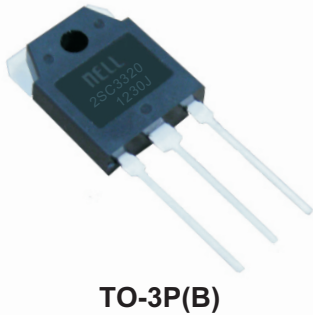


## Silicon NPN triple diffusion planar transistor (High voltage switching transistor) 15A/400V/150W

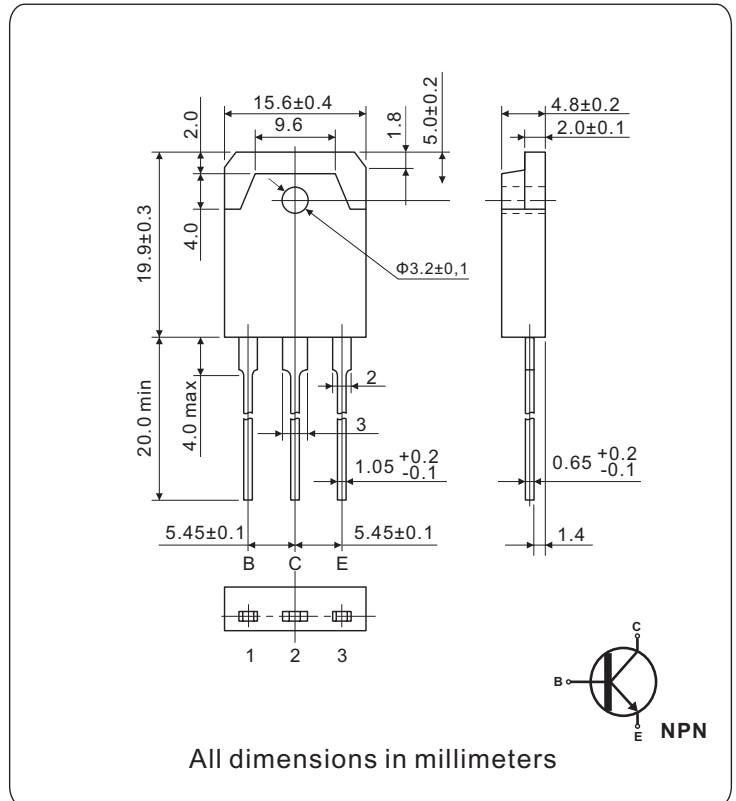


### FEATURES

- High-speed switching
- High collector to base voltage,  $V_{CBO}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- TO-3P package which can be installed to the heat sink with one screw

### APPLICATIONS

- Switching regulator and general purpose
- Ultrasonic generators
- High frequency inverters
- General purpose power amplifiers



### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ )

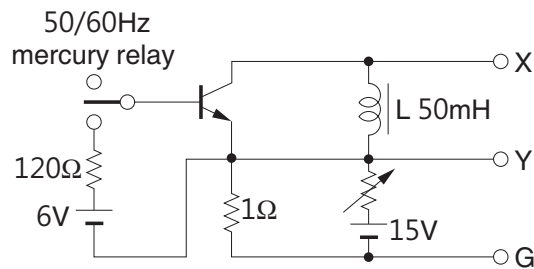
| SYMBOL         | PARAMETER                    |                          | VALUE      | UNIT             |
|----------------|------------------------------|--------------------------|------------|------------------|
| $V_{CBO}$      | Collector to base voltage    |                          | 500        | V                |
| $V_{CEO}$      | Collector to emitter voltage |                          | 400        |                  |
| $V_{CEO(SUS)}$ |                              |                          | 400        |                  |
| $V_{EBO}$      | Emitter to base voltage      |                          | 7          | A                |
| $I_C$          | Collector current            |                          | 15         |                  |
| $I_B$          | Base current                 |                          | 5          | W                |
| $P_C$          | Collector power dissipation  | $T_C = 25^\circ\text{C}$ | 150        |                  |
| $T_j$          | Junction temperature         |                          | 150        |                  |
| $T_{stg}$      | Storage temperature          |                          | -55 to 150 | $^\circ\text{C}$ |

### THERMAL RESISTANCE

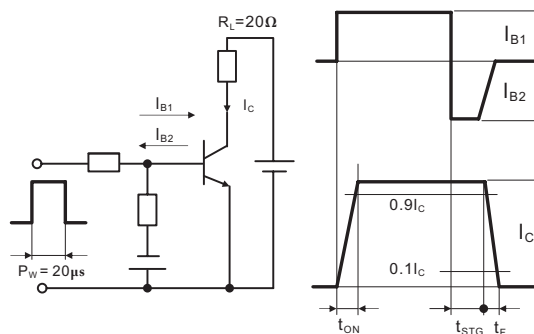
| SYMBOL        | PARAMETER                                   | VALUE | UNIT                      |
|---------------|---|-------|---------------------------|
| $R_{th(j-c)}$ | Thermal resistance, Junction to case (MAX.) | 1.55  | $^\circ\text{C}/\text{W}$ |

| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25°C) |   |   |     |      |      |
|--|---|---|-----|------|------|
| SYMBOL   | PARAMETER                               | CONDITIONS  | MIN | MAX  | UNIT |
| V <sub>CEO</sub>                                   | Collector to emitter voltage            | I <sub>CEO</sub> = 10mA   | 400 |      | V    |
| V <sub>CEO(SUS)</sub> *                            |   | I <sub>C</sub> = 0.2A, L = 50mH   |     |      |      |
| V <sub>CBO</sub>                                   | Collector to base voltage               | I <sub>CBO</sub> = 1mA  | 500 |      |      |
| V <sub>EBO</sub>                                   | Emitter to base voltage                 | I <sub>EBO</sub> = 1mA  | 7   |      |      |
| I <sub>CBO</sub>                                   | Collector cutoff current                | V <sub>CBO</sub> = 500V, I <sub>E</sub> = 0   |     | 1    | mA   |
| I <sub>EBO</sub>                                   | Emitter cutoff current                  | V <sub>EBO</sub> = 7V, I <sub>C</sub> = 0   |     | 1    |      |
| h <sub>FE</sub>                                    | Forward current transfer ratio          | V <sub>CE</sub> = 5V, I <sub>C</sub> = 6A   | 10  |      |      |
| V <sub>CE(sat)</sub>                               | Collector to emitter saturation voltage | I <sub>C</sub> = 6A, I <sub>B</sub> = 1.2A  |     | 1    | V    |
| V <sub>BE(sat)</sub>                               | Base to emitter saturation voltage      | I <sub>C</sub> = 6A, I <sub>B</sub> = 1.2A  |     | 1.5  |      |
| t <sub>on</sub>                                    | Turn-on time                            | I <sub>C</sub> = 7.5A, I <sub>B1</sub> = 1.5A, I <sub>B2</sub> = -3A<br>R <sub>L</sub> = 20Ω, P <sub>W</sub> = 20μs,<br>Duty ≤ 2% |     | 0.5  | μA   |
| t <sub>stg</sub>                                   | Storage time                            |   |     | 1.5  |      |
| t <sub>f</sub>                                     | Fall time                               |   |     | 0.15 |      |

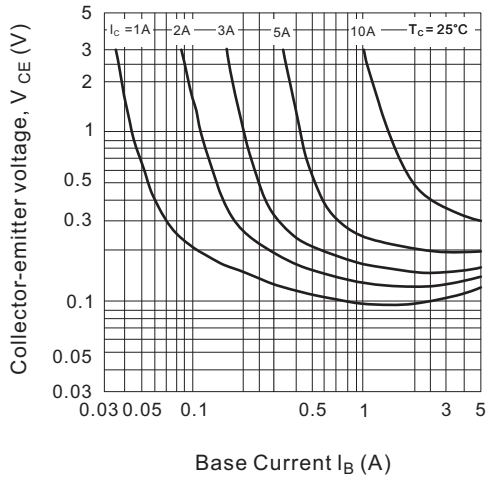
### \*V<sub>CEO(SUS)</sub> Test circuit



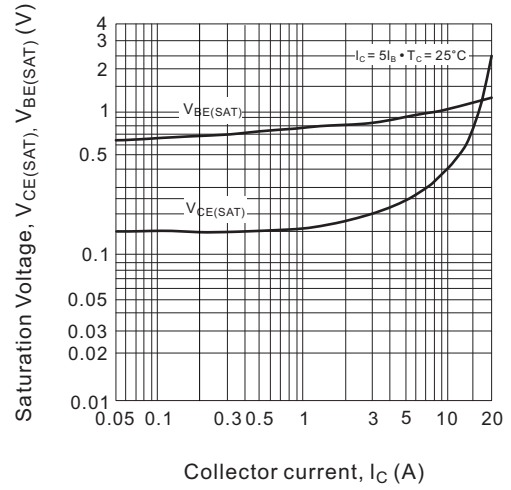
### • Switching time test circuit



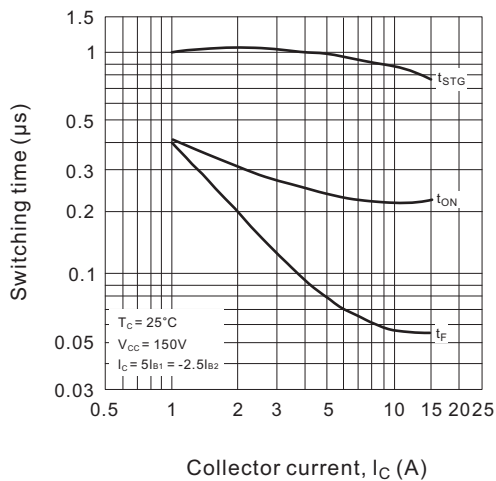
**Fig.1 Collector output characteristics**



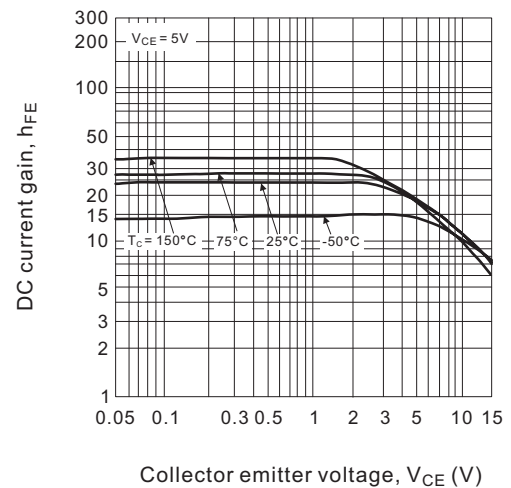
**Fig.2 Base and collector saturation voltage**



**Fig.3 Switching time**



**Fig.4  $H_{FE}$ - $I_C$  Characteristics**



**Fig.5 Safe operation area**

