

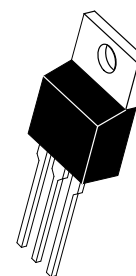
Complementary Silicon Power Transistors

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

NPN
D44VH
PNP
D45VH

15 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
80 VOLTS
83 WATTS



CASE 221A-06
TO-220AB

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 @ $T_C = 25^\circ\text{C}$ 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

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

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

D44VH D45VH

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1) (I _C = 25 mA _{dc} , I _B = 0)	V _{CEO(sus)}	80	—	—	V _{dc}
Collector–Emitter Cutoff Current (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc}) (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc} , T _C = 100°C)	I _{CEV}	—	—	10 100	μA _{dc}
Emitter Base Cutoff Current (V _{EB} = 7.0 V _{dc} , I _C = 0)	I _{EBO}	—	—	10	μA _{dc}

ON CHARACTERISTICS (1)

DC Current Gain (I _C = 2.0 A _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 4.0 A _{dc} , V _{CE} = 1.0 V _{dc})	h _{FE}	35 20	— —	— —	—
Collector–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) (I _C = 15 A _{dc} , I _B = 3.0 A _{dc} , T _C = 100°C)	V _{CE(sat)}	— — — —	— — — —	0.4 1.0 0.8 1.5	V _{dc}
Base–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc} , T _C = 100°C) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc} , T _C = 100°C)	V _{BE(sat)}	— — — —	— — — —	1.2 1.0 1.1 1.5	V _{dc}

DYNAMIC CHARACTERISTICS

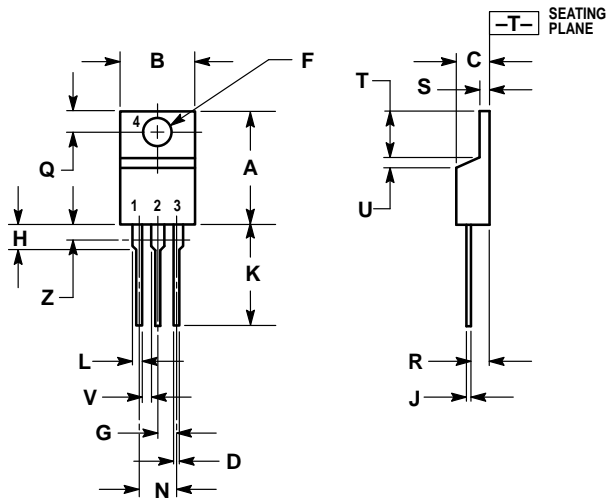
Current Gain Bandwidth Product (I _C = 0.1 A _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz)	f _T	—	50	—	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _C = 0, f _{test} = 1.0 MHz)	C _{ob}	— —	120 275	— —	pF

SWITCHING CHARACTERISTICS

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

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

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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