CEB100W SERIES
100 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 93.5%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Fully Protected (OTP/OCP/OVP/UVLO)
- 3000Vdc I/O Isolation
- Operating Case Temperature -40 to +105℃
- Eighth Brick Size Meet Industrial Standard 2.45"x1.05"x0.5"
- CB Test Certificate IEC 62368-1
- UL 62368-1 (Basic Insulation) Approval
- Shock & Vibration MIL-STD-810F/EN 61373 Compliant
- Fire & Smoke EN 45545-2 Compliant
- 5000m Operating Altitude



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(3)	(2)	
CEB100W-24S05	9-40 VDC	5 VDC	0 mA	20 A	125 mA	4735 mA	92	91	20000uF
CEB100W-24S12	9-40 VDC	12 VDC	0 mA	8.3 A	125 mA	4663 mA	92.5	90.5	8300μF
CEB100W-24S24	9-40 VDC	24 VDC	0 mA	4.2 A	125 mA	4667 mA	90.5	90	4200uF
CEB100W-24S48	9-40 VDC	48 VDC	0 mA	2.1 A	125 mA	4625 mA	90.5	90.5	1000uF
CEB100W-24S54	9-40 VDC	54 VDC	0 mA	1.85 A	125 mA	4574 mA	91	91	1000uF
CEB100W-48S05	16.5-74 VDC	5 VDC	0 mA	20 A	80 mA	2252 mA	93.5	92.5	20000uF
CEB100W-48S12	16.5-74 VDC	12 VDC	0 mA	8.3 A	80 mA	2255 mA	93	92	8300μF
CEB100W-48S24	16.5-74 VDC	24 VDC	0 mA	4.2 A	80 mA	2320 mA	91	90.5	4200uF
CEB100W-48S48	16.5-74 VDC	48 VDC	0 mA	2.1 A	80 mA	2308 mA	91	91	1000uF
CEB100W-48S54	16.5-74 VDC	54 VDC	0 mA	1.85 A	80 mA	2287 mA	91.5	91	1000uF

NOTE:

1. Nominal Input Voltage 24, 48VDC.
2. Measured at Nominal Input Voltage.
3. Measured at 12VDC for 24Vin, 24VDC for 48Vin.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Mounting Inserts	Operating Case Temp. Range
CEB100W-	II	O	XX	L	-Y (Option)	-Z (Option)
CEB100W	24：24 VDC 48：48 VDC	S：Single	05：5.0VDC 12：12VDC 24：24 VDC 48：48VDC 54：54VDC	None：Positive N：Negative	-F：Flanged Baseplate with M2.5 mounting insert	None：-40~105℃

Part Number Example:

CEB100W-48S12N: Eighth Brick, 100W, 4:1 16.5-74Vdc Input, Single 12Vdc Output, Negative Logic, -40~105℃ Operating Case Temp. Range

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		40 75	V_{dc}
Input Surge Voltage	100ms max.	24Vin 48Vin			50 100	V_{dc}
Operating Ambient Temperature	At the center part of case plate (with derating)	All	-40		105	℃
Maximum Case Temperature		All			110	℃
Storage Temperature		All	-55		125	℃

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Input Voltage		24Vin 48Vin	9 16.5	24 48	40 75	V_{dc}
Input Under Voltage Lockout						
Turn-On Voltage Threshold		24Vin 48Vin	8 15.7	8.5 16	8.8 16.3	V_{dc}
Turn-Off Voltage Threshold		24Vin 48Vin	7.7 14.7	8 15	8.3 15.3	V_{dc}
Lockout Hysteresis Voltage		24Vin 48Vin		0.6 1		V_{dc}
Maximum Input Current	V_{in}=9V, Full load. V_{in}=16.5V, Full load	24Vin 48Vin		13.5 6.8		A
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			0.1	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 105℃	All			±0.02	%/℃
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 10uF polymer and 1.0uF ceramic capacitors	5Vo 12Vo 24Vo 48Vo 54Vo			100 150 240 480 480	mV
RMS		5Vo 12Vo 24Vo 48Vo 54Vo			40 60 100 200 200	

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
Over Current Protection	Hiccup mode. Auto recovery	All	110	125	160	%
Over Voltage Protection	Limited voltage	5Vo	112		130	%
		12Vo	122		135	
		24Vo	122		135	
		48Vo	112		130	
		54Vo	106		115	
Short Circuit Protection		All	**Continuous, Auto Recovery**			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Output Voltage Trim Range	$P_o \leqq$ max. rated power, $I_o \leqq I_{o_max.}$	5Vo	-20		+10	%
		12Vo	-20		+20	
		24Vo	-20		+20	
		48Vo	-20		+10	
		54Vo	-20		+5	

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 d_i/d_t=0.1A/us (within 1% V_{out} nominal)	All			±5	%
Recovery Time		All			250	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		30		ms
Turn-On Delay Time, From Input	V_{in_min} to 10%V_{o_set}, Power up	All		30		ms
Output Voltage Rise Time	10%V_{o_set} to 90%V_{o_set}	All		30		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			3000	V_{dc}
	1 Minute; input to case				1600	
	1 Minute; output to case				1600	
Isolation Resistance	Input to output	All	1			GΩ
Isolation Capacitance	Input to output	All		1000		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	270	300	330	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		0.3	1	mA
Leakage Current (for Both Remote On/Off Logic)	Logic high, $V_{on/off}$=15V	All			30	uA

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Off Converter Input Current	Shutdown input idle current	All		5	10	mA
Over Temperature Shutdown	Temperature at the center part of case, non-latching	All		110		℃
Over Temperature Recovery		All		100		℃

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℃	05Vo 12Vo		1000		K hours
		24Vo 48Vo 54Vo		980		
Weight		All		49		grams
Case Material	Plastic, DAP, UL 94V-0					
Base plate Material	FR4					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: Nickel with Matte Tin					
Shock/Vibration	MIL-STD-810F/EN 61373 Compliant					
Humidity	95% RH max. Non condensing					
Altitude	5000m Operating altitude, 12000m Transport altitude					
Thermal Shock	MIL-STD-810F					
Fire & Smoke	EN 45545-2 Compliant					

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

EMI	Meets EN 55032, External Input Filter	Class A
ESD	EN 61000-4-2 Level 3: Air ±8kV, Contact ±6kV, external components required	Perf. Criteria A
Radiated Immunity	EN 61000-4-3 Level 3: 80~1000MHz, 20V/m, external components required	Perf. Criteria A
Fast Transient	EN 61000-4-4 Level 3: On power input port, ±2kV, external components required	Perf. Criteria A
Surge	EN 61000-4-5 Level 4: Line to earth, ±4kV, Line to line, ±2kV, external components required	Perf. Criteria A
Conducted Immunity	EN 61000-4-6 Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Application Note Link		CEB100W Series App Notes
Packaging Information Link		Packaging Information

Immunity to Environmental Conditions.

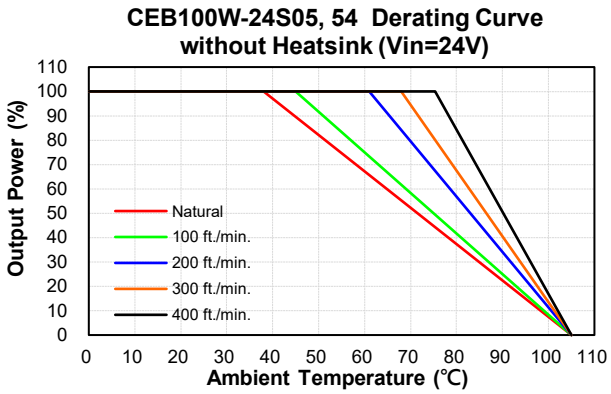
Phenomenon	EN 50155; 2017 Reference Clause(s)	Reference Standard	Test Conditions	Result
Low Temperature Start-up test	13.4.4	EN 60068-2-1	Class OT6 Temperature: -40℃ Duration: 2 hrs	Pass
Dry Heat Test	13.4.5	EN 60068-2-2	Class OT6 & ST2 Temperature: 85℃ Duration: 6 hrs Extended temperature: 100℃ Extended Duration: 10min	Pass
Low Temperature Storage Test	13.4.6	EN 60068-2-1	Temperature: -40℃ Duration: 16 hrs	Pass
Cyclic Damp Heat Test	13.4.7	EN 60068-2-30	Temperature: 25℃ - 55℃ Humidity: 90% RH Duration: 48 hrs	Pass
Random Vibration Test	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz Vertical: 1.01 m/s^2 Transverse: 0.450 m/s^2 Longitudinal: 0.700 m/s^2 Duration: 10 min / axis	Pass
Simulated Long Life Test at Increased Random Vibration Levels	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz Vertical: 5.72 m/s^2 Transverse: 2.55 m/s^2 Longitudinal: 3.96 m/s^2 Duration: 5 hrs / axis	Pass
Shock Test	13.4.11	EN 61373	Temperature: 25℃±10℃ Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz ±Vertical: 30 m/s^2 ±Transverse: 30 m/s^2 ±Longitudinal: 50 m/s^2 Duration: 30ms x18 (Each axis 3 shocks)	Pass

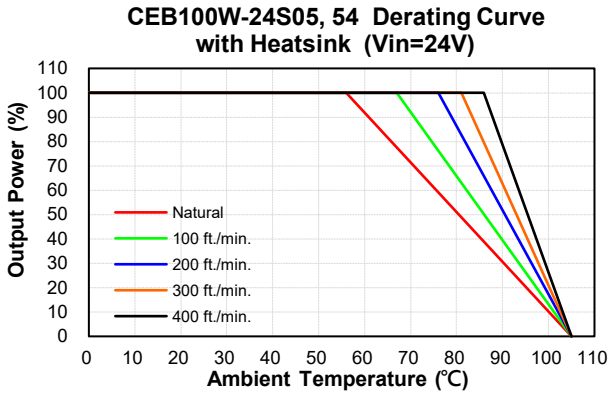
EN 45545-2 Fire & Smoke Test Conditions.

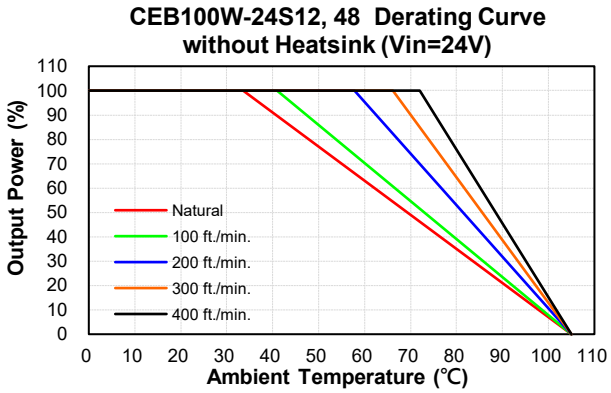
Item		Standard	Hazard Level
R22	Oxygen Index Test	EN 45545-2: 2013+A1:2015 EN ISO 4589-2: 2017	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013+A1:2015 EN ISO 5659-2: 2017	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013+A1:2015 NF X70-100-1&2: 2006	HL1, HL2, HL3
R23	Oxygen Index Test	EN 45545-2: 2013+A1:2015 EN ISO 4589-2: 2017	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013+A1:2015 EN ISO 5659-2: 2017	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013+A1:2015 NF X70-100-1&2: 2006	HL1, HL2, HL3
R24	Oxygen Index Test	EN45545-2: 2013 EN ISO 4589-2	HL1, HL2, HL3
R25	Glow - Wire Test	EN 45545-2: 2020+A1:2023 EN 60695-2-11:2014	HL1, HL2, HL3
R26	Vertical Flame Test	EN 45545-2: 2013+A1:2015 EN 60695-11-10: 2013	HL1, HL2, HL3

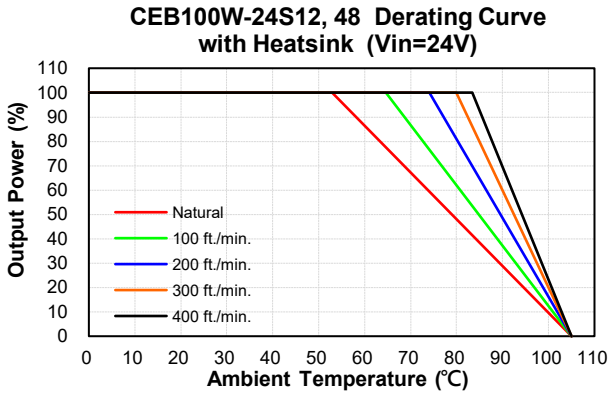
CHARACTERISTIC CURVE

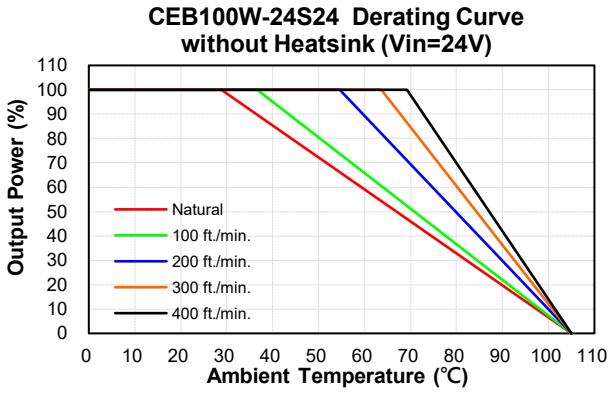
Power Derating Curve

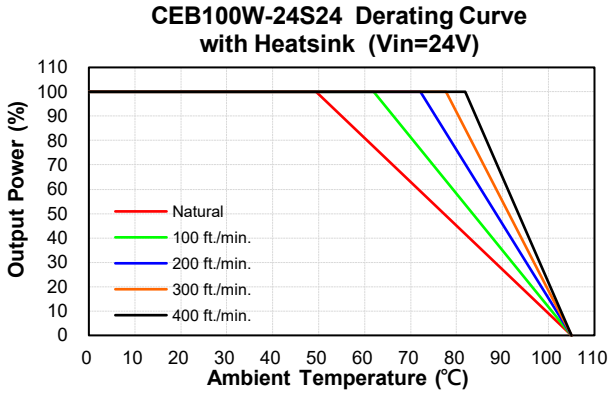




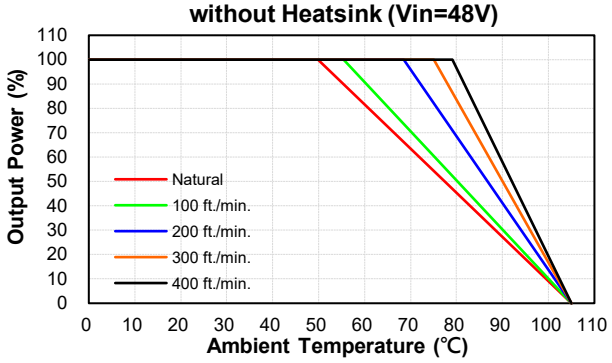








CEB100W-48S05 Derating Curve without Heatsink (Vin=48V)



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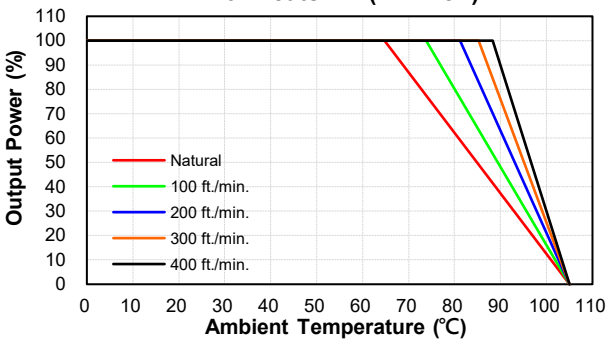

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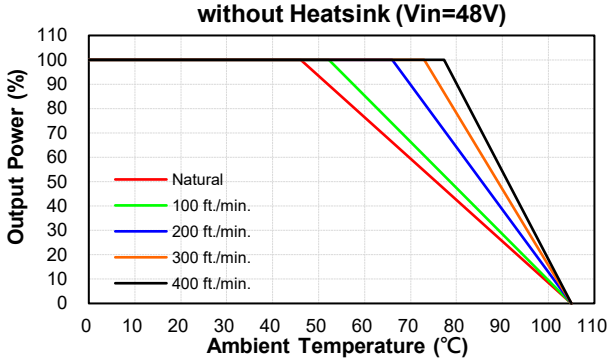
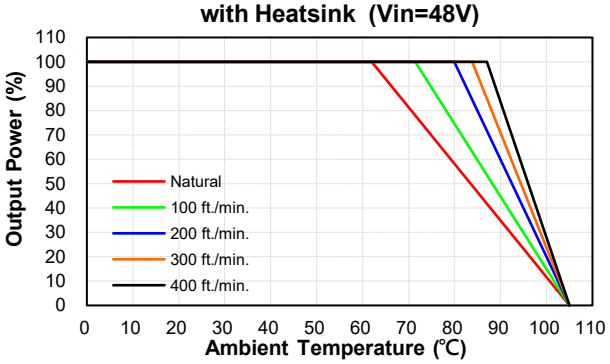
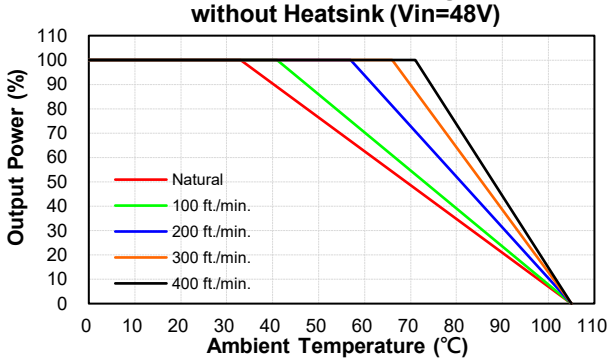


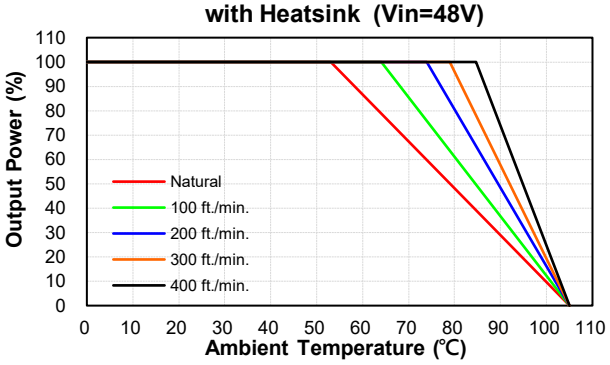
CEB100W-48S12 Derating Curve with Heatsink (Vin=48V)



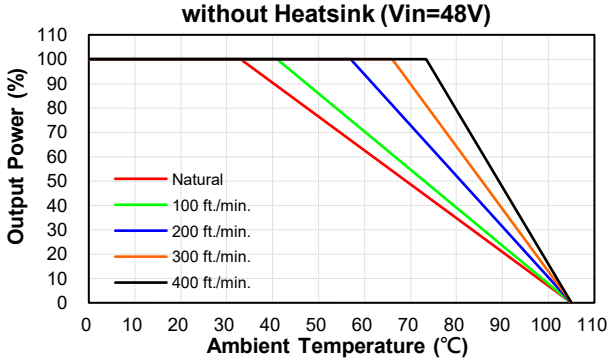
CEB100W-48S24 Derating Curve without Heatsink (Vin=48V)



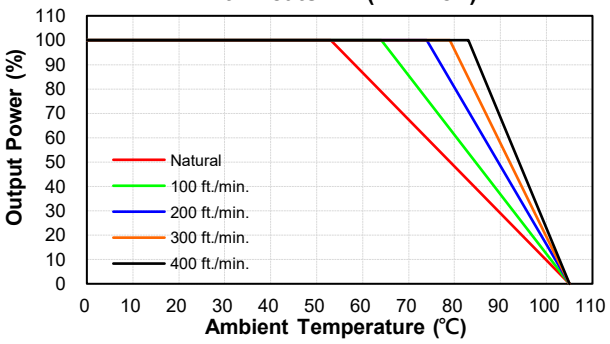
CEB100W-48S24 Derating Curve with Heatsink (Vin=48V)



CEB100W-48S48, 54 Derating Curve without Heatsink (Vin=48V)



CEB100W-48S48, 54 Derating Curve with Heatsink (Vin=48V)



Performance Data

CEB100W-24S05
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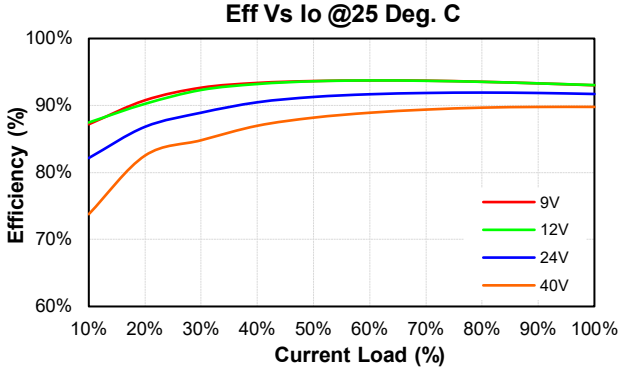

CEB100W-24S05
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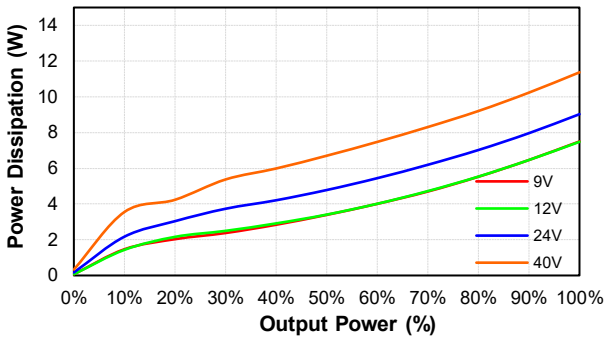

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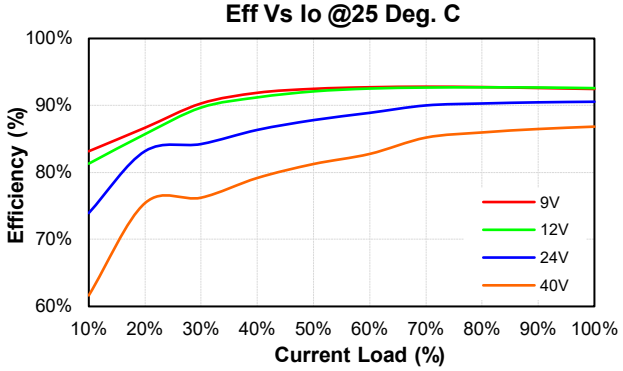

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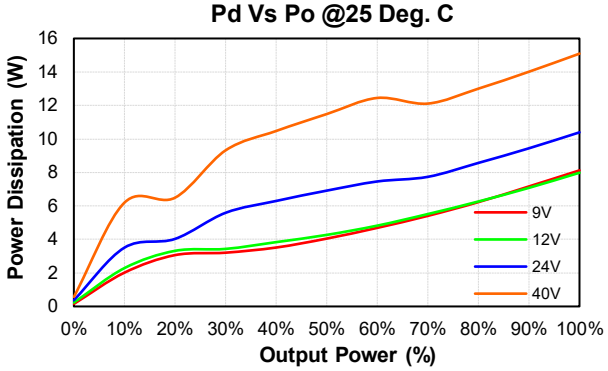

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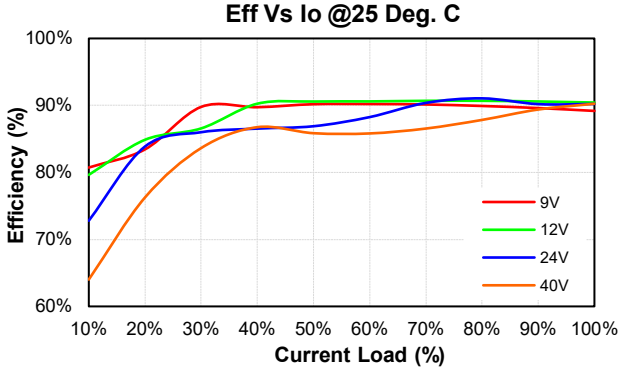

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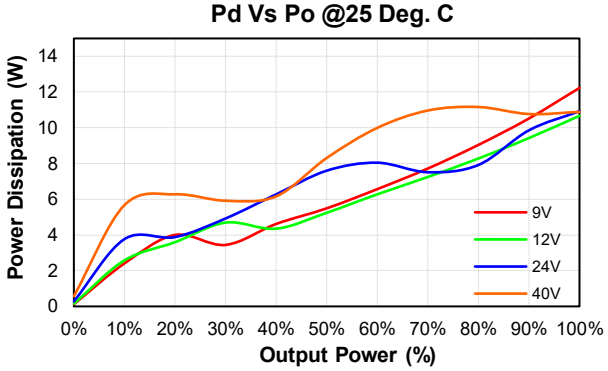

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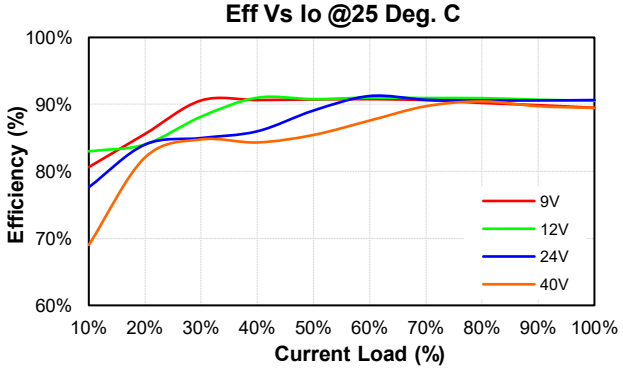
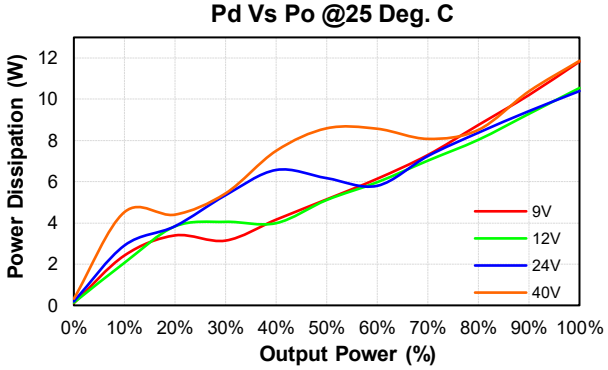
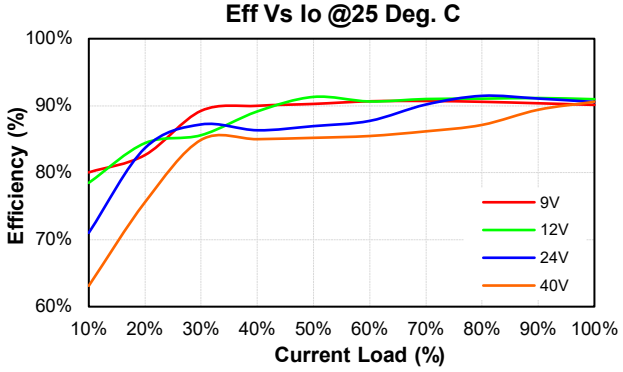


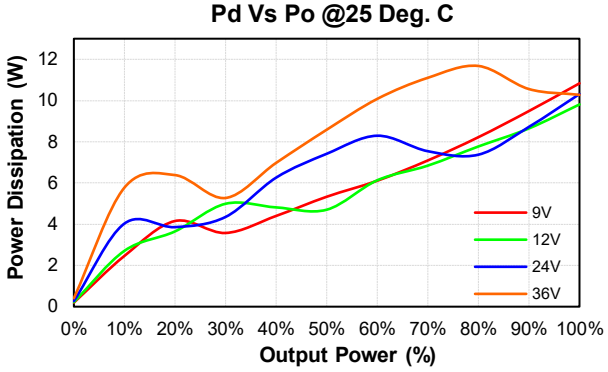
CEB100W-24S48
Pd Vs Po @25 Deg. C



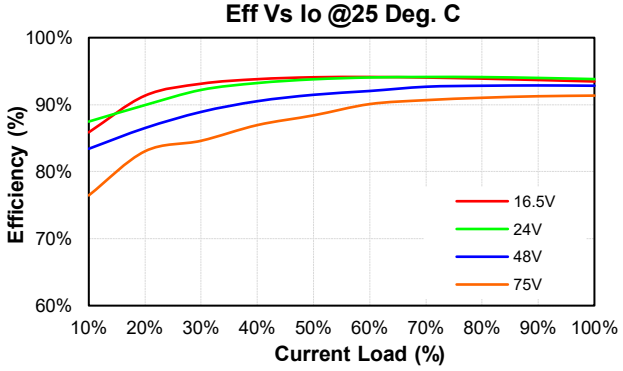
CEB100W-24S54
Eff Vs Io @25 Deg. C



CEB100W-24S54
Pd Vs Po @25 Deg. C



CEB100W-48S05
Eff Vs Io @25 Deg. C



CEB100W-48S05
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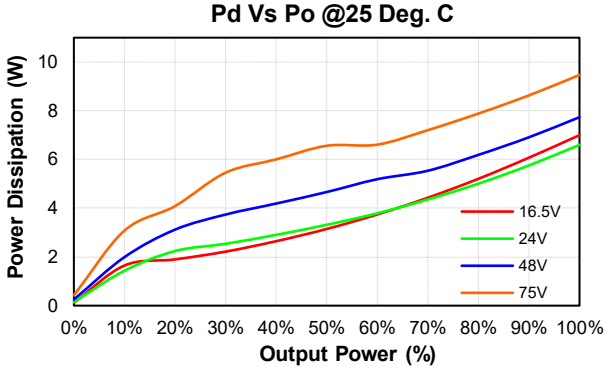
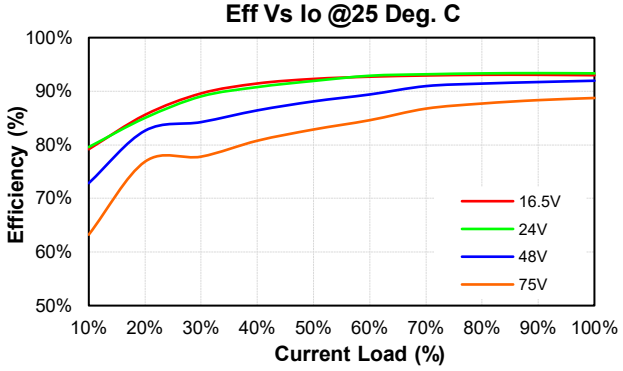
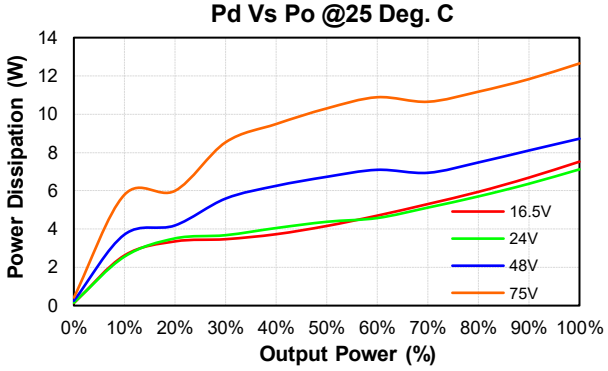


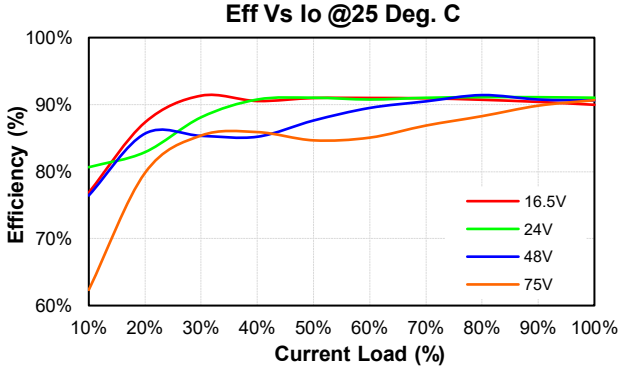
CEB100W-48S12
Eff Vs Io @25 Deg. C



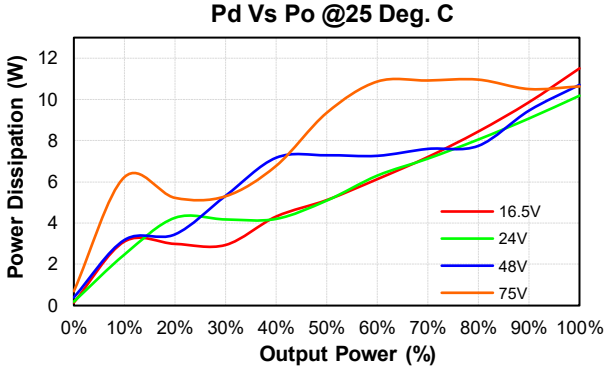
CEB100W-48S12
Pd Vs Po @25 Deg. C



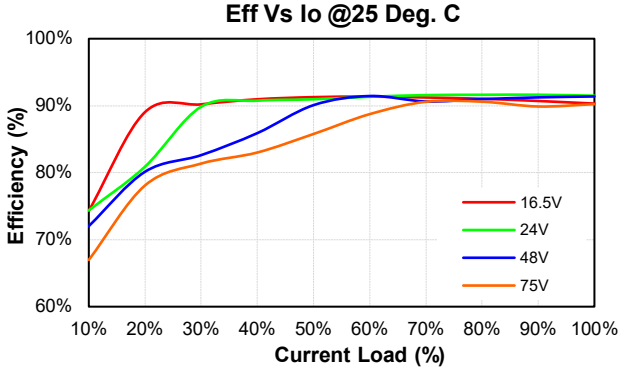
CEB100W-48S24
Eff Vs Io @25 Deg. C



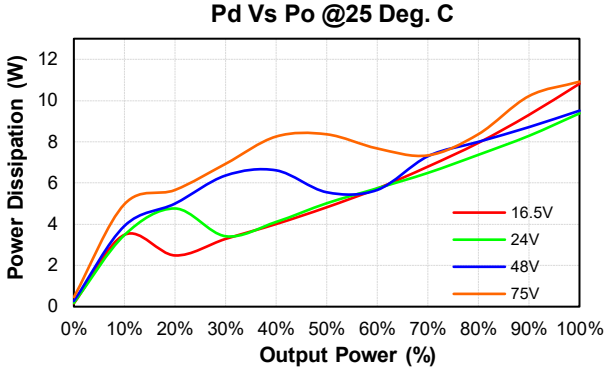
CEB100W-48S24
Pd Vs Po @25 Deg. C



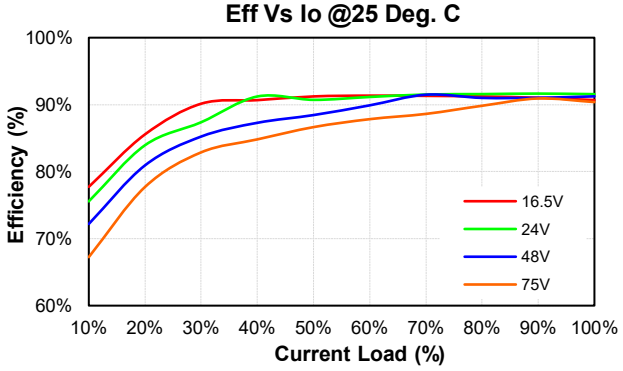
CEB100W-48S48
Eff Vs Io @25 Deg. C



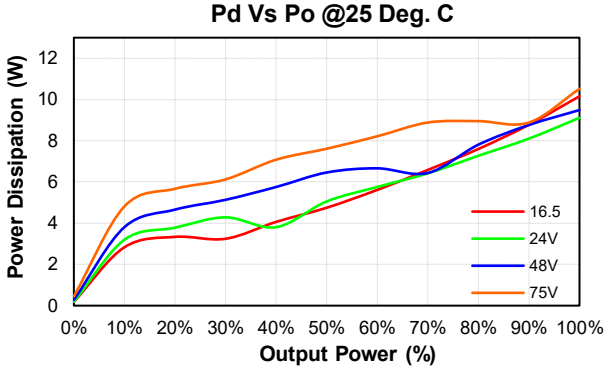
CEB100W-48S48
Pd Vs Po @25 Deg. C



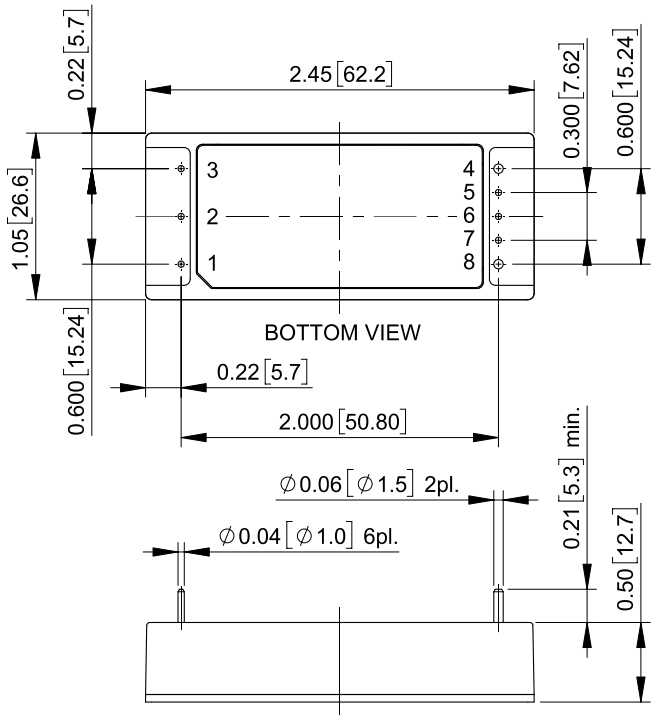
CEB100W-48S54
Eff Vs Io @25 Deg. C



CEB100W-48S54
Pd Vs Po @25 Deg. C



MECHANICAL SPECIFICATION



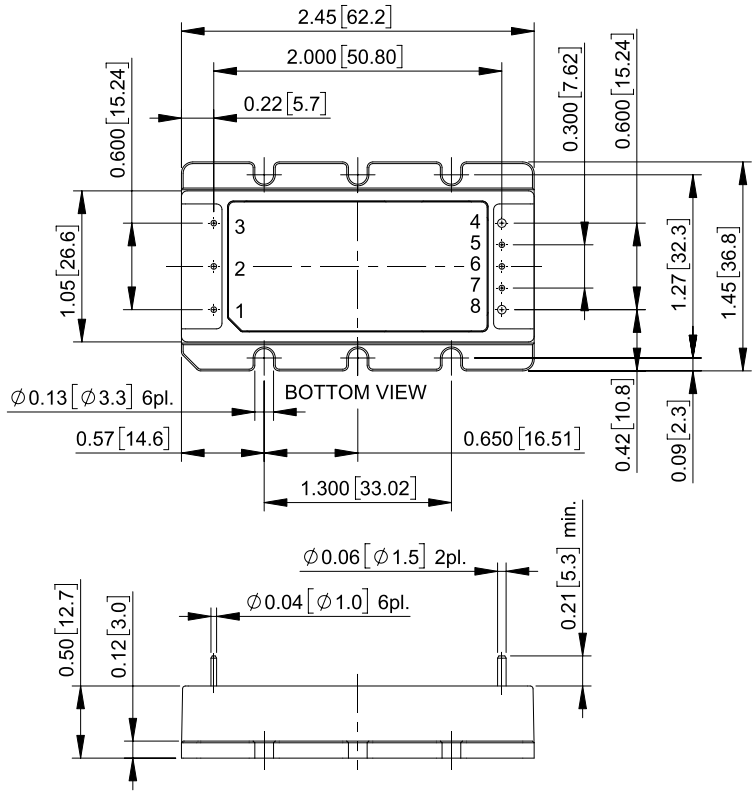
All Dimensions in Inches[mm]
Tolerance Inches: x.xx=±0.02, x.xxx=±0.010
Millimeters: x.x=±0.5, x.xx=±0.25

Pin Connection

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

Note:Pin Size is ∅0.04±0.004 Inch [∅1.0±0.1 mm]
Pin Size is ∅0.06±0.004 Inch [∅1.5±0.1 mm]

-F: Flanged Baseplate



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
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Note:Pin Size is ∅0.04±0.004 Inch [∅1.0±0.1 mm]
Pin Size is ∅0.06±0.004 Inch [∅1.5±0.1 mm]

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