

## COMPLEMENTARY SILICON POWER TRANSISTORS

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

### FEATURES:

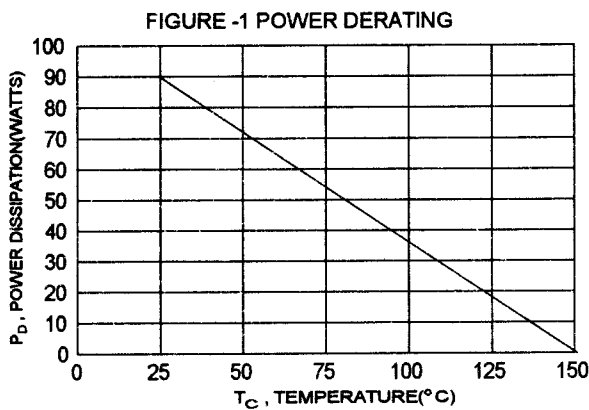
- \* Power Dissipation -  $P_D = 90W @ T_C = 25^\circ C$
- \* DC Current Gain  $hFE = 20 \sim 100 @ I_C = 4.0 A$
- \*  $V_{CE(sat)} = 1.1 V (Max.) @ I_C = 4.0 A, I_B = 400 mA$

### MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	V
Collector-Emitter Voltage	$V_{CER}$	70	V
Collector-Base Voltage	$V_{CBO}$	100	V
Emitter-Base Voltage	$V_{EBO}$	7.0	V
Collector Current-Continuous	$I_C$	15	A
Base Current	$I_B$	7.0	A
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	90 0.72	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	- 65 to +150	$^\circ C$

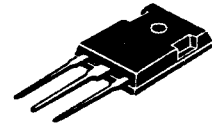
### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.39	$^\circ C/W$

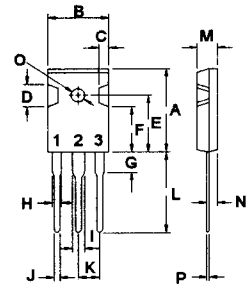


**NPN**      **PNP**  
**TIP3055**   **TIP2955**

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



**TO-247(3P)**



PIN 1.BASE  
2.COLLECTOR  
3.EMITTER

DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

**ELECTRICAL CHARACTERISTICS (  $T_c = 25^\circ\text{C}$  unless otherwise noted )**

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Collector - Emitter Sustaining Voltage (1) ( $I_c = 30\text{ mA}$ , $I_B = 0$ )	$V_{CE(sus)}$	60		V
Collector Cutoff Current ( $V_{CE} = 70\text{ V}$ , $R_{BE} = 100\text{ ohm}$ )	$I_{CER}$		1.0	mA
Collector Cutoff Current ( $V_{CE} = 30\text{ V}$ , $I_B = 0$ )	$I_{CEO}$		0.7	mA
Collector Cutoff Current ( $V_{CE} = 100\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ )	$I_{CEV}$		5.0	mA
Emitter Cutoff Current ( $V_{EB} = 7.0\text{ V}$ , $I_c = 0$ )	$I_{EBO}$		5.0	mA

**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_c = 4.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ ) ( $I_c = 10\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	hFE	20 5.0	100	
Collector - Emitter Saturation Voltage ( $I_c = 4.0\text{ A}$ , $I_B = 0.4\text{ A}$ ) ( $I_c = 10\text{ A}$ , $I_B = 3.3\text{ A}$ )	$V_{CE(sat)}$		1.1 3.0	V
Base - Emitter On Voltage ( $I_c = 4.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$V_{BE(on)}$		1.8	V

**DYNAMIC CHARACTERISTICS**

Current Gain - Bandwidth Product ( $I_c = 500\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ )	$f_T$	2.5		MHz
Small-Signal Current Gain ( $I_c = 1.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ , $f = 1\text{ KHz}$ )	$h_{FE}$	15		

(1) Pulse Test: Pulse width =  $300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

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

FIG-2 DC CURRENT GAIN

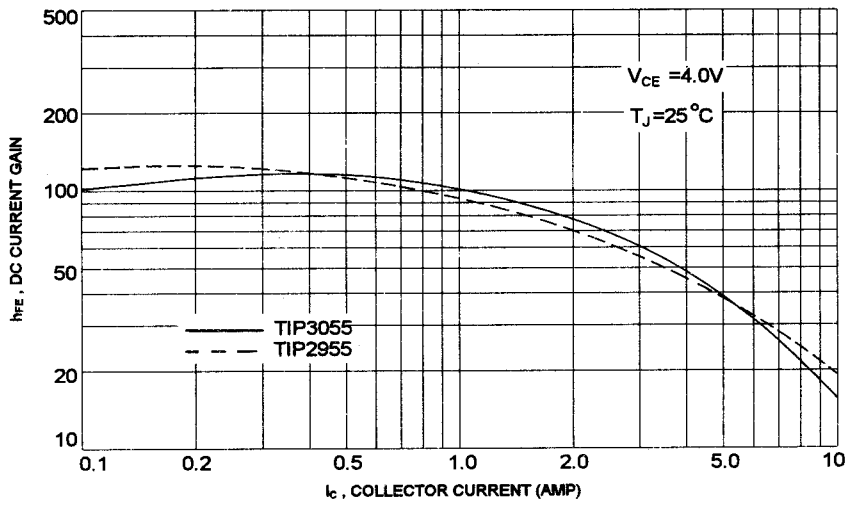
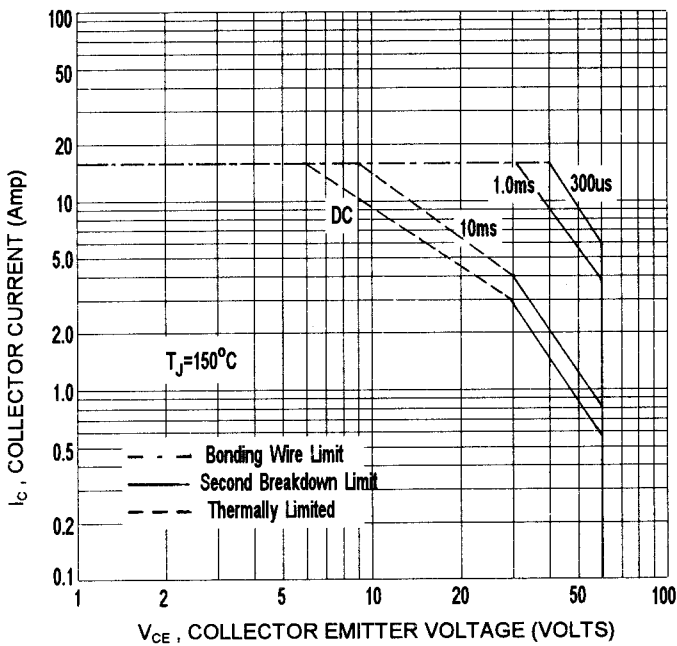


FIG-3 ACTIVE-REGION SAFE OPERATING AREA



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 of FIG-3 is base on  $T_C = 150^\circ C$ ;  $T_{J(PK)}$  is variable depending on power level. second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature.