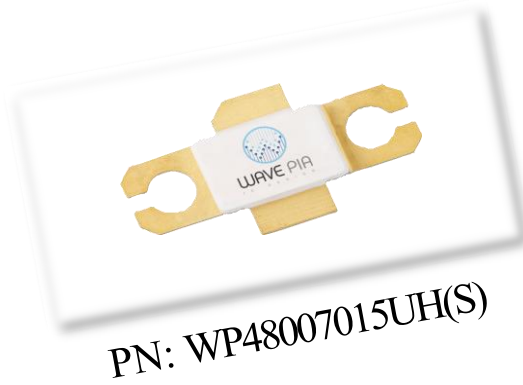




WP48007015UH(S)

15W, 48V GaN HEMT Unmatched TR



The WP48007015UH(S) is a 15W 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

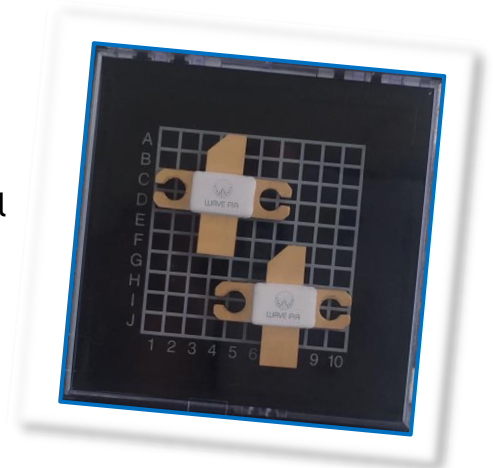
- Up to 8 GHz Operation
- 14.0 dB Typical Small Signal Gain @4.7 GHz
- 15 W Typical Psat @5.8GHz
- 48V Operation
- High Breakdown Voltage
- High Efficiency
- Reliability Monitoring Supporting

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

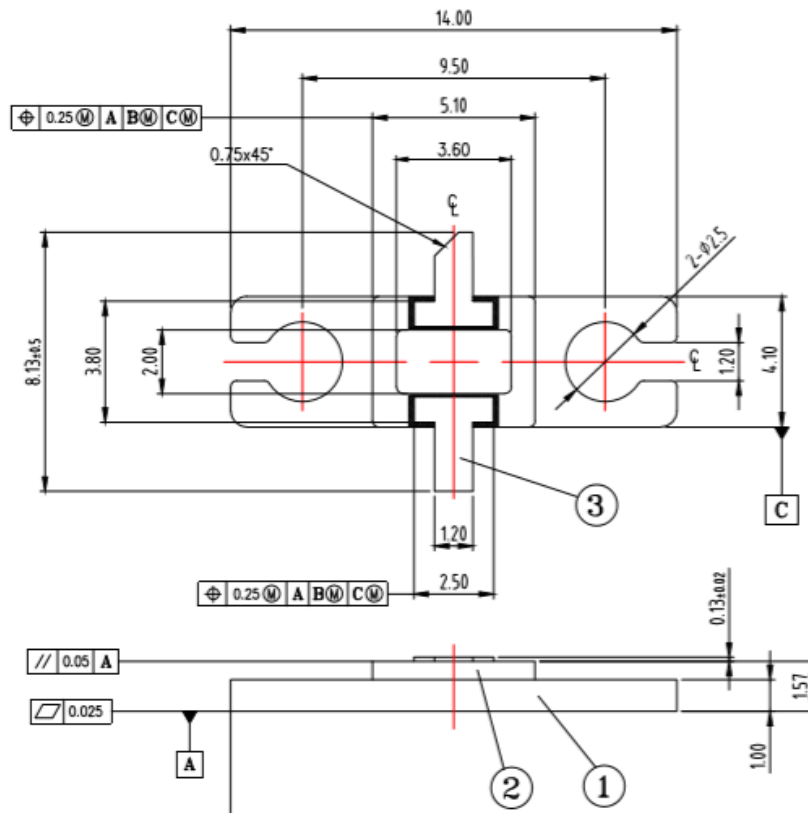
Parameter	Parameter	Typical Value	Units	Conditions
Threshold voltage @ Id=1mA/mm, Vd=10V	V _{to}	-3.4	V	25°C
Breakdown voltage @ Id=1mA/mm	V _{DG}	160	V	25°C
Drain-source current, Id @ Vd=10V, Vg=0	I _{dss}	800	mA/mm	25°C
Operating Junction Temperature	T _J	225	°C	
Storage Temperature	T _{STG}	-65, +150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

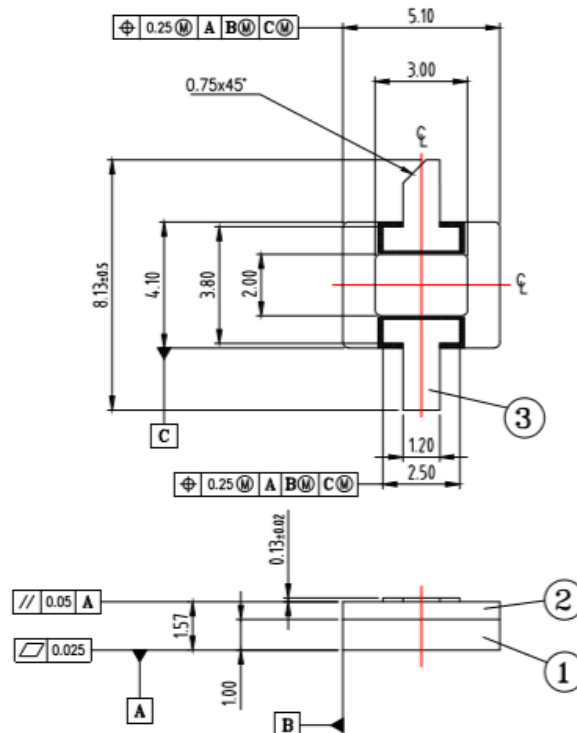
Parameter	Parameter	Typical Value	Units	Conditions
DC Characteristics				
Ohmic contact resistance	RC	0.3	Ohm-mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I _{dmax}	1000	mA/mm	25°C
Max. trans-conductance, @ Vd=10V, Vg=-4V ~ -1V (1X125µm device)	GM_PEAK	290	mS/mm	25°C
Maximum 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} =100mA
Saturated Power Output	P _{SAT}	15	W	V _{DD} =48V, I _{DQ} =100mA
Drain Efficiency	η	>60	%	V _{DD} =48V, I _{DQ} =100mA
Intermodulation Distortion	IM3	-30	dBc	V _{DD} =48V, I _{DQ} =100mA
Output Mismatch Stress	VSWR	10:1	ψ	



TR Dimensions (units in inch)



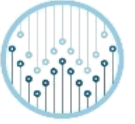
<WP48007015UH>



<WP48007015US>

Assembly Notes:

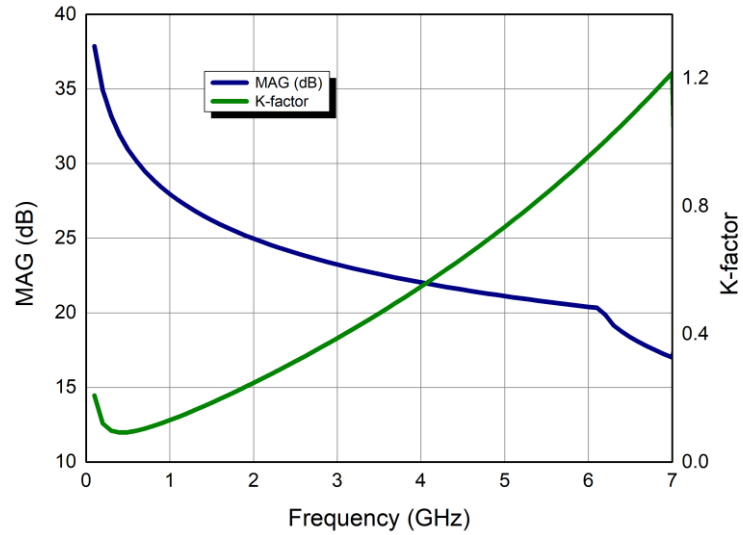
- Recommended solder is AuSn (80/20) solder. Refer to Wavepia's guide for the Eutectic Bond Procedure



Typical Performance

Simulated Maximum Available Gain (MAG) and K Factor of the WP48007015UH(S)

$$V_{DD} = 48 \text{ V}, I_{DQ} = 100 \text{ mA}$$



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

Typical Performance

Simulated Minimum Noise Figure of the WP48007015UH(S)

$$V_{DD} = 48 \text{ V}, I_{DQ} = 100 \text{ mA}$$

Under construction



Typical TR S-Parameters

(Small Signal, $V_{DS} = 48\text{ V}$, $I_{DQ} = 100\text{ mA}$, magnitude / angle)

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
100MHz	0.964966	-30.794	37.02598	160.8474	0.006045	59.66602	0.722845	-16.8368
200MHz	0.95016	-58.1667	33.61128	143.6411	0.010817	48.12179	0.682384	-31.856
300MHz	0.934153	-80.629	29.54304	129.1771	0.014221	35.63108	0.637788	-44.3685
400MHz	0.920871	-98.4446	25.71347	117.2459	0.016486	24.73194	0.600783	-54.6354
500MHz	0.911016	-112.548	22.43503	107.2983	0.01797	15.4382	0.574537	-63.2064
600MHz	0.904034	-123.881	19.72471	98.81621	0.018951	7.420342	0.558145	-70.5671
700MHz	0.899181	-133.188	17.50271	91.40545	0.019613	0.365417	0.54958	-77.0629
800MHz	0.89584	-141.015	15.6754	84.78619	0.020068	-5.9658	0.546864	-82.9227
900MHz	0.893556	-147.751	14.16114	78.76248	0.02039	-11.7466	0.548369	-88.2967
1000MHz	0.892005	-153.678	12.89494	73.19594	0.020623	-17.1019	0.552838	-93.2852
1100MHz	0.890955	-158.997	11.82666	67.98692	0.020799	-22.1227	0.559321	-97.958
1200MHz	0.89024	-163.861	10.9179	63.06181	0.020939	-26.8768	0.567103	-102.366
1300MHz	0.889733	-168.381	10.1392	58.36469	0.021058	-31.4161	0.575645	-106.547
1400MHz	0.889341	-172.646	9.467762	53.85178	0.021168	-35.7816	0.584543	-110.531
1500MHz	0.888992	-176.726	8.885776	49.48771	0.021277	-40.0065	0.593492	-114.346
1600MHz	0.888626	179.3227	8.379188	45.24297	0.021392	-44.1188	0.602259	-118.011
1700MHz	0.8882	175.4541	7.936782	41.09218	0.021519	-48.1426	0.610668	-121.546
1800MHz	0.887676	171.6276	7.549515	37.01282	0.021662	-52.0996	0.618586	-124.968
1900MHz	0.887023	167.8077	7.21002	32.98438	0.021825	-56.0095	0.625908	-128.294
2000MHz	0.886218	163.9627	6.912238	28.98769	0.022013	-59.8908	0.632553	-131.536
2100MHz	0.88524	160.0627	6.651135	25.00445	0.022228	-63.7615	0.638455	-134.711
2200MHz	0.884075	156.0794	6.422485	21.01682	0.022472	-67.6389	0.64356	-137.83
2300MHz	0.882711	151.9852	6.222701	17.00719	0.022748	-71.5403	0.647817	-140.909
2400MHz	0.881142	147.7528	6.048697	12.95794	0.023058	-75.4831	0.651179	-143.959
2500MHz	0.879366	143.3546	5.897776	8.851272	0.023403	-79.4848	0.6536	-146.994
2600MHz	0.877389	138.763	5.767535	4.669114	0.023784	-83.5633	0.655027	-150.027
2700MHz	0.875223	133.9495	5.655781	0.393072	0.024202	-87.7369	0.655405	-153.073
2800MHz	0.872889	128.8857	5.560451	-3.99555	0.024656	-92.0241	0.654669	-156.145
2900MHz	0.870421	123.5429	5.479547	-8.51567	0.025145	-96.4436	0.652746	-159.259
3000MHz	0.867867	117.8931	5.411064	-13.1862	0.025665	-101.014	0.649552	-162.43
3100MHz	0.865291	111.9099	5.352931	-18.0257	0.026213	-105.755	0.644994	-165.674
3200MHz	0.862778	105.5696	5.302952	-23.052	0.026782	-110.682	0.638966	-169.009
3300MHz	0.860431	98.85317	5.258761	-28.2816	0.027364	-115.814	0.631355	-172.454
3400MHz	0.858376	91.74856	5.217797	-33.7287	0.027946	-121.163	0.622042	-176.03
3500MHz	0.856756	84.25303	5.177303	-39.4046	0.028517	-126.742	0.610907	-179.759
3600MHz	0.855722	76.37606	5.134365	-45.3164	0.029059	-132.557	0.597835	176.3349
3700MHz	0.855426	68.14186	5.085991	-51.4663	0.029554	-138.61	0.582728	172.2211
3800MHz	0.856003	59.59125	5.029244	-57.8508	0.029982	-144.898	0.565515	167.8652
3900MHz	0.857551	50.78221	4.961415	-64.4603	0.030322	-151.412	0.546163	163.2245



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