



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°C
- Half Brick Size Meet Industrial Standard
2.28"x2.40"x0.5"
- IEC/EN/UL 62368-1 Approval
- Shock & Vibration MIL-STD-810F Compliant



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	220-4700uF
CHB300W-24S28	9-36 VDC	28 VDC	0 mA	10.7 A	80 mA	14.12 A	88.5	88.5	220-4700uF
CHB300W-24S48	9-36 VDC	48 VDC	0 mA	6.25 A	100 mA	14.20 A	88	88	220-2200uF
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	0-4700uF
CHB300W-48S28	18-75 VDC	28 VDC	0 mA	10.7 A	60 mA	6.94 A	91	89.5	0-4700uF
CHB300W-48S48	18-75 VDC	48 VDC	0 mA	6.25 A	80 mA	7.02 A	90	89	220-2200uF

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



CHB300W Series

TECHNICAL SPECIFICATIONS

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

ABSOLUTE MAXIMUM RATINGS

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

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24Vin	9	24	36	V _{dc}
		48Vin	18	48	75	
Input Under Voltage Lockout						
Turn-On Voltage Threshold		24Vin	8	8.8	9	V _{dc}
		48Vin	16	17	18	
Turn-Off Voltage Threshold		24Vin	7	8.0	8.5	V _{dc}
		48Vin	15	16	17	
Lockout Hysteresis Voltage		24Vin	0.8			V _{dc}
		48Vin	1			
Maximum Input Current	V _{in} =9V, Full load.	24Vin	40			A
	V _{in} =18V, Full load	48Vin	19			
No-Load Input Current	V _{in} =24, 48V, I _o =0A	See Model Number Table				mA
Input Filter	LC filter	24SXX 48S15				
	Pi Filter	Others				
Inrush Current (I ² t)	As per ETS300 132-2	All	1			A ² s
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°C	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°C to 100°C	All			±0.03	%/°C
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			100	mV
		12Vo			120	
		15Vo			200	
		24&28Vo			280	
		48Vo			480	
RMS		5Vo			40	
		12Vo			60	
		15Vo			80	
		24&28Vo			100	
		48Vo			200	



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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				μF
Output Voltage Trim Range	$V_{in} = 18-23V$ $I_{out} = \text{max. rated current}$	48S28	-10		0	%
	$V_{in} = 23-75V$, $P_{out} = \text{max. rated power}$ $I_{out} = \text{max. rated current}$	48S28	-10		-10	
	$P_o \leq \text{max. rated power}$, $I_o \leq I_{o_max}$	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 $dI/dt = 0.1A/\mu s$ (within 1% V_{out} nominal)	All			± 5	%
Recovery Time		All			500	μs
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 1 Minute; input to case 1 Minute; output to case	All			1500 1500 1500	V_{dc}
Isolation Resistance	Input to output	All	10			$M\Omega$
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		220		KHz
On/Off Control, Positive Remote On/Off Logic, Refer to $-V_{in}$ 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 $I_{on/off} = 0.0\mu A$, Pin open=On	All	3.5		75	V
On/Off Control, Negative Remote On/Off Logic, Refer to $-V_{in}$ Pin						
Logic High (Module Off)	$V_{on/off}$ at $I_{on/off} = 0.0\mu A$, 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



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PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Temperature Shutdown	Temperature at the center part of case, non-latching	All		110		°C
Over Temperature Recovery		24SXX		90		°C
		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°C	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 ± 8 kV, Contact ± 6 kV	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, ± 2 kV, external input capacitor required	Perf. Criteria A
Surge	EN 61000-4-5	Level 3: Line to earth, ± 2 kV, Line to line, ± 1 kV	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

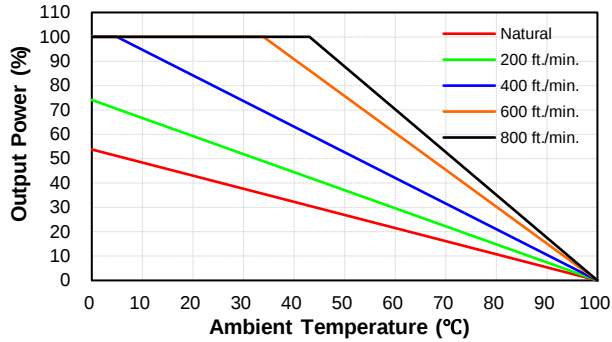


CHB300W Series

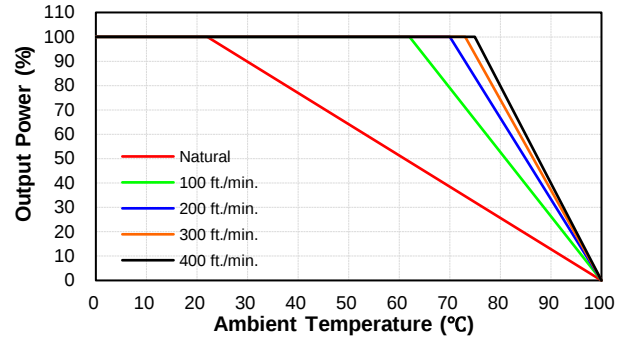
CHARACTERISTIC CURVE

Power Derating Curve

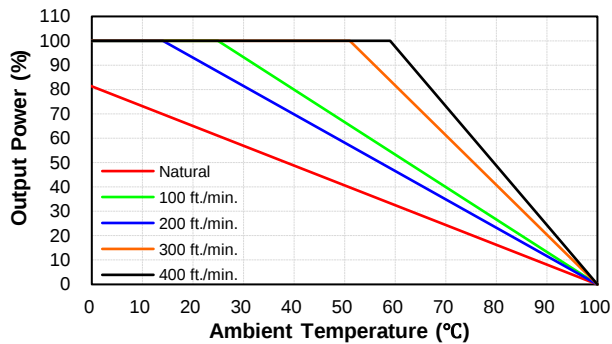
CHB300W Derating Curve
without Heatsink



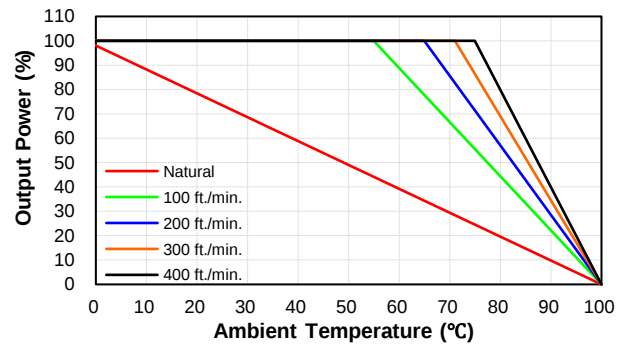
CHB300W Derating Curve
with Heatsink HBT254



CHB300W Derating Curve
with Heatsink HBT127

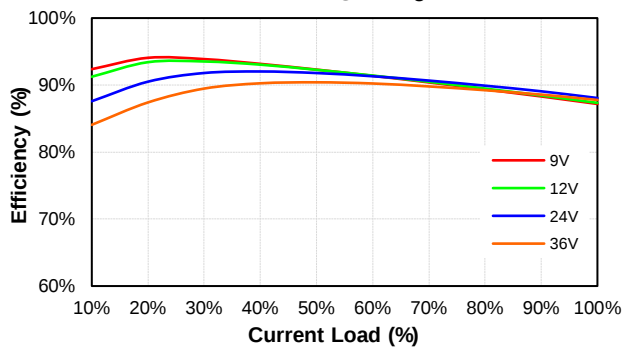


CHB300W Derating Curve
with Heatsink HBL210

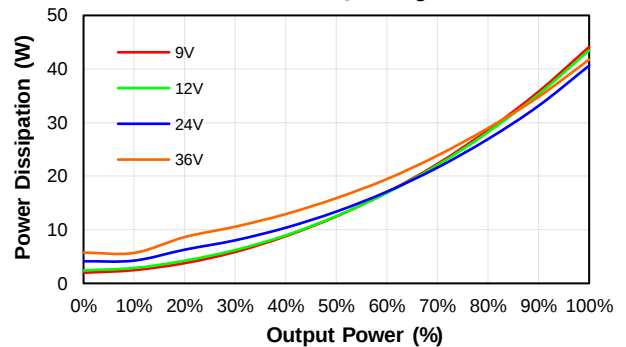


Performance Data

CHB300W-24S05
Eff Vs Io @ 25 Deg. C



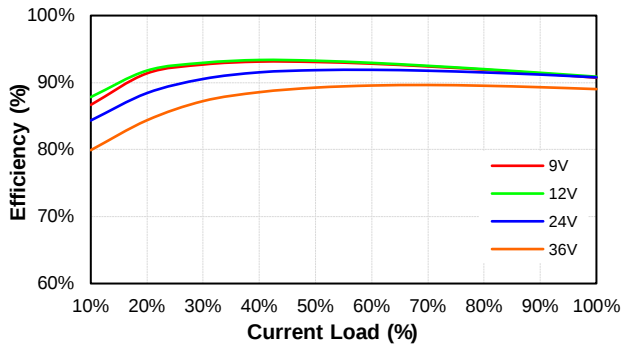
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Pd Vs Po @ 25 Deg. C



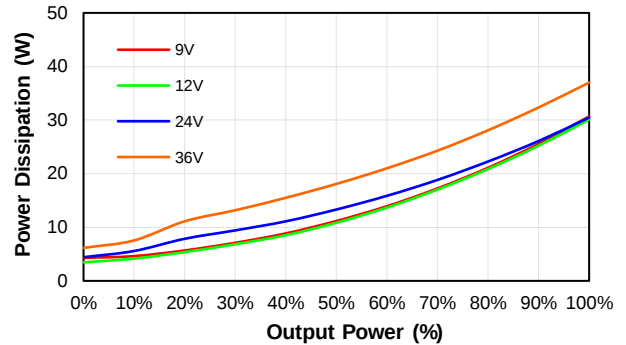


CHB300W Series

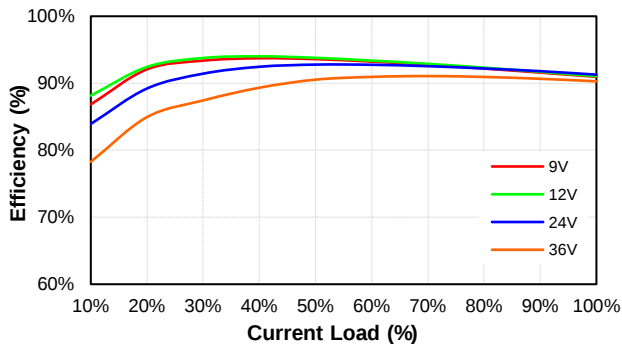
CHB300W-24S12
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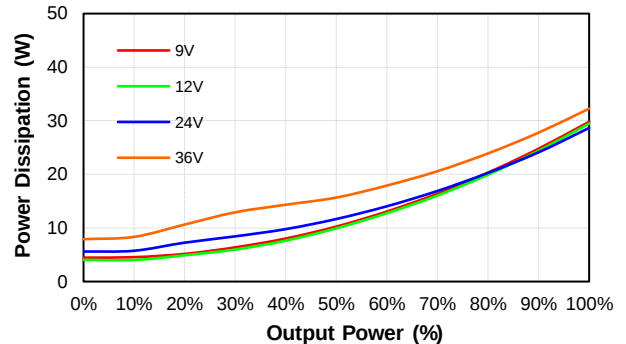
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Pd Vs Po @25 Deg. C



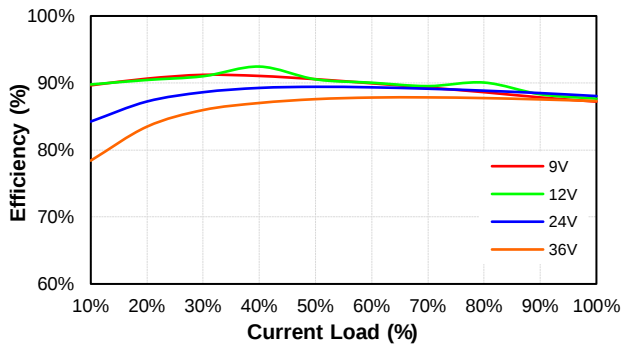
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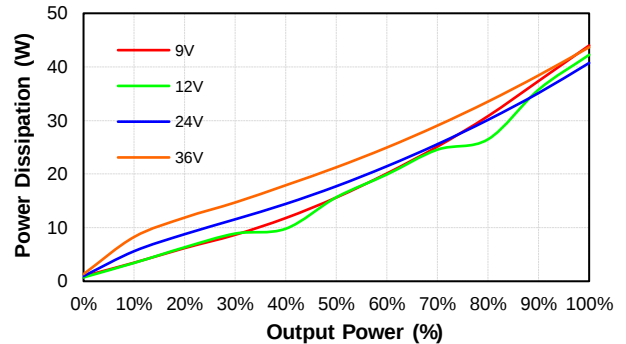
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Pd Vs Po @25 Deg. C



CHB300W-24S24
Eff Vs Io @25 Deg. C



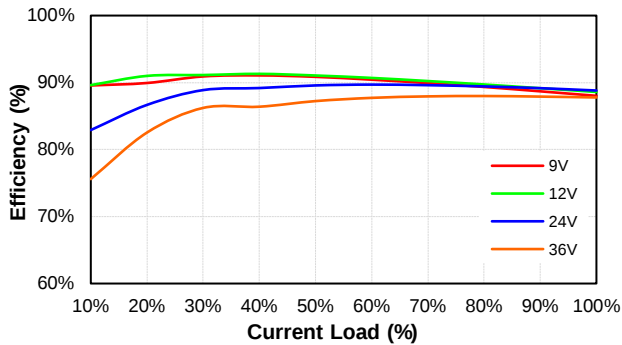
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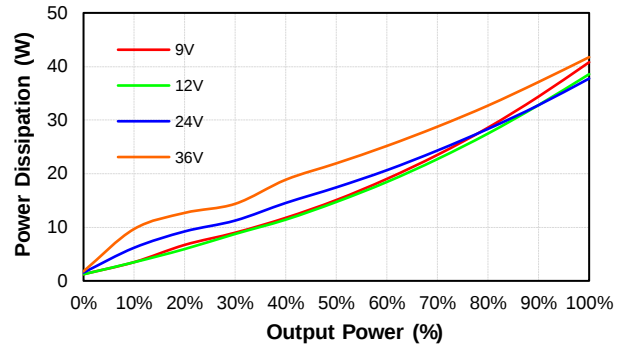


CHB300W Series

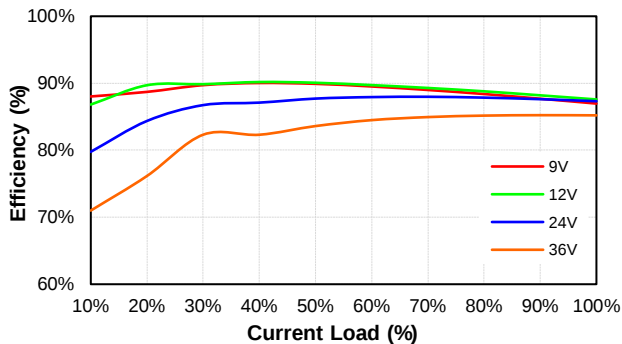
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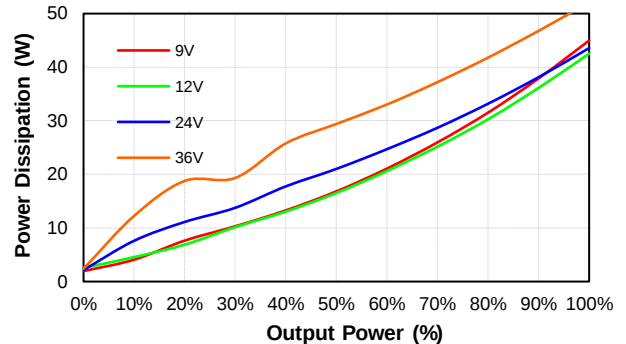
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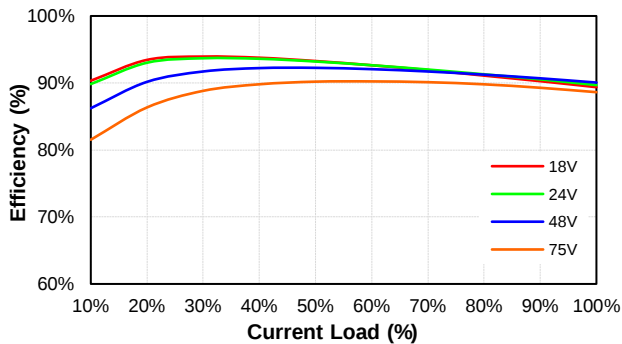
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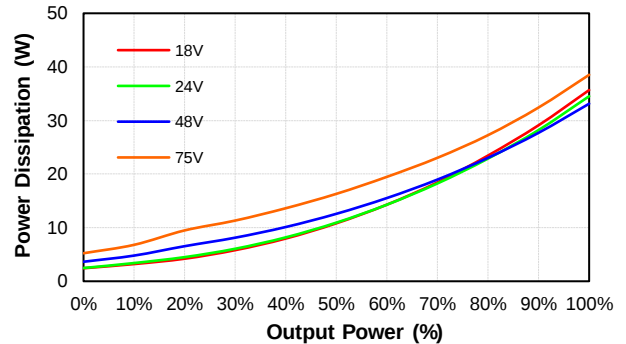
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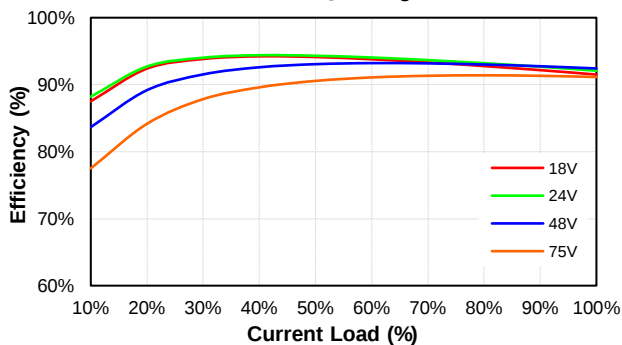
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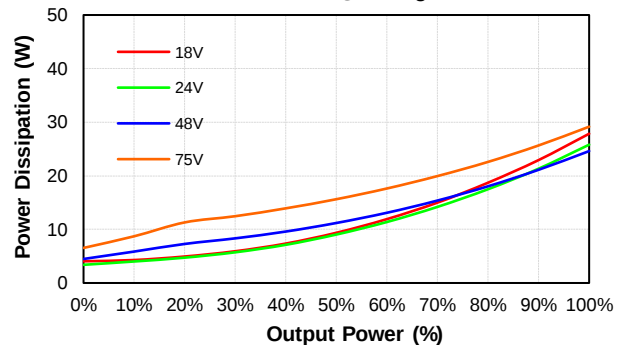
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CHB300W-48S12
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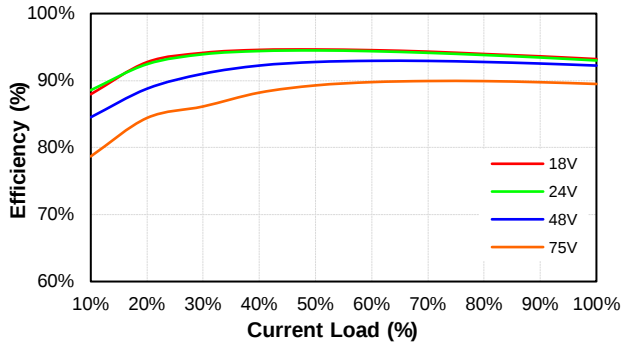
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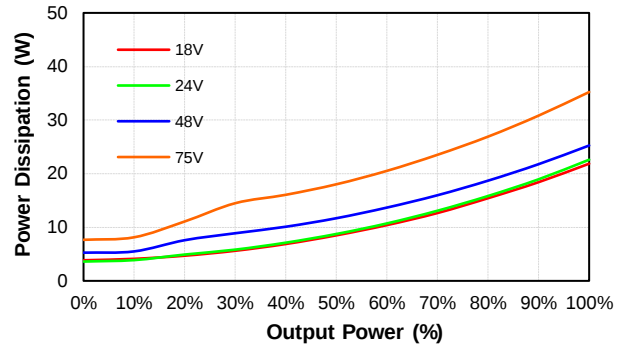


CHB300W Series

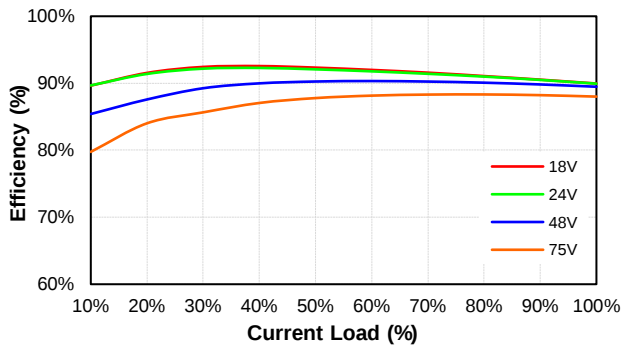
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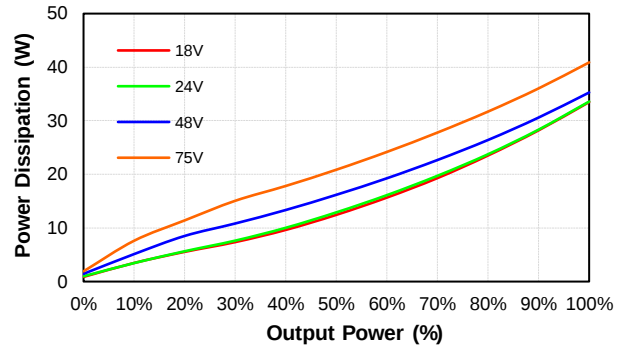
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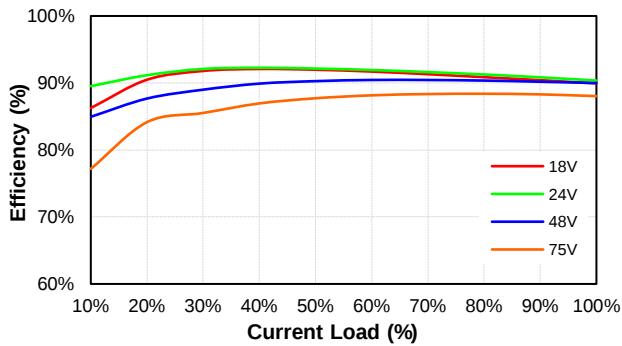
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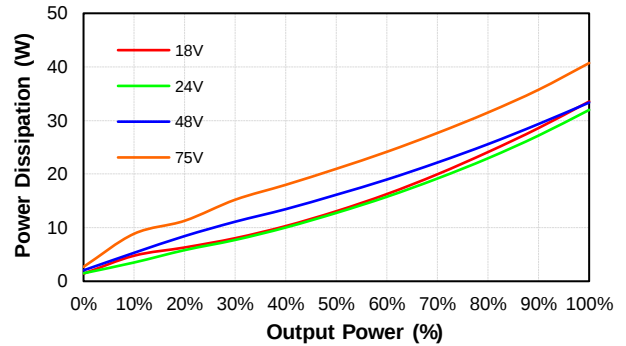
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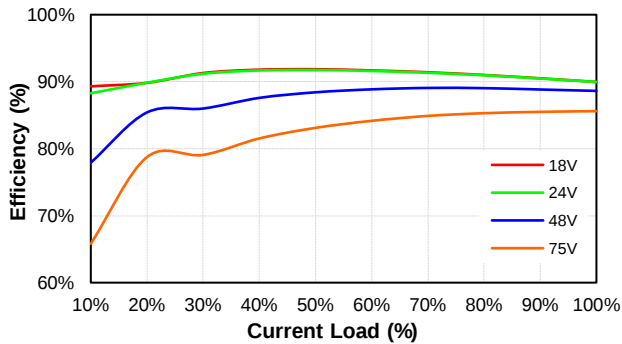
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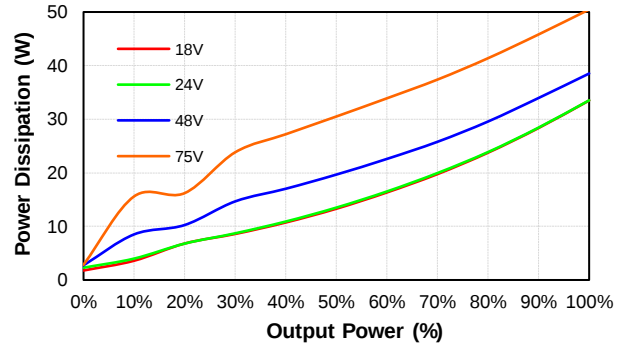
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CHB300W-48S48
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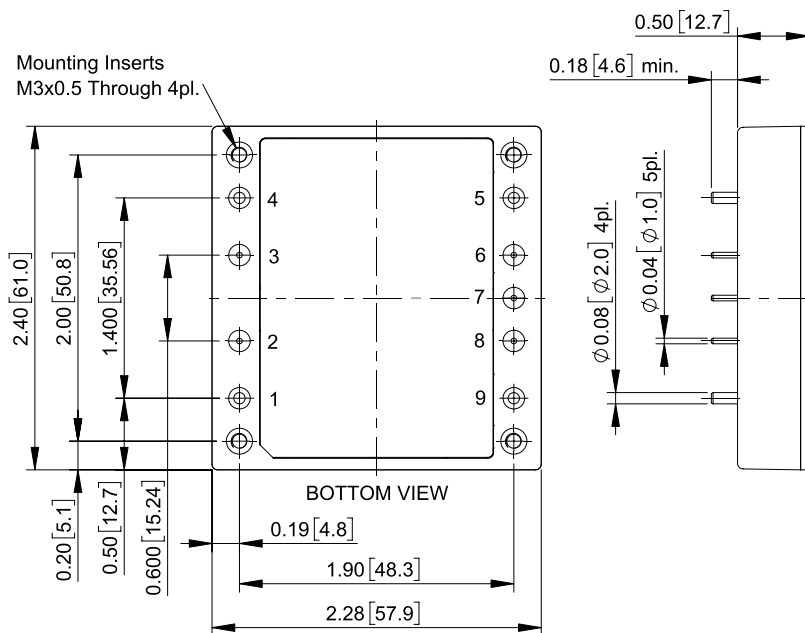
CHB300W-48S48
Pd Vs Po @25 Deg. C





CHB300W Series

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 $\phi 0.04 \pm 0.004$ Inch [$\phi 1.0 \pm 0.1$ mm]

Pin Size is $\phi 0.08 \pm 0.004$ Inch [$\phi 2.0 \pm 0.1$ mm]