

T-33-05

Silicon N-P-N Transistors

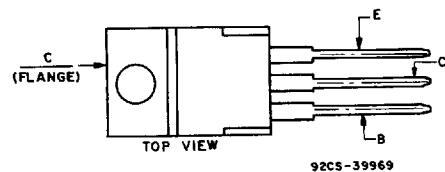
For Switching and Linear Applications

Features:

- Very low collector saturation voltage
- Excellent linearity
- Fast switching

The D44Q-series n-p-n power transistors feature low collector saturation voltage, excellent linearity, and fast switching speed. They are useful for general purposes applications such as: 120 V ac line operated amplifiers, regulators (series, shunt, and switching), high-frequency inverters/converters and tv deflection circuits.

TERMINAL DESIGNATIONS



JEDEC TO-220AB

POWER TRANSISTORS

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

RATING	SYMBOL	D44Q1	D44Q3	D44Q5	UNITS
Collector-Emitter Voltage	V_{CEO}	125	175	225	Volts
Collector-Emitter Voltage	V_{CES}	200	250	300	Volts
Emitter Base Voltage	V_{EBO}	7	7	7	Volts
Collector Current — Continuous	I_C	4	4	4	A
Base Current — Continuous	I_B	2	2	2	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	P_D	1.67 31.25	1.67 31.25	1.67 31.25	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	$R_{\theta JA}$	75	75	75	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4	4	4	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purpose: $\frac{1}{16}$ " from Case for 5 Seconds	T_L	260	260	260	$^\circ\text{C}$

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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ C$) (unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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OFF CHARACTERISTICS⁽¹⁾

Collector-Emitter Sustaining Voltage ($I_C = 10mA$)	D44Q1 D44Q3 D44Q5	$V_{CE(sus)}$	125 175 225	—	—	Volts
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CE0}$)		I_{CBO}	—	—	10	μA

SECOND BREAKDOWN

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

DC Current Gain ($I_C = 2A, V_{CE} = 10V$) ($I_C = 200mA, V_{CE} = 10V$)	h_{FE}	20 30	—	—	—
Collector-Emitter Saturation Voltage ($I_C = 2A, I_B = 200mA$)	$V_{CE(sat)}$	—	—	1	V
Base-Emitter Saturation Voltage ($I_C = 2A, I_B = 200mA$)	$V_{BE(sat)}$	—	—	1.3	V

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10V, f = 1 \text{ MHz}$)	C_{CBO}	—	40	—	pF
Current Gain — Bandwidth Product ($I_C = 100mA, V_{CE} = 10V$)	f_T	—	50	—	MHz

SWITCHING CHARACTERISTICS

Resistive Load						
Delay Time + Rise Time	$I_C = 1.0A, I_{B1} = I_{B2} = 100mA$ $V_{CC} = 50V, t_p = 25 \mu sec$	$t_d + t_r$	—	—	0.2	μs
Storage Time		t_s	—	—	2.0	
Fall Time		t_f	—	—	1.7	

(1) Pulse Test: Pulse Width - 300 μs Duty Cycle $\leq 2\%$.

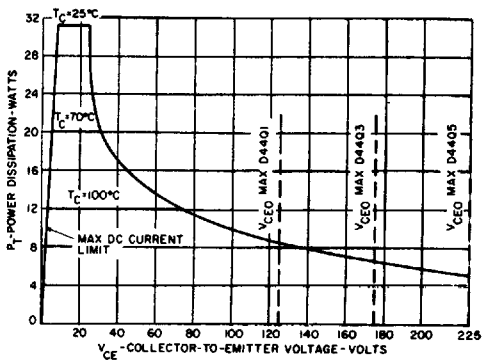


FIG. 1 MAXIMUM PERMISSIBLE DC POWER DISSIPATION

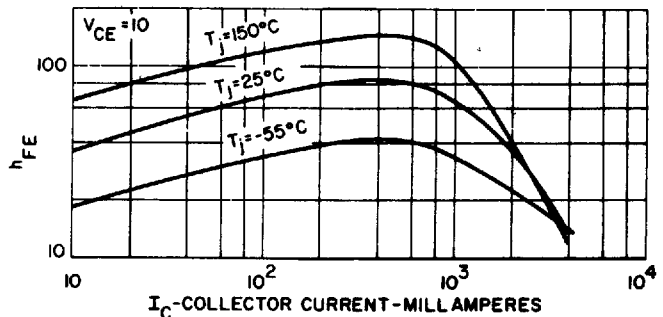


FIG. 2 TYPICAL h_{FE} vs. I_C

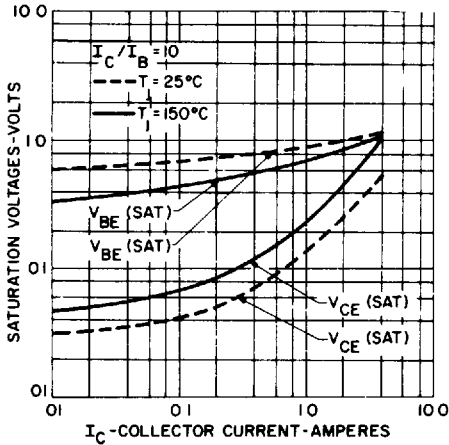


FIG. 3 TYPICAL SATURATION VOLTAGE CHARACTERISTICS

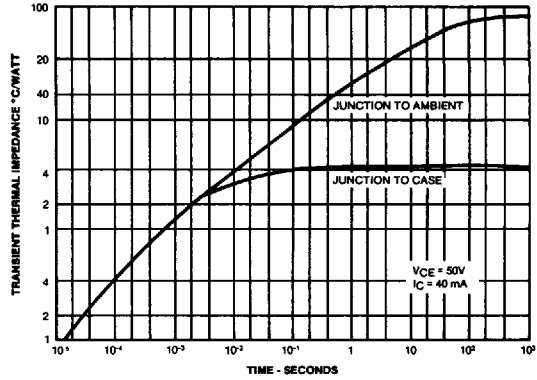


FIG. 4 MAXIMUM TRANSIENT THERMAL IMPEDANCE

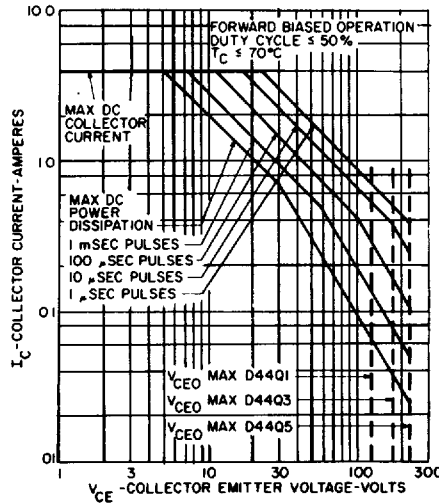


FIG. 5 FORWARD BIAS SAFE OPERATING AREA

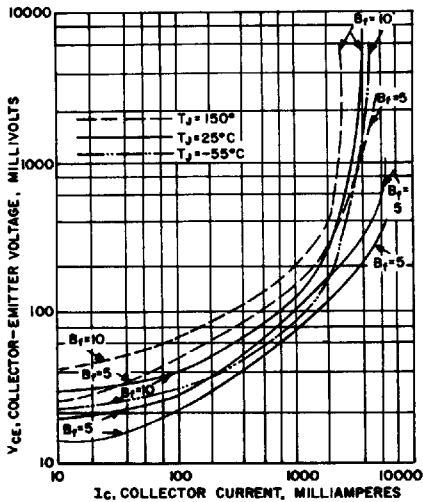


FIG. 6 $V_{CE(SAT)}$ vs. I_C TYPICAL

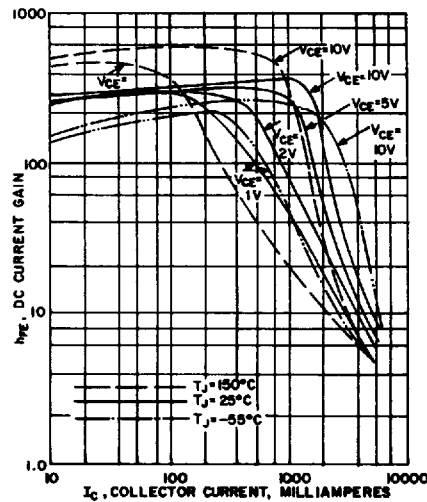


FIG. 7 DC CURRENT GAIN, TYPICAL

POWER TRANSISTORS