

NPN Triple Diffused Planar Silicon Transistor

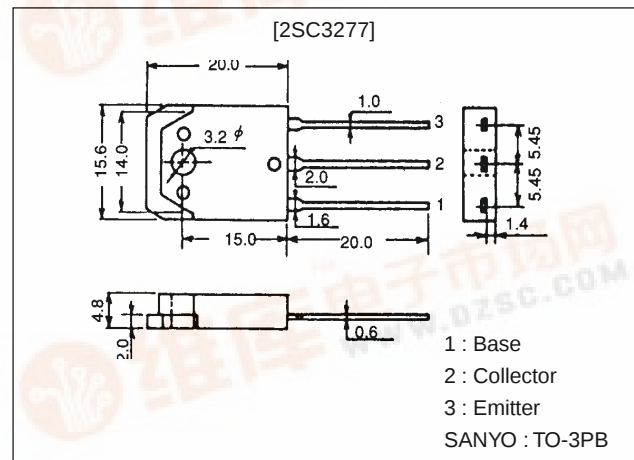
**SANYO****2SC3277****400V/10A Switching Regulator Applications****Features**

- High breakdown voltage, high current.
- Wide ASO.
- Fast switching speed.

**Package Dimensions**

unit:mm

2022A

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

| Parameter                    | Symbol    | Conditions                                  | Ratings     | Unit       |
|------------------------------|-----------|---------------------------------------------|-------------|------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |                                             | 500         | V          |
| Collector-to-Emitter Voltage | $V_{CE0}$ |                                             | 400         | V          |
| Emitter-to-Base Voltage      | $V_{EB0}$ |                                             | 7           | V          |
| Collector Current            | $I_C$     |                                             | 10          | A          |
| Collector Current (Pulse)    | $I_{CP}$  | $PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$ | 20          | A          |
| Collector Dissipation        | $P_C$     | $T_c = 25^\circ C$                          | 90          | 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 | $I_{CB0}$ | $V_{CB} = 400V$ , $I_E = 0$   |         |     | 10  | $\mu A$ |
| Emitter Cutoff Current   | $I_{EB0}$ | $V_{EB} = 5V$ , $I_C = 0$     |         |     | 10  | $\mu A$ |
| DC Current Gain          | $h_{FE1}$ | $V_{CE} = 5V$ , $I_C = 1.2A$  | 15*     |     | 50* |         |
|                          | $h_{FE2}$ | $V_{CE} = 5V$ , $I_C = 6A$    | 8       |     |     |         |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE} = 10V$ , $I_C = 1.2A$ |         | 20  |     | MHz     |
| Output Capacitance       | $C_{ob}$  | $V_{CB} = 10V$ , $f = 1MHz$   |         | 120 |     | pF      |

\* : The  $h_{FE1}$  of the 2SC3277 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 |
|----|---|----|----|---|----|----|---|----|

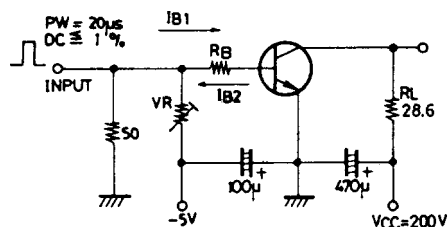
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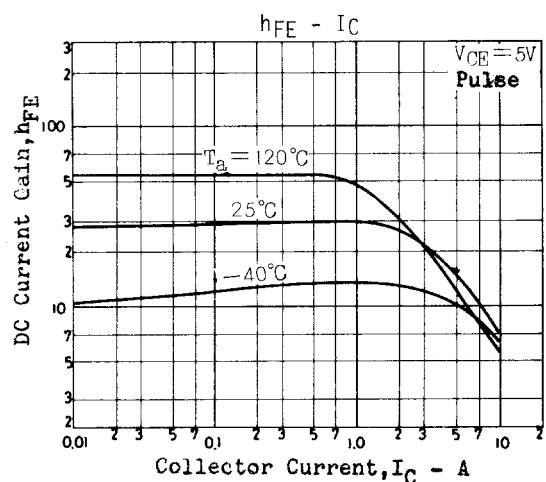
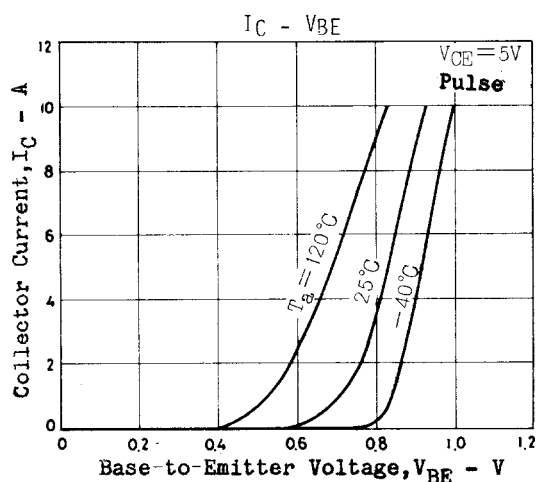
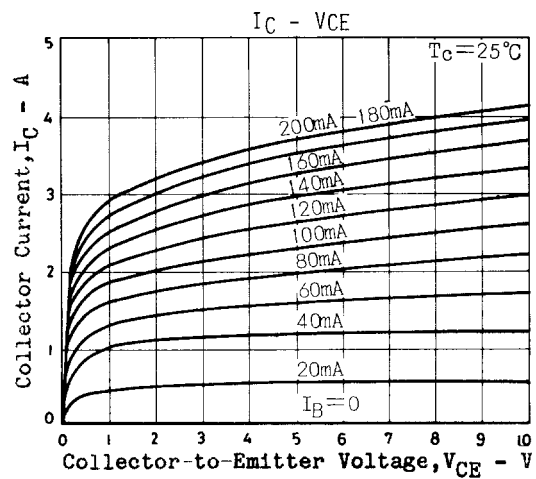
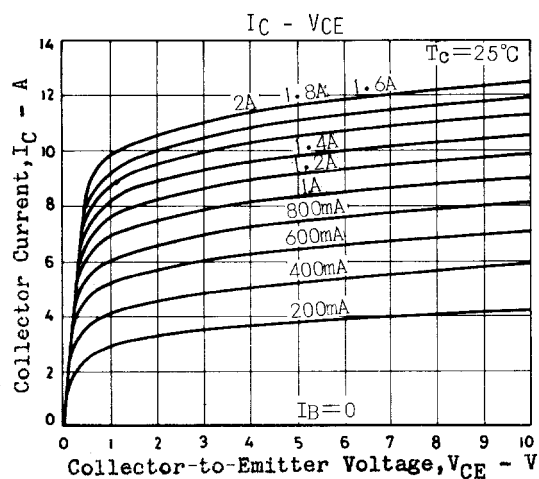
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| Parameter                               | Symbol          | Conditions                                                        | Ratings |     |     | Unit    |
|-----------------------------------------|-----------------|-------------------------------------------------------------------|---------|-----|-----|---------|
|                                         |                 |                                                                   | min     | typ | max |         |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$   | $I_C=6A, I_B=1.2A$                                                |         |     | 1.0 | V       |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$   | $I_C=6A, I_B=1.2A$                                                |         |     | 1.5 | V       |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$   | $I_C=1mA, I_E=0$                                                  | 500     |     |     | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$   | $I_C=5mA, R_{BE}=\infty$                                          | 400     |     |     | V       |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$   | $I_E=1mA, I_C=0$                                                  | 7       |     |     | V       |
| Collector-to-Emitter Sustain Voltage    | $V_{CEO(sus)}$  | $I_C=10A, I_B=2A, L=50\mu H$                                      | 400     |     |     | V       |
| Collector-to-Emitter Sustain Voltage    | $V_{CEX(sus)1}$ | $I_C=10A, I_{B1}=2A, L=200\mu H, I_{B2}=-2A, \text{clamped}$      | 400     |     |     | V       |
|                                         | $V_{CEX(sus)2}$ | $I_C=2.5A, I_{B1}=0.5A, L=200\mu H, I_{B2}=-0.5A, \text{clamped}$ | 450     |     |     | V       |
| Turn-ON Time                            | $t_{on}$        | $I_C=7A, I_{B1}=1.4A, I_{B2}=-1.4A, R_L=28.6\Omega, V_{CC}=200V$  |         |     | 1.0 | $\mu s$ |
| Storage Time                            | $t_{stg}$       | $I_C=7A, I_{B1}=1.4A, I_{B2}=-1.4A, R_L=28.6\Omega, V_{CC}=200V$  |         |     | 2.5 | $\mu s$ |
| Fall Time                               | $t_f$           | $I_C=7A, I_{B1}=1.4A, I_{B2}=-1.4A, R_L=28.6\Omega, V_{CC}=200V$  |         |     | 1.0 | $\mu s$ |

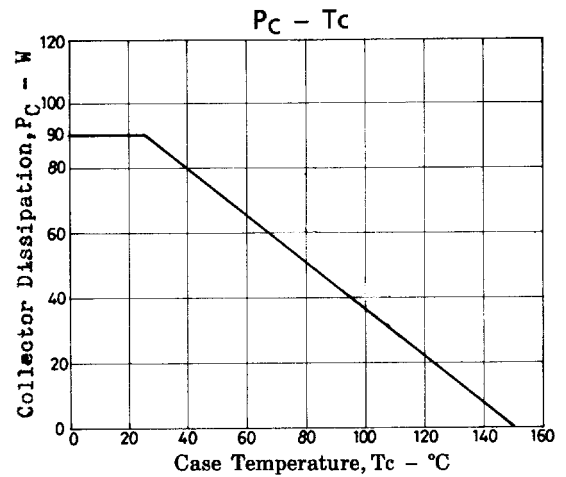
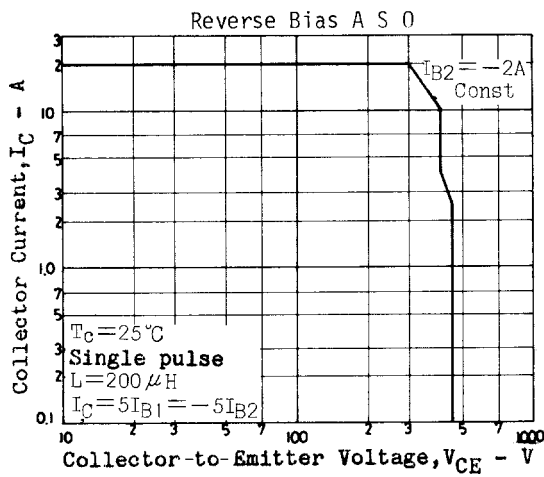
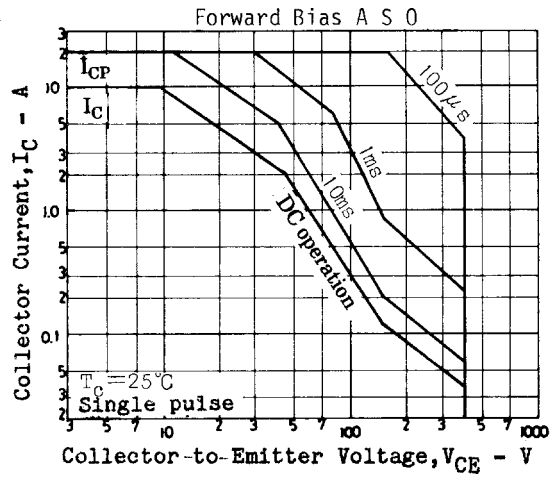
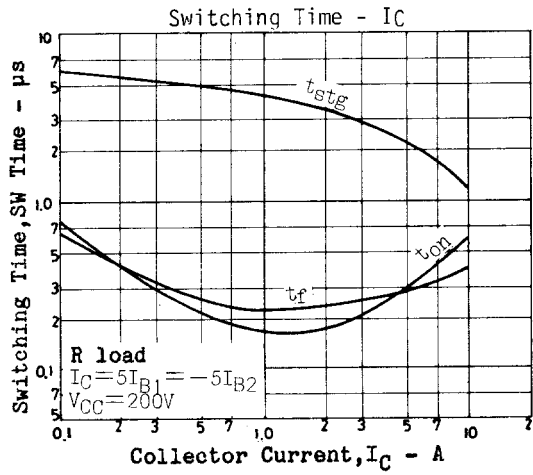
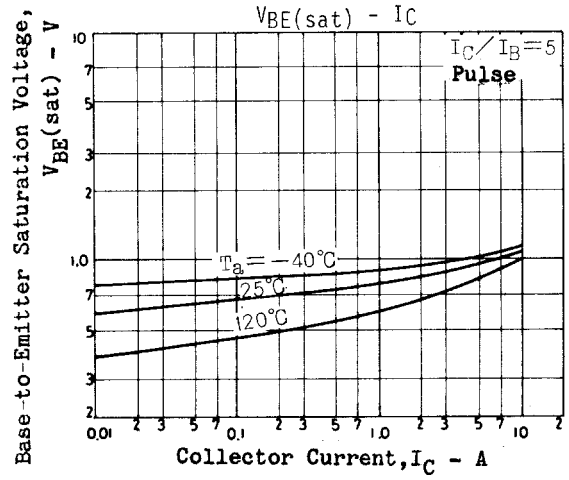
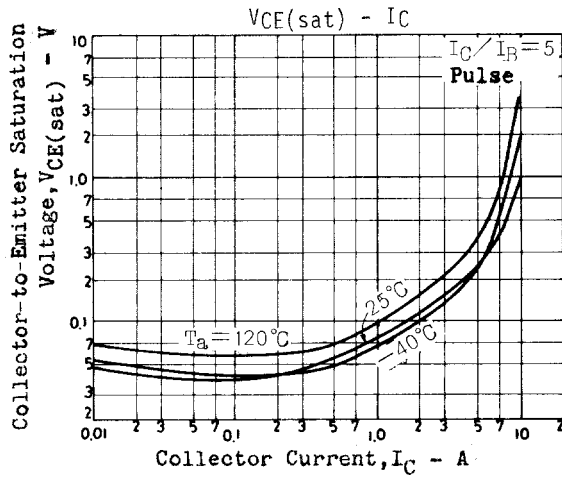
### Switching Time Test Circuit



Unit (resistance :  $\Omega$ , capacitance : F)



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