

SAC5008CR6

GaN MMIC Power Amplifier
5GHz~8GHz 49dBm

Rev 1.0

Features

- Frequency: 5GHz~8GHz
- Small Signal Gain: 33dB
- Output Power: 49dBm
- PAE: 30%
- Package: Flage (CR6)
- Supply Voltage: +28V/-Vg

Typical Applications

- Point-to-Point Radios

General Description

SAC5008CR6 is a C-band power amplifier in a ceramic frame package with a flange and straight RF and DC leads for drop-in assembly that delivering 49dBm with 30% power added efficiency from 5GHz to 8GHz. No external matching is required to achieve full band operation.

Picture



Electrical Performance

$T_{BASE}=23^{\circ}C$, $V_D=+28V$, $I_{DQ}=2.6A$, $Z_0=50\Omega$, $PW=100\mu S$, Duty Cycle=10%

Parameter	Min.	Typ.	Max.	Units
Frequency Range	5	—	8	GHz
Small Signal Gain	—	33	—	dB
Power Gain	—	21	—	dB
Reverse Isolation	—	45	—	dB
RF Input Port Return Loss	—	1.8	—	dB
Output Power	—	49	—	dBm
Drain Voltage (V_D)	—	28	—	V
Gate Current	—	2	23	mA
Supply Current (I_D)*	—	—	13	A

*Adjust Vg between -2.5V to -1.5V to achieve $I_{DQ}=2.6A$, and typical Vg voltage is -2V

Absolute Maximum Ratings

Maximum Input Power	+33dBm	Operating Temperature (T_{BASE})	-55°C~+85°C
Channel Temperature	230°C	Storage Temperature	-55°C~+165°C
Maximum V_D	+32V	V_G Range	-5V~-1.5 V
ESD Tolerance Level	Class 1B, HBM		

SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

SAC5008CR6



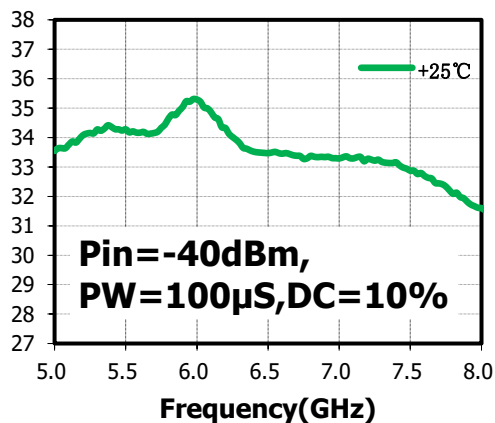
GaN MMIC Power Amplifier
5GHz~8GHz 49dBm

Rev 1.0

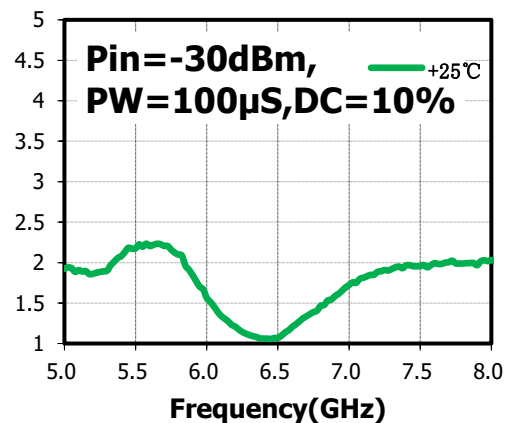
Typical Performance Curve

The following curves are taken from SAC5008CR6 evaluation board. De-embedding operation has been implemented. $V_D=+28V$, $I_{DQ}=2.6A$, $T_{BASE}=+23^{\circ}C$

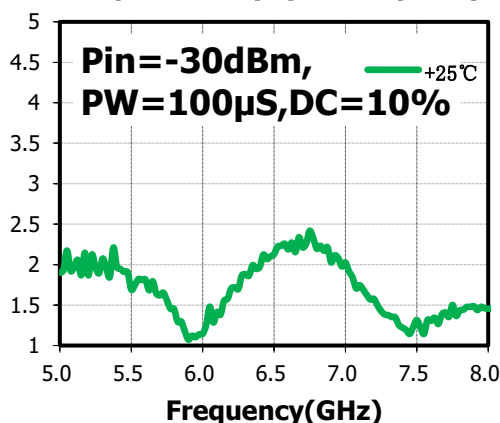
Small Signal Gain(dB) vs.Frequency



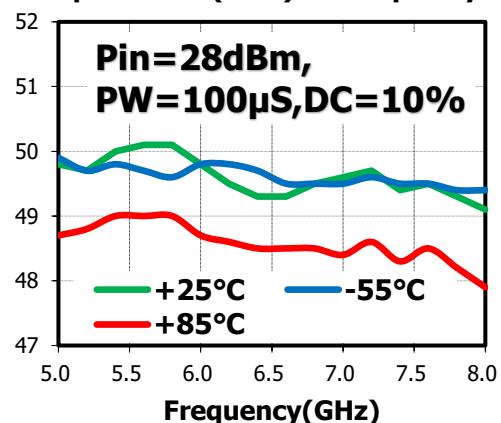
RF Input VSWR(:1) vs.Frequency



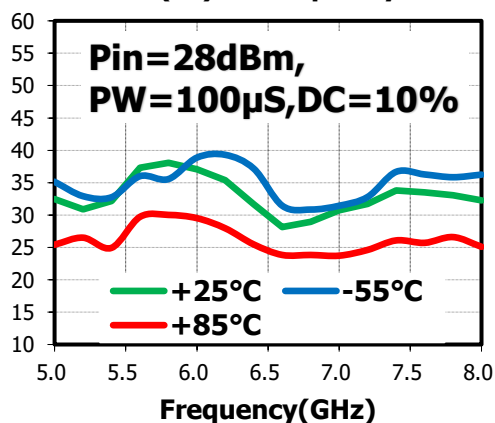
RF Output VSWR(:1) vs.Frequency



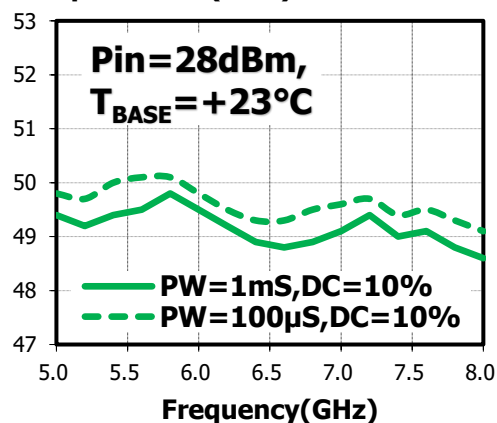
Output Power(dBm) vs.Frequency



PAE(%) vs.Frequency



Output Power(dBm) vs.Pulse Width



SuperApex, LLC

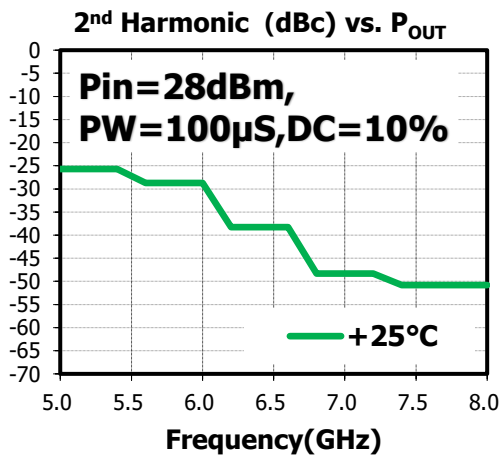
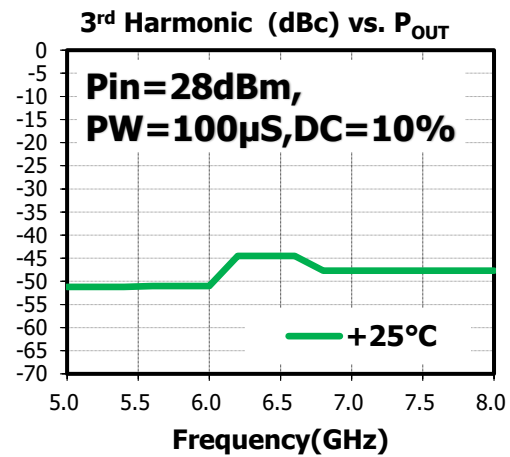
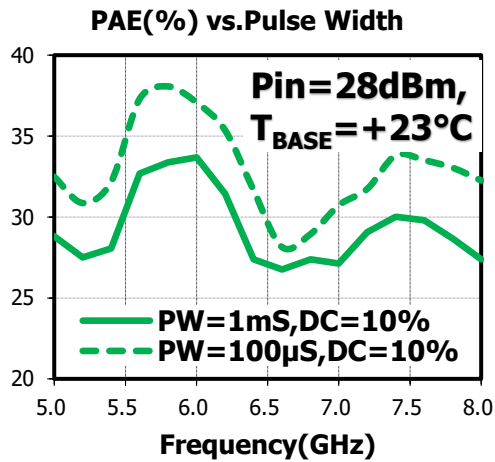
1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

SAC5008CR6



GaN MMIC Power Amplifier
5GHz~8GHz 49dBm

Rev 1.0



Thermal Resistance

Parameter	Conditions	Value	Unit
θ_{JC1}	VD=+28V, T _{BASE} =+70°C, Pin=+28dBm, PW=1mS, DC=10%, f=6GHz	1.52	°C/W

SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

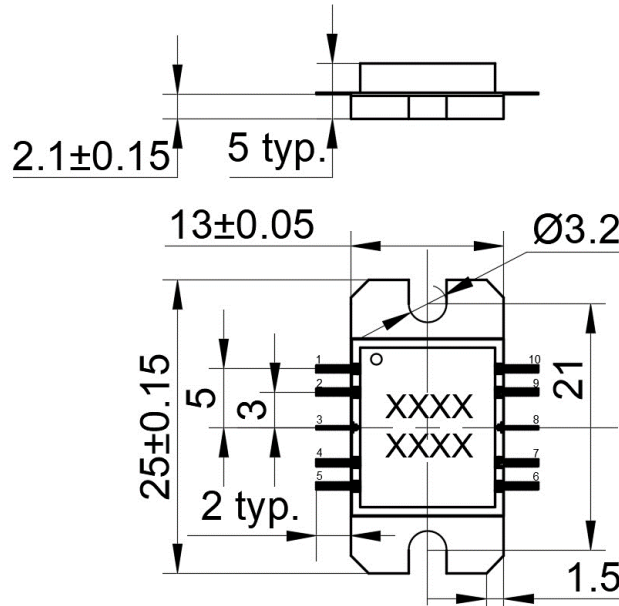
SAC5008CR6

GaN MMIC Power Amplifier
5GHz~8GHz 49dBm

Rev 1.0

Outline Drawing

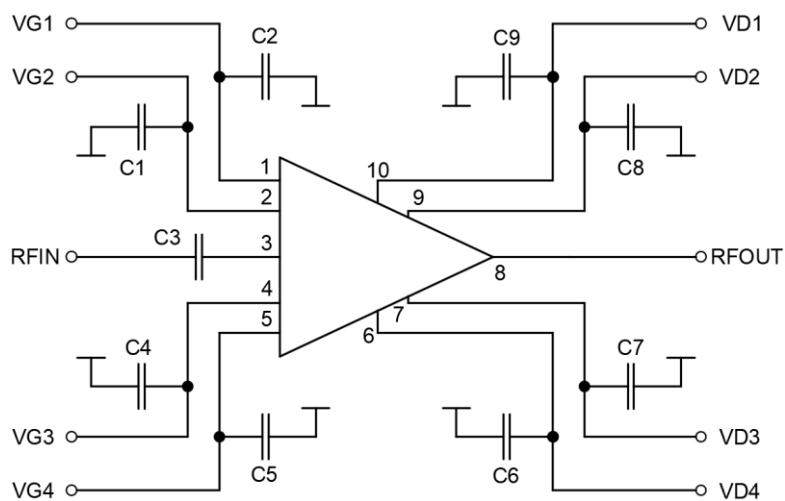
(All dimensions in mm)



Pin Descriptions

Pin No.	Function	Pin No.	Function
1	VG1	6	VD4
2	VG2	7	VD3
3	RFIN	8	RFOUT
4	VG3	9	VD2
5	VG4	10	VD1

Application Circuit



SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com

SAC5008CR6



GaN MMIC Power Amplifier
5GHz~8GHz 49dBm

Rev 1.0

BOM

Reference Des.	Value	Part Number	Manuf.	Size
C1, C2, C4, C5	0.68 μ F	—	—	0603
C6, C7, C8, C9	0.022 μ F	—	—	0603
C3	39pF	—	—	0603

Notes

1. SAC5008CR6 requires a bias of drain positive voltage (VDx) and gate negative voltage (VGx). Before applying drain positive voltage, it is necessary to ensure that the gate negative voltage has been applied. When turning off, the drain positive voltage should be turned off first and then the gate negative voltage should be turned off;
2. For best RF performance we recommend using 0.1mm indium shim between MMIC package and heatsink, the surface finish of the heat sink should be better than 0.8 μ m, and the surface flatness must be better than 10 μ m;
3. The flange of package may be attached using screws. Torque conditions are 15N-cm for M3 screw;
4. Because of high DC power dissipation, good heat sinking is required;
5. This chip is an electrostatic sensitive device;
6. The maximum soldering temperature for device pins is 400 °C/3s.

Revision History

Revision	Date	Comment
1.0	Aug. 5, 2024	First Release

SuperApex, LLC

1580 S. Milwaukee Ave. Suite 405, Libertyville, IL 60048, USA
Tel: 1-847-505-8319, 1-847-573-9866
E-mail: sales@superapexco.com
Website: www.superapexco.com