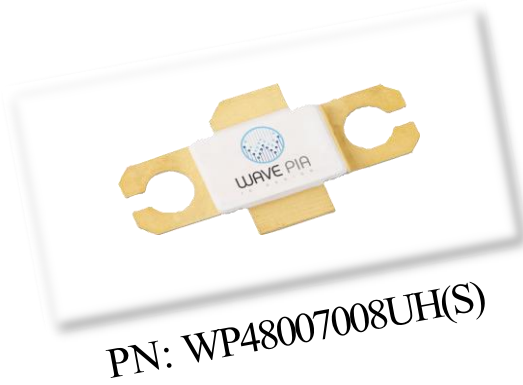




WP48007008UH(S)

8W, 48V GaN HEMT Unmatched TR



The WP48007008UH(S) is a 8W gallium nitride (GaN) High Electron Mobility Transistor (HEMT). This GaN HEMT is a wideband transistor optimized for 4.4-5.0GHz 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

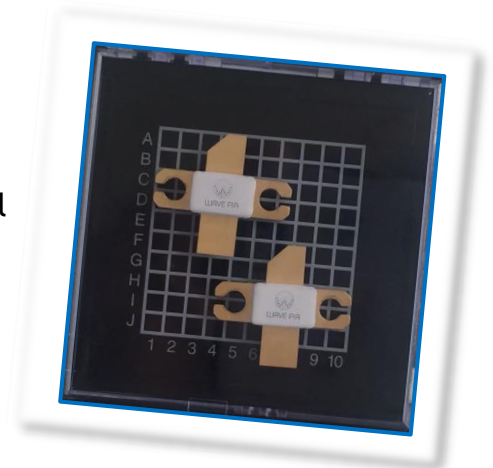
- Up to 8 GHz Operation
- 14.0 dB Typical Small Signal Gain @ 4.7GHz
- 8 W Typical Psat @4.7GHz
- 48V Operation
- High Breakdown Voltage
- High Efficiency
- Reliability Monitoring Supporting

Applications

- U/VHF Amplifiers
- 4.4-5.0GHz applications
- 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

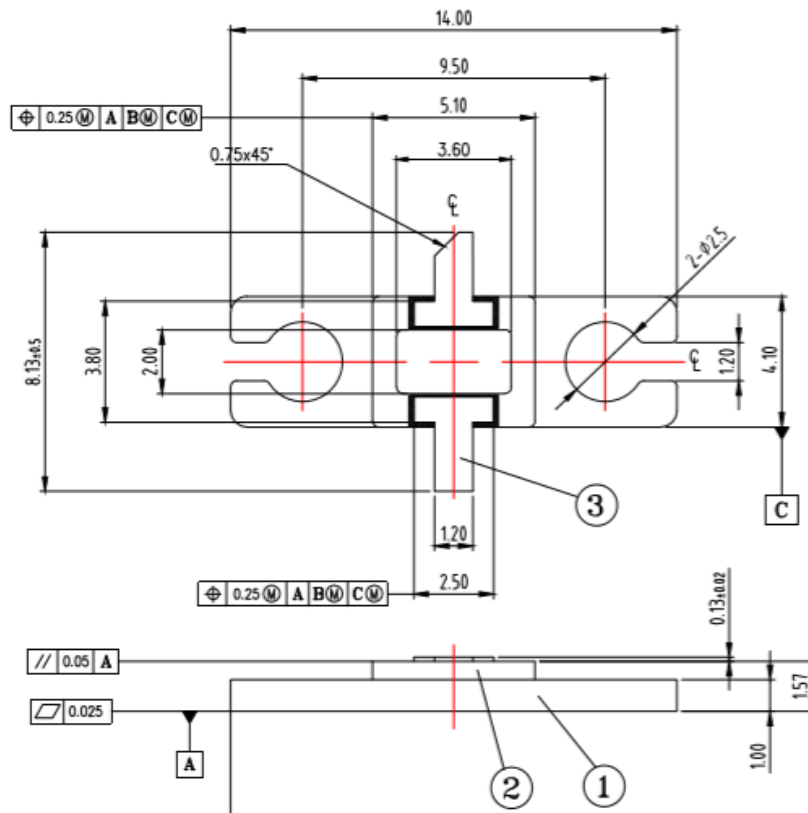
Parameter	Parameter	Typical Value	Units	Conditions
Threshold voltage @ Id=1mA/mm, Vd=10V	V _{to}	-3.4	V	25°C
Breakdown voltage @ Id=1mA/mm	V _{DG}	160	V	25°C
Drain-source current, Id @ Vd=10V, Vg=0	I _{dss}	800	mA/mm	25°C
Operating Junction Temperature	T _J	225	°C	
Storage Temperature	T _{STG}	-65, +150	°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 = 4.7 GHz unless otherwise stated; TC = 25 °C)

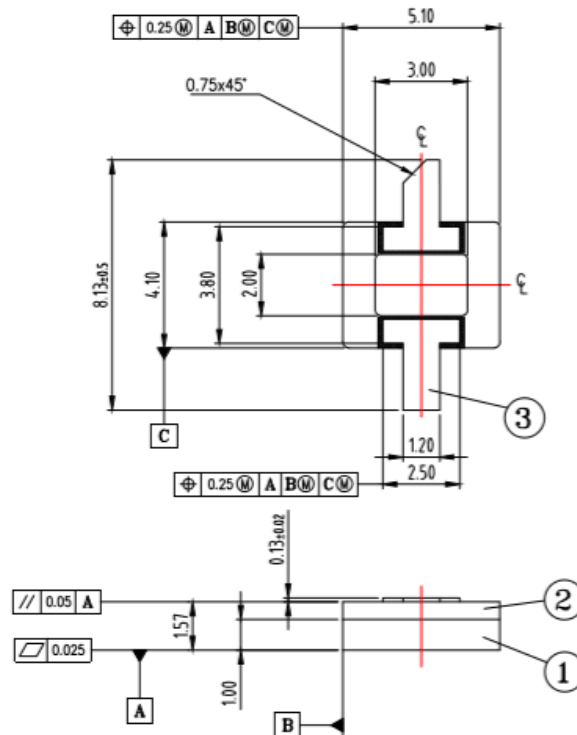
Parameter	Parameter	Typical Value	Units	Conditions
DC Characteristics				
Ohmic contact resistance	RC	0.3	Ohm-mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I _{dmax}	1000	mA/mm	25°C
Max. trans-conductance, @ Vd=10V, Vg=-4V ~ -1V (1X125µm device)	GM_PEAK	290	mS/mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I _{dmax}	1000	mA/mm	25°C
RF Characteristics				
Small Signal Gain	G _{SS}	14	dB	V _{DD} =48V, I _{DQ} =50mA
Saturated Power Output	P _{SAT}	8	W	V _{DD} =48V, I _{DQ} =50mA
Drain Efficiency	η	>60	%	V _{DD} =48V, I _{DQ} =50mA
Intermodulation Distortion	IM3	-30	dBc	V _{DD} =48V, I _{DQ} =50mA
Output Mismatch Stress	VSWR	10:1	ψ	



TR Dimensions (units in inch)



<WP48007008UH>



<WP48007008US>

Assembly Notes:

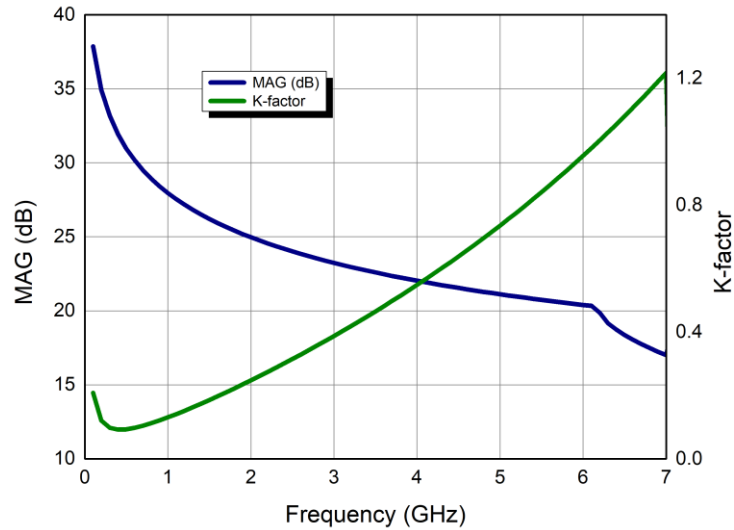
- Recommended solder is AuSn (80/20) solder. Refer to Wavepia's guide for the Eutectic Bond Procedure



Typical Performance

Simulated Maximum Available Gain (MAG) and K Factor of the WP48007008UH(S)

$$V_{DD} = 48 \text{ V}, I_{DQ} = 50 \text{ mA}$$



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

Typical Performance

Simulated Minimum Noise Figure of the WP48007008UH(S)

$$V_{DD} = 48 \text{ V}, I_{DQ} = 50 \text{ mA}$$

Under construction



Typical TR S-Parameters

(Small Signal, $V_{DS} = 48\text{ V}$, $I_{DQ} = 50\text{ mA}$, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
100MHz	0.990516	-15.6543	20.4868	169.0354	0.003345	67.85405	0.864954	-8.12066
200MHz	0.986491	-30.9964	20.08643	158.2495	0.006464	62.73015	0.857197	-16.096
300MHz	0.980357	-45.7588	19.4727	147.8056	0.009374	54.25954	0.845509	-23.8033
400MHz	0.972831	-59.7545	18.7089	137.8155	0.011995	45.30156	0.831353	-31.1615
500MHz	0.964619	-72.8856	17.85961	128.3361	0.014305	36.47594	0.816158	-38.1332
600MHz	0.95629	-85.1331	16.98015	119.3774	0.016314	27.98149	0.801073	-44.7167
700MHz	0.948224	-96.5368	16.11201	110.9156	0.018054	19.87558	0.786868	-50.9336
800MHz	0.940634	-107.174	15.28303	102.9064	0.019566	12.15438	0.773957	-56.8178
900MHz	0.933605	-117.144	14.50973	95.29469	0.020892	4.785569	0.762481	-62.4068
1000MHz	0.927137	-126.554	13.80036	88.02214	0.022071	-2.27574	0.752387	-67.7375
1100MHz	0.921186	-135.51	13.15755	81.03066	0.02314	-9.07896	0.743504	-72.8436
1200MHz	0.915682	-144.119	12.58039	74.26456	0.024128	-15.674	0.735595	-77.7546
1300MHz	0.910552	-152.479	12.06587	67.67121	0.02506	-22.1096	0.728388	-82.4964
1400MHz	0.905731	-160.687	11.60979	61.20097	0.025957	-28.4324	0.721596	-87.0916
1500MHz	0.901163	-168.833	11.20734	54.8069	0.026836	-34.6873	0.714929	-91.5599
1600MHz	0.896814	-177.001	10.85336	48.44425	0.027708	-40.9175	0.708096	-95.9186
1700MHz	0.892673	174.7242	10.54251	42.07012	0.028583	-47.1647	0.700805	-100.183
1800MHz	0.888755	166.2651	10.26922	35.64329	0.029465	-53.4691	0.692763	-104.365
1900MHz	0.885113	157.5471	10.02765	29.12427	0.030355	-59.8696	0.683673	-108.477
2000MHz	0.881835	148.5019	9.81154	22.47588	0.031246	-66.4026	0.673241	-112.523
2100MHz	0.879055	139.0698	9.614143	15.66417	0.03213	-73.1017	0.661173	-116.508
2200MHz	0.876948	129.2045	9.428106	8.659977	0.032988	-79.9957	0.647196	-120.428
2300MHz	0.875724	118.8784	9.245521	1.441007	0.033798	-87.1065	0.63107	-124.274
2400MHz	0.875613	108.0893	9.058114	-6.00566	0.03453	-94.4467	0.61262	-128.029
2500MHz	0.876835	96.86679	8.857665	-13.681	0.035148	-102.017	0.591763	-131.667
2600MHz	0.879556	85.277	8.636659	-21.5718	0.035616	-109.804	0.568547	-135.156
2700MHz	0.883842	73.42298	8.389125	-29.6499	0.035899	-117.78	0.543159	-138.458
2800MHz	0.889624	61.43992	8.111484	-37.873	0.035968	-125.901	0.515924	-141.536
2900MHz	0.896677	49.48418	7.80319	-46.1881	0.035808	-134.116	0.487255	-144.359
3000MHz	0.904643	37.71824	7.466898	-54.5371	0.035416	-142.365	0.457578	-146.907
3100MHz	0.913082	26.29451	7.108066	-62.8633	0.034808	-150.592	0.427234	-149.177
3200MHz	0.921535	15.34186	6.734052	-71.118	0.03401	-158.748	0.396392	-151.18
3300MHz	0.929589	4.957305	6.352943	-79.2657	0.033057	-166.798	0.364999	-152.927
3400MHz	0.936922	-4.79649	5.972437	-87.2863	0.031988	-174.721	0.332783	-154.418
3500MHz	0.943314	-13.8887	5.599002	-95.1758	0.03084	177.4866	0.299304	-155.607
3600MHz	0.948651	-22.3149	5.237405	-102.944	0.029642	169.8153	0.264054	-156.359
3700MHz	0.952902	-30.0904	4.890604	-110.611	0.028419	162.2445	0.226607	-156.357
3800MHz	0.9561	-37.2437	4.559895	-118.206	0.027184	154.7468	0.186869	-154.884
3900MHz	0.958329	-43.8109	4.24522	-125.756	0.025945	147.2924	0.145689	-150.242

Typical TR S-Parameters

(Small Signal, $V_{DS} = 48\text{ V}$, $I_{DQ} = 50\text{ mA}$, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
4000MHz	0.959707	-49.8321	3.945535	-133.292	0.024704	139.853	0.106795	-138.123
4100MHz	0.960381	-55.348	3.659219	-140.834	0.023457	132.4063	0.083081	-110.395
4200MHz	0.960521	-60.3989	3.384459	-148.397	0.022198	124.9397	0.096692	-75.669
4300MHz	0.960317	-65.0241	3.119622	-155.978	0.020923	117.4538	0.142715	-57.2757
4400MHz	0.959966	-69.2617	2.863568	-163.564	0.019628	109.9643	0.203204	-50.9265
4500MHz	0.959661	-73.1493	2.61587	-171.121	0.018314	102.5025	0.269938	-49.9416
4600MHz	0.959573	-76.7237	2.376899	-178.606	0.016988	95.11348	0.339098	-51.5047
4700MHz	0.95983	-80.0212	2.147742	174.0366	0.015663	87.85204	0.40815	-54.3995
4800MHz	0.960504	-83.0762	1.929964	166.8656	0.014355	80.77694	0.475099	-58.0156
4900MHz	0.961608	-85.9207	1.725282	159.9372	0.013081	73.94455	0.538369	-62.0026
5000MHz	0.9631	-88.5825	1.535229	153.2998	0.011861	67.4033	0.596823	-66.1401
5100MHz	0.964907	-91.0854	1.360893	146.9901	0.010708	61.18989	0.649774	-70.2831
5200MHz	0.966933	-93.4486	1.20279	141.0315	0.009636	55.32767	0.696947	-74.3359
5300MHz	0.969084	-95.6875	1.060847	135.4342	0.008649	49.82702	0.738407	-78.2373
5400MHz	0.971275	-97.8139	0.934491	130.1976	0.00775	44.68709	0.774458	-81.9509
5500MHz	0.973441	-99.8372548	0.822773	125.3118	0.006939	39.89827	0.805556	-85.4585
5600MHz	0.97553	-101.765282	0.72451	120.761	0.006211	35.44472	0.832232	-88.7542
5700MHz	0.977509	-103.604342	0.638403	116.5256	0.005562	31.30673	0.85503	-91.8406
5800MHz	0.97936	-105.359981	0.563135	112.5837	0.004984	27.4625	0.874474	-94.7255
6000MHz	0.981074	-107.037165	0.497436	108.9129	0.00447	23.88965	0.891046	-97.42
6100MHz	0.982649	-108.640444	0.440121	105.4911	0.004015	20.56608	0.905174	-99.9368
6200MHz	0.984088	-110.174048	0.390114	102.2972	0.003612	17.47069	0.917233	-102.289
6300MHz	0.985399	-111.641949	0.346455	99.31137	0.003254	14.58369	0.927542	-104.49
6400MHz	0.98659	-113.047885	0.308297	96.51534	0.002937	11.88682	0.936375	-106.552
6500MHz	0.98767	-114.39538	0.274901	93.89238	0.002656	9.363354	0.943962	-108.486
6600MHz	0.98865	-115.687754	0.245625	91.42731	0.002405	6.998129	0.950495	-110.304
6700MHz	0.989538	-116.92813	0.219915	89.1064	0.002183	4.777427	0.956137	-112.016
6800MHz	0.990343	-118.119442	0.197295	86.91728	0.001984	2.688891	0.961023	-113.63
6900MHz	0.991074	-119.264442	0.177353	84.84881	0.001806	0.721405	0.965268	-115.155
7000MHz	0.991737	-120.365709	0.159738	82.89099	0.001647	-1.13502	0.968965	-116.599



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