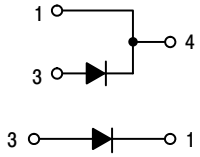
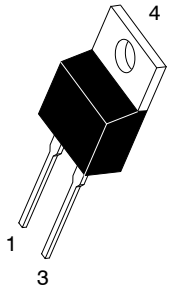
Switch-mode Power Rectifiers

NHPV08S600G

PLANAR ULTRAFAST RECTIFIERS 8 A, 600 V





TO−220AC
CASE 221B

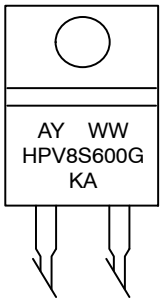
Features

- Ultrafast 30 Nanosecond Recovery Time
- 150°C Operating Junction Temperature
- High Voltage Capability of 600 V
- Low Forward Drop
- Low Leakage Specified @ 125°C Case Temperature
- This Device is Pb−Free and RoHS Compliant

Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

MARKING DIAGRAMS



A	= Assembly Location
Y	= Year
WW	= Work Week
G	= Pb−Free Package
KA	= Diode Polarity

ORDERING INFORMATION

Device	Package	Shipping
NHPV08S600G	TO−220AC (Pb−Free)	50 Units / Rail

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

© Semiconductor Components Industries, LLC, 2014

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	600	V
Average Rectified Forward Current (Rated V_R)	$I_{F(AV)}$	8 A @ T_C = 130°C	A
Peak Rectified Forward Current (Rated V_R, Square Wave, 20 kHz)	I_{FRM}	8 A @ T_C = 125°C	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	80	A
Operating Junction Temperature and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
NHPV08S600G: Thermal Resistance Junction−to−Case (Note 1)	$R_{\theta JC}$	1.5	°C/W
NHPJ08S600G: Thermal Resistance Junction−to−Case (Note 1)	$R_{\theta JC}$	4.25	°C/W

1. Junction−to−Case shown as a typical value using a fixed 25°C cold plate boundary.

ELECTRICAL CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 2)	(I_F = 8 A, T_C = 125°C) (I_F = 8 A, T_C = 25°C)	V_F	1.5 2.7	1.8 3.2	V
Instantaneous Reverse Current (Note 2)	(Rated DC Voltage, T_C = 125°C) (Rated DC Voltage, T_C = 25°C)	I_R	46 0.1	400 30	μA
Reverse Recovery Time	(I_F = 0.5 A, I_{rr} = 0.25 A, I_R = 1 A) (I_F = 1 A, dI_F/dt = −50 A/μs, V_R = 30 V)	t_{rr}	– –	30 50	ns
Reverse Recovery Time Peak Reverse Recovery Current Total Reverse Recovery Charge Softness Factor	(I_F = 8 A, d_{IF}/d_t = −200 A/μs, T_C = 25°C)	t_{rr} I_{RM} Q_{rr} S	30 2.3 37 2	50 3 50 –	ns A nC –
Reverse Recovery Time Peak Reverse Recovery Current Total Reverse Recovery Charge Softness Factor	(I_F = 8 A, d_{IF}/d_t = −200 A/μs, T_C = 125°C)	t_{rr} I_{RM} Q_{rr} S	45 5.5 150 0.35	– – – –	ns A nC –
Forward Recovery Time Peak Forward Recovery Voltage	(I_F = 8 A, d_{IF}/d_t = 120 A/μs, T_C = 25°C)	t_{fr} V_{FP}	– –	200 6	ns V

2. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

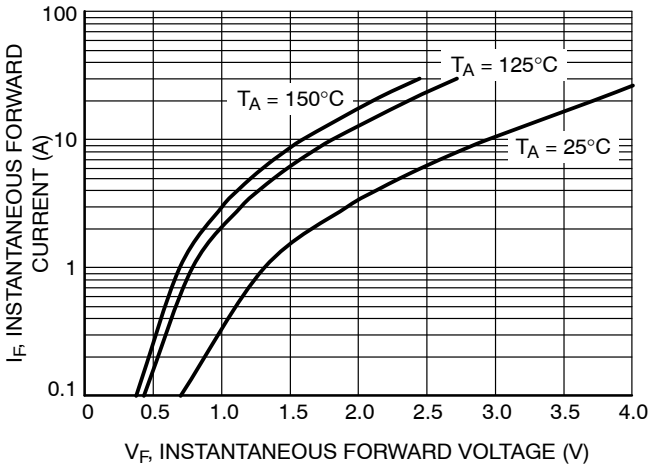


Figure 1. Typical Instantaneous Forward Characteristics

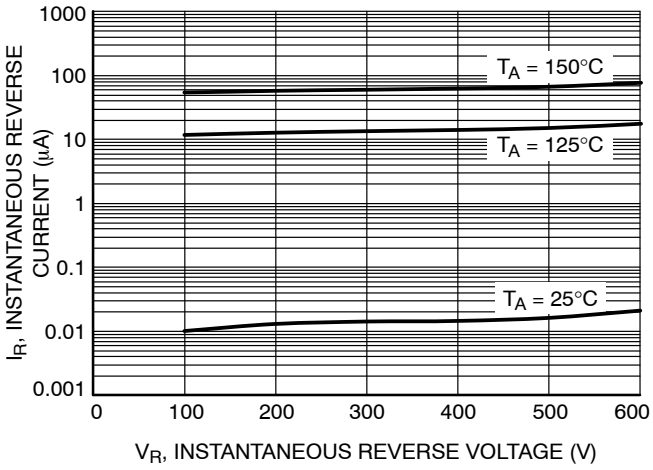


Figure 2. Typical Reverse Characteristics

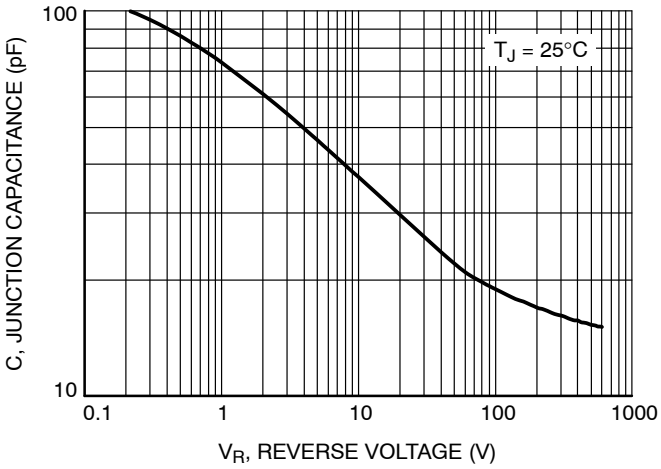


Figure 3. Typical Junction Capacitance

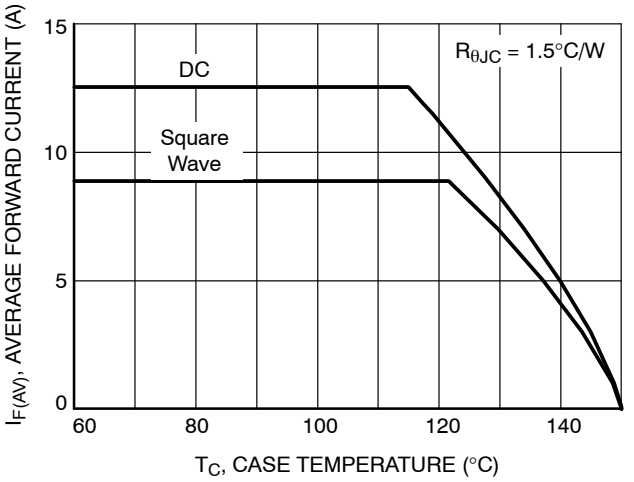


Figure 4. Current Derating TO−220AC

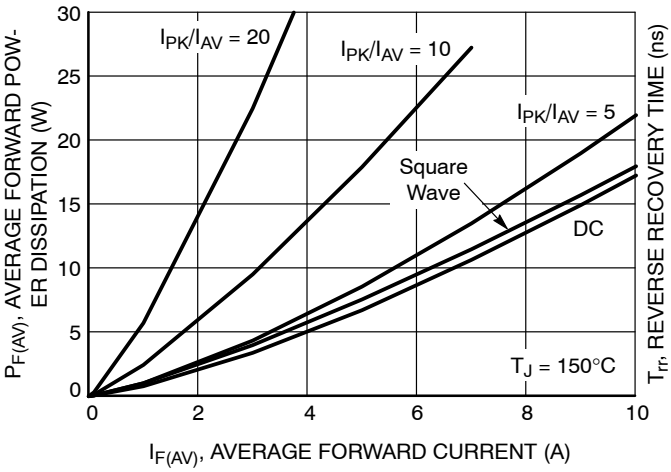


Figure 5. Forward Power Dissipation

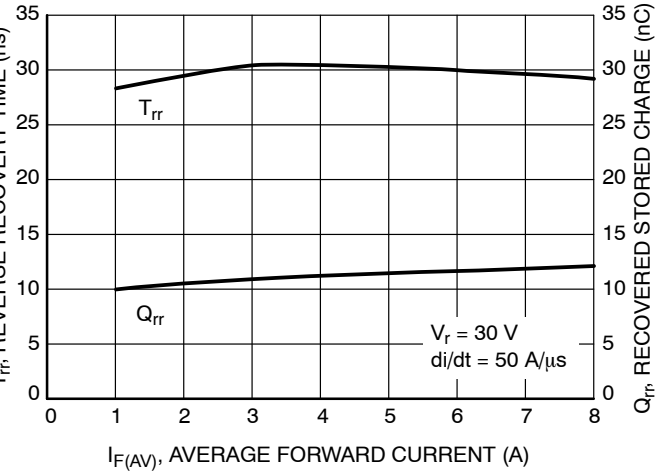


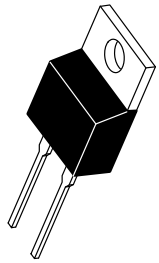
Figure 6. Typical Recovery Characteristics

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

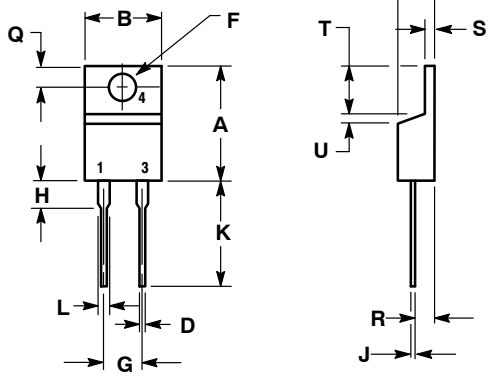
ON Semiconductor®

TO−220, 2−LEAD
CASE 221B−04
ISSUE F

DATE 12 APR 2013



SCALE 1:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.039	0.64	1.00
F	0.142	0.161	3.61	4.09
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27

STYLE 1:
PIN 1. CATHODE
2. N/A
3. ANODE
4. CATHODE

STYLE 2:
PIN 1. ANODE
2. N/A
3. CATHODE
4. ANODE

DOCUMENT NUMBER:	**98ASB42149B**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	**TO−220, 2−LEAD**		**PAGE 1 OF 1**

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

© Semiconductor Components Industries, LLC, 2019

onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** 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. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** 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. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** 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 **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales