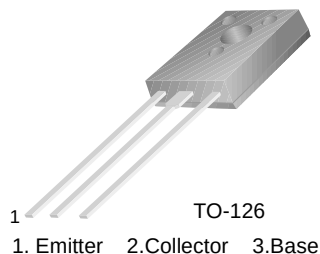


# KSE5020

KSE5020

## Feature

- High Voltage, High Quality High Speed Switching :  $t_F=0.1\mu s$
- WIDE SOA



## NPN Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

| Symbol    | Parameter                                  | Value      | Units      |
|-----------|--------------------------------------------|------------|------------|
| $V_{CBO}$ | Collector-Base Voltage                     | 800        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage                  | 500        | V          |
| $V_{EBO}$ | Emitter-Base Voltage                       | 7          | V          |
| $I_C$     | Collector Current (DC)                     | 3          | A          |
| $I_{CP}$  | Collector Current (Pulse)                  | 6          | A          |
| $I_B$     | Base Current (DC)                          | 1          | A          |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ C$ ) | 30         | W          |
| $T_J$     | Junction Temperature                       | 150        | $^\circ C$ |
| $T_{STG}$ | Storage Temperature                        | - 55 ~ 150 | $^\circ C$ |

### Electrical Characteristics $T_C=25^\circ C$ unless otherwise noted

| Symbol                 | Parameter                            | Test Condition                                                            | Min.    | Typ. | Max. | Units   |
|------------------------|--------------------------------------|---------------------------------------------------------------------------|---------|------|------|---------|
| $BV_{CBO}$             | Collector-Base Breakdown Voltage     | $I_C = 1mA, I_E = 0$                                                      | 800     |      |      | V       |
| $BV_{CEO}$             | Collector-Emitter Breakdown Voltage  | $I_C = 5mA, R_{BE} = \infty$                                              | 500     |      |      | V       |
| $BV_{EBO}$             | Emitter-Base Breakdown Voltage       | $I_E = 1mA, I_C = 0$                                                      | 7       |      |      | V       |
| $V_{CEX(sus)}$         | Collector-Emitter Sustaining Voltage | $I_C = 1.5A, I_{B1} = -I_{B2} = 0.6A$<br>$L = 2mH, \text{Clamped}$        | 500     |      |      | V       |
| $I_{CBO}$              | Collector Cut-off Current            | $V_{CB} = 500V, I_E = 0$                                                  |         |      | 10   | $\mu A$ |
| $I_{EBO}$              | Emitter Cut-off Current              | $V_{EB} = 5V, I_C = 0$                                                    |         |      | 10   | $\mu A$ |
| $h_{FE1}$<br>$h_{FE2}$ | DC Current Gain                      | $V_{CE} = 5V, I_C = 0.3A$<br>$V_{CE} = 5V, I_C = 1.5A$                    | 15<br>8 |      | 50   |         |
| $V_{CE(sat)}$          | Collector-Emitter Saturation Voltage | $I_C = 1.5A, I_B = 0.3A$                                                  |         |      | 1    | V       |
| $V_{BE(sat)}$          | Base-Emitter Saturation Voltage      | $I_C = 1.5A, I_B = 0.3A$                                                  |         |      | 1.5  | V       |
| $C_{ob}$               | Output Capacitance                   | $V_{CB} = 10V, f = 1MHz$                                                  |         | 50   |      | pF      |
| $f_T$                  | Current Gain Bandwidth Product       | $V_{CE} = 10V, I_C = 0.3A$                                                |         | 18   |      | MHz     |
| $t_{ON}$               | Turn ON Time                         | $V_{CC} = 200V$<br>$5I_{B1} = -2.5I_{B2} = I_C = 2A$<br>$R_L = 100\Omega$ |         |      | 0.5  | $\mu s$ |
| $t_S$                  | Storage Time                         |                                                                           |         |      | 3    | $\mu s$ |
| $t_F$                  | Fall Time                            |                                                                           |         |      | 0.3  | $\mu s$ |

## $h_{FE}$ Classification

| Classification | R       | O       | Y       |
|----------------|---------|---------|---------|
| $h_{FE1}$      | 15 ~ 30 | 20 ~ 40 | 30 ~ 50 |

## Typical Characteristics

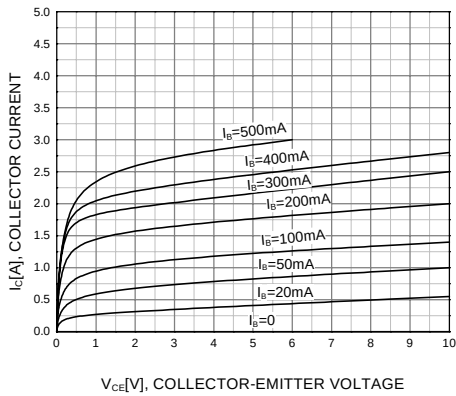


Figure 1. Static Characteristic

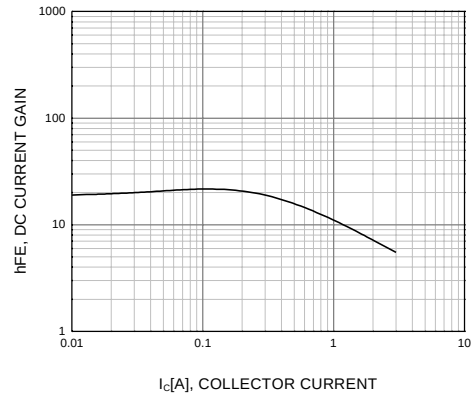


Figure 2. DC current Gain

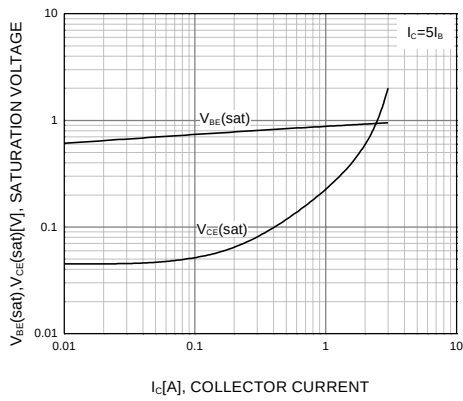


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

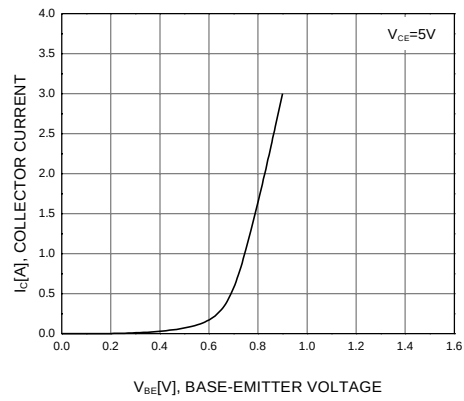


Figure 4. Base-Emitter On Voltage

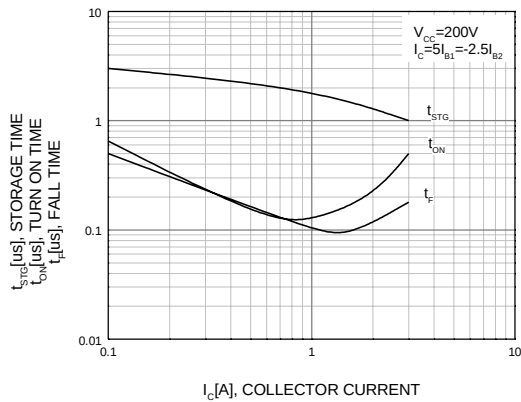
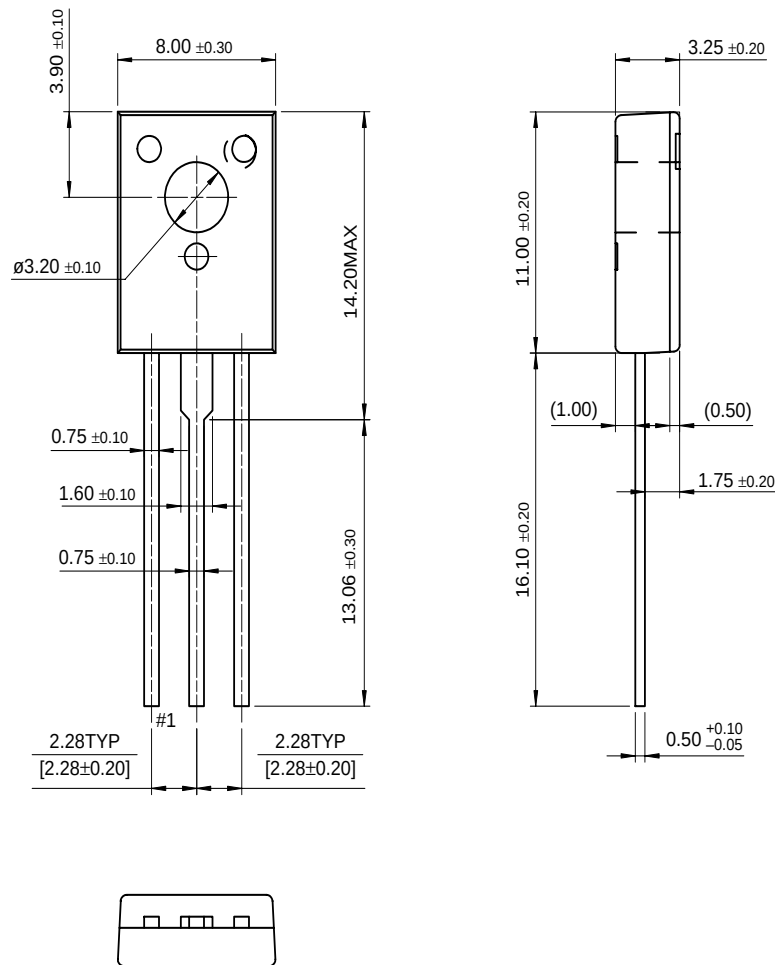


Figure 5. Turn On Time

# Package Dimensions

KSE5020

## TO-126



Dimensions in Millimeters

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| DOME™                | HiSeC™              | QFET™               | SyncFET™        |
| EcoSPARK™            | ISOPLANAR™          | QS™                 | TruTranslation™ |
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