

T-35-29

6-Ampere N-P-N Darlington Power Transistors

Complementary to the D45D Series

40, 60, and 80 Volts, 30 Watts
Gain of 2000 at 1 A

Features:

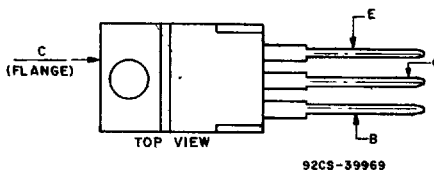
- Operates from IC without predriver

Applications:

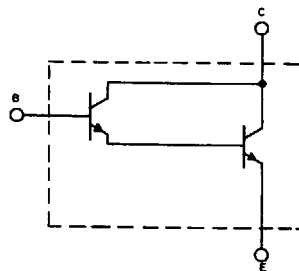
- Solenoid Driver
- Lamp Driver
- Relay Substitute
- Switching Regulator
- Inverter/Converter

The D44D-series n-p-n Darlington power transistors are designed for general purpose switching of multi-ampere loads directly from low-level logic circuitry. The monolithic base-to-emitter resistors have been deleted from the structure to enhance the gain characteristics. These devices feature minimum gains of 2000.

TERMINAL DESIGNATIONS



JEDEC TO-220AB



92CS-43150

Schematic diagram for all types.

POWER TRANSISTORS

MAXIMUM RATINGS (T_A = 25° 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	0.5	0.5	0.5	A
Total Power Dissipation @ T _A = 25° C @ T _C = 25° 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	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Ambient	R _{θJA}	60	60	60	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	4.2	4.2	4.2	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T _L	260	260	260	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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OFF CHARACTERISTICS⁽¹⁾

T-35-29

Collector-Emitter Breakdown Voltage (I _C = 50mA)	D44D1,2	V _{CEO(BR)}	40	—	—	Volts
	D44D3,4		60	—	—	
	D44D5,6		80	—	—	
Collector Cut-off Current (V _{CE} = Rated V _{CEs}) (V _{CE} = Rated V _{CEs} , V _{BE} = 0.4V)	T _C = 25°C T _C = 125°C	I _{ICES}	—	—	10	μA
		I _{CEV}	—	—	5	
Emitter Cutoff Current (V _{EB} = 5V)		I _{EBO}	—	—	10	μA

SECOND BREAKDOWN

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 5
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ON CHARACTERISTICS⁽¹⁾

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)	D44D2,4,6 only	V _{CE(sat)}	—	—	1.5	V
			—	—	1.5	V
Base-Emitter Saturation Voltage (I _C = 5A, I _B = 5mA)		V _{BE(sat)}	—	—	2.5	Volts

DYNAMIC CHARACTERISTICS

Collector Capacitance (V _{CB} = 10V, f = 1MHz)	C _{CB0}	—	—	45	pF
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SWITCHING CHARACTERISTICS

Resistive Load	I _C = 3A, I _{B1} = I _{B2} = 3mA V _{CC} = 40V, t _p = 25 μsec					
Delay Time + Rise Time		t _d + t _r	—	0.5	—	μS
Storage Time		t _s	—	1.2	—	
Fall Time		t _f	—	0.8	—	

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

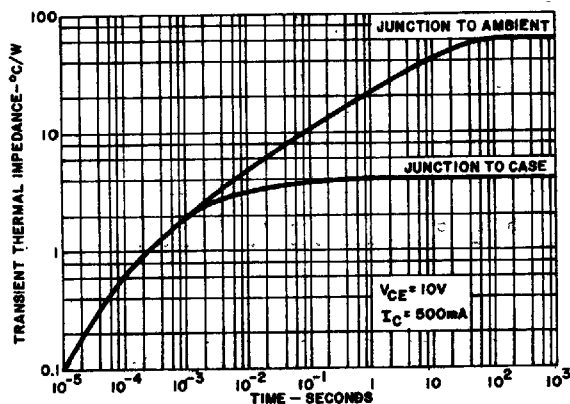


FIG. 1
MAXIMUM TRANSIENT THERMAL IMPEDANCE

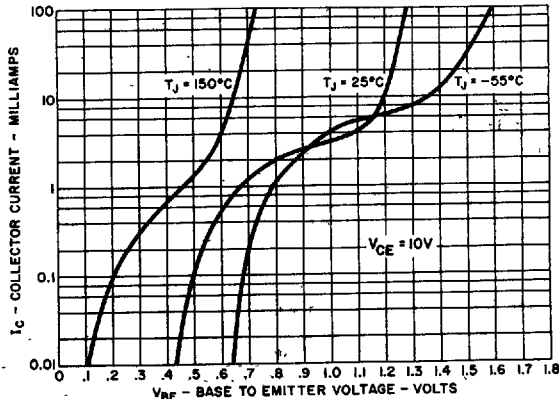


FIG. 2
TYPICAL TRANSCONDUCTANCE CHARACTERISTICS

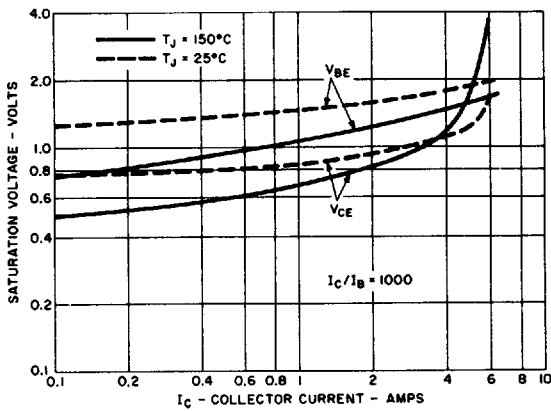


FIG. 3

TYPICAL SATURATION VOLTAGE CHARACTERISTICS

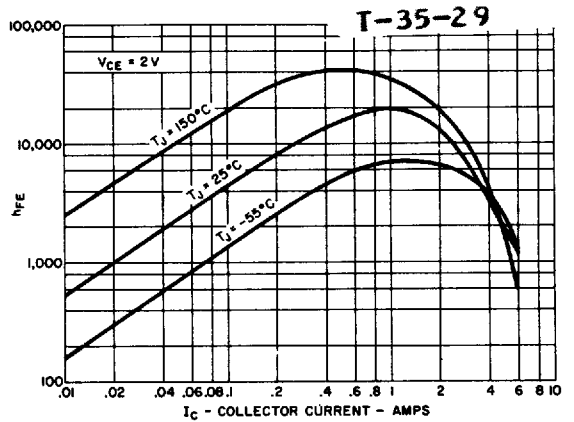


FIG. 4 TYPICAL h_{FE} VS. I_C

HARRIS SEMICONDUCTOR

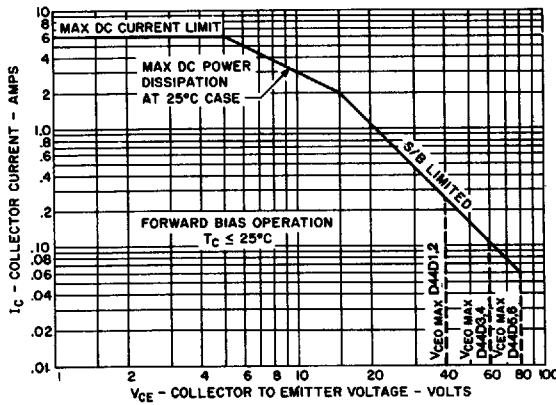


FIG. 5 SAFE REGION OF OPERATION

POWER TRANSISTORS