

DARLINGTON SILICON POWER TRANSISTORS

...designed for general-purpose amplifier, hammer drive, pulse motor drive and low speed switching, applications.

FEATURES:

- * Collector-Emitter Sustaining Voltage-

$$V_{CE0(sus)} = 60 \text{ V (Min) - 2SD635}$$

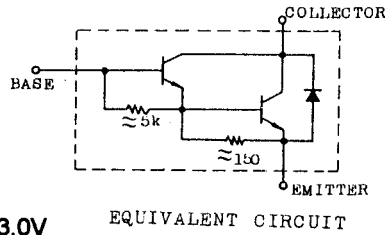
$$= 80 \text{ V (Min) - 2SD634}$$

$$= 100 \text{ V (Min) - 2SD633}$$

- * Collector-Emitter Saturation Voltage

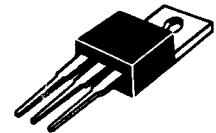
$$V_{CE(sat)} = 2.0 \text{ V (Max.) @ } I_C = 7.0 \text{ A, } I_B = 14 \text{ mA}$$

- * DC Current Gain $h_{FE} = 2000(\text{Min}) @ I_C = 3.0 \text{ A, } V_{CE} = 3.0 \text{ V}$



NPN
2SD633
2SD634
2SD635

7 AMPERE
DARLINGTON
POWER TRANSISTORS
NPN SILICON
60-100 VOLTS
40 WATTS



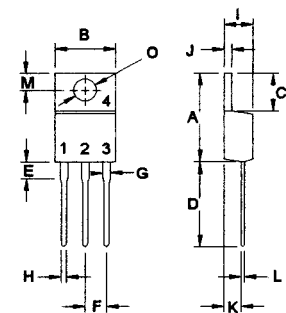
TO-220

MAXIMUM RATINGS

Characteristic	Symbol	2SD635	2SD634	2SD633	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	100	V
Collector-Base Voltage	V_{CBO}	60	80	100	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-Continuous -Peak	I_C I_{CM}	7.0 10			A
Base Current	I_B	0.2			A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	40 0.32			W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS

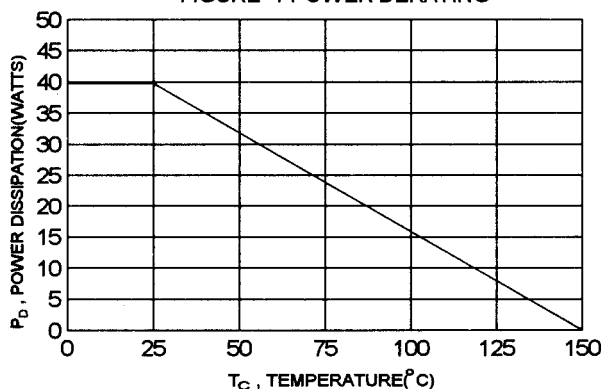
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	3.125	$^\circ\text{C/W}$



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

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

FIGURE -1 POWER DERATING



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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector - Emitter Breakdown Voltage ($I_c = 50 \text{ mA}, I_B = 0$)	2SD633 2SD634 2SD635	$V_{(BR)CEO}$	100 80 60	V
Collector Cutoff Current ($V_{CE} = 100 \text{ V}, I_E = 0$) ($V_{CE} = 80 \text{ V}, I_E = 0$) ($V_{CE} = 60 \text{ V}, I_E = 0$)	2SD633 2SD634 2SD635	I_{CBO}	100 100 100	μA
Emitter Cutoff Current ($V_{EB} = 5.0 \text{ V}, I_C = 0$)		I_{EBO}	3.0	mA

ON CHARACTERISTICS (1)

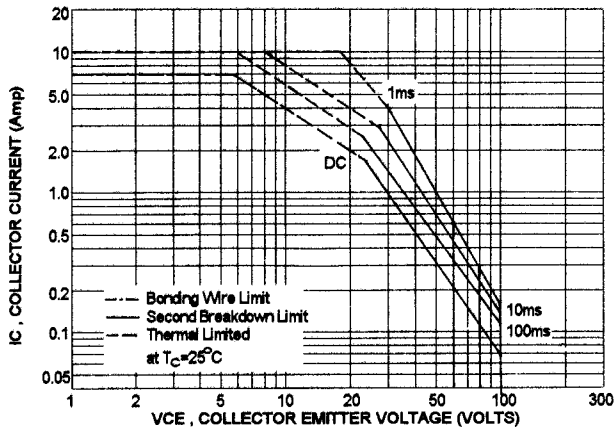
DC Current Gain ($I_c = 3.0 \text{ A}, V_{CE} = 3.0 \text{ V}$) ($I_c = 7.0 \text{ A}, V_{CE} = 3.0 \text{ V}$)		hFE	2000 1000	15000	
Collector-Emitter Saturation Voltage ($I_c = 3.0 \text{ A}, I_B = 6.0 \text{ mA}$) ($I_c = 7.0 \text{ A}, I_B = 14 \text{ mA}$)		$V_{CE(sat)}$		1.5 2.0	V
Base-Emitter On Voltage ($I_c = 3.0 \text{ A}, I_B = 6.0 \text{ mA}$)		$V_{BE(sat)}$		2.5	V

SWITCHING CHARACTERISTICS

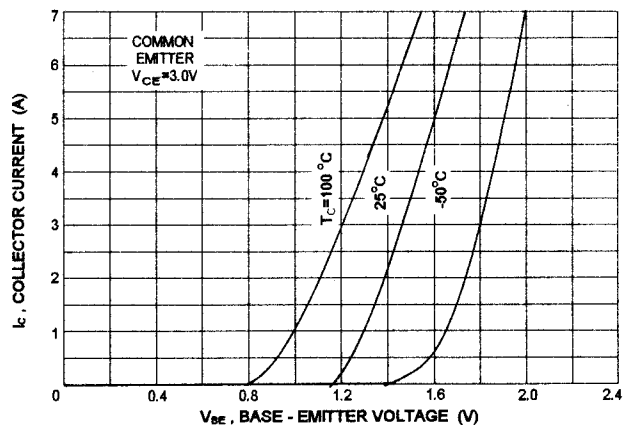
On Time	$I_c = 3.0 \text{ A}, V_{CC} = 45 \text{ V}$ $I_{B1} = -I_{B2} = 6.0 \text{ mA}$ PW= 20 μs , Duty<1%	t_{on}	1.2	μs
Storage Time		t_s	3.5	μs
Fall Time		t_f	3.0	μs

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

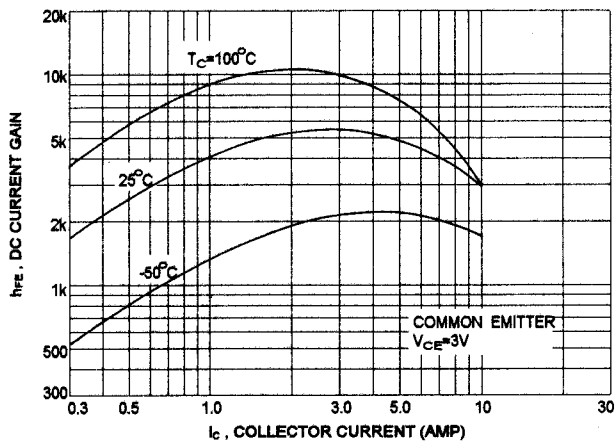
SAFE OPERATING AREA



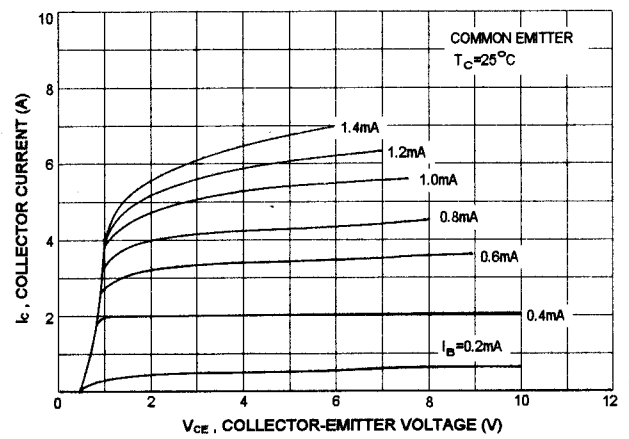
$I_C - V_{BE}$



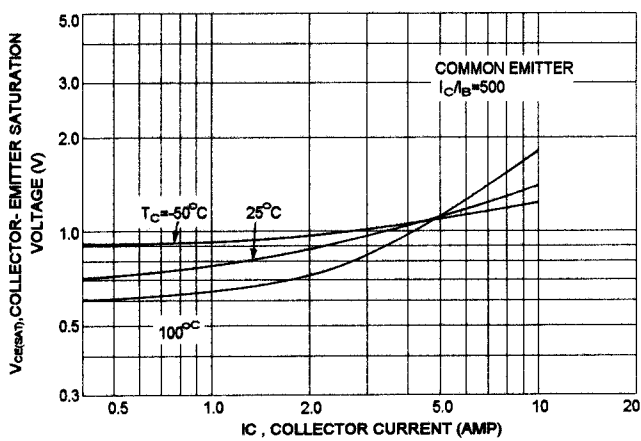
DC CURRENT GAIN



$I_C - V_{CE}$



$V_{CE(sat)} - I_C$



$V_{BE(sat)} - I_C$

