

January 1990  
Edition 1.1

FUJITSU

PRODUCT PROFILE

**2SC3847****Silicon High Speed Power Transistor**

2SC3847 800V, 10A

## ABSOLUTE MAXIMUM RATINGS

| Parameter                    | Symbol    | Conditions                         | Rating     | Unit |
|------------------------------|-----------|------------------------------------|------------|------|
| Storage Temperature Range    | $T_{stg}$ |                                    | -55 ~ +150 | °C   |
| Junction Temperature         | $T_J$     |                                    | +150       | °C   |
| Collector to Base Voltage    | $V_{CBO}$ |                                    | 1200       | V    |
| Emitter to Base Voltage      | $V_{EBO}$ |                                    | 7          | V    |
| Collector to Emitter Voltage | $V_{CEO}$ |                                    | 800        | V    |
| Collector Current            | $I_C$     |                                    | 10         | A    |
|                              | $I_{CM}$  | $P_W \leq 25\mu s, D.R. \leq 50\%$ | 20         |      |
| Base Current                 | $I_B$     |                                    | 5          | A    |
| Collector Power Dissipation  | $P_C$     | $T_C = 25^\circ C$                 | 85         | W    |

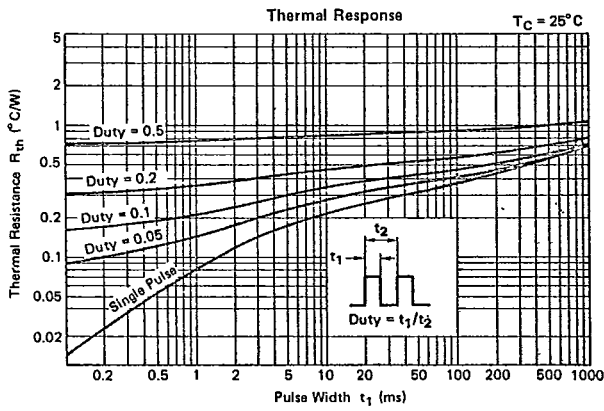
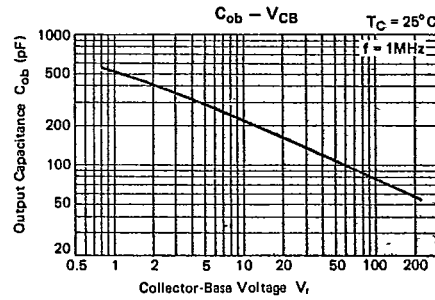
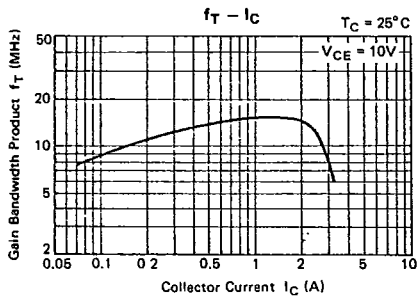
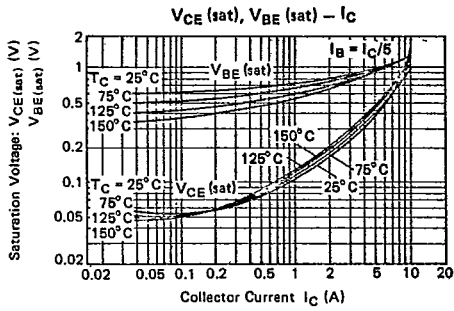
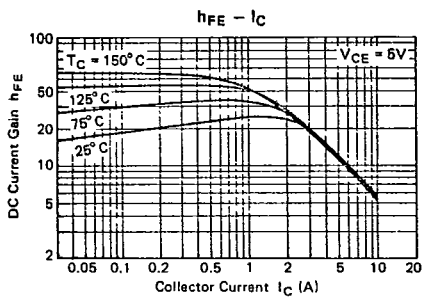
ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ C$ )

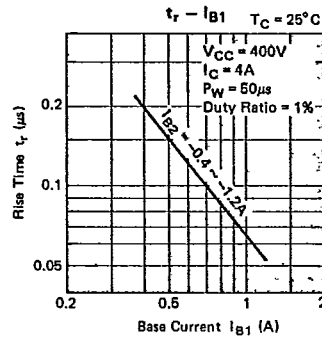
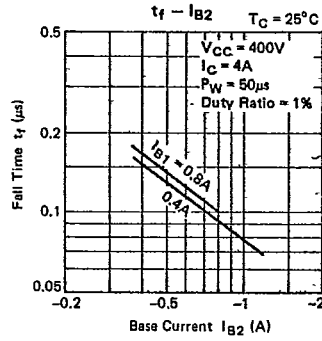
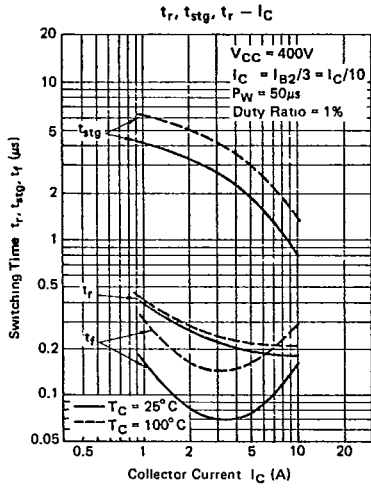
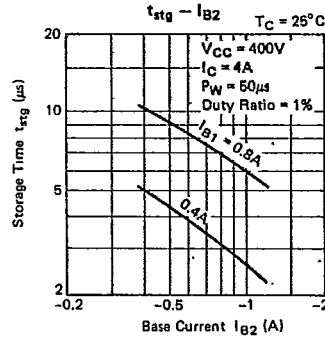
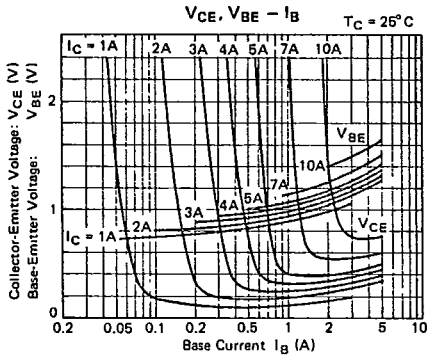
| Parameter                               | Symbol         | Test Conditions                                       | Limit |      |      | Unit    |
|---|----------------|---|-------|------|------|---------|
|   |                |   | Min.  | Typ. | Max. |         |
| Collector to Base Breakdown Voltage     | $V_{(BR)CBO}$  | $I_C = 1mA, I_E = 0$                                  | 1200  | -    | -    | V       |
| Emitter to Base Breakdown Voltage       | $V_{(BR)EBO}$  | $I_E = 1mA, I_C = 0$                                  | 7     | -    | -    | V       |
| Collector to Emitter Sustaining Voltage | $V_{(BR)CEO}$  | $I_C = 10mA, R_{BE} = \infty\Omega$                   | 800   | -    | -    | V       |
| Collector to Emitter Sustaining Voltage | $V_{CEX(SUS)}$ | $I_C = 7A, I_{B2} = -1.2A, L = 1mH^*$                 | 900   | -    | -    | V       |
| Collector Cutoff Current                | $I_{CBO}$      | $V_{CB} = 1000V, I_E = 0$                             | -     | -    | 100  | $\mu A$ |
|   |                | $V_{CB} = 1000V, I_E = 0, T_C = 100^\circ C$          | -     | -    | 1    | mA      |
| Emitter Cutoff Current                  | $I_{EBO}$      | $V_{EB} = 6V, I_C = 0$                                | -     | -    | 100  | $\mu A$ |
| DC Current Gain                         | $h_{FE}$       | $V_{CE} = 5V, I_C = 4A^{**}$                          | 10    | 15   | 30   | -       |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 4A, I_B = 0.8A^{**}$                           | -     | 0.3  | 1.5  | V       |
| Base to Emitter Saturation Voltage      | $V_{BE(sat)}$  |   | -     | 1.0  | 2.0  | V       |
| Output Capacitance                      | $C_{ob}$       | $V_{CB} = 10V, I_E = 0, f = 1MHz$                     | -     | 220  | -    | pF      |
| Gain Bandwidth Product                  | $f_T$          | $V_{CE} = 10V, I_C = 0.1A$                            | -     | 15   | -    | MHz     |
| Rise Time                               | $t_r$          | $V_{CC} = 400V, I_C = 4A, 3I_{B1} = -I_{B2} = 1.2A^*$ | -     | 0.20 | 0.5  | $\mu s$ |
| Storage Time                            | $t_{stg}$      |   | -     | 2.50 | 3.5  | $\mu s$ |
| Fall Time                               | $t_f$          |   | -     | 0.07 | 0.3  | $\mu s$ |

\*1 Test Circuit \*\*2 Pulse  $P_W \leq 300\mu s$ , Duty Ratio  $\leq 6\%$ 

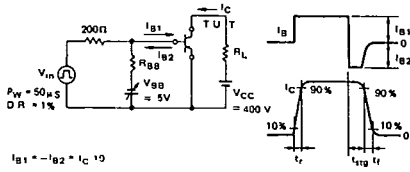
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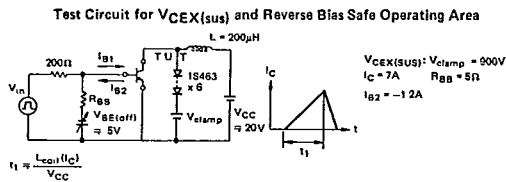
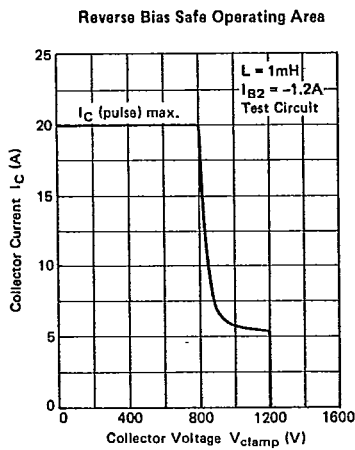
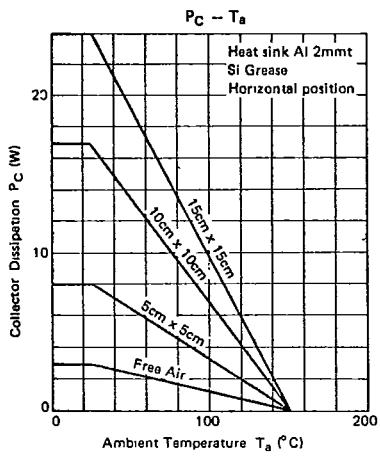
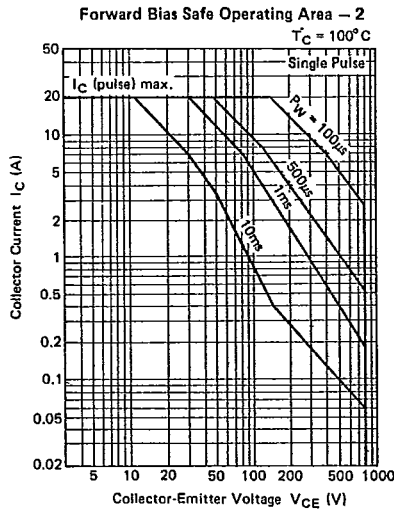
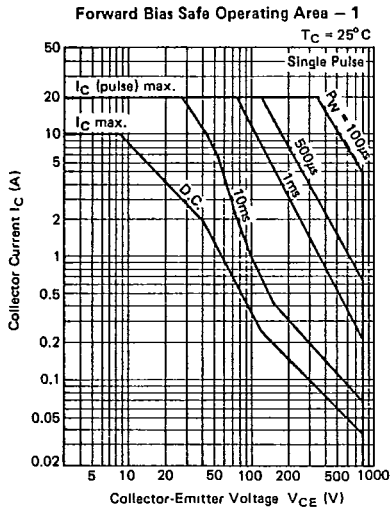




Test Circuit for Switching Time



2SC3847



TO-3PF FULL PLASTIC MOLD POWER TRANSISTORS  
(RING EMITTER TRANSISTORS)

ELECTRICAL CHARACTERISTICS

| Type No. | Maximum Ratings (T <sub>a</sub> = 25°C) |                         |                       |                          |                       | Electrical Characteristics (T <sub>a</sub> = 25°C) |                    |                         |                     |
|----------|---|-------------------------|-----------------------|--------------------------|-----------------------|--|--------------------|-------------------------|---------------------|
|          | V <sub>CB0</sub><br>(V)                 | V <sub>CE0</sub><br>(V) | I <sub>C</sub><br>(A) | I <sub>CM</sub> *<br>(A) | P <sub>C</sub><br>(W) | V <sub>CE</sub> (V)                                | I <sub>C</sub> (A) | h <sub>FE</sub><br>Min. | t <sub>f</sub> (μs) |
|          |   |                         |                       |                          |                       |  |                    |                         | Max.                |
| 2SC3842  | 600                                     | 400                     | 10                    | 15                       | 70                    | 5  | 5                  | 10                      | 0.3                 |
| 2SC3843  | 600                                     | 450                     | 10                    | 20                       | 75                    | 5  | 6                  | 10                      | 0.2                 |
| 2SC3844  | 600                                     | 450                     | 15                    | 20                       | 75                    | 5  | 10                 | 10                      | 0.3                 |
| 2SC3845  | 1200                                    | 800                     | 3                     | 6                        | 75                    | 5  | 1                  | 10                      | 0.3                 |
| 2SC3846  | 1200                                    | 800                     | 6                     | 10                       | 80                    | 5  | 2                  | 10                      | 0.3                 |
| 2SC3847  | 1200                                    | 800                     | 10                    | 20                       | 85                    | 5  | 4                  | 10                      | 0.3                 |
| 2SC3947  | 850                                     | 500                     | 5                     | 8                        | 70                    | 5  | 2.5                | 10                      | 0.3                 |
| 2SC3948  | 850                                     | 500                     | 10                    | 15                       | 75                    | 5  | 5                  | 10                      | 0.3                 |
| 2SC3949  | 850                                     | 500                     | 15                    | 20                       | 80                    | 5  | 10                 | 10                      | 0.3                 |

\* Pulsed P<sub>w</sub> ≤ 25μs, D.R. ≤ 50%

• Package Outline and Terminal Configuration

