

Preliminary DATA SHEET

CAQ1215

28V, DC-1700MHz, 15Watts GaN Power Amplifier

Product overview

CAQ1215 is a 15W GaN power amplifier with input matching circuits. It operates DC-1700MHz with 28 volts rail, offers a general purpose, broadband, high power level and high efficiency wireless communication application.

Key Features

- DC – 1.7GHz
- Operating Drain Voltage: +28V
- 19dB linear Gain @1.2GHz
- 15W Peak Power @1.2GHz
- 58% Drain Efficiency @P_{satdB},1.2GHz
- 5x6mm DFN plastic package
- ROHS compatible

Applications

- Radio communication
- Driver amplifier for micro-base and macro-base Stations
- Active antenna array
- Pico/Small Cell
- Test Instrumentation
- Industrial, scientific, and medical
- Wideband amplifiers



CAQ1215

Figure 1. 5x6mm DFN Package

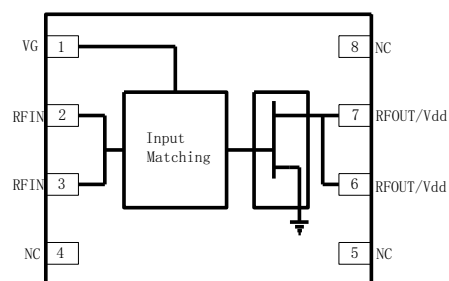


Figure 2. CAQ1215 Function Block Diagram

Table 1. CAQ1215 Pinout Descriptions

Pin	Name	Description
1	VG	Gate Bias
2, 3	RFIn	RF input port
4, 5, 8	NC	Not connected
6, 7	RFOUT/VDD	RF output port with Drain voltage

Ordering Information

Part No.	Description
CAQ1215	DC-1.7GHz 15W GaN PA without Flange, 7' Reel with 500pcs

Table 3. CAQ1215 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	225	°C
Thermal Resistance	Rθjc		°C/W
Operating Voltage	VDD	0 to 55	V
Drain-Source Voltage	VDSS	50	V
Gate-Source Voltage	VGS	-8 to 0	V
Maximum Forward Gate Current		10	mA
Input Power	PIN	+30	dBm

Table 4. CAQ1215 Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating frequency	f	DC		1.5	GHz
Operating temperature	TC	-40	25	85	°C
Drain Voltage	VDD		28	50	V
Gate Voltage	VGS		-3.15		V
Quiescent Current	IDQ		30		mA

Table 5. CAQ1215 Electrical Specifications

TYPICAL PERFORMANCE (VDD=28V, IDq=30mA, TC= +25 °C, Input /Output Load = 48Ω)

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		DC	1200	1480	MHz
Output P3dB	CW		41.8		dBm
Gain@ small signal	CW		19		dB
Drain efficiency@Psat	CW		58		%

Table 6. CAQ1215 28V Typical performance

Freq_MHz	30	88	137	370	470	915	1200	1500	1600	1700
S11	-7.3	-7.5	-7.7	-9.3	-10.5	-12.2	-11.4	-16.5	-12.5	-9.6
S21@ Small signal	15.9	15.8	16.1	16.5	16.5	18.4	19	17.7	16.5	15.1
P3dB_dBm	41.1	41.3	42.5	41.4	41.6	41.4	41.4	41	40.7	40.6
Psat_dBm	41.8	41.8	43	42	42.6	42	41.8	41.7	41.7	41.5
Psat_Watts	15.1	15.1	20	15.8	18.2	15.8	15.1	14.8	14.8	14.1
Gain_dB@Psat	10.6	11	10.8	11.5	11	12.9	13.6	12.5	11.6	10.2
Current_A@Psat	0.59	0.59	0.75	0.69	0.85	0.86	0.9	0.86	0.86	0.84
Efficiency_%@Psat	84.8%	81.2%	88.5%	77.1%	70.9%	62.4%	58.4%	58.0%	58.0%	53.8%

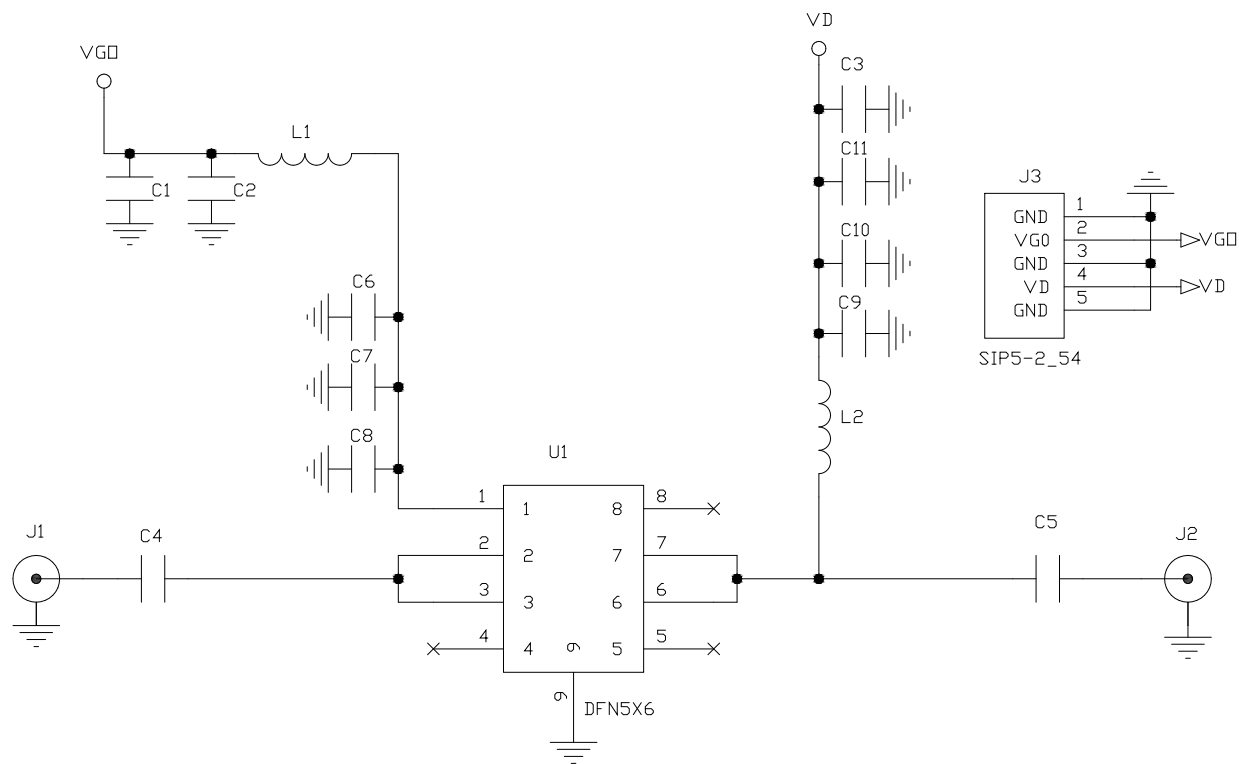


Figure 3. CAQ1215 Evaluation Board Schematic

Table 6. CAQ1215 Evaluation Board Bill of Materials (BOM)

Component	Description	P/N
C1, C2, C3	10uF, 1210	C1210
C4, C5	1nF, 0603	C0603
C6, C11	100nF	C0603
C7, C10	4.7nF	C0603
C8, C9	470pF	C0603
L1	0 Ohm, 0603	R0603
L2	3.5uH, Coil inductor 4310LC-352KE_	Coilcraft

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

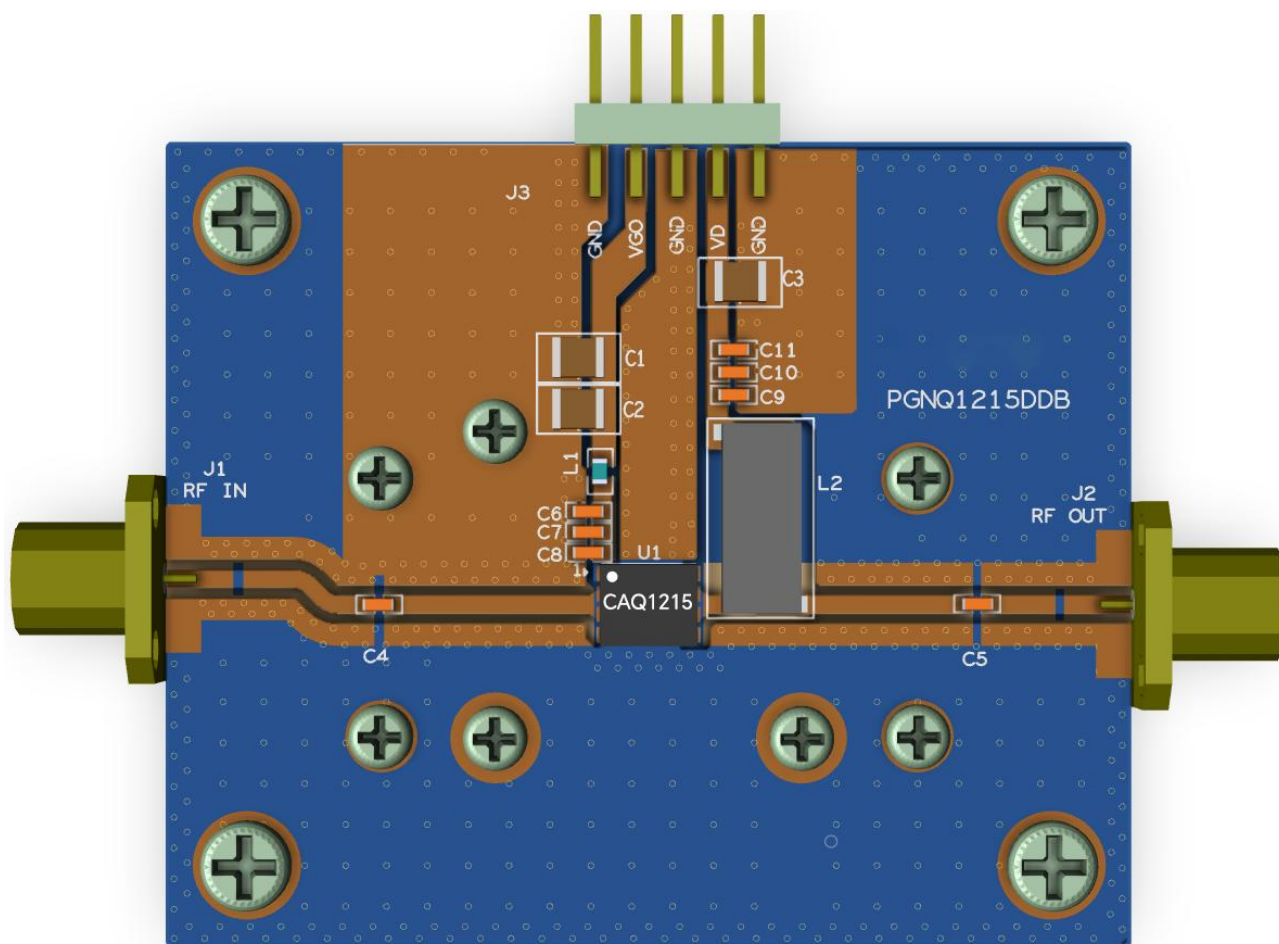


Figure 4. CAQ1215 Evaluation Board Schematic

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 Vgs to 30mA quiescent current in order.
- 3 . Apply RF signal.

Turn-off sequence

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

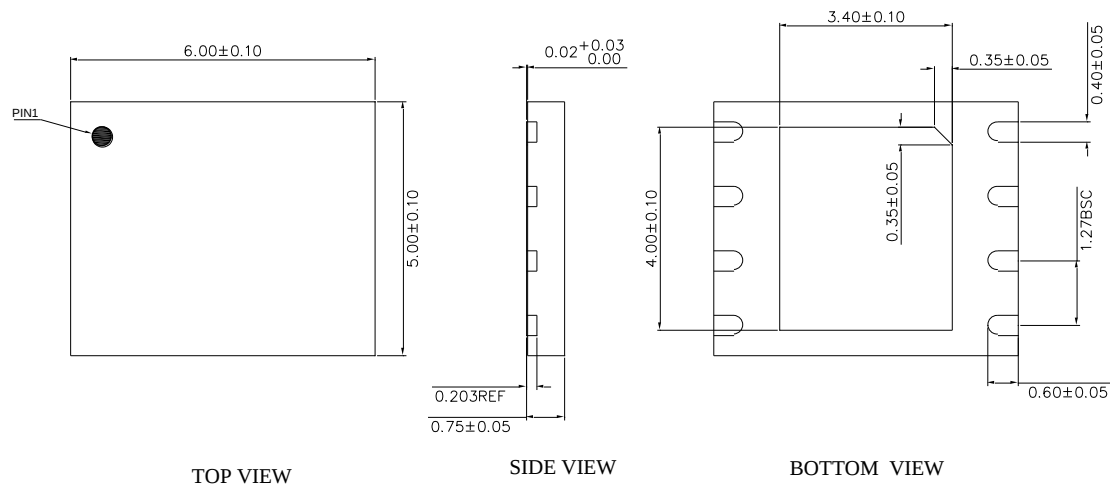
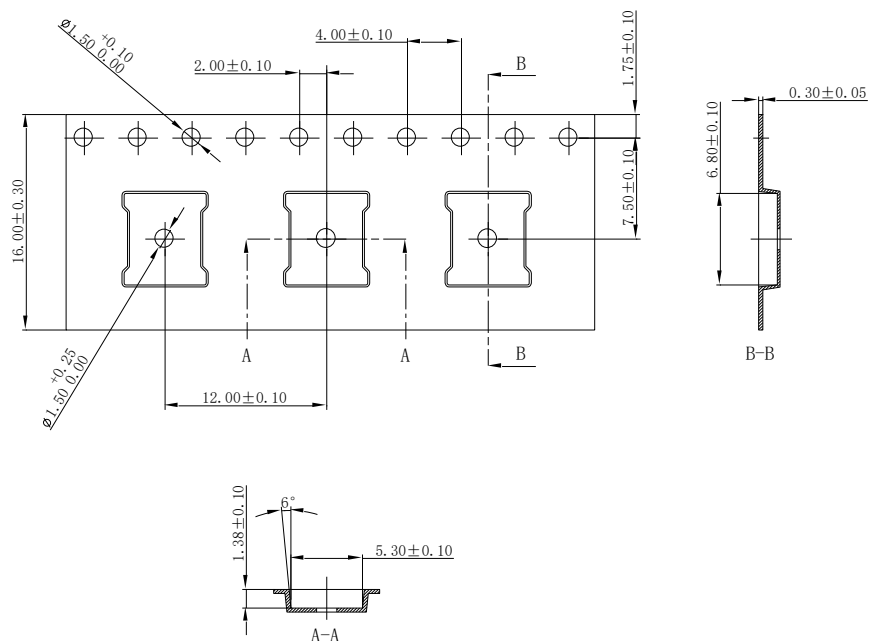


Figure 5. CAQ1215SN Package Dimensions



Figure 6. Marking



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: $Ra < 0.8\mu m$;
- 4.Carrier tape color:Black.

Figure 7. Tape and Reel Dimensions

CAQ1215 REVISION HISTORY

Revision	Date	Description
0.1	Jan 30,2024	Initial release of data sheet
0.2	March 20, 2025	Update L2 and others errors

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