

# MMIC PRODUCTS

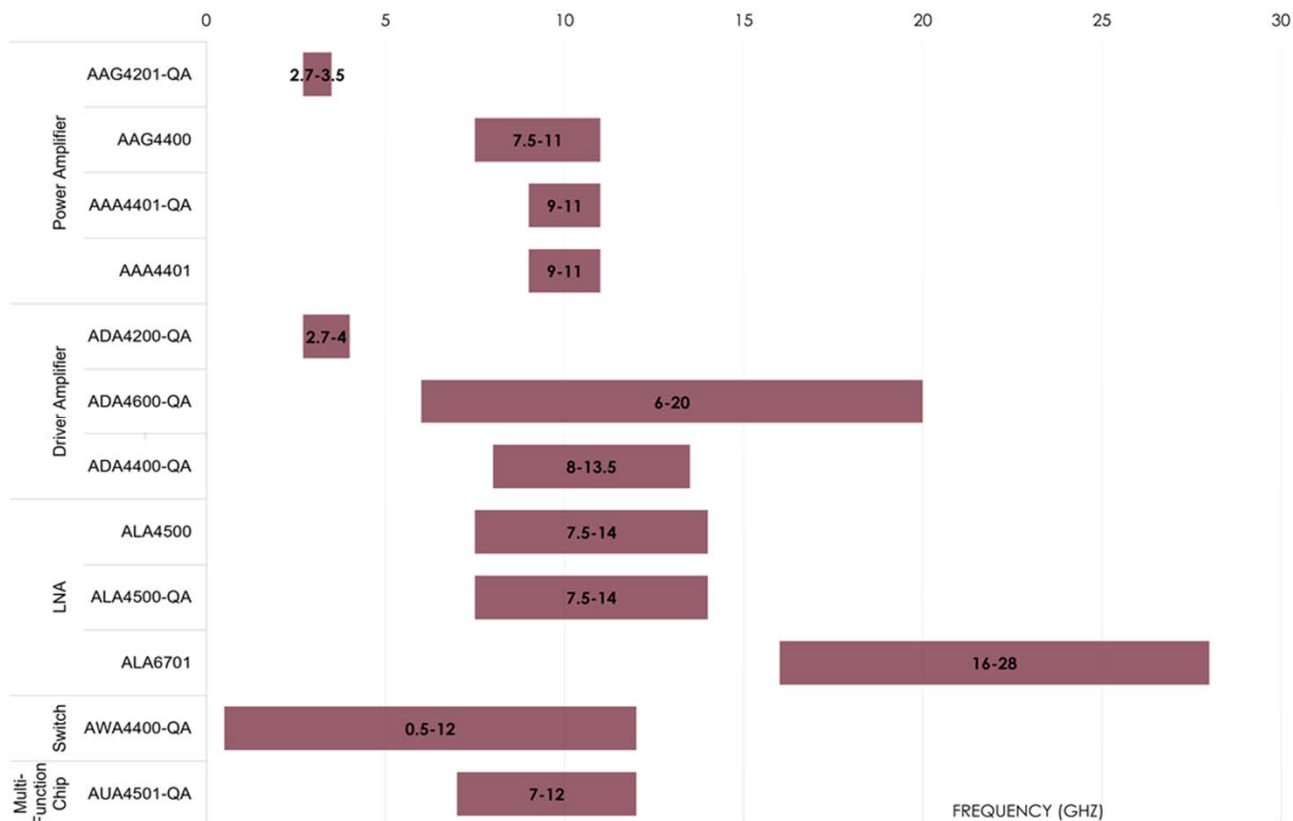


## PRODUCT CATALOGUE

# MMIC

MAY 2020

MMIC PRODUCT CATALOG



POWER AMPLIFIERS										
Part #	Min. Frequency GHz	Max. Frequency GHz	Psat dBm	Gain dB	PAE %	OIP3 dBm	Voltage V <sub>d</sub> V	Current I <sub>dq</sub> mA	Package Type	Package mm
AAG4201-QA	2.7	3.5	>48	24	>45	-	28	300	QFN	6x6
AAG4400	7.5	11	>48	24	>40	-	28	600	Die	-
AAA4401-QA	9	11	>36	23	25	45	8	1800	QFN	6x6
AAA4401	9	11	36	23	25	44	8	1800	Die	-

DRIVER AMPLIFIERS										
Part #	Min. Frequency GHz	Max. Frequency GHz	Gain dB	OP1dB dBm	OIP3 dBm	PAE %	Voltage V <sub>d</sub> V	Current I <sub>dq</sub> mA	Package Type	Package mm
ADA4200-QA	2.7	4	24	31	43	25	9	700	QFN	5x5
ADA4600-QA	6	20	16	24	28	20	8	180	QFN	4x4
ADA4400-QA	8	13.5	>22	31	>40	>30	9	700	QFN	5x5

LOW NOISE AMPLIFIER										
Part #	Min. Frequency GHz	Max. Frequency GHz	Gain dB	OP1dB dBm	NF dB	OIP3 dBm	Voltage V <sub>d</sub> V	Current I <sub>dq</sub> mA	Package Type	Package mm
ALA4500	7.5	14	23	14	2	20	3.3	50	Die	-
ALA4500-QA	7.5	14	23	13	1.8	20	3.3	50	QFN	4x4
ALA6701	16	28	>30	>7	<2	18	3.5	70	Die	-

SPDT SWITCH										
Part #	Min. Frequency GHz	Max. Frequency GHz	Special Features	Insertion Loss dB	ON to OFF ISO (typ) dB	Control Voltage V	Rise/Fall time (typ) ns	Reflective / Absorptive	Package Type	Package mm
AWA4400-QA	0.5	12	SPDT	-1.5	>40	0/-5	60	Non Reflective	QFN	3x3

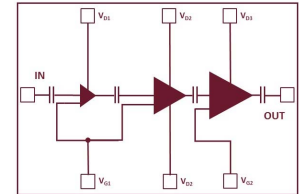
MULTI FUNCTION CHIPS										
Part #	Min. Frequency GHz	Max. Frequency GHz	Gain dB	Noise Figure dB	Maximum Input Sustainable Power W	Variable Gain Range dB	Package Type	Package mm		
AUA4501-QA	7	12	24	2.2	1	10	QFN	4x4		

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# 9 - 11 GHz GaAs POWER AMPLIFIER

## General Description

The AAA4401 is a GaAs MMIC high power amplifier which covers the frequency range from 9 to 11 GHz in die form. This amplifier is ideally suited for use in X-Band Radar applications and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Small Signal Gain	9 - 11 GHz $V_g = -0.8\text{ V}$ $V_d = 8\text{ V}$	-	25	-	dB
$G_p$	Power Gain		-	23	-	dB
$P_{sat}$	Saturated Output Power		-	36	-	dBm
$P_{-1}$	Output Power for 1 dB compression		-	> 34	-	dBm
$RL_{in}$	Input Return Loss		-	-15	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	dB
PAE	Power Added Efficiency		-	25	-	%
OIP3	Output Third Order Intercept		-	44	-	dBm
Harm <sub>2</sub>	2 <sup>nd</sup> Harmonics		-	< -50	-	dBc
Harm <sub>3</sub>	3 <sup>rd</sup> Harmonics		-	< -50	-	dBc

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Voltage	20 V	
$I_{dd}$	Drain Current	5 A	
$P_{in}$	Input Power	20 dBm	
$T_{ch}$	Channel Temperature	150 °C	
$T_m$	Die Bonding Temperature	300 °C	1 min, N <sub>2</sub> Protection
$T_{stg}$	Storage Temperature	-65 - 150 °C	

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Rev 1.5

### Features

Frequency: 9 - 11 GHz
$P_{sat}$ : 36 dBm
PAE: 25 %
Power Gain: 23 dB
Die Size: 2.54 x 3.71 x 0.1 mm
Lead-Free, RoHS Compliant

### Typical Applications

AESA-Radar
Point-to-point Communications
Satellite Communications
Multi-Band VSAT
Marine and Air Radar, Traffic Control
Weather Monitoring
Port Security

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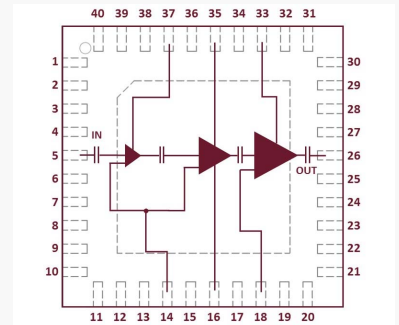
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# 9 - 11 GHz GaAs 4 W POWER AMPLIFIER

## General Description

The AAA4401-QA is a GaAs MMIC high power amplifier which covers the frequency range from 9 to 11 GHz in 6 mm x 6 mm QFN Package. This amplifier is ideally suited for use in X-Band Radar applications and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Small Signal Gain	9 - 11 GHz $V_B = -0.8\text{ V}$ $V_d = 8\text{ V}$	-	26	-	dB
$G_p$	Power Gain		-	23	-	dB
$P_{sat}$	Saturated Output Power		-	> 36	-	dBm
$P_{-1}$	Output Power for 1dB compression		-	> 34	-	dBm
$RL_{in}$	Input Return Loss		-	-20	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	dB
PAE	Power Added Efficiency		-	25	-	%
OIP3	Output Third Order Intercept		-	45	-	dBm
Harm <sub>2</sub>	2 <sup>nd</sup> Harmonics		-	< -50	-	dBc
Harm <sub>3</sub>	3 <sup>rd</sup> Harmonics		-	< -40	-	dBc

Features
Frequency: 9 - 11 GHz
$P_{sat}^*$ > 36 dBm
PAE: 25 %
Power Gain: 23 dB
Package Size: 6.0 x 6.0 x 1.35 mm
Lead-Free, RoHS Compliant

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_d$	Drain Voltage	20 V	
$I_d$	Drain Current	5 A	
$P_{in}$	Input Power	20 dBm	
$T_{ch}$	Channel Temperature	150 °C	
$T_{stg}$	Storage Temperature	-65 - 150 °C	

Typical Applications
AESA-Radar
Point-to-point Communications
Satellite Communications
Multi-Band VSAT
Marine and Air Radar, Traffic Control
Weather Monitoring
Port Security

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Rev 1.7

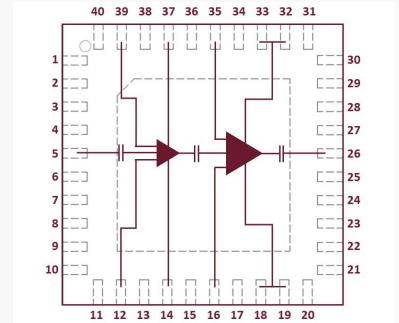
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# 2.7 - 3.5 GHz GaN 60 W POWER AMPLIFIER

## General Description

The AAG4201-QA is a GaN MMIC HEMT high power amplifier in 6 mm x 6 mm QFN package which covers the frequency range from 2.7 to 3.5 GHz. This amplifier is ideally suited for use in S-Band Radar applications.



## Specifications ( $T_A = 25^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Small Signal Gain	2.7 - 3.5 GHz $V_d = 28\text{ V}$ $I_{dq} = 300\text{ mA}$ $P_{in} = 24\text{ dBm}$ 10% D.C 100 $\mu\text{s}$	-	28	-	dB
$G_p$	Power Gain		-	24	-	dB
$P_{sat}$	Saturated Output Power		-	> 48	-	dBm
$RL_{in}$	Input Return Loss		-	-10	-	dB
$RL_{out}$	Output Return Loss		-	-7	-	dB
PAE	Power Added Efficiency		-	> 45	-	%
Harm <sub>2</sub>	2 <sup>nd</sup> Harmonics		-	< -40	-	dBc
Harm <sub>3</sub>	3 <sup>rd</sup> Harmonics		-	< -60	-	dBc
$TC_{Pout}$	Output Power Temp. Coefficient <sup>1</sup>		-	0.013	-	dB/ $^\circ\text{C}$

<sup>1</sup> $TC_{Pout}$  applicable from 25  $^\circ\text{C}$  to 85  $^\circ\text{C}$

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Voltage	40 V	
$I_{dd}$	Drain Current ( $I_{d1}/I_{d2}$ )	10 A	
$I_g$	Gate Current	-50 mA	
$P_{diss}$	Power Dissipation	90 W	Approximated
$P_{in}$	Input Power	28 dBm	VSWR: 3 : 1, 28 V
$P_{in}$	Input Power	30 dBm	50 $\Omega$ , 28 V
$T_{ch}$	Channel Temperature	225 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-55 - 150 $^\circ\text{C}$	

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Rev 1.7

### Features

Frequency: 2.7 - 3.5 GHz

$P_{sat}^1$ : > 48 dBm

PAE: > 45 %

Power Gain: 24 dB

Pacakge Size: 6.0 x 6.0 x 1.35 mm

Lead-Free, RoHS Compliant

### Typical Applications

S-Band Commercial and Military Radar

Satellite Communications

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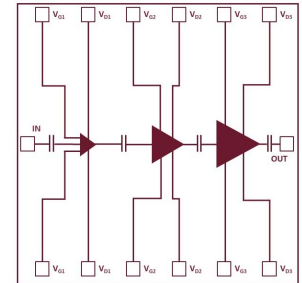
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## 7.5 - 11 GHz GaN POWER AMPLIFIER

### General Description

The AAG4400 is a GaN MMIC high power amplifier which covers the frequency range from 7.5 to 11 GHz in die form. This amplifier is ideally suited for use in X-band Radar applications.



### Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Small Signal Gain	7.5 - 11 GHz $V_d = 28\text{ V}$ $I_{dq} = 600\text{ mA}$ $P_{in} = 24\text{ dBm}$ 10% D.C 100 $\mu\text{s}$	-	> 32	-	dB
$G_p$	Power Gain		-	24	-	dB
$P_{sat}$	Saturated Output Power		-	> 48	-	dBm
$RL_{in}$	Input Return Loss		-	-7	-	dB
$RL_{out}$	Output Return Loss		-	-9	-	dB
PAE	Power Added Efficiency		-	> 40	-	%
Harm <sub>2</sub>	2 <sup>nd</sup> Harmonics		-	< -35	-	dBc
Harm <sub>3</sub>	3 <sup>rd</sup> Harmonics		-	< -45	-	dBc
$TC_{Pout}$	Output Power Temp. Coefficient		-	0.01	-	dB/ $^\circ\text{C}$

Features
Frequency: 7.5 - 11 GHz
$P_{sat} > 48\text{ dBm}$
PAE: > 40 %
Power Gain: 24 dB
Die Size: 4.85 x 5.06 x 0.1 mm
Lead-Free, RoHS Compliant

### Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Voltage	40 V	
$I_{dd}$	Drain Current	10 A	
$I_g$	Gate Current	-50 mA	
$P_{diss}$	Power Dissipation	150 W	Approximated
$P_{in}$	Input Power	30 dBm	VSWR: 3 : 1, 28 V
$P_{in}$	Input Power	30 dBm	50 $\Omega$ , 28 V
$T_{ch}$	Channel Temperature	225 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-55 - 150 $^\circ\text{C}$	

Typical Applications
X-Band Radar
Data Link
EW Signal Jammer
Repeaters / Boosters / DAS

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## 2.7 - 4.0 GHz GaAs DRIVER AMPLIFIER

### General Description

The ADA4200-QA is a GaAs MMIC pHEMT driver amplifier in 5 mm x 5 mm QFN packaged which covers the frequency range from 2.7 to 4.0 GHz. It includes a 13 dB variable attenuator at the input, and a resistively coupled power detector at the output. This amplifier is ideally suited for use in S-Band Radar applications and point-to-point transceiver modules.

### Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Small Signal Gain	2.7 - 4.0 GHz $V_d = 9\text{ V}$	-	24	-	dB
$P_{sat}$	Saturated Output Power		-	33	-	dBm
$P_{-1}$	Output Power for 1 dB compression		-	31	-	dBm
OIP3	Output Third Order Intercept		-	43	-	dBm
PAE	Power Added Efficiency		-	25	-	%
$RL_{in}$	Input Return Loss		-	-15	-	dB
$RL_{out}$	Output Return Loss		-	-15	-	dB

### Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

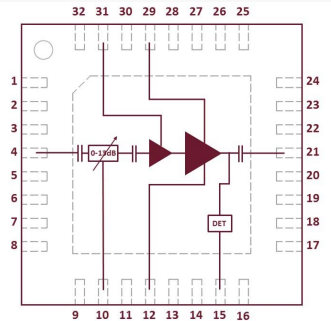
Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Voltage	20 V	
$I_{dd}$	Drain Current	2.94 A	
$P_{in}$	RF Input Power	20 dBm	
$T_{ch}$	Channel Temperature	320 °C	
$T_{op}$	Operating Temperature	-40 - 85 °C	
$T_{stg}$	Storage Temperature	-65 - 150 °C	

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Rev 1.6



### Features

Frequency: 2.7 - 4.0 GHz

$P_{sat}$ : 33 dBm

Small Signal Gain: 24 dB

PAE: 25 %

Package Size: 5.0 x 5.0 x 1.14 mm

Lead-Free, RoHS Compliant

### Typical Applications

S Band-Radar

Point-to-point Communications

Satellite Communications

Multi-Band VSAT

Test Instrumentation

Repeaters / Boosters / DAS

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# 8.0 - 13.5 GHz GaAs DRIVER AMPLIFIER

## General Description

The ADA4400-QA is a GaAs MMIC pHEMT driver amplifier in 5 mm x 5 mm QFN packaged which covers the frequency range from 8.0 to 13.5 GHz. This amplifier is ideally suited for use in Radar applications and point-to-point transceiver modules.

## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Condi- tions	Value						Units
			Min	Typ.	Max	Min	Typ.	Max	
F	Frequency Range		8 - 10 GHz			10 - 13.5 GHz			-
G	Small Signal Gain		-	> 22	-	-	> 22	-	dB
$P_{sat}$	Saturated Output Power		-	33	-	-	33	-	dBm
$P_{-1}$	Output Power for 1 dB compression	8.0 - 13.5 GHz	-	31	-	-	32	-	dBm
OIP3	Output Third Order Intercept	$V_d = 9\text{ V}$ $V_g = -0.7\text{ V}$	-	> 40	-	-	> 40	-	dBm
$RL_{in}$	Input Return Loss		-	-5	-	-	-10	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	-	-10	-	dB
PAE	Power Added Efficiency		-	> 30	-	-	> 30	-	%

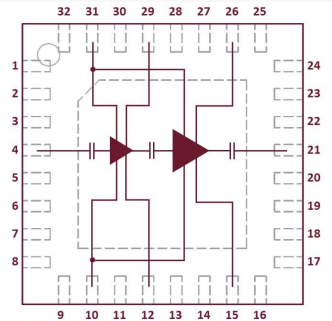
## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Voltage	20 V	
$I_{dd}$	Drain Current	2.94 A	
$P_{in}$	RF Input Power	20 dBm	
$T_{ch}$	Channel Temperature	320 $^\circ\text{C}$	
$T_{op}$	Operating Temperature	-40 - 85 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-65 - 150 $^\circ\text{C}$	

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### Features

Frequency: 8 - 13.5 GHz

$P_{sat}$ : 33 dBm

Small Signal Gain: > 22 dB

PAE: > 30 %

Lead-Free, RoHS Compliant

### Typical Applications

Radar

Point-to-point Communications

Point-to-multi-point  
Communications

Satellite Communications

Multi-Band VSAT

Test Equipment & Sensors

Repeaters / Boosters / DAS

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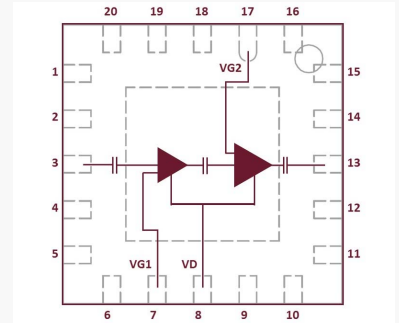
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# 6 - 20 GHz GaAs DRIVER AMPLIFIER

## General Description

The ADA4600-QA is a GaAs MMIC pHEMT driver amplifier in 4 mm x 4 mm QFN package which covers the frequency range from 6 to 20 GHz. This amplifier is ideally suited for use in VSAT and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Gain	6 - 20 GHz $V_d = 8\text{ V}$ $V_g = -0.7\text{ V}$ $P_{in} = 10\text{ dBm}$	-	16	-	dB
$P_{sat}$	Saturated Output Power		-	25	-	dBm
OIP3	Output Third Order Intercept		-	28	-	dBm
$P_{-1}$	Output Power for 1 dB compression		-	24	-	dBm
$RL_{in}$	Input Return Loss		-	-10	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	dB
PAE	Power Added Efficiency		-	20	-	%

Features
Frequency: 6 - 20 GHz
$P_{sat}$ : 25 dBm
PAE: 20 %
Gain: 16 dB
Package Size: 4.0 x 4.0 x 1.03 mm
Lead-Free, RoHS Compliant

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_d$	Drain Voltage	15 V	
$I_d$	Drain Current	500 mA	
$P_{in}$	RF Input Power	15 dBm	
$T_{ch}$	Channel Temperature	200 °C	
$T_{op}$	Operating Temperature	-40 - 85 °C	
$T_{stg}$	Storage Temperature	-65 - 150 °C	

Typical Applications
Microwave Radio Systems
Satellite VSAT & DBS Systems
Test Instruments
802.16 and 802.20 WiMax BWA Systems
WLL and MMDS Loops

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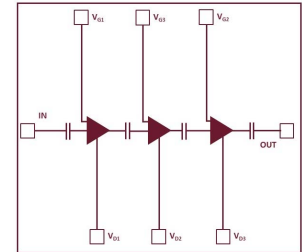
# ALA4500

PRELIMINARY DATA SHEET

## 7.5 - 14 GHz GaAs LOW NOISE AMPLIFIER

### General Description

The ALA4500 is a GaAs MMIC pHEMT low noise amplifier which covers the frequency range from 7.5 to 14 GHz in die form. This amplifier is ideally suited for use in AESA Radar applications and point-to-point transceiver modules.



### Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Gain	7.5 - 14 GHz $V_d = 3.3\text{ V}$ $V_g = -0.7\text{ V}$ $P_{in} = -30\text{ dBm}$	-	23	-	dB
NF	Noise Figure		-	2	-	dB
RL <sub>in</sub>	Input Return Loss		-	-10	-	dB
RL <sub>out</sub>	Output Return Loss		-	-15	-	dB
P <sub>-1</sub>	Output Power for 1 dB compression		-	14	-	dBm
OIP3	Output Third Order Intercept		-	20	-	dBm
I <sub>dq</sub>	Quiescent Current		-	50	-	mA

### Features

Frequency: 7.5 - 14 GHz
Noise Figure: 2 dB
P1dB Output Power: 14 dBm
Gain: 23 dB
Die Size: 1.32 x 1.50 x 0.1 mm
Lead-Free, RoHS Compliant

### Typical Applications

AESA-Radar
Point-to-point Communications
Satellite Communications
Multi-Band VSAT
Repeaters / Boosters / DAS

### Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
V <sub>dd</sub>	Drain Supply Voltage	8 V	
I <sub>dd</sub>	Drain Current	300 mA	
P <sub>in</sub>	Input Power(CW)	10 dBm	
T <sub>ch</sub>	Channel Temperature	150 °C	
T <sub>m</sub>	Die Bonding Temperature	300 °C	1 min, N <sub>2</sub> Protection
T <sub>stg</sub>	Storage Temperature	-65 - 150 °C	

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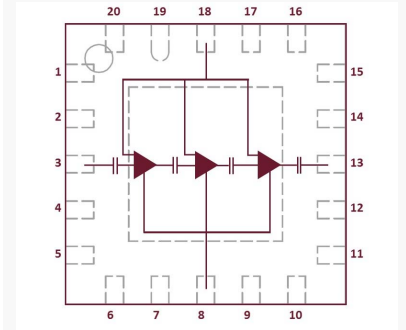
5012 Ang Mo Kio Avenue 5  
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# 7.5 - 14 GHz GaAs LOW NOISE AMPLIFIER

## General Description

The ALA4500-QA is a GaAs MMIC pHEMT low noise amplifier which covers the frequency range from 7.5 to 14 GHz in 4 mm x 4 mm QFN package. This amplifier is ideally suited for use in AESA Radar applications and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Gain	7.5 - 14 GHz $V_d = 3.3\text{ V}$ $V_g = -0.7\text{ V}$ $P_{in} = -30\text{ dBm}$	-	23	-	dB
NF	Noise Figure		-	1.8	-	dB
$RL_{in}$	Input Return Loss		-	-15	-	dB
$RL_{out}$	Output Return Loss		-	-13	-	dB
$P_{-1}$	Output Power for 1 dB compression		-	13	-	dBm
OIP3	Output Third Order Intercept		-	20	-	dBm
$I_{dq}$	Quiescent Current		-	50	-	mA

Features
Frequency: 7.5 - 14 GHz
Noise Figure: 1.8 dB
P1dB Output Power: 13 dBm
Gain: 23 dB
Package Size: 4.0 x 4.0 x 1.03 mm
Lead-Free, RoHS Compliant

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Supply Voltage	8 V	
$I_{dd}$	Drain Current	300 mA	
$P_{in}$	Input Power (CW)	10 dBm	
$T_{ch}$	Channel Temperature	150 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-65 - 150 $^\circ\text{C}$	

Typical Applications
AESA-Radar
Point-to-point Communications
Satellite Communications
Multi-Band VSAT
Repeaters / Boosters / DAS

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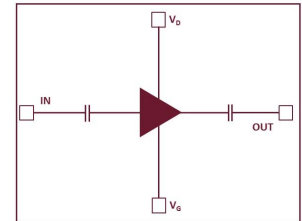
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# 16 - 28 GHz GaAs LOW NOISE AMPLIFIER

## General Description

The ALA6701 is a GaAs MMIC pHEMT low noise amplifier which covers the frequency range from 16 to 28 GHz in die form. This amplifier is ideally suited for use in AESA Radar applications and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Gain	16 - 28 GHz $V_d = V_g = 3.5\text{ V}$ $P_{in} = -30\text{ dBm}$	-	> 30	-	dB
NF	Noise Figure		-	< 2	-	dB
$RL_{in}$	Input Return Loss		-	-10	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	dB
$P_{-1}$	Output Power for 1 dB compression		-	> 7	-	dBm
OIP3	Output Third Order Intercept		-	18	-	dBm
$I_{dq}$	Quiescent Drain Current		-	85	-	mA

### Features

Frequency: 16 - 28 GHz
Noise Figure: < 2 dB
P1dB Output Power: 7 dBm
Gain: > 30 dB
Die Size: 1.28 x 1.65 x 0.1 mm
Lead-Free, RoHS Compliant

### Typical Applications

AESA-Radar
Point-to-point Radios
Point-to-multi-point Radios & VSAT
Test Equipment & Sensors
Military & Space
Repeaters / Boosters / DAS

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Supply Voltage	8 V	
$I_{dd}$	Drain Current	300 mA	
$P_{in}$	Input Power(CW)	10 dBm	
$T_{ch}$	Channel Temperature	150 °C	
$T_m$	Die Bonding Temperature	300 °C	1 min, N <sub>2</sub> Protection
$T_{stg}$	Storage Temperature	-65 - 150 °C	

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# 0.5 - 12 GHz GaAs SPDT SWITCH

## General Description

The AWA4400-QA is a GaAs MMIC SPDT Non Reflective Switch which covers the frequency range from 0.5 to 12 GHz in 3 mm x 3 mm QFN Package. This Switch is ideally suited for use in Radar applications and point-to-point transceiver modules.

## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
$L_i$	Insertion Loss	$0.5 - 12\text{ GHz}$ $V_{CTRL} = 0 / -5\text{ V}$	-	-1.5	-	dB
ISO	Isolation		-	> 40	-	dB
$t_{RISE} / t_{FALL}$	Rise / Fall time (10/90% RF)		-	60	-	ns
$t_{ON} / t_{OFF}$	ON / OFF time (50% $V_{CTRL}$ to 10/90% RF)		-	120	-	ns
RL	Return Loss		-	< -15	-	dB
$P_{-1}$	Input Power for 1 dB compression		-	28	-	dBm
$I_{CTRL}$	Control current		-	50	-	nA

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

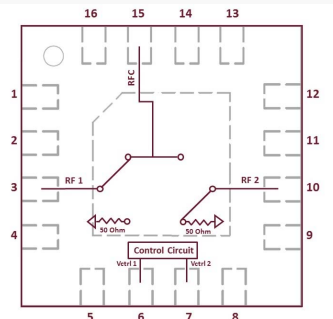
Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{ctrl\ High}$	Control Voltage High	-6 V	
$V_{ctrl\ Low}$	Control Voltage Low	-1.5 V	
$P_{in}$	RF Input Power Through Path	35 dBm	
$T_{ch}$	Channel Temperature	150 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-65 - 150 $^\circ\text{C}$	

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### Features

Frequency: 0.5 - 12 GHz
Insertion Loss: -1.5 dB
Isolation: > 40 dB
Switching Time: 120 ns
Switches Type: Non-Reflective
Package Size: 3.0 x 3.0 x 0.75 mm
Lead-Free, RoHS Compliant

### Typical Applications

Microwave Radios
Multi-Band VSAT
Test Instrumentation
General Purpose Switches

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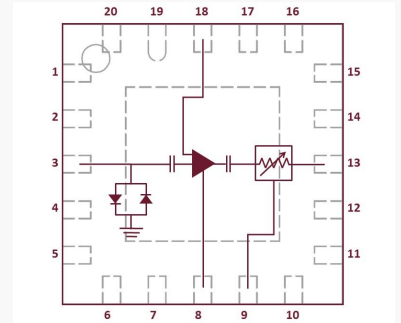
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# 7 - 12 GHz GaAs MULTI FUNCTION CHIP

## General Description

The AUA4501-QA is a GaAs MMIC pHEMT Multi Function Chip that combines a LNA, Limiter and VCA in 4 mm x 4 mm QFN package which covers the frequency range from 7 to 12 GHz. This amplifier is ideally suited for use in Radar applications and point-to-point transceiver modules.



## Specifications ( $T_A = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Conditions	Value			Units
			Min	Typical	Max	
G	Gain	7 - 12 GHz $V_d = 4\text{ V}$ $V_g = -0.7\text{ V}$ $V_{ctrl} = -2\text{ V} - 0\text{ V}$	-	24	-	dB
NF	Noise Figure		-	2.2	-	dB
$RL_{in}$	Input Return Loss		-	-10	-	dB
$RL_{out}$	Output Return Loss		-	-10	-	dB
$G_{var}$	Variable Gain Range		-	10	-	dB
$SP_{in}$	Max Input Sustainable Power		-	1	-	W
$I_{dq}$	Quiescent Current		-	50	-	mA

Features
Frequency: 7 - 12 GHz
Noise Figure: 2.2 dB
Gain: 24 dB
Package Size: 4.0 x 4.0 x 1.03 mm
Lead-Free, RoHS Compliant

## Absolute Maximum Ratings ( $T_A = 25\text{ }^\circ\text{C}$ )

Please note: Any stress above the ratings listed may cause permanent damage!

Symbol	Parameter	Value	Notes
$V_{dd}$	Drain Supply Voltage	8 V	
$I_{dd}$	Drain Current	300 mA	
$P_{in}$	Input Power(CW)	30 dBm	
$T_{ch}$	Channel Temperature	150 $^\circ\text{C}$	
$T_{stg}$	Storage Temperature	-65 - 150 $^\circ\text{C}$	

Typical Applications
AESA-Radar
Point-to-point Communications
Satellite Communications
Multi-Band VSAT
Repeaters / Boosters / DAS

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