

Complementary Silicon Power Transistors

... for general purpose power amplification and switching such as output or driver stages in applications such as switching regulators, converters and power amplifiers.

- Low Collector-Emitter Saturation Voltage
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ } 8.0 \text{ A}$
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs

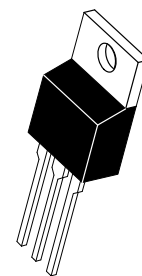
NPN
D44H Series*
PNP
D45H Series*

*Motorola Preferred Device

10 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
60, 80 VOLTS

MAXIMUM RATINGS

Rating	Symbol	D44H or D45H		Unit
		8	10, 11	
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Emitter Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous — Peak (1)	I_C	10 20		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ @ $T_A = 25^\circ\text{C}$	P_D	50 1.67		Watts
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$



CASE 221A-06
TO-220AB

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	$^\circ\text{C}$

(1) Pulse Width $\leq 6.0 \text{ ms}$, Duty Cycle $\leq 50\%$.

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
DC Current Gain ($V_{CE} = 1.0 \text{ Vdc}$, $I_C = 2.0 \text{ Adc}$)	D44H10 D45H10	h_{FE}	35	—	—
	D44H8,11 D45H8,11		60	—	
($V_{CE} = 1.0 \text{ Vdc}$, $I_C = 4.0 \text{ Adc}$)	D44H10 D45H10		20	—	
	D44H8,11 D45H8,11		40	—	

Preferred devices are Motorola recommended choices for future use and best overall value.

D44H Series D45H Series

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}, V_{BE} = 0$)	I_{CES}	—	—	10	μA
Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}$)	I_{EBO}	—	—	100	μA

ON CHARACTERISTICS

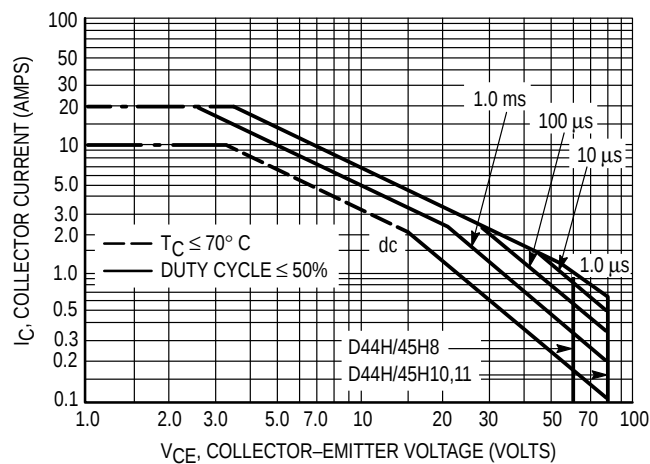
Collector-Emitter Saturation Voltage ($I_C = 8.0 \text{ Adc}, I_B = 0.4 \text{ Adc}$) ($I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$)	D44H/D45H8,11 D44H/D45H10	$V_{CE(sat)}$	— —	— —	1.0 1.0	Vdc
Base-Emitter Saturation Voltage ($I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$)		$V_{BE(sat)}$	—	—	1.5	Vdc

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10 \text{ Vdc}, f_{\text{test}} = 1.0 \text{ MHz}$)	D44H Series D45H Series	C_{cb}	— —	130 230	— —	pF
Gain Bandwidth Product ($I_C = 0.5 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 20 \text{ MHz}$)	D44H Series D45H Series	f_T	— —	50 40	— —	MHz

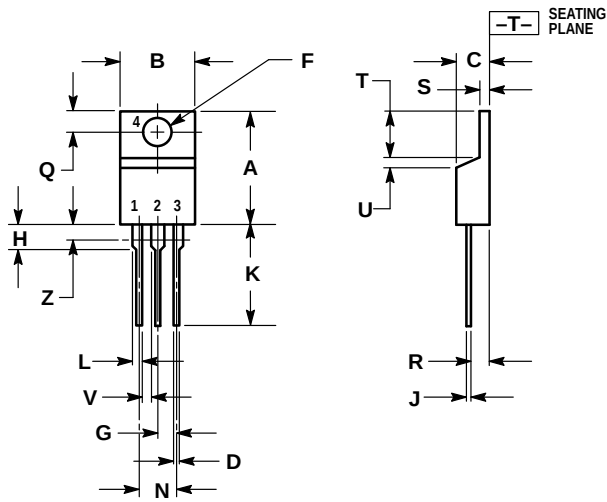
SWITCHING TIMES

Delay and Rise Times ($I_C = 5.0 \text{ Adc}, I_{B1} = 0.5 \text{ Adc}$)	D44H Series D45H Series	$t_d + t_r$	— —	300 135	— —	ns
Storage Time ($I_C = 5.0 \text{ Adc}, I_{B1} = I_{B2} = 0.5 \text{ Adc}$)	D44H Series D45H Series	t_s	— —	500 500	— —	ns
Fall Time ($I_C = 5.0 \text{ Adc}, I_{B1} = 102 = 0.5 \text{ Adc}$)	D44H Series D45H Series	t_f	— —	140 100	— —	ns



**Figure 1. Maximum Rated Forward Bias
Safe Operating Area**

PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

- STYLE 1:
- PIN 1. BASE
 2. COLLECTOR
 3. EMITTER
 4. COLLECTOR

**CASE 221A-06
TO-220AB
ISSUE Y**

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**MOTOROLA****D44H/D**