HIGH-POWER NPN SILICON TRANSISTORS

... designed for use in industrial power amplifiers and switching circuit applications.

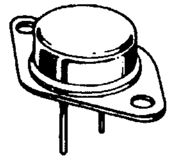
FEATURES:

- * High DC Current Gain
  hFE=30-120 @ I_C =10A
  =12 (Min)@I_C=25A
- * Low Collector-Emitter Saturation Voltage
  $V_{CE(SAT)}$ = 1.0V (Max.) @ I_C = 10 A, I_B = 1.0A
- * Complement to 2N6436-38

Boca Semiconductor Corp.
BSC
http://www.bocasemi.com

NPN
2N6338
2N6339
2N6340
2N6341

25 AMPERE
POWER TRANSISTOR
NPN SILICON
100-150 VOLTS
200 WATTS



TO-3

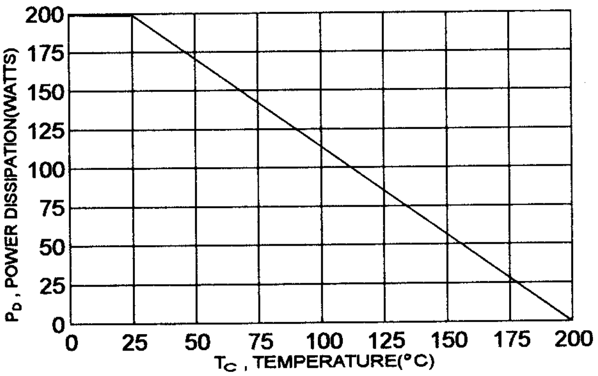
MAXIMUM RATINGS

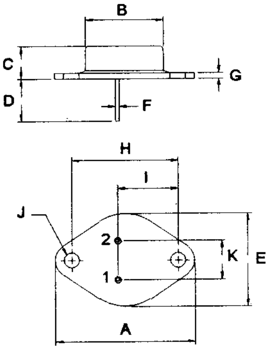
Characteristic	Symbol	2N6338	2N6339	2N6340	2N6341	Unit
Collector-Emitter Voltage	V_{CEO}	100	120	140	150	V
Collector-Base Voltage	V_{CBO}	120	140	160	180	V
Emitter-Base Voltage	V_{EBO}	6.0				V
Collector Current-Continuous -Peak	I_C	25 50				A
Base Current	I_B	10				A
Total Power Dissipation @T_C=25°C Derate above 25°C	P_D	200 1.14				W W/°C
Operating and Storage Junction Temperature Range	T_J ,T_{STG}	-65 to +200				°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	0.875	°C/W

FIGURE -1 POWER DERATING





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

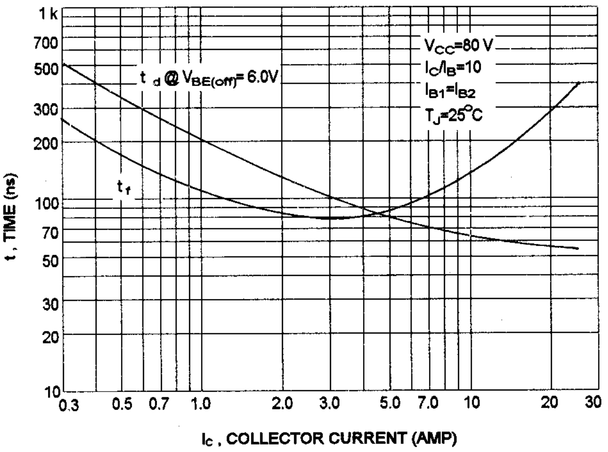
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector -Emitter Sustaining Voltage (1) (I_C =50mA, I_B= 0) 2N6338	$V_{CEO(sus)}$	100		V
2N6339		120		
2N6340		140		
2N6341		150		
Collector Cutoff Current (V_{CE}= 50 V, I_B= 0) 2N6338	I_{CEO}		50	uA
(V_{CE}= 60 V, I_B= 0) 2N6339			50	
(V_{CE}= 70 V, I_B= 0) 2N6340			50	
(V_{CE}= 75 V, I_B= 0) 2N6341			50	
Collector Cutoff Current (V_{CB}= Rated V_{CB}, I_E= 0)	I_{CBO}		10	uA
Emitter Cutoff Current (V_{EB}= 6.0 V, I_C= 0)	I_{EBO}		100	uA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= 0.5 A, V_{CE}= 2.0 V)	hFE	50		
(I_C= 10 A, V_{CE}= 2.0 V)		30	120	
(Ic= 25 A, V_{CE}= 2.0 V)		12		
Collector-Emitter Saturation Voltage (I_C =10 A, I_B=1.0 A)	$V_{CE(sat)}$		1.0	V
(I_C= 25 A, I_B= 2.5 A)			1.8	
Base-Emitter Saturation Voltage (I_C= 10 A, I_B= 1.0 A)	$V_{BE(sat)}$		1.8	V
(I_C= 25 A, I_B= 2.5 A)			2.5	
Base-Emitter On Voltage (I_C= 10 A, V_{CE}= 2.0 V)	$V_{BE(on)}$		1.8	V
DYNAMIC CHARATERISTICS				
Current-Gain Bandwidth Product (2) (I_C= 1.0 A, V_{CE} = 10 V,f = 10MHz)	f_T	40		MHz
Output Capacitance (V_{CB}= 10 V,I_E = 0,f= 0.1MHz)	C_{ob}		300	pF
SWITCHING CHARACTERISTICS				
Rise Time — V_{CC}= 80 V, I_C= 10 A I_{B1}= -I_{B2} = 1 A, $V_{BE(off)}$ = 6 V	t_r		0.4	us
Storage Time	t_s		1.5	us
Fall Time	t_f		0.6	us

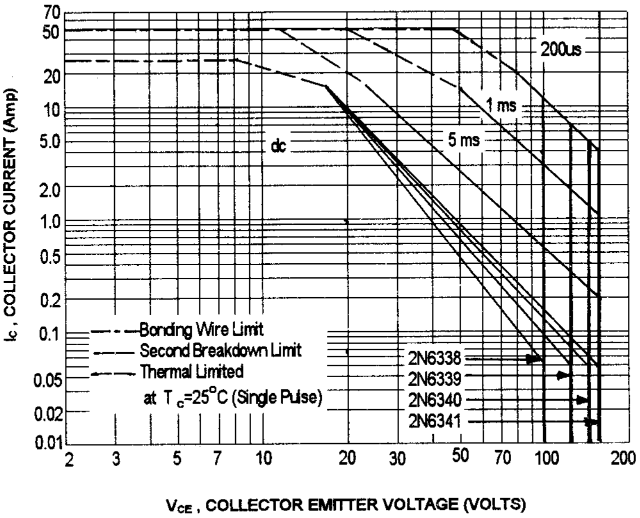
(1) Pulse Test: Pulse width = 300 µs , Duty Cycle ≦ 2.0%

(2) $f_T = |h_{fe}| \circ f_{test}$

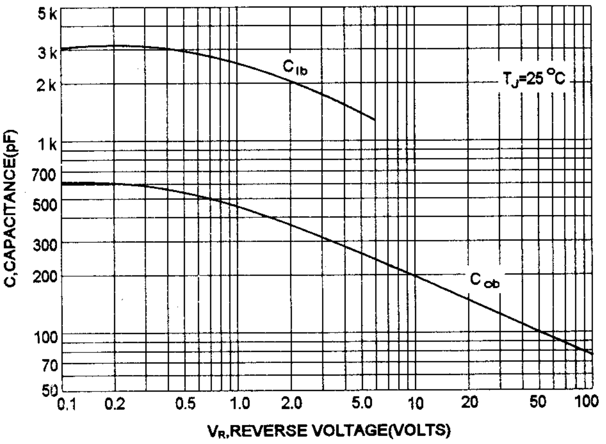
TURN-ON TIME



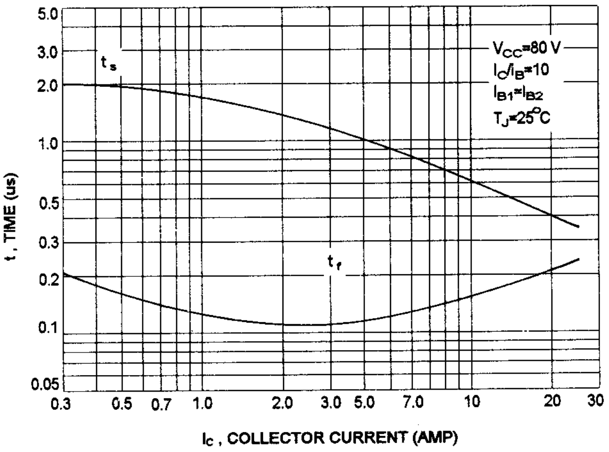
ACTIVE-REGION SAFE OPERATING AREA (SOA)



CAPACITANCES



TURN-OFF TIME



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 °C;T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 200$°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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