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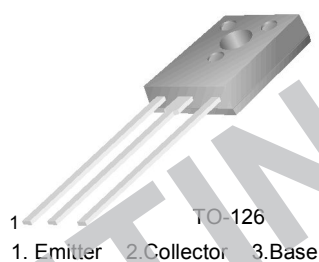
May 2026

# KSE13003

## NPN Silicon Transistor

### High Voltage Switch Mode Applications

- High Voltage Capability
- High Speed Switching
- Suitable for Switching Regulator and Motor Control



### Absolute Maximum Ratings\* $T_C = 25^\circ\text{C}$ unless otherwise noted (notes\_1)

| Symbol    | Parameter                                          | Value     | Units            |
|-----------|----------------------------------------------------|-----------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                             | 700       | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                          | 400       | V                |
| $V_{EBO}$ | Emitter-Base Voltage                               | 9         | V                |
| $I_C$     | Collector Current (DC)                             | 1.5       | A                |
| $I_{CP}$  | Collector Current (Pulse)                          | 3         | A                |
| $I_B$     | Base Current                                       | 0.75      | A                |
| $P_C$     | Collector Dissipation ( $T_C = 25^\circ\text{C}$ ) | 20        | W                |
| $T_J$     | Junction Temperature                               | 150       | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature Range                          | -65 ~ 150 | $^\circ\text{C}$ |

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES\_1:

1) These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .

2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### $h_{FE}$ Classification

| Classification | H1     | H2      | H3      |
|----------------|--------|---------|---------|
| $h_{FE}^*$     | 9 ~ 16 | 14 ~ 21 | 19 ~ 26 |

\* Test on  $V_{CE} = 2V$ ,  $I_C = 0.5A$ .

**Electrical Characteristics**  $T_C = 25^\circ\text{C}$  unless otherwise noted

| Symbol        | Parameter                             | Conditions                                                                                                                | Min.   | Typ. | Max           | Units         |
|---------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------|------|---------------|---------------|
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage   | $I_C = 5\text{mA}, I_B = 0$                                                                                               | 400    |      |               | V             |
| $I_{EBO}$     | Emitter Cut-off Current               | $V_{EB} = 9\text{V}, I_C = 0$                                                                                             |        |      | 10            | $\mu\text{A}$ |
| $h_{FE}$      | *DC Current Gain                      | $V_{CE} = 2\text{V}, I_C = 0.5\text{A}$<br>$V_{CE} = 2\text{V}, I_C = 1\text{A}$                                          | 8<br>5 |      | 40            |               |
| $V_{CE(sat)}$ | *Collector Emitter Saturation Voltage | $I_C = 0.5\text{A}, I_B = 0.1\text{A}$<br>$I_C = 1\text{A}, I_B = 0.25\text{A}$<br>$I_C = 1.5\text{A}, I_B = 0.5\text{A}$ |        |      | 0.5<br>1<br>3 | V<br>V<br>V   |
| $V_{BE(sat)}$ | *Base Emitter Saturation Voltage      | $I_C = 0.5\text{A}, I_B = 0.1\text{A}$<br>$I_C = 1\text{A}, I_B = 0.25\text{A}$                                           |        |      | 1<br>1.2      | V<br>V        |
| $C_{ob}$      | Output Capacitance                    | $V_{CB} = 10\text{V}, f = 0.1\text{MHz}$                                                                                  |        | 21   |               | pF            |
| $f_T$         | Current Gain Bandwidth Product        | $V_{CE} = 10\text{V}, I_C = 0.1\text{A}$                                                                                  | 4      |      |               | MHz           |
| $t_{ON}$      | Turn On Time                          | $V_{CC} = 125\text{V}, I_C = 1\text{A}$                                                                                   |        |      | 1.1           | ms            |
| $t_{STG}$     | Storage Time                          | $I_{B1} = 0.2\text{A}, I_{B2} = -0.2\text{A}$<br>$R_L = 125\Omega$                                                        |        |      | 4.0           | ms            |
| $t_F$         | Fall Time                             |                                                                                                                           |        |      | 0.7           | ms            |

\* Pulse Test: Pulse Width=5ms, Duty Cycle≤10%

**Package Marking and Ordering Information**

| Device Item (notes_2) | Device Marking | Package | Packing Method | Remarks |
|-----------------------|----------------|---------|----------------|---------|
| KSE13003H1ASTU        | 1 E13003       | TO-126  | TUBE           |         |
| KSE13003H2ASTU        | 2 E13003       | TO-126  | TUBE           |         |
| KSE13003H3ASTU        | 3 E13003       | TO-126  | TUBE           |         |

Notes\_2 :

- 1) The Affix "-H1/-H2/-H3" means the  $h_{FE}$  classification.
- 2) The Suffix "-STU" means the TO126 short lead package and the Tube packing method, which can be on fairchildsemi website at <http://www.fairchildsemi.com>

## Typical Performance Characteristics

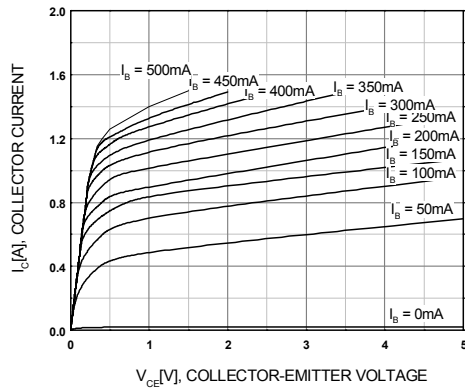


Figure 1. Static Characteristic

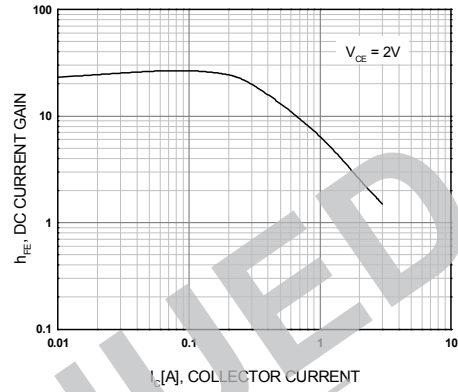


Figure 2. DC current Gain

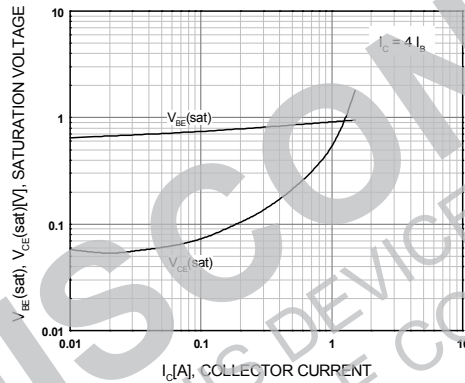


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

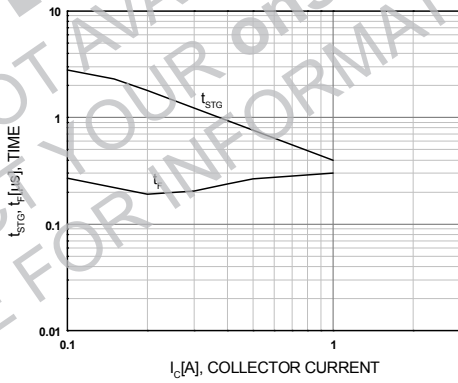


Figure 4. Switching Time

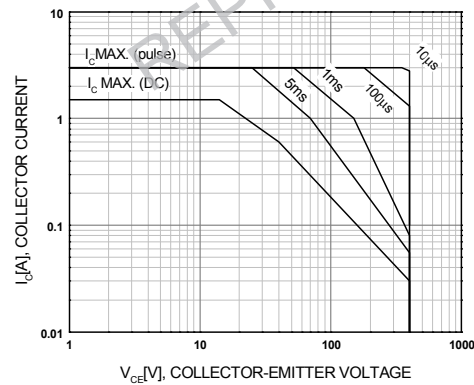


Figure 5. Safe Operating Area

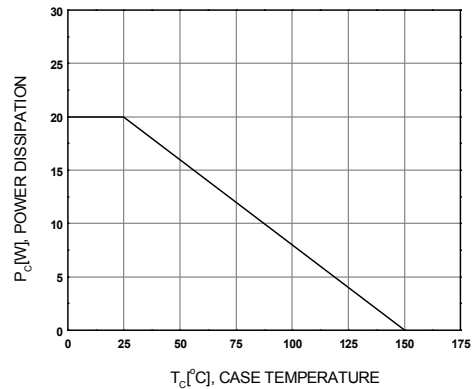


Figure 6. Power Derating



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|                                      |                                              | <b>SYSTEM GENERAL</b>                        |                                  |

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