

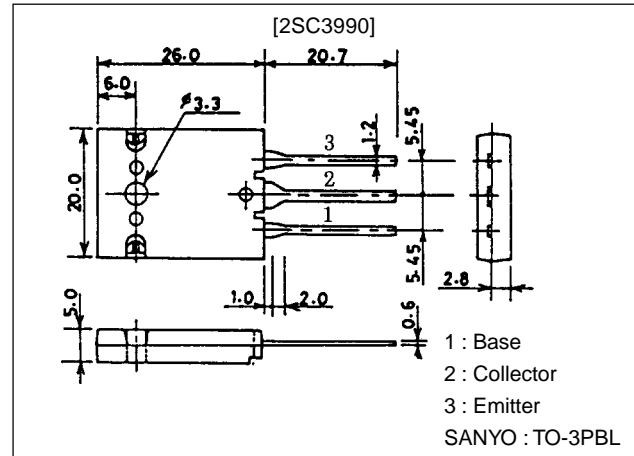
**2SC3990****500V/35A Switching Regulator Applications****Features**

- High breakdown voltage, high reliability.
- Fast switching speed.
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2048B

**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_{EBO} | | 7 | V |
| Collector Current | I_C | | 35 | A |
| Collector Current (Pulse) | I_{CP} | $PW \leq 300\mu s$, duty cycle $\leq 10\%$ | 50 | A |
| Base Current | I_B | | 12 | A |
| Collector Dissipation | P_C | $T_c = 25^\circ C$ | 250 | W |
| Junction Temperature | T_j | | 150 | $^\circ C$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ C$ |

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} | $V_{CE} = 5V$, $I_C = 3.2A$ | 15* | | 50* | |
| | h_{FE2} | $V_{CE} = 5V$, $I_C = 16A$ | 8 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE} = 10V$, $I_C = 3.2A$ | | 18 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB} = 10V$, $f = 1MHz$ | | 400 | | pF |

* : The 2SC3990 is classified by 3.2A h_{FE} as follows :

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

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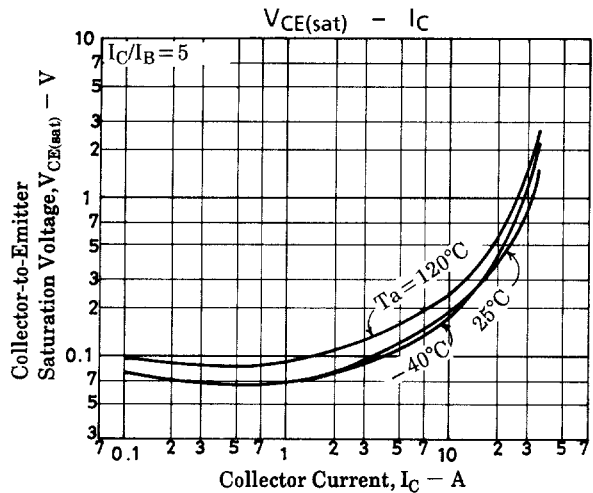
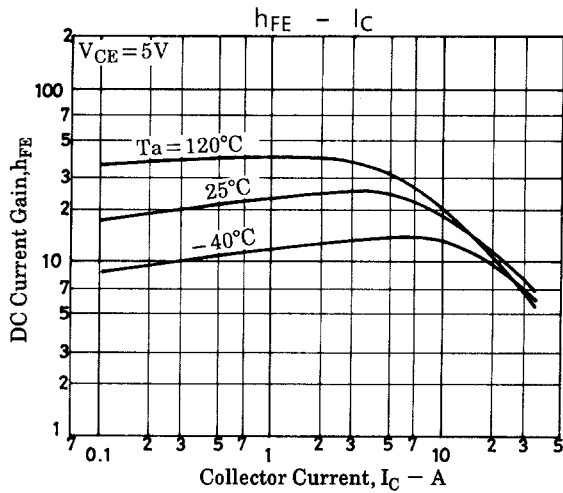
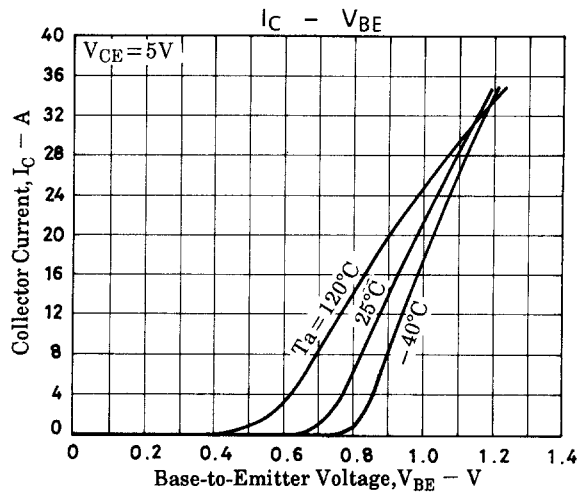
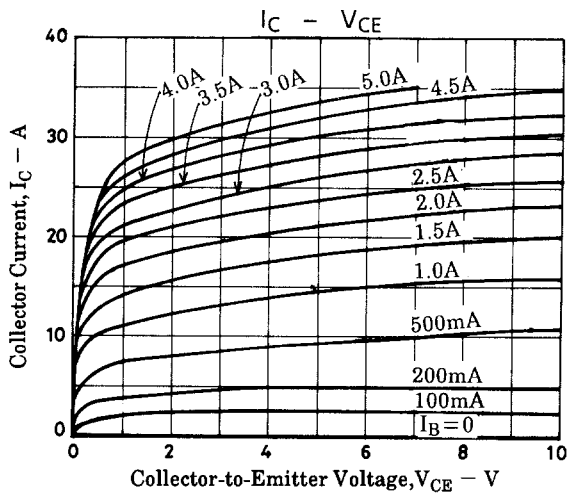
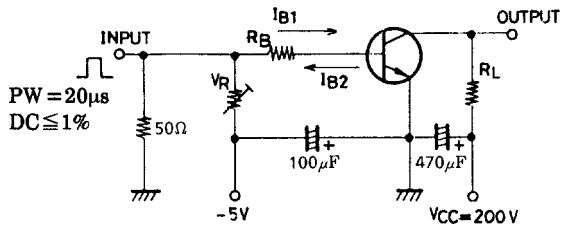
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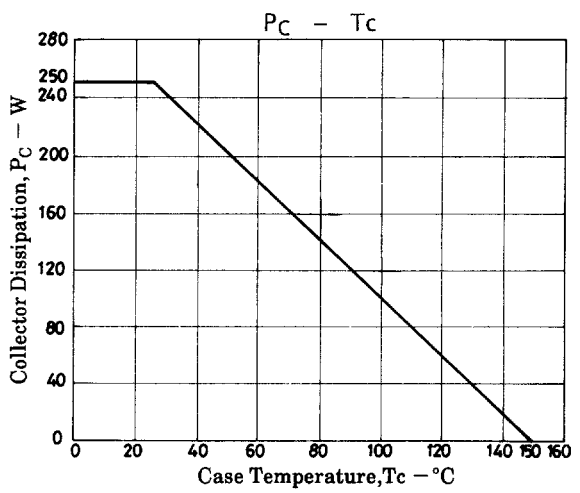
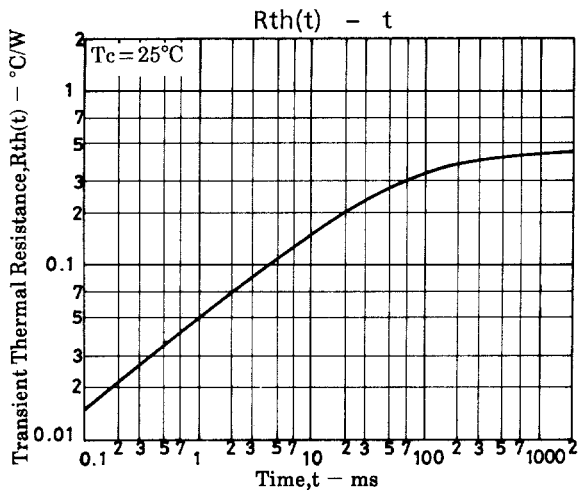
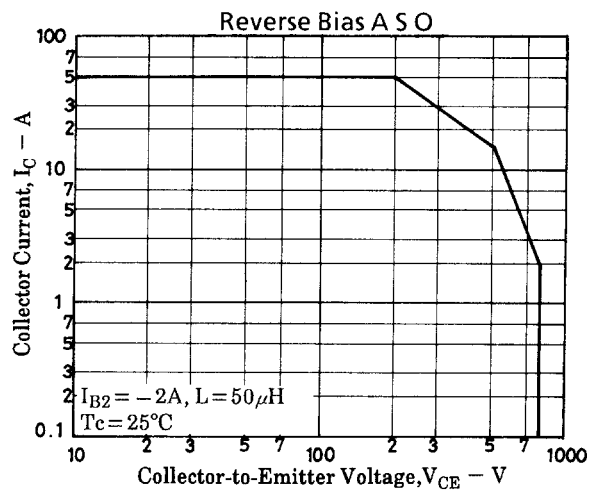
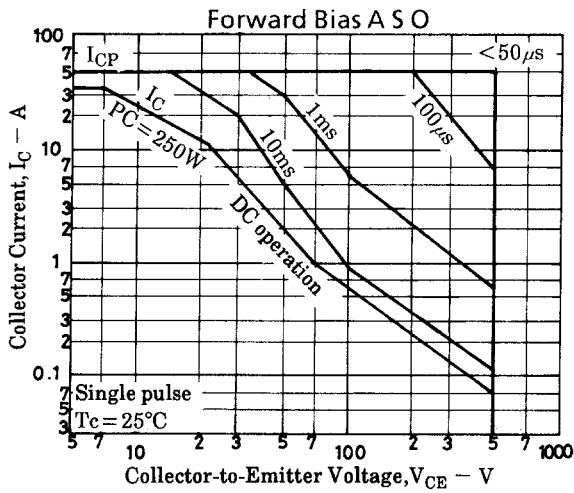
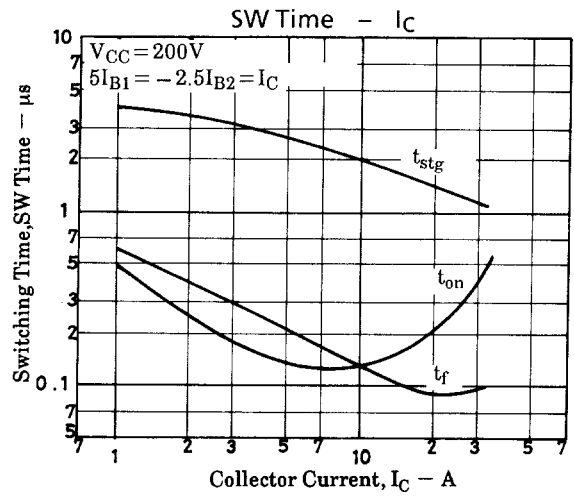
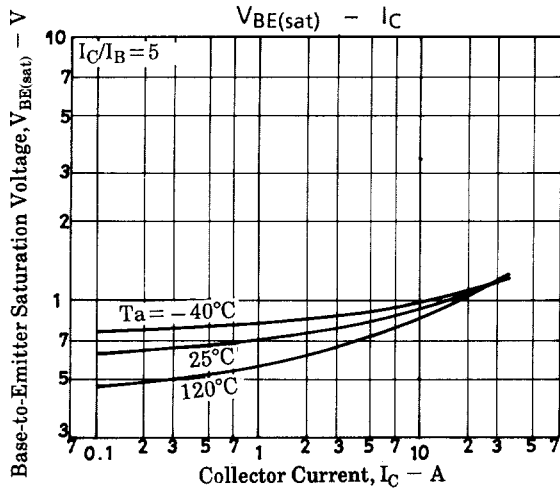
2SC3990

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------|---|---------|-----|-----|---------|
| | | | min | typ | max | |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=16A, I_B=3.2A$ | | | 1.0 | V |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=16A, I_B=3.2A$ | | | 1.5 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=1mA, I_E=0$ | 800 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=10mA, R_{BE}=\infty$ | 500 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=1mA, I_C=0$ | 7 | | | V |
| Collector-to-Emitter Sustain Voltage | $V_{CEX(sus)}$ | $I_C=15A, I_{B1}=-I_{B2}=-2A, L=200\mu H, \text{clamped}$ | 500 | | | V |
| Turn-ON Time | t_{on} | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$ | | | 0.5 | μs |
| Storage Time | t_{stg} | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$ | | | 3.0 | μs |
| Fall Time | t_f | $V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$ | | | 0.3 | μs |

Switching Time Test Circuit



2SC3990



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