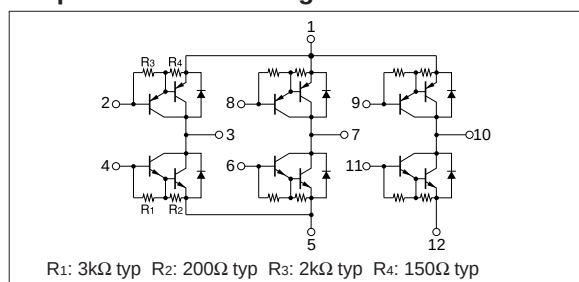


## Absolute maximum ratings

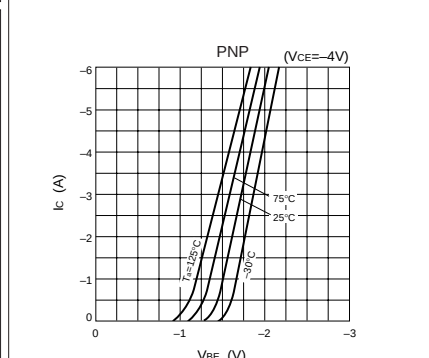
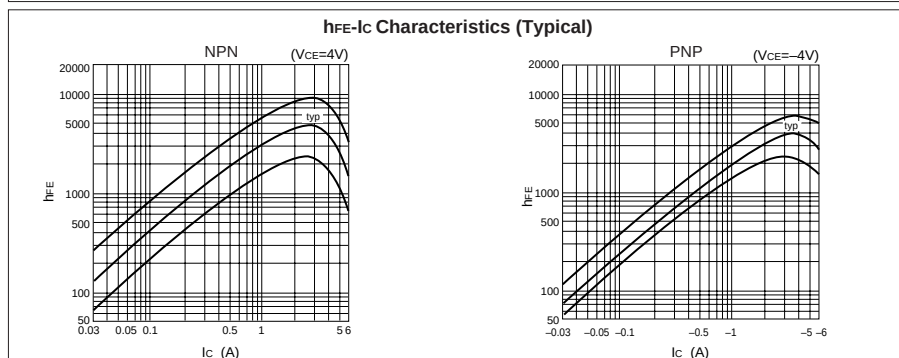
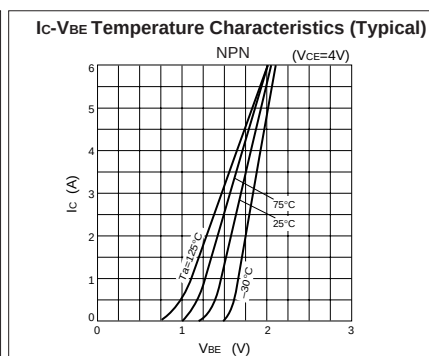
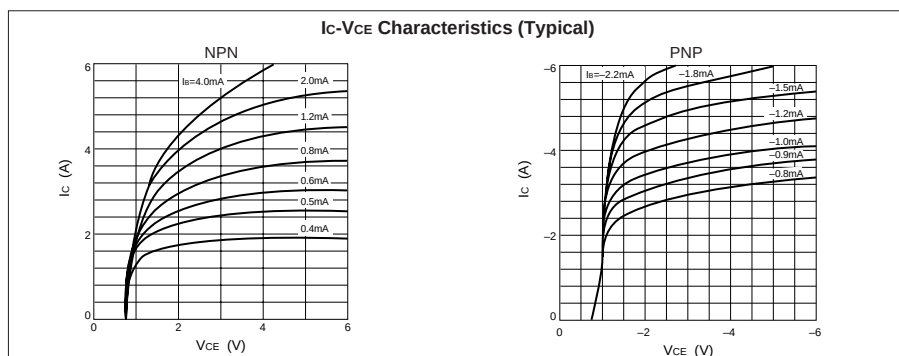
(Ta=25°C)

| Symbol           | Ratings                   |                     | Unit |
|------------------|---------------------------|---------------------|------|
|                  | NPN                       | PNP                 |      |
| V <sub>CBO</sub> | 60                        | −60                 | V    |
| V <sub>CEO</sub> | 60                        | −60                 | V    |
| V <sub>EBO</sub> | 6                         | −6                  | V    |
| I <sub>C</sub>   | 4                         | −4                  | A    |
| I <sub>CP</sub>  | 6 (PW≤1ms, Du≤50%)        | −6 (PW≤1ms, Du≤50%) | A    |
| I <sub>B</sub>   | 0.5                       | −0.5                | A    |
| P <sub>T</sub>   | 4 (T <sub>a</sub> =25°C)  |                     | W    |
|                  | 20 (T <sub>c</sub> =25°C) |                     |      |
| T <sub>j</sub>   | 150                       |                     | °C   |
| T <sub>stg</sub> | −40 to +150               |                     | °C   |
| θ <sub>J-c</sub> | 6.25                      |                     | °C/W |

## Equivalent circuit diagram



## Characteristic curves



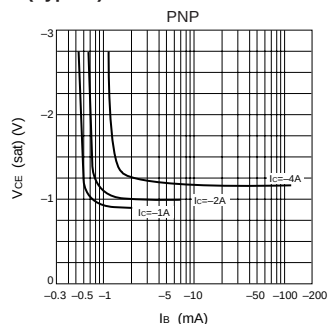
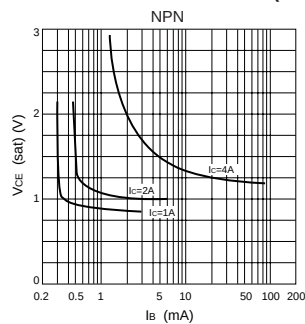
## Electrical characteristics

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

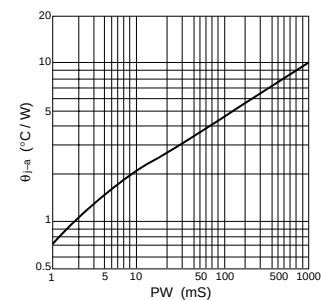
| Symbol        | NPN           |      |       |               |                                                                              | PNP           |      |       |               |                                                                                |
|---------------|---------------|------|-------|---------------|------------------------------------------------------------------------------|---------------|------|-------|---------------|--------------------------------------------------------------------------------|
|               | Specification |      |       | Unit          | Conditions                                                                   | Specification |      |       | Unit          | Conditions                                                                     |
|               | min           | typ  | max   |               |                                                                              | min           | typ  | max   |               |                                                                                |
| $I_{CBO}$     |               |      | 10    | $\mu\text{A}$ | $V_{CB}=60\text{V}$                                                          |               |      | -10   | $\mu\text{A}$ | $V_{CB}=-60\text{V}$                                                           |
| $I_{EBO}$     |               |      | 10    | $\text{mA}$   | $V_{EB}=6\text{V}$                                                           |               |      | -10   | $\text{mA}$   | $V_{EB}=-6\text{V}$                                                            |
| $V_{CEO}$     | 60            |      |       | $\text{V}$    | $I_C=10\text{mA}$                                                            | -60           |      |       | $\text{V}$    | $I_C=-20\text{mA}$                                                             |
| $h_{FE}$      | 2000          | 5000 | 12000 |               | $V_{CE}=4\text{V}, I_C=3\text{A}$                                            | 2000          | 5000 | 12000 |               | $V_{CE}=-4\text{V}, I_C=-3\text{A}$                                            |
| $V_{CE(sat)}$ |               |      | 1.5   | $\text{V}$    | $I_C=3\text{A}, I_B=6\text{mA}$                                              |               |      | -1.5  | $\text{V}$    | $I_C=-3\text{A}, I_B=-6\text{mA}$                                              |
| $V_{BE(sat)}$ |               |      | 2.0   | $\text{V}$    |                                                                              |               |      | -2.0  | $\text{V}$    |                                                                                |
| $V_{FEC}$     |               |      | 1.8   | $\text{V}$    | $I_{FEC}=1\text{A}$                                                          |               |      | -1.8  | $\text{V}$    | $I_{FEC}=-1\text{A}$                                                           |
| $t_{on}$      |               | 1.0  |       | $\mu\text{s}$ | $V_{CC}\div 30\text{V},$<br>$I_C=3\text{A},$<br>$I_{B1}=-I_{B2}=10\text{mA}$ |               | 0.4  |       | $\mu\text{s}$ | $V_{CC}\div 30\text{V},$<br>$I_C=-3\text{A},$<br>$I_{B1}=-I_{B2}=-10\text{mA}$ |
| $t_{stg}$     |               | 4.0  |       | $\mu\text{s}$ |                                                                              |               | 0.8  |       | $\mu\text{s}$ |                                                                                |
| $t_r$         |               | 1.5  |       | $\mu\text{s}$ |                                                                              |               | 0.6  |       | $\mu\text{s}$ |                                                                                |
| $f_T$         |               | 75   |       | $\text{MHz}$  | $V_{CE}=12\text{V}, I_E=-0.1\text{A}$                                        |               | 200  |       | $\text{MHz}$  | $V_{CE}=-12\text{V}, I_E=0.2\text{A}$                                          |
| $C_{ob}$      |               | 50   |       | $\text{pF}$   | $V_{CB}=10\text{V}, f=1\text{MHz}$                                           |               | 75   |       | $\text{pF}$   | $V_{CB}=-10\text{V}, f=1\text{MHz}$                                            |

## Characteristic curves

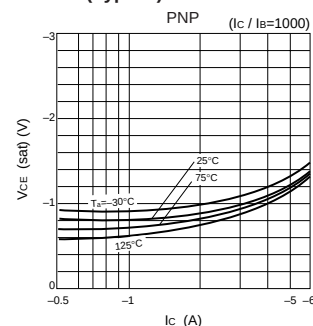
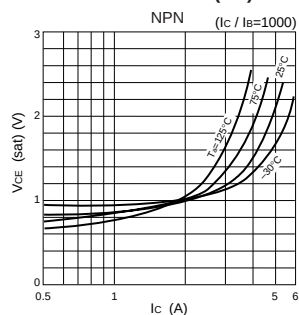
$V_{CE(sat)}-I_B$  Characteristics (Typical)



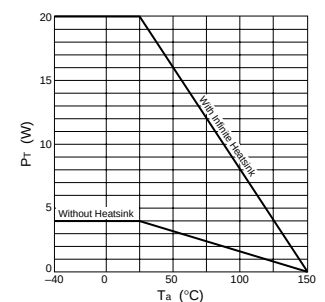
$\theta_{JA}-PW$  Characteristics



$V_{CE(sat)}-I_C$  Temperature Characteristics (Typical)



$P_T-T_a$  Characteristics



Safe Operating Area (SOA)

