### **TOSHIBA**

# MICROWAVE SEMICONDUCTOR TECHNICAL DATA

## MICROWAVE POWER GaAs FET TIM1414-30L

**■ BROAD BAND INTERNALLY MATCHED FET** 

#### **FEATURES**

- **HIGH POWER** 
  - P1dB=45.0dBm at 14.0GHz to 14.5GHz
- HIGH GAIN

- HERMETICALLY SEALED PACKAGE
- G1dB=5.5dB at 14.0GHz to 14.5GHz
- **LOW INTERMODULATION DISTORTION**

IM3(Min.)=-25dBc at Po=38.0dBm Single Carrier Level

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

| CHARACTERISTICS           | SYMBOL | CONDITIONS                          | UNIT | MIN. | TYP. | MAX. |
|---------------------------|--------|-------------------------------------|------|------|------|------|
| Output Power at 1dB Gain  | P1dB   |                                     | dBm  | 44.0 | 45.0 |      |
| Compression Point         |        |                                     |      |      |      |      |
| Power Gain at 1dB Gain    | G1dB   | VDS= 10V                            | dB   | 4.5  | 5.5  |      |
| Compression Point         |        | IDSset≅7.0A                         |      |      |      |      |
| Drain Current             | IDS1   | f = 14.0 to 14.5GHz                 | Α    |      | 10.0 | 11.0 |
| Gain Flatness             | ΔG     |                                     | dB   | _    |      | ±0.8 |
| Power Added Efficiency    | ηadd   |                                     | %    | _    | 23   |      |
| 3rd Order Intermodulation | IM3    | Two-Tone Test                       | dBc  | -25  | _    |      |
| Distortion                |        | Po= 38.0dBm                         |      |      |      |      |
| Drain Current             | IDS2   | (Single Carrier Level)              | Α    |      | 9.0  | 10.1 |
| Channel Temperature Rise  | ∆Tch   | (VDS X IDS +Pin-P1dB)<br>X Rth(c-c) | °C   |      |      | 100  |

Recommended gate resistance(Rg) : Rg= 10  $\Omega$ (MAX.)

#### **ELECTRICAL CHARACTERISTICS** (Ta= 25°C)

| CHARACTERISTICS         | SYMBOL   | CONDITIONS      | UNIT | MIN. | TYP. | MAX. |
|-------------------------|----------|-----------------|------|------|------|------|
| Transconductance        | gm       | VDS= 3V         | S    |      | 5.5  |      |
|                         |          | IDS= 9.6A       |      |      |      |      |
| Pinch-off Voltage       | VGSoff   | VDS= 3V         | V    | -0.7 | -2.0 | -4.5 |
|                         |          | IDS= 290mA      |      |      |      |      |
| Saturated Drain Current | IDSS     | VDS= 3V         | Α    |      | 20.0 |      |
|                         |          | VGS= 0V         |      |      |      |      |
| Gate-Source Breakdown   | VGSO     | IGS= -290μA     | V    | -5   | _    |      |
| Voltage                 |          |                 |      |      |      |      |
| Thermal Resistance      | Rth(c-c) | Channel to Case | °C/W |      | 1.0  | 1.1  |

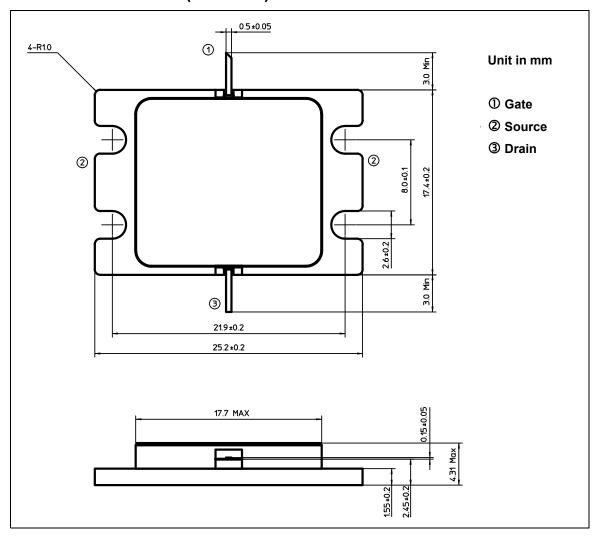
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The information contained herein is subject to change without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with design of equipment incorporating this product.

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

| CHARACTERISTICS                     | SYMBOL | UNIT | RATING      |
|-------------------------------------|--------|------|-------------|
| Drain-Source Voltage                | VDS    | V    | 15          |
| Gate-Source Voltage                 | VGS    | V    | -5          |
| Drain Current                       | IDS    | Α    | 20          |
| Total Power Dissipation (Tc= 25 °C) | PT     | W    | 136         |
| Channel Temperature                 | Tch    | °C   | 175         |
| Storage                             | Tstg   | °C   | -65 to +175 |

#### **PACKAGE OUTLINE (7-AA03A)**



#### **HANDLING PRECAUTIONS FOR PACKAGE MODEL**

Soldering iron should be grounded and the operating time should not exceed 10 seconds at  $260^{\circ}$ C.