

SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching applications such as switching regulator's, inverters, and conveter.

FEATURES:

*Collector-Emitter Sustaining Voltage-

$$V_{CE(sus)} = 800 \text{ V (Min)}$$

* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 2.0 \text{ V (Max.) @ } I_C = 1.5 \text{ A, } I_B = 0.3 \text{ A}$$

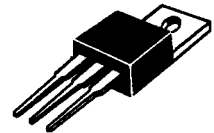
* Switching Time - $t_f = 0.7 \text{ us (Max.) @ } I_C = 2.0 \text{ A}$

NPN
2SC3150

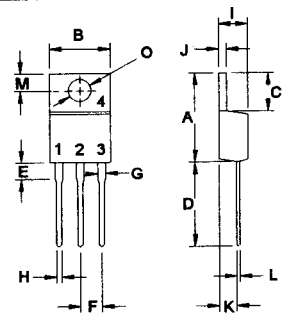
3 AMPERE
SILICON POWER
TRANSISTORS
800 VOLTS
50 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	2SC3150	Unit
Collector-Emitter Voltage	V_{CEO}	800	V
Collector-Base Voltage	V_{CBO}	900	V
Emitter-Base Voltage	V_{EBO}	7.0	V
Collector Current - Continuous	I_C	3.0	A
- Peak	I_{CM}	10	
Base current	I_B	1.5	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	50 0.4	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$



TO-220



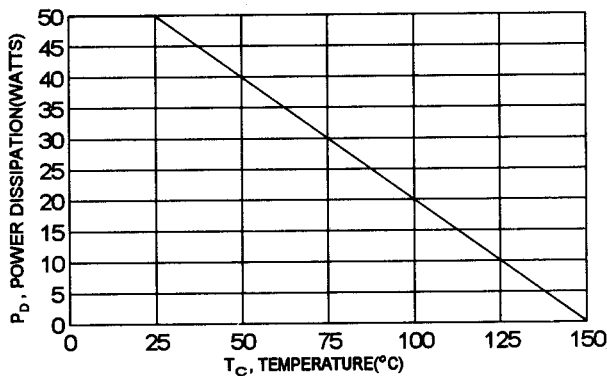
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR(CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.5	$^\circ\text{C/W}$

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 Sustaining Voltage ($I_C = 3.0\text{ A}$, $I_B = 1.0\text{ A}$, $L = 500\text{ }\mu\text{H}$)	$V_{\text{CEO(sus)}}$	800		V
Collector-Emitter Breakdown Voltage ($I_C = 5.0\text{ mA}$, $I_B = 0$)	$V_{\text{(BR)CEO}}$	800		V
Collector-Base Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_E = 0$)	$V_{\text{(BR)CBO}}$	900		V
Emitter-Base Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_C = 0$)	$V_{\text{(BR)EBO}}$	7.0		V
Collector Cutoff Current ($V_{\text{CB}} = 800\text{ V}$, $I_E = 0$)	I_{CBO}		10	μA
Emitter Cutoff Current ($V_{\text{EB}} = 5.0\text{ V}$, $I_C = 0$)	I_{EBO}		10	μA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 0.2\text{ A}$, $V_{\text{CE}} = 5.0\text{ V}$) * ($I_C = 1.0\text{ A}$, $V_{\text{CE}} = 5.0\text{ V}$)	$h_{\text{FE}(2)}$ h_{FE}	10 8.0	40	
Collector-Emitter Saturation Voltage ($I_C = 1.5\text{ A}$, $I_B = 300\text{ mA}$)	$V_{\text{CE(sat)}}$		2.0	V
Base-Emitter Saturation Voltage ($I_C = 1.5\text{ A}$, $I_B = 300\text{ mA}$)	$V_{\text{BE(sat)}}$		1.5	V

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 0.2\text{ A}$, $V_{\text{CE}} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	f_T	7.0		MHz
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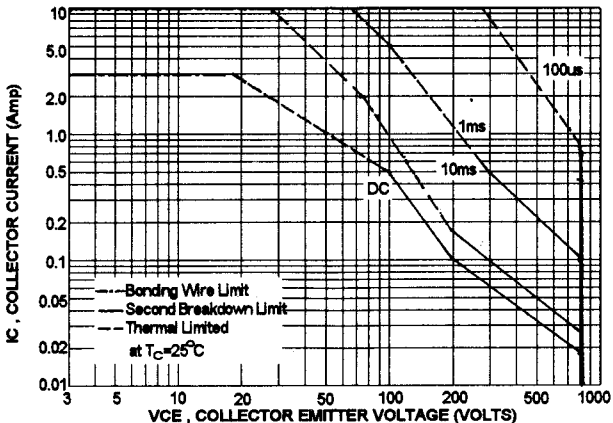
SWITCHING CHARACTERISTICS

On Time	$V_{\text{CC}} = 400\text{ V}$, $I_C = 2.0\text{ A}$ $I_{\text{B1}} = 0.4\text{ A}$, $I_{\text{B2}} = -0.8\text{ A}$ $R_L = 200\text{ }\Omega$	t_{on}	1.0	μs
Storage Time		t_s	3.0	μs
Fall Time		t_f	0.7	μs

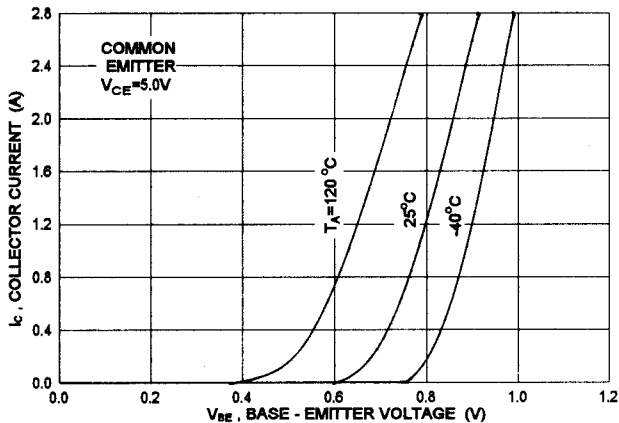
(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$ * $h_{\text{FE}(2)}$ Classification:

10	K	20	15	L	30	20	M	40
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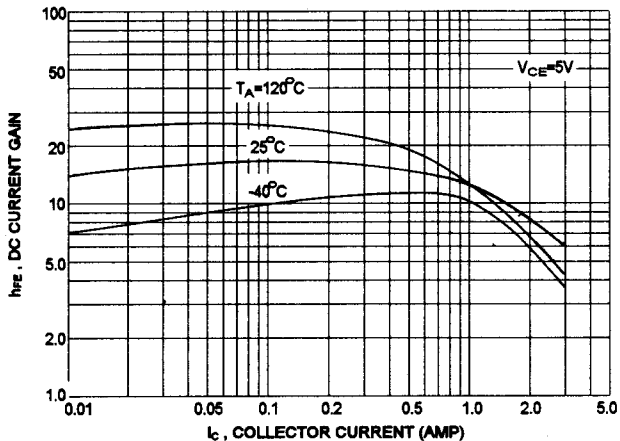
SAFE OPERATING AREA



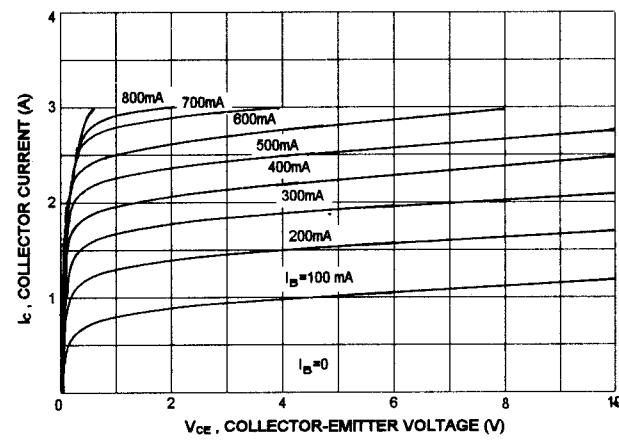
$I_C - V_{BE}$



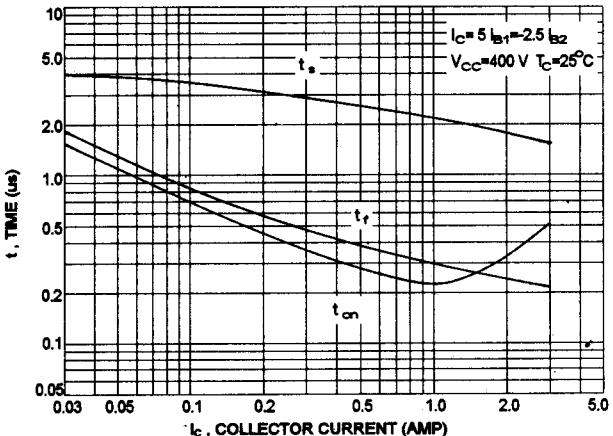
DC CURRENT GAIN



$I_C - V_{CE}$



SWITCHING TIME



"ON" VOLTAGES

