

# Silicon N-P-N Transistors

## Complementary to the D45C Series

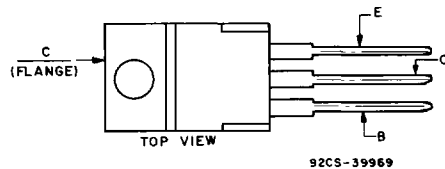
General-Purpose Types for Medium-Power Switching and Amplifier Applications

**Features:**

- *Very low collector saturation voltage* [0.5V typ. @ 3.0A  $I_C$ ]
- *Excellent linearity*
- *Fast switching*

D44C-series n-p-n power transistors are designed for various specific and general purpose applications, such as: output and driver stages of amplifiers operating at frequencies from DC to greater than 1.0 MHz, series, shunt and switching regulators, and low and high frequency inverters/converters.

**TERMINAL DESIGNATIONS**



**JEDEC TO-220AB**

**MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ ) (unless otherwise specified)**

RATING	SYMBOL	D44C1, 2, 3	D44C4, 5, 6	D44C7, 8, 9	D44C10, 11, 12	UNITS
Collector-Emitter Voltage	$V_{CEO}$	30	45	60	80	Volts
Collector-Emitter Voltage	$V_{CES}$	40	55	70	90	Volts
Emitter Base Voltage	$V_{EBO}$	5	5	5	5	Volts
Collector Current — Continuous	$I_C$	4	4	4	4	A
Peak <sup>(1)</sup>	$I_{CM}$	6	6	6	6	
Base Current — Continuous	$I_B$	2	2	2	2	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	$P_D$	1.67 30	1.67 30	1.67 30	1.67 30	Watts
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	-55 to +150	-55 to +150	-55 to +150	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	75	75	75	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.2	4.2	4.2	4.2	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	+260	+260	+260	+260	$^\circ\text{C}$

(1) Pulse Test Pulse Width = 300ms Duty Cycle  $\leq 2\%$ .

# D44C Series

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ ) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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### OFF CHARACTERISTICS<sup>(1)</sup>

Collector-Emitter Sustaining Voltage ( $I_C = 100\text{mA}$ )	D44C1, 2, 3 D44C4, 5, 6 D44C7, 8, 9 D44C10, 11, 12	$V_{CEO(sus)}$	30 45 60 80	— — — —	— — — —	Volts
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CES}$ )		$I_{CES}$	—	—	10	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5\text{V}$ )		$I_{EBO}$	—	—	100	$\mu\text{A}$

### SECOND BREAKDOWN

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 3
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### ON CHARACTERISTICS<sup>(1)</sup>

DC Current Gain ( $I_C = 0.2\text{A}, V_{CE} = 1\text{V}$ )	D44C1, 4, 7, 10 D44C2, 5, 8, 11 D44C3, 6, 9, 12	$h_{FE}$	25 100 40	— — —	— 220 120	—
( $I_C = 1\text{A}, V_{CE} = 1\text{V}$ ) ( $I_C = 2\text{A}, V_{CE} = 1\text{V}$ )	D44C1, 4, 7, 10 D44C2, 5, 8, 11 D44C3, 6, 9, 12	$h_{FE}$	10 20 20	— — —	— — —	—
Collector-Emitter Saturation Voltage ( $I_C = 1\text{A}, I_B = 50\text{mA}$ ) ( $I_C = 1\text{A}, I_B = 100\text{mA}$ )	D44C2, 5, 8, 11 D44C3, 6, 9, 12 D44C1, 4, 7, 10	$V_{CE(sat)}$	— — —	— — —	0.5 0.5 0.5	Volts
Base-Emitter Saturation Voltage ( $I_C = 1\text{A}, I_B = 100\text{mA}$ )		$V_{BE(sat)}$	—	—	1.3	Volts

**2**  
POWER TRANSISTORS

### DYNAMIC CHARACTERISTICS

Collector Capacitance ( $V_{CB} = 10\text{V}, f = 1\text{MHz}$ )	$C_{CBO}$	—	—	100	pF
Current-Gain — Bandwidth Product ( $I_C = 20\text{mA}, V_{CE} = 4\text{V}$ )	$f_T$	—	50	—	MHz

### SWITCHING CHARACTERISTICS

Resistive Load						
Delay Time + Rise Time	$I_C = 1\text{A}, I_{B1} = I_{B2} = 0.1\text{A},$ $V_{CC} = 30\text{A}, t_p = 25 \mu\text{sec}$	$t_d + t_r$	—	100	—	nS
Storage Time		$t_s$	—	500	—	
Fall Time		$t_f$	—	75	—	

(1) Pulse Test PW = 300ms Duty Cycle  $\leq$  2%.

# D44C Series

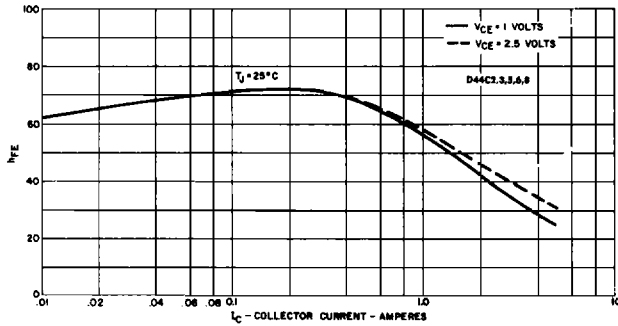


FIG. 1 TYPICAL  $h_{FE}$  VS.  $I_C$

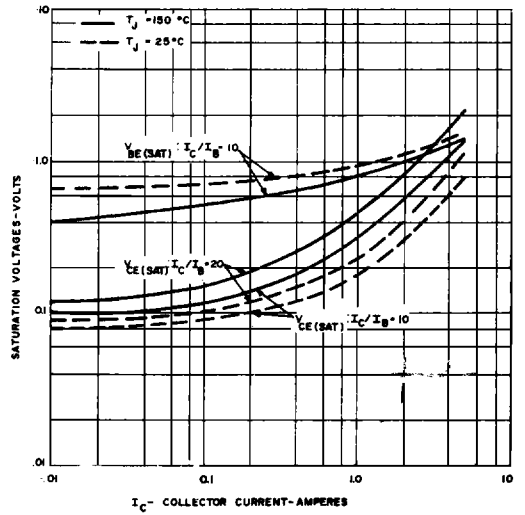


FIG. 2 TYPICAL SATURATION VOLTAGE CHARACTERISTICS

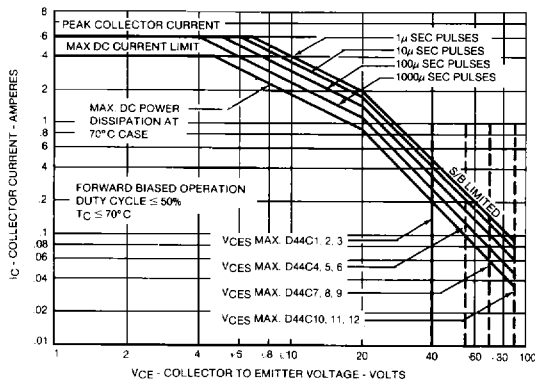


FIG. 3 SAFE REGION OF OPERATION

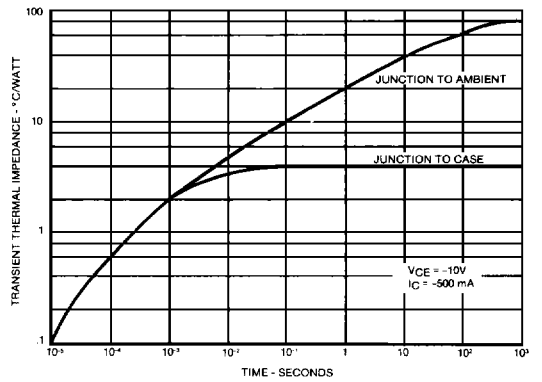


FIG. 4 MAXIMUM TRANSIENT THERMAL IMPEDANCE