

DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS

...designed for general-purpose amplifier and low speed switching applications

FEATURES:

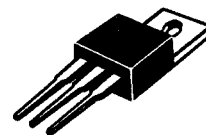
- * Collector-Emitter Sustaining Voltage-
 $V_{CE(SUS)}$ = 45 V (Min) - BDX53, BDX54
 = 60 V (Min) - BDX53A, BDX54A
 = 80 V (Min) - BDX53B, BDX54B
 = 100 V (Min) - BDX53C, BDX54C
- * Monolithic Construction with Built-in Base-Emitter Shunt Resistor

NPN	PNP
BDX53	BDX54
BDX53A	BDX54A
BDX53B	BDX54B
BDX53C	BDX54C

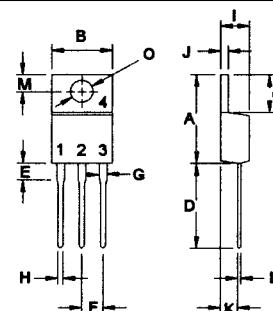
8 AMPERE
DARLINGTON
COMPLEMENTARY SILICON
POWER TRANSISTORS
45-100 VOLTS
60 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	BDX53 BDX54	BDX53A BDX54A	BDX53B BDX54B	BDX53C BDX54C	Unit
Collector-Emitter Voltage	V_{CEO}	45	60	80	100	V
Collector-Base Voltage	V_{CBO}	45	60	80	100	V
Emitter-Base Voltage	V_{EBO}	5.0				V
Collector Current - Continuous Peak	I_C I_{CM}	8.0 12				A
Base Current	I_B	0.2				A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	60 0.48				W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150				$^\circ\text{C}$



TO-220

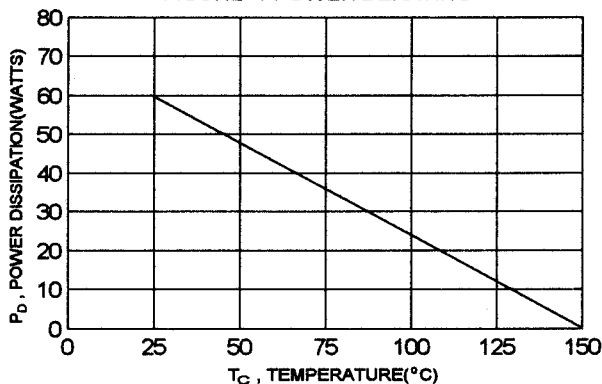


PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR (CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.08	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage(1) ($I_C = 100\text{ mA}$, $I_B = 0$)	BDX53, BDX54 BDX53A, BDX54A BDX53B, BDX54B BDX53C, BDX54C	$V_{CEO(sus)}$	45 60 80 100	V
Collector Cutoff Current ($V_{CE} = 22\text{ V}$, $I_B = 0$) ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 40\text{ V}$, $I_B = 0$) ($V_{CE} = 50\text{ V}$, $I_B = 0$)	BDX53, BDX54 BDX53A, BDX54A BDX53B, BDX54B BDX53C, BDX54C	I_{CEO}	0.5 0.5 0.5 0.5	mA
Collector-Base Cutoff Current ($V_{CB} = \text{Rated } V_{CB}$, $I_E = 0$)		I_{CBO}	200	μA
Emitter-Base Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)		I_{EBO}	2.0	mA

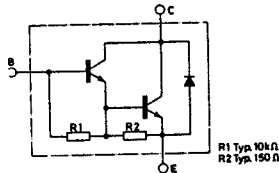
ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 3.0\text{ A}$, $V_{CE} = 3.0\text{ V}$)	h_{FE}	750		
Collector-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 12\text{ mA}$)	$V_{CE(sat)}$		2.0	V
Base-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 12\text{ mA}$)	$V_{BE(sat)}$		2.5	V
Diode Forward-Voltage ($I_F = 3.0\text{ A}$)	V_F		2.5	V

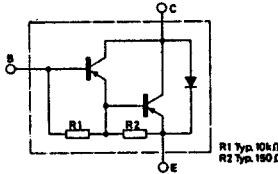
(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

INTERNAL SCHEMATIC DIAGRAM

BDX53 Series NPN



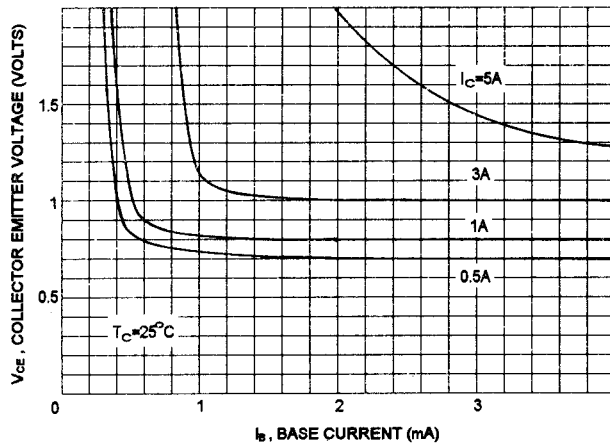
BDX54 Series PNP



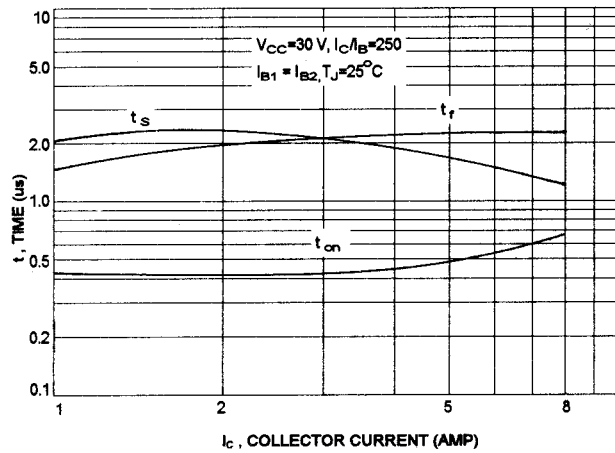
BDX53,A,B,C NPN / BDX54,A,B,C PNP

NPN BDX53,A,B,C

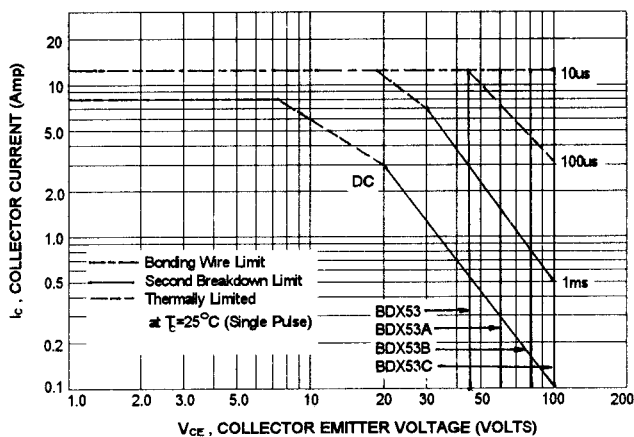
COLLECTOR SATURATION REGION



SWITCHING TIME

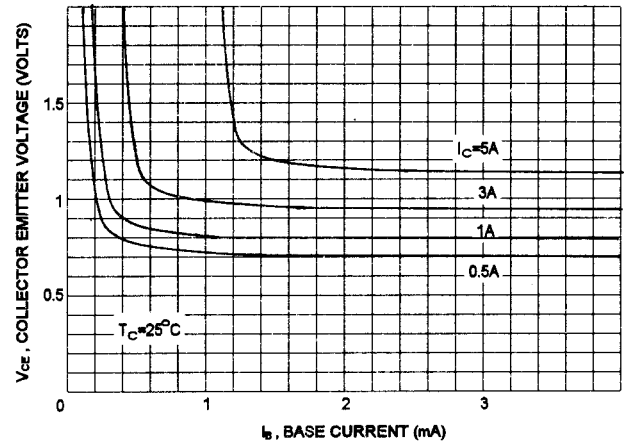


SAFE OPERATING AREA

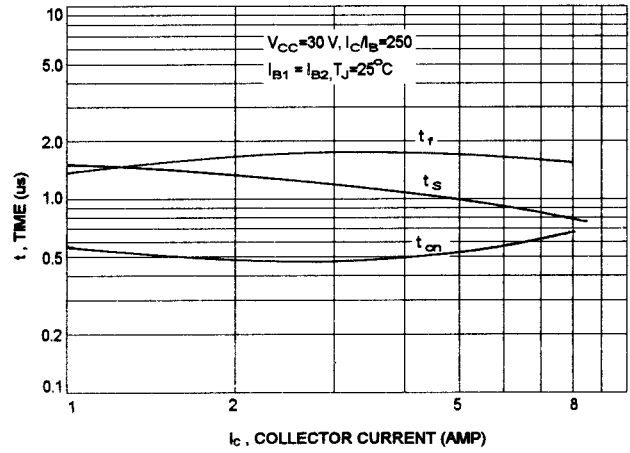


PNP BDX54,A,B,C

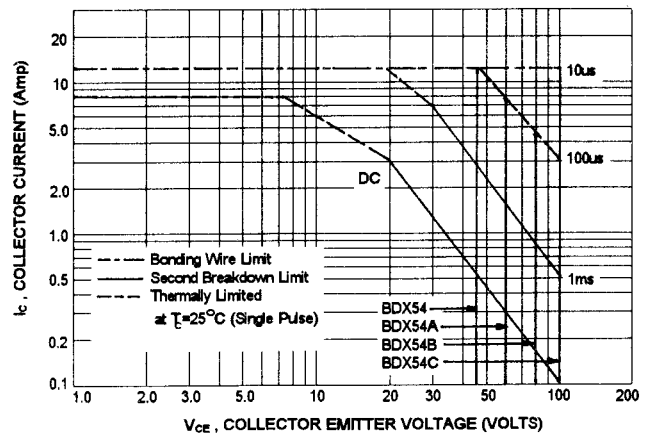
COLLECTOR SATURATION REGION



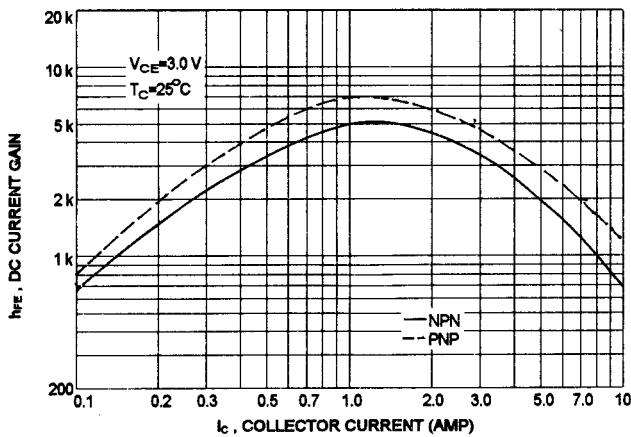
SWITCHING TIME



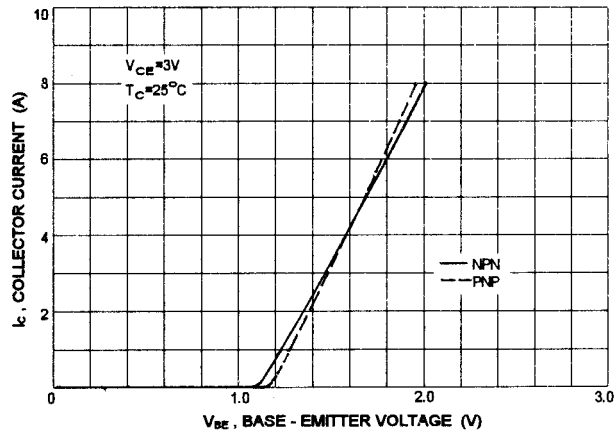
SAFE OPERATING AREA



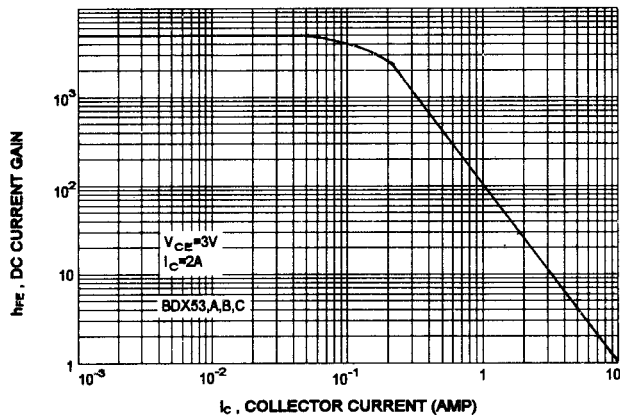
DC CURRENT GAIN



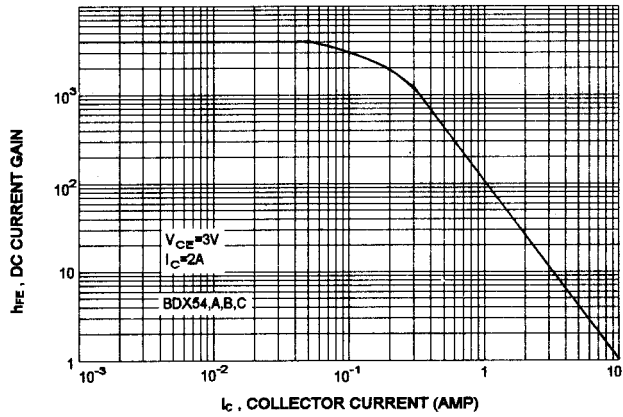
$I_C - V_{BE}$



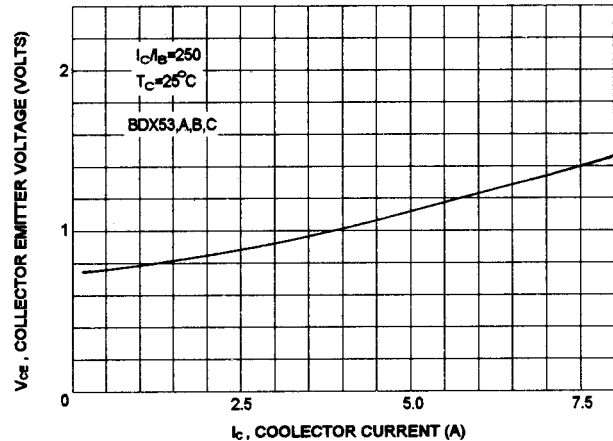
SMALL SIGNAL CURRENT GAIN



SMALL SIGNAL CURRENT GAIN



$V_{CE(sat)} - I_C$



$V_{CE(sat)} - I_C$

