WP28015030UH(S)

30W, 28V GaN HEMT unmatched TR

PN: WP28015030UH(S)

The WP28015030UH(S) is a 30W 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

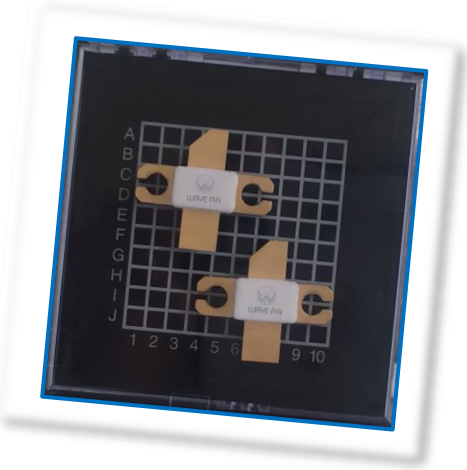
- Up to 10 GHz Operation
- 11.7 dB Typical Small Signal Gain @ 6.0 GHz
- 30 W Typical Psat @6.0GHz
- 28V Operation
- High Breakdown Voltage
- High Breakdown Voltage
- High Efficiency
- Reliability Monitoring Supporting

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



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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)	$R_{\theta JC}$		°C/W	
Thermal Resistance, Junction to Case (die only)	$R_{\theta JC}$		°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}=330mA
Saturated Power Output	P_{SAT}	25	W	V_{DD}=28V, I_{DQ}=330mA
Drain Efficiency	η	>40	%	V_{DD}=28V, I_{DQ}=330mA
Intermodulation Distortion	IM3	<-30	dBc	V_{DD}=28V, I_{DQ}=330mA
Output Mismatch Stress	VSWR	10:1	ψ	

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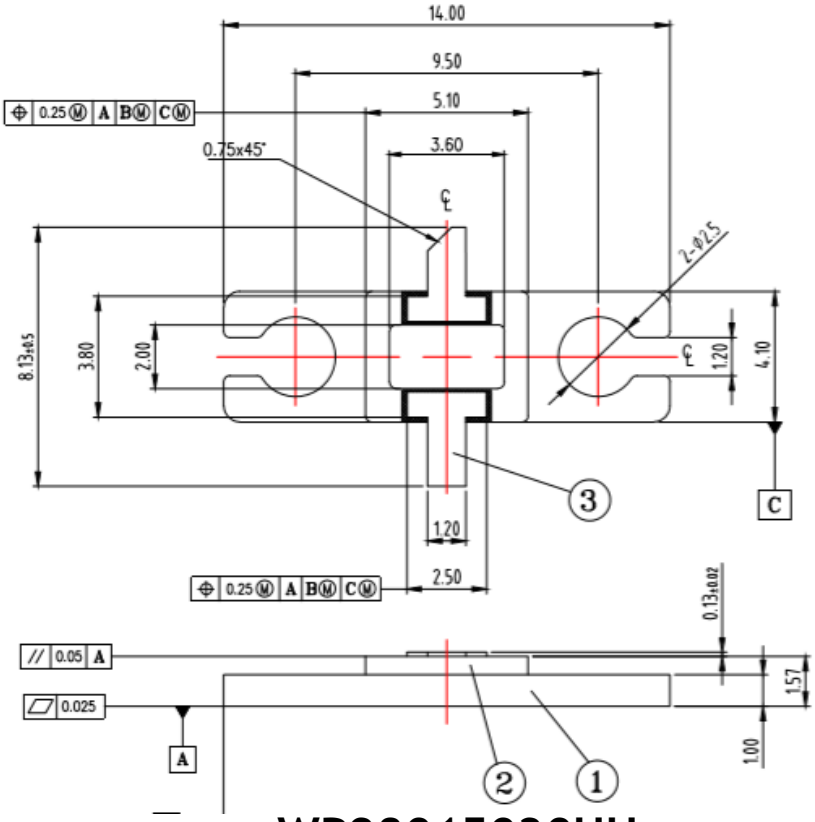
TR Dimensions (units in inch)



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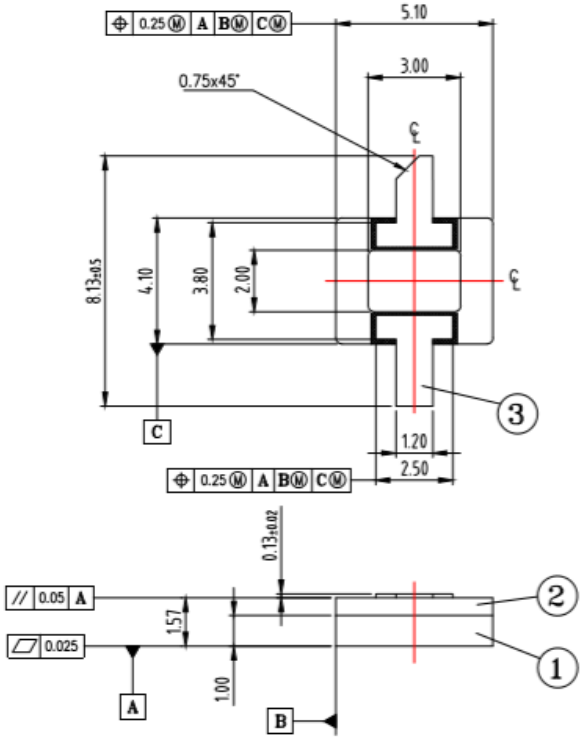

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Assembly Notes:

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

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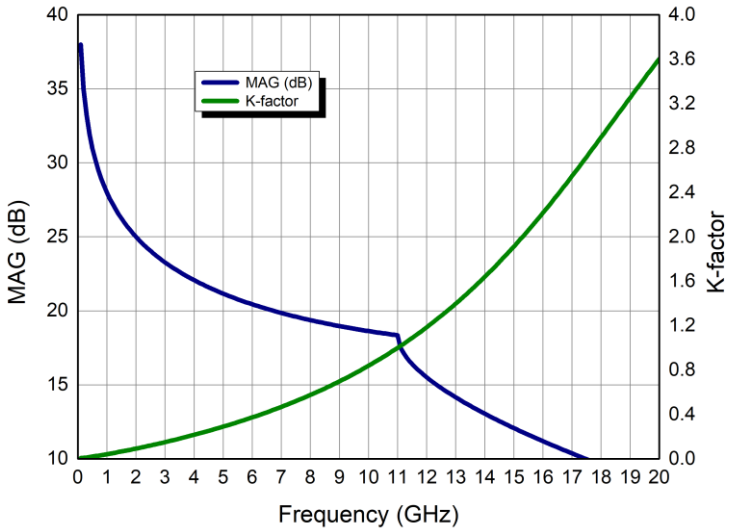
Typical Performance

Simulated Maximum Available Gain (MAG) and K Factor of the WP28015030UH(S)

V_{DD} = 28 V, I_{DQ} = 330 mA



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

Typical Performance

Simulated Minimum Noise Figure of the WP28015030UH(S)

V_{DD} = 28 V, I_{DQ} = 330 mA

Under construction

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Typical TR S-Parameters

(Small Signal, V_{DS} = 28 V, I_{DQ} = 330 mA, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
1000MHz	0.957162	-86.0336	67.46303	134.0622	0.010723	44.08787	0.454753	-118.646
1100MHz	0.931235	-124.367	43.15517	113.4138	0.013718	23.72872	0.56633	-144.913
1200MHz	0.92208	-142.21	30.63998	103.0639	0.014608	13.60957	0.600186	-155.936
1300MHz	0.91821	-152.285	23.54781	96.52149	0.014968	7.283277	0.614133	-161.873
1400MHz	0.916276	-158.817	19.06855	91.69982	0.015149	2.671945	0.621414	-165.58
1500MHz	0.915197	-163.476	16.00572	87.78662	0.015256	-1.03375	0.62598	-168.131
1600MHz	0.914553	-167.033	13.78743	84.40847	0.015329	-4.20597	0.629293	-170.012
1700MHz	0.914157	-169.894	12.11051	81.37149	0.015385	-7.03794	0.631989	-171.475
1800MHz	0.913912	-172.287	10.80048	78.5655	0.015432	-9.63947	0.634369	-172.664
1900MHz	0.913767	-174.355	9.750234	75.92342	0.015474	-12.0774	0.636589	-173.666
2000MHz	0.913689	-176.188	8.890551	73.40208	0.015516	-14.3948	0.638732	-174.538
2100MHz	0.913658	-177.848	8.174763	70.97243	0.015559	-16.6206	0.640842	-175.319
2200MHz	0.913658	-179.379	7.5703	68.61417	0.015603	-18.775	0.642939	-176.034
2300MHz	0.913679	179.1887	7.053759	66.31259	0.01565	-20.8726	0.645032	-176.704
2400MHz	0.913712	177.8307	6.607902	64.05675	0.015701	-22.9244	0.64712	-177.343
2500MHz	0.913751	176.5291	6.219759	61.83823	0.015757	-24.9386	0.649199	-177.963
2600MHz	0.913788	175.2698	5.879387	59.65036	0.015818	-26.9221	0.65126	-178.571
2700MHz	0.913818	174.0415	5.579044	57.48775	0.015884	-28.88	0.653293	-179.176
2800MHz	0.913837	172.8346	5.31261	55.34587	0.015957	-30.817	0.655286	-179.781
2900MHz	0.913839	171.6415	5.07519	53.22082	0.016037	-32.7368	0.657226	179.608
3000MHz	0.91382	170.4552	4.862825	51.10916	0.016124	-34.643	0.659099	178.9875
3100MHz	0.913776	169.2699	4.672279	49.00777	0.01622	-36.5385	0.660893	178.3544
3200MHz	0.913701	168.0803	4.500884	46.91371	0.016324	-38.4263	0.662594	177.7061
3300MHz	0.913592	166.8815	4.346423	44.82423	0.016438	-40.3092	0.664189	177.0401
3400MHz	0.913445	165.6691	4.207043	42.7366	0.016561	-42.1898	0.665663	176.3542
3500MHz	0.913256	164.4388	4.081182	40.64816	0.016696	-44.0708	0.667005	175.6465
3600MHz	0.91302	163.1864	3.96752	38.55621	0.016841	-45.9549	0.6682	174.9152
3700MHz	0.912734	161.9079	3.864933	36.45802	0.017	-47.8447	0.669236	174.1584
3800MHz	0.912393	160.5993	3.772465	34.35077	0.017171	-49.7431	0.670101	173.3742
3900MHz	0.911993	159.2563	3.689296	32.23155	0.017356	-51.6529	0.67078	172.561
4000MHz	0.911531	157.8748	3.614722	30.09732	0.017556	-53.5772	0.671262	171.7169
4100MHz	0.911001	156.4505	3.54814	27.94489	0.017771	-55.5192	0.671533	170.8398
4200MHz	0.910399	154.9788	3.489031	25.7709	0.018004	-57.4821	0.67158	169.9277
4300MHz	0.909722	153.4549	3.436951	23.57178	0.018254	-59.4696	0.67139	168.9783
4400MHz	0.908964	151.8737	3.391517	21.34376	0.018523	-61.4854	0.670948	167.9893
4500MHz	0.908122	150.2298	3.352404	19.0828	0.018813	-63.5334	0.670241	166.958
4600MHz	0.90719	148.5172	3.319333	16.78462	0.019124	-65.6181	0.669253	165.8814
4700MHz	0.906164	146.7298	3.292068	14.4446	0.019457	-67.7438	0.667969	164.7564
4800MHz	0.90504	144.8607	3.270411	12.05784	0.019815	-69.9156	0.666371	163.5793

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Typical TR S-Parameters

(Small Signal, V_{DS} = 28 V, I_{DQ} = 330 mA, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
4900MHz	0.88763	119.6837	3.334473	-15.7672	0.02505	-95.5476	0.628373	147.7878
5000MHz	0.885268	116.2545	3.366586	-19.1211	0.025769	-98.6773	0.621744	145.6353
5100MHz	0.88282	112.5985	3.402711	-22.6185	0.026526	-101.95	0.614451	143.3327
5200MHz	0.880306	108.6969	3.442506	-26.2713	0.027321	-105.376	0.606447	140.8633
5300MHz	0.877756	104.5305	3.485519	-30.0916	0.028149	-108.969	0.597681	138.2079
5400MHz	0.875204	100.0799	3.531161	-34.0921	0.02901	-112.742	0.588104	135.3448
5500MHz	0.872697	95.32604	3.578675	-38.2852	0.029895	-116.705	0.577665	132.2492
5600MHz	0.870292	90.25085	3.627101	-42.6831	0.030799	-120.873	0.566317	128.893
5700MHz	0.868059	84.83865	3.67525	-47.2972	0.031712	-125.256	0.554023	125.2442
5800MHz	0.866078	79.07728	3.721677	-52.1376	0.032619	-129.863	0.540761	121.2666
5900MHz	0.86444	72.9598	3.764666	-57.2121	0.033506	-134.704	0.526538	116.9194
6000MHz	0.863243	66.48633	3.802238	-62.5258	0.034353	-139.783	0.511396	112.1572
6100MHz	0.862589	59.66593	3.832183	-68.0797	0.035137	-145.1	0.49544	106.9297
6200MHz	0.862569	52.51848	3.852127	-73.8704	0.035832	-150.653	0.478852	101.1825
6300MHz	0.863264	45.07595	3.859647	-79.8887	0.036413	-156.433	0.461916	94.85918
6400MHz	0.864726	37.38305	3.852421	-86.1193	0.036852	-162.423	0.445049	87.90407
6500MHz	0.866971	29.49673	3.828407	-92.5404	0.037122	-168.603	0.428813	80.26948
6600MHz	0.869975	21.48434	3.78604	-99.1243	0.037203	-174.944	0.413923	71.92614
6700MHz	0.873669	13.42064	3.724403	-105.838	0.037078	178.5869	0.40123	62.87864
6800MHz	0.877945	5.383765	3.643355	-112.643	0.036738	172.0271	0.391655	53.18375
6900MHz	0.88267	-2.54933	3.543579	-119.501	0.036184	165.4164	0.386096	42.96543
7000MHz	0.887697	-10.3072	3.426547	-126.371	0.035422	158.7949	0.385287	32.41706
7100MHz	0.89288	-17.8274	3.294399	-133.214	0.03447	152.2017	0.389667	21.78229
7200MHz	0.898092	-25.0594	3.149763	-139.994	0.033349	145.6732	0.399299	11.31616
7300MHz	0.90323	-31.9651	2.995554	-146.679	0.032087	139.2418	0.413868	1.241083
7400MHz	0.908222	-38.5195	2.834764	-153.24	0.030714	132.9357	0.432762	-8.28399
7500MHz	0.913023	-44.7093	2.670292	-159.653	0.029258	126.7786	0.455187	-17.1718
7600MHz	0.917611	-50.5314	2.504812	-165.9	0.027748	120.7897	0.480292	-25.3967
7700MHz	0.921984	-55.991	2.340681	-171.966	0.026211	114.984	0.507247	-32.9757
7800MHz	0.926151	-61.0998	2.179897	-177.838	0.024671	109.3732	0.535303	-39.9505
7900MHz	0.930125	-65.8736	2.024085	176.4908	0.023147	103.9655	0.563811	-46.3734
8000MHz	0.933922	-70.3313	1.874505	171.0267	0.021656	98.76642	0.592235	-52.2985
8100MHz	0.937557	-74.4932	1.732085	165.7725	0.020213	93.77922	0.620142	-57.7769
8200MHz	0.94104	-78.3801	1.597449	160.7294	0.018826	89.0049	0.647197	-62.8549
8300MHz	0.944379	-82.0125	1.470966	155.8965	0.017504	84.44269	0.673151	-67.573
8400MHz	0.947579	-85.4102	1.352784	151.2714	0.016251	80.09026	0.697828	-71.9662
8500MHz	0.950642	-88.5919	1.242875	146.8504	0.015071	75.94393	0.721117	-76.0652
8600MHz	0.953569	-91.575	1.141072	142.6288	0.013964	71.9989	0.742954	-79.8964
8700MHz	0.95636	-94.3754	1.0471	138.6006	0.01293	68.24943	0.763322	-83.4827

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