Complementary Silicon Plastic Power Transistors

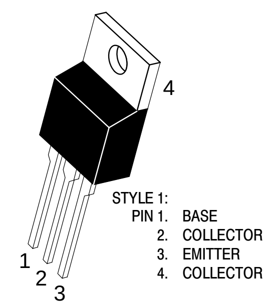
. . . designed for use in general purpose amplifier and switching applications.

- Collector – Emitter Saturation Voltage —
  $V_{CE(sat)}$ = 1.5 Vdc (Max) @ I_C = 6.0 Adc
- Collector Emitter Sustaining Voltage —
  $V_{CEO(sus)}$ = 80 Vdc (Min) — BD243B, BD244B
  = 100 Vdc (Min) — BD243C, BD244C
- High Current Gain Bandwidth Product
  f_T = 3.0 MHz (Min) @ I_C = 500 mAdc
- Compact TO–220 AB Package

NPN
BD243B
BD243C*
PNP
BD244B
BD244C*

*ON Semiconductor Preferred Device

**6 AMPERE
POWER TRANSISTORS
COMPLEMENTARY
SILICON
80–100 VOLTS
65 WATTS**



**CASE 221A–06
TO–220AB**

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.92	°C/W

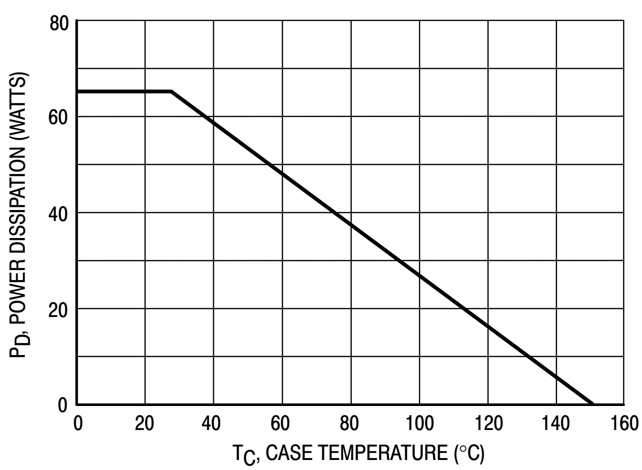


Figure 1. Power Derating

April, 2002 – Rev. 10

Publication Order Number:
BD243B/D

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
Collector–Emitter Sustaining Voltage (1) (I_C = 30 mAdc, I_B = 0)	 BD243B, BD244B BD243C, BD244C	$V_{CEO(sus)}$	 80 100	 — —	Vdc
Collector Cutoff Current (V_{CE} = 60 Vdc, I_B = 0)	 BD243B, BD243C, BD244B, BD244C	I_{CEO}	—	0.7	mAdc
Collector Cutoff Current (V_{CE} = 80 Vdc, V_{EB} = 0) (V_{CE} = 100 Vdc, V_{EB} = 0)	 BD243B, BD244B BD243C, BD244C	I_{CES}	 — —	 400 400	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	1.0	mAdc
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 0.3 Adc, V_{CE} = 4.0 Vdc) (I_C = 3.0 Adc, V_{CE} = 4.0 Vdc)		h_{FE}	 30 15	 — —	—
Collector–Emitter Saturation Voltage (I_C = 6.0 Adc, I_B = 1.0 Adc)		$V_{CE(sat)}$	—	1.5	Vdc
Base–Emitter On Voltage (I_C = 6.0 Adc, V_{CE} = 4.0 Vdc)		$V_{BE(on)}$	—	2.0	Vdc
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product (2) (I_C = 500 mAdc, V_{CE} = 10 Vdc, f_{test} = 1.0 MHz)		f_T	3.0	—	MHz
Small–Signal Current Gain (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{fe}	20	—	—

(1) Pulse Test: Pulsewidth ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) $f_T = h_{fe} \bullet f_{test}$

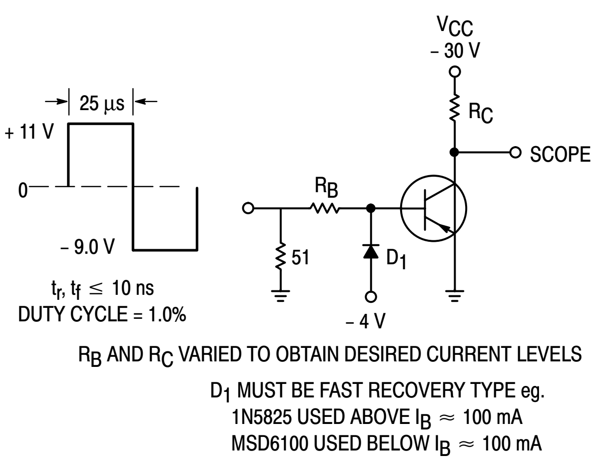


Figure 2. Switching Time Test Circuit

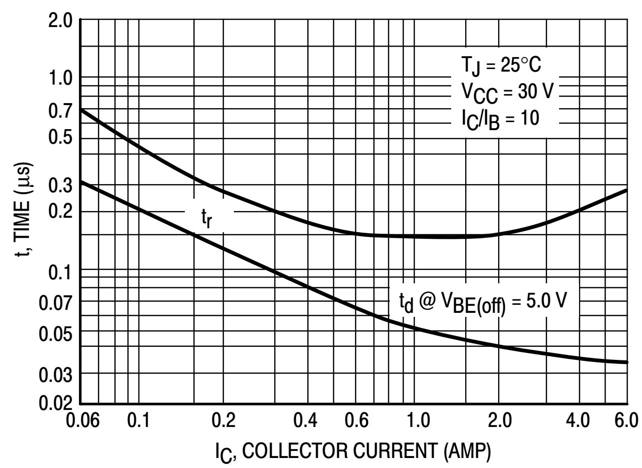


Figure 3. Turn–On Time

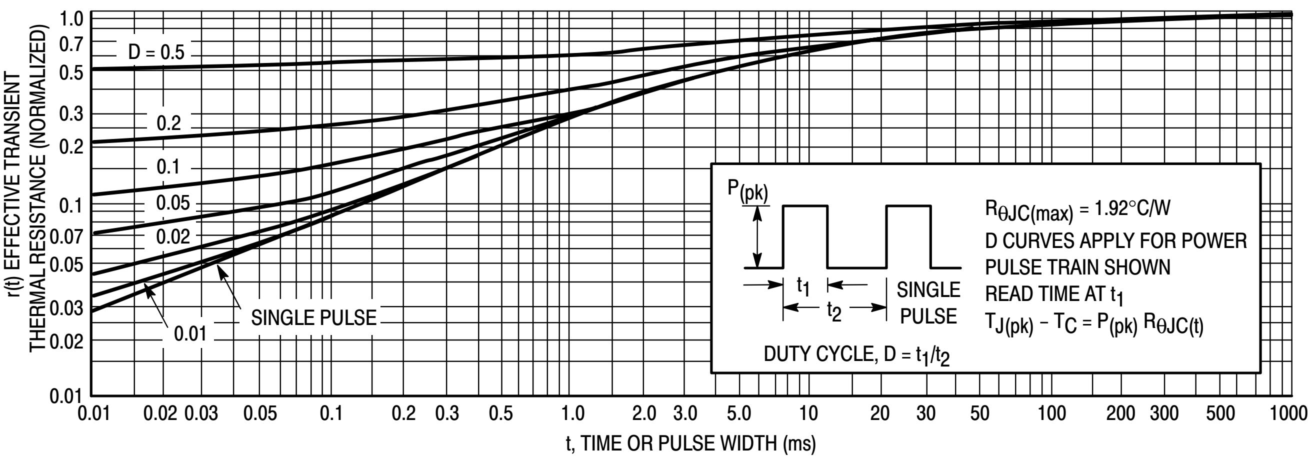


Figure 4. Thermal Response

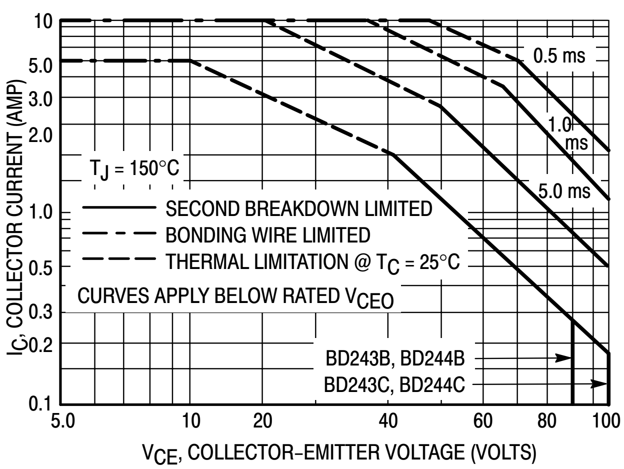


Figure 5. Active Region Safe Operating Area

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 $T_{J(pk)} = 150°C$: T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$, $T_{J(pk)}$ 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.

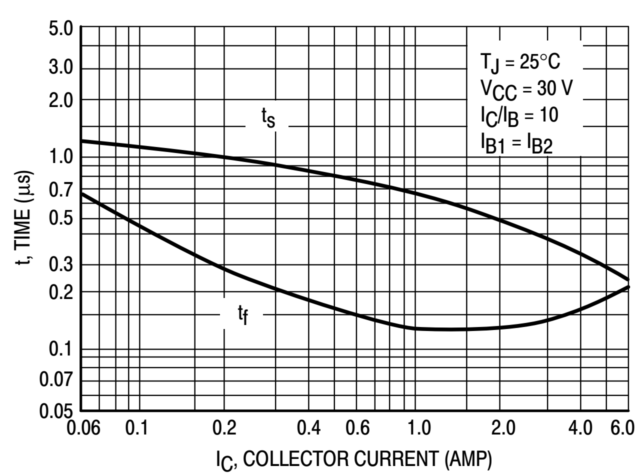


Figure 6. Turn-Off Time

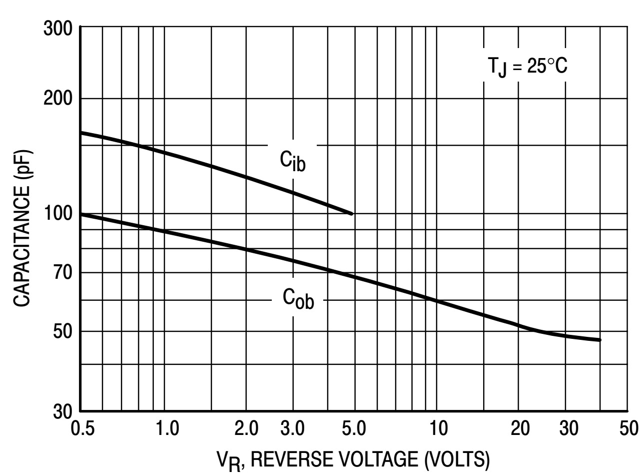


Figure 7. Capacitance

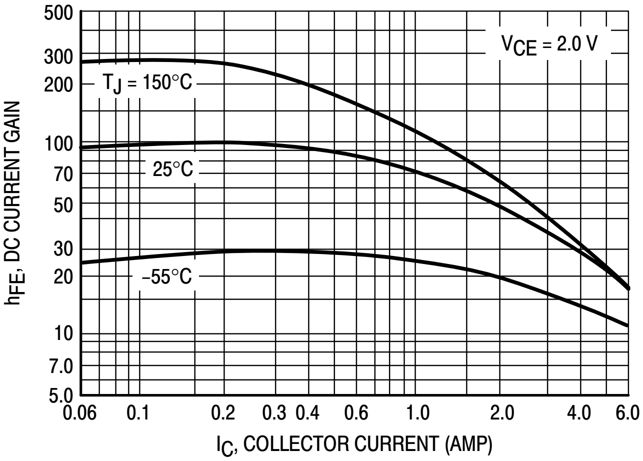


Figure 8. DC Current Gain

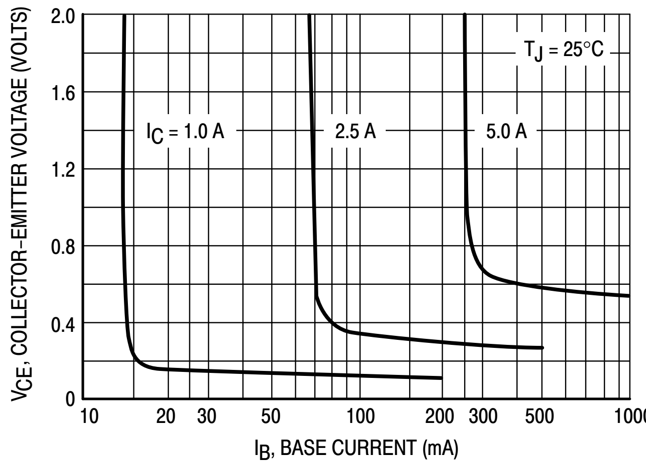


Figure 9. Collector Saturation Region

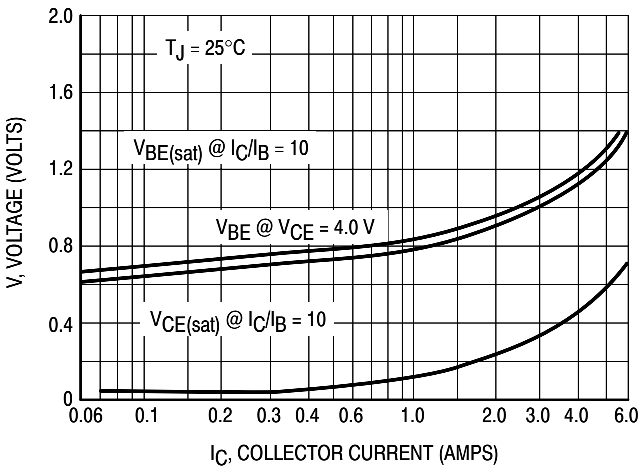


Figure 10. “On” Voltages

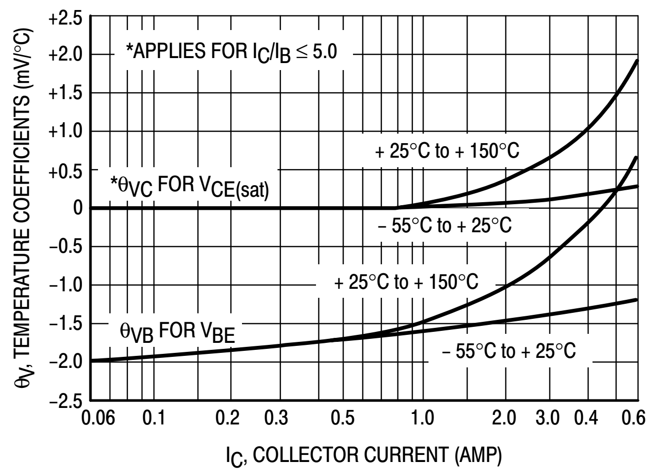


Figure 11. Temperature Coefficients

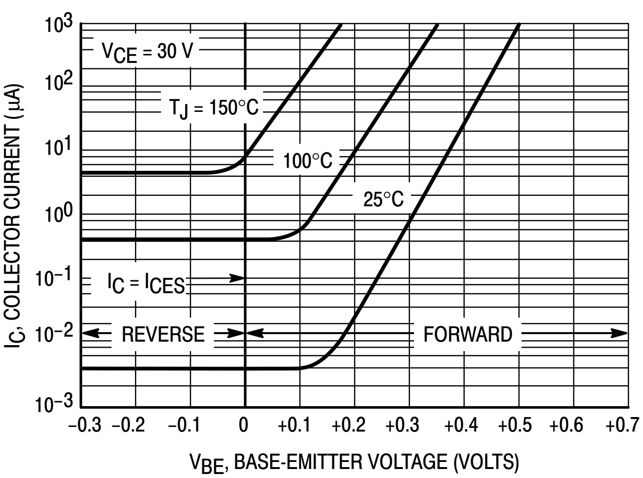


Figure 12. Collector Cut-Off Region

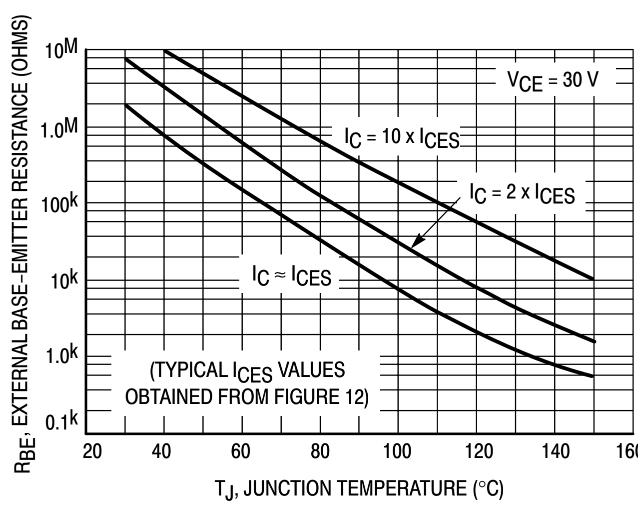
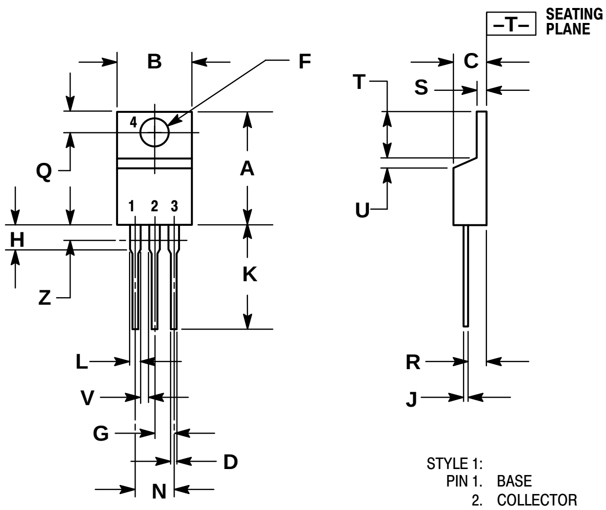


Figure 13. Effects of Base–Emitter Resistance

PACKAGE DIMENSIONS

TO–220
CASE 221A–09
ISSUE AA



STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

Notes

Notes

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local Sales Representative.