



MICROWAVE MONOLITHIC INTEGRATED CIRCUITS

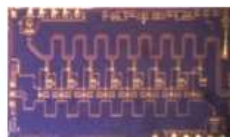
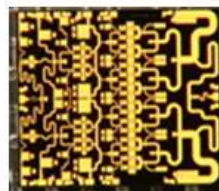
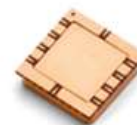
“Providing integrated circuit solutions up to 110 GHz”

ISO 9001
REGISTERED FIRM

www.vectrawave.com

RoHS
COMPLIANT

- ✓ Off-the-shelf MMIC: TIA, LNA, MPA, UWBA, HPA, MFC
- ✓ From “Design to performance” to “Design to Cost”
- ✓ Custom designed products: SiGe, GaAs, GaN
- ✓ Bare die, SMD, packaged components
- ✓ ISO 9001 Certified



New **advanced** Surface Mount Technologies & Packaging solutions

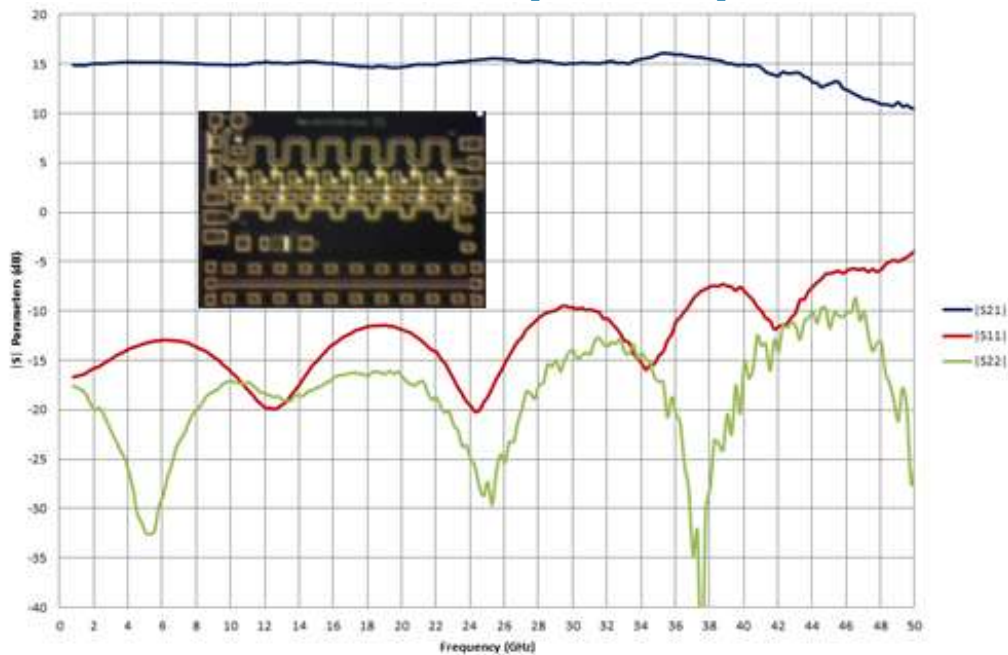


VectraWave is a solution provider for integrated electronic in high frequency microwaves and optoelectronic for telecommunications over radio or optical fibre, in the field of civil, security, military market. VectraWave is an independent company, delivering “OEM” and proprietary Integrated Circuits and System In Package or Multi-Chip-Modules improving performances and costs of communication system equipments, by offering components based on SiGe, GaAs, micro-electronics and packaging advanced technologies.

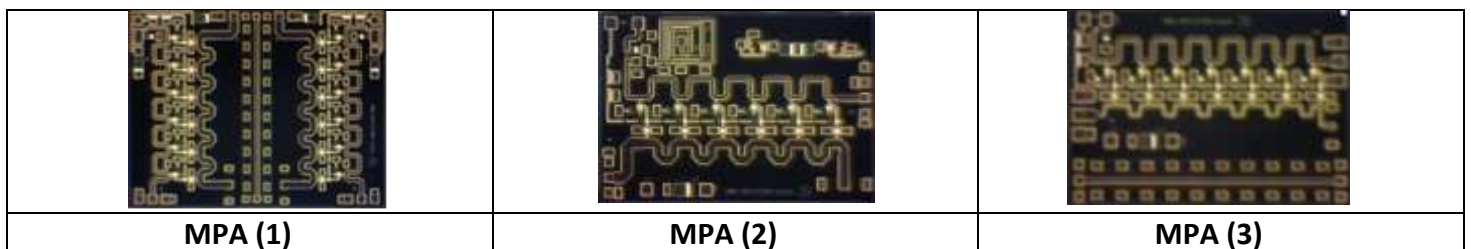
**Smart Amplifiers, Integrated Circuits, Systems
for Microwave, RF and Lightwave Equipements**



Distributed MMIC Amplifier up to 50 GHz



P/N	Function	Format	F min (GHz)	F max (GHz)	P Sat (dBm)	P Sat (W)	P 1dB (dBm)	Gain (dB)	Vdd (V)	Idd (mA)
VWA 50014 AA	MPA	Single Die	DC	28	23	0.2	21	17	9	200
VWA 50015 AA	LNA	Single Die	DC	35	16	0.04	15	10	8	80
VWA 50015 AB	LNA	Single Die	DC	31	20	0.1	19	14	8	100
VWA 50015 AC	LNA	Single Die	DC	35	16	0.04	15	10	8	80
VWA 50025 AA	LNA	Single Die	DC	44	15	0.03	14	10	8	90
VWA 5000056 AA	MPA	Single Die	1	20	27	0.5	24	15	8	290
VWA 5000065 AA	Laser Driver	Single Die	DC	13	16	0.04	15	10	5	150
VWA 5000050 AA	MPA	Single Die	DC	45	19	0.08	16	13	5	85
VWA 5000051 AA	MPA	Double Die	DC	45	19	0.08	16	13	5	85
VWA 5000052 AA	MPA	Single Die	DC	50	21	0.12	19	12	5	150
VWA 5000053 AA	MPA (1)	Double Die	DC	50	21	0.12	19	12	5	150
VWA 5000054 AA	MPA (2)	Single Die	DC	50	21	0.12	19	13	5	140
VWA 5000062 AA	MPA (3)	Single Die	DC	50	23	0.2	19	14	6	150

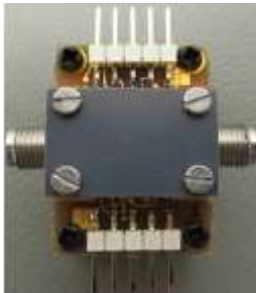


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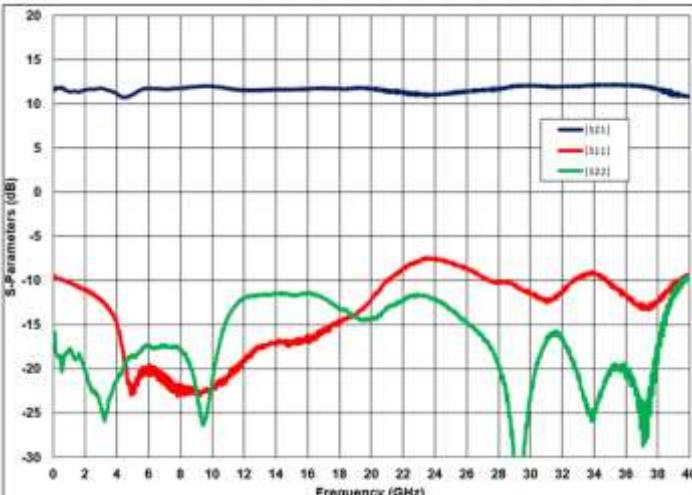


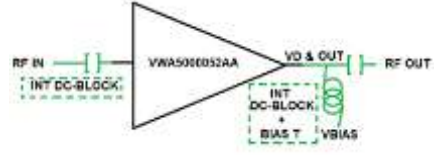
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Evaluation board (EVB) for Chip & QFN up to 40GHz



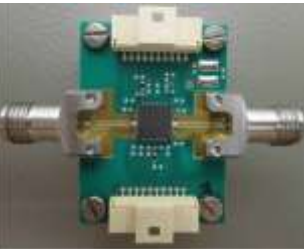
VWA 0000918 AA
EVB for
VWA 000052 AA



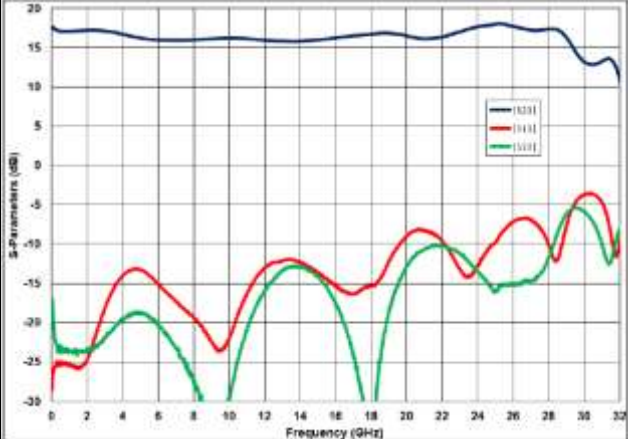


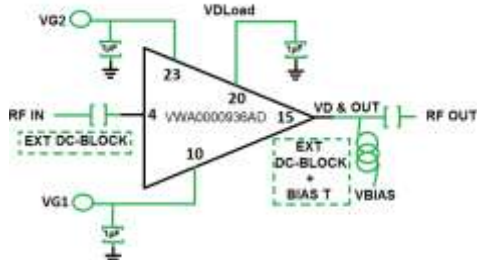
VWA 0000918 AA
include Bias Tee & DC Block

MMIC P/N	EVB Chip	QFN P/N	Size	EVB QFN
VWA 50014 AA	VWA 0000921 AA	VWA 0000936 AD	5X5 24L	VWA 0000957 AA
VWA 50015 AA	VWA 0000924 AA	Consult Factory		Consult Factory
VWA 50015 AB	VWA 0000925 AA	Consult Factory		Consult Factory
VWA 50015 AC	VWA 0000924 AA	Consult Factory		Consult Factory
VWA 50025 AA	VWA 0000922 AA	Consult Factory		Consult Factory
VWA 5000050 AA	VWA 0000927 AA	Consult Factory		Consult Factory
VWA 5000051 AA	VWA 0000928 AA	Consult Factory		Consult Factory
VWA 5000052 AA	VWA 0000918 AA	VWA 0000940 AA	4X4 24L	VWA0000958 AA
VWA 5000053 AA	VWA 0000926 AA	Consult Factory		Consult Factory
VWA 5000054 AA	VWA 0000919 AB	Consult Factory		Consult Factory
VWA 5000056 AA	VWA 0000923 AB	VWA 0000942 AA	5X5 24L	VWA 0000960 AA
VWA 5000062 AA	VWA 0000920 AB	Consult Factory		Consult Factory



VWA 0000957 AA
EVB for QFN
VWA 0000936 AD





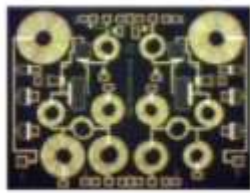
VWA 0000957 AA
External Bias Tee & DC Block

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MMIC Design for system Solution up to 110GHz



➔ MMIC

VWA 5000063 AA
Double TIA 2.9-3.4GHz/3.7-4.3GHz ZT>350 Ohms



➔ EVB

Description

The **VWA 5000063 AA** is a double transimpedance amplifier designed on a 0.15 μm pHEMT process.

The two embedded devices are capable of more than +10dBm of output power at saturation regime. And more than +8dBm of output power at 1 dB of gain compression regime. It provides 16dB of linear gain for each sub-band. When operating with VD=+ 2.5V, with a small consumption of 25mA. The design has been optimized to provide high signal to noise ratio.

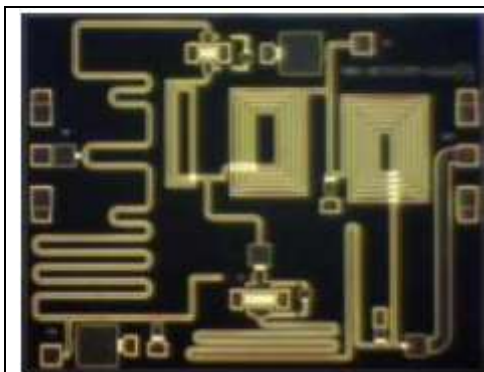
Features

- Transimpedance amplifier pHEMT GaAs MMIC
- SUB-BAND 1: SBA from 2.9GHz to 3.4GHz.
- SUB-BAND 2: SBB from 3.7GHz to 4.3GHz.
- 50ΩRF Single ended output
- DC coupled IN, AC coupled Out
- P1dB >+8dBm.
- Psat >+10dBm.
- Small signal gain : >16dB.
- Power supply: 25 mA @ +2.5V
- 2.291 x 1.77 x 0.1mm (VWA 5000063 AA)

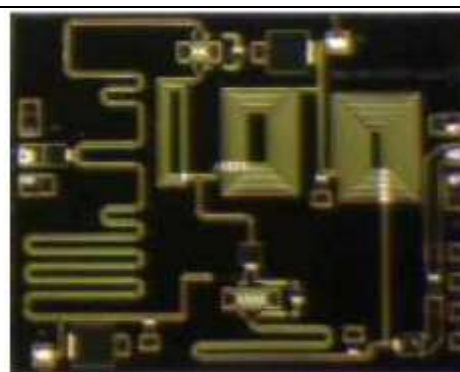
Tools

S2P file can be provided for system design simulation.
 DXF file is available for mechanical design.
 Evaluation board available on request.

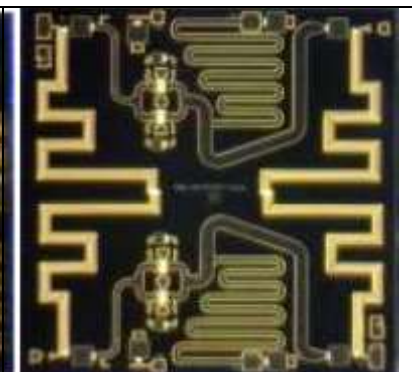
VWA P/N	Function	Specification
VWA 5000063 AA	Dual Transimpedance amplifier	2,9-3,4_3,7-4,3 GHz - ZT=350_ 16dB Gain - Pout +10 dBm
VWA 5000068 AA	Low Noise Amplifier	2,5-3,5 GHz - 16dB Gain - Pout +17 dBm
VWA 5000069 AA	Low Noise Amplifier	2,9-4,3 GHz -14dB Gain - Pout +15 dBm
VWA 5000060 AA	MPA Amplifier	2,5-6 GH - 10dB Gain -pout +24 dBm



VWA 5000068 AA



VWA 5000069 AA



VWA 5000060 AA

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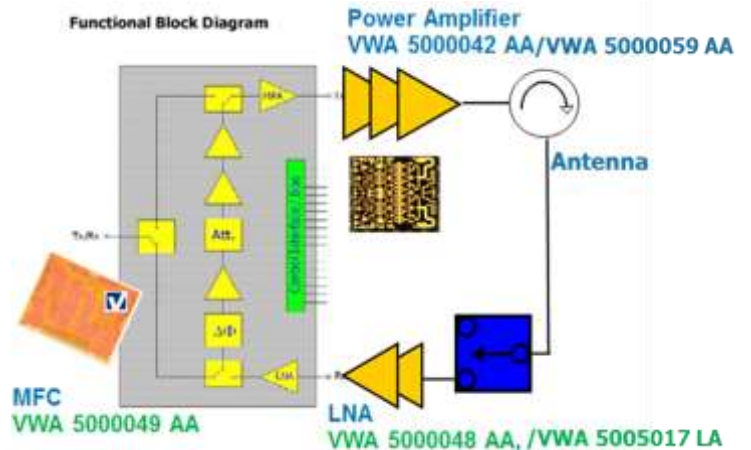
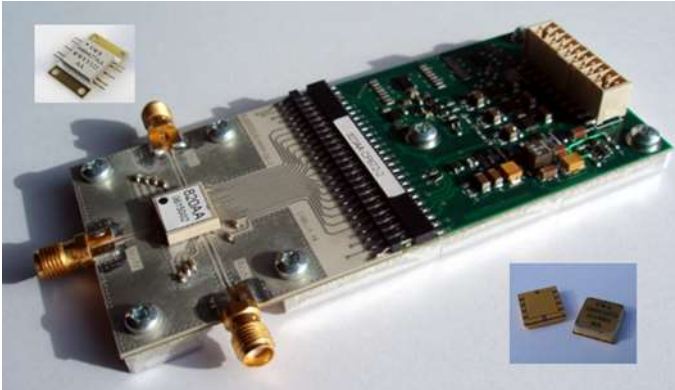


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TX/RX MMIC CHIP SET SOLUTION

**GaAs HPA = 5W, 9W,
10W, 12W, 15W**
GaN/SiC HPA = 35W

VWA 500057 AA = DPS 6 Bits /7-13 GHz
VWA 500055 AA = DAT 5 Bits /DC – 18GHz
VWA 500049 AA = MFC /8-12 GHz
VWA 5005017 LA = LNA /8-12 GHz



Chip Set 1: LNA, MFC, HPA (MPA)
Chip Set 2: LNA, DPS, DAT, MPA, HPA

X Band Design Kit for T/R					Die	Status
P/N	Function	Frequency	Gain/A/PHI	P1dB	Size (mm)	P,E
VWA 5000061 AA	Gain Block Amplifier	7 to 13 GHz	13dB	17dBm	2,3X3,0X0,1	P
VWA 50035 AA	Medium Power Amplifier	8 to 13 GHz	22dB	26dBm	3,5X2,9X0,2	P
VWA 50035 AC	Medium Power Amplifier	8 to 12 GHz	22dB	24dBm	2,3X1,8X0,1	P
VWA 5000058 AA	High Power Amplifier (2 Stages)	8 to 11GHz	21dB	37dBm	1,4X4,4X0,1	P
VWA 5000059 AA	High Power Amplifier (2 Stages)	9 to 11GHz	21dB	39dBm	2,5X4,4X0,1	P
VWA 50036 AC	High Power Amplifier (3 Stages)	7 to 13 GHz	21dB	40dBm	4,1X4,4X0,1	P
VWA 5000070 AA	High Power Amplifier (2 Stages)	8.5 to 10.5GHz	17dB	41.7dBm	4,4X3,6X0,1	P
VWA 5000042 AA	High Power Amplifier (3 Stages)	8 to 12 GHz	25dB	41dBm	3,9X4,5X0,1	P
VWA 5005017 LA	Low Noise Amplifier (NF=1,6dB)	9 to 12 GHz	19dB	10dBm	1,6X1,1X0,1	P
VWA 5000048 AA	Low Noise Amplifier (NF=1,1dB)	8 to 12 GHz	32dB	10dBm	2,4X1,56X0,1	P
VWA 5000055 AA	5 Bits Digital Attenuator	DC-18GHz	31dB/5 Bits	24dBm	2,4X1,55X0,1	P
VWA 5000057 AA	6 Bits Digital Phase Shifter	7-13 GHz	360°/6 Bits	21dBm	3X2,1X0,1	P
VWA 5000049 AA	Multi Function Chip (DPS/DAT)	8 to 12 GHz	20dB	20dBm	4X5X0,1	P

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QFN SET SOLUTION for T/R Module

X Band QFN KIT		Evaluation board	characteristics					
Part Number	Size (mm)	Part Number	function	Supply	Frequencies	Pout (SAT)	Gain	NF
VWA0000702XX	4x4 - 24 L	VWA0000703AA	X-band MPA	8V / 115mA	7.5-13GHz	23dBm	22dB	
VWA0000946AA	4x4 - 24 L	VWA0000952AA	X-Band MPA	8V / 190mA	8-12GHz	26 dBm	21 dB	
VWA0000947AA	4x4 - 24 L	VWA0000955AA	5 bits/31db attenuator	-7.5V / 9mA	DC-18GHz	24dBm	IL=6dB	
VWA0000948AA	5x5 - 24 L	VWA0000956AA	360°/6 bits phase shifter	-7.5V / 10mA	7-13GHz	21dBm	IL=6dB	
VWA0000949AA	3x3 - 16 L	VWA0000951AA	X-band LNA	5V / 70mA	7-13GHz	14.5dBm	18 dB	1,6dB
VWA0000950XX	7x7 - 48 L	VWA0000963AA	X-band MFC	4V/300mA ; -5V/25mA	8.5-11GHz	20dBm	20dB	5dB
VWA0000968XX	6x6 - 28 L	Contact Factory	X-band HPA	8V / 3A	7.5-11.5GHz	39dBm	20dB	

MFC 8-12 GHz
VWA 0000950 AA
QFN 7X7

QFN Set 1: LNA, MFC, HPA

HPA 9W
VWA 0000968 AA
QFN 6X6

LNA 8-12 GHz
VWA 0000949 AA
QFN 3X3

QFN Set 2: LNA, DPS, DAT, MPA, HPA

VWA 0000949 AA
LNA 8-12 GHz
QFN 3X3 - 16 L

VWA 0000948 AA
DPS 6 Bits/7-13 GHz
QFN 5X5 - 24 L

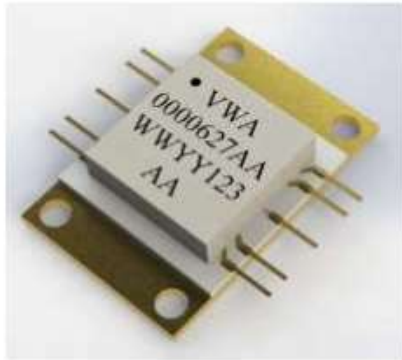
VWA 0000947 AA
DAT 5 Bits/DC-18GHz
QFN 4X4 - 24 L

VWA 0000946 AA
MPA 7-13 GHz
QFN 4X4 - 24 L

VWA 0000968 AA
HPA 9W
QFN (6X6)



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VWA 0000627 AA
8.5 to 11 GHz – 25dB – 40dBm
Flange Package
Solid State Amplifier
Description

The VWA 0000627 AA is a 3 stages Solid State Amplifier operating in the frequency range 8.5 to 11 GHz. The device is capable of +40dBm output power at Psat.

This amplifier uses a leaded package with a thermally conductive copper composite base. A plastic lid, fixed with epoxy glue, closes the package.

The module has been optimized to provide high efficiency (PAE > 30%) with Vd=+8.0V.

Features

- 3 stages High Power PHEMT Amplifier
- Wide band : 8.5 to 11 GHz
- High Output Psat : +40dBm
- High linear gain : 25dB typ.
- 50Ω, AC coupled RF input and output,
- Supply (saturation) : 4.5A @ +8.0V; Vg= -0.7V
- Copper composite base to reduce thermal resistance
- Dimensions : 11.43 x 17.32 mm²

HERMETICAL PACKAGE SOLUTION


VWA-0000699-AA
**8 to 12 GHz – 25 dB – 10W
SMD High Power Amplifier**
Description

The **VWA-0000699-AA** is a 3 Stages analog High Power Surface Mount Package amplifier operating in the frequency range 8 to 12 GHz.

The SMD package includes a cascaded 3 stages amplifier designed in 0.25μm pHEMT process, and its decoupling circuit interfaces.

The device is capable of +40 dBm output power at Psat, and provides 25 dB of large signal gain from 8 to 12 GHz with less than 1 dB of Gain variation. The package has been optimized to provide high efficiency, supply current is 4.5A with Vd=+8.5V, when delivering +40dBm output power, in pulse mode.

Features

- 3 stages High Power pHEMT GaAs Amplifier
- Small Surface Mount Package Device
- Wide band : 8 to 12 GHz
- High Output Psat : +40 dBm
- Large signal gain : 25 dB
- 50Ω, AC coupled RF input and output,
- Power supply: 4.5A @ +8.5 V; Vg= -0.7V
- 8 x 8 x 2 mm

Applications

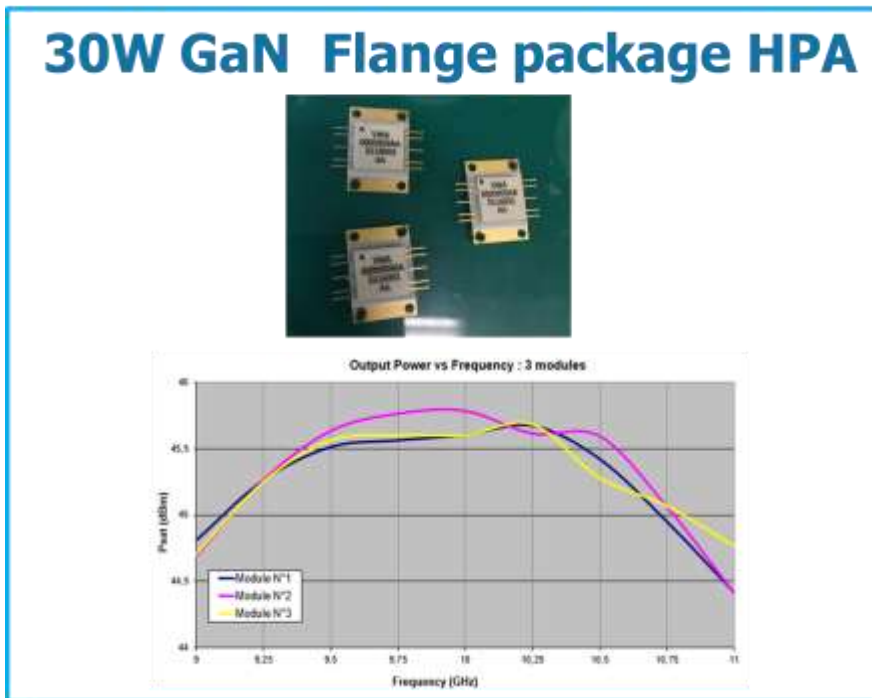
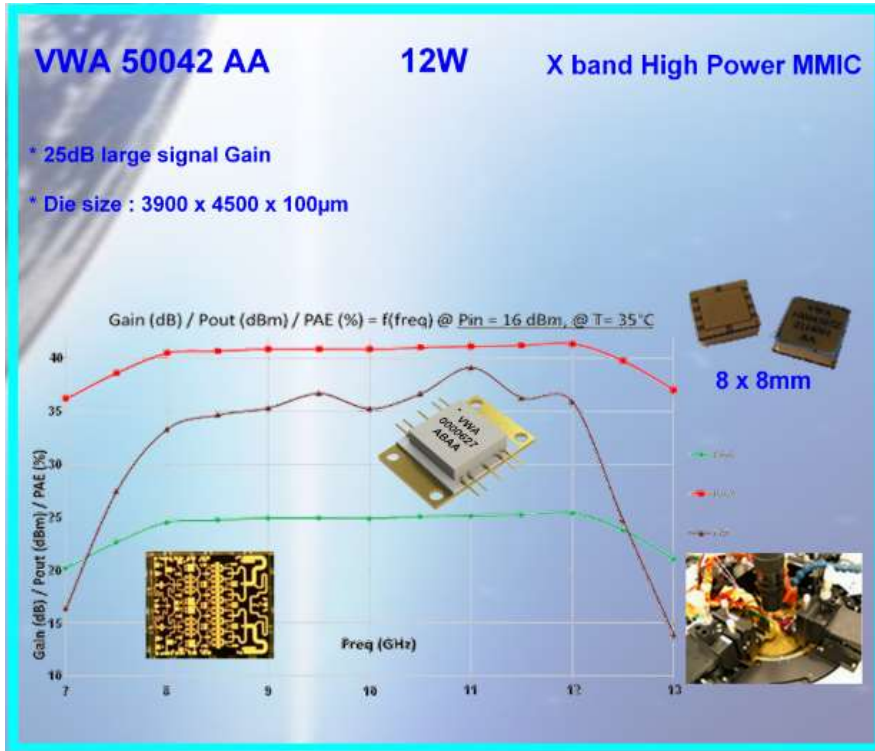
- X band High Power amplifier
- Broadband communication
- Radar
- Test and measurement

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HIGH POWER AMPLIFIER SSPA SOLUTIONS



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