

# TOSHIBA

## MICROWAVE SEMICONDUCTOR

### TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM8596-8

#### FEATURES:

- HIGH POWER  
 $P_{1dB} = 39.5$  dBm at 8.5 GHz to 9.6 GHz
- BROAD BAND INTERNALLY MATCHED
- HIGH GAIN  
 $G_{1dB} = 6.0$  dB at 8.5 GHz to 9.6 GHz
- HERMETICALLY SEALED PACKAGE

#### RF PERFORMANCE SPECIFICATIONS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTICS                        | SYMBOL          | CONDITION                                      | UNIT             | MIN. | TYP. | MAX. |
|----------------------------------------|-----------------|------------------------------------------------|------------------|------|------|------|
| Output Power at 1 dB Compression Point | $P_{1dB}$       | $V_{DS} = 9\text{ V}$<br>$f = 8.5$<br>-9.6 GHz | dBm              | 38.5 | 39.5 | -    |
| Power Gain at 1 dB Compression Point   | $G_{1dB}$       |                                                | dB               | 5.0  | 6.0  | -    |
| Drain Current                          | $I_{DS}$        |                                                | A                | -    | 3.4  | 4.4  |
| Power Added Efficiency                 | $\eta_{add}$    |                                                | %                | -    | 22   | -    |
| Channel-Temperature Rise               | $\Delta T_{ch}$ | $V_{DS} \times I_{DS} \times R_{th(c-c)}$      | $^\circ\text{C}$ | -    | -    | 80   |

#### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTICS               | SYMBOL        | CONDITION                                         | UNIT               | MIN. | TYP. | MAX. |
|-------------------------------|---------------|---------------------------------------------------|--------------------|------|------|------|
| Trans-conductance             | gm            | $V_{DS} = 3\text{ V}$<br>$I_{DS} = 4.0\text{ A}$  | mS                 | -    | 2400 | -    |
| Pinch-off Voltage             | $V_{GSoff}$   | $V_{DS} = 3\text{ V}$<br>$I_{DS} = 120\text{ mA}$ | V                  | -2   | -3.5 | -5   |
| Saturated Drain Current       | $I_{DSS}$     | $V_{DS} = 3\text{ V}$<br>$V_{GS} = 0\text{ V}$    | A                  | -    | 8.0  | 10.4 |
| Gate-Source Breakdown Voltage | $V_{GSO}$     | $I_{GS} = -120\text{ }\mu\text{A}$                | V                  | -5   | -    | -    |
| Thermal Resistance            | $R_{th(c-c)}$ | Channel to Case                                   | $^\circ\text{C/W}$ | -    | 1.6  | 2.5  |

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TOSHIBA CORPORATION

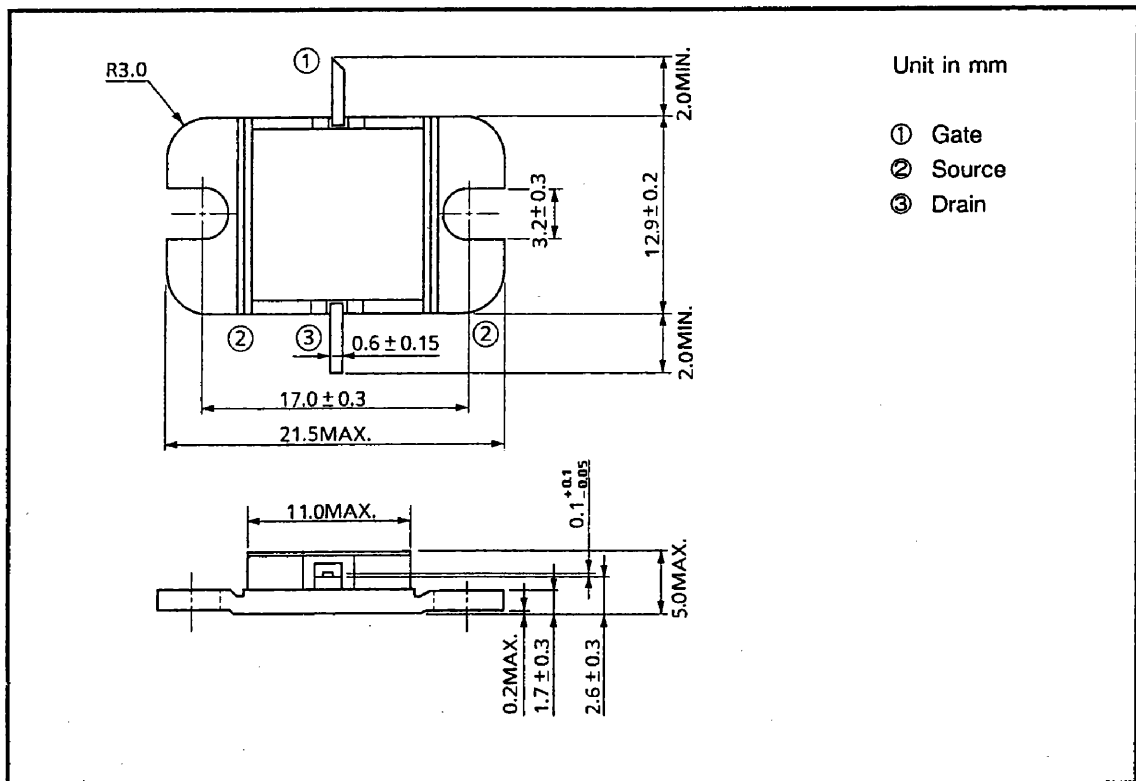
Revised Apr., 1990

## TIM8596-8

### 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                | 10.4    |
| Total Power Dissipation<br>( $T_C=25^\circ\text{C}$ ) | $P_T$     | W                | 60      |
| Channel Temperature                                   | $T_{ch}$  | $^\circ\text{C}$ | 175     |
| Storage Temperature                                   | $T_{stg}$ | $^\circ\text{C}$ | -65~175 |

### PACKAGE OUTLINE (2-11C1B)

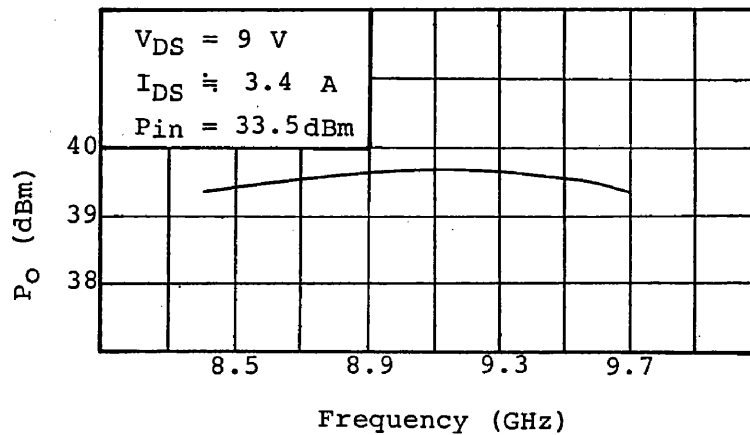


#### HANDLING PRECAUTIONS FOR PACKAGED TYPE

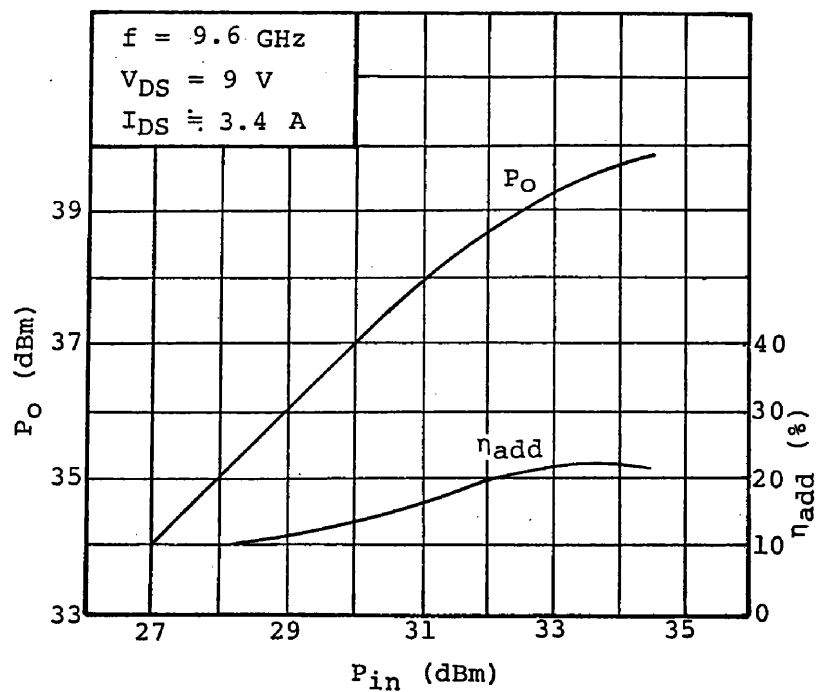
Soldering iron should be grounded and the operating time should not exceed 10 seconds at  $260^\circ\text{C}$ .

## RF PERFORMANCES

Output Power vs. Frequency



Output Power vs. Input Power



## TIM8596-8

### POWER DISSIPATION VS. CASE TEMPERATURE

