# Ceramic Package GaAs Power pHEMT
DC-8GHz

**AM120WX-CU-R**
April 2014
Rev 0

## DESCRIPTION

AMCOM's AM120WX-CU-R is part of the CU series of GaAs pHEMTs. This part has a total gate width of 12mm. The AM120WX-CU-R is designed for high power microwave applications, operating up to 8GHz.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 8 GHz
- High Gain & High Power, $P_{1dB}$=38 dBm @3.5GHz
- Surface Mountable
- Bottom ground for Effective Heat Removal

## APPLICATIONS

- Wireless Local Loop Network
- Cellular Radio Communications
- WLAN, Repeaters & HYPERLAN
- C-Band VSAT
- Radar

## RF PERFORMANCE @ 3.5 GHz, ($V_{ds}$ = 8V, $I_{dq}$ = 1.2A)

| Parameters | MIN | TYP |
|---|---|---|
| $P_{1dB}$* (dBm) | 36 | 38 |
| Eff @ $P_{1dB}$ | 35% | 45% |
| Small Signal Gain (dB) | 10 | 11.5 |
| IP3 (dBm) | - | 46 |

* Power typically remains the same as frequency changes.

## ABSOLUTE MAXIMUM RATING

| Parameters | Symbol | Rating |
|---|---|---|
| Drain-Source Voltage (V) | $V_{ds}$ | 10 |
| Gate-Source Voltage (V) | $V_{gs}$ | -5 |
| Drain Current (A) | $I_{ds}$ | 3.6 |
| Continuous Dissipation At Room Temp. (W) | $P_t$ | 23 |
| Operating Temp. ($^oC$) | $T_A$ | -55 to +85 |
| Max. Channel Temp. ($^oC$) | $T_{ch}$ | +175 |

## DC PARAMETERS

| Parameters | Conditions | MIN | TYP | MAX |
|---|---|---|---|---|
| Saturation Current $I_{dss}$ (A) | $V_{ds}$=3V, Vgs=0V | 2.4 | 3.6 | 4.8 |
| Pinch-off Voltage $V_p$ (V) | $V_{ds}$=3V, Ids=2.5% Idss | -2.2 | -1.7 | -1.2 |
| Drain to Gate Breakdown Voltage $BV_{gd}$ (V) | $I_{dg}$ = 1mA/mm | 15 | 20 | |
| Thermal Resistance ($^oC/W$) | | | 6.6 | |

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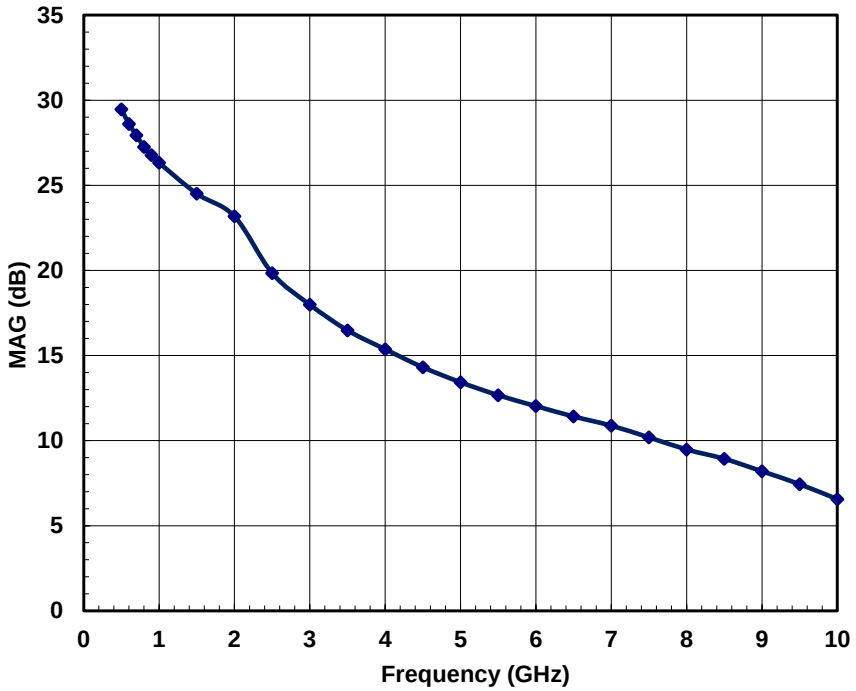
## S- Parameters for AM120WX-CU-R @ 8V / 1.2A (S2P file downloadable from the Web)

| Freq(GHz) | MAG(S11) | ANG(S11) | MAG(S21) | ANG(S21) | MAG(S12) | ANG(S12) | MAG(S22) | ANG(S22) |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 0.944 | -175.3 | 6.526 | 81.63 | 0.007 | 2.56 | 0.784 | 179.23 |
| 0.6 | 0.945 | -178.22 | 5.392 | 77.92 | 0.007 | 1.86 | 0.779 | 178.38 |
| 0.7 | 0.945 | 179.6 | 4.546 | 75.08 | 0.007 | 1.36 | 0.774 | 177.23 |
| 0.8 | 0.947 | 177.81 | 3.935 | 72.10 | 0.007 | 0.56 | 0.776 | 176.49 |
| 0.9 | 0.946 | 176.41 | 3.479 | 69.35 | 0.007 | -0.37 | 0.779 | 176.21 |
| 1 | 0.947 | 175.13 | 3.115 | 66.59 | 0.007 | -0.11 | 0.778 | 175.98 |
| 1.5 | 0.943 | 170.97 | 2.277 | 54.31 | 0.008 | -2.67 | 0.764 | 174.93 |
| 2 | 0.931 | 166.78 | 2.119 | 40.54 | 0.010 | -6.21 | 0.748 | 173.01 |
| 2.5 | 0.911 | 159.8 | 2.027 | 26.05 | 0.012 | -11.94 | 0.726 | 170.66 |
| 3 | 0.882 | 150.79 | 2.025 | 11.06 | 0.015 | -19.40 | 0.709 | 167.56 |
| 3.5 | 0.837 | 139.72 | 2.108 | -6.03 | 0.018 | -29.54 | 0.692 | 164.81 |
| 4 | 0.757 | 124.25 | 2.326 | -26.57 | 0.024 | -43.40 | 0.678 | 163.07 |
| 4.5 | 0.583 | 97.24 | 2.765 | -54.91 | 0.033 | -65.27 | 0.662 | 160.86 |
| 5 | 0.328 | 28.89 | 3.179 | -94.31 | 0.043 | -100.46 | 0.632 | 155.17 |
| 5.5 | 0.514 | -79.76 | 2.965 | -142.7 | 0.045 | -144.07 | 0.487 | 147.23 |
| 6 | 0.785 | -121.97 | 2.203 | 175.49 | 0.038 | 179.32 | 0.300 | 159.15 |
| 6.5 | 0.899 | -142.52 | 1.555 | 144.06 | 0.029 | 152.2 | 0.300 | -166.43 |
| 7 | 0.944 | -154.94 | 1.118 | 119.52 | 0.023 | 131.49 | 0.429 | -155.11 |
| 7.5 | 0.961 | -163.87 | 0.822 | 98.77 | 0.018 | 115.06 | 0.562 | -157.3 |
| 8 | 0.969 | -171.24 | 0.618 | 81.26 | 0.014 | 101.48 | 0.665 | -162.94 |
| 8.5 | 0.974 | -177.66 | 0.473 | 65.84 | 0.012 | 89.81 | 0.743 | -169.43 |
| 9 | 0.975 | 176.76 | 0.374 | 52.14 | 0.010 | 78.5 | 0.796 | -175.61 |
| 9.5 | 0.975 | 171.69 | 0.308 | 39.83 | 0.009 | 67.14 | 0.830 | 178.54 |
| 10 | 0.973 | 166.54 | 0.269 | 28.43 | 0.008 | 57.59 | 0.846 | 173.03 |
| 10.5 | 0.968 | 160.81 | 0.250 | 17.58 | 0.008 | 48.05 | 0.851 | 167.13 |
| 11 | 0.962 | 153.99 | 0.244 | 6.12 | 0.009 | 37.56 | 0.846 | 160.22 |
| 11.5 | 0.953 | 145.89 | 0.250 | -6.37 | 0.010 | 24.48 | 0.826 | 152.28 |
| 12 | 0.938 | 136.17 | 0.264 | -20.65 | 0.013 | -4.85 | 0.793 | 143.5 |

* Download S-parameters file from website: http://www.amcomusa.com

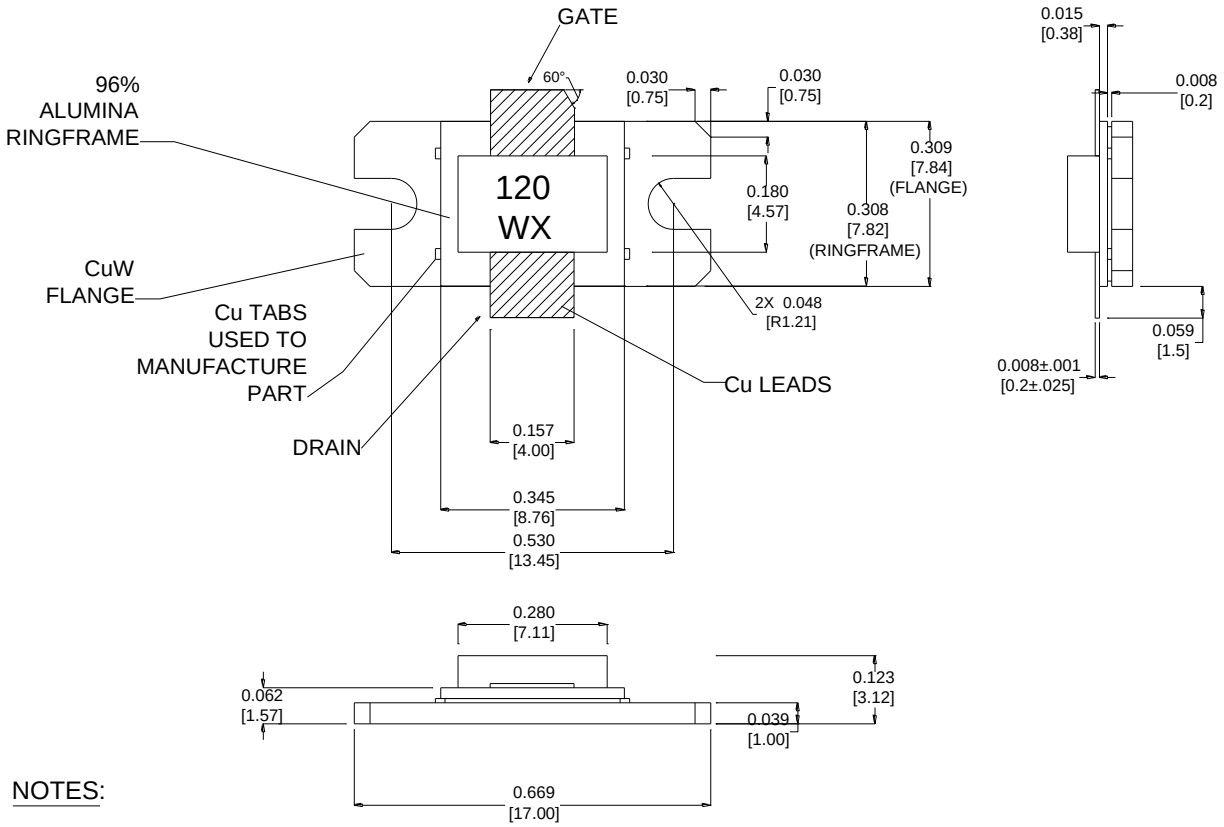
## MAXIMUM AVAILABLE GAIN (8V,1.2A)




**Optimum Load (8V,1.2A)**

| Freq (GHz) | MAG($\Gamma_L$) | ANG($\Gamma_L$) |
|---|---|---|
| 0.1 | 0.856 | -179.62 |
| 0.2 | 0.856 | -179.23 |
| 0.3 | 0.856 | -178.85 |
| 0.4 | 0.855 | -178.47 |
| 0.5 | 0.855 | -178.09 |
| 0.6 | 0.855 | -177.70 |
| 0.7 | 0.854 | -177.32 |
| 0.8 | 0.854 | -176.93 |
| 0.9 | 0.853 | -176.54 |
| 1 | 0.852 | -176.15 |
| 1.5 | 0.847 | -174.16 |
| 2 | 0.838 | -172.09 |
| 2.5 | 0.827 | -169.89 |
| 3 | 0.811 | -167.55 |
| 3.5 | 0.790 | -165.04 |
| 4 | 0.762 | -162.32 |
| 4.5 | 0.725 | -159.41 |
| 5 | 0.675 | -156.38 |
| 5.5 | 0.610 | -153.52 |
| 6 | 0.526 | -151.63 |

## CU PACKAGE OUTLINE




NOTES:

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