

## Complementary power Darlington transistors

### Features

- Complementary transistors in monolithic Darlington configuration
- Integrated collector-emitter antiparallel diode

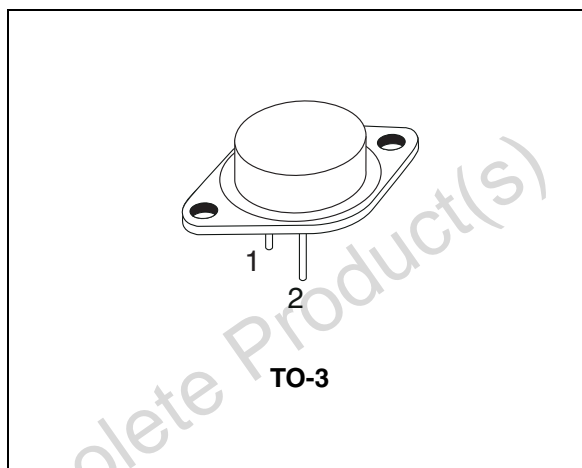
### Applications

- Audio power amplifier
- DC-AC converter
- General purpose switching applications

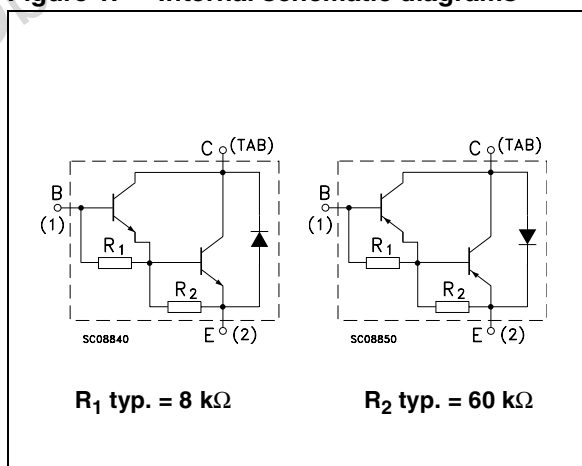
### Description

The 2N6284 is an epitaxial-base NPN power transistor in monolithic Darlington configuration mounted in TO-3 metal case. It is intended for general purpose amplifier and low frequency switching applications.

The complementary PNP type is 2N6287.



**Figure 1. Internal schematic diagrams**



**Table 1. Device summary**

| Order code | Marking | Package | Packaging |
|------------|---------|---------|-----------|
| 2N6284     | 2N6284  | TO-3    | Bag       |
| 2N6287     | 2N6287  |         |           |

# 1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

| Symbol    | Parameter                               | Value |            | Unit |
|-----------|---|-------|------------|------|
|           |   | NPN   | 2N6284     |      |
|           |   | PNP   | 2N6287     |      |
| $V_{CBO}$ | Collector-base voltage ( $I_E = 0$ )    |       | 100        | V    |
| $V_{CEO}$ | Collector-emitter voltage ( $I_B = 0$ ) |       | 100        | V    |
| $V_{EBO}$ | Emitter-base voltage ( $I_C = 0$ )      |       | 5          | V    |
| $I_C$     | Collector current                       |       | 20         | A    |
| $I_{CM}$  | Collector peak current ( $t_p < 5$ ms)  |       | 40         | A    |
| $I_B$     | Base current                            |       | 0.5        | A    |
| $P_{tot}$ | Total dissipation at $T_C = 25$ °C      |       | 160        | W    |
| $T_{stg}$ | Storage temperature                     |       | -65 to 200 | °C   |
| $T_J$     | Max. operating junction temperature     |       | 200        | °C   |

For PNP type voltage and current values are negative

**Table 3. Thermal data**

| Symbol         | Parameter                            | Value | Unit |
|----------------|--------------------------------------|-------|------|
| $R_{thj-case}$ | Thermal resistance junction-case Max | 1.09  | °C/W |

## 2 Electrical characteristics

( $T_{\text{case}} = 25\text{ °C}$ ; unless otherwise specified)

**Table 4. Electrical characteristics**

| Symbol                      | Parameter  | Test conditions   | Min.       | Typ. | Max.       | Unit     |
|-----------------------------|--|---|------------|------|------------|----------|
| $I_{\text{CEV}}$            | Collector cut-off current<br>( $V_{\text{BE}} = -1.5\text{ V}$ ) | $V_{\text{CE}} = 100\text{ V}$<br>$V_{\text{CE}} = 100\text{ V}$ $T_{\text{c}} = 150\text{ °C}$                           |            |      | 0.5<br>5   | mA<br>mA |
| $I_{\text{CEO}}$            | Collector cut-off current<br>( $I_{\text{B}} = 0$ )              | $V_{\text{CE}} = 50\text{ V}$   |            |      | 1          | mA       |
| $I_{\text{EBO}}$            | Emitter cut-off current<br>( $I_{\text{C}} = 0$ )                | $V_{\text{EB}} = 5\text{ V}$  |            |      | 2          | mA       |
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter<br>sustaining voltage ( $I_{\text{B}} = 0$ )   | $I_{\text{C}} = 100\text{ mA}$  | 100        |      |            | V        |
| $V_{\text{CE(sat)}}^{(1)}$  | Collector-emitter<br>saturation voltage                          | $I_{\text{C}} = 10\text{ A}$ $I_{\text{B}} = 40\text{ mA}$<br>$I_{\text{C}} = 20\text{ A}$ $I_{\text{B}} = 200\text{ mA}$ |            |      | 2<br>3     | V<br>V   |
| $V_{\text{BE(sat)}}^{(1)}$  | Base-emitter saturation<br>voltage                               | $I_{\text{C}} = 20\text{ A}$ $I_{\text{B}} = 200\text{ mA}$   |            |      | 4          | V        |
| $V_{\text{BE}}^{(1)}$       | Base-emitter voltage   | $I_{\text{C}} = 10\text{ A}$ $V_{\text{CE}} = 3\text{ V}$   |            |      | 2.8        | V        |
| $h_{\text{FE}}^{(1)}$       | DC current gain  | $I_{\text{C}} = 10\text{ A}$ $V_{\text{CE}} = 3\text{ V}$<br>$I_{\text{C}} = 20\text{ A}$ $V_{\text{CE}} = 3\text{ V}$    | 750<br>100 |      | 18000      |          |
| $h_{\text{fe}}$             | Small signal current gain  | $I_{\text{C}} = 10\text{ A}$ $V_{\text{CE}} = 3\text{ V}$<br>$f = 1\text{ kHz}$   | 300        |      |            |          |
| $C_{\text{CBO}}$            | Collector-base<br>capacitance ( $I_{\text{E}} = 0$ )             | $V_{\text{CB}} = 10\text{ V}$ $f = 100\text{ kHz}$<br>for 2N6284<br>for 2N6287  |            |      | 400<br>600 | pF<br>pF |

1. Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$

For PNP type voltage and current values are negative

## 2.1 Electrical characteristics (curves)

Figure 2. DC current gain (NPN type)

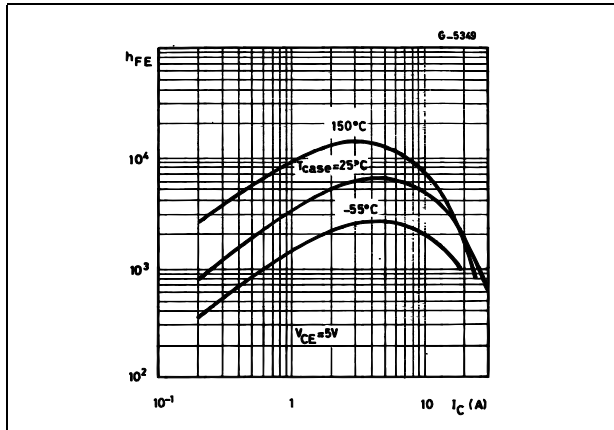


Figure 3. DC current gain (PNP type)

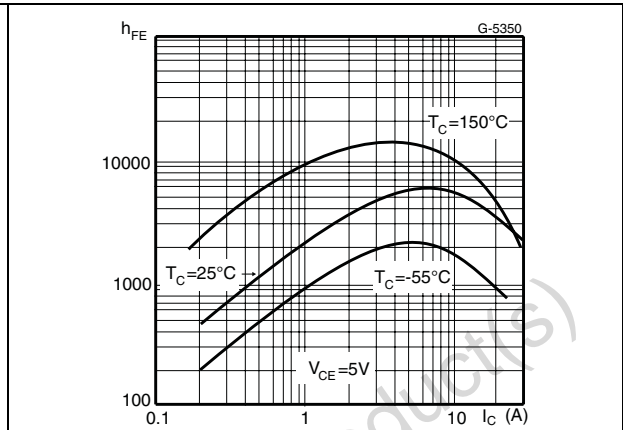


Figure 4. DC current gain (NPN type)

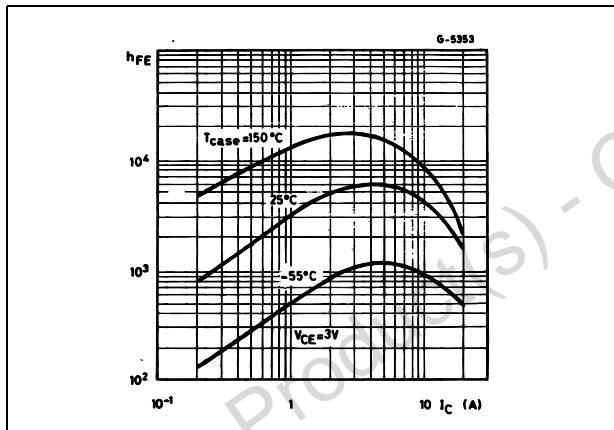


Figure 5. DC current gain (PNP type)

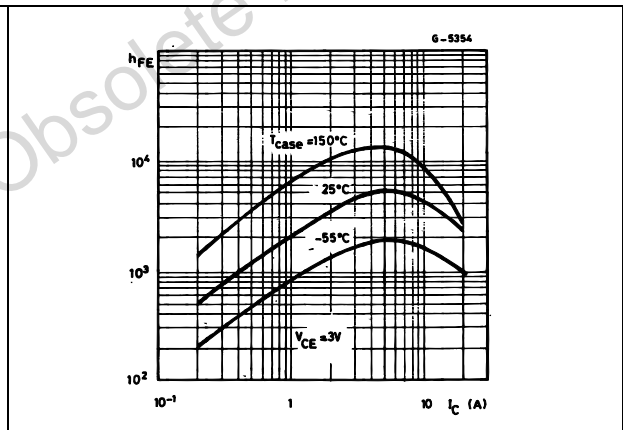


Figure 6. Collector-emitter saturation voltage (NPN type)

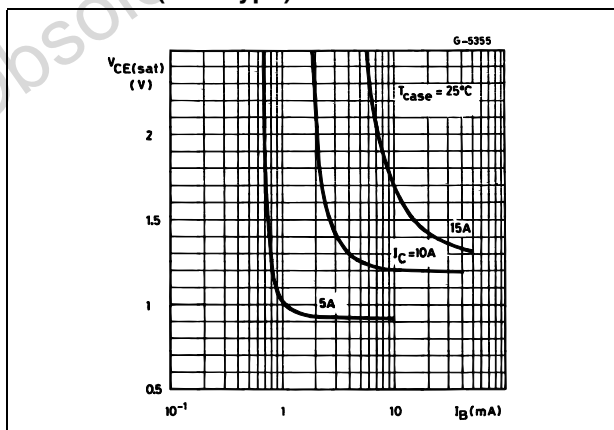
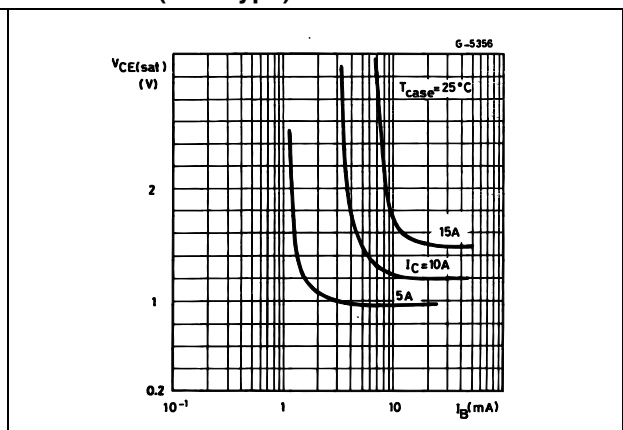


Figure 7. Collector-emitter saturation voltage (PNP type)



### 3 Package mechanical data

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Obsolete Product(s) - Obsolete Product(s)

## 4 Revision history

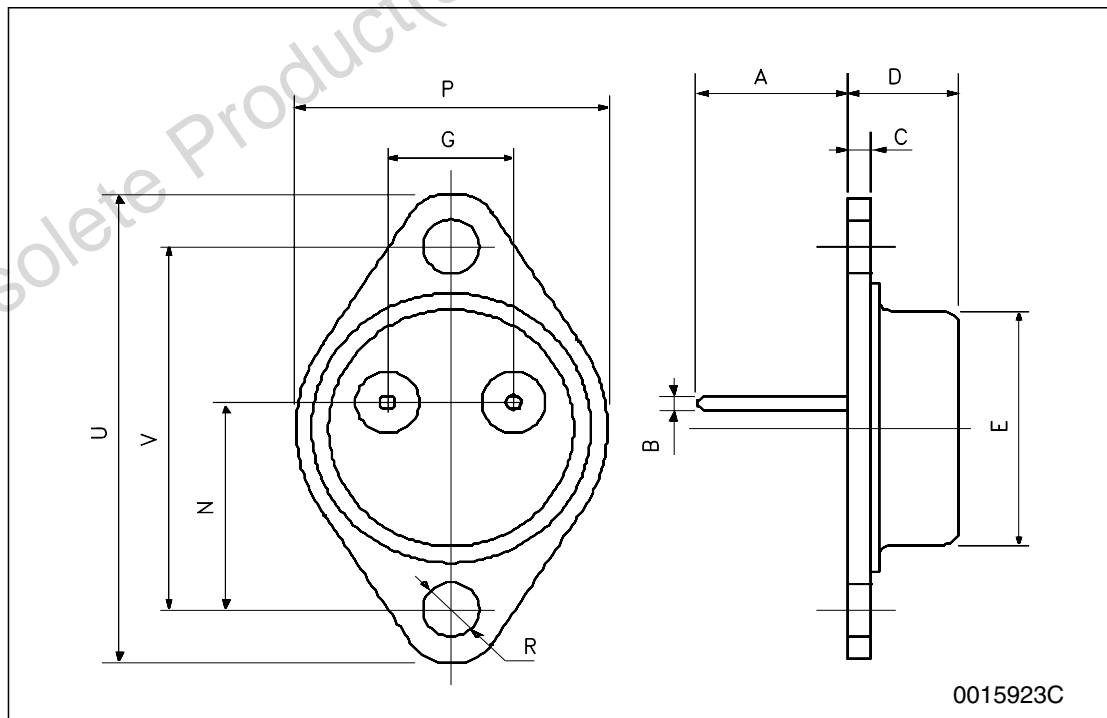
Table 5. Document revision history

| Date        | Revision | Changes                             |
|-------------|----------|-------------------------------------|
| 02-Mar-2000 | 2        |                                     |
| 26-Jan-2009 | 3        | Added paragraph <a href="#">2.1</a> |

Obsolete Product(s) - Obsolete Product(s)

**TO-3 mechanical data**

| DIM. | mm.   |     |       |
|------|-------|-----|-------|
|      | min.  | typ | max.  |
| A    | 11.00 |     | 13.10 |
| B    | 0.97  |     | 1.15  |
| C    | 1.50  |     | 1.65  |
| D    | 8.32  |     | 8.92  |
| E    | 19.00 |     | 20.00 |
| G    | 10.70 |     | 11.10 |
| N    | 16.50 |     | 17.20 |
| P    | 25.00 |     | 26.00 |
| R    | 4.00  |     | 4.09  |
| U    | 38.50 |     | 39.30 |
| V    | 30.00 |     | 30.30 |



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