



VERY HIGH GAIN NPN POWER DARLINGTON TRANSISTORS

COMPLEMENTARY TO THE D45D SERIES

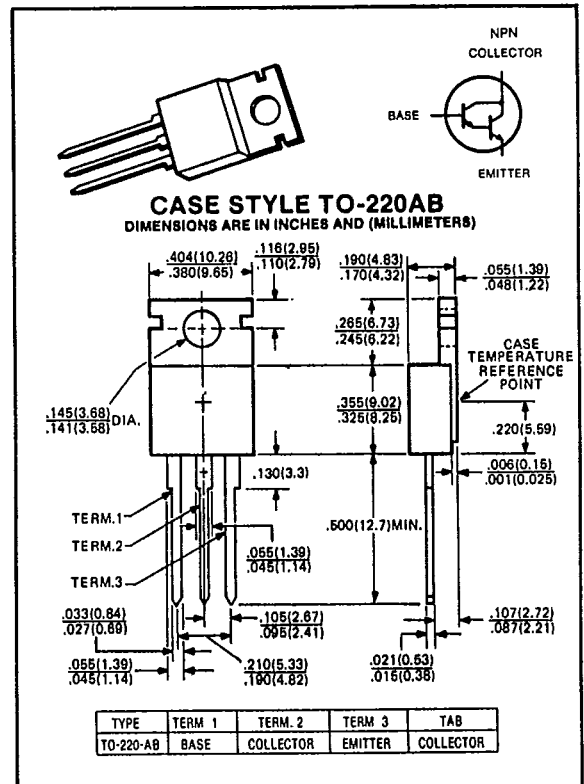
D44D Series

40-80 VOLTS
6 AMP, 30 WATTS

The General Electric D44D is a Darlington power transistor. It is designed for general purpose switching of multi-ampere loads directly from low level logic circuitry. A monolithic bias resistor is included for elevated temperature stability and bypass diode for reduced dissipation under negative transient conditions.

Applications:

- Solenoid Driver
- Lamp Driver
- Relay Substitute
- Switching Regulator
- Inverter/Converter



maximum ratings ($T_A = 25^\circ\text{C}$) (unless otherwise specified)

RATING	SYMBOL	D44D1,2	D44D3,4	D44D5,6	UNITS
Collector-Emitter Voltage	V_{CEO}	40	60	80	Volts
Collector-Emitter Voltage	V_{CES}	50	70	90	Volts
Emitter Base Voltage	V_{EBO}	5	5	5	Volts
Collector Current — Continuous	I_C	6	6	6	A
Base Current — Continuous	I_B	.5	.5	.5	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	P_D	2.1 30	2.1 30	2.1 30	Watts
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	-55 to +150	-55 to +150	$^\circ\text{C}$

thermal characteristics

Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	60	60	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	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	$^\circ\text{C}$

electrical characteristics ($T_C = 25^\circ\text{C}$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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off characteristics⁽¹⁾

Collector-Emitter Breakdown Voltage ($I_C = 50\text{mA}$)	D44D1,2 D44D3,4 D44D5,6	$V_{CEO(BR)}$	40 60 80	— — —	— — —	Volts
Collector Cut-off Current ($V_{CE} = \text{Rated } V_{CES}$) ($V_{CE} = \text{Rated } V_{CES}, V_{BE} = 0.4\text{V}$)	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	I_{CES} I_{CEV}	— —	— —	10 5	μA
Emitter Cutoff Current ($V_{EB} = 5\text{V}$)		I_{EBO}	—	—	10	μA

second breakdown

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 5
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on characteristics

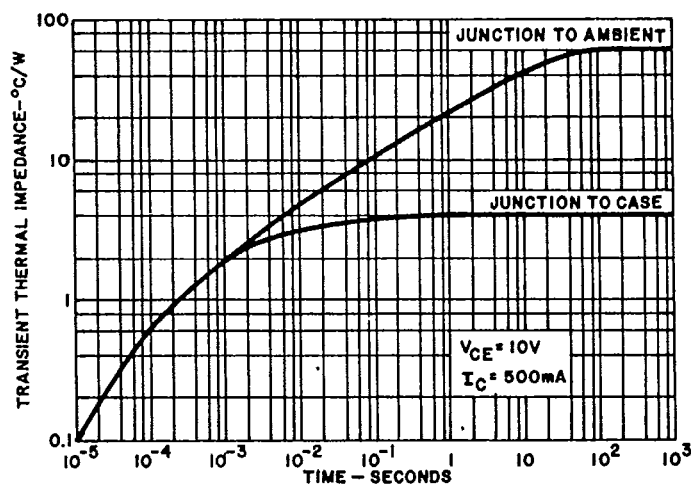
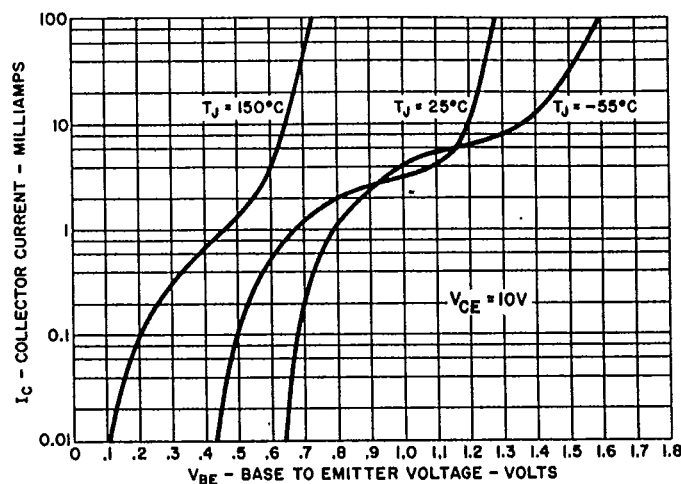
DC Current Gain ($I_C = 1\text{A}, V_{CE} = 2\text{V}$)	h_{FE}	2,000	5,000	—	—
Collector-Emitter Saturation Voltage ($I_C = 3\text{A}, I_B = 3\text{mA}$) ($I_C = 5\text{A}, I_B = 5\text{mA}$)	$V_{CE(sat)}$	— —	— —	1.5 1.5	V V
Base-Emitter Saturation Voltage ($I_C = 5\text{A}, I_B = 5\text{mA}$)	$V_{BE(sat)}$	—	—	2.5	Volts

dynamic characteristics

Collector Capacitance ($V_{CE} = 10\text{V}, f = 1\text{MHz}$)	C_{CBO}	—	—	45	pF
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switching characteristics

Resistive Load	$I_C = 3\text{A}, I_{B1} = I_{B2} = 3\text{mA}$ $V_{CC} = 40\text{V}, t_p = 25 \mu\text{sec}$				
Delay Time + Rise Time		$t_d + t_r$	—	0.5	—
Storage Time		t_s	—	1.2	—
Fall Time		t_f	—	0.8	—

(1) Pulse Test: $PW \leq 300\text{ms}$ Duty Cycle $\leq 2\%$.FIG. 1
MAXIMUM TRANSIENT THERMAL IMPEDANCEFIG. 2
TYPICAL TRANSCONDUCTANCE CHARACTERISTICS

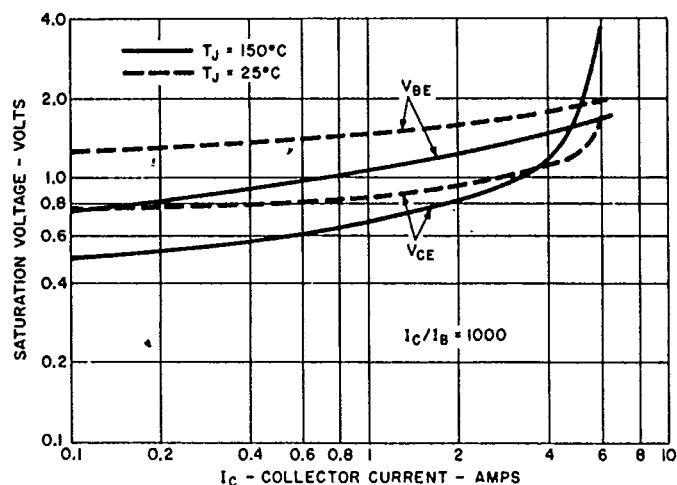


FIG. 3
TYPICAL SATURATION VOLTAGE CHARACTERISTICS

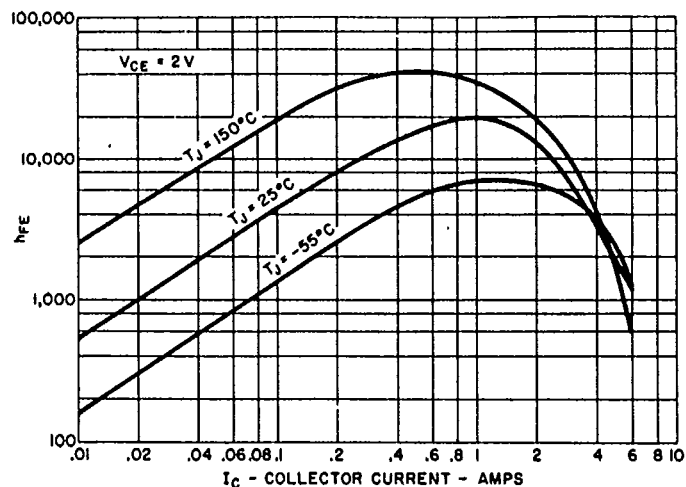


FIG. 4 TYPICAL h_{FE} VS. I_C

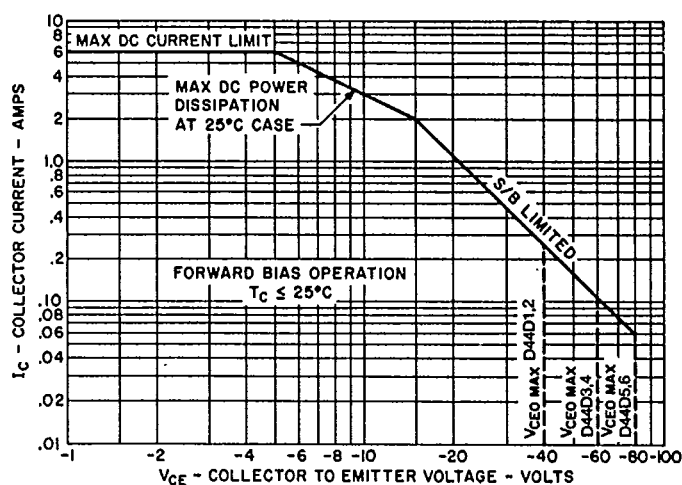


FIG. 5 SAFE REGION OF OPERATION