

**DESCRIPTION** The 2SC2518 is NPN triple diffused transistor designed for switching regulator, DC-DC converter and ultrasonic appliance applications.

- FEATURES**
- High speed, high voltage switching.
  - Low collector saturation voltage.
  - Specified of reverse biased SOA with inductive loads.

### ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature . . . . .  $-55$  to  $+150^{\circ}\text{C}$

Junction Temperature . . . . .  $150^{\circ}\text{C}$  Maximum

Maximum Power Dissipation ( $T_c = 25^{\circ}\text{C}$ )

Total Power Dissipation . . . . . 40 W

Maximum Voltages and Currents ( $T_a = 25^{\circ}\text{C}$ )

$V_{CB0}$  Collector to Base Voltage . . . . . 500 V

$V_{CE0}$  Collector to Emitter Voltage . . . . . 400 V

$V_{EB0}$  Emitter to Base Voltage . . . . . 8.0 V

$I_C(\text{DC})$  Collector Current (DC) . . . . . 5.0 A

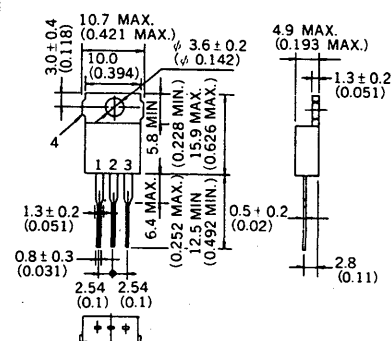
$I_C(\text{pulse})$  Collector Current (pulse)\* . . . . . 10 A

$I_B(\text{DC})$  Base Current (DC) . . . . . 2.5 A

\*  $PW \leq 300 \mu\text{s}$ , Duty Cycle  $\leq 10\%$

### PACKAGE DIMENSIONS

in millimeters (inches)



1. Base (B)
  2. Collector (C)
  3. Emitter (E)
  4. Fin (Collector)
- JEDEC: TO-220AB

### ELECTRICAL CHARACTERISTICS ( $T_a = 25^{\circ}\text{C}$ )

| SYMBOL          | CHARACTERISTIC                          | MIN. | TYP. | MAX. | UNIT          | TEST CONDITIONS                                                                                                                              |
|-----------------|-----------------------------------------|------|------|------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| $t_{on}$        | Turn On Time                            |      |      | 1.0  | $\mu\text{s}$ | $I_C = 2.0 \text{ A}$ , $I_{B1} = -I_{B2} = 0.4 \text{ A}$<br>$R_L = 75 \Omega$ , $V_{CC} = 150 \text{ V}$<br>See Test Circuit.              |
| $t_{stg}$       | Storage Time                            |      |      | 2.5  | $\mu\text{s}$ |                                                                                                                                              |
| $t_f$           | Fall Time                               |      |      | 0.7  | $\mu\text{s}$ |                                                                                                                                              |
| $h_{FE1}$       | DC Current Gain**                       | 20   |      | 80   | —             | $V_{CE} = 5.0 \text{ V}$ , $I_C = 0.5 \text{ A}$                                                                                             |
| $h_{FE2}$       | DC Current Gain**                       | 10   |      |      | —             | $V_{CE} = 5.0 \text{ V}$ , $I_C = 2.0 \text{ A}$                                                                                             |
| $V_{CE(sat)}$   | Collector Saturation Voltage**          |      |      | 1.0  | V             | $I_C = 2.0 \text{ A}$ , $I_B = 0.4 \text{ A}$                                                                                                |
| $V_{BE(sat)}$   | Base Saturation Voltage**               |      |      | 1.5  | V             | $I_C = 2.0 \text{ A}$ , $I_B = 0.4 \text{ A}$                                                                                                |
| $V_{CE0(SUS)}$  | Collector to Emitter Sustaining Voltage | 400  |      |      | V             | $I_C = 2.0 \text{ A}$ , $I_B = 0.4 \text{ A}$ , $L = 1 \text{ mH}$                                                                           |
| $V_{CEX(SUS)1}$ | Collector to Emitter Sustaining Voltage | 450  |      |      | V             | $I_C = 2.0 \text{ A}$ , $I_{B1} = -I_{B2} = 0.4 \text{ A}$ , $T_a = 125^{\circ}\text{C}$ , $L = 180 \mu\text{H}$ , Clamped                   |
| $V_{CEX(SUS)2}$ | Collector to Emitter Sustaining Voltage | 400  |      |      | V             | $I_C = 4.0 \text{ A}$ , $I_{B1} = 0.8 \text{ A}$ , $-I_{B2} = 0.4 \text{ A}$ , $T_a = 125^{\circ}\text{C}$ , $L = 180 \mu\text{H}$ , Clamped |
| $I_{CBO}$       | Collector Cutoff Current                |      |      | 10   | $\mu\text{A}$ | $V_{CB} = 400 \text{ V}$ , $I_E = 0$                                                                                                         |
| $I_{CER}$       | Collector Cutoff Current                |      |      | 1.0  | mA            | $V_{CE} = 400 \text{ V}$ , $R_{BE} = 51 \Omega$ , $T_a = 125^{\circ}\text{C}$                                                                |
| $I_{CEX1}$      | Collector Cutoff Current                |      |      | 10   | $\mu\text{A}$ | $V_{CE} = 400 \text{ V}$ , $V_{BE(OFF)} = -1.5 \text{ V}$                                                                                    |
| $I_{CEX2}$      | Collector Cutoff Current                |      |      | 1.0  | mA            | $V_{CE} = 400 \text{ V}$ , $V_{BE(OFF)} = -1.5 \text{ V}$ , $T_a = 125^{\circ}\text{C}$                                                      |
| $I_{EBO}$       | Emitter Cutoff Current                  |      |      | 10   | $\mu\text{A}$ | $V_{EB} = 5.0 \text{ V}$ , $I_C = 0$                                                                                                         |

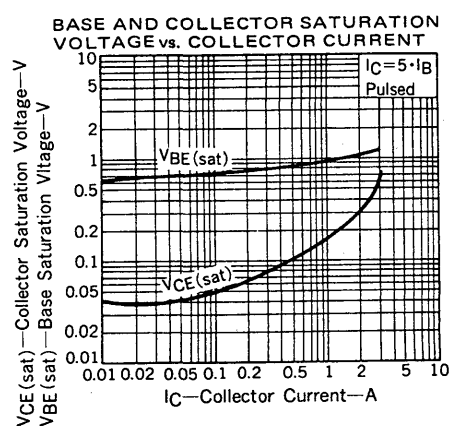
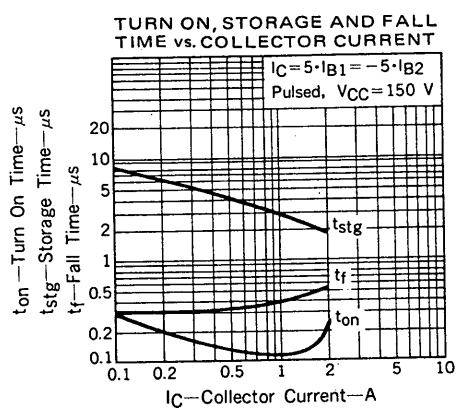
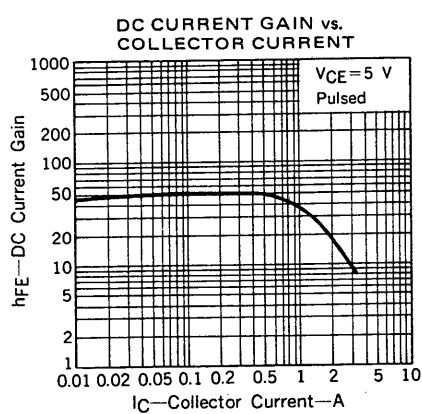
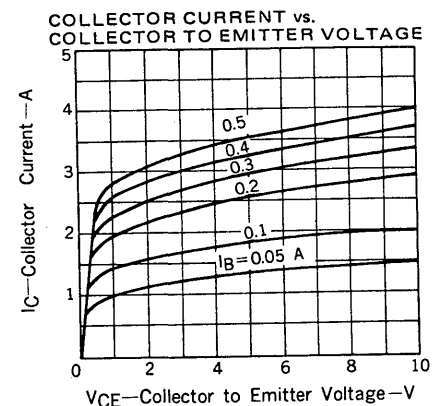
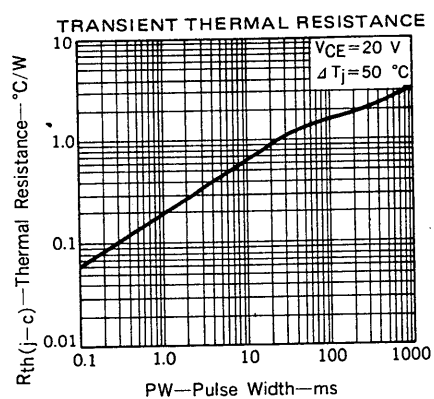
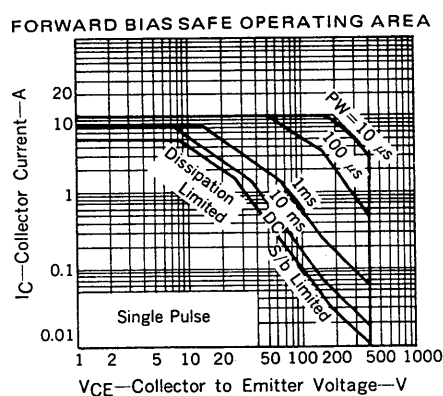
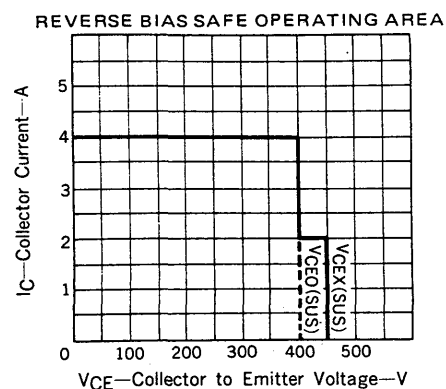
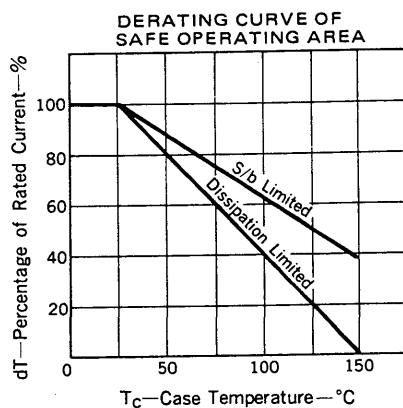
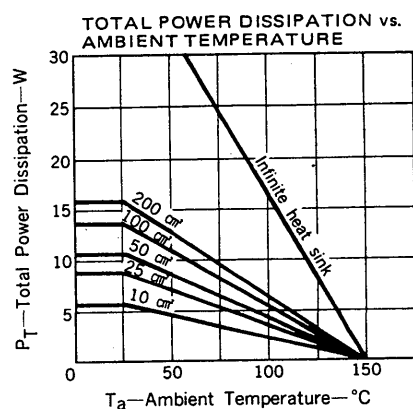
\*\*Pulse Test :  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ /Pulsed

Classification of  $h_{FE1}$

| Rank  | M        | L        | K        |
|-------|----------|----------|----------|
| Range | 20 to 40 | 30 to 60 | 40 to 80 |

Test Conditions :  $V_{CE} = 5.0 \text{ V}$ ,  $I_C = 0.5 \text{ A}$

### TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)



SWITCHING TIME ( $t_{on}$ ,  $t_{stg}$ ,  $t_f$ ) TEST CIRCUIT

