

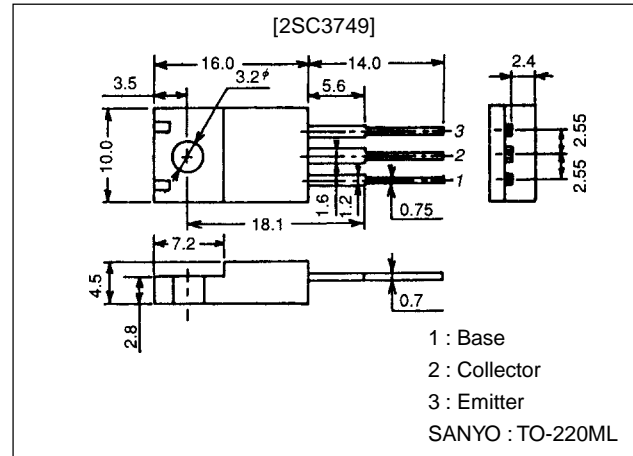
**2SC3749****500V/3A Switching Regulator Applications****Features**

- High breakdown voltage and high reliability.
- Fast switching speed.
- Wide ASO.
- Adoption of MBIT process.
- Micaless package facilitating mounting.

**Package Dimensions**

unit:mm

2041A

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

| Parameter                    | Symbol    | Conditions               | Ratings     | Unit |
|------------------------------|-----------|--------------------------|-------------|------|
| Collector-to-Base Voltage    | $V_{CB0}$ |                          | 800         | V    |
| Collector-to-Emitter Voltage | $V_{CE0}$ |                          | 500         | V    |
| Emitter-to-Base Voltage      | $V_{EB0}$ |                          | 7           | V    |
| Collector Current            | $I_C$     |                          | 3           | A    |
| Collector Current (Pulse)    | $I_{CP}$  | PW≤300μs, Duty Cycle≤10% | 6           | A    |
| Base Current                 | $I_B$     |                          | 1           | A    |
| Collector Dissipation        | $P_C$     | Tc=25°C                  | 25          | W    |
| Junction Temperature         | $T_J$     |                          | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |                          | -55 to +150 | °C   |

**Electrical Characteristics at Ta = 25°C**

| Parameter                | Symbol    | Conditions             | Ratings |     |     | Unit |
|--------------------------|-----------|------------------------|---------|-----|-----|------|
|                          |           |                        | min     | typ | max |      |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}=500V, I_E=0$   |         |     | 10  | μA   |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=5V, I_C=0$     |         |     | 10  | μA   |
| DC Current Gain          | $h_{FE1}$ | $V_{CE}=5V, I_C=0.3A$  | 15*     |     | 50* |      |
|                          | $h_{FE2}$ | $V_{CE}=5V, I_C=1.5A$  | 8       |     |     |      |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=10V, I_C=0.3A$ |         | 18  |     | MHz  |
| Output Capacitance       | $C_{ob}$  | $V_{CB}=10V, f=1MHz$   |         | 50  |     | pF   |

\* : The  $h_{FE1}$  of the 2SC3749 is classified as follows. When specifying the  $h_{FE1}$  rank, specify two ranks or more in principle.

|    |   |    |    |   |    |    |   |    |
|----|---|----|----|---|----|----|---|----|
| 15 | L | 30 | 20 | M | 40 | 30 | N | 50 |
|----|---|----|----|---|----|----|---|----|

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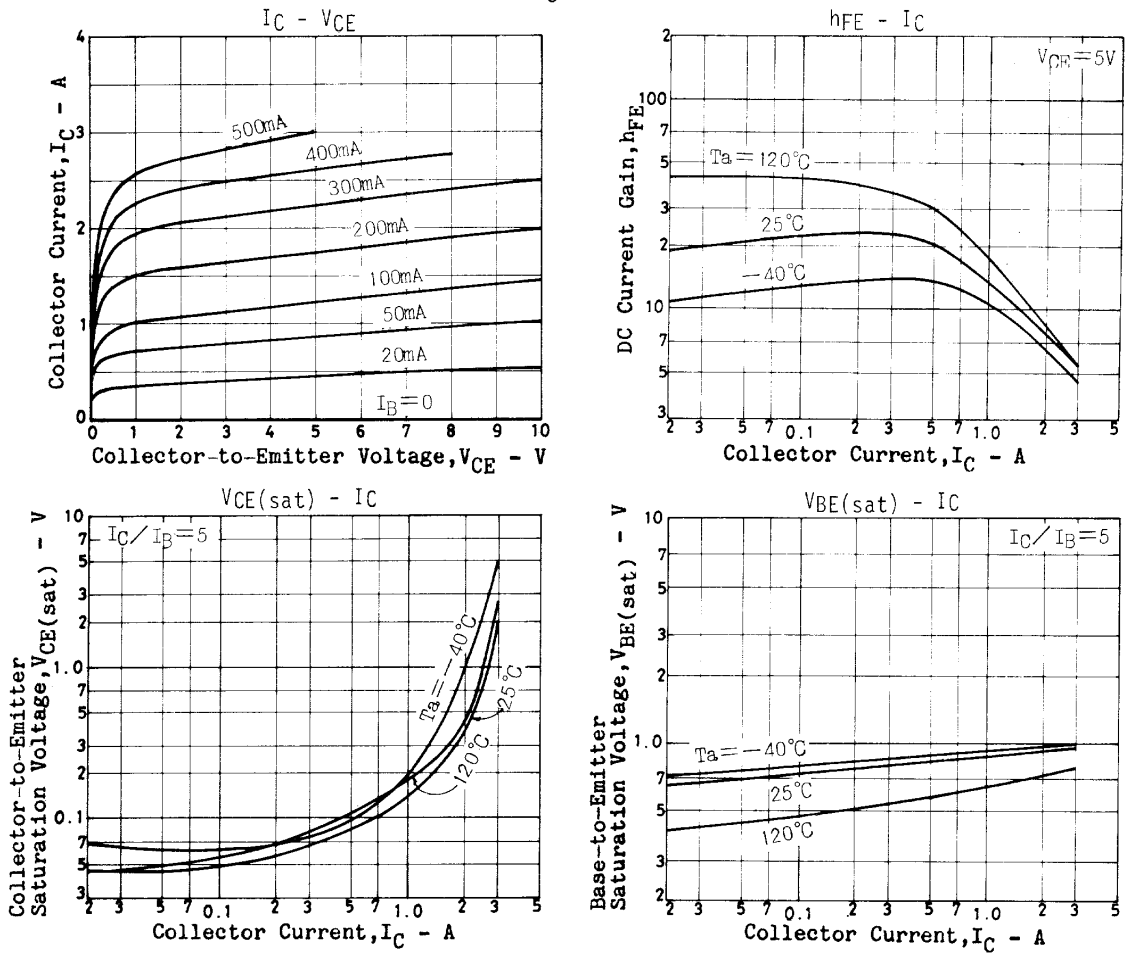
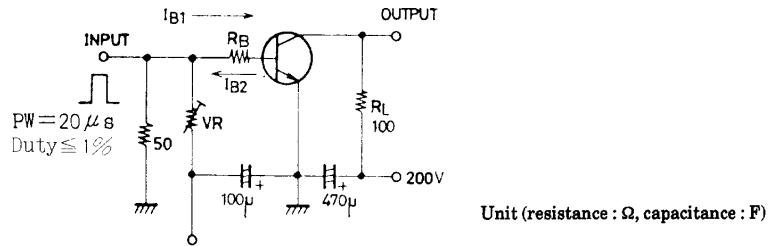
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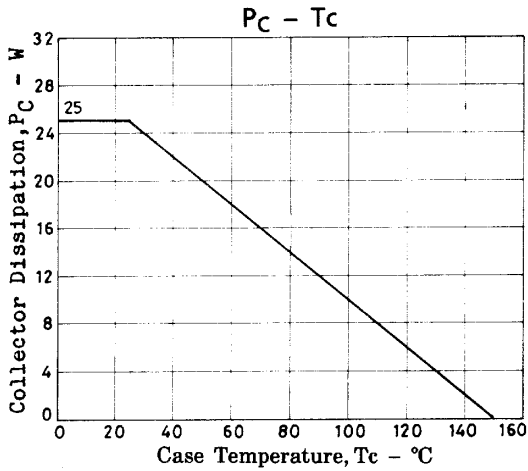
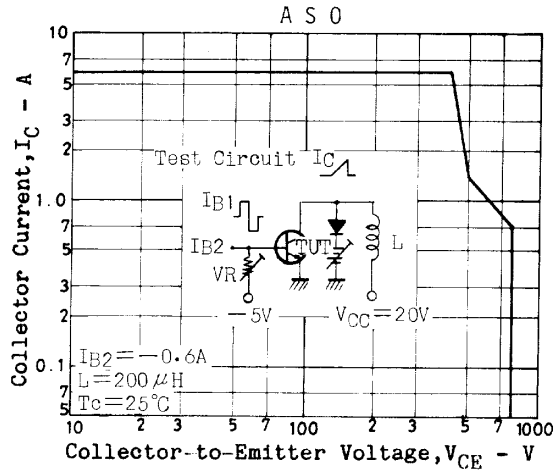
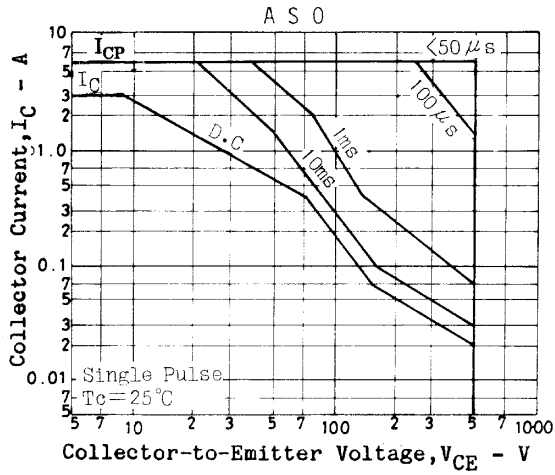
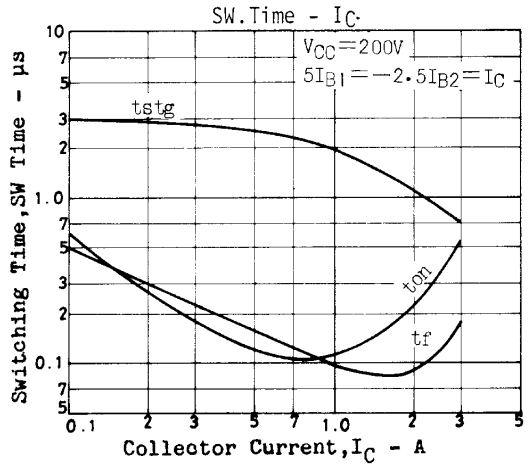
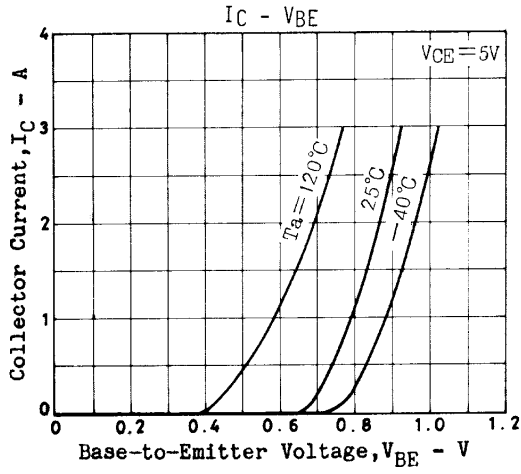
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| Parameter                               | Symbol         | Conditions  | Ratings |     |     | Unit    |
|---|----------------|---|---------|-----|-----|---------|
|   |                |   | min     | typ | max |         |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C=1.5A, I_B=0.3A$                                    |         |     | 1.0 | V       |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$  | $I_C=1.5A, I_B=0.3A$                                    |         |     | 1.5 | V       |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$  | $I_C=1mA, I_E=0$  | 800     |     |     | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$  | $I_C=5mA, R_{BE}=\infty$                                | 500     |     |     | V       |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$  | $I_E=1mA, I_C=0$  | 7       |     |     | V       |
| Collector-to-Emitter Sustain Voltage    | $V_{CEX(sus)}$ | $I_C=1.5A, I_{B1}=-I_{B2}=0.6A, L=2mH, \text{Clamped}$  | 500     |     |     | V       |
| Turn-ON Time                            | $t_{on}$       | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=2A, R_L=100\Omega$ |         |     | 0.5 | $\mu s$ |
| Storage Time                            | $t_{stg}$      | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=2A, R_L=100\Omega$ |         |     | 3.0 | $\mu s$ |
| Fall Time                               | $t_f$          | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=2A, R_L=100\Omega$ |         |     | 0.3 | $\mu s$ |

## Switching Time Test Circuit



# 2SC3749



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