D44H Series (NPN), D45H Series (PNP)

Preferred Devices

Complementary Silicon Power Transistors

These series of plastic, silicon NPN and PNP power transistors can be used as general purpose power amplification and switching such as output or driver stages in applications such as switching regulators, converters and power amplifiers.

Features

- Low Collector−Emitter Saturation Voltage
  $V_{CE(sat)} = 1.0$ V (Max) @ 8.0 A
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs
- Pb−Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage D44H8, D45H8 D44H11, D45H11	V_{CEO}	 60 80	Vdc
Emitter Base Voltage	V_{EB}	5.0	Vdc
Collector Current − Continuous − Peak (Note 1)	I_C	 10 20	Adc
Total Power Dissipation @ $T_C = 25°C$ @ $T_A = 25°C$	P_D	 70 2.0	W
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	$R_{\theta JC}$	1.8	°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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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

ON Semiconductor®

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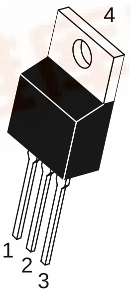
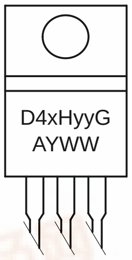
10 AMP COMPLEMENTARY SILICON POWER TRANSISTORS 60, 80 VOLTS



TO−220AB
CASE 221A−09
STYLE 1

MARKING DIAGRAM



D4xHyy = Device Code
x = 4 or 5
yy = 8 or 11
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping[†]
D44H8	TO−220	50 Units/Rail
D44H8G	TO−220 (Pb−Free)	50 Units/Rail
D44H11	TO−220	50 Units/Rail
D44H11G	TO−220 (Pb−Free)	50 Units/Rail
D45H8	TO−220	50 Units/Rail
D45H8G	TO−220 (Pb−Free)	50 Units/Rail
D45H11	TO−220	50 Units/Rail
D45H11G	TO−220 (Pb−Free)	50 Units/Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage D44H8, D45H8 (I_C = 30 mAdc, I_B = 0 Adc) D44H11, D45H11	$V_{CEO(sus)}$	60 80	– –	– –	Vdc
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, V_{BE} = 0)	I_{CES}	–	–	10	μA
Emitter Cutoff Current (V_{EB} = 5.0 Vdc)	I_{EBO}	–	–	10	μA
ON CHARACTERISTICS					
DC Current Gain (V_{CE} = 1.0 Vdc, I_C = 2.0 Adc) (V_{CE} = 1.0 Vdc, I_C = 4.0 Adc)	h_{FE}	 60 40	 – –	 – –	–
Collector−Emitter Saturation Voltage (I_C = 8.0 Adc, I_B = 0.4 Adc)	$V_{CE(sat)}$	–	–	1.0	Vdc
Base−Emitter Saturation Voltage (I_C = 8.0 Adc, I_B = 0.8 Adc)	$V_{BE(sat)}$	–	–	1.5	Vdc
DYNAMIC CHARACTERISTICS					
Collector Capacitance (V_{CB} = 10 Vdc, f_{test} = 1.0 MHz) D44H Series D45H Series	C_{cb}	 – –	 90 160	 – –	pF
Gain Bandwidth Product (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 20 MHz) D44H Series D45H Series	f_T	 – –	 50 40	 – –	MHz
SWITCHING TIMES					
Delay and Rise Times (I_C = 5.0 Adc, I_{B1} = 0.5 Adc) D44H Series D45H Series	$t_d + t_r$	 – –	 300 135	 – –	ns
Storage Time (I_C = 5.0 Adc, I_{B1} = I_{B2} = 0.5 Adc) D44H Series D45H Series	t_s	 – –	 500 500	 – –	ns
Fall Time (I_C = 5.0 Adc, I_{B1} = 102 = 0.5 Adc) D44H Series D45H Series	t_f	 – –	 140 100	 – –	ns

D44H Series (NPN),

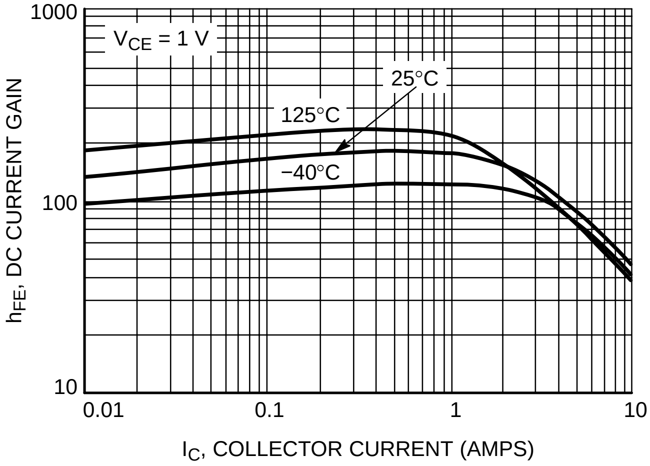


Figure 1. D44H11 DC Current Gain

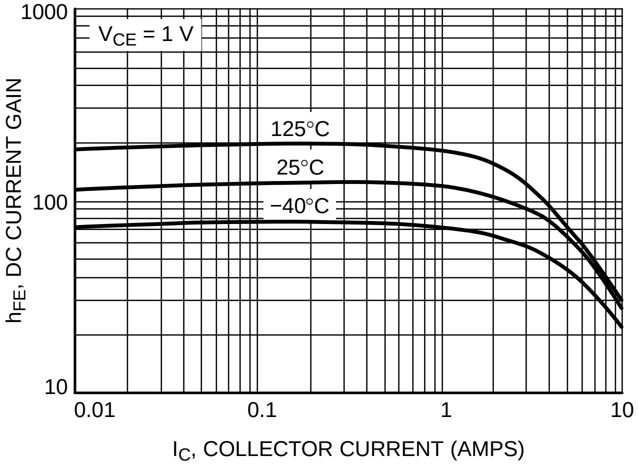


Figure 2. D45H11 DC Current Gain

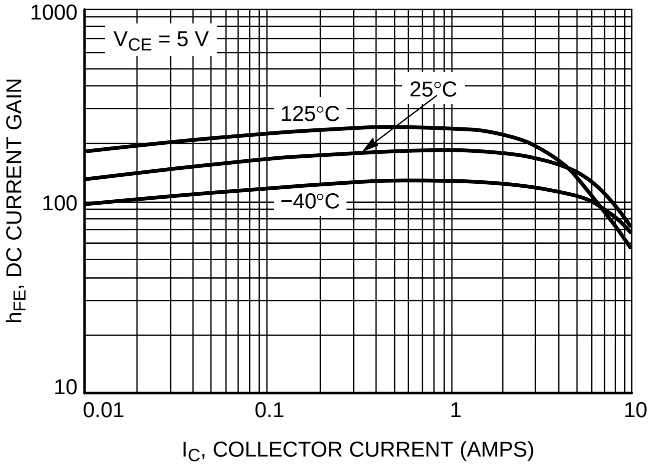


Figure 3. D44H11 DC Current Gain

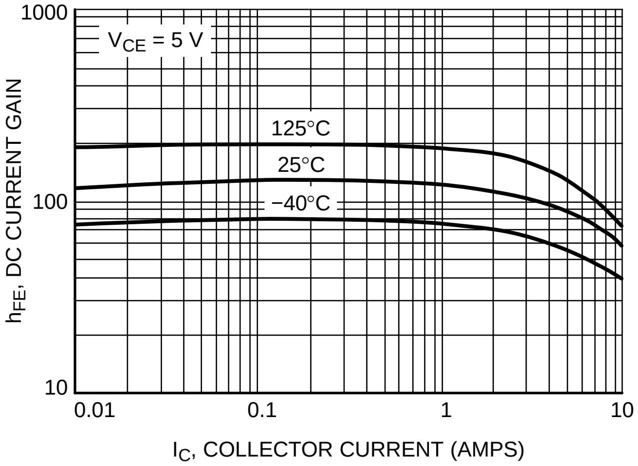


Figure 4. D45H11 DC Current Gain

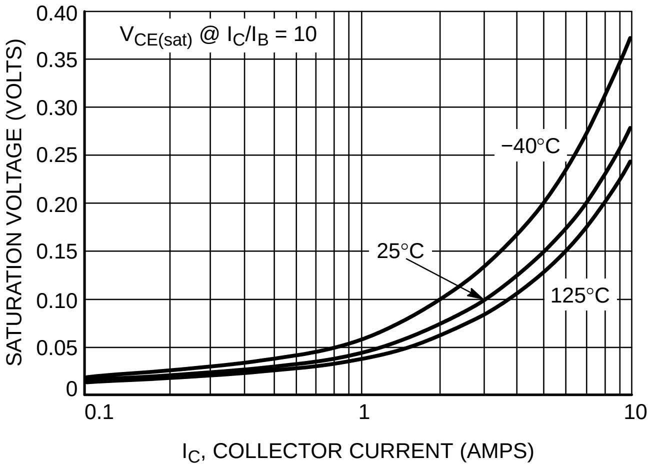


Figure 5. D44H11 ON−Voltage

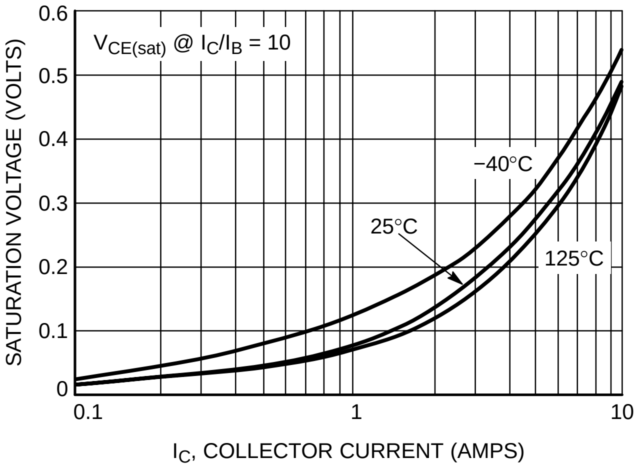


Figure 6. D45H11 ON−Voltage

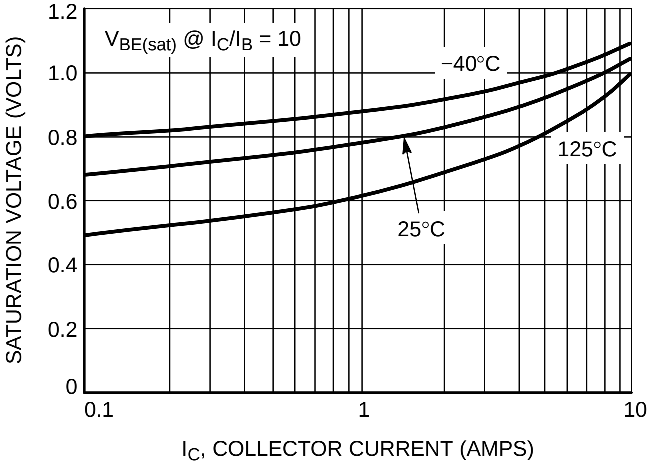


Figure 7. D44H11 ON−Voltage

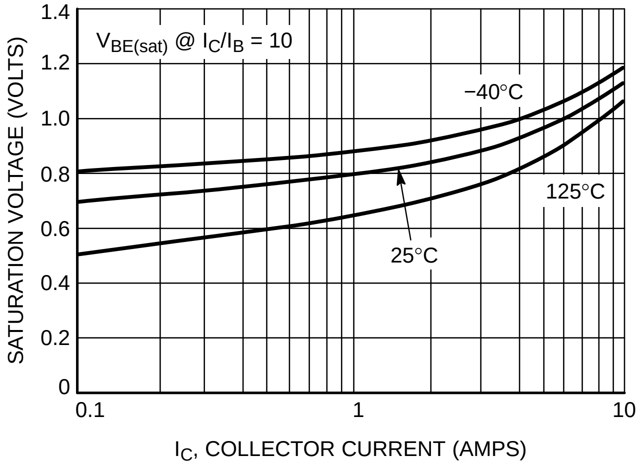


Figure 8. D45H11 ON−Voltage

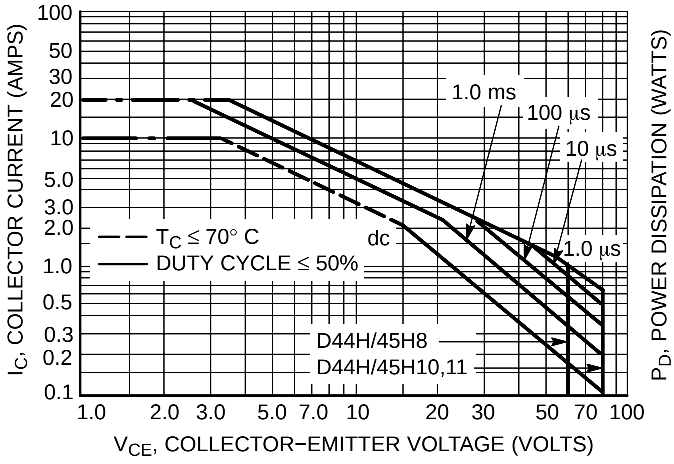


Figure 9. Maximum Rated Forward Bias Safe Operating Area

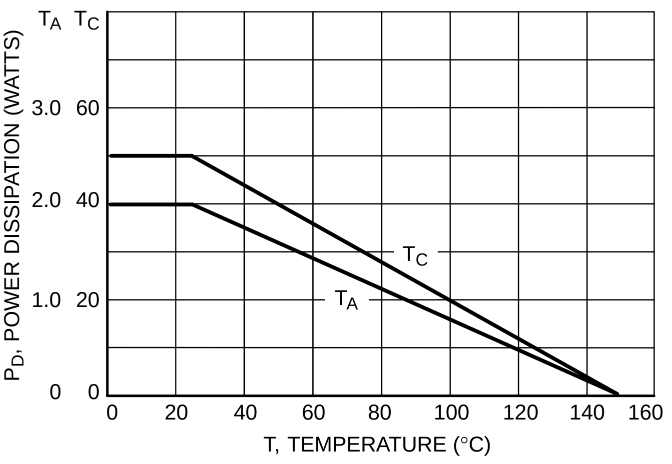


Figure 10. Power Derating

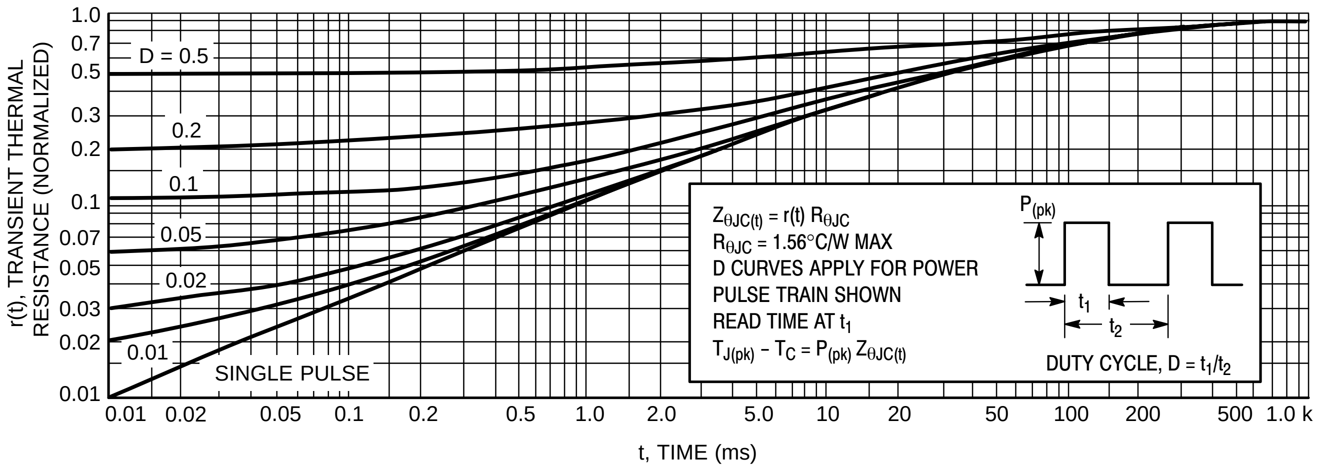
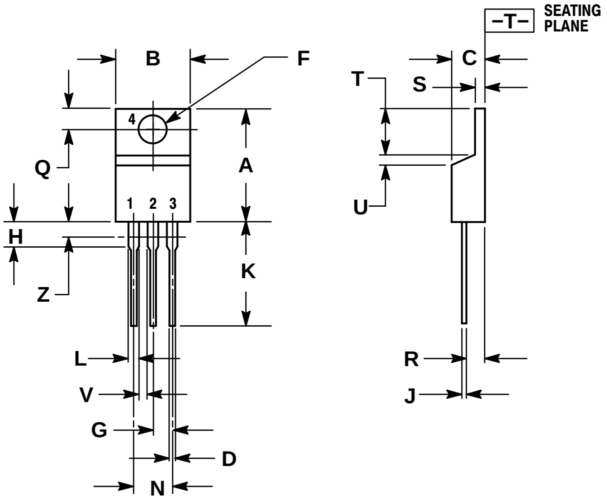


Figure 11. Thermal Response

D44H Series (NPN),

PACKAGE DIMENSIONS

TO−220
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.

	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	0.035	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

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