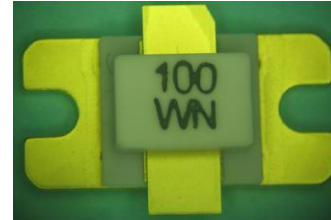


## DESCRIPTION

AMCOM's AM100WN-CU-R is part of the CU series of GaN/SiC HEMTs. This part has a total gate width of 10mm. The AM100WN-CU-R is designed for high power microwave applications, operating up to 6GHz. The CU series is a specially designed ceramic package with straight leads and flange in a drop-in mounting style. The flange at the bottom of the package serves simultaneously as DC ground, RF ground and thermal path. This part is RoHS compliant.



## FEATURES

- High Frequency Operation up to 6 GHz
- High Gain & High Power,  $P_{5dB} = 46$  dBm @ 2 GHz
- Low Cost Ceramic Package.
- Copper Tungsten Carrier Effective Heat Removal

## APPLICATIONS

- High dynamic receiver
- Cellular Radio Base Stations
- Wideband and narrowband amplifiers
- Radar
- Test Instrumentation
- Military
- Jammers

## RF PERFORMANCE @ 2 GHz (CW)

( $V_{ds} = 28V$ ,  $I_{dq} = 1.5A$ )

Parameters	MIN	TYP
$P_{5dB}^*$ (dBm)	45	46
PAE @ $P_{5dB}$	40%	50%
Drain eff	45%	55%
Small Signal Gain (dB)	12	14
Optimum load Ref Coeff.	-	$0.78 \angle -177^\circ$

\* Power typically remains the same as frequency changes.

## ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain-Source Voltage (V)	$V_{ds}$	40
Gate-Source Voltage (V)	$V_{gs}$	-6
Drain Current (A)	$I_{ds}$	4000
Continuous Dissipation At Room Temp. (W)	$P_t$	165.1
Operating Temp. ( $^\circ C$ )	$T_A$	-55 to +85
Max. Channel Temp. ( $^\circ C$ )	$T_{ch}$	+200

## DC PARAMETERS

Parameters	Conditions	MIN	TYP	MAX
Saturation Current $I_{dss}$ (A)	$V_{ds}=10V$ , $V_{gs}=0V$	5000	8000	11400
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 ( $^\circ C/W$ )		-	1.06	-

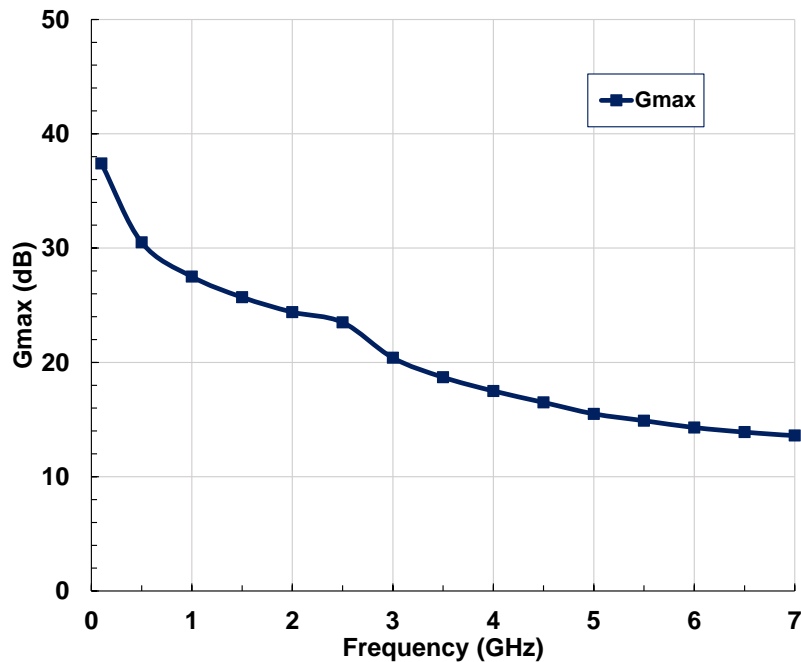
**SMALL SIGNAL MEASUREMENTS**

S-Parameters\* @  $V_{ds} = 28V$ ,  $I_{dq} = 1500mA$

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.1	0.939	-96.821	37.498	126.63	0.007	40.033	0.63	-167.52
0.5	0.922	-162.09	9.868	85.861	0.009	5.808	0.727	-176.63
1	0.922	-174.63	5.065	68.167	0.009	-3.499	0.737	-178.74
1.5	0.92	179.25	3.475	53.915	0.009	-8.913	0.744	179.99
2	0.916	174.49	2.726	40.721	0.01	-12.618	0.751	178.61
2.5	0.908	169.89	2.336	27.929	0.01	-15.15	0.754	176.96
3	0.894	164.86	2.153	15.016	0.011	-17.064	0.751	175.06
3.5	0.87	158.83	2.119	1.347	0.014	-19.237	0.742	173.01
4	0.828	151.08	2.221	-13.963	0.017	-22.998	0.725	170.94
4.5	0.754	140.26	2.475	-32.291	0.024	-30.261	0.703	169.03
5	0.618	123.77	2.889	-55.558	0.034	-43.377	0.682	167.05
5.5	0.386	93.559	3.402	-86.122	0.05	-64.954	0.664	162.77
6	0.203	-5.751	3.723	-125.07	0.067	-96.118	0.59	151.96
6.5	0.526	-85.257	3.421	-169.71	0.076	-134.11	0.338	140.67
7	0.814	-118.09	2.516	147.62	0.068	-171.13	0.189	-144.68
7.5	0.937	-138.14	1.606	114.22	0.053	160.26	0.484	-132.17
8	0.975	-150.35	1.006	90.522	0.04	140.66	0.683	-142.06

\* S2P file downloadable from the web: <http://www.amcomusa.com/products/rftrans.html>

**MAXIMUM AVAILABLE GAIN (28V ,1.5A)**



## POWER MEASUREMENTS

### OPTIMUM LOAD (28V/1.5A)\*

Freq (GHz)	MAG( $\Gamma_L$ )	ANG( $\Gamma_L$ )
1	0.77	-179
1.5	0.77	-178
2	0.78	-177
2.5	0.78	-175
3	0.78	-172
3.5	0.77	-170
4	0.75	-166
4.5	0.7	-163
5	0.64	-159
5.5	0.54	-157
6	0.42	-159

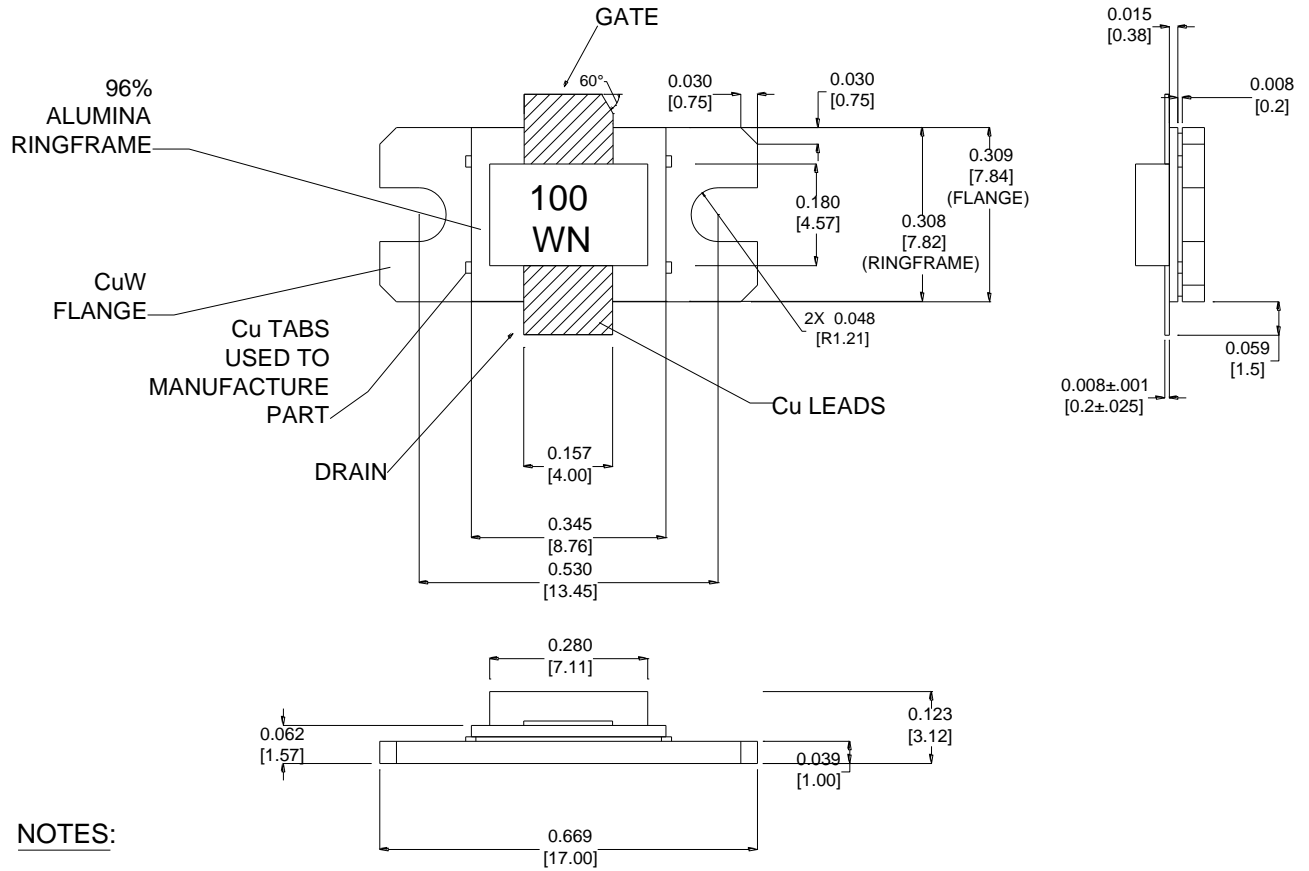
\* Reference line is at the edge of the package.

### Evaluation board power measurements (CW)

( $V_{ds} = 28V$ ,  $I_{dq} = 1.5A$ )

Parameters	0.9 GHz		1.8 GHz		3.4 GHz	
	MIN	TYP	MIN	TYP	MIN	TYP
$P_{5dB}$ (dBm)	45	46	45	46	45	46
PAE @ $P_{5dB}$	40%	50%	40%	51%	-	45%
Drain eff @ $P_{5B}$	45%	55%	48%	59%	-	50%
Small Signal Gain (dB)	16	18	12	14	10	13
Input RL (dB)	-	15	-	15	-	10

**CU PACKAGE OUTLINE:**

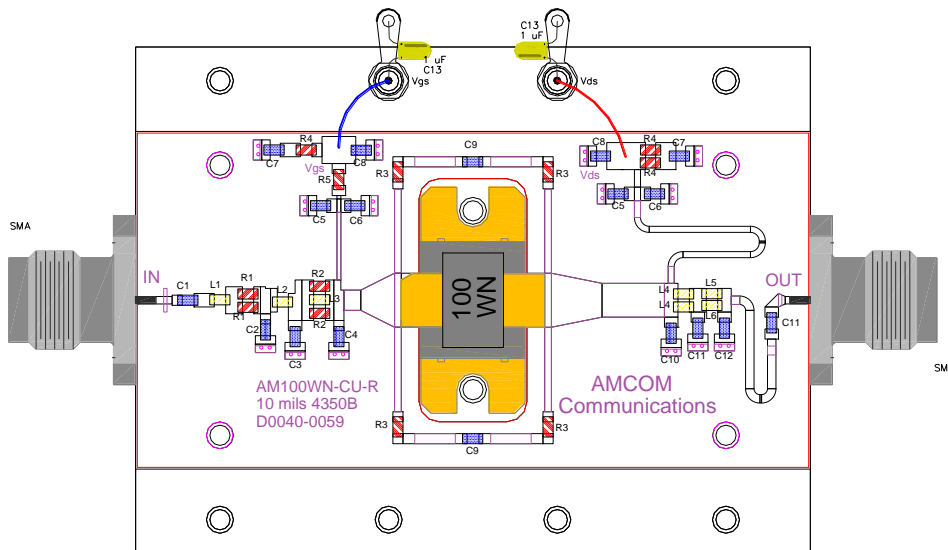
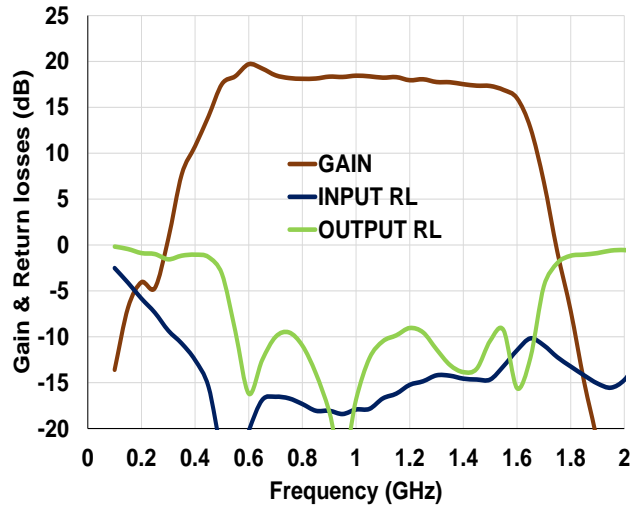
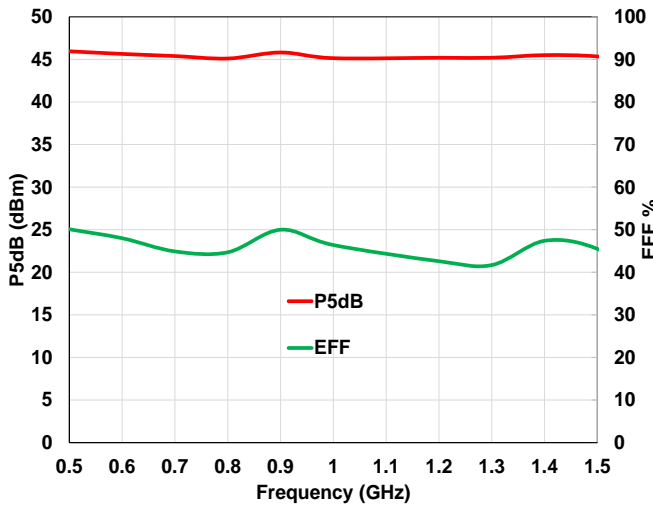


**NOTES:**

1. ALL DIMENSIONS AND TOLERANCE BOX IN INCHES (mm IN PARENTHESIS).

TEST CIRCUITS

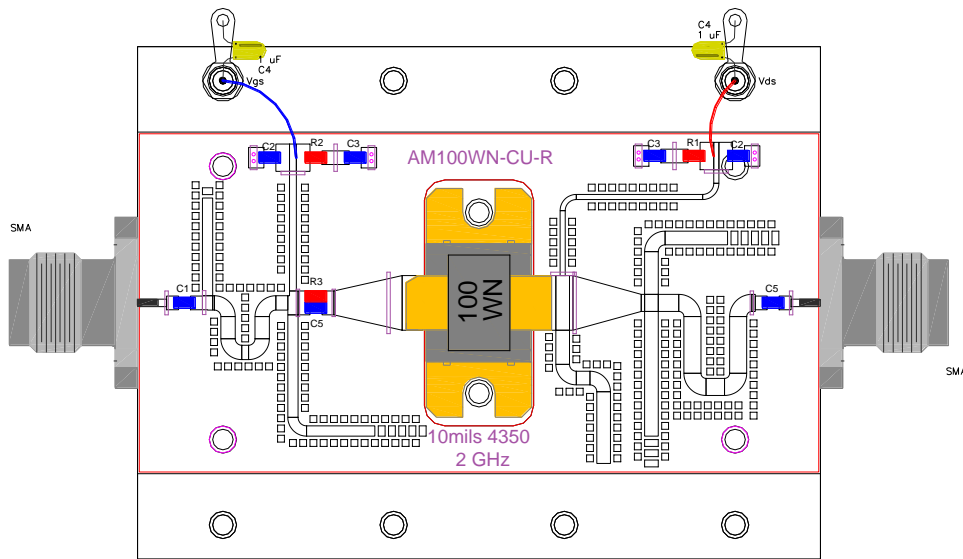
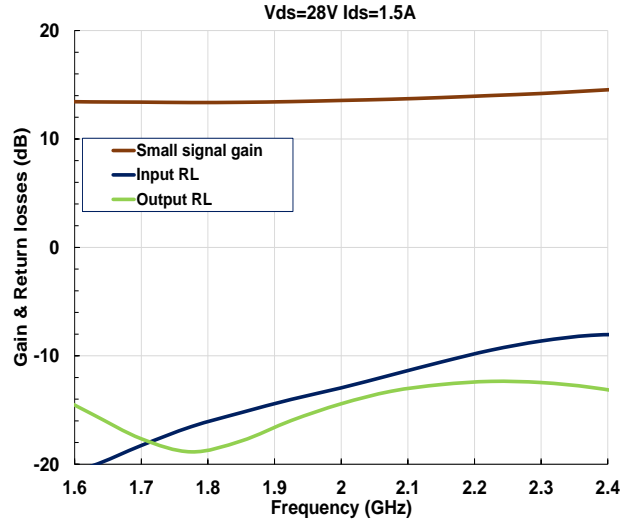
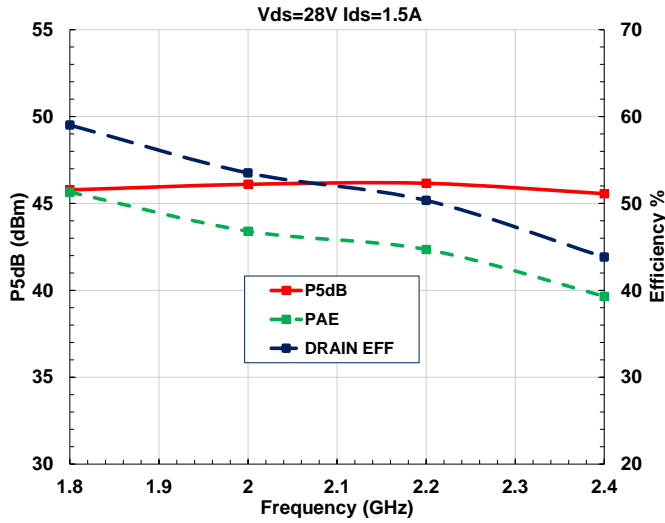
1) 0.5 GHz to 1.5 GHz



Notes:

- 1- 10mils Rogers 4350 Material (LoPro)
- 2- C1=20pF, C2=3pF, C3=4.7pF, C4=8.2pF, C5=82pF, C6=100pF, C7=1000pF, C8=0.1uF, C9=3pF, C10=8.2pF, C11=6.8pF, C12=2pF, R1=39 ohms, R2=18 ohms, R3=150 ohms, R4=50 ohms, R5=5 ohms, L1,2,3= 1.8 nH, L4=3.3 nH, L5=6.8 nH, L6=5.1 nH
- 3- All SMT Caps , Resistors & Inductors are 0603 size

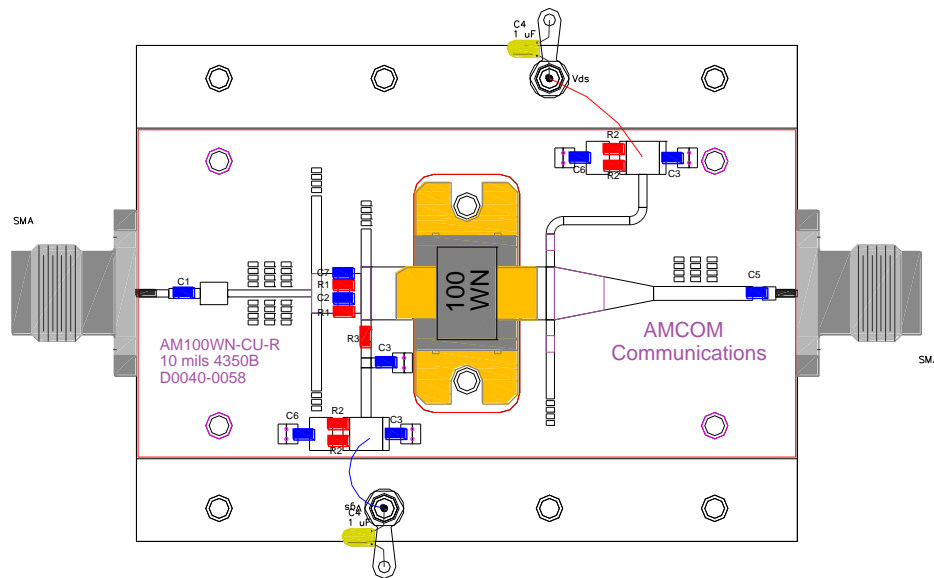
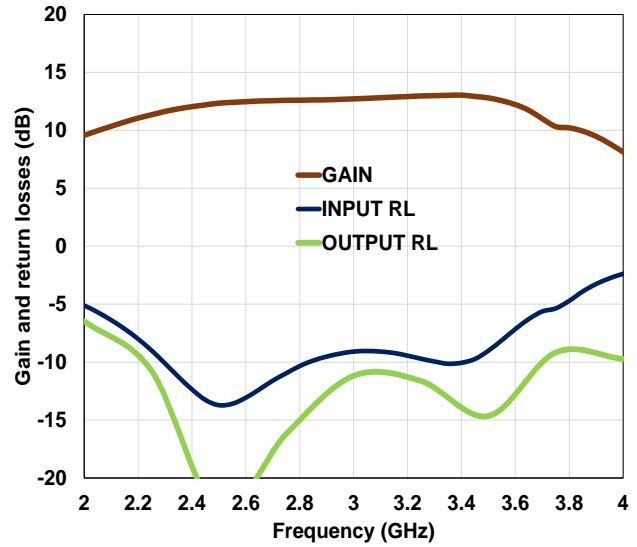
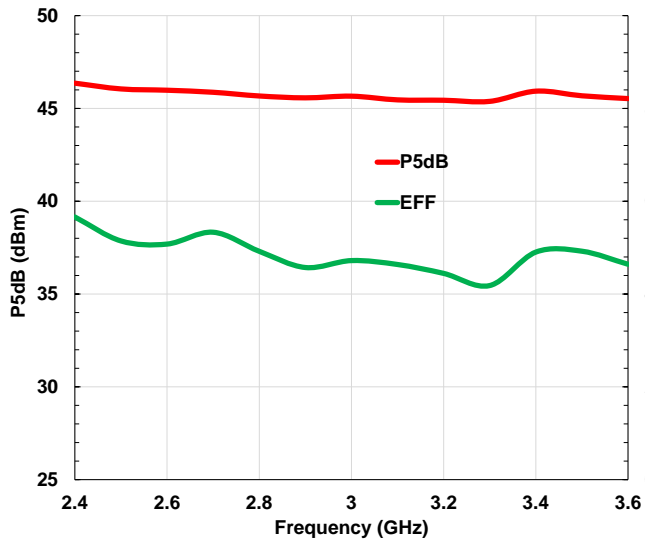
2) 1.8 GHz to 2.4 GHz



Notes:

- 1- 10mils Rogers 4350 Material (LoPro)
- 2- Ckt is for 5mm mask71 @ 2GHz
- 3- C1=6.8pF, C2=22pF, C3=1000pF, C4=1uF, C5=5.6pF  
R1=5.1ohms, R2=51ohms, R3=15ohms
- 4- All SMT Caps & Resistors are 0603 size

3) 2.4 GHz 3.6 GHz



Notes:

- 1- 10mils Rogers 4350 Material (LoPro)
- 2- C1=1.5pF, C2=3.9pF, C3=20pF, C4=1uF, C5=2.2pF, C6=1000pF, C7=0.5pF  
R1=43 ohms, R2=27 ohms, R3=15 ohms
- 3- All SMT Caps , Resistors & Inductors are 0603 size