Advanced Microwave Technologies Co., Ltd

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Microwave
Advanced technologies

Advanced Microwave Technologies

Specializes in offering leading microwave tech solutions globally

CONTENTS

Company Profile

Advanced Microwave Technologies Co., Ltd. (ADM), established in 2000, specializes in the innovation, research and development, precision manufacturing, and global sales of microwave technologies. With its strong technical foundation and continuous investment in R&D, the company has become a key provider of advanced microwave solutions for industries such as telecommunications, aerospace, defense, electronics, and healthcare.

ADM's product portfolio includes waveguides, coaxial cable assemblies, microwave antennas, satellite communication equipment, and other critical components, which are widely used in high-tech sectors such as communication, radar, satellite, and electronic warfare. The company is committed to delivering efficient, reliable, and customized high-performance microwave products to clients worldwide, helping them maintain a competitive edge in their respective fields.

Development History

Since 2000, ADM has followed "technological innovation, quality first, customer-oriented".

2000 - 2005: Focused on high-performance microwave component R&D. Launched competitive products, built domestic brand, and primed for global expansion.

2006 - 2010: Expanded to aerospace, etc. Launched international standard products, strengthened leadership, and entered international markets.

2011 - 2015: Accelerated internationalization via partnerships. Set up international sales network, boosted brand, and engaged in standard-setting.

2016 - present: Introduced smart production lines. Enhanced R&D and ops, leading globally. Will keep driving smart and international growth.

Company Strengths

Microwave Dark Room: ADM has a 24m advanced microwave anechoic chamber, testing up to 110 GHz for product dev and quality.

Certifications and Honors: Holds ISO 14001:2015, ISO 9001:2015, ISO 45001:2018, and complies with RoHS.

Facilities and Services: Operates offices in Chengdu, Beijing, Tianjin, and Shijiazhuang in China for better customer support.


CERTIFICATE OF CONFORMITY
OF OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT SYSTEMCERTIFICATION

ADVANCED MICROWAVE TECHNOLOGIES CO.,LTD

GB/T45001-2020/ISO 45001：2018 standard

This certificate is valid to the following area

Microwave Components, Microwave Antenna, The Design, Development, Production and Related Management Activities of Microwave Receiving and Transmitting Equipment Components


CERTIFICATE OF CONFORMITY
OF ENVIRONMENTAL MANAGEMENT SYSTEM
CERTIFICATION

ADVANCDE MICROWAVE TECHNOLOGIES
CO., LTD

GB/T24001-2016/ISO14001:2015 standard

This certificate is valid to the following area

Microwave Components, Microwave Antenna, The Design, Development, Production and Related Management Activities of Microwave Receiving and Transmitting Equipment Components


CERTIFICATE OF CONFORMITY OF
QUALITY MANAGEMENT SYSTEM
CERTIFICATION

ADVANCED MICROWAVE TECHNOLOGIES
CO., LTD

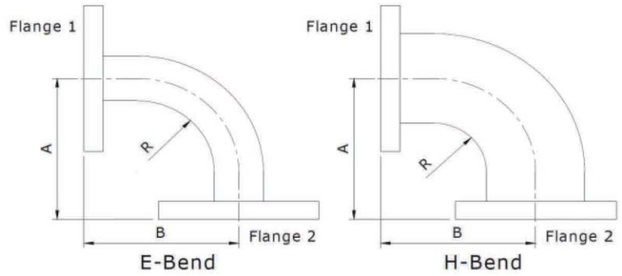
GB/T 19001-2016/ISO 9001:2015 standard

This certificate is valid to the following area

Design, Development, Production and Service of Microwave Passive Components, Microwave Antennas and Microwave Receiving and Transmitting Equipments Subassembly (Except Require Licensed Products)

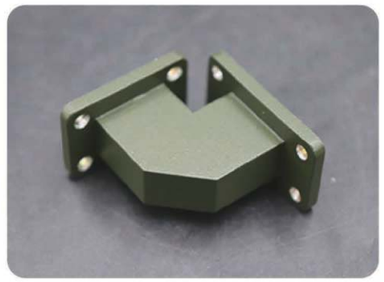
WAVEGUIDE COMPONENTS

Waveguide Bend



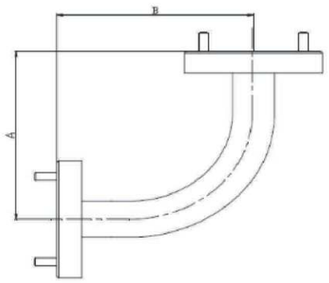
- Bending Type: ARC Bend、Miter Bend.
- Bends other than 90 available on request.

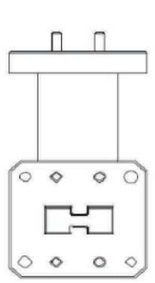
Waveguide ARC Bend



Waveguide Miter Bend

Dual Ridge Waveguide Bend

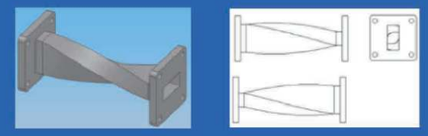
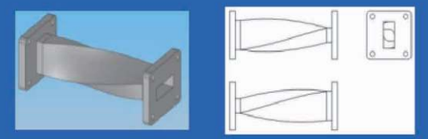




- Dual Ridge Waveguides (WRD Series): WRD580, WRD650, WRD750, WRD1800
- Customizable

WAVEGUIDE COMPONENTS

Waveguide Twist

TYPE	DESCRIPTION	STRUCTURE
WTA...	Rectangular Right-handed Twist Waveguide	
WLTA...	Rectangular Left-handed Twist Waveguide	

- Reverse orientation: Left, Right
- Twist Angle: Customizable (typically 45° or 90°)

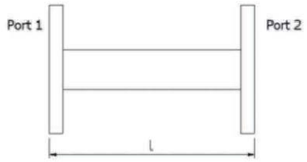
Rectangular Twist Waveguide

Water-cooled Twist Waveguide

Dual Ridge Twist Waveguide

WAVEGUIDE COMPONENTS

Flexible Waveguide

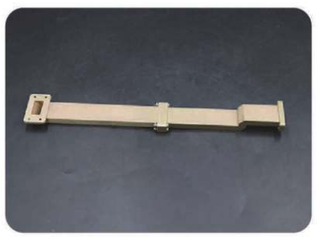


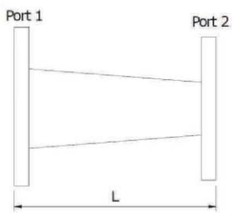
- Std lengths (mm):100,200,300,500,600,900, 1000 Customizable
- Supplied with Neoprene jacket in order to hold pressure, as a standard

Flexible Twistable Waveguide

Flexible Seamless Waveguide

Waveguide Transition





- Product Type： waveguide transitions in overlapping bands to custom transitions spanning multiple bands
- Waveguide types: Rectangular, Square, Circular, Single-ridge and Double-ridge

WAVEGUIDE COMPONENTS

Straight waveguide

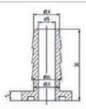
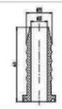
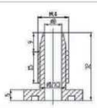
Rectangular Striaight Waveguide

Circular Straight Waveguide

Double Ridge Straight Waveguide

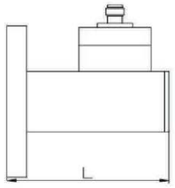
- Covering waveguide sizes WR10 thru WR2300
- Lengths: Customizable

Inflatable Straight Waveguide

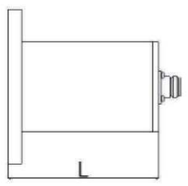
Product Name	Self-locking type	Barbed Champ Type	Pagon ClampType	Thread Type
Outline Drawings				
Inside Diameter (mm)	φ3.3	φ9	φ18	φ8
Outside Diameter (mm)	φ6.4	φ16	φ28	M14
Inside Diameter of Inflatable tube (mm)	φ4	φ12	φ26	φ10
Outside Diameter of Inflatable tube (mm)	φ6	φ16	φ30	φ14

WAVEGUIDE COMPONENTS

Waveguide to Coaxial Adapter



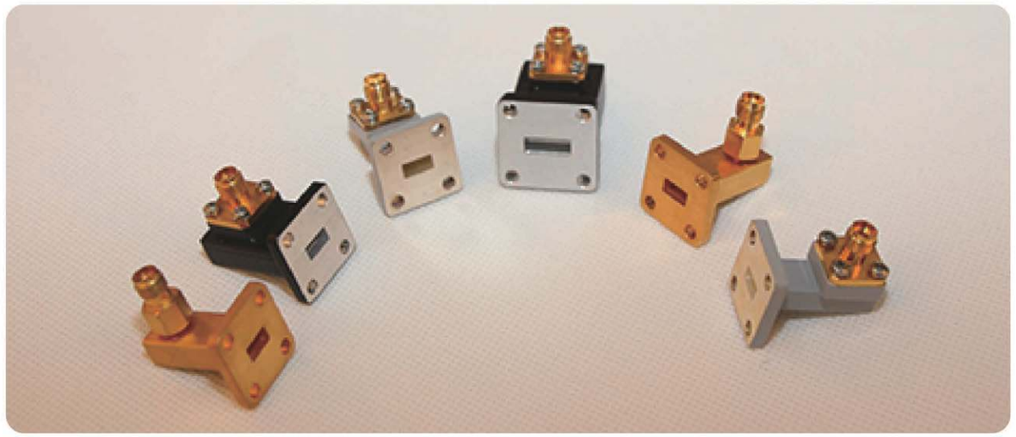
Right Angle



End-launch

- Structural Type:End-launch , Right Angle
- Coaxial Connector

N-K N-J SMA-K SMA-J TNC-K TNC-J BNC-K BNC-J
K2.92-K K2.92-J V2.4-K V2.4-J L16-K L16-J
L29-K L29-J H63-K H63-J



Waveguide to Coaxial Adapter (Right Angle)

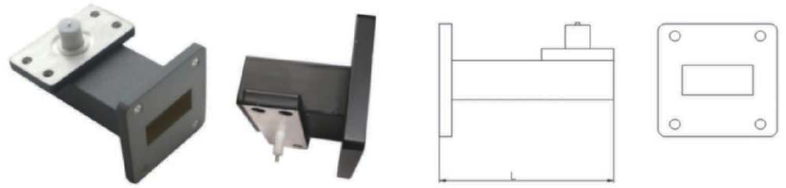
Circular Waveguide To Coaxial Adapter

Waveguide to Coaxial Adapter (End-launch)

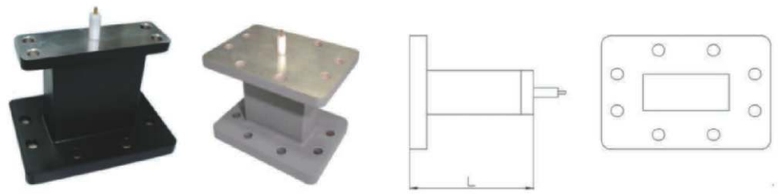
High Power Double-Ridged Wavegudie to Coaxial Adapter

WAVEGUIDE COMPONENTS

Waveguide To Microstrip Adapter



Waveguide To Microstrip Adapter (Right Angle)



Waveguide To Microstrip Adapter (End Launch)

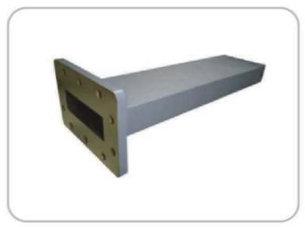
WAVEGUIDE COMPONENTS

Waveguide Termination

Waveguide Matched Termination

- Product Type：Unmatched Termination、Matching Load、Waveguide High Power Termination、Small Size Waveguide Termination
- Waveguide types: Rectangular, Square, Circular, Single-ridge and Double-ridge

Waveguide Sliding Termination



Waveguide Unmatched Termination

Double Ridge WG High Power Termination

Short Plate

Waveguide Short Plate

Waveguide Offset Short

Waveguide Sliding Short

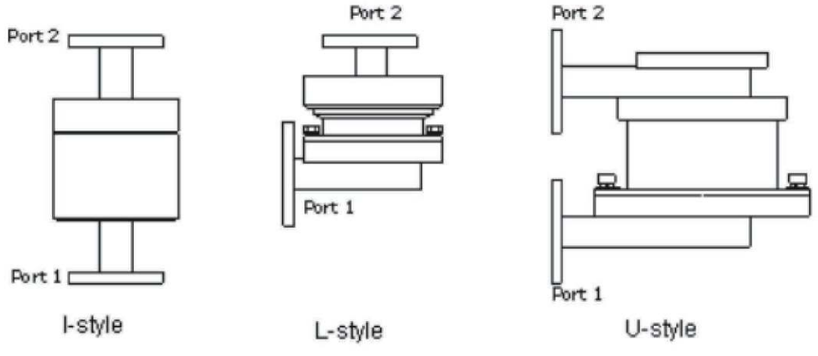
WAVEGUIDE COMPONENTS

Waveguide Coupler

Type	Feature	Application	Image
Broadwall Directional Coupler	Full waveguide bandwidth, coupling selection is 2~60dB, the directivity is 40-20dB, coupling flatness is best.	High precision measurement, monitoring and measuring system.	
Crossguide Directional Coupler	20%~100% of waveguide bandwidth, coupling selection is 20-60dB, coupling flatness is better than loop coupler, the directivity is 23-15dB.	System monitoring and measurement.	
Waveguide Loop Coupler	20% of waveguide bandwidth, coupling selection is 20-60dB, the directivity is 20-15dB, small size.	Used under 10GHz of waveguide system monitoring and measurement.	
Waveguide Probe Coupler	20% of waveguide bandwidth, coupling selection is 10-60dB, no directivity, smallest size.	Simple system testing.	

Waveguide Rotary Joint

Waveguide Single Channel Rotary Joint

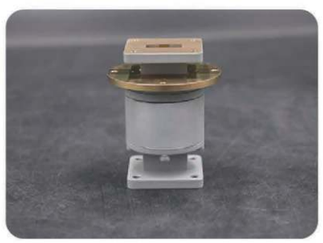


Product Type:

- I-style - Two in-line arms both collinear with the axis of rotation.
- L-style - One arm is perpendicular to the axis of rotation.
- U-style - Both arms are perpendicular to the axis of rotation.

L Type Waveguide Rotary Joint

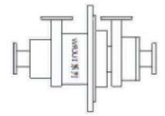
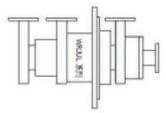
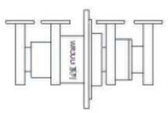
U Type Waveguide Rotary Joint



I Type Waveguide Rotary Joint

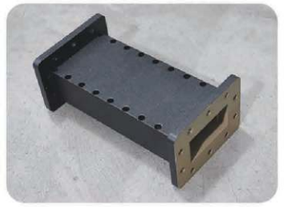
WAVEGUIDE COMPONENTS

Waveguide Dual-Channel Rotary Joint

Model	UI	UL	UU
Description	Dual-Channel U+I Type	Dual-Channel U+L Type	Dual-Channel U+U Type
Drawing			
Channel Isolation	≥50dB	≥50dB	≥50dB

Waveguide Dual-Channel Rotary Joint

WAVEGUIDE COMPONENTS



Waveguide Filter

Product Type :

- Lowpass Filter、Highpass Filter、Bandpass Filter、Band Stop Filter

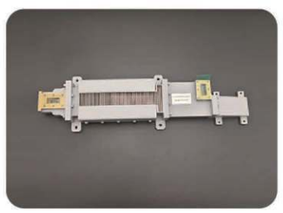
Waveguide Isolator

Low Power
Waveguide Isolator

High Power Waveguide Differential
Phase Shift Isolator

Waveguide Circulator

Low Power
Waveguide Circulator



High Power Waveguide Differential
Phase Shift Circulator

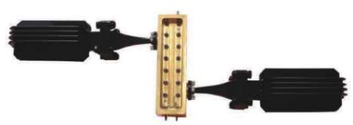
WAVEGUIDE COMPONENTS

Waveguide Attenuator

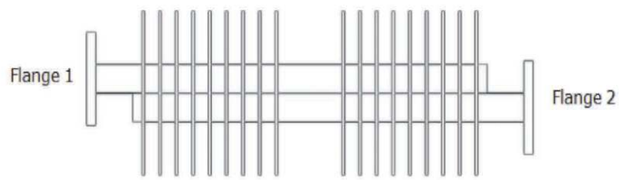
Waveguide Fixed Attenuator

Attenuation	VSWR
3dB,6dB	≤1.25~1.35
10-30 dB	≤1.15

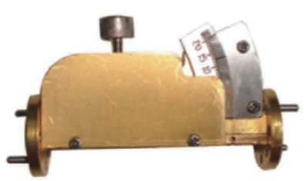
High Power Waveguide-Coupled Fixed Attenuators

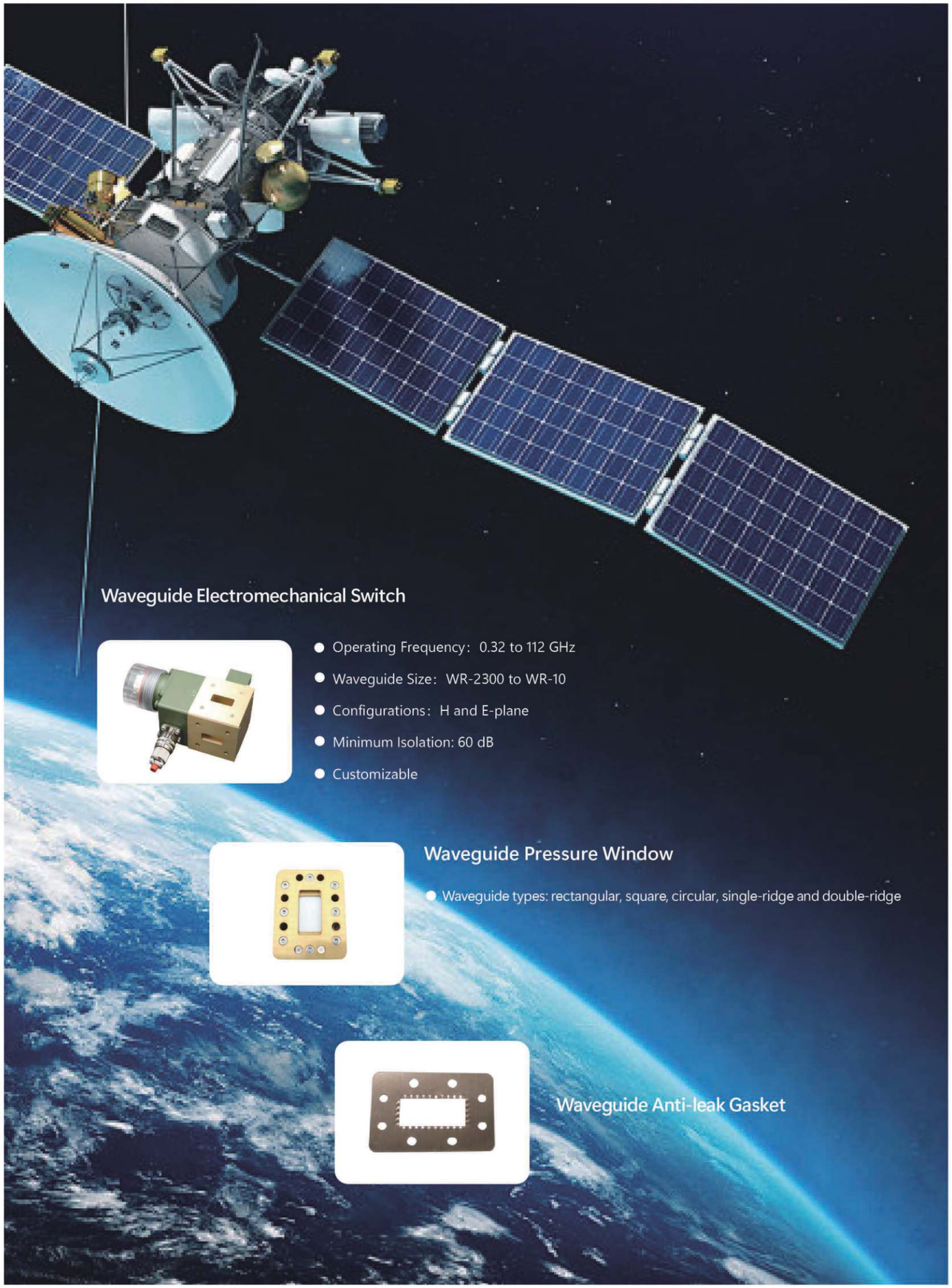


Attenuation	Frequency Response
3dB	≤±1.8dB
6dB	≤±1 dB
10-60 dB	≤±0.75 dB



Waveguide Variable Attenuator





Waveguide Electromechanical Switch

- Operating Frequency: 0.32 to 112 GHz
- Waveguide Size: WR-2300 to WR-10
- Configurations: H and E-plane
- Minimum Isolation: 60 dB
- Customizable

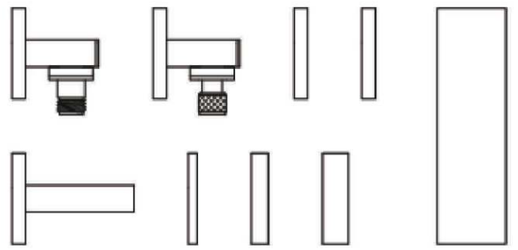
Waveguide Pressure Window

- Waveguide types: rectangular, square, circular, single-ridge and double-ridge

Waveguide Anti-leak Gasket

WAVEGUIDE COMPONENTS

Waveguide Calibration Kits



Component list

No.	Description	Parameter	Qty
1	Waveguide to Coaxial Adapter	Each of Male and Female Connector	2
2	Waveguide Matched Termination	VSWR≤1.03	1
3	Waveguide Short Plate	VSWR≥60	2
4	1/4λ Precision Waveguide Section	L=1/4λ	1
5	1/8λ Precision Waveguide Section	L=1/8λ	1
6	3/8λ Precision Waveguide Section	L=3/8λ	1
7	Packing Case of Aluminum Alloy	/	1
8	Screws	/	1 set

COAXIAL COMPONENTS

Coaxial Calibration Kits

No.	Description	Parameter	Qty
1	Coaxial Termination	Male	1
2	Coaxial Termination	Female	1
3	Coaxial Short Plate	VSWR≥60; Male	1
4	Coaxial Short Plate	VSWR≥60: Female	1
5	Coaxial Open	VSWR≥60: Male	1
6	Coaxial Open	VSWR≥60; Female	1
7	Precision Transmission Line (Coaxial Air Line)	L=JJ:KK:JK	3
8	Adaptor	NSJJ;NSKKNSJKNSKJ	4
9	Spanner		1
10	Packing Case of Aluminum Alloy		1

Coaxial Fixed Attenuator

Coaxial Termination

Coaxial Adapter

Coaxial Cable Assembly

COAXIAL COMPONENTS

Coaxial Rotary Joint

Single Channel Coaxial Rotary Joint

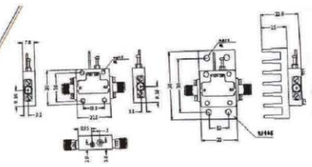
Dual Channel Coaxial Rotary Joint (II Type)

Dual Channel Coaxial Rotary Joint (UI Type)

ACTIVE PRODUCTS

Low Phase Noise Amplifier

Product Model: ADM-60180LNA40S



Detailed technical parameters

Parameter	Minimum	Typical	Maximum
Frequency Range	6GHz		18GHz
Gain	45dB	50dB	60dB
Gain Flatness		±2.5dB	
Gain variation coefficient with temperature		±1.0dB	
Noise Factor	1.3 dB	1.5dB	2.0 dB
Input VSWR		1.8:1	2.5:1
Output VSWR		1.6:1	2.0:1
1dB Compression Point	12dBm	14 dBm	
Saturation output power		17 dBm	
Isolation		-50 dB	
Input and output connectors	SMA or 2.92mm-Female		
Cavity material	Aluminum		

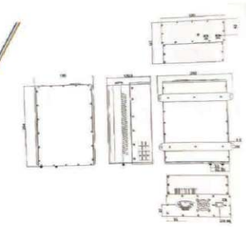
Rated parameters and environment

Operating voltage	+15.5V
Maximum input power to prevent burnout	-30 dBm
Operating temperature	-45℃~+85℃
Storage temperature	-55℃~+125℃
Altitude	762m(Epoxy resin sealing conditions)
	1524m, Minimum one standard atmospheric pressure (hermetic packaging condition)

ACTIVE PRODUCTS

Ac Power Amplifier

Product Model : ADM-200470ACPAK



Detailed technical parameters

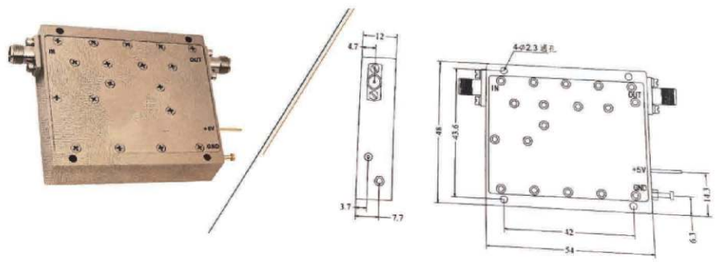
Parameter	Minimum	Typical	Maximum	Minimum	Typical	Maximum	unit
Frequency Range	20		30	30		47	GHz
Gain	30	43		28	32		dB
Gain Flatness		±8.0			±3.0		dB
Gain variation coefficient with temperature		±3.0			±3.0		dB
Input VSWR		1.6			1.8		： 1
1dB Compression Point	24	28		26	29		dBm
Saturation output power		29			29		dB
Isolation		-60			-55		g
Input and output connectors	2.92mm-Female						Ω
Cavity material	Aluminum						

Rated parameters and environment

Operating voltage	AC110-220V
Maximum input power to prevent burnout	0 dBm
Operating temperature	-45℃~+85℃
Storage temperature	-55℃~+125℃
Altitude	762m(Epoxy resin sealing conditions)
	1524m, Minimum one standard atmospheric pressure (hermetic packaging condition)

ACTIVE PRODUCTS

Active Limiter



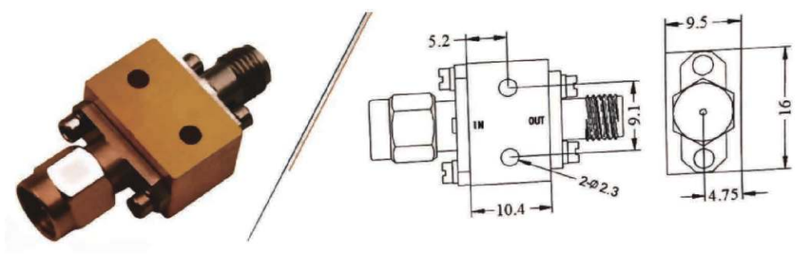
Product Model：ADM-2080LT30S

Detailed technical parameters

Parameter	Minimum	Typical	Maximum	unit
Frequency Range	2		8	GHz
Input Power		1		CW
Peak power (duty cycle <10% pulse width <2us)		1		W
Insertion Loss		1.3	1.8	dB
VSWR		1.4	1.5	： 1
Leakage (input power≤30dBm)		-17	-15	dBm
Peak power leakage (input power ≤ 33dBm, duty cycle < 10%, pulse width < 2us)		-14	-12	dBm
Weight	70.02			g
Input and output connectors	SMA-Female			Ω
Cavity material	Aluminum			

ACTIVE PRODUCTS

Coaxial Detector



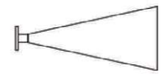
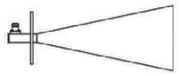
Product Model：ADM-618CDSS

Detailed technical parameters

Parameter	Minimum	Typical	Maximum	unit
Frequency Range	6		18	GHz
VSWR		1.4	1.5	:1
Detection sensitivity	-45			dBm
Sensitivity	0.5			mv/uw
Input Power			23	dBm
Leakage (input power≤30dBm)		-17	-15	dBm
Input polarity	Positive			
Weight	9.92			g
Input and output connectors	SMA-Female/SMA-Male			
Cavity material	Aluminum			

MICROWAVE ANTENNAS

Standard Gain Horn Antenna

Type	With Waveguide Input Style	With Built-in Coaxial Input	With Coaxial Connector Style
Outline Drawing			
WG Type	WR770-WR3	R2300-R28	R975-WR22
VSWR	≤1.25	≤1.5	≤1.5

- Nominal Gain Value: 10dB/15dB/20dB/25dB

0ctave Double-ridged Horn Antenna

Type	WG Input	Built-in Coaxial Input	With Coaxial Connector
Model	DRHAX	DRHAX...	DRHAX+.....
Outline			

MICROWAVE ANTENNAS

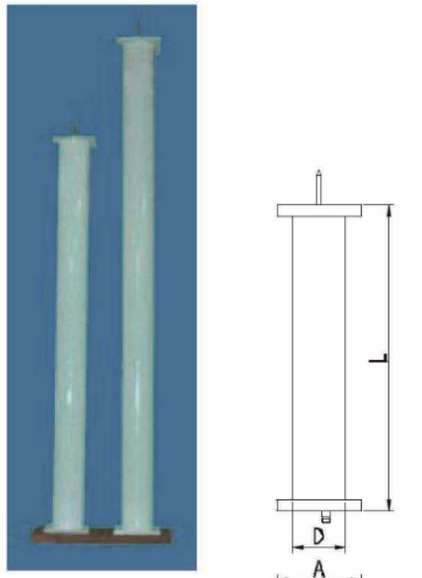
MMDS Transmitting Antenna

Features:

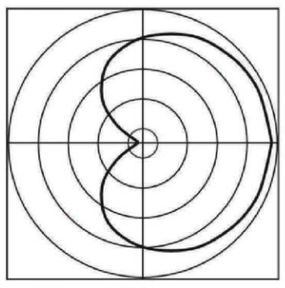
- High radiation efficiency
- Wide frequency range
- Low VSWR
- More Gain values available
- Power rating 300W (CW)
- Light weight aluminium material
- Well sealed
- Easy for installation
- Direct lightning protection
- Ground wind velocity 25m/s

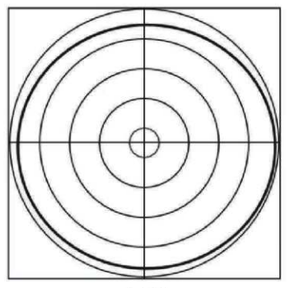
Antenna Type:

- HOA-Omni-directional, Horizontal polarized
- HCA-Half-directional, Horizontal polarized
- VoA-Omni-directional, Vertical polarized
- VCA-Half -directional, Vertical polarized



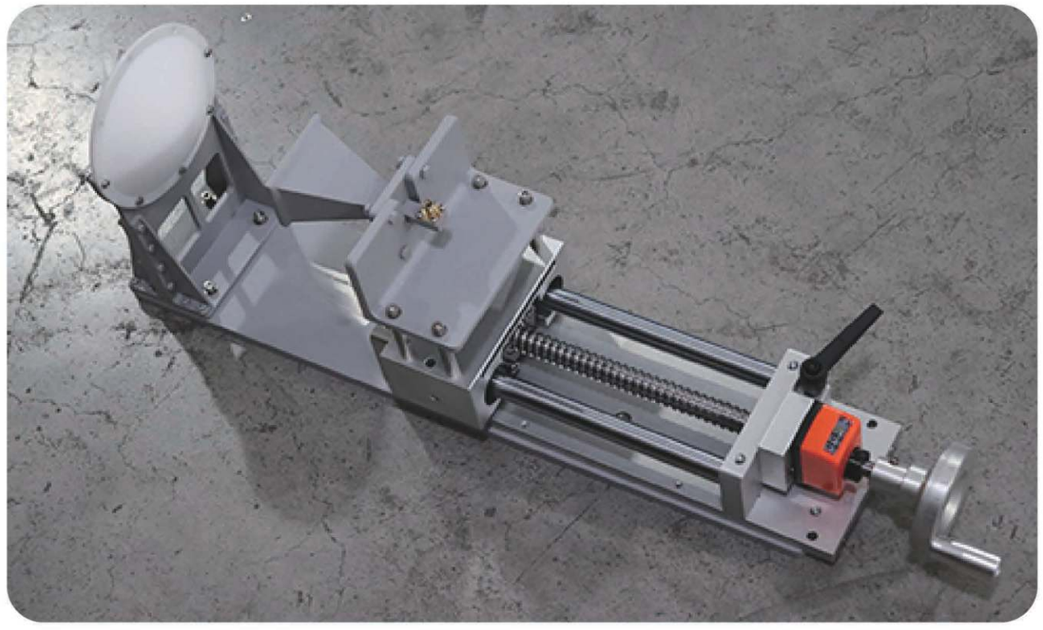
Azimuth Beam Pattern



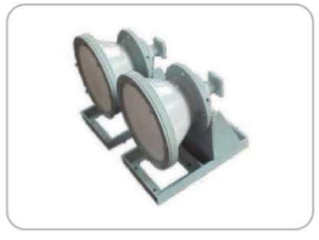


MICROWAVE ANTENNAS

Lens Antenna



Feed Fired Lens Antenna



Conical Horn Lens Antenna

Pyramid Horn Lens Antenna

Point Focusing Horn Lens Antenna

MICROWAVE ANTENNAS

Cassegrain Antenna

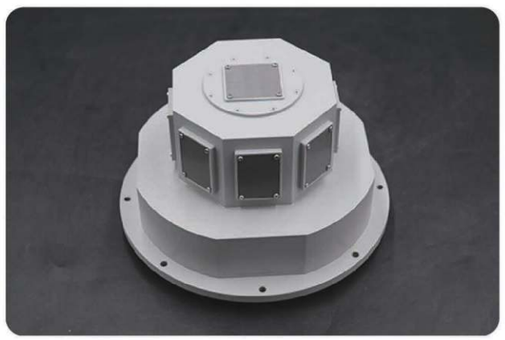
Model No*	ADM-620KRA250
Freq Range (GHz)	F0±4GHZ
Gain (dB)	>38dB
VSWR	≤1.5
Polarization mode	Linear polarization

Model No*	ADM-740KRA160
Freq Range (GHz)	F0±2GHZ
Gain (dB)	>38dB
VSWR	≤1.5
Polarization mode	Linear polarization

Model No*	ADM-900KRA135
Freq Range (GHz)	F0±1GHZ
Gain (dB)	>37dB
VSWR	≤1.5
Polarization mode	Linear polarization

Model No*	ADM-320KRA1200
Freq Range (GHz)	F0±2GHZ
Gain (dB)	>48dB
VSWR	≤1.5
Polarization mode	Linear polarization

MICROWAVE ANTENNAS



Slotted Waveguide Array Antenna

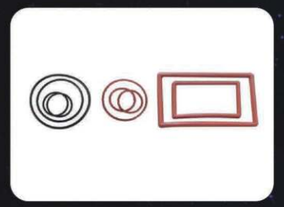
Logarithm Periodic Antenna

Antenna Near Field Measurement Probe

Helical Antenna

Paraboloid Antenna

COMMON ACCESSORIES



Waveguide Flange Gasket

Plastic Flange Caps

Waveguide Adjustable Support

Screws

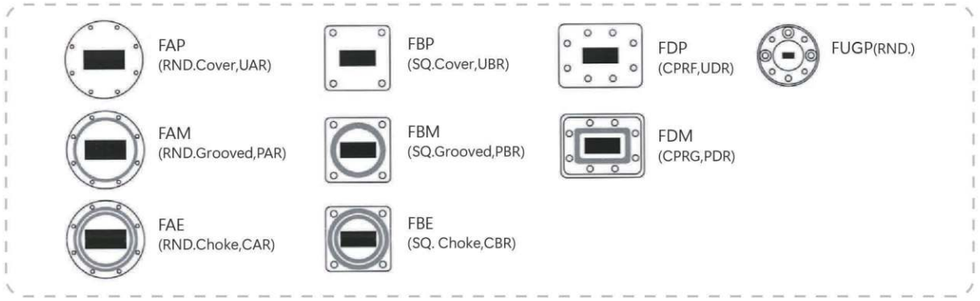
TECHNICAL REFERENCE

Rectangular Waveguide Tubing Information

Model No.	IEC WG Type	EIA WG	Freq Range	Inside Dimensions (mm)			Outside Dimensions (mm)		Power Handling (MW)	Weight		Theoretical Attenuation	
		Type	(GHz)	Width	Height	Std Tol(±)	Width	Height		(Kg /m)		(dB/m)	
										Cu	Al	Cu	Al
ADM-3	R3	WR2300	0.32 ~ 0.49	584.2	292.1				246-348		28.781		0.013
ADM-4	R4	WR2100	0.35 ~ 0.53	533.4	266.7				205-290		21.873		0.015
ADM-5	R5	WR1800	0.41 ~ 0.62	457.2	228.6	0.51			150-213		18.787		0.019
ADM-6	R6	WR1500	0.49 ~ 0.75	381	190.5	0.38			104-148		9.923		0.025
ADM-8	R8	WR1150	0.64 ~ 0.98	292.1	146.05	0.38			61.5-87.1		7.633		0.004
ADM-9	R9	WR975	0.76 ~ 1.15	247.65	123.82				44.2-62.6		6.488		0.005
ADM-12	R12	WR770	0.96 ~ 1.46	195.58	97.79				27.6-39.1		5.147		0.007
ADM-14	R14	WR650	1.13 ~ 1.73	165.1	82.55	0.33	169.16	86.61	19.6-27.8	9.1	2.79	0.01	0.009
ADM-18	R18	WR510	1.45 ~ 2.20	129.54	64.77	0.26	133.6	68.83	12.09-17.1	7.17	2.2	0.015	0.013
ADM-22	R22	WR430	1.72 ~ 2.61	109.22	54.61	0.22	113.28	58.67	8.6-12.2	6.07	1.86	0.019	0.016
ADM-26	R26	WR340	2.17 ~ 3.30	86.36	43.18	0.17	90.42	47.24	5.4-7.6	4.83	1.46	0.027	0.023
ADM-32	R32	WR284	2.60 ~ 3.95	72.14	34.04	0.14	76.2	38.1	3.5-5	3.98	1.22	0.037	0.031
ADM-40	R40	WR229	3.22 ~ 4.90	58.17	29.08	0.12	61.42	32.33	2.44-3.46	2.62	0.8	0.05	0.042
ADM-48	R48	WR187	3.94 ~ 5.99	47.549	22.149	0.095	50.8	25.4	1.52-2.15	2.11	0.65	0.07	0.059
ADM-58	R58	WR159	4.64 ~ 7.05	40.386	20.193	0.081	43.64	23.44	1.17-1.66	1.85	0.57	0.086	0.072
ADM-70	R70	WR137	5.38 ~ 8.17	34.849	15.799	0.07	38.1	19.05	0.79-1.12	1.56	0.48	0.114	0.095
ADM-84	R84	WR112	6.57 ~ 9.99	28.499	12.624	0.057	31.75	15.88	0.52-0.73	1.28	0.39	0.156	0.131
ADM-100	R100	WR90	8.20 ~ 12.5	22.86	10.16	0.046	25.4	12.7	0.33-0.47	0.8	0.25	0.217	0.182
ADM-120	R120	WR75	9.84 ~ 15.0	19.05	9.525	0.038	21.59	12.06	0.26-0.34	0.7	0.22	0.265	0.222
ADM-140	R140	WR62	11.9 ~ 18.0	15.799	7.899	0.031	17.83	9.93	0.18-0.25	0.47	0.14	0.351	0.294
ADM-180	R180	WR51	14.5 ~ 22.0	12.954	6.477	0.026	14.99	8.51	0.12-0.17	0.39	0.12	0.473	0.396
ADM-220	R220	WR42	17.6 ~ 26.7	10.668	4.318	0.021	12.7	6.35	0.066-0.094	0.31	0.09	0.723	0.607
ADM-260	R260	WR34	21.7 ~ 33.0	8.636	4.318	0.02	10.67	6.35	0.053-0.076	0.27	0.08	0.868	0.728
ADM-320	R320	WR28	26.3 ~ 40.0	7.112	3.556	0.02	9.14	5.59	0.036-0.051	0.23	0.07	1.162	0.974
ADM-400	R400	WR22	32.9 ~ 50.1	5.69	2.845	0.02	7.72	4.88	0.023-0.033	0.2	0.06	1.624	1.362
ADM-500	R500	WR19	39.2 ~ 59.6	4.775	2.388	0.02	6.81	4.42	0.016-0.023	0.17	0.05	2.112	
ADM-620	R620	WR15	49.8 ~ 75.8	3.759	1.88	0.02	5.79	3.91	0.01-0.144	0.14	0.04	3.023	
ADM-740	R740	WR12	60.5 ~ 91.9	3.0988	1.5494	0.0127	5.13	3.58	0.0069-0.0098	0.12	0.037	4.04	
ADM-900	R900	WR10	73.8 ~ 112	2.54	1.27	0.0127	4.57	3.3	0.0046-0.0066	0.11	0.032	5.444	
ADM-1200	R1200	WR8	92.2 ~ 140	2.032	1.016	0.0076	3.556	2.54	0.003-0.0042				
ADM-1400	R1400	WR7	113 ~ 173	1.651	0.8255	0.0064	3.175	2.35	0.0019-0.0028				
ADM-1800	R1800	WR5	145 ~ 220	1.2954	0.6477	0.0064	2.819	2.172	0.0012-0.0017				
ADM-2200	R2200	WR4	172 ~ 261	1.0922	0.5461	0.0051	2.616	2.07	0.00086-0.00122				
ADM-2600	R2600	WR3	217 ~ 330	0.8636	0.4318	0.0051	2.388	1.956	0.00054-0.00076				

TECHNICAL REFERENCE

Flange InformationInformation



WG Type		A Type			B Type			D Type		FUGP
EIA Std	IEC Std	FAP (RND.COVER)	FAM (RND.GROOVED)	FAE (RND.CHKE.)	FBP (SQ.COVER)	FBM (SQ.GROOVED)	FBE (SQ.CHKE.)	FDP (CPRF)	FDM (CPRG)	
WR2300	R3							FDP3	FDM3	
WR2100	R4							FDP4	FDM4	
WR1800	R5							FDP5	FDM5	
WR1500	R6							FDP6	FDM6	
WR1150	R8							FDP8	FDM8	
WR975	R9							FDP9	FDM9	
WR770	R12							FDP12	FDM12	
WR650	R14							FDP14	FDM14	
WR510	R18							FDP18	FDM18	
WR430	R22							FDP22	FDM22	
WR340	R26							FDP26	FDM26	
WR284	R32	FAP32	FAM32	FAM32				FDP32	FDM32	
WR229	R40	FAP40	FAM40	FAM40				FDP40	FDM40	
WR187	R48	FAP48	FAM48	FAM48				FDP48	FDM48	
WR159	R58	FAP58	FAM58	FAM58				FDP58	FDM58	
WR137	R70	FAP70	FAM70	FAM70				FDP70	FDM70	
WR112	R84				FBP84	FBM84	FBE84	FDP84	FDM84	
WR90	R100				FBP100	FBM100	FBE100	FDP100	FDM100	
WR75	R120				FBP120	FBM120	FBE120	FDP120	FDM120	
WR62	R140				FBP140	FBM140	FBE140	FDP140	FDM140	
WR51	R180				FBP180	FBM180	FBE180	FDP180	FDM180	
WR42	R220				FBP220	FBM220	FBE220			
WR34	R260				FBP260	FBM260	FBE260			
WR28	R320				FBP320	FBM320	FBE320			
WR22	R400	FAP400	FAM400							FUGP400
WR19	R500	FAP500	FAM500							FUGP500
WR15	R620	FAP620	FAM620							FUGP620
WR12	R740	FAP740	FAM740							FUGP740
WR10	R900	FAP900	FAM900							FUGP900
WR8	R1200	FAP1200	FAM1200							FUGP1200
WR7	R1400	FAP1400	FAM1400							FUGP1400
WR5	R1800	FAP1800	FAM1800							FUGP1800
WR4	R2200	FAP2200	FAM2200							FUGP2200
WR3	R2600	FAP2600	FAM2600							FUGP2600