

NPN PNP
BDX 63 BDX 62
BDX 63A BDX 62A
BDX 63B BDX 62B



DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS

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

- High DC Current Gain: $h_{FE} = 2500$ (Typ) at $I_C = 3.0$ Adc
- Collector Emitter Sustaining Voltage
 $V_{CE(sus)} = 60$ Vdc (Min.) – BDX 62/BDX 63
 $= 80$ Vdc (Min.) – BDX 62A/BDX 63A
 $= 100$ Vdc (Min.) – BDX 62B/BDX 63B
- Low Collector Emitter Saturation Voltage
 $V_{CE(sat)} = 2.0$ Vdc (Max.) at $I_C = 3$ Adc
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

12 AMPERE PEAK

DARLINGTON COMPLEMENTARY SILICON POWER TRANSISTORS

**60-80-100 VOLTS
 90 WATTS**

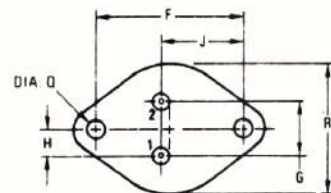
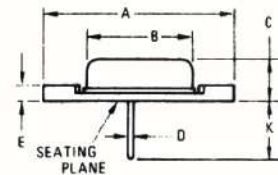
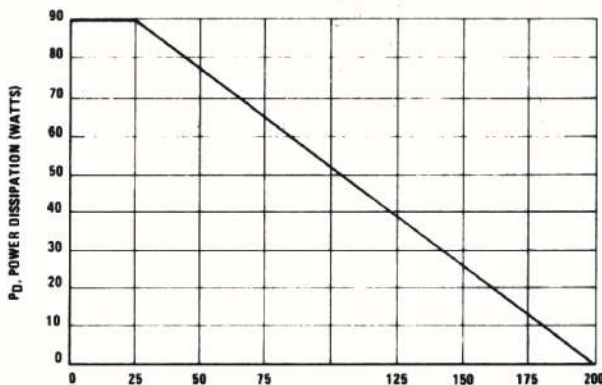
MAXIMUM RATINGS

Rating	Symbol	BDX 62 BDX 63	BDX 62A BDX 63A	BDX 62B BDX 63B	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	100	Vdc
Collector-Base Voltage	V_{CB}	60	80	100	Vdc
Emitter-Base Voltage	V_{EB}	5			Vdc
Collector Current - Continuous	I_C	8			A dc
Collector Current - Peak	I_{CM}	12			A dc
Base Current	I_B	0.5			A dc
Total Device Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	90			Watts
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to 200			$^\circ C$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.94	$^\circ C/W$

FIGURE 1 – POWER TEMPERATURE DERATING CURVE



STYLE 1:
 PIN 1: BASE
 2: EMITTER
 CASE: COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	39.37	-	1.550
B	-	21.08	-	0.830
C	6.35	7.62	0.250	0.300
D	0.99	1.09	0.039	0.043
E	-	3.43	-	0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.33	5.59	0.210	0.220
J	16.64	17.15	0.655	0.675
K	11.18	12.19	0.440	0.480
Q	3.84	4.09	0.151	0.161
R	-	26.67	-	1.050

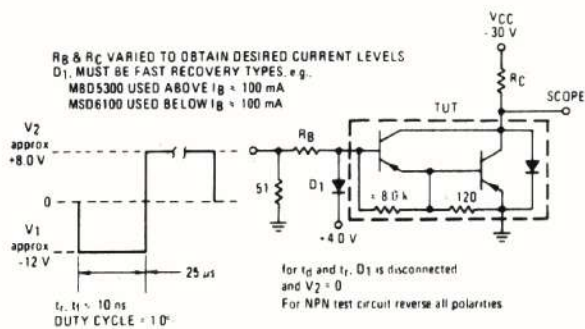
**CASE 11
 (TO-3)**

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

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (1) ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	BDX62, BDX63 BDX62A, BDX63A BDX62B, BDX63B	$V_{CE(sus)}$	60 80 100	Vdc	
Collector Cutoff Current ($V_{CE} = 30 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 40 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 50 \text{ Vdc}$, $I_B = 0$)	BDX62, BDX63 BDX62A, BDX63A BDX62B, BDX63B	I_{CEO}	— — —	0.5 0.5 0.5	mAdc
Collector Cutoff Current ($V_{CB} = \text{Rated } V_{CBO}$, $I_E = 0$) ($V_{CB} = \text{Rated } V_{CBO}$, $I_E = 0 - T_C = 150^\circ\text{C}$)		I_{CBO}	— —	0.2 2.0	mAdc
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)		I_{EBO}	—	5	mAdc
ON CHARACTERISTICS (1)					
DC Current Gain ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 3.0 \text{ Vdc}$)		h_{FE}	1000	—	—
Collector-Emitter Saturation Voltage ($I_C = 3.0 \text{ Adc}$, $I_B = 12 \text{ mAdc}$)		$V_{CE(sat)}$	—	2.0	Vdc
Base-Emitter On Voltage ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 3.0 \text{ Vdc}$)		$V_{BE(on)}$	—	2.5	Vdc

(1) Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2%.

FIGURE 2 – SWITCHING TIMES TEST CIRCUIT



For NPN test circuit, reverse all polarities

FIGURE 3 – SWITCHING TIMES

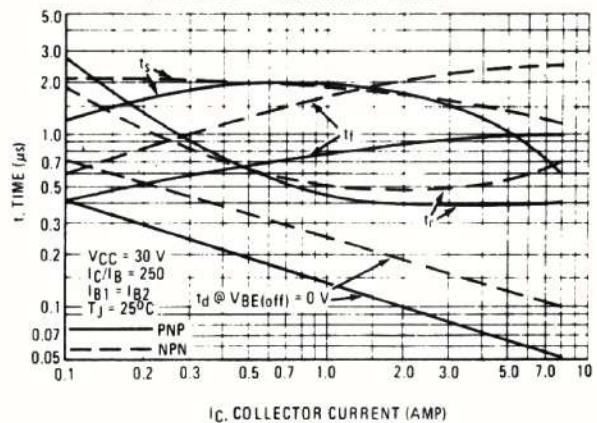


FIGURE 4 - THERMAL RESPONSE

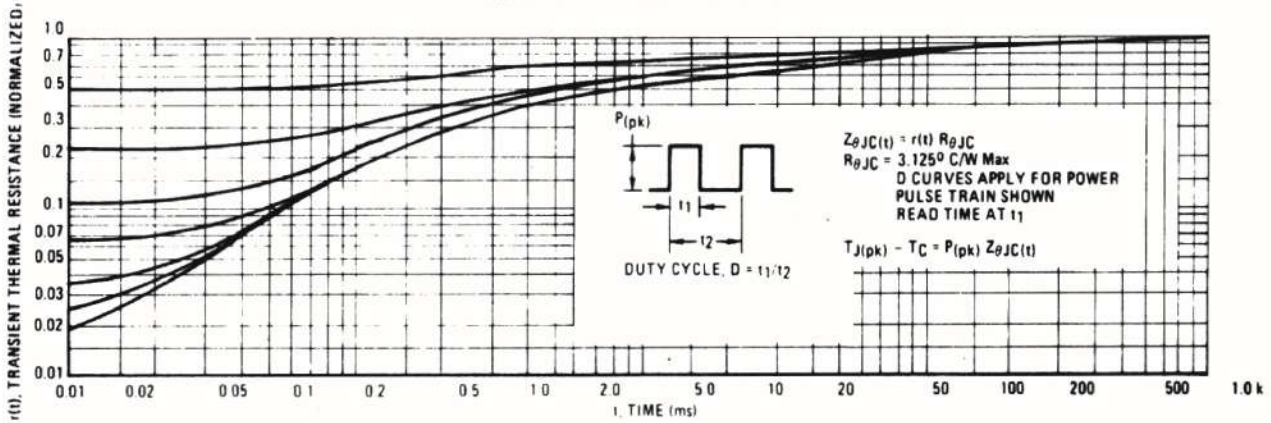
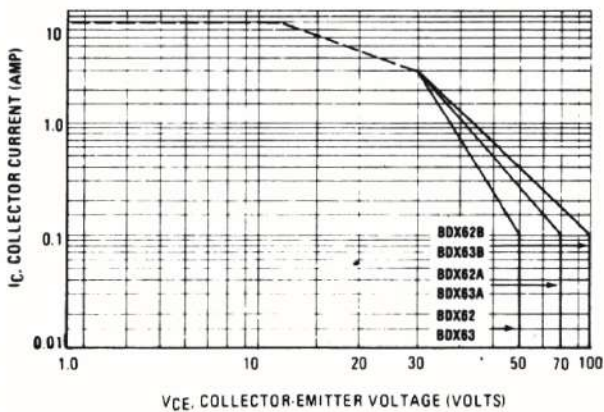


FIGURE 5 - ACTIVE-REGION SAFE OPERATING AREA



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 $T_C = 25^\circ\text{C}$; $T_{J(pk)}$ is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature.

$T_{J(pk)}$ may be calculated from the data in Figure 4. At high case temperatures, thermal limitations will reduce the current that can be handled to values less than the limitations imposed by second breakdown. Second breakdown limitations do derate the same as thermal limitations. Allowable current at the voltages shown on Figure 5 may be found at any case temperature by derating linearly to 200°C .

FIGURE 6 - SMALL-SIGNAL CURRENT GAIN

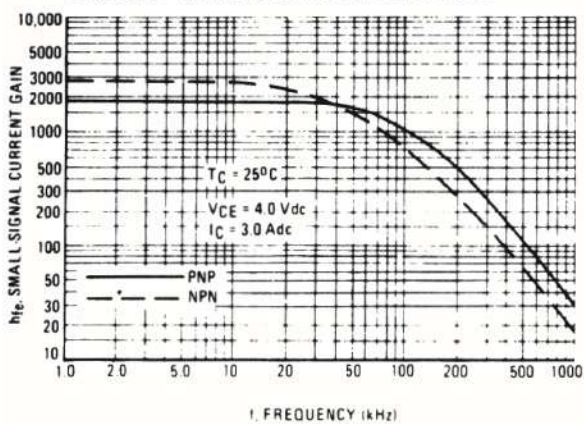
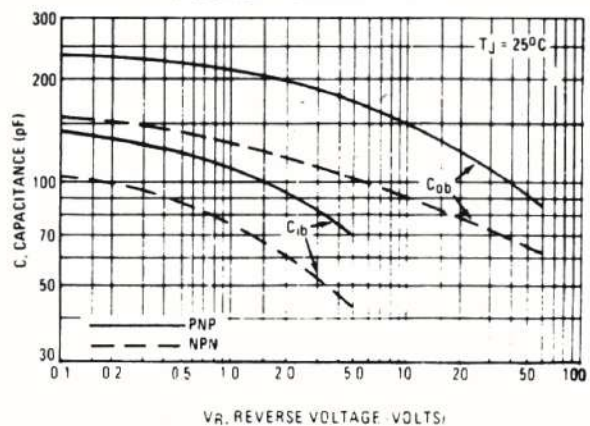


FIGURE 7 - CAPACITANCE



NPN
BDX63, BDX63A, BDX63B

PNP
BDX62, BDX62A, BDX62B

FIGURE 8 - DC CURRENT GAIN

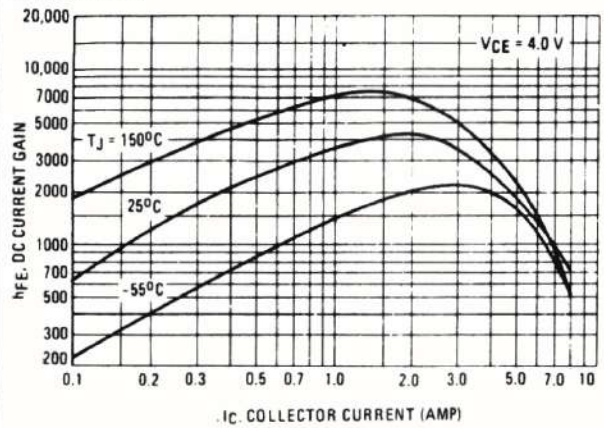
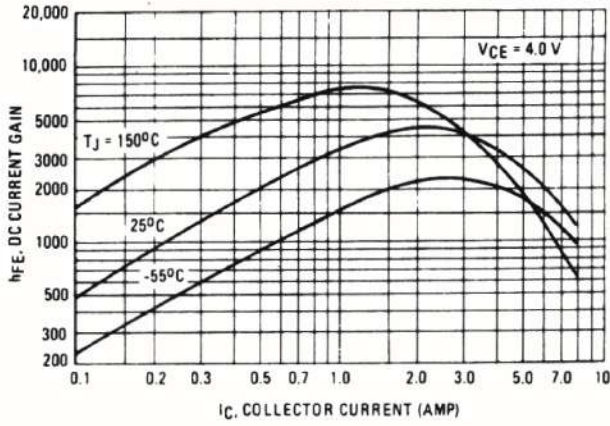


FIGURE 9 - COLLECTOR SATURATION REGION

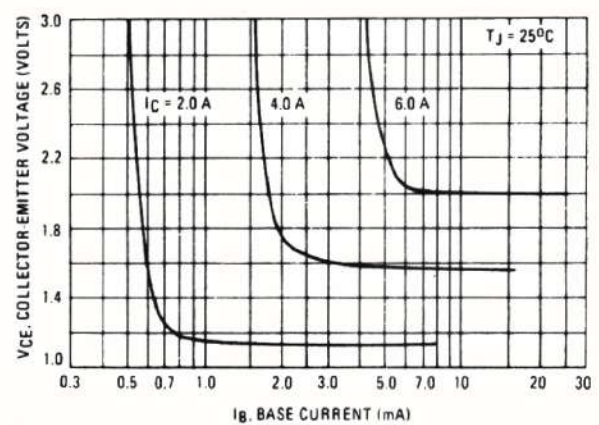
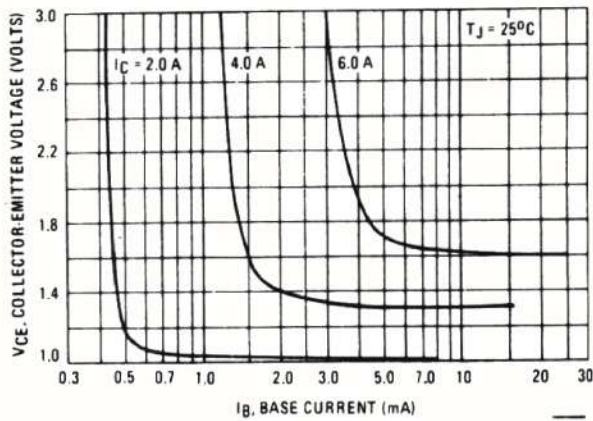
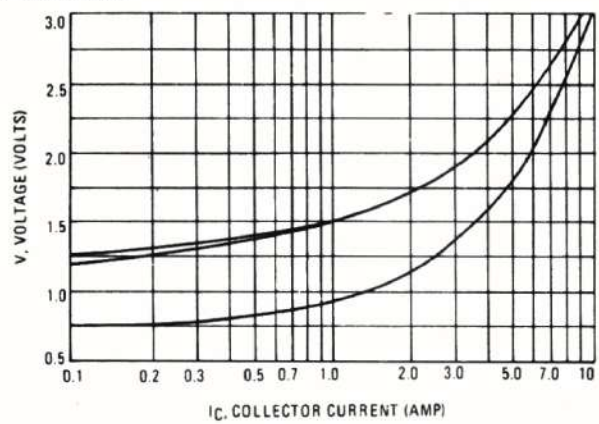
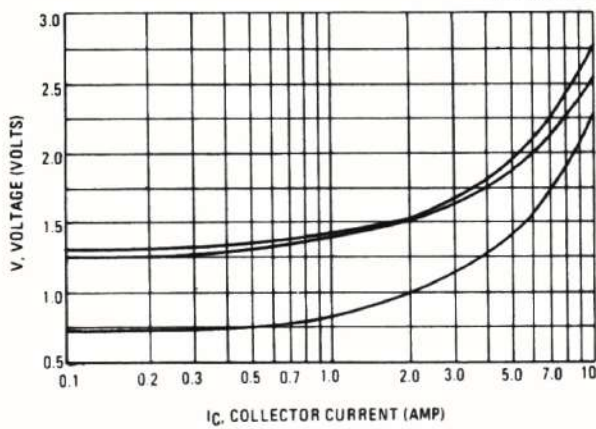


FIGURE 10 - "ON" VOLTAGES



NPN
 BDX63, BDX63A, BDX63B

PNP
 BDX62, BDX62A, BDX62B

FIGURE 11 - TEMPERATURE COEFFICIENTS

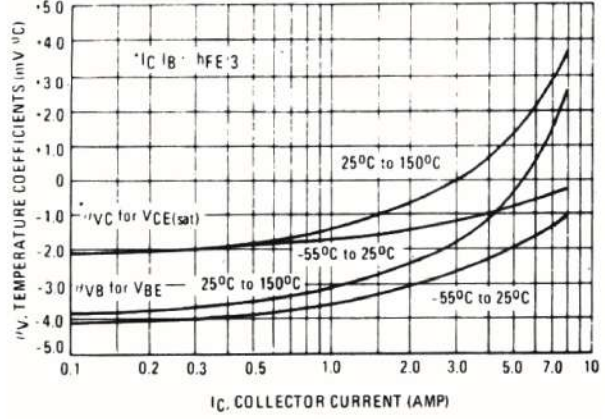
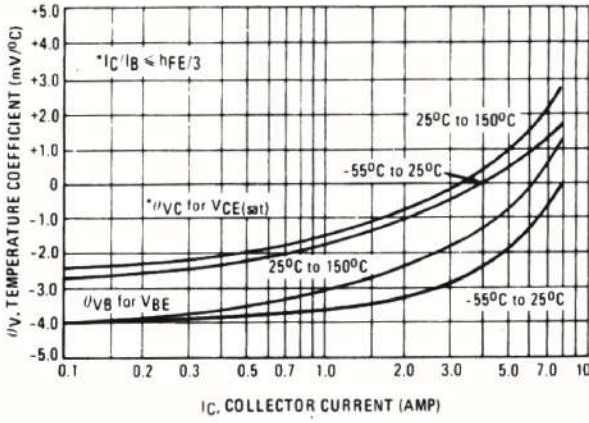


FIGURE 12 - COLLECTOR CUT-OFF REGION

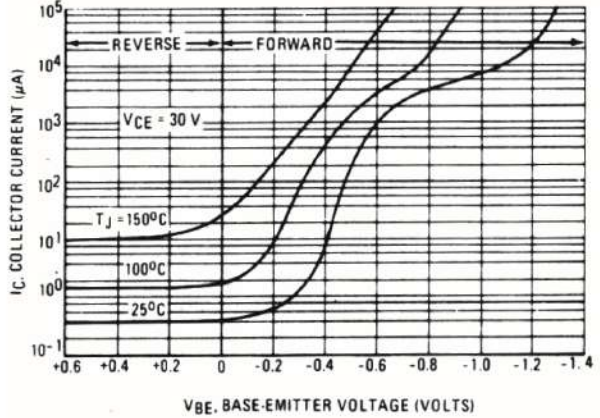
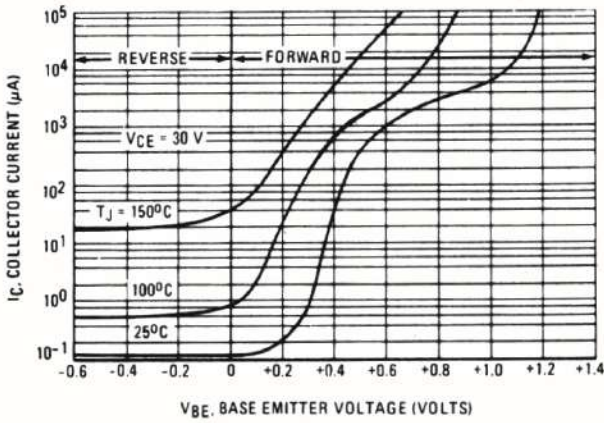


FIGURE 13 - DARLINGTON SCHEMATIC

