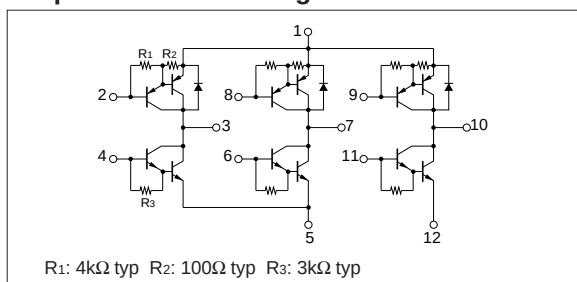


#### Absolute maximum ratings

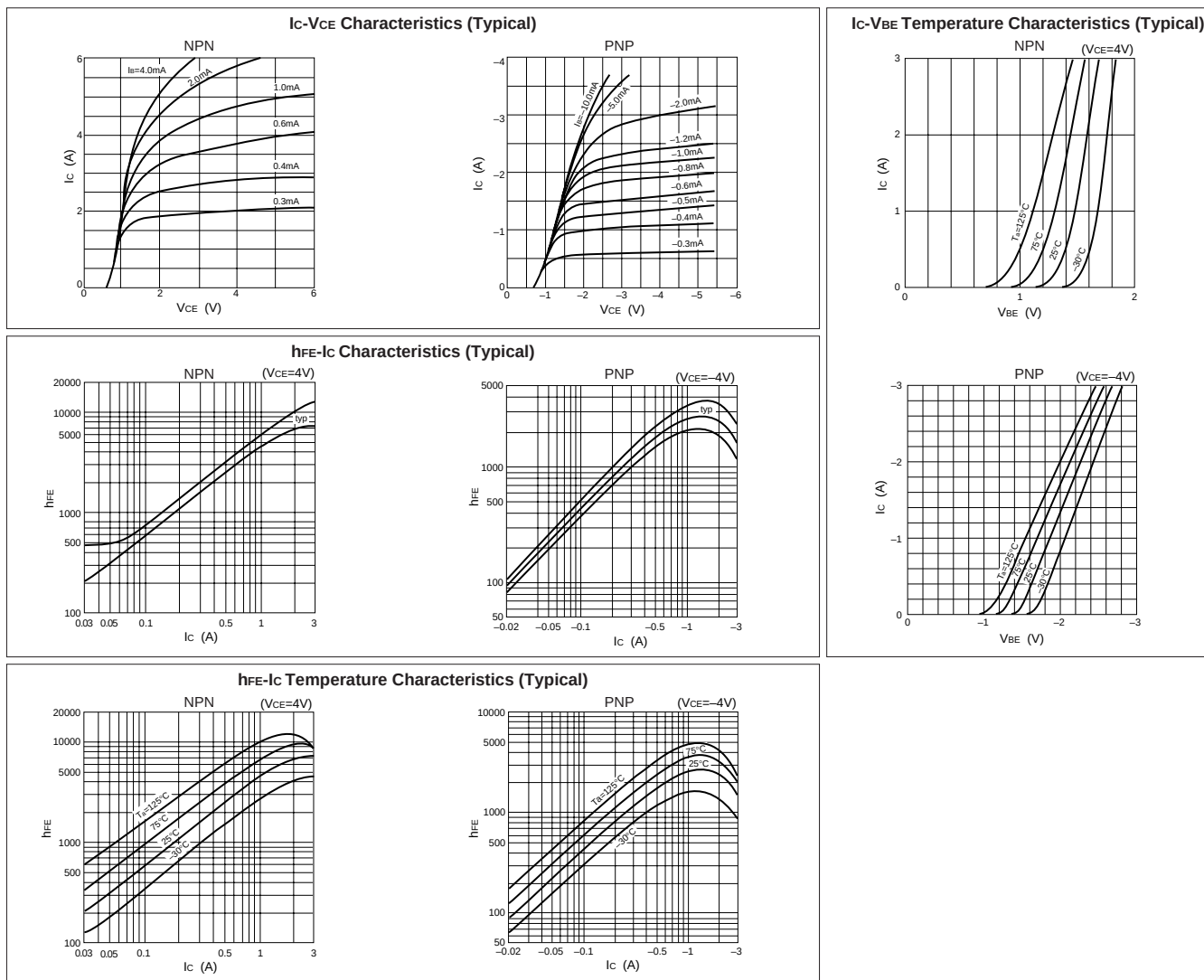
(Ta=25°C)

| 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>   | 2                         | −2                  | A    |
| I <sub>CP</sub>  | 3 (PW≤1ms, Du≤50%)        | −3 (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    | $\mu\text{A}$ | $V_{EB}=6\text{V}$                                                          |               |      | -5    | $\text{mA}$   | $V_{EB}=-6\text{V}$                                                           |
| $V_{CEO}$     | 60            |      |       | $\text{V}$    | $I_C=10\text{mA}$                                                           | -60           |      |       | $\text{V}$    | $I_C=-10\text{mA}$                                                            |
| $h_{FE}$      | 1500          | 4000 | 10000 |               | $V_{CE}=4\text{V}, I_C=1\text{A}$                                           | 2000          | 4000 | 10000 |               | $V_{CE}=-4\text{V}, I_C=-1\text{A}$                                           |
| $V_{CE(sat)}$ |               |      | 1.5   | $\text{V}$    | $I_C=1\text{A}, I_B=2\text{mA}$                                             |               |      | -1.5  | $\text{V}$    | $I_C=-1\text{A}, I_B=-2\text{mA}$                                             |
| $V_{BE(sat)}$ |               |      | 2.2   | $\text{V}$    |                                                                             |               |      | -2.2  | $\text{V}$    |                                                                               |
| $V_{FEC}$     |               | —    |       | $\text{V}$    |                                                                             |               |      | -1.8  | $\text{V}$    | $I_{FEC}=-1\text{A}$                                                          |
| $t_{rr}$      |               | —    |       | $\mu\text{s}$ | $V_{CC}\div 30\text{V},$<br>$I_C=1\text{A},$<br>$I_{B1}=-I_{B2}=2\text{mA}$ |               | 3.0  |       | $\mu\text{s}$ | $I_{FEC}=\pm 100\text{mA}$                                                    |
| $t_{on}$      |               | 0.7  |       | $\mu\text{s}$ |                                                                             |               | 0.4  |       | $\mu\text{s}$ | $V_{CC}\div 30\text{V},$<br>$I_C=-1\text{A},$<br>$I_{B1}=-I_{B2}=-2\text{mA}$ |
| $t_{stg}$     |               | 5.0  |       | $\mu\text{s}$ |                                                                             |               | 1.0  |       | $\mu\text{s}$ |                                                                               |
| $t_f$         |               | 3.0  |       | $\mu\text{s}$ |                                                                             |               | 0.4  |       | $\mu\text{s}$ |                                                                               |
| $f_T$         |               | 20   |       | $\text{MHz}$  | $V_{CE}=12\text{V}, I_E=-1\text{A}$                                         |               | 100  |       | $\text{MHz}$  | $V_{CE}=-12\text{V}, I_E=0.1\text{A}$                                         |
| $C_{ob}$      |               | 45   |       | $\text{pF}$   | $V_{CB}=10\text{V}, f=1\text{MHz}$                                          |               | 30   |       | $\text{pF}$   | $V_{CB}=-10\text{V}, f=1\text{MHz}$                                           |

## Characteristic curves

