

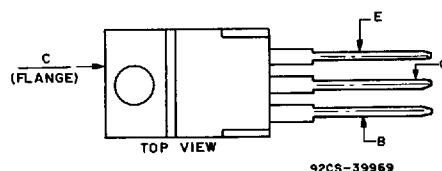
**D45C Series**File Number **2352***T-33-17***Silicon P-N-P Transistors****Complementary to the D44C Series**

General-Purpose Types for Medium-Power Switching and Amplifier Applications

**Features:**

- *Very low collector saturation voltage* [-0.5V typ. @ -3.0A  $I_C$ ]
- *Excellent linearity*
- *Fast switching*

D45C-series p-n-p power transistors are designed for various specific and general purpose applications, such as: output and driver stages of amplifiers operating at frequency from DC to greater than 1.0 MHz, series, shunt and switching regulators, and low and high frequency inverters/converters.

**TERMINAL DESIGNATIONS****JEDEC TO-220AB****MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ ) (unless otherwise specified)**

RATING	SYMBOL	D45C1, 2, 3	D45C4, 5, 6	D45C7, 8, 9	D45C10, 11, 12	UNITS
Collector-Emitter Voltage	$V_{CEO}$	-30	-45	-60	-80	Volts
Collector-Emitter Voltage	$V_{CES}$	-40	-55	-70	-90	Volts
Emitter Base Voltage	$V_{EBO}$	-5	-5	-5	-5	Volts
Collector Current — Continuous	$I_C$	-4	-4	-4	-4	A
Peak <sup>(1)</sup>	$I_{CM}$	-6	-6	-6	-6	A
Base Current — Continuous	$I_B$	-2	-2	-2	-2	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	$P_D$	1.67 30	1.67 30	1.67 30	1.67 30	Watts
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	-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	75	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.2	4.2	4.2	4.2	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: $\frac{1}{8}$ " from Case for 5 Seconds	$T_L$	+260	+260	+260	+260	$^\circ\text{C}$

(1) Pulse Test Pulse Width = 300ms Duty Cycle  $\leq 2\%$ .

**D45C Series**

**ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25° C) (unless otherwise specified)**

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNIT
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**OFF CHARACTERISTICS<sup>(1)</sup>**

**T-33-17**

Collector-Emitter Sustaining Voltage (I <sub>C</sub> = -100mA)	D45C1, 2, 3 D45C4, 5, 6 D45C7, 8, 9 D45C10, 11, 12	V <sub>CEO(sus)</sub>	-30 -45 -60 -80	— — — —	— — — —	Volts
Collector Cutoff Current (V <sub>CE</sub> = Rated V <sub>CEs</sub> )		I <sub>CES</sub>	—	—	-10	μA
Emitter Cutoff Current (V <sub>EB</sub> = -5V)		I <sub>EBO</sub>	—	—	-100	μA

**SECOND BREAKDOWN**

Second Breakdown with Base Forward Biased	FBSOA	SEE FIGURE 3
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**ON CHARACTERISTICS<sup>(1)</sup>**

DC Current Gain (I <sub>C</sub> = -0.2A, V <sub>CE</sub> = -1V)	D45C1, 4, 7, 10 D45C2, 5, 8, 11 D45C3, 6, 9, 12	h <sub>FE</sub>	25 40 40	— — —	— 120 120	—
(I <sub>C</sub> = -1A, V <sub>CE</sub> = -1V)	D45C1, 4, 7, 10 D45C2, 5, 8, 11	h <sub>FE</sub>	10 20	— —	— —	—
(I <sub>C</sub> = -2A, V <sub>CE</sub> = -1V)	D45C3, 6, 9, 12	h <sub>FE</sub>	20	—	—	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA)	D45C2, 5, 8, 11 D45C3, 6, 9, 12 D43C1, 4, 7, 10	V <sub>CE(sat)</sub>	— — —	— — —	-0.5 -0.5 -0.5	Volts
Base-Emitter Saturation Voltage (I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA)		V <sub>BE(sat)</sub>	—	—	-1.3	Volts

**DYNAMIC CHARACTERISTICS**

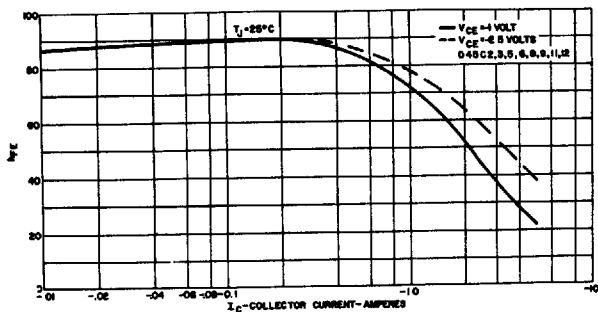
Collector Capacitance (V <sub>CB</sub> = -10V, f = 1MHz)	C <sub>CB0</sub>	—	—	125	pF
Current-Gain — Bandwidth Product (I <sub>C</sub> = -20mA, V <sub>CE</sub> = -4V)	f <sub>T</sub>	—	40	—	MHz

**SWITCHING CHARACTERISTICS**

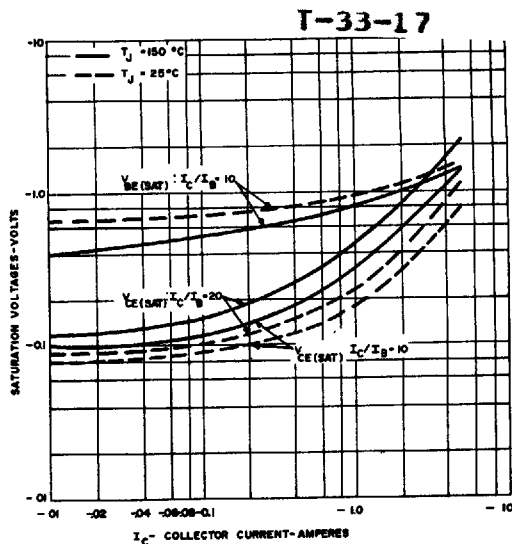
Resistive Load					
Delay Time + Rise Time	I <sub>C</sub> = -1A, I <sub>B1</sub> = I <sub>B2</sub> = -0.1A, V <sub>CC</sub> = -1A, t <sub>p</sub> = 25 μsec	t <sub>d</sub> + t <sub>r</sub>	—	50	nS
Storage Time		t <sub>s</sub>	—	500	
Fall Time		t <sub>f</sub>	—	50	

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

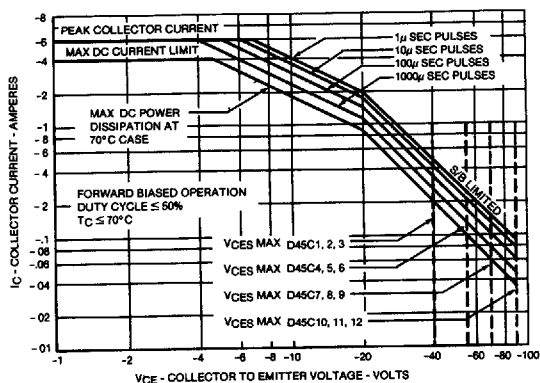
POWER TRANSISTORS



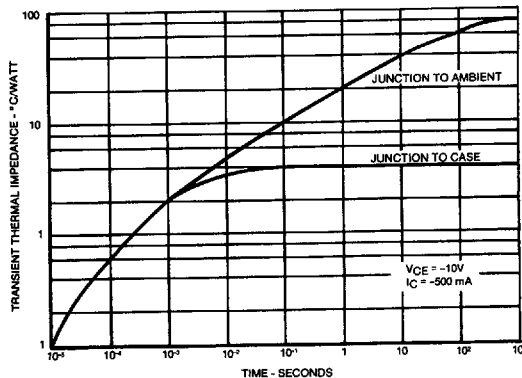
**FIG. 1 TYPICAL  $h_{FE}$  VS.  $I_C$**



**FIG. 2 TYPICAL SATURATION VOLTAGE CHARACTERISTICS**



**FIG. 3 SAFE REGION OF OPERATION**



**FIG. 4 MAXIMUM TRANSIENT THERMAL IMPEDANCE**