

### Product Features

- Up to 5 GHz Operation
- 14 dB Typical Small Signal Gain at 3.5 GHz
- 200 W Typical Psat at 3.5GHz
- 48V Operation
- High Breakdown Voltage
- High Efficiency
- Reliability Monitoring Supporting

### Applications

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



WP48005200

### Absolute Maximum Rating (not simultaneous) at 25°C

Parameter	Symbol	Typical Value	Units	Conditions
Threshold voltage @ Id=1mA/mm, Vd=10V	V <sub>to</sub>	-3.4	V	25°C
Breakdown voltage @ Id=1mA/mm	V <sub>DG</sub>	160	V	25°C
Drain-source current, Id @ Vd=10V, Vg=0	I <sub>dss</sub>	800	mA/mm	25°C
Operating Junction Temperature	T <sub>J</sub>	225	°C	
Storage Temperature	T <sub>STG</sub>	-65, +150	°C	
Thermal Resistance, Junction to Case (packaged)	R <sub>θJC</sub>		°C/W	
Thermal Resistance, Junction to Case (die only)	R <sub>θJC</sub>		°C/W	
Mounting Temperature (30 seconds)	T <sub>S</sub>	320	°C	30 seconds

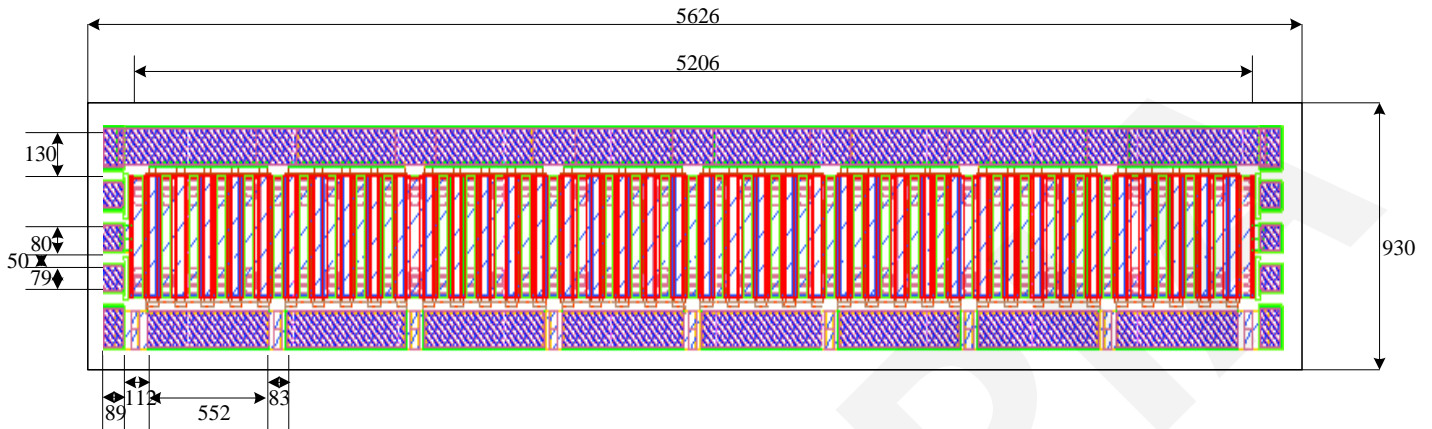
### DC Characteristics (Frequency= 3.5GHz unless otherwise stated; TA=25°C)

Parameter	Symbol	Typical Value	Units	Conditions
Ohmic contact resistance	RC	0.3	Ohm-mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I <sub>dmax</sub>	1000	mA/mm	25°C
Max. trans-conductance, @ Vd=10V, Vg=-4V ~ -1V (1X125µm device)	GM <sub>PEAK</sub>	290	mS/mm	25°C
Maximum Drain-source current, Id @ Vd=10V, Vg=1V (1X125µm device)	I <sub>dmax</sub>	1000	mA/mm	25°C

### RF Characteristics (Frequency= 3.5GHz unless otherwise stated; TA=25°C)

Parameter	Symbol	Typical Value	Units	Conditions
Small Signal Gain	G <sub>SS</sub>	>12	dB	V <sub>DD</sub> =48V, I <sub>DQ</sub> =1000mA
Saturated Power Output	P <sub>SAT</sub>	200	W	V <sub>DD</sub> =48V, I <sub>DQ</sub> =1000mA
Drain Efficiency	η	>55	%	V <sub>DD</sub> =48V, I <sub>DQ</sub> =1000mA
Intermodulation Distortion	IM3	<-30	dBc	V <sub>DD</sub> =48V, I <sub>DQ</sub> =1000mA
Output Mismatch Stress	V <sub>SWR</sub>	10:1	ψ	

### Die Dimensions (Units in microns)

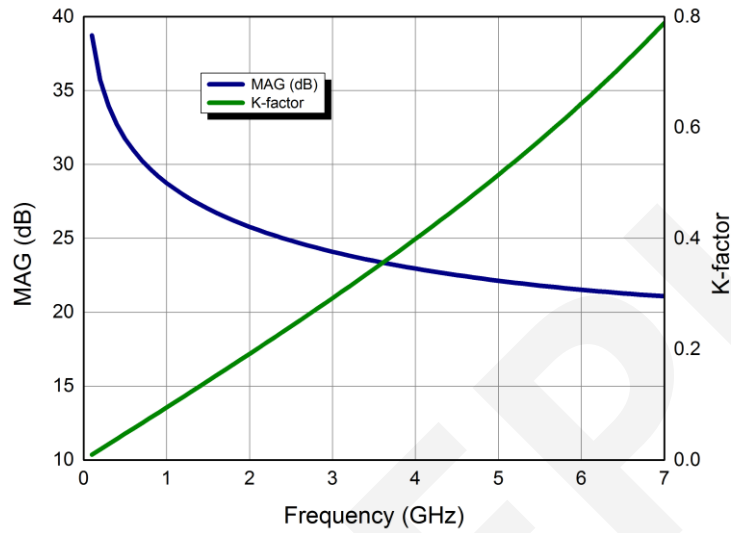


Overall die size 5626 x 930 (+0/-50) microns, die thickness 100 (+/- 10) microns.  
All Gate and Drain pads must be wire bonded for electrical connection.

### Assembly Notes:

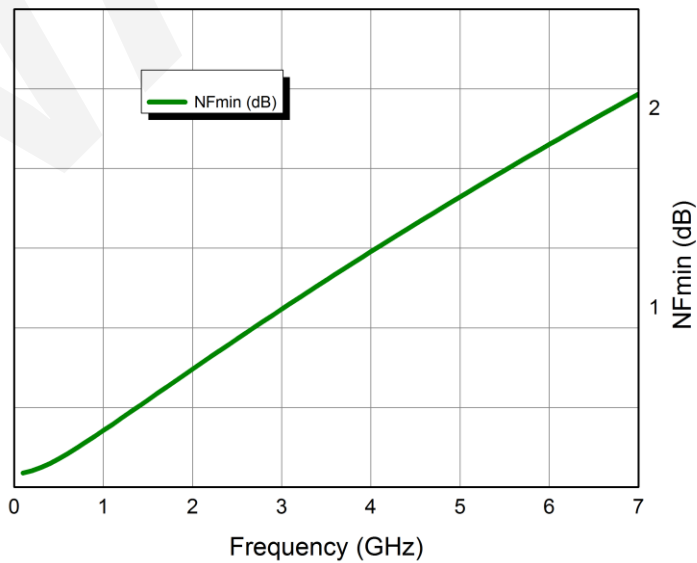
- Recommended solder is AuSn (80/20) solder. Refer to Wavepia's guide for the Eutectic Die Bond Procedure.
- Vacuum collet is the preferred method of pick-up.
- The backside of the die is the Source (ground) contact.
- Die back side gold plating is 5 microns thick minimum.
- Thermosonic ball or wedge bonding are the preferred connection methods.
- Gold wire must be used for connections.

**Simulated Maximum Available Gain (MAG) and K Factor of the WP48005200**  
 VDD=48V, IDQ=1000mA



Intrinsic die parameters - reference planes at centers of gate and drain bonding pads. No wire bonds assumed.

**Simulated Minimum Noise Figure of the WP48005200**  
 VDD=48V, IDQ=1000mA



### Small Signal Performance

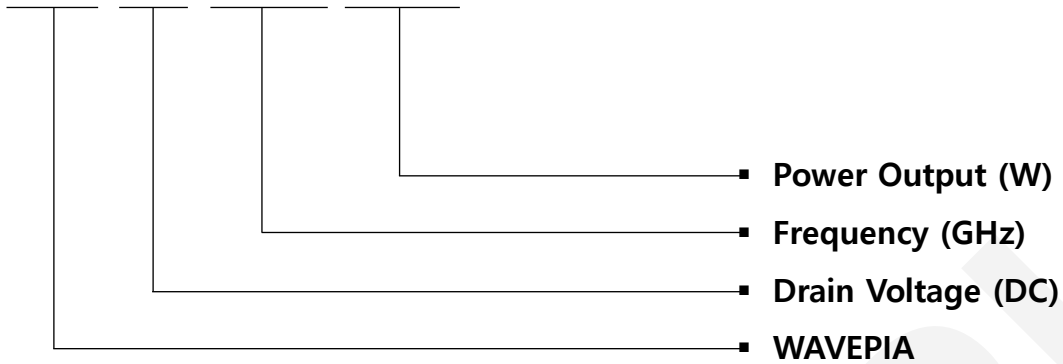
VDS=48V, IDQ=1000mA, magnitude / angle

Frequency	Mag S11	Ang S11	Mag S21	Ang S21	Mag S12	Ang S12	Mag S22	Ang S22
100MHz	0.97264	-148.39	34.19395	103.951	0.004581	14.10993	0.799177	-173.862
200MHz	0.971165	-163.855	17.5602	94.6859	0.004705	5.003872	0.813221	-176.336
300MHz	0.970955	-169.161	11.74846	90.44071	0.00472	0.91771	0.816596	-177.009
400MHz	0.970977	-171.822	8.806139	87.50589	0.004717	-1.85804	0.818522	-177.198
500MHz	0.971092	-173.415	7.028843	85.10633	0.004704	-4.09848	0.820207	-177.195
600MHz	0.971263	-174.473	5.837753	82.98172	0.004687	-6.0639	0.821946	-177.099
700MHz	0.971478	-175.224	4.982812	81.02095	0.004665	-7.86537	0.82383	-176.956
800MHz	0.971728	-175.784	4.338468	79.16918	0.00464	-9.55776	0.825887	-176.787
900MHz	0.97201	-176.217	3.834801	77.39656	0.004611	-11.1709	0.828124	-176.606
1000MHz	0.972321	-176.562	3.429798	75.68573	0.004579	-12.7221	0.830534	-176.42
1100MHz	0.972657	-176.842	3.096698	74.02609	0.004545	-14.2219	0.833104	-176.236
1200MHz	0.973015	-177.075	2.81765	72.41092	0.004507	-15.6772	0.835821	-176.056
1300MHz	0.973394	-177.272	2.580292	70.83585	0.004468	-17.0921	0.838667	-175.884
1400MHz	0.973789	-177.441	2.375791	69.29793	0.004426	-18.4697	0.841626	-175.72
1500MHz	0.9742	-177.588	2.197666	67.79519	0.004382	-19.8119	0.84468	-175.567
1600MHz	0.974624	-177.717	2.041057	66.32622	0.004336	-21.1202	0.847813	-175.424
1700MHz	0.975057	-177.831	1.902244	64.89	0.004289	-22.3954	0.851008	-175.293
1800MHz	0.975499	-177.935	1.778332	63.48578	0.00424	-23.6384	0.85425	-175.173
1900MHz	0.975947	-178.028	1.667032	62.11293	0.00419	-24.8497	0.857523	-175.065
2000MHz	0.9764	-178.114	1.566513	60.77095	0.004139	-26.0299	0.860815	-174.968
2100MHz	0.976854	-178.193	1.475288	59.45936	0.004087	-27.1794	0.864111	-174.882
2200MHz	0.97731	-178.266	1.392139	58.17774	0.004035	-28.2986	0.867402	-174.807
2300MHz	0.977765	-178.335	1.316055	56.92563	0.003981	-29.388	0.870677	-174.743
2400MHz	0.978218	-178.4	1.246194	55.7026	0.003927	-30.4479	0.873925	-174.688
2500MHz	0.978667	-178.461	1.181843	54.5082	0.003873	-31.4788	0.877139	-174.643
2600MHz	0.979113	-178.52	1.1224	53.34194	0.003818	-32.4812	0.880312	-174.607
2700MHz	0.979553	-178.576	1.067345	52.20333	0.003764	-33.4555	0.883437	-174.58
2800MHz	0.979987	-178.63	1.016234	51.09186	0.003709	-34.4023	0.886509	-174.56
2900MHz	0.980414	-178.682	0.968682	50.007	0.003654	-35.322	0.889524	-174.548
3000MHz	0.980834	-178.731815	0.92435	48.94818	0.0036	-36.2152	0.892477	-174.542
3100MHz	0.981246	-178.780571	0.882945	47.91486	0.003545	-37.0824	0.895365	-174.543
3200MHz	0.981649	-178.828019	0.844206	46.90645	0.003491	-37.9242	0.898188	-174.55
3300MHz	0.982044	-178.874298	0.807904	45.92236	0.003437	-38.7411	0.900941	-174.563
3400MHz	0.98243	-178.919527	0.773835	44.96201	0.003384	-39.5338	0.903625	-174.58
3500MHz	0.982806	-178.963808	0.741816	44.0248	0.003331	-40.3028	0.906238	-174.602
3600MHz	0.983173	-179.007227	0.711684	43.11014	0.003279	-41.0486	0.908781	-174.628
3700MHz	0.983531	-179.049859	0.683294	42.21741	0.003227	-41.7718	0.911252	-174.658
3800MHz	0.98388	-179.091766	0.656513	41.34604	0.003176	-42.4731	0.913653	-174.692
3900MHz	0.984219	-179.133003	0.631222	40.49542	0.003125	-43.153	0.915983	-174.728



### Part Number System

**W P 4 8 0 0 5 2 0 0**



Parameter	Value	Units
Drain Voltage	48	V
Lower Frequency	DC	GHz
Upper Frequency	5	GHz
Output Power	200	W
Transistor Type	Bare-die	-

### Packaging Information

- Bare die are shipped in Wafer-level with Expander Ring or Gel-Pak® containers.
- Possible UV Curing for Wafer-level with dicing saw