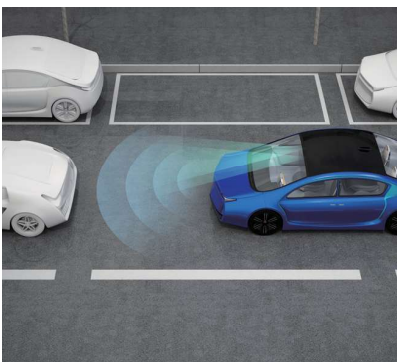


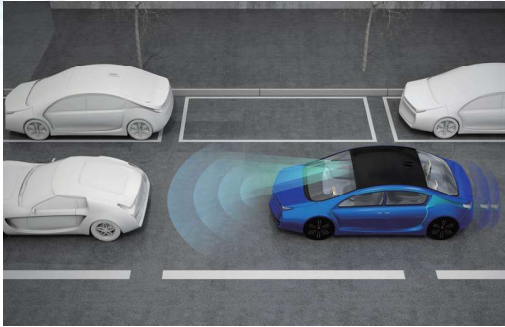
WVETRACK

RF & Microwave MMIC/RFIC Technology

www.wavetrackinc.com



Company Overview



Introduction to Wavetrack

Wavetrack Inc. is a total component manufacturer of MMIC/RFIC, active/passive module that can be used for RF to millimeter-wave frequency band, which was established in 2014. Our technical members have 10 to 15-year field experience in the area of amplifier, SSPA, up/down converter, PLL synthesizer, filter and MMIC/RFIC of various frequencies. Wavetrack supplies various active, passive modules and unique MMIC/RFIC for wired and wireless systems application of RF, microwave and millimeter-wave band. We have been providing user-defined products with a long-term development experience and our unique know-how on manufacturing products cooperating with our customers.

Products Line-up and Technology

- ▶ MMIC/RFIC
Gain-block, Driver amplifier, Power amplifier, Mixer, Switch, Attenuator, Low noise amplifier, Passive(RF Power Divider, coupler), VCO, Phase shifter
- ▶ RF, Microwave and Millimeter-wave Active and passive module
Up/down converter, PLDRO, PLL synthesizer, SSPA(Pulsed, CW), High power RF signal divider, Waveguide filter, 2-8-way power divider
- ▶ Microwave sensor MMIC and module
10.525GHz and 24.125GHz band

5G Communication Module

The 5G communication module designed and optimized for frequency and power. It has a wide frequency range, high output power and high efficiency.

WMCUH0001(28GHz Transmitter)



Parameter	Specification	Remark
Frequency	Input : 4.95 ~ 5.45GHz Output : 27.75 ~ 28.25GHz	
Gain	30dB	Min
Flatness	3dBp-p @500MHz	Max
Phase Noise	-65dBc/Hz @100Hz -83dBc/Hz @1KHz -90dBc/Hz @10KHz -95dBc/Hz @100KHz -110dBc/Hz @1MHz	External 100MHz OP1dB : +36dBm over (6dB BACK-OFF)
Input Power	-20 ~ 0dBm @500MHz	
Output Power	30dBm @500MHz, LO input: 0dBm 10dBm @500MHz, LO input: -20dBm	Lo Leakage & Harmonics
ACLR	-35dBc	
Spurious	<-10dBm @Pout=+30dBm	
VSWR	Input > 1.5 : 1 Output > 2.0 : 1	Max
Connector	Input : SMA(F) Output : Waveguide WR28	
Power Supply	+27V/3A	

WMCDD0001(28GHz Receiver)



Parameter	Specification	Remark
Frequency	Input : 27.75 ~ 28.25GHz Output : 4.95 ~ 5.45GHz	
Gain	15dB	Min
Flatness	3dBp-p @500MHz	Max
Phase Noise	-65dBc/Hz @100Hz -83dBc/Hz @1KHz -90dBc/Hz @10KHz -95dBc/Hz @100KHz -110dBc/Hz @1MHz	External 100MHz
Input Power	-71 ~ -11dBm @500MHz	
Output Power	-56dBm ~ -16dBm @BW=500MHz Total Gain 15dB : Output -56dBm @-71dBm input Total Gain -5dB : Output -16dBm @-11dBm input	
Noise Figure	< 6dB	
VSWR	Input > 1.5 : 1 Output > 2.0 : 1	Max
IIP3	> -10dBm	
Connector	Input : Waveguide WR28 Output : SMA(F)	
Power Supply	+27 V/1A	

Product Selection Guide

WSHH0001(28GHz HPA)



Parameter	Specification	Remark
Frequency	27.7 ~ 28.3GHz	
Gain	50dB	@25°C
Flatness	± 1dB	
Psat	> 40dBm	@25°C
Supply	220Vac	
Current	-	@10W
Input Connector	SMA Female	
Output Connector	WR-28 Waveguide	

WMPHF0001(Ku-band SSPA)



Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		13,300~13,700	
Gain	dB	42.0		
Gain Flatness	dB			± 1.0
Input VSWR	-			1.5
Output VSWR	-		TBD	
DC Current @Pout 48.5 dBm	A			
Pout	dBm	48.5		
Spurious	dBc	60		

WMLLF0001(Ku-band LNA)



Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		13,300~13,700	
Gain	dB	34.7		
Gain Flatness	dB			± 0.5
Input VSWR	-			1.5
Output VSWR	-			1.5
DC Current	A			1
NF	dB			4.85
Output P1dB	dBm			
Spurious	dBc	60		
Isolation	dB	30		

High Power Amplifier (Rack Mount)

The high power amplifier has a designed band and a power specific customized rack mount including integrated heat sink, power supply, cooling fan, high power switch, etc.



WSPC0001(2.5GHz 5KW HPA)

Parameter	Specification	Remark
Frequency	2,400~2,800 MHz	
Output Power	67dBm	5 KW
Gain	67dB	Min
Rated Input Power	0dBm	
Max Input Power	5dBm	
Pulse Width	0.01~300μs	
Duty Cycle	5%	Max
Output VSWR Protection	Operating back off	@ VSWR 4:1
Supply	380Vac	3 Phase
Input Connector	SMA Female	
Output Connector	7/16" DIN Female	
Dimension	Under 12U	
Communication Interface	RS 232	

WSHD0001(5.8GHz 400W HPA)



Parameter	Specification	Remark
Frequency Range	5,800~5,900MHz	
Output Power	56dBm	400W
Pout 1dB Compression	55dBm	
Psat	56dBm	
Gain	56dB ± 1dB	
Gain Flatness	± 1.5dB	
Input Return Loss	-15dB	@25℃
Current	70A @ 400W	@25℃
Supply Voltage	28V	
Dimension (W*D*H)	300mm(W)*700mm(D)*400mm(H)	

Product Selection Guide

High Power Amplifier (Module Type)

The high power amplifier module has a designed band and a power specific application. It has wide frequency range, high output power, high efficiency, which uses GaN device and LDMOS power device for the high performance and reliability.



WMPHA0003(900MHz 50W HPA)

Parameter	Specification	Remark
Frequency	800~1,000MHz	
Output Power	56.5dBm	
Pout 1dB Compression	55dBm	Psat
Psat	56.5dBm	
Gain	56dB ±1dB	@25℃
Gain Flatness	±1dB	@25℃
Input Return Loss	-15dB	
Current	35A	@56.5 dBm
Supply Voltage	28V	
Dimension (W*D*H)	240mm(W)*280mm(D)*30mm(H)	
Power Connector	D-SUB (3 Pin Male)	VCC/GND/N.C



WMPHC0004(2.3GHz 200W HPA)

Parameter	Specification	Remark
Frequency	2,300~2,400MHz	
Output Power	54dBm	250W
Pout 1dB Compression	53dBm	Psat
Psat	54dBm	
Gain	55dB ±1dB	@25℃
Gain Flatness	±1dB	@25℃
Input Return Loss	-15dB	
Current	23A	@54dBm
Supply Voltage	28V	D-SUB(3W3)
Dimension (W*D*H)	240mm(W)*280mm(D)*30mm(H)	
Power Connector	D-SUB (3 Pin Male)	VCC/GND/N.C



WMPHD0003(5.8GHz 100W HPA)

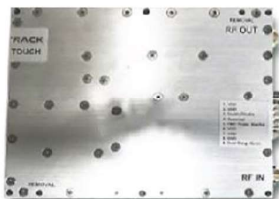
Parameter	Specification	Remark
Frequency	5,765~5,835MHz	
Psat	50dBm @Input 20dBm	Min
Gain	30dBm ±1dB	@25℃
Gain Flatness	±1dB	
Input Return Loss	-10dB	
Voltage	40V	
Dimension (W*D*H)	50mm(W)*50mm(H)+200mm(D)	D-SUB(3W3)
I/O Signal Connector	D-SUB	9 pin Male
Input Connector	SMA Type	Female
Output Connector	N Type	Female

WMPHA0001A(80MHz 50W HPA)



Parameter	Specification	Remark
Frequency	30~80MHz	
Psat	47dBm	Typ
Gain	32dB	Min
Gain Flatness	±0.5dB	
Input Return Loss	-14dB	Max
Voltage	28V	
Dimension (W*D*H)	142mm(W)*87mm(H)*25mm(D)	D-SUB(3W3)
I/O Signal Connector	D-SUB	10 Pin Male
Input Connector	SMA Type	Female
Output Connector	SMA Type	Female

WMPHA0002(1GHz 30W HPA)



Parameter	Specification	Remark
Frequency	500~1,000MHz	
Psat	45dBm	@25°C
Gain	45dB ± 1dB	@25°C
Gain Flatness	±1dB	
Input Return Loss	-15dB	D-SUB
Voltage	28V	
Dimension (W*D*H)	110mm(W)*140mm(H)*200mm(D)	
I/O Signal Connector	D-SUB	9 Pin Male
Input Connector	SMA Type	Female
Output Connector	SMA Type	Female

Part Number	Frequency(MHz)
WMPHB0001	1,000 ~ 1,500
WMPHB0002	1,500 ~ 2,000
WMPHC0002	2,000 ~ 2,500
WMPHD0002	5,000 ~ 5,700

Product Selection Guide



WMPHE0001(X-band SSPA)

Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		9,460~9,860	
Gain	dB	44.0		
Gain Flatness	dB			±1.0
Input VSWR	-			1.5
Output VSWR	-		TBD	
DC Current @Pout 50.0dBm	A			
Pout	dBm	50.0		
Spurious	dBc	45		



WMLLE0001(X-band LNA)

Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		9,460~9,860	
Gain	dB	31.0		
Gain Flatness	dB			± 0.5
Input VSWR	-			1.5
Output VSWR	-			1.5
DC Current	A			1
NF	dB			4.95
Output P1dB	dBm			
Spurious	dBc	60		
Isolation	dB	30		



WMPHD0001(C-band SSPA)

Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		5,200~5,600	
Gain	dB	44.0		
Gain Flatness	dB			±1.0
Input VSWR	-			1.5
Output VSWR	-		TBD	
DC Current @Pout 50.0dBm	A			
Pout	dBm	51.3		
Spurious	dBc	60		



WMLLD0001(C-band LNA)

Parameter	Specification			
	Unit	MIN	TYP	MAX
Frequency	MHz		5,200~5,600	
Gain	dB	31.8		
Gain Flatness	dB			± 0.5
Input VSWR	-			1.5
Output VSWR	-			1.5
DC Current	A			1
NF	dB			4.5
Output P1dB	dBm			
Spurious	dBc	60		
Isolation	dB	30		

WSBB0001(Broad band HPA)



Parameter	Specification	Remark
Frequency Range	500~2,700MHz	
Pout 1dB Compression	42dBm	
Psat	43dBm	@ 25℃
Gain	45dB	@ 25℃
Gain Flatness	±2dB	
Noise Figure	7dB	
Input Return Loss	-15dB	
Current	3.5A @ 20W	
Supply Voltage	220V	
Dimension (W*D*H)	580mm(W)*540mm(D)*120mm(H)	

Customized Solutions

Wavetrack provides fully reliable and customer-oriented solutions. We are now supporting more than 30 clients with customized solutions that include high power amplifier, wide band amplifier, up/down converter and complete system designs.

WMPHC0003(2GHz HPA)



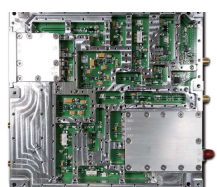
	Parameter	Specification	Remark
1	Frequency	2381.5MHz	
2	Output power	43dBm(20W)	@ average power
3	Gain	45dB ±1dB	
4	Gain Flatness	±0.5dB	
5	Input Return Loss	-15dB	
6	Current	2.3A	@ 43dBm
7	Supply voltage	28V	

WMCUE0001(3-band up converter)



	Parameter	Specification	Remark
1	Input Frequency	1~2 GHz	
2	Output Frequency	9~10 GHz	
3	Output power(P1dB)	10dBm	Min
4	Gain	20dB	Min
5	Flatness	3dBp-p	Max
6	In/Out VSWR	1.5:1	

WMCDB0001(3-band down converter)



	Parameter	Specification	Remark
1	Input Frequency	9~10 GHz	
2	Output Frequency	1~2 GHz	
3	Output power(P1dB)	10dBm	Min
4	Gain	20dB	Min
5	Flatness	3dBp-p	Max
6	In/Out VSWR	1.5:1	

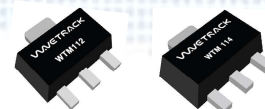
Product Selection Guide

Gain Block Amplifier MMIC



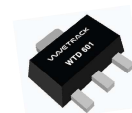
Part No.	Frequency (MHz)	Gain (dB)	P1dB (dBm)	OIP3 (dBm)	NF (dB)	S11 (dB)	S22 (dB)	5(V)/Id(mA)	Package
WTM102	900	22.0	20.5	34.5	3.0	-13.0	-13.2	77	SOT89
	1900	21.5	19.3	31.5	3.2	-11.0	-14.0		
	2140	21.1	19.0	30.0	3.3	-11.3	-14.1		
	2650	20.7	20.7	30.0	3.3	-11.0	-11.4		
WTM105	900	20.0	20.9	39.5	3.2	-13.4	-13.5	85	SOT89
	1900	19.9	19.7	33.5	3.4	-11.5	-15.2		
	2140	19.8	19.2	32.5	3.5	-12.1	-16.1		
	2650	19.7	17.8	31.0	3.5	-13.3	-13.2		
WTM106	900	18.4	17.8	31.5	3.2	-12.5	-12.5	55	SOT89
	1900	18.6	17.7	30.5	3.4	-12.1	-14.3		
	2140	18.6	17.2	29.0	3.4	-12.8	-15.4		
	2650	18.5	15.2	26.5	3.4	-12.5	-12.5		
WTM107	900	17.0	15.9	31.0	3.2	-13.5	-13.3	46	SOT89
	1900	17.2	15.6	28.5	3.3	-13.2	-13.2		
	2140	17.3	15.2	27.5	3.3	-13.7	-12.7		
	2650	17.4	12.7	24.5	3.3	-12.3	-12.3		
WTM108	900	16.6	20.0	35.5	3.6	-13.7	-13.6	73	SOT89
	1900	17.0	18.8	32.5	3.8	-13.3	-14.0		
	2140	17.0	18.5	31.0	3.9	-14.6	-14.4		
	2650	17.0	17.0	29.5	3.8	-14.3	-11.1		
WTM109	900	15.6	15.2	28.5	3.5	-15.9	-15.2	45	SOT89
	1900	15.8	15.3	27.5	3.7	-15.1	-13.5		
	2140	15.9	15.0	27.0	3.7	-15.7	-13.3		
	2650	16.0	12.5	25.0	4.0	-13.7	-10.6		
WTM110	900	15.3	19.7	36.0	4.0	-14.7	-14.5	76	SOT89
	1900	15.6	18.8	32.0	4.3	-13.6	-13.3		
	2140	15.7	18.8	31.5	4.3	-14.5	-13.5		
	2650	15.8	18.8	30.5	4.3	-15.7	-11.7		
WTM111	900	14.0	19.3	36.0	3.8	-18.9	-17.7	73	SOT89
	1900	14.1	17.6	32.5	4.0	-16.7	-13.0		
	2140	14.2	17.4	30.5	4.0	-17.1	-12.3		
	2650	14.3	16.8	29.0	4.0	-14.5	-9.7		

IF Amplifier MMIC



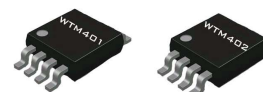
Part No.	Frequency (MHz)	Gain (dB)	P1dB (dBm)	OIP3 (dBm)	NF (dB)	S11 (dB)	S22 (dB)	5(V)/Id(mA)	Package
WTM112	80	26.6	20.4	39.5	3.5	-18.0	-14.6	96	SOT89
	140	26.5	20.5	39.6	3.6	-18.6	-15.4		
	250	26.4	20.6	37.0	3.9	-18.2	-14.9		
	500	26.0	20.5	36.6	3.7	-16.9	-12.3		
WTM114	80	17.6	23.1	41.5	5.4	-15.8	-18.7	77	SOT89
	140	17.5	23.2	37.4	5.5	-16.4	-18.9		
	250	17.4	23.4	38.2	5.6	-16.6	-18.7		
	500	17.0	22.9	36.3	5.8	-16.7	-17.4		

Driver Amplifier MMIC



Part No.	Frequency (MHz)	Gain (dB)	P1dB (dBm)	OIP3 (dBm)	NF (dB)	S11 (dB)	S22 (dB)	5(V)/Id(mA)	Package
WTD601	900	20.7	24.0	39.5	4.5	-20.0	-16.0	88	SOT89
	1900	16.0	24.1	39.5	4.8	-19.0	-14.9		
	2140	15.0	23.9	39.0	4.8	-20.3	-18.0		
	2650	13.3	23.8	38.0	4.9	-20.7	-28.5		

Mixer MMIC



Part No.	Frequency (MHz)	Conversion Loss (dB)	Input P1dB (dBm)	Input IP3 (dBm)	Lo-RF isolation (dB)	3.3(V)/Current(mA)	Package
WTM401	800	9.9	19	33.1	18.1	22.6	MSOP8
	1000	9.2	19	26.0	15.4		
	1300	8.9	19	28.9	13.1		
WTM402	1800	10.1	21	29.3	11	23.5	MSOP8
	1900	9.2	22	29.7	8.8		
	2140	9.9	19	29.1	8.7		



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