

# Eudyna GaN-HEMT 180W

## ES/EGN26A180IV

### Preliminary

### High Voltage - High Power GaN-HEMT

#### FEATURES

- High Voltage Operation :  $V_{DS}=50V$
- High Power : 53.0dBm (typ.) @ P3dB
- High Efficiency: 55%(typ.) @ P3dB
- Linear Gain : 14.0dB(typ.) @  $f=2.6GHz$
- Proven Reliability

#### DESCRIPTION

Eudyna's GaN-HEMT offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers with 50V operation, and gives you higher gain.

This device target applications are low current and wide band applications for high voltage.



#### ABSOLUTE MAXIMUM RATINGS

| Item                    | Symbol    | Condition        | Rating      | Unit       |
|-------------------------|-----------|------------------|-------------|------------|
| Drain-Source Voltage    | $V_{DS}$  | $T_c=25^\circ C$ | 120         | V          |
| Gate-Source Voltage     | $V_{GS}$  |                  | -5          | V          |
| Total Power Dissipation | $P_t$     |                  | 281.25      | W          |
| Storage Temperature     | $T_{stg}$ |                  | -65 to +175 | $^\circ C$ |
| Channel Temperature     | $T_{ch}$  |                  | 250         | $^\circ C$ |

#### RECOMMENDED OPERATING CONDITION(Case Temperature $T_c=25^\circ C$ )

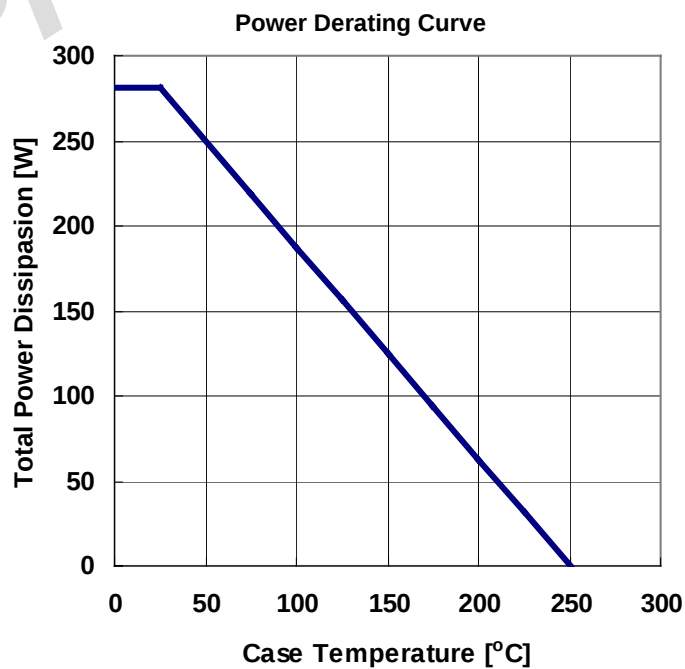
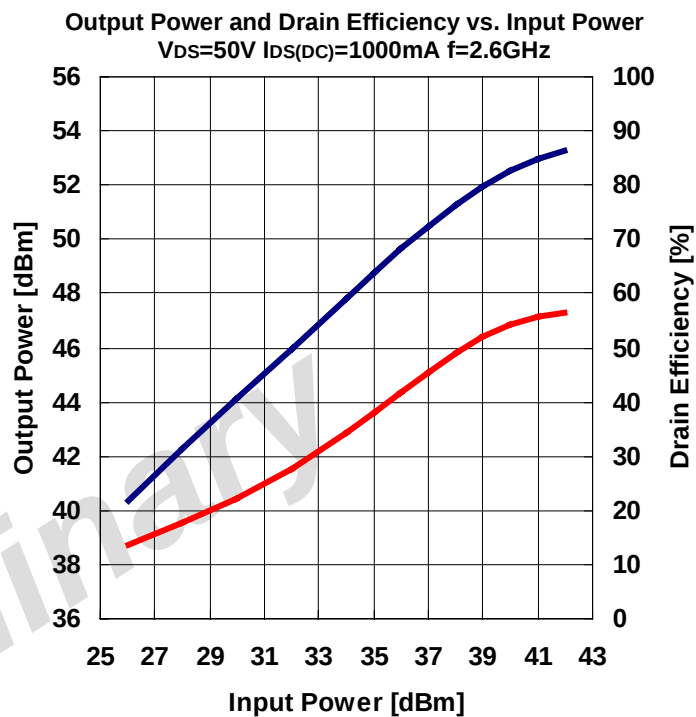
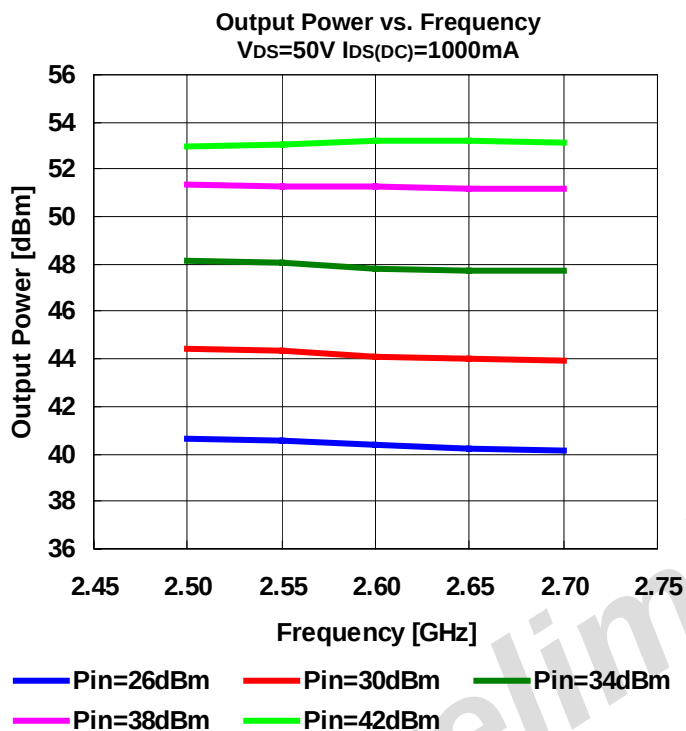
| Item                 | Symbol   | Condition       | Limit | Unit       |
|----------------------|----------|-----------------|-------|------------|
| DC Input Voltage     | $V_{DS}$ |                 | 50    | V          |
| Forward Gate Current | $I_{GF}$ | $R_G=2\ \Omega$ | <TBD  | mA         |
| Reverse Gate Current | $I_{GR}$ | $R_G=2\ \Omega$ | >-7.2 | mA         |
| Channel Temperature  | $T_{ch}$ |                 | 200   | $^\circ C$ |

#### ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25^\circ C$ )

| Item                         | Symbol    | Condition                  | Limit |      |      | Unit         |
|------------------------------|-----------|----------------------------|-------|------|------|--------------|
|                              |           |                            | min.  | Typ. | Max. |              |
| Pinch-Off Voltage            | $V_p$     | $V_{DS}=50V$ $I_{DS}=72mA$ | -1.0  | -2.0 | -3.5 | V            |
| Gate-Drain Breakdown Voltage | $V_{GDO}$ | $I_{GS}=-36mA$             | -     | -350 | -    | V            |
| 3dB Gain Compression Power   | $P_{3dB}$ | $V_{DS}=50V$               | TBD   | 53.0 | -    | dBm          |
| Drain Efficiency             | $\eta_d$  | $I_{DS}(DC)=1000mA$        | -     | 55   | -    | %            |
| Linear Gain                  | $GL$      | $f=2.6GHz$                 | TBD   | 14.0 | -    | dB           |
| Thermal Resistance           | $R_{th}$  | Channel to Case            | -     | 0.65 | 0.8  | $^\circ C/W$ |

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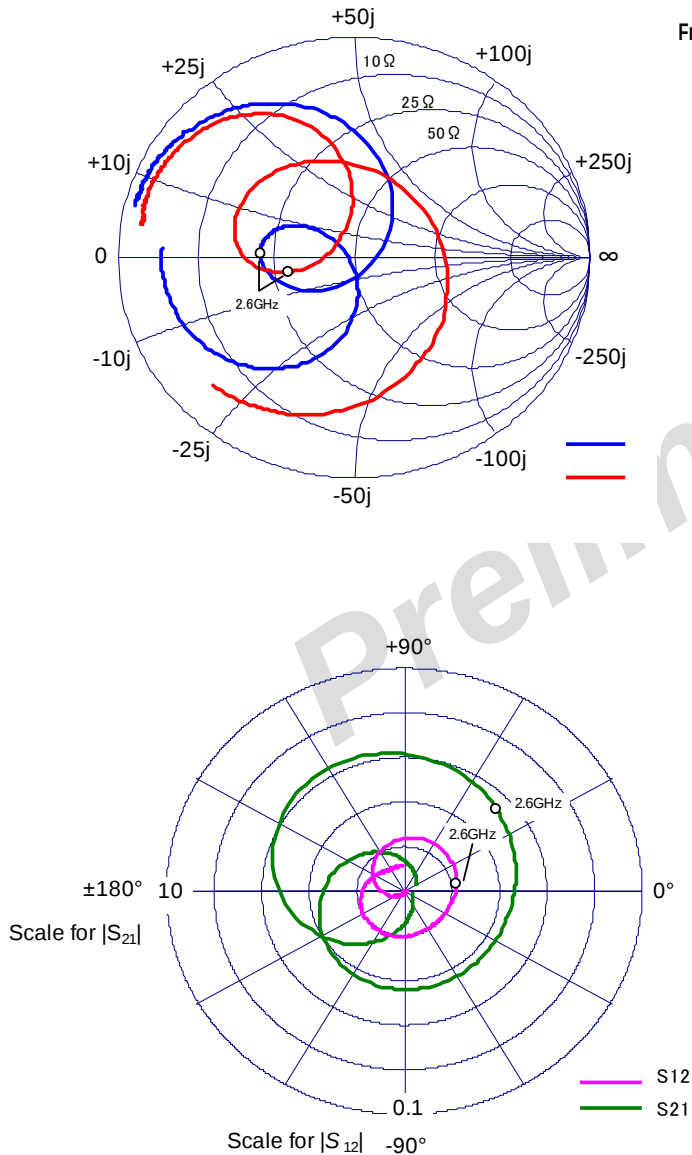
High Voltage - High Power GaN-HEMT



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## High Voltage - High Power GaN-HEMT

S-Parameters @V<sub>DS</sub>=50V, I<sub>DS</sub>=1000mA, f=1 to 4 GHz,  
Z<sub>I</sub> = Z<sub>S</sub> = 50 ohm



| Freq<br>[GHz] | S11   |        | S21   |        | S12   |        | S22   |        |
|---------------|-------|--------|-------|--------|-------|--------|-------|--------|
|               | MAG   | ANG    | MAG   | ANG    | MAG   | ANG    | MAG   | ANG    |
| 1.0           | 0.957 | 165.6  | 0.367 | -14.0  | 0.001 | -13.4  | 0.915 | 170.5  |
| 1.1           | 0.956 | 163.6  | 0.357 | -19.3  | 0.001 | -41.8  | 0.913 | 169.7  |
| 1.2           | 0.956 | 161.5  | 0.359 | -24.4  | 0.001 | -55.6  | 0.912 | 168.5  |
| 1.3           | 0.954 | 159.0  | 0.378 | -30.2  | 0.001 | -37.1  | 0.917 | 167.0  |
| 1.4           | 0.951 | 156.6  | 0.415 | -35.8  | 0.000 | -22.2  | 0.918 | 165.0  |
| 1.5           | 0.944 | 153.0  | 0.469 | -42.4  | 0.000 | -60.3  | 0.920 | 162.7  |
| 1.6           | 0.936 | 148.9  | 0.556 | -50.1  | 0.001 | -86.6  | 0.917 | 159.8  |
| 1.7           | 0.918 | 144.4  | 0.685 | -59.1  | 0.001 | -110.0 | 0.913 | 156.4  |
| 1.8           | 0.900 | 138.3  | 0.895 | -69.4  | 0.002 | -116.6 | 0.905 | 152.4  |
| 1.9           | 0.864 | 130.4  | 1.223 | -81.8  | 0.003 | -128.9 | 0.898 | 147.4  |
| 2.0           | 0.801 | 119.3  | 1.764 | -98.8  | 0.004 | -154.1 | 0.876 | 140.7  |
| 2.1           | 0.685 | 103.0  | 2.704 | -121.5 | 0.008 | -174.2 | 0.833 | 131.3  |
| 2.2           | 0.461 | 76.9   | 4.175 | -153.4 | 0.014 | 156.9  | 0.731 | 117.6  |
| 2.3           | 0.127 | 19.7   | 5.757 | 163.9  | 0.021 | 118.8  | 0.517 | 100.1  |
| 2.4           | 0.225 | -137.7 | 6.357 | 118.3  | 0.025 | 76.0   | 0.228 | 92.5   |
| 2.5           | 0.363 | -167.4 | 5.961 | 78.0   | 0.024 | 38.1   | 0.114 | 173.0  |
| 2.6           | 0.398 | 177.4  | 5.343 | 43.8   | 0.022 | 8.6    | 0.284 | -165.8 |
| 2.7           | 0.386 | 167.3  | 4.844 | 14.6   | 0.020 | -16.2  | 0.418 | -174.2 |
| 2.8           | 0.343 | 157.7  | 4.522 | -12.6  | 0.019 | -38.7  | 0.496 | 173.4  |
| 2.9           | 0.258 | 147.1  | 4.398 | -39.2  | 0.019 | -61.9  | 0.533 | 159.2  |
| 3.0           | 0.123 | 137.9  | 4.404 | -67.6  | 0.020 | -86.6  | 0.531 | 141.2  |
| 3.1           | 0.069 | -85.7  | 4.384 | -99.0  | 0.021 | -112.8 | 0.482 | 117.1  |
| 3.2           | 0.282 | -91.9  | 4.180 | -133.5 | 0.020 | -142.0 | 0.407 | 81.9   |
| 3.3           | 0.470 | -108.2 | 3.645 | -168.8 | 0.019 | -168.8 | 0.364 | 30.5   |
| 3.4           | 0.606 | -123.5 | 2.923 | 157.5  | 0.017 | 169.6  | 0.425 | -22.0  |
| 3.5           | 0.694 | -136.2 | 2.205 | 127.9  | 0.014 | 150.7  | 0.549 | -59.7  |
| 3.6           | 0.747 | -146.9 | 1.641 | 102.7  | 0.013 | 136.1  | 0.657 | -85.1  |
| 3.7           | 0.783 | -156.2 | 1.222 | 82.1   | 0.012 | 127.1  | 0.735 | -103.4 |
| 3.8           | 0.800 | -165.4 | 0.942 | 64.4   | 0.011 | 119.5  | 0.782 | -117.1 |
| 3.9           | 0.810 | -174.0 | 0.752 | 49.5   | 0.011 | 106.6  | 0.814 | -127.5 |
| 4.0           | 0.810 | 177.1  | 0.632 | 35.4   | 0.011 | 95.0   | 0.834 | -136.2 |

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Technical drawing of a rectangular component with dimensions and a side view.

**Top View Dimensions:**

- Overall width:  $24.0 \pm 0.2$
- Overall height:  $17.4$
- Inner width:  $14.9$
- Inner height:  $8.0$
- Top flange width:  $2 - 2.0 \pm 0.1$
- Bottom flange width:  $3.0 \pm 0.5$
- Left flange width:  $3.0 \pm 0.5$
- Right flange width:  $15.5$

**Side View Dimensions:**

- Overall height:  $1.9$
- Maximum width:  $5.5 \text{ Max.}$
- Top flange thickness:  $0.1$

**Geometric Features:**

- Top corners:  $4 - R1.5$
- Right corners:  $4 - R1.3$
- Bottom corners:  $(12 - R0.5)$
- Feature 1: Top center flange
- Feature 2: Right side flange
- Feature 3: Bottom center flange

Unit : mm