



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.

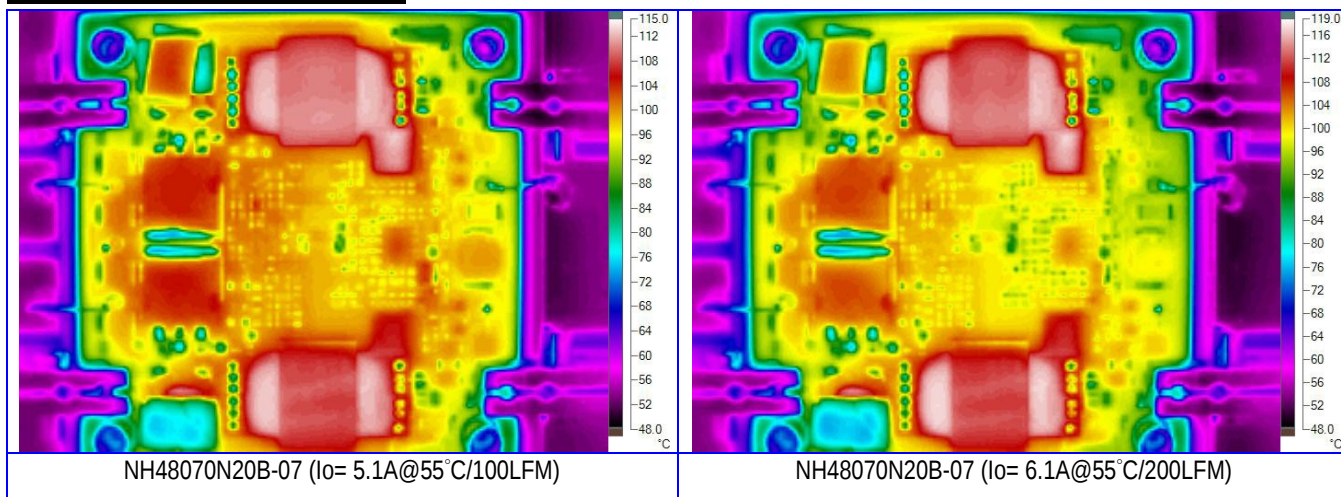
PART NUMBER SYSTEM

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	Part Number *		Maximum Input		Maximum Output		Efficiency
NH48480abcd-07XXX		36V~75V	378W	48V/7.0A	336W	89%	NH24480abcd-07XXX		18V~36V	381W	48V/7.0A	336W	88%
NH48280abcd-11XXX		36V~75V	342W	28V/11A	308W	90%	NH24280abcd-11XXX		18V~36V	342W	28V/11A	308W	90%
NH48240abcd-12XXX		36V~75V	323W	24V/12A	288W	89%	NH24240abcd-12XXX		18V~36V	323W	24V/12A	288W	89%
NH48240abcd-07XXX		36V~75V	174W	24V/6.5A	156W	90%	NH24120abcd-21XXX		18V~36V	280W	12V/21A	252W	90%
NH48120abcd-21XXX		36V~75V	280W	12V/21A	252W	90%							

REFERENCED THERMAL IMAGES



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) $\pm 5^\circ\text{C}$
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

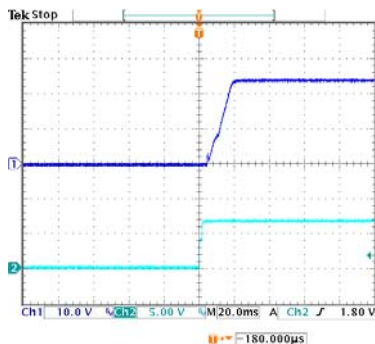
Input

Operation Voltage Range	24V Models 48V Models	+18V to +36Vdc +36V to +75Vdc
Reflected Ripple Current	$L_{EXT} = 10\mu\text{H}$	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

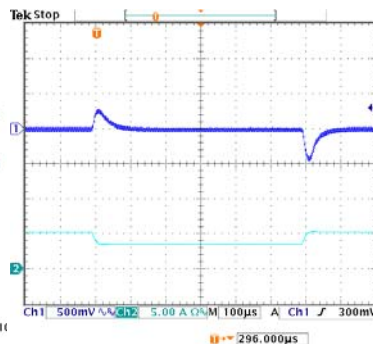
Output

Voltage Accuracy	Typical	$\pm 1.0\%$
Line Regulation	Full Input Range	$\pm 0.3\%$
Load Regulation	2%~100%	$\pm 0.3\%$
Temperature Drift	-40°C ~100°C	$\pm 0.03\%/^\circ\text{C}$
Output Tolerance Band	All Conditions	$\pm 4\%$
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	$\pm 10\%$
Input Ripple Rejection (<1KHz)	V_{NOM} , Full Load	-50dB
Step Load (2.5A/ μS)	50%~75% Load	$\pm 6\%V_O/500\mu\text{S}$
Start-Up Delay Time	V_{NOM} , Full Load	20mS/250mS

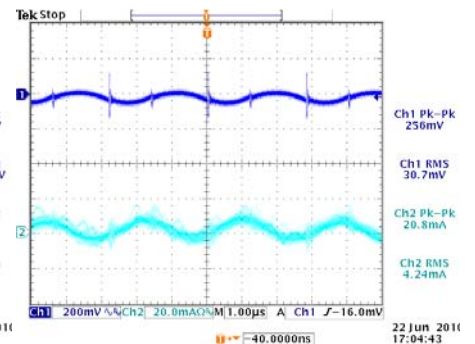
TYPICAL WAVES AND CURVES



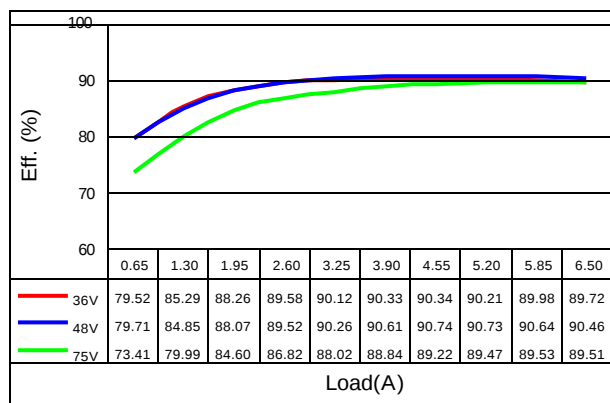
Start-up waveform of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A)



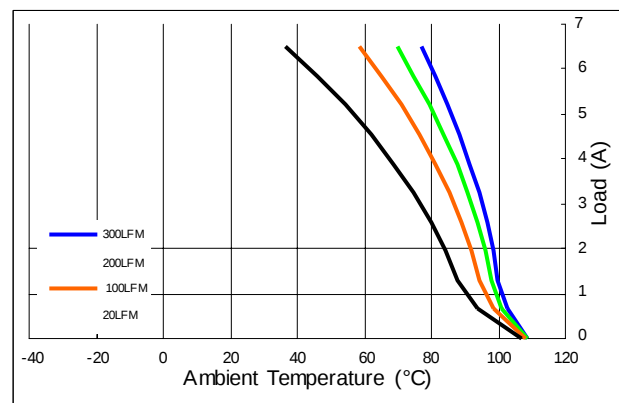
Transient response of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 5.0A/3.3A@2.5A/μs)



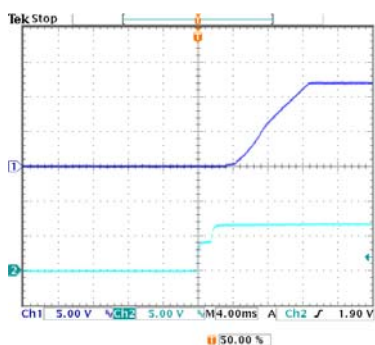
Input/Output ripples of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A, L_{IN} =10uH)



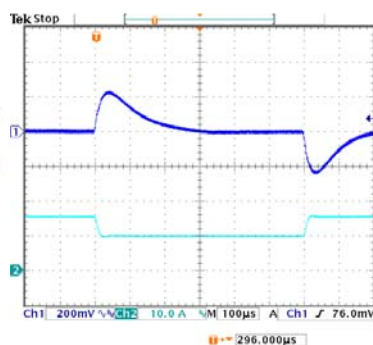
Efficiency plot of NH48240abcB-07XXX



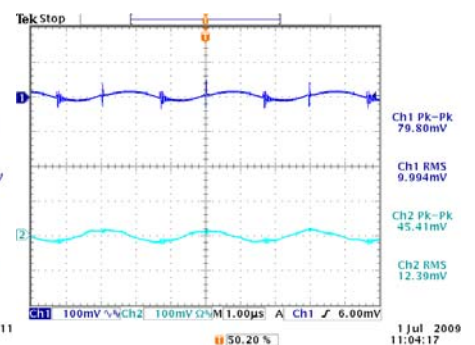
Derating curves of NH48240abcB-07XXX for $T_C = 110^\circ\text{C}$



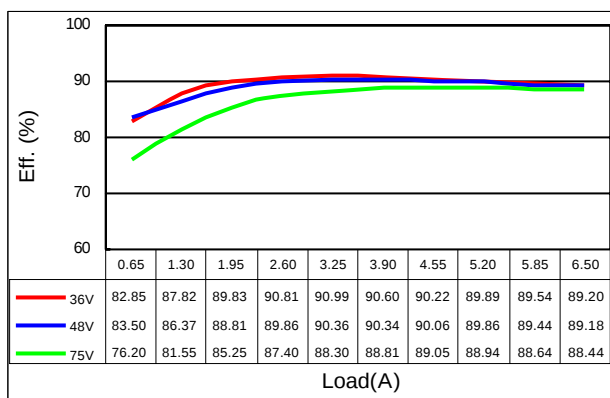
Start-up waveform of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 21A)



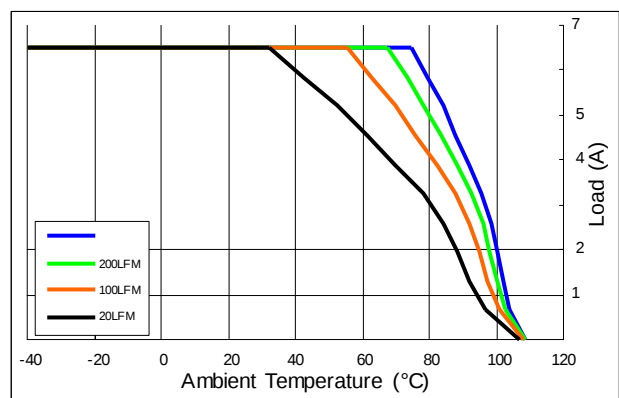
Transient response of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 15.5A/9.5A@2.5A/μs)



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

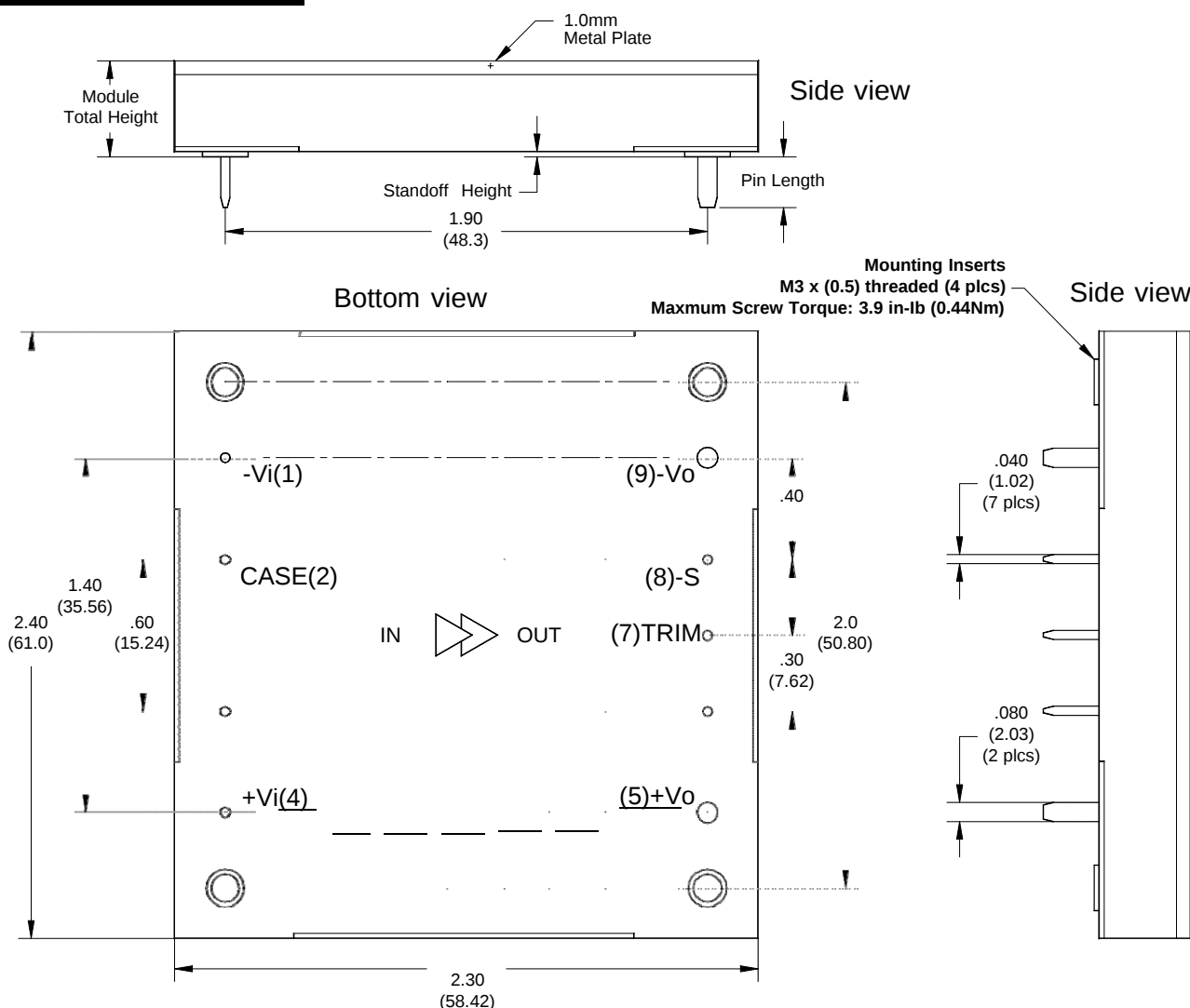


Efficiency plot of NH48120abcB-21XXX



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

METAL ENCLOSED PACKAGE

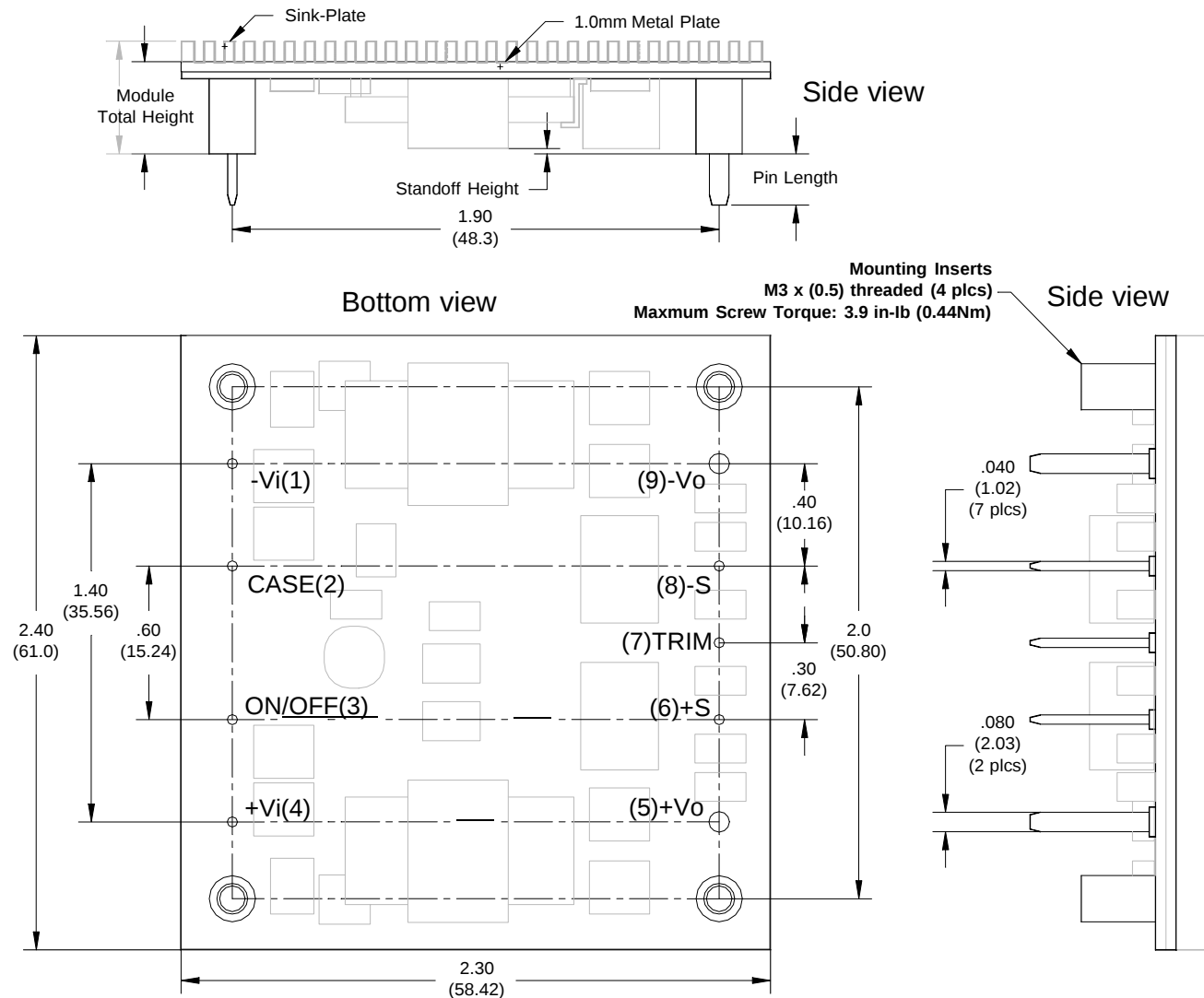


Dimensions and Pin Connections

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

OPEN FRAME PACKAGE

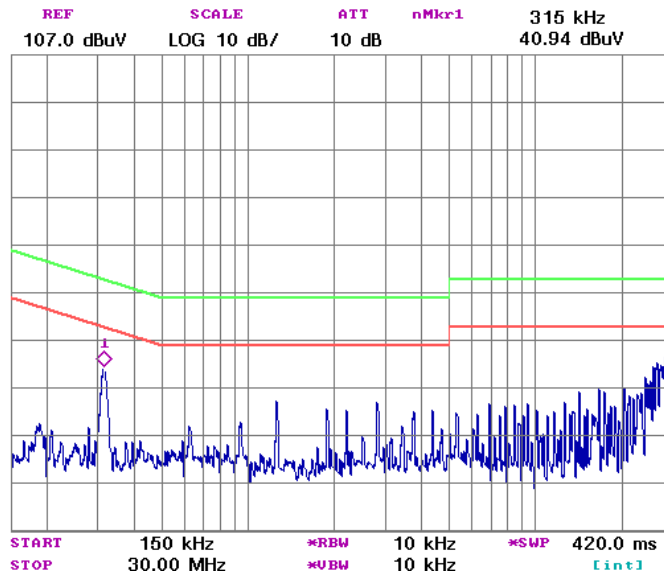


Dimensions and Pin Connections

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

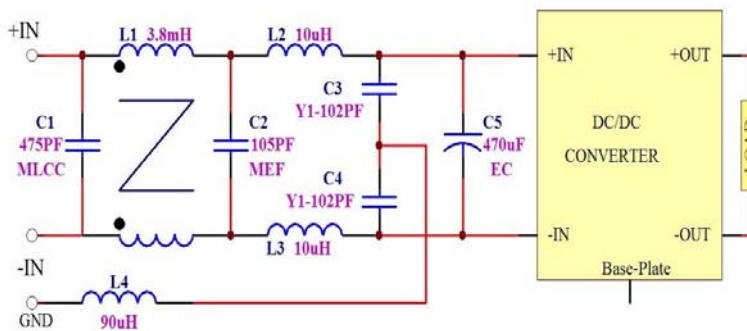
Dimensions: inches (mm)
Tolerances: .xx±0.02 (.x±0.5)
 .xxx±0.01 (.x±0.25)
Weight: 60g / 1.0mm metal plate
Base plate: Aluminum alloy with anode oxide
Mounting inserts: Stainless steel
Maximum torque: 3.9 in-lb (0.44Nm)
Pin material: Copper alloy or Brass
Pin plating: Golden over Nickel

REFERENCED EMC CIRCUIT



Referenced EMC Performance

The tested result shown in left-hand side is obtained by loading the power module with a resistive load only. It can be used as a design reference for customer system. However! The performance of customer's system depends on the whole system design. It should be noted that modifications on the circuit parameters and fine adjustment of the final layout affect the final EMC performance greatly.



Measured conductive level of NH48280abcd-11XXX and referenced filter circuit

Bandwidth of EMC Components

No components are ideal for infinite frequency range. The bandwidth of EMC components should be taking into consideration when designing an EMC filter circuit. To connect ceramic capacitor with electricity capacitor in parallel and connect low inductance inductor with big one could get a better bandwidth.

NOTE:

1. It is recommended that the input should be protected by fuses or other protection devices.
2. All specifications are typical at nominal input, full load and 25°C unless otherwise noted.
3. Specifications are subject to change without notice.
4. Printed or downloaded datasheets are not subject to Glary document control.
5. Product labels shown, including safety agency certificates, may vary based on the date of manufacture.
6. Information provided in this documentation is for ordering purposes only.
7. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications, which necessitate specific safety and regulatory standards other than the ones listed in this datasheet.

IMPORTANT

- ※ General specifications and the performances are related to standard series only, no special customer specification display here except requested items.
- ※ In order to secure effective usage of converter and the validity of Glary's service and warranty coverage, please refer to the application notes for general usage. For needs of usage beyond the application notes, please contact to Glary headquarter or our regional sales representative office for help.