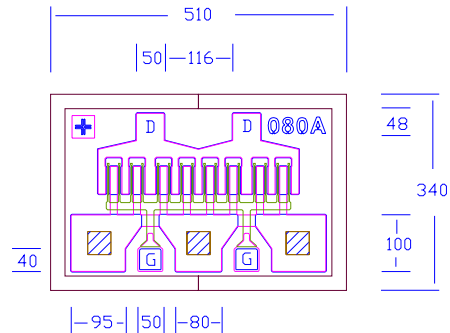




# EPA080A/EPA080AV

## High Efficiency Heterojunction Power FET

- +27.5dBm TYPICAL OUTPUT POWER
- 9.5dB TYPICAL POWER GAIN FOR EPA080A AND 10.5dB FOR EPA080AV AT 18GHz
- 0.3 X 800 MICRON RECESSED "MUSHROOM" GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- EPA080AV WITH VIA HOLE SOURCE GROUNDING



Chip Thickness: 75 ± 20 microns  
All Dimensions In Microns

⊠ : Via Hole  
**No Via Hole For EPA080A**

### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

| SYMBOLS          | PARAMETERS/TEST CONDITIONS   | EPA080A |      |      | EPA080AV |      |      | UNIT |
|------------------|--|---------|------|------|----------|------|------|------|
|                  |  | MIN     | TYP  | MAX  | MIN      | TYP  | MAX  |      |
| P <sub>1dB</sub> | Output Power at 1dB Compression f=12GHz  | 26      | 27.5 |      | 26       | 27.5 |      | dBm  |
|                  | V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz                         |         | 27.5 |      |          | 27.5 |      |      |
| G <sub>1dB</sub> | Gain at 1dB Compression f=12GHz  | 10.5    | 12.5 |      | 11.0     | 13.0 |      | dB   |
|                  | V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz                         |         | 9.5  |      |          | 10.5 |      |      |
| PAE              | Gain at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=12GHz |         | 45   |      |          | 46   |      | %    |
| I <sub>dss</sub> | Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V                           |         | 240  | 320  |          | 240  | 320  | mA   |
| G <sub>m</sub>   | Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V                                  | 160     | 260  |      | 160      | 260  |      | mS   |
| V <sub>p</sub>   | Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =2.5mA                              |         | -1.0 | -2.5 |          | -1.0 | -2.5 | V    |
| BV <sub>gd</sub> | Drain Breakdown Voltage I <sub>gd</sub> =1.0mA   | -11     | -15  |      | -11      | -15  |      | V    |
| BV <sub>gs</sub> | Source Breakdown Voltage I <sub>gs</sub> =1.0mA  | -7      | -14  |      | -7       | -14  |      | V    |
| R <sub>th</sub>  | Thermal Resistance (Au-Sn Eutectic Attach)   |         | 55   |      |          | 40   |      | °C/W |

### MAXIMUM RATINGS AT 25°C

| SYMBOLS          | PARAMETERS              | EPA080A               | EPA080AV              |
|------------------|-------------------------|-----------------------|-----------------------|
|                  |                         | ABSOLUTE <sup>1</sup> | ABSOLUTE <sup>1</sup> |
| V <sub>ds</sub>  | Drain-Source Voltage    | 12V                   | 12V                   |
| V <sub>gs</sub>  | Gate-Source Voltage     | -8V                   | -8V                   |
| I <sub>ds</sub>  | Drain Current           | I <sub>dss</sub>      | I <sub>dss</sub>      |
| I <sub>gsf</sub> | Forward Gate Current    | 40mA                  | 40mA                  |
| P <sub>in</sub>  | Input Power             | 25dBm                 | 25dBm                 |
| T <sub>ch</sub>  | Channel Temperature     | 175°C                 | 175°C                 |
| T <sub>stg</sub> | Storage Temperature     | -65/175°C             | -65/175°C             |
| P <sub>t</sub>   | Total Power Dissipation | 2.5W                  | 3.4W                  |

Note: 1. Exceeding any of the above ratings may result in permanent damage.

Recommended conditions for reliable operation is V<sub>ds</sub> of 8V maximum, channel temperature below 150 °C, and input power lower than 3dB gain compression point.

Specifications are subject to change without notice.

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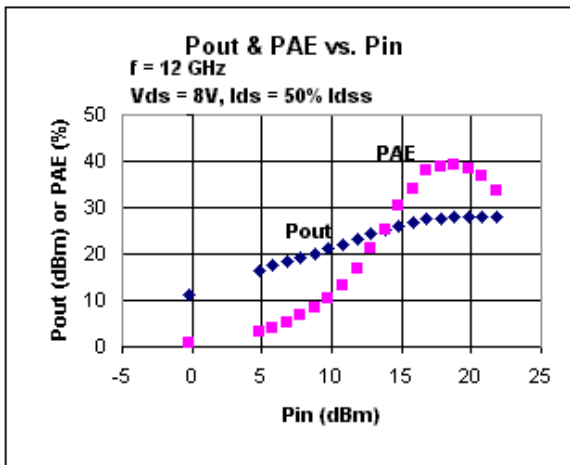
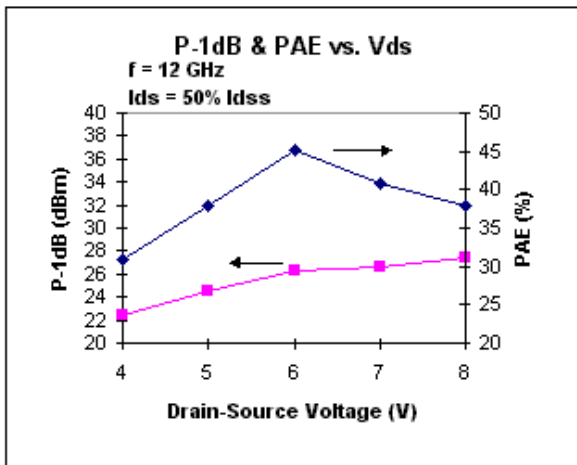
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# EPA080A/EPA080AV

## High Efficiency Heterojunction Power FET

### EPA080A



### S-PARAMETERS

### EPA080A 8V, 1/2 Idss

| FREQ (GHz) | S11   |        | S21    |       | S12   |      | S22   |        | FREQ (GHz) | S11   |       | S21   |       | S12   |       | S22   |        |
|------------|-------|--------|--------|-------|-------|------|-------|--------|------------|-------|-------|-------|-------|-------|-------|-------|--------|
|            | MAG   | ANG    | MAG    | ANG   | MAG   | ANG  | MAG   | ANG    |            | MAG   | ANG   | MAG   | ANG   | MAG   | ANG   | MAG   | ANG    |
| 1.0        | 0.929 | -63.0  | 13.172 | 141.6 | 0.035 | 56.2 | 0.478 | -36.9  | 21.0       | 0.892 | 151.7 | 1.076 | -6.7  | 0.060 | 1.8   | 0.546 | -173.4 |
| 2.0        | 0.885 | -102.9 | 9.639  | 117.9 | 0.051 | 36.9 | 0.380 | -60.7  | 22.0       | 0.893 | 148.0 | 1.015 | -11.2 | 0.060 | 1.7   | 0.566 | -176.3 |
| 4.0        | 0.856 | -140.4 | 5.741  | 91.7  | 0.058 | 20.1 | 0.290 | -86.4  | 24.0       | 0.895 | 140.9 | 0.909 | -21.0 | 0.062 | 1.6   | 0.606 | 176.9  |
| 6.0        | 0.843 | -160.5 | 3.991  | 74.6  | 0.059 | 12.5 | 0.288 | -102.3 | 26.0       | 0.905 | 136.3 | 0.814 | -30.3 | 0.068 | 2.1   | 0.644 | 167.6  |
| 8.0        | 0.853 | -171.0 | 3.045  | 61.6  | 0.059 | 8.2  | 0.304 | -114.3 | 28.0       | 0.924 | 133.4 | 0.745 | -39.2 | 0.074 | 2.6   | 0.687 | 158.0  |
| 10.0       | 0.866 | -177.6 | 2.437  | 50.3  | 0.056 | 5.6  | 0.331 | -125.3 | 30.0       | 0.928 | 133.6 | 0.675 | -46.9 | 0.079 | 0.1   | 0.721 | 149.1  |
| 12.0       | 0.874 | -176.9 | 2.011  | 39.2  | 0.055 | 5.0  | 0.375 | -136.0 | 32.0       | 0.931 | 133.2 | 0.616 | -54.2 | 0.080 | -0.5  | 0.749 | 141.4  |
| 14.0       | 0.883 | -171.6 | 1.698  | 29.1  | 0.053 | 3.6  | 0.423 | -145.0 | 34.0       | 0.922 | 129.9 | 0.547 | -61.2 | 0.081 | -1.4  | 0.771 | 135.0  |
| 16.0       | 0.886 | -166.1 | 1.457  | 18.7  | 0.053 | 3.4  | 0.466 | -152.1 | 36.0       | 0.935 | 125.9 | 0.494 | -67.2 | 0.088 | -6.5  | 0.784 | 129.7  |
| 18.0       | 0.885 | -160.2 | 1.287  | 8.8   | 0.055 | 2.3  | 0.501 | -158.3 | 38.0       | 0.929 | 119.1 | 0.465 | -75.0 | 0.094 | -14.2 | 0.797 | 122.8  |
| 20.0       | 0.885 | -152.0 | 1.166  | -2.2  | 0.059 | 0.6  | 0.524 | -165.7 | 40.0       | 0.913 | 109.5 | 0.439 | -83.8 | 0.096 | -29.3 | 0.799 | 115.9  |

### EPA080AV 8V, 1/2 Idss

| FREQ (GHz) | S11   |        | S21    |       | S12   |      | S22   |        | FREQ (GHz) | S11   |       | S21   |       | S12   |       | S22   |        |
|------------|-------|--------|--------|-------|-------|------|-------|--------|------------|-------|-------|-------|-------|-------|-------|-------|--------|
|            | MAG   | ANG    | MAG    | ANG   | MAG   | ANG  | MAG   | ANG    |            | MAG   | ANG   | MAG   | ANG   | MAG   | ANG   | MAG   | ANG    |
| 1.0        | 0.942 | -63.5  | 13.243 | 142.1 | 0.027 | 56.6 | 0.437 | -32.4  | 21.0       | 0.903 | 146.0 | 1.031 | -10.4 | 0.041 | -6.5  | 0.587 | -163.3 |
| 2.0        | 0.902 | -104.4 | 9.769  | 118.0 | 0.039 | 36.7 | 0.357 | -53.6  | 22.0       | 0.899 | 143.1 | 0.959 | -15.5 | 0.040 | -8.1  | 0.614 | -168.3 |
| 4.0        | 0.873 | -144.6 | 5.824  | 91.0  | 0.046 | 18.6 | 0.283 | -76.5  | 24.0       | 0.897 | 135.6 | 0.815 | -26.1 | 0.040 | -7.9  | 0.672 | -176.7 |
| 6.0        | 0.869 | -167.2 | 4.016  | 73.2  | 0.046 | 9.9  | 0.283 | -90.9  | 26.0       | 0.900 | 131.5 | 0.680 | -36.3 | 0.040 | -5.5  | 0.727 | 172.9  |
| 8.0        | 0.875 | -175.8 | 3.068  | 60.2  | 0.044 | 5.5  | 0.288 | -104.7 | 28.0       | 0.891 | 123.6 | 0.571 | -45.3 | 0.039 | -8.3  | 0.782 | 167.9  |
| 10.0       | 0.878 | -178.4 | 2.445  | 48.1  | 0.042 | 1.0  | 0.318 | -120.2 | 30.0       | 0.882 | 116.2 | 0.475 | -54.8 | 0.038 | -8.6  | 0.818 | 164.5  |
| 12.0       | 0.885 | -168.6 | 1.970  | 35.5  | 0.038 | -1.9 | 0.388 | -129.0 | 32.0       | 0.845 | 115.4 | 0.408 | -63.3 | 0.033 | -11.4 | 0.873 | 156.4  |
| 14.0       | 0.894 | -162.9 | 1.624  | 24.8  | 0.037 | -3.9 | 0.447 | -137.8 | 34.0       | 0.906 | 116.7 | 0.361 | -70.2 | 0.033 | -15.1 | 0.831 | 149.0  |
| 16.0       | 0.907 | -157.7 | 1.361  | 14.6  | 0.036 | -4.5 | 0.509 | -144.0 | 36.0       | 0.940 | 118.7 | 0.336 | -75.7 | 0.035 | -20.7 | 0.855 | 142.1  |
| 18.0       | 0.908 | -156.8 | 1.187  | 5.7   | 0.036 | -5.9 | 0.547 | -154.3 | 38.0       | 0.954 | 120.1 | 0.332 | -83.5 | 0.043 | -37.4 | 0.895 | 134.0  |
| 20.0       | 0.905 | -150.5 | 1.056  | -4.2  | 0.037 | -7.1 | 0.586 | -160.4 | 40.0       | 0.940 | 117.6 | 0.314 | -90.8 | 0.050 | -59.0 | 0.905 | 129.4  |

Note: The data included 0.7 mils diameter Au bonding wires; 2 gate wires, 15 mils each; 2 drain wires, 20 mils each; 6 source wires, 7 mils each; no source wires for EPA080AV.

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## High Efficiency Heterojunction Power FET

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