

**D44C Series**File Number **2343**

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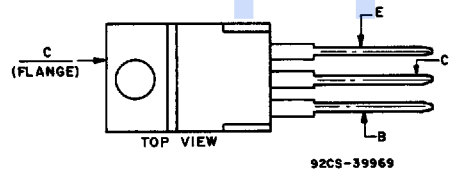
**Silicon N-P-N Transistors****Complementary to the D45C Series**

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
Collector Current — Peak <sup>(1)</sup>	$I_{CM}$	6	6	6	6	A
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: $\frac{1}{8}$ " 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<sub>C</sub> = 25°C) (unless otherwise specified)**

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

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Collector-Emitter Sustaining Voltage (I <sub>C</sub> = 100mA)	D44C1, 2, 3 D44C4, 5, 6 D44C7, 8, 9 D44C10, 11, 12	V <sub>CEO(sus)</sub>	30 45 60 80	— — — —	— — — —	Volts
Collector Cutoff Current (V <sub>CE</sub> = Rated V <sub>CE(s)</sub> )		I <sub>CES</sub>	—	—	10	μA
Emitter Cutoff Current (V <sub>EB</sub> = 5V)		I <sub>EBO</sub>	—	—	100	μA

**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 <sub>C</sub> = 0.2A, V <sub>CE</sub> = 1V)	D44C1, 4, 7, 10 D44C2, 5, 8, 11 D44C3, 6, 9, 12	h <sub>FE</sub>	25 100 40	— — —	— 220 120	—
(I <sub>C</sub> = 1A, V <sub>CE</sub> = 1V) (I <sub>C</sub> = 2A, V <sub>CE</sub> = 1V)	D44C1, 4, 7, 10 D44C2, 5, 8, 11 D44C3, 6, 9, 12	h <sub>FE</sub>	10 20 20	— — —	— — —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA)	D44C2, 5, 8, 11 D44C3, 6, 9, 12 D44C1, 4, 7, 10	V <sub>CE(sat)</sub>	— — —	— — —	0.5 0.5 0.5	Volts
(I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA)						
Base-Emitter Saturation Voltage (I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA)		V <sub>BE(sat)</sub>	—	—	1.3	Volts

POWER TRANSISTORS

**DYNAMIC CHARACTERISTICS**

Collector Capacitance (V <sub>CB</sub> = 10V, f = 1MHz)	C <sub>CBO</sub>	—	—	100	pF
Current-Gain — Bandwidth Product (I <sub>C</sub> = 20mA, V <sub>CE</sub> = 4V)	f <sub>T</sub>	—	50	—	MHz

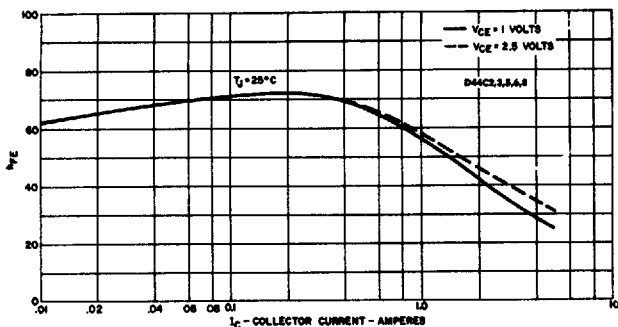
**SWITCHING CHARACTERISTICS**

Resistive Load						
Delay Time + Rise Time	I <sub>C</sub> = 1A, I <sub>B1</sub> = I <sub>B2</sub> = 0.1A, V <sub>CC</sub> = 30A, t <sub>p</sub> = 25 μsec	t <sub>d</sub> + t <sub>r</sub>	—	100	—	nS
Storage Time		t <sub>s</sub>	—	500	—	
Fall Time		t <sub>f</sub>	—	75	—	

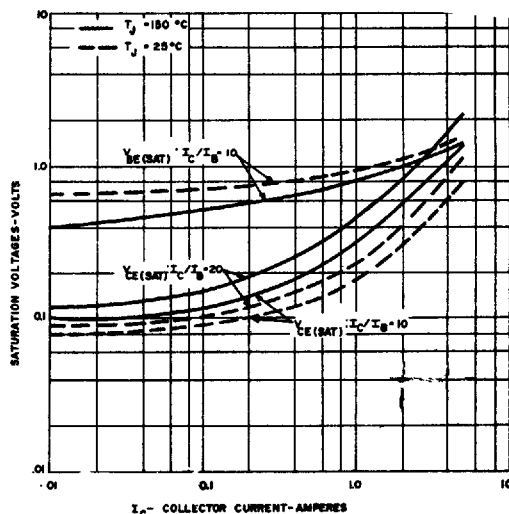
(1) Pulse Test PW = 300ms Duty Cycle ≤ 2%.

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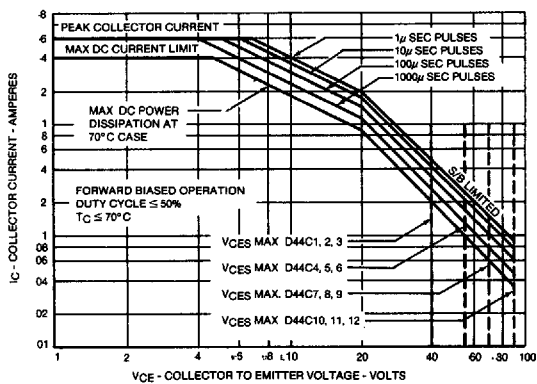
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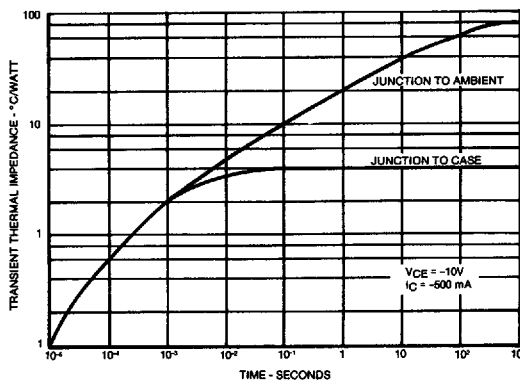
**FIG. 1 TYPICAL  $h_{FE}$  VS.  $I_C$**



**FIG. 2 TYPICAL SATURATION VOLTAGE CHARACTERISTICS**



**FIG. 3 SAFE REGION OF OPERATION**



**FIG. 4 MAXIMUM TRANSIENT THERMAL IMPEDANCE**