

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 —
 $t_f = 90 \text{ ns (Max)}$
- Key Parameters Specified @ 100°C
- Low Collector-Emitter Saturation Voltage —
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ 8.0 A}$
- Complementary Pairs Simplify Circuit Designs

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	I_C	15	Adc
— Peak (1)	I_{CM}	20	
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	83	Watts
Derate above 25°C		0.67	W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150	°C

THERMAL CHARACTERISTICS

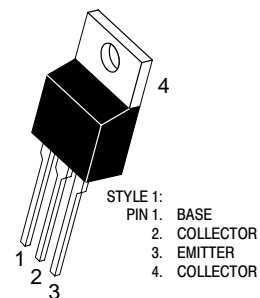
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	°C

(2) Pulse Width $\leq 6.0 \text{ ms}$, Duty Cycle $\leq 50\%$.

NOTE: All polarities are shown for NPN transistors. For PNP transistors, reverse polarities.

NPN
D44VH
PNP
D45VH

15 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
80 VOLTS
83 WATTS



CASE 221A-09
TO-220AB

D44VH D45VH

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

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

OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage (2) (I _C = 25 mA _{dc} , I _B = 0)	V _{CEO(sus)}	80	—	—	V _{dc}
Collector–Emitter Cutoff Current (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc}) (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc} , T _C = 100°C)	I _{CEV}	— —	— —	10 100	μA _{dc}
Emitter Base Cutoff Current (V _{EB} = 7.0 V _{dc} , I _C = 0)	I _{EBO}	—	—	10	μA _{dc}

ON CHARACTERISTICS (2)

DC Current Gain (I _C = 2.0 A _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 4.0 A _{dc} , V _{CE} = 1.0 V _{dc})	h _{FE}	35 20	— —	— —	—
Collector–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) D44VH10 (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) D45VH10 (I _C = 15 A _{dc} , I _B = 3.0 A _{dc} , T _C = 100°C) D44VH10 D45VH10	V _{CE(sat)}	— — — —	— — — —	0.4 1.0 0.8 1.5	V _{dc}
Base–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) D44VH10 (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) D45VH10 (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc} , T _C = 100°C) D44VH10 (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc} , T _C = 100°C) D45VH10	V _{BE(sat)}	— — — —	— — — —	1.2 1.0 1.1 1.5	V _{dc}

DYNAMIC CHARACTERISTICS

Current Gain Bandwidth Product (I _C = 0.1 A _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz)	f _T	—	50	—	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _C = 0, f _{test} = 1.0 MHz) D44VH10 D45VH10	C _{ob}	— —	120 275	— —	pF

SWITCHING CHARACTERISTICS

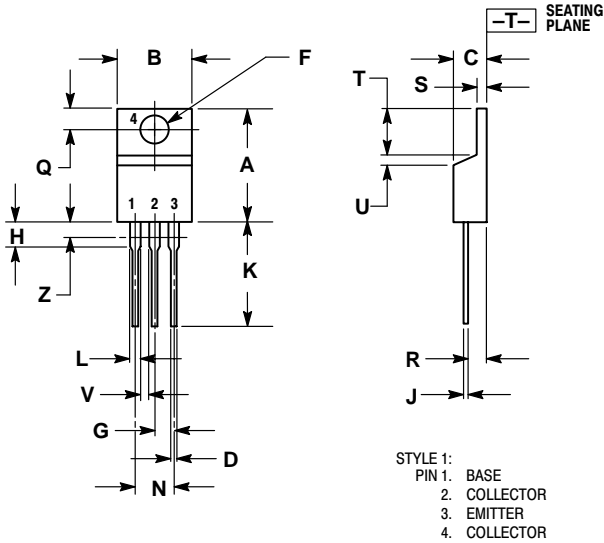
Delay Time	(V _{CC} = 20 V _{dc} , I _C = 8.0 A _{dc} , I _{B1} = I _{B2} = 0.8 A _{dc})	t _d	—	—	50	ns
Rise Time		t _r	—	—	250	
Storage Time		t _s	—	—	700	
Fall Time		t _f	—	—	90	

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

D44VH D45VH

PACKAGE DIMENSIONS


TO-220AB 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

D44VH D45VH

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.

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: ONlit@hibbertco.com

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

JAPAN: ON Semiconductor, Japan Customer Focus Center
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-0031
Phone: 81-3-5740-2700
Email: r14525@onsemi.com

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

For additional information, please contact your local Sales Representative.