

COMPLEMENTARY SILICON HIGH-POWER TRANSISTORS

General-purpose power amplifier and switching applications

FEATURES:

- * Low Collector-Emitter Saturation Voltage -
 $V_{CE(SAT)} = 1.0V(\text{Max.}) @ I_C = 5.0A$
- * Excellent DC Current Gain -
 $hFE = 20 \sim 100 @ I_C = 4.0 A$

MAXIMUM RATINGS

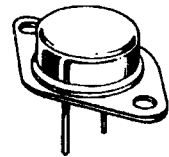
Characteristic	Symbol	2N5875 2N5877	2N5876 2N5878	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	V
Collector-Base Voltage	V_{CBO}	60	80	V
Emitter-Base Voltage	V_{EBO}	5.0		V
Collector Current-Continuous -Peak	I_C I_{CM}	10 20		A
Base Current	I_B	4.0		A
Total Power Dissipation@ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	150 0.857		W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +200		$^\circ C$

THERMAL CHARACTERISTICS

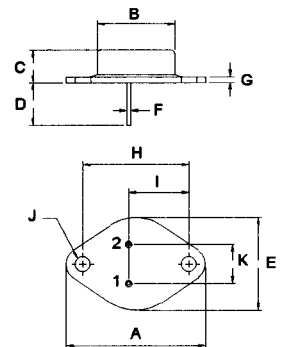
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.17	$^\circ C/W$

PNP	NPN
2N5875	2N5877
2N5876	2N5878

10 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
60 - 80 Volts
150 Watts



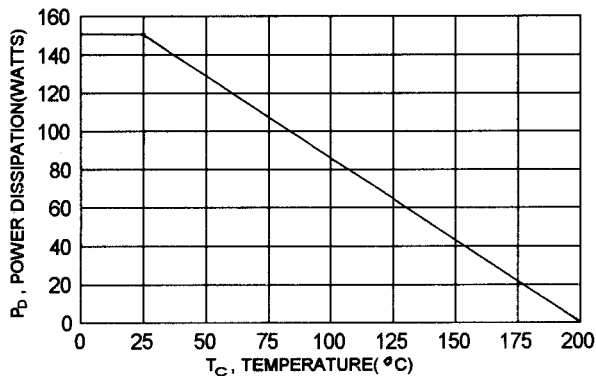
TO-3



PIN 1. BASE
2. EMITTER
COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

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 (1) ($I_c = 200\text{ mA}$, $I_B = 0$)	2N5875, 2N5877 2N5876, 2N5878	$V_{CE(sus)}$	60 80	V
Collector Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) ($V_{CE} = 40\text{ V}$, $I_B = 0$)	2N5875, 2N5877 2N5876, 2N5878	I_{CEO}	1.0 1.0	mA
Collector Cutoff Current ($V_{CE} = 60\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 80\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 60\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_c = 150^\circ\text{C}$) ($V_{CE} = 80\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_c = 150^\circ\text{C}$)	2N5875, 2N5877 2N5876, 2N5878 2N5875, 2N5877 2N5876, 2N5878	I_{CEX}	0.5 0.5 5.0 5.0	mA
Collector Cutoff Current ($V_{CB} = 60\text{ V}$, $I_E = 0$) ($V_{CB} = 80\text{ V}$, $I_E = 0$)	2N5875, 2N5877 2N5876, 2N5878	I_{CBO}	0.5 0.5	mA
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)		I_{EBO}	1.0	mA

ON CHARACTERISTICS (1)

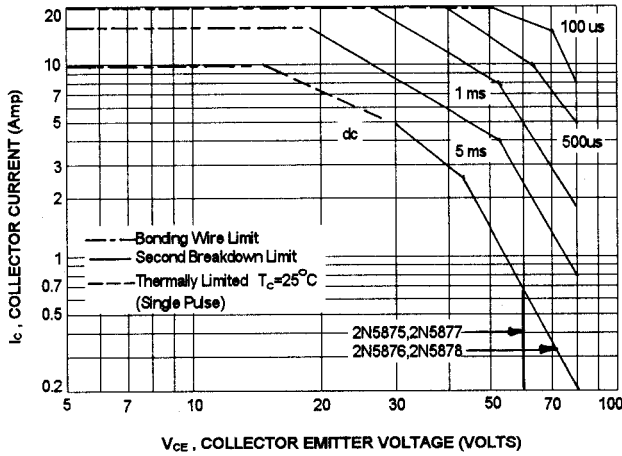
DC Current Gain ($I_c = 1.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_c = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_c = 10\text{ A}$, $V_{CE} = 4.0\text{ V}$)	h_{FE}	35 20 4.0	100	
Collector-Emitter saturation Voltage ($I_c = 5.0\text{ A}$, $I_B = 0.5\text{ A}$) ($I_c = 10\text{ A}$, $I_B = 2.5\text{ A}$)	$V_{CE(sat)}$		1.0 3.0	V
Base-Emitter On Voltage ($I_c = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$)	$V_{BE(on)}$		1.5	V
Base-Emitter Saturation Voltage ($I_c = 10\text{ A}$, $I_B = 2.5\text{ A}$)	$V_{BE(sat)}$		2.5	V

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product (2) ($I_c = 0.5\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	f_T	4.0		MHz
Small-Signal Current Gain ($I_c = 1.0\text{ A}$, $V_{CE} = 4.0\text{ V}$, $f = 1.0\text{ KHz}$)	h_{fe}	20		

(1) Pulse Test: Pulse width $\leq 300\text{ us}$, Duty Cycle $\leq 2.0\%$ (2) $f_T = |h_{fe}| \cdot f_{test}$

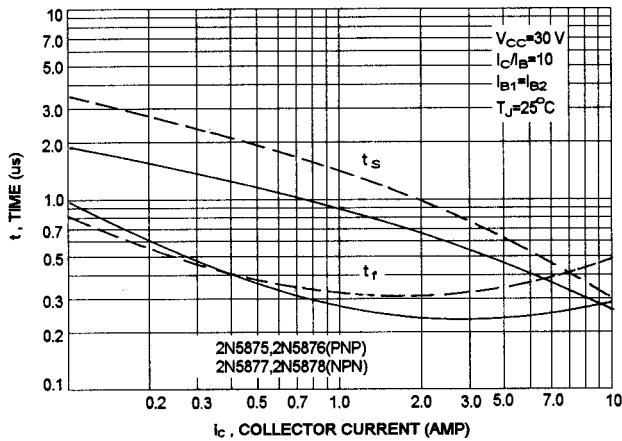
ACTIVE-REGION SAFE OPERATING AREA (SOA)



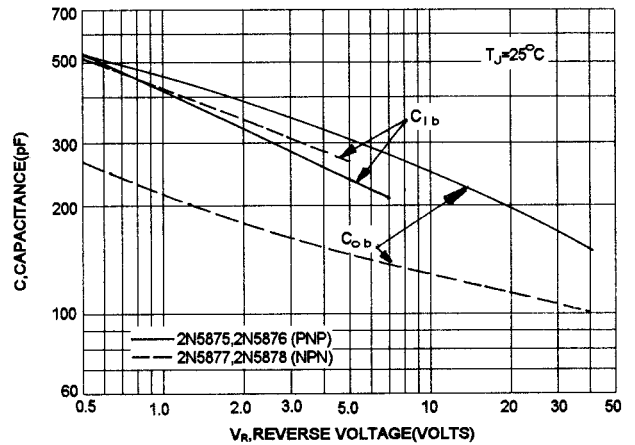
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on $T_{J(PK)} = 200^\circ\text{C}$; T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 200^\circ\text{C}$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

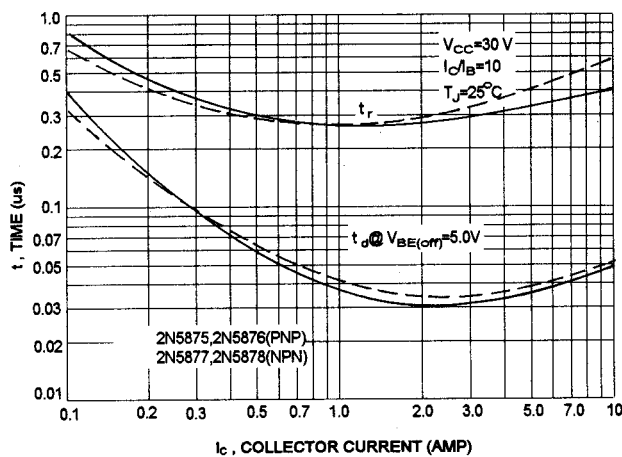
TURN-OFF TIME



CAPACITANCES



TURN-ON TIME



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