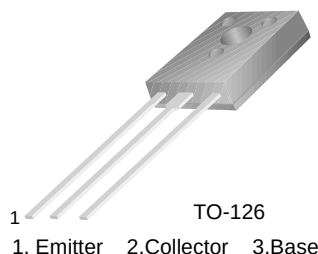


# KSD985/986

## Low Frequency Power Amplifier

- Low Speed Switching Industrial Use

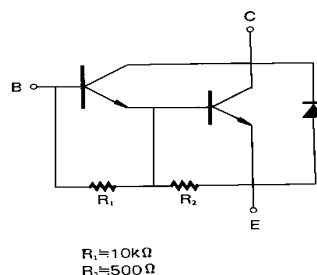


## NPN Epitaxial Silicon Darlington Transistor

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

| Symbol    | Parameter                                        | Value                | Units            |
|-----------|--------------------------------------------------|----------------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | 150                  | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                        | : KSD985<br>: KSD986 | V                |
|           |                                                  | 60                   | V                |
|           |                                                  | 80                   | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 8.0                  | V                |
| $I_C$     | Collector Current (DC)                           | 1.5                  | A                |
| $I_{CP}$  | *Collector Current (Pulse)                       | 3.0                  | A                |
| $I_B$     | Base Current                                     | 0.15                 | A                |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1.0                  | W                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 10                   | W                |
| $T_J$     | Junction Temperature                             | 150                  | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 55 ~ 150           | $^\circ\text{C}$ |

\*  $PW \leq 300\mu\text{s}$ , Duty Cycle 10%



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

| Symbol                   | Parameter                             | Test Condition                                                                                                                                            | Min.         | Typ. | Max.      | Units               |
|--------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|-----------|---------------------|
| $I_{CBO}$                | Collector Cut-off Current             | $V_{CB} = 60\text{V}$ , $I_E = 0$                                                                                                                         |              |      | 10        | $\mu\text{A}$       |
| $I_{CER}$                | Collector Cut-off Current             | $V_{CE} = 60\text{V}$ , $R_{BE} = 51\Omega$<br>@ $T_C = 125^\circ\text{C}$                                                                                |              |      | 1.0       | mA                  |
| $I_{CEX1}$<br>$I_{CEX2}$ | Collector Cut-off Current             | $V_{CE} = 60\text{V}$ , $V_{BE}(\text{off}) = -1.5\text{A}$<br>$V_{CE} = 60\text{V}$ , $V_{BE}(\text{off}) = -1.5\text{A}$<br>@ $T_C = 125^\circ\text{C}$ |              |      | 10<br>1.0 | $\mu\text{A}$<br>mA |
| $I_{EBO}$                | Emitter Cut-off Current               | $V_{EB} = 5\text{V}$ , $I_C = 0$                                                                                                                          |              |      | 1.0       | mA                  |
| $h_{FE1}$<br>$h_{FE2}$   | *DC Current Gain                      | $V_{CE} = 2\text{V}$ , $I_C = 0.5\text{A}$<br>$V_{CE} = 2\text{V}$ , $I_C = 1\text{A}$                                                                    | 1000<br>2000 |      | 30000     |                     |
| $V_{CE}(\text{sat})$     | *Collector-Emitter Saturation Voltage | $I_C = 1\text{A}$ , $I_B = 1\text{mA}$                                                                                                                    |              |      | 1.5       | V                   |
| $V_{BE}(\text{sat})$     | *Base-Emitter Saturation Voltage      | $I_C = 1\text{A}$ , $I_B = 1\text{mA}$                                                                                                                    |              |      | 2.0       | V                   |
| $t_{ON}$                 | Turn ON Time                          | $V_{CC} = 50\text{V}$ , $I_C = 1\text{A}$                                                                                                                 |              | 0.5  |           | $\mu\text{s}$       |
| $t_{STG}$                | Storage Time                          | $I_{B1} = -I_{B2} = 1\text{mA}$<br>$R_L = 50\Omega$                                                                                                       |              | 1.0  |           | $\mu\text{s}$       |
| $t_F$                    | Fall Time                             |                                                                                                                                                           |              | 1.0  |           | $\mu\text{s}$       |

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

### $h_{FE}$ Classification

| Classification | R           | O            | Y            |
|----------------|-------------|--------------|--------------|
| $h_{FE2}$      | 2000 ~ 5000 | 4000 ~ 10000 | 8000 ~ 30000 |

## Typical Characteristics

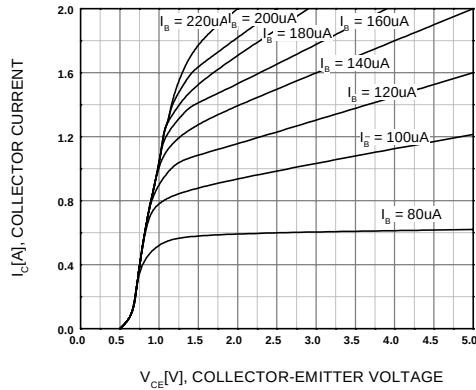


Figure 1. Static Characteristic

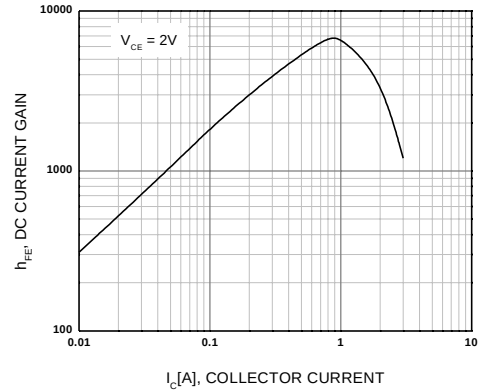


Figure 2. DC current Gain

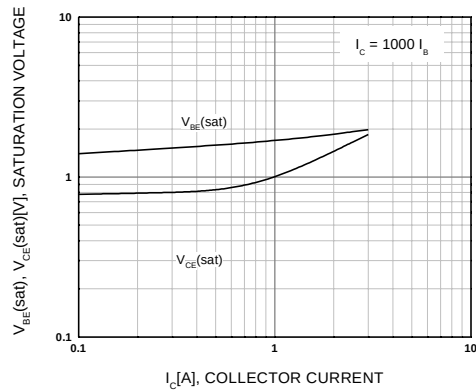


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

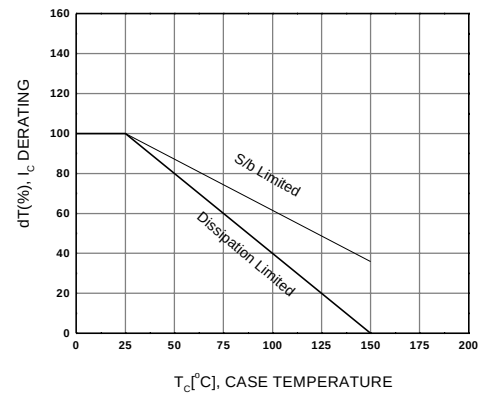


Figure 4. Derating Curve Of Safe Operating Areas

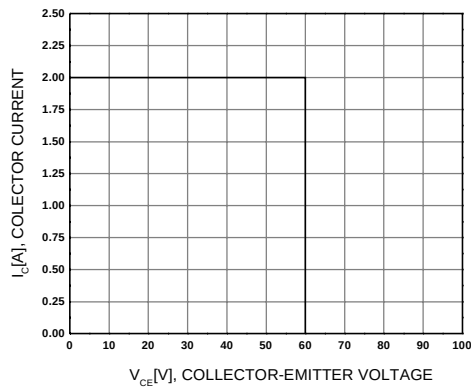


Figure 5. Reverse Bias Safe Operating Areas

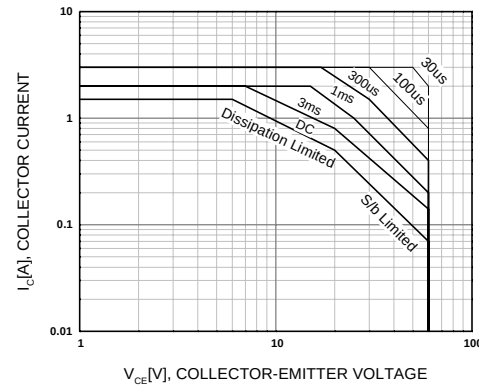


Figure 6. Safe Operating Area

# Typical Characteristics (Continued)

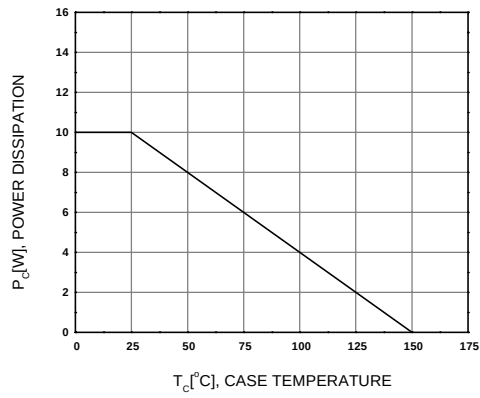
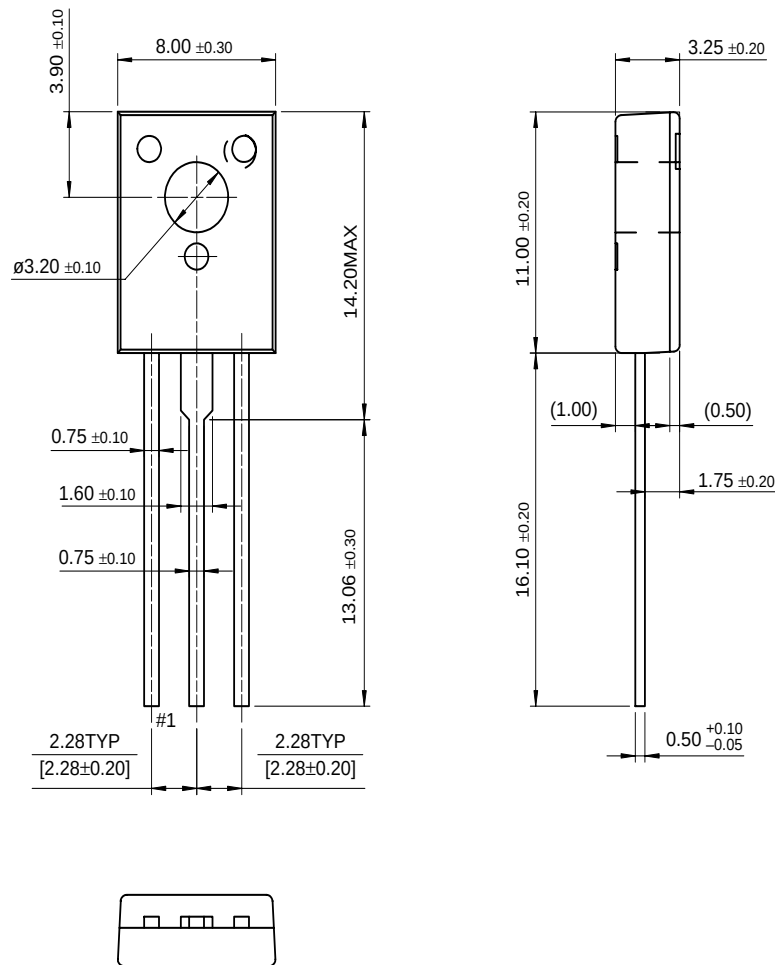


Figure 7. Power Derating

# Package Dimensions

## TO-126



Dimensions in Millimeters

KSD985/986

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