



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.

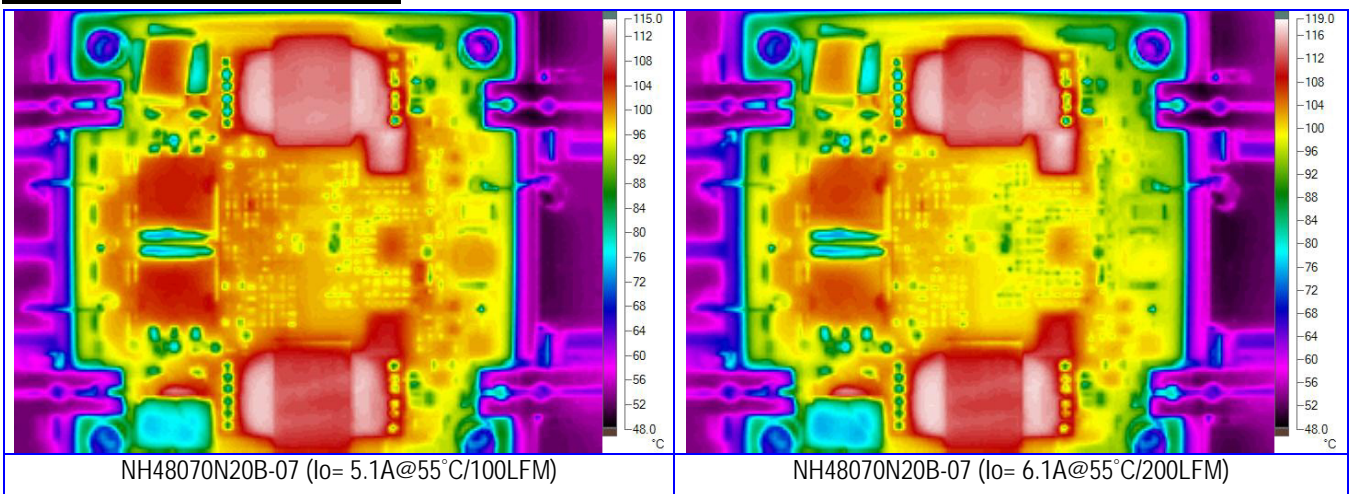
PART NUMBER SYSTEM

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

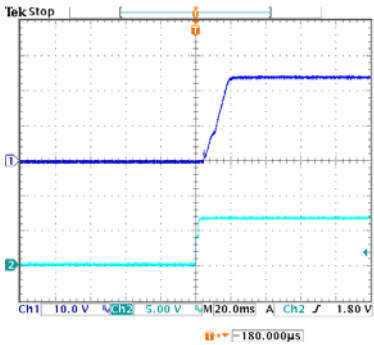
General Parameters		
Conversion Efficiency	Typical	See table
Switching Frequency	Typical	340KHz
MTBF	Bellcore TR-332 issue 6	4.11×10 ⁶ hrs @GB/25°C. (NH24280abcd-11XXX)
OTP	Internal	110°C(Tc) ±5°C
Weight	Open frame Metallic enclosure	60g / 1.0mm metal plate 95g / 1.0mm metal plate

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

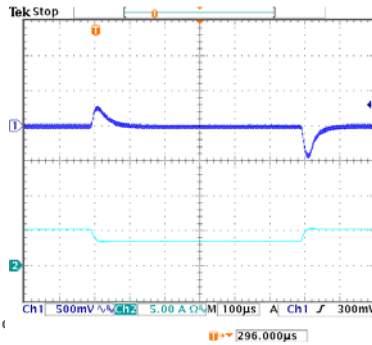
Input		
Operation Voltage Range	24V Models 48V Models	+18V to +36Vdc +36V to +75Vdc
Reflected Ripple Current	L _{EXT} = 10uH	30mA rms/100mAp-p
Power ON Voltage Ranges	24V Models 48V Models	+17.0V to +18.0Vdc +34.0V to +36.0Vdc
Power OFF Voltage Ranges	24V Models 48V Models	+15.6V to +16.6Vdc +31.2V to +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

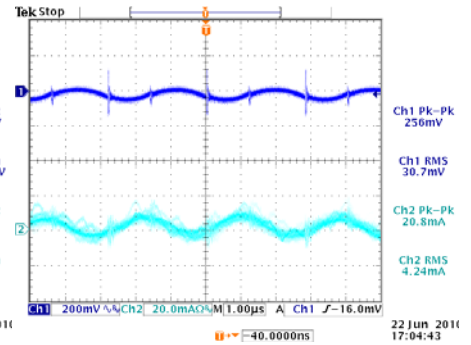
TYPICAL WAVES AND CURVES



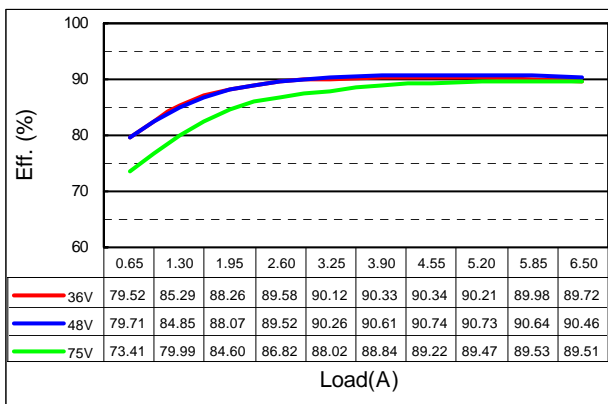
Start-up waveform of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A)



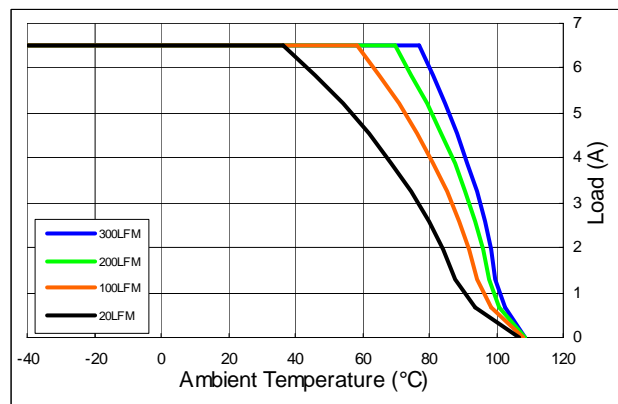
Transient response of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 5.0A/3.3A@2.5A/µs)



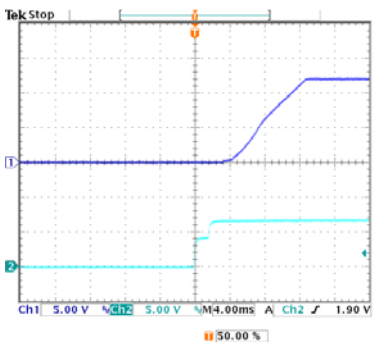
Input/Output ripples of NH48240abcd-07XXX
(V_{IN} : 48V, Load: 6.5A, L_{IN} =10uH)



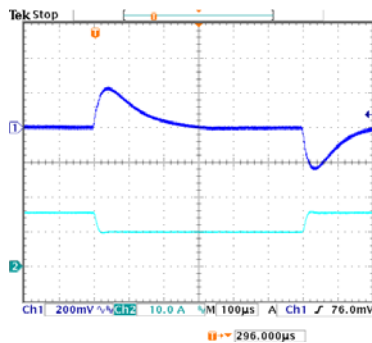
Efficiency plot of NH48240abcB-07XXX



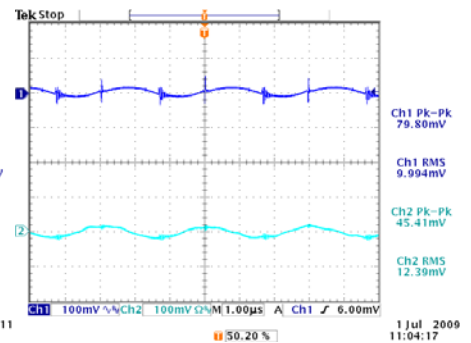
Derating curves of NH48240abcB-07XXX for $T_C = 110^\circ\text{C}$



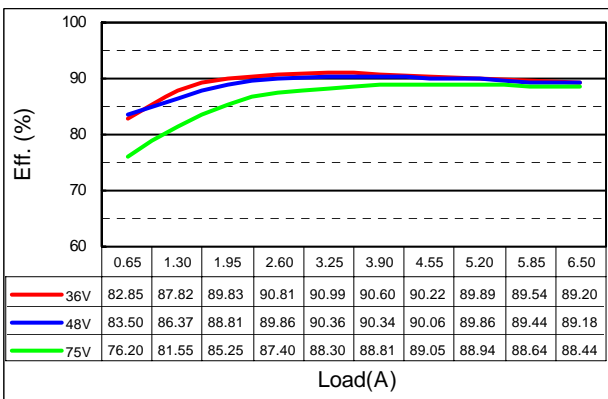
Start-up waveform of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 21A)



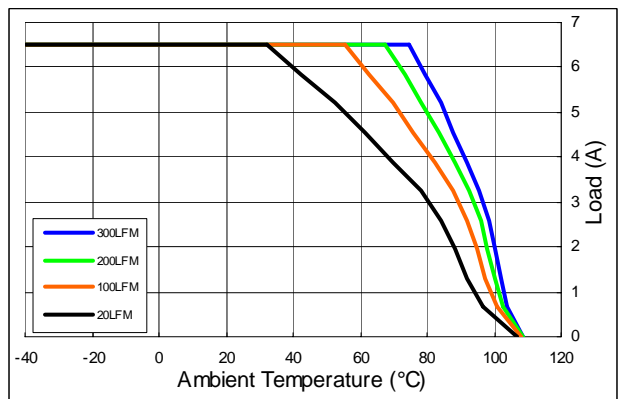
Transient response of NH48120abcd-21XXX
(V_{IN} : 48V, Load: 15.5A/9.5A@2.5A/µs)



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

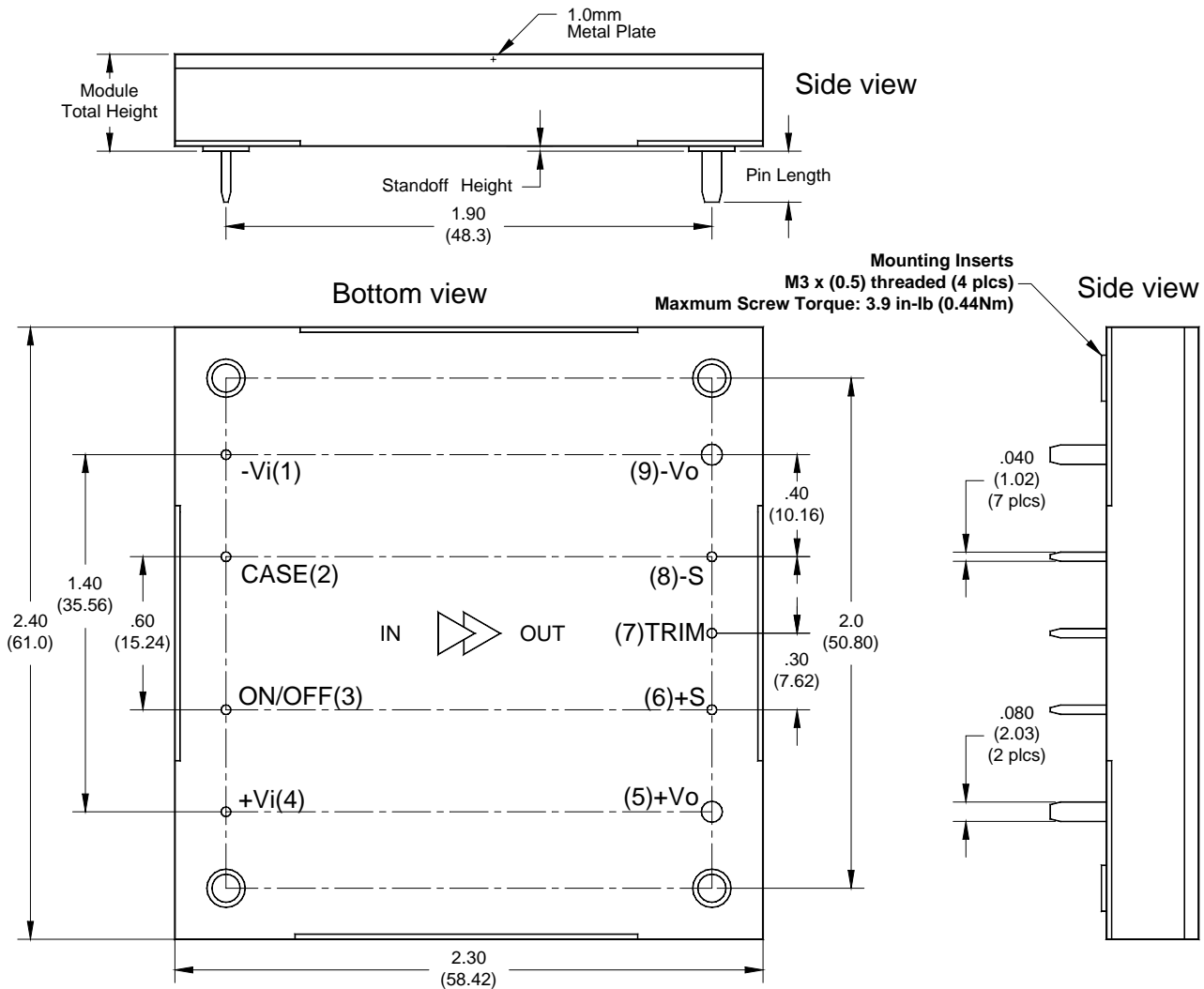


Efficiency plot of NH48120abcB-21XXX



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

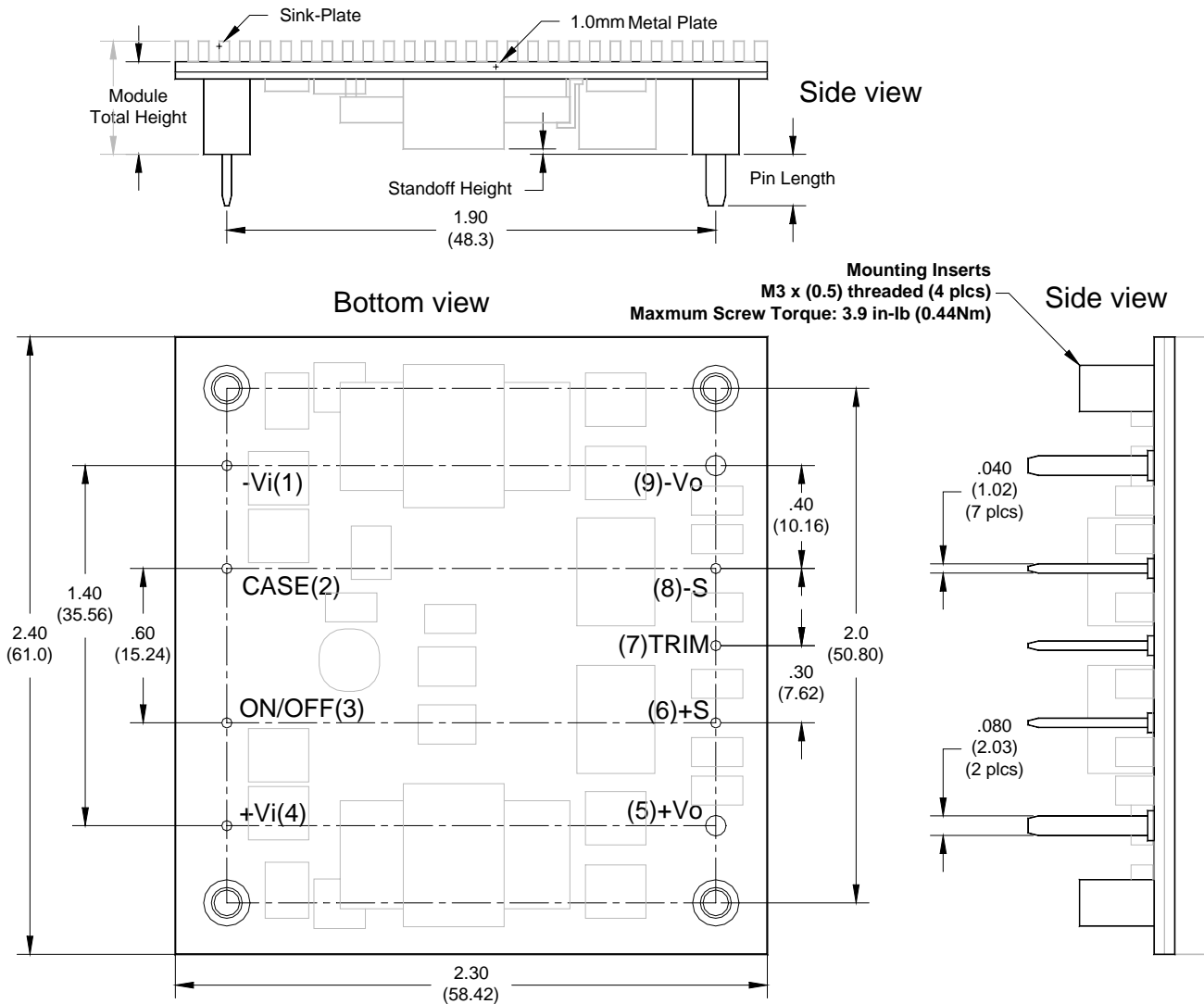
Mounting inserts: Stainless steel

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

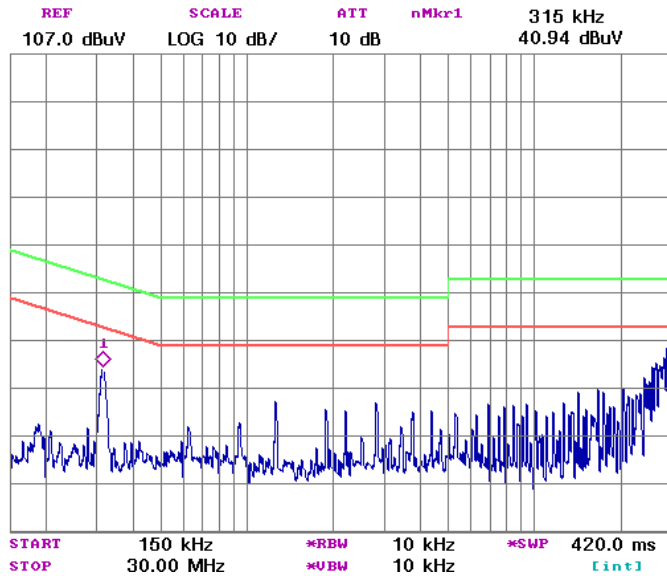
Mounting inserts: Stainless steel

Maximum torque: 3.9 in-lb (0.44Nm)

Pin material: Copper alloy or Brass

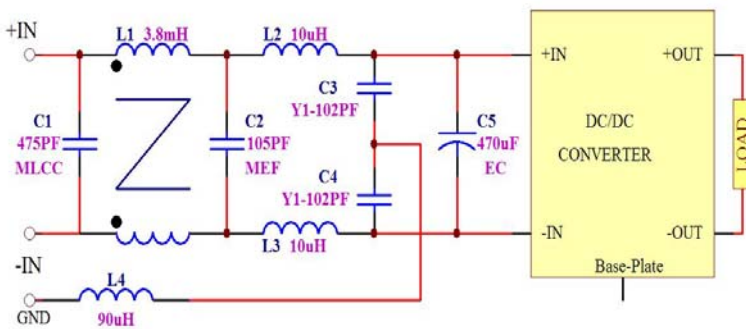
Pin plating: Golden over Nickel

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.



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.

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

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.