

Internally Matched Power GaAs FETs (X, Ku-Band)

Features

- High power
 - $P_{1dB} = 37.5$ dBm at 14.0 GHz to 14.5 GHz
- High gain
 - $G_{1dB} = 6.0$ dB at 14.0 GHz to 14.5 GHz
- Broad Band Internally Matched
- Hermetically sealed package

RF Performance Specifications ($T_a = 25^\circ\text{C}$)

| Characteristics | Symbol | Condition | Unit | Min. | Typ. | Max |
|---------------------------------------|-----------------|---|------------------|------|------|-----|
| Output Power at 1dB Compression Point | P_{1dB} | $V_{DS} = 9V$ $f = 14.0 \sim 14.5\text{GHz}$ | dBm | 37.0 | 37.5 | – |
| Power Gain at 1dB Compression Point | G_{1dB} | | dB | 5.0 | 6.0 | – |
| Drain Current | I_{DS} | | A | – | 2.0 | 2.5 |
| Power Added Efficiency | η_{add} | | % | – | 20 | – |
| Channel-Temperature Rise | ΔT_{ch} | $V_{DS} \times I_{DS} \times R_{th(c-c)}$ | $^\circ\text{C}$ | – | – | 80 |

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Condition | Unit | Min. | Typ. | Max |
|----------------------------------|---------------|-------------------------------------|--------------------|------|------|------|
| Trans-conductance | gm | $V_{DS}=3V$ $I_{DS}=2.4\text{A}$ | mS | – | 1400 | – |
| Pinch-off Voltage | V_{GSoff} | $V_{DS}=3V$ $I_{DS}=72\text{mA}$ | V | -2.0 | -3.5 | -5.0 |
| Saturated Drain Current | I_{DSS} | $V_{DS}=3V$ $V_{GS}=0V$ | A | – | 5.0 | 5.7 |
| Gate to Source Breakdown Voltage | V_{GSO} | $I_{GS}=-72\mu\text{A}$ | V | -5 | – | – |
| Thermal Resistance | $R_{th(c-c)}$ | Channel to case | $^\circ\text{C/W}$ | – | 3.0 | 3.7 |

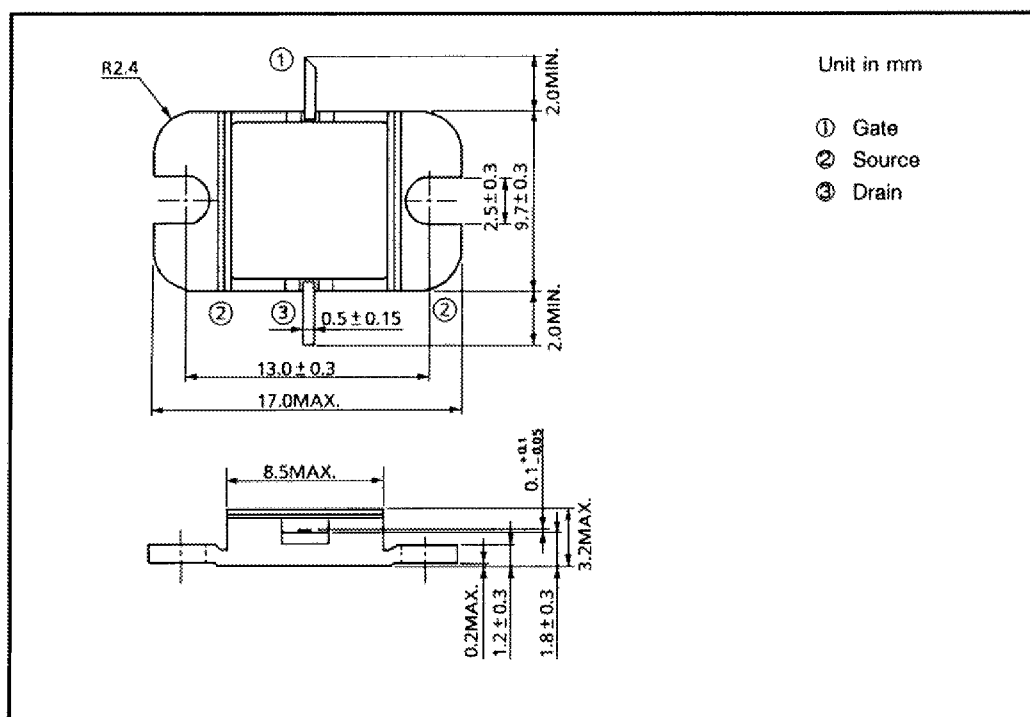
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Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Unit | Rating |
|--|-----------|------------------|---------|
| Drain Source Voltage | V_{DS} | V | 15 |
| Gate Source Voltage | V_{GS} | V | -5 |
| Drain Current | I_{DS} | A | 5.7 |
| Total Power Dissipation ($T_c = 25^\circ\text{C}$) | P_T | W | 30 |
| Channel Temperature | T_{ch} | $^\circ\text{C}$ | 175 |
| Storage Temperature | T_{stg} | $^\circ\text{C}$ | -65~175 |

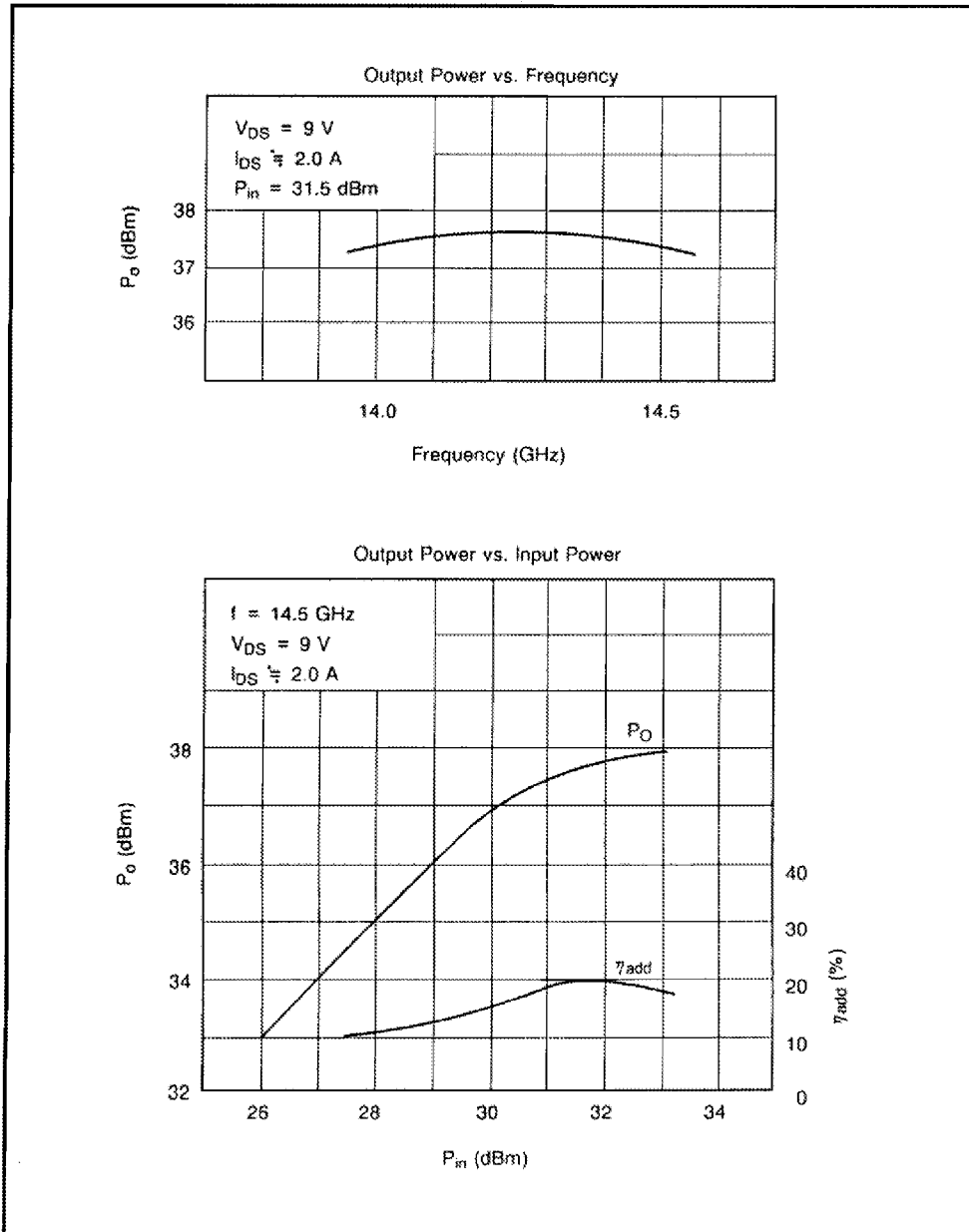
Package Outline (2-9D1B)



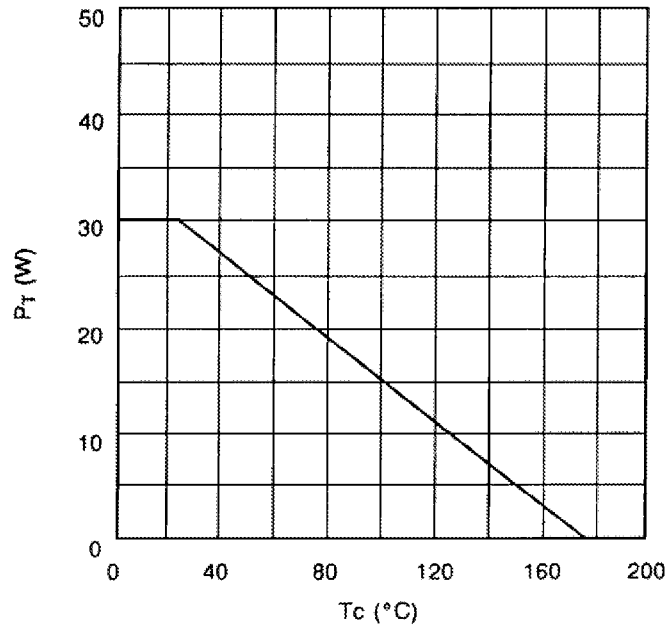
Handling Precautions for Packaged Type

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF Performances

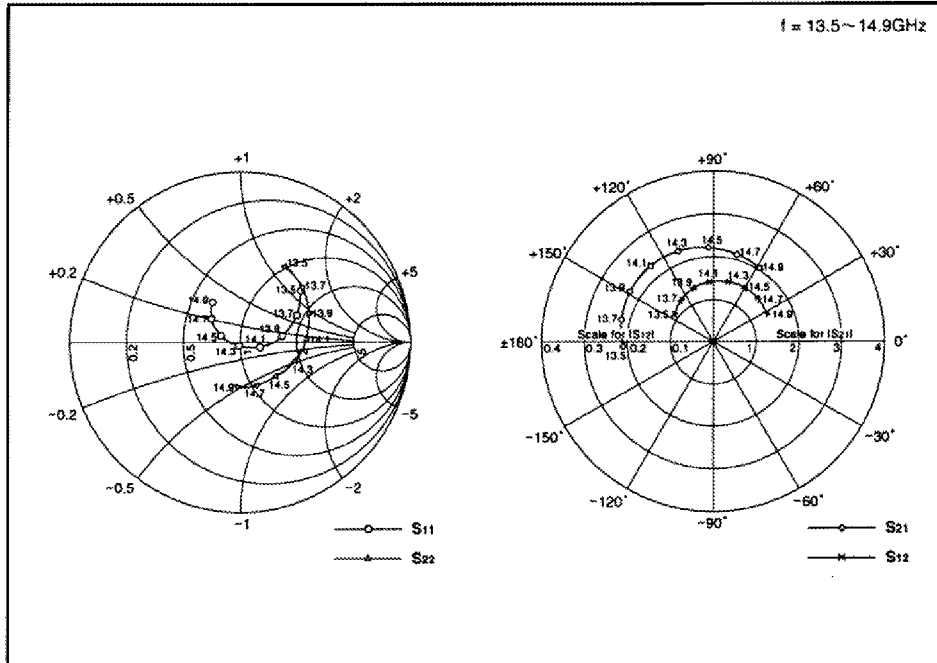


Power Dissipation vs. Case Temperature



Tim1414-5 S-Parameters
(MAGN. and ANGLES)

$V_{DS} = 9\text{ V}$, $I_{DS} = 2\text{ A}$



| FREQUENCY (GHz) | S ₁₁ | | S ₂₁ | | S ₁₂ | | S ₂₂ | |
|--------------------|-----------------|------|-----------------|------|-----------------|-----|-----------------|-----|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 13.50 | 0.47 | 41 | 2.10 | -177 | 0.111 | 144 | 0.52 | 60 |
| 13.60 | 0.42 | 34 | 2.16 | 175 | 0.118 | 136 | 0.51 | 51 |
| 13.70 | 0.37 | 26 | 2.20 | 166 | 0.124 | 127 | 0.49 | 42 |
| 13.80 | 0.31 | 18 | 2.25 | 157 | 0.130 | 119 | 0.47 | 33 |
| 13.90 | 0.25 | 9 | 2.28 | 148 | 0.135 | 110 | 0.44 | 23 |
| 14.00 | 0.19 | -1 | 2.30 | 139 | 0.139 | 102 | 0.42 | 13 |
| 14.10 | 0.12 | -13 | 2.31 | 129 | 0.142 | 94 | 0.39 | 3 |
| 14.20 | 0.06 | -32 | 2.30 | 120 | 0.145 | 85 | 0.36 | -8 |
| 14.30 | 0.02 | -113 | 2.29 | 111 | 0.146 | 76 | 0.34 | -19 |
| 14.40 | 0.07 | 178 | 2.26 | 102 | 0.148 | 68 | 0.31 | -31 |
| 14.50 | 0.12 | 160 | 2.22 | 93 | 0.147 | 60 | 0.29 | -43 |
| 14.60 | 0.17 | 149 | 2.18 | 84 | 0.147 | 51 | 0.28 | -56 |
| 14.70 | 0.22 | 140 | 2.13 | 75 | 0.146 | 44 | 0.27 | -68 |
| 14.80 | 0.26 | 132 | 2.09 | 66 | 0.144 | 36 | 0.27 | -81 |
| 14.90 | 0.29 | 124 | 2.04 | 58 | 0.142 | 28 | 0.29 | -93 |