CHB200W SERIES
165-200 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 89%
- 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"x0.52"
- UL 60950-1 Approval (Except 28 V_{out} & 48S3V3)
- Safety Meets IEC/EN/UL 62368-1
- Shock & Vibration MIL-STD-810F Compliant

E176177

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD MAX. (3)
			MIN.	MAX.	NO LOAD	FULL LOAD		
CHB200W-24S3V3	10-36 VDC	3.3 VDC	0 mA	50 A	130 mA	7.90 A	87	0-10000μF
CHB200W-24S05	10-36 VDC	5.0 VDC	0 mA	40 A	150 mA	9.58 A	87	0-10000μF
CHB200W-24S12	10-36 VDC	12 VDC	0 mA	16.7 A	50 mA	9.71 A	86	0-2200μF
CHB200W-24S15	10-36 VDC	15 VDC	0 mA	13.3 A	50 mA	9.56 A	87	0-2200μF
CHB200W-24S24	10-36 VDC	24 VDC	0 mA	8.3 A	45 mA	9.54 A	87	0-2200μF
CHB200W-24S28	10-36 VDC	28 VDC	0 mA	7.14 A	55 mA	9.41 A	88.5	100-2200μF
CHB200W-24S48	10-36 VDC	48 VDC	0 mA	4.2 A	60 mA	9.77 A	86	47-2200μF
CHB200W-48S3V3	18-75 VDC	3.3 VDC	0 mA	50 A	80 mA	3.91 A	88	0-10000μF
CHB200W-48S05	18-75 VDC	5.0 VDC	0 mA	40 A	80 mA	4.68 A	89	0-10000μF
CHB200W-48S12	18-75 VDC	12 VDC	0 mA	16.7 A	60 mA	4.74 A	88	0-2200μF
CHB200W-48S15	18-75 VDC	15 VDC	0 mA	13.3 A	60 mA	4.72 A	88	0-2200μF
CHB200W-48S24	18-75 VDC	24 VDC	0 mA	8.3 A	60 mA	4.72 A	88	0-2200μF
CHB200W-48S28	18-75 VDC	28 VDC	0 mA	7.14 A	50 mA	4.68 A	89	100-2200μF
CHB200W-48S48	18-75 VDC	48 VDC	0 mA	4.2 A	50 mA	4.83 A	87	47-2200μF

NOTE:

1. Nominal input voltage 24, 48VDC.
2. Measured at nominal input voltage.
3. The output terminal of models required a minimum capacitor to maintain specified regulation.
4. The input terminal recommend to parallel with 470uF for 24V_{in} ,47uF for 48V_{in} models to reduce the input ripple voltage.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Mounting Inserts
CHB200W-	II	O	XX	L	-Y (Option)
CHB200W	24：24 VDC 48：48 VDC	S：Single	3V3：3.3VDC 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:

CHB200W-48S12N-C: Half Brick, 200W, 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	10 18	24 48	36 75	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold		24Vin 48Vin	9.2 16	9.6 17	10 18	V_{dc}
Turn-Off Voltage Threshold		24Vin 48Vin	8.4 15	8.8 16	9.2 17	V_{dc}
Lockout Hysteresis Voltage		24Vin 48Vin		0.8 1		V_{dc}
Maximum Input Current	V_{in}=10V, Full load	24S3V3 24S12 Others		18 27 26		A
	V_{in}=18V, Full load	48S12 Others		13.5 13		
No-Load Input Current	V_{in}=24, 48V, I_o=0A	See Model Number Table				mA
Input Filter	Pi Filter	All				
Inrush Current (I^2t)	As per ETS300 132-2	All			0.5	A^2s

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	5Hz to 20MHz bandwidth, Full load, 10uF tantalum and 1.0uF ceramic capacitors (48V: 10uF aluminum and 1uF ceramic capacitor across output)	3.3&5Vo 12&15Vo 24Vo 28Vo 48Vo			100 150 240 280 480	mV
RMS		3.3&5Vo 12&15Vo 24&28Vo 48Vo			40 60 100 150	

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Current Range	V_{in}= 10 to 36V, 18 to 75V	See Model Number Table				A
Over Current Protection	Hiccup mode. Auto recovery	All	110	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}=10-10.8V for 24S28 V_{in}=18-19V for 48S28 I_{out}=max. rated current	XXS28	-10		0	%
	V_{in}=10.8-36V, P_{out}=max. rated power I_{out}=max. rated current V_{in}=19-75V, P_{out}=max. rated power I_{out}=max. rated current	24S28 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	V_{in}=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 di/dt=0.1A/us (within 1% $V_{out\ nominal}$)	24S3V3 48S3V3 Others			±7 ±6 ±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			75	ms
Turn-On Delay Time, From Input	$V_{in\_min.}$ to 10%V_{o_set}, Power up	All			250	ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All			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 1 Minute; input to case 1 Minute; output to case	All			1500 1500 1500	V_{dc}
Isolation Resistance	Input to output	All	10			MΩ
Isolation Capacitance	Input to output Input to case Output to case	All		2000 NC NC		pF

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	All		250		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		10	15	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		90		
		48SXX		85		

GENERAL SPECIFICATIONS

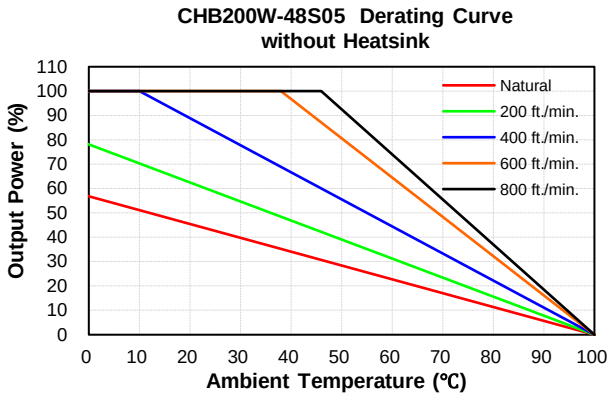
PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100% of $I_{o\_max.}$; MIL-HDBK - 217F_Notice 1, GB, 25℃	All		600		K hours
Weight		All		114		grams
Case Material	Plastic, DAP, UL 94V-0					
Base plate Material	Aluminum					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: 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					

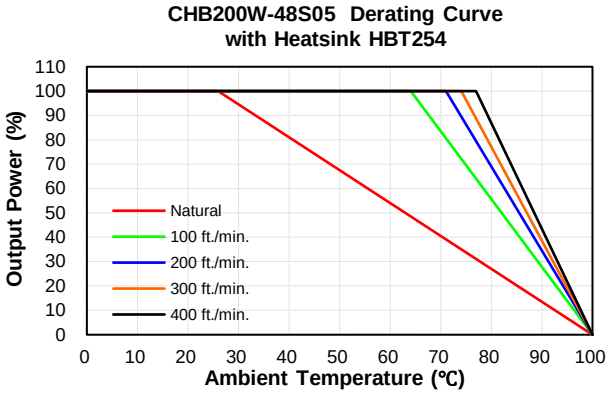
EMC SPECIFICATIONS (External components required, please refer to application note.)

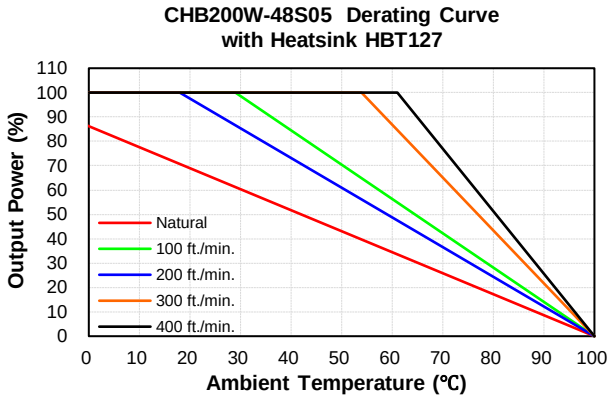
EMI	Meets EN 55032 (with external filter)	Class A
ESD	EN 61000-4-2 Level 3: Air ±8kV, Contact ±6kV	Perf. Criteria A
Radiated immunity	EN 61000-4-3 Level 2: 80~1000MHz, 3V/m	Perf. Criteria A
Fast Transient	EN 61000-4-4 Level 3: On power input port, ±2kV, external input capacitor required	Perf. Criteria 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		CHB200W Series App Notes
Packaging Information Link		Packaging Information

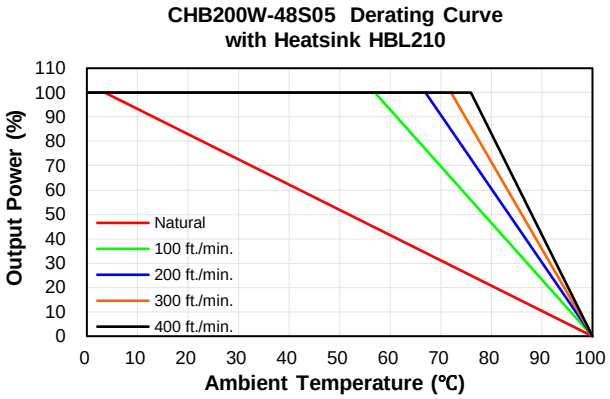
CHARACTERISTIC CURVE

Power Derating Curve









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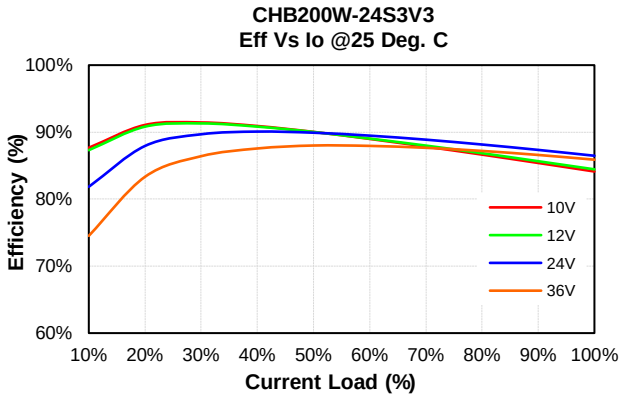
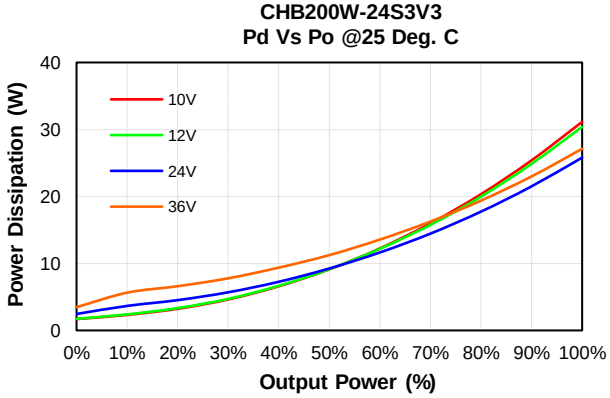
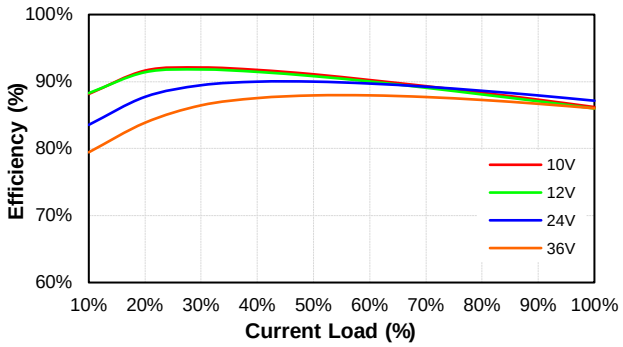




CHB200W-24S05
Eff Vs Io @25 Deg. C



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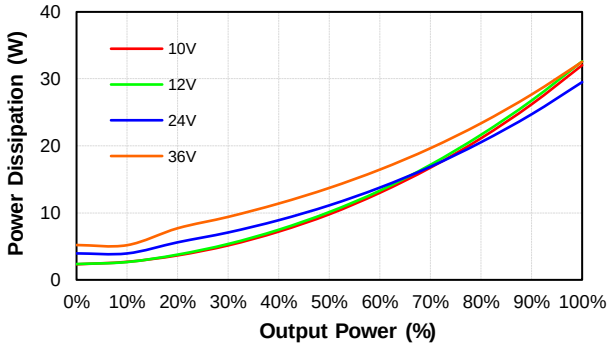

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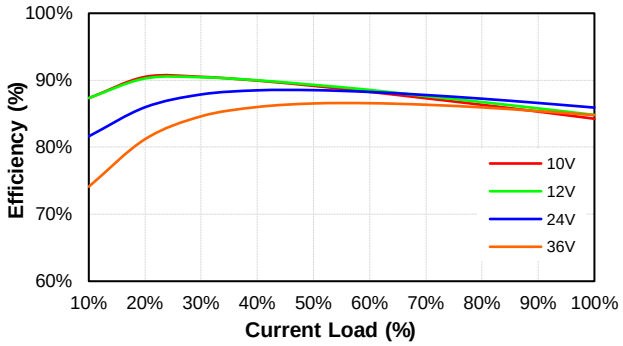

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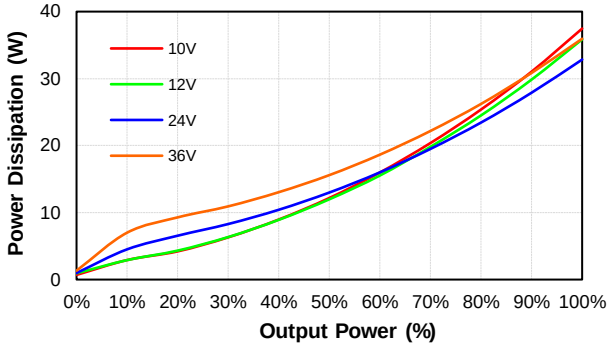

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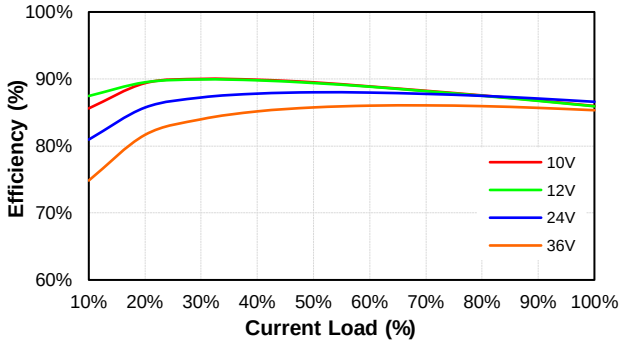

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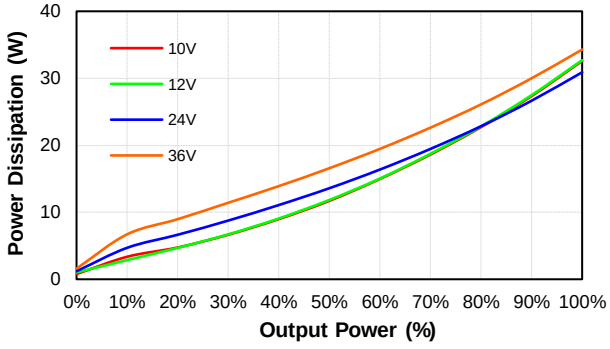

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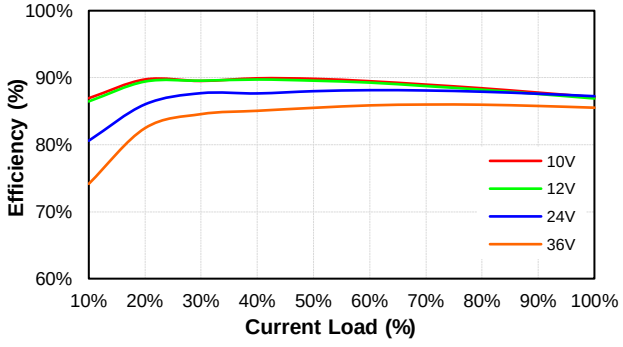

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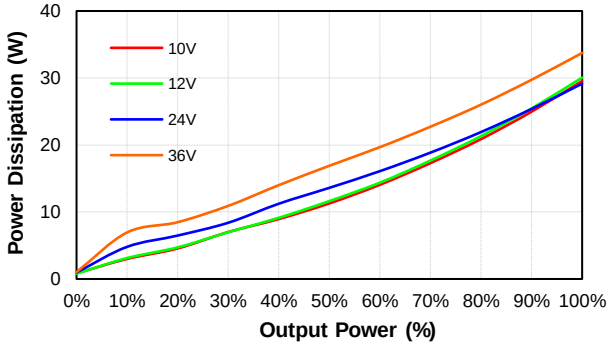

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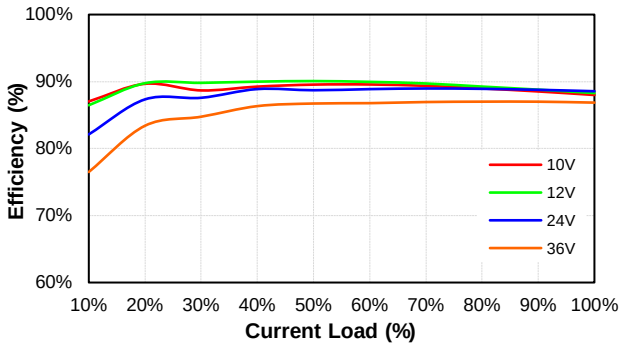

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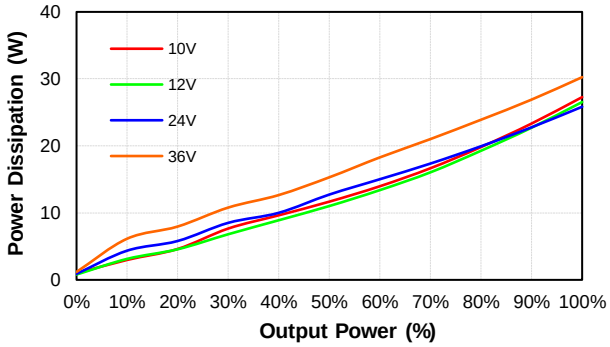

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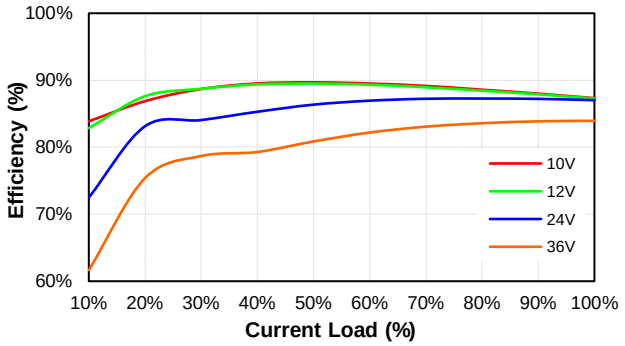

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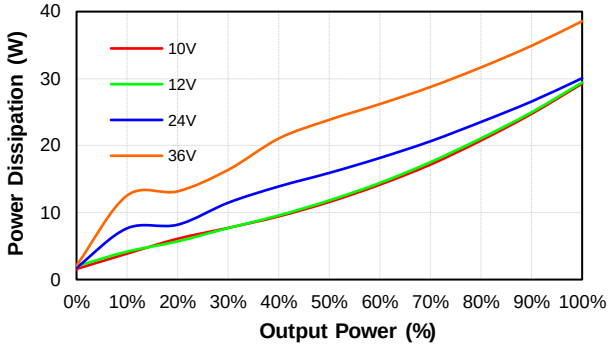

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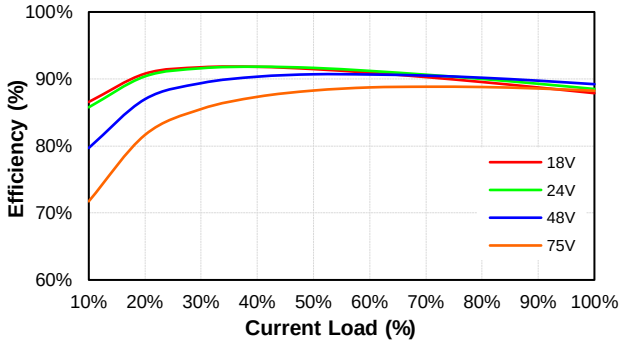

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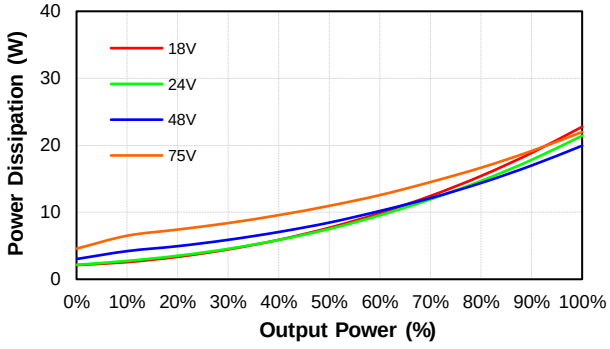

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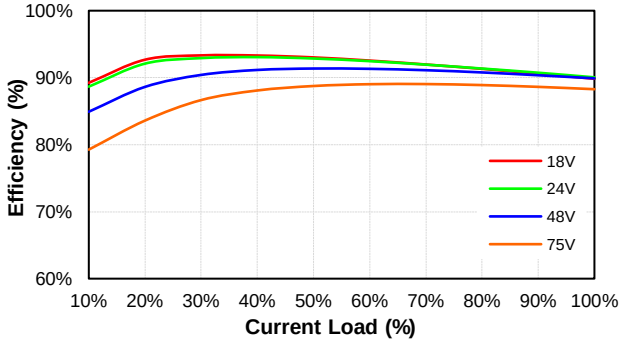

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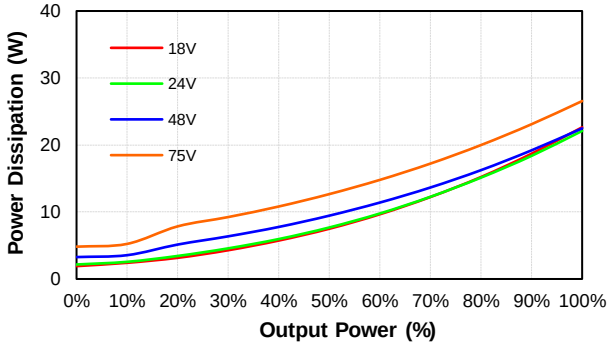

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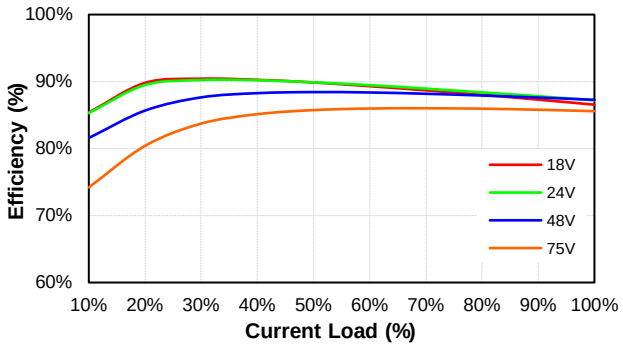

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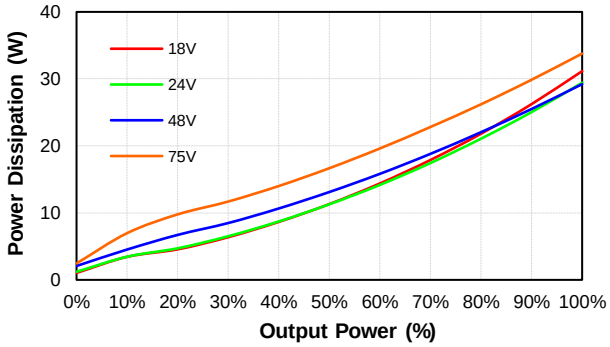

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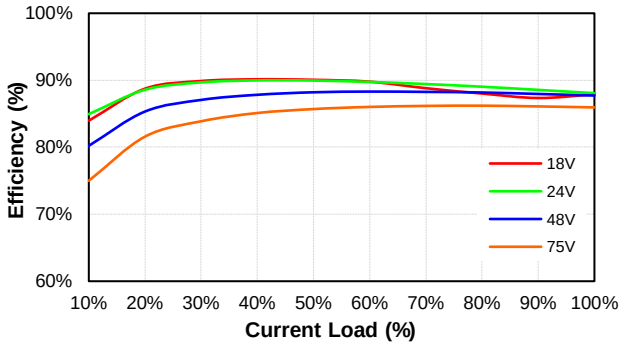

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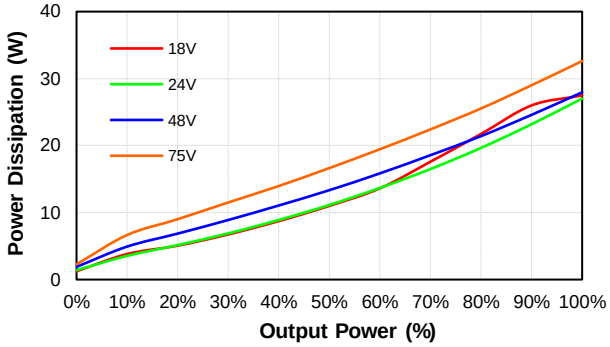

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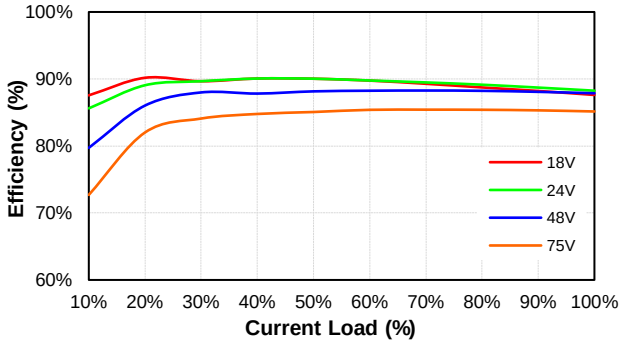

CHB200W-48S24
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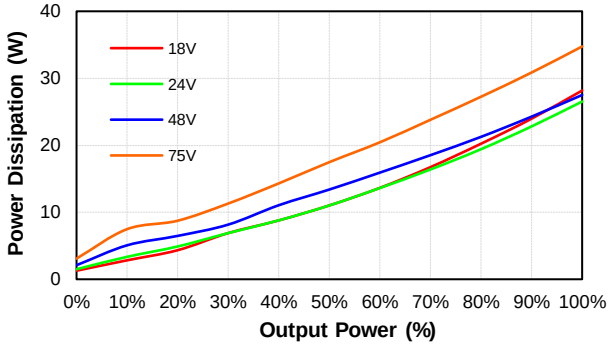

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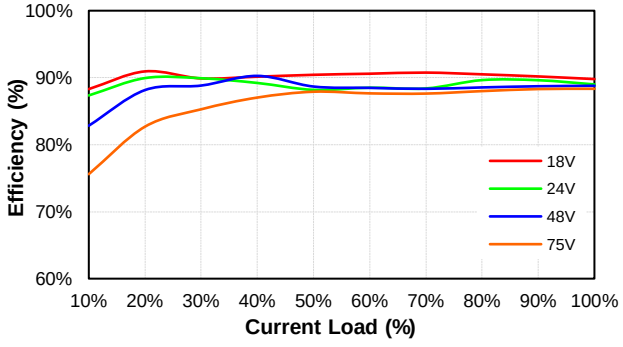

CHB200W-48S28
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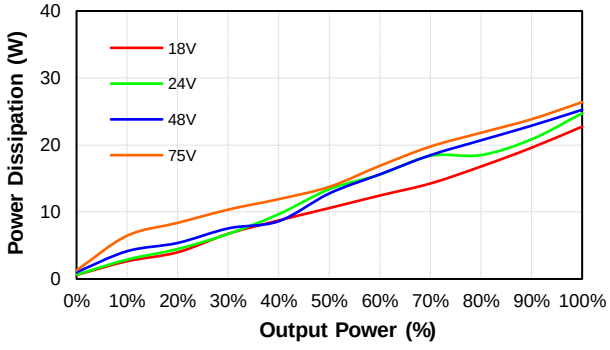

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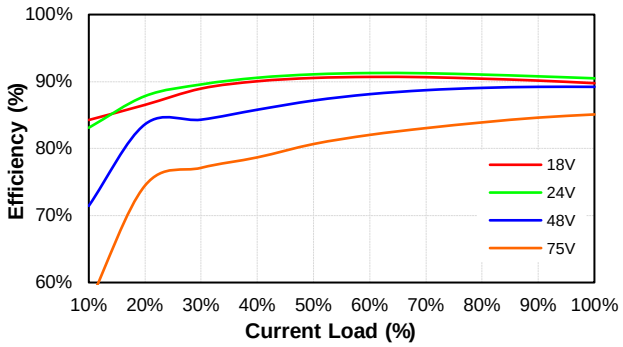
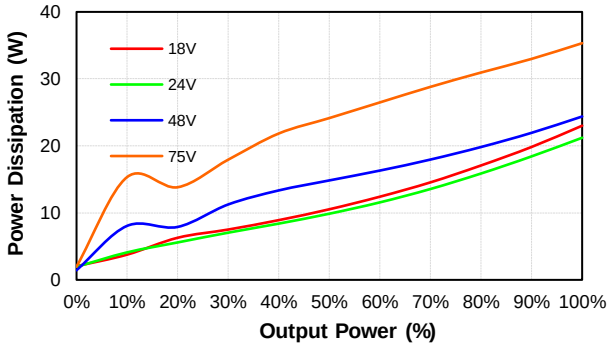
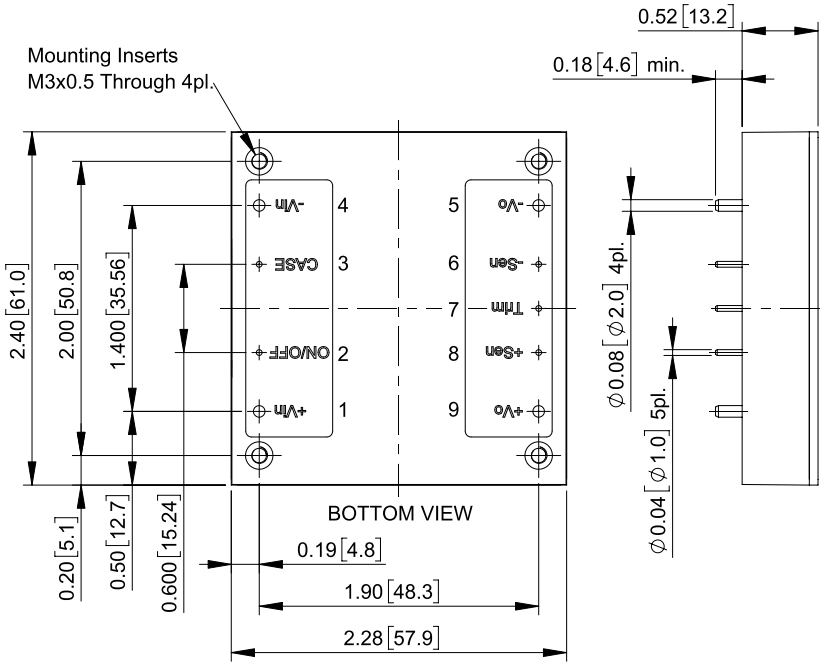


CHB200W-48S48
Pd Vs Po @25 Deg. C



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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