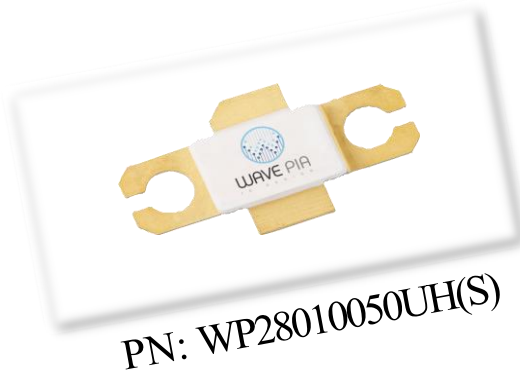




WP28010050UH(S)

50W, 28V GaN HEMT Unmatched TR



The WP28010050UH(S) is a 50W gallium nitride (GaN) High Electron Mobility Transistor (HEMT). This GaN HEMT is a wideband transistor optimized for C-band operation in a user-friendly device for high bandwidth applications. Gallium nitride (GaN) HEMT is a device optimized for 5G. GaN HEMT resistance is only 1/10 that of silicon transistors, making it capable of switching frequencies faster for greater energy efficiency.

Features

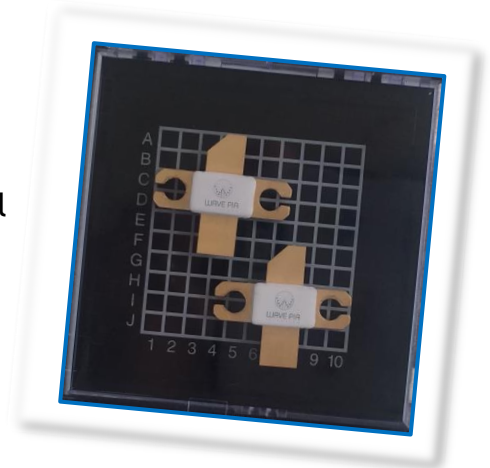
- Up to 10 GHz Operation
- 11.7 dB Typical Small Signal Gain @ 6.0 GHz
- 30 W Typical Psat @6.0GHz
- 28V Operation
- High Breakdown Voltage
- High Breakdown Voltage
- High Efficiency
- Reliability Monitoring Supporting

Applications

- U/VHF Amplifiers
- C-band Amplifiers
- Broadband Amplifiers
- Base Station Communications
- Drone, UAV
- WiMAX, LTE, WCDMA, GSM
- WPT, V2X
- Radar application

Packaging Information

- Unmatched TRs are shipped in packaged-level with each-bag or Gel-Pak® containers.
- Possible Reel-type container for SMT



Absolute Maximum Ratings (not simultaneous) at 25 °C

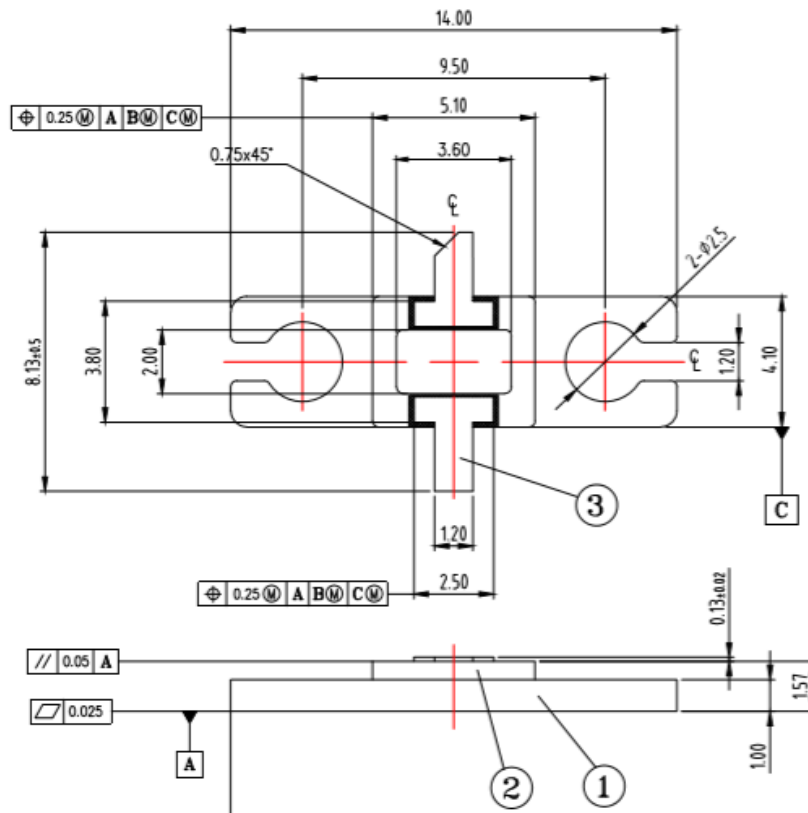
Parameter	Parameter	Typical Value	Units	Conditions
Threshold voltage @ Id=1mA/mm, Vd=10V	V _{to}	-3.2	V	25°C
Breakdown voltage @ Id=1mA/mm	V _{DG}	>100	V	25°C
Drain-source current, Id @ Vd=10V, Vg=0	I _{dss}	880	mA/mm	25°C
Operating Junction Temperature	T _J	225	°C	
Storage Temperature	T _{STG}	-65, +150	°C	
Thermal Resistance, Junction to Case (packaged)	R _{θJC}		°C/W	
Thermal Resistance, Junction to Case (die only)	R _{θJC}		°C/W	
Mounting Temperature (30 seconds)	T _S	320	°C	30 seconds

Electrical Characteristics (Frequency = 6.0 GHz unless otherwise stated; TC = 25 °C)

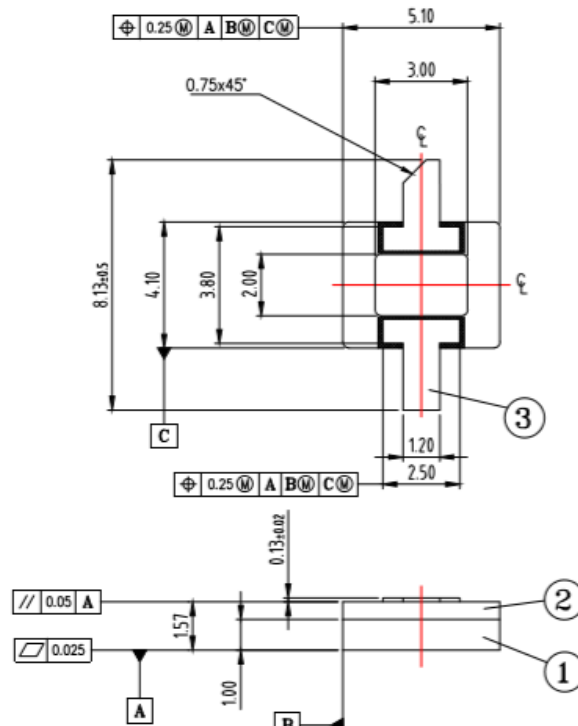
Parameter	Parameter	Typical Value	Units	Conditions
DC Characteristics				
Ohmic contact resistance	RC	0.4	Ohm-mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I _{dmax}	1050	mA/mm	25°C
Max. trans-conductance, @ Vd=10V, Vg=-4V ~ -1V (1X125µm device)	GM_PEAK	340	mS/mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I _{dmax}	1000	mA/mm	25°C
RF Characteristics				
Small Signal Gain	G _{SS}	>10	dB	V _{DD} =28V, I _{DQ} =200mA
Saturated Power Output	P _{SAT}	50	W	V _{DD} =28V, I _{DQ} =200mA
Drain Efficiency	η	>40	%	V _{DD} =28V, I _{DQ} =200mA
Intermodulation Distortion	IM3	<-30	dBc	V _{DD} =28V, I _{DQ} =200mA
Output Mismatch Stress	VSWR	10:1	ψ	



TR Dimensions (units in inch)



<WP28010050UH>



<WP28010050US>

Assembly Notes:

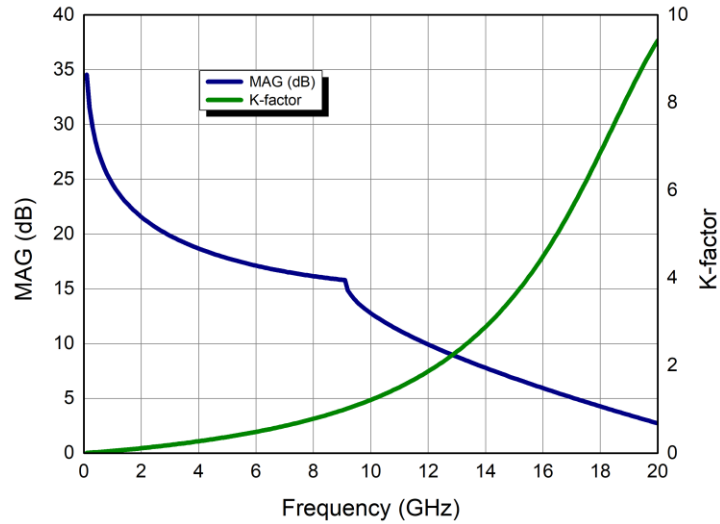
- Recommended solder is AuSn (80/20) solder. Refer to Wavepia's guide for the Eutectic Die Bond Procedure



Typical Performance

Simulated Maximum Available Gain (MAG) and K Factor of the WP28010050UH(S)

$$V_{DD} = 28 \text{ V}, I_{DQ} = 200 \text{ mA}$$



Intrinsic TR parameters - reference planes at centers of gate and drain pads. Wire bonds assumed.

Typical Performance

Simulated Minimum Noise Figure of the WP28010050UH(S)

$$V_{DD} = 28 \text{ V}, I_{DQ} = 200 \text{ mA}$$

Under construction



Typical TR S-Parameters

(Small Signal, $V_{DS} = 28\text{ V}$, $I_{DQ} = 200\text{ mA}$, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
100MHz	0.934072	-110.619	46.99783	121.1904	0.016519	31.21257	0.555904	-129.278
200MHz	0.914595	-142.627	26.7812	103.4057	0.018825	13.62533	0.614326	-152.622
300MHz	0.909658	-155.564	18.35739	94.98057	0.019353	5.358725	0.629502	-161.235
400MHz	0.907966	-162.609	13.89786	89.40492	0.019533	-0.0681	0.63655	-165.615
500MHz	0.907387	-167.157	11.15915	85.039	0.019601	-4.28903	0.641416	-168.25
600MHz	0.907323	-170.429	9.311184	81.29902	0.019621	-7.88592	0.645671	-170.015
700MHz	0.907551	-172.967	7.981618	77.92817	0.019617	-11.1147	0.649845	-171.297
800MHz	0.90797	-175.049	6.979706	74.7968	0.019599	-14.1046	0.654134	-172.293
900MHz	0.908524	-176.829	6.197935	71.83272	0.019572	-16.9276	0.658604	-173.113
1000MHz	0.90918	-178.403	5.571201	68.99272	0.019539	-19.6267	0.663265	-173.826
1100MHz	0.909913	-179.832	5.057812	66.24941	0.019503	-22.2293	0.668102	-174.473
1200MHz	0.910704	178.8434	4.629853	63.58454	0.019466	-24.7534	0.673083	-175.085
1300MHz	0.911537	177.5941	4.267936	60.9854	0.019429	-27.2118	0.678173	-175.681
1400MHz	0.9124	176.3991	3.95818	58.44276	0.019394	-29.6136	0.683331	-176.274
1500MHz	0.913278	175.2425	3.690387	55.94961	0.019361	-31.9659	0.68852	-176.875
1600MHz	0.914161	174.1121	3.456894	53.5004	0.019332	-34.2741	0.693701	-177.49
1700MHz	0.91504	172.9984	3.251836	51.09055	0.019308	-36.5428	0.69884	-178.124
1800MHz	0.915904	171.8936	3.070645	48.71608	0.019289	-38.7759	0.703903	-178.782
1900MHz	0.916745	170.7912	2.90971	46.37344	0.019278	-40.977	0.708861	-179.464
2000MHz	0.917556	169.6857	2.766139	44.05931	0.019275	-43.1494	0.713688	179.8264
2100MHz	0.918329	168.5723	2.63759	41.77054	0.019281	-45.2962	0.71836	179.0882
2200MHz	0.919058	167.4468	2.522143	39.50404	0.019296	-47.4205	0.722856	178.3205
2300MHz	0.919737	166.3051	2.418214	37.25673	0.019323	-49.5253	0.727159	177.5224
2400MHz	0.92036	165.1436	2.324482	35.02551	0.019361	-51.6138	0.731252	176.6932
2500MHz	0.920922	163.9589	2.239836	32.80724	0.019412	-53.689	0.735121	175.8322
2600MHz	0.921419	162.7473	2.16334	30.59868	0.019477	-55.7542	0.738756	174.9385
2700MHz	0.921847	161.5056	2.094198	28.39651	0.019557	-57.8126	0.742146	174.0114
2800MHz	0.922201	160.2302	2.03173	26.19728	0.019652	-59.8678	0.745281	173.0498
2900MHz	0.922478	158.9176	1.975352	23.99742	0.019764	-61.9232	0.748155	172.0526
3000MHz	0.922674	157.564	1.924564	21.79319	0.019894	-63.9827	0.75076	171.0185
3100MHz	0.922784	156.1656	1.878934	19.5807	0.020043	-66.05	0.753089	169.9459
3200MHz	0.922806	154.7183	1.838088	17.35587	0.020211	-68.1292	0.755135	168.833
3300MHz	0.922737	153.2177	1.801703	15.11442	0.0204	-70.2246	0.756894	167.6778
3400MHz	0.922571	151.6592	1.769502	12.85183	0.020612	-72.3407	0.758359	166.4779
3500MHz	0.922306	150.0377	1.741245	10.56334	0.020847	-74.4823	0.759523	165.2307
3600MHz	0.921937	148.3479	1.716723	8.243914	0.021107	-76.6543	0.760378	163.9332
3700MHz	0.921461	146.5839	1.695758	5.888216	0.021394	-78.862	0.760919	162.5819
3800MHz	0.920873	144.7394	1.678199	3.490571	0.021708	-81.1112	0.761136	161.173
3900MHz	0.920169	142.8074	1.663915	1.04494	0.022051	-83.4079	0.76102	159.7024

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For more information, please contact :

- *For more details : WAVEPIA Co., Ltd.*
- *#1301, 557, Dongtangiheung-ro, Hwaseong-si, Gyeonggi-do, Republic of Korea*
- *Application Support: platune@wavepia.com*

Sanghun Lee
CTO
WAVEPIA, IC DESIGN
+82.31.8058.3374