

BD243B, BD243C (NPN), BD244B, BD244C (PNP)



ON Semiconductor®

www.onsemi.com

Complementary Silicon Plastic Power Transistors

These devices are designed for use in general purpose amplifier and switching applications.

Features

- High Current Gain Bandwidth Product
- These Devices are Pb-Free and are RoHS Compliant*

MAXIMUM RATINGS

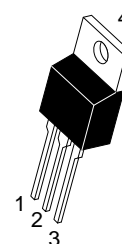
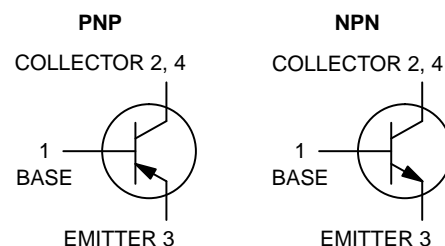
| Rating | Symbol | Value | Unit |
|---|----------------|-------------|--------------------------|
| Collector-Emitter Voltage BD243B, BD244B BD243C, BD244C | V_{CEO} | 80 100 | Vdc |
| Collector-Base Voltage BD243B, BD244B BD243C, BD244C | V_{CB} | 80 100 | Vdc |
| Emitter-Base Voltage | V_{EB} | 5.0 | Vdc |
| Collector Current - Continuous | I_C | 6 | Adc |
| Collector Current - Peak | I_{CM} | 10 | Adc |
| Base Current | I_B | 2.0 | Adc |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 65 0.52 | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -65 to +150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

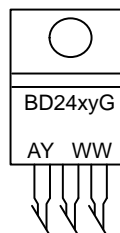
| Characteristics | Symbol | Max | Unit |
|--------------------------------------|-----------------|------|---------------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.92 | $^\circ\text{C}/\text{W}$ |

6 AMPERE POWER TRANSISTORS COMPLEMENTARY SILICON 80-100 VOLTS 65 WATTS



TO-220
CASE 221A
STYLE 1

MARKING DIAGRAM



BD24xy = Device Code
x = 3 or 4
y = B or C
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping |
|---------|---------------------|-----------------|
| BD243BG | TO-220 (Pb-Free) | 50 Units / Rail |
| BD243CG | TO-220 (Pb-Free) | 50 Units / Rail |
| BD244BG | TO-220 (Pb-Free) | 50 Units / Rail |
| BD244CG | TO-220 (Pb-Free) | 50 Units / Rail |

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|----------------|-----------|------------|-----------------|
| Collector–Emitter Sustaining Voltage (Note 1) ($I_C = 30\text{ mAdc}$, $I_B = 0$) BD243B, BD244B BD243C, BD244C | $V_{CEO(sus)}$ | 80 100 | – – | Vdc |
| Collector Cutoff Current ($V_{CE} = 60\text{ Vdc}$, $I_B = 0$) BD243B, BD243C, BD244B, BD244C | I_{CEO} | – | 0.7 | mAdc |
| Collector Cutoff Current ($V_{CE} = 80\text{ Vdc}$, $V_{EB} = 0$) BD243B, BD244B ($V_{CE} = 100\text{ Vdc}$, $V_{EB} = 0$) BD243C, BD244C | I_{CES} | – – | 400 400 | μAdc |
| Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$) | I_{EBO} | – | 1.0 | mAdc |

ON CHARACTERISTICS (Note 1)

| | | | | |
|---|---------------|----------|--------|-----|
| DC Current Gain ($I_C = 0.3\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) ($I_C = 3.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) | h_{FE} | 30 15 | – – | – |
| Collector–Emitter Saturation Voltage ($I_C = 6.0\text{ Adc}$, $I_B = 1.0\text{ Adc}$) | $V_{CE(sat)}$ | – | 1.5 | Vdc |
| Base–Emitter On Voltage ($I_C = 6.0\text{ Adc}$, $V_{CE} = 4.0\text{ Vdc}$) | $V_{BE(on)}$ | – | 2.0 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|---|----------|-----|---|-----|
| Current–Gain – Bandwidth Product (Note 2) ($I_C = 500\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f_{test} = 1.0\text{ MHz}$) | f_T | 3.0 | – | MHz |
| Small–Signal Current Gain ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$) | h_{fe} | 20 | – | – |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse Test: Pulsewidth $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.
2. $f_T = h_{fe} \cdot f_{test}$

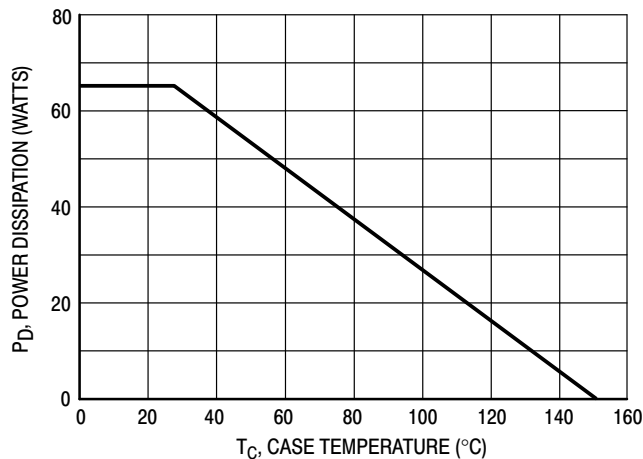


Figure 1. Power Derating

BD243B, BD243C (NPN), BD244B, BD244C (PNP)

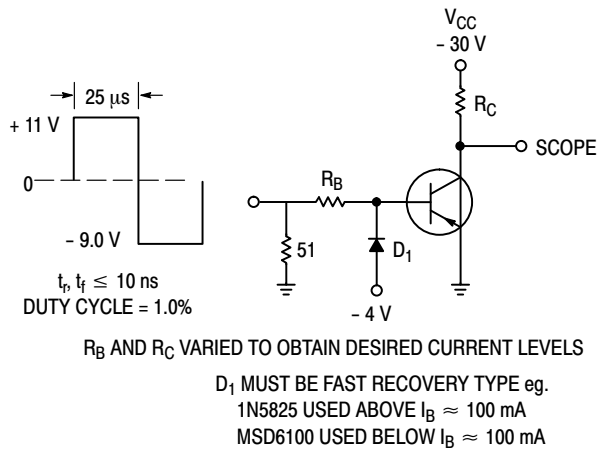


Figure 2. Switching Time Test Circuit

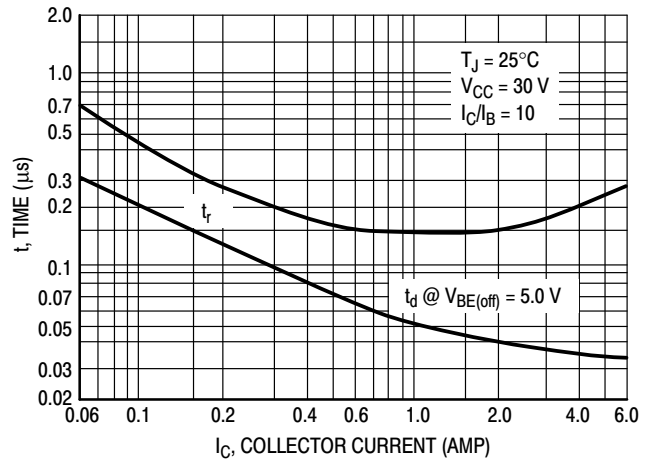


Figure 3. Turn-On Time

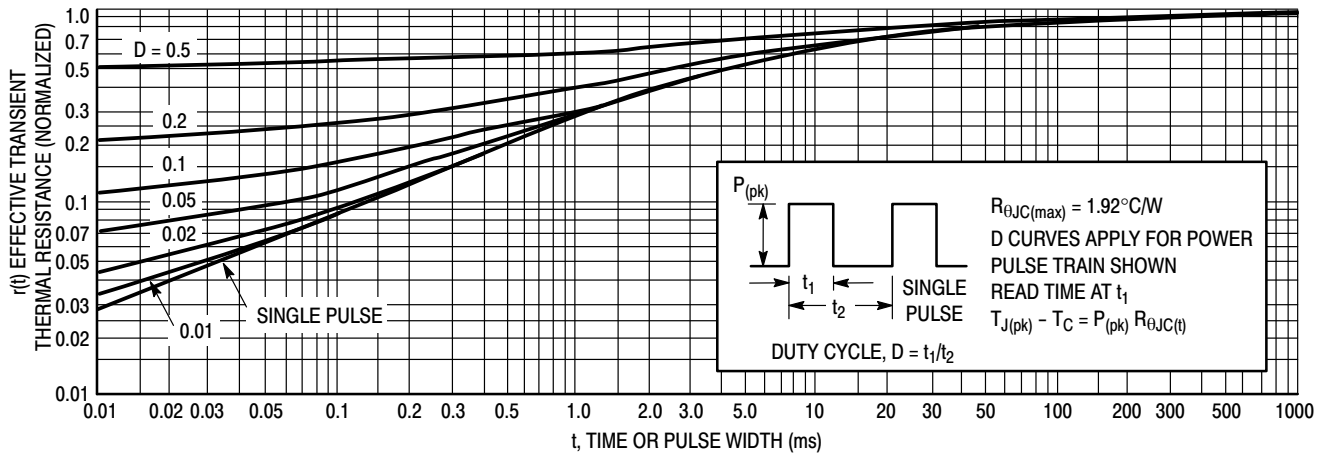


Figure 4. Thermal Response

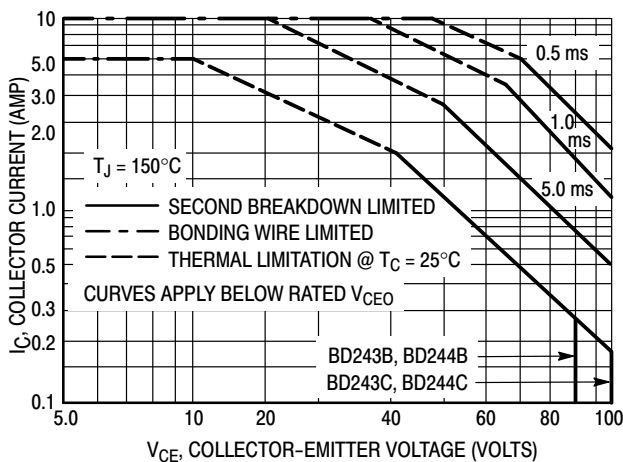


Figure 5. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 5 is based on $T_{J(pk)} = 150^\circ\text{C}$: T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$, $T_{J(pk)}$ may be calculated from the data in Figure 4. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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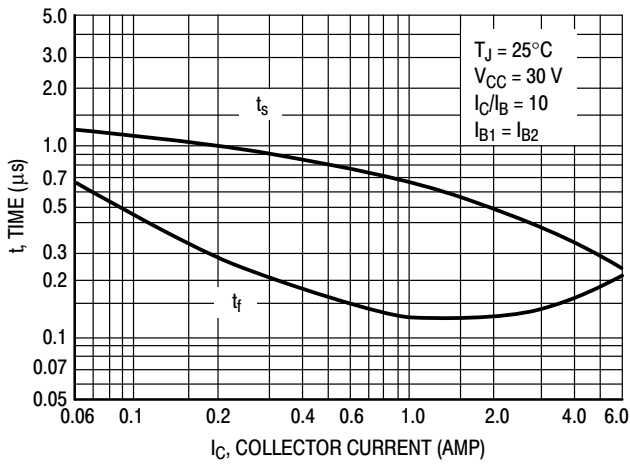


Figure 6. Turn-Off Time

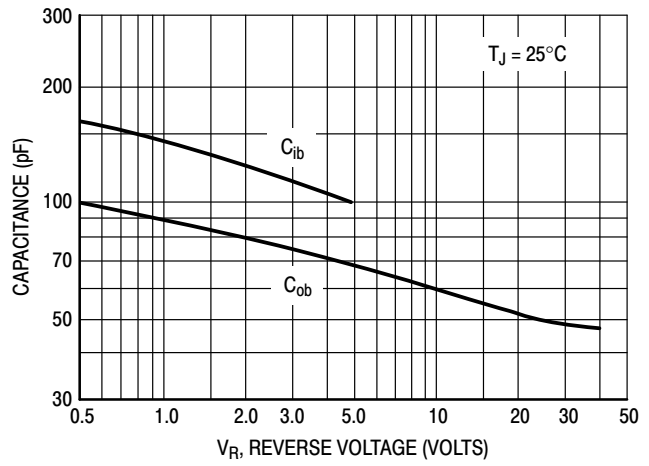


Figure 7. Capacitance

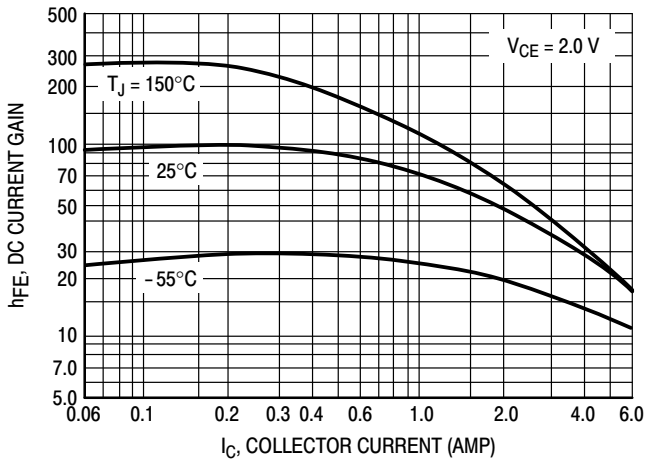


Figure 8. DC Current Gain

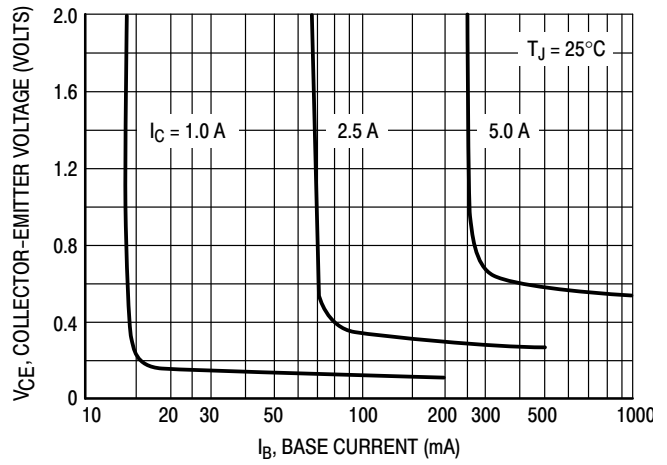


Figure 9. Collector Saturation Region



Figure 10. "On" Voltages

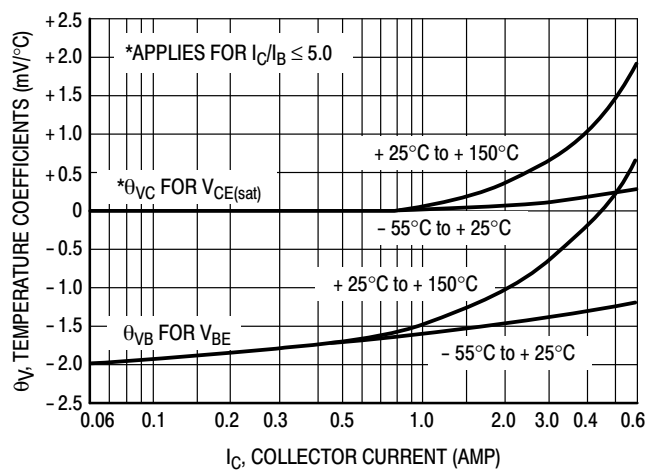


Figure 11. Temperature Coefficients

BD243B, BD243C (NPN), BD244B, BD244C (PNP)



Figure 12. Collector Cut-Off Region

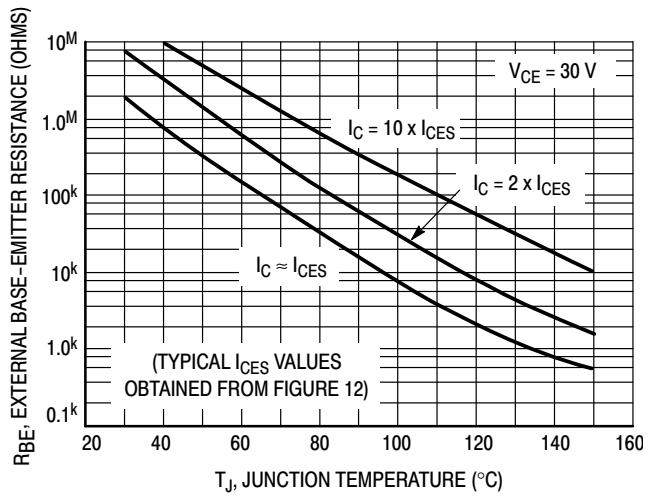


Figure 13. Effects of Base-Emitter Resistance

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