

# Silicon N-P-N Switching Transistors

For Switching Applications in Industrial and Commercial Equipment

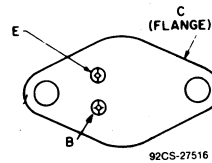
**Features:**

- $V_{CE0}$  — 300 V and 400 V
- $I_C$  — 10 A
- $P_T$  — 100 W

The TIP562 and TIP563 silicon n-p-n power transistors feature fast switching speeds, low saturation voltage, and high safe-operating-area (SOA) ratings. They are specially designed for converters, inverters, pulse-width-modulated regulators, and a variety of power-switching circuits.

The TIP562 and TIP563 transistors are supplied in steel JEDEC TO-204AA hermetic packages.

**TERMINAL DESIGNATIONS**



**JEDEC TO-204AA**

**MAXIMUM RATINGS, Absolute-Maximum Values:**

	TIP562	TIP563	
$V_{CB0}$ .....	300	400	V
$V_{CE0(SUS)}$ .....	300	400	V
$V_{EBO}$ .....	8		V
$I_C$ .....	10		A
$I_{CM}$ .....	15		A
$I_B$ .....	2		A
$P_T$ : At $T_c$ up to 100 °C .....	100		W
$T_{J,atg}$ .....	-65 to +200		°C
$T_c$ : At distances $\geq 1/16$ , in. (1.58 mm) from case for 10 s max. ....	200		°C

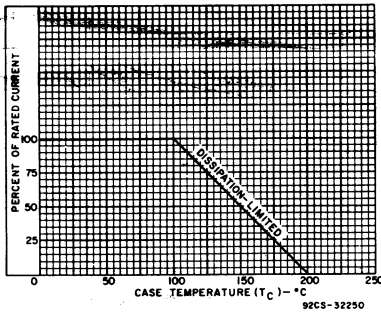


Fig. 1 - Dissipation derating curve.

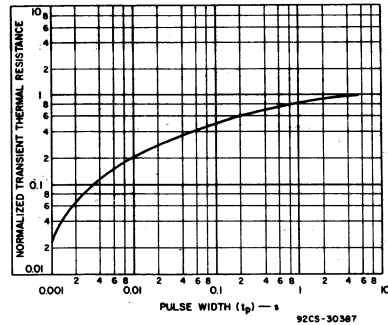


Fig. 2 - Typical thermal-response characteristic.

# TIP562, TIP563

**ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C**  
*unless otherwise specified*

CHARACTERISTIC	TEST CONDITIONS				LIMITS						UNITS
	VOLTAGE V dc		CURRENT A dc		TIP562			TIP563			
	V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	Min.	Typ.	Max.	Min.	Typ.	Max.	
I <sub>CEO</sub>	270	—	—	0	—	—	1	—	—	—	mA
	360	—	—	0	—	—	—	—	—	1	
I <sub>CBO</sub> , I <sub>E</sub> = 0	300 <sup>b</sup>	—	—	—	—	—	100	—	—	—	μA
	400 <sup>b</sup>	—	—	—	—	—	—	—	—	100	
I <sub>EBO</sub>	—	8	0	—	—	—	5	—	—	5	mA
V <sub>CEO(sus)</sub> <sup>a</sup>	—	—	0.1	—	300	—	—	400	—	—	
V <sub>BE(sat)</sub> <sup>a</sup>	—	—	10	1.66	—	—	1.4	—	—	1.4	V
V <sub>CE(sat)</sub> <sup>2</sup>	—	—	10	1.66	—	—	1.2	—	—	1.2	
	—	—	15	5	—	—	2.0	—	—	2.0	
h <sub>FE</sub> <sup>a</sup>	4	—	1.0	—	20	—	—	20	—	—	
	4	—	10	—	8	—	—	8	—	—	
I <sub>S</sub> /b, t <sub>p</sub> = 1 s, non-repetitive	40	—	—	—	2.5	—	—	2.5	—	—	A
t <sub>d</sub>	V <sub>CC</sub> = 180 V	-5.2	10	2	—	.05	—	—	.05	—	μs
t <sub>r</sub>	V <sub>CC</sub> = 180 V	-5.2	10	2	—	0.5	—	—	0.5	—	
t <sub>s</sub> (I <sub>B1</sub> = I <sub>B2</sub> )	V <sub>CC</sub> = 180 V	-5.2	10	2	—	1.2	—	—	1.2	—	
t <sub>f</sub> (I <sub>B1</sub> = I <sub>B2</sub> )	V <sub>CC</sub> = 180 V	-5.2	10	2	—	0.3	—	—	0.3	—	
t <sub>c</sub> V <sub>CC</sub> = 135 V L = 50 μH R <sub>C</sub> = 13.5 Ω	—	-6	10	2	—	—	700	—	—	700	ns
R <sub>θJC</sub>	—	—	—	—	—	—	1.0	—	—	1.0	°C/W

<sup>a</sup>Pulsed, pulse duration = 300 μs, duty factor < 2%.

<sup>b</sup>V<sub>CB</sub> value.

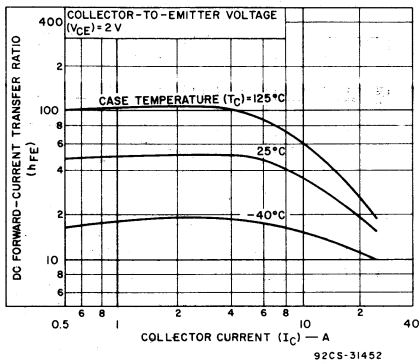


Fig. 3 - Typical dc beta characteristics for both types.

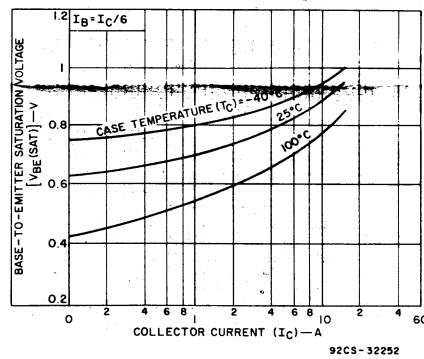


Fig. 4 - Typical base-to-emitter saturation voltage characteristics for both types.

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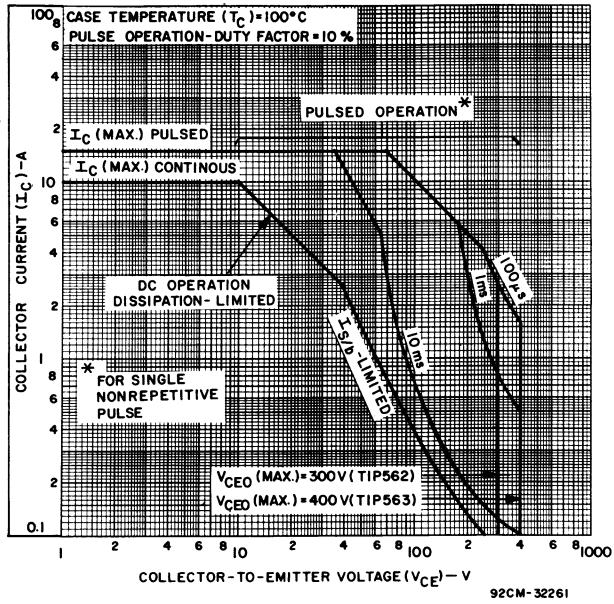


Fig. 5 - Maximum operating areas ( $T_C = 100^\circ\text{C}$ ).

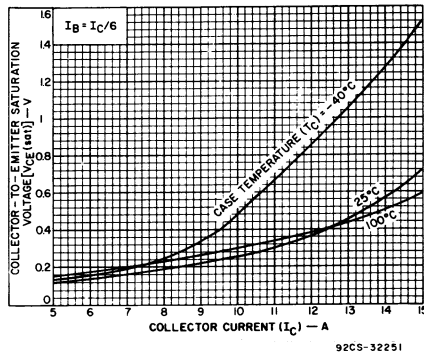


Fig. 6 - Typical collector-to-emitter saturation voltage characteristics for both types.