

## PLASTIC MEDIUM- POWER SILICON TRANSISTORS

...designed for general-purpose amplifier and low speed switching applications

### FEATURES:

- \* Collector-Emitter Sustaining Voltage-

$$V_{CEO(SUS)} = 40 \text{ V (Min) - 2N6666}$$

$$= 60 \text{ V (Min) - 2N6667}$$

$$= 80 \text{ V (Min) - 2N6668}$$

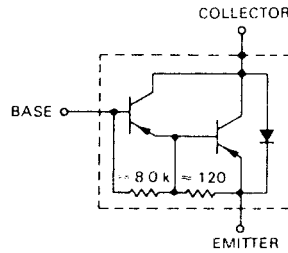
- \* Collector-Emitter Saturation Voltage

$$V_{CE(sat)} = 2.0 \text{ V (Max.) @ } I_C = 3.0 \text{ A - 2N6666}$$

$$= 2.0 \text{ V (Max.) @ } I_C = 5.0 \text{ A - 2N6667, 2N6668}$$

- \* DC Current Gain  $h_{FE} = 3000(\text{Typ}) @ I_C = 4.0 \text{ A}$

- \* Complementary to 2N6386, 2N6387, 2N6388

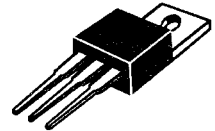


**PNP**  
**2N6666**  
**2N6667**  
**2N6668**

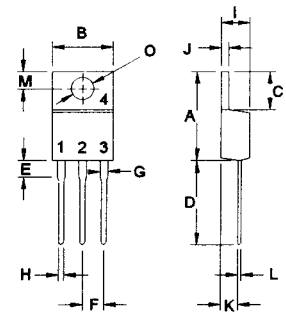
**8 AND 10 AMPERE**  
**DARLINGTON**  
**POWER TRANSISTORS**  
**PNP SILICON**  
**40-80 VOLTS**  
**65 WATTS**

### MAXIMUM RATINGS

Characteristic	Symbol	2N6666	2N6667	2N6668	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	60	80	V
Collector-Base Voltage	$V_{CBO}$	40	60	80	V
Emitter-Base Voltage	$V_{EBO}$	5.0			V
Collector Current-Continuous	$I_C$	8.0	10	10	A
-Peak	$I_{CM}$	15	15	15	
Base Current	$I_B$	0.25			A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	65			W
Derate above $25^\circ\text{C}$		0.52			W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	- 65 to +150			$^\circ\text{C}$



TO-220

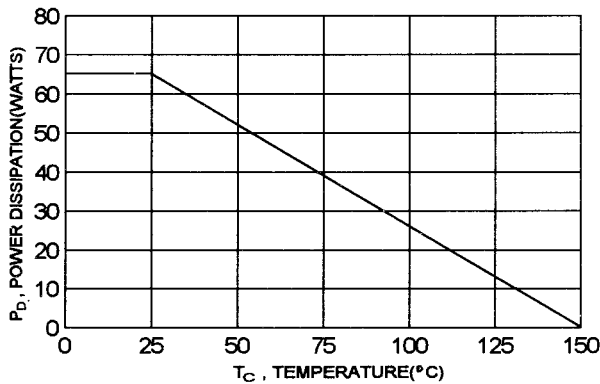


PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.92	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING



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

**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) ( $I_c = 200 \text{ mA}, I_B = 0$ )	2N6666 2N6667 2N6668	$V_{CEO(sus)}$	40 60 80	V
Collector Cutoff Current ( $V_{CE} = 40 \text{ V}, I_B = 0$ ) ( $V_{CE} = 60 \text{ V}, I_B = 0$ ) ( $V_{CE} = 80 \text{ V}, I_B = 0$ )	2N6666 2N6667 2N6668	$I_{CEO}$	1.0 1.0 1.0	mA
Collector Cutoff Current ( $V_{CE} = 40 \text{ V}, V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 60 \text{ V}, V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 80 \text{ V}, V_{BE(off)} = 1.5 \text{ V}$ ) ( $V_{CE} = 40 \text{ V}, V_{BE(off)} = 1.5 \text{ V}, T_c = 125^\circ\text{C}$ ) ( $V_{CE} = 60 \text{ V}, V_{BE(off)} = 1.5 \text{ V}, T_c = 125^\circ\text{C}$ ) ( $V_{CE} = 80 \text{ V}, V_{BE(off)} = 1.5 \text{ V}, T_c = 125^\circ\text{C}$ )	2N6666 2N6667 2N6668 2N6666 2N6667 2N6668	$I_{CEX}$	0.3 0.3 0.3 3.0 3.0 3.0	mA
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ V}, I_C = 0$ )		$I_{EBO}$	5.0	mA

**ON CHARACTERISTICS (1)**

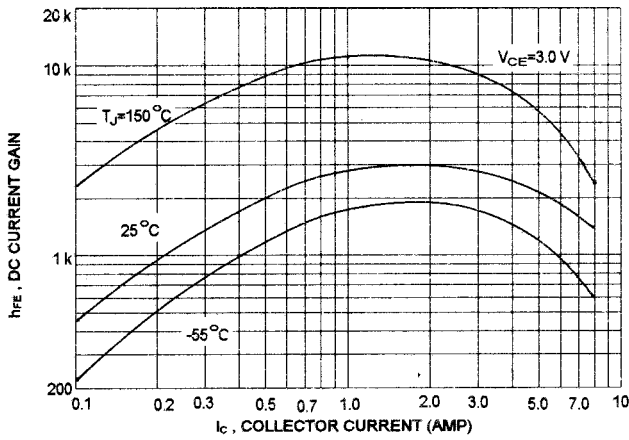
DC Current Gain ( $I_c = 3.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 5.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 8.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 10 \text{ A}, V_{CE} = 3.0 \text{ V}$ )	2N6666 2N6667, 2N6668 2N6666 2N6667, 2N6668	hFE	1000 1000 100 100	20000 20000
Collector-Emitter Saturation Voltage ( $I_c = 3.0 \text{ A}, I_B = 6 \text{ mA}$ ) ( $I_c = 5.0 \text{ A}, I_B = 10 \text{ mA}$ ) ( $I_c = 8.0 \text{ A}, I_B = 80 \text{ mA}$ ) ( $I_c = 10 \text{ A}, I_B = 100 \text{ mA}$ )	2N6666 2N6667, 2N6668 2N6666 2N6667, 2N6668	$V_{CE(sat)}$		2.0 2.0 3.0 3.0
Base-Emitter On Voltage ( $I_c = 3.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 5.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 8.0 \text{ A}, V_{CE} = 3.0 \text{ V}$ ) ( $I_c = 10 \text{ A}, V_{CE} = 3.0 \text{ V}$ )	2N6666 2N6667, 2N6668 2N6666 2N6667, 2N6668	$V_{BE(on)}$		2.8 2.8 4.5 4.5

**DYNAMIC CHARACTERISTICS**

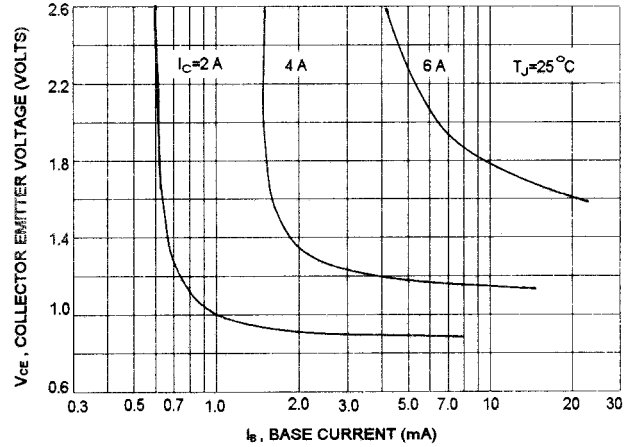
Small-Signal Current Gain ( $I_c = 1.0 \text{ A}, V_{CE} = 5.0 \text{ V}, f = 1.0 \text{ KHz}$ )		$h_{fe}$	1000	
Output Capacitance ( $V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$ )		$C_{ob}$	200	pF

(1) Pulse Test: Pulse width =  $300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

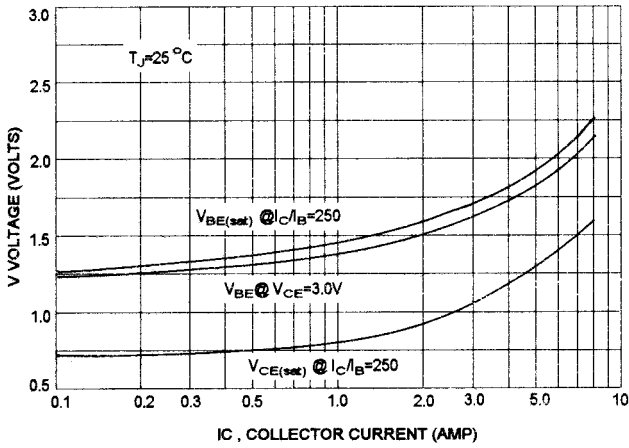
DC CURRENT GAIN



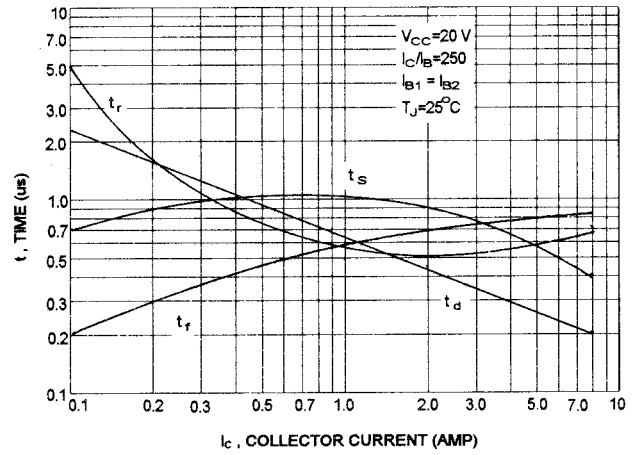
COLLECTOR SATURATION REGION



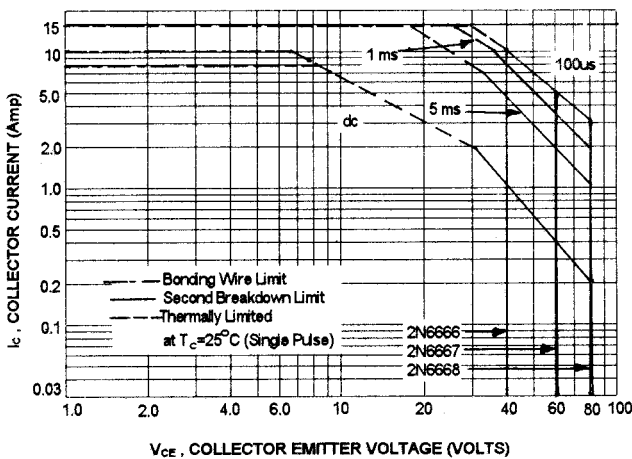
"ON" VOLTAGES



SWITCHING TIME



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  $T_{J(PK)}=150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.



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