

## 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

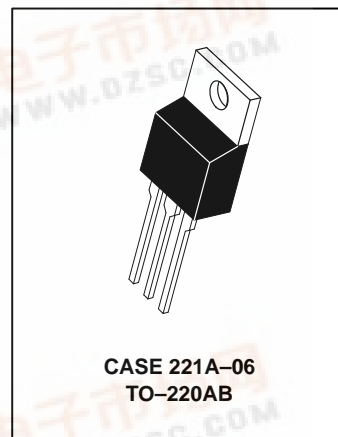
**NPN  
 D44H Series\***  
**PNP  
 D45H Series\***

\*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		$^\circ\text{C}$



### 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 D44H8,11		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
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#### OFF CHARACTERISTICS

Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CEO}, V_{BE} = 0$ )	$I_{CES}$	—	—	10	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ Vdc}$ )	$I_{EBO}$	—	—	100	$\mu\text{A}$

#### ON CHARACTERISTICS

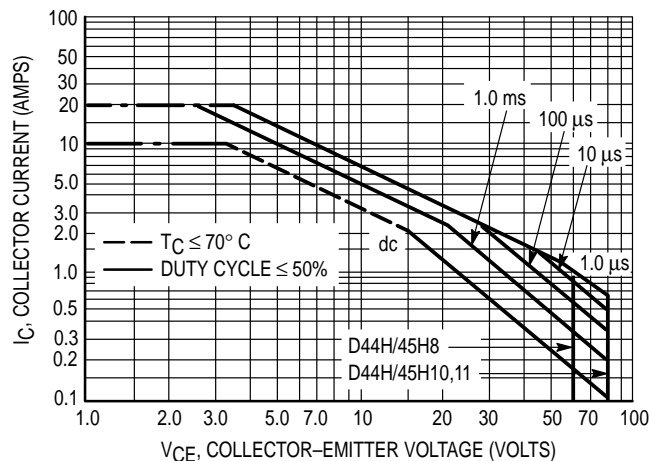
Collector–Emitter Saturation Voltage ( $I_C = 8.0 \text{ Adc}, I_B = 0.4 \text{ Adc}$ ) ( $I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$ )	D44H/D45H8,11 D44H/D45H10	$V_{CE(sat)}$	—	—	1.0 1.0	Vdc
Base–Emitter Saturation Voltage ( $I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$ )		$V_{BE(sat)}$	—	—	1.5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

#### DYNAMIC CHARACTERISTICS

Collector Capacitance ( $V_{CB} = 10 \text{ Vdc}, f_{test} = 1.0 \text{ MHz}$ )	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

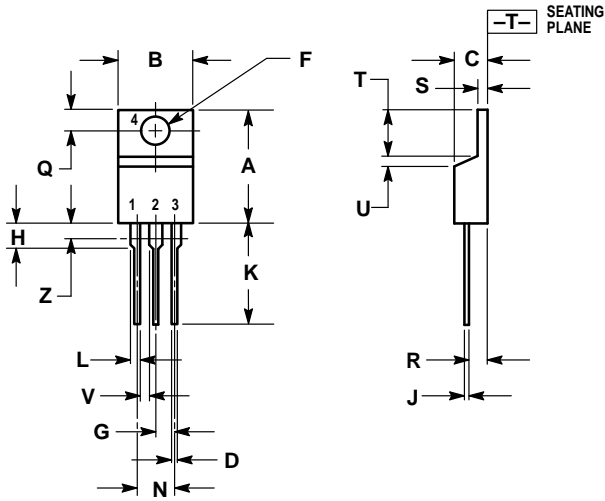
Delay and Rise Times ( $I_C = 5.0 \text{ Adc}, I_{B1} = 0.5 \text{ Adc}$ )	D44H Series D45H Series	$t_d + t_r$	—	300 135	—	ns
Storage Time ( $I_C = 5.0 \text{ Adc}, I_{B1} = I_{B2} = 0.5 \text{ Adc}$ )	D44H Series D45H Series	$t_s$	—	500 500	—	ns
Fall Time ( $I_C = 5.0 \text{ Adc}, I_{B1} = I_{B2} =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



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

**D44H Series D45H Series**

**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**

## D44H Series D45H Series

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