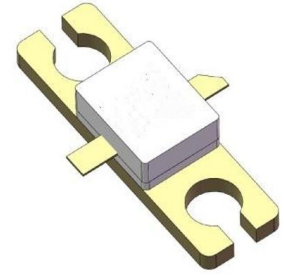


Performance features:

- ◆ Frequency range: 5.7 ~ 5.9 GHz
- ◆ Power gain: > 9dB
- ◆ Output power: > 39dBm
- ◆ Drain efficiency: > 60%
- ◆ Package Form: RF0302



Product Introduction:

CWBT-0060P08 is a kind of GaN power tube without pre-matching. The working frequency covers DC ~ 6.0 GHz. Under the test conditions of frequency 5.7 ~ 5.9 GHz and working voltage 28V, the continuous wave output power is greater than 39dBm, and the efficiency is greater than 58%, with the characteristics of high efficiency, high power and high reliability.

Table 1. Typical performance parameters (TC = 25 °C)

Index	Symbols	Test Conditions	Minimum Value	Typical value	Maximum value	Unit
Output power	P_{sat}	f = 5.7 ~ 5.9 GHz Pulse (1mS/100uS) $V_{DS} = 28V$, $I_{DQ} = 60mA$	39		40	dBm
Power gain	G_p			9.5		dB
Drain efficiency	E_{ff}		60		65	%
Output power	P_{sat}	f = 5.7 ~ 5.9 GHz CW $V_{DS} = 28V$, $I_{DQ} = 60mA$	39		40	dBm
Power gain	G_p			9.5		dB
Drain efficiency	E_{ff}		58		64	%

Table 2. Maximum ratings

Parameter	Symbols	Limit value	Unit
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GS}	-8,+2	V
Drain operating voltage	V_{DD}	36	V
Storage Temperature	T_{stg}	-65~175	°C
Channel Temperature	T_{ch}	225	°C
Maximum gate current @ TC = 25 °C	I_{gmax}	2	mA

Table 3 Thermal resistance parameters

Parameter	Symbols	Value	Unit
Thermal resistance (infrared measurement), chip surface to flange $T_C = 85\text{ }^\circ\text{C}, P_D = 6.5\text{ W}$	R_{QJC}	8.33	$^\circ\text{C/W}$

Table 4 Electrical parameters

DC parameters

Parameter	Symbols	Minimum Value	Typical value	Maximum value	Unit
Source-drain breakdown voltage ($V_g = -8\text{ V}, I_d = 1\text{ mA}$)	BV_{dss}		120		V
Gate on voltage ($V_d = 28\text{ V}, I_d = 2\text{ mA}$)	$V_{GS(th)}$		-3		V
Gate static voltage ($V_d = 28\text{ V}, I_d = 60\text{ mA}$)	$V_{GS(Q)}$		-2.65		V
Gate-source-drain current ($V_{DS} = 0\text{ V}, V_{GS} = -5\text{ V}$)	I_{GSS}			0.1	mA
Drain-Source-Drain Current ($V_{DS} = 28\text{ V}, V_{GS} = -5\text{ V}$)	I_{DSS}			1	mA

RF parameters (TC = 25 °C, F0 = 5.8 GHz)

Parameter	Symbols	Minimum Value	Typical value	Maximum value	Unit
Small signal gain ($V_{DS} = 28\text{ V}, I_{DQ} = 60\text{ mA}$)	G_{SS}	12			dB
Output power ($V_{DS} = 28\text{ V}, I_{DQ} = 60\text{ mA}$)	P_{OUT}		39(8)		dBm (W)
Drain efficiency ($V_{DS} = 28\text{ V}, I_{DQ} = 60\text{ mA}, P_{SAT}$)	η		60		%
Voltage standing wave ratio	V_{SWR}		10:1		$V_{DD} = 28\text{ V},$ $I_{DQ} = 60\text{ mA},$ $P_{OUT} = 8\text{ W CW}$

Remarks: VDS = 28V, CW signal, after 30 minutes of open circuit test under saturated power, there is no damage to the tube.

Typical test curve:

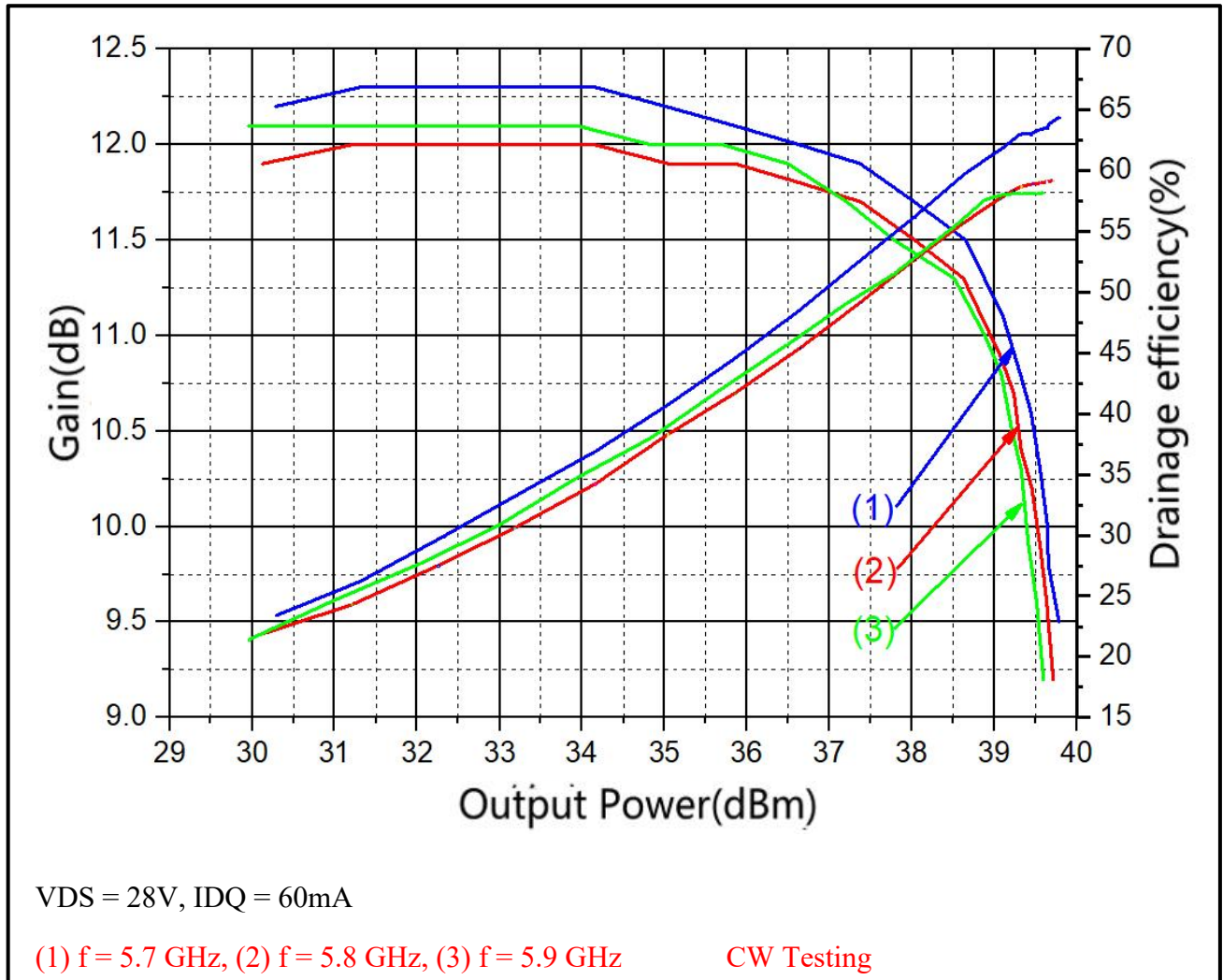


Figure 1

GaN device operation considerations:

- 1 When powering on, please strictly follow the order of first negative and then positive; When powering on, please add the gate voltage first and then add the leakage voltage; When powering down, reduce the leakage voltage first and then the gate voltage.
- 2 Pay attention to heat dissipation during use. The lower the temperature of the tube and shell, the longer the service life of the device.
- 3 It is recommended that the working shell temperature of the device should not exceed 75 °C. If it is too high, the performance of the device will deteriorate and the service life will be shortened.
- 4 During use, devices, instruments, etc. should be well grounded. This product is an electrostatic sensitive device. Pay attention to anti-static when storing and using.

Reference circuit diagram at 5.7 ~ 5.9 GHz application frequency

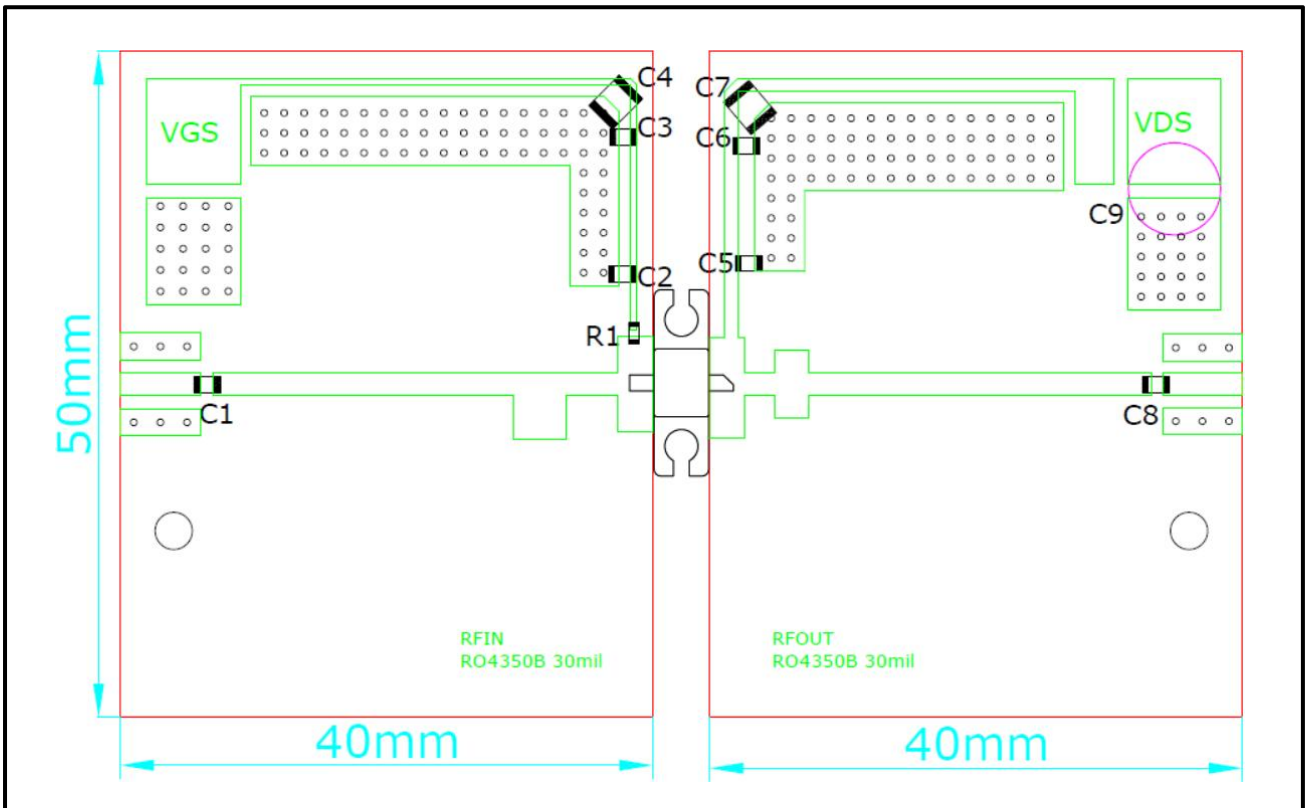


Figure 2

Table 5. Component description

Components	Description	Value	Remark
R1	Resistor 0805	5.1 Ω	
C1, C2, C5	Ceramic capacitor 0805	3.9 pF	ATC600F
C8	Ceramic capacitor 0805	2.7 pF	ATC600F
C3, C6	Ceramic capacitor 0805	10nF	TDK
C4, C7	Ceramic capacitor 1210	10uF	TDK
C9	Electrolytic capacitor	470uF, 63V	
Q1	CWBT-0060P08	8W	

Table 6. Additional application references

Attachments	Application frequency (GHz)	Minimum ~ Maximum Power (W)	Lowest ~ highest gain (dB)	Minimum ~ Maximum Efficiency (%)	Remark
1	5.3~5.9	8~9.5	10~10.1	62~71	
2	2.7~3.1	11	15.8~16.5	71~85	
3	0.5~2.7	8~10	13~15	50~70	
4	4.4~5	9~10	11~13	>60	ACPR <-45 @ 24dBm
5	4~6	6W	9~11	>40	
6	0.3~1	10~12	18	>65	

Table 7. S-Parameters

(Small signal, $V_{DS} = 28\text{ V}$, $I_{DQ} = 120\text{ mA}$, angle in degrees)

Freq.	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
500	0.943	-70.22	19.03	130.20	0.015	43.36	0.602	-47.09
600	0.929	-80.72	17.66	122.44	0.016	36.24	0.594	-54.32
700	0.916	-90.02	16.35	115.39	0.017	29.82	0.588	-60.86
800	0.905	-98.26	15.14	108.97	0.018	24.04	0.585	-66.77
900	0.896	-105.57	14.03	103.08	0.019	18.80	0.584	-72.14
1000	0.889	-112.08	13.03	97.66	0.020	14.02	0.586	-77.06
1100	0.882	-117.92	12.12	92.63	0.020	9.65	0.589	-81.58
1200	0.877	-123.18	11.31	87.93	0.020	5.62	0.594	-85.76
1300	0.873	-127.94	10.58	83.58	0.021	1.88	0.600	-89.65
1400	0.870	-132.30	9.92	79.39	0.021	-1.59	0.607	-93.28
1500	0.867	-136.29	9.32	75.46	0.021	-4.84	0.614	-96.69
1600	0.865	-139.99	8.78	71.72	0.021	-7.90	0.622	-99.91
1700	0.863	-143.43	8.29	68.15	0.021	-10.78	0.631	-102.94
1800	0.861	-146.65	7.85	64.74	0.021	-13.50	0.639	-105.82
1900	0.860	-149.69	7.45	61.45	0.021	-16.08	0.648	-108.56
2000	0.858	-152.56	7.08	58.29	0.021	-18.53	0.656	-111.16
2100	0.857	-155.30	6.75	55.23	0.021	-20.86	0.665	-113.66
2200	0.856	-157.92	6.44	52.27	0.021	-23.09	0.673	-116.04
2300	0.855	-160.43	6.16	49.40	0.020	-25.22	0.681	-118.33
2400	0.854	-162.87	5.90	46.60	0.020	-27.26	0.689	-120.53
2500	0.853	-165.23	5.67	43.88	0.020	-29.22	0.697	-122.64
2600	0.852	-167.54	5.45	41.21	0.020	-31.10	0.704	-124.68
2700	0.850	-169.80	5.25	38.60	0.020	-32.92	0.711	-126.65
2800	0.849	-172.01	5.07	36.05	0.020	-34.67	0.718	-128.55
2900	0.848	-174.20	4.90	33.53	0.020	-36.36	0.724	-130.39
3000	0.846	-176.37	4.75	31.06	0.020	-38.00	0.730	-132.17
3100	0.844	-178.53	4.60	28.62	0.020	-39.59	0.736	-133.90
3200	0.842	-179.31	4.47	26.21	0.020	-41.14	0.742	-135.58
3300	0.840	-177.15	4.35	23.82	0.019	-42.64	0.747	-137.22
3400	0.838	-174.99	4.24	21.45	0.019	-44.11	0.752	-138.81
3500	0.835	-172.81	4.14	19.09	0.019	-45.54	0.756	-140.37
3600	0.832	-170.61	4.05	16.74	0.019	-46.94	0.761	-141.89
3700	0.829	-168.37	3.96	14.40	0.019	-48.32	0.765	-143.37
3800	0.826	-166.10	3.88	12.06	0.019	-49.67	0.768	-144.83
3900	0.822	-163.79	3.81	9.72	0.019	-51.01	0.772	-146.25
4000	0.818	-161.42	3.75	7.37	0.019	-52.33	0.775	-147.65
4100	0.814	-158.99	3.69	5.00	0.019	-53.63	0.778	-149.03
4200	0.810	-156.49	3.63	2.62	0.019	-54.93	0.781	-150.39
4300	0.805	-153.92	3.59	0.21	0.019	-56.23	0.783	-151.72
4400	0.799	-151.26	3.55	-2.21	0.020	-57.53	0.786	-153.04
4500	0.794	-148.50	3.51	-4.67	0.020	-58.83	0.788	-154.35
4600	0.788	-145.63	3.48	-7.18	0.020	-60.14	0.790	-155.64
4700	0.781	-142.65	3.45	-9.72	0.020	-61.46	0.791	-156.93
4800	0.774	-139.53	3.42	-12.32	0.020	-62.79	0.792	-158.20
4900	0.767	-136.27	3.41	-14.96	0.020	-64.15	0.793	-159.47
5000	0.759	-132.86	3.39	-17.67	0.020	-65.54	0.794	-160.73
5100	0.751	-129.27	3.38	-20.44	0.020	-66.96	0.795	-161.99
5200	0.742	-125.49	3.37	-23.28	0.021	-68.41	0.795	-163.26
5300	0.733	-121.50	3.36	-26.19	0.021	-69.91	0.795	-164.52
5400	0.724	-117.29	3.35	-29.19	0.021	-71.45	0.795	-165.79
5500	0.714	-112.84	3.35	-32.27	0.021	-73.04	0.795	-167.07
5600	0.704	-108.13	3.35	-35.45	0.022	-74.69	0.794	-168.35
5700	0.694	-103.14	3.35	-38.72	0.022	-76.41	0.793	-169.65
5800	0.684	-97.86	3.35	-42.09	0.022	-78.18	0.792	-170.95
5900	0.674	-92.28	3.35	-45.56	0.022	-80.03	0.790	-172.28
6000	0.665	-86.37	3.35	-49.14	0.023	-81.95	0.788	-173.62

Product Dimensions (Package: RF0302)

Unit: mm

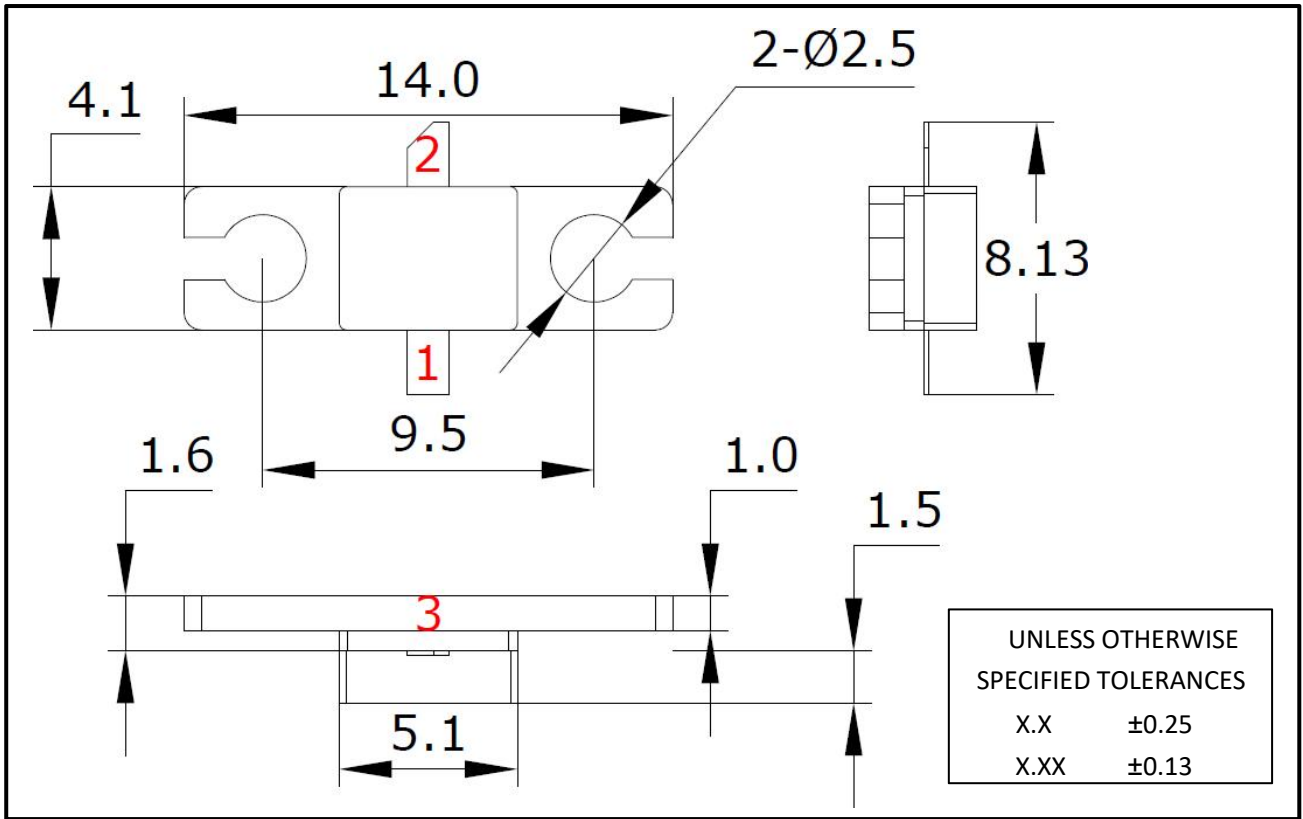


Figure 3

PIN 1: Gate PIN 2: Drain
PIN 3: Source (GND)

Table 7. Specifications and Revision History

Version	Description of modified content of specification sheet
V0.1	Preliminary Datasheet Creation
V1.0	Add S-Parameters