NHPV15S600G, NHPJ15S600G

SWITCHMODE Power Rectifiers

Features

- Ultrafast 30 Nanosecond Recovery Time
- 150°C Operating Junction Temperature
- High Voltage Capability of 600 V
- ESD Ratings:
  - Machine Model = C
  - Human Body Model = 3A
- Low Forward Drop
- Low Leakage Specified @ 125°C Case Temperature
- These Devices are Pb−Free and are RoHS Compliant*
- NHPJ15S600G is Halogen−Free/BFR−Free

Mechanical Characteristics:

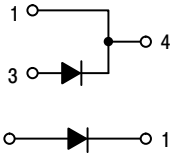
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

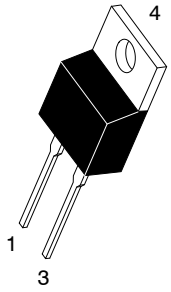
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor®

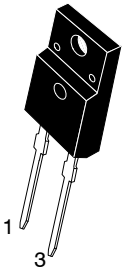
http://onsemi.com

PLANAR ULTRAFAST RECTIFIERS 15 A, 600 V



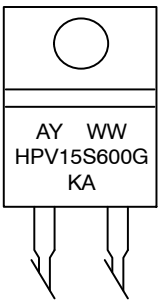


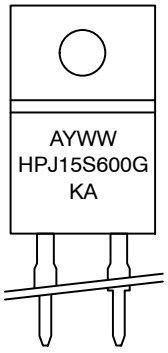
TO−220AC
CASE 221B



TO−220 FULLPAK
CASE 221AG

MARKING DIAGRAMS





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

ORDERING INFORMATION

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

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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)	TO−220AC TO−220FP	$I_{F(AV)}$	15 A @ T_C = 118°C 15 A @ T_C = 60°C	A
Peak Rectified Forward Current (Rated V_R, Square Wave, 20 kHz)	TO−220AC TO−220FP	I_{FRM}	15 A @ T_C = 110°C 15 A @ T_C = 40°C	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I_{FSM}	150	A
Operating Junction Temperature and Storage Temperature Range		T_J, T_{stg}	−55 to +150	°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	Value	Unit
NHPV15S600G: Thermal Resistance Junction−to−Case Junction−to−Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 1.5 73	°C/W
NHPJ15S600G: Thermal Resistance Junction−to−Case Junction−to−Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 4.25 75	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1) (i_F = 15 A, T_C = 125°C) (i_F = 15 A, T_C = 25°C)	v_F	 1.5 2.7	 1.8 3.2	V
Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, T_C = 125°C) (Rated DC Voltage, T_C = 25°C)	i_R	 46 0.1	 800 60	μA
Maximum 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) Current Charge Softness (I_F = 15 A, dI_F/dt = −200 A/μs, T_C = 125°C)	 t_{rr} I_{RM} Q_{rr} S	 − − 7.7 220 0.15	 30 50 9.9 − −	 ns A nC −
Maximum Forward Recovery Time Voltage (I_F = 15 A, dI_F/dt = 120 A/μs, T_C = 25°C)	 t_{fr} V_{FP}	 	 200 6	 ns V

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

ORDERING INFORMATION

Device	Package	Shipping†
NHPV15S600G	TO−220AC (Pb−Free)	50 Units / Rail
NHPJ15S600G	TO−220FP (Pb−Free / Halide−Free)	50 Units / Rail

†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.

TYPICAL CHARACTERISTICS

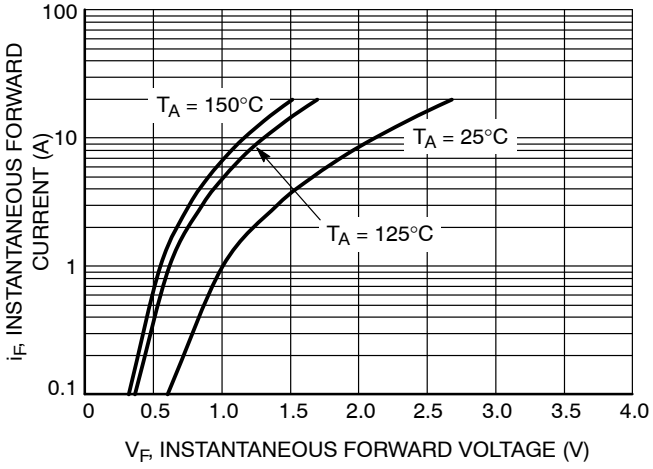


Figure 1. Typical Instantaneous Forward Characteristics

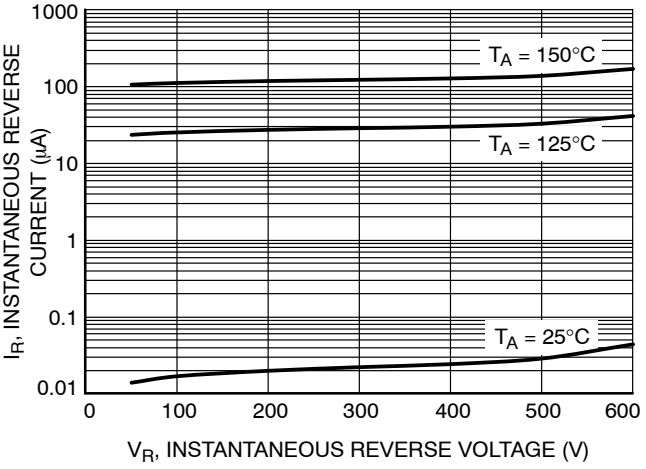


Figure 2. Typical Reverse Characteristics

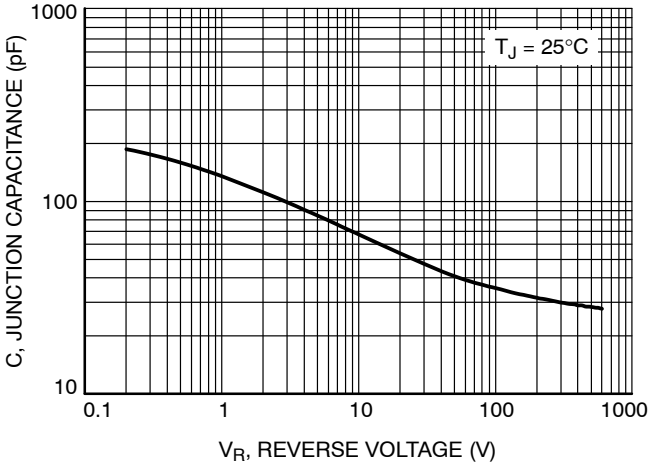


Figure 3. Typical Junction Capacitance

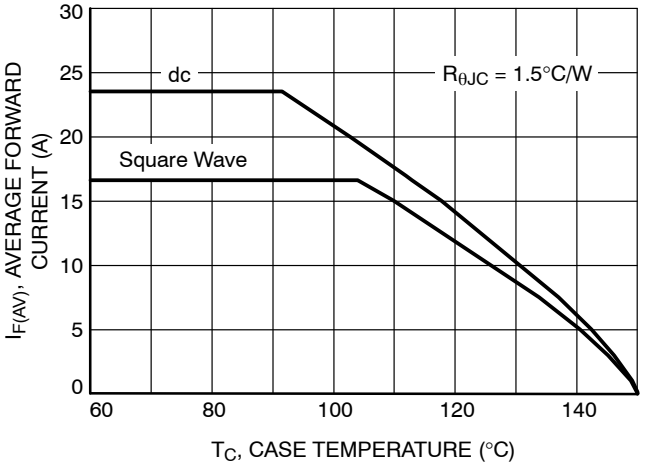


Figure 4. Current Derating TO−220AC

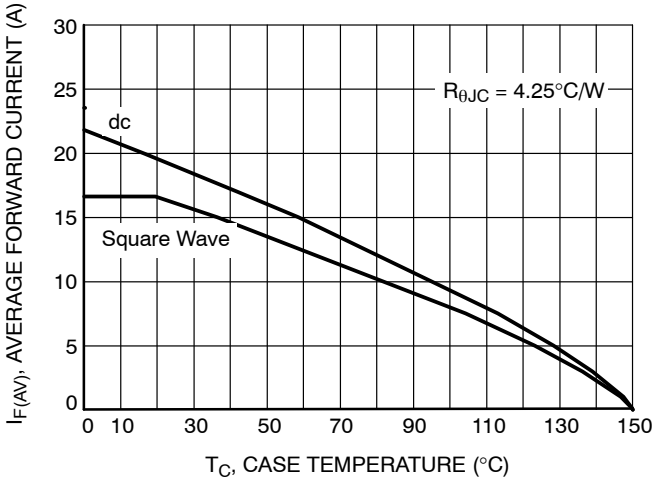


Figure 5. Current Derating TO−220 FULLPAK

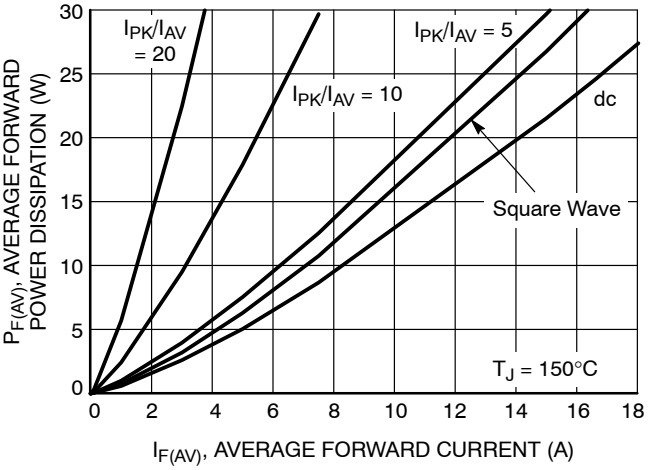
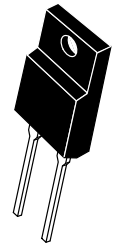


Figure 6. Forward Power Dissipation

TO−220 FULLPACK, 2−LEAD
CASE 221AG
ISSUE B

DATE 27 AUG 2015



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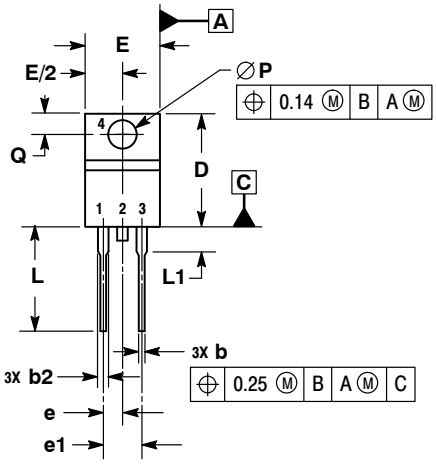
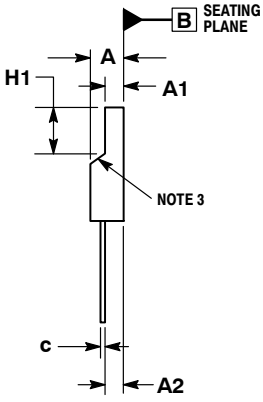
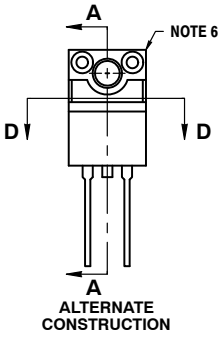


TOP VIEW



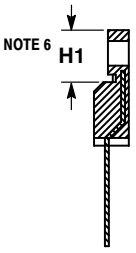
SIDE VIEW



ALTERNATE CONSTRUCTION



SECTION D−D

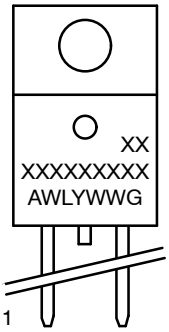


SECTION A−A

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.

	MILLIMETERS	
DIM	MIN	MAX
A	4.30	4.70
A1	2.50	2.90
A2	2.50	2.90
b	0.54	0.84
b2	1.10	1.40
c	0.49	0.79
D	14.22	15.88
E	9.65	10.67
e	2.54 BSC	
e1	5.08 BSC	
H1	6.40	6.90
L	12.70	14.73
L1	---	2.80
P	3.00	3.40
Q	2.80	3.20

GENERIC MARKING DIAGRAM*



A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

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MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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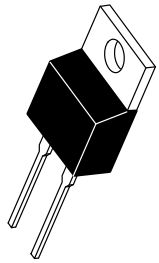
TO−220, 2−LEAD
CASE 221B−04
ISSUE F

DATE 12 APR 2013



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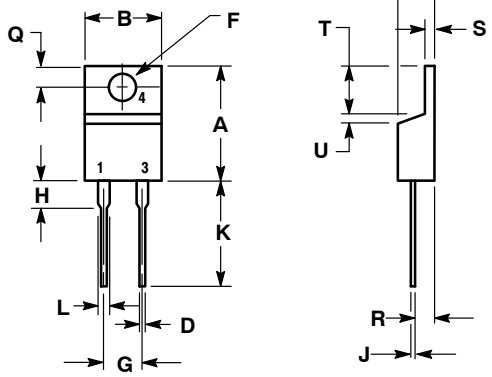

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	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

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