Preliminary DATA SHEET

CAQ6031LW

28V, 5-6GHz, CW 30Watts GaN Power Amplifier

Product overview

CAQ6031LW is a 30W(P3dB) internally matched GaN power amplifier. It operates from 5 to 6GHz with 28 volt rail, offers a general purpose, broadband, high power and high efficiency wireless pulse and CW communication application.

Figure 1. 7x6.5mmmm DFN Package

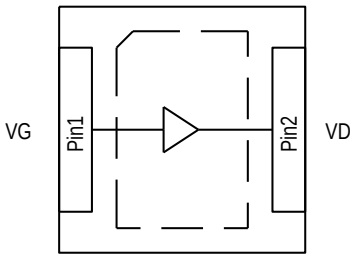


Figure 2. CAQ6031LW Function Block Diagram

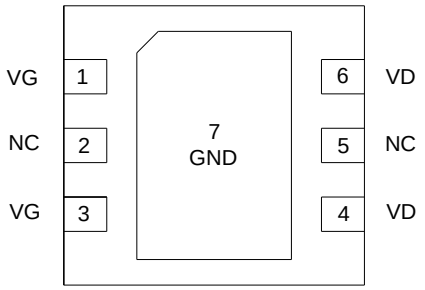


Figure 3. CAQ6031LW Pinout

Key Features

- 5– 6GHz
- Operating Drain Voltage: +28V
- 10dB Gain @5.3GHz, Psat
- 45dBm CW Peak Power
- 55% Drain Efficiency @Psat
- 7x6.5mm DFN package
  (MSL3, 260℃ 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

Table 1. CAQ6031LW Signal Descriptions

Pin	Name	Description
1,3	RFIN/VG	RF input port with Gate Bias
4,6	RFOUT/VD	RF output port with Drain Supply Voltage
2,5	NC	No connection
7	GND	Ground

Ordering Information

Part No.	Description
CAQ6031LW	5-6GHz CW 30Watts Peak Power GaN wideband PA, 7’ Reel with 1500pcs

Table 2. CAQ6031LW 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 55	V
Drain-Source Voltage	VDSS	200	V
Gate-Source Voltage	VGS	-8 to 0	V
Maximum Forward Gate Current		10	mA
Input Power	PIN	+33	dBm

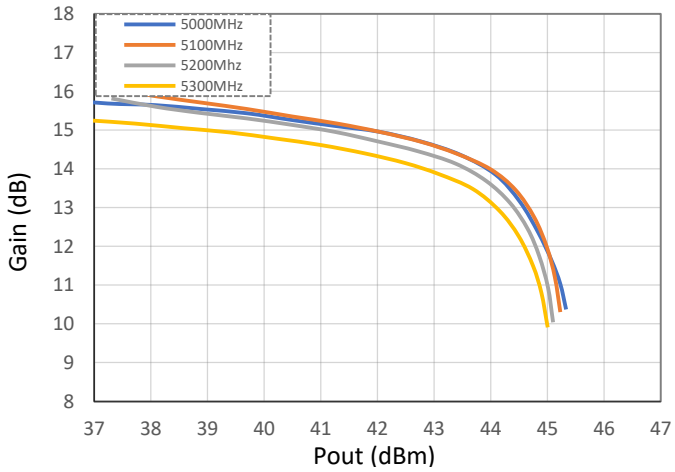
Table 3. CAQ6031LW Recommended Operating Conditions

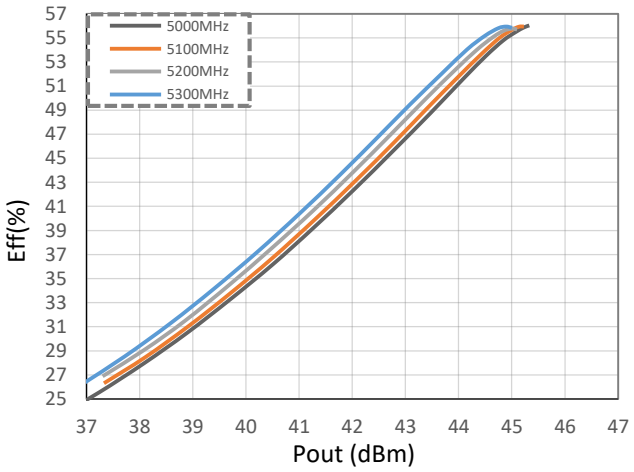
Parameter	Symbol	Min	Typ	Max	Unit
Operating frequency	f	5		6	GHz
Operating temperature	TC	-40	25	65	˚C
Drain Voltage	VDD		28		V
Gate Voltage	VGS		-2		V
Quiescent Current	IDQ		150		mA

Table 4. CAQ6031LW Electrical Specifications

Evaluation Board TYPICAL PERFORMANCE: POWER TUNED AT P3dB (VD=28V, Idq=150mA, TC=+25 ˚C, Input /Output Load = 50Ω)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		5000	5300	6000	MHz
Output P3dB			+45		dBm
Gain @ P3dB			10		dB
Drain efficiency @P3dB			55		%





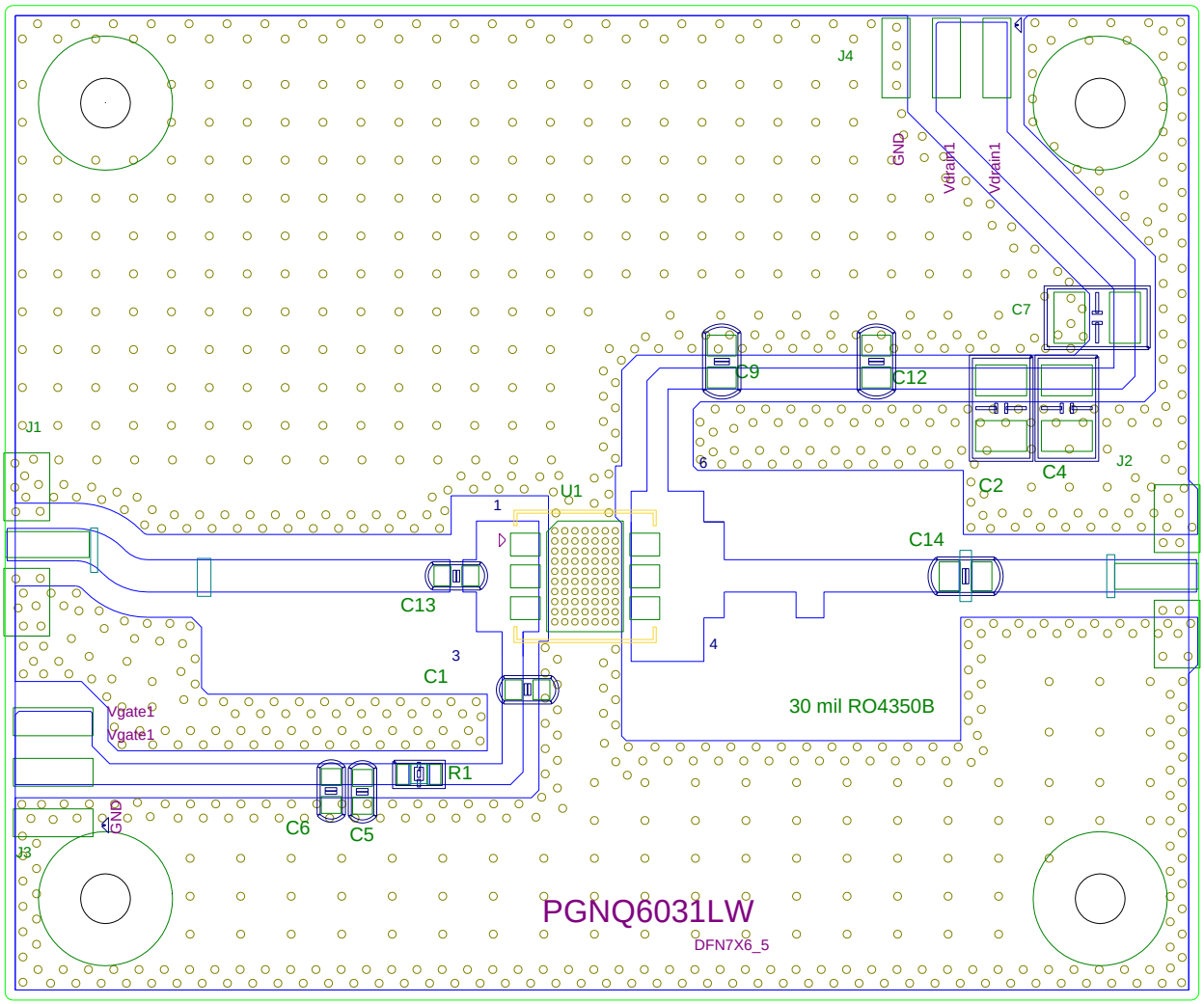


Figure 4. GNC6060 5.1-5.9GHz Evaluation Board

Table 5. CAQ6031LW 5.1-5.9GHz Evaluation Board Bill of Materials (BOM)

Component	Description	Size
C1, C11, C14	2.8pF High Q	C0603
C13	0.3pF High Q	C0603
C2, C4	10uF	C1210
C5	1nF	C0603
C6	1uF	C0603
C12	100pF	C0603
R1	10ohm	R0603

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 150mA quiescent current in order.
3．Apply RF signal.

Turn-off sequence

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

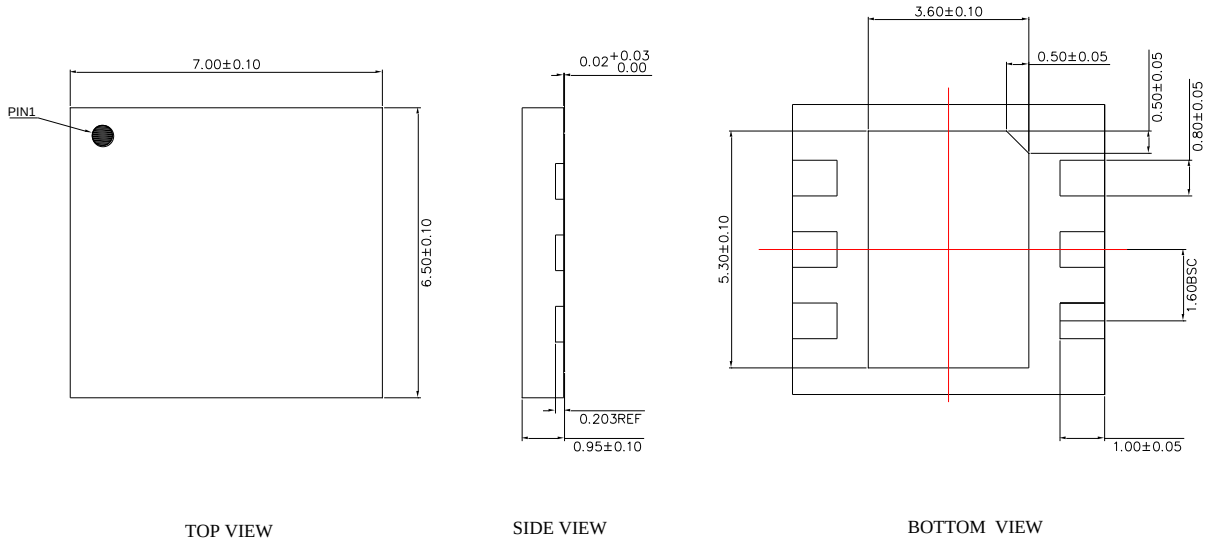


Figure 4. CAQ6031LW Package Dimensions

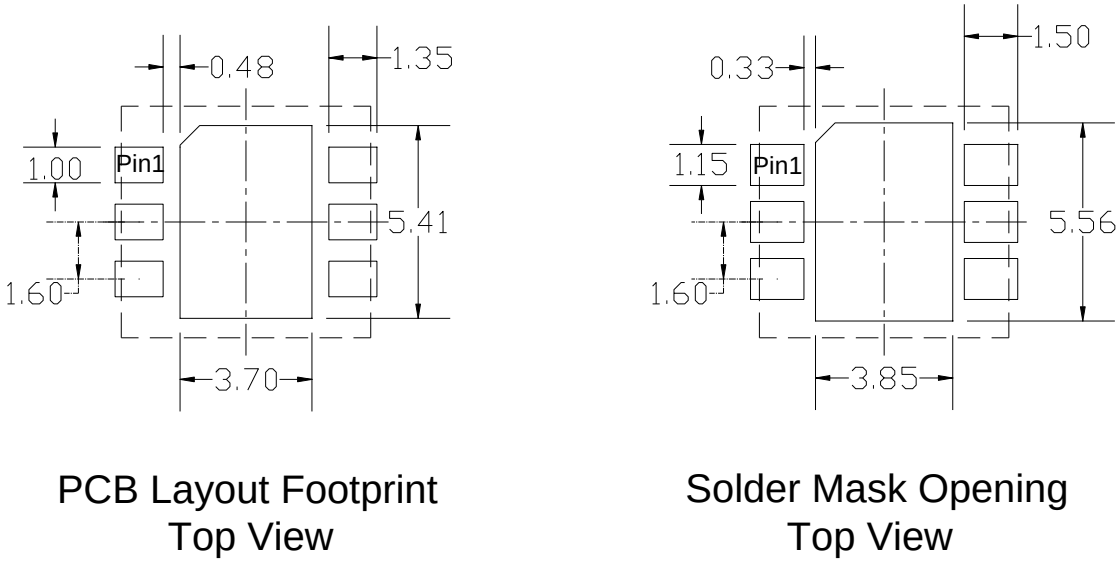
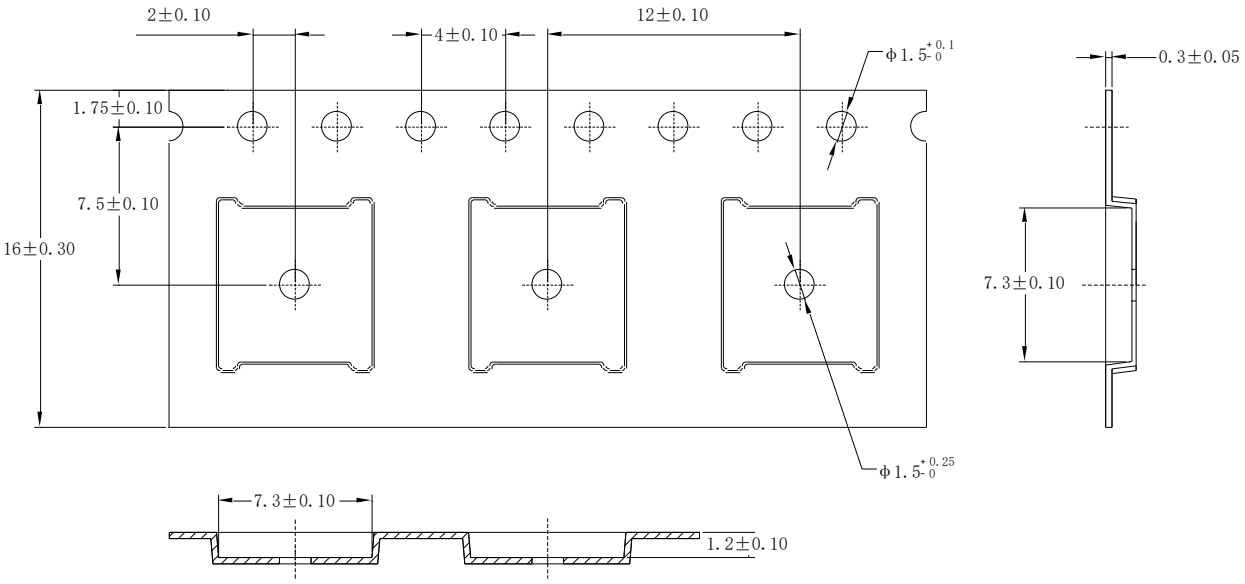


Figure 5. CAQ6031LW Package Dimensions



Technical requirements：
1.The accumulative error of the distance between any 10 transmitting holes is ± 0.1 mm;
2.The lateral bending of the belt along the length direction is ≤1mm/100mm;
3.Roughness：Ra＜0.8um;
4.Carrier tape color:Black.

Figure 7. Tape and Reel Dimensions

CAQ6031LW REVISION HISTORY

Revision	Date	Description
0.1	Sept 2, 2024	Initial release of data sheet
0.2	2025-06-26	Update Vgs