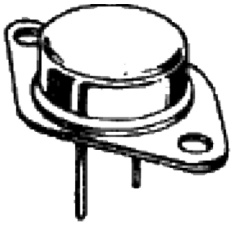
Darlington Transistor
TO-3

PNP
2N6051

12A
Complementary Silicon
Power Transistors
60V - 100V
150W



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Description:

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

Features:

- Monolithic construction with bult-in base-emitter shunt resistors
- High DC current gain - hFE = 3,500 (typical) at I_C = 5A

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°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	$R_{\theta jc}$	1.17	°C/W

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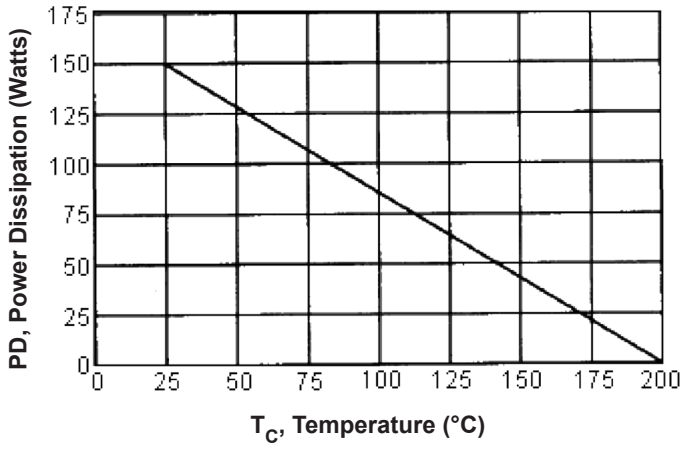
Electrical Characteristics (TC = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage (1) (I_C = 100mA, I_B = 0)	$V_{CEO\ (sus)}$	80	-	V
Collector Cut off Current (V_{CE} = 40V, I_B = 0)	I_{CEO}	-	1	mA
Collector Cut off Current (V_{CE} = Rated V_{CEO}, $V_{BE\ (off)}$ = 1.5V) (V_{CE} = Rated V_{CEO}, $V_{BE\ (off)}$ = 1.5V, T_C = 150°C)	I_{CEX}	-	0.5 5	
Emitter Cut off Current (V_{EB} = 5V, I_C = 0)	I	-	2	
On Characteristics (1)				
DC Current Gain (I_C = 6A, V_{CE} = 3V) (I_C = 12A, V_{CE} = 3V)	h_{FE}	750 100	18,000	-
Collector-Emitter Saturation Voltage (I_C = 6A, I_B = 24mA) (I_C = 12A, I_B = 120mA)	$V_{CE\ (sat)}$	-	2 3	V
Base-Emitter On Voltage (I_C = 6A, V_{CE} = 3V)	V	-	2.8	
Base-Emitter Saturation Voltage (I_C = 12A, I_B = 120mA)	V	-	4	
Dynamic Characteristics				
Current-Gain-Bandwidth Product (2) (I_C = 500mA, V_{CE} = 3V, f = 1MHz)	f	4	-	MHz
Small-Signal Current Gain (I_C = 5A, V_{CE} = 3V, f = 1.0kHz)	h	300	-	

(1) Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2.0%.
(2) fT = | hfe | • ftest.

Power Derating



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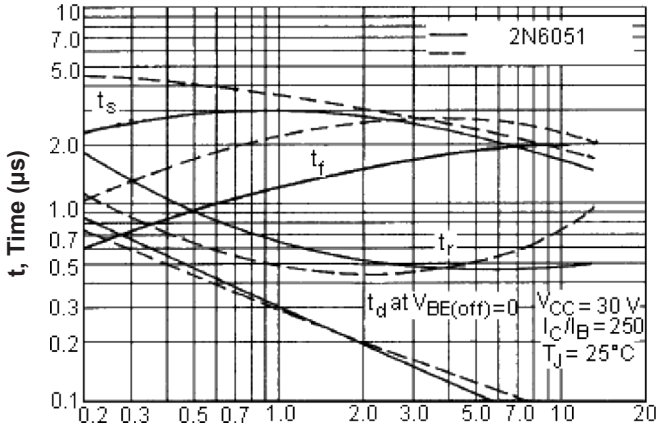
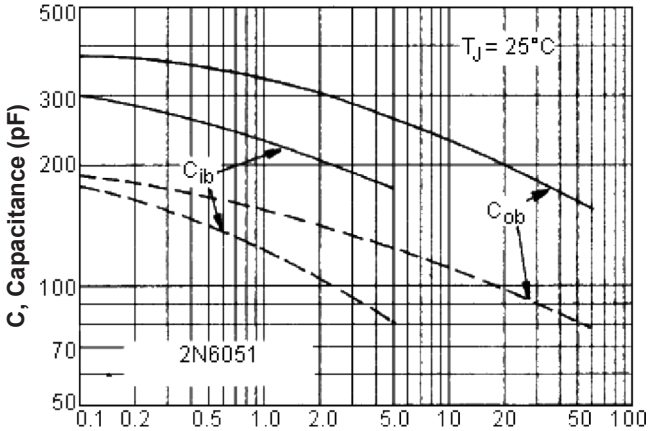
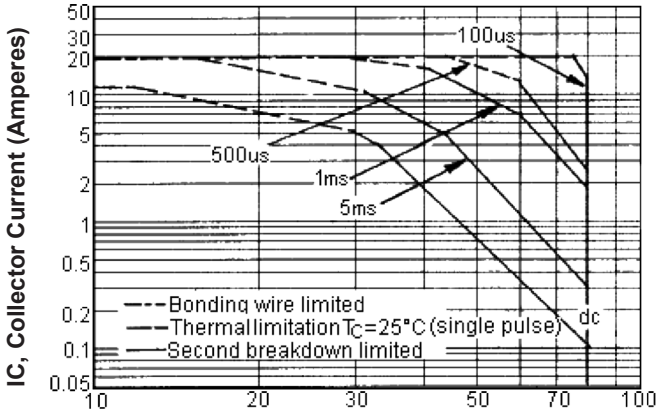
Switching Time



Capacitances



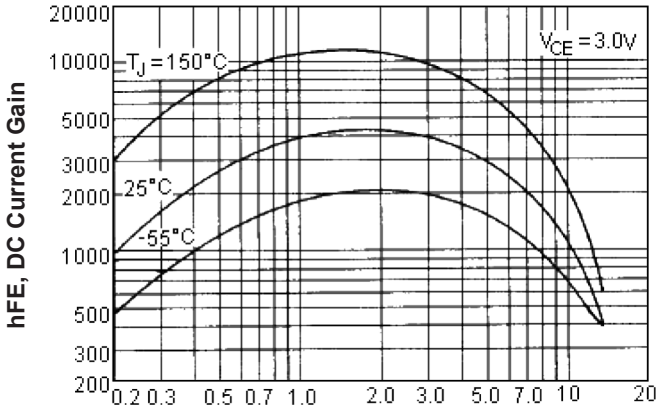
Active-Region Safe Operating Area (SOA)



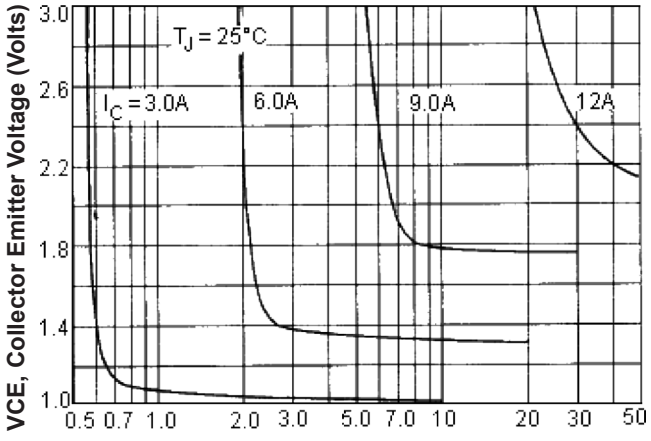
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate IC - VCE limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

The data of SOA curve is base on TJ (PK) = 200°C; TC is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided TJ (PK) ≤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



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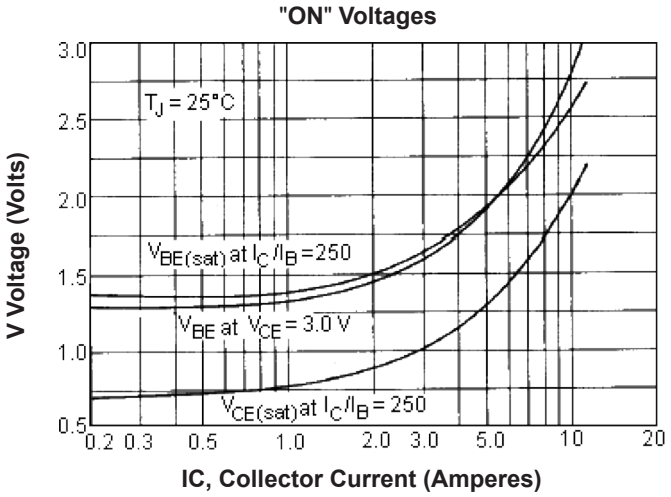

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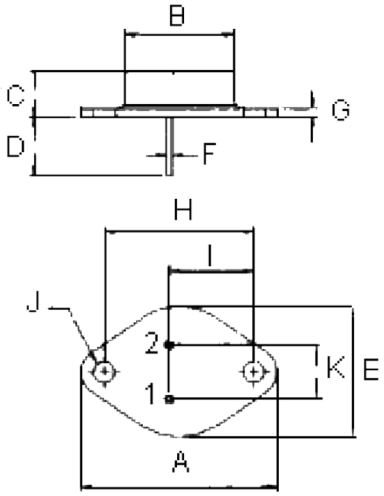

Dimensions	Min.	Max.
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.2	26.67
F	0.92	1.09
G	1.38	1.62
H	29.9	30.4
I	16.64	17.3
J	3.88	4.36
K	10.67	11.18

Pin 1. Base
2. Emitter
Collector (Case)

Dimensions : Millimetres

Part Number Table

Description	Part Number
Darlington Transistor, TO-3	2N6051