



VERY HIGH GAIN PNP POWER DARLINGTON TRANSISTORS

COMPLEMENTARY TO THE D44D SERIES

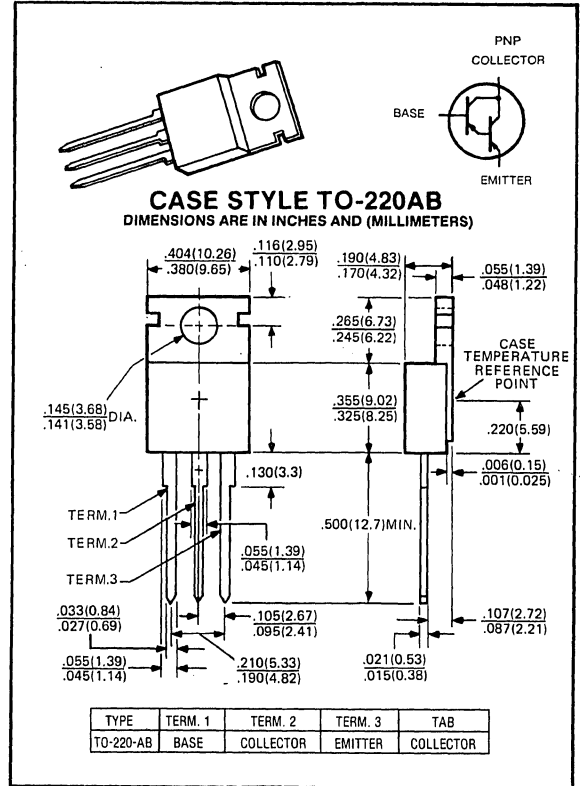
D45D Series

**-40 - (-80) VOLTS
-6 AMP, 30 WATTS**

The General Electric D45D 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 reverse 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	D45D1,2	D45D3,4	D45D5,6	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 ($T_C = 25^\circ C$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
----------------	--------	-----	-----	-----	------

off characteristics⁽¹⁾

Collector-Emitter Breakdown Voltage ($I_C = -50mA$)	D45D1,2 D45D3,4 D45D5,6	$V_{CEO(BR)}$	-40 -60 -80	— — —	— — —	Volts
Collector Cut-off Current ($V_{CE} = \text{Rated } V_{CES}$) ($V_{CE} = \text{Rated } V_{CES}, V_{BE} = -0.4V$)	$T_C = 25^\circ C$ $T_C = 125^\circ C$	I_{CES} I_{CEV}	— —	— —	-10 -5	μA
Emitter Cutoff Current ($V_{EB} = -5V$)		I_{EBO}	—	—	-10	μA

second breakdown

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 5
-------------------------------------------	-------	--------------

on characteristics

DC Current Gain ($I_C = -1A, V_{CE} = -2V$)		h_{FE}	2,000	5,000	—	—
Collector-Emitter Saturation Voltage ($I_C = -3A, I_B = -3mA$) ($I_C = -5A, I_B = -5mA$)	D45D2,4,6 only	$V_{CE(sat)}$	— —	— —	-1.5 -2.0	V V
Base-Emitter Saturation Voltage ($I_C = -5A, I_B = -5mA$)		$V_{BE(sat)}$	—	—	-2.5	Volts

dynamic characteristics

Collector Capacitance ($V_{CE} = 10V, f = 1MHz$)	C_{CBO}	—	—	-75	pF
-------------------------------------------------------	-----------	---	---	-----	----

switching characteristics

Resistive Load						
Delay Time + Rise Time	$I_C = -3A, I_{B1} = I_{B2} = -3mA$ $V_{CC} = 40V, t_p = 25 \mu sec$	$t_d + t_r$	—	0.35	—	μs
Storage Time		t_s	—	0.4	—	
Fall Time		t_f	—	0.3	—	

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

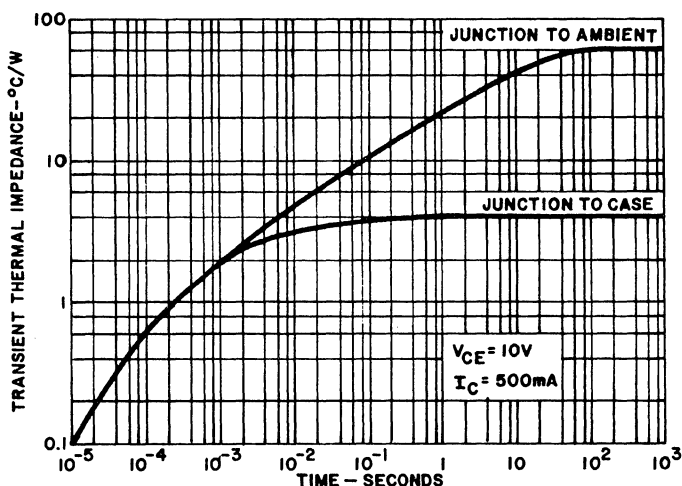


FIG. 1
MAXIMUM TRANSIENT THERMAL IMPEDANCE

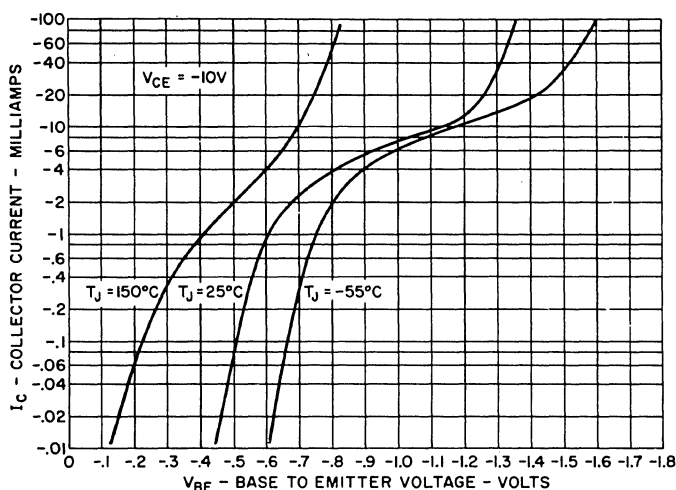


FIG. 2
TYPICAL TRANSCONDUCTANCE CHARACTERISTICS

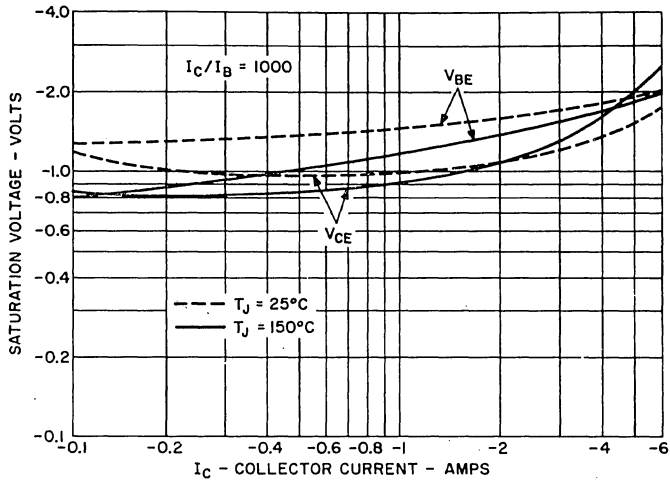


FIG. 3

TYPICAL SATURATION VOLTAGE CHARACTERISTICS

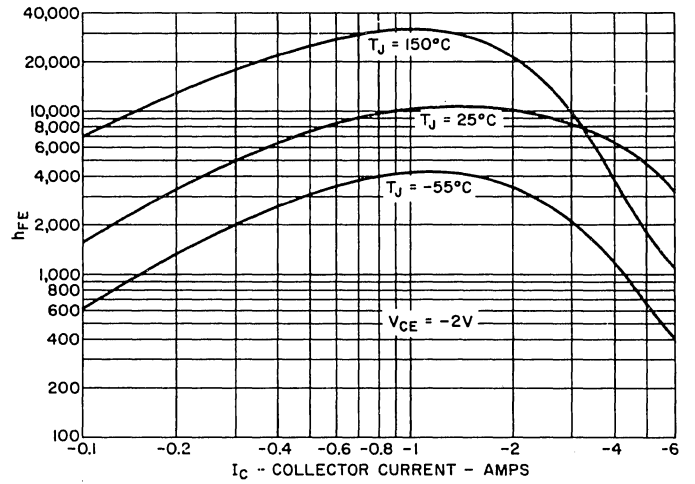


FIG. 4 TYPICAL h_{FE} VS. I_C

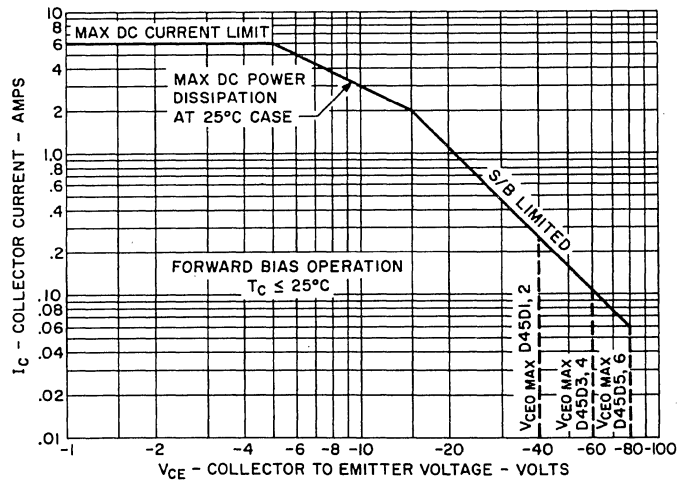


FIG. 5 SAFE REGION OF OPERATION