

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
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ } 8.0 \text{ A}$
- 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 @ $T_C = 25^\circ\text{C}$ @ $T_A = 25^\circ\text{C}$	P_D	70 2.0	W
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	$^\circ\text{C}$

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 $\leq 6.0 \text{ ms}$, Duty Cycle $\leq 50\%$.

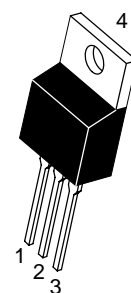
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

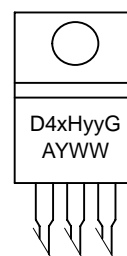
<http://onsemi.com>

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.

D44H Series (NPN),

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage ($I_C = 30\text{ mA}$, $I_B = 0\text{ A}$)	D44H8, D45H8 D44H11, D45H11	$V_{CEO(sus)}$	60 80	– –	– –	Vdc
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $V_{BE} = 0$)		I_{CES}	–	–	10	μA
Emitter Cutoff Current ($V_{EB} = 5.0\text{ Vdc}$)		I_{EBO}	–	–	10	μA

ON CHARACTERISTICS

DC Current Gain ($V_{CE} = 1.0\text{ Vdc}$, $I_C = 2.0\text{ Adc}$) ($V_{CE} = 1.0\text{ Vdc}$, $I_C = 4.0\text{ Adc}$)		h_{FE}	60 40	– –	– –	–
Collector–Emitter Saturation Voltage ($I_C = 8.0\text{ Adc}$, $I_B = 0.4\text{ Adc}$)		$V_{CE(sat)}$	–	–	1.0	Vdc
Base–Emitter Saturation Voltage ($I_C = 8.0\text{ Adc}$, $I_B = 0.8\text{ Adc}$)		$V_{BE(sat)}$	–	–	1.5	Vdc

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10\text{ Vdc}$, $f_{test} = 1.0\text{ MHz}$)	D44H Series D45H Series	C_{cb}	– –	90 160	– –	pF
Gain Bandwidth Product ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 20\text{ MHz}$)	D44H Series D45H Series	f_T	– –	50 40	– –	MHz

SWITCHING TIMES

Delay and Rise Times ($I_C = 5.0\text{ Adc}$, $I_{B1} = 0.5\text{ Adc}$)	D44H Series D45H Series	$t_d + t_r$	– –	300 135	– –	ns
Storage Time ($I_C = 5.0\text{ Adc}$, $I_{B1} = I_{B2} = 0.5\text{ Adc}$)	D44H Series D45H Series	t_s	– –	500 500	– –	ns
Fall Time ($I_C = 5.0\text{ Adc}$, $I_{B1} = 102 = 0.5\text{ Adc}$)	D44H Series D45H Series	t_f	– –	140 100	– –	ns

D44H Series (NPN),

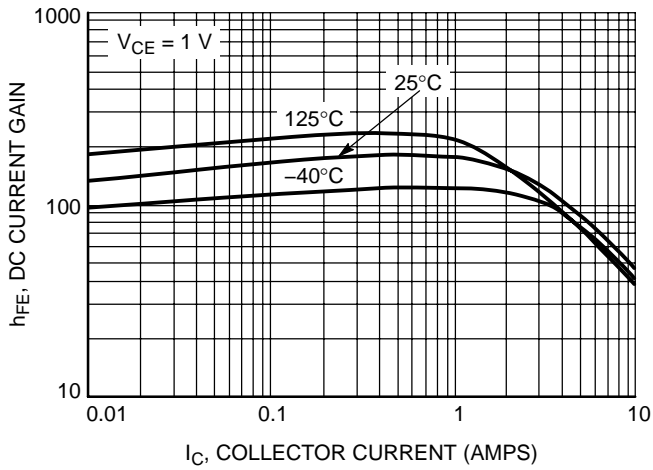


Figure 1. D44H11 DC Current Gain

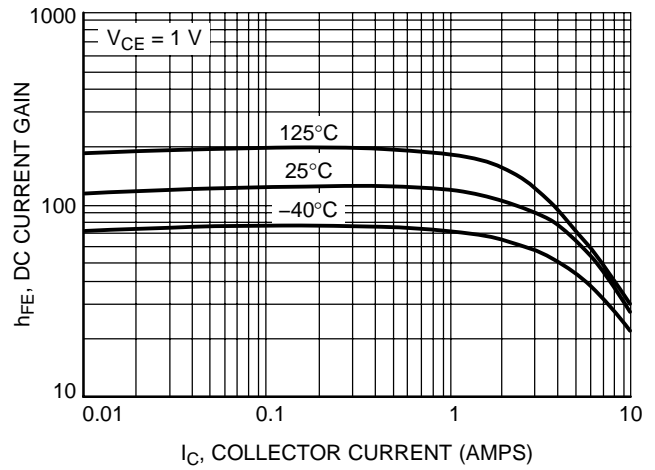


Figure 2. D45H11 DC Current Gain

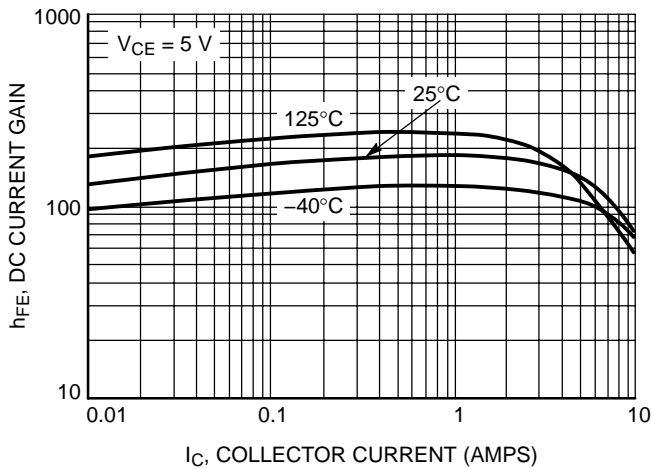


Figure 3. D44H11 DC Current Gain

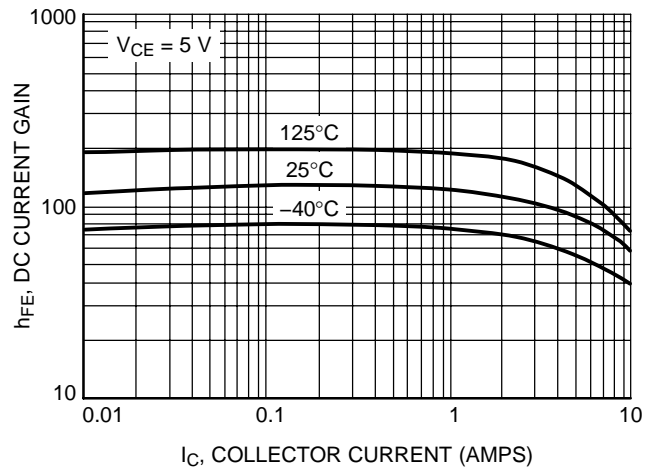


Figure 4. D45H11 DC Current Gain

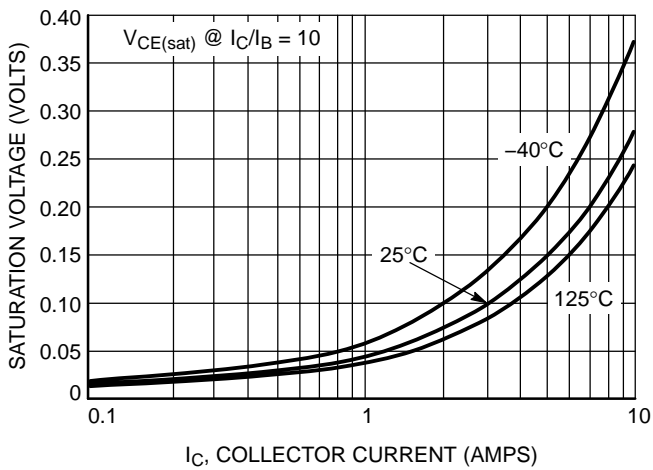


Figure 5. D44H11 ON-Voltage

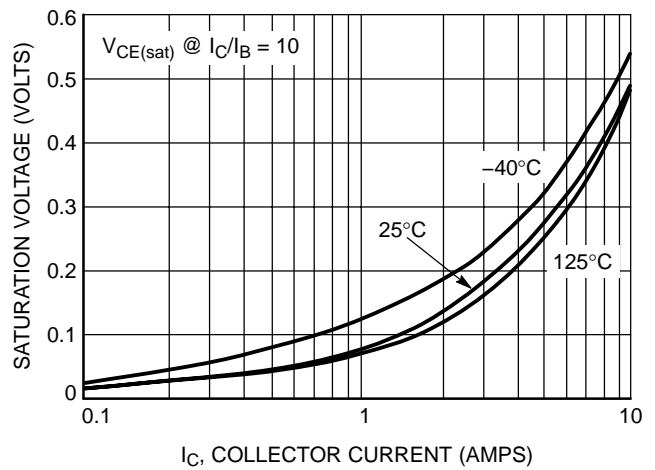


Figure 6. D45H11 ON-Voltage

D44H Series (NPN),

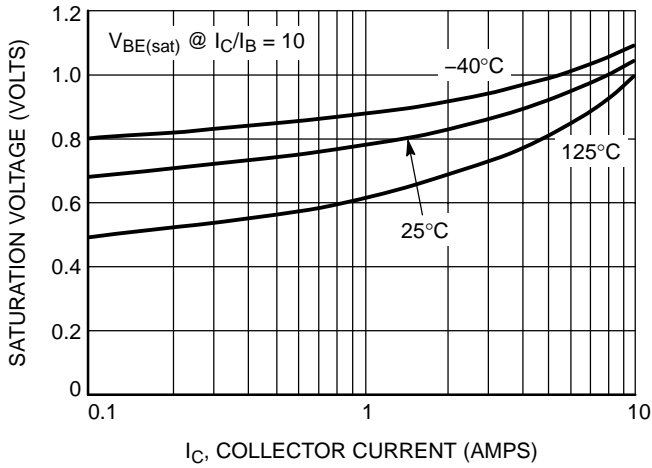


Figure 7. D44H11 ON-Voltage

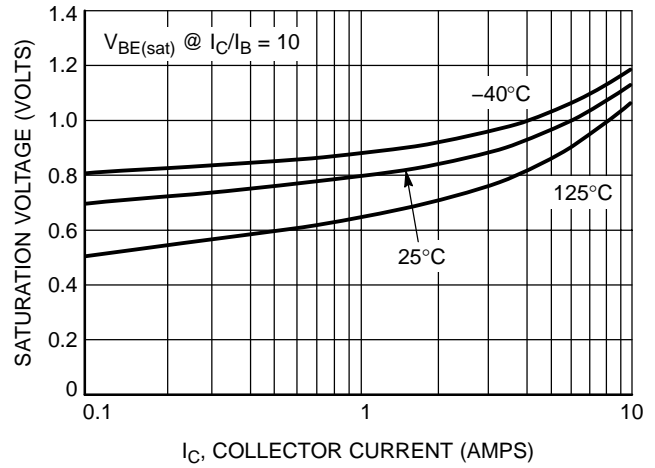


Figure 8. D45H11 ON-Voltage

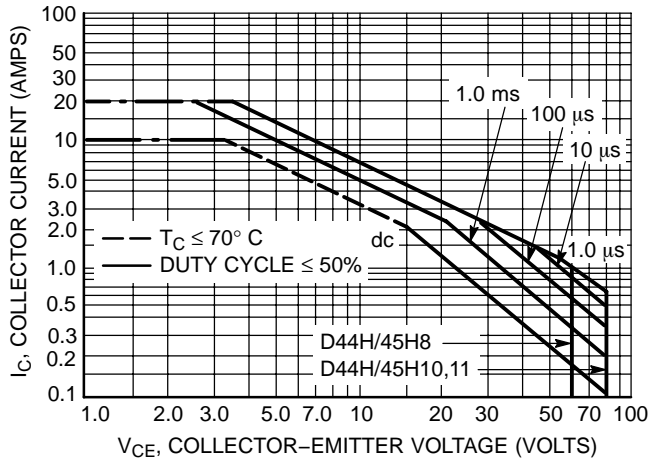


Figure 9. Maximum Rated Forward Bias Safe Operating Area

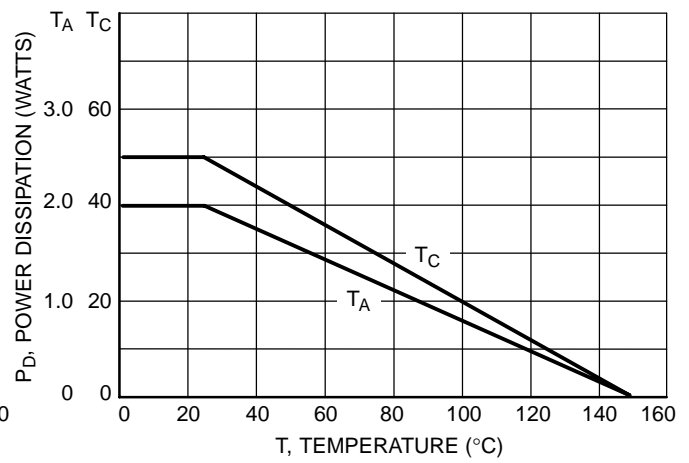


Figure 10. Power Derating

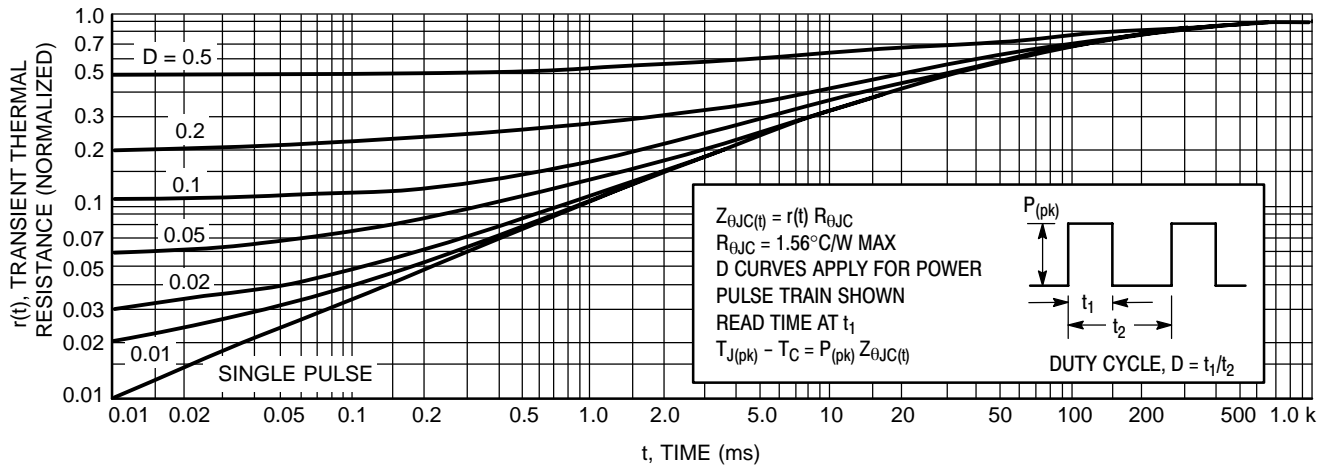
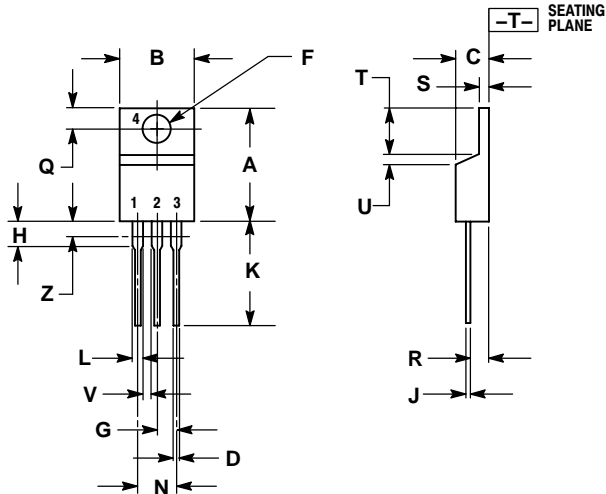


Figure 11. Thermal Response

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.

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

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your
local Sales Representative.