

NH Series

Half Brick up to 336W/21A



The **NH** series provides up to 336W/21A outputs with industry standard half brick package. The efficient Non-SR technology is combined with ultra low leakage inductance magnetic design to gives converters “SR-like” conversion efficiency. The multi-layer single side circuit board design plus the Sink-plate technology would enhance the thermal performance and improve its reliability. Modules are designed for Telecom, Servers, Networking equipments and other applications that use a 24V or 48V input bus.

PART NUMBER SYSTEM

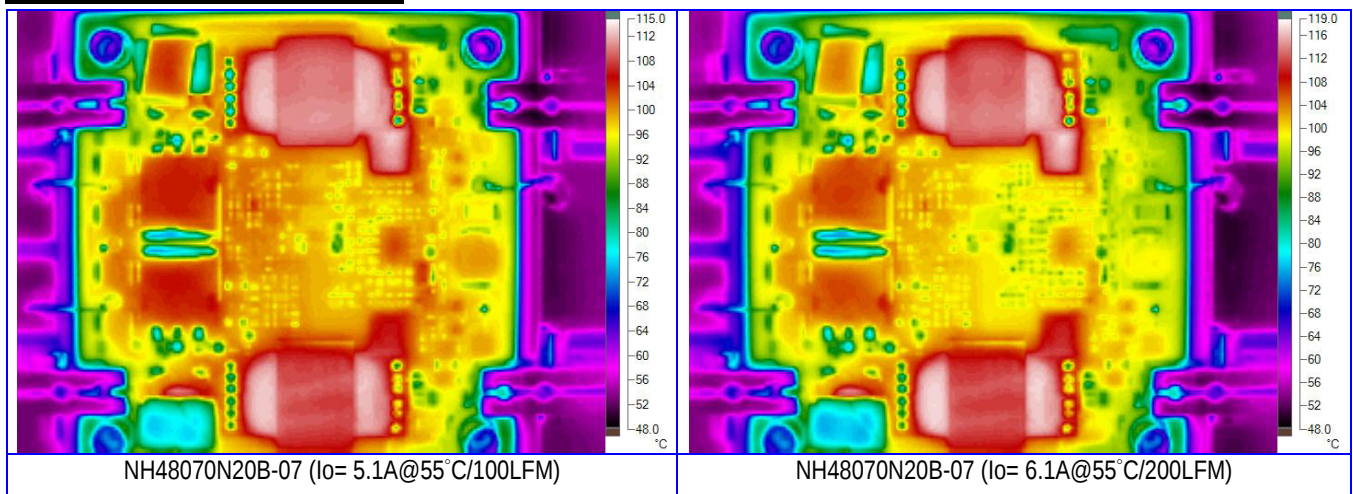
NH	48	480	a	b	c	d	-	07	XX	X
Series Name	Input Voltage	Output Voltage	Enable Logic	Pin Dimension	Standoff Height	Base-Plate		Output Current	Suffix	Version
NH	48=36V~75V 24=18V~36V	Unit: 0.1V Increments 480=48V 120=12V	P: Positive N: Negative	0 : 0.12" 1 : 0.16" 2 : 0.20" 3 : 0.24"	0 : 0.02" 1 : 0.08" 2 : 0.16"	M : 1.0mm Metal Plate A : 3.0mm Sink-Plate B : 5.0mm Sink-Plate E : Metallic enclosure (1.0mm metal plate)	-	00~21 : For output current rating	For marketing purpose only	

MODEL LIST (Contact to factory for special input / output)

Part Number *	Maximum Input		Maximum Output		Efficiency	
NH48480abcd-07XXX	36V~75V	378W	48V/7.0A	336W	89%	
NH48280abcd-11XXX	36V~75V	342W	28V/11A	308W	90%	
NH48240abcd-12XXX	36V~75V	323W	24V/12A	288W	89%	
NH48240abcd-07XXX	36V~75V	174W	24V/6.5A	156W	90%	
NH48120abcd-21XXX	36V~75V	280W	12V/21A	252W	90%	

Part Number *	Maximum Input		Maximum Output		Efficiency	
NH24480abcd-07XXX	18V~36V	381W	48V/7.0A	336W	88%	
NH24280abcd-11XXX	18V~36V	342W	28V/11A	308W	90%	
NH24240abcd-12XXX	18V~36V	323W	24V/12A	288W	89%	
NH24120abcd-21XXX	18V~36V	280W	12V/21A	252W	90%	

REFERENCED THERMAL IMAGES



NH Series

SPECIFICATIONS

Absolute Maximum Ratings		
Temperature	Operation Storage	-40°C to +110°C -55°C to +125°C
Input Voltage Range	Operation: 24V Models 48V Models Transient (100mS): 24V Models 48V Models	-0.5V to +40Vdc -0.5V to +80Vdc 50V Maximum 100V Maximum
Isolation Voltage	Input to Output Input to Case Output to Case	2.0KV Minimum 1.0KV Minimum 1.0KV Minimum
Remote Control		-0.5V to +12Vdc

General Parameters		
Conversion Efficiency	Typical	See table
Switching Frequency	Typical	340KHz
MTBF	Bellcore TR-332 issue 6	4.11×10 ⁶ hrs @GB/25°C. (NH24280abcd-11XXX)
OTP	Internal	110°C(Tc) ±5°C
Weight	Open frame Metallic enclosure	60g / 1.0mm metal plate 95g / 1.0mm metal plate

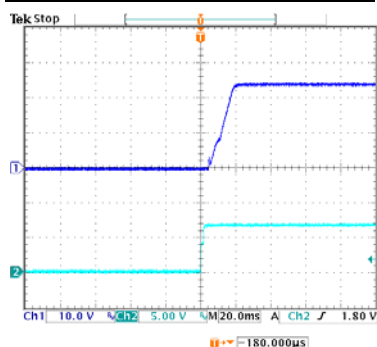
Control Functions		
Remote Control	Logic High Logic Low	+3.0V to +6.5V 0V to +1.0V
Input Current of Remote Control Pin		-0.5mA ~ +1.5mA

Input		
Operation Voltage Range	24V Models 48V Models	+18V to +36Vdc +36V to +75Vdc
Reflected Ripple Current	L _{EXT} = 10uH	30mA rms/100mAp-p
Power ON Voltage Ranges	24V Models 48V Models	+17.0V to +18.0Vdc +34.0V to +36.0Vdc
Power OFF Voltage Ranges	24V Models 48V Models	+15.6V to +16.6Vdc +31.2V to +33.2Vdc
Off State Input Current	V _{NOM}	6mA Max
Latch-State Input Current	V _{NOM}	8mA Max
Input Capacitance	24V Models 48V Models	42.0uF Max 15.0uF Max

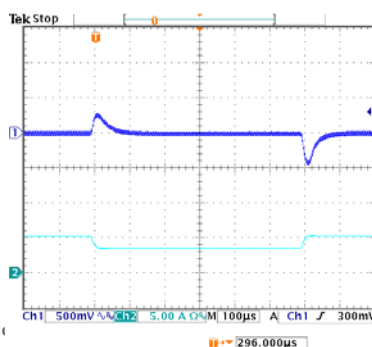
Output		
Voltage Accuracy	Typical	±1.0%
Line Regulation	Full Input Range	±0.3%
Load Regulation	2%~100%	±0.3%
Temperature Drift	-40°C ~100°C	±0.03%/°C
Output Tolerance Band	All Conditions	±4%
Ripple & Noise (20MHz)	Peak-Peak (RMS)	3% (1%) V _O
Over Voltage Protection	V _{NOM} , 10% Load	115~130 %V _O
Output Current Limits	V _{NOM}	108%~125%
Voltage Trim	V _{NOM} , 10% Load	±10%
Input Ripple Rejection (<1KHz)	V _{NOM} , Full Load	-50dB
Step Load (2.5A/μS)	50%~75% Load	±6%Vo/500μS
Start-Up Delay Time	V _{NOM} , Full Load	20mS/250mS

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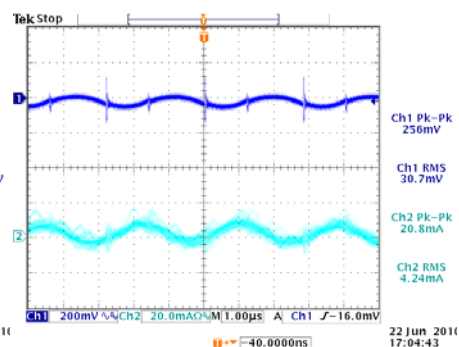
TYPICAL WAVES AND CURVES



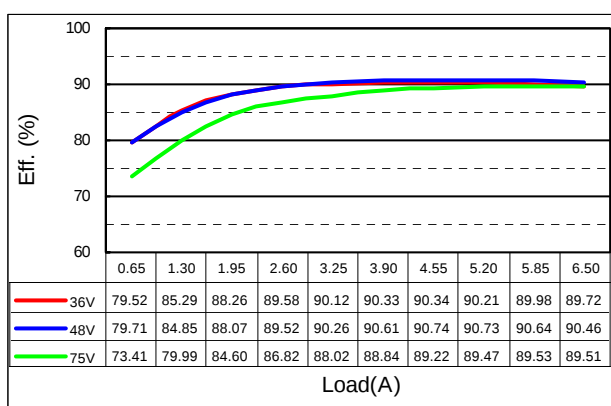
Start-up waveform of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A)



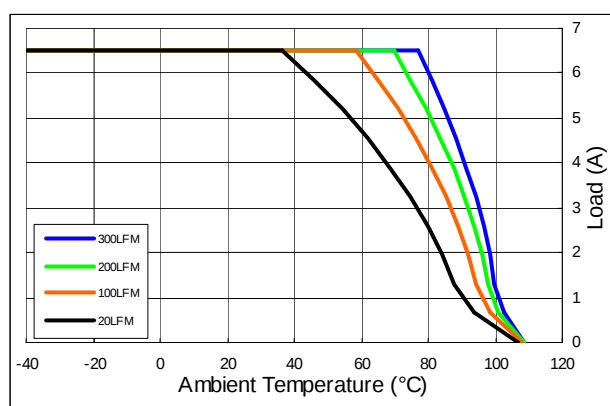
Transient response of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 5.0A/3.3A@2.5A/µs)



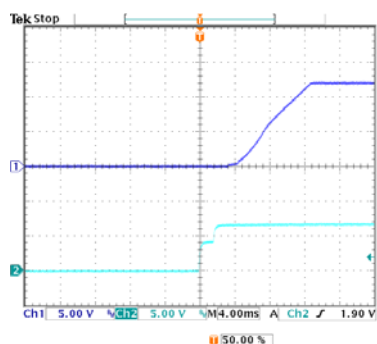
Input/Output ripples of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A, L_{IN} =10uH)



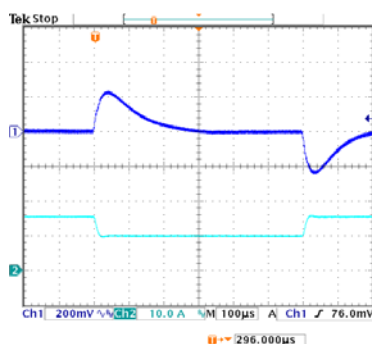
Efficiency plot of NH48240abcB-07XXX



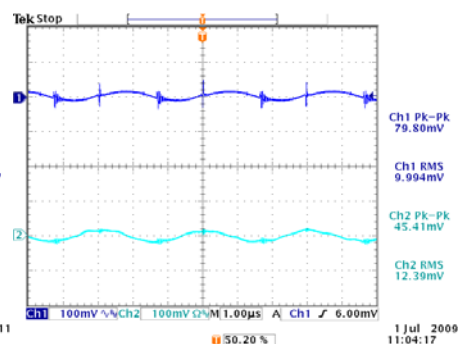
Derating curves of NH48240abcB-07XXX for $T_C = 110^\circ\text{C}$



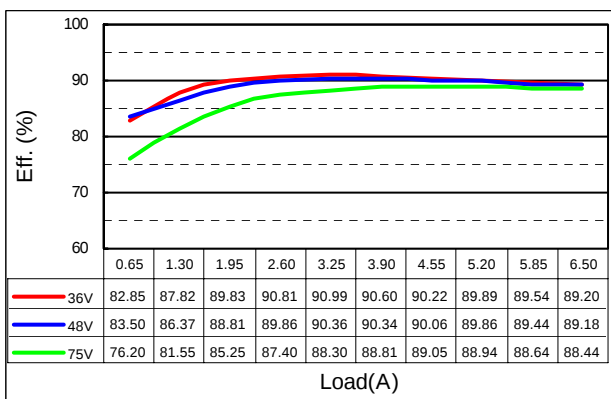
Start-up waveform of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 21A)



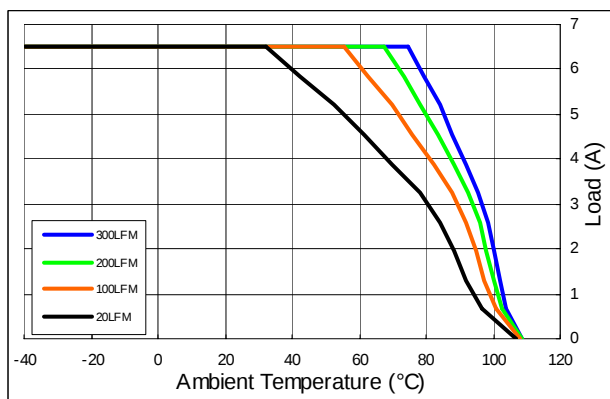
Transient response of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 15.5A/9.5A@2.5A/µs)



Input/Output ripples of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 21A, L_{IN} =10uH)



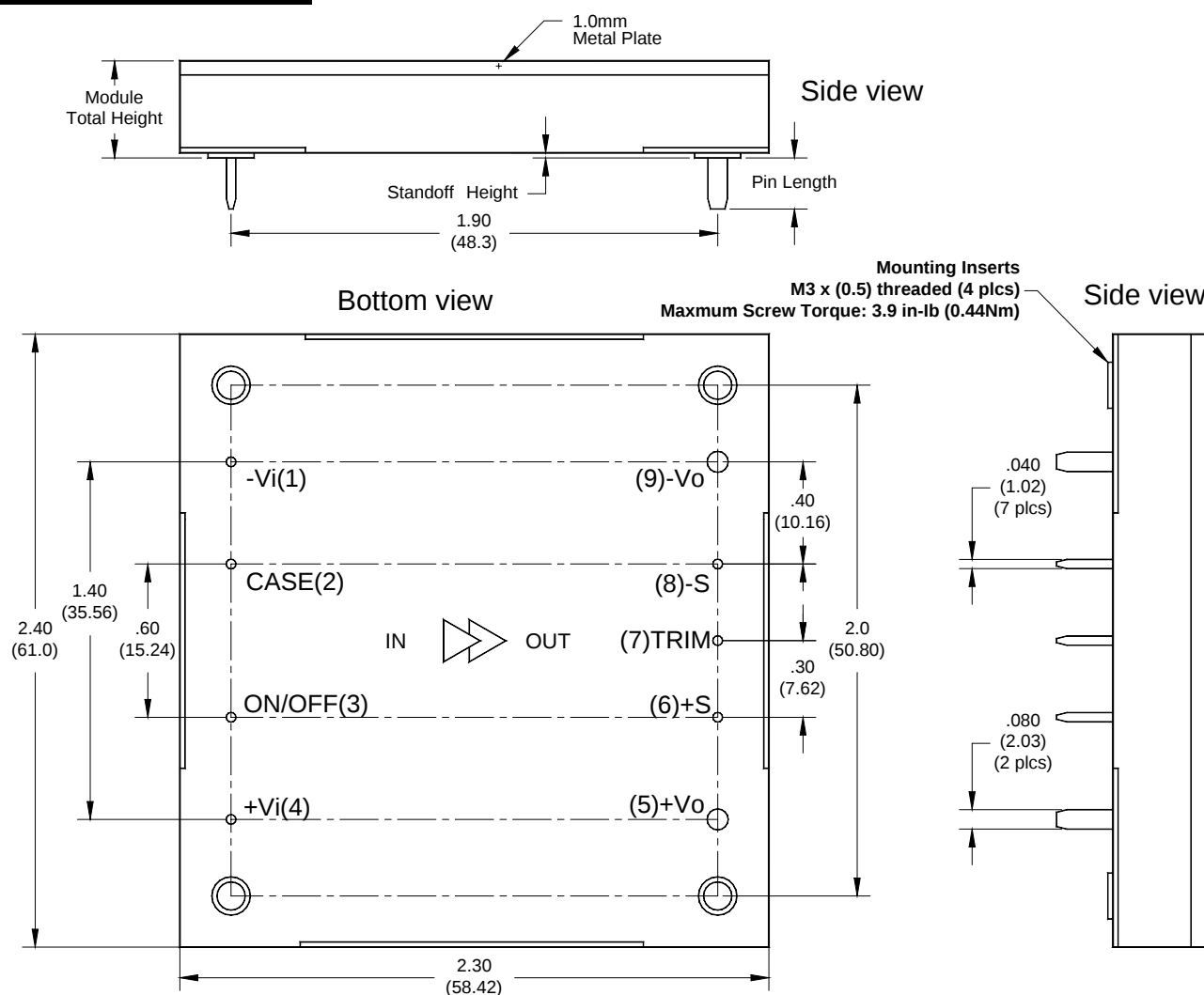
Efficiency plot of NH48120abcB-21XXX



Derating curves of NH48120abcB-21XXX for $T_C = 110^\circ\text{C}$

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METAL ENCLOSED PACKAGE



Dimensions and Pin Connections

Designation	Function Description	Pin #
-Vi	Negative input	1
CASE	Connected to base plate	2
ON/OFF	Remote control. To turn-on and turn-off output.	3
+Vi	Positive input	4
+Vo	Positive output	5
+S	Positive remote sense	6
TRIM	Output voltage adjust	7
-S	Negative remote sense	8
-Vo	Negative output	9

Dimensions: inches (mm)

Tolerances: .xx±0.02 (.x±0.5)
.xxx±0.01 (.x±0.25)

Weight: 95g / 1.0mm metal plate

Base plate: Aluminum alloy with anode oxide

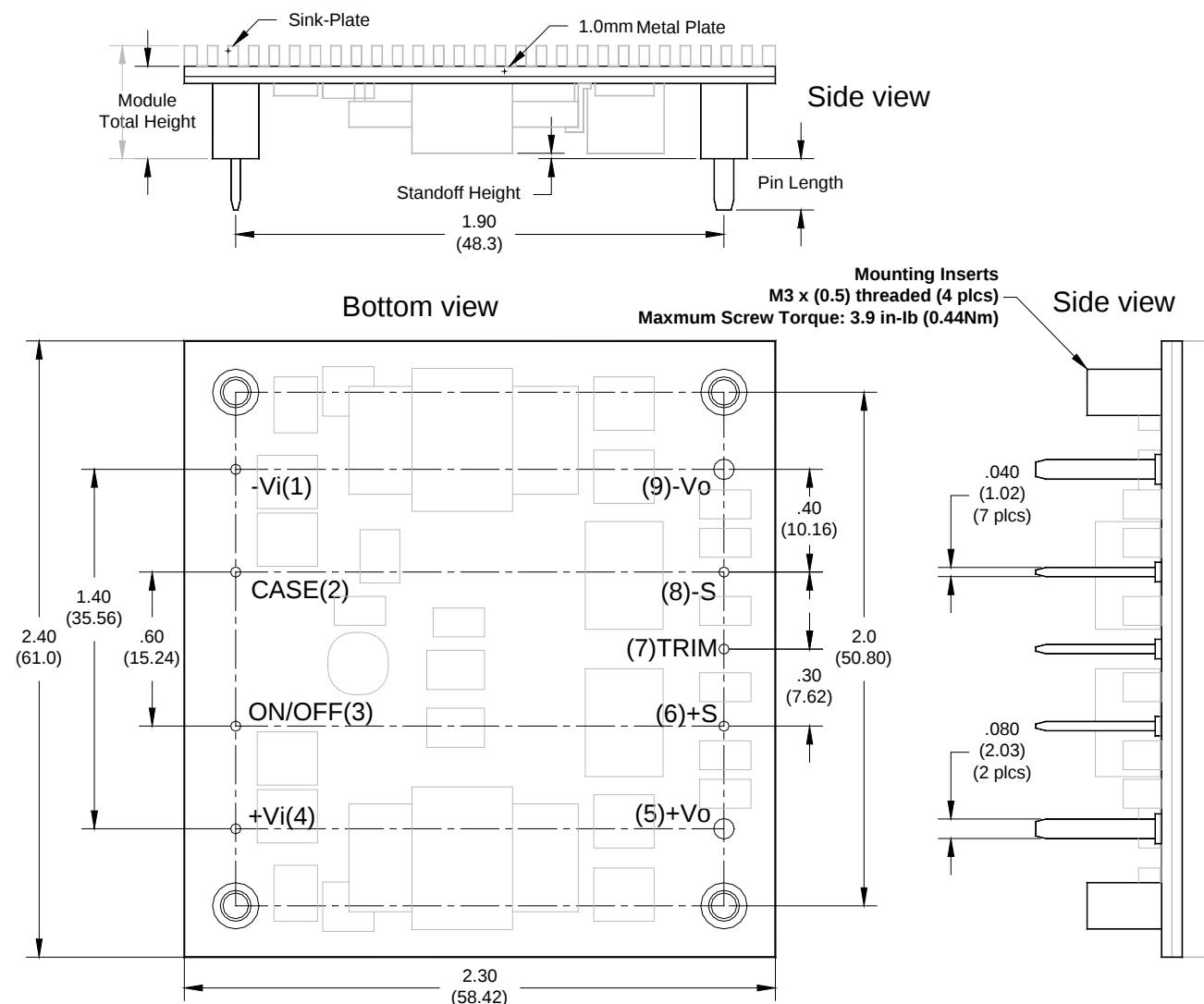
Mounting inserts: Stainless steel
Maximum torque: 3.9 in-lb (0.44Nm)

Pin material: Copper alloy or Brass

Pin plating: Golden over Nickel

NH Series

OPEN FRAME PACKAGE



Dimensions and Pin Connections

Designation	Function Description	Pin #
-Vi	Negative input	1
CASE	Connected to base plate	2
ON/OFF	Remote control. To turn-on and turn-off output.	3
+Vi	Positive input	4
+Vo	Positive output	5
+S	Positive remote sense	6
TRIM	Output voltage adjust	7
-S	Negative remote sense	8
-Vo	Negative output	9

Dimensions: inches (mm)

Tolerances: .xx±0.02 (.x±0.5)
.xxx±0.01 (.x±0.25)

Weight: 60g / 1.0mm metal plate

Base plate: Aluminum alloy with anode oxide

Mounting inserts: Stainless steel
Maximum torque: 3.9 in-lb (0.44Nm)

Pin material: Copper alloy or Brass

Pin plating: Golden over Nickel