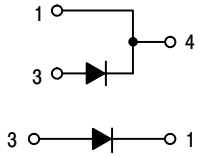
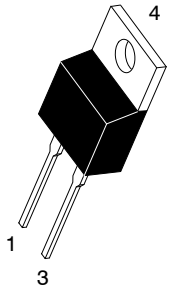
Switch-mode Power Rectifiers

NHPV08S600G

PLANAR ULTRAFAST RECTIFIERS 8 A, 600 V





TO−220AC
CASE 221B

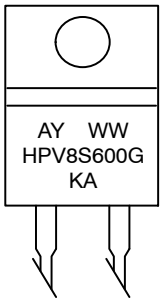
Features

- 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.

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

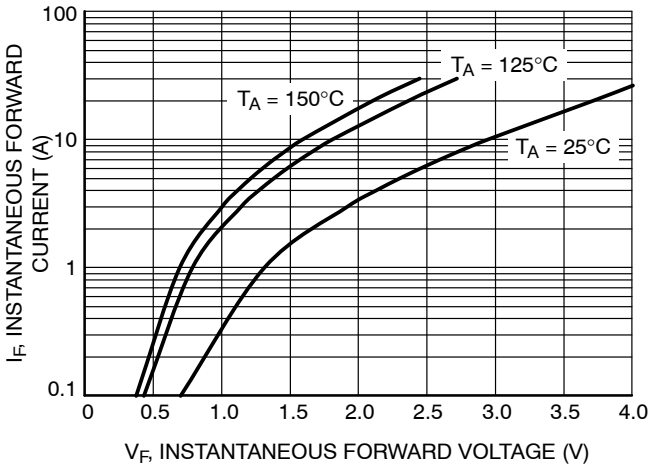


Figure 1. Typical Instantaneous Forward Characteristics

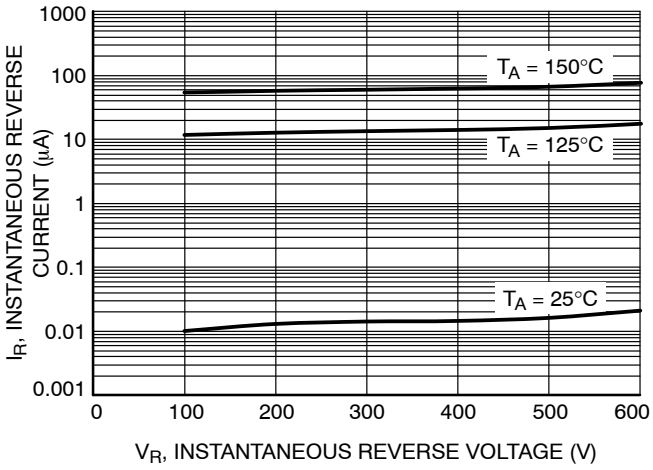


Figure 2. Typical Reverse Characteristics

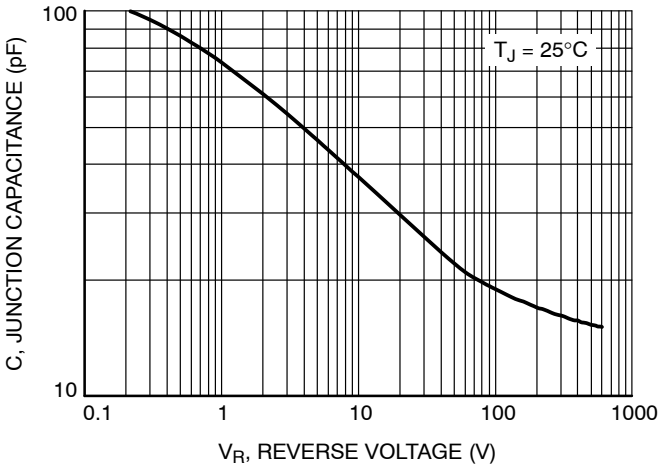


Figure 3. Typical Junction Capacitance

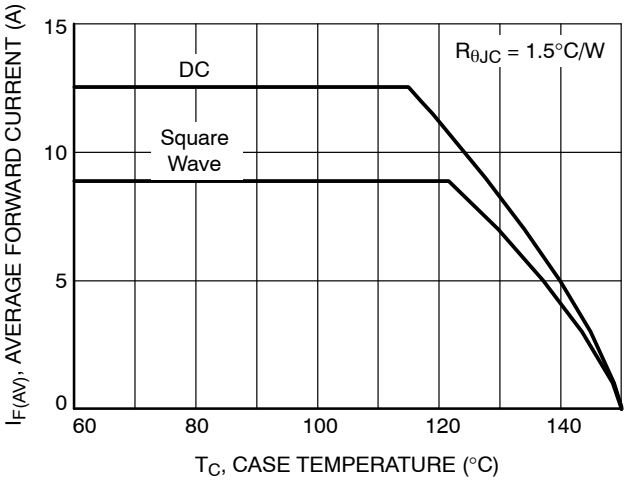


Figure 4. Current Derating TO−220AC

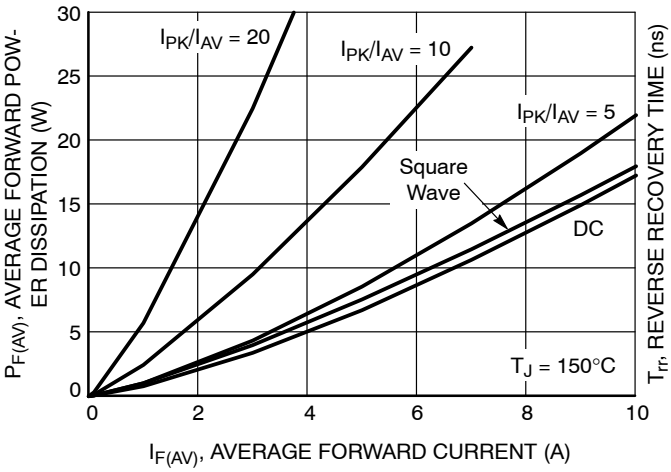


Figure 5. Forward Power Dissipation

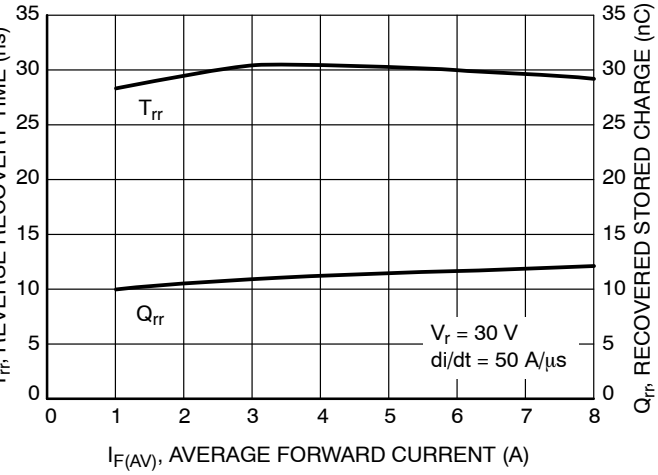
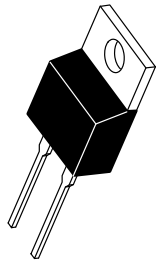


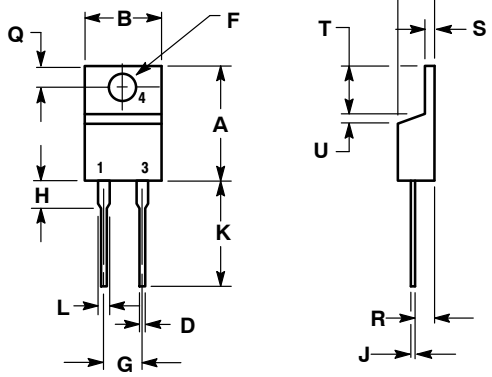
Figure 6. Typical Recovery Characteristics

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**

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