

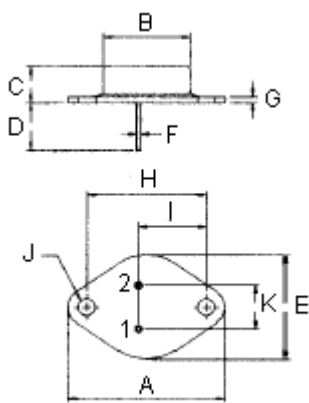
Silicon Power Transistor



Features:

- Power dissipation - $P_D = 115 \text{ W}$ at $T_C = 25^\circ\text{C}$
- DC current gain $h_{FE} = 20$ to 70 at $I_C = 4 \text{ A}$
- $V_{CE(sat)} = 1.1 \text{ V}$ (Maximum) at $I_C = 4 \text{ A}$, $I_B = 400 \text{ mA}$
- Designed for use general-purpose amplifier and low - frequency switching applications

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

NPN
2N3055
15 Amperes
Complementary Silicon
Power Transistors
60 Volts
115 Watts

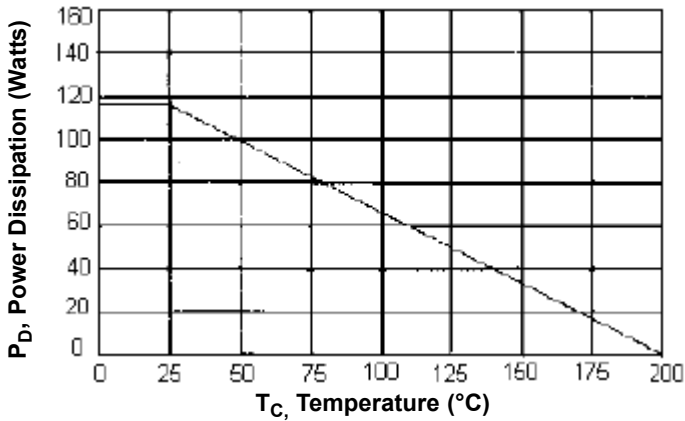
Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector - emitter voltage	V_{CEO}	60	V
Collector - emitter voltage	V_{CEB}	70	
Collector - base voltage	V_{CBO}	100	
Emitter - base voltage	V_{EBO}	7	
Collector current - continuous	I_C	15	A
Base current	I_B	7	
Total power dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	115 0.657	W W/ $^\circ\text{C}$
Operating and storage junction temperature range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal resistance junction to case	$R_{\theta jc}$	1.52	$^{\circ}C/W$

Figure-1 Power Derating



Electrical Characteristics ($T_C = 25^{\circ}C$ Unless Otherwise Noted)

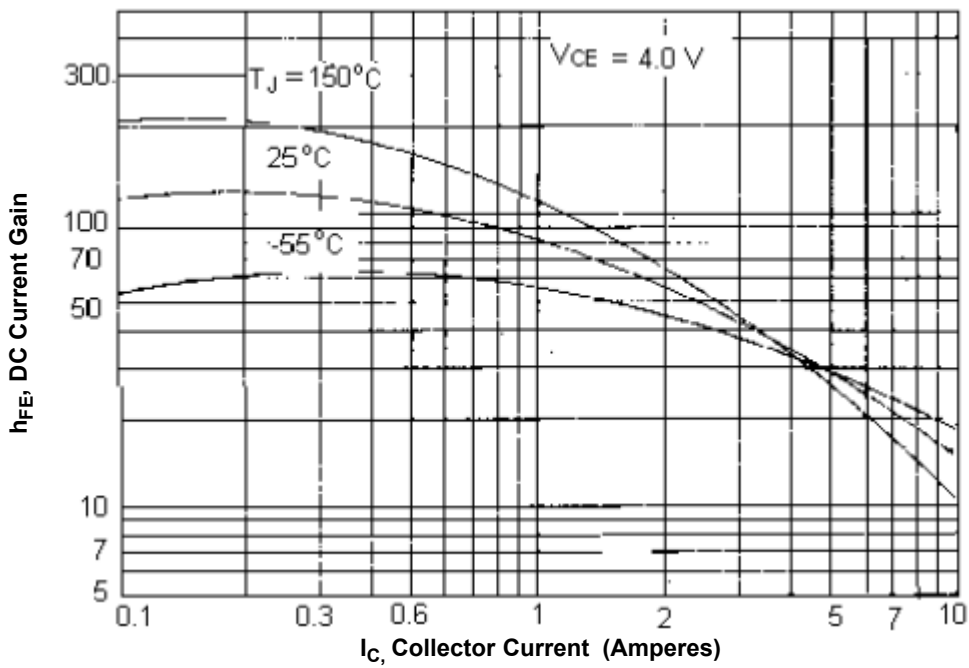
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector - emitter sustaining voltage (1) ($I_C = 200\text{ mA}$, $I_B = 0$)	$V_{CEO(SUS)}$	60	-	V
Collector - base sustaining voltage (1) ($I_C = 200\text{ mA}$, $R_{BE} = 100\text{ ohms}$)	$V_{CER(SUS)}$	70	-	V
Collector cut off current ($V_{CE} = 30\text{ V}$, $I_B = 0$)	I_{CEO}	-	0.7	mA
Collector cut off current ($V_{CE} = 100\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 100\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_C = 150^{\circ}C$)	I_{CEX}	-	1 5	
Emitter cut off current ($V_{EB} = 7\text{ V}$, $I_C = 0$)	I_{EBO}	-	5	
ON Characteristics (1)				
DC current gain ($I_C = 4\text{ A}$, $V_{CE} = 4\text{ V}$) ($I_C = 10\text{ A}$, $V_{CE} = 4\text{ V}$)	h_{FE}	20 5	70	-
Collector - emitter saturation voltage ($I_C = 4\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 3.3\text{ A}$)	$V_{CE(sat)}$	-	1.1 3	V
Base - emitter on voltage ($I_C = 4\text{ A}$, $V_{CE} = 4\text{ V}$)	$V_{BE(sat)}$	-	1.5	V
Dynamic Characteristics				
Current gain - bandwidth product (2) ($I_C = 500\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ MHz}$)	f_T	2.5	-	MHz
Small - signal current gain ($I_C = 1\text{ A}$, $V_{CE} = 2\text{ V}$, $f = 1\text{ KHZ}$)	h_{fe}	15	120	-

(1) Pulse Test: Pulse width = 300 μs , Duty Cycle $\leq 2\%$

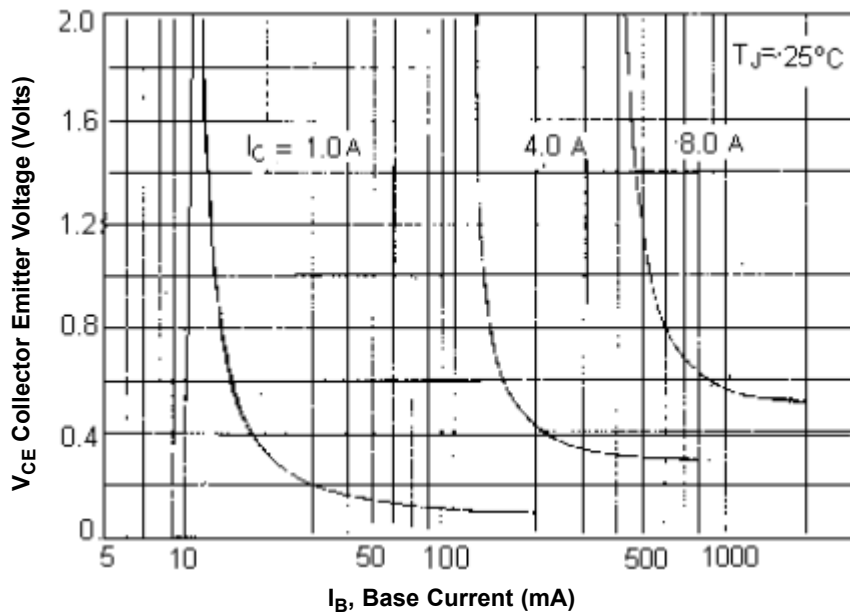
(2) $f_T = |h_{fe}| \cdot f_{test}$

Silicon Power Transistor

DC Current Gain



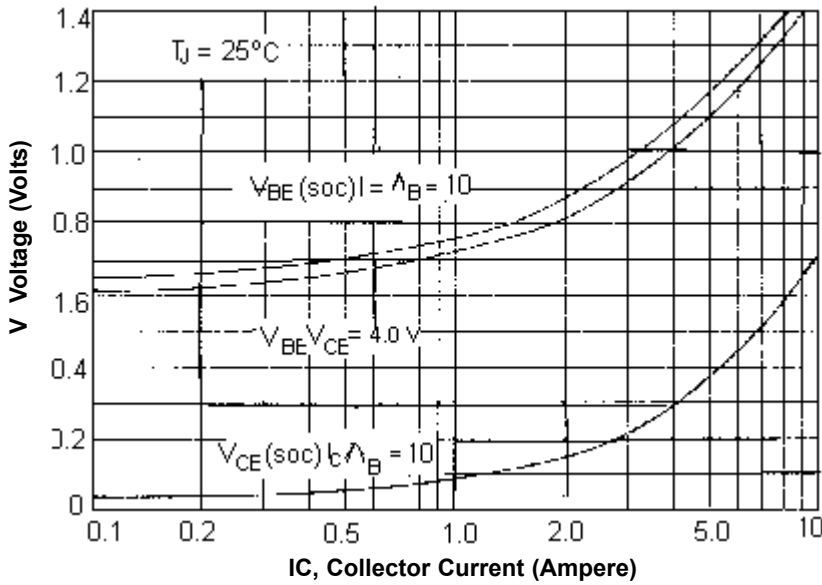
Collector Saturation Region



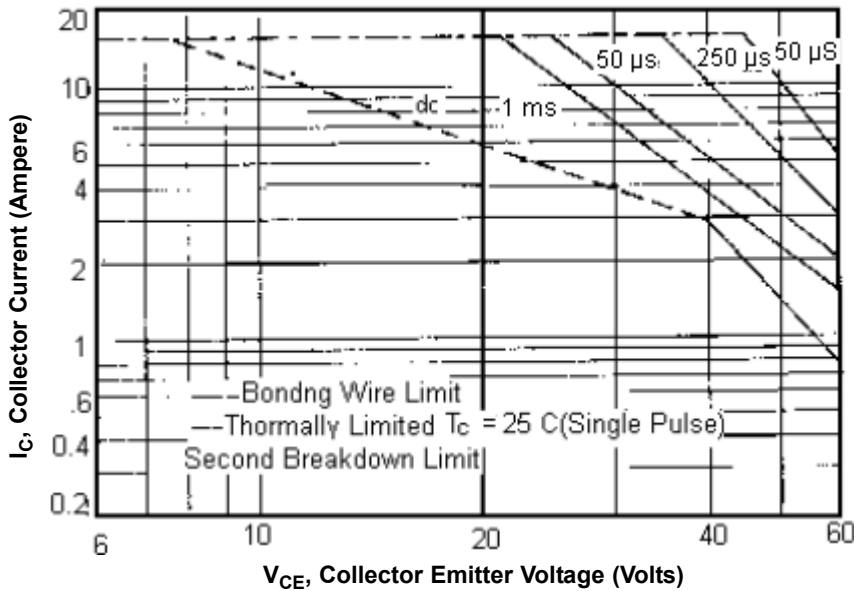
Silicon Power Transistor



“On Voltage”



Active Region Sage 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 $T_{J(PK)} = 200^\circ C$, At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown

Part Number Table

Description	Part Number
Transistor, NPN To-3	2N3055

Important Notice : This data sheet and its contents (the "Information") belong to the members of the Premier Farnell group of companies (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. Multicomp is the registered trademark of the Group. © Premier Farnell plc 2011.