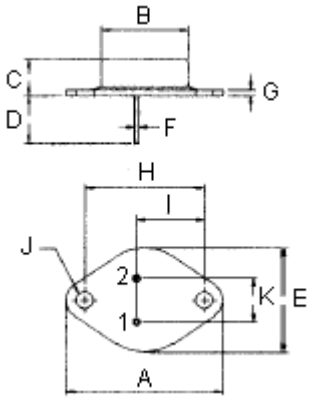
Silicon NPN Power Transistor

Feature:

- Low collector - Emitter saturation voltage :
  $V_{CE\ (SAT)}$ = 4 V (Maximum) at I_C = 20 A, I_B = 4 A

TO-3



Pin 1. Base
2. Emitter
Collector (Case)

Dimension	Millimetres	
	Minimum	Maximum
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.2	26.67
F	0.92	1.09
G	1.38	1.62
H	29.9	30.4
I	16.64	17.3
J	3.88	4.36
K	10.67	11.18

Dimensions : Millimetres

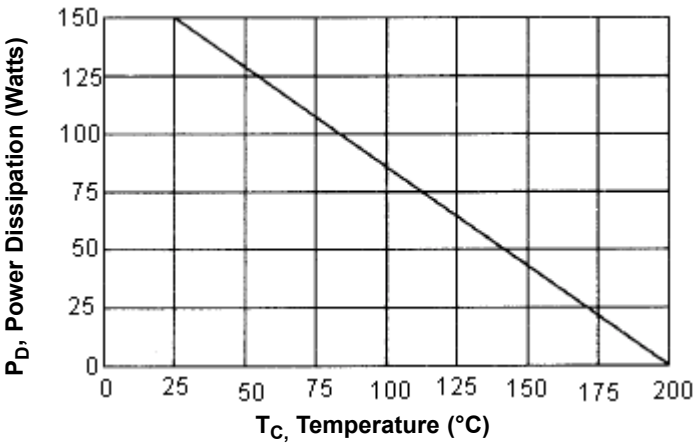
Maximum Ratings

Parameter	Symbol	2N3772	Unit
Collector - emitter voltage	V_{CEO}	60	V
Collector - emitter voltage	V_{CEX}	80	V
Collector - base voltage	V_{CBO}	100	V
Emitter - base voltage	V_{EBO}	7	V
Collector current - continuous - peak	I_C I_{CM}	20 30	A
Base current - continuous - peak	I_B I_{BM}	5 15	A
Collector power dissipation at 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	Maximum	Unit
Thermal resistance junction to case	$R_{\theta jc}$	1.17	°C/W

Figure-1 Power Derating



Electrical Characteristics (T_C = 25°C Unless Otherwise Specified)

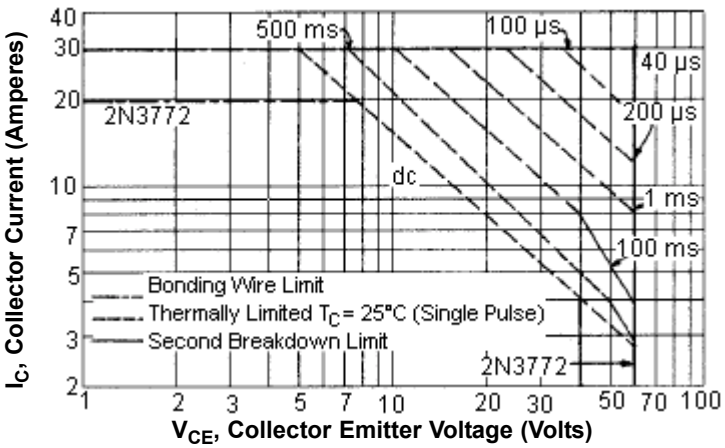
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector - emitter sustaining voltage (1) (I_C = 200 mA, I_B = 0)	$V_{CEO\ (SUS)}$	60	-	V
Collector - emitter sustaining voltage (I_C = 0.2 A, $V_{BE\ (off)}$ = 1.5 V, R_{BE} = 100 Ohms)	$V_{CEX\ (SUS)}$	80	-	V
Collector cut off current (V_{CE} = 50 V, I_B = 0)	I_{CEO}	-	10	mA
Collector cut off current (V_{CE} = 100 V, $V_{BE\ (off)}$ = 1.5 V)	I_{CEV}	-	5	mA
Collector cut off current (V_{CE} = 100 V, I_E = 0)	I_{CBO}	-	5	mA
Emitter cut off current (V_{EB} = 7 V, I_C = 0)	I_{EBO}	-	5	mA
ON Characteristics (1)				
DC current gain (I_C = 10 A, V_{CE} = 4 V) (I_C = 20 A, V_{CE} = 4 V)	h_{FE}	15 5	60	-
Collector - emitter saturation voltage (I_C = 10 A, I_B = 1 A) (I_C = 20 A, I_B = 4 A)	$V_{CE\ (sat)}$	-	1.4 4	V
Base - emitter on voltage (I_C = 10 A, V_{CE} = 4 V)	$V_{BE\ (on)}$	-	2.2	V

Electrical Characteristics (T_C = 25°C Unless Otherwise Specified)

Characteristic	Symbol	Minimum	Maximum	Unit
Dynamic Characteristics				
Current gain - bandwidth product (2) (I_C = 1 A, V_{CE} = 4 V, f = 50 KHz)	f_T	0.2	-	MHz

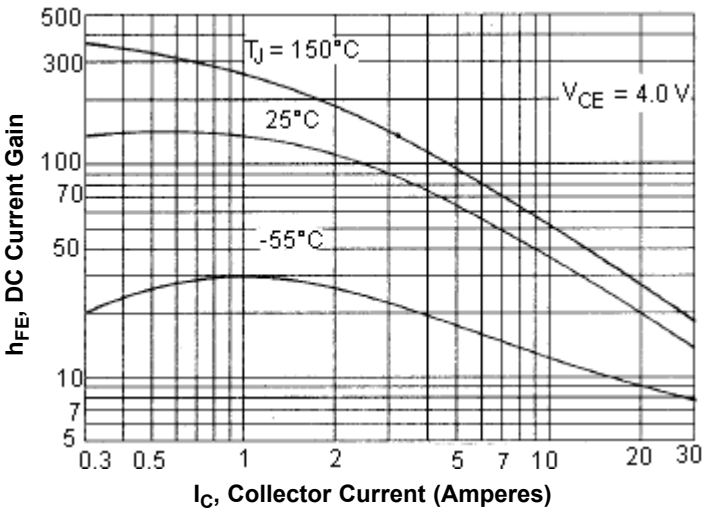
(1) Pulse Test : Pulse width = 300 µs, duty cycle ≤ 2%
(2) $f_T = |h_{fe}| f_{test}$

Active - Region Safe Operating area (SOA)

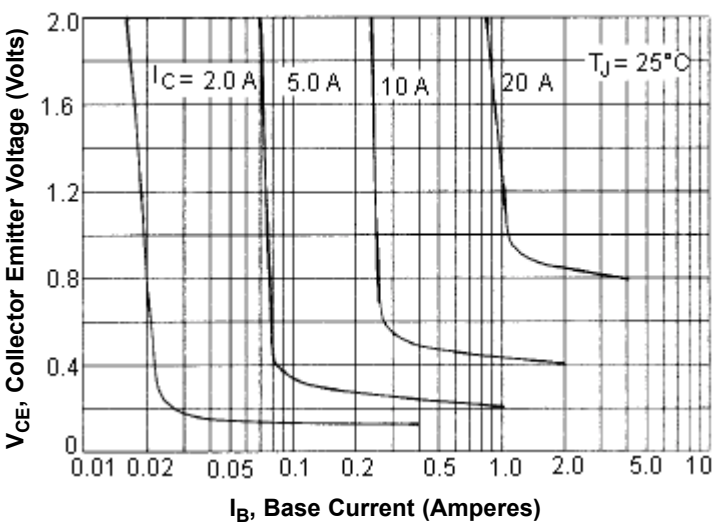


There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

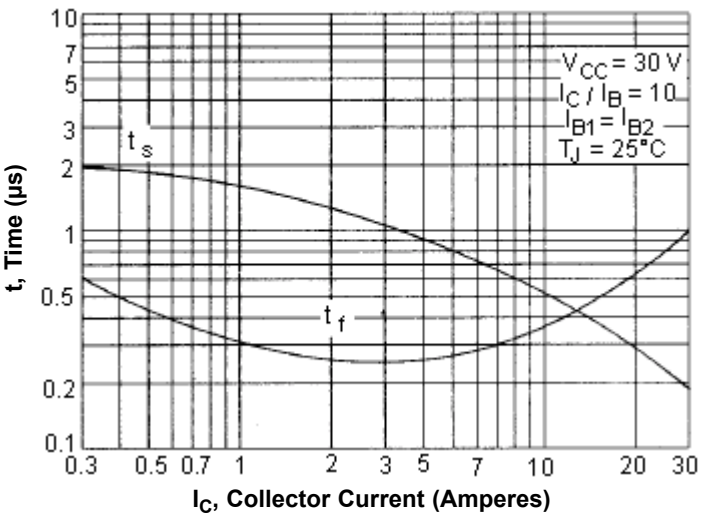
DC Current Gain



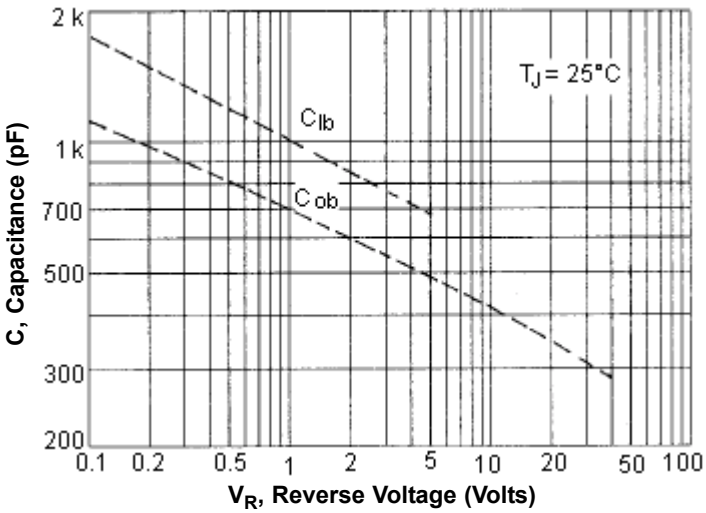
Collector Saturation Region



Turn - off Time



Capacitances



Part Number Table

Description	Part Number
Silicon NPN Power Transistor	2N3772