

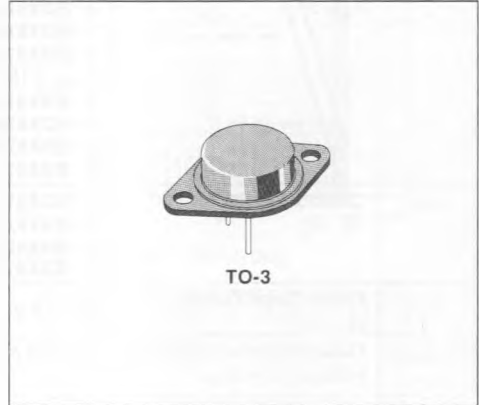


POWER DARLINGTONS

DESCRIPTION

The BDX87, BDX87A, BDX87B and BDX87C are silicon epitaxial-base NPN power transistors in monolithic Darlingtion configuration and are mounted in Jedec TO-3 metal case. They are intended for use in power linear and switching applications.

The complementary PNP types are the BDX88, BDX88A, BDX88B and BDX88C respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | NPN PNP* | Value | | | | Unit |
|------------------|--|-------------|----------------|------------------|------------------|------------------|------|
| | | | BDX87 BDX88 | BDX87A BDX88A | BDX87B BDX88B | BDX87C BDX88C | |
| V _{CB0} | Collector-base Voltage (I _E = 0) | | 45 | 60 | 80 | 100 | V |
| V _{CE0} | Collector-emitter Voltage (I _B = 0) | | 45 | 60 | 80 | 100 | V |
| V _{EB0} | Emitter-base Voltage (I _C = 0) | | 5 | | | | V |
| I _C | Collector Current | | 12 | | | | A |
| I _{CM} | Collector Peak Current (repetitive) | | 18 | | | | A |
| I _B | Base Current | | 0.2 | | | | A |
| P _{tot} | Total Power Dissipation at T _{case} ≤ 25 °C | | 120 | | | | W |
| T _{stg} | Storage Temperature | | - 65 to 200 | | | | °C |
| T _j | Junction Temperature | | 200 | | | | °C |

* For PNP types voltage and current values are negative.

THERMAL DATA

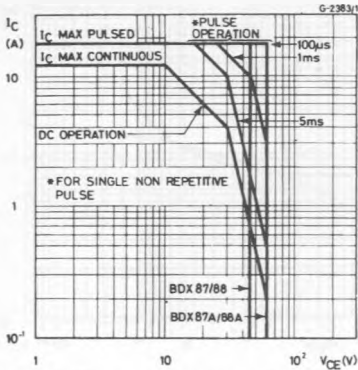
| | | | | |
|------------------|----------------------------------|-----|------|------|
| $R_{th(j-case)}$ | Thermal Resistance Junction-case | Max | 1.45 | °C/W |
|------------------|----------------------------------|-----|------|------|

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

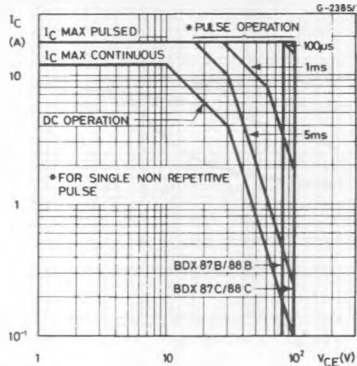
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------|--|--|-----------------------|------|--|--|
| I_{CBO} | Collector Cutoff Current ($I_E = 0$) | for BDX87/8 $V_{CB} = 45\text{ V}$ for BDX87A/8A $V_{CB} = 60\text{ V}$ for BDX87B/8B $V_{CB} = 80\text{ V}$ for BDX87C/8C $V_{CB} = 100\text{ V}$ $T_{case} = 150\text{ °C}$ for BDX87/8 $V_{CB} = 45\text{ V}$ for BDX87A/8A $V_{CB} = 60\text{ V}$ for BDX87B/8B $V_{CB} = 80\text{ V}$ for BDX87C/8C $V_{CB} = 100\text{ V}$ | | | 500 500 500 500 5 5 5 5 | μA μA μA μA mA mA mA mA |
| I_{CEO} | Collector Cutoff Current ($I_B = 0$) | for BDX87/8 $V_{CE} = 22\text{ V}$ for BDX87A/8A $V_{CE} = 30\text{ V}$ for BDX87B/8B $V_{CE} = 40\text{ V}$ for BDX87C/8C $V_{CE} = 50\text{ V}$ | | | 1 1 1 1 | mA mA mA mA |
| I_{EBO} | Emitter Cutoff Current ($I_C = 0$) | $V_{EB} = 5\text{ V}$ | | | 1 | mA |
| $V_{CEO(sus)}^*$ | Collector-emitter Sustaining Voltage ($I_B = 0$) | $I_C = 100\text{ mA}$ for BDX87/88 for BDX87A/88A for BDX87B/88B for BDX87C/88C | 45 60 80 100 | | | V V V V |
| $V_{CE(sat)}^*$ | Collector-emitter Saturation Voltage | $I_C = 6\text{ A}$ $I_B = 24\text{ mA}$ $I_C = 12\text{ A}$ $I_B = 120\text{ mA}$ | | | 2 3 | V V |
| $V_{BE(sat)}^*$ | Base-emitter Saturation Voltage | $I_C = 12\text{ A}$ $I_B = 120\text{ mA}$ | | | 4 | V |
| V_{BE}^* | Base-emitter Voltage | $I_C = 6\text{ A}$ $V_{CE} = 3\text{ V}$ | | | 2.8 | V |
| h_{FE}^* | DC Current Gain | $I_C = 5\text{ A}$ $V_{CE} = 3\text{ V}$ $I_C = 6\text{ A}$ $V_{CE} = 3\text{ V}$ $I_C = 12\text{ A}$ $V_{CE} = 3\text{ V}$ | 1000 750 100 | | 18000 | |
| V_F | Parallel-diode Forward Voltage | $I_F = 3\text{ A}$ $I_F = 8\text{ A}$ | | | 2.5 | V V |
| h_{fe} | Small Signal Current Gain | $I_C = 5\text{ A}$ $V_{CE} = 3\text{ V}$ $f = 1\text{ MHz}$ | | | 25 | |

* Pulsed : pulse duration = 300 μs , duty cycle = 1.5%.
For PNP type voltage and current values are negative.

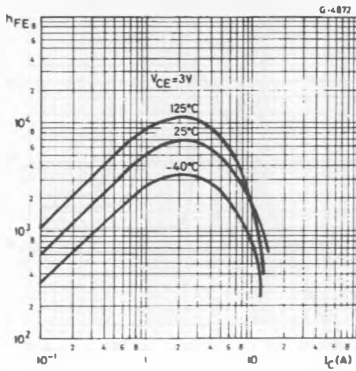
Safe Operating Areas (for BDX87, BDX87A, BDX88, BDX88A).



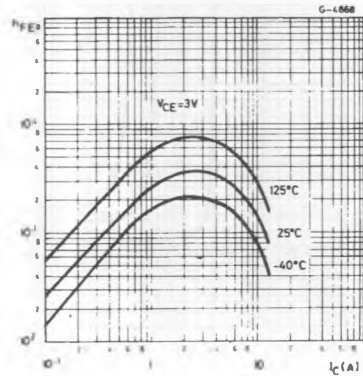
Safe Operating Areas (for BDX87A, BDX87C, BDX88B, BDX88C).



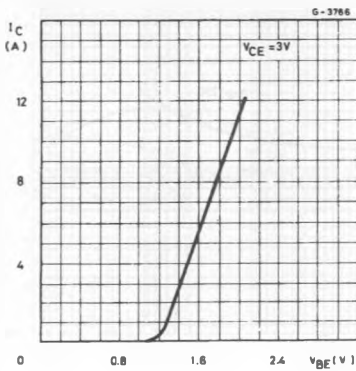
DC Current Gain (NPN types).



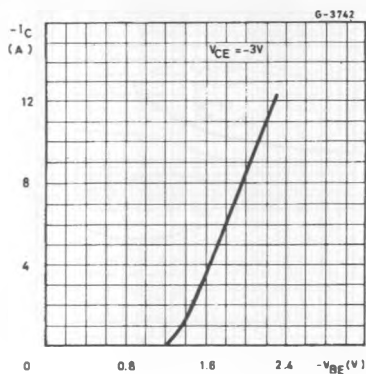
DC Current Gain (PNP types).



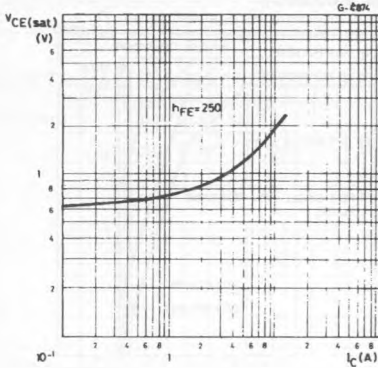
DC Transconductance (NPN types).



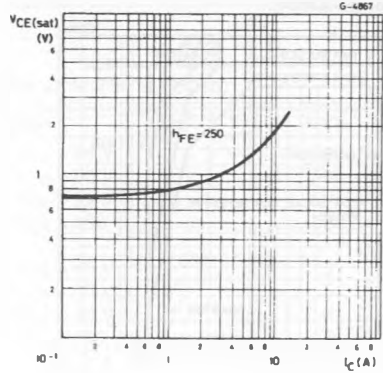
DC Transconductance (PNP types).



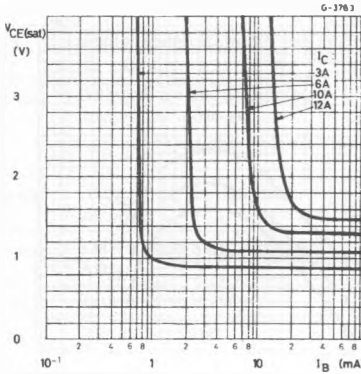
Collector-emitter Saturation Voltage (NPN types).



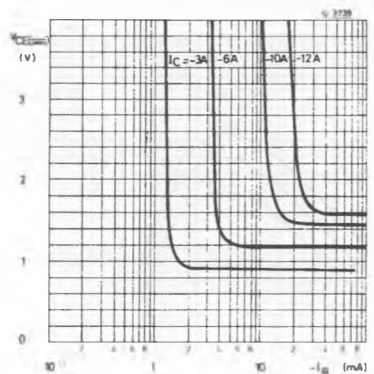
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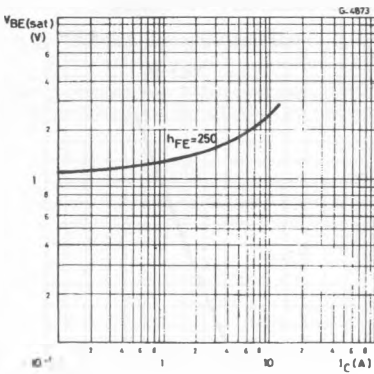
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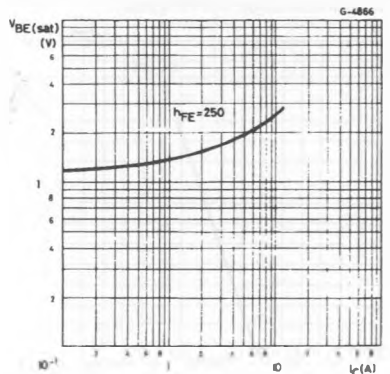
Collector-emitter Saturation Voltage (PNP types).



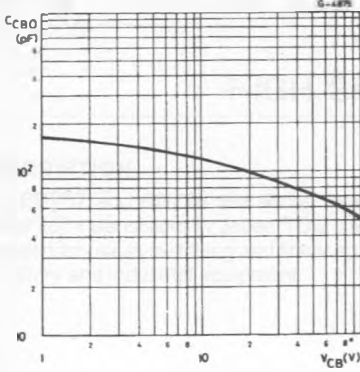
Base-emitter Saturation Voltage (NPN types).



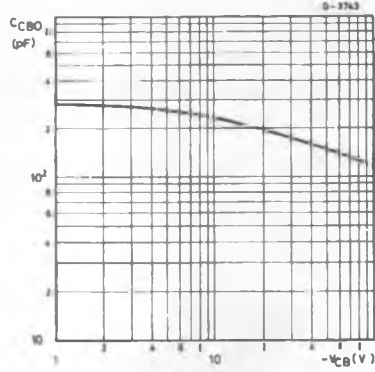
Base-emitter Saturation Voltage (PNP types).



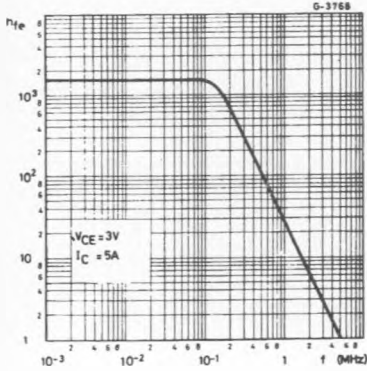
Collector-base Capacitance (NPN types).



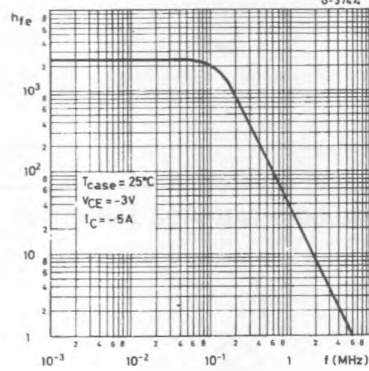
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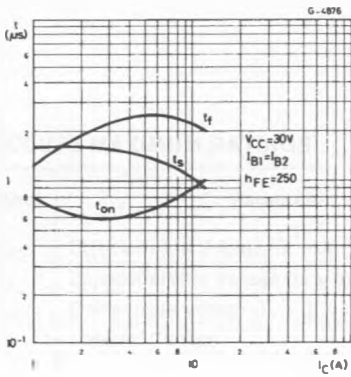
Small Signal Current Gain (NPN types).



Small Signal Current Gain (PNP types).



Saturated Switching Characteristics (NPN types).



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