

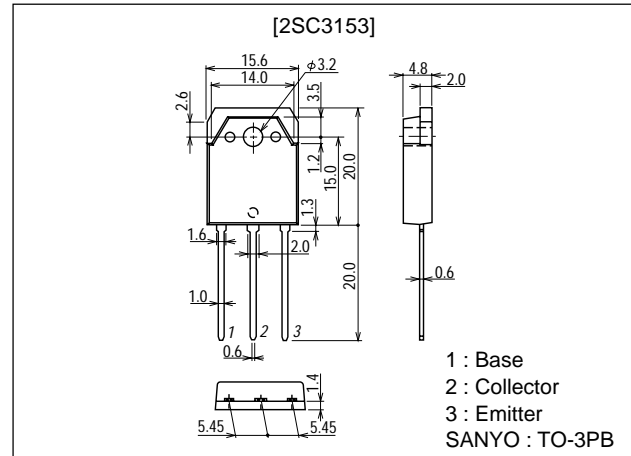
**2SC3153****800V/6A Switching Regulator Applications****Features**

- High breakdown voltage ( $V_{CBO} \geq 900V$ ).
- High-speed switching.
- 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    | $V_{CBO}$ |  | 900         | V          |
| Collector-to-Emitter Voltage | $V_{CEO}$ |  | 800         | V          |
| Emitter-to-Base Voltage      | $V_{EBO}$ |  | 7           | V          |
| Collector Current            | $I_C$     |  | 6           | A          |
| Collector Current (Pulse)    | $I_{CP}$  | Pulse, $PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$ | 20          | A          |
| Base Current                 | $I_B$     |  | 3           | A          |
| Collector Dissipation        | $P_C$     | $T_c = 25^\circ C$                                 | 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 | $I_{CBO}$ | $V_{CB} = 800V, I_E = 0$  |         |     | 10  | $\mu A$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB} = 5V, I_C = 0$    |         |     | 10  | $\mu A$ |
| DC Current Gain          | $h_{FE1}$ | $V_{CE} = 5V, I_C = 0.4A$ | 10*     |     | 40* |         |
|                          | $h_{FE2}$ | $V_{CE} = 5V, I_C = 2A$   | 8       |     |     |         |

Continued on next page.

\* : For the  $h_{FE1}$  of the 2SC3153, specify two ranks or more in principle.

| Rank     | K        | L        | M        |
|----------|----------|----------|----------|
| $h_{FE}$ | 10 to 20 | 15 to 30 | 20 to 40 |

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**SANYO Electric Co., Ltd. Semiconductor Company**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

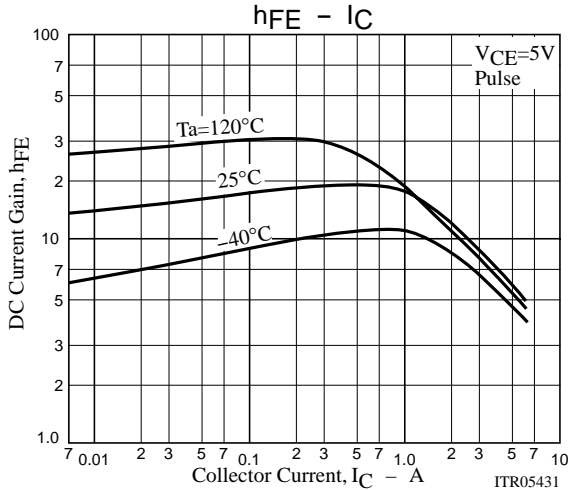
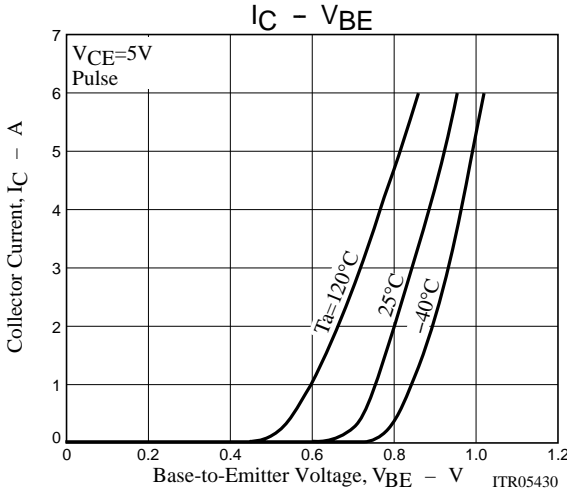
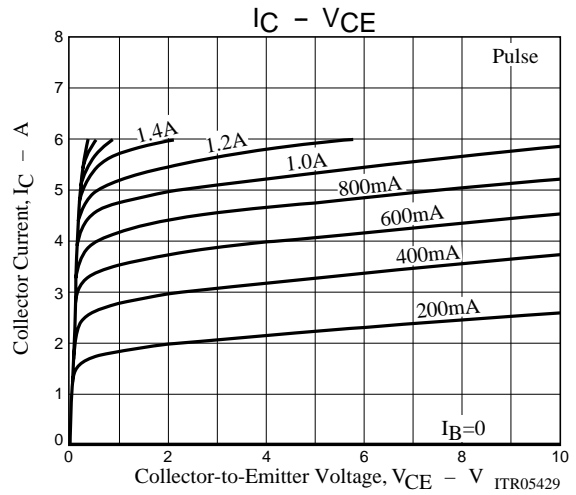
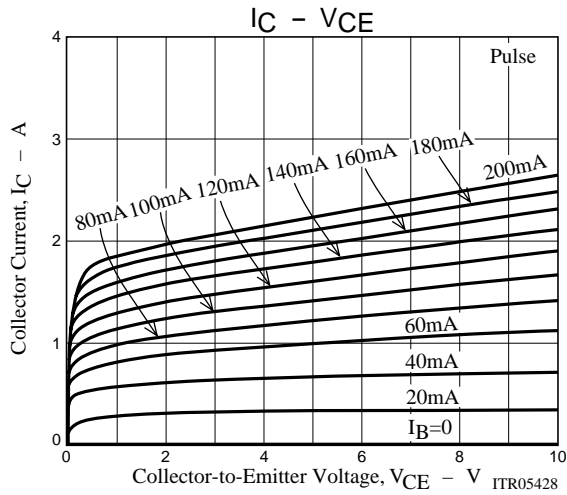
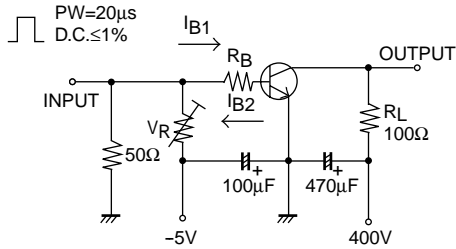
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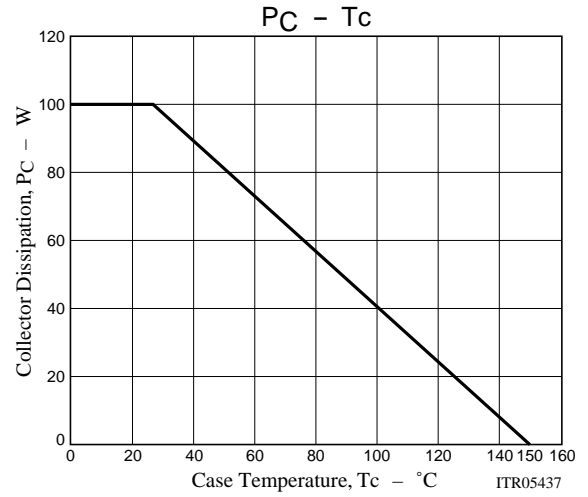
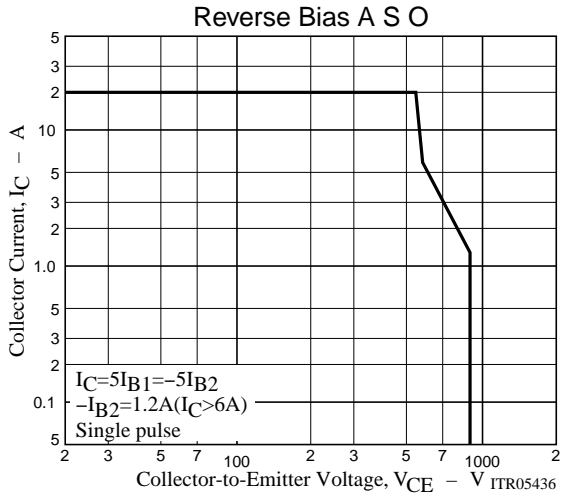
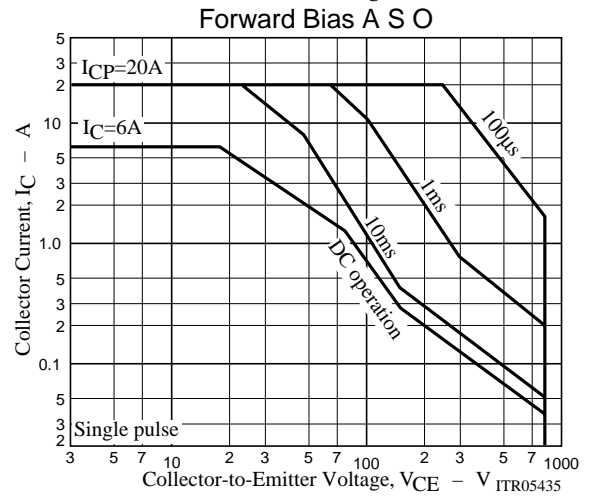
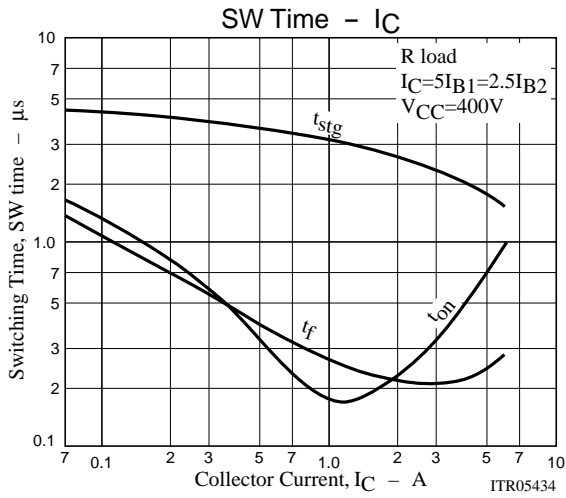
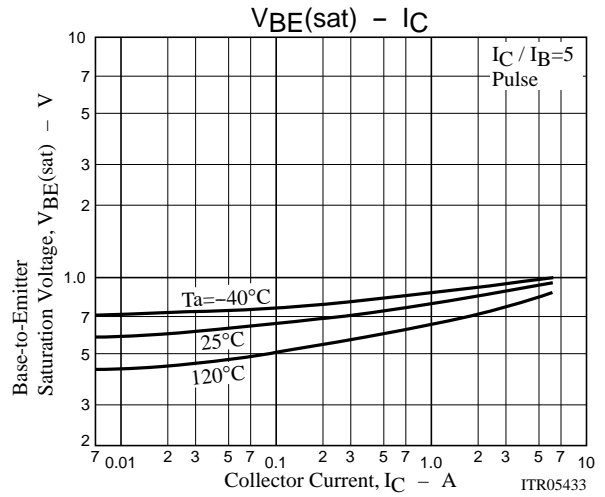
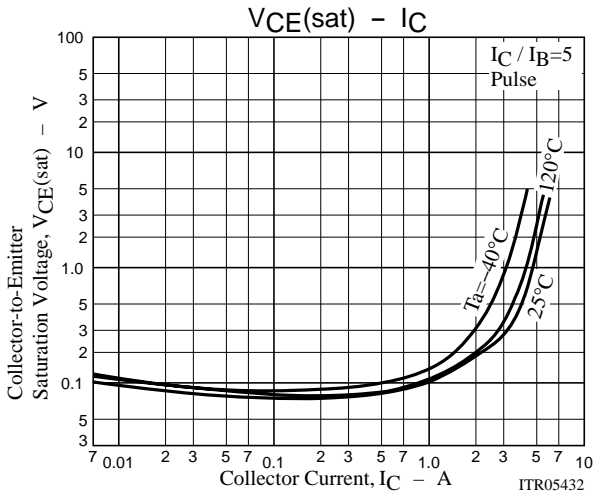
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| Parameter                               | Symbol          | Conditions  | Ratings |     |     | Unit    |
|---|-----------------|---|---------|-----|-----|---------|
|   |                 |   | min     | typ | max |         |
| Gain-Bandwidth Product                  | $f_T$           | $V_{CE}=10V, I_C=0.4A$  |         | 15  |     | MHz     |
| Output Capacitance                      | $C_{ob}$        | $V_{CB}=10V, f=1MHz$  |         | 120 |     | pF      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$   | $I_C=3A, I_B=0.6A$  |         |     | 2.0 | V       |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$   | $I_C=3A, I_B=0.6A$  |         |     | 1.5 | V       |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$   | $I_C=1mA, I_E=0$  | 900     |     |     | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$   | $I_C=5mA, R_{BE}=\infty$  | 800     |     |     | V       |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$   | $I_E=1mA, I_C=0$  | 7       |     |     | V       |
| Collector-to-Emitter Sustain Voltage    | $V_{CEO(sus)}$  | $I_C=6A, L=200\mu H, I_B=2A$                                    | 800     |     |     | V       |
| Collector-to-Emitter Sustain Voltage    | $V_{CEX(sus)1}$ | $I_C=2A, I_{B1}=0.4A, I_{B2}=-0.4A, L=1mH, \text{clamped}$      | 800     |     |     | V       |
|   | $V_{CEX(sus)2}$ | $I_C=1A, I_{B1}=0.2A, I_{B2}=-0.2A, L=2mH, \text{clamped}$      | 900     |     |     | V       |
| Turn-ON Time                            | $t_{on}$        | $I_C=4A, I_{B1}=0.8A, I_{B2}=-1.6A, R_L=100\Omega, V_{CC}=400V$ |         |     | 1.0 | $\mu s$ |
| Storage Time                            | $t_{stg}$       | $I_C=4A, I_{B1}=0.8A, I_{B2}=-1.6A, R_L=100\Omega, V_{CC}=400V$ |         |     | 3.0 | $\mu s$ |
| Fall Time                               | $t_f$           | $I_C=4A, I_{B1}=0.8A, I_{B2}=-1.6A, R_L=100\Omega, V_{CC}=400V$ |         |     | 0.7 | $\mu s$ |

## Switching Time Test Circuit



# 2SC3153



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