

Preliminary DATA SHEET

CAQ8008L

28V, DC-4GHz, 10Watts GaN Power Amplifier

Product overview

CAQ8008L is an 10W(P3dB) unmatched GaN power amplifier. It operates from DC to 4GHz with 28 volt rail, offers a general purpose, broadband, high power and high efficiency wireless pulse and CW communication application.

Key Features

- DC– 4GHz
- Operating Drain Voltage: +28V
- 18dB linear Gain @39dBm, 3.3GHz
- 40.5dBm Peak Power
- 63% Drain Efficiency @P3dB
- 4x4.5mmmm DFN 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



Figure 1. 4x4.5mmmm DFN Package

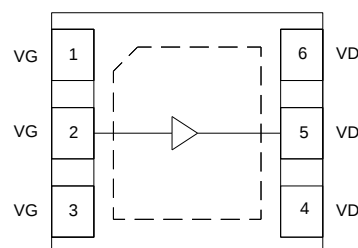


Figure 2. CAQ8008L Function Block Diagram

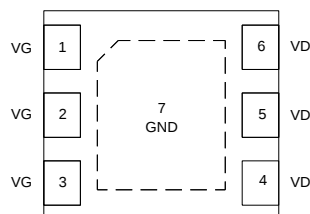


Figure 3. CAQ8008L Pinout

Table 1. CAQ8008L Signal Descriptions

Pin	Name	Description
1, 2, 3	VG/RFin	RF input port with Gate Bias
4, 5, 6	VD/RFout	RF output port with Drain Supply Voltage
7	GND	Ground

Ordering Information

Part No.	Description
CAQ8008L	DC-4GHz 10Watts Peak Power GaN wideband PA, 7' Reel with 1500pcs

Table 2. CAQ8008L Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Storage Temperature	TSTG	-55 to 125	°C
Operating Temperature	TC	-40 to +85	°C
Operating Junction Temperature	TJ	200	°C
Thermal Resistance	Rθjc		°C/W
Operating Voltage	VDD	0 to 32	V
Drain-Source Voltage	VDSS	150	V
Gate-Source Voltage	VGS	-8 to 0	V
Maximum Forward Gate Current		10	mA
Input Power	PIN	+35	dBm

Table 3. CAQ8008L Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating frequency	f	DC		8	GHz
Operating temperature	TC	-40	25	85	°C
Drain Voltage	VDD		28		V
Gate Voltage	VGS		-3.1		V
Quiescent Current	IDQ		35		mA

Table 4. CAQ8008L Electrical Specifications

Evaluation Board TYPICAL PERFORMANCE: POWER TUNED AT P3dB (VD=28V, Idq=35mA, TC=+25 °C, Input /Output Load = 50Ω)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency			3300		MHz
Output P3dB			40	40.5	dBm
Gain @ small signal			20		dB
Gain @ 39dBm			18		dB
Drain efficiency @P3dB			63		%

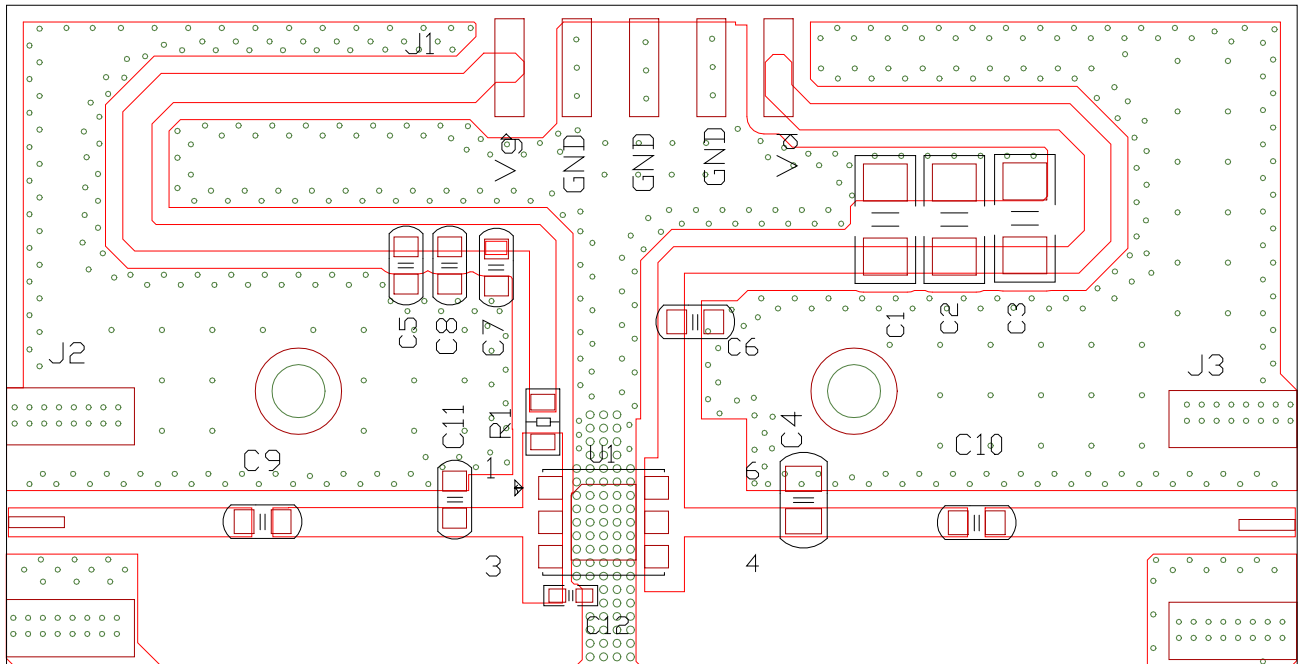


Figure 4. CAQ8008L 2.7G-3.5GHz Evaluation Board

Table 6. CAQ8008L 3.3-3.4GHz Evaluation Board Bill of Materials (BOM)

Component	Description	Size
C8	1nF, 50V	0603
C1, C5	1uF, 50V	0603
C2, C3	10uF, 100V	1206
C6, C7, C9, C10	12pF, high Q, 250V	0805
C4	1.1pF, high Q, 250V	0805
C11	2pF, high Q, 250V	0805
R1	10 Ohm	0603

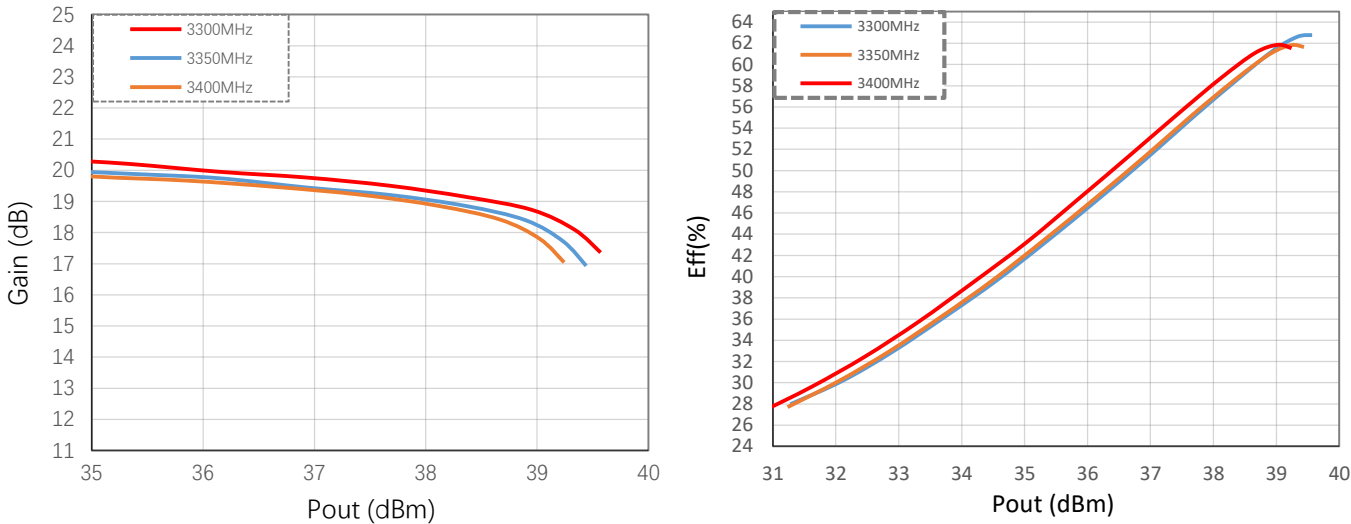


Figure 5. CAQ8008L 3.3-3.4GHz EVB High Efficiency Performance

Table 5. CAQ8008L 2.7-3.5GHz Evaluation Board Bill of Materials (BOM)

Component	Description	Size
C8	1nF, 50V	0603
C1, C5	1uF, 50V	0603
C2, C3	10uF, 100V	1206
C6, C7, C10	12pF, high Q, 250V	0805
C9	2pF, high Q, 250V	0805
C4	0.7pF, high Q, 250V	0805
C11	1.6pF, high Q, 250V	0805
R1	10 Ohm	0603

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 35mA quiescent current in order.
- 3 . Apply RF signal.

Turn-off sequence

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

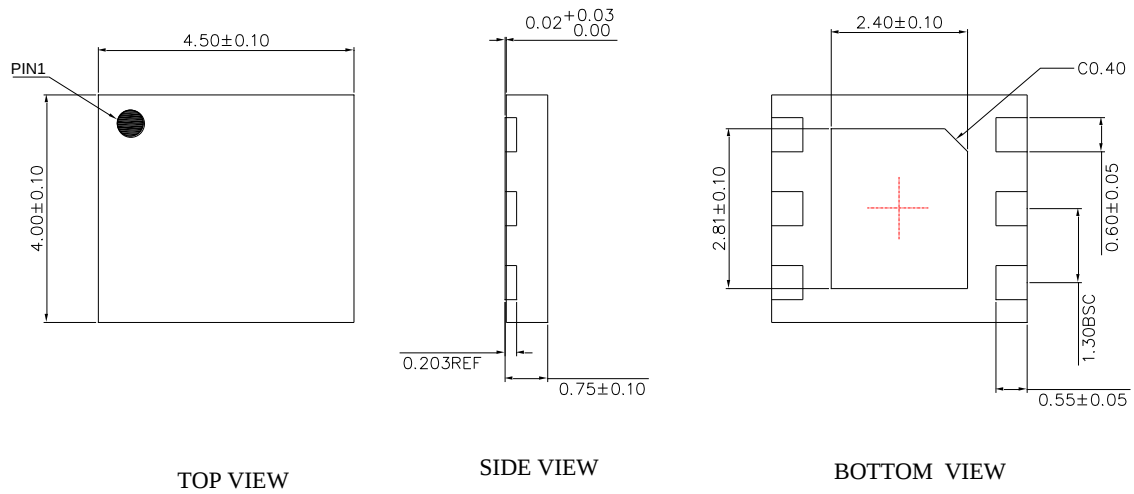
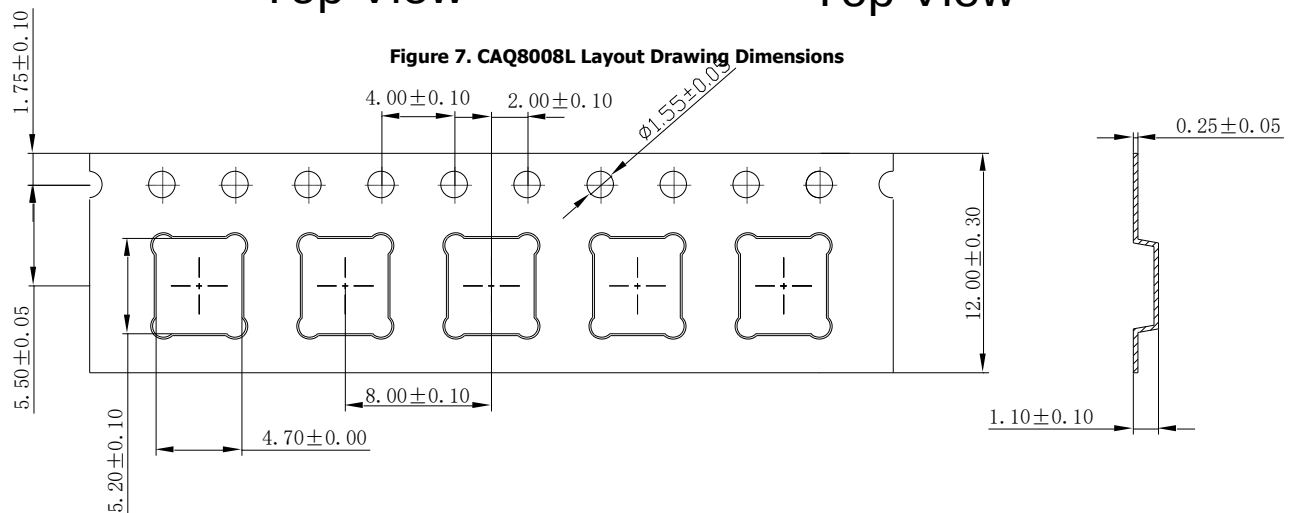
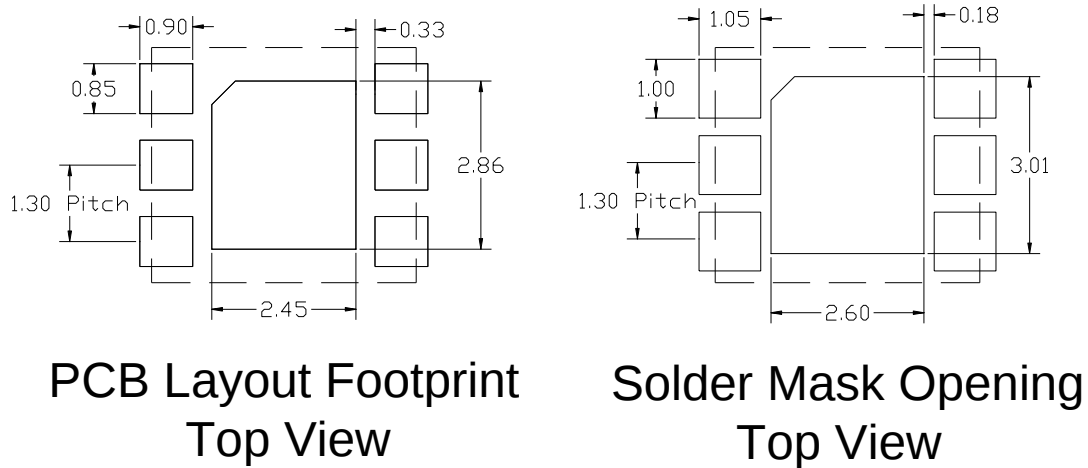


Figure 6. CAQ8008L Package Dimensions



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 ≤ 1 mm/100mm;
- 3.Roughness: $R_a < 0.8\mu\text{m}$;
- 4.Carrier tape color:Black.

Figure 8. Tape and Reel Dimensions