Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

© 2013 Rochester Electronics, LLC. All Rights Reserved 07112013

D44H Series (NPN), D45H Series (PNP)

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.

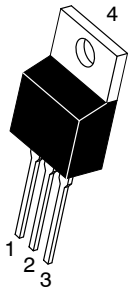
Features

- 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*

ON Semiconductor®

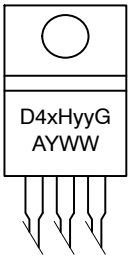
http://onsemi.com

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

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

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.

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.

© Semiconductor Components Industries, LLC, 2011

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Sustaining Voltage (I_C = 30 mAdc, I_B = 0 Adc)	D44H8, D45H8 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

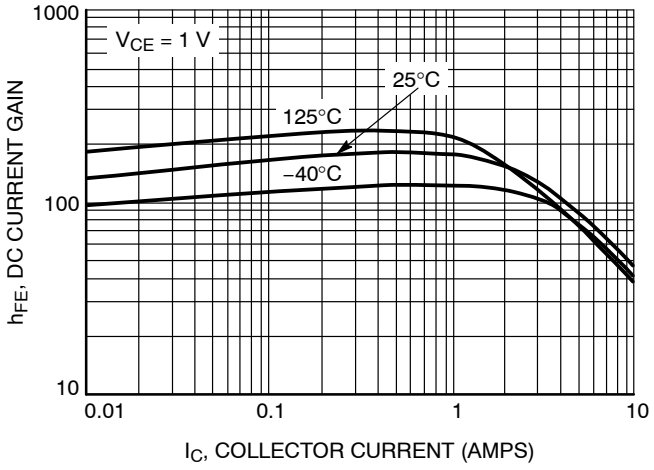


Figure 1. D44H11 DC Current Gain

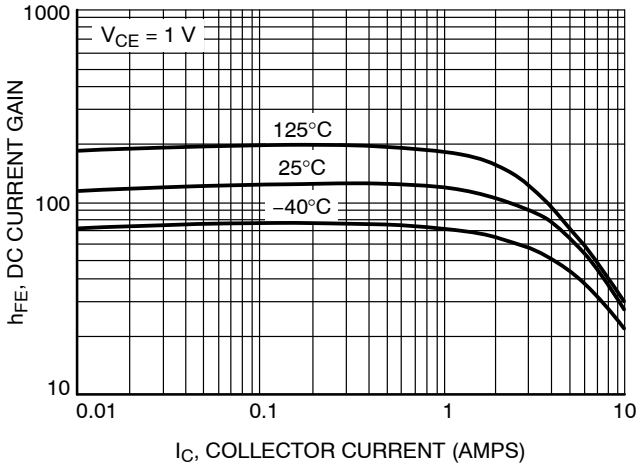


Figure 2. D45H11 DC Current Gain

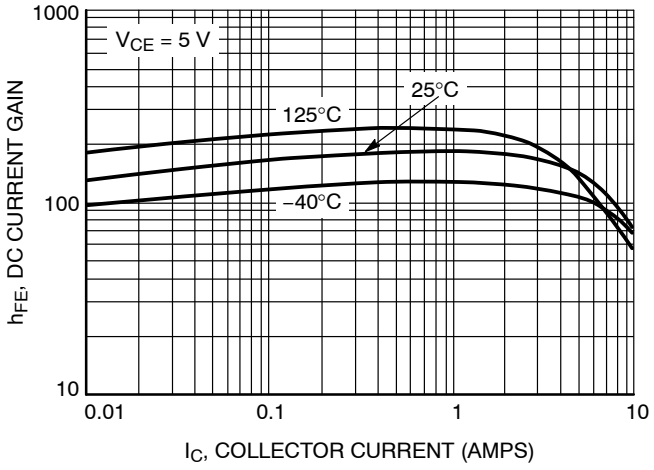


Figure 3. D44H11 DC Current Gain

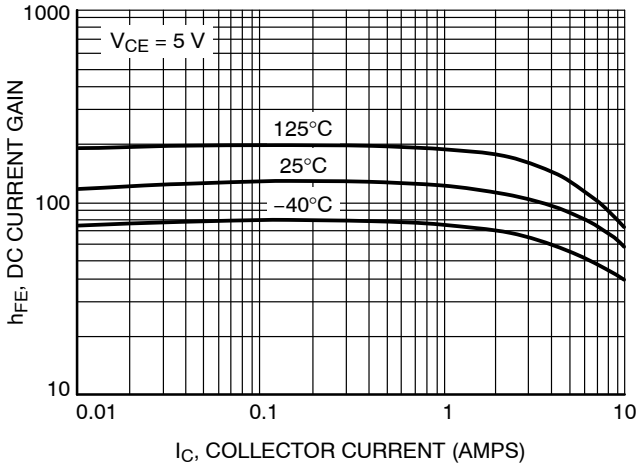


Figure 4. D45H11 DC Current Gain

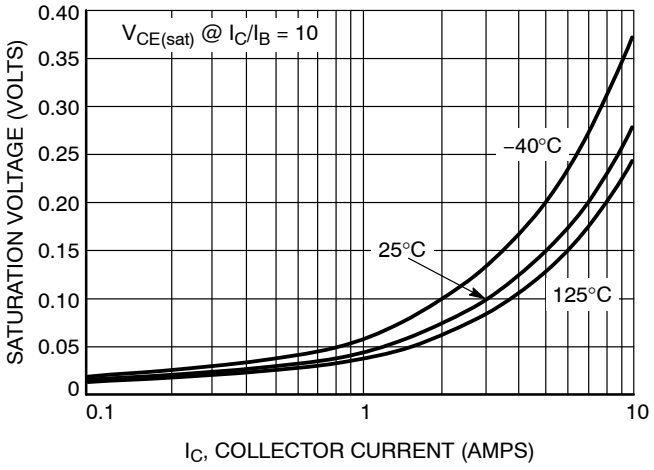


Figure 5. D44H11 ON−Voltage

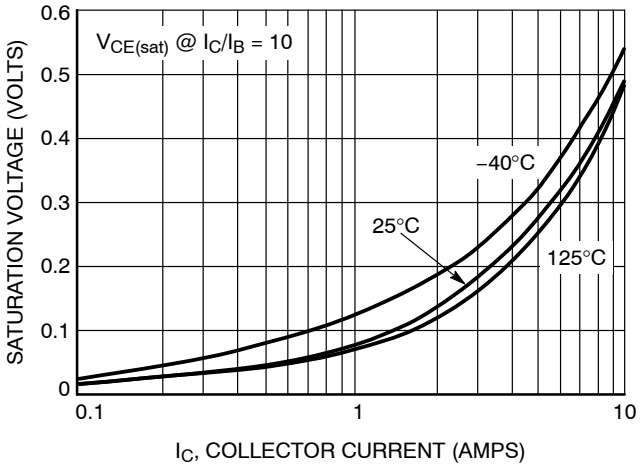


Figure 6. D45H11 ON−Voltage

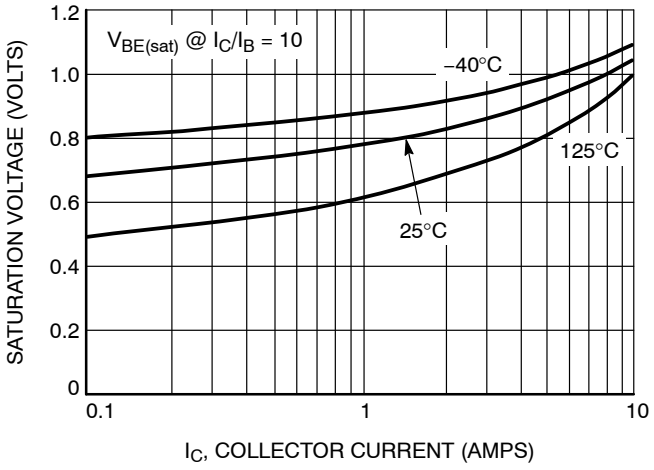


Figure 7. D44H11 ON−Voltage

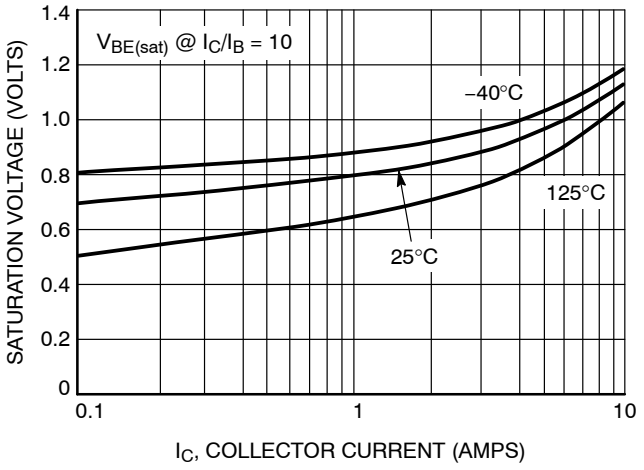


Figure 8. D45H11 ON−Voltage

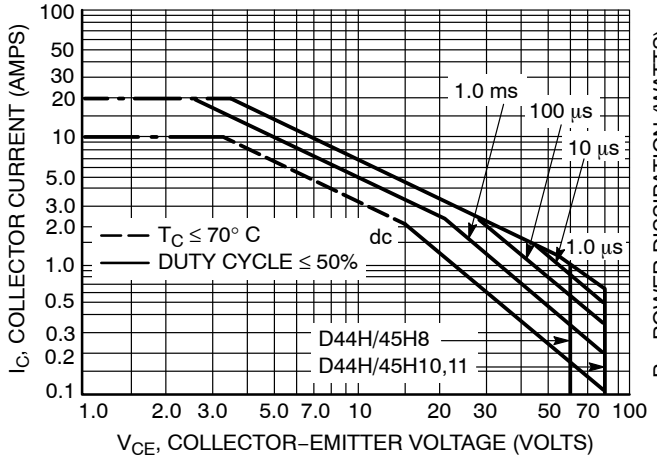


Figure 9. Maximum Rated Forward Bias Safe Operating Area

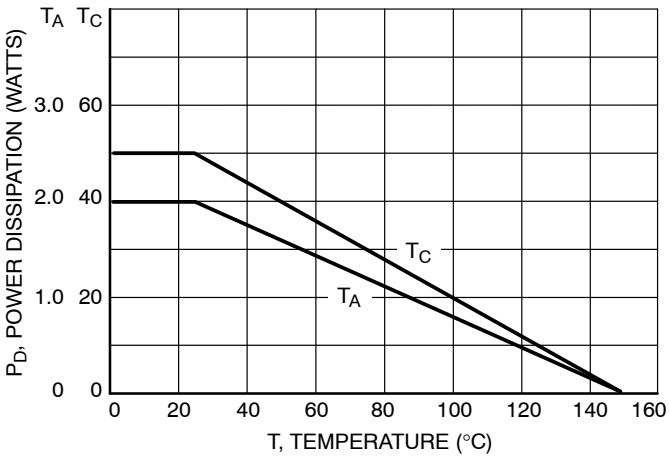


Figure 10. Power Derating

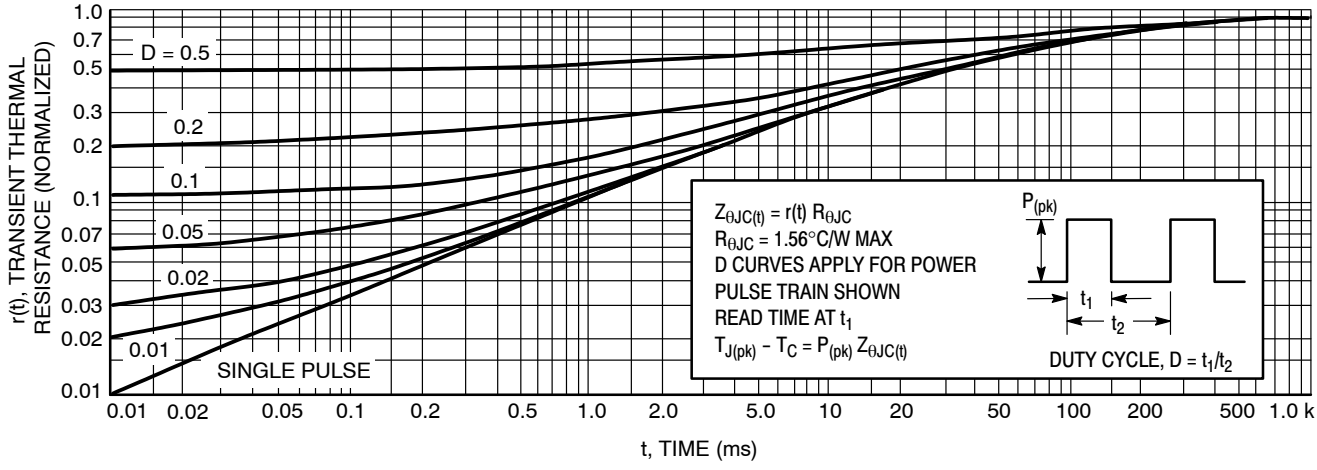
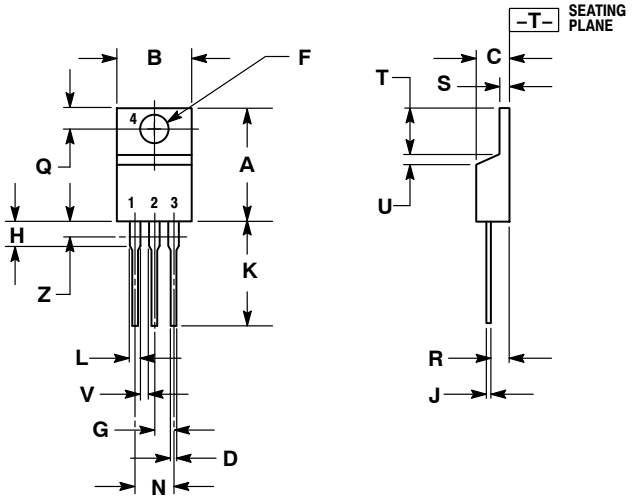


Figure 11. Thermal Response

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

ON Semiconductor and ON 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 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative