

D45C12 (PNP), D44C12 (NPN)

Complementary Silicon Power Transistor

The D45C12 and D44C12 are for general purpose driver or medium power output stages in CW or switching applications.

Features

- Low Collector-Emitter Saturation Voltage - 0.5 V (Max)
- High f_t for Good Frequency Response
- Low Leakage Current
- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Emitter Voltage	V_{CES}	90	Vdc
Emitter Base Voltage	V_{EB}	5.0	Vdc
Collector Current - Continuous Peak (Note 1)	I_C	4.0 6.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ @ $T_A = 25^\circ\text{C}$	P_D	30 1.67	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.2	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes: 1/8 in from Case for 5 Sec	T_L	275	$^\circ\text{C}$

1. Pulse Width \leq 6.0 ms, Duty Cycle \leq 50%.

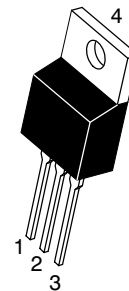
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

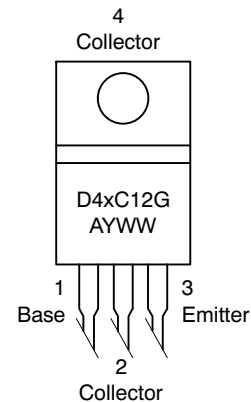
<http://onsemi.com>

4.0 AMPERE COMPLEMENTARY SILICON POWER TRANSISTORS 80 VOLTS



TO-220AB
CASE 221A
STYLE 1

MARKING DIAGRAM & PIN ASSIGNMENT



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

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

D45C12 (PNP), D44C12 (NPN)

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

Characteristic	Symbol	Min	Max	Unit
DC Current Gain (V _{CE} = 1.0 Vdc, I _C = 0.2 Adc) (V _{CE} = 1.0 Vdc, I _C = 1.0 Adc) (V _{CE} = 1.0 Vdc, I _C = 2.0 Adc)	h _{FE}	40 20 20	120 - -	-

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

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

OFF CHARACTERISTICS

Collector Cutoff Current (V _{CE} = Rated V _{CES} , V _{BE} = 0)	I _{CES}	-	-	0.1	μA
Emitter Cutoff Current (V _{EB} = 5.0 Vdc)	I _{EBO}	-	-	10	μA

ON CHARACTERISTICS

Collector-Emitter Saturation Voltage (I _C = 1.0 Adc, I _B = 50 mAdc)	V _{CE(sat)}	-	0.135	0.5	Vdc
Base-Emitter Saturation Voltage (I _C = 1.0 Adc, I _B = 100 mAdc)	V _{BE(sat)}	-	0.85	1.3	Vdc

DYNAMIC CHARACTERISTICS

Collector Capacitance (V _{CB} = 10 Vdc, f = 1.0 MHz)	C _{cb}	-	125	-	pF
Gain Bandwidth Product (I _C = 20 mA, V _{CE} = 4.0 Vdc, f = 20 MHz)	f _T	-	40	-	MHz

SWITCHING TIMES

Delay and Rise Times (I _C = 1.0 Adc, I _{B1} = 0.1 Adc)	t _d + t _r	-	50	75	ns
Storage Time (I _C = 1.0 Adc, I _{B1} = I _{B2} = 0.1 Adc)	t _s	-	350	550	ns
Fall Time (I _C = 1.0 Adc, I _{B1} = I _{B2} = 0.1 Adc)	t _f	-	50	75	ns

ORDERING INFORMATION

Device	Package	Shipping†
D45C12	TO-220AB	50 Units / Rail
D45C12G	TO-220AB (Pb-Free)	
D44C12	TO-220AB	
D44C12G	TO-220AB (Pb-Free)	

†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.

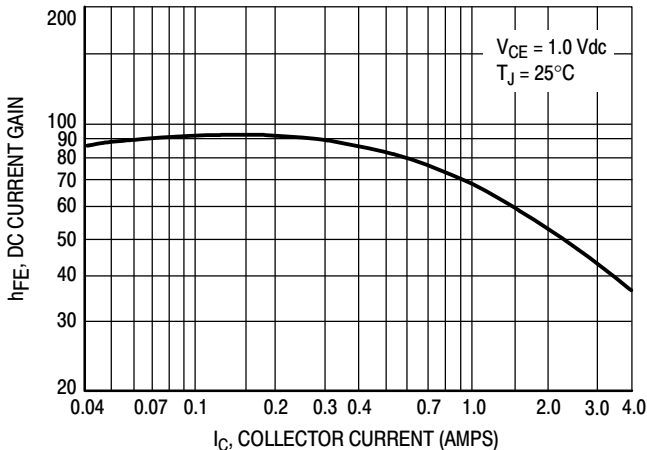


Figure 1. Typical DC Current Gain

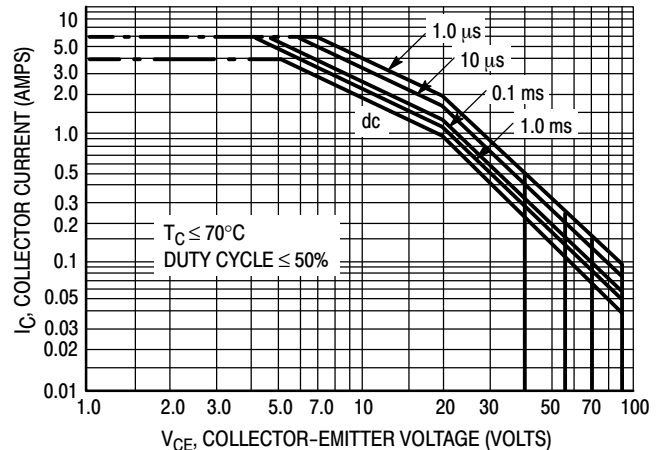
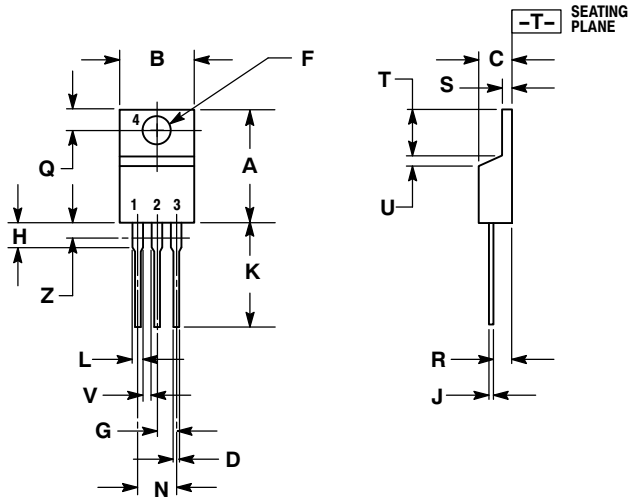


Figure 2. Maximum Rated Forward Bias Safe Operating Area

D45C12 (PNP), D44C12 (NPN)

PACKAGE DIMENSIONS

TO-220
CASE 221A-09
ISSUE AE



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	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
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 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: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative