

PRELIMINARY

Features

- Low intermodulation distortion
 - $IM_3 = -45$ dBc at $P_o = 30.0$ dBm, Single Carrier Level
- High power
 - $P_{1dB} = 42.0$ dBm at 14.0 GHz to 14.5 GHz
- High gain
 - $G_{1dB} = 6.0$ dB at 14.0 GHz to 14.5 GHz
- Broadband internally matched
- Hermetically sealed package

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

| Characteristic | Symbol | Condition | Unit | Min. | Typ. | Max. |
|---------------------------------------|-----------------|-------------------------------------------|------------------|------|------|-----------|
| Output Power at 1dB Compression Point | P_{1dB} | $V_{DS} = 9V$ $f = 14.0 \sim 14.5$ GHz | dBm | 41.0 | 42.0 | - |
| Power Gain at 1dB Compression Point | G_{1dB} | | dB | 5.0 | 6.0 | - |
| Drain Current | I_{DS1} | | A | - | 4.5 | 5.5 |
| Gain Flatness | ΔG | | dB | - | - | ± 0.8 |
| Power Added Efficiency | η_{add} | | % | - | 29 | - |
| 3rd Order Intermodulation Distortion | IM_3 | Note 1 | dBc | -42 | -45 | - |
| Drain Current | I_{DS2} | | A | - | 4.5 | 5.5 |
| Channel-Temperature Rise | ΔT_{ch} | $V_{DS} \times I_{DS} \times R_{th(c-c)}$ | $^\circ\text{C}$ | - | - | 100 |

Note 1: 2-tone Test Pout, $P_o = 30.0$ dBm Single Carrier Level.

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

| Characteristic | Symbol | Condition | Unit | Min. | Typ. | Max. |
|-------------------------------|---------------|------------------------------------|--------------------|------|------|------|
| Transconductance | gm | $V_{DS} = 3V$ $I_{DS} = 4.8A$ | mS | - | 3000 | - |
| Pinch-off Voltage | V_{GSoff} | $V_{DS} = 3V$ $I_{DS} = 145$ mA | V | -1.5 | -3.0 | -4.5 |
| Saturated Drain Current | I_{DSS} | $V_{DS} = 3V$ $V_{GS} = 0V$ | A | - | 10.0 | 11.5 |
| Gate-Source Breakdown Voltage | V_{GSO} | $I_{GS} = -145$ μA | V | -5 | - | - |
| Thermal Resistance | $R_{th(c-c)}$ | Channel to Case | $^\circ\text{C/W}$ | - | 2.0 | 2.5 |

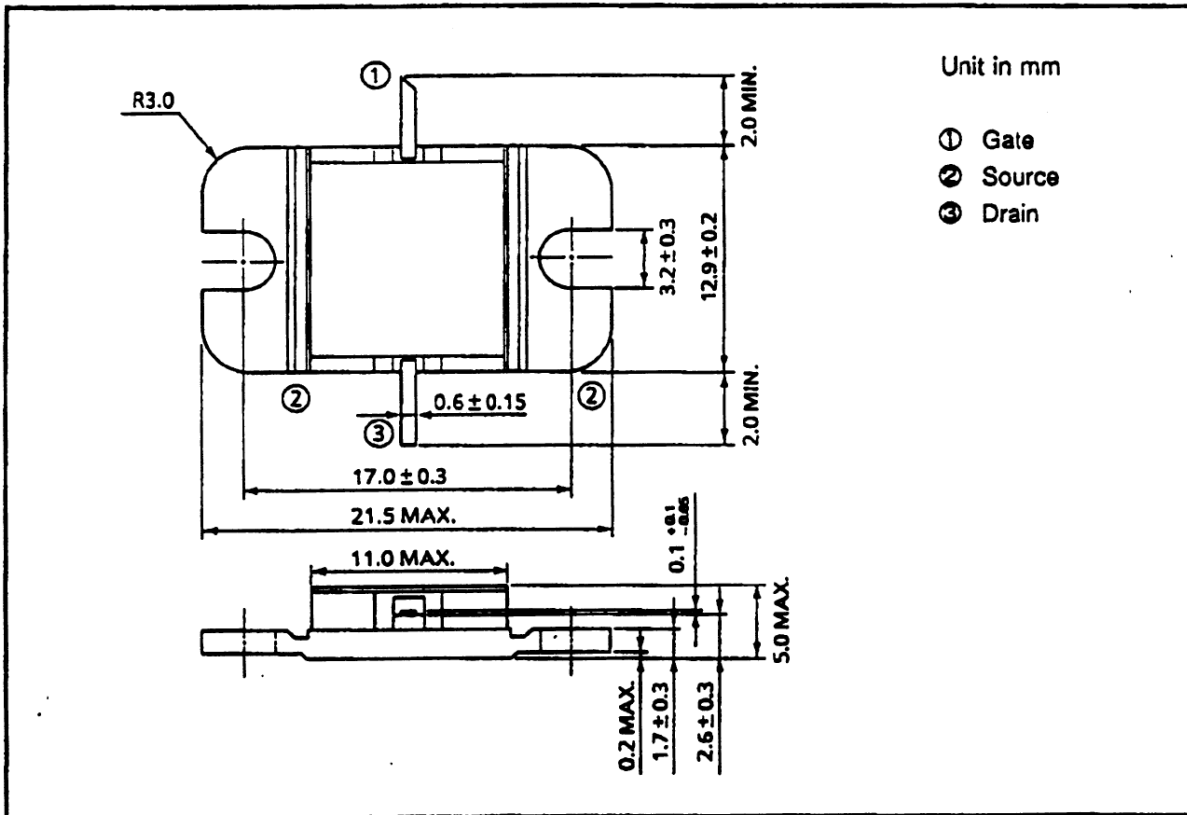
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Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Unit | Rating |
|------------------------------------------------------|-----------|------------------|-----------|
| Drain-Source Voltage | V_{DS} | V | 15 |
| Gate-Source Voltage | V_{GS} | V | -5 |
| Drain Current | I_{DS} | A | 11.5 |
| Total Power Dissipation ($T_c = 25^\circ\text{C}$) | P_T | W | 60 |
| Channel Temperature | T_{ch} | $^\circ\text{C}$ | 175 |
| Storage Temperature | T_{stg} | $^\circ\text{C}$ | -65 ~ 175 |

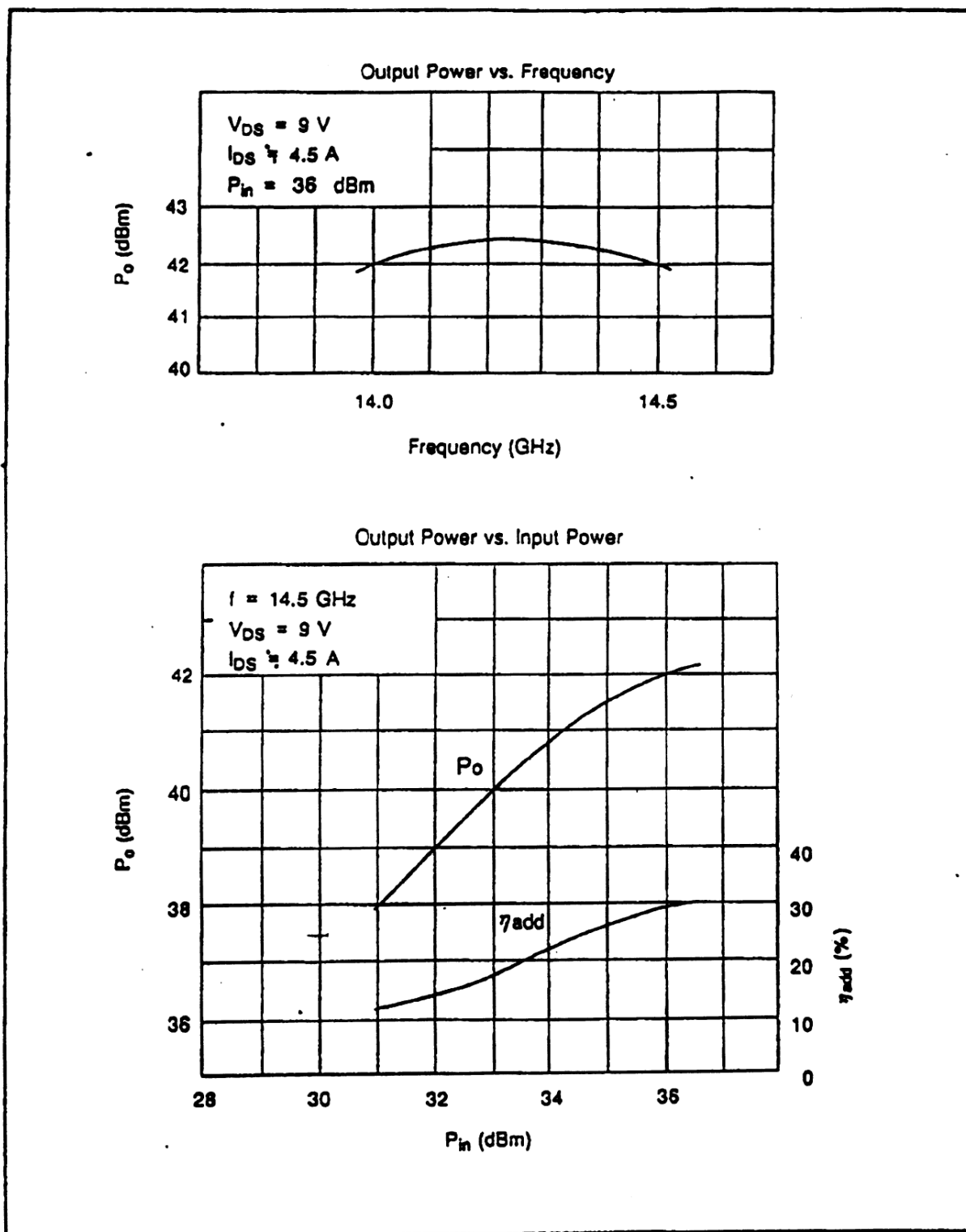
Package Outline (2-11C1B)



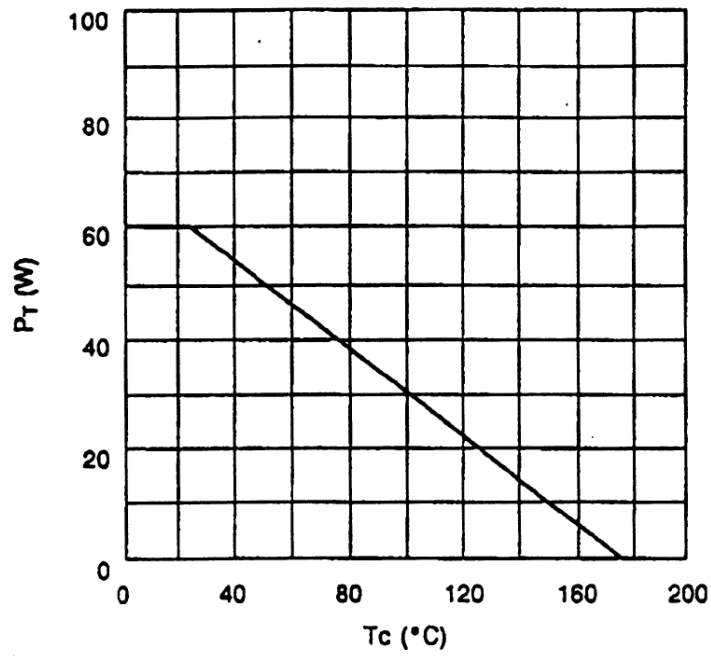
Handling Precautions for Packaged Type

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

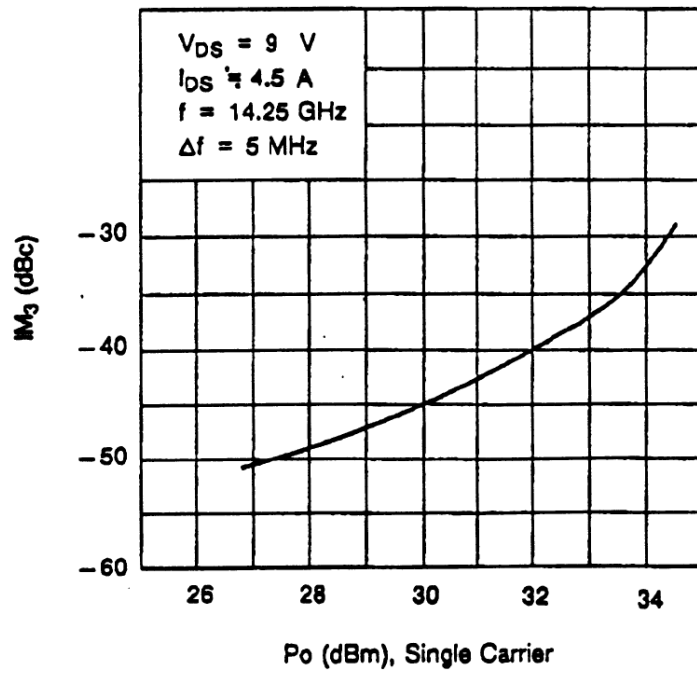
RF Performances



Power Dissipation vs. Case Temperature

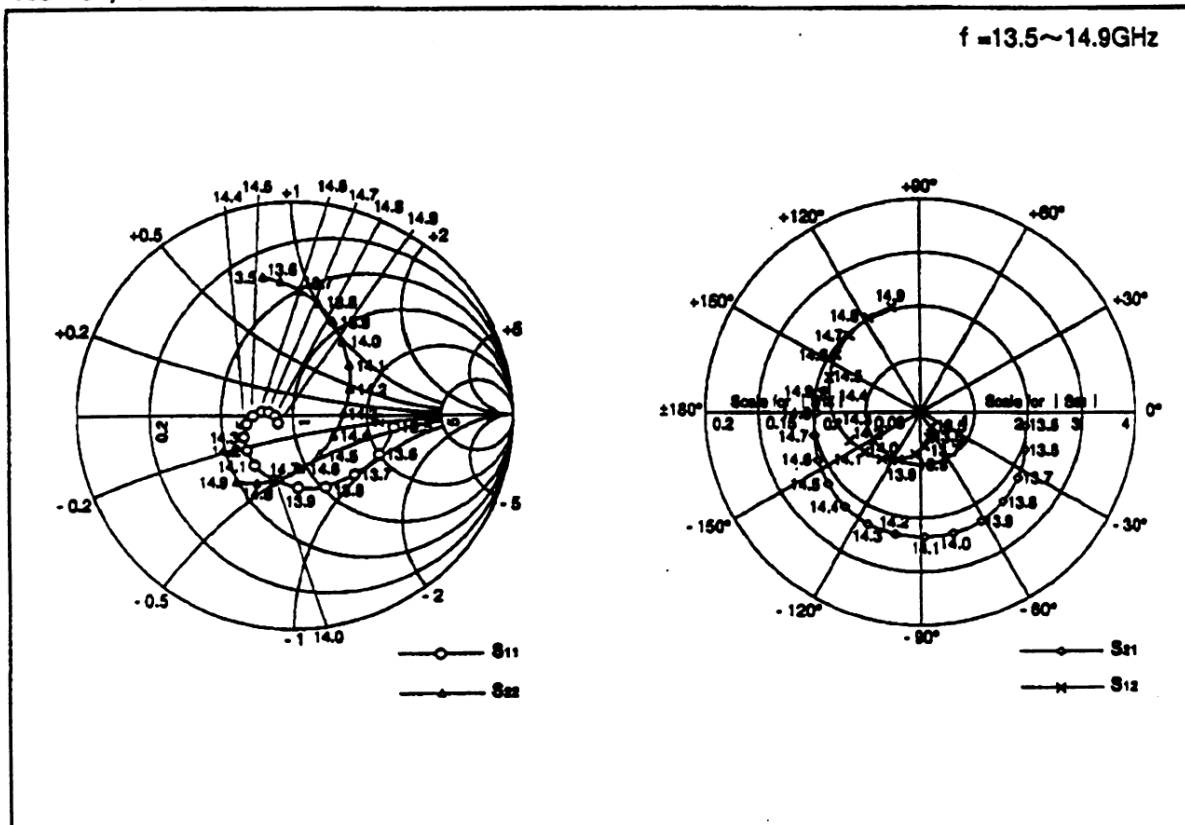


IM_3 vs. Output Power Characteristics



TIM1414-15L S-Parameters (Magn. and Angles)

$V_{DS} = 9V, I_{DS} = 4.5A$



| FREQUENCY (MHz) | S_{11} | | S_{12} | | S_{21} | | S_{22} | |
|--------------------|----------|--------|----------|--------|----------|--------|----------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 13.5 | 0.475 | -6.2 | 0.017 | -56.5 | 1.962 | -7.6 | 0.669 | 102.1 |
| 13.6 | 0.435 | -24.8 | 0.024 | -71.9 | 2.070 | -20.5 | 0.634 | 94.7 |
| 13.7 | 0.397 | -44.8 | 0.031 | -86.9 | 2.172 | -33.9 | 0.592 | 86.8 |
| 13.8 | 0.364 | -65.6 | 0.039 | -101.7 | 2.247 | -47.5 | 0.541 | 78.1 |
| 13.9 | 0.335 | -86.5 | 0.048 | -116.5 | 2.298 | -61.3 | 0.482 | 68.3 |
| 14.0 | 0.310 | -107.0 | 0.056 | -131.3 | 2.325 | -75.1 | 0.419 | 57.0 |
| 14.1 | 0.289 | -126.1 | 0.064 | -145.7 | 2.329 | -88.9 | 0.355 | 43.5 |
| 14.2 | 0.267 | -143.3 | 0.072 | -159.8 | 2.316 | -102.3 | 0.293 | 26.8 |
| 14.3 | 0.243 | -158.5 | 0.079 | -173.9 | 2.285 | -115.8 | 0.241 | 4.6 |
| 14.4 | 0.215 | -171.2 | 0.086 | 172.3 | 2.245 | -129.1 | 0.212 | -24.1 |
| 14.5 | 0.183 | 178.1 | 0.092 | 158.6 | 2.190 | -142.3 | 0.216 | -55.1 |
| 14.6 | 0.147 | 171.3 | 0.096 | 145.0 | 2.123 | -155.3 | 0.249 | -81.5 |
| 14.7 | 0.112 | 169.9 | 0.100 | 131.7 | 2.046 | -168.1 | 0.299 | -102.0 |
| 14.8 | 0.084 | 178.9 | 0.102 | 118.8 | 1.963 | 179.5 | 0.353 | -117.9 |
| 14.9 | 0.074 | -181.1 | 0.103 | 106.2 | 1.875 | 167.2 | 0.404 | -130.7 |