1-Ampere Silicon N-P-N Power Transistors

Complementary to the D41D Series

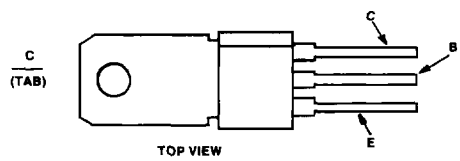
Features:

- High free-air power dissipation
- Low collector saturation voltage (0.5V typ. @ 1.0A I_C)
- Excellent linearity
- Fast switching

The D40D-series of silicon 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 MHz; series, shunt and switching regulators; and low and high frequency inverters/converters.

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

TERMINAL DESIGNATIONS



92CS-43222

JEDEC TO-202AB

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

RATING	SYMBOL	D40D1, 2	D40D4, 5	D40D7, 8	UNITS
Collector-Emitter Voltage	V_{CEO}	30	45	60	Volts
Collector-Emitter Voltage	V_{CES}	45	60	75	Volts
Emitter Base Voltage	V_{EBO}	5	5	5	Volts
Collector Current — Continuous Peak(1)	I_C I_{CM}	1 1.5	1 1.5	1 1.5	A
Base Current — Continuous	I_B	0.5	0.5	0.5	A
Total Power Dissipation @ T_A = 25° C @ T_C = 25C	P_D	1.67 6.25	1.67 6.25	1.67 6.25	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	$R_{\theta JA}$	75	75	75	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	20	20	20	°C/W
Maximum Lead Temperature for Soldering Purposes: ⅛" from Case for 5 Seconds	T_L	+260	+260	+260	°C

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

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

CHARACTERISTIC		SYMBOL	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS[1]						
Collector-Emitter Sustaining Voltage (I_C = 10mA)	D40D1, 2 D40D4, 5 D40D7, 8	$V_{CEO(sus)}$	30 45 60	— — —	— — —	Volts
Collector Cutoff Current (V_{CE} = Rated V_{CEO}) T_C = 25°C (V_{CE} = Rated V_{CES}) T_C = 150°C		I_{CES}	— —	— 1.0	0.1 —	 μA
Emitter Cutoff Current (V_{EB} = 5V)		I_{EBO}	—	—	0.1	μA
SECOND BREAKDOWN						
Second Breakdown with Base Forward Biased		FBSOA	SEE FIGURE 4			
ON CHARACTERISTICS[1]						
DC Current Gain (I_C = 100mA, V_{CE} = 2V)	D40D1, 4, 7 D40D2, 5, 8	h_{FE}	50 120	— —	150 360	—
(I_C = 1A, V_{CE} = 2V)	D40D1, 4, 7 D40D2 D40D5, 8	h_{FE}	10 20 10	— — —	— — —	—
Collector-Emitter Saturation Voltage (I_C = 500mA, I_B = 50mA)	D40D1, 2, 4, 5 D40D7, 8	$V_{CE(sat)}$	— —	— —	0.5 1.0	Volts
Base-Emitter Saturation Voltage (I_C = 500mA, I_B = 50mA)		$V_{BE(sat)}$	—	—	1.5	Volts
DYNAMIC CHARACTERISTICS						
Collector Capacitance (V_{CB} = 10V, f = 1M_{Hz})		C_{CBO}	—	8	—	pF
Current-Gain — Bandwidth Product (I_C = 20mA, V_{CE} = 10V)		f_T	—	200	—	MHz
SWITCHING CHARACTERISTICS						
Resistive Load						
Delay Time + Rise Time	I_C = 1A, I_{B1} = I_{B2} = 0.1A	$t_d + t_r$	—	25	—	nS
Storage Time	V_{CC} = 30V, t_p = 25 μsec	t_s	—	200	—	
Fall Time		t_f	—	50	—	

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

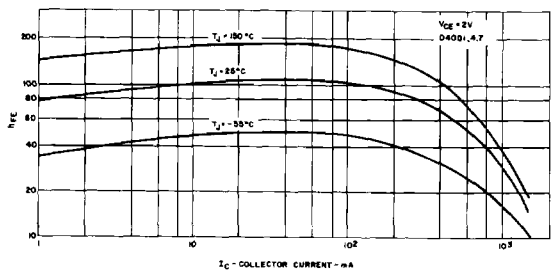


FIG. 1

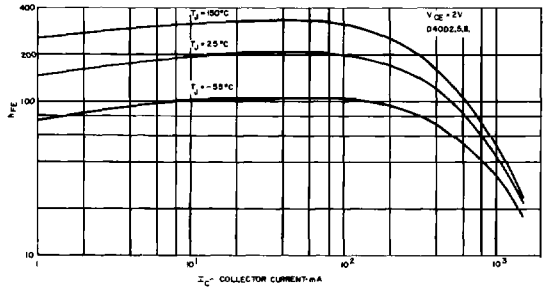


FIG. 2

TYPICAL H_{FE} VS I_C

2-509

2 POWER TRANSISTORS

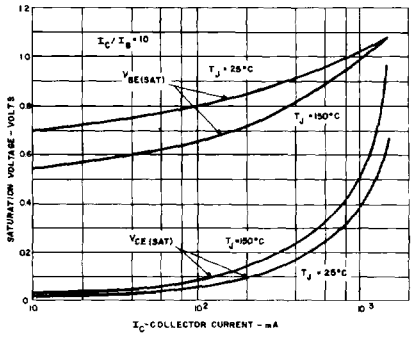


FIG. 3 TYPICAL SATURATION VOLTAGE CHARACTERISTICS

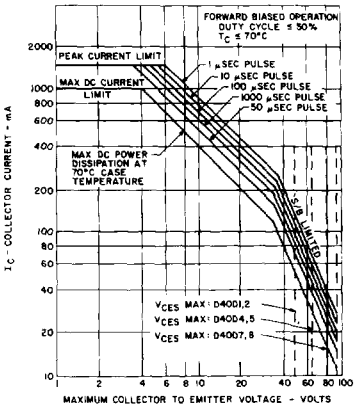


FIG. 4 SAFE REGION OF OPERATION

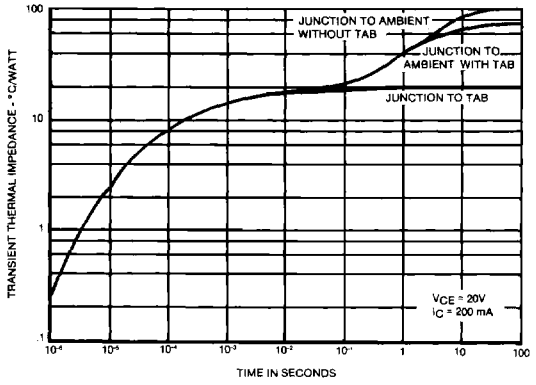


FIG. 5 MAXIMUM TRANSIENT THERMAL IMPEDANCE