

# TOSHIBA

MICROWAVE SEMICONDUCTOR

## TECHNICAL DATA

MICROWAVE POWER GaAs FET

S8834

### FEATURES:

- MEDIUM POWER  
 $P_{1dB} = 21 \text{ dBm}$  at  $f = 8 \text{ GHz}$
- HIGH GAIN  
 $G_{1dB} = 9 \text{ dB}$  at  $f = 8 \text{ GHz}$
- SUITABLE FOR C-BAND AMPLIFIER
- ION IMPLANTATION

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

| TYPE NUMBER<br>(PACKAGE CODE)         |              |                                                |      | S8834<br>(2-3H1B) |      |      |
|---------------------------------------|--------------|------------------------------------------------|------|-------------------|------|------|
| CHARACTERISTIC                        | SYMBOL       | CONDITION                                      | UNIT | MIN.              | TYP. | MAX. |
| Output Power at 1dB Compression Point | $P_{1dB}$    | $V_{DS} = 10\text{V}$<br><br>$f = 8\text{GHz}$ | dBm  | 20.0              | 21.0 | -    |
| Power Gain at 1dB Compression Point   | $G_{1dB}$    |                                                | dB   | 8.0               | 9.0  | -    |
| Drain Current                         | $I_{DS}$     |                                                | A    | -                 | 0.04 | 0.07 |
| Power Added Efficiency                | $\eta_{add}$ |                                                | %    | -                 | 27   | -    |

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

| TYPE NUMBER<br>(PACKAGE CODE)    |               |                                                 |                    | S8834<br>(2-3H1B) |      |       |
|----------------------------------|---------------|-------------------------------------------------|--------------------|-------------------|------|-------|
| CHARACTERISTIC                   | SYMBOL        | CONDITION                                       | UNIT               | MIN.              | TYP. | MAX.  |
| Trans-conductance                | $g_m$         | $V_{DS} = 3\text{V}$<br>$I_{DS} = 45\text{mA}$  | mS                 | -                 | 30   | -     |
| Pinch-off Voltage                | $V_{GSoff}$   | $V_{DS} = 3\text{V}$<br>$I_{DS} = 1.5\text{mA}$ | V                  | -2                | -3   | -5    |
| Saturated Drain Current          | $I_{DSS}$     | $V_{DS} = 3\text{V}$<br>$V_{GS} = 0\text{V}$    | A                  | -                 | 0.09 | 0.125 |
| Gate to Source Breakdown Voltage | $V_{GSO}$     | $I_{GS} = -1.5\mu\text{A}$                      | V                  | -5                | -    | -     |
| Thermal Resistance               | $R_{th(c-c)}$ | Channel to case                                 | $^\circ\text{C/W}$ | -                 | 50   | 100   |

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\* The information contained herein may be changed without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with the design of equipment incorporating this product.



TOSHIBA CORPORATION

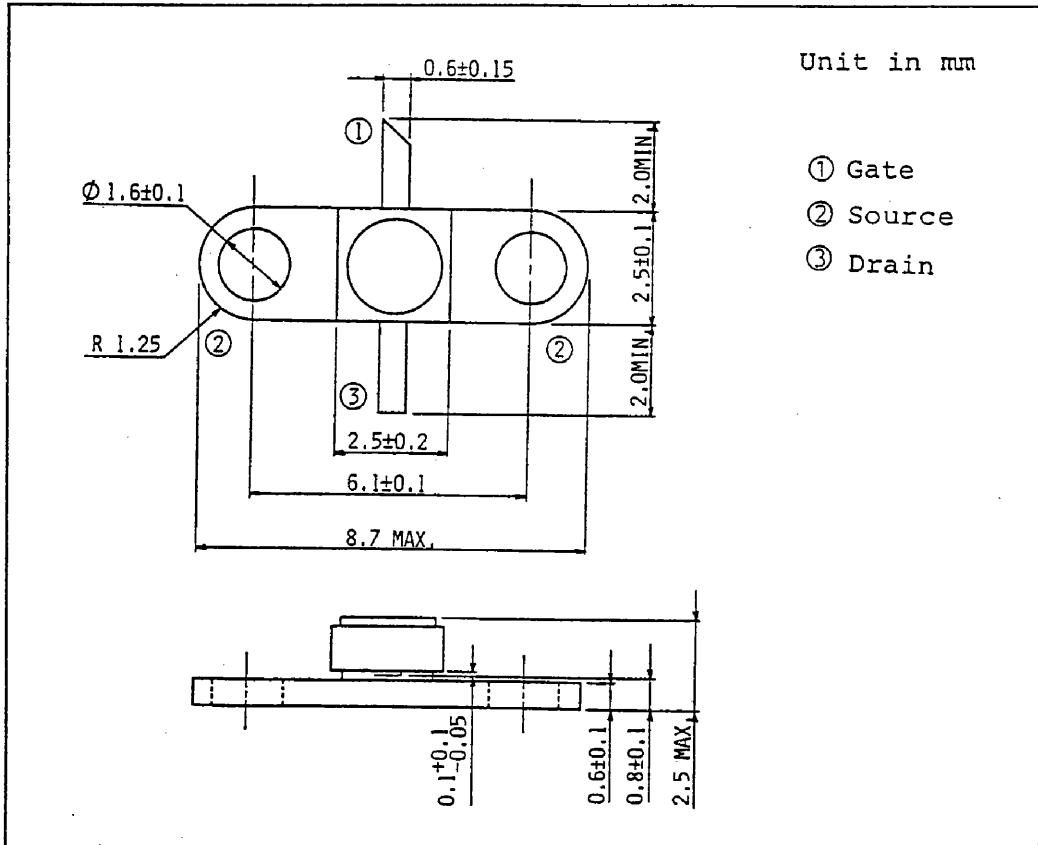
Revised May 1989

# S8834

## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| TYPE NUMBER<br>(PACKAGE CODE)        |                  |      | S8834<br>(2-3H1B) |
|--------------------------------------|------------------|------|-------------------|
| CHARACTERISTIC                       | SYMBOL           | UNIT | RATING            |
| Drain-Source Voltage                 | V <sub>DS</sub>  | V    | 15                |
| Gate-Source Voltage                  | V <sub>GS</sub>  | V    | -5                |
| Drain Current                        | I <sub>D</sub>   | A    | 0.125             |
| Total Power Dissipation<br>(Tc=25°C) | P <sub>T</sub>   | W    | 1.5               |
| Channel Temperature                  | T <sub>ch</sub>  | °C   | 175               |
| Storage Temperature                  | T <sub>stg</sub> | °C   | -65~175           |

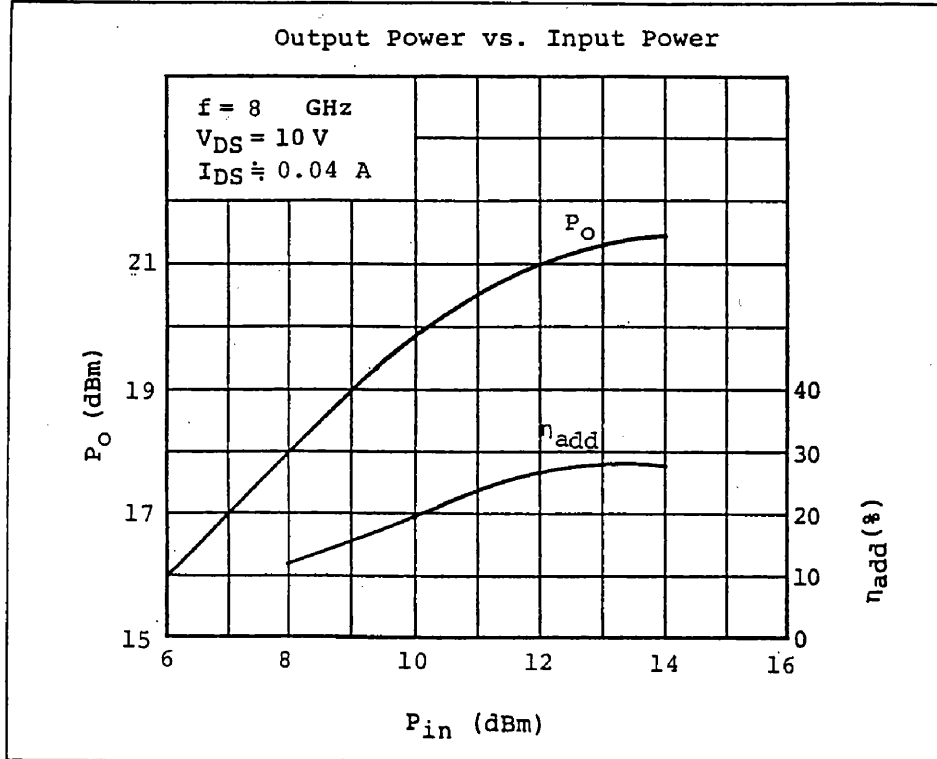
## PACKAGE OUTLINE (2-3H1B)



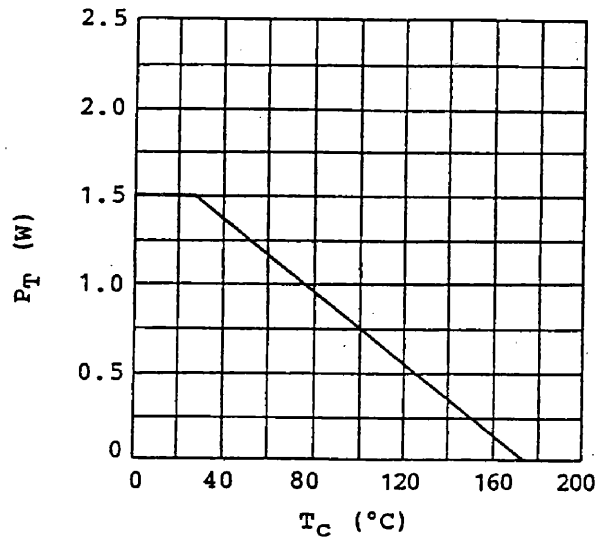
### HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

OUTPUT POWER CHARACTERISTIC



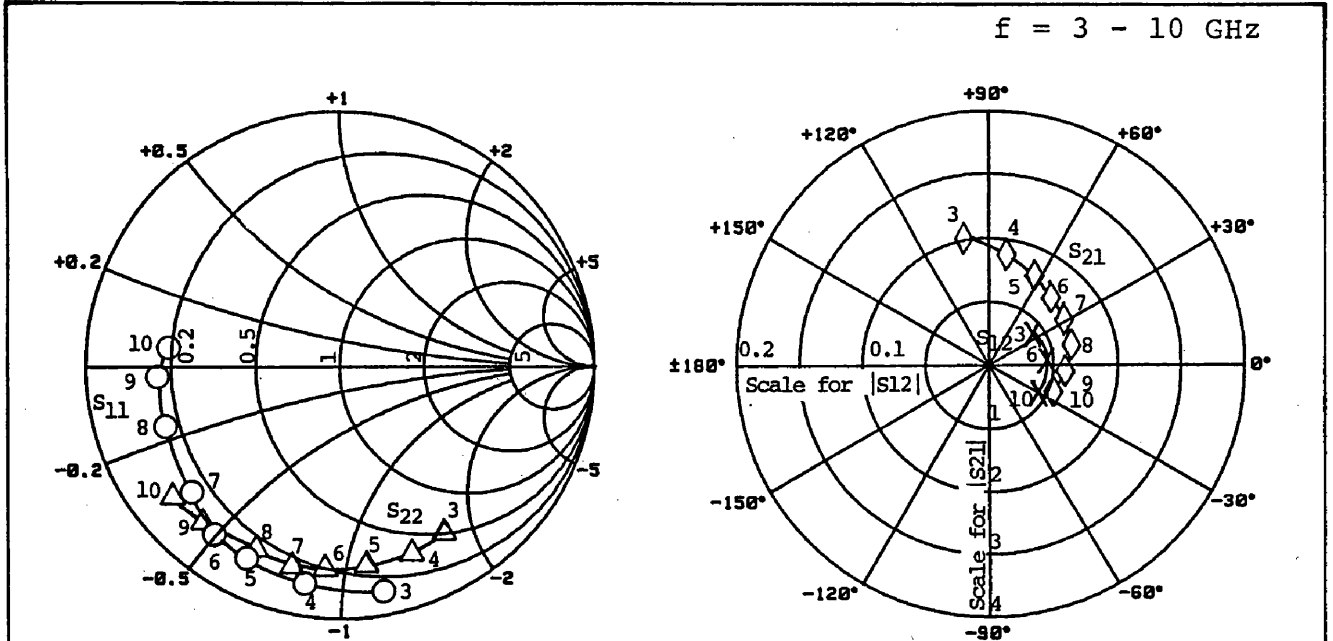
POWER DISSIPATION VS. CASE TEMPERATURE



# S8834

## S8834 S-PARAMETERS (MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$ ,  $I_{DS} = 40 \text{ mA}$



| FREQUENCY<br>(GHz) | S <sub>11</sub> |      | S <sub>12</sub> |     | S <sub>21</sub> |     | S <sub>22</sub> |      |
|--------------------|-----------------|------|-----------------|-----|-----------------|-----|-----------------|------|
| 3                  | 0.91            | -79  | 0.042           | 32  | 2.04            | 101 | 0.78            | -58  |
| 4                  | 0.87            | -99  | 0.046           | 20  | 1.78            | 81  | 0.79            | -69  |
| 5                  | 0.84            | -116 | 0.048           | 10  | 1.58            | 63  | 0.79            | -82  |
| 6                  | 0.83            | -127 | 0.046           | 2   | 1.43            | 47  | 0.80            | -94  |
| 7                  | 0.77            | -140 | 0.048           | -4  | 1.35            | 31  | 0.81            | -103 |
| 8                  | 0.73            | -161 | 0.050           | -13 | 1.31            | 13  | 0.80            | -115 |
| 9                  | 0.72            | -177 | 0.049           | -24 | 1.20            | -6  | 0.82            | -131 |
| 10                 | 0.68            | 174  | 0.047           | -31 | 1.07            | -22 | 0.84            | -142 |