

Preliminary DATA SHEET

CAC30251

28V, DC-3GHz, CW 250Watts GaN Power Amplifier

Product overview

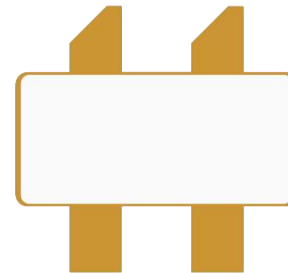
CAC30251 is a 250W(P3dB) discrete GaN power amplifier. It operates perfectly from DC to 3GHz with 28 volts rail, offers a general purpose, broadband, high power and high efficiency wireless pulse or CW communication application.

Key Features

- DC – 3GHz
- Operating Drain Voltage: +28V
- 18dB small signal Gain @2.6GHz
- 15dB Gain @ 53dBm, 2.6GHz
- 53.5dBm CW Peak Power
- 63.5% Drain Efficiency @53.5dBm,2.6GHz
- NI780 4 Lead flange Ceramic package (MSL3, 260°C per JEDEC J-STD-020)
- ESD Level: HBM TBD ; CDM TBD
- ROHS compatible

Applications

- 3GPP 4G LTE/5G NR massive MIMO basestation
- Driver amplifier for micro-base and macro-base Stations
- Active antenna array
- Pico/Small Cell
- Test Instrumentation
- Industrial, scientific, and medical
- Wideband amplifiers



CAC30251DF

Figure 1. NI780 4L Package

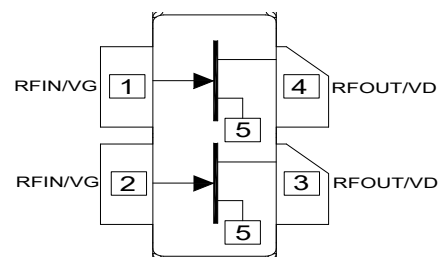


Figure 2. CAC30251 Function Block Diagram

Table 1. CAC30251 Pinout Descriptions

Pin	Name	Description
1,2	RFIN/VG	RF input port with Gate Bias
3,4	RFOUT/VD	RF output port with Drain Supply Voltage
5	GND/Source	Grounding

Ordering Information

Part No.	Description
CAC30251DF	DC-3GHz 250W GaN PA with Flange, 7' Reel with 500pcs

Table 3. CAC30251 Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Storage Temperature	TSTG	-55 to 125	°C
Operating Temperature	TC	-40 to +105	°C
Operating Junction Temperature	TJ	225	°C
Thermal Resistance	Rθjc		°C/W
Operating Voltage	VDD	0 to 32	V
Drain-Source Voltage	VDSS	180	V
Gate-Source Voltage	VGS	-8 to 0	V
Maximum Forward Gate Current		10	mA
Input Power	PIN	+37	dBm

Table 4. CAC30251 Recommended Operating Conditions

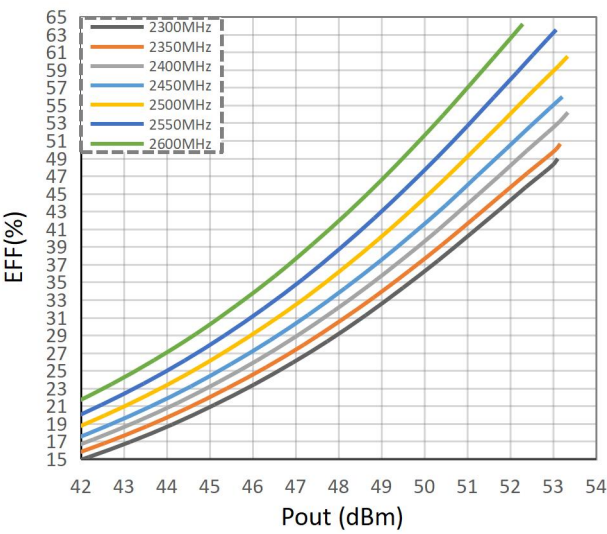
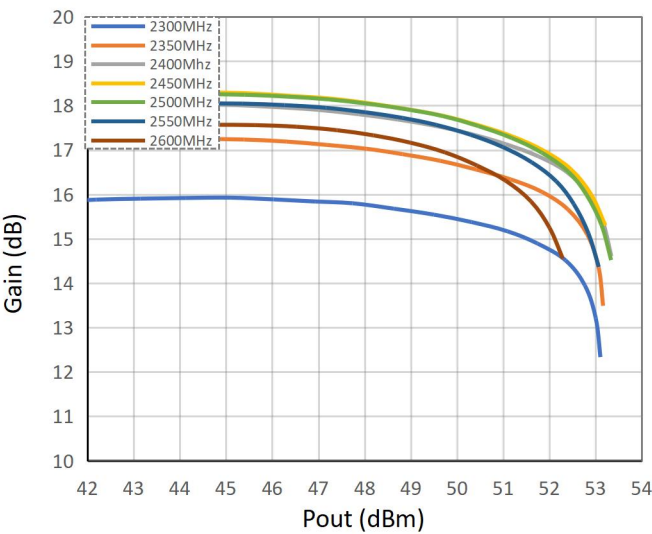
Parameter	Symbol	Min	Typ	Max	Unit
Operating frequency	f	DC		3	GHz
Operating temperature	TC	-40	25	85	°C
Drain Voltage	VDD		28		V
Gate Voltage	VGS		-2.1		V
Quiescent Current	IDQ		550		mA

Table 5. CAC30251 Electrical Specifications

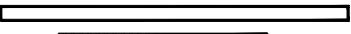
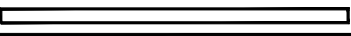
EVb TYPICAL PERFORMANCE: EFFICIENCY TUNED AT P3dB (VD=28V, Idq=550mA, TC=+25 °C, Input /Output Load = 50Ω)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency			2600		MHz
Output P3dB	CW		+53.5		dBm
Gain @ P3dB	CW		15		dB
Drain efficiency @P3dB	CW		63.5		%

Table 7. CAC30251 Electrical Specifications



Datasheet: CAC30251 DC to 2GHz 250Watts GaN Power Amplifier

	Layer Stack up	0.9 mm+/-0.1mm
	Silk Top	Default
	Solder Top	
TOP		2.1mil (1.0oz+plating)
CORE(R04350B)	 0.762mm	30mil (R04350B)
BOTTOM		2.1mil (1.0oz+plating)
	Solder Bot	Default
	Silk Bot	

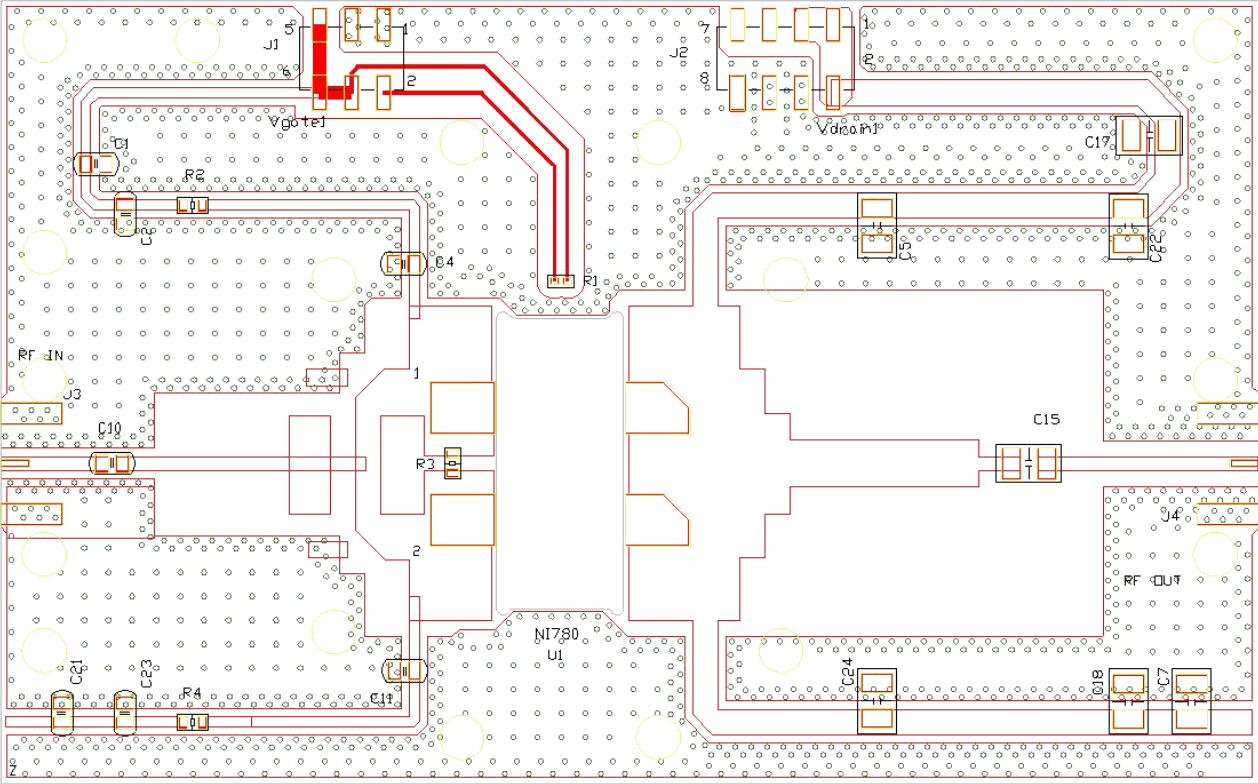


Figure 4. CAC30251 2000-2600MHz Evaluation Board

Table 6. CAC30251 2000-2600MHz Evaluation Board Bill of Materials (BOM)

Component	Description	Size
C5, C15, C24	10pF 100V	1206
C4, C10, C11	10pF 50V	0603
R2, R4	100ohm	0603
C1, C21	1uF	0603
C2, C23	1nF	0603
C7, C17, C18, C22	10uF 100V	

Rest of the components on the schematic are not used in this part.

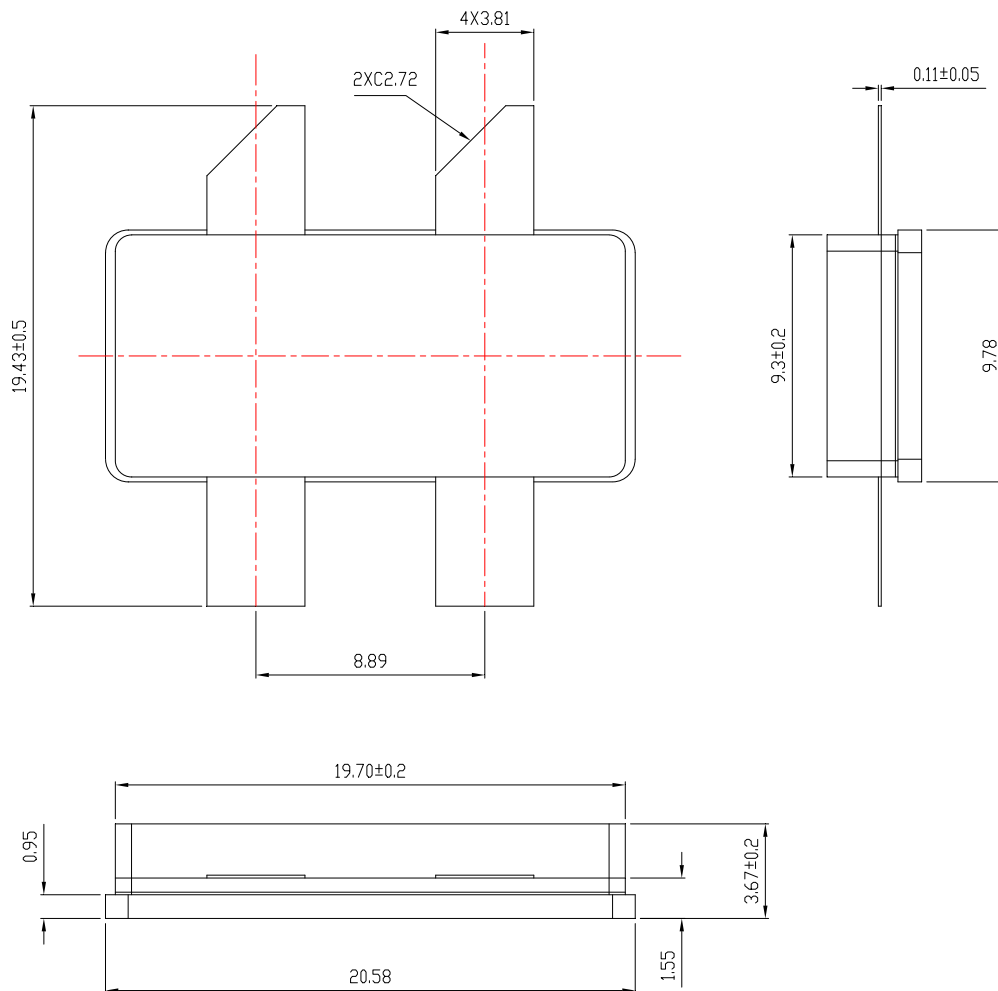
Evaluation board test procedure

Turn-on sequence

- 1 . Connect test equipment to the input and output port of Evaluation board and then connect DC ground.
- 2 . Turn on VG to -7V, turn on VD to 28V then tune VG to 550mA quiescent current in order.
- 3 . Apply RF signal.

Turn-off sequence

- 1 . Turn off RF signal.
- 2 . Turn off VD.
- 3 . Turn off VG.



Notes:

1. ALL DIMENSIONS ARE MM.
2. ALL TOLERANCES $\pm 0.15\text{mm}$ UNLESS SPECIFIED OTHERWISE.

Figure 5. CAC30251 Package Dimensions

CAC30251 REVISION HISTORY

Revision	Date	Description
0.1	2025-8-11	Initial datasheet