

**WWW.MIWV.COM**

## Millimeter Wave & Microwave Products & Capabilities



**From stock items or custom components to full sub-system buildouts from 7-325 GHz.**

上海藤莱电子有限公司 **Stock Products**  
电话：021-52918556 **Customized Solutions**  
手机/微信：13764441515  
邮箱：sales@fulai-elec.com  
www.fulai-elec.com

- High Volume
- Sub-Assembly Builds

**5G Has Arrived**  
see more



LETS  
TALK 5G

5G is the fifth generation of wireless technology. Powered by Millimeter Wave Technology, it will usher in a new era of communications and transform industries. Autonomous cars, smart communities, industrial IoT, immersive education, routers, mobile devices and more—they will all rely on 5G.

As the dawn has broken on the 5G era, Mi-Wave is there to provide you a complete set of 5G products and solutions at each stage of R&D, Measurement, Manufacturing and Deployment.

Country	5G Spectrum Allocations Globally
USA	24.25 - 28.35 GHz 37.0 - 40 GHz 64 - 71 GHz
UK/Europe	24.25 - 27.5 GHz
Japan	27.5 - 28.25 GHz
China	24.25 - 27.5 GHz 37.25 - 43.5 GHz
Korea	26.5 - 29.5 GHz
India	24.5 - 29.5 GHz

**WE HAVE  
ALREADY BEGUN!**



- Amplifiers
- Antennas
- Oscillators
- Test Equipment
- Filters
- Attenuators

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# HIGH QUALITY 5G PRODUCTS & SOLUTIONS

Millimeter Wave Products Inc. is perfectly situated to become your 5G components, products and system supplier. Whatever the need we can help your company by providing top of the line 5G components, test tools and systems. Below are a few of many 5G products we provide.

Can't find what you need? Contact us for more information. We can help bring your ideas to life.



## 14 Watt Power Amplifier

Frequency 27-34GHz  
Small Signal Gain 40dB typ  
Output Power (Psat) +41.5dBm typ  
Input Drive Level +5dBm typ  
Input/Output Return Loss (dB) 2.0 :1

*\*See More on Amplifiers Page*



## 182 Series Diplexer

This high performance diplexer with Passband 1 at 24-28 GHz and Passband 2 at 66-67 GHz has Insertion Loss of 2 dB with a Channel Isolation of 60dB.



## WR-28 Transmitter

Operating at 37-40 GHz generating 10 Watts of output power is helping 5G customers in their test and measurement needs.

## 25 Watt 5G Amplifier

Frequency 26-29 GHz  
Small Signal Gain 42dB  
Output Power (Psat) +44dBm typ  
Input Power Min+10dBm Max+15dBm  
Bias Voltage: 28-30V  
Bias Current: 3.2amps @Psat



## 27 - 30.5 GHz SP12T Switch

This switch features 60dB Isolation between channels with Insertion Loss 7dB over band.

Contact us for more information and ordering



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# LOW NOISE AMPLIFIERS

Please view our catalog online for the complete line of products



Low Noise Amp Technical Specs (typical)

Freq. Min. (GHz)	Freq. Max (GHz)	Gain	Noise Figure	VSWR	I/O
08	12	33dB	2.0 dB	1.8:1	SMA (F)
18	40	41dB	3.0 dB	2.4:1	K (F)
18	26.5	48dB	2.5 dB	2:1	K (F)
18	26.5	48dB	2.5 dB	2:1	WR42 Waveguide
18	26.5	30dB	2.5 dB	2:1	K (F)
18	26.5	30dB	2.5 dB	2:1	WR42 Waveguide
18	26.5	20dB	2.5 dB	2:1	K (F)
18	26.5	20dB	2.5 dB	2:1	WR42 Waveguide
26.5	40	30dB	3.0 dB	2:1	K (F)
36	45.5	25dB	3.5 dB	2:1	2.4mm (F)
40	60	30dB	8.0 dB	3:1	WR19 Waveguide
40	45	35dB	4.0 dB	2.5:1	2.4mm (F)
50	75	35dB	5.0 dB	2.5:1	WR15 Waveguide
50	70	35dB	5.0 dB	2.5:1	V (F)
60	90	25dB	5.0 dB	3.5:1	WR12 Waveguide
71	86	30dB	6.0 dB	3:1	WR12 Waveguide
71	86	20dB	4.0 dB	3.5:1	WR12 Waveguide
75	110	20dB	4.0 dB	3:1	WR10 Waveguide
80	100	25dB	4.0 dB	3:1	WR10 Waveguide
80	100	25dB	4.0 dB	3.5:1	WR10 Waveguide

## MEDIUM POWER

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## WIDEBAND AMPLIFIERS GENERAL PURPOSE AMPLIFIERS

We have hundreds of configurations, specifications and high performance amplifiers of all bands available. Contact our sales engineers for more information, outlines and performance data.

Standard Amp Technical Specs (typical)

Freq. Min. (GHz)	Freq. Max (GHz)	Gain	Output Power	VSWR	I/O
18	40	20dB	+20 dBm	2:1	K (F)
26.5	40	20dB	+20 dBm	2:1	K (F)
33	50	30dB	+18 dBm	2:1	2.4mm (F)
33	50	30dB	+18 dBm	2:1	WR22 Waveguide
35	47	35dB	+20 dBm	2:1	2.4mm (F)
35	47	35dB	+20 dBm	2:1	WR22 Waveguide
50	70	28dB	+15 dBm	2:1	WR15 Waveguide
50	68	35dB	+18 dBm	2:1	V (F)
55	65	25dB	+18 dBm	1.5:1	WR15 Waveguide
63	90	10dB	+8.5 dBm	3:1	WR12 Waveguide
66	78	20dB	+16 dBm	3:1	WR12 Waveguide
70	90	30dB	+15 dBm	2:1	WR12 Waveguide
71	86	30dB	+15 dBm	2:1	WR12 Waveguide
75	110	25dB	+15 dBm	2:1	WR10 Waveguide
75	110	10dB	+15 dBm	2:1	WR10 Waveguide
76	81	16dB	+10 dBm	3:1	WR12 Waveguide
81	86	25dB	+20 dBm	2:1	WR12 Waveguide
90	100	30dB	+15 dBm	2:1	WR10 Waveguide
92	96	35dB	+16 dBm	3:1	WR10 Waveguide
92	96	30dB	+20dBm	3:1	WR10 Waveguide

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# HIGH POWER AMPLIFIERS

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## Technical Specifications (typical)

Freq. Min. (GHz)	Freq. Max (GHz)	Gain	Output Power	VSWR	I/O
18	26.5	25 dB	+28 dBm	2:1	K (F)
18	26.5	25 dB	+28 dBm	2:1	WR42 Waveguide
18	40	30 dB	+20 dBm	2:1	K (F)
23	35	19 dB	+28 dBm	2:1	K (F)
23	35	19 dB	+28 dBm	2:1	WR28 Waveguide
27	34	40 dB	+40 dBm	2:1	2.4mm (F)
27	34	40 dB	+40 dBm	2:1	WR28 Waveguide
26.5	40	30 dB	+31 dBm	2:1	K (F)
26.5	40	30 dB	+31 dBm	2:1	WR28 Waveguide
31	38	40 dB	+34 dBm	2:1	K (F)
31	38	40 dB	+34 dBm	2:1	WR28 Waveguide
33	50	30 dB	+18 dBm	2:1	2.4mm (F)
40	60	25 dB	+20 dBm	2:1	WR19 Waveguide
50	68	35 dB	+18 dBm	2:1	V (F)
50	68	35 dB	+18 dBm	2:1	WR15 Waveguide
55	65	30 dB	+22 dBm	2:1	V (F)
76	81	25 dB	+25 dB	3:1	WR12 Waveguide
81	86	30 dB	+26 dB	2:1	WR12 Waveguide
90	95	11 dB	+24 dBm	2:1	WR10 Waveguide
70	95	12 dB	+16 dBm	3:1	WR10 Waveguide
40	60	25 dB	+20 dBm	2:1	WR19 Waveguide

**HIGH POWER**

## 25 Watt 5G Amplifier

Frequency 26-29 GHz  
Small Signal Gain 42dB  
Output Power (Psat) +44dBm typ  
Input Power Min+10dBm Max+15dBm  
Bias Voltage: 28-30V  
Bias Current: 3.2amps @Psat

**NEW**

**5G  
READY**

## 14 Watt Power Amplifier

Frequency 27-34GHz  
Small Signal Gain 40dB typ  
Output Power (Psat) +41.5dBm typ  
Input Drive Level +5dBm typ  
Input/Output Return Loss (dB) 2.0 :1  
Bias Voltage 100 to 230 VAC 50 to 60 Hz  
Maximum RF Input Power +15dBm max

# NOISE SOURCES

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## ✓ 870 SERIES NOISE SOURCE

FEATURES OUTSTANDING STABILITY, SWITCHING SPEED, AND RIPPLE FREE RESPONSE OVER STANDARD WAVEGUIDE BANDS.

RIPPLE IN THE OUTPUT HAS A DIRECT EFFECT ON MEASUREMENTS. THESE NOISE SOURCES OPERATE SO THAT RIPPLE IS MINIMIZED THROUGHOUT THE FREQUENCY RANGE.

ISOLATOR OPTIONAL  
FOR ALL NOISE SOURCES

## TECHNICAL SPECIFICATIONS (TYPICAL)

Model No.	870K	870A	870B	870V	870E	870W
Frequency (GHz)	18-26.5	26.5-40	33-50	50-75	60-90	75-110
Noise Output ENR (dB)	15.5	15.5	15.5	15.5	15	13
Noise Output Flatness (dB)	±1.5	±1.5	±1.5	±3.0	±4.0	±5.0
VSWR (typical)	1.3:1	1.3:1	1.3:1	1.6:1	1.6:1	1.6:1
Calibration Frequencies	1 GHz steps	1 GHz steps	1 GHz steps	1 GHz steps	1 GHz steps	1 GHz steps
I (max) (mA)	30	30	30	30	30	30
Waveguide/Flange	WR42, UG595/U	WR28, UG599/U	WR22, UG383/U	WR15, UG385/U	WR12, UG387/U	WR10, UG387/U

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# SOURCES/OSCILLATORS

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## 840 SERIES FREQUENCY SOURCES 840W-92/95/30/387S

Frequency (GHz)	92 to 95GHz
Frequency Resolution (Hz)	<10Hz
Internal Reference Frequency Output (MHz)	100 MHz typ.
Internal REF Frequency Output Interface	SMA(F) / 50(Ω)
REF Frequency Output Amplitude (dBm)	≥ +5dBm
Internal Time Base Reference	≤ ±5ppm/year
External Reference Input Frequency (MHz)	10MHz
10MHz External Ref Input Amplitude (dBm)	0dBm to +10dBm
External Ref Input Interface/Impedance (Ω)	SMA(F) / 50(Ω)
RF Output Power	≥ 1W / 30dBm
RF Output Port	WR10 UG387/U-M
Synthesizer Communication Interface	USB

## TEST DATA RESULTS

92 to 95GHz
1
100
+7.5dBm
10MHz
+5dBm
>30dBm

✓ 830 FIXED FREQUENCY SOURCES

✓ 840 VOLTAGE CONTROLLED SOURCES

✓ 957 PHASE LOCKED OSCILLATORS

## 840 SERIES TECHNICAL SPECIFICATIONS

Model No.	840K	840A	840B	840U	840V	840E	840W
Frequency (GHz)	18-26.5	26.5-40	33-50	40-60	50-75	60-90	75-110
Output Port	WR-42/SMA-F	WR-428/K-F	WR-22/2.4mF	WR-19/1.85mm	WR-15	WR-12	WR-10
Output Power	30dBm	30dBm	20dBm	20dBm	17dBm	17dBm	15dBm

# MULTIPLIERS

Please view our catalog online for the complete line of products



- ✓ 182 DIPLEXER
- ✓ 932/934/936/938 ACTIVE FREQUENCY MULTIPLIERS
- ✓ 938 PASSIVE FREQUENCY MULTIPLIERS
- ✓ FREQUENCY EXTENDERS



## TECHNICAL SPECIFICATIONS (TYPICAL)

\* More options available

Output Frequency (GHz)	Multiplying Factor	Input Freq. (GHz)	Output Power (dBm typ)	Bandwidth (GHz)	Output Waveguide	Input Connector
18.0-26.5	x2	9.0-13.25	10 to 30	±2 to Full	WR-42,K,F	SMA(F)
26.5-40.0	x2	13.25-20.0	10 to 27	±2 to Full	WR-28,K,F	SMA(F)
40.0-60.0	x4	6.625-10.0	10 to 27	±2 to Full	WR-28	SMA(F)
60.0-90.0	x2	16.5-25.0	10 to 25	±2 to Full	WR-22	SMA(F)
90.0-110.0	x4	8.25-12.5	7 to 25	±2 to Full	WR-22	SMA(F)
110.0-130.0	x4	10.0-15.0	7 to 25	±2 to Full	WR-19	SMA(F)
130.0-150.0	x4	12.5-18.75	7 to 20	±2 to Full	WR-15	K(F)
150.0-180.0	x6	10.0-15.0	7 to 25	±2 to Full	WR-12	K(F)
180.0-210.0	x6	12.5-18.33	5 to 25	±2 to Full	WR-10	SMA(F)

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# MIXERS

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- ✓ 920/922 HARMONIC MIXERS
- ✓ 970/980 WIDE-BAND BALANCED MIXERS
- ✓ 971 IQ MIXER
- ✓ 972 SUBHARMONIC MIXERS



# SWITCHES

Please view our catalog online for the complete line of products



- ✓ 145 POLARIZATION SWITCHES
- ✓ 530 MANUAL WAVEGUIDE SWITCH
- ✓ 535 ELECTROMECHANICAL SWITCHES  
TWO-POSITION SOLENOID
- ✓ PIN DIODE SWITCHES  
911/912/914/918/9112  
(SPST, SPDT, SP3T, SP4T, SP8T, SP12T)



535 SERIES SWITCH TECHNICAL SPECIFICATIONS (TYPICAL)

Model No.	535A	535B	535U	535V	535E	535W	535F	535D	535G
Frequency (GHz)	26.5-40	33-50	40-60	50-75	60-90	75-110	90-140	110-170	140-220
Isolation	70	70	70	70	70	70	60	60	50
Insertion Loss (dB)	0.3	0.3	0.3	0.4	0.5	0.7	0.9	0.9	1.0
Switch Time (Seconds)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.2

Available in WR-4 and WR-3 waveguide sizes also

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# ATTENUATORS

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**HIGH POWER**  
ATTENUATORS AVAILABLE

- ✓ 510 PRECISION DIRECT-READING ATTENUATORS
- ✓ 511 PROGRAMMABLE ROTARY VANE ATTENUATORS
- ✓ 512 DUAL PROGRAMMABLE ROTARY VANE ATTENUATORS
- ✓ 520 UNCALIBRATED VARIABLE ATTENUATORS
- ✓ 521 FIXED ATTENUATORS
- ✓ 522 DIAL-DRIVEN CALLIBRATED ATTENUATORS
- ✓ 523 MICROMETER-DRIVEN CALLIBRATED ATTENUATORS
- ✓ 900 PIN DIODE VOLTAGE VARIABLE ATTENUATORS



## SERIES 511 ATTENUATORS

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See videos, datasheets  
and more by scanning  
this QR code.



Mi-Wave's 511 Series Precision Programmable Rotary Vane Attenuators are available in full waveguide bands from 7.0 to 220GHz. Attenuation control is performed manually via a front panel or remote controlled using a standard IEEE-488 or USB interface. The attenuators small compact size incorporates both the electronic controller and the microwave components. The unit operates from a single +24 Volt DC source or with an optional adapter.

Attenuation range is from 0 to 70 dB in .01 dB steps from 0 to 70 dB. A digital readout is provided on the front panel to display attenuation settings. The attenuators are highly reliable and designed to be used in ATE and remote power control applications. USB & GPIB interface available. Tested to over 1 million cycles.

New company proprietary internal absorbing material that will handle high power levels and yield low insertion loss and mode free operation to 70 db attenuation levels.

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Technical Specifications (typical)					
Model No.	Frequency Band	Waveguide	Insertion Loss	VSWR	Power
	GHz	WR	Max.	Max.	Max.
511XL	7.0-10.0	112	0.5 dB	1.2:1	20 watt
511X	8.2-12.4	90	0.5 dB	1.2:1	20 watt
511XS	10.0-15.0	75	0.5 dB	1.25:1	20 watt
511KU	12.4-18.0	62	0.5 dB	1.25:1	20 watt
511K	18.0-26.5	42	0.5 dB	1.15:1	20 watt
511A	26.5-40.0	28	0.5 dB	1.15:1	20 watt
511B	33.0-50.0	22	0.6 dB	1.15:1	15 watt

Technical Specifications (typical)					
Model No.	Frequency Band	Waveguide	Insertion Loss	VSWR	Power
	GHz	WR	Max.	Max.	Max.
511U	40.0-60.0	19	0.7 dB	1.15:1	15 watt
511V	50.0-75.0	15	0.9 dB	1.20:1	15 watt
511E	60.0-90.0	12	1.0 dB	1.2:1	10 watt
511W	75.0-110.0	10	1.3 dB	1.2:1	2 watt
511F	90.0-140.0	8	1.5 dB	1.3:1	1 watt
511D	110.0-170.0	7	3.0 dB	1.3:1	1 watt
511G	140.0-220.0	5	3.0 dB	1.3:1	0.5 watt



# DETECTORS

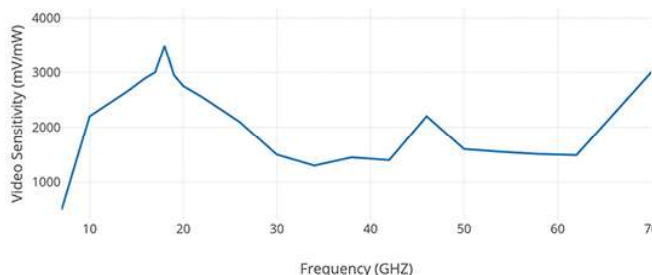
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- ✓ 950 AMPLITUDE DETECTORS
- ✓ 951 SERIES ULTRA WIDEBAND DETECTORS
- ✓ 990 BALANCED PHASE DETECTORS



## Ultra Wideband Coaxial Detector (7-70GHz)



## 950 SERIES TECHNICAL SPECIFICATIONS (TYPICAL)

Model No.	950K	950A	950B	950U	950V	950E	950W
Frequency (GHz)	18.0-26.5	26.5-40	33-50	40-60	50-75	60-90	75-110
Video Sensitivity (mV/mW typ.)	1100	1100	950	950	700	550	500
Tangential Sensitivity (dBm)	-55	-55	-50	-50	-50	-45	-45
Flatness (dB)	±1.5	±1.5	±1.5	±1.5	±2.0	±2.0	±2.0

Available in WR-8, WR-6, WR-5, WR-4, WR-3, waveguide sizes also

# ISOLATORS & CIRCULATORS

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- ✓ 115 FARADAY ISOLATORS
- ✓ 172/178 JUNCTION ISOLATORS
- ✓ 173/179 JUNCTION CIRCULATORS
- ✓ 180 MULTI-JUNCTION CIRCULATORS



## 115 SERIES TECHNICAL SPECIFICATIONS (TYPICAL)

Model No.	115K	115	115A	115B	115U	115V	115E	115W	115F	115D	115G
Frequency (GHz)	18-26.5	22-33	26.5-40	33-50	40-60	50-75	60-90	75-110	90-140	110-170	140-220
Waveguide Size	WR-42	WR-34	WR-28	WR-22	WR-19	WR-15	WR-12	WR-10	WR-8	WR-6	WR-5
Isolation	25	25	25	25	25	25	25	25	22	20	20
Insertion Loss (dB typ.)	1.0	1.0	1.0	1.3	1.5	1.7	2.0	2.2	2.7	3.1	3.5
VSWR (typ.)	1.30	1.30	1.30	1.30	1.30	1.35	1.35	1.40	1.50	1.50	1.50
Power Handling (Watts Max)	2.0	2.0	2.0	1.5	1.5	1.0	1.0	1.0	0.4	0.2	0.2

Available in WR-4 and WR-3, waveguide sizes also

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# ANTENNA PRODUCTS

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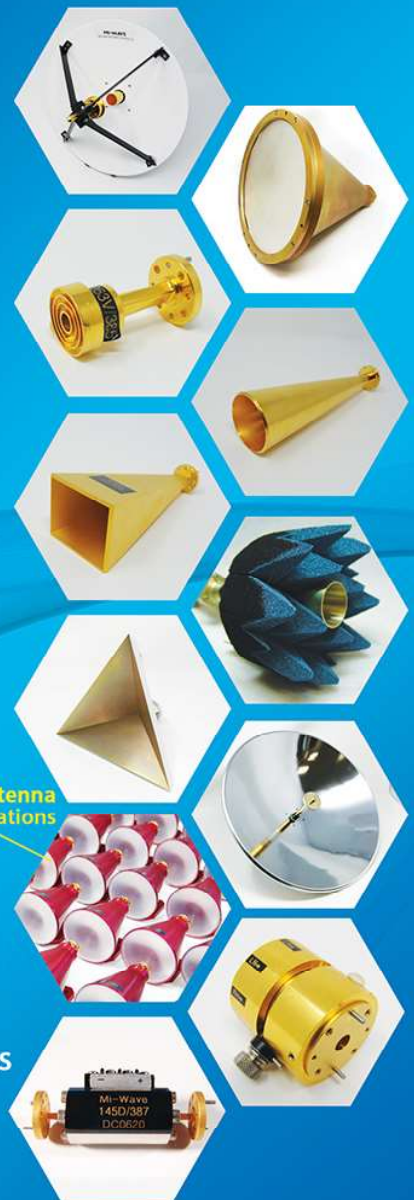
ANECHOIC TEST CHAMBER  
ON-SITE FOR QUALITY ASSURANCE



- ✓ 202/203 PRIME FOCUS ANTENNAS
- ✓ 222/223 CASSEGRAIN ANTENNAS
- ✓ 257 SPOT FOCUS LENS ANTENNAS
- ✓ 258 HORN LENS ANTENNAS
- ✓ 261 STANDARD GAIN HORNS
- ✓ 262 CONICAL HORNS
- ✓ 263 SCALAR FEED HORNS
- ✓ 267 OMNI-DIRECTIONAL ANTENNAS
- ✓ 268 CORRUGATED HORN ANTENNAS
- ✓ 770 TRIHEDRAL REFLECTORS
- ✓ PROBE ANTENNAS
- ✓ CUSTOM ANTENNAS

77GHz WR-12 Antenna  
for Automotive Applications

- ✓ 145 POLARIZATION SWITCHES
- ✓ 281 ORTHOMODE TRANSDUCERS
- ✓ 282 CIRCULAR POLARIZERS
- ✓ 283 LINEAR-CIRCULAR SWITCHABLE POLARIZERS



## OMNI-DIRECTIONAL ANTENNAS

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### 267 SERIES TECHNICAL SPECIFICATIONS

Model No.	267A	267U	267V	267E	267W
Frequency (GHz)	26.5 - 36	50 - 60	55 - 65	72 - 82	89 - 99
Gain (nominal)	3.5 dBi	3.5 dBi	4 dBi	4 dBi	4 dBi
Gain Variation	+/- 2dB	+/- 2dB	+/- 2dB	+/- 2dB	+/- 2dB
3dB Vertical Beamwidth	360 Degree	360 Degree	360 Degree	360 Degree	360 Degree
3dB Horizontal Beamwidth	45 Degree	45 Degree	45 Degree	45 Degree	45 Degree
Return Loss	20 dB	17 dB	17 dB	17 dB	20 dB
Antenna Port					

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# FILTERS

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460 Technical Specifications (typical)

Min Passband Frequency	Max Passband Frequency	Min Rejection Frequency (Low Side)	Max Rejection Frequency (Low Side)	Min Rejection Frequency (High Side)	Max Rejection Frequency (High Side)	Rejection	Waveguide
98GHz	102GHz	DC	95GHz	105GHz	110GHz	40dB	WR-10 Waveguide
92GHz	100GHz	DC	88GHz	104GHz	110GHz	50dB	WR-10 Waveguide
90GHz	98GHz	DC	88GHz	102GHz	110GHz	25dB	WR-10 Waveguide
92GHz	96GHz	DC	90GHz	98GHz	130GHz	40dB	WR-10 Waveguide
73GHz	76GHz	DC	67GHz	82GHz	100GHz	40dB	WR-12 Waveguide
74GHz	76GHz	DC	70GHz	80GHz	100GHz	40dB	WR-12 Waveguide
50GHz	75GHz	DC	44GHz	80GHz	110GHz	40dB	WR-15 Waveguide
73GHz	74GHz	DC	70GHz	76.6GHz	95GHz	30dB	WR-12 Waveguide
49.75GHz	50.25GHz	DC	49GHz	51GHz	60GHz	30dB	WR-15 Waveguide
34GHz	67GHz	DC	30GHz	69GHz	120GHz	40dB	WR-19 Waveguide
43GHz	46GHz	DC	42GHz	47GHz	55GHz	30dB	WR-22 Waveguide
30GHz	50GHz	DC	25GHz	56GHz	100GHz	40dB	WR-22 Waveguide
33GHz	50GHz	DC	25GHz	56GHz	60GHz	40dB	WR-22 Waveguide
40GHz	50GHz	DC	34GHz	57GHz	65GHz	60dB	WR-22 Waveguide
30GHz	45GHz	DC	28GHz	47GHz	90GHz	40dB	WR-22 Waveguide
22GHz	42GHz	DC	20GHz	48GHz	95GHz	60dB	WR-28 Waveguide
22GHz	38GHz	DC	19.6GHz	41GHz	45GHz	50dB	WR-28 Waveguide
32GHz	38GHz	DC	28GHz	40GHz	46GHz	40dB	WR-28 Waveguide
33GHz	37GHz	DC	31GHz	39GHz	46GHz	40dB	WR-28 Waveguide
35.26GHz	36.26GHz	DC	33.9GHz	38GHz	45GHz	40dB	WR-28 Waveguide
22GHz	35GHz	DC	20GHz	40GHz	72GHz	40dB	WR-28 Waveguide
29GHz	35GHz	DC	27GHz	37GHz	45GHz	40dB	WR-28 Waveguide
27.5GHz	32.5GHz	DC	23.5GHz	36.5GHz	41.5GHz	40dB	WR-28 Waveguide
22GHz	32GHz	DC	18GHz	37GHz	75GHz	40dB	WR-28 Waveguide



ADDITIONAL CONFIGURATIONS  
AVAILABLE UP TO WR-05

## ✓ HIGH PASS FILTERS

## ✓ BAND PASS FILTERS

## ✓ LOW PASS FILTERS

460E-74.5/82.5/40/387P



FREQUENCY RANGE: 74.5-82.5 GHZ,  
REJECTION LEVEL: -40dB TYP. @ DC-71.5GHZ & 85.5-105GHZ  
-30dB TYP. @ 72.5 & 73.5GHZ  
PASSBAND RIPPLE:  $\pm 0.3$ dB TYP.  
PASSBAND INSERTION LOSS: 2DB TYP.  
INPUT AND OUTPUT PORT: WR12 WAVEGUIDE, UG-387 FLANGE

460W-107/4/387



FREQUENCY RANGE: 106.5-107.5 GHZ,  
REJECTION LEVEL: -40dB TYP. @ 110 AND 104 GHZ  
VSWR: 1.5:1 NOMINAL  
PASSBAND INSERTION LOSS: 2DB TYP.  
INPUT AND OUTPUT PORT: WR-10, UG-385 FLANGE

460E-76/81/40/387P



FREQUENCY RANGE: 76 - 81 GHZ,  
REJECTION LEVEL: -40dB TYP. @ DC-73GHZ =  
-40dB TYP. @ 84-105GHZ  
PASSBAND RIPPLE:  $\pm 0.3$ dB TYP.  
PASSBAND INSERTION LOSS: 2DB TYP.  
INPUT AND OUTPUT PORT: WR12 WAVEGUIDE, UG-387 FLANGE

460V-64/14/385



FREQUENCY RANGE: 64 GHZ CF, 14 GHZ (-3 DB) BANDWIDTH,  
REJECTION LEVEL: -40dB TYP. @ 53.28GHZ OR BELOW  
VSWR: 2.0 MAX  
PASSBAND INSERTION LOSS: 2dB TYP. 2.5 dB MAX  
INPUT AND OUTPUT PORT: WR15 WAVEGUIDE, UG-385 FLANGE

上海融策电子有限公司

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FREQUENCY RANGE: 40.5-50 GHZ  
REJECTION LEVEL: 40dB TYP. @ 39.995GHZ  
PASSBAND INSERTION LOSS: 1.5 dB TYP.  
INPUT AND OUTPUT PORT: WR19 WAVEGUIDE, UG-383 FLANGE

460V-64/14/385



FREQUENCY RANGE: 64 GHZ CF, 14 GHZ (-3 DB) BANDWIDTH,  
REJECTION LEVEL: -40dB TYP. @ 53.28GHZ OR BELOW  
VSWR: 2.0 MAX  
PASSBAND INSERTION LOSS: 2dB TYP. 2.5 dB MAX  
INPUT AND OUTPUT PORT: WR15 WAVEGUIDE, UG-385 FLANGE



# PASSIVE WAVEGUIDE PRODUCTS

Please view our catalog online for the complete line of products

## STRAIGHTS, BENDS & TWISTS

- ✓ 370/371 CIRCULAR WAVEGUIDES
- ✓ 660/661/662/665 E-PLANE BENDS
- ✓ 670/671/671/675 H-PLANE BENDS
- ✓ 680/681 TWISTS
- ✓ 690/691 STRAIGHT WAVEGUIDES

## TUNING & CALIBRATION

- ✓ 590 ADJUSTABLE WAVEGUIDE SHORT CIRCUITS
- ✓ 595 FIXED SHORTS
- ✓ 620 E/H PLANE TUNERS

## POWER DIVIDERS

- ✓ 600 SINGLE HYBRID RINGS
- ✓ 604 FOUR WAY POWER DIVIDERS
- ✓ 605 3 DB SHORT SLOT HYBRIDS
- ✓ 608 EIGHT WAY POWER DIVIDERS
- ✓ 616 SIXTEEN WAY POWER DIVIDERS
- ✓ 635 MAGIC HYBRID TEES
- ✓ 640/650 E AND H PLANE TEES

## TERMINATIONS

- ✓ 580 LOW POWER TERMINATIONS
- ✓ 581 MEDIUM POWER TERMINATIONS
- ✓ 582 HIGH POWER TERMINATIONS
- ✓ 585 SLIDING MATCHED TERMINATIONS

## ADAPTERS

- ✓ 284 LINEAR TO CIRCULAR MODE TRANSITIONS
- ✓ 688 FLANGE ADAPTERS
- ✓ 692 TAPERED MODE TRANSITIONS
- ✓ 712 BULKHEAD ADAPTERS
- ✓ 713 PANEL MOUNT ADAPTERS

CUSTOM WAVEGUIDE  
PRODUCTS AVAILABLE

## 780 SERIES CALIBRATION KIT

Millimeter Wave Products Inc has developed a line of millimeter waveguide calibration kits for calibrating Vector Network Analyzers (VNA) utilizing millimeter waveguide test heads or modules from 26.5 to 325 GHz. These kits provide the Short-Short-Load-Thru (SSLT) calibration method utilizing offset shorts and fixed precision termination.

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• AGILENT PNA COMPATIBLE  
• VNA 110/137/150 SERIES COMPATIBLE  
• ANRITSU VECTORSTAR FAMILY COMPATIBLE  
• ROHDE & SCHWARZ ZV/B SERIES COMPATIBLE



# WAVEGUIDE TO COAXIAL ADAPTERS

Please view our catalog online for the complete line of products



## 410/411 SERIES WAVEGUIDE TO COAXIAL ADAPTERS

- ✓ FULL BAND UNITS
- ✓ COMPACT SIZE
- ✓ HIGH PERFORMANCE LAB VERSIONS
- ✓ WIDE VARIETY OF COAX CONNECTORS
- ✓ N, SMA, 2.92, 2.4, 1.85, 1.0mm
- ✓ 1MM CONNECTORS FOR WR-15, WR-12, WR-10



## 411 SERIES TECHNICAL SPECIFICATIONS

Model No.	411Ku	411K	411(WR34)	411A	411B	411U	411V
Frequency (GHz)	12.4-18.0	18-26.5	22-33	26.5-40	33-50	40-60	50-75
Waveguide Size	WR-62	WR-42	WR-34	WR-28	WR-22	WR-19	WR-15
Flange	UG-419/U	UG-595/U	UG-595/UM	UG-595/U	UG-599/UM	UG-383/UM	UG-385/U
Standard Connectors	N,SMA	2.92-2.4	2.92-2.4	2.92-2.4	2.92-2.4	2.92-2.4	1.85, 1.0
Available	2.92, 2.4	2.0	1.85, 1.0	2.0	1.85, 1.0	1.85, 1.0	1.0
Insertion Loss (dB typ)	.3	.3	.3	.4	.7	.7	.7
VSWR (typ.)	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1

# COUPLERS

Please view our catalog online for the complete line of products

## ✓ 566 CROSSGUIDE DIRECTIONAL COUPLERS



- ✓ 555 BI-DIRECTIONAL COUPLERS
- ✓ 559/560 BROADBAND DIRECTIONAL COUPLERS (E & H PLANE)
- ✓ 561 BROADBAND DIRECTIONAL COUPLER (BLOCK TYPE)
- ✓ 567 DUAL DIRECTIONAL COUPLERS

## 561 BROADBAND DIRECTIONAL COUPLER SERIES TECHNICAL SPECIFICATIONS (TYPICAL)

Model No.	561A	561B	561U	561V	561E	561W	561F	561D	561G
Frequency (GHz)	26.5-40	33-50	40-60	50-75	60-90	75-110	90-140	110-170	140-220
Coupling (dB)	3, 6, 10, 20, 30, 40								
Coupling Variation (dB)	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.5	±1.5	±1.5
Coupling Accuracy (dB) (at center frequency)	±1.0	±1.0	±1.0	±1.5	±1.5	±1.5	±2.0	±2.0	±2.0
Directivity (dB)	35	35	35	35	35	35	25	25	25
Main Line VSWR	1.05	1.05	1.05	1.10	1.10	1.10	1.15	1.15	1.15
Aux Line VSWR	1.12	1.12	1.12	1.15	1.15	1.17	1.20	1.20	1.20

Available in WR-3 and WR-4 waveguide sizes also

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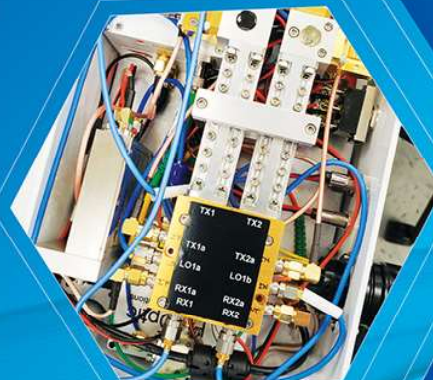


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MI-WAVE SPECIALIZES IN BROAD RANGE OF FULLY INTEGRATED MILLIMETER-WAVE SUBSYSTEMS AND MULTI-FUNCTION COMPONENTS.

THESE SOLUTIONS RANGE FROM MINIATURE TRANSCIVERS AND BROADBAND RECEIVERS TO ANTENNA SUBSYSTEMS AND COMMUNICATION FRONT ENDS.

THESE SUBSYSTEMS ARE TYPICALLY USED IN COMMUNICATIONS, AUTOMOTIVE INDUSTRY, RADAR SYSTEMS, AND SCIENTIFIC RESEARCH.



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# CUSTOM ASSEMBLIES

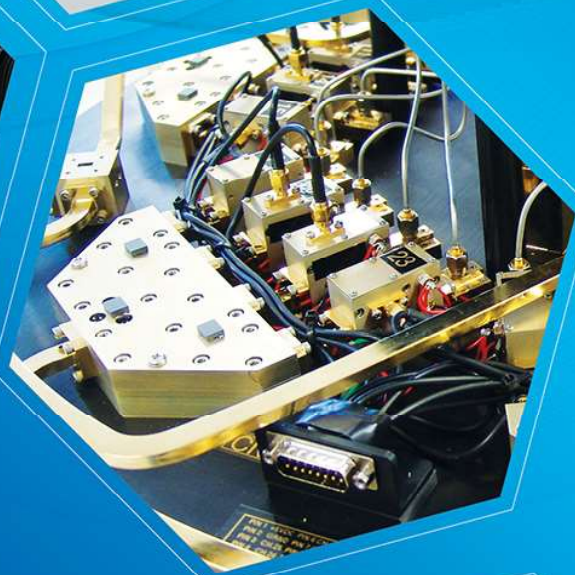
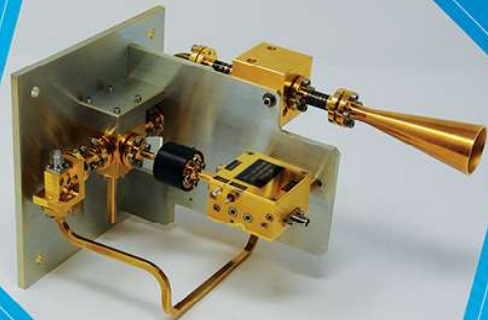
MI-WAVE OFFERS CUSTOM ASSEMBLIES IN THE FREQUENCY RANGE OF 18 TO 110 GHz.

OUR EXPERIENCED ENGINEERS AND ON-SITE MANUFACTURING CAPABILITIES ENABLES US TO OFFER CUSTOMERS THE CUSTOM AND COST EFFECTIVE MMW INTEGRATED SOLUTIONS WITH BETTER LEAD TIME.

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- ✓ DOWNCONVERTER/RECEIVER
- ✓ TRANSCEIVERS

- ✓ INTERFEROMETER
- ✓ RADAR FRONT ENDS
- ✓ AUTOMOTIVE TESTING



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Millimeter Wave Products, Inc. is a global leader of millimeter and microwave technology, components, and assemblies. Our capabilities range from custom designed systems to large volume production within the 7-325GHz spectrum.

Our products are the foundation of many of the devices and applications that are changing and enhancing everyday lives around the world.

All components and assemblies are manufactured in our U.S. based facility utilizing the latest production, inspection, and testing technology and methods to ensure quality. We work with a wide variety of clients across many industries globally providing everything from standard products to custom designed assemblies. Contact us today to see how we can help you.

- 25,000 square foot facility

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- Video Inspection System and Microscopes

- Semi-Automatic Wire bonders

- 3 and 4-axis CNC Mills

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