

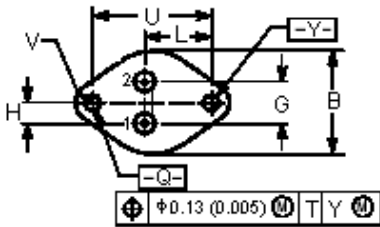
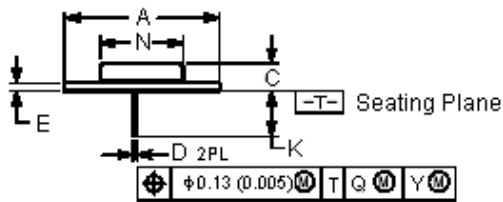
Complementary silicon power transistors are designed for general-purpose switching and amplifier applications.

**Features:**

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



**(TO-3)**



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

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



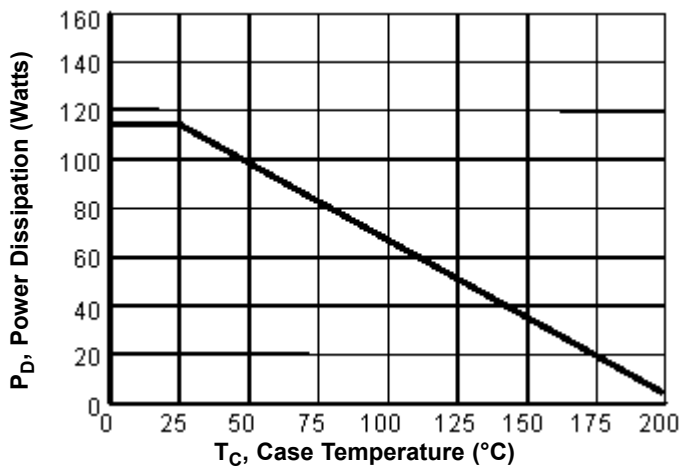
**(TO-3)**  
**Case 1-07**  
**Style 1**

## Maximum Ratings

Rating	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 $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	115 0.657	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

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

Characteristics	Symbol	Maximum	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.52	$^\circ\text{C/W}$

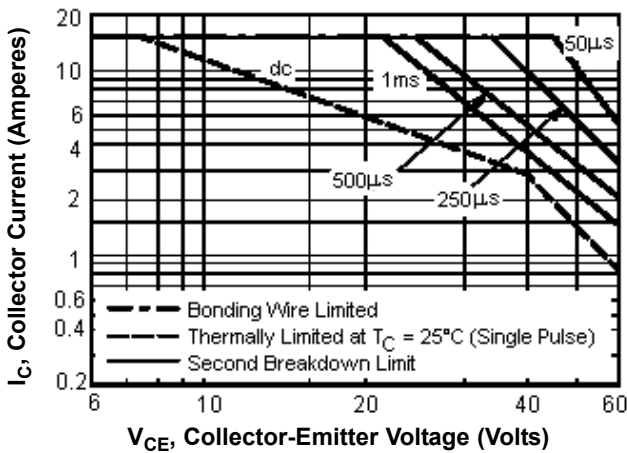
**Electrical Characteristics** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit
<b>Off Characteristics*</b>				
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 200\text{mA dc}$ , $I_B = 0$ )	$V_{EO(sus)}$	60	-	V dc
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 200\text{mA dc}$ , $R_{BE} = 100\Omega$ )	$V_{CER(sus)}$	70	-	
Collector Cut off Current ( $V_{CE} = 30\text{V dc}$ , $I_B = 0$ )	$I_{CEO}$	-	0.7	mA dc
Collector Cut off Current ( $V_{CE} = 100\text{V dc}$ , $V_{BE(off)} = 1.5\text{V dc}$ ) ( $V_{CE} = 100\text{V dc}$ , $V_{BE(off)} = 1.5\text{V dc}$ , $T_C = 150^\circ\text{C}$ )	$I_{CEX}$	-	1.0 5.0	
Emitter Cut off Current ( $V_{BE} = 7.0\text{V dc}$ , $I_C = 0$ )	$I_{EBO}$	-	5.0	
<b>On Characteristic* (Note 1)</b>				
DC Current Gain ( $I_C = 4.0\text{A dc}$ , $V_{CE} = 4.0\text{mA dc}$ ) ( $I_C = 10\text{A dc}$ , $V_{CE} = 4.0\text{V dc}$ )	$h_{FE}$	20 5.0	70 -	-
Collector-Emitter Saturation Voltage ( $I_C = 4.0\text{A dc}$ , $I_B = 400\text{A dc}$ ) ( $I_C = 10\text{A dc}$ , $I_B = 3.3\text{A dc}$ )	$V_{CE(sat)}$	-	1.1 3.0	V dc
Base-Emitter On Voltage ( $I_C = 4.0\text{A dc}$ , $V_{CE} = 4.0\text{V dc}$ )	$V_{BE(on)}$	-	1.5	
<b>Second Breakdown</b>				
Second Breakdown Collector Current with Base Forward Biased ( $V_{CE} = 40\text{V dc}$ , $t = 1.0\text{s}$ , Non Repetitive)	$I_{S/b}$	2.87	-	A dc
<b>Dynamic Characteristics</b>				
Current-Gain - Bandwidth Product ( $I_C = 0.5\text{A dc}$ , $V_{CE} = 10\text{V dc}$ , $f = 1.0\text{MHz}$ )	$f_T$	2.5	-	MHz
*Small-Signal Current Gain ( $I_C = 1.0\text{A dc}$ , $V_{CE} = 4.0\text{V dc}$ , $f = 1.0\text{kHz}$ )	$h_{fe}$	15	120	pF
*Small-Signal Current Gain Cut off Frequency ( $V_{CE} = 4.0\text{V dc}$ , $I_C = 1.0\text{A dc}$ , $f = 1.0\text{kHz}$ )	$f_{hfe}$	10	-	kHz

\*Indicates Within JEDEC Registration. (MJ2955).

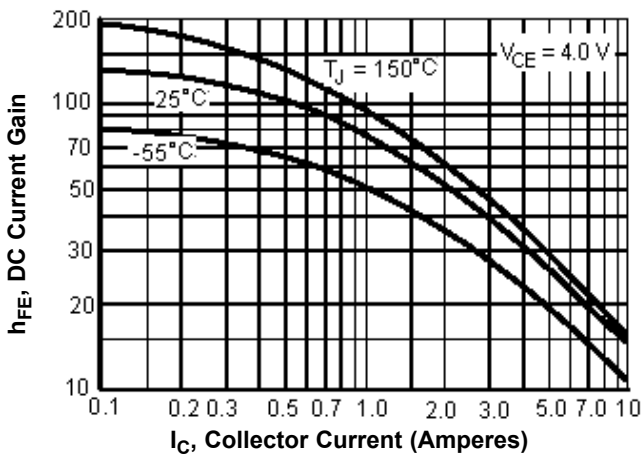
1. Pulse Test : Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

### Active Region Safe Operating Area

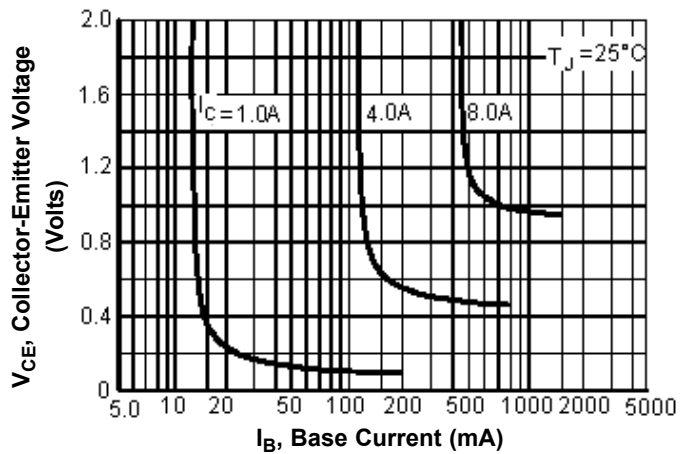


There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than curves indicate. The data is based on  $T_C = 25^\circ\text{C}$ ;  $T_J$  (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



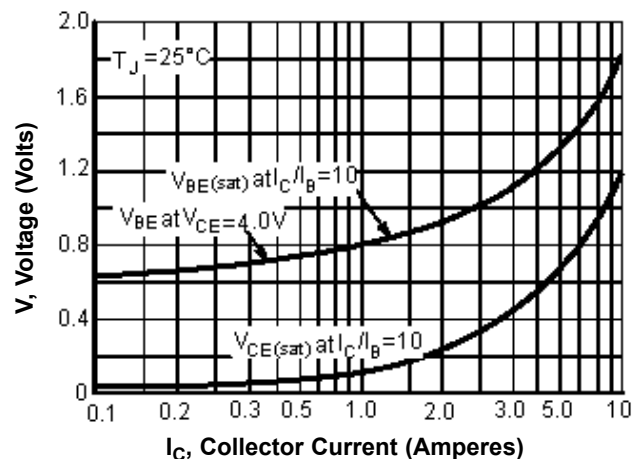
### Collector Saturation Region



### Part Number Table

Description	Part Number
Transistor, PNP, TO-3	MJ2955

### "On" Voltage



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