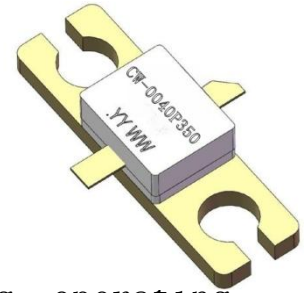


Performance Features :

- ◆ Frequency range: 1.5GHz
- ◆ Power gain: >16.4dB
- ◆ Output power: >45.5dBm (35W)
- ◆ Drain efficiency: >74%
- ◆ Package form: RF0302

**Product Description :**

CWBT-0040P35 is a GaN power tube without pre-matching, operating frequency covers DC~4.0GHz, under the test condition of frequency 1.5GHz and operating voltage 28V, the output power is more than 45.5dBm (35W), efficiency is more than 74%, with high efficiency, high power, high gain, etc.

Table 1. Typical performance parameters ($T_c=25^\circ\text{C}$)

Indicators	Symbols	Test conditions	Minimum value	Typical values	Maximum value	Unit
Output power	P_{sat}	f=1.5GHz Pulse (1mS/100uS) $V_{\text{DS}}=28\text{V}$, $I_{\text{DQ}}=180\text{mA}$		45.5		dBm
Power Gain	G_p			16.4		dB
Drain efficiency	E_{ff}			74		%

Table 2. Maximum ratings

Parameters	Symbols	Limit values	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	$^\circ\text{C}$
Channel Temperature	T_{ch}	225	$^\circ\text{C}$
Knot temperature	T_j	225	$^\circ\text{C}$
Maximum gate current @ TC=25 $^\circ\text{C}$	I_{gmax}	8	mA

Table 3 Thermal resistance parameters :

Parameters	Symbols	Value	Unit
Thermal resistance (IR measurement), chip surface to flange $T_c=85^\circ\text{C}$, $P_D=40\text{W}$	R_{qJC}	2.89	$^\circ\text{C/W}$

Table 4 Electrical parameters :

DC Parameters

Parameters	Symbols	Minimum value	Typical values	Maximum value	Unit
Source Leakage Breakdown Voltage ($V_g=-8\text{V}$, $I_d=1\text{mA}$)	BV_{dss}		120		V
Gate turn-on voltage ($V_d=28\text{V}$, $I_d=7\text{mA}$)	$V_{GS(th)}$		-3		V
Gate quiescent voltage ($V_d=28\text{V}$, $I_d=180\text{mA}$)	$V_{GS(Q)}$		-2.7		V
Gate-source leakage current ($V_{DS}=0\text{V}$, $V_{GS}=-5\text{V}$)	I_{GSS}			0.1	mA
Drain-source leakage current ($V_{DS}=28\text{V}$, $V_{GS}=-5\text{V}$)	I_{DSS}			1	mA

RF parameters ($T_c = 25^\circ\text{C}$, $F_0 = 1.5\text{GHz}$)

Parameters	Symbols	Minimum value	Typical values	Maximum value	Unit
Small signal gain ($V_{DS}=28\text{V}$, $I_{DQ}=180\text{mA}$)	G_{SS}	19.4			dB
Output power ($V_{DS}=28\text{V}$, $I_{DQ}=180\text{mA}$)	P_{OUT}		45.5 (35)		dBm (W)
Drain efficiency ($V_{DS}=28\text{V}$, $I_{DQ}=180\text{mA}$, P_{SAT})	η		74		%
Voltage VSWR	VSWR		10:1		$V_{DD} = 28\text{V}$, $I_{DQ} = 180\text{mA}$, $P_{OUT} = 35\text{W}$

NOTE: $V_{DS}=28\text{V}$, CW Signal , Open circuit test at saturation power for 30 minutes, no damage to the tube.

Typical test curves:

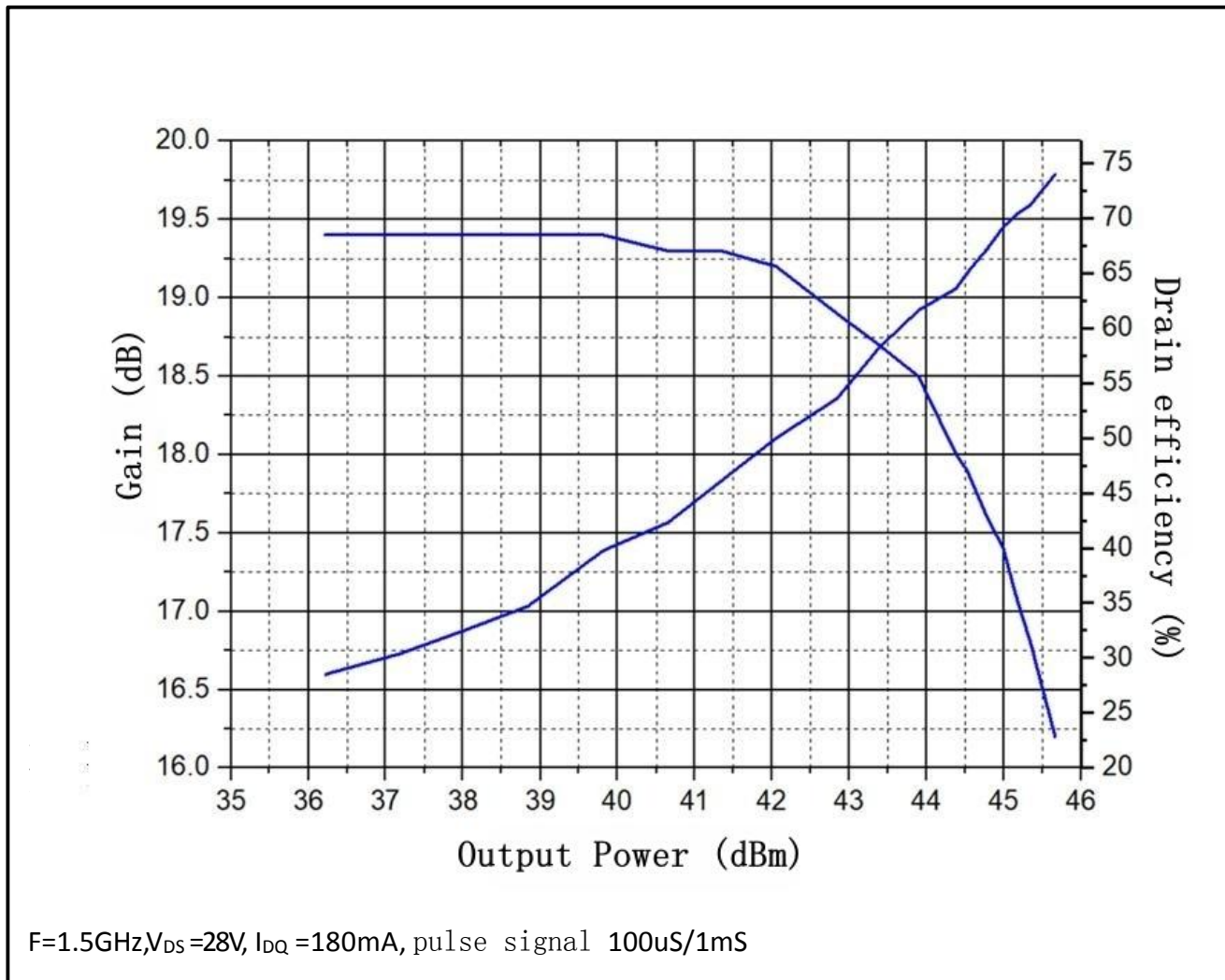


Figure 1

GaN device operating considerations:

1. When adding power, please strictly follow the order of negative first and then positive; when adding power, please add the gate voltage first and then the leakage voltage; when removing power, please lower the leakage voltage first and then the gate voltage.
2. Pay attention to the heat dissipation during use, the lower the temperature of the tube case, the longer the service life of the device.
3. Recommended device operating case temperature does not exceed 75 °C, too high will lead to deterioration of device performance and shorten the service life.
4. During use, devices and instruments should be well grounded. This product is an electrostatic sensitive device, so pay attention to anti-static when storing and using.

Table 5. Other application references (complete **DEMO** testing)

Annexes	Application frequency (GHz)	Minimum~maximum power (W)	Min~max gain (dB)	Minimum ~ Maximum efficiency (%)	Remarks
1	0.5~2.7	28~38	11.2~13.8	41~79	

Table 6: S-parameters

(Small signal, $V_{DS}=28V$, $I_{DQ}=250mA$, angle in degrees)

Freq.	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
500	0.899	-144.24	16.50	93.87	0.016	7.12	0.440	-144.55
600	0.897	-150.59	13.87	88.33	0.016	2.24	0.456	-147.19
700	0.896	-155.36	11.91	83.59	0.016	-1.84	0.471	-148.93
800	0.896	-159.11	10.41	79.37	0.016	-5.39	0.487	-150.17
900	0.896	-162.17	9.22	75.53	0.016	-8.56	0.502	-151.13
1000	0.897	-164.73	8.25	71.98	0.016	-11.44	0.518	-151.94
1100	0.898	-166.94	7.44	68.64	0.015	-14.10	0.533	-152.68
1200	0.900	-168.88	6.77	65.49	0.015	-16.56	0.549	-153.40
1300	0.901	-170.62	6.19	62.49	0.015	-18.87	0.564	-154.12
1400	0.903	-172.20	5.70	59.62	0.015	-21.03	0.579	-154.85
1500	0.904	-173.65	5.27	56.87	0.015	-23.07	0.594	-155.60
1600	0.906	-175.01	4.89	54.22	0.014	-25.00	0.608	-156.37
1700	0.907	-176.29	4.55	51.67	0.014	-26.82	0.622	-157.17
1800	0.909	-177.50	4.25	49.20	0.014	-28.55	0.635	-157.99
1900	0.910	-178.67	3.99	46.81	0.014	-30.19	0.648	-158.82
2000	0.912	-179.79	3.75	44.49	0.013	-31.73	0.661	-159.68
2100	0.913	179.12	3.53	42.24	0.013	-33.20	0.672	-160.54
2200	0.915	178.06	3.34	40.05	0.013	-34.59	0.684	-161.42
2300	0.916	177.02	3.16	37.92	0.013	-35.91	0.694	-162.30
2400	0.917	176.00	3.00	35.85	0.013	-37.15	0.704	-163.19
2500	0.918	174.99	2.86	33.83	0.012	-38.32	0.714	-164.09
2600	0.919	173.99	2.72	31.85	0.012	-39.43	0.723	-164.99
2700	0.920	173.00	2.60	29.92	0.012	-40.47	0.732	-165.89
2800	0.921	172.02	2.49	28.03	0.012	-41.45	0.740	-166.78
2900	0.922	171.04	2.38	26.18	0.011	-42.37	0.747	-167.68
3000	0.922	170.06	2.29	24.36	0.011	-43.23	0.755	-168.58
3100	0.923	169.07	2.20	22.58	0.011	-44.03	0.761	-169.48
3200	0.924	168.09	2.12	20.82	0.011	-44.78	0.768	-170.37
3300	0.924	167.09	2.04	19.09	0.011	-45.47	0.774	-171.27
3400	0.924	166.09	1.97	17.39	0.011	-46.10	0.779	-172.16
3500	0.925	165.08	1.91	15.71	0.010	-46.68	0.785	-173.05
3600	0.925	164.07	1.85	14.04	0.010	-47.21	0.789	-173.94
3700	0.925	163.04	1.79	12.40	0.010	-47.69	0.794	-174.82
3800	0.925	161.99	1.74	10.76	0.010	-48.11	0.798	-175.71
3900	0.925	160.93	1.69	9.15	0.010	-48.48	0.802	-176.60
4000	0.925	159.85	1.65	7.54	0.010	-48.80	0.806	-177.49
4100	0.925	158.76	1.61	5.94	0.010	-49.07	0.810	-178.38
4200	0.924	157.64	1.57	4.34	0.010	-49.29	0.813	-179.27
4300	0.924	156.51	1.54	2.75	0.009	-49.46	0.816	179.83
4400	0.924	155.34	1.51	1.16	0.009	-49.58	0.819	178.93
4500	0.923	154.16	1.48	-0.42	0.009	-49.65	0.821	178.03
4600	0.922	152.94	1.45	-2.01	0.009	-49.67	0.823	177.12
4700	0.922	151.69	1.42	-3.61	0.009	-49.64	0.826	176.21
4800	0.921	150.41	1.40	-5.21	0.009	-49.56	0.827	175.29
4900	0.920	149.10	1.38	-6.83	0.009	-49.44	0.829	174.36
5000	0.919	147.75	1.36	-8.45	0.009	-49.27	0.831	173.42
5100	0.918	146.36	1.35	-10.09	0.009	-49.06	0.832	172.48
5200	0.916	144.92	1.33	-11.75	0.009	-48.81	0.833	171.52
5300	0.915	143.44	1.32	-13.43	0.009	-48.52	0.834	170.55
5400	0.914	141.92	1.30	-15.12	0.009	-48.20	0.835	169.57
5500	0.912	140.33	1.29	-16.84	0.009	-47.84	0.835	168.57
5600	0.910	138.70	1.29	-18.59	0.009	-47.46	0.836	167.56
5700	0.908	137.00	1.28	-20.37	0.009	-47.06	0.836	166.53
5800	0.907	135.24	1.27	-22.18	0.009	-46.64	0.836	165.48
5900	0.904	133.41	1.27	-24.03	0.009	-46.22	0.836	164.41
6000	0.902	131.50	1.26	-25.91	0.009	-45.79	0.836	163.32

Product Size (Package:RF0302)

Unit:mm

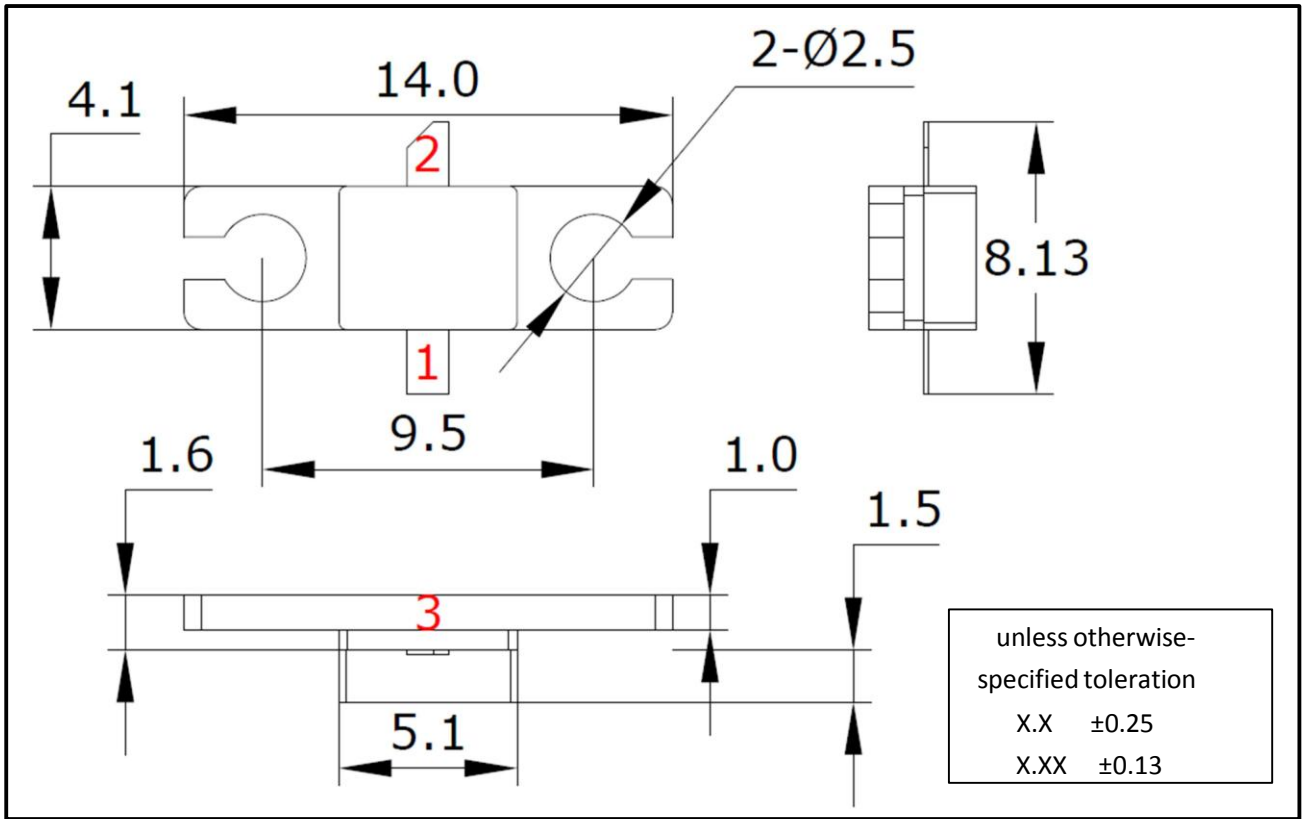


Figure 2

PIN 1: Gate

PIN 2: Drain

PIN 3: Source (GND)