NHP420LFS, NRVHP420LFS

Switch-mode Power Rectifiers

This LFPAK ultrafast rectifier provides fast switching performance with soft recovery in a compact thermally efficient package. The LFPAK package provides an excellent alternative to the DPAK, offering thermal performance nearly as good in a package occupying less than half the board space. Its low profile makes it a good option for flat panel display and other applications with limited vertical clearance. The device offers low leakage over temperature making it a good match for applications requiring low quiescent current.

Features

- New Package Provides Capability of Inspection and Probe After Board Mounting
- Low Forward Voltage Drop
- 175°C Operating Junction Temperature
- Excellent Ability to Absorb Stresses Associated with Power Temperature Cycling
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94−0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements

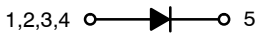
Applications

- Excellent Alternative to DPAK in Space−Constrained Automotive Applications
- Very Low Leakage for Higher Temperature Operation
- Output Rectification in Compact Portable Consumer Applications
- Freewheeling Diode used with Inductive Loads

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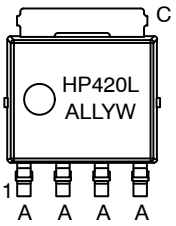
ULTRAFAST RECTIFIERS
4 AMPERES
200 VOLTS





LFPAK4
CASE 760AB

MARKING DIAGRAM



HP420L	= Specific Device Code
A	= Assembly Location
LL	= Wafer Lot
Y	= Year
W	= Work Week

ORDERING INFORMATION

Device	Package	Shipping†
NHP420LFST1G	LFPAK4 (Pb−Free)	3000 / Tape & Reel
NRVHP420LFST1G	LFPAK4 (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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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	 200	V
Average Rectified Forward Current (Rated V_R, T_C = 169°C)	$I_{F(AV)}$	4.0	A
Peak Repetitive Forward Current, (Rated V_R, Square Wave, 20 kHz, T_C = 160°C)	I_{FRM}	8.0	A
Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	125	A
Storage Temperature Range	T_{stg}	−65 to +175	°C
Operating Junction Temperature	T_J	−55 to +175	°C
ESD Rating (Human Body Model)		3B	
ESD Rating (Machine Model)		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	Max	Unit
Thermal Resistance, Junction−to−Case, Steady State (Assumes 600 mm^2 1 oz. copper bond pad, on a FR4 board)	$R_{\theta JC}$	1.93	°C/W
Thermal Resistance, Junction−to−Ambient, Steady State (Assumes 600 mm^2 1 oz. copper bond pad, on a FR4 board)	$R_{\theta JA}$	45.4	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Instantaneous Forward Voltage (Note 1) (i_F = 4 A, T_J = 125°C) (i_F = 4 A, T_J = 25°C)	v_F	 0.80 0.95	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, T_J = 125°C) (Rated dc Voltage, T_J = 25°C)	i_R	 50 0.5	μA
Maximum Reverse Recovery Time (I_F = 1.0 A, di/dt = 50 A/μs, V_R = 30 V)	T_{rr}	50	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

TYPICAL CHARACTERISTICS

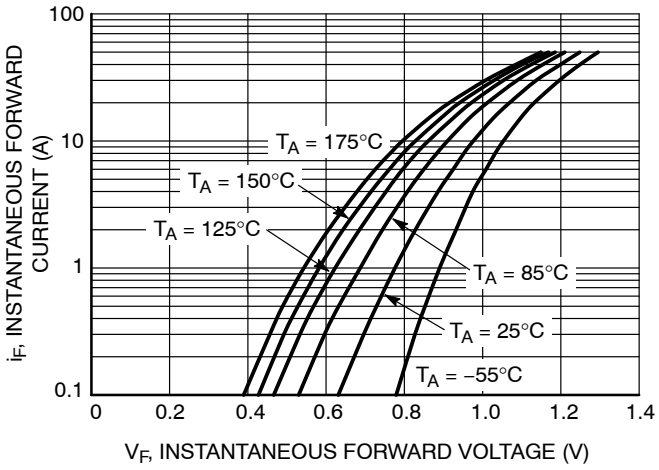


Figure 1. Typical Instantaneous Forward Characteristics

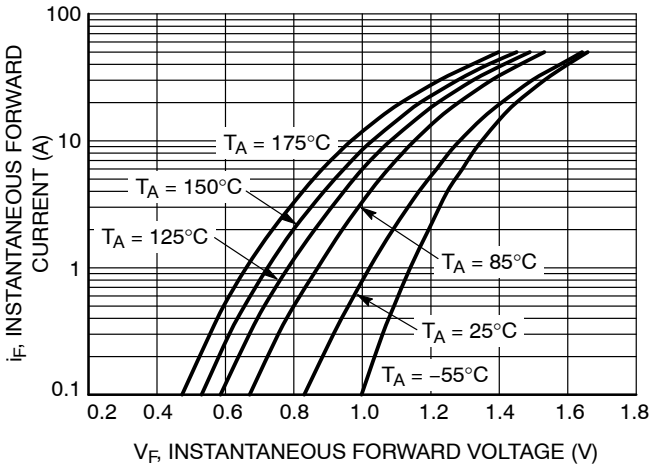


Figure 2. Maximum Instantaneous Forward Characteristics

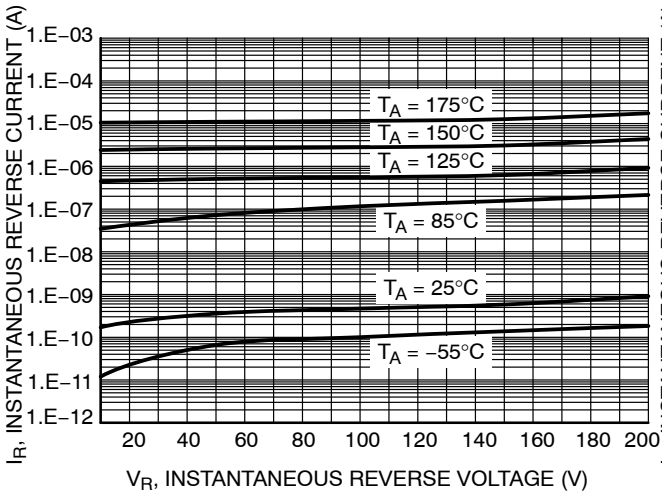


Figure 3. Typical Reverse Characteristics

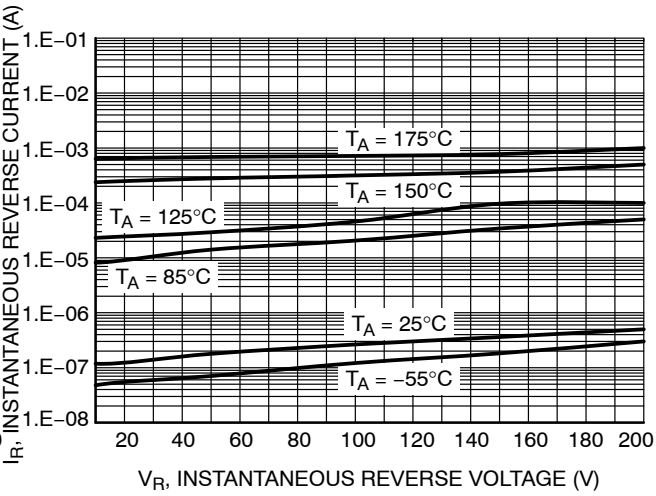


Figure 4. Maximum Reverse Characteristics

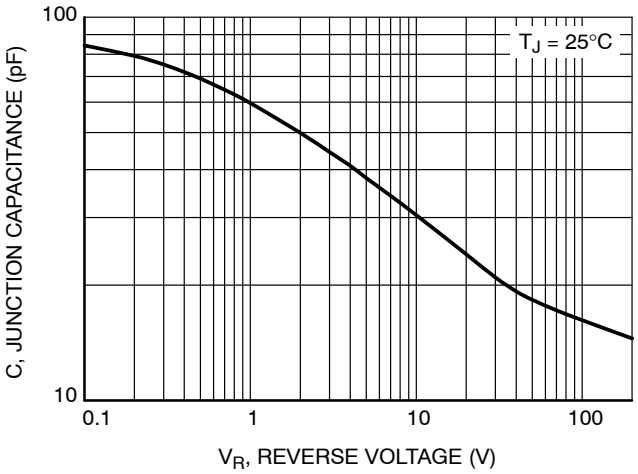


Figure 5. Typical Junction Capacitance

TYPICAL CHARACTERISTICS

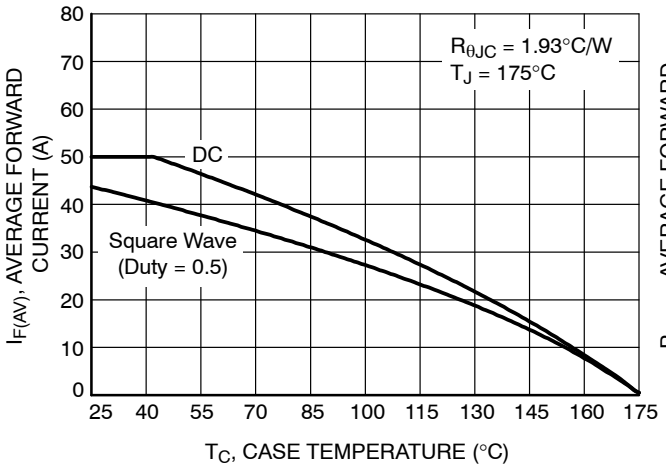


Figure 6. Current Derating per Device

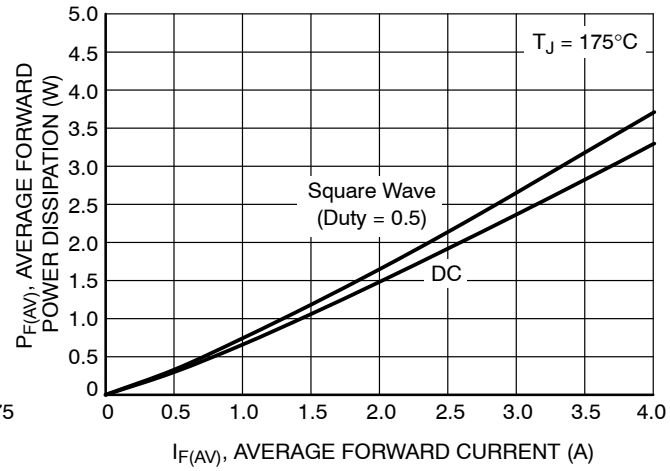


Figure 7. Forward Power Dissipation

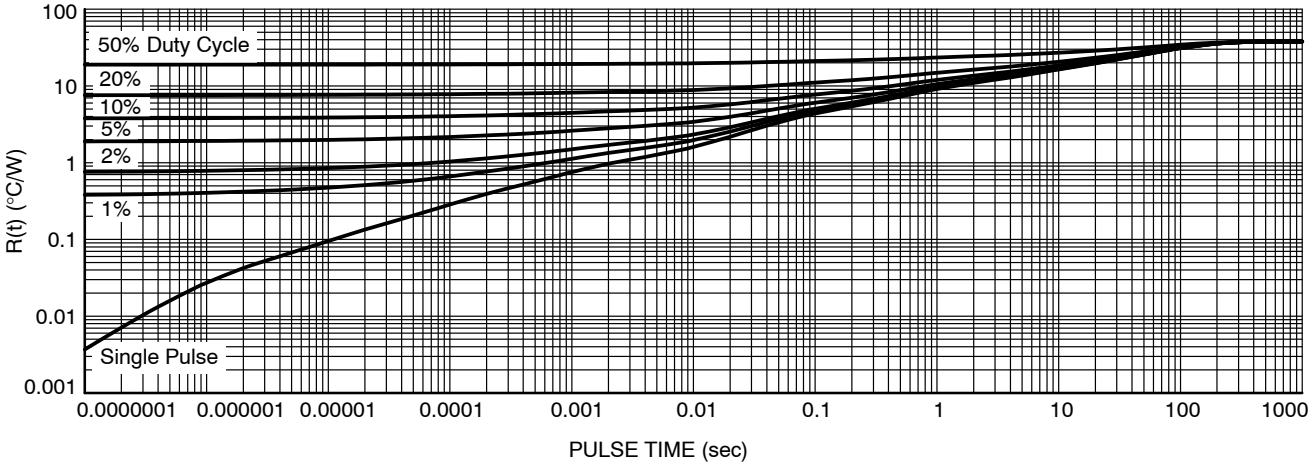
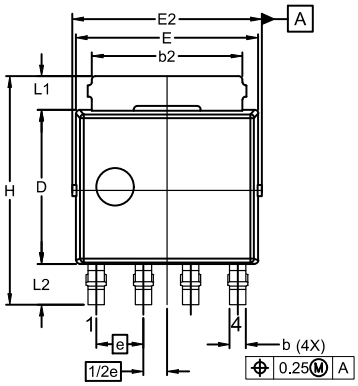


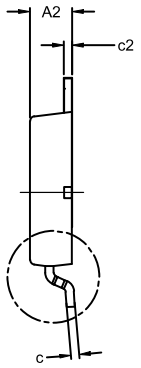
Figure 8. Typical Thermal Characteristics, Junction−to−Ambient

PACKAGE DIMENSIONS

LFPAK4 5x6
CASE 760AB
ISSUE A

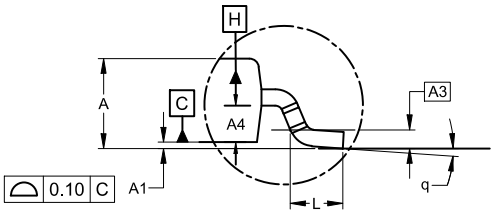


TOP VIEW

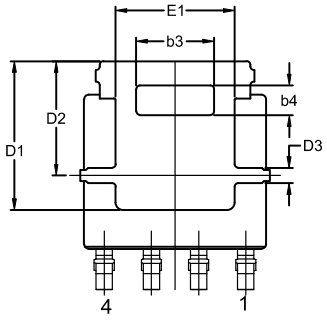


SIDE VIEW

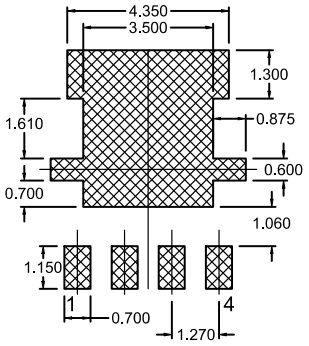
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.150mm PER SIDE.
4. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
5. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.



DETAIL 'A'
SCALE: 2:1



BOTTOM VIEW



RECOMMENDED MOUNTING FOOTPRINT

UNIT IN MILLIMETER			
DIM	MIN	NOM	MAX
A	1.10	1.20	1.30
A1	0.00	0.08	0.15
A2	1.10	1.15	1.20
A3		0.25	
A4	0.45	0.50	0.55
b	0.40	0.45	0.50
b2	3.80	4.10	4.40
b3	2.00	2.10	2.20
b4	0.70	0.80	0.90
c	0.19	0.22	0.25
c2	0.19	0.22	0.25
D	4.05	4.15	4.25
D1	-	-	4.20
D2	3.0	3.10	3.20
D3	0.30	0.40	0.50
E	4.80	4.90	5.00
E1	3.10	3.20	3.30
E2	5.00	5.15	5.30
e		1.27 BSC	
H	6.00	6.15	6.30
L	0.40	0.65	0.85
L1	0.80	0.90	1.00
L2	0.80	1.05	1.30
q	0°	4°	8°

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