

# Complementary Silicon Power Transistors

These complementary silicon power transistors are designed for high-speed switching applications, such as switching regulators and high frequency inverters. The devices are also well-suited for drivers for high power switching circuits.

- Fast Switching —  
 $t_f = 90 \text{ ns (Max)}$
- Key Parameters Specified @ 100°C
- Low Collector-Emitter Saturation Voltage —  
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ 8.0 A}$
- Complementary Pairs Simplify Circuit Designs

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	Vdc
Collector-Emitter Voltage	$V_{CEV}$	100	Vdc
Emitter Base Voltage	$V_{EB}$	7.0	Vdc
Collector Current — Continuous	$I_C$	15	Adc
— Peak (1)	$I_{CM}$	20	
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	$P_D$	83	Watts
Derate above 25°C		0.67	W/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to 150	°C

## THERMAL CHARACTERISTICS

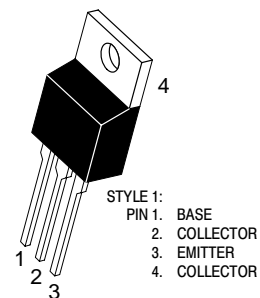
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	275	°C

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

NOTE: All polarities are shown for NPN transistors. For PNP transistors, reverse polarities.

**NPN**  
**D44VH**  
**PNP**  
**D45VH**

**15 AMPERE**  
**COMPLEMENTARY**  
**SILICON**  
**POWER TRANSISTORS**  
**80 VOLTS**  
**83 WATTS**



**CASE 221A-09**  
**TO-220AB**

# D44VH D45VH

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage (2) ( $I_C = 25\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	80	—	—	Vdc
Collector–Emitter Cutoff Current ( $V_{CE} = \text{Rated } V_{CEV}$ , $V_{BE(off)} = 4.0\text{ Vdc}$ ) ( $V_{CE} = \text{Rated } V_{CEV}$ , $V_{BE(off)} = 4.0\text{ Vdc}$ , $T_C = 100^\circ\text{C}$ )	$I_{CEV}$	—	—	10 100	$\mu\text{Adc}$
Emitter Base Cutoff Current ( $V_{EB} = 7.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	—	10	$\mu\text{Adc}$

### ON CHARACTERISTICS (2)

DC Current Gain ( $I_C = 2.0\text{ Adc}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	35 20	— —	— —	—
Collector–Emitter Saturation Voltage ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.4\text{ Adc}$ ) D44VH10 ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.8\text{ Adc}$ ) D45VH10 ( $I_C = 15\text{ Adc}$ , $I_B = 3.0\text{ Adc}$ , $T_C = 100^\circ\text{C}$ ) D44VH10 D45VH10	$V_{CE(sat)}$	— — — —	— — — —	0.4 1.0 0.8 1.5	Vdc
Base–Emitter Saturation Voltage ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.4\text{ Adc}$ ) D44VH10 ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.8\text{ Adc}$ ) D45VH10 ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.4\text{ Adc}$ , $T_C = 100^\circ\text{C}$ ) D44VH10 ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.8\text{ Adc}$ , $T_C = 100^\circ\text{C}$ ) D45VH10	$V_{BE(sat)}$	— — — —	— — — —	1.2 1.0 1.1 1.5	Vdc

### DYNAMIC CHARACTERISTICS

Current Gain Bandwidth Product ( $I_C = 0.1\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 20\text{ MHz}$ )	$f_T$	—	50	—	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_C = 0$ , $f_{test} = 1.0\text{ MHz}$ ) D44VH10 D45VH10	$C_{ob}$	— —	120 275	— —	pF

### SWITCHING CHARACTERISTICS

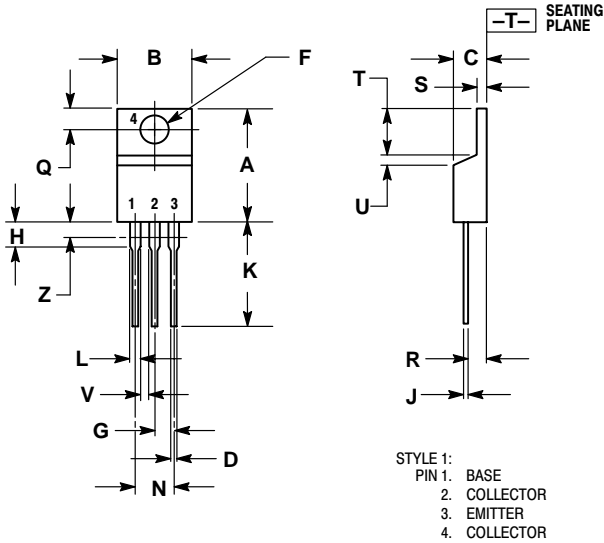
Delay Time	$(V_{CC} = 20\text{ Vdc}$ , $I_C = 8.0\text{ Adc}$ , $I_{B1} = I_{B2} = 0.8\text{ Adc}$ )	$t_d$	—	—	50	ns
Rise Time		$t_r$	—	—	250	
Storage Time		$t_s$	—	—	700	
Fall Time		$t_f$	—	—	90	

(2) Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# D44VH D45VH

## PACKAGE DIMENSIONS


### TO-220AB CASE 221A-09 ISSUE AA



- 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

# D44VH D45VH

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