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Jameco Part Number 211385

## Complementary Silicon Power Transistors

... designed for general-purpose switching and amplifier applications.

- DC Current Gain —  $h_{FE} = 20-70$  @  $I_C = 4.0$  Adc
- Collector-Emitter Saturation Voltage —  $V_{CE(sat)} = 1.1$  Vdc (Max) @  $I_C = 4.0$  Adc
- Excellent Safe Operating Area

### MAXIMUM RATINGS

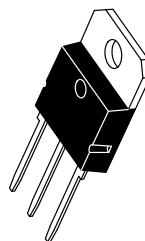
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	Vdc
Collector-Emitter Voltage	$V_{CER}$	70	Vdc
Collector-Base Voltage	$V_{CB}$	100	Vdc
Emitter-Base Voltage	$V_{EB}$	7.0	Vdc
Collector Current — Continuous	$I_C$	1.5	Adc
Base Current	$I_B$	7.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	90 0.72	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.39	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	35.7	$^\circ\text{C}/\text{W}$

**NPN**  
**TIP3055**  
**PNP**  
**TIP2955**

**15 AMPERE**  
**POWER TRANSISTORS**  
**COMPLEMENTARY**  
**SILICON**  
**60 VOLTS**  
**90 WATTS**



CASE 340D-02

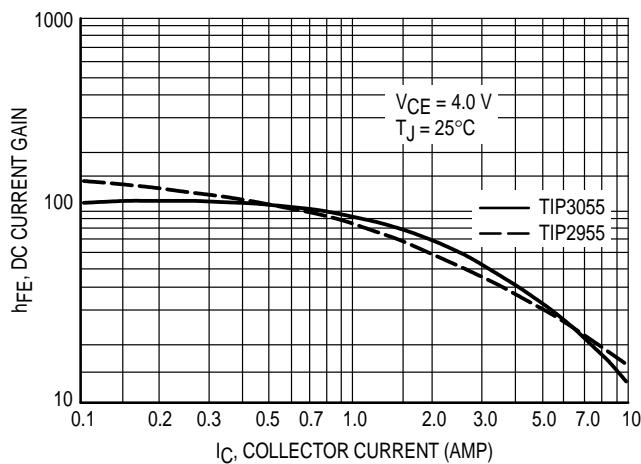


Figure 1. DC Current Gain

**ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)**

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (1) (I <sub>C</sub> = 30 mA, I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	60	—	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 70 Vdc, R <sub>BE</sub> = 100 Ohms)	I <sub>CER</sub>	—	1.0	mA
Collector Cutoff Current (V <sub>CE</sub> = 30 Vdc, I <sub>B</sub> = 0)	I <sub>CEO</sub>	—	0.7	mA
Collector Cutoff Current (V <sub>CE</sub> = 100 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc)	I <sub>CEV</sub>	—	5.0	mA
Emitter Cutoff Current (V <sub>BE</sub> = 7.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	5.0	mA
<b>ON CHARACTERISTICS (1)</b>				
DC Current Gain (I <sub>C</sub> = 4.0 Adc, V <sub>CE</sub> = 4.0 Vdc) (I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 4.0 Vdc)	h <sub>FE</sub>	20 5.0	70 —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 4.0 Adc, I <sub>B</sub> = 400 mA) (I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 3.3 Adc)	V <sub>CE(sat)</sub>	— —	1.1 3.0	Vdc
Base-Emitter On Voltage (I <sub>C</sub> = 4.0 Adc, V <sub>CE</sub> = 4.0 Vdc)	V <sub>BE(on)</sub>	—	1.8	Vdc

**SECOND BREAKDOWN**

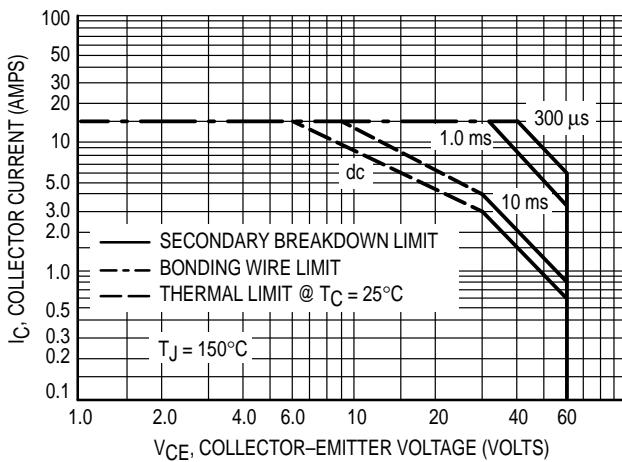
Second Breakdown Collector Current with Base Forward Biased (V <sub>CE</sub> = 30 Vdc, t = 1.0 s; Nonrepetitive)	I <sub>s/b</sub>	3.0	—	Adc
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**DYNAMIC CHARACTERISTICS**

Current Gain — Bandwidth Product (I <sub>C</sub> = 0.5 Adc, V <sub>CE</sub> = 10 Vdc, f = 1.0 MHz)	f <sub>T</sub>	2.5	—	MHz
Small-Signal Current Gain (V <sub>CE</sub> = 4.0 Vdc, I <sub>C</sub> = 1.0 Adc, f = 1.0 kHz)	h <sub>fe</sub>	15	—	kHz

(1) Pulse Test: Pulse Width = 300  $\mu$ s, Duty Cycle  $\leq$  2.0%.

NOTE: For additional design curves, refer to electrical characteristics curves of 2N3055.

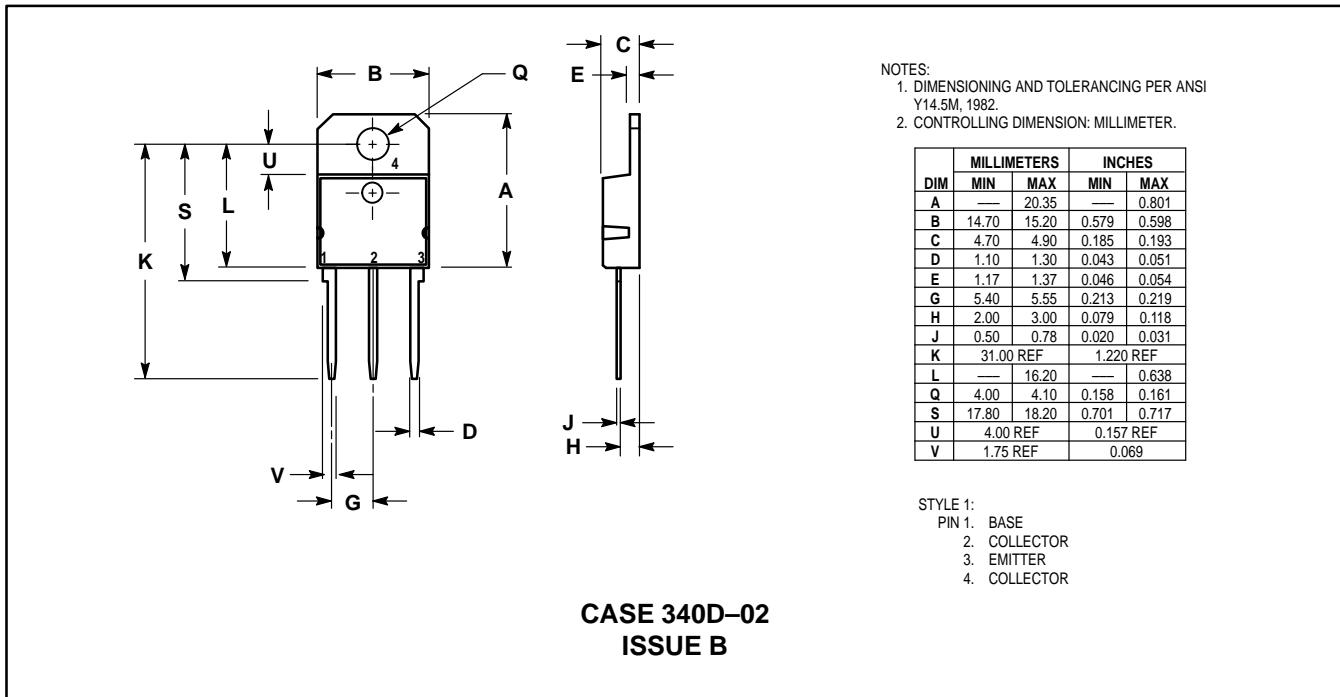


**Figure 2. Maximum Rated Forward Bias  
Safe Operating Area**

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I<sub>C</sub> – V<sub>CE</sub> limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 2 is based on T<sub>C</sub> = 25°C; T<sub>J(pk)</sub> is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature.

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