

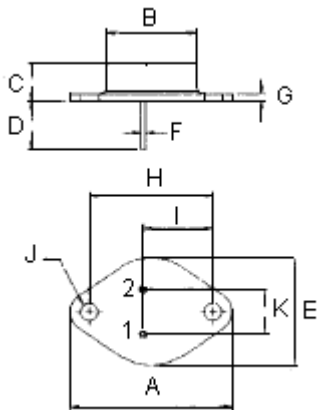


Designed for general-purpose power amplifier and low frequency switching applications.

Features:

- Monolithic construction with built-in base-emitter shunt resistors.
- High DC current gain - $h_{FE} = 3500$ (typical) at $I_C = 5.0A$.

TO-3



Pin 1. Base
2. Emitter
Collector (Case)

Dimensions	Minimum	Maximum
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

Dimensions : Millimetres

**PNP
2N6051**

Darlington
12 Ampere
Complementary Silicon
Power Transistors
60 - 100 Volts
150 Watts



TO-3

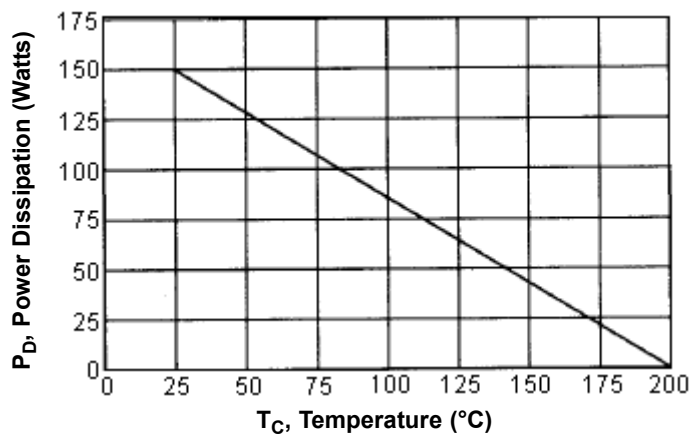
Maximum Ratings

Characteristic	Symbol	2N6051	Unit
Collector-Emitter Voltage	V_{CEO}	80	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5	
Collector Current-Continuous -Peak	I_C	12 20	A
Base Current	I_B	0.2	
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	150 0.857	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +200	$^\circ\text{C}$

Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.17	$^\circ\text{C}/\text{W}$

Power Derating



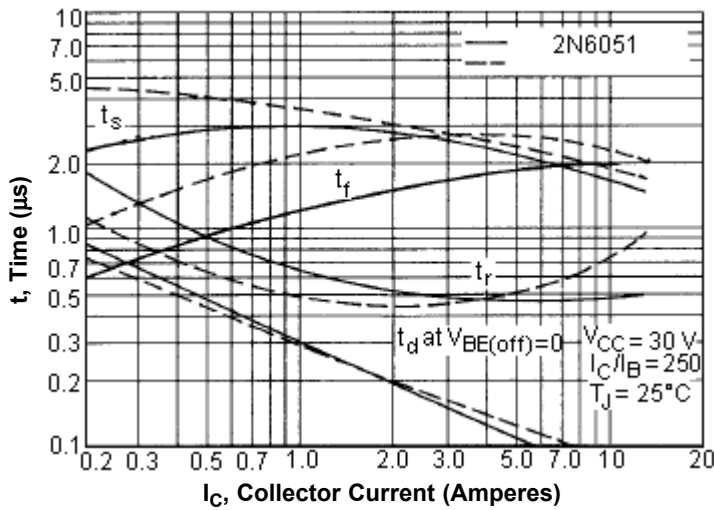
Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (1) ($I_C = 100\text{mA}$, $I_B = 0$)	2N6051 $V_{CEO(sus)}$	80	-	V
Collector Cut off Current ($V_{CE} = 40\text{V}$, $I_B = 0$)	2N6051 I_{CEO}	-	1.0	mA
Collector Cut off Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE(off)} = 1.5\text{V}$) ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE(off)} = 1.5\text{V}$, $T_C = 150^\circ\text{C}$)	I_{CEX}	-	0.5 5.0	
Emitter Cut off Current ($V_{EB} = 5.0\text{V}$, $I_C = 0$)	I_{EBO}	-	2.0	
On Characteristics (1)				
DC Current Gain ($I_C = 6.0\text{A}$, $V_{CE} = 3.0\text{V}$) ($I_C = 12\text{A}$, $V_{CE} = 3.0\text{V}$)	h_{FE}	750 100	18,000	-
Collector-Emitter Saturation Voltage ($I_C = 6.0\text{A}$, $I_B = 24\text{mA}$) ($I_C = 12\text{A}$, $I_B = 120\text{mA}$)	$V_{CE(sat)}$	-	2.0 3.0	V
Base-Emitter On Voltage ($I_C = 6.0\text{A}$, $V_{CE} = 3.0\text{V}$)	$V_{BE(on)}$	-	2.8	
Base-Emitter Saturation Voltage ($I_C = 12\text{A}$, $I_B = 120\text{mA}$)	$V_{BE(sat)}$	-	4.0	
Dynamic Characteristics				
Current-Gain-Bandwidth Product (2) ($I_C = 500\text{mA}$, $V_{CE} = 3.0\text{V}$, $f = 1.0\text{MHz}$)	f_T	4.0	-	MHz
Small-Signal Current Gain ($I_C = 5.0\text{A}$, $V_{CE} = 3.0\text{V}$, $f = 1.0\text{KHz}$)	h_{fe}	300	-	

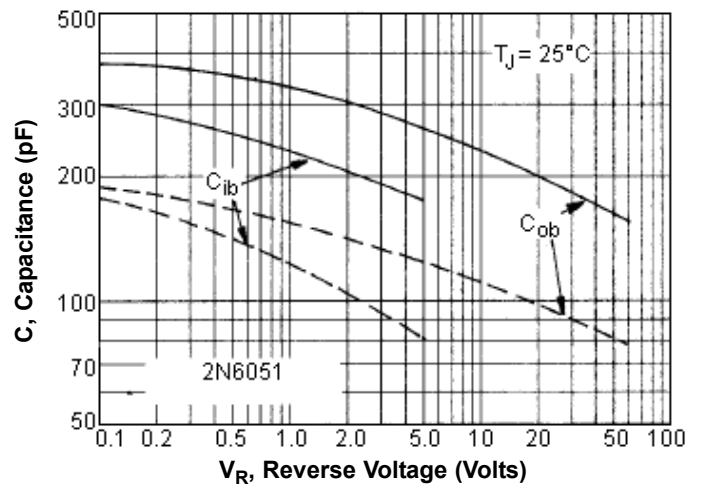
(1) Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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

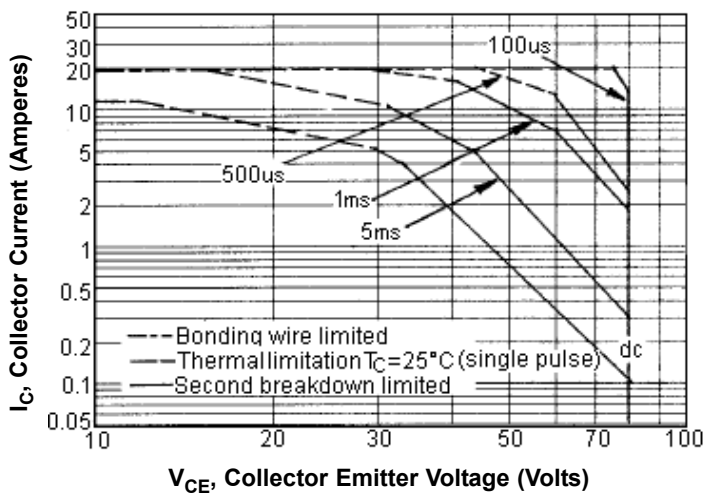
Switching Time



Capacitances



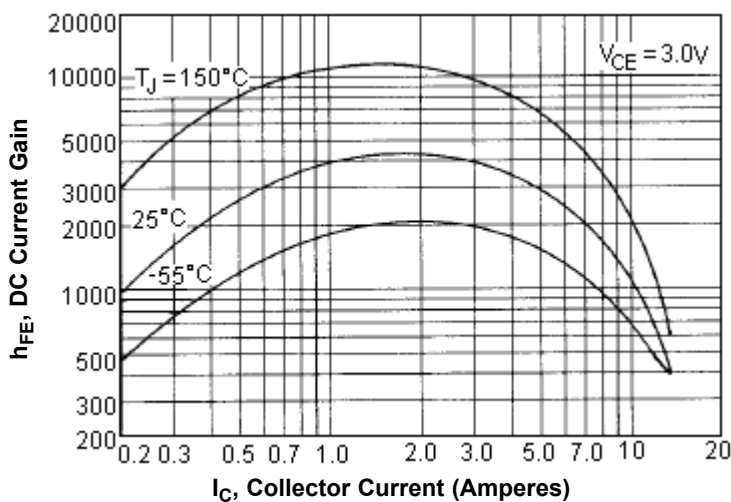
Active-Region Safe Operating Area (SOA)



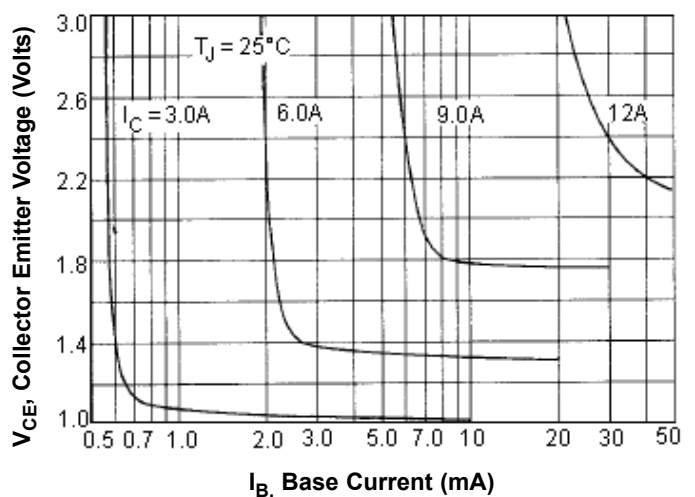
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

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

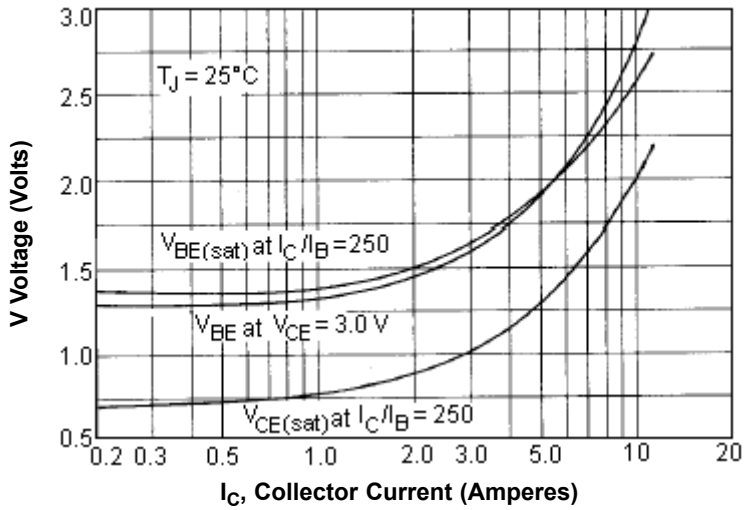
DC Current Gain



Collector Saturation Region



"ON" Voltages



Part Number Table

Description	Part Number
Darlington Transistor, TO-3	2N6051

Disclaimer This data sheet and its contents (the "Information") belong to the Premier Farnell Group (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. SPC Multicomp is the registered trademark of the Group. © Premier Farnell plc 2008.