**TOSHIBA**

*MICROWAVE SEMICONDUCTOR*

TECHNICAL DATA

**MICROWAVE POWER GaN HEMT**

# TGI1414-50L

## FEATURES

- **HIGH POWER**
  Pout=47.0dBm at Pin=42.0dBm
- **HIGH GAIN**
  GL=8.0dB at 14.0GHz to 14.5GHz
- **BROAD BAND INTERNALLY MATCHED HEMT**
  HERMETICALLY SEALED PACKAGE
- **LOW INTERMODULATION DISTORTION**
  IM3(Min.)=–25dBc at Po=40.0dBm
  Single Carrier Level

## RF PERFORMANCE SPECIFICATIONS ( Ta= 25°C )

| CHARACTERISTICS | SYMBOL | CONDITIONS | UNIT | MIN. | TYP. | MAX. |
|---|---|---|---|---|---|---|
| Output Power | Pout | VDS = 24V<br>IDSset≅2.0A<br>f = 14.0 to 14.5GHz<br>@ Pin=42dBm | dBm | 46.0 | 47.0 | — |
| Gain Flatness | ΔG | | dB | — | — | ±0.8 |
| Drain Current | IDS1 | | A | — | 5.0 | 6.0 |
| Power Added Efficiency | ηadd | | % | — | 29 | — |
| Gate Current | $Ig_{RF}$ | | mA | -40 | — | +100 |
| Linear Gain | GL | @Pin=20dBm | dB | 7.0 | 8.0 | — |
| 3rd Order Intermodulation Distortion | IM3 | Two-Tone Test<br>Po= 40.0dBm<br>(Single Carrier Level) | dBc | -25 | — | — |
| Drain Current | IDS2 | | A | — | 5.0 | 6.0 |
| Channel Temperature Rise | ΔTch | (VDS X IDS + Pin – Pout) X Rth(c-c) | °C | — | 130 | 150 |

**Recommended gate resistance(Rg) : Rg= 13.3 Ω(TYP.)**

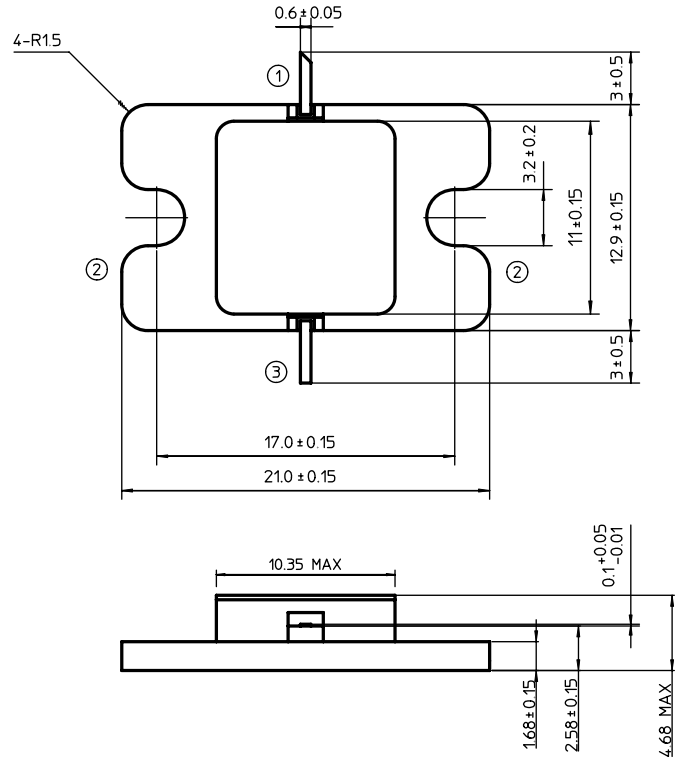
## ELECTRICAL CHARACTERISTICS ( Ta= 25°C )

| CHARACTERISTICS | SYMBOL | CONDITIONS | UNIT | MIN. | TYP. | MAX. |
|---|---|---|---|---|---|---|
| Transconductance | gm | VDS= 5V<br>IDS= 5.0A | S | — | 4.5 | — |
| Pinch-off Voltage | VGSoff | VDS= 5V<br>IDS= 23mA | V | -1 | -4 | -6 |
| Saturated Drain Current | IDSS | VDS= 5V<br>VGS= 0V | A | — | 15 | — |
| Gate-Source Breakdown Voltage | VGSO | IGS= -10mA | V | -10 | — | — |
| Thermal Resistance | Rth(c-c) | Channel to Case | °C/W | — | — | 1.6 |

## ABSOLUTE MAXIMUM RATINGS ( Ta= 25°C )

| CHARACTERISTICS | SYMBOL | UNIT | RATING |
|---|---|---|---|
| Drain-Source Voltage | VDS | V | 50 |
| Gate-Source Voltage | VGS | V | -10 |
| Drain Current | IDS | A | 15 |
| Total Power Dissipation (Tc= 25 °C) | PT | W | 140 |
| Channel Temperature | Tch | °C | 250 |
| Storage | Tstg | °C | -65 to +175 |

## PACKAGE OUTLINE ( 7- AA04A )




**Unit in mm**

**① Gate**
**② Source**
**③ Drain**

### HANDLING PRECAUTIONS FOR PACKAGE MODEL

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