

## Features

- Low Cost GaAs Power FET
- Class A or Class AB Operation
- 14.5 dB Typical Gain at 2.4GHz
- 5V to 10V Operation

## Description

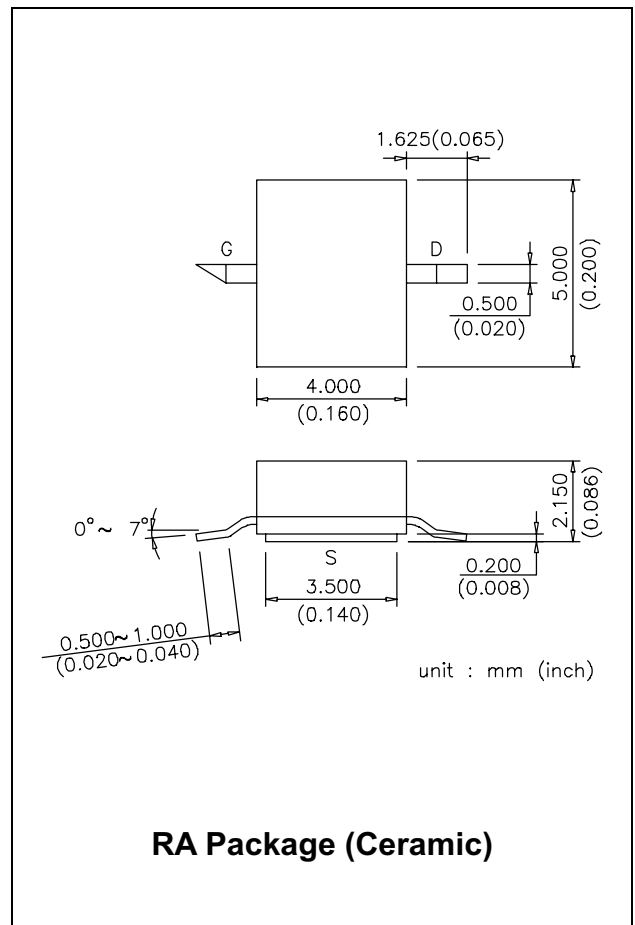
The HWL34YRA is a Power GaAs FET designed for various L-band & S-band applications. It is presently offered in low cost ceramic package.

## Absolute Maximum Ratings

|           |                         |               |
|-----------|-------------------------|---------------|
| $V_{DS}$  | Drain to Source Voltage | +15V          |
| $V_{GS}$  | Gate to Source Voltage  | -5V           |
| $I_D$     | Drain Current           | $I_{DSS}$     |
| $I_G$     | Gate Current            | 6mA           |
| $T_{CH}$  | Channel Temperature     | 175°C         |
| $T_{STG}$ | Storage Temperature     | -65 to +175°C |
| $P_T^*$   | Power Dissipation       | 12W           |

\* mounted on an infinite heat sink.

## Outline Dimensions

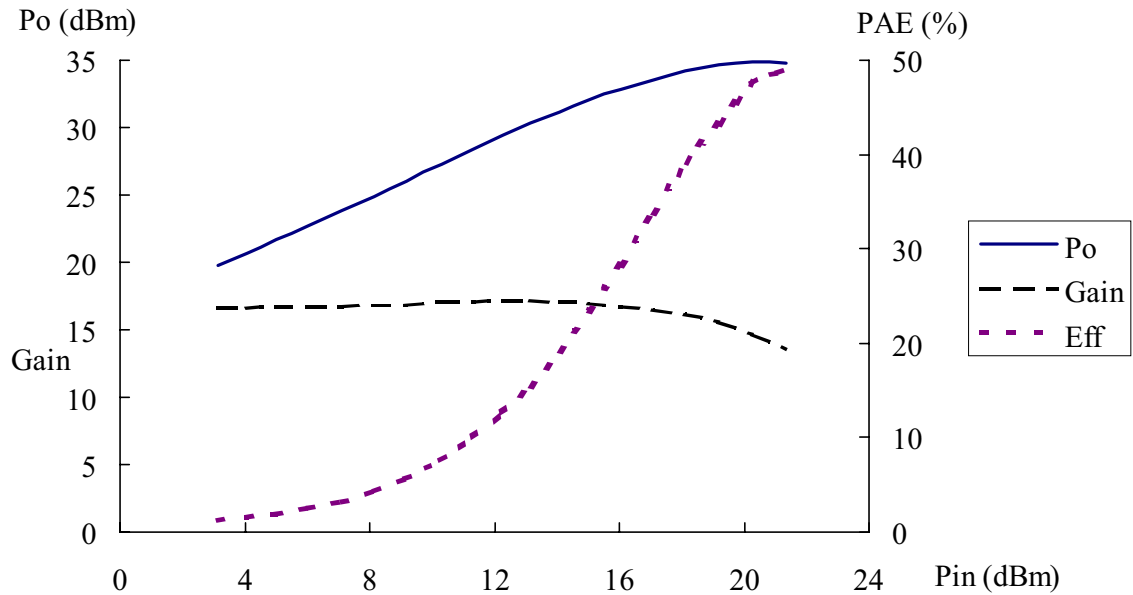


## Electrical Specifications ( $T_A=25^\circ\text{C}$ ) $f=2400\text{ MHz}$ for all RF Tests

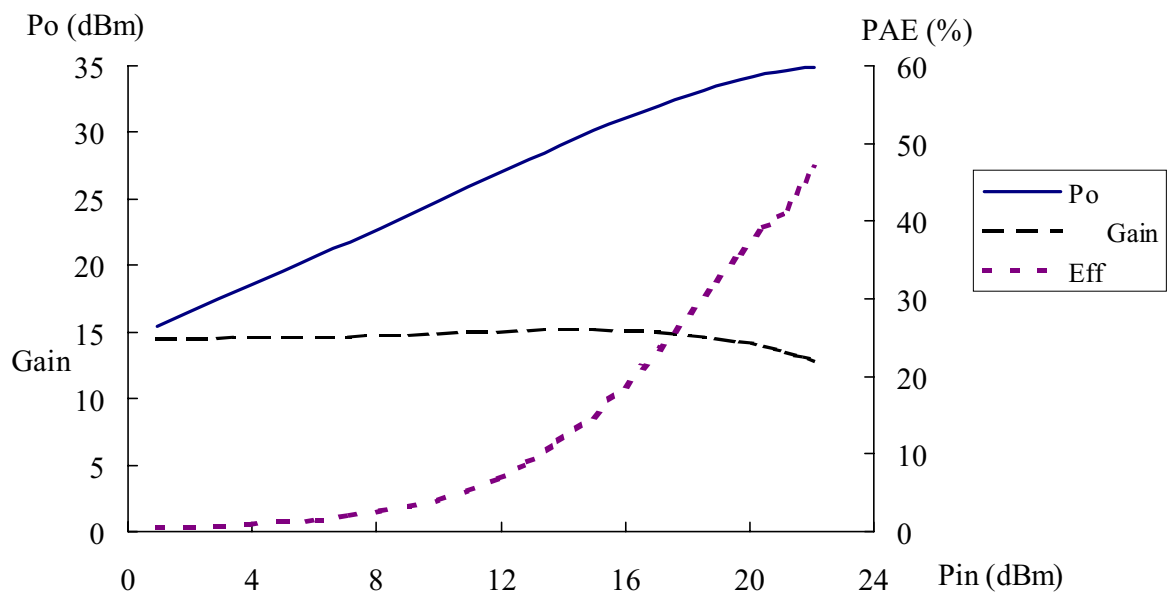
| Symbol    | Parameters & Conditions                                                           | Units              | Min. | Typ. | Max. |
|-----------|-----------------------------------------------------------------------------------|--------------------|------|------|------|
| $I_{DSS}$ | Saturated Current at $V_{DS}=3V$ , $V_{GS}=0V$                                    | mA                 | 900  | 1200 | 1600 |
| $V_P$     | Pinch-off Voltage at $V_{DS}=3V$ , $I_D=60\text{mA}$                              | V                  | -3.5 | -2.0 | -1.5 |
| $g_m$     | Transconductance at $V_{DS}=3V$ , $I_D=600\text{mA}$                              | mS                 | -    | 700  | -    |
| $R_{th}$  | Thermal Resistance                                                                | $^\circ\text{C/W}$ | -    | 9    | 12   |
| $P_{1dB}$ | Power Output at Test Points<br>$V_{DS}=10V$ , $I_D=0.5I_{DSS}$                    | dBm                | 33   | 34   | -    |
| $G_{1dB}$ | Gain at 1dB Compression Point<br>$V_{DS}=10V$ , $I_D=0.5I_{DSS}$                  | dB                 | 13.5 | 14.5 | -    |
| PAE       | Power-Added Efficiency ( $P_{out} = P_{1dB}$ )<br>$V_{DS}=10V$ , $I_D=0.5I_{DSS}$ | %                  | 35   | 45   | -    |

**Typical Performance at 25°C**
**Output Power & Efficiency & Gain vs Input Power**

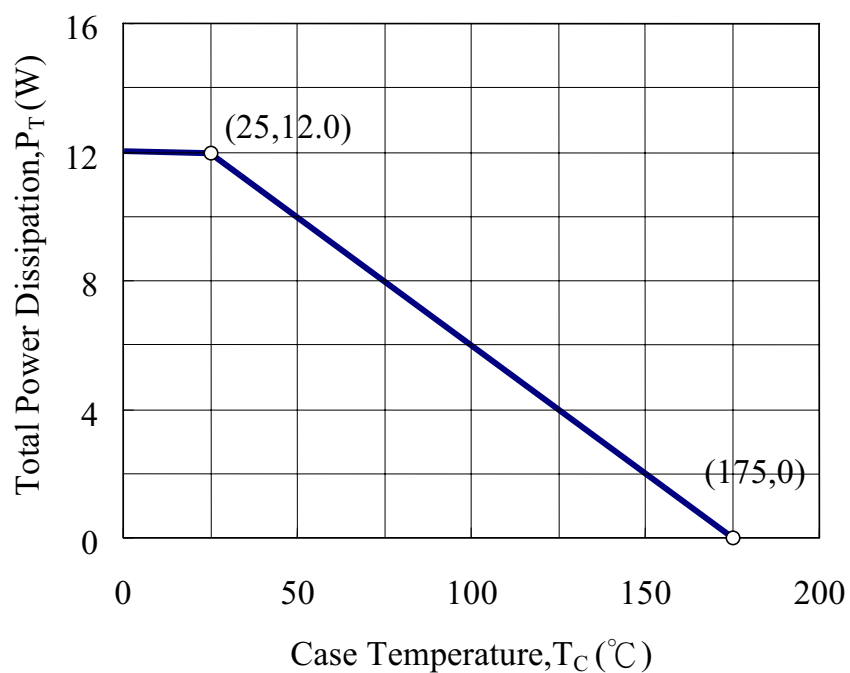
@ f=1.9 GHz, Vds=10V, Ids = 0.5 Idss


**Output Power & Efficiency & Gain vs Input Power**

@ f=2.4 GHz, Vds=10V, Ids = 0.5 Idss



### Power Derating Curve



## Small Signal Common Source Scattering Parameters

### S-MAGN AND ANGLES

 $V_{DS}=10V, I_{DS}=0.5I_{DSS}$ 

| (GHz) | IS11I | ∠ANG     | IS21I  | ∠ANG    | IS12I | ∠ANG    | IS22I | ∠ANG     |
|-------|-------|----------|--------|---------|-------|---------|-------|----------|
| 0.5   | 0.947 | -130.684 | 11.604 | 99.353  | 0.014 | 30.593  | 0.254 | -131.689 |
| 0.6   | 0.949 | -142.198 | 10.210 | 91.564  | 0.013 | 16.744  | 0.270 | -131.001 |
| 0.7   | 0.927 | -152.271 | 8.674  | 84.882  | 0.016 | 18.392  | 0.299 | -138.530 |
| 0.8   | 0.931 | -160.245 | 7.616  | 78.087  | 0.014 | 11.917  | 0.321 | -141.943 |
| 0.9   | 0.930 | -167.066 | 6.801  | 73.266  | 0.016 | 11.796  | 0.331 | -144.778 |
| 1.0   | 0.934 | -173.566 | 6.168  | 67.037  | 0.022 | 3.037   | 0.351 | -147.447 |
| 1.1   | 0.929 | -179.133 | 5.472  | 63.127  | 0.015 | 8.597   | 0.369 | -151.567 |
| 1.2   | 0.930 | 175.811  | 4.965  | 57.754  | 0.016 | -0.436  | 0.386 | -153.251 |
| 1.3   | 0.927 | 171.215  | 4.528  | 53.779  | 0.015 | 2.559   | 0.399 | -155.880 |
| 1.4   | 0.926 | 167.036  | 4.141  | 49.641  | 0.016 | -1.229  | 0.421 | -158.172 |
| 1.5   | 0.924 | 162.831  | 3.818  | 45.231  | 0.017 | -8.179  | 0.430 | -160.732 |
| 1.6   | 0.925 | 158.511  | 3.553  | 41.565  | 0.016 | -9.085  | 0.441 | -162.681 |
| 1.7   | 0.929 | 155.145  | 3.306  | 37.733  | 0.016 | -9.257  | 0.457 | -165.441 |
| 1.8   | 0.928 | 152.195  | 3.053  | 34.226  | 0.016 | -10.604 | 0.476 | -166.853 |
| 1.9   | 0.923 | 148.836  | 2.852  | 30.512  | 0.017 | -17.858 | 0.483 | -169.223 |
| 2.0   | 0.936 | 145.751  | 2.675  | 27.311  | 0.015 | -11.779 | 0.504 | -170.146 |
| 2.1   | 0.924 | 142.432  | 2.506  | 23.576  | 0.014 | -19.614 | 0.512 | -172.408 |
| 2.2   | 0.927 | 139.764  | 2.356  | 20.349  | 0.015 | -17.051 | 0.529 | -174.536 |
| 2.3   | 0.929 | 136.975  | 2.211  | 17.260  | 0.015 | -22.120 | 0.540 | -175.615 |
| 2.4   | 0.930 | 134.915  | 2.076  | 14.278  | 0.015 | -18.382 | 0.550 | -176.656 |
| 2.5   | 0.927 | 131.630  | 1.963  | 10.858  | 0.014 | -25.142 | 0.563 | -178.245 |
| 2.6   | 0.933 | 129.386  | 1.874  | 8.107   | 0.014 | -22.983 | 0.588 | -179.669 |
| 2.7   | 0.932 | 127.241  | 1.756  | 5.346   | 0.014 | -29.044 | 0.583 | 179.190  |
| 2.8   | 0.929 | 125.386  | 1.665  | 2.538   | 0.014 | -19.682 | 0.597 | 178.052  |
| 2.9   | 0.935 | 122.879  | 1.578  | -0.146  | 0.013 | -29.826 | 0.606 | 176.436  |
| 3.0   | 0.935 | 120.597  | 1.497  | -3.033  | 0.012 | -49.463 | 0.613 | 175.600  |
| 3.1   | 0.934 | 118.987  | 1.427  | -5.365  | 0.012 | -29.255 | 0.622 | 174.679  |
| 3.2   | 0.939 | 116.922  | 1.358  | -8.017  | 0.015 | -14.167 | 0.631 | 173.081  |
| 3.3   | 0.935 | 114.958  | 1.304  | -10.711 | 0.012 | -32.211 | 0.639 | 171.960  |
| 3.4   | 0.931 | 113.530  | 1.254  | -12.885 | 0.013 | -28.065 | 0.645 | 171.700  |
| 3.5   | 0.931 | 111.453  | 1.202  | -15.654 | 0.014 | -26.944 | 0.659 | 170.094  |
| 3.6   | 0.939 | 109.845  | 1.157  | -17.709 | 0.011 | -42.929 | 0.662 | 168.398  |
| 3.7   | 0.934 | 108.557  | 1.120  | -20.278 | 0.012 | -28.638 | 0.675 | 168.044  |
| 3.8   | 0.939 | 106.654  | 1.086  | -22.849 | 0.013 | -16.919 | 0.666 | 164.745  |
| 3.9   | 0.939 | 105.303  | 1.039  | -24.926 | 0.012 | -35.426 | 0.683 | 166.180  |
| 4.0   | 0.938 | 103.525  | 1.015  | -27.027 | 0.013 | -28.487 | 0.691 | 165.577  |