CHB300W SERIES
300 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 92%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Fully Protected (OTP/OCP/OVP/UVLO)
- 1500Vdc I/O Isolation
- Operating Case Temperature -40 to +100℃
- Half Brick Size Meet Industrial Standard 2.28”x2.40”x0.5”
- IEC/EN/UL 62368-1 Approval
- Shock & Vibration MIL-STD-810F Compliant

E176177

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX. (4)
			MIN.	MAX.	NO LOAD	FULL LOAD	(3)	(2)	
CHB300W-24S05	9-36 VDC	5 VDC	0 mA	60 A	200 mA	14.12 A	88	88.5	470 -10000uF
CHB300W-24S12	9-36 VDC	12 VDC	0 mA	25 A	200 mA	13.74 A	91	91	330-10000uF
CHB300W-24S15	9-36 VDC	15 VDC	0 mA	20 A	250 mA	13.74 A	91	91	0-10000uF
CHB300W-24S24	9-36 VDC	24 VDC	0 mA	12.5 A	80 mA	14.20 A	88	88	220-4700μF
CHB300W-24S28	9-36 VDC	28 VDC	0 mA	10.7 A	80 mA	14.12 A	88.5	88.5	220-4700μF
CHB300W-24S48	9-36 VDC	48 VDC	0 mA	6.25 A	100 mA	14.20 A	88	88	220-2200μF
CHB300W-48S05	18-75 VDC	5 VDC	0 mA	60 A	100 mA	6.94 A	89	90	0-10000uF
CHB300W-48S12	18-75 VDC	12 VDC	0 mA	25 A	120 mA	6.94 A	92	92	0-10000uF
CHB300W-48S15	18-75 VDC	15 VDC	0 mA	20 A	130 mA	6.80 A	92	92	0-10000uF
CHB300W-48S24	18-75 VDC	24 VDC	0 mA	12.5 A	60 mA	6.98 A	90	89	0-4700μF
CHB300W-48S28	18-75 VDC	28 VDC	0 mA	10.7 A	60 mA	6.94 A	91	89.5	0-4700μF
CHB300W-48S48	18-75 VDC	48 VDC	0 mA	6.25 A	80 mA	7.02 A	90	89	220-2200μF

NOTE:

1. Nominal input voltage 24, 48VDC.
2. Measured at nominal input voltage.
3. Measured at 12VDC for 24V_{in}, 24VDC for 48V_{in}.
4. The output terminal of models required a minimum capacitor to maintain specified regulation.
5. The input terminal recommend to parallel with 1000uF for 24V_{in}, 470uF for 48S15 model and 220uF for other 48V_{in} models ESR<0.7Ω to reduce the input ripple voltage.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Mounting Inserts
CHB300W-	II	O	XX	L	-Y (Option)
CHB300W	24： 24 VDC 48： 48 VDC	S：Single	05：5.0VDC 12：12VDC 15：15 VDC 24：24VDC 28：28VDC 48：48VDC	None：Positive N：Negative	None：M3x0.5 Mounting Inserts -C：Clear Mounting Insert (3.2mm DIA.)

Part Number Example:

CHB300W-48S12N-C: Quarter Brick, 300W, 4:1 18-75Vdc Input, Single 12Vdc Output, Negative Logic, Clear Mounting Insert

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25℃ unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Continuous	24Vin 48Vin	-0.3 -0.3		36 75	V_{dc}
Input Surge Voltage	100ms max.	24Vin 48Vin			50 100	V_{dc}
Operating Case Temperature	At the center part of case plate (with derating)	All	-40		100	℃
Storage Temperature		All	-55		105	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24Vin 48Vin	9 18	24 48	36 75	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold		24Vin 48Vin	8 16	8.8 17	9 18	V_{dc}
Turn-Off Voltage Threshold		24Vin 48Vin	7 15	8.0 16	8.5 17	V_{dc}
Lockout Hysteresis Voltage		24Vin 48Vin		0.8 1		V_{dc}
Maximum Input Current	V_{in}=9V, Full load. V_{in}=18V, Full load	24Vin 48Vin			40 19	A
No-Load Input Current	V_{in}=24, 48V, Io=0A	See Model Number Table				mA
Input Filter	LC filter	24SXX 48S15				
	Pi Filter	Others				
Inrush Current (I^2t)	As per ETS300 132-2	All			1	A^2s
Input Reflected Ripple Current	P-P thru 12uH inductor, 5Hz to 20MHz	All		30		mA

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Voltage Set Point Accuracy	V_{in}=24, 48V, Full Load, T_c=25℃	All	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full Load to no load	All			±0.2	%
Line Regulation	V_{in}=High line to low line, full load	All			±0.2	%
Temperature Coefficient	T_c=-40℃ to 100℃	All			±0.03	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 10uF tantalum (for 24S05 with 330uF tantalum, 24S12 with 100uF tantalum and 48Vout with 10uF aluminum) and 1uF ceramic capacitor across output	5Vo 12Vo 15Vo 24&28Vo 48Vo			100 120 200 280 480	mV
RMS		5Vo 12Vo 15Vo 24&28Vo 48Vo			40 60 80 100 200	

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Current Range	V_{in}= 9 to 36V, 18 to 75V	See Model Number Table				A
Output Peak Power	3 Seconds with maximum duty cycle of 10%, average output power not to exceed 300W	All			350	Watt
Over Current Protection	Hiccup mode. Auto recovery	All	120	125	160	%
Over Voltage Protection	Limited voltage	All	115	125	140	%
Short Circuit Protection		All	Continuous, Auto Recovery			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Output Voltage Trim Range	V_{in}=18-23V I_{out}=max. rated current	48S28	-10		0	%
	V_{in}=23-75V, P_{out}=max. rated power I_{out}=max. rated current	48S28	-10		-10	
	$P_o \leqq$ max. rated power, $I_o \leqq I_{o\_max.}$	Others	-10		+10	

EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	Vin=24V, 48V	See Model Number Table				%

DYNAMIC CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Current Transient						
Error Band	75% to 100% of $I_{o\_max.}$ step load change d_i/d_t=0.1A/us (within 1% $V_{out\ nominal}$)	All			±5	%
Recovery Time		All			500	us
Turn-On Delay and Rise Time	Full load (Constant resistive load)					
Turn-On Delay Time, From On/Off Control	$V_{on/off}$ to 10%V_{o_set}, Remote on	All		40	75	ms
Turn-On Delay Time, From Input	$V_{in\_min.}$ to 10%V_{o_set}, Power up	All		120	250	ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		25	50	ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Isolation Voltage (100% Factory Hi-Pot Tested @2sec.)	1 Minute; input to output	All			1500	V_{dc}
	1 Minute; input to case				1500	
	1 Minute; output to case				1500	
Isolation Resistance	Input to output	All	10			MΩ
Isolation Capacitance	Input to output	All		2000		pF
	Input to case			NC		
	Output to case			NC		

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	All		220		KHz
On/Off Control, Positive Remote On/Off Logic, Refer to –Vin Pin						
Logic Low (Module Off)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	0		1.2	V
Logic High (Module On)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=On	All	3.5		75	V
On/Off Control, Negative Remote On/Off Logic, Refer to –Vin Pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off}$=0.0uA, Pin open=Off	All	3.5		75	V
Logic Low (Module On)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All	0		1.2	V
On/Off Current (for Both Remote On/Off Logic)	$I_{on/off}$ at $V_{on/off}$=0V	All			1	mA
Leakage Current (for Both Remote On/Off Logic)	Logic high, $V_{on/off}$=15V	All			1	mA
Off Converter Input Current	Shutdown input idle current	All		7	10	mA

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Temperature Shutdown	Temperature at the center part of case, non-latching	All		110		℃
Over Temperature Recovery		24SXX 48SXX		90 85		℃

GENERAL SPECIFICATIONS

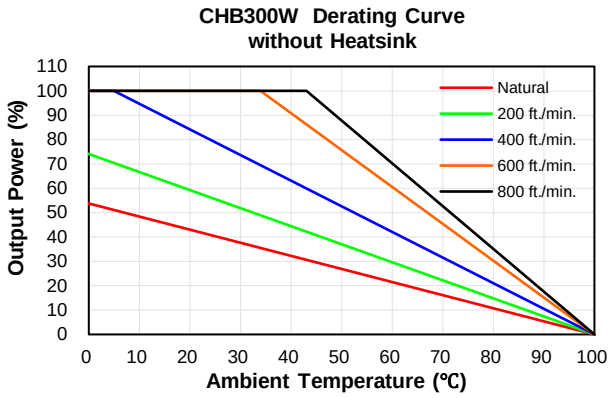
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100% of $I_{o\_max.}$; MIL-HDBK - 217F_Notice 1, GB, 25℃	All		600		K hours
Weight		All		114		grams
Case Material	Plastic, DAP, UL 94V-0					
Base Plate Material	Aluminum					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: Nickel with Matte Tin					
Shock/Vibration	MIL-STD-810F Compliant					
Humidity	95% RH max. Non condensing					
Altitude	2000m Operating altitude, 12000m Transport altitude					
Thermal Shock	MIL-STD-810F					

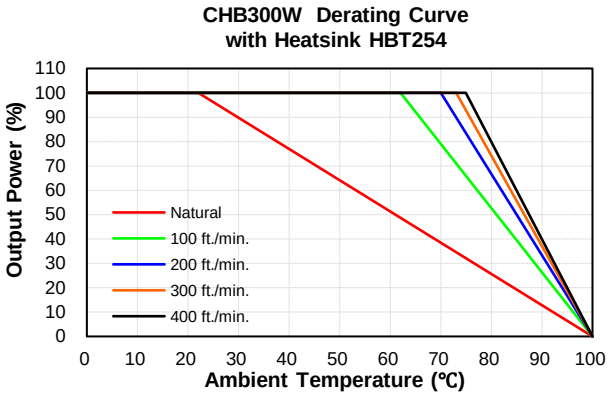
EMC SPECIFICATIONS (External components required, please refer to application note.)

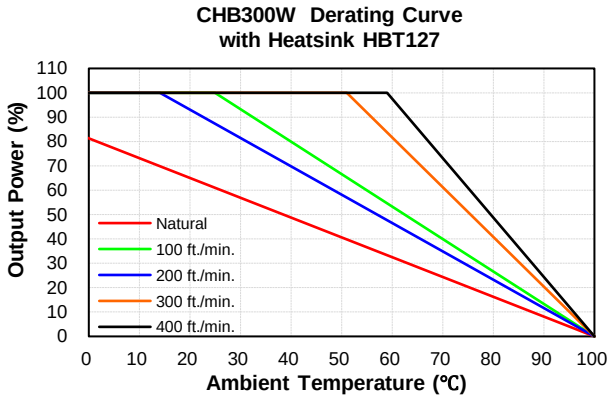
EMI	Meets EN 55032 (with external filter)	Class A
ESD	EN 61000-4-2 Level 3: Air ±8kV, Contact ±6kV	Perf. Criteria A
Radiated immunity	EN 61000-4-3 Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	EN 61000-4-4 Level 3: On power input port, ±2kV, external input capacitor required	Perf. Criteria A
Surge	EN 61000-4-5 Level 3: Line to earth, ±2kV, Line to line, ±1kV	Perf. Criteria A
Conducted immunity	EN 61000-4-6 Level 3: 0.15~10MHz/3V, 10~30MHz/3-1V, 30~80MHz/1V	Perf. Criteria A
Application Note Link		CHB300W Series App Notes
Packaging Information Link		Packaging Information

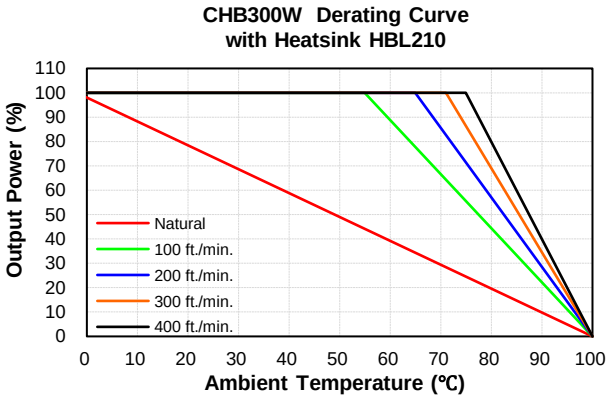
CHARACTERISTIC CURVE

Power Derating Curve









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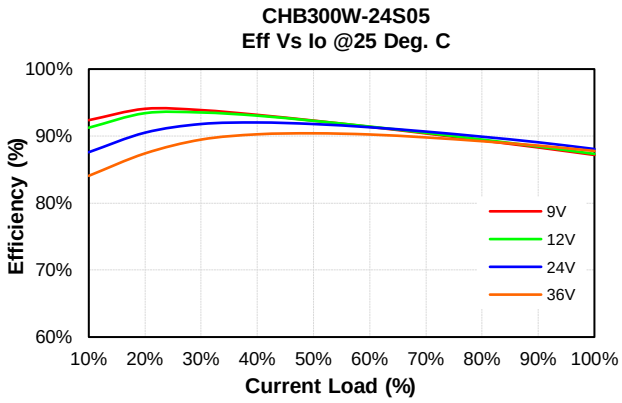
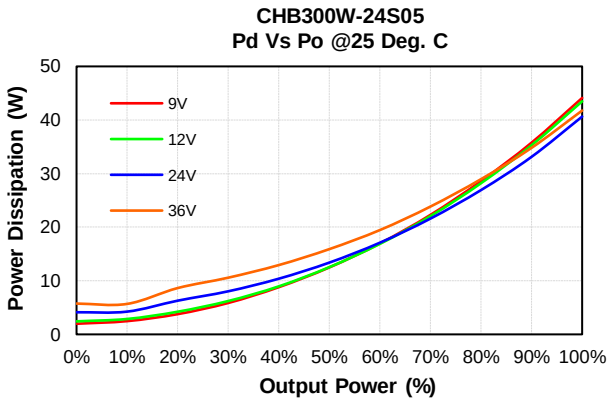
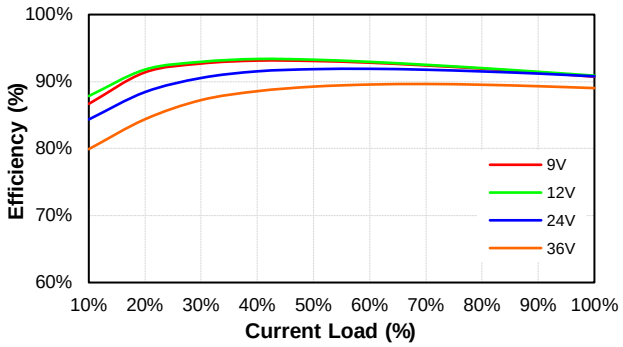




CHB300W-24S12
Eff Vs Io @25 Deg. C



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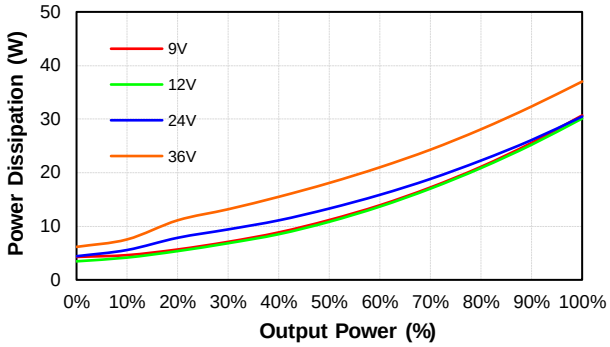

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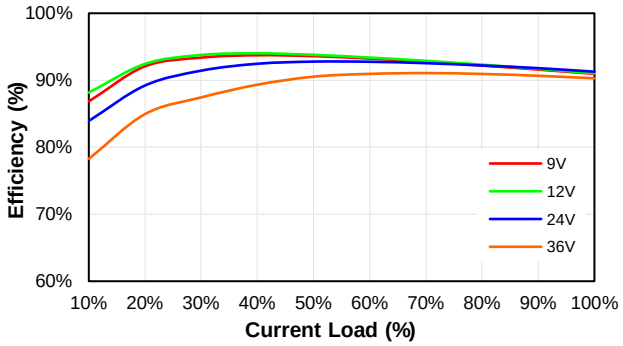

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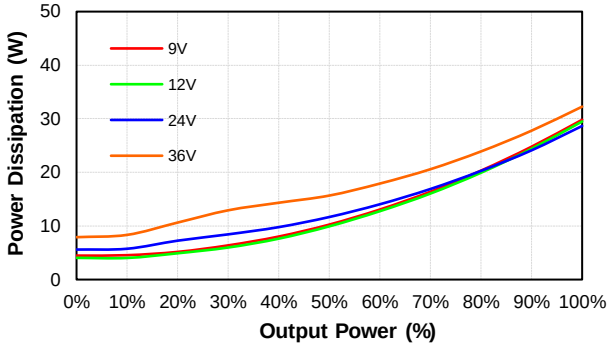

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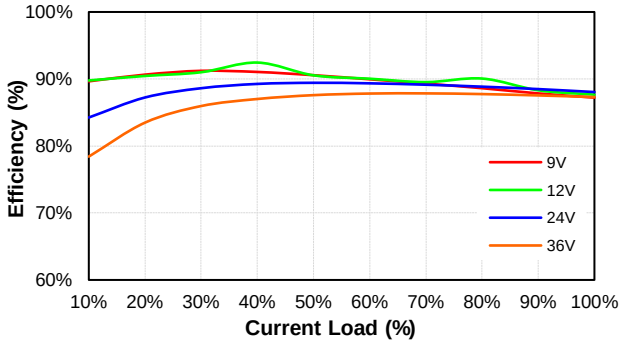

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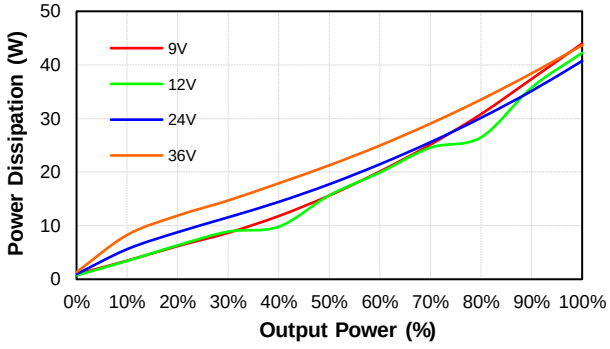

CHB300W-24S28
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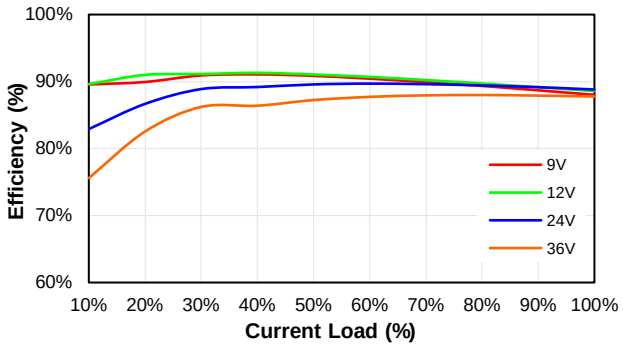

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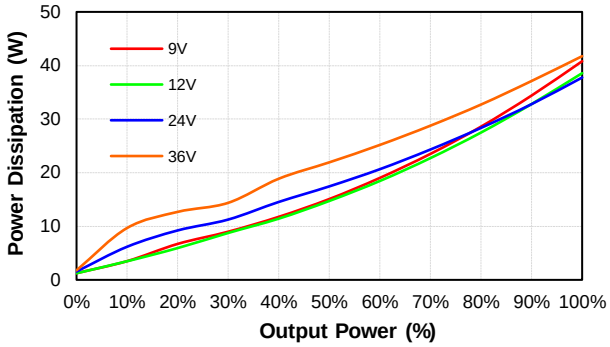

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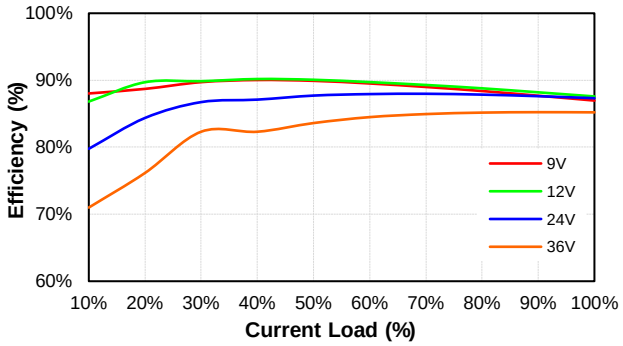

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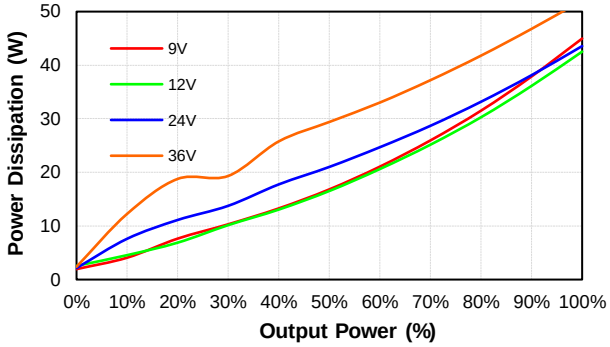

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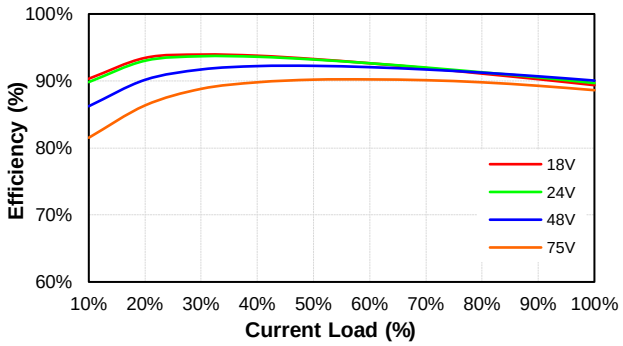

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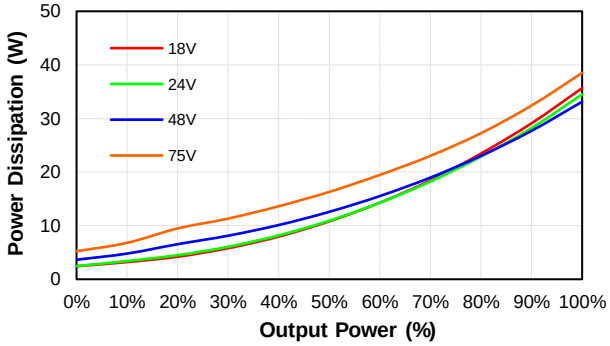

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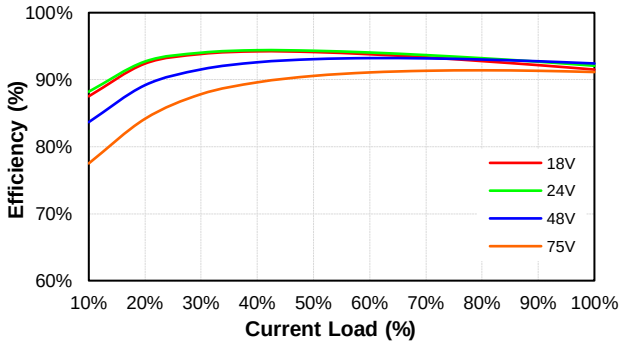

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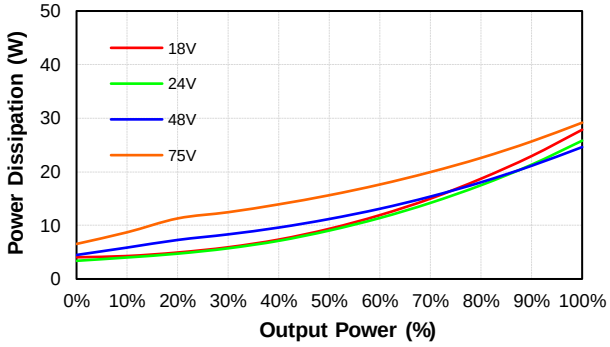

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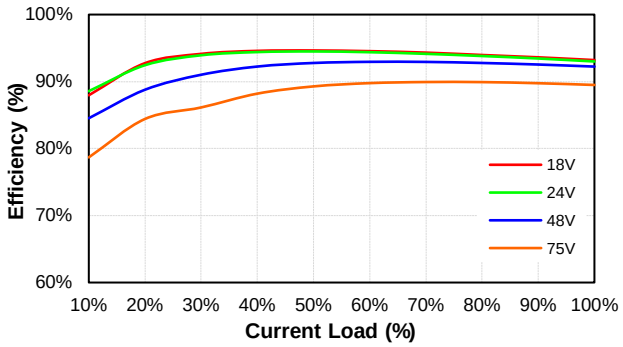

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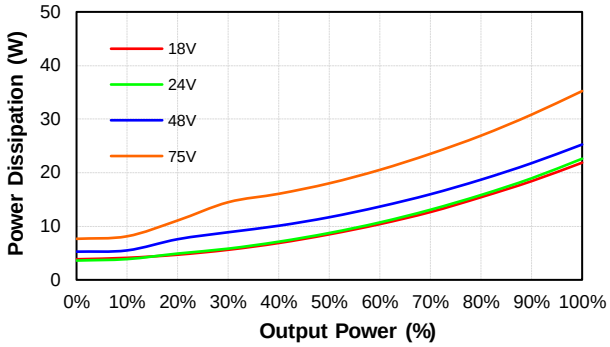

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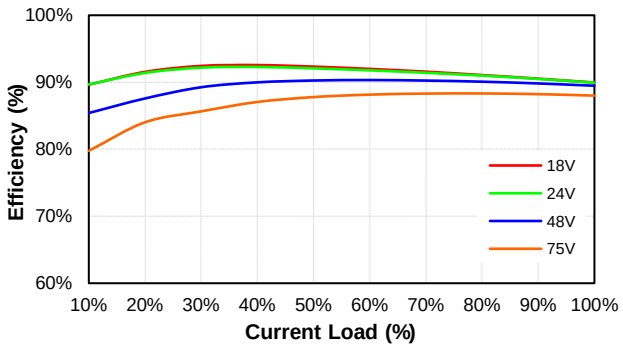

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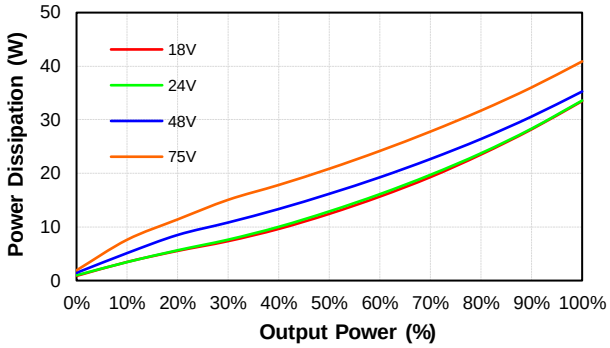

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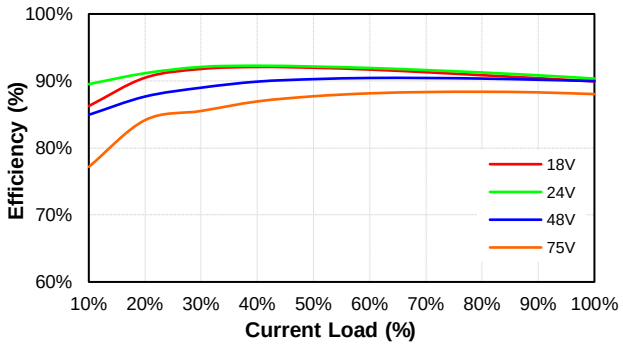

CHB300W-48S28
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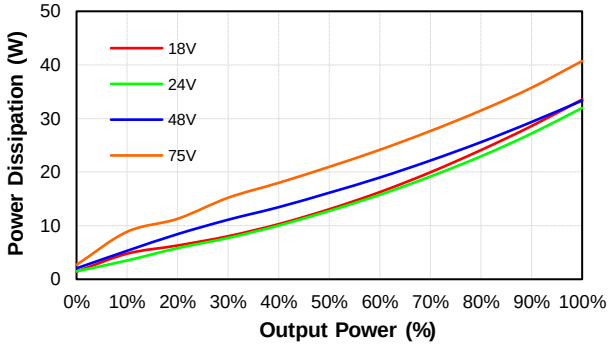

CHB300W-48S48
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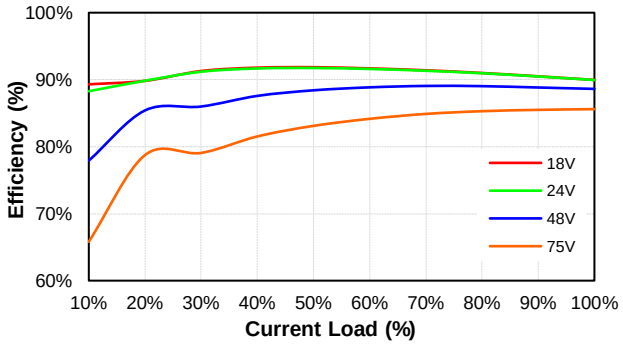

CHB300W-48S48
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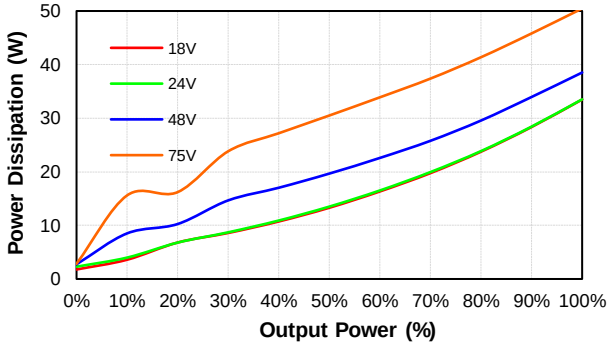
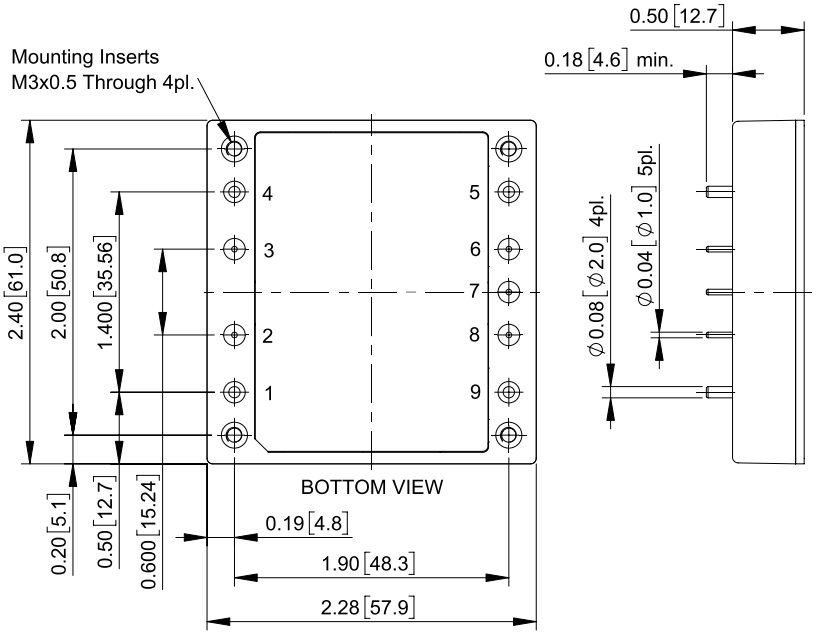


MECHANICAL SPECIFICATION



All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.02, x.xxx=±0.010
Millimeters: x.x=±0.5, x.xx=±0.25

Pin Connection

Pin	Function
1	+V Input
2	On/Off
3	CASE
4	-V Input
5	-V Output
6	-Sense
7	Trim
8	+Sense
9	+V Output

Note:Pin Size is ∅0.04±0.004 Inch [∅1.0±0.1 mm]
Pin Size is ∅0.08±0.004 Inch [∅2.0±0.1 mm]

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