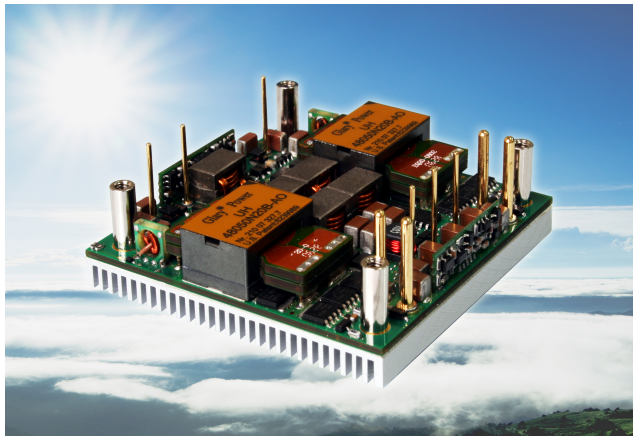
Efficiency >94% | 2.51Mhrs MTBF | No Load P_D<2W | Current Share | Anti Back-Drive

219W/in³ | Open Frame Package | OCP | OTP | OVP

INPUT 2:1 | Remote ON OFF

Pb | RoHS 2002/95/EC



The UH series provides up to 800W/67A outputs with industry standard half brick package. The efficient SR stage is combined with patented "Buck Reset" topology that would reduce power loss to achieve 219W/in3 power density. The multi-layer single side circuit board design plus the patented 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 48V input bus.

PART NUMBER SYSTEM (Total height = standoff height + module thickness)

Preliminary Data Sheet

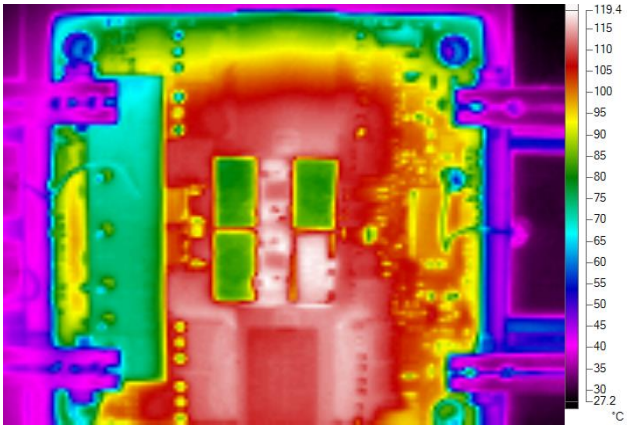
UH	48	033	a	b	c	d	-	N	29	XX	X
Series Name	Rated Input	Rated Output	Enable Logic	Pin Length	Standoff Height	Base-Plate / module thickness		Current Share	Output Current	Suffix	Version
UH	**24=**18V~36V **48=**36V~75V	**Unit:** 0.1V Increments **120=** 12V **033= 3.3**V	**P:** Positive **N:** Negative	**0:** 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/0.46" S: 3.0mm Metal-Plate/0.54" A: 3.0mm Sink-Plate/0.54" B: 5.0mm Sink-Plate/0.62"	-	**N:** without Current share **S:** secondary Current share	**00~C0:** for output current rating	For marketing purpose only	

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

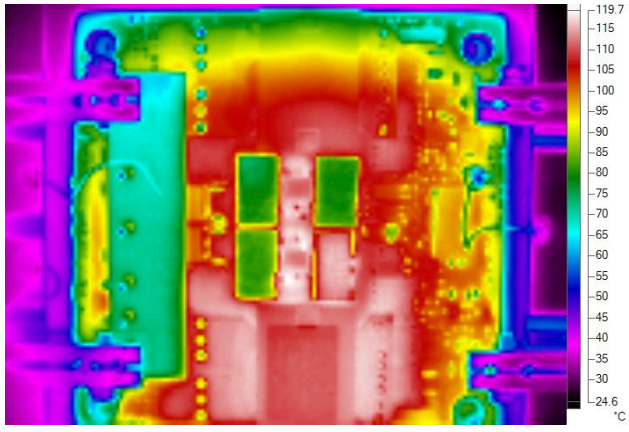
Part Number *	Maximum Input		Maximum Output		Efficiency
UH48480abcd-N17XXX	36V~75V	887W	48V/17A	816W	93%
UH48280abcd-N29XXX	36V~75V	883W	28V/29A	812W	93%
UH48120abcd-N67XXX	36V~75V	874W	12V/67A	804W	94%

Part Number *	Maximum Input		Maximum Output		Efficiency

REFERENCED THERMAL IMAGES



UH48280N20M-S29 (Io= 15A@50°C/200LFM)



UH48280N20M-S29 (Io= 19.5A@50°C/400LFM)

SPECIFICATIONS

Absolute Maximum Ratings

Temperature	Operation Storage	-40°C to +110°C -55°C to +125°C
Input Voltage Range	Operation: 48V Models Transient (100mS): 48V Models	 -0.5V to +80Vdc 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	330KHz
MTBF	Bellcore TR-332 issue 6	2.51×10^6 hrs @GB/25°C (UH48280abcd-N29XXX)
OTP	T_{AVG} or T_C	110°C ±5°C for standard setting
Weight	1mm Metal-plate 3mm Sink-plate	87g 94g

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

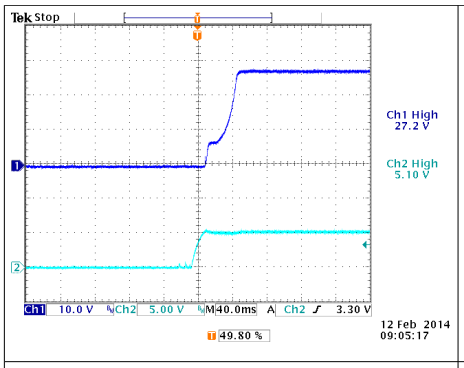
Input

Operation Voltage Range	48V Models	+36V to +75Vdc
Reflected Ripple Current	L_{EXT} = 10uH	50mA rms/200mAp-p
Power ON Voltage Ranges	48V Models	+34.0V to +36.0Vdc
Power OFF Voltage Ranges	48V Models	+31.2V to +33.2Vdc
Off State Input Current	V_{NOM}	6mA Max
Latch-State Input Current	V_{NOM}	8mA Max
Input Capacitance	48V Models	22.0uF Max

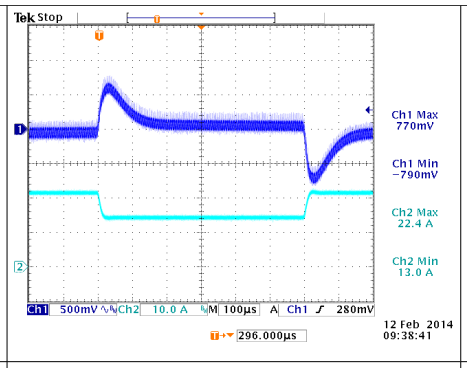
Output

Voltage Accuracy	Typical	±1.0%
Line Regulation	Full Input Range	±0.3%
Load Regulation	0%~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	50mS/250mS

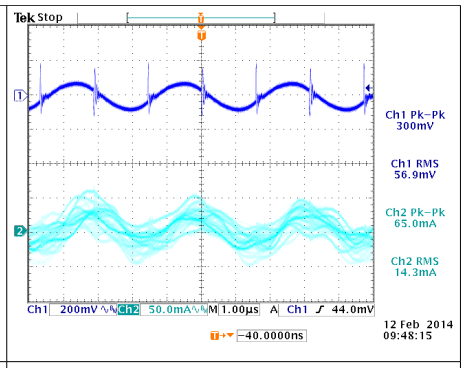
TYPICAL WAVES AND CURVES



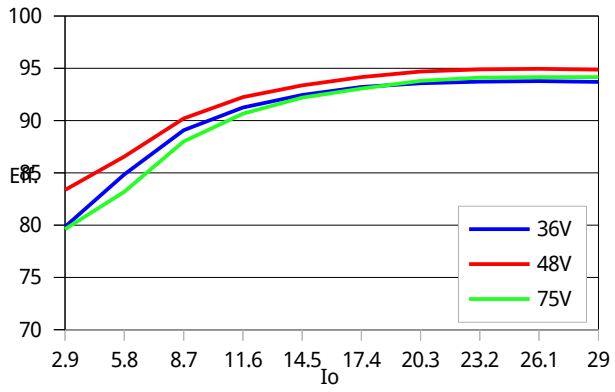
Start-up waveform of UH48280P20S-S29
(VIN: 48V, Load: 29A)



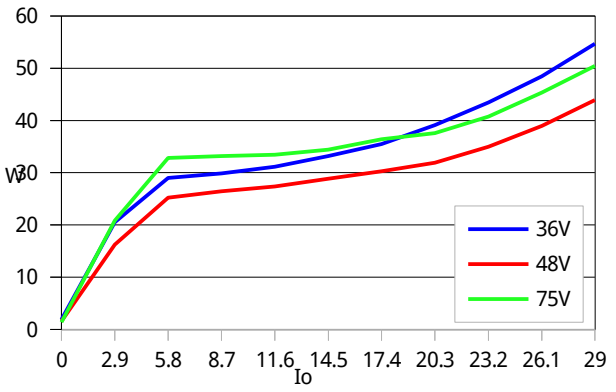
Transient response of UH48280P20S-S29
(VIN: 48V, Load: 22.5A/13.0A@2.5A/µS)



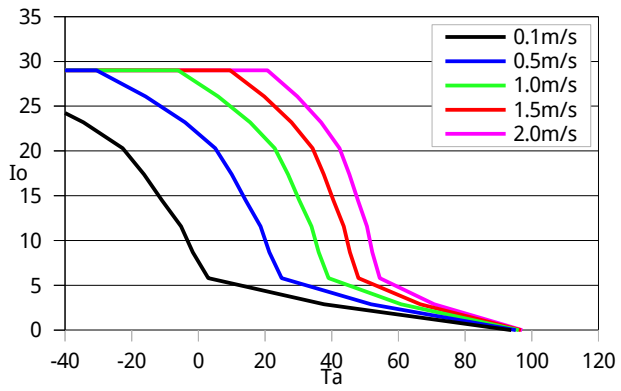
Input/Output ripples of UH48280P20S-S29
(VIN: 48V, Load: 29A, LIN=10uH)



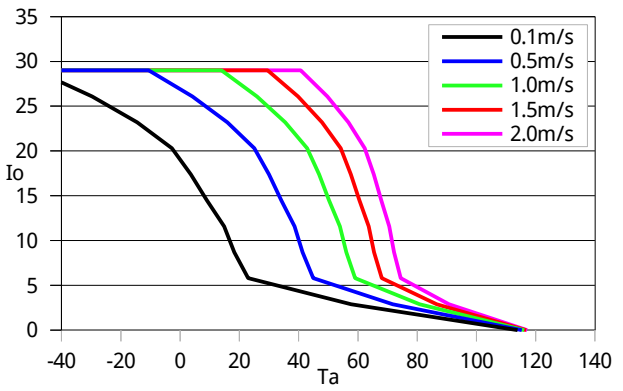
Efficiency plot of UH48280P20S-S29



Power loss curves of UH48280P20S-S29

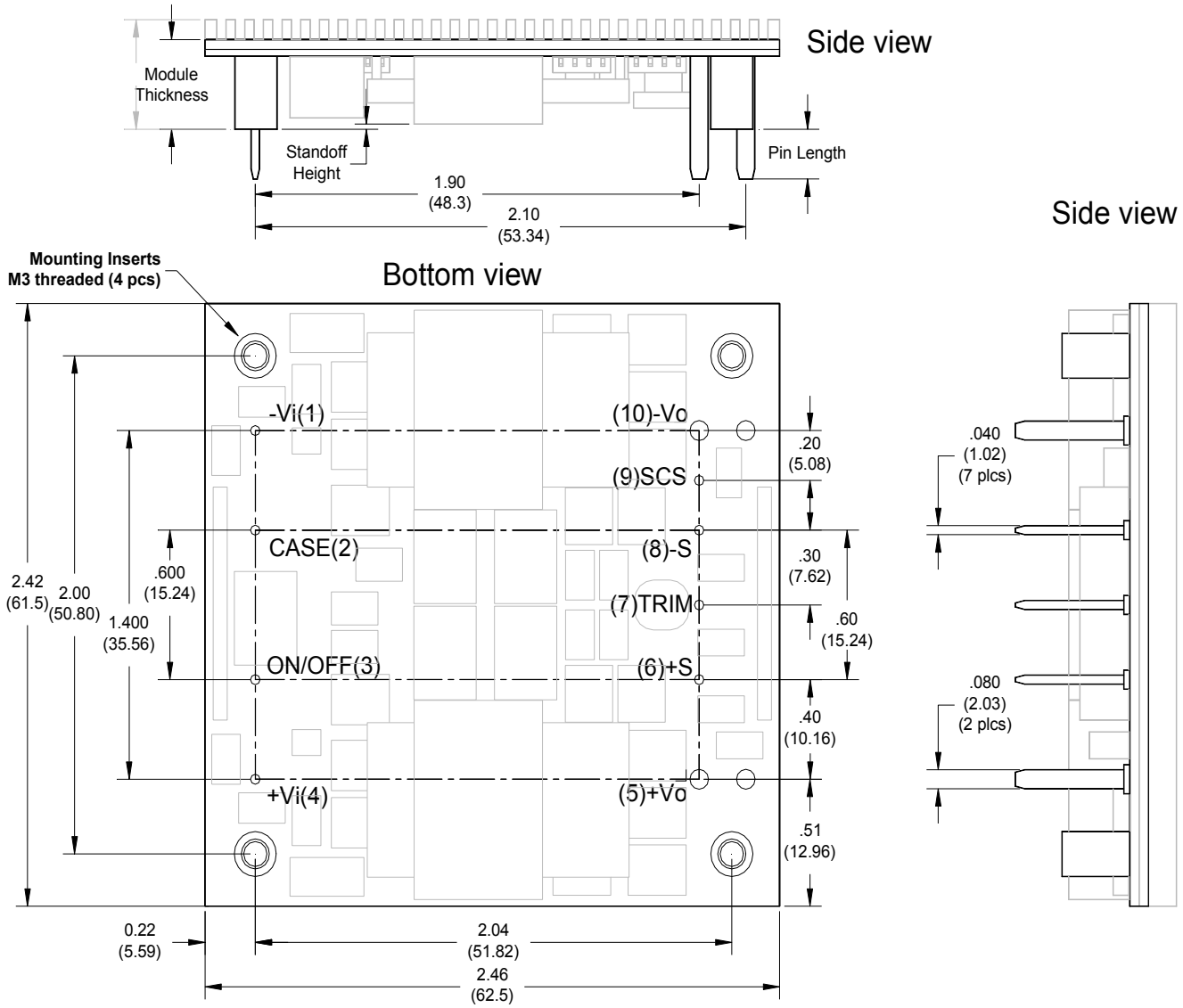


Calculated derating of UH48280P20S-S29 (T_{AVG}= 100ºC)



Calculated derating of UH48280P20S-S29 (T_{AVG}= 120ºC)

MECHANICAL DRAWING

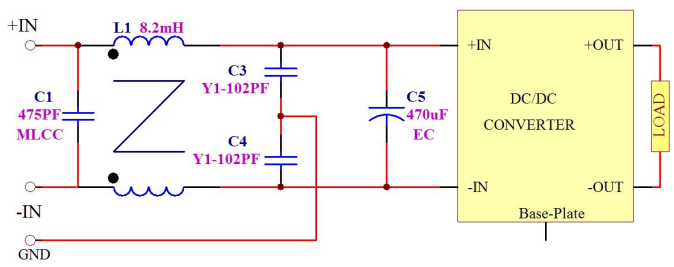


Dimensions and Pin Connections

Designation	Function Description	Pin #
+IN	Positive input	**1**
PC	Remote control. To turn-on and turn-off output.	**2**
-IN	Negative input	**3**
-Vo	Negative output	**4**
-S	Negative remote sense	**5**
TRIM	Output voltage adjust	**6**
+S	Positive remote sense	**7**
+Vo	Positive output	**8**

Dimensions: inches (mm)
Tolerances: .xx±0.02 (.x±0.5)
.xxx±0.01 (.x±0.25)
Mass: 87g / 1.0mm Metal Plate
94g / 3.0mm Sink 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 input filter circuit

Referenced Input Filter Circuit

The circuit shown in left-hand side can be used as a design reference for customer system. The EMC 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. Since no components are ideal for infinite frequency range. The bandwidth of EMC components should be taking into consideration when designing an EMC filter circuit.

EXTERNAL OUTPUT CAPACITANCE

For reducing the ripple/noise voltage on the load or the peak voltage deviation caused by a step load, additional capacitor is required for decoupling the unwanted voltage components from the load. Since the step load performance is mainly dominated by the feedback loop performance, which also affected by the additional output capacitance. To put some low-bandwidth high capacitance Electrolytic capacitors very close to the power module help nothing and even introduces unwanted effects on the feedback performance, sinking or sourcing surge current damaging the power module. Glary suggest to put a low ESR capacitor with simply sufficient capacitance to handle the short duration high frequency component of ripple/noise or voltage peak deviation, and the capacitor needs to be as close as possible to the load. Do not add capacitor for no reason.

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.

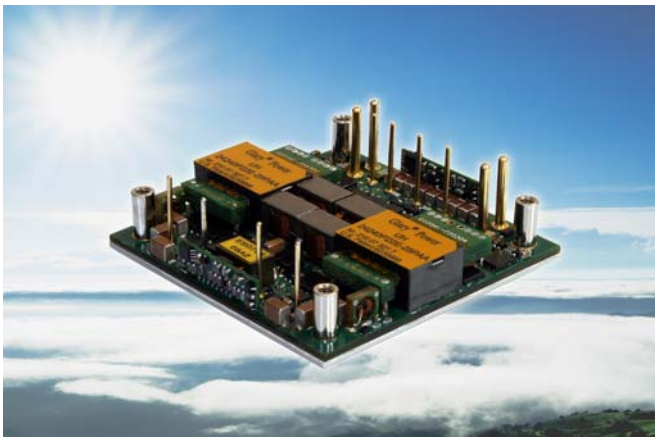
※ In order to secure effective usage of converter and the validity of Glary's service and warranty coverage, please refer to the application notes for general usage. For needs of usage beyond the application notes, please contact to Glary headquarter or our regional sales representative office for help.

Glary Power Technology

UH Series

Half Brick up to 600W／120A

Efficiency >92% | 219W/in³ | Open Frame Package | OCP | 2.51Mhrs MTBF | Remote ON OFF | INPUT 2:1 | OVP | OTP | Pb | RoHS 2002/95/EC



The ***UH*** series provides up to 600W/120A outputs with industry standard half brick package. The efficient SR stage is combined with patented "Buck Reset" topology that would reduce power loss to achieve 219W/in³ power density. The multi-layer single side circuit board design plus the patented 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

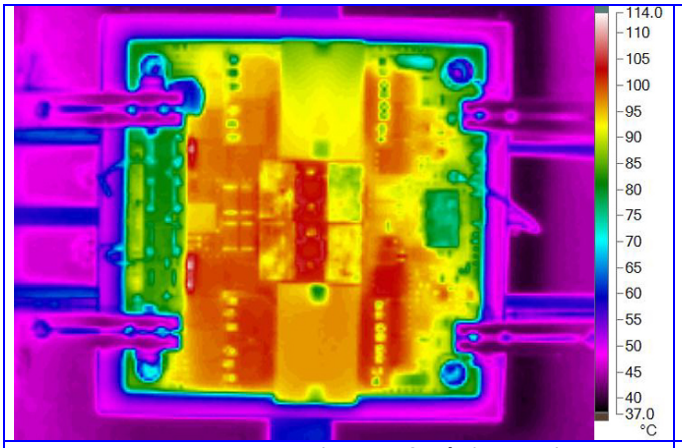
UH	48	480	a	b	c	d	-	N	12	xx	x
Series Name	Input Voltage	Output Voltage	Enable Logic	Pin Dimension	Standoff Height	Base-Plate / module thickness (Total Height = c + d)		Current Share	Output Current	Suffix	Version
UH	**48=**36V~75V **24=**18V~36V	**Unit:** 0.1V Increments **280=**28V **120=**12V	**P:** 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/0.46" **S**：3.0mm Metal-Plate/0.54" **A**：3.0mm Sink-Plate/0.54" **B**：5.0mm Sink-Plate/0.62"	-	**N**：without Current share **S**：secondary Current share	**00~C0**：for output current rating	For marketing purpose only	

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

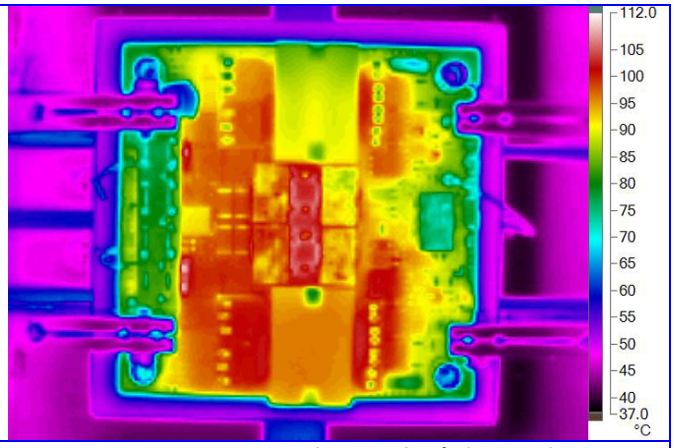
Part Number *	Maximum Input		Maximum Output		Efficiency
UH48480abcd-N12xxx	36V~75V	627W	48V/12A	576W	92%
UH48280abcd-N21xxx	36V~75V	640W	28V/21A	588W	92%
UH48120abcd-N50xxx	36V~75V	653W	12V/50A	600W	92%
UH48050abcd-NA0xxx	36V~75V	550W	5V/100A	500W	91%
UH48033abcd-NC0xxx	36V~75V	440W	3.3V/120A	396W	90%

Part Number *	Maximum Input		Maximum Output		Efficiency
UH24480abcd-N11xxx	18V~36V	548W	48V/10.5A	504W	92%
UH48280abcd-N18xxx	18V~36V	548W	28V/18A	504W	92%
UH24120abcd-N42xxx	18V~36V	548W	12V/42A	504W	92%
UH48050abcd-NA0xxx	18V~36V	550W	5V/100A	500W	91%
UH24033abcd-NC0xxx	18V~36V	440W	3.3V/120A	396W	90%

REFERENCED THERMAL IMAGES



UH48050P00B-NA0 (Io= 50A@50°C/200LFM)



UH48050P00B-NA0 (Io= 61A@50°C/400LFM)

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

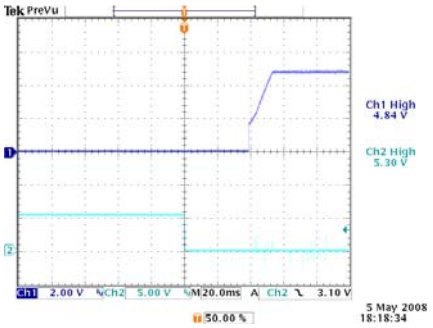
General Parameters		
Conversion Efficiency	Typical	See table
Switching Frequency	Typical	300KHz
MTBF	Bellcore TR-332 issue 6	2.51×10^6 hrs @GB/25°C (UH48050abcd-NA0xxx)
OTP	Internal	110°C(Tc) ±5°C
Weight	1.0mm Metal Plate 3.0mm Sink Plate	87g 94g

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

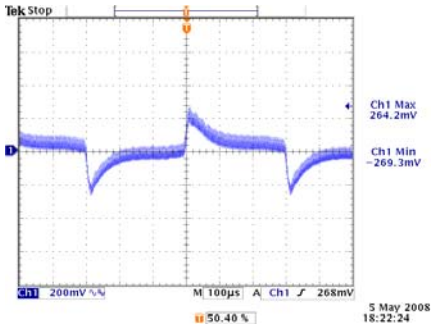
Input		
Operation Voltage Range	24V Models 48V Models	+18V to +36Vdc +36V to +75Vdc
Reflected Ripple Current	L_{EXT} = 10uH	80mA rms/300mAp-p
Power ON Voltage Ranges	24V Models 48V Models	+17.0V to +18.0Vdc +34.0V to +36.0Vdc
Power OFF Voltage Ranges	24V Models 48V Models	+15.6V to +16.6Vdc +31.2V to +33.2Vdc
Off State Input Current	V_{NOM}	6mA Max
Latch-State Input Current	V_{NOM}	8mA Max
Input Capacitance	24V Models 48V Models	48.0uF Max 20.0uF Max

Output		
Voltage Accuracy	Typical	±1.0%
Line Regulation	Full Input Range	±0.3%
Load Regulation	0%~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	50mS/250mS

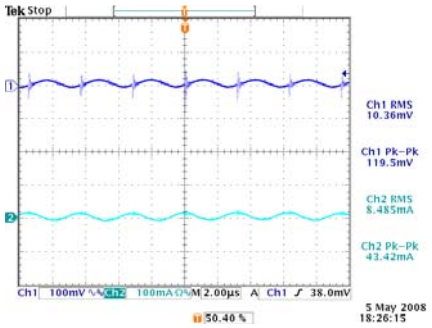
TYPICAL WAVES AND CURVES



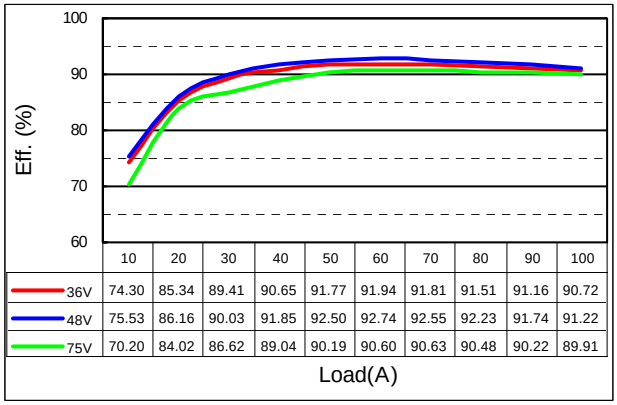
Start-up waveform of UH48050abcd-NA0xxx
(V_{IN}: 50V, Load: 100A)



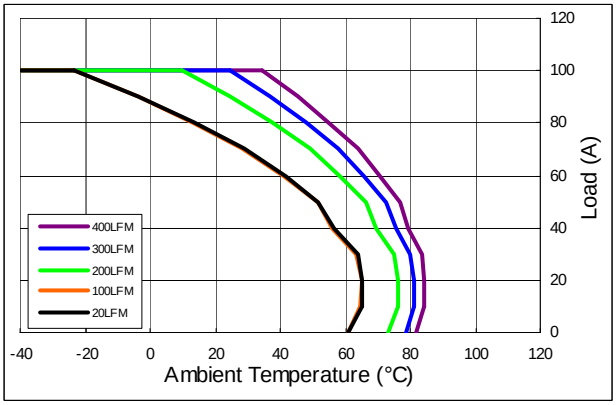
Transient response of UH48050abcd-NA0xxx
(V_{IN}: 50V, Load: 70.0A/50.0A@2.5A/μS)



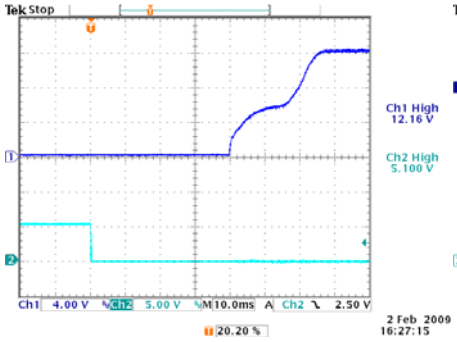
Input/Output ripples of UH48050abcd-NA0xxx
(V_{IN}: 50V, Load: 100A, L_{IN}=10uH)



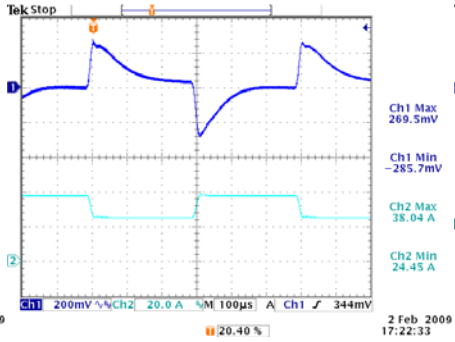
Efficiency plot of UH48050abcB-NA0xxx



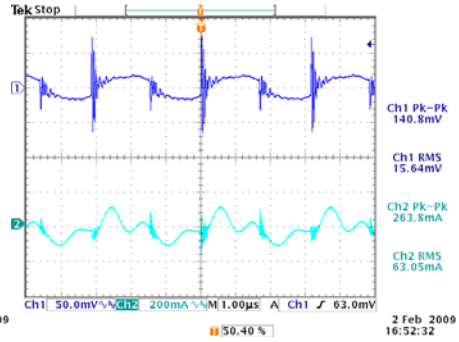
Derating curves of UH48050abcB-NA0xxx for T_C= 110°C



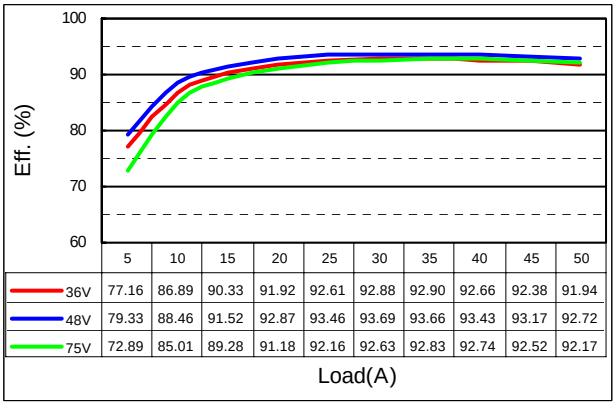
Start-up waveform of UH48120abcd-N50xxx
(V_{IN}: 48V, Load: 50A)



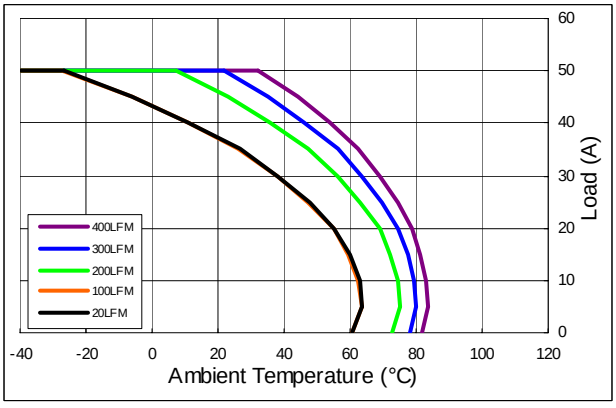
Transient response of UH48120abcd-N50xxx
(V_{IN}: 48V, Load: 38.0A/25.0A@2.5A/μS)



Input/Output ripples of UH48120abcd-N50xxx
(V_{IN}: 48V, Load: 50A, L_{IN}=10uH)

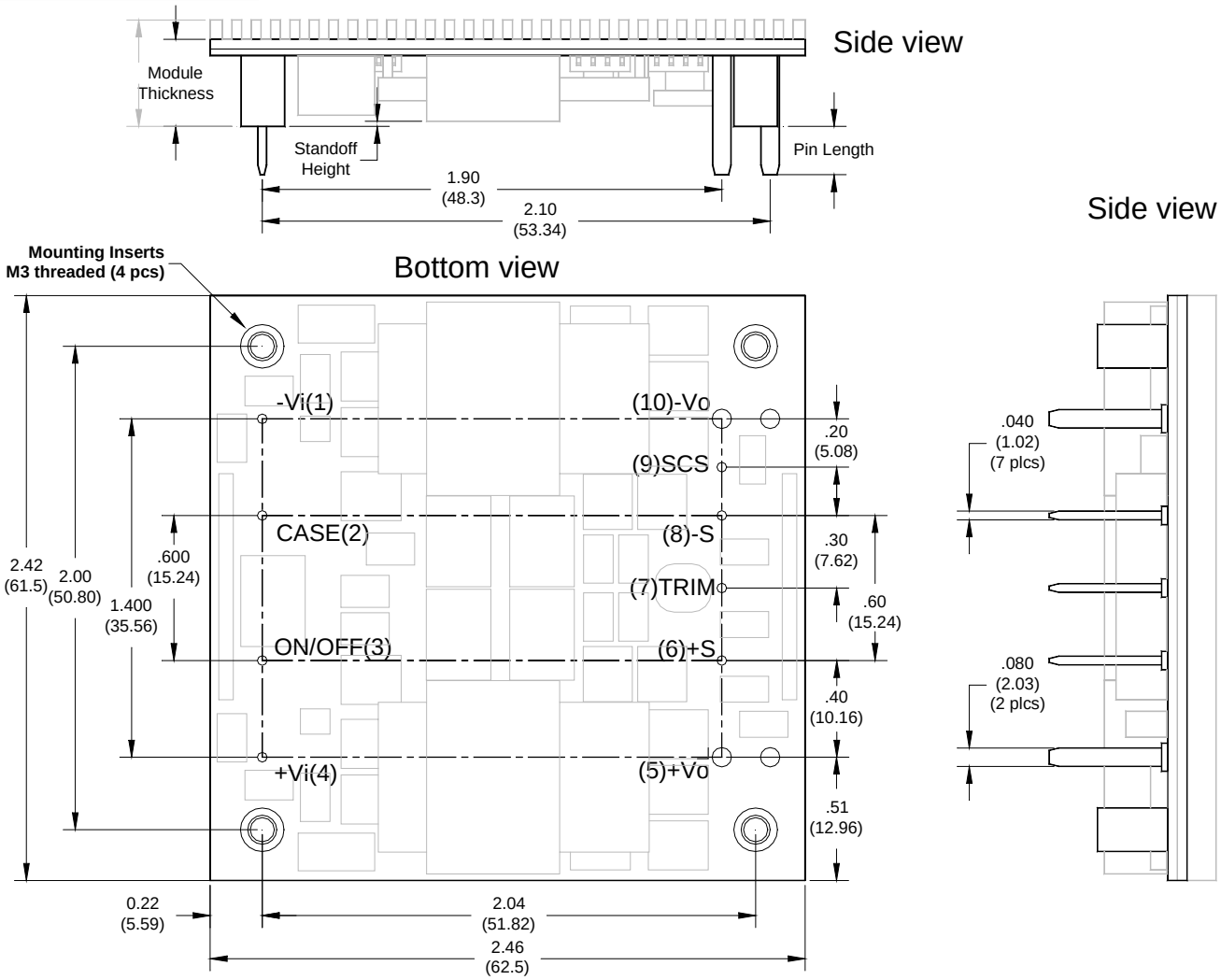


Efficiency plot of UH48120abcB-N50xxx



Derating curves of UH48120abcB-N50xxx for T_C= 110°C

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**
SCS	Secondary current share bus	**9**
-Vo	Negative output	**10**

Dimensions: inches (mm)

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

Mass: 87g / 1.0mm metal plate
94g / 3.0 mm metal plate

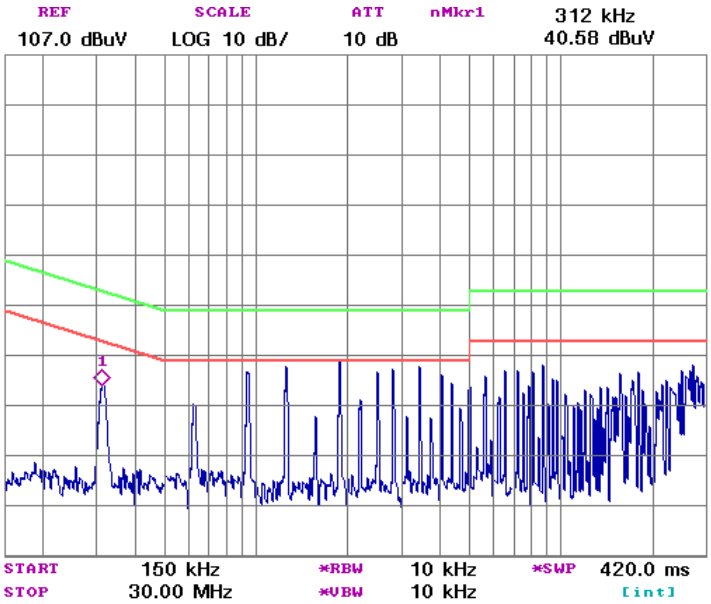
Base plate: Aluminum alloy with anode oxide

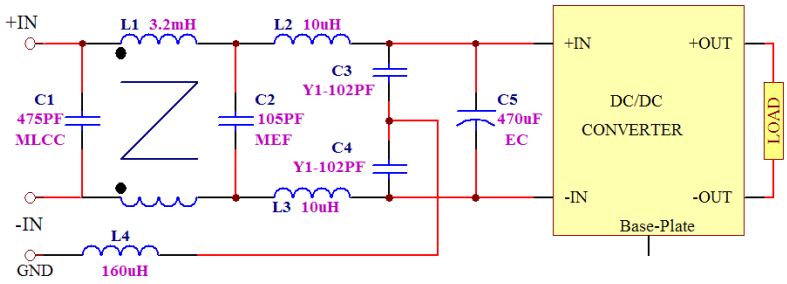
Mounting inserts: Stainless steel
Maximum torque: 3.9 in-lb (0.44Nm)

Pin material: Copper alloy or Brass

Pin plating: Golden over Nickel

REFERENCED EMC CIRCUIT





Measured conductive level of UH48120abcd-S50xxx and referenced filter 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.

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.