

# Switch-mode Power Rectifiers

## NHPV08S600G

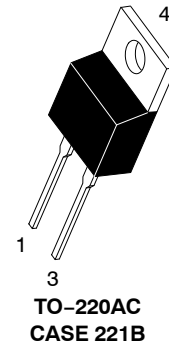
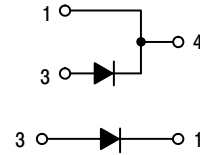
### Features

- 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

## PLANAR ULTRAFAST RECTIFIERS 8 A, 600 V



### 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.

# NHPV08S600G

## 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 @ $T_C = 130^\circ\text{C}$	A
Peak Rectified Forward Current (Rated $V_R$ , Square Wave, 20 kHz)	$I_{FRM}$	8 A @ $T_C = 125^\circ\text{C}$	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	$^\circ\text{C}$

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	$^\circ\text{C}/\text{W}$
NHPJ08S600G: Thermal Resistance Junction-to-Case (Note 1)	$R_{\theta JC}$	4.25	$^\circ\text{C}/\text{W}$

1. Junction-to-Case shown as a typical value using a fixed  $25^\circ\text{C}$  cold plate boundary.

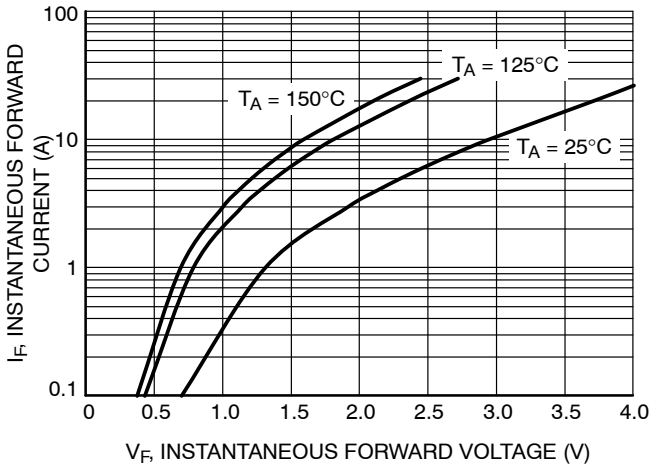
## ELECTRICAL CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 2)	$(I_F = 8 \text{ A}, T_C = 125^\circ\text{C})$ $(I_F = 8 \text{ A}, T_C = 25^\circ\text{C})$	$V_F$	1.5 2.7	1.8 3.2	V
Instantaneous Reverse Current (Note 2)	(Rated DC Voltage, $T_C = 125^\circ\text{C}$ ) (Rated DC Voltage, $T_C = 25^\circ\text{C}$ )	$I_R$	46 0.1	400 30	$\mu\text{A}$
Reverse Recovery Time	$(I_F = 0.5 \text{ A}, I_{rr} = 0.25 \text{ A}, I_R = 1 \text{ A})$ $(I_F = 1 \text{ A}, dI_F/dt = -50 \text{ A}/\mu\text{s}, V_R = 30 \text{ V})$	$t_{rr}$	- -	30 50	ns
Reverse Recovery Time Peak Reverse Recovery Current Total Reverse Recovery Charge Softness Factor	$(I_F = 8 \text{ A}, dI_F/dt = -200 \text{ A}/\mu\text{s}, T_C = 25^\circ\text{C})$	$t_{rr}$ $I_{RM}$ $Q_{rr}$ 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	$(I_F = 8 \text{ A}, dI_F/dt = -200 \text{ A}/\mu\text{s}, T_C = 125^\circ\text{C})$	$t_{rr}$ $I_{RM}$ $Q_{rr}$ S	45 5.5 150 0.35	- - - -	ns A nC -
Forward Recovery Time Peak Forward Recovery Voltage	$(I_F = 8 \text{ A}, dI_F/dt = 120 \text{ A}/\mu\text{s}, T_C = 25^\circ\text{C})$	$t_{fr}$ $V_{FP}$	- -	200 6	ns V

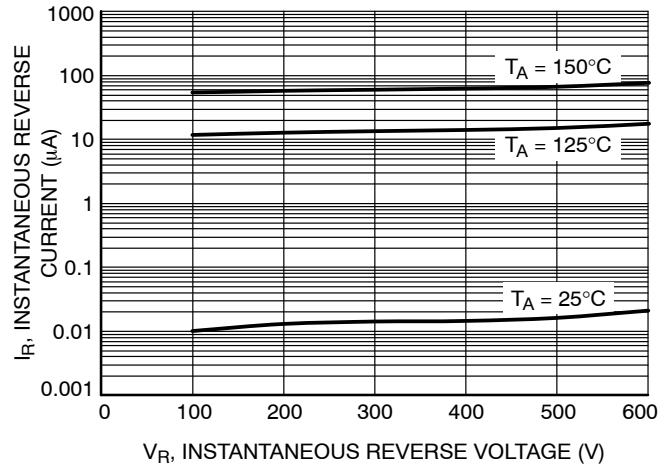
2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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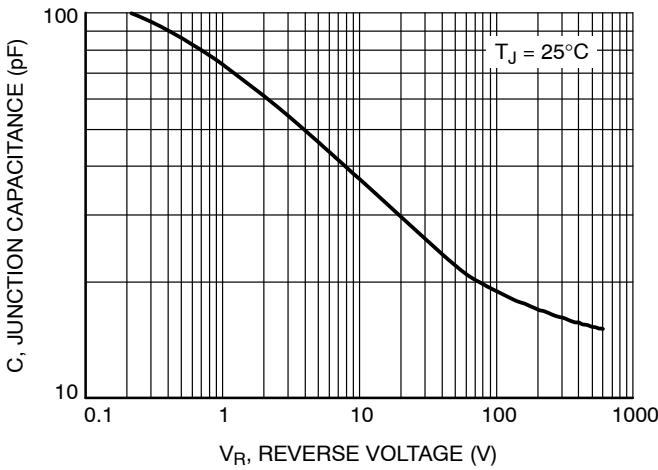
## TYPICAL CHARACTERISTICS



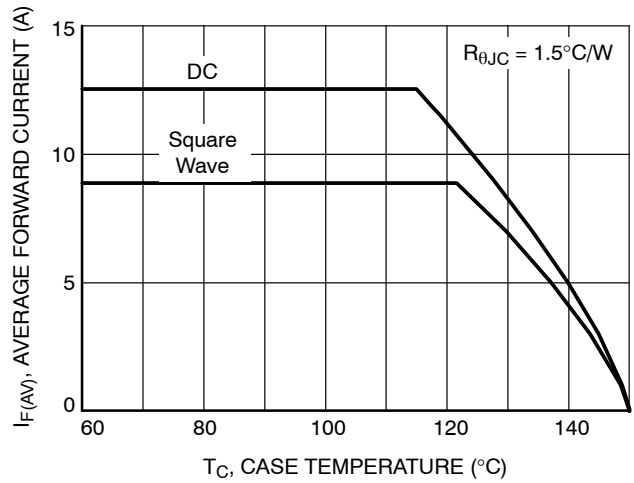
**Figure 1. Typical Instantaneous Forward Characteristics**



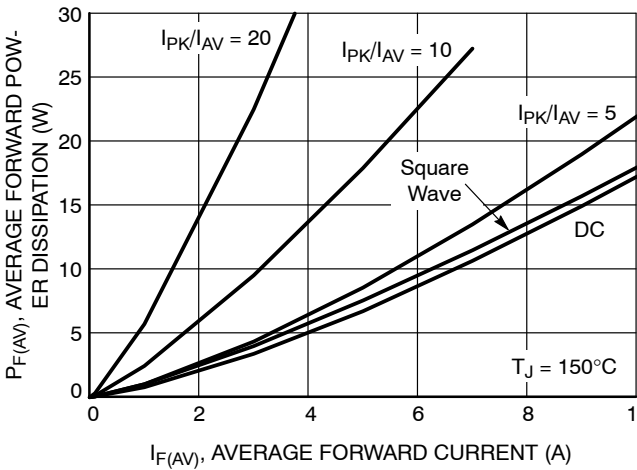
**Figure 2. Typical Reverse Characteristics**



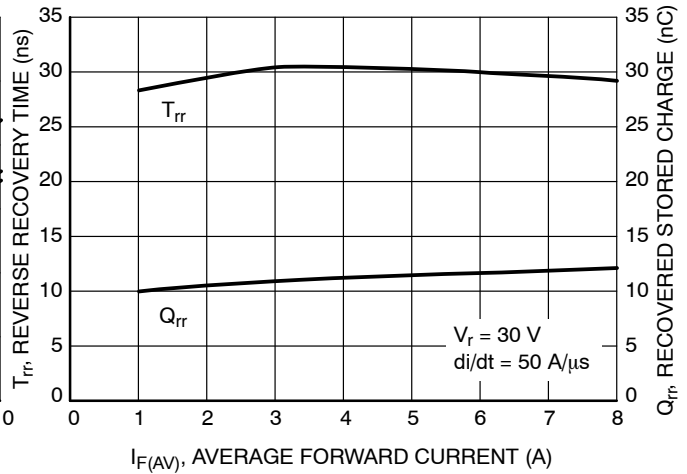
**Figure 3. Typical Junction Capacitance**



**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.

DIM	INCHES		MILLIMETERS	
	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

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