



MMIC Technologies Drive New Trends in Phased Array RADAR

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Introduction

• Phased Array RADAR Trends

AESA RF Front End Architecture

• Choosing the Right Amplifiers

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History of Phased Array Systems





Active Electronically Scanned Array (AESA)





Market Segmentation by RF Technologies



- GaN technology to be the fastest growing at a CAGR of 19%
- GaAs will keep strong and stable technology of choice among years
- Vacuum tube parts (TWT) will have a CAGR of -4.8% as they will be replaced by solid state components with years.

Semiconductor Technologies

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Materials		Advantages
GaAs	Gallium Arsenide	High thermal stability, low noise, resistance to radiation
GaN	Gallium Nitride	High power output at high frequency, high thermal stability
SiC	Silicon Carbide	High power and high voltage switching power applications



Transceiver Architecture (RADAR)





Transceiver Architecture (SATCOM)





arQana MMICs for Phased Array Systems





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Choosing the Right components

Power Amplifier (PA) and Driver Amplifier (DA)





S-band 60 Watts PA, AAG4201-QA

- Bandwidth: 2.7-3.5 GHz
- ✓ Output power: >60 W at 10% duty cycle
- ✓ Large signal gain: >28 dB
 - Large pulse width of operation: 300 us
 - Power gain: >22 dB
- ✓ High PAE: \approx 50% with frequency >3 GHz
 - Low I_{DQ}: 400 mA
 - Small package: 40-Pin QFN 6 x 6 mm Package



AAG4201-QA with Evaluation Board









S-band 2 Watts DA, ADA4200-QA

- Bandwidth: 2.7 4 GHz
- ✓ Small signal gain: 24 dB
 - Output saturated power: 33 dBm, 2 W
 - Gain Control & Power Detector
- ✓ Output P1dB: 31 dBm
 - Output IP3: 43 dBm
- ✓ PAE: >25%





ADA4200-QA with Evaluation Board







X-band 4 Watts PA, AAA4401-QA



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Choosing the Right components

Low Noise Amplifier (LNA)





Collaboration with A*STAR







Contact Us

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