

High Power Silicon Power Transistor
V_{CEO} 60V, I_c 20A, 150W, TO-3

multicomp^{PRO}

RoHS
Compliant



Features

Forward Biased Second Breakdown Current Capability
2N3772 -- I_{s/b} = 2.5 A DC @ V_{CE} = 60 V DC

APPLICATIONS: Linear amplifiers, series pass regulators, and inductive switching applications.

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Rating	Symbol	2N3772	Units
Collector - Emitter Voltage	V _{CEO}	60	V DC
Collector - Emitter Voltage	V _{CEX}	80	V DC
Collector - Base Voltage	V _{CB}	100	V DC
Emitter Base Voltage	V _{EB}	7	V DC
Collector Current - Continuous Peak	I _C	20 30	A DC
Base Current - Continuous Peak	I _B	5 15	A DC
Total Device Dissipation @ TC = 25°C Derate above 25°C	P _D	150 0.855	Watts W/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65°C to +200°C	°C

Thermal Characteristics

Characteristic	Symbol	2N3771, 2N3772	Unit
Thermal Resistance, Junction to case	j-c	1.17	°C/W

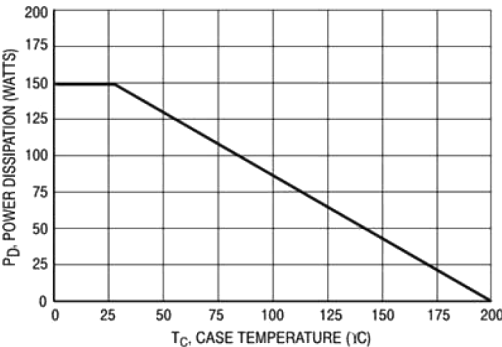


Figure 1. Power Derating

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Electrical Characteristics at T_a = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Max	Units
*Off Characteristics				
*Collector Emitter Sustaining Voltage (1) (I _C = 0.2A DC, I _B = 0)	V _{CEO(sus)}	40 60	- -	V DC
Collector Emitter Sustaining Voltage (I _C = 0.2A DC, V _{EB(off)} = 1.5 V DC R _{BE} = 100Ω)	V _{CEX(sus)}	50 80	- -	V DC
Collector Emitter Sustaining Voltage (I _C = 0.2A DC, R _{BE} = 100Ω)	V _{CER(sus)}	45 70	- -	V DC
*Collector Cut Off Current (V _{CE} = 30V DC, I _B = 0) (V _{CE} = 50V DC, I _B = 0) (V _{CE} = 25V DC, I _B = 0)	I _{CEO}	- -	10 10	mA DC
*Collector Cut Off Current (V _{CE} = 50V DC, V _{EB(off)} = 1.5V DC (V _{CE} = 100V DC, V _{EB(off)} = 1.5V DC (V _{CE} = 45V DC, V _{EB(off)} = 1.5V DC (V _{CE} = 30V DC, V _{EB(off)} = 1.5V DC, T _C = 150°C (V _{CE} = 45V DC, V _{EB(off)} = 1.5V DC, T _C = 150°C	I _{CEV}	-	2 5 4 10 10	mA DC
*Collector Cut Off Current (V _{CB} = 50V DC, I _E = 0) (V _{CB} = 100V DC, I _E = 0)	I _{CBO}	-	2 5	mA DC
*Emitter Cut Off Current (V _{BE} = 5V DC, I _C = 0) (V _{BE} = 7V DC, I _C = 0)	I _{EBO}	-	5 5	mA DC
*On Characteristics				
DC Current Gain (1) (I _C = 15A DC, V _{CE} = 4 V _{DC}) (I _C = 10A DC, V _{CE} = 4 V _{DC}) (I _C = 8A DC, V _{CE} = 4 V _{DC}) (I _C = 30A DC, V _{CE} = 4 V _{DC}) (I _C = 20A DC, V _{CE} = 4 V _{DC})	h _{FE}	15 15 5 5	60 60 - -	-
Collector Emitter Saturation Voltage (I _C = 15A DC, I _B = 1.5 A _{DC}) (I _C = 10A DC, I _B = 1 A _{DC}) (I _C = 30A DC, I _B = 6 A _{DC}) (I _C = 20A DC, I _B = 4 A _{DC})	V _{CE(sat)}	- - -	2 1.4 4 4	V DC
Base Emitter on Voltage (I _C = 15A DC, V _{CE} = 4 V _{DC}) (I _C = 10A DC, V _{CE} = 4 V _{DC}) (I _C = 8A DC, V _{CE} = 4 V _{DC})	V _{BE(on)}	-	2.7 2.2	V DC
*Dynamic Characteristics				
Current-Gain - Bandwidth Product (I _C = 1A DC, V _{CE} = 4 V _{DC} , f _{test} = 50 kHz)	f _T	0.2	-	MHz
Small-Signal Current Gain (I _C = 1A DC, V _{CE} = 4 V _{DC} , f = 1 kHz)	h _{fe}	40	-	-

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Characteristic	Symbol	Min	Max	Units
*Second Breakdown				
Second Breakdown Energy with Base Forward Biased, $t = 1$ s (non- repetitive) ($V_{CE} = 60$ V DC 2N3772	$I_{S/b}$	2.75	-	ADC

* Indicates JEDEC Registered Data

(1) Pulse Test: 300s, Rep. Rate 60 cps

Typical Characteristics Curves

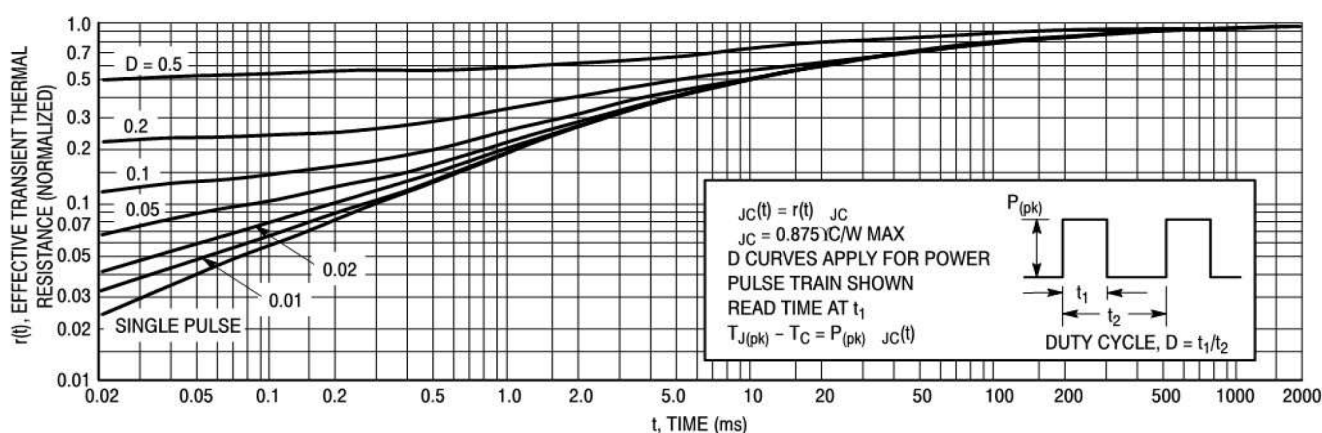


Figure 2. Thermal Response — 2N3772

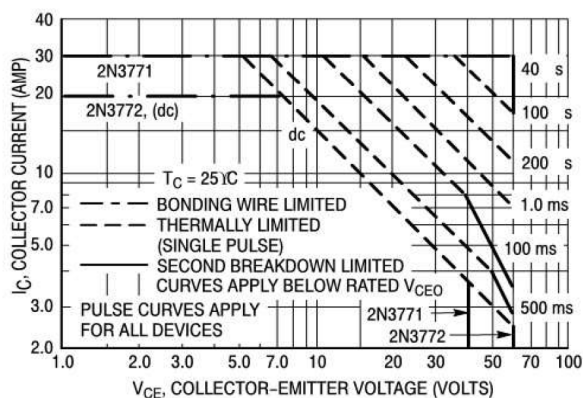


Figure 3. Active-Region Safe Operating Area
2N3772

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Typical Characteristics Curves

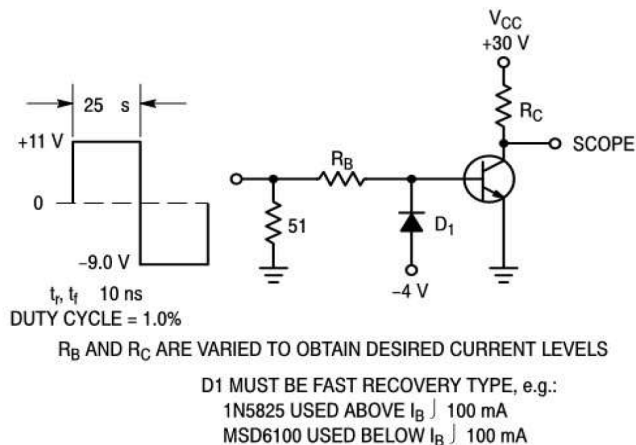


Figure 4. Switching Time Test Circuit

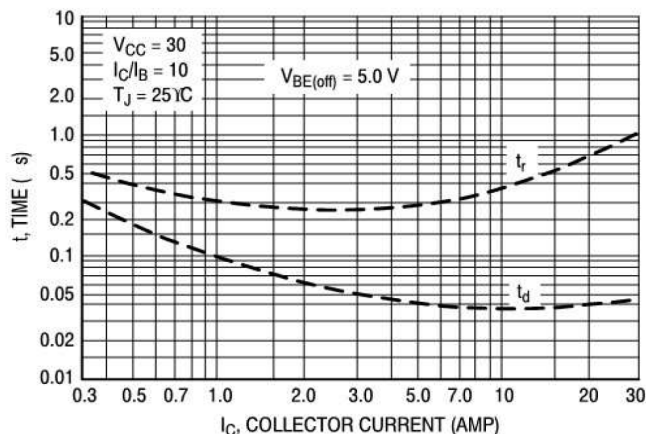


Figure 5. Turn-On Time

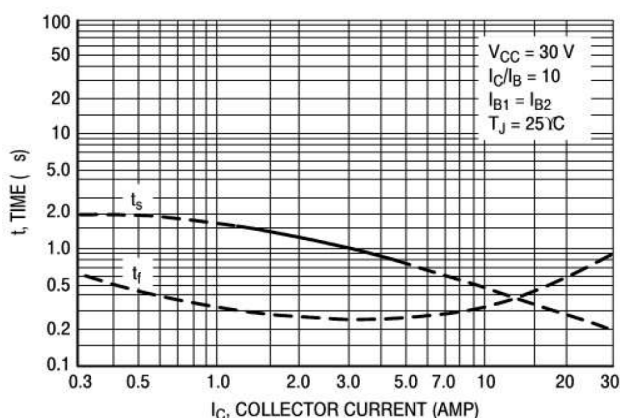


Figure 6. Turn-Off Time

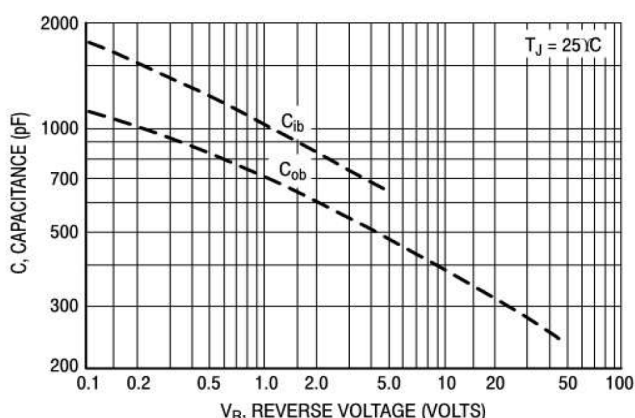


Figure 7. Capacitance

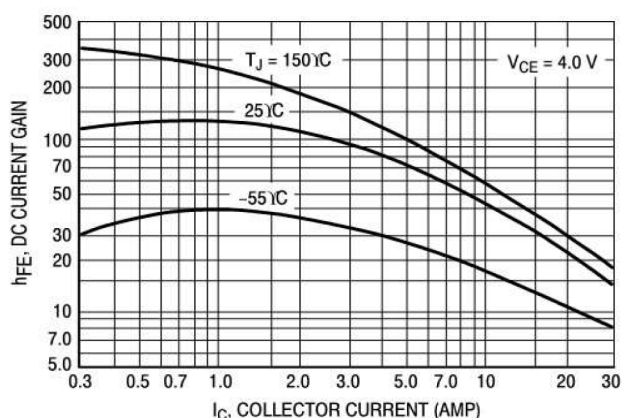


Figure 8. DC Current Gain

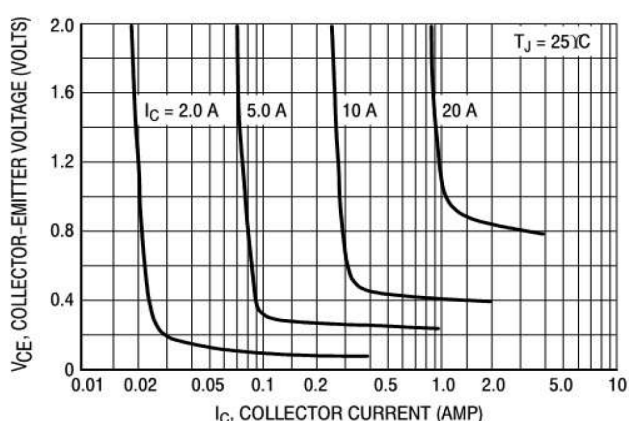


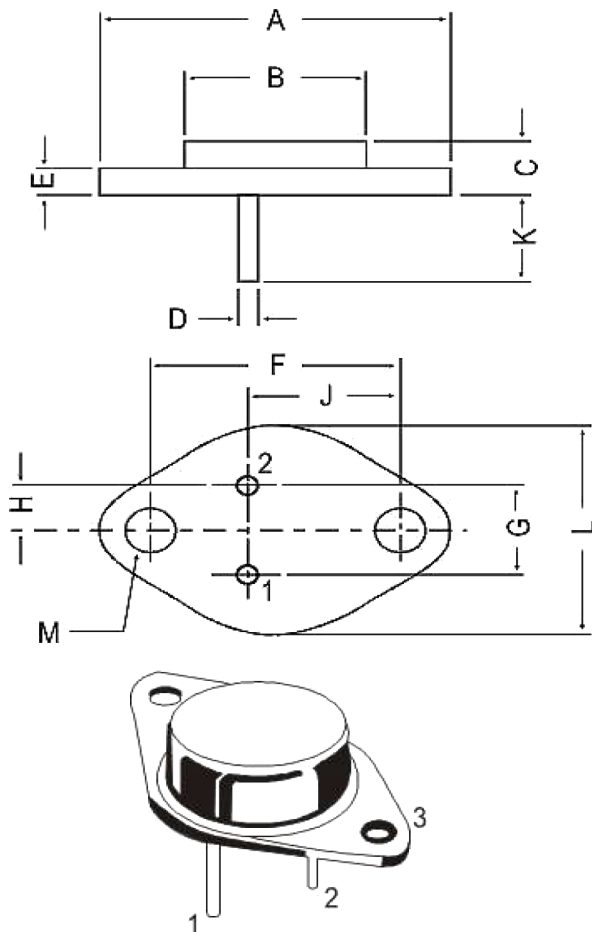
Figure 9. Collector Saturation Region

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Package Details



Dimensions : Millimetres

PIN CONFIGURATION

1. BASE
2. EMITTER
3. COLLECTOR

Dim	Min.	Max.
A	-	39.37
B	-	22.22
C	6.35	8.5
D	0.96	1.09
E	-	1.77
F	29.9	30.4
G	10.69	11.18
H	5.2	5.72
J	16.64	17.15
K	11.15	12.25
L	-	26.67
M	3.84	4.19

Part Number Table

Description	Part Number
Silicon High Power Transistor, NPN, 60V, 20A, TO-3	2N3772

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