D40K Series

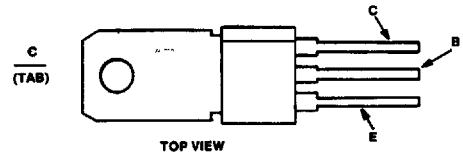
File Number **2336**

T-33-29

2-Ampere N-P-N Darlington Power Transistors

Complementary to the D41K Series

TERMINAL DESIGNATIONS



92CS-43222

Features:

- Operates from IC without predriver

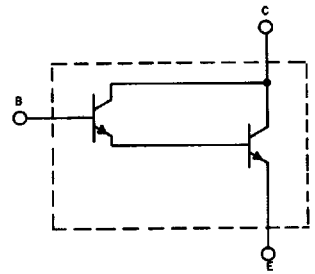
Applications:

- Switching regulator
- Lamp driver
- Touch switch
- Solenoid driver

The D40K-series of silicon n-p-n Darlington power transistors are designed for use in general purpose amplifier and medium-speed switching circuits. The high gain of these devices makes it possible for them to be driven directly from integrated circuits. The monolithic base-to-emitter resistors have been deleted from the structure to enhance the gain characteristics. These devices feature minimum gains of 10,000.

These devices are supplied in the JEDEC TO-202AB plastic package.

JEDEC TO-202AB



92CS-43150

Schematic diagram for all types.

MAXIMUM RATINGS (T_A = 25° C) (unless otherwise specified)

RATING	SYMBOL	D40K1,3	D40K2,4	UNITS
Collector-Emitter Voltage	V_{CEO}	30	50	Volts
Collector-Emitter Voltage	V_{CES}	30	50	Volts
Emitter Base Voltage	V_{EBO}	13	13	Volts
Collector Current — Continuous Peak(1)	I_C I_{CM}	2 3	2 3	A A
Base Current — Continuous	I_B	0.2	0.2	A
Total Power Dissipation @ T_A = 25°C @ T_C = 25°C	P_D	1.67 10	1.67 10	Watts
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	-55 to +150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	75	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	12.5	°C/W
Maximum Lead Temperature for Soldering Purposes: ⅛" from Case for 5 Seconds	T_L	260	260	°C

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

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

T-33-29

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS[1]	56E D ■ 4302271 0040771 627 ■HAS					
Collector-Emitter Sustaining Voltage (I_C = 10mA)	D40K1,3 D40K2,4	V_{CEO}	30 50	— —	— —	Volts
Collector Cut-off Current (V_{CE} = Rated V_{CES})		I_{CES}	—	—	.5	μA
Emitter Cutoff Current (V_{EB} = 13V)		I_{EBO}	—	—	.1	μA
ON CHARACTERISTICS[1]						
DC Current Gain (I_C = 200mA, V_{CE} = 5V)		h_{FE}	10K	—	—	—
(I_C = 1.5A, V_{CE} = 5V) (I_C = 1A, V_{CE} = 5V)	D40K1,2 D40K3,4	h_{FE}	1K 1K	— —	— —	— —
Collector-Emitter Saturation Voltage (I_C = 1.5A, I_B = 3mA) (I_C = 1A, I_B = 2mA)	 D40K1,2 D40K3,4	$V_{CE(sat)}$	 — —	 — —	 1.5 1.5	 V V
Base-Emitter Saturation Voltage (I_C = 1.5A, I_B = 3mA) (I_C = 1A, I_B = 2mA)	 D40K1,2 D40K3,4	$V_{BE(sat)}$	 — —	 — —	 2.5 2.5	 V
DYNAMIC CHARACTERISTICS						
Collector Capacitance (V_{CB} = 10V, f = 1MHz)		C_{CBO}	—	5	10	pF
Current-Gain — Bandwidth Product (I_C = 20mA, V_{CE} = 5V)		f_T	—	75	—	MHz

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

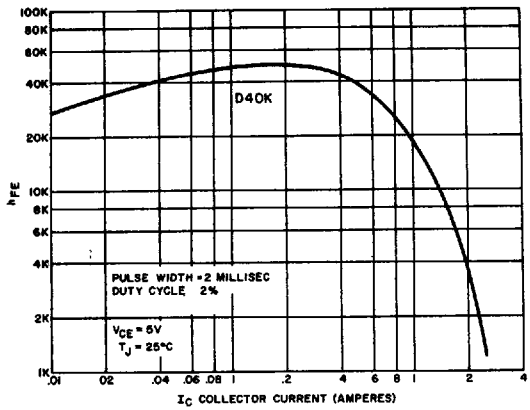


FIG. 1 TYPICAL h_{FE} vs. I_C

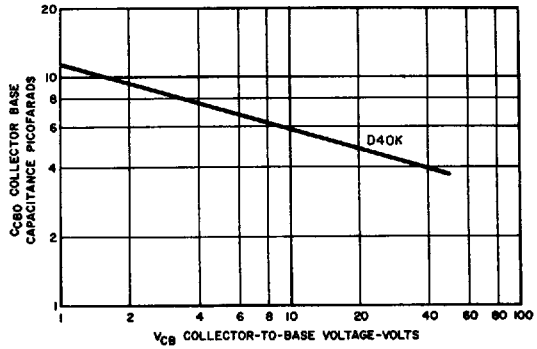


FIG. 2 TYPICAL C_{CBO} vs. VOLTAGE

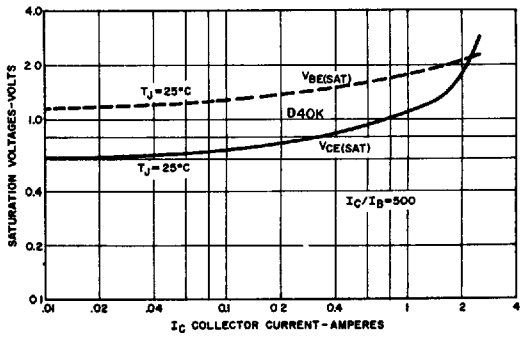


FIG. 3 TYPICAL SATURATION VOLTAGE

POWER TRANSISTORS