Glary Power Technology

Half Brick
UH2H280abcd-x18

- High efficiency ..... 91%@28V/18A
- High useable power--- Add Heat-Sink (5.0mm Height)
  ..... 28V/16.2A/454W at Tc 50°C/500LFM
- Low profile (Open Frame) ..... 0.50"(12.7mm)
- Standard footprint ..... 2.66"×2.62"
- Operation temperature ..... -40°C~110°C

The UH2H280abcd-x18 provides up to 504W/18A outputs with industry standard half brick package. The efficient SR stage is combined with patented "Buck Reset" topology for reduce power loss to achieve 144W/in3 power density. The multi-layer single side circuit board design plus the patented Sink-Plate technology is able to enhance the thermal performance and improve its reliability. Modules are designed for Telecom, Servers, Networking equipments and other applications that use a 300V (200~400V) input bus.

Part Number *	Maximum Input		Maximum Output		Efficiency
UH2H280abcd-x18	200V~420V	554W	28V/18.0A	504W	91.0%

* Options for **UH2H280abcd-x18** are listed as follows:

a (Enable Logic):	**P**: Positive	**N**: Negative		
b (Pin Length):	**0**: 0.12"	**1**: 0.16"	**2**: 0.20"	**3**: 0.24"
c (Standoff Height):	**0**: 0.02"			
d (Base-Plate/Module Thickness):	**E**: Metallic enclosure with 1.0mm Metal Plate /0.48"			
x (Current Share):	**N:** Without Current Share	**S:** Secondary current share		
18(Output):	for output current rating **18A**			

Example: **UH2H280P20E-N18** is a ***UH2H*** series half brick 200~400V to 28V/18A dc/dc converter with positive control logic, 0.20" pin length, 0.02" of standoff height and 1.0mm metal plate. It features no current share function and the total height is 0.02"+0.44"=0.46"

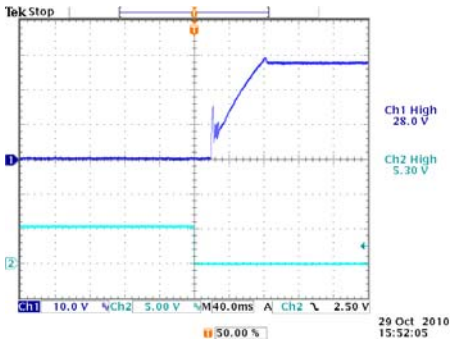
ABSOLUTE MAXIMUM RATINGS		
Temperature	Operation	-40°C to +110°C
	Storage	-55°C to +125°C
Input Voltage Range	Operation:	
	300V Models	+190V to +420Vdc
	Transient (100ms):	
	300V Models	450V Maximum
Isolation Voltage	Input to Output	3.0KVdc
	Input to Case	1.5KVdc
	Output to Case	1.0KVdc
Remote Control		-0.5V to +12Vdc

GENERAL SPECIFICATION		
Conversion Efficiency	Typical	See table
Switching Frequency	Typical	160KHz
MTBF	Bellcore	2.62×10^6 hrs @GB/25°C.
	TR-332 issue 6	1.09×10^6 hrs @GB/50°C.
OTP	Internal	110°C±5°C (T_C)
Weight		163g/1mm Metal Plate

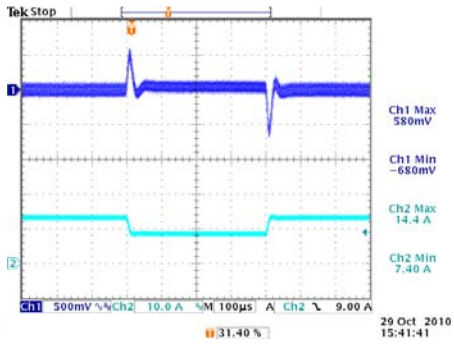
CONTROL FUNCTIONS		
Remote Control	Logic High	+3.0V to +6.5V
	Logic Low	0V to +1.0V
Input Current of Remote Control Pin		-0.5mA ~ +1.5mA

INPUT SPECIFICATIONS		
Operation Voltage Range	300V Models	+200V to +400Vdc
Reflected Ripple Current	L_{EXT} = 20uH	
	C_{EXT} = 270uF	20mA(rms)/100mAp-p
Input Over Voltage Protection		+435VMax.
Turn-On Voltage Threshold	300V Models	+190V to +198Vdc
Turn-Off Voltage Threshold	300V Models	+185V to +194Vdc
Off State Input Current	V_{NOM}	8mA Max
Latch-State Input Current	V_{NOM}	12mA Max
Input Capacitance	300V Models	4.7uF Max

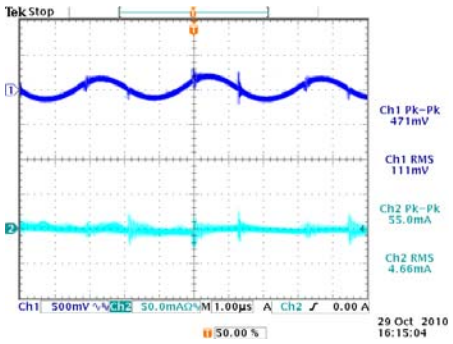
OUTPUT SPECIFICATIONS		
Voltage Accuracy	Typical	±1%
Line Regulation	Full Input Range	±0.3%
Load Regulation	5%~100%	±0.3%
Temperature Drift	-40°C ~100°C	±0.03%/°C
Output Tolerance Band	All Conditions	±4%
Ripple & Noise (20MHz)	Peak-Peak (rms)	3% (1%) V_o
Over Voltage Protection	V_{NOM}, 10% Load	115~130 %Vo
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/uS)	50%~75% Load	±4%Vo/500us
Start-Up Delay Time	V_{NOM}, Full Load	100ms/250ms



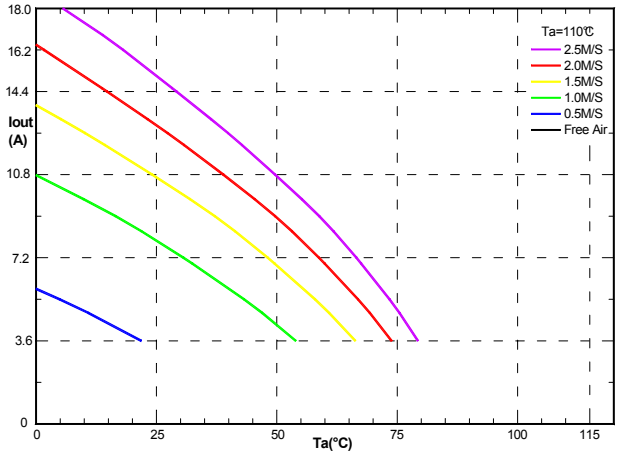
Start-Up Waveform
(V_{IN}: 270V, Load: 18A)
(External CAP 100uF/100V)



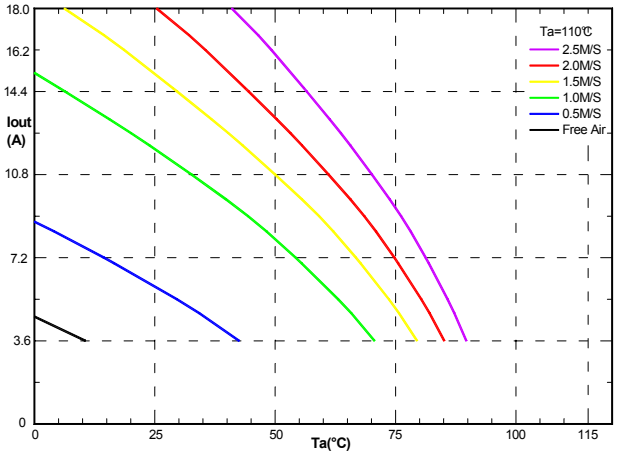
Transient Response
(V_{IN}: 270V, Load: 7.5A/4.5A@2.5A/µS)
(External CAP 100uF/100V)



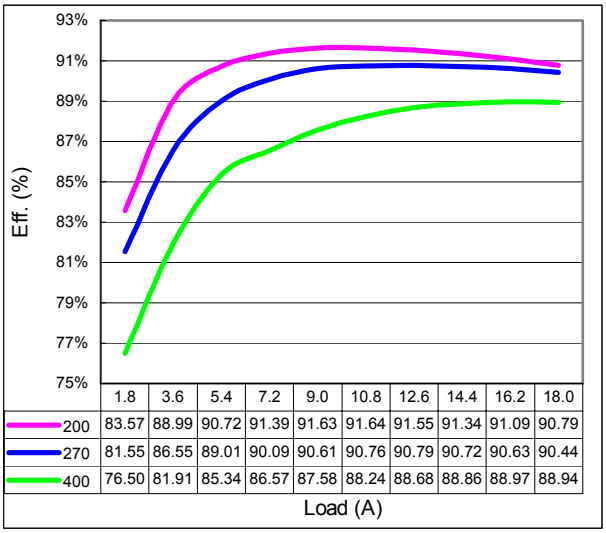
Output Ripple/Noise and Input Ripple Current
(V_{IN}: 270V, Load: 9A, L_{IN}=20uH, C_{IN}=270uF)
(External CAP 100uF/100V)



Derating Plot of UH2H280P20E-N18
Vin: 270V

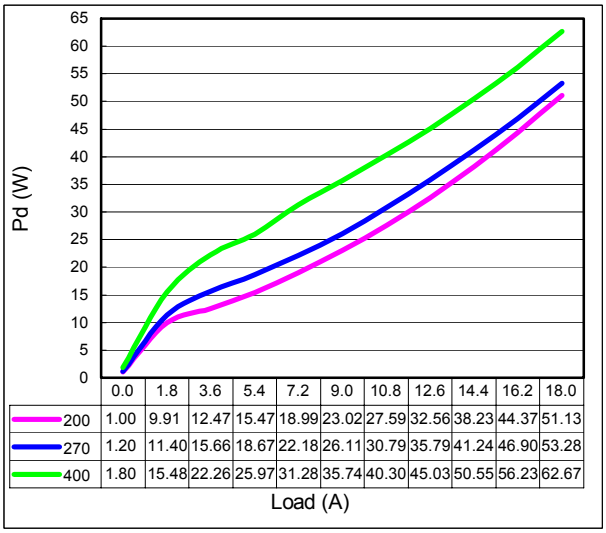


Derating Plot of UH2H280P20V-N18
Vin: 270V / Add Heat-Sink (5.0mm Height)



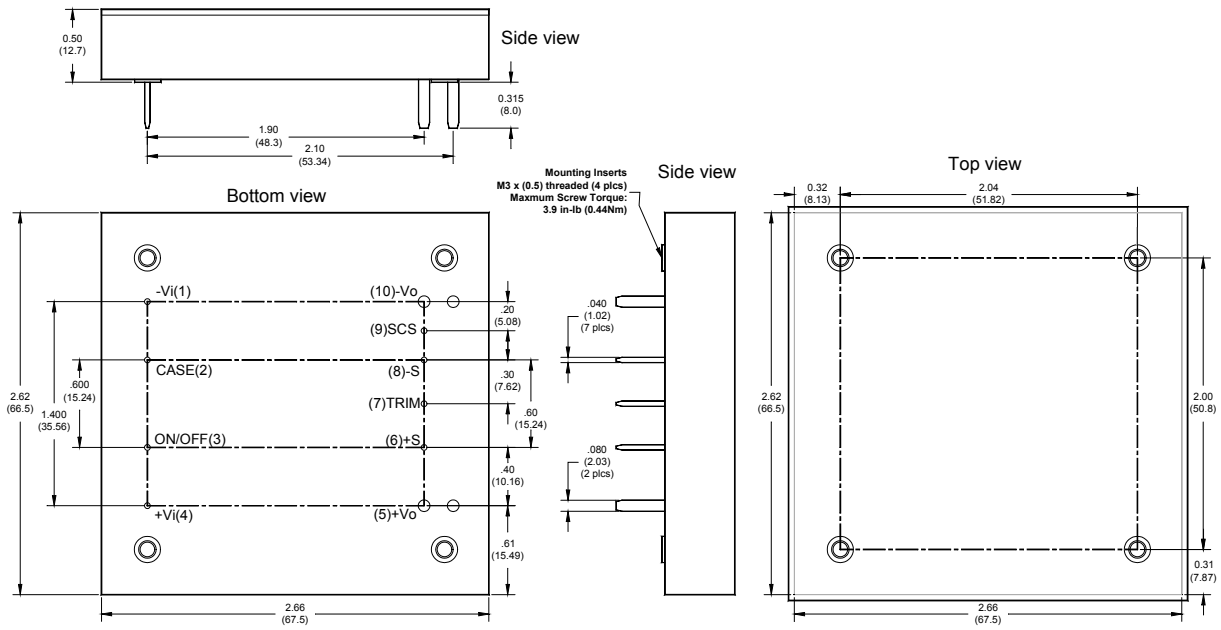
	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0
200	83.57	88.99	90.72	91.39	91.63	91.64	91.55	91.34	91.09	90.79
270	81.55	86.55	89.01	90.09	90.61	90.76	90.79	90.72	90.63	90.44
400	76.50	81.91	85.34	86.57	87.58	88.24	88.68	88.86	88.97	88.94

Efficiency Plot



	0.0	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0
200	1.00	9.91	12.47	15.47	18.99	23.02	27.59	32.56	38.23	44.37	51.13
270	1.20	11.40	15.66	18.67	22.18	26.11	30.79	35.79	41.24	46.90	53.28
400	1.80	15.48	22.26	25.97	31.28	35.74	40.30	45.03	50.55	56.23	62.67

Power Loss Plot



Module Mechanical Data

Connection:

Designation	Function Description	Pin #
-Vi	Negative input	**1**
CASE	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)

Weight: 87g／1.0mm Metal Plate
94g／3.0mm Sink-Plate

Base plate: Aluminum alloy with anode oxide

Mounting inserts: Iron alloy with Nickel plated
Maximum Torque: 3.9 in-Ib (0.44Nm)

Pin material: Copper alloy or Brass

Pin plating: Golden over Nickel

Referenced EMC Circuit:

The tested curve and referenced EMC circuit**:**

TBD	TBD

Important Note:
※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 carefully go through the application notes stated at the end of this document. For needs of usage beyond the application notes, please contact us or our regional sales representative office for help.

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Reliability Prediction Result of UH2H280abcd-x18

Base Plate Temperature (˚C): 25
Input Range: 200~420Vdc
Output Power: 28Vdc / 18A / 504W

The MTBF, calculated in accordance with the Parts Count Method of Bellcore TR-332 issue 6, December 1997. The General Case is used for calculations.

Parts Failure Rates

Resistors :	18.52
Capacitors :	52.11
Diodes :	34.25
BiopolarTransistors :	10.97
Field Effect Transistors :	68.31
Optocouplers :	10.97
Chokes :	68.17
Transformers :	9.04
Integreated Circuits :	100.11
Zener Diode:	6.54
Thermistor:	1.71
Total :	380.70

$$\lambda_{Unit} = \pi_E * \Sigma\lambda_p$$

= 380.70 Failures / 10^9 Hours

MTBF = 2,626,717 Hours

= 299.854 *Years*

The detail MTBF calculation of UH2H series dc/dc converters are base on specified base plate temperature with component temperature rise listed as following pages.

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Reliability Prediction Result of UH2H280abcd-x18

Base Plate Temperature (˚C): 50
Input Range: 200~420Vdc
Output Power: 28Vdc / 18A / 504W

The MTBF, calculated in accordance with the Parts Count Method of Bellcore TR-332 issue 6, December 1997. The General Case is used for calculations.

Parts Failure Rates

Resistors :	29.10
Capacitors :	60.59
Diodes :	66.45
BiopolarTransistors :	90.43
Field Effect Transistors :	125.87
Optocouplers :	90.43
Chokes :	105.61
Transformers :	13.98
Integreated Circuits :	311.74
Zener Diode:	10.28
Thermistor:	5.70
Total :	910.17

$\lambda_{Unit} = \pi_E * \Sigma\lambda_p$

= 910.17 Failures / 10^9 Hours

MTBF = 1,098,702 Hours

= 125.423 *Years*

The detail MTBF calculation of UH2H series dc/dc converters are base on specified base plate temperature with component temperature rise listed as following pages.

Glary Power Technology

Reliability Prediction Result of UH2H280abcd-x18

Base Plate Temperature (˚C): 75
Input Range: 200~420Vdc
Output Power: 28Vdc / 18A / 504W

The MTBF, calculated in accordance with the Parts Count Method of Bellcore TR-332 issue 6, December 1997. The General Case is used for calculations.

Parts Failure Rates

Resistors :	42.85
Capacitors :	68.93
Diodes :	117.23
BiopolarTransistors :	550.41
Field Effect Transistors :	215.29
Optocouplers :	550.41
Chokes :	153.77
Transformers :	20.34
Integreated Circuits :	844.52
Zener Diode:	15.14
Thermistor:	15.99
Total :	2594.88

$$\lambda_{Unit} = \pi_E * \Sigma\lambda_p$$

= 2594.88 Failures / 10^9 Hours

MTBF = 385,374 Hours

= 43.992 *Years*

The detail MTBF calculation of UH2H series dc/dc converters are base on specified base plate temperature with component temperature rise listed as following pages.