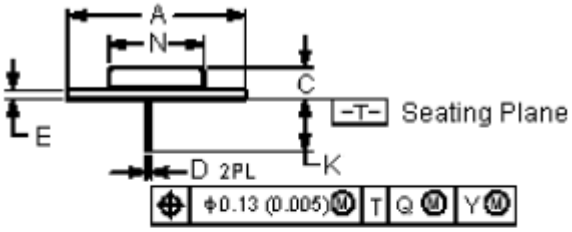
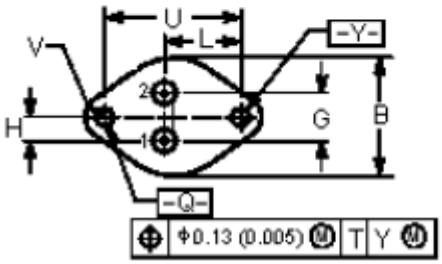
1165912

(TO-3)





Style 1:
Pin 1. Base
2. Emitter
Collector (Case)

Complementary Silicon Power Transistors are designed for general purpose switching and amplifier applications

Features:

- DC current gain h_{FE} = 20 - 70 at I_C = 4 A dc
- Collector-emitter saturation voltage-$V_{CE(sat)}$ = 1.1 V dc (maximum) at I_C = 4 A dc
- Excellent safe operating area
- Pb-free packages

Dimensions	Minimum	Maximum
A	1.550 (39.37) Reference	
B	-	1.050 (26.67)
C	0.250(6.35)	0.335 (8.51)
D	0.038 (0.97)	0.043 (1.09)
E	0.055 (1.40)	0.070 (1.77)
G	0.430 (10.92) BSC	
H	0.215 (5.46) BSC	
K	0.440 (11.18)	0.480 (12.19)
L	0.665 (16.89) BSC	
N	-	0.830 (21.08)
Q	0.151 (3.84)	0.165 (4.19)
U	1.187 (30.15) BSC	
V	0.131 (3.33)	0.188 (4.77)

Dimensions : Inches Millimetres

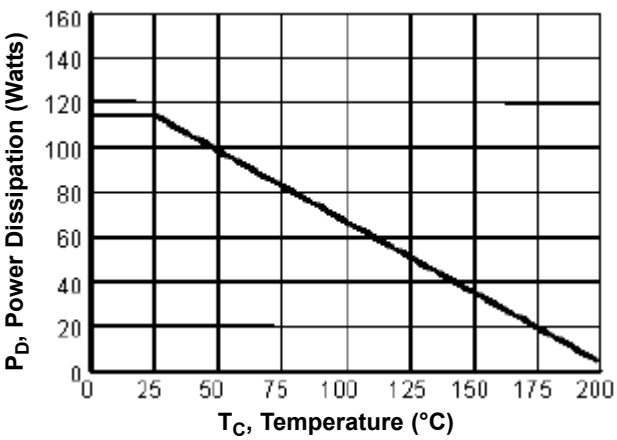
15 Amperes
Power Transistors
Complementary Silicon
60 Volts, 115 Watts

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	60	V dc
Collector-Emitter Voltage	V_{CER}	70	
Collector-Base Voltage	V_{CB}	100	
Emitter-Base Voltage	V_{EB}	7	
Collector Current-Continuous	I_C	15	A dc
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 +200	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

Power Derating



Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance, Junction to Case	$R_{\theta jc}$	1.52	°C/W

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

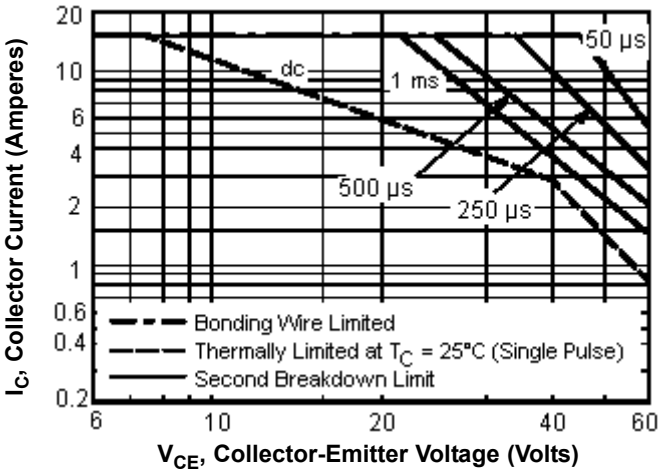
Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics*				
Collector-Emitter Sustaining Voltage (Note 1) (I_C = 200 mA, I_B = 0)	$V_{CEO\ (sus)}$	60	-	V dc
Collector-Emitter Sustaining Voltage (Note 1) (I_C = 200 mA, R_{BE} = 100 Ω)	$V_{CE\ (sus)}$	70	-	
Collector Cut off Current (V_{CE} = 30 V dc, I_B = 0)	I_{CEO}	-	0.7	mA dc
Collector Cut off Current (V_{CE} = 100 V dc $V_{BE\ (off)}$ = 1.5 V dc) (V_{CE} = 100 V dc $V_{BE\ (off)}$ = 1.5 V dc, T_C = 150°C)	I_{CEX}	-	1 5	
Emitter Cut off Current (V_{EB} =7 V dc, I_C = 0)	I_{EBO}	-	5	
ON Characteristics* (Note 1)				
DC Current Gain (I_C = 4 A, V_{CE} = 4 mA dc) (I_C = 10 A, V_{CE} = 4 V dc)	h_{FE}	20 5	70	-
Collector-Emitter Saturation Voltage (I_C = 4 A dc, I_B = 400 A dc) (I_C = 10 A dc, I_B = 3.3 A dc)	$V_{CE\ (sat)}$	-	1.1 3	V dc
Base-Emitter on Voltage (I_C = 4 A dc, V_{CE} = 4 V dc)	$V_{BE\ (on)}$	-	1.5	
Second Breakdown				
Second Breakdown Collector Current with Base Forward Biased (VCE = 40V dc, t = 1.0s, Non Repetitive)	$I_{S/b}$	2.87	-	A dc

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

Characteristic	Symbol	Minimum	Maximum	Unit
Dynamic Characteristics				
Current Gain-Bandwidth Product (2) (I_C = 0.5 A dc, V_{CE} = 10 V dc, f = 1 MHz)	f_T	2.5	-	MHz
*Small-Signal Current Gain (I_C = 1 A dc, V_{CE} = 4 V dc, f = 1 KHz)	h_{fe}	15	120	pF
*Small-Signal Current Gain Cut off Frequency (V_{CE} = 4 Vdc, I_C = 1 A dc, f = 1 KHz)	f_{hfe}	10	-	KHz

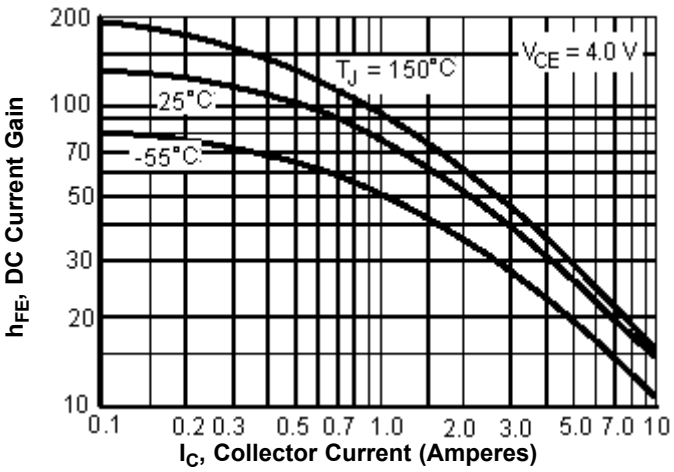
* Indicates Within JEDEC Registration. (MJ2955)
1. Pulse Test : Pulse Width = 300 µs, Duty Cycle ≤2.0%

Active Region Safe Operating Area

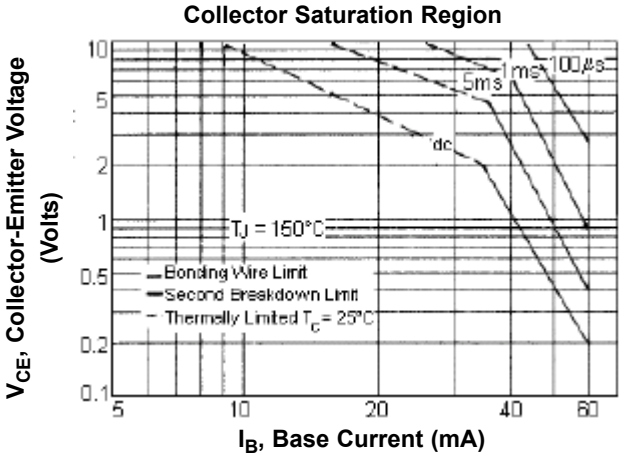


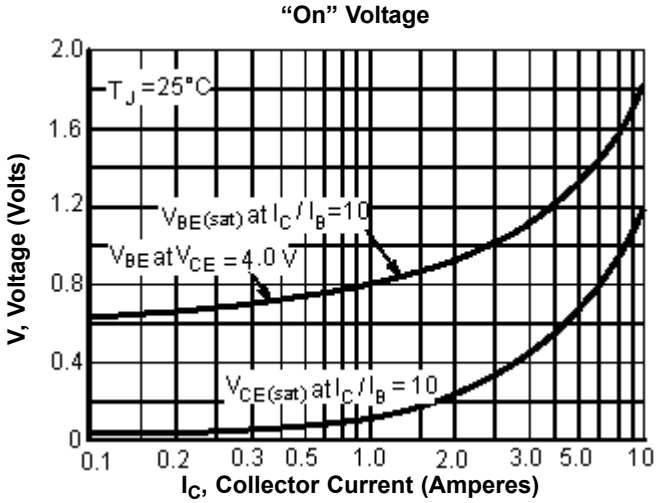
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than curves indicate.
The data is based on T_C = 25°C; $T_{J\,(pk)}$ is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature according

DC Current Gain



Collector Saturation Region





Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ2955