

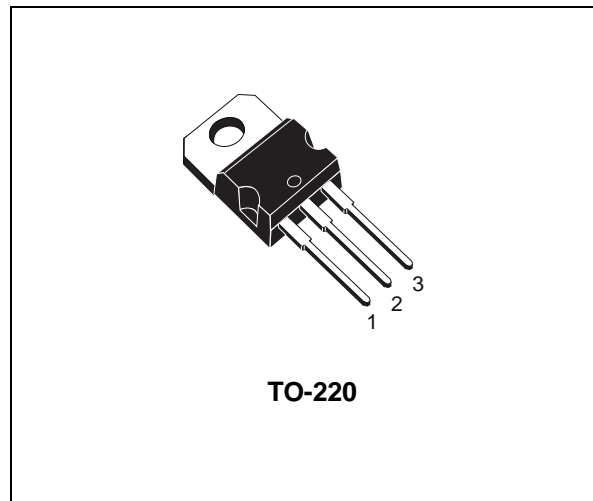


BDX33B BDX33C BDX34B BDX34C

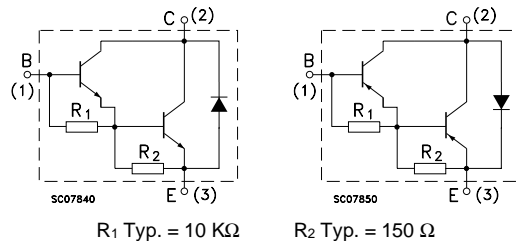
COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

DESCRIPTION

The BDX33B and BDX33C are silicon Epitaxial-Base NPN power transistors in monolithic Darlington configuration mounted in Jedec TO-220 plastic package. They are intended for use in power linear and switching applications. The complementary PNP types are BDX34B and BDX34C respectively.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | | | Unit | |
|-----------|--|-----|------------|--------|------------------|
| | | NPN | BDX33B | | BDX33C |
| | | PNP | BDX34B | BDX34C | |
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | | 80 | 100 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | | 80 | 100 | V |
| I_C | Collector Current | | 10 | | A |
| I_{CM} | Collector Peak Current | | 15 | | A |
| I_B | Base Current | | 0.25 | | A |
| P_{tot} | Total Dissipation at $T_c \leq 25^\circ\text{C}$ | | 70 | | W |
| T_{stg} | Storage Temperature | | -65 to 150 | | $^\circ\text{C}$ |
| T_j | Max. Operating Junction Temperature | | 150 | | $^\circ\text{C}$ |

For PNP types voltage and current values are negative.

BDX33B BDX33C BDX34B BDX34C

THERMAL DATA

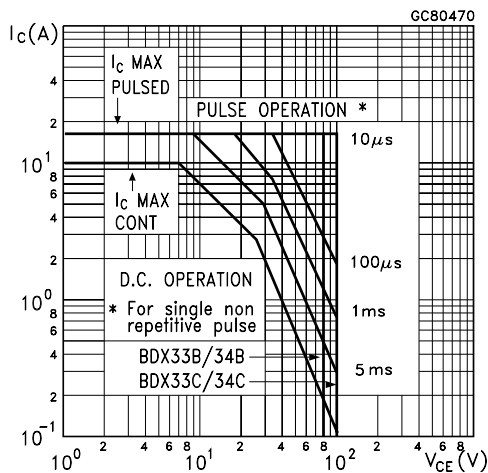
| | | | |
|-----------------------|----------------------------------|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | 1.78 | °C/W |
|-----------------------|----------------------------------|------|------|

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

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------|---|--|-----------|------|------|--------|
| I _{CBO} | Collector Cut-off Current (I _E = 0) | for BDX33B/34B V _{CB} = 80 V | | | 0.2 | mA |
| | | for BDX33C/34C V _{CB} = 100V | | | 0.2 | mA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | T _{case} = 100 °C | | | | |
| | | for BDX33B/34B V _{CE} = 40 V | | | 0.5 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | for BDX33C/34C V _{CE} = 50V | | | 0.5 | mA |
| | | for BDX33B/34B V _{CE} = 40 V | | | 10 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | for BDX33C/34C V _{CE} = 50 V | | | 10 | mA |
| | | for BDX33B/34B V _{CE} = 40 V | | | 10 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 5 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 100 mA for BDX33B/34B for BDX33C/34C | 80 100 | | | V V |
| V _{CER(sus)*} | Collector-emitter Sustaining Voltage (R _{BE} = 100 Ω) | I _C = 100 mA for BDX33B/34B for BDX33C/34C | 80 100 | | | V V |
| V _{CEV(sus)*} | Collector-emitter Sustaining Voltage (V _{BE} = -1.5 V) | I _C = 100 mA for BDX33B/34B for BDX33C/34C | 80 100 | | | V V |
| V _{CE(sat)*} | Collector-emitter Saturation Voltage | I _C = 3 A I _B = 6 mA | | | 2.5 | V |
| V _{BE*} | Base-emitter Voltage | I _C = 3 A V _{CE} = 3 V | | | 2.5 | V |
| h _{FE*} | DC Current Gain | I _C = 3 A V _{CE} = 3 V | 750 | | | V |
| V _{F*} | Parallel-Diode Forward Voltage | I _F = 8 A | | | 4 | V |
| h _{fe} | Small Signal Current Gain | I _C = 1 A V _{CE} = 5 V f = 1MHz | 100 | | | |

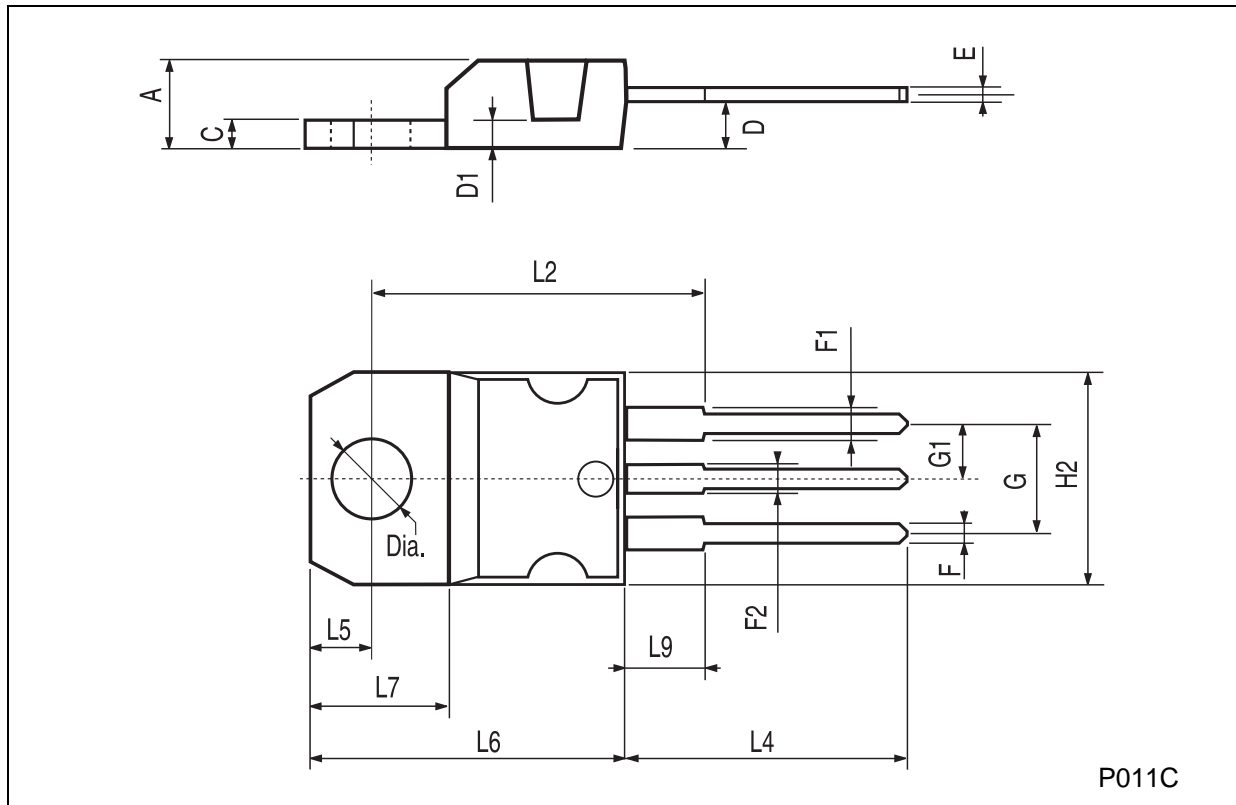
* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %
For PNP types voltage and current values are negative.

Safe Operating Area



TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.40 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |



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