



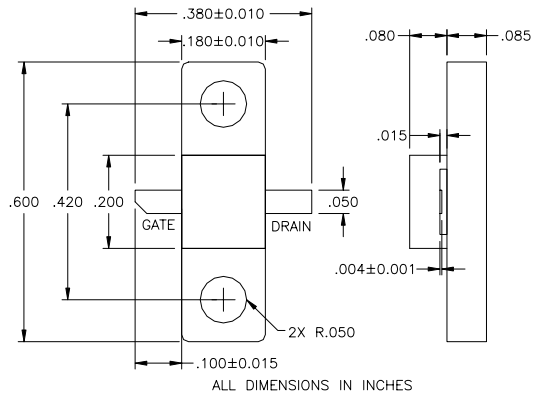
# EPA680AV-180F

ISSUED 05/02/2006

## High Efficiency Heterojunction Power FET

### FEATURES

- Non-Hermetic 180mil Metal Flange Package
- +36.5 dBm Typical Output Power
- 17.5 dB Typical Power Gain at 2GHz
- 0.4 x 6800 Micron Recessed "Mushroom" Gate
- Si<sub>3</sub>N<sub>4</sub> Passivation
- Advanced Epitaxial Heterojunction Profile Provides Extra High Power Efficiency and High Reliability



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



Caution! ESD sensitive device.

| SYMBOL                 | PARAMETERS/TEST CONDITIONS <sup>1</sup>  | MIN  | TYP          | MAX  | UNITS |
|------------------------|--|------|--------------|------|-------|
| <b>P<sub>1dB</sub></b> | Output Power at 1dB Compression<br>V <sub>DS</sub> = 8 V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub><br>f = 2GHz<br>f = 4GHz | 35.0 | 36.5<br>36.5 |      | dBm   |
| <b>G<sub>1dB</sub></b> | Gain at 1dB Compression<br>V <sub>DS</sub> = 8 V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub><br>f = 2GHz<br>f = 4GHz         | 16.0 | 17.5<br>12.5 |      | dB    |
| <b>PAE</b>             | Power Added Efficiency at 1dB Compression<br>V <sub>DS</sub> = 8 V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub><br>f = 2GHz   |      | 45           |      | %     |
| <b>I<sub>DSS</sub></b> | Saturated Drain Current<br>V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V  | 1250 | 2050         | 2690 | mA    |
| <b>G<sub>M</sub></b>   | Transconductance<br>V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V   | 1360 | 2150         |      | mS    |
| <b>V<sub>P</sub></b>   | Pinch-off Voltage<br>V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 20 mA  |      | -1.0         | -2.5 | V     |
| <b>BV<sub>GD</sub></b> | Drain Breakdown Voltage<br>I <sub>GD</sub> = 6.8 mA  | -13  | -15          |      | V     |
| <b>BV<sub>GS</sub></b> | Source Breakdown Voltage<br>I <sub>GS</sub> = 6.8 mA   | -7   | -14          |      | V     |
| <b>R<sub>TH</sub></b>  | Thermal Resistance   |      | 7*           |      | °C/W  |

\* Overall R<sub>th</sub> depends on case mounting.

### MAXIMUM RATINGS AT 25°C

| SYMBOLS                | PARAMETERS              | ABSOLUTE <sup>1</sup> | CONTINUOUS <sup>2</sup> |
|------------------------|-------------------------|-----------------------|-------------------------|
| <b>V<sub>ds</sub></b>  | Drain-Source Voltage    | 12V                   | 8V                      |
| <b>V<sub>gs</sub></b>  | Gate-Source Voltage     | -5V                   | -3V                     |
| <b>I<sub>gsf</sub></b> | Forward Gate Current    | 30.6 mA               | 10.2 mA                 |
| <b>I<sub>gsr</sub></b> | Reversed Gate Current   | -5.1 mA               | -1.7 mA                 |
| <b>P<sub>in</sub></b>  | Input Power             | 33.5 dBm              | @ 3dB Compression       |
| <b>T<sub>ch</sub></b>  | Channel Temperature     | 175°C                 | 175°C                   |
| <b>T<sub>stg</sub></b> | Storage Temperature     | -65/175°C             | -65/175°C               |
| <b>P<sub>t</sub></b>   | Total Power Dissipation | 21 W                  | 21 W                    |

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

2. Exceeding any of the above ratings may reduce MTTF below design goals.

Specifications are subject to change without notice.

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