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D44VH10 (NPN), D45VH10 (PNP)

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.

Features

- 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
- Pb−Free Packages are Available*

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 (Note 1)	I_C I_{CM}	15 20	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	83 0.67	W 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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

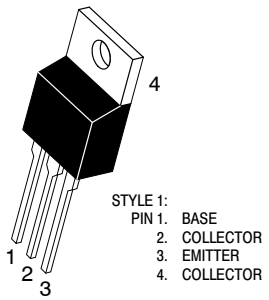
1. Pulse Width ≤ 6.0 ms, Duty Cycle ≤ 50%.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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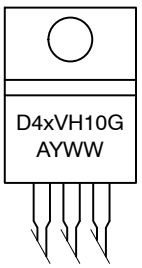
http://onsemi.com

15 A COMPLEMENTARY SILICON POWER TRANSISTORS 80 V, 83 W



CASE 221A−09
TO−220AB

MARKING DIAGRAM



x = 4 or 5
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
D44VH10	TO−220	50 Units/Rail
D44VH10G	TO−220 (Pb−Free)	50 Units/Rail
D45VH10	TO−220	50 Units/Rail
D45VH10G	TO−220 (Pb−Free)	50 Units/Rail

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Sustaining Voltage (Note 2) (I_C = 25 mAdc, I_B = 0)		$V_{CEO(sus)}$	80	–	–	Vdc
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 (V_{EB} = 7.0 Vdc, I_C = 0)		I_{EBO}	–	–	10	μAdc
ON CHARACTERISTICS (Note 2)						
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)	D44VH10		–	–	0.4	
(I_C = 8.0 Adc, I_B = 0.8 Adc)	D45VH10		–	–	1.0	
(I_C = 15 Adc, I_B = 3.0 Adc, T_C = 100°C)	D44VH10		–	–	0.8	
	D45VH10		–	–	1.5	
Base−Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 8.0 Adc, I_B = 0.4 Adc)	D44VH10		–	–	1.2	
(I_C = 8.0 Adc, I_B = 0.8 Adc)	D45VH10		–	–	1.0	
(I_C = 8.0 Adc, I_B = 0.4 Adc, T_C = 100°C)	D44VH10		–	–	1.1	
(I_C = 8.0 Adc, I_B = 0.8 Adc, T_C = 100°C)	D45VH10		–	–	1.5	
DYNAMIC CHARACTERISTICS						
Current Gain Bandwidth Product (I_C = 0.1 Adc, V_{CE} = 10 Vdc, f = 20 MHz)		f_T	–	50	–	MHz
Output Capacitance		C_{ob}				pF
(V_{CB} = 10 Vdc, I_C = 0, f_{test} = 1.0 MHz)	D44VH10		–	120	–	
	D45VH10		–	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	

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

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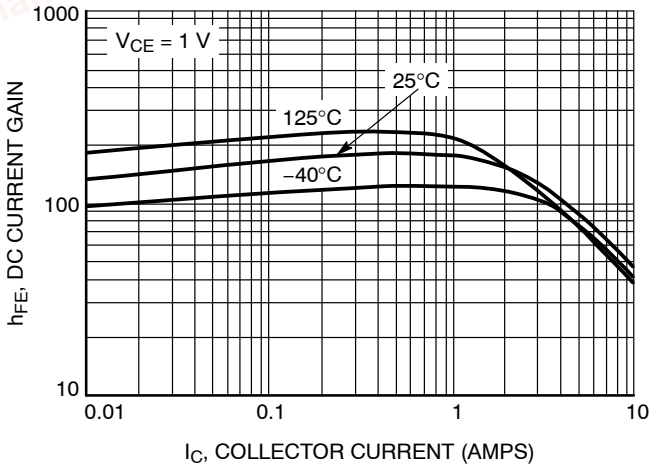


Figure 1. D44VH10 DC Current Gain

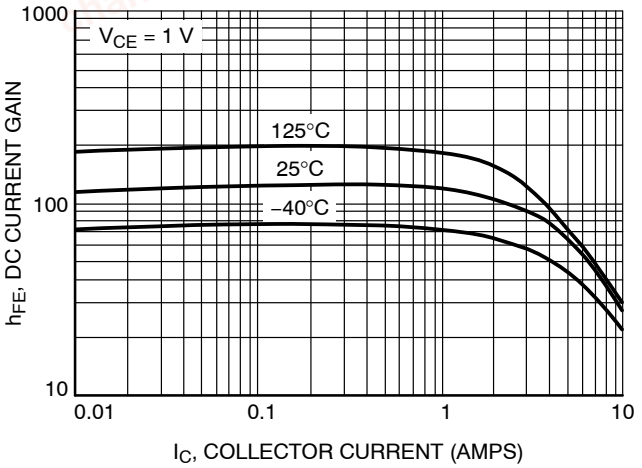


Figure 2. D45VH10 DC Current Gain

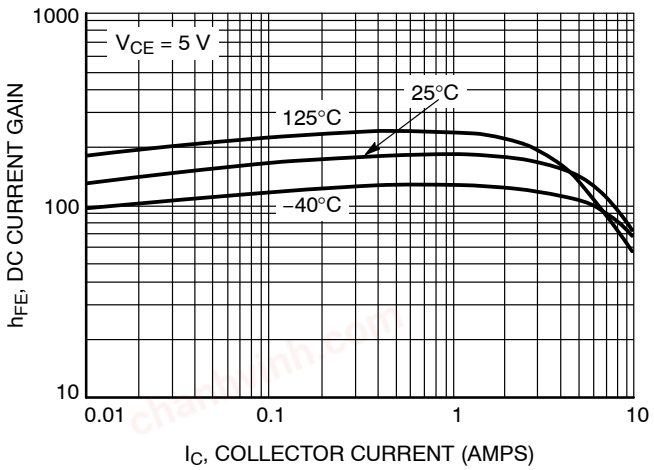


Figure 3. D44VH10 DC Current Gain

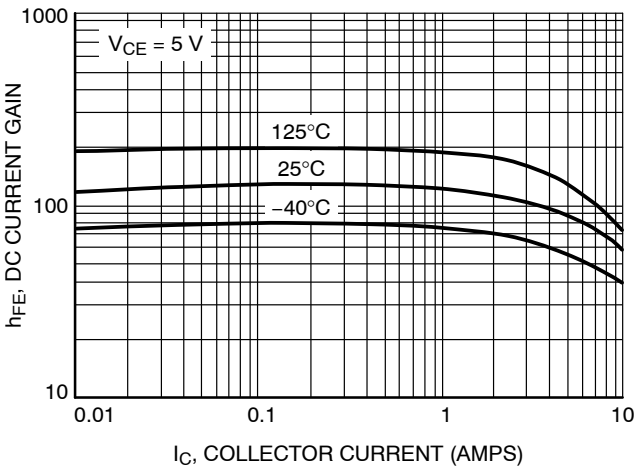


Figure 4. D45VH10 DC Current Gain

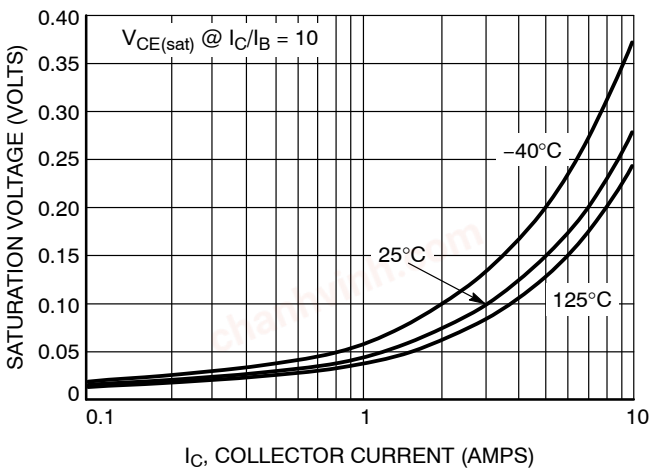


Figure 5. D44VH10 ON−Voltage

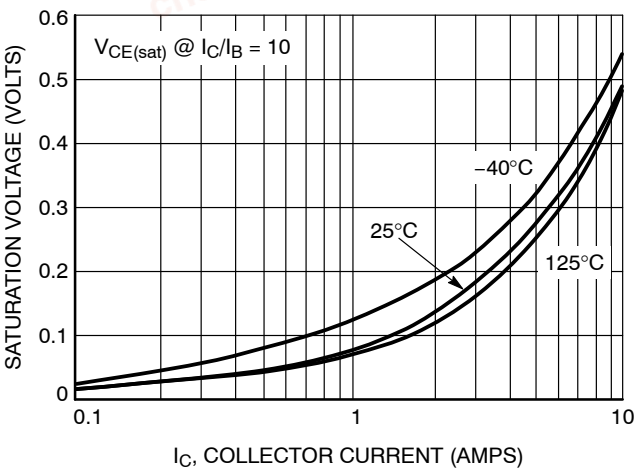


Figure 6. D45VH10 ON−Voltage

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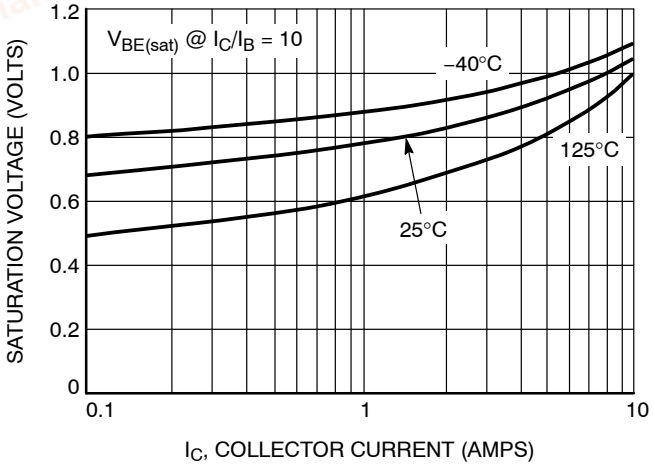


Figure 7. D44VH10 ON−Voltage

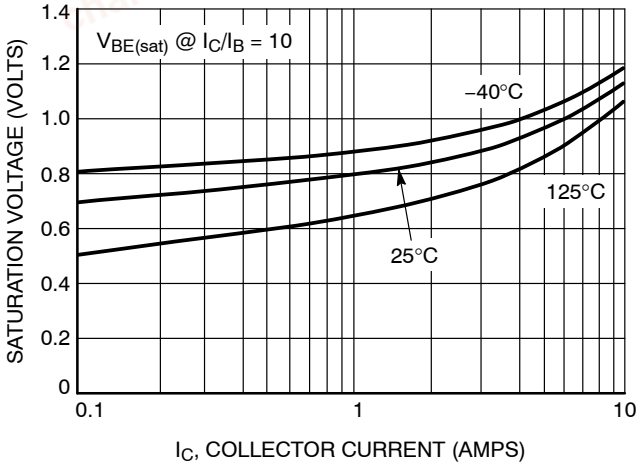


Figure 8. D45VH10 ON−Voltage

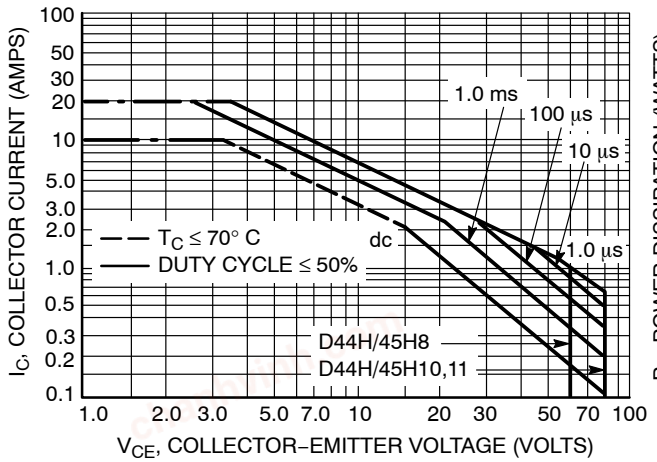


Figure 9. Maximum Rated Forward Bias Safe Operating Area

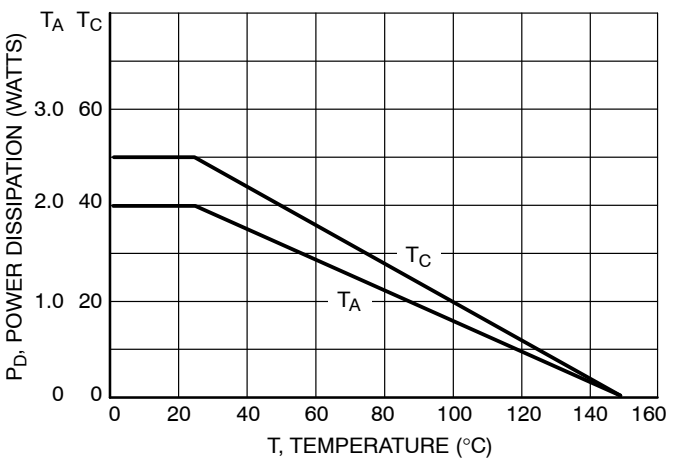


Figure 10. Power Derating

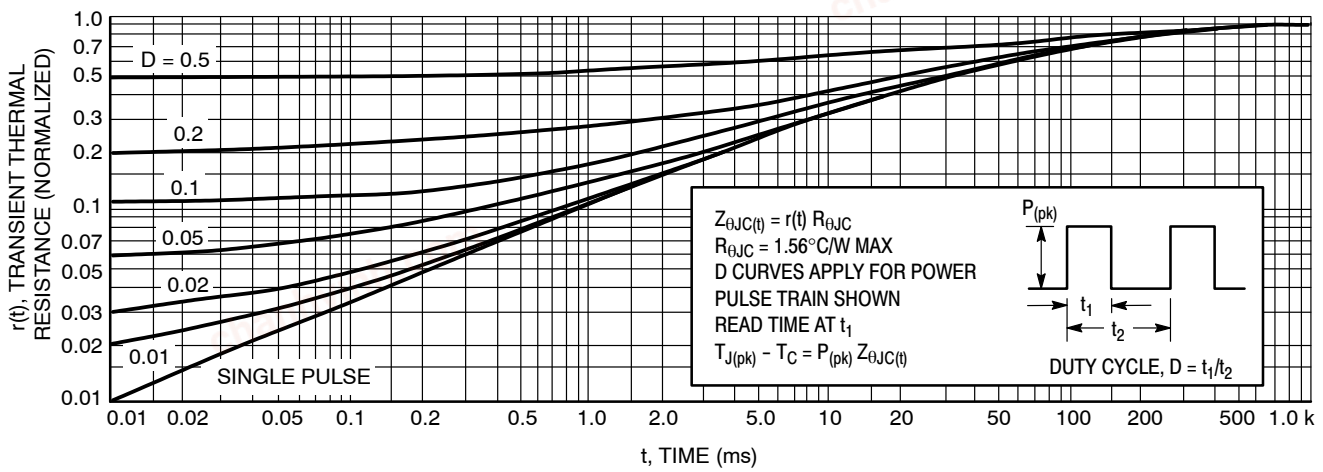


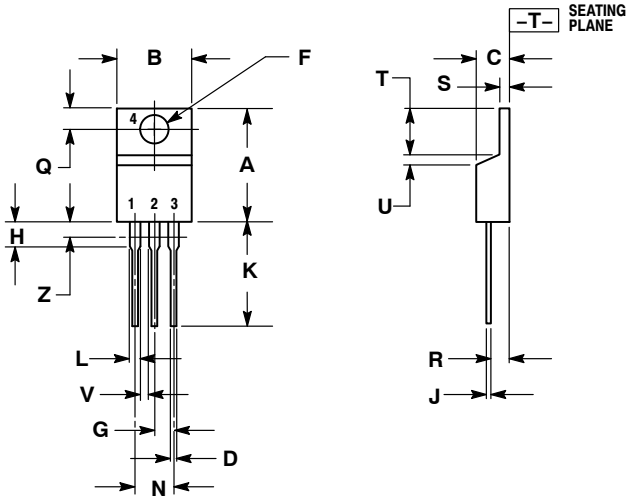
Figure 11. Thermal Response

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D44VH10 (NPN), D45VH10 (PNP)

PACKAGE DIMENSIONS

TO−220
CASE 221A−09
ISSUE AG



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.

	INCHES		MILLIMETERS	
DIM	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	0.036	0.64	0.91
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.025	0.36	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

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