MICROWAVE POWER GaAs FET

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

Features

- Low intermodulation distortion
- $IM_3 = -42 \, dBc \, at \, Po = 31.5 \, dBm$,
- Single carrier level
- High power
- P_{1dB} = 42.0 dBm at 6.4 GHz to 7.2 GHz
- High gain
 - $G_{1dB} = 7.5 \text{ dB}$ at 6.4 GHz to 7.2 GHz
- Broad band internally matched
- Hermetically sealed package

RF Performance Specifications (Ta = 25° C)

| Characteristics | Symbol | Condition | Unit | Min. | Тур. | Мах |
|--|------------------|---|------|------|------|------|
| Output Power at 1dB Compression Point | P _{1dB} | | dBm | 41.0 | 42.0 | - |
| Power Gain at 1dB Compression Point | G _{1dB} | V _{DS} = 10V | dB | 6.5 | 7.5 | - |
| Drain Current | I _{DS1} | f = 6.4 ~ 7.2 GHz | А | _ | 4.2 | 5.0 |
| Gain Flatness | ΔG | | dB | _ | - | ±0.6 |
| Power Added Efficiency | η _{add} | | % | _ | 31 | _ |
| 3rd Order Intermodulation Distortion | IM ₃ | Note 1 | dBc | -42 | -45 | - |
| Drain Current | I _{DS2} | | А | _ | 4.2 | 5.0 |
| Channel-Temperature Rise | ΔT_{ch} | V _{DS} xI _{DS} xR _{th} (c-c) | °C | _ | _ | 80 |

Electrical Characteristics (Ta = 25° C)

| Characteristic | Symbol | Condition | Unit | Min. | Тур. | Мах |
|-------------------------------|-----------------------|--|------|------|------|------|
| Trans-conductance | gm | V _{DS} = 3V I _{DS} = 5.2A | mS | _ | 3200 | _ |
| Pinch-off Voltage | V _{GSoff} | V _{DS} = 3V I _{DS} = 70mA | V | -2 | -3.5 | -5.0 |
| Saturated Drain Current | I _{DSS} | $V_{DS} = 3V$ $V_{GS} = 0V$ | А | _ | 10.0 | 13.0 |
| Gate-Source Breakdown Voltage | V _{GSO} | I _{GS} = -210μA | V | -5 | _ | _ |
| Thermal Resistance | R _{th (c-c)} | Channel to case | °C/W | - | 1.9 | 2.5 |

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

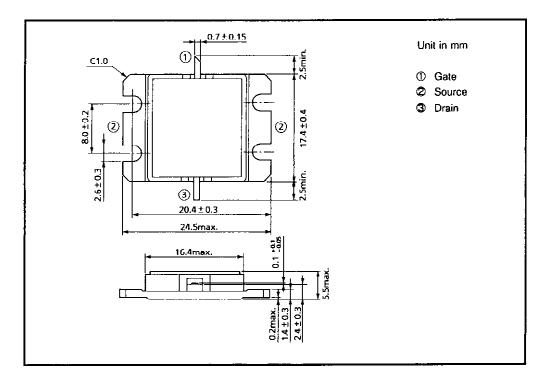
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Absolute Maximum Ratings (Ta = 25° C)

| Characteristic | Symbol | Unit | Rating |
|---|------------------|------|---------|
| Drain-Source Voltage | V _{DS} | V | 15 |
| Gate-Source Voltage | V _{GS} | V | -5 |
| Drain Current | I _{DS} | А | 13 |
| Total Power Dissipation ($T_c = 25^{\circ}C$) | P _T | W | 60 |
| Channel Temperature | T _{ch} | °C | 175 |
| Storage Temperature | T _{stg} | °C | -65~175 |

Package Outline (2-16G1B)

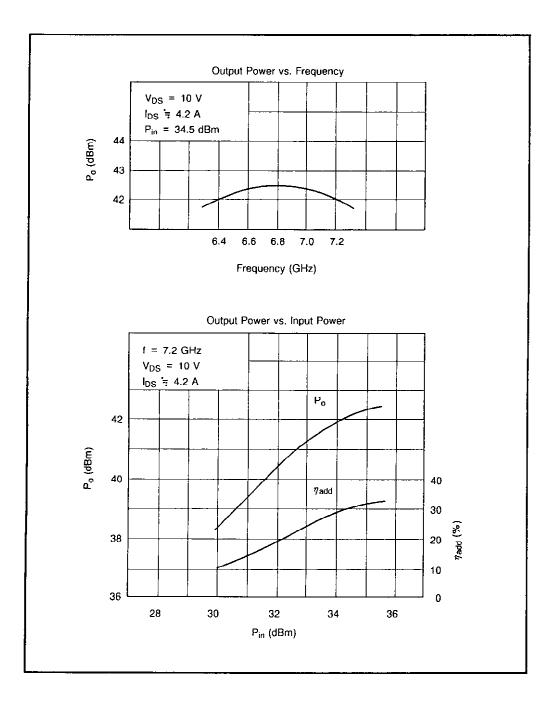


Handling Precautions for Packaged Type

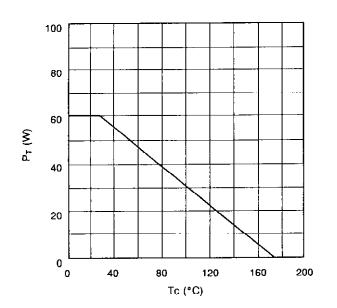
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

2/5

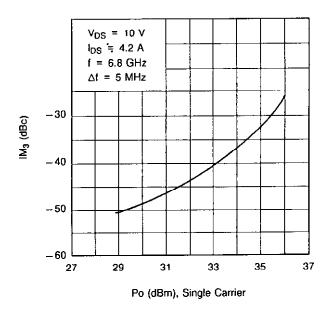
RF Performances



Power Dissipation vs. Case Temperature



IM₃ vs. Output Power Characteristics



TIM6472-14L S-Parameters (MAGN. and ANGLES)

| | A | | | | | | | |
|---|---|--|--|---|---|--|---|---|
| +0.5 | | +2 | +5 | +150 | 7.20 7.00 5685 Scale for 512 | +90° 7.6 72 7.8 | f =6.0~7 +60° 7.6 Scale or I Sc | +30° |
| -0.2 | 20072 7.0 200 | 60 -2 | - 5 | - 150° | 6.80 | | 2 3 | y 6.0 ⁴ y − 30° |
| | -1 | | S11 S# | | - 120* | - 90° | 4 ← 60° ← ★ | — S21 — S12 |
| FREQUENCY (MHz) | T | S11 ANG | Ser | S12 ANG | . 120' < | | | |
| | MAG | 511 ANG | See MAG | ANG | MAG | - 90° | MAG | — \$12 \$22 ANG |
| (MHz) | | 511 | Ser I | | . 120' < | <u>- 90°</u> | | - \$12 522 |
| (MHz) 6.0 | MAG 0.529 | 511 ANG 157.2 | S≃ MAG 0.048 | ANG -56.3 | MAG 3.350 | 521 ANG -7.0 | MAG 0.558 | - \$12 522 ANG -113.8 |
| (MHz) 6.0 6.2 | MAG 0.529 0.442 | S11 ANG 157.2 110.8 | Sz: MAG 0.048 0.063 | ANG -56.3 -94.8 -129.5 | . 120 MAG 3.350 3.549 | 521 ANG -7.0 -41.8 | MAG 0.558 0.500 | - \$12 522 ANG -113.8 -149.5 |
| (MHz) 6.0 6.2 6.4 | MAG 0.529 0.442 0.372 | 511 ANG 157.2 110.8 61.6 | Ser MAG 0.048 0.063 0.078 | ANG -56.3 -94.8 | MAG 3.350 3.549 3.565 | - 90° - 90° - - 90 - 90° - 90° - 90° - 90° - 90° - 90 | MAG 0.558 0.500 0.473 | S ²² ANG -113.8 -149.5 175.2 |
| (MHz) 6.0 6.2 6.4 6.6 | MAG 0.529 0.442 0.372 0.334 | S11 ANG 157.2 110.8 61.6 12.1 | See MAG 0.048 0.063 0.078 0.089 | ANG -56.3 -94.8 -129.5 -162.2 | MAG 3.350 3.549 3.565 3.478 | - 30° - 30° - 7.0 - 41.8 - 75.6 - 108.1 - 139.4 | MAG 0.558 0.500 0.473 0.462 | - \$12 522 ANG -113.8 -149.5 175.2 143.6 114.6 |
| (MHz) 6.0 6.2 6.4 6.6 6.8 | MAG 0.529 0.442 0.372 0.334 0.315 | 511 ANG 157.2 110.8 61.6 12.1 -35.9 | Sz: MAG 0.048 0.063 0.078 0.089 0.098 | ANG -56.3 -94.8 -129.5 -162.2 167.0 | MAG 3.350 3.549 3.565 3.478 3.386 | - 90° - 90° - - 90 - 90° - 90° - 90° - 90° - 90° - 90 | MAG 0.558 0.500 0.473 0.462 0.441 | S22 ANG -113.8 -149.5 175.2 143.6 |
| (MHz) 6.0 6.2 6.4 6.6 6.8 7.0 | MAG 0.529 0.442 0.372 0.334 0.315 0.289 | 511 ANG 157.2 110.8 61.6 12.1 -35.9 -83.0 | Szz MAG 0.048 0.063 0.078 0.089 0.098 0.105 | ANG -56.3 -94.8 -129.5 -162.2 167.0 135.6 | MAG 3.350 3.549 3.565 3.478 3.386 3.292 | - 90° - 90° - 90° - 7.0 - 41.8 - 75.6 - 108.1 - 139.4 - 170.8 | MAG 0.558 0.500 0.473 0.462 0.441 0.416 | S22 ANG -113.8 -149.5 175.2 143.6 114.6 83.1 |