQ BAND	S	C	J	X	Ku	K
Wave Guide Size	WR 284	WR 229	WR 137	WR 90	WR 62	WR 4
Model No	DMW 284	DMW 229	DMW 137	DMW 90	DMW 62	DMW
Insertion Length	150 mm	150 mm	150 mm	150 mm	150 mm	100 mm



Pipe Sizes available are 1/2 inch BSP, 3/4 inch BSP.

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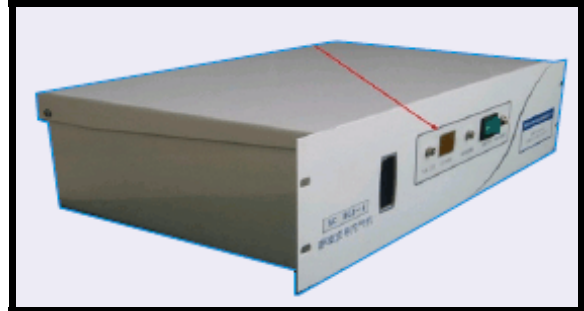
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Dehydrators

The Dehydrators maintain the performance of system components and save money. Thanks to lower Maintenance costs. As the successful cases, the dehydrator is ideal for small, medium volume microwave, cellular and broadcast systems from 2 to 100ft

Features:

- Digital display system
- Small volume and light weight;
- Electro-magnetic pump instead of electrical pump;
- Inflation enables long time pressure keeping Power consumption less than 0.03 Kwh.
- The modern power supply 220V +/- 20% suitable for areas with no stable voltage.
- Strong functions: automatic air leak monitoring, Remote alarm, automatic counting times, pressure control or timer control.
- Desiccant last long time for recycling Desiccant has larger volume, better seal and special air tunnel. Working ambient temperature -10°C ~ 40°C, Humidity < 90%.



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Multihole Directional Couplers

Directional couplers are used to sample power flowing in waveguides. The power so tapped is called coupling factor or coupling in dB. These are designed using Microwave CAD software. These are available in 3, 6, 10 and 20 dB coupling. It consists of two wave guide, joined with their broad wall. The main wave guide is straight and fitted with flanges at both ends. The auxiliary wave guide has 90° bend at one end in E plane and another end is fitted with suitable matched load. The common broad wall of both wave guides has a row of coupling holes. The diameter and number of holes in a row and number of rows varies accordingly to coupling factor required. Special designs for military have achieved coupling in 40dB, 50dB, 60dB in waveguide WR-112



Specification

FREQ BAND	S	C	j	X	X-Mil	Ku	K	Ka
Wave Guide Size	WR 284	WR 229	WR 137	WR 90	WR 112	WR 62	WR 42	WR 28
Model No.	DMW284-X	DMW228-X	DMW90-X	DMW112-X	DMW42-X	DMW62-X	DMW42-X	DMW28-X
Length (mm)	1140 mm	950 mm	550 mm	350 mm	350 mm	300 mm	250 mm	250 mm

X stands for coupling value

Coupling : 3,6,10,20,30 dB

Directivity : > 30 dB

VSWR Primary Line --- 1.1 , Secondary Line — 1.15 max

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Cross Directional Coupler

This is another type of directional coupler. It differs from multihole directional coupler in some manners, two waveguide joined with their broad wall makes an exact 90 cross. Thus any two consequent ports has 90deg angle with each other. All four ports are fitted with flanges.

FREQ BAND	S	C	J	X	Ku	K	Ka
Wave Guide Size	WR 284	WR 229	WR 137	WR 90	WR 62	WR42	WR 28
Model No.	DMW 284	DMW 229	DMW 137	DMW 90	DMW 62	DMW 42	DM W 28
Length (mm)	180 mm	150 mm	120 mm	75 mm	75 mm	75 mm	75 mm

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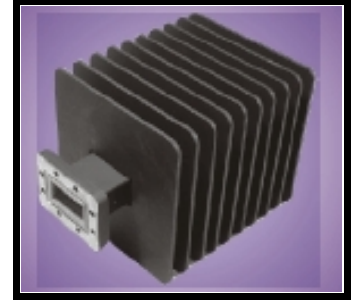
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Dummy Load

Dinesh Microwaves and Electronics standard products line of high & low power termination are constructed using extruded heat sink material. The load elements are custom ground silicon carbide Tapered for optimum- VSWR response (1.15 max.) maintaining moderate power handling characteristics



Specifications

FREQ BAND	S	C	J	X	X- Military	Ku	K	Ka
Wave Guide Size	WR 284	WR 229	WR 137	WR 90	WR 112	WR 62	WR 42	WR 28
Model No.	DMW 229	DMW 187	DMW 159	DMW 75	DMW 90	DMW 42	DM W 34	DM W 28
Length (mm)	250 mm	225 mm	200 mm	150 mm	150 mm	100 mm	50 mm	50 mm
VSWR Max	1.06	1.06	1.07	1.07	1.07	1.10	1.1 2	1.1 2
Max Power CW	500 Watts	500 Watts	400 Watts	100 Watts	100 Watts	100 Watts	100 Wat ts	10 Wat ts

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Waveguide To Coaxial Adopter

This is immense tool to connect waveguide output to coaxial system. The waveguide mode is converted to TEM coaxial mode. The output connector can be N type or SMA type. Low VSWR is maintained for optimum coupling. Lambda design coaxial adopters in all frequency bands achieving low VSWR of 1.15 in full band. High power adopters with pressure sealing 30 p.s.i are also available.



Specifications

FREQ BAND	S	C	J	X	X- Military	Ku	K	Ka
Wave Guide Size	WR 284	WR 229	WR 137	WR 90	WR 112	WR 62	WR 42	WR 28
Model No.	XX 284	XX 229	XX137	XX 90	XX112	XX 62	XX 42	XX 28
Length (mm)	100 mm	75 mm	50 mm	30 mm	35 mm	Custo m	Cu sto m	Cu sto m
VSWR Max	<1.25	<1.25	<1.25	<1.25	<1.15	<1.25	<1. 25	<1. 25

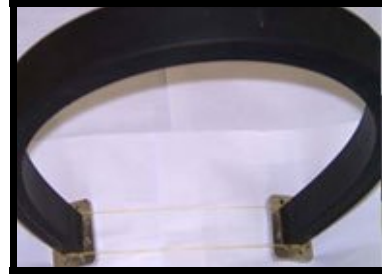
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Waveguide Flex Twist

To meet customers' multiple require in mobile communication, satellite communication, military, radar, medical..., we supply high performance flexible twistable waveguide, which have standard connection and jacket, or as per customers' request.



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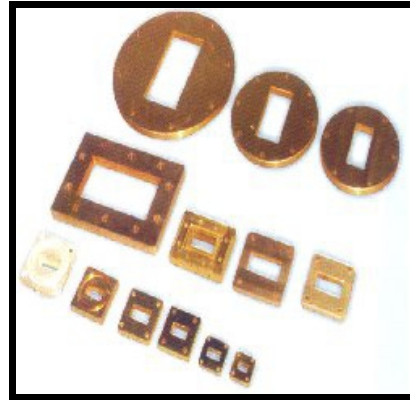
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Note:

1. Length not listed is available as customers' request;
2. Length tolerance less than 1.5% or 2mm,

FLANGES

Flanges for waveguide are precisely fabricated from brass copper or aluminum material in plane cover type or choke type or pressurizable or unpressurizable materials as per customer requirements. Gaskets for grooved flanges are available.

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WAVEGUIDE STANDS

Waveguide stand are meant to accept the components of respective bands for setting up a waveguide test benches and systems. The height of the stand is adjustable and consists of a C.I base with supports of different frequency bands. Frequency band designations L,S,C,J,X, AND Ku suffices may be added advantage. Clamps for K,V,R,W bands have adjustable width to hold corresponding waveguides of millimeter components.



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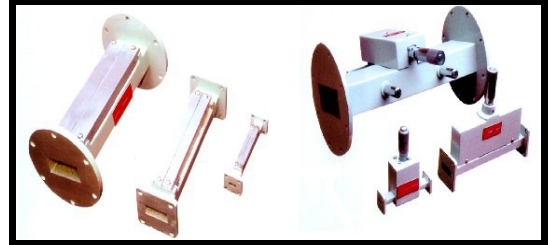
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ATTENUATORS

Attenuators are meant for inserting a known attenuation in waveguide systems. These consist of a lossy-vane inserted in a section of waveguide flanged on both ends and it's useful for isolation of waveguide circuits padding and extending the range of measuring equipments. Conveniently variable type set-level attenuators to provide at least 20db of continuously variable attenuation. Consists of movable lossy vane inside the section of a waveguide by means of a micrometer and designed to obtain the low VSWR characteristics over the entire frequency band. Variable attenuators are meant for adjusting power levels and isolating a source from the load.



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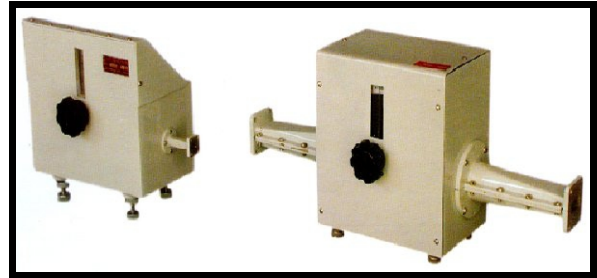
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ROTARY-VANE WAVEGUIDE (PRECISION VARIABLE ATTENUATORS)

Direct reading, precision, continuously variable attenuators are accurate, stable and frequency insensitive. These attenuators utilize the rotary vane principle of operation where attenuation is determined by the angle of rotation of an attenuating film fitted in a circular waveguide. Low-reflection transitions to rectangular waveguide are provided on both ends and rotations of circular waveguides are calibrated in terms of attenuation as shown as on the dial.



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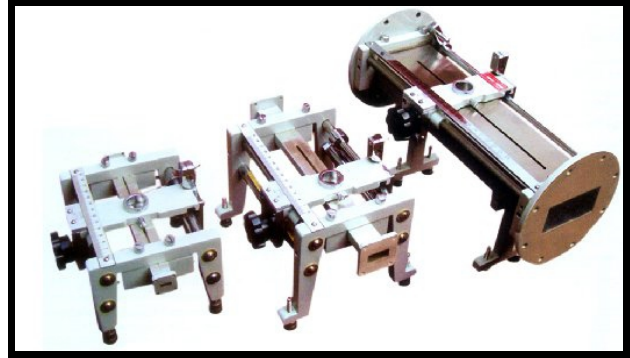
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SLOTTED – SECTION WITH PROBE-CARRIAGE

The waveguide slotted line, comprise of an accurately machined section of waveguide in which a small longitudinal slot has been cut which is a basic means for monitoring wave-patterns inside the waveguides system. Such data may be transformed into impedance of the terminal load of unknown systems of components, percent of transmitted power, degree of antenna match and other characteristics of waveguide. A precision built probe carriage has a centimeter-scale with a vernier reading if 0.1mm least count and a dial guage can be mounted easily if precise readings are required.



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