

# SAC5006CR5



GaN MMIC Power Amplifier  
2GHz~6GHz 46dBm

Rev 1.0

## Features

- Frequency: 2GHz~6GHz
- Small Signal Gain: 33dB
- Output Power: 46dBm
- Power Gain: 22dB
- Supply Voltage: +28V/-Vg
- Packaged: Metal-Ceramic-Package (CR5)

## Typical Applications

- Point-to-Point Radios

## General Description

SAC5006CR5 is a power amplifier delivering 46dBm with 35% power added efficiency from 2GHz to 6GHz. No external matching is required to achieve full-band operation.

## Electrical Performance

$T_A=25^{\circ}\text{C}$ ,  $V_D=+28\text{V}$ ,  $I_{DQ}=1.3\text{A}$ ,  $Z_0=50\Omega$ , CW

Parameter	Min.	Typ.	Max.	Units
Frequency	2	—	6	GHz
Small Signal Gain	—	33	—	dB
Small Signal Gain Flatness	—	$\pm 3$	—	dB
Power Gain**	—	22	—	dB
Reverse Isolation	—	-50	—	dB
RF input port VSWR	—	1.5	3.0	:1
Power-Added Efficiency	—	35	—	%
Output Power	—	46	—	dBm
Drain Voltage ( $V_D$ )	—	28	—	V
Gate Current	—	2	20	mA
Supply Current ( $I_D$ )**	—	—	8	A

\*Adjust the Vg voltage (- 2.3 ~ -2.0V) so that the  $I_{DQ}$  is about 1.3A, and the typical Vg voltage is -2.2V

\*\*Pin=22dBm

## Absolute Maximum Ratings

Maximum Input Power	+27dBm	Operating Temperature (Backside)	-55°C~+85°C
Channel Temperature	250°C	Storage Temperature	-55°C~+180°C
Maximum $V_D$ Supply	+32V	$V_G$ Range	-5V~-1.8V
Mounting Temperature	320°C,30s		

## SuperApex, LLC

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# SAC5006CR5



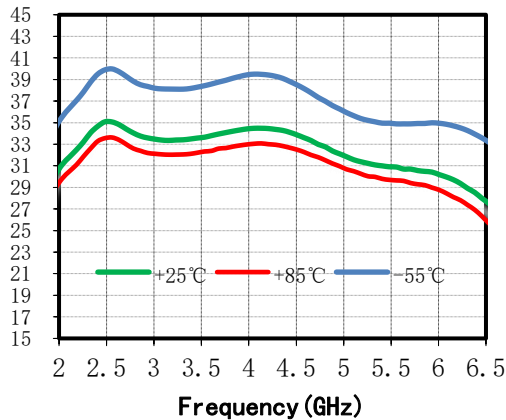
GaN MMIC Power Amplifier  
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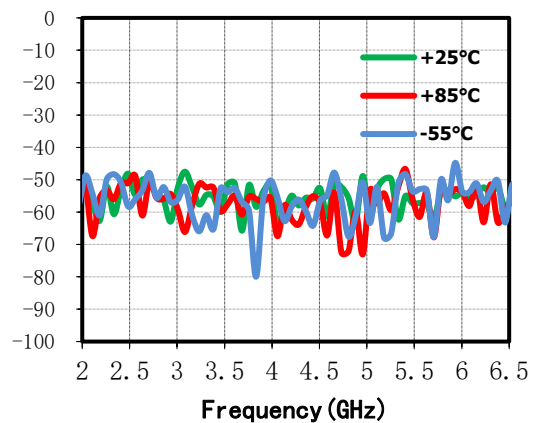
## Typical Performance Curve

The following data are obtained by SAC5006CR5 evaluation board test,  $V_D = +28V$ ,  $I_{DQ} = 1.3A$ ,  $T_A = +25^\circ C$

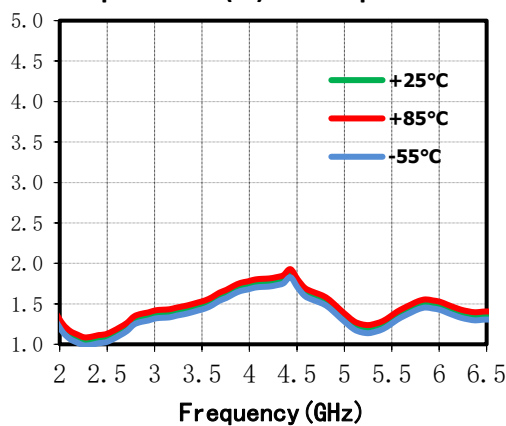
Small Signal Gain(dB) vs. Temperature



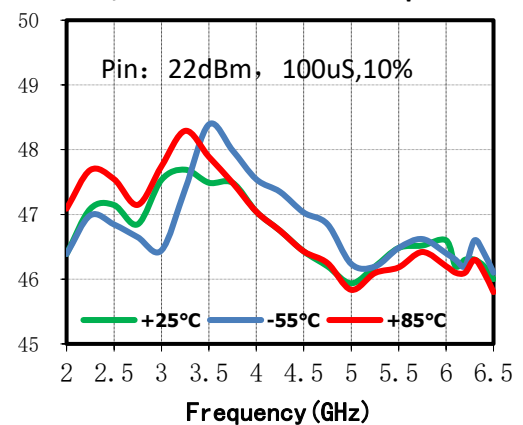
Isolation(dB) vs. Temperature



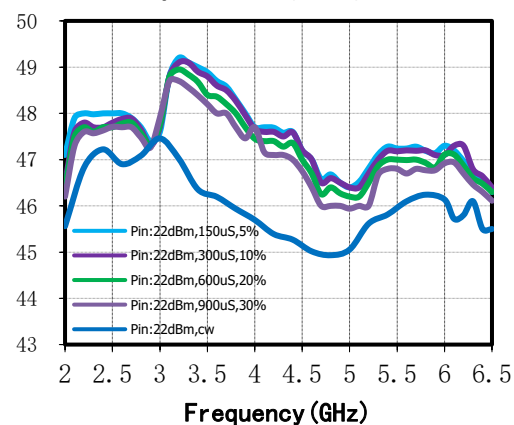
Input VSWR(:1) vs. Temperature



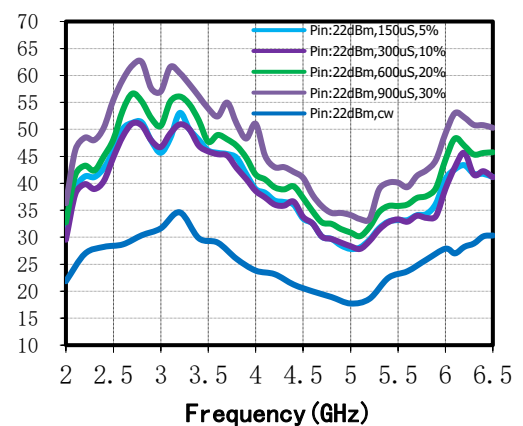
Output Power (dBm) vs. Temperature



Output Power(dBm)vs.Pulse



PAE (%) vs. Pulse



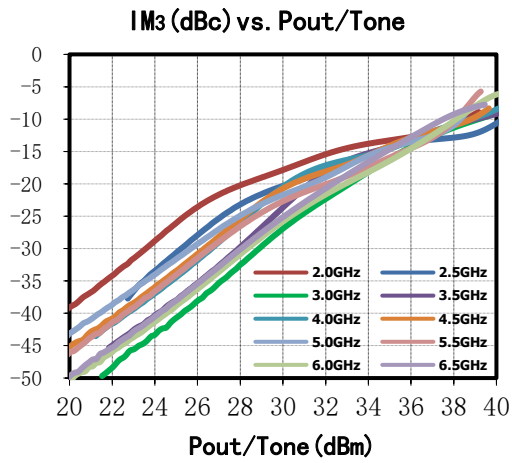
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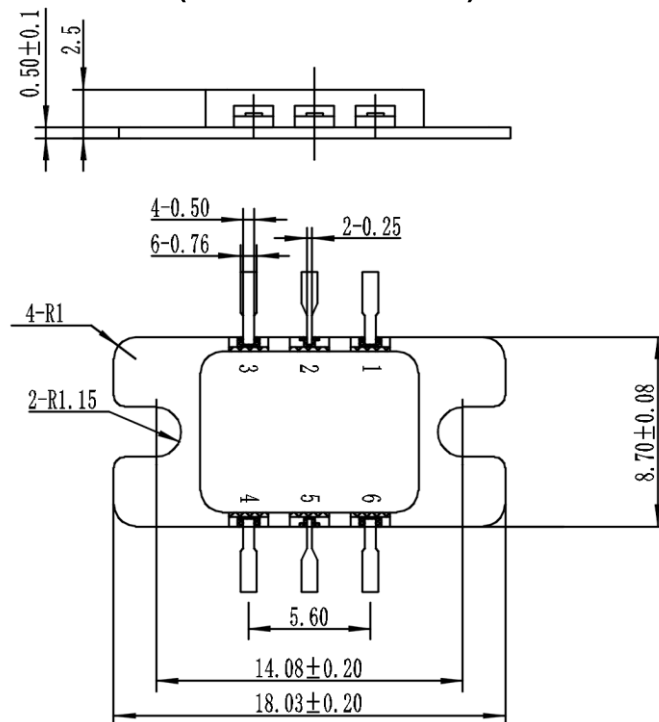
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## Outline Drawing

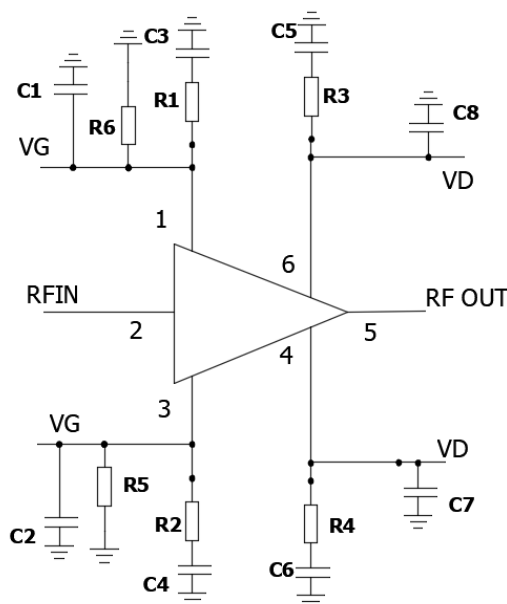
(All dimensions in mm)



## Pin Descriptions

Pin No.	Function	Pin No.	Function
1	Gate	4	Drain
2	RF input, AC Coupled	5	RF Output, AC Coupled
3	Gate	6	Drain

## Application Circuit



## BOM

Reference Des.	Value	Part Number	Manuf.	Size
C1, C2	0.47 $\mu$ F	—	—	0805
C3~C6	0.022 $\mu$ F	—	—	0603
C7, C8	10 $\mu$ F	—	—	0603
R1~R4	2.2 $\Omega$	—	—	0603
R5,R6	100 $\Omega$	—	—	0603

## Notes

- SAC5006CR5 requires VDx and VGx bias.  
Turn-on: Apply VGx, Apply VDx, Apply RFIN signal.  
Turn-off: Remove RFIN signal, Decrease VG to -5V(pinch-off), Decrease VD to 0 V;
- The flange of package may be attached using screws, recommended torque for screw mounting is 10N-cm;
- The surface finish of the heat sink should be better than 0.8 $\mu$ m, and the surface flatness must be better than 10  $\mu$ m;
- Silicon based heat sink compounds should not be used for the thermal conductive grease. They cause poor grounding of the source flange. contamination and long-term degradation of thermal resistance between the FET package and heat sink;
- The chip is an Electrostatic Sensitive Device;
- The maximum soldering temperature for device pins is 400 °C/3s.

## Revision History

Revision	Date	Comment
1.0	Sept. 27, 2024	First Release