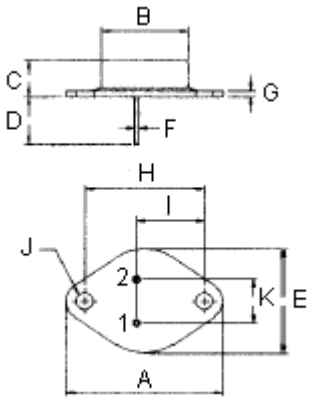
Silicon Power Transistor

Features:

- Power dissipation - P_D = 115 W at T_C = 25°C
- DC current gain h_{FE} = 20 to 70 at I_C = 4 A
- $V_{CE(\ Sat)}$ = 1.1 V (Maximum) at I_C = 4 A, I_B = 400 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

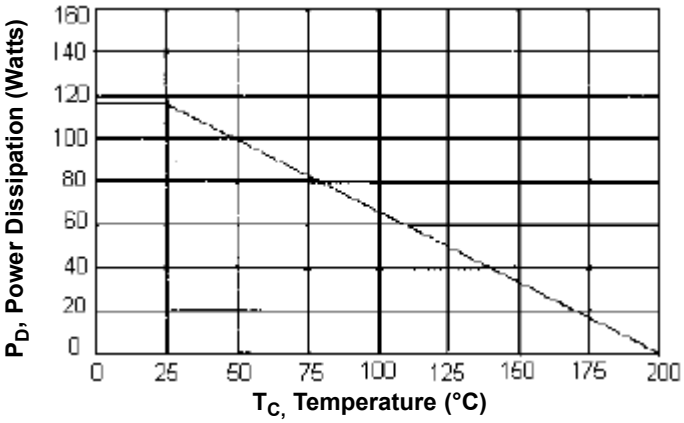
Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector - emitter voltage	V_{CEO}	60	V
Collector - emitter voltage	V_{CBR}	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°C Derate above 25°C	P_D	115 0.657	W W/°C
Operating and storage junction temperature range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristics

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

Figure-1 Power Derating

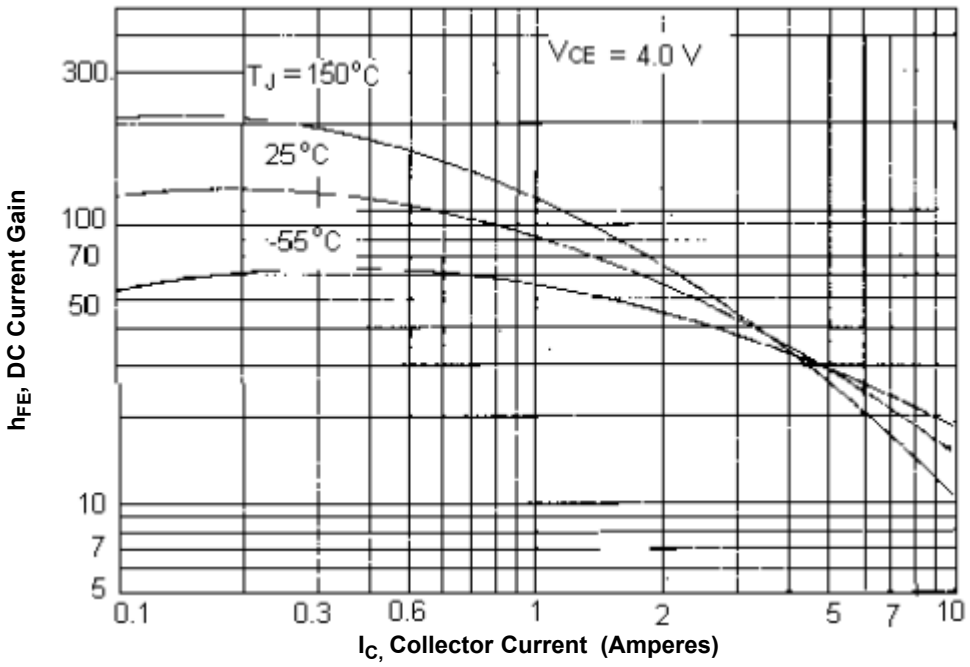


Electrical Characteristics (T_C = 25°C Unless Otherwise Noted)

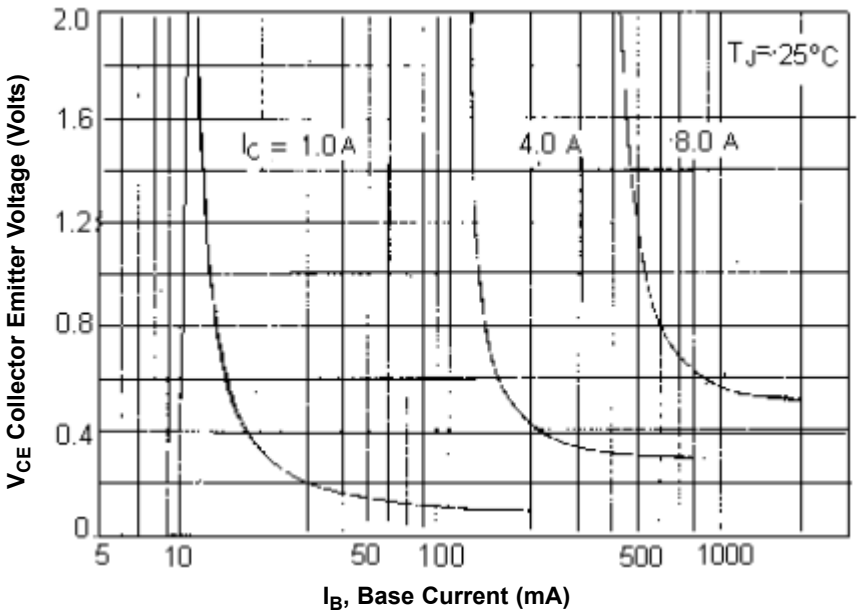
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector - emitter sustaining voltage (1) (I_C = 200 mA, I_B = 0)	$V_{CEO\ (SUS)}$	60	-	V
Collector - base sustaining voltage (1) (I_C = 200 mA, R_{BE} = 100 ohms)	$V_{CER\ (SUS)}$	70	-	V
Collector cut off current (V_{CE} = 30 V, I_B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

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

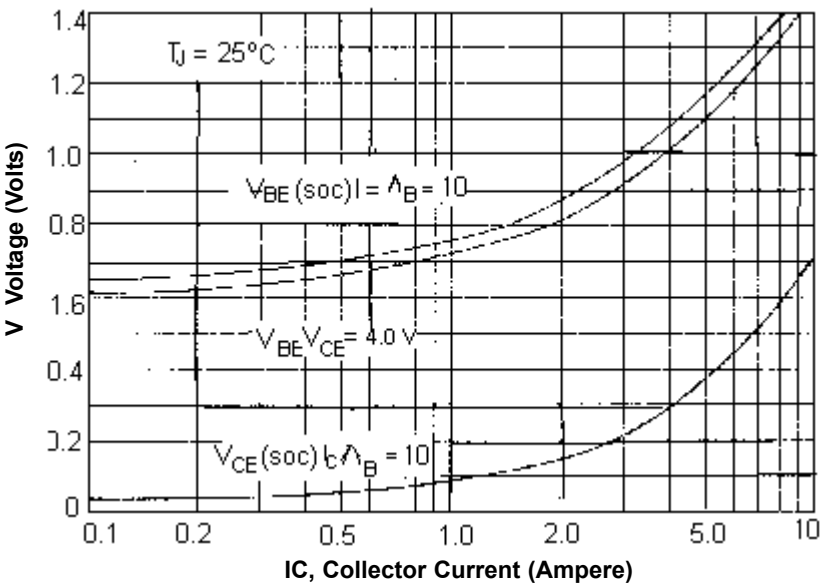
DC Current Gain



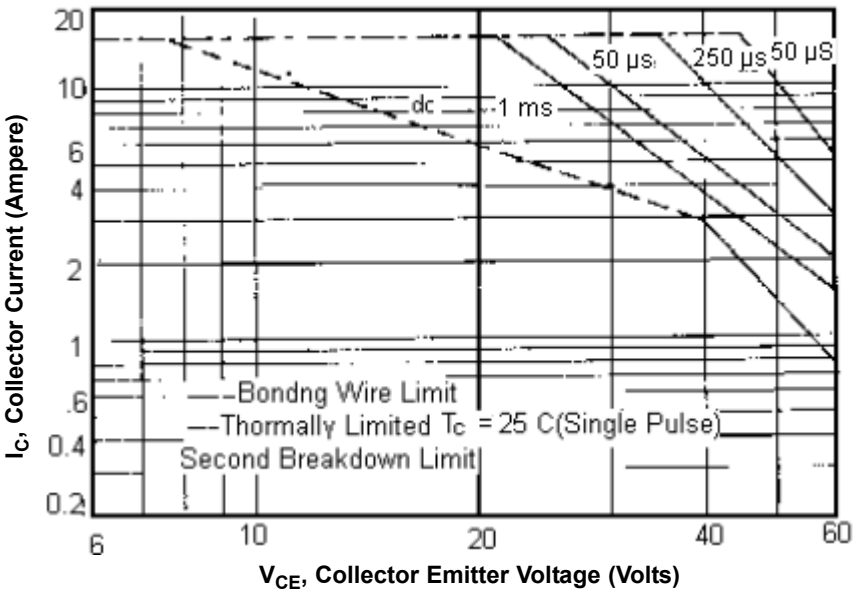
Collector Saturation Region



"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°C; T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J\ (PK)}$ = 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

Part Number Table

Description	Part Number
Transistor, NPN To-3	2N3055