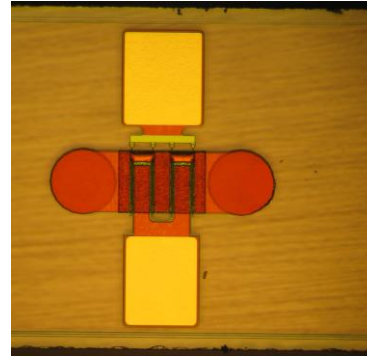


DESCRIPTION

AMCOM's AM005WN-00-R is a discrete GaN/SiC HEMT that has a total gate width of 0.5mm. It is a bare die which can be operated up to 18 GHz. It can provide a typically saturated power of 33.4 dBm. It can be used in low noise, high dynamic range receiver and as driver to high power transmitter. This part is RoHS compliant.



FEATURES

- High Frequency Operation up to 18GHz
- Low noise figure, <1dB at 3GHz
- Gain=23 dB at 2GHz
- PAE=56%
- $P_{5dB}=33.4dBm$

APPLICATIONS

- High dynamic receiver
- Cellular Radio Base Stations
- WLAN, Repeaters
- Radar
- Test Instrumentation
- Military

TYPICAL RF PERFORMANCE (CW)

FREQUENCY	2 (GHz)	10 (GHz)
P_{5dB} (dBm)	33.4	33.2
PAE @ P_{5dB}	56%	46%
Small Signal Gain (dB)	23	14.5
Load Reflection Coeff.	$0.41 \angle 12^\circ$	$0.60 \angle 81^\circ$

*($V_{ds}=28V$, $I_{ds}=75mA$)

**Bond wires are not included and the reference line is 75 microns from the edge of the bonding pads towards the device.

ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain-Source Voltage (V)	V_{ds}	40
Gate-Source Voltage (V)	V_{gs}	-6
Drain Current (mA)	I_{ds}	200
Continuous Dissipation At Room Temp. (W)	P_t	8.3
Operating Temp. (°C)	T_A	-55 to +85
Max. Channel Temp. (°C)	T_{ch}	+200

DC PARAMETERS

Parameters	Conditions	MIN	TYP	MAX
Saturation Current I_{dss} (mA)	$V_{ds}=10V$, $V_{gs}=0V$	250	400	570
Pinch-off Voltage V_p (V)	$V_{ds}=10V$, $I_{ds}=2.5\% I_{dss}$	-3.9	-2.9	-1.9
Drain to Gate Breakdown Voltage BV_{gd} (V)	$I_{dg} = 1 mA/mm$	90	120	-
Thermal Resistance (°C/W)		-	21.14	-

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SMALL SIGNAL MEASUREMENTS *

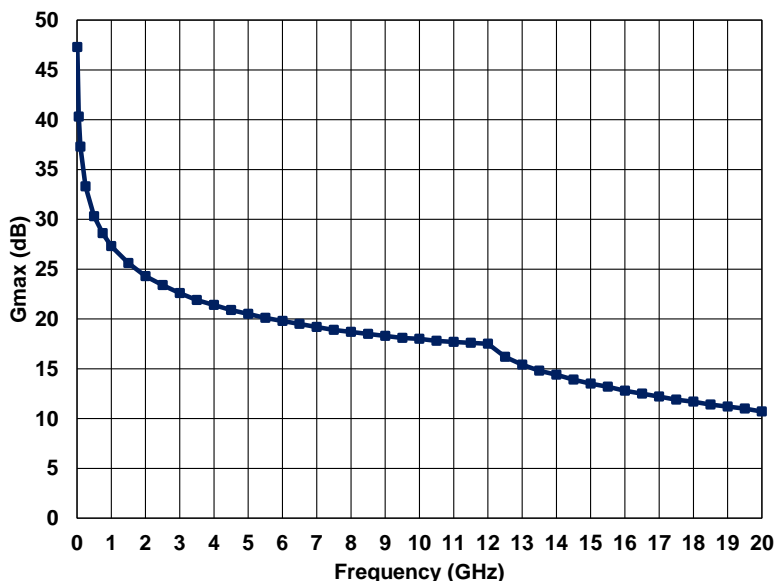
S-Parameters for AM005WN-00-R. $V_{ds} = 28V$, $V_{gs} = -2.35V$, $I_{ds} = 75mA$

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.01	1	-0.331	9.755	178.21	0	89.174	0.768	-1.447
0.1	1	-3.307	9.74	176.68	0.002	87.836	0.766	-1.754
0.5	0.994	-16.423	9.617	167.52	0.009	79.555	0.761	-8.088
1	0.98	-32.209	9.267	156.44	0.017	69.571	0.746	-15.784
1.5	0.96	-46.877	8.762	146.11	0.024	60.342	0.725	-22.897
2	0.938	-60.156	8.174	136.69	0.03	52.03	0.702	-29.324
2.5	0.917	-71.97	7.564	128.21	0.035	44.656	0.68	-35.083
3	0.898	-82.376	6.971	120.59	0.038	38.156	0.66	-40.255
3.5	0.881	-91.503	6.418	113.74	0.041	32.428	0.644	-44.944
4	0.867	-99.507	5.912	107.55	0.043	27.361	0.631	-49.248
4.5	0.856	-106.54	5.457	101.9	0.044	22.853	0.621	-53.248
5	0.846	-112.76	5.048	96.713	0.045	18.816	0.615	-57.006
5.5	0.839	-118.27	4.682	91.912	0.046	15.176	0.61	-60.57
6	0.833	-123.2	4.355	87.436	0.046	11.874	0.608	-63.973
6.5	0.828	-127.63	4.062	83.234	0.046	8.863	0.607	-67.238
7	0.824	-131.63	3.798	79.267	0.046	6.103	0.608	-70.384
7.5	0.821	-135.27	3.56	75.503	0.046	3.565	0.611	-73.423
8	0.819	-138.6	3.345	71.914	0.045	1.223	0.614	-76.364
8.5	0.818	-141.67	3.149	68.479	0.045	-0.94	0.618	-79.213
9	0.817	-144.51	2.971	65.18	0.044	-2.94	0.622	-81.977
9.5	0.816	-147.15	2.809	62.003	0.043	-4.789	0.627	-84.659
10	0.816	-149.63	2.659	58.935	0.042	-6.495	0.633	-87.263
10.5	0.816	-151.95	2.522	55.966	0.041	-8.065	0.639	-89.792
11	0.816	-154.14	2.396	53.087	0.04	-9.503	0.645	-92.251
11.5	0.816	-156.22	2.279	50.29	0.039	-10.813	0.651	-94.64
12	0.817	-158.2	2.171	47.57	0.038	-11.994	0.657	-96.963
12.5	0.818	-160.09	2.07	44.921	0.037	-13.047	0.664	-99.222
13	0.818	-161.9	1.976	42.337	0.036	-13.968	0.67	-101.42
13.5	0.819	-163.64	1.889	39.815	0.035	-14.755	0.677	-103.56
14	0.82	-165.32	1.808	37.352	0.034	-15.402	0.683	-105.64
14.5	0.821	-166.94	1.732	34.942	0.033	-15.902	0.689	-107.67
15	0.822	-168.52	1.66	32.585	0.032	-16.246	0.695	-109.65
15.5	0.823	-170.05	1.593	30.276	0.03	-16.425	0.702	-111.57
16	0.824	-171.54	1.53	28.014	0.029	-16.426	0.708	-113.45
16.5	0.825	-172.99	1.471	25.796	0.028	-16.233	0.713	-115.28
17	0.826	-174.41	1.415	23.621	0.027	-15.831	0.719	-117.06
17.5	0.827	-175.81	1.362	21.486	0.026	-15.201	0.725	-118.81
18	0.828	-177.18	1.312	19.39	0.025	-14.322	0.73	-120.51
18.5	0.829	-178.52	1.265	17.33	0.024	-13.172	0.736	-122.17
19	0.83	-179.85	1.221	15.307	0.023	-11.726	0.741	-123.8
19.5	0.831	-178.85	1.178	13.318	0.022	-9.963	0.746	-125.39
20	0.832	-177.56	1.138	11.361	0.021	-7.861	0.751	-126.94

*Notes:

- 1) Bond wires are not included and the reference line is 75 microns from the edge of the bonding pads towards the device.
- 2) S2P file downloadable from the web : <http://www.amcomusa.com/products/rftrans.html>

MAXIMUM AVAILABLE GAIN (Gmax) 28V/75 mA



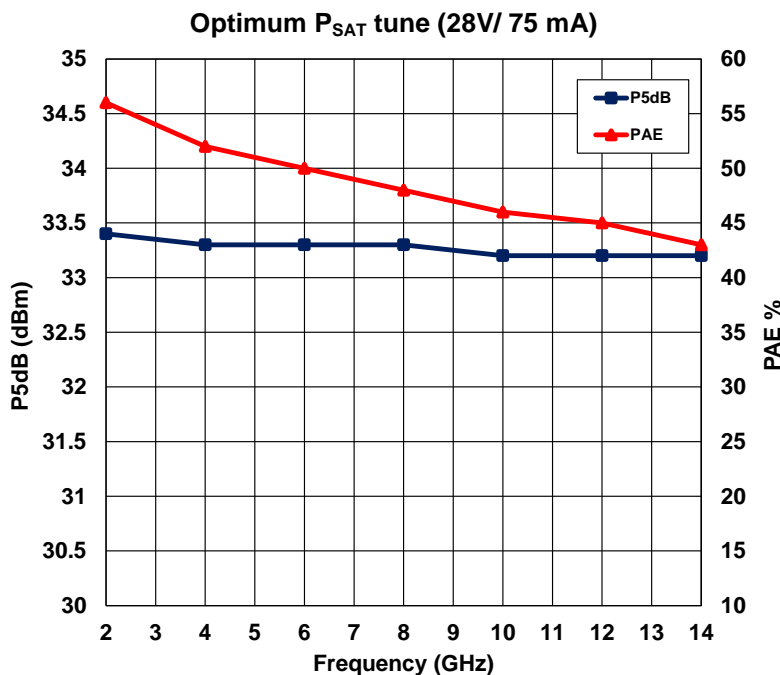
POWER DATA (CW)

1) Optimum P_{SAT} tune (V_{ds} = 28V, I_{ds} = 75mA) *

Frequency	SOURCE Γ	LOAD Γ	Gain (dB)	P _{1dB} (dBm)	P _{5dB} (dBm)	PAE @ P _{5dB}
2 GHz	0.8 \angle 54°	0.41 \angle 12°	23	32	33.4	56%
4 GHz	0.81 \angle 86°	0.44 \angle 34°	19.5	32.1	33.3	52%
6 GHz	0.81 \angle 118°	0.47 \angle 56°	17	31.2	33.3	50%
8 GHz	0.81 \angle 128°	0.55 \angle 72°	15.5	30.8	33.3	48%
10 GHz	0.81 \angle 138°	0.60 \angle 81°	14.5	30.5	33.2	46%
12 GHz	0.78 \angle 153°	0.62 \angle 92°	14	29.4	33.2	45%
14 GHz	0.71 \angle 160°	0.66 \angle 102°	13	29	33.2	43%

***Notes:**

- 1) Source tuning has effect on P_{1dB} & small signal gain, and the source points in this table is a compromise between high gain and high P_{1dB} at that frequency.
- 2) Bond wires are not included and the reference line is 75 microns from the edge of the bonding pads towards the device.

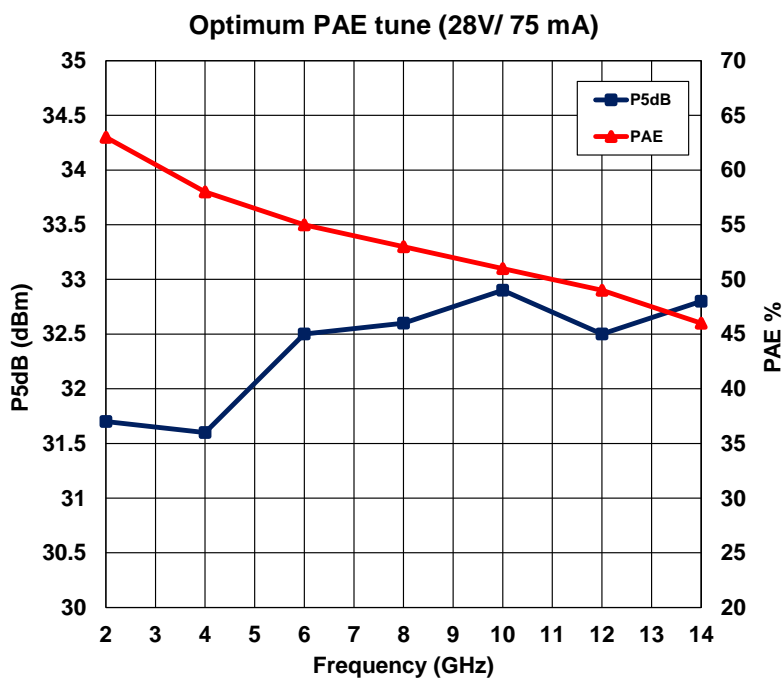


2) Optimum PAE tune ($V_{ds}=28V$, $I_{ds}=75mA$)*

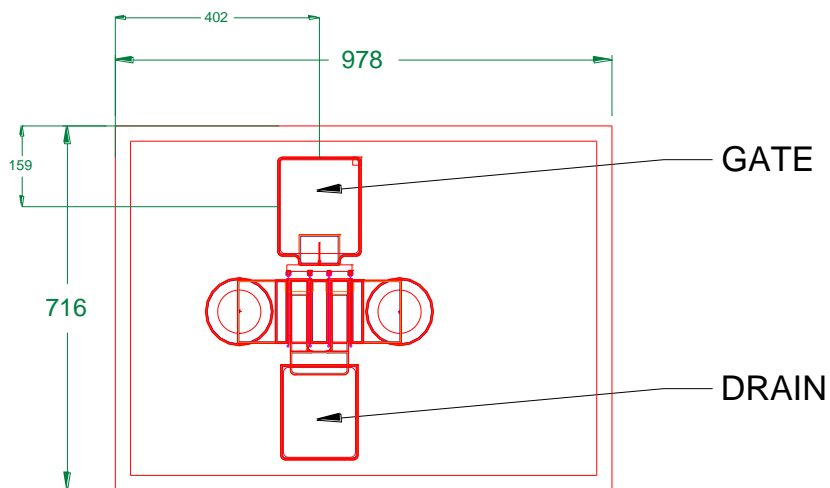
Frequency	SOURCE Γ	LOAD Γ	Gain (dB)	P _{1dB} (dBm)	P _{5dB} (dBm)	PAE @ P _{5dB}
2 GHz	0.8 \angle 54°	0.71 \angle 26°	23	30.6	31.7	63%
4 GHz	0.81 \angle 86°	0.74 \angle 42°	20	30.1	31.6	58%
6 GHz	0.81 \angle 118°	0.69 \angle 56°	19	31.2	32.5	55%
8 GHz	0.81 \angle 128°	0.66 \angle 73°	15	30.5	32.6	53%
10 GHz	0.81 \angle 138°	0.69 \angle 83°	13.5	30.8	32.9	51%
12 GHz	0.78 \angle 153°	0.75 \angle 92°	14	30.1	32.5	49%
14 GHz	0.71 \angle 160°	0.76 \angle 103°	13	29.4	32.8	46%

*Notes:

- 1) Source tuning has effect on P_{1dB} & small signal gain, and the source points in this table is a compromise between high gain and high P_{1dB} at that frequency.
- 2) Bond wires are not included and the reference line is 75 microns from the edge of the bonding pads towards the device.



CHIP OUTLINE



Notes:

- 1- 0.5 mm GaN HEMT
- 2- Chip is 100 μm thick
- 3- Dimensions in microns
- 4- Use eutectic bonding Au85Sn15 at 290°C