# Silicon PNP Darlington Transistor

# **BDX86C**

Power Linear and Switching

100V / 10A

# DATASHEET

OEM –SGS Ates

Source: SGS Ates Databook 1977

*Datasheet Rev. 2.0 – 09/19 – data without warranty / liability*

**BDX 86**
**BDX 86A**
**BDX 86B**
**BDX 86C**

# EPITAXIAL-BASE PNP

## POWER DARLINGTONS

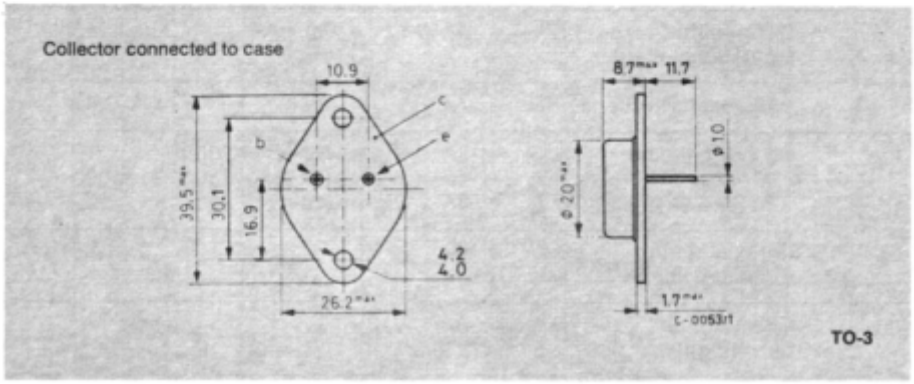
The BDX 86, BDX 86A, BDX 86B and BDX 86C are silicon epitaxial-base PNP power transistors in monolithic Darlington configuration and are mounted in Jedec TO-3 metal case. They are intended for use in power linear and switching applications.
The complementary NPN types are the BDX 85, BDX 85A, BDX 85B and BDX 85C respectively.

## ABSOLUTE MAXIMUM RATINGS

| | | BDX86 | BDX86A | BDX86B | BDX86C |
|---|---|---|---|---|---|
| $V_{CBO}$ | Collector-base voltage ($I_E = 0$) | -45V | -60V | -80V | -100V |
| $V_{CEO}$ | Collector-emitter voltage ($I_B = 0$) | -45V | -60V | -80V | -100V |
| $V_{EBO}$ | Emitter-base voltage ($I_C = 0$) | -5V | | | |
| $I_C$ | Collector current | -10A | | | |
| $I_{CM}$ | Collector peak current (repetitive) | -15A | | | |
| $I_B$ | Base current | -0.1A | | | |
| $P_{tot}$ | Total power dissipation at $T_{case} \leq 25°C$ | 100W | | | |
| $T_{stg}$ | Storage temperature | -65 to 200°C | | | |
| $T_j$ | Junction temperature | 200 °C | | | |

## MECHANICAL DATA

Dimensions in mm



**BDX 86**
**BDX 86A**
**BDX 86B**
**BDX 86C**

## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal resistance junction-case | max | 1.75 | °C/W |

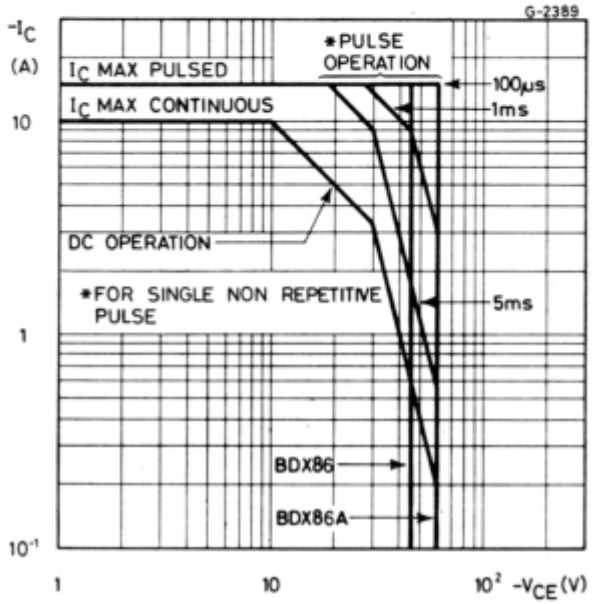
## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25°C unless otherwise specified)

| | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector cutoff current ($I_E$ = 0) | for **BDX86** $V_{CB}$ = -45 V | | | -500 | μA |
| | | for **BDX86A** $V_{CB}$ = -60 V | | | -500 | μA |
| | | for **BDX86B** $V_{CB}$ = -80 V | | | -500 | μA |
| | | for **BDX86C** $V_{CB}$ = -100 V | | | -500 | μA |
| | | $T_{case}$ = 150°C | | | | |
| | | for **BDX86** $V_{CB}$ = -45 V | | | -5 | mA |
| | | for **BDX86A** $V_{CB}$ = -60 V | | | -5 | mA |
| | | for **BDX86B** $V_{CB}$ = -80 V | | | -5 | mA |
| | | for **BDX86C** $V_{CB}$ = -100 V | | | -5 | mA |
| $I_{CEO}$ | Collector cutoff current ($I_B$ = 0) | for **BDX86** $V_{CE}$ = -22 V | | | -1 | mA |
| | | for **BDX86A** $V_{CE}$ = -30 V | | | -1 | mA |
| | | for **BDX86B** $V_{CE}$ = -40 V | | | -1 | mA |
| | | for **BDX86C** $V_{CE}$ = -50 V | | | -1 | mA |
| $I_{EBO}$ | Emitter cutoff current ($I_C$ = 0) | $V_{EB}$ = -5 V | | | -2 | mA |
| $V_{CEO(sus)}$* | Collector-emitter sustaining voltage ($I_B$ = 0) | $I_C$ = -100 mA | | | | |
| | | for **BDX86** | -45 | | | V |
| | | for **BDX86A** | -60 | | | V |
| | | for **BDX86B** | -80 | | | V |
| | | for **BDX86C** | -100 | | | V |
| $V_{CE(sat)}$* | Collector-emitter saturation voltage | $I_C$ = -4A $I_B$ = -16 mA | | | -2 | V |
| | | $I_C$ = -8A $I_B$ = -40 mA | | | -4 | V |
| $V_{BE(sat)}$* | Base-emitter saturation voltage | $I_C$ = -8A $I_B$ = -80 mA | | | -4 | V |
| $V_{BE}$* | Base-emitter voltage | $I_C$ = -4A $V_{CE}$ = -3V | | | -2.8 | V |
| $h_{FE}$* | DC current gain | $I_C$ = -3A $V_{CE}$ = -3V | 1000 | | | — |
| | | $I_C$ = -4A $V_{CE}$ = -3V | 750 | | 18000 | — |
| | | $I_C$ = -8A $V_{CE}$ = -4V | 200 | | | — |
| $V_F$ | Parallel-diode forward voltage | $I_F$ = 3A | | | 1.8 | V |
| | | $I_F$ = 8A | | 2.5 | | V |
| $h_{fe}$ | Small signal current gain | $I_C$ = -3A $V_{CE}$ = -3V f = 1 MHz | | 10 | | — |

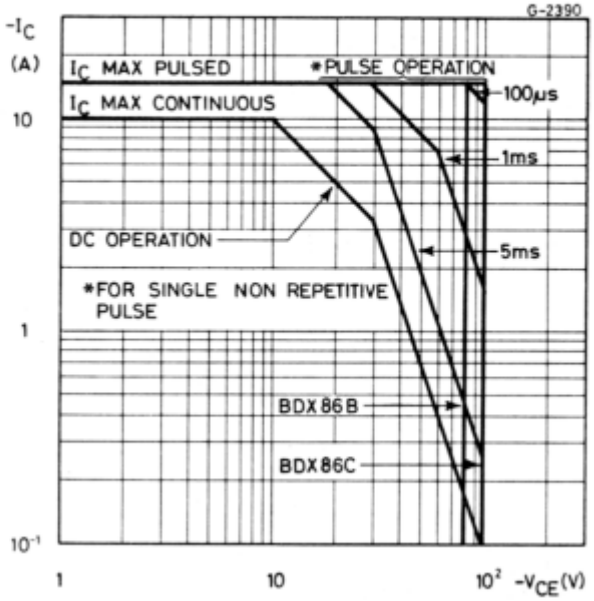
* Pulsed: pulse duration = 300 μs, duty cycle = 1.5%

**BDX 86**
**BDX 86A**
**BDX 86B**
**BDX 86C**

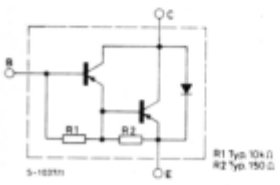
Safe operating areas
(for **BDX86** and **BDX86A**)




Safe operating areas
(for **BDX86B** and **BDX86C**)

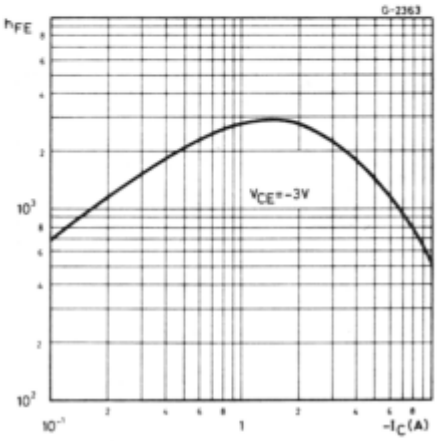



Internal circuit diagram

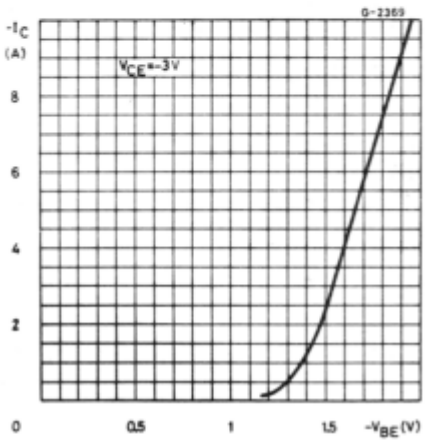


**BDX 86**
**BDX 86A**
**BDX 86B**
**BDX 86C**

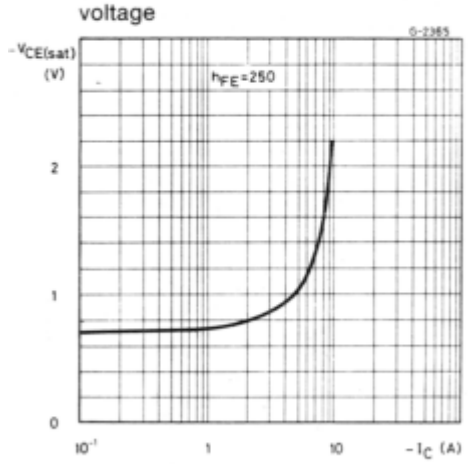
DC current gain



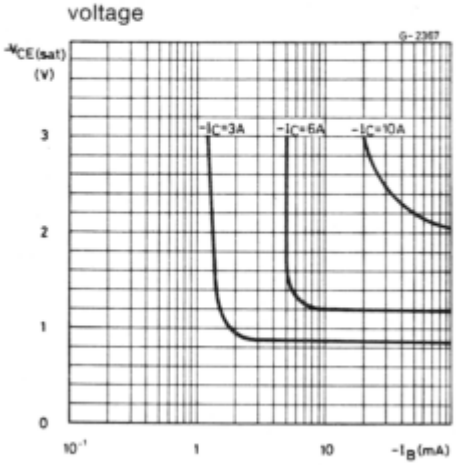

DC transconductance




Collector-emitter saturation voltage

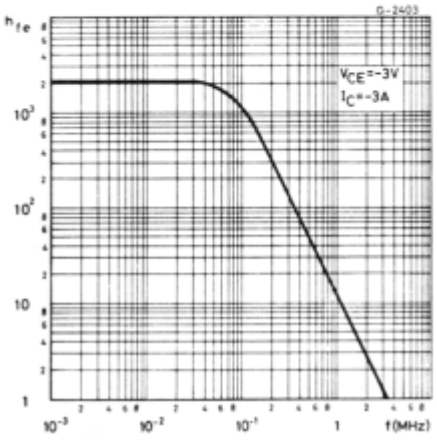



Collector-emitter saturation voltage

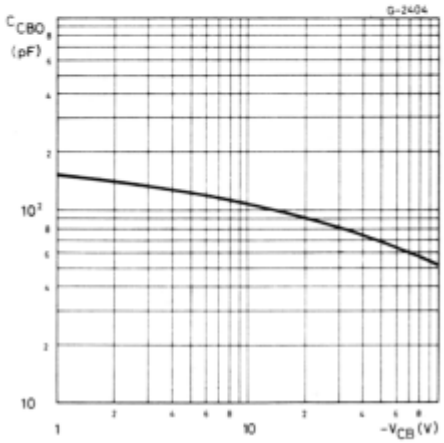


**BDX 86**
**BDX 86A**
**BDX 86B**
**BDX 86C**

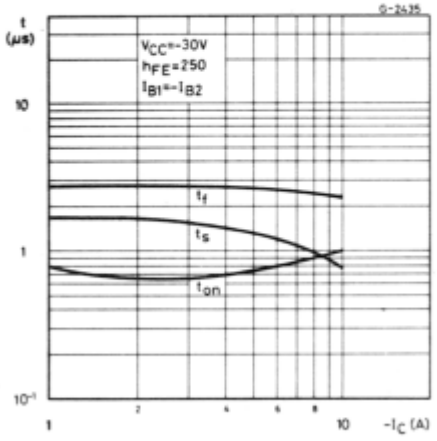
Small signal current gain




Collector-base capacitance




Saturated switching characteristics




Power rating chart