

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 —
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ } 8.0 \text{ A}$
- 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 — Peak (1)	I_C I_{CM}	15 20	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	83 0.67	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150	°C

THERMAL CHARACTERISTICS

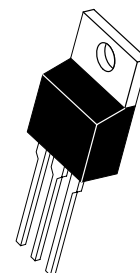
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	°C

(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) ($I_C = 25\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	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	μAdc
Emitter Base Cutoff Current ($V_{EB} = 7.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	—	10	μAdc

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

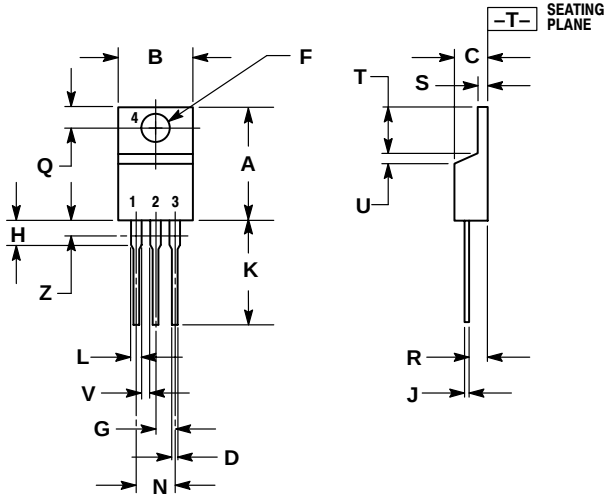
Delay Time	(V _{CC} = 20 Vdc, I _C = 8.0 Adc, I _{B1} = I _{B2} = 0.8 Adc)	t _d	—	—	50	ns
Rise Time		t _r	—	—	250	
Storage Time		t _s	—	—	700	
Fall Time		t _f	—	—	90	

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

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