

### Low Distortion Internally Matched Power GaAs FETs (C-Band)

#### Features

- Low intermodulation distortion
  - $IM_3 = -42$  dBc at  $P_o = 31.5$  dBm,
  - Single carrier level
- High power
  - $P_{1dB} = 42.0$  dBm at 5.9 GHz to 6.4 GHz
- High gain
  - $G_{1dB} = 8.5$  dB at 5.9 GHz to 6.4 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 | $P_{1dB}$       | $V_{DS} = 10V$<br>$f = 5.9 \sim 6.4 \text{ GHz}$ | dBm              | 41.0 | 42.0 | —         |
| Power Gain at 1dB Compression Point   | $G_{1dB}$       |                                                  | dB               | 7.5  | 8.5  | —         |
| Drain Current                         | $I_{DS1}$       |                                                  | A                | —    | 4.2  | 5.0       |
| Gain Flatness                         | $\Delta G$      |                                                  | dB               | —    | —    | $\pm 0.6$ |
| Power Added Efficiency                | $\eta_{add}$    |                                                  | %                | —    | 32   | —         |
| 3rd Order Intermodulation Distortion  | $IM_3$          | Note 1                                           | dBc              | -42  | -45  | —         |
| Drain Current                         | $I_{DS2}$       |                                                  | A                | —    | 4.2  | 5.0       |
| Channel-Temperature Rise              | $\Delta T_{ch}$ | $V_{DS} \times I_{DS} \times R_{th}(C-C)$        | $^\circ\text{C}$ | —    | —    | 80        |

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

| Characteristic                | Symbol        | Condition                        | Unit               | Min. | Typ. | Max  |
|-------------------------------|---------------|----------------------------------|--------------------|------|------|------|
| Trans-conductance             | gm            | $V_{DS} = 3V$<br>$I_{DS} = 5.2A$ | mS                 | —    | 3200 | —    |
| Pinch-off Voltage             | $V_{GSoff}$   | $V_{DS} = 3V$<br>$I_{DS} = 70mA$ | V                  | -2   | -3.5 | -5.0 |
| Saturated Drain Current       | $I_{DSS}$     | $V_{DS} = 3V$<br>$V_{GS} = 0V$   | A                  | —    | 10.0 | 13.0 |
| Gate-Source Breakdown Voltage | $V_{GSO}$     | $I_{GS} = -210\mu A$             | V                  | -5   | —    | —    |
| Thermal Resistance            | $R_{th}(C-C)$ | Channel to case                  | $^\circ\text{C/W}$ | —    | 1.9  | 2.5  |

Note 1: 2 tone Test Pout = 31.5dBm Single Carrier Level.

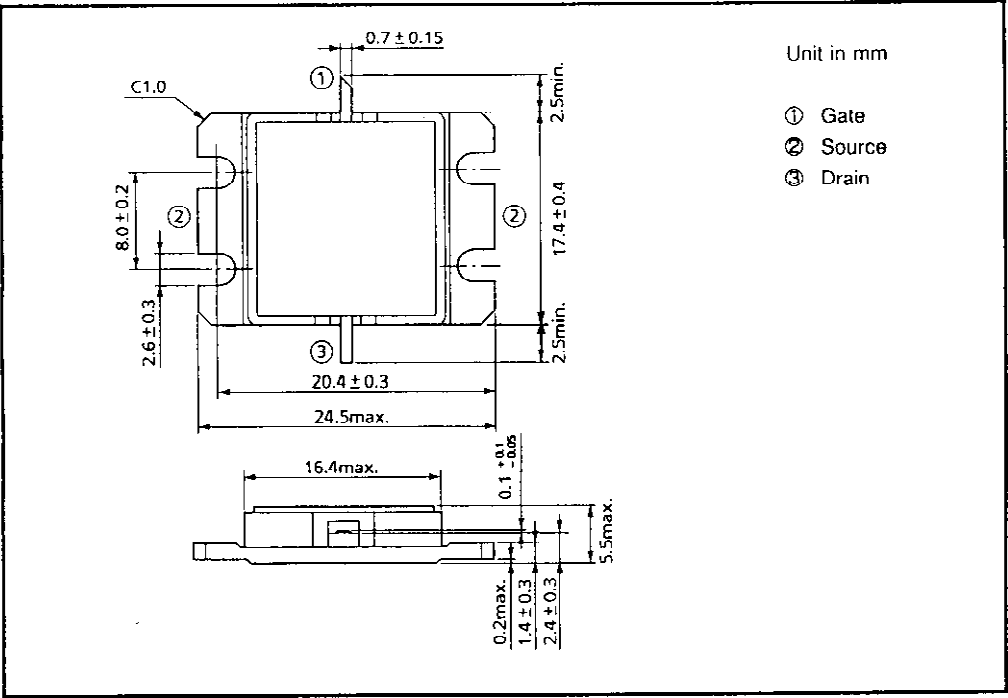
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Absolute Maximum Ratings (Ta = 25° C)

| Characteristic                      | Symbol    | Unit | Rating  |
|-------------------------------------|-----------|------|---------|
| Drain-Source Voltage                | $V_{DS}$  | V    | 15      |
| Gate-Source Voltage                 | $V_{GS}$  | V    | -5      |
| Drain Current                       | $I_{DS}$  | A    | 13      |
| Total Power Dissipation (Tc = 25°C) | $P_T$     | W    | 60      |
| Channel Temperature                 | $T_{ch}$  | °C   | 175     |
| Storage Temperature                 | $T_{stg}$ | °C   | -65~175 |

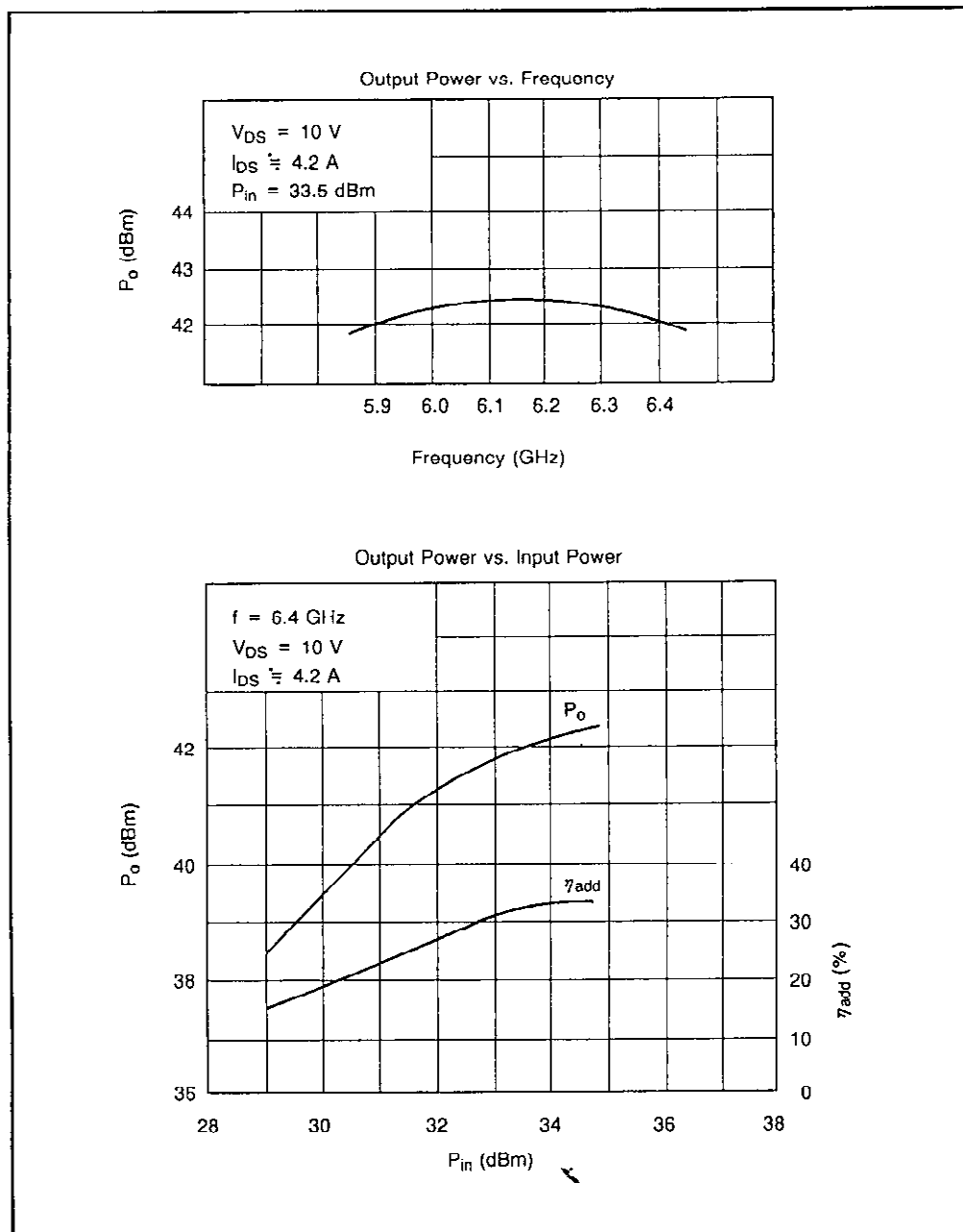
Package Outline (2-16G1B)



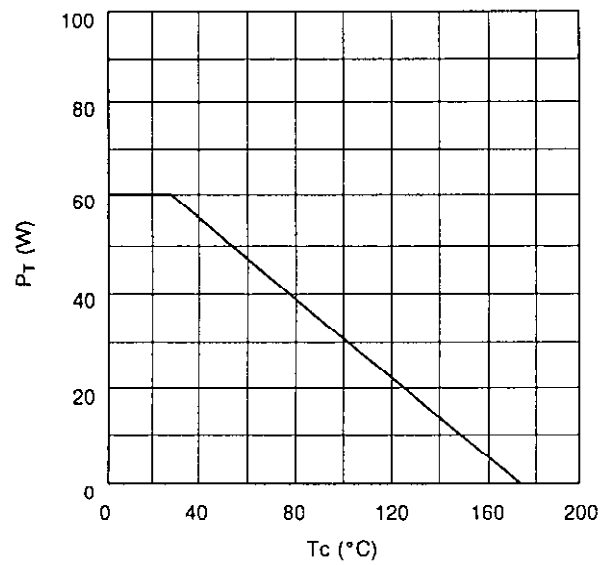
Handling Precautions for Packaged Type

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

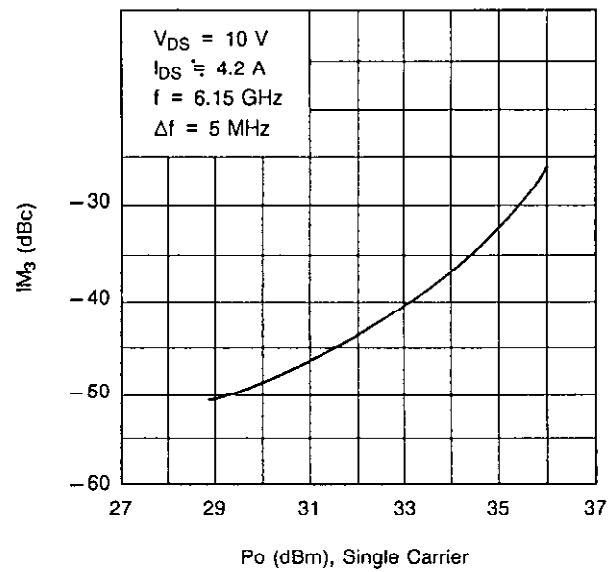
## RF Performances



Power Dissipation vs. Case Temperature



IM<sub>3</sub> vs. Output Power Characteristics



**TIM5964-14L S-Parameters**  
(MAGN. and ANGLES)

$V_{DS} = 10V, I_{DS} = 4.2A$

$f = 5.3 \sim 6.9GHz$

