MOSPEC

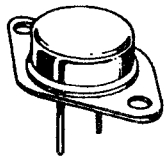
HIGH POWER NPN SILICON POWER TRANSISTORS

General-purpose linear amplifiers,series pass regulatorsand inductive switching Applications.

FEATURES:
* Low Collector-Emitter Saturation Voltage-
  $V_{CE(SAT)}$ = 4.0 V (Max.) @ I_C = 30 A, I_B = 6.0 A -- 2N3771
  $V_{CE(SAT)}$ = 4.0 V (Max.) @ I_C = 20 A, I_B = 4.0 A -- 2N3772

NPN
2N3771
2N3772

20 AND 30 AMPE
NPN SILICON
POWER TRANSISTORS
40 and 60 VOLTS
150 WATTS



TO-3

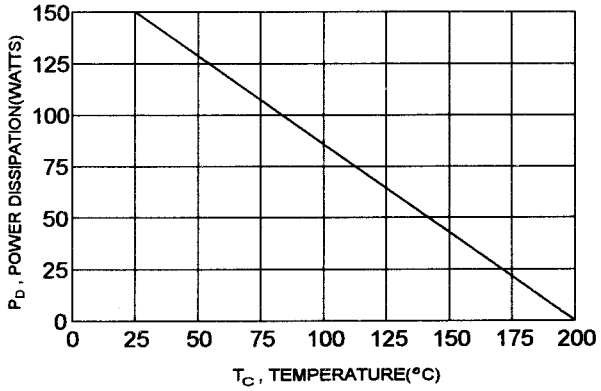
MAXIMUM RATINGS

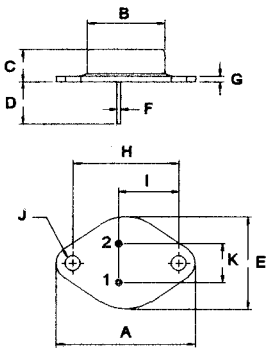
Characteristic	Symbol	2N3771	2N3772	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	V
Collector-Emitter Voltage	V_{CEX}	50	80	V
Collector-Base Voltage	V_{CBO}	50	100	V
Emitter-Base Voltage	V_{EBO}	5	7	V
Collector Current-Continuous -Peak	I_C I_{CM}	30 30	20 30	A
Base Current-Continuous -Peak	I_B I_{BM}	7.5 15	5.0 15	A
Total Power Dissipation @T_C=25°C Derate above 25°C	P_D	150 0.857		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	1.17	°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

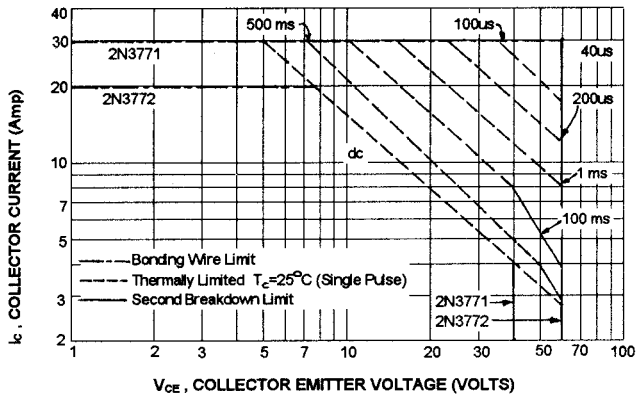
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector - Emitter Sustaining Voltage (1) (I_C = 200 mA, I_B = 0)	2N3771 2N3772	$V_{CEO(SUS)}$	 40 60		V
Collector - Emitter Sustaining Voltage (I_C = 0.2 A, $V_{BE(off)}$ = 1.5 V, R_{BE} = 100 Ohms)	2N3771 2N3772	$V_{CEX(SUS)}$	 50 80		V
Collector Cutoff Current (V_{CE} = 30 V , I_B = 0) (V_{CE} = 50 V , I_B = 0)	2N3771 2N3772	I_{CEO}		 10 10	mA
Collector Cutoff Current (V_{CE} = 50 V, $V_{BE(off)}$ = 1.5 V) (V_{CE} = 100 V, $V_{BE(off)}$ = 1.5 V)	2N3771 2N3772	I_{CEV}		 2.0 5.0	mA
Collector Cutoff Current (V_{CE} = 50 V , I_E = 0) (V_{CE} = 100 V , I_E = 0)	2N3771 2N3772	I_{CBO}		 2.0 5.0	mA
Emitter Cutoff Current (V_{EB} = 5.0 V, I_C = 0) (V_{EB} = 7.0 V, I_C = 0)	2N3771 2N3772	I_{EBO}		 5.0 5.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 15 A , V_{CE} = 4.0 V) (I_C = 10 A, V_{CE} = 4.0 V) (I_C = 30 A , V_{CE} = 4.0 V) (I_C = 20 A , V_{CE} = 4.0 V)	 2N3771 2N3772 2N3771 2N3772	hFE	 15 15 5.0 5.0	 60 60	
Collector - Emitter Saturation Voltage (I_C = 15 A , I_B = 1.5 A) (I_C = 10 A , I_B = 1.0 A) (I_C = 30 A , I_B = 6.0 A) (I_C = 20 A , I_B = 4.0 A)	 2N3771 2N3772 2N3771 2N3772	$V_{CE(sat)}$		 2.0 1.4 4.0 4.0	V
Base - Emitter On Voltage (I_C = 15 A, V_{CE} = 4.0 V) (I_C = 10 A, V_{CE} = 4.0 V)	 2N3771 2N3772	$V_{BE(on)}$		 2.7 2.2	V
DYNAMIC CHARACTERISTICS					
Current Gain - Bandwidth Product (2) (I_C = 1.0 A , V_{CE} = 4.0 V , f = 50 KHz)		f_T	 0.2		MHz

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

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

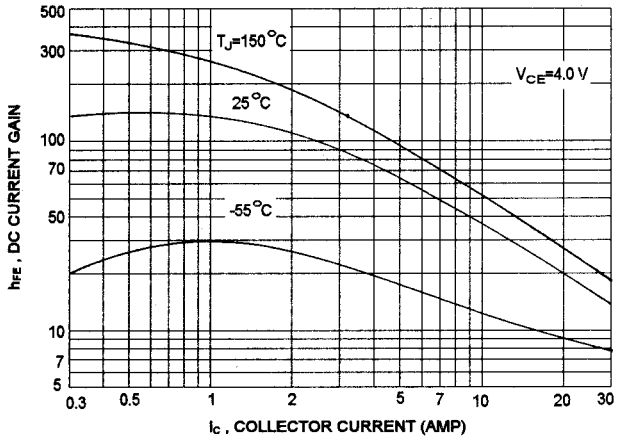
ACTIVE-REGION SAFE OPERATING AREA (SOA)



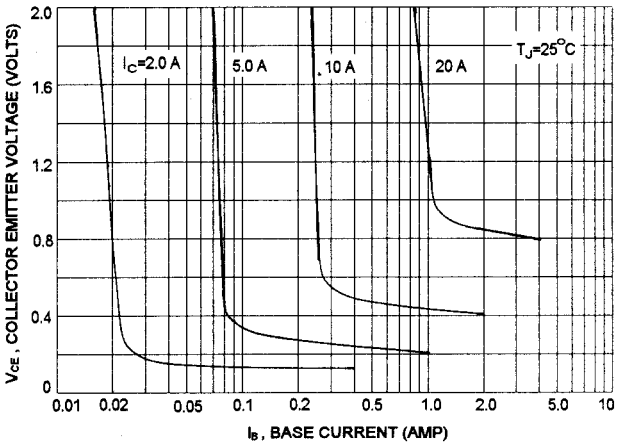
There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

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

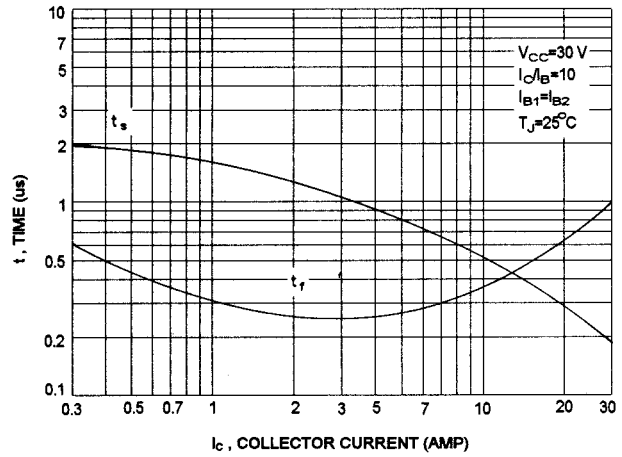
DC CURRENT GAIN



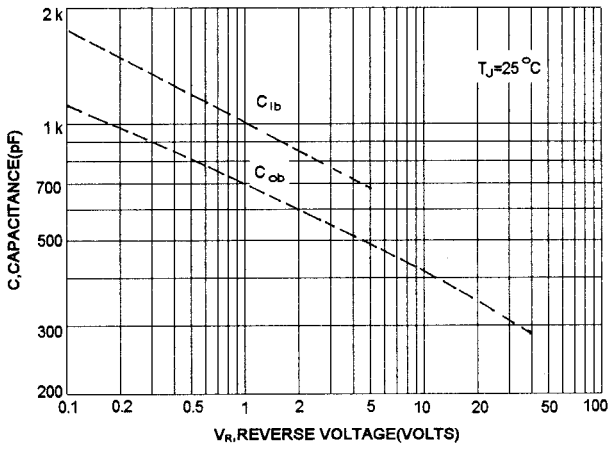
COLLECTOR SATURATION REGION



TURN-OFF TIME



CAPACITANCES



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