MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

NPN D44VH Series PNP D45VH Series

COMPLEMENTARY SILICON POWER TRANSISTORS

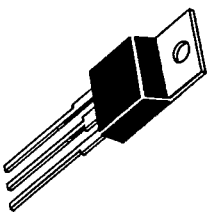
These complementary silicon power transistors are designed for high-speed switching applications, such as switching regulators and high frequency inverters. The devices are also well-suited for drivers for high power switching circuits.

- 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

15 AMPERE

COMPLEMENTARY SILICON POWER TRANSISTORS

30, 45, 60 and 80 VOLTS
83 WATTS



MAXIMUM RATINGS

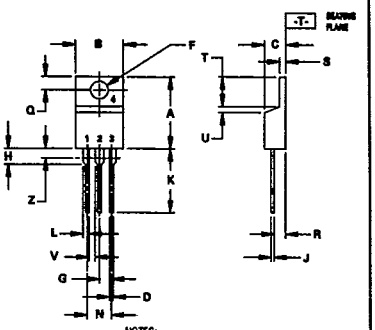
Rating	Symbol	D44VH or D45VH				Unit
		1	4	7	10	
Collector-Emitter Voltage	V_{CEO}	30	45	60	80	Vdc
Collector-Emitter Voltage	V_{CEV}	50	70	80	100	Vdc
Emitter Base Voltage	V_{EB}	7.0				Vdc
Collector Current — Continuous Peak (1)	I_C I_{CM}	15 20				Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	83 1.67				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 ≤ 50%.

Note 1: All polarities are shown for NPN transistors. For PNP transistors, reverse polarities.
Note 2: See MJE5220/5230 Series data sheet for characteristic curves.



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

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	14.48	15.75	0.570	0.620
B	9.66	10.28	0.380	0.405
C	4.07	4.82	0.160	0.190
D	0.64	0.88	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.42	2.66	0.095	0.105
H	2.80	3.93	0.110	0.155
J	0.46	0.71	0.018	0.028
K	12.70	14.27	0.500	0.562
L	1.15	1.39	0.045	0.055
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.15	1.39	0.045	0.055
T	5.97	6.47	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.15	—	0.045	—
Z	—	2.04	—	0.080

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

CASE 221A-04
TO-220AB

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D44VH Series NPN, D45VH Series PNP

T-33-13
T-33-21

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Sustaining Voltage (1)		$V_{CEO(sus)}$				Vdc
(I_C = 25 mAdc, I_B = 0)	D44VH1, D45VH1		30	—	—	
	D44VH4, D45VH4		45	—	—	
	D44VH7, D45VH7		60	—	—	
	D44VH10, D45VH10		80	—	—	
Collector-Emitter Cutoff Current		I_{CEV}				μAdc
(V_{CE} = Rated V_{CEV}, $V_{BE(off)}$ = 4.0 Vdc)			—	—	10	
(V_{CE} = Rated V_{CEV}, $V_{BE(off)}$ = 4.0 Vdc, T_C = 100°C)			—	—	100	
Emitter Base Cutoff Current		I_{EBO}	—	—	10	μAdc
(V_{EB} = 7.0 Vdc, I_C = 0)						
ON CHARACTERISTICS (1)						
DC Current Gain		h_{FE}				—
(I_C = 2.0 Adc, V_{CE} = 1.0 Vdc)			35	—	—	
(I_C = 4.0 Adc, V_{CE} = 1.0 Vdc)			20	—	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 8.0 Adc, I_B = 0.4 Adc)	D44VH Series		—	—	0.4	
(I_C = 8.0 Adc, I_B = 0.8 Adc)	D45VH Series		—	—	1.0	
(I_C = 15 Adc, I_B = 3.0 Adc, T_C = 100°C)	D44VH Series		—	—	0.8	
	D45VH Series		—	—	1.5	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 8.0 Adc, I_B = 0.4 Adc)	D44VH Series		—	—	1.2	
(I_C = 8.0 Adc, I_B = 0.8 Adc)	D45VH Series		—	—	1.0	
(I_C = 8.0 Adc, I_B = 0.4 Adc, T_C = 100°C)	D44VH Series		—	—	1.1	
(I_C = 8.0 Adc, I_B = 0.8 Adc, T_C = 100°C)	D45VH Series		—	—	1.5	
DYNAMIC CHARACTERISTICS						
Current Gain Bandwidth Product		f_T	—	50	—	MHz
(I_C = 0.1 Adc, V_{CE} = 10 Vdc, f = 20 MHz)						
Output Capacitance		C_{cb}				pF
(V_{CB} = 10 Vdc, I_C = 0, f_{test} = 1.0 MHz)	D44VH Series		—	120	—	
	D45VH Series		—	275	—	
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	

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

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