

WAVETRACK Technology

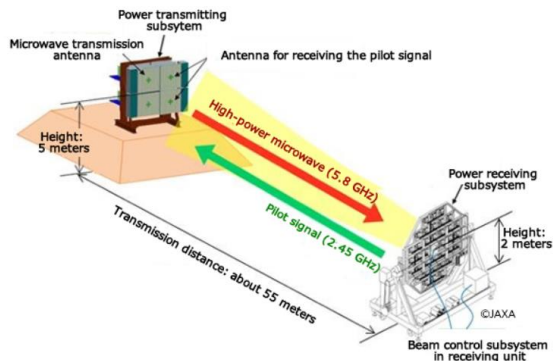
HPA Overview

Products Introduce & Core Technologies

Defense/Military

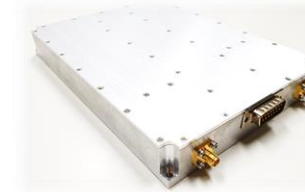
- wireless power transmission system

- 5750~5850MHz 96Channel, 64Channel system for wireless power transmission



- Anti-Drone Jammer

- 15MHz to 6GHz 400W to 20W HPA, Power Cut-back for Optimum Power Consumption



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Defense/Military

- EMC/EMI, Test & Measurement

- S-band, C-band, Ka-band HPA module and Rack for radiation & conduction EMC/EMI testing



- Radar for Marine

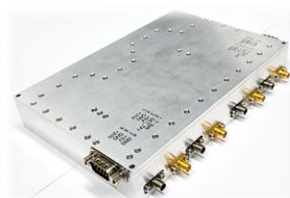
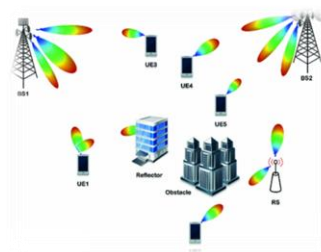
- X-band High power pulsed SSPA, Up-Down Converter and FPGA



Mobile Networks

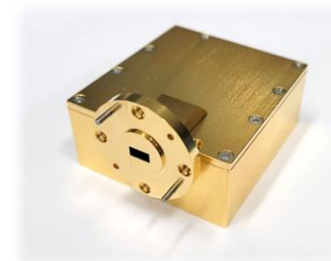
- Transceiver for 5G Communication

- 28GHz Phased array antenna, Beam control, Transceiver and Receiver modules (2T x2R, 1T x1R) with similar technology as Vsat satellite system



- Commercial Satellite Communication

- Ka-band 10W BUC, Q-band SSPA with waveguide combining

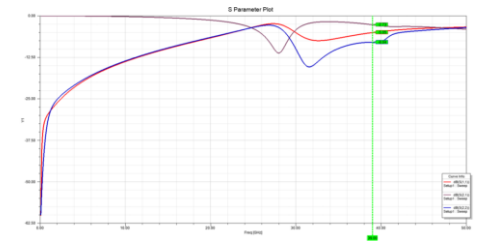
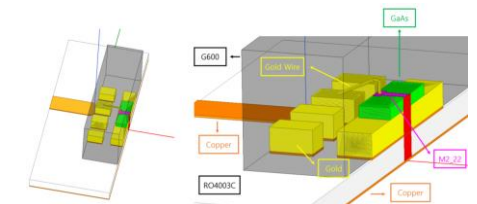
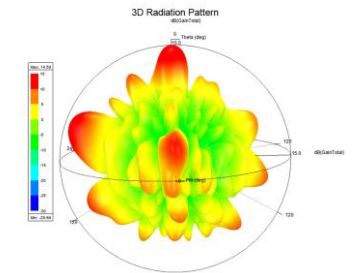
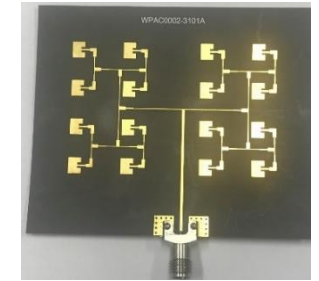
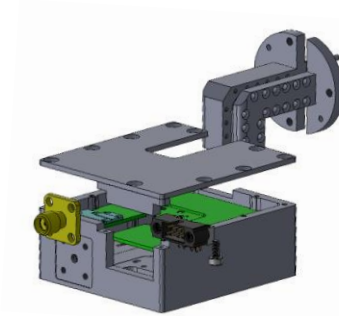
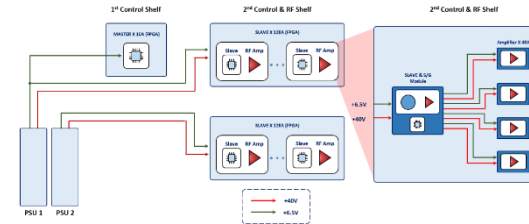


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Core Technologies

- System Design
- Antenna Technology
- 3D Analysis and Mechanical Design
- Thermal Analysis
- Power Combining Technologies
- High educated Engineer : Over 50% Ph.D and Master Degree
- Total microwave experience 170 year Over
- ISO9001 Certified.



HPA module & HPA Rack system Products

S-band HPA Rack Specification

- **Application : EMI & EMC Test**
- A power level can be set command using Ethernet that allows setting the amplifier for different output power levels.
- Over Temperature & Over Power Protection
- LDMOS Base HPA



Specification			Comments
1	Frequency range	2400~2800MHz	
2	Output power	67dBm	5KW
3	Rated input power	0dBm	
4	Maximum input power	+5dBm	
5	Pulse Width	0.01~300us	
6	Duty Cycle	10%	Max
7	Input voltage	220V	3Phase
8	Gain Adjustment Range	30dB, 0.5dB step	
9	Supply voltage	40V	
10	Dimension (W*D*H)	13U	
11	Weight	120Kg	Max

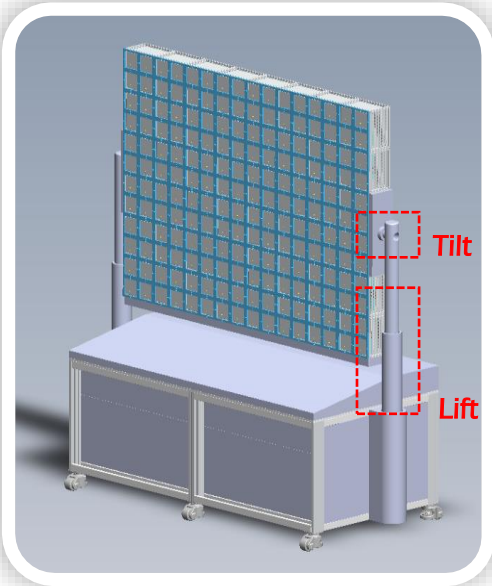
C-band HPA Rack Specification



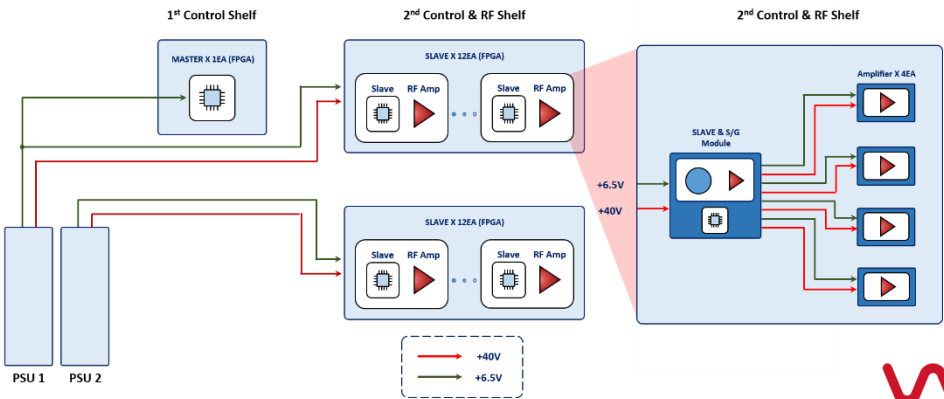
- Application : Anti-Drone Jammer System
- A power level can be set command using RS232 that allows setting the amplifier for different output power levels
- Over Temperature & Over Power Protection
- Include Signal generator unit, MCU control unit, Power supply unit
- Air Cooled system
- GaN FET Base HPA

Specification			Comments
1	Frequency range	5800~5900MHz	
2	Output power	56dBm (400W)	@ Psat
3	Current	70A	
4	Supply voltage	220V	
5	Dimension (W*D*H)	300mm*700mm*400mm	

C-band HPA Rack Specification



- Application : 96Channel system for wireless power transmission with beam-forming
- A power level can be set command using Ethernet that allows setting the amplifier for different output power levels and beam forming.
- System with lift and Tilt function
- Over Temperature & Over Power Protection
- Include Signal generator unit, FPGA control unit, Power supply unit
- Air Cooled system
- GaN FET Base HPA



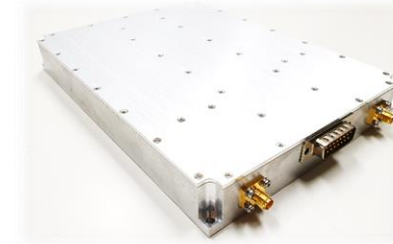
Specification			Comments
1	Frequency range	5750~5850MHz	
2	Output power	50W	
3	Efficiency	50%	@ RF module
4	Supply voltage	220Vac (AC 187~264V)	
5	Dimension (W*D*H)	220cm*210mm*200mm	

Wideband HPA Module



- Application : Anti-Drone Jammer for hand-held Gun
- 6 band support : 3 band HPA is available in 1 HPA module
- Over Temperature & Over Power Protection
- Dimension : 358mm * 114mm * 40mm

Frequency range	Output Power @ Psat
2,400~2,483.5MHz	5W
5,725~5,875MHz	8W
1,559~1,610MHz	2W
1,215~1,300MHz	2W
433~435MH	5W
902~915MHz	3W



- Application : Anti-Drone Jammer System
- Over Temperature & Over Power Protection
- Dimension : 199.8mm * 144.8mm * 23mm (2 band)
189.8mm * 121.8mm * 23mm (1 band)

Frequency range	Output Power @ Psat
433~434MHz 902~928MHz	50W
1,160~1,254MHz 1563~1,610MHz	10W
2,400~2,485MHz	100W
5,725~5,875MHz	50W

Ku-band HPA Module Configurations



- Application : Medium Power Amplifier
- Over Temperature & Over Power Protection
- GaN FET Base HPA
- Power supply : +28V

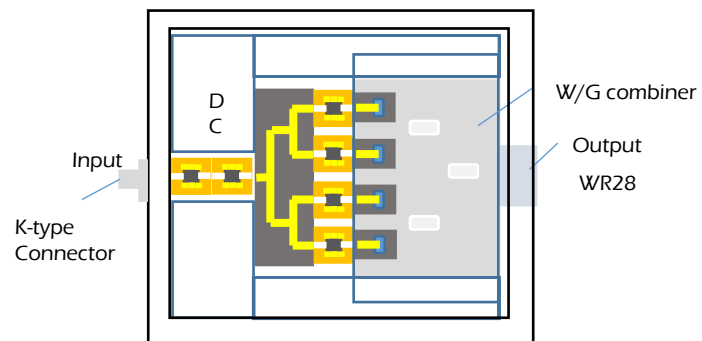
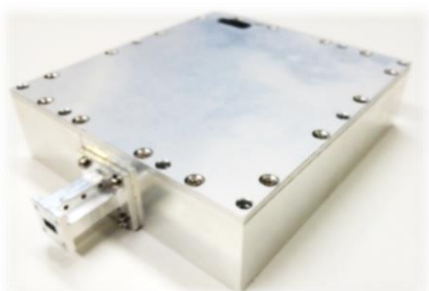
Specification			Comments
1	Frequency range	14~15.5GHz	
2	Output power	43dBm	@ Psat
3	Gain	40	
4	Power consumption	70W	
5	Dimension (W*D*H)	103cm*61mm*17.9mm	



- Application : Low noise and Medium Power Amplifier
- These modular ensure quick time to market for custom specification
- Dimension : 53.32mm * 18.8mm * 9.27mm
- Power supply : +15V

Frequency range	Output Power @ P1dB	Gain(dB)	Current(mA)	Nosie Figure (dB)
12~18GHz	25dBm	35	850	4.0
12~18GHz	23dBm	26	600	4.0
12~18GHz	10dBm	44	400	4.0

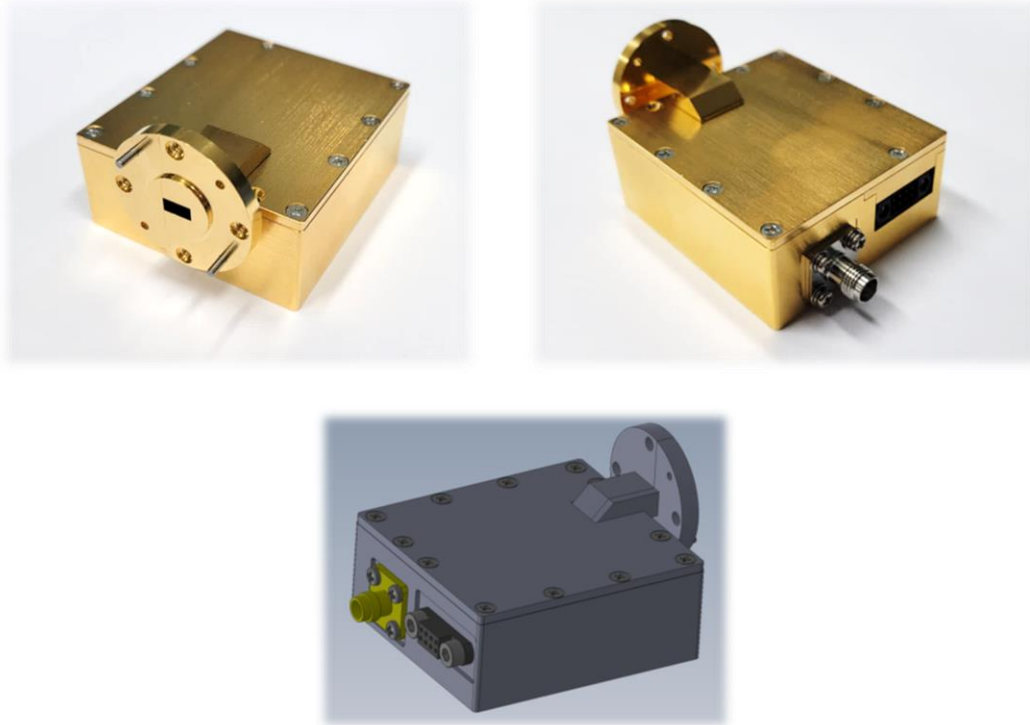
Ka-band HPA Rack Configurations



- Applications : EMI & EMC Test, Test & Measurement
- Protections against High VSWR & Over Temperature
- Air Cooled system
- 2way or 4way Waveguide Combining
- GaN FET Base HPA

Frequency range	Output Power @ Psat	Gain(dB)
25.5~27GHz	10W	40
27.5~28.5GHz	20W	46
35~38GHz	10W	45
38~41GHz	8W	43

Q-band HPA module



- Applications : Vsat satellite
- Protections against Output Power
- WR22 Waveguide output
- Waveguide transition
- GaN FET Base HPA

Specification			Comments
1	Frequency range	37.5~42.5GHz	
2	Output power	8W	@ Psat
3	Gain	40	
4	Gain Flatness	± 1.5	@ Psat
5	Power consumption	48W	@ Psat
6	Dimension (W*D*H)	50mm * 58.2mm * 38mm	



Thank you

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