

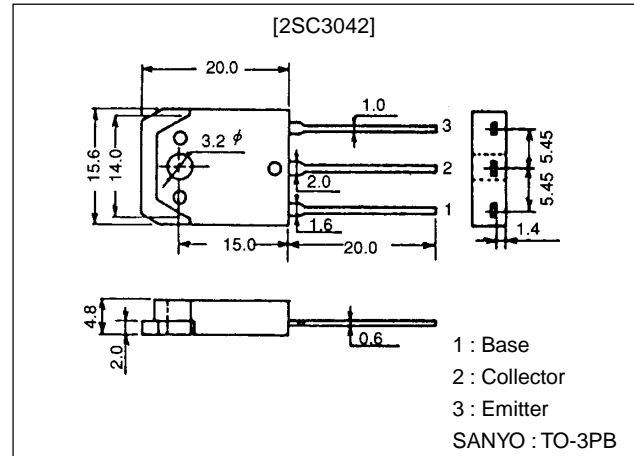
**SANYO****400V/12A Switching Regulator Applications****Features**

- High breakdown voltage ( $V_{CBO} \geq 500V$ ).
- Fast switching speed.
- Wide ASO.

**Package Dimensions**

unit:mm

2022A

**Specifications****Absolute Maximum Ratings at  $T_a = 25^\circ C$** 

| Parameter                    | Symbol    | Conditions                                  | Ratings     | Unit       |
|------------------------------|-----------|---|-------------|------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |   | 500         | V          |
| Collector-to-Emitter Voltage | $V_{CEO}$ |   | 400         | V          |
| Emitter-to-Base Voltage      | $V_{EBO}$ |   | 7           | V          |
| Collector Current            | $I_C$     |   | 12          | A          |
| Collector Current (Pulse)    | $I_{CP}$  | $PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$ | 25          | A          |
| Base Current                 | $I_B$     |   | 4           | A          |
| Collector Dissipation        | $P_C$     |   | 2.5         | W          |
|                              |           | $T_c = 25^\circ C$                          | 100         | W          |
| Junction Temperature         | $T_j$     |   | 150         | $^\circ C$ |
| Storage Temperature          | $T_{stg}$ |   | -55 to +150 | $^\circ C$ |

**Electrical Characteristics at  $T_a = 25^\circ C$** 

| Parameter                               | Symbol        | Conditions                   | Ratings |     |     | Unit    |
|---|---------------|------------------------------|---------|-----|-----|---------|
|   |               |                              | min     | typ | max |         |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB} = 400V$ , $I_E = 0$  |         |     | 10  | $\mu A$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB} = 5V$ , $I_C = 0$    |         |     | 10  | $\mu A$ |
| DC Current Gain                         | $h_{FE1}$     | $V_{CE} = 5V$ , $I_C = 1.6A$ | 15*     |     | 50* |         |
|   | $h_{FE2}$     | $V_{CE} = 5V$ , $I_C = 8A$   | 8       |     |     |         |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 8A$ , $I_B = 1.6A$    |         |     | 1.0 | V       |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 8A$ , $I_B = 1.6A$    |         |     | 1.5 | V       |

\* : The  $h_{FE1}$  of the 2SC3042 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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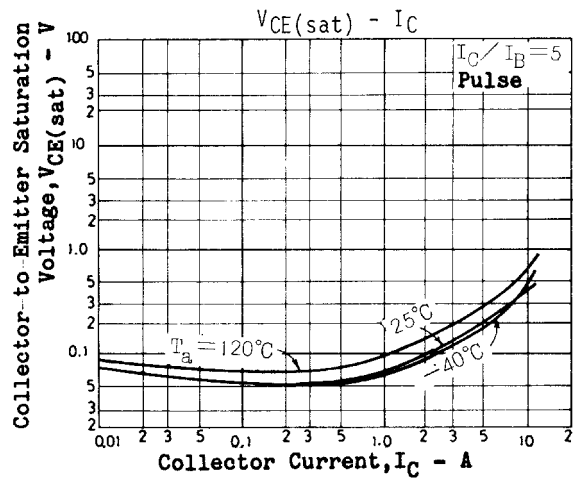
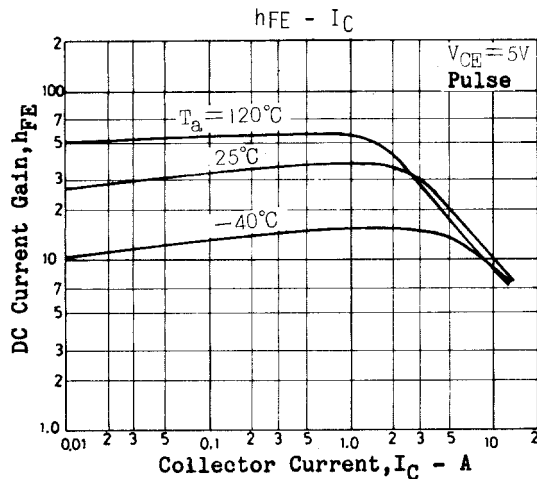
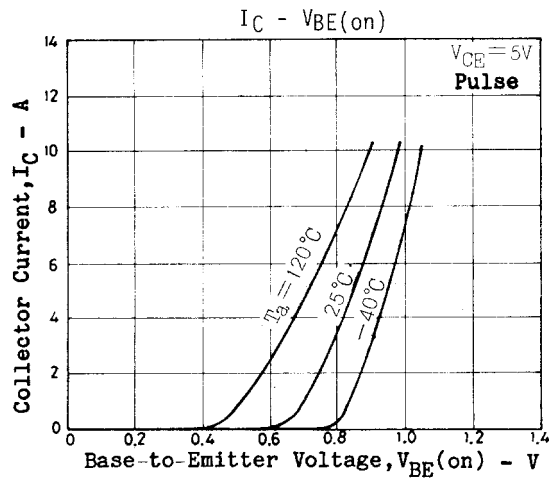
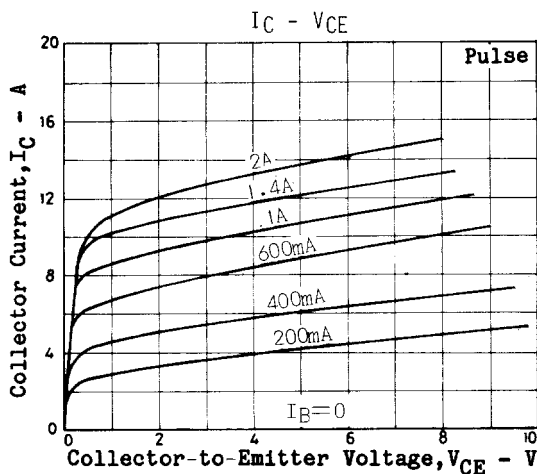
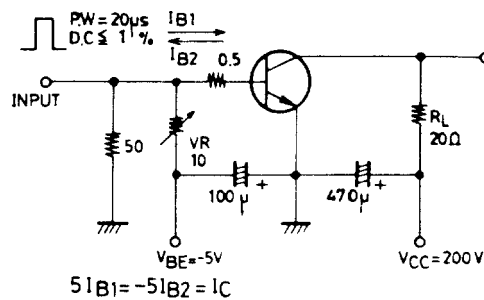
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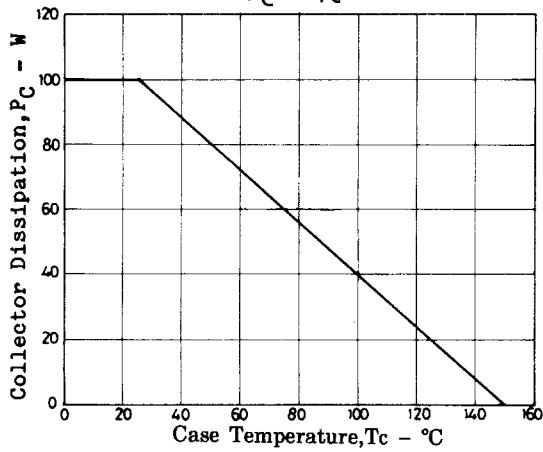
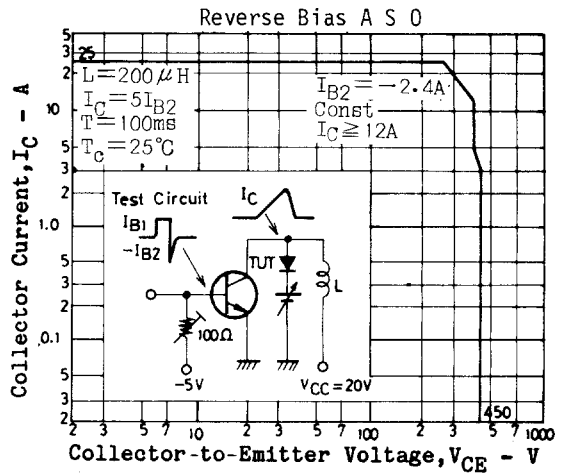
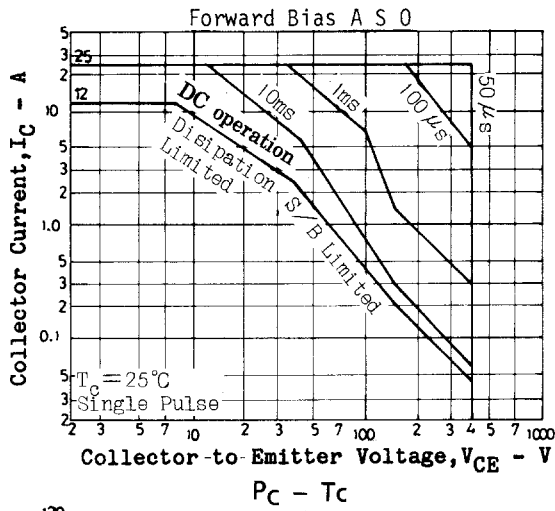
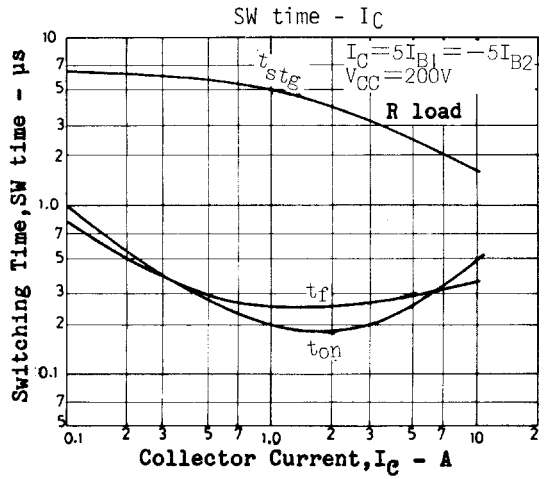
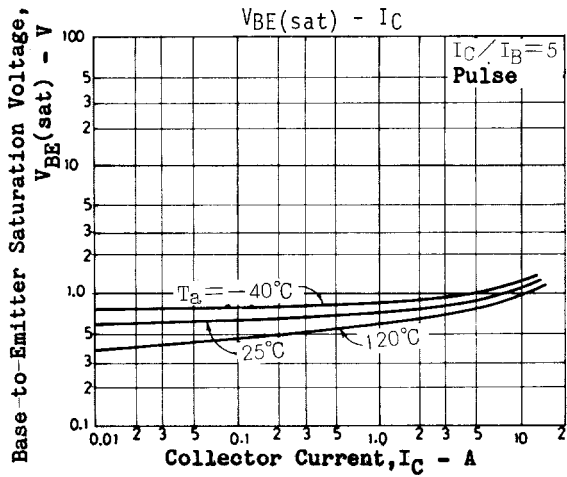
# 2SC3042

| Parameter                              | Symbol          | Conditions   | Ratings |     |     | Unit    |
|--|-----------------|--|---------|-----|-----|---------|
|  |                 |  | min     | typ | max |         |
| Gain-Bandwidth Product                 | $f_T$           | $V_{CE}=10V, I_C=1.6A$   |         | 20  |     | MHz     |
| Output Capacitance                     | $C_{ob}$        | $V_{CB}=10V, f=1MHz$   |         | 160 |     | pF      |
| Collector-to-Base Breakdown Voltage    | $V_{(BR)CBO}$   | $I_C=1mA, I_E=0$   | 500     |     |     | V       |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$   | $I_C=10mA, R_{BE}=\infty$  | 400     |     |     | V       |
| Emitter-to-Base Breakdown Voltage      | $V_{(BR)EBO}$   | $I_E=1mA, I_C=0$   | 7       |     |     | V       |
| Collector-to-Emitter Sustain Voltage   | $V_{CEO(sus)}$  | $I_C=12A, I_B=2.4A, L=50\mu H$                                   | 400     |     |     | V       |
| Collector-to-Emitter Sustain Voltage   | $V_{CEX(sus)1}$ | $I_C=12A, I_{B1}=2.4A, L=200\mu H, I_{B2}=-2.4A, \text{clamped}$ | 400     |     |     | V       |
|  | $V_{CEX(sus)2}$ | $I_C=3A, I_{B1}=0.6A, L=200\mu H, I_{B2}=-0.6A, \text{clamped}$  | 450     |     |     | V       |
| Turn-ON Time                           | $t_{on}$        | $I_C=10A, I_{B1}=2A, I_{B2}=-2A, R_L=20\Omega, V_{CC}=200V$      |         |     | 1.0 | $\mu s$ |
| Storage Time                           | $t_{stg}$       | $I_C=10A, I_{B1}=2A, I_{B2}=-2A, R_L=20\Omega, V_{CC}=200V$      |         |     | 2.5 | $\mu s$ |
| Fall Time                              | $t_f$           | $I_C=10A, I_{B1}=2A, I_{B2}=-2A, R_L=20\Omega, V_{CC}=200V$      |         |     | 1.0 | $\mu s$ |

## Switching Time Test Circuit



# 2SC3042



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