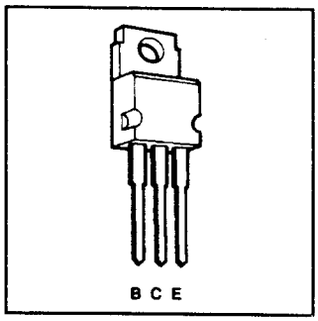
BD743, BD743A, BD743B, BD743C
NPN SILICON POWER TRANSISTORS

Revised March 1990

- **90 W at 25°C Case Temperature**
- **15 A Continuous Collector Current**
- **20 A Peak Collector Current**
- **Customer Specified Selections Available**



PACKAGE: TO220

Absolute Maximum Ratings at 25°C Case Temperature (unless otherwise noted)

		BD743	BD743A	BD743B	BD743C
V_{CBO}	Collector - base voltage (I_E = 0)	50 V	70 V	90 V	110 V
V_{CEO}	Collector - emitter voltage (I_B =0)	45 V	60 V	80 V	100 V
V_{EBO}	Base - emitter voltage	5 V			
I_C	Continuous collector current	15 A			
I_{CM}	Peak collector current (Note 1)	20 A			
I_B	Continuous base current	5 A			
P_{tot}	Continuous device dissipation at (or below) 25°C case temperature (Note 2)	90 W			
P_{tot}	Continuous device dissipation at (or below) 25°C free - air temperature (Note 3)	2 W			
$I_C^2L/2$	Unclamped inductive load energy (Note 4)	90 mJ			
T_A	Operating free - air temperature range	-65°C to + 150°C			
T_j & T_{stg}	Operating junction and storage temperature range	-65°C to + 150°C			
T_L	Lead temperature 3.2 mm from case for 10 seconds	260°C			

NOTES: 1: This value applies for $t_w \leq 0.3$ ms, duty cycle $\leq 10\%$.
2: Derate linearly to 150°C case temperature at the rate of 0.72 W/°C.
3: Derate linearly to 150°C free - air - temperature at the rate of 16 mW/°C.
4: This rating is based on the capability of the transistor to operate safely in a circuit of L = 20 mH, R_{BB2} = 100 Ω, V_{BB2} = 0 V, R_S = 0.1 Ω, V_{CC} = 20 V.

Electrical Characteristics at 25°C Case Temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	Collector - emitter sustaining voltage (Note 5)	I_C = 30 mA	I_B = 0	BD743 BD743A BD743B BD743C	45 60 80 100			V
I_{CBO}	Collector cut - off current	V_{CE} = 50 V V_{CE} = 70 V V_{CE} = 90 V V_{CE} =110 V	V_{BE} = 0 V_{BE} = 0 V_{BE} = 0 V_{BE} = 0	BD743 BD743A BD743B BD743C			0.1 0.1 0.1 0.1	mA
I_{CBO}	Collector cut - off current (T_C = 125°C)	V_{CE} = 50 V V_{CE} = 70 V V_{CE} = 90 V V_{CE} =110 V	V_{BE} = 0 V_{BE} = 0 V_{BE} = 0 V_{BE} = 0	BD743 BD743A BD743B BD743C			5 5 5 5	mA
I_{CEO}	Collector cut - off current	V_{CE} = 30 V V_{CE} = 60 V	I_B = 0 I_B = 0	BD743/743A BD743B/743C			0.1 0.1	mA
I_{EBO}	Emitter cut - off current	V_{EB} = 5 V	I_C = 0				0.5	mA
h_{FE}	Forward current transfer ratio	V_{CE} = 4 V V_{CE} = 4 V V_{CE} = 4 V	I_C = 1 A I_C = 5 A I_C= 15 A	(Notes 5 & 6)	40 20 5		150	
$V_{CE(sat)}$	Collector - emitter saturation voltage	I_B = 0.5 A I_B = 5 A	I_C = 5 A I_C= 15 A	(Notes 5 & 6)			1 3	V
V_{BE}	Base - emitter voltage	V_{CE} = 4 V V_{CE} = 4 V	I_C = 5 A I_C =15 A	(Notes 5 & 6)			1 3	V

Electrical Characteristics at 25°C Case Temperature (continued)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
h_{fe}	Small signal forward current transfer ratio	V_{CE} = 10 V I_C = 1A f = 1kHz	25			
$\|h_{fe}\|$	Small signal forward current transfer ratio	V_{CE} = 10 V I_C = 1A f = 1MHz	5			

Thermal Characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction - to - case thermal resistance			1.4	°C/W
$R_{\theta JA}$	Junction - to - free - air thermal resistance			62.5	°C/W

Resistive - Load - Switching characteristics at 25°C Case Temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS†	MIN	TYP	MAX	UNIT
t_d	Delay time	I_C = 5A $I_{B(on)}$ = 500mA $I_{B(off)}$ = -500mA $V_{BE(off)}$ = -4.2V R_L = 6 Ω		20		ns
t_r	Rise time			350		ns
t_s	Storage time			500		ns
t_f	Fall time			400		ns

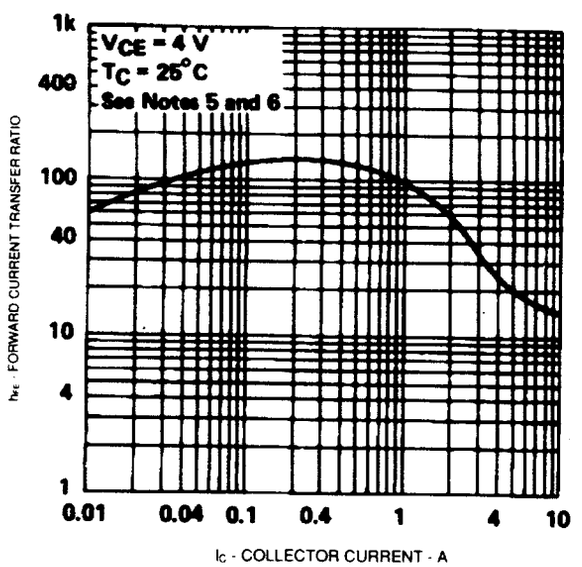
† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

NOTES: 5: These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle ≤ 2%

6: These parameters must be measured using voltage sensing contacts separate from the current - carrying contacts.

TYPICAL CHARACTERISTICS

FORWARD CURRENT TRANSFER RATIO vs COLLECTOR CURRENT



MAXIMUM FORWARD - BIAS SAFE OPERATING AREA