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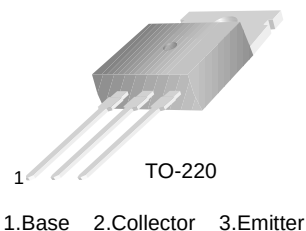
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# KSB601

## Low Frequency Power Amplifier

- Medium Speed Switching Industrial Use
- Complement to KSD560

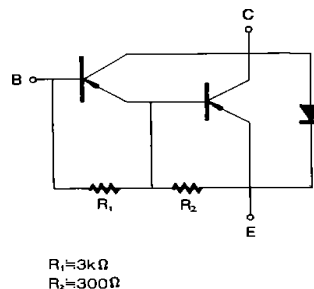


## PNP Epitaxial Silicon Darlington Transistor

**Absolute Maximum Ratings**  $T_C=25^{\circ}\text{C}$  unless otherwise noted

| Symbol    | Parameter                                          | Value      | Units              |
|-----------|----------------------------------------------------|------------|--------------------|
| $V_{CBO}$ | Collector-Base Voltage                             | - 100      | V                  |
| $V_{CEO}$ | Collector-Emitter Voltage                          | - 100      | V                  |
| $V_{EBO}$ | Emitter-Base Voltage                               | - 7        | V                  |
| $I_C$     | Collector Current (DC)                             | - 5        | A                  |
| $I_{CP}$  | *Collector Current (Pulse)                         | - 8        | A                  |
| $I_B$     | Base Current                                       | - 0.5      | A                  |
| $P_C$     | Collector Dissipation ( $T_a=25^{\circ}\text{C}$ ) | 1.5        | W                  |
| $P_C$     | Collector Dissipation ( $T_C=25^{\circ}\text{C}$ ) | 30         | W                  |
| $T_J$     | Junction Temperature                               | 150        | $^{\circ}\text{C}$ |
| $T_{STG}$ | Storage Temperature                                | - 55 ~ 150 | $^{\circ}\text{C}$ |

\*  $PW \leq 10\text{ms}$ , Duty Cycle  $\leq 50\%$



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

| Symbol                 | Parameter                              | Test Condition                                                                              | Min.        | Typ. | Max.  | Units   |
|------------------------|----------------------------------------|---------------------------------------------------------------------------------------------|-------------|------|-------|---------|
| $V_{CEO(sus)}$         | Collector-Emitter Sustaining Voltage   | $I_C = -3A, I_{B1} = -3mA,$<br>$L = 1mH$                                                    | -<br>100    |      |       | V       |
| $V_{CEX(sus)1}$        | Collector-Emitter Sustaining Voltage   | $I_C = -3A, I_{B1} = -I_{B2} = -3mA$<br>$V_{BE(off)} = 5V, L = 180\mu H$<br>Clamped         | -<br>100    |      |       | V       |
| $V_{CEX(sus)2}$        | Collector-Emitter Sustaining Voltage   | $I_C = -6A, I_{B1} = -12mA$<br>$I_{B2} = 3mA, V_{BE(off)} = 5V$<br>$L = 180\mu H$ , Clamped | -<br>100    |      |       | V       |
| $I_{CBO}$              | Collector Cut-off Current              | $V_{CB} = -100V, I_E = 0$                                                                   |             |      | - 10  | $\mu A$ |
| $I_{CER}$              | Collector Cut-off Current              | $V_{CE} = -100V, R_{BE} = 51\Omega$<br>$T_C = 125^{\circ}\text{C}$                          |             |      | - 1   | mA      |
| $I_{CEX1}$             | Collector Cut-off Current              | $V_{CE} = -100V, V_{BE(off)} = 1.5V$                                                        |             |      | - 10  | $\mu A$ |
| $I_{CEX2}$             | Collector Cut-off Current              | $V_{CE} = -100V, V_{BE(off)} = 1.5V$<br>$T_C = 125^{\circ}\text{C}$                         |             |      | - 1   | mA      |
| $I_{EBO}$              | Emitter Cut-off Current                | $V_{EB} = -5V, I_C = 0$                                                                     |             |      | - 3   | mA      |
| $h_{FE1}$<br>$h_{FE2}$ | *DC Current Gain                       | $V_{CE} = -2V, I_C = -3A$<br>$V_{CE} = -2V, I_C = -5A$                                      | 2000<br>500 |      | 15000 |         |
| $V_{CE(sat)}$          | * Collector-Emitter Saturation Voltage | $I_C = -3A, I_B = -3mA$                                                                     |             |      | - 1.5 | V       |
| $V_{BE(sat)}$          | * Base-Emitter Saturation Voltage      | $I_C = -3A, I_B = -3mA$                                                                     |             |      | - 2   | V       |
| $t_{ON}$               | Turn ON Time                           | $V_{CC} = -50V, I_C = -3A$<br>$I_{B1} = -I_{B2} = -3mA$<br>$R_L = 17\Omega$                 |             | 0.5  |       | $\mu s$ |
| $t_S$                  | Storage                                |                                                                                             |             | 1    |       | $\mu s$ |
| $t_F$                  | Fall time                              |                                                                                             |             | 1    |       | $\mu s$ |

\* Pulse Test:  $PW \leq 350\mu s$ , Duty Cycle  $\leq 2\%$  **$h_{FE}$  Classification**

| Classification | R           | O           | Y            |
|----------------|-------------|-------------|--------------|
| $h_{FE1}$      | 2000 ~ 5000 | 3000 ~ 7000 | 5000 ~ 15000 |

## Typical Characteristics

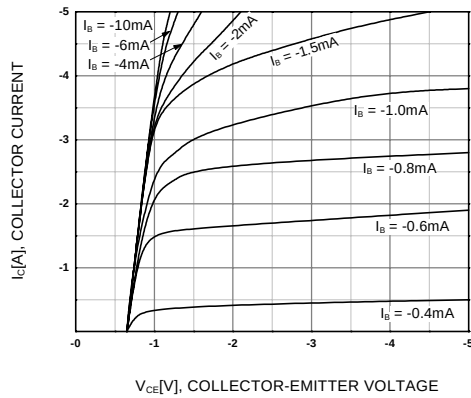


Figure 1. Static Characteristic

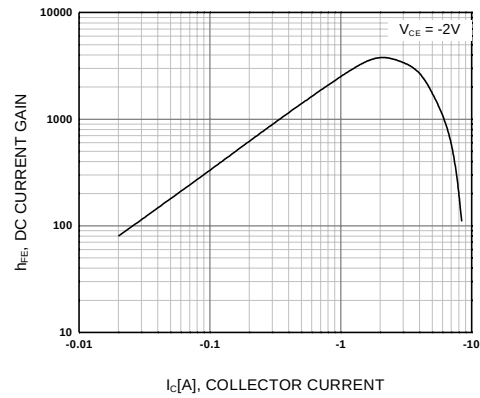


Figure 2. DC current Gain

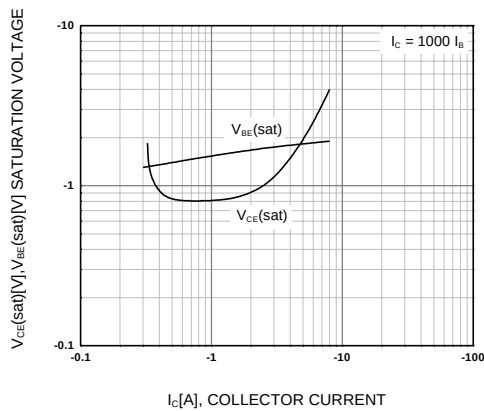


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

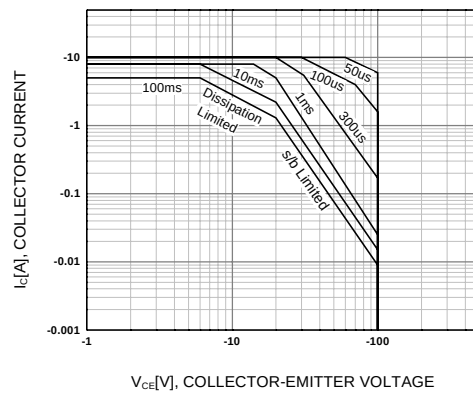


Figure 4. Safe Operating Area

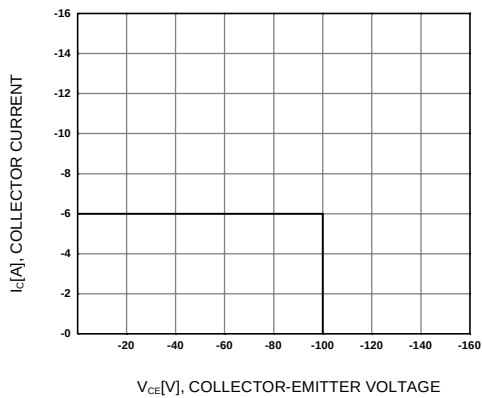


Figure 5. Reverse Bias Safe Operating Areas

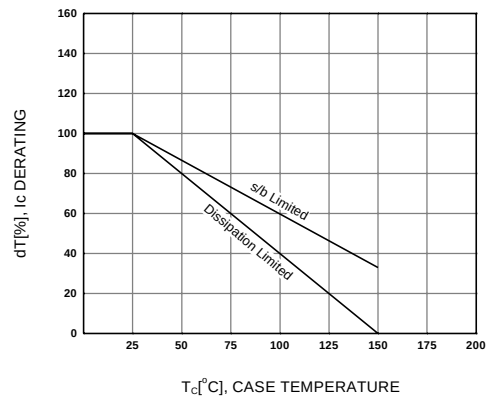
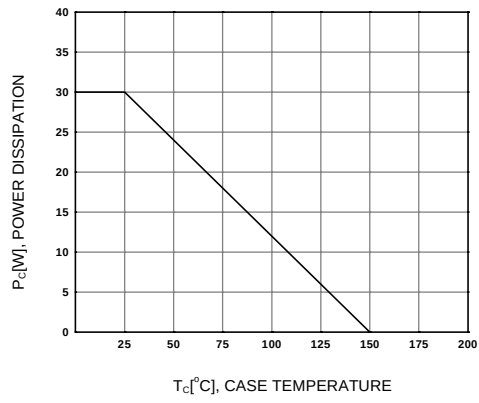


Figure 6. Derating Curve of Safe Operating Areas

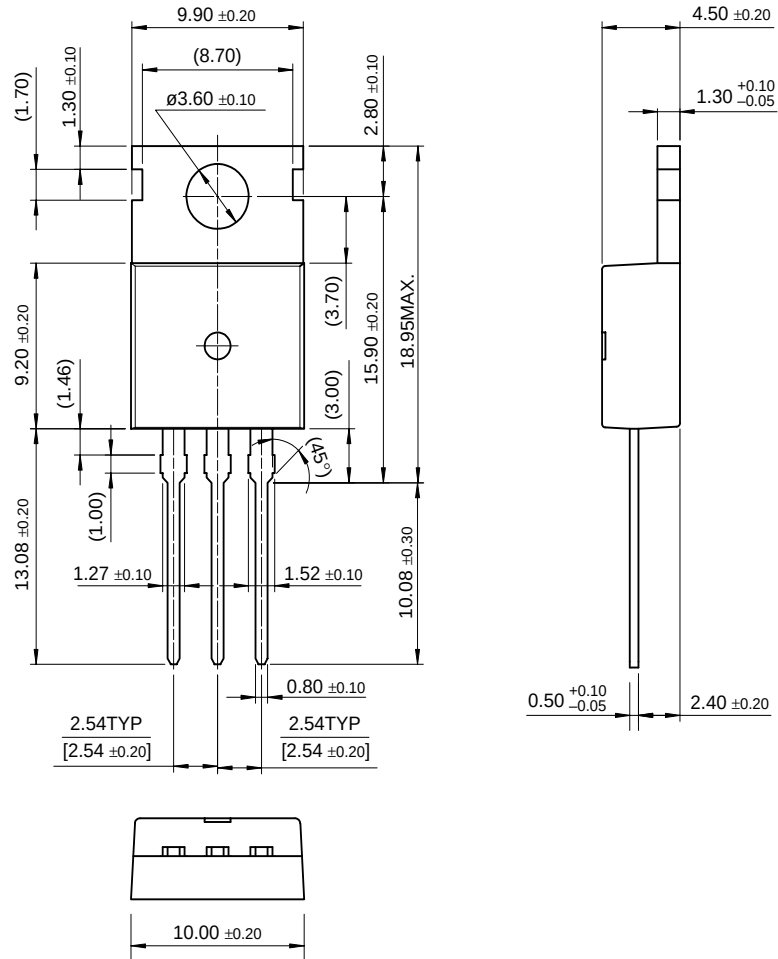
## Typical Characteristics (Continued)



**Figure 7. Power Derating**

# Package Dimensions

## TO-220



Dimensions in Millimeters

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