

SWITCHMODE SERIES NPN SILICON POWER TRANSISTORS

These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. They are particularly suit for 115 and 220 V SWITCHMODE applications such as Switching Regulators, Inverters

FEATURES:

- * Collector-Emitter Sustaining Voltage-
 $V_{CEO(sus)} = 500V(\text{Min})$
- * SOA and Switching Application Information.

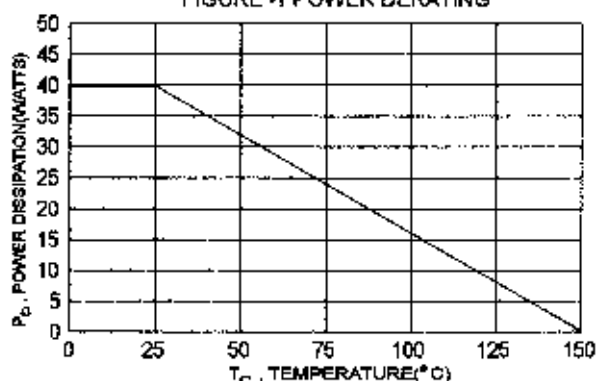
MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	500	V
Collector-Base Voltage	V_{CBO}	800	V
Emitter-Base Voltage	V_{EBO}	7.0	V
Collector Current - Continuous -peak	I_C I_{CM}	3.0 6.0	A
Base Current - Continuous	I_B	1.0	A
Total Power Dissipation@ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	40 320	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

FIGURE -1 POWER DERATING

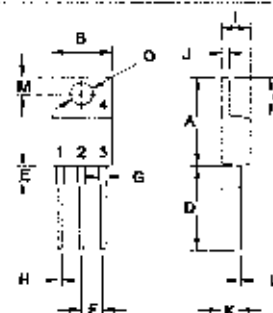


NPN
2SC3086

3 AMPERE
SILICON POWER
TRANSISTORS
500 VOLTS
40 WATTS



TO-220



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

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.32
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 Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_E = 0$)	$V_{(BR)CEO}$	500		V
Collector-Base Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	800		V
Emitter-Base Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	7.0		V
Collector Cutoff Current ($V_{CE} = 500\text{ V}$, $I_E = 0$)	I_{CBO}		10	μA
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)	I_{EBO}		10	μA

ON CHARACTERISTICS (1)

DC Current Gain ($V_{CE} = 5.0\text{ V}$, $I_C = 0.3\text{ A}$) ($V_{CE} = 5.0\text{ V}$, $I_C = 1.5\text{ A}$)	$h_{FE(2)}$ h_{FE}	15 8.0	50	
Collector-Emitter Saturation Voltage ($I_C = 1.5\text{ A}$, $I_B = 0.3\text{ A}$)	$V_{CE(sat)}$		1.0	V
Base-Emitter Saturation Voltage ($I_C = 1.5\text{ A}$, $I_B = 0.3\text{ A}$)	$V_{BE(sat)}$		1.5	V

DYNAMIC CHARACTERISTICS

Current-Gain Bandwidth Product ($I_C = 300\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ MHz}$)	f_T	5.0		MHz
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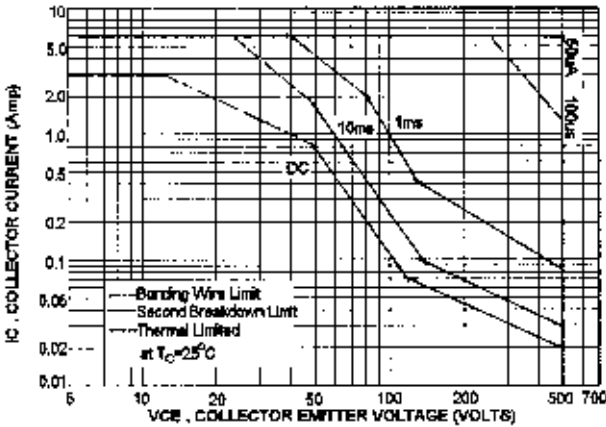
SWITCHING CHARACTERISTICS

Turn On Time	$V_{CC} = 200\text{ V}$, $I_C = 2.0\text{ A}$ $I_{B1} = -I_{B2} = 0.3\text{ A}$ $R_L = 100\text{ ohm}$	t_{on}	1.0	μs
Storage Time		t_s	3.0	μs
Fall Time		t_f	1.0	μs

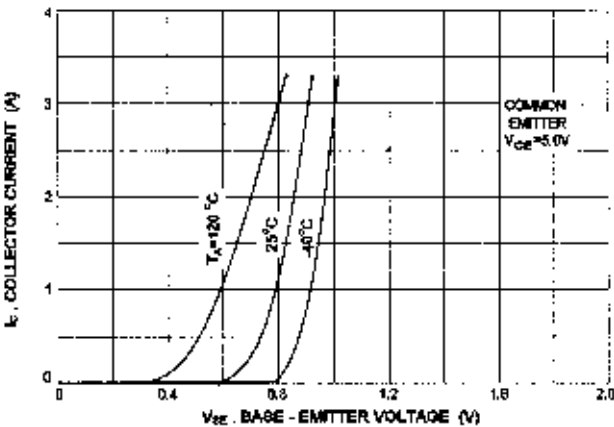
(1) Pulse Test: Pulse width $\approx 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$ * $h_{FE(2)}$ Classification:

15	L	30	20	M	40	30	N	50
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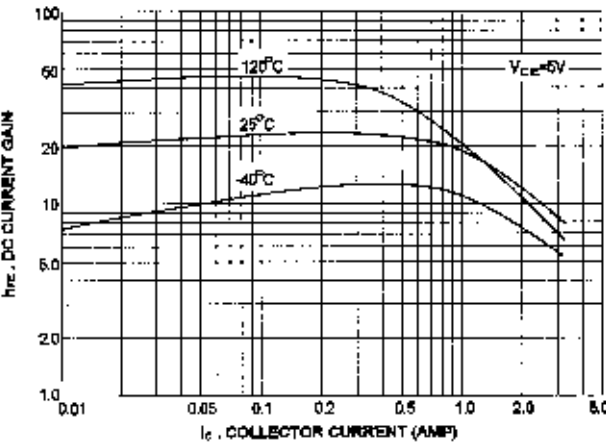
SAFE OPERATING AREA



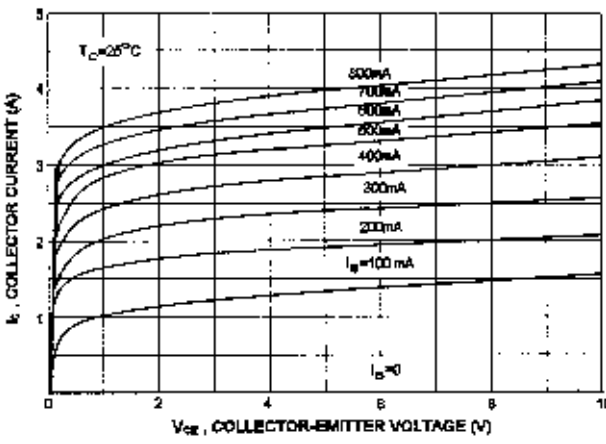
$I_C - V_{BE}$



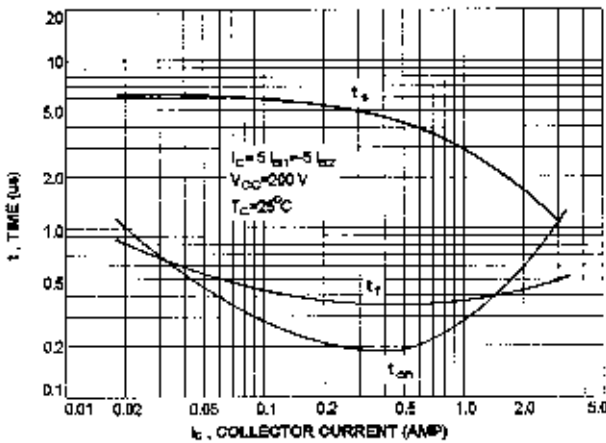
DC CURRENT GAIN



$I_C - V_{CE}$



SWITCHING TIME



"ON" VOLTAGES

