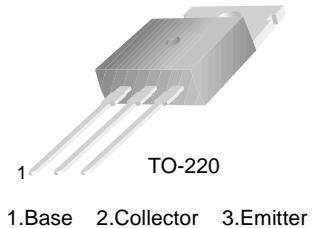


**Low Frequency Power Amplifier**

- Medium Speed Switching Industrial Use
- Complement to KSD560

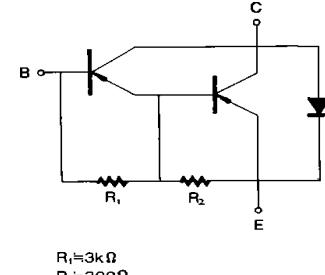


**PNP Epitaxial Silicon Darlington Transistor**

**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≤10ms, Duty Cycle≤50%



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

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

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

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

## Typical Characteristics

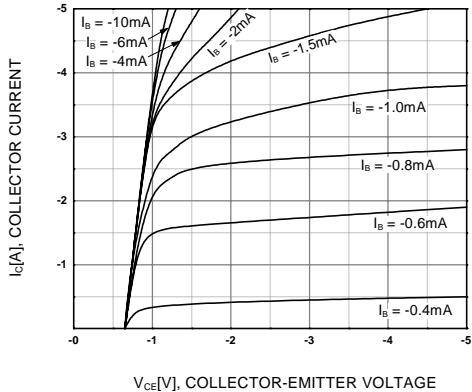


Figure 1. Static Characteristic

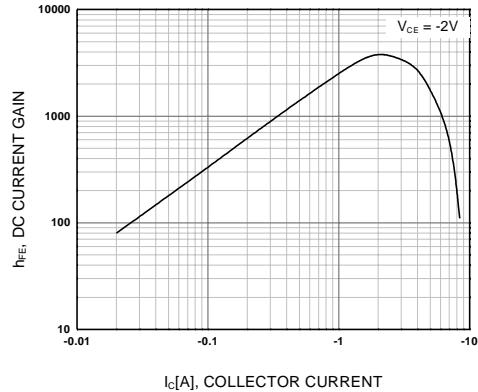


Figure 2. DC current Gain

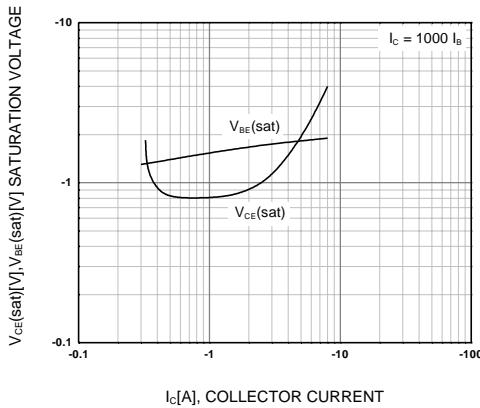


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

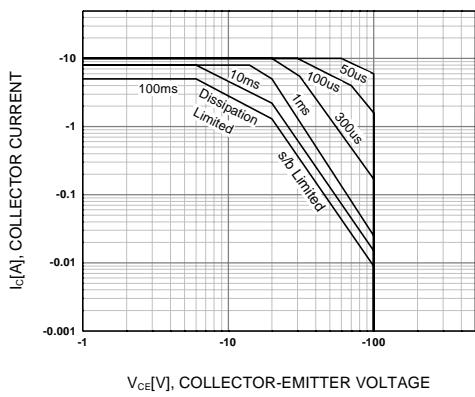


Figure 4. Safe Operating Area

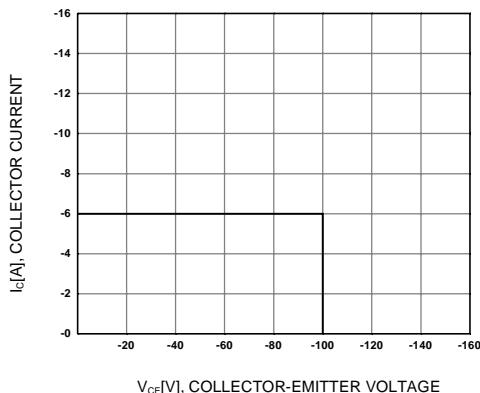


Figure 5. Reverse Bias Safe Operating Areas

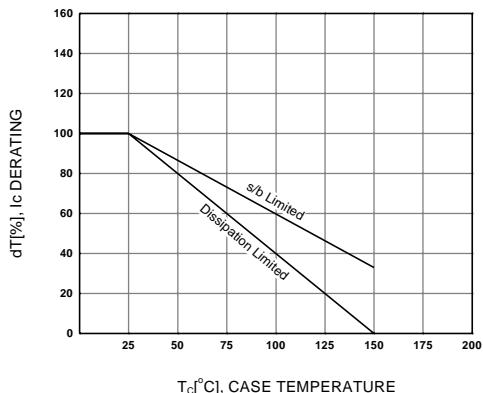
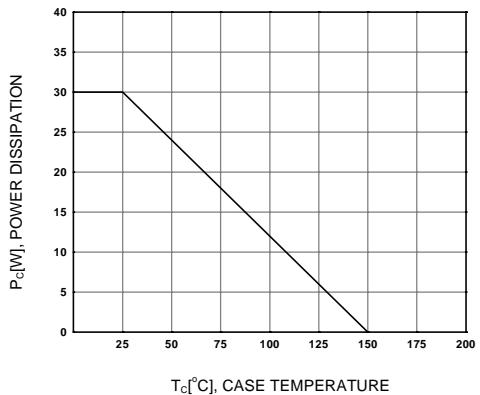


Figure 6. Derating Curve of Safe Operating Areas

## Typical Characteristics (Continued)

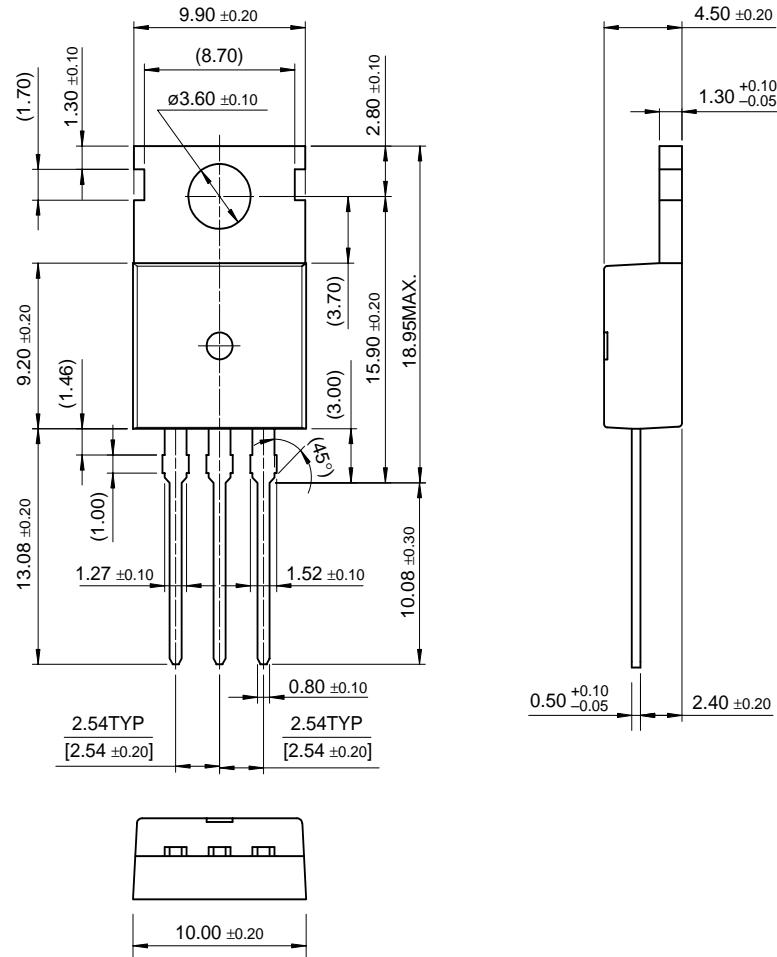


**Figure 7. Power Derating**

## Package Demensions

KSB601

### TO-220



Dimensions in Millimeters

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