



ECLB75W SERIES 75 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

Features

- Efficiency Up to 92.5%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Low No Load Power Consumption
- Fully Protected (OTP/OCP/OVP/UVLO)
- 2250Vdc I/O Isolation
- No Tantalum Capacitor Inside
- 2.05"x1.2"x0.4" Six-Sided Shield Metal Case
- Standard 2"X1" Pin Out Compatible
- UL62368-1 Approval
- CB Test Certificate IEC62368-1
- 5000m Operating Altitude
- Full Load Operation up to 54°C with Heat Sink
- LBT127 (M-C655) Natural Convection
- -55°C Operating Available (Suffix "-M2")



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.		CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(3)	(2)	
ECLB75W-24S05	9-36 VDC	5 VDC	0 mA	15 A	10 mA	3415 mA	92	91.5	15000µF
ECLB75W-24S12	9-36 VDC	12 VDC	0 mA	6.25 A	10 mA	3415 mA	92	91	6250µF
ECLB75W-24S15	9-36 VDC	15 VDC	0 mA	5 A	10 mA	3434 mA	92	90.5	5000µF
ECLB75W-24D12	9-36 VDC	±12 VDC	0 mA	±3.12 A	12 mA	3448 mA	91	90.5	3200µF
ECLB75W-24D15	9-36 VDC	±15 VDC	0 mA	±2.5 A	12 mA	3453 mA	91	91	2500µF
ECLB75W-24D24	9-36 VDC	±24 VDC	0 mA	±1.56 A	18 mA	3448 mA	91	90.5	1560µF
ECLB75W-48S05	18-75 VDC	5 VDC	0 mA	15 A	8 mA	1708 mA	92	91.5	15000µF
ECLB75W-48S12	18-75 VDC	12 VDC	0 mA	6.25 A	8 mA	1708 mA	92	91	6250µF
ECLB75W-48S15	18-75 VDC	15 VDC	0 mA	5 A	8 mA	1717 mA	92.5	91	5000µF
ECLB75W-48D12	18-75 VDC	±12 VDC	0 mA	±3.12 A	8 mA	1724 mA	91.5	90.5	3200µF
ECLB75W-48D15	18-75 VDC	±15 VDC	0 mA	±2.5 A	8 mA	1717 mA	91.5	91	2500µF
ECLB75W-48D24	18-75 VDC	±24 VDC	0 mA	±1.56 A	8 mA	1715 mA	92	91.5	1560µF

NOTE:

1. Nominal Input Voltage 24 or 48 VDC.
2. Measured at Nominal Input Voltage.
3. Measured at 12VDC for 24Vin, 24VDC for 48Vin.
4. An External input Capacitor 100uF for 48Vin Models and 220uF for 24Vin Models are Recommended to Reduce Input ripple Voltage.
5. -55°C Start-up Screen per MIL-STD105E S1 Sampling Procedure for "-M2" Version.

PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic	Mounting Inserts	Operating Case Temp. Range
ECLB75W-	II	O	XX	L	-Y (Option)	-Z (Option)
ECLB75W	24 : 24 VDC 48 : 48 VDC	S : Single D : Dual	33 : 3.3VDC 05 : 5.0VDC 12 : 12VDC 15 : 15VDC 12 : ±12VDC 15 : ±15VDC 24 : ±24VDC	None : Positive N : Negative	None : M2.5x0.45 Mounting Inserts -C : Clear Mounting Insert (2.65mm DIA.)	None : -40~105°C -M2 : -55~105°C

Part Number Example:

ECLB75W-24S12N-M2: LB Case, 75W, 4:1 9-36Vdc Input, Single 12Vdc Output, Negative Logic, -55~105°C Operating Case Temp. Range



ECLB75W 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 Ambient Temperature	At the center part of case plate (with derating) Suffix "-M2" (with Derating)	All	-40		105	°C
		-M2	-55		105	
Maximum Case Temperature		All			105	°C
Storage Temperature		All	-55		125	°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	8.5	8.8	V _{dc}
		48Vin	15.5	16	16.5	
Turn-Off Voltage Threshold		24Vin	7.5	7.8	8.1	V _{dc}
		48Vin	14.5	14	15.5	
Lockout Hysteresis Voltage		24Vin		0.7		V _{dc}
		48Vin		1		
Maximum Input Current	V _{in} =9V, Full load. V _{in} =18V, Full load.	24Vin		9.26		A
		48Vin		4.63		
No-Load Input Current	V _{in} =24, 48V, I _o =0A	See Model Number Table				mA
Input Filter	Pi filter	All				
Inrush Current (I ² t)	As per ETS300 132-2.	All			0.1	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 Balance	V _{in} =24, 48V, Full load, T _c =25°C	Dual	-1.0		+1.0	%
Output Voltage Regulation						
Load Regulation	Full Load to no load	All			±0.5	%
Line Regulation	V _{in} =High line to low line, full load	All			±0.2	%
Cross Regulation	Load cross variation 10%/100%	Dual			±5.0	%
Temperature Coefficient	T _c =-40°C to 105°C	All			±0.02	%/°C
Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth)						
Peak-to-Peak	Full load, 1uF ceramic capacitors	5Vo			100	mV
		±24Vo			240	
		Others			150	
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	130	160	%
Short Circuit Protection		All	Continuous, Auto Recovery			
External Load Capacitance	Full load (resistive)	See Model Number Table				uF
Output Voltage Trim Range	P _o ≤ max. rated power, I _o ≤ I _{o,max.}	All	-20		+10	%



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PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	Zener clamp	5.0Vo		6.2		V _{dc}
		12Vo		15		
		15Vo		18		
		±12Vo		±15		
		±15Vo		±18		
		±24Vo		±30		

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)	All			±5	%
Recovery Time					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		15		ms
Turn-On Delay Time, From Input	V _{in_min} . to 10%V _{o_set} , Power up	All		15		ms
Output Voltage Rise Time	10%V _{o_set} to 90%V _{o_set}	All		15		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 _{ac}
					2250	V _{dc}
	1 Minute; input to case				1000	V _{ac}
					1600	V _{dc}
	1 Minute; output to case			1000	V _{ac}	
				1600	V _{dc}	
Isolation Resistance	Input to output	All	1000			MΩ
Isolation Capacitance	Input to output	All		1500		pF
	Input to case	All		1000		
	Output to case	All		1000		

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pulse width modulation (PWM), fixed	Single	240	270	300	KHz
		Dual	300	330	360	
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	-M2	0		1.0	V
		Others	0		1.2	
Logic High (Module On)	V _{on/off} at I _{on/off} =0.0uA, Pin open=On	All	3.5 or Open Circuit		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 or Open Circuit		75	V
Logic Low (Module On)	V _{on/off} at I _{on/off} =1.0mA	-M2	0		1.0	V
		Others	0		1.2	
On/Off Current (for Both Remote On/Off Logic)	I _{on/off} at V _{on/off} =0V	All		0.3	1	mA



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PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Leakage Current (for Both Remote On/Off Logic)	Logic high, $V_{on/off}=15V$	All			30	uA
Off Converter Input Current	Shutdown input idle current	All		4	10	mA
Over Temperature Shutdown	Temperature at the center part of case, non-latching	All		110		°C
Over Temperature Recovery				100		°C

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	5.0Vo		904		K hours
		12Vo		840		
		15Vo		995		
		±12Vo		792		
		±15Vo		998		
		±24Vo		691		
Weight		All		39		grams
Case Material	Aluminum,					
Base Plate Material	FR4					
Potting Material	UL 94V-0					
Pin Material	Base: Copper Plating: Matte Tin					
Shock/Vibration	MIL-STD-810F / EN61373					
Humidity	95% RH max. Non Condensing					
Altitude	5000m Operating Altitude, 12000m Transport Altitude					
Thermal Shock	MIL-STD-810F					
Fire & Smoke	EN45545-2 Compliant					
EMI	Meets EN55032, Conducted with external input filter				Class A	
ESD	IEC61000-4-2 Level 3: Air ±8kV, Level 2: Contact ±4kV				Perf. Criteria A	
Radiated Immunity	EN61000-4-3 Level 2: 80~1000MHz, 3V/m				Perf. Criteria A	
Fast Transient	EN61000-4-4 Level 1: On power input port, ±0.5kV, external input TVS required				Perf. Criteria A	
Surge	EN61000-4-5 Level 1: Line to line, ±0.5kV				Perf. Criteria A	
Conducted Immunity	EN61000-4-6 Level 2: 0.15~80MHz, 3V				Perf. Criteria A	
Application Note Link						ECLB75W Series App Notes
Packaging Information Link						Packaging Information

Immunity to Environmental Conditions

Phenomenon	Reference Clause	Reference Standard	Test Conditions	Result
Vibration Test	MIL-STD-810F Table 514.5C-VIII Figure 514.5C-6	MIL-STD-810F	Unit are Non-Operating Vibration Waveform: Random Vibration Frequency: 15 ~ 2000 Hz Vibration axis : X · Y · Z axis Duration : 1hr / axis	Pass
Shock Test	MIL-STD-810F 516.5 Table 516.5-I	MIL-STD-810F	Wave Form: Sawtooth Wave Test Category : Crash Hazard Test for Ground Equipment Duration: 10 ms Peak Acceleration: 75 G Cross-Over Frequency: 80 Hz No. of Shock : Each axis 3 times Shock Direction: ±X, ±Y, ±Z axis	Pass
Thermal Shock Cycling Test	MIL-STD-810F 503.4 Figure 503.4-1	MIL-STD-810F	Temperature: -55°C to 105°C Humidity: 95%RH Duration: 8hrs/ 3 times cycling & 4hrs dwell time	Pass
Thermal Humidity Cycling Test	MIL-STD-810F Notice 3 Method 507.4	MIL-STD-810F	Temperature: 60°C to 30°C Humidity: 95%RH Duration: 240 hrs	Pass



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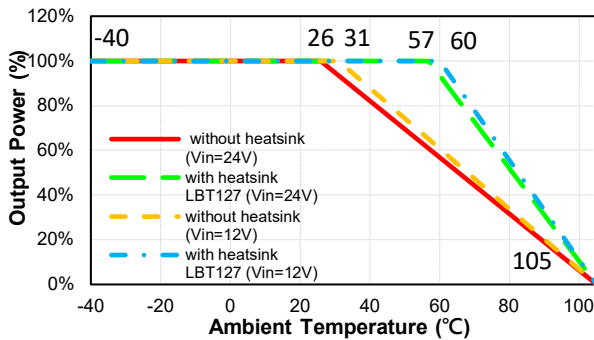
EN45545-2 Fire & Smoke Test Conditions

Item		Standard	Hazard Level
R22	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R23	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R24	Oxygen Index Test	EN45545-2: 2013 EN ISO 4589-2	HL1, HL2, HL3
R25	Glow - Wire Test	EN 45545-2:2013 EN 60695-2-11:2001	HL1, HL2, HL3
R26	Vertical Flame Test	EN 45545-2: 2013 EN 60695-11-10: 2013	HL1, HL2, HL3

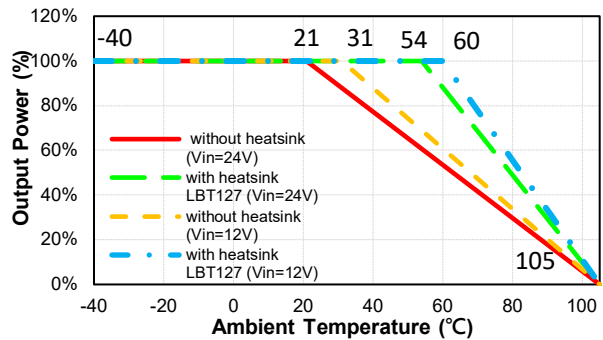
CHARACTERISTIC CURVE

Power Derating Curve

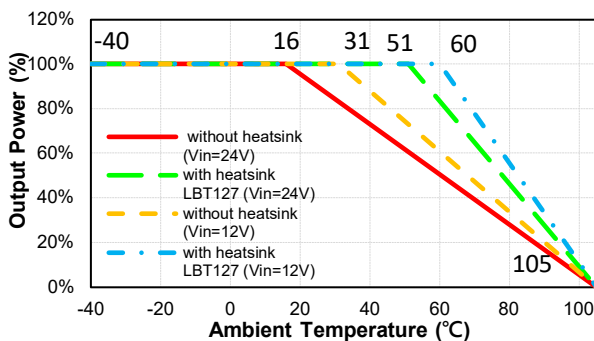
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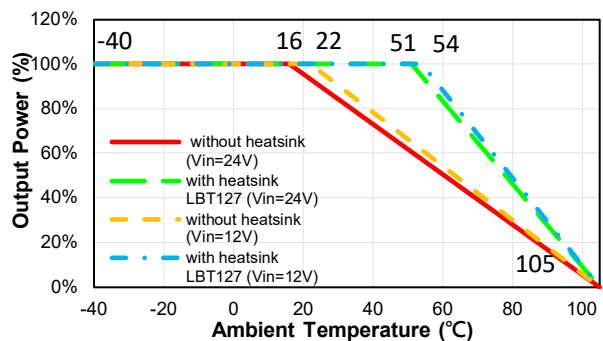
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ECLB75W-24S15 Derating Curve



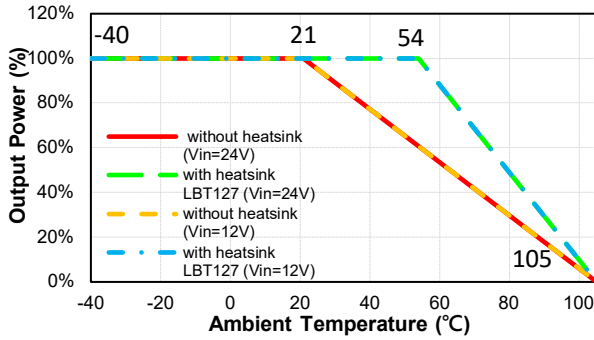
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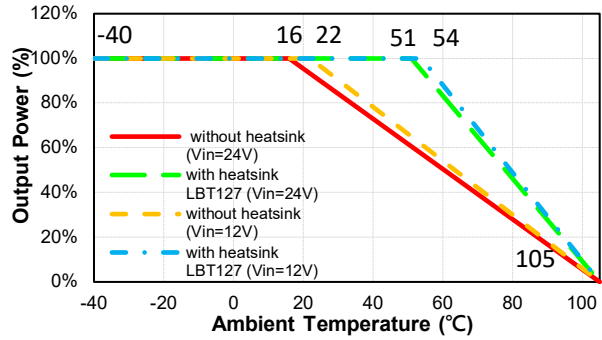


ECLB75W Series

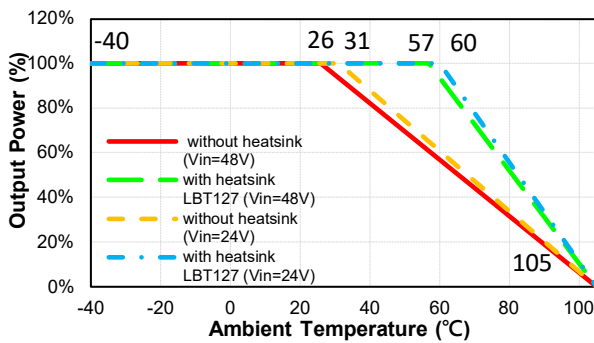
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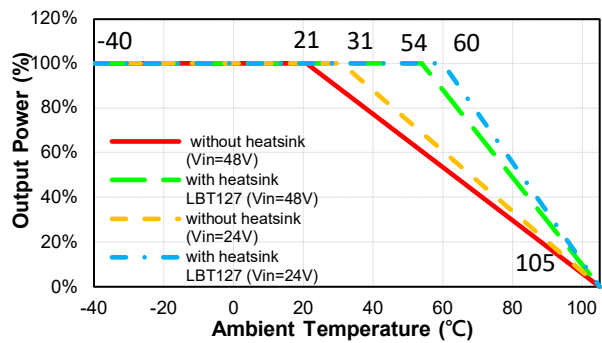
ECLB75W-24D24 Derating Curve



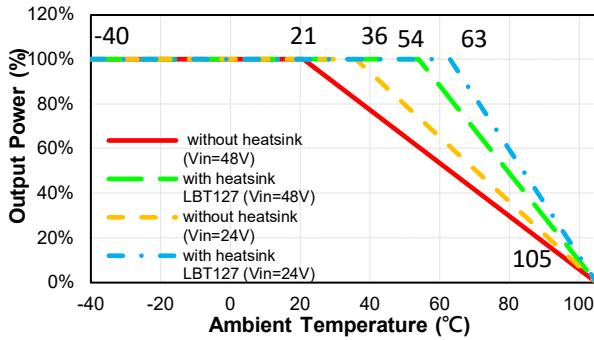
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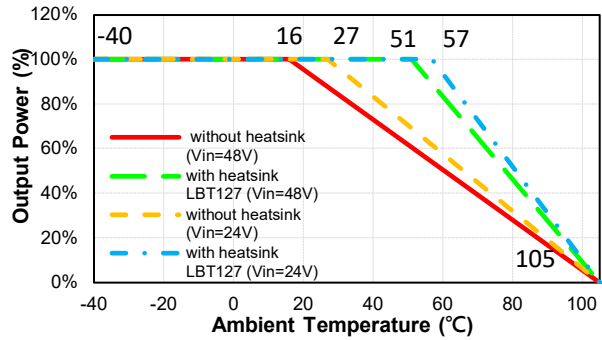
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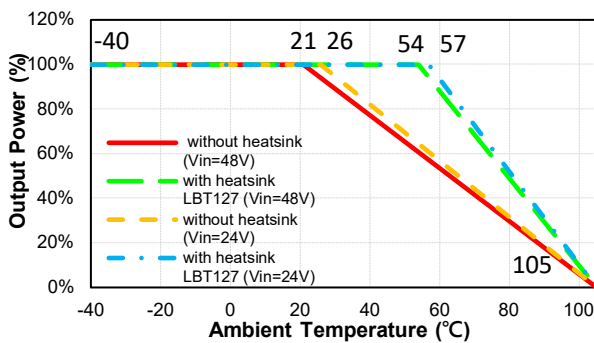
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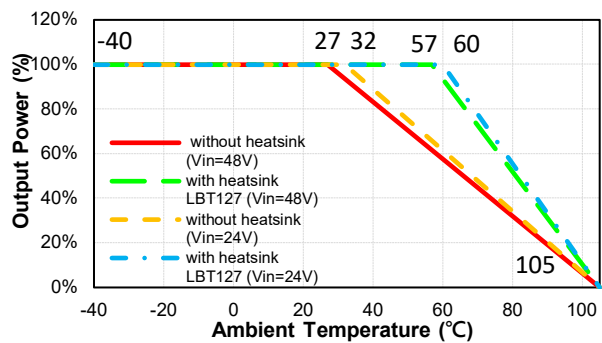
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ECLB75W-48D15 Derating Curve



ECLB75W-48D24 Derating Curve

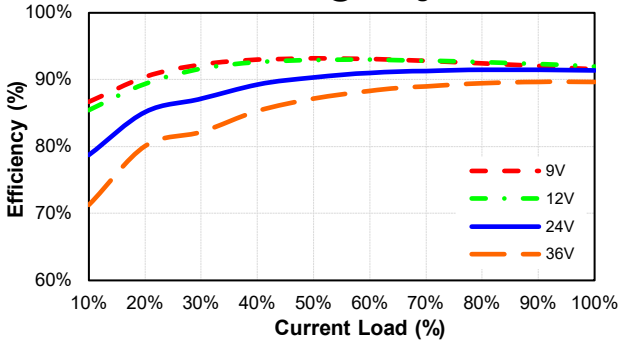




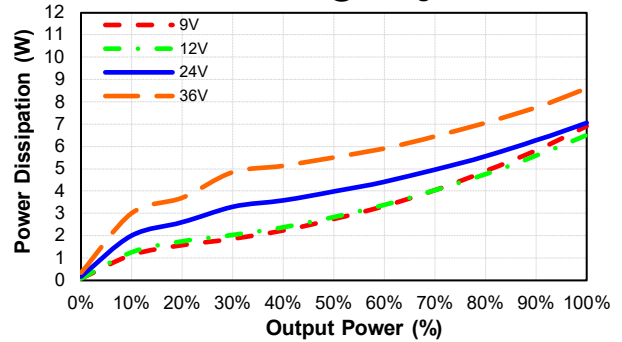
ECLB75W Series

Performance Data

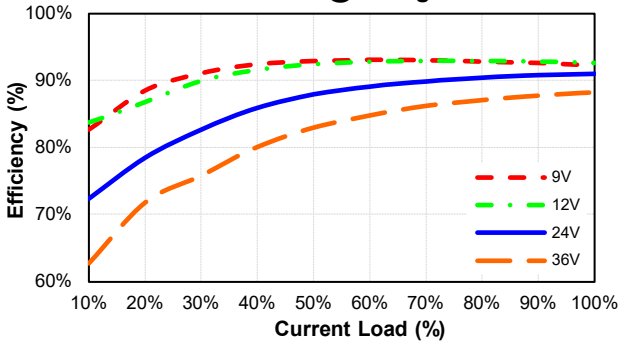
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Eff Vs Io @25 Deg. C



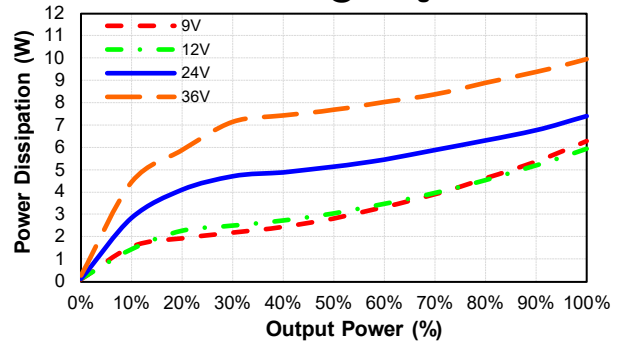
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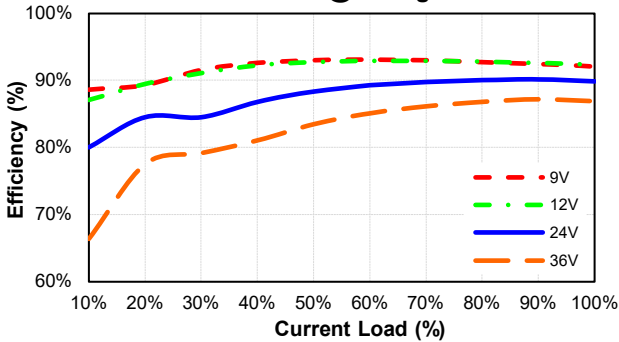
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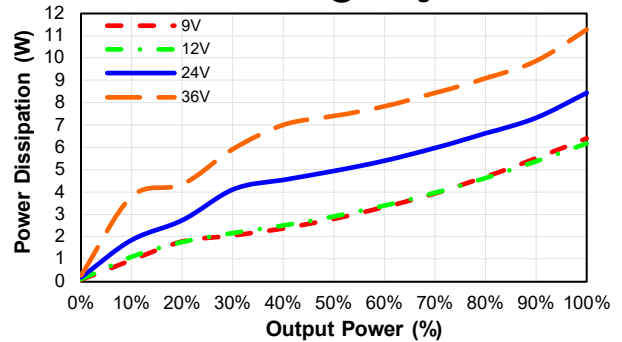
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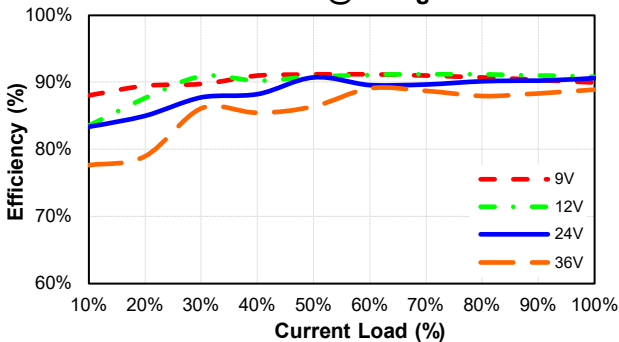
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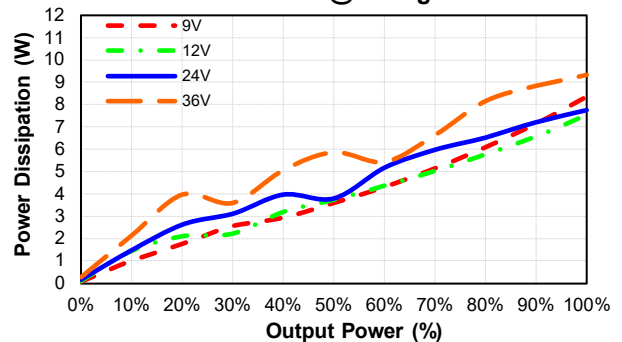
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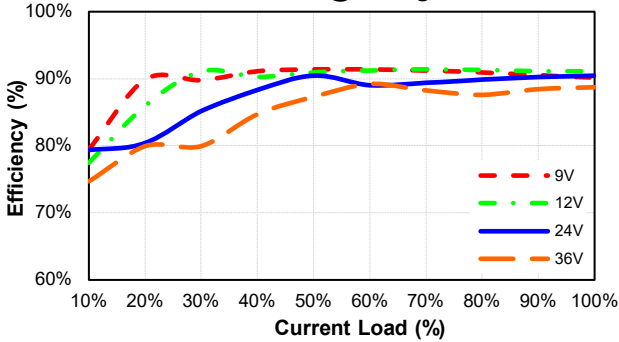
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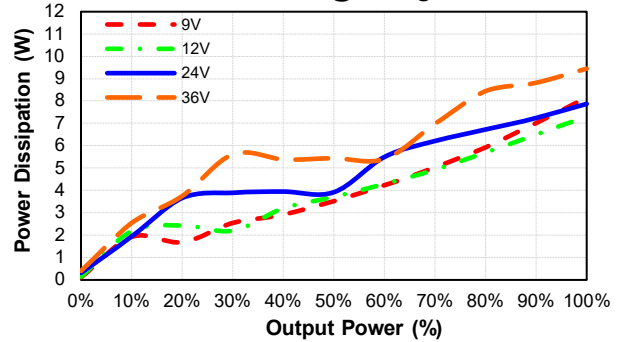


ECLB75W Series

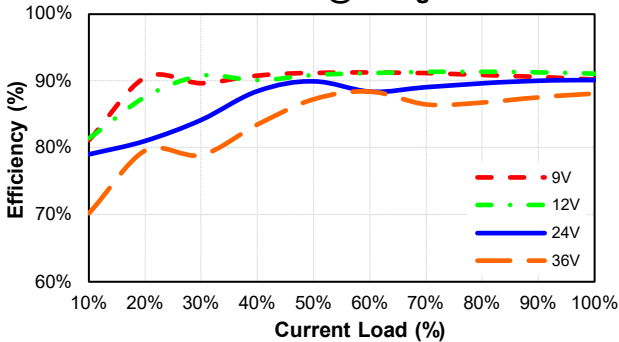
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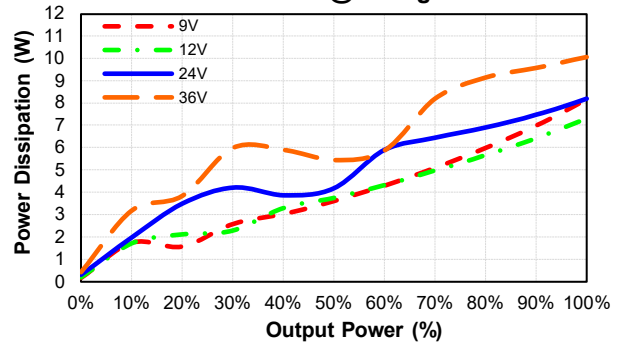
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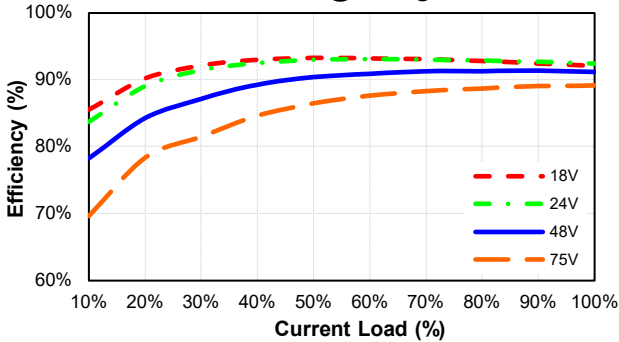
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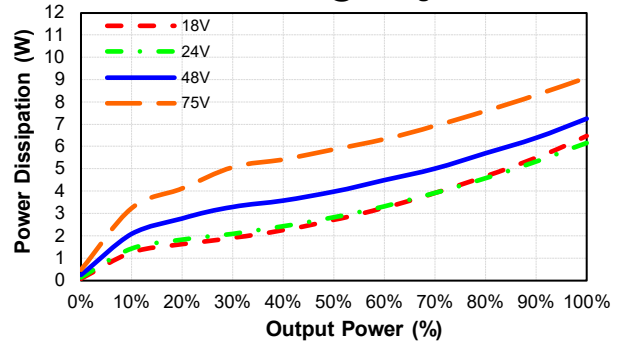
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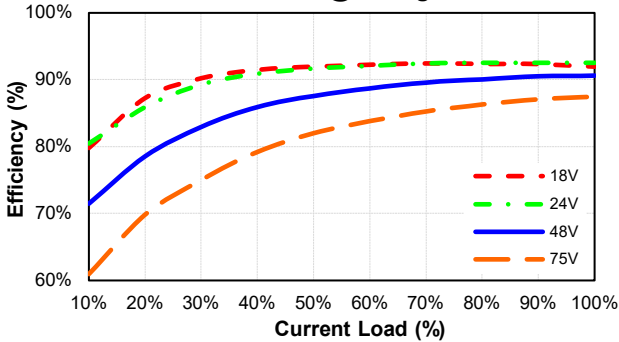
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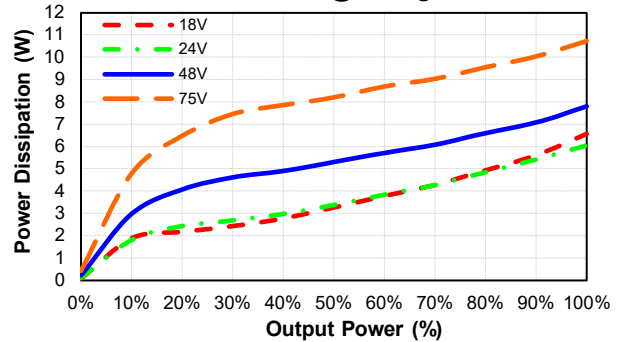
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ECLB75W-48S12
Eff Vs Io @25 Deg. C



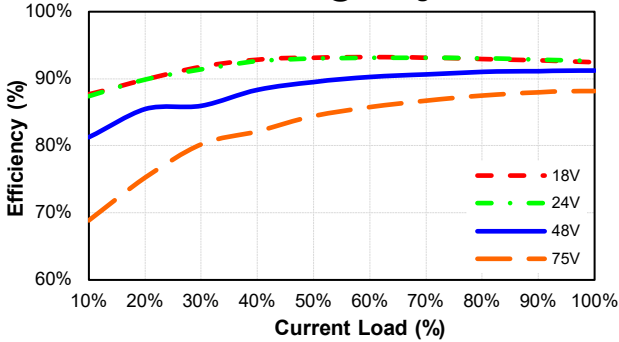
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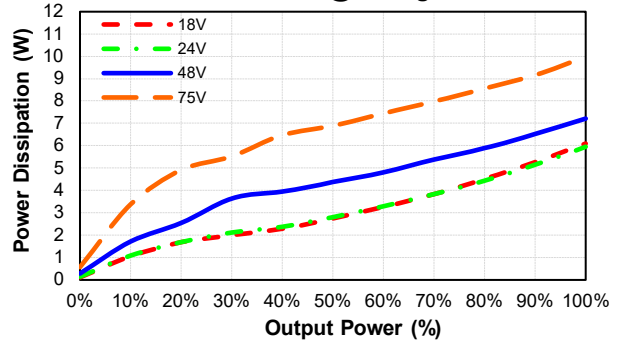


ECLB75W Series

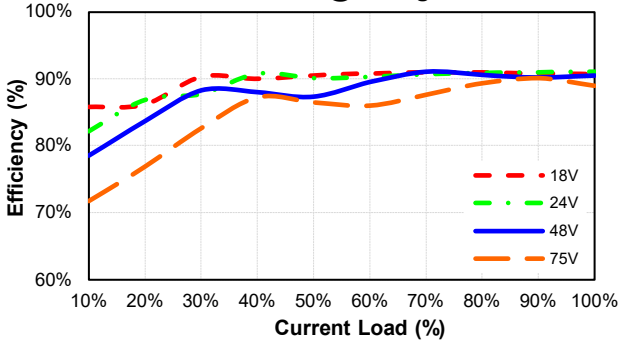
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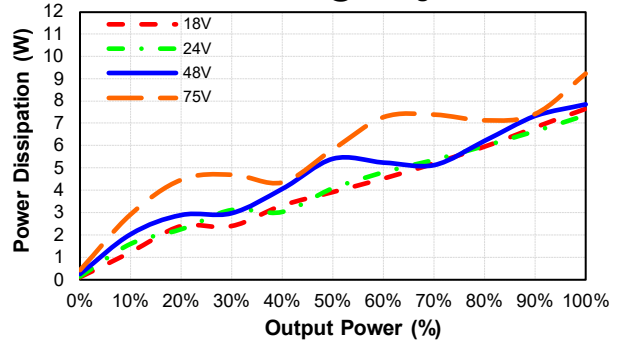
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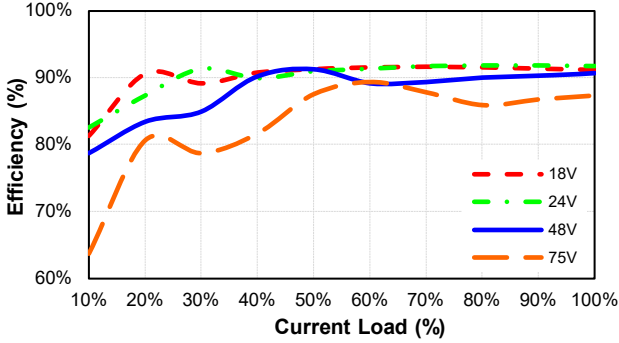
ECLB75W-48D12
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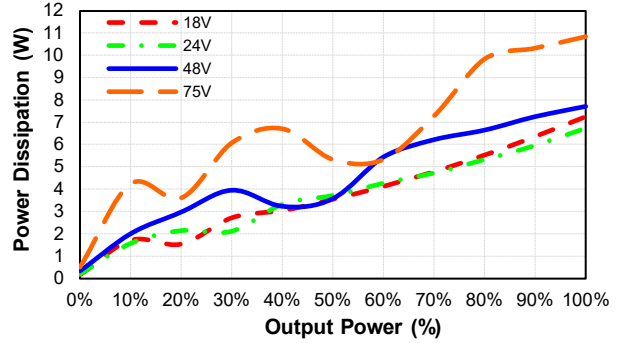
ECLB75W-48D12
Pd Vs Po @25 Deg. C



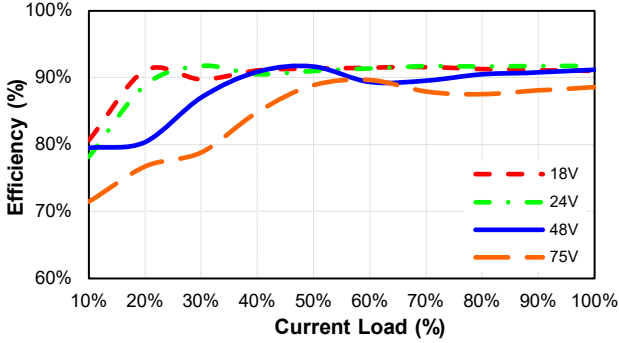
ECLB75W-48D15
Eff Vs Io @25 Deg. C



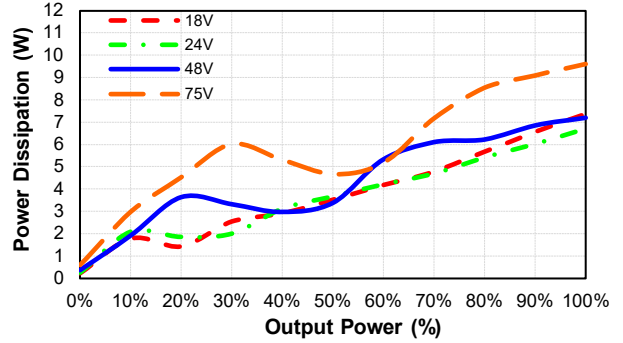
ECLB75W-48D15
Pd Vs Po @25 Deg. C



ECLB75W-48D24
Eff Vs Io @25 Deg. C



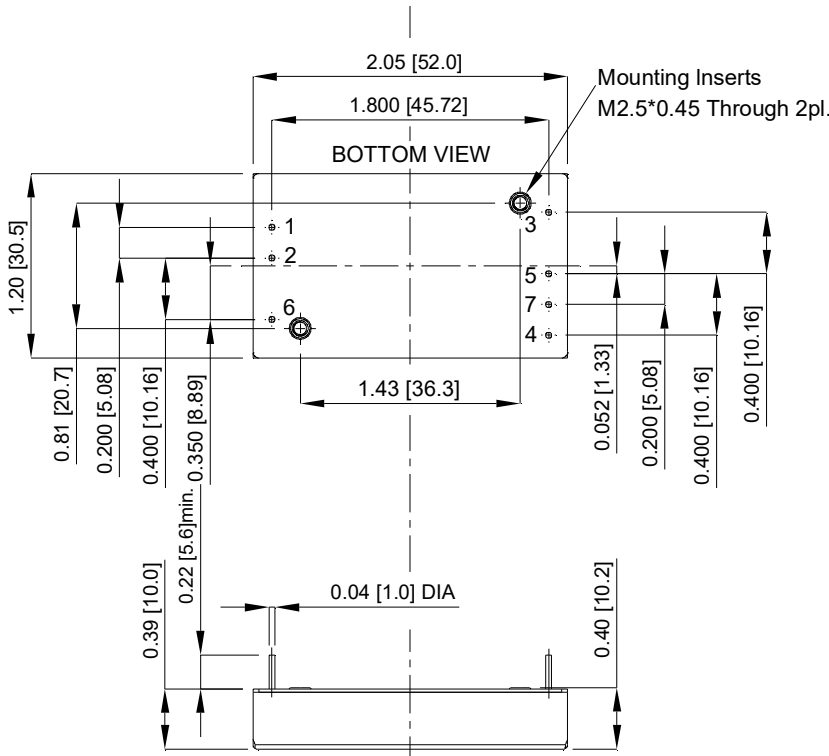
ECLB75W-48D24
Pd Vs Po @25 Deg. C





ECLB75W Series

MECHANICAL SPECIFICATION



PIN CONNECTION		
PIN	Single Output	Dual Output
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	Trim	-V Output
5	-V Output	Common
6	Remote On / Off	
7	NP	Trim

NOTE: Pin Size is 0.04±0.004 Inch[1.0±0.1 mm]DIA
 All Dimensions in Inches[mm]
 Tolerance Inches : X.XX=±0.02,X.XXX=±0.010
 Millimeters : X.X=±0.5,X.XX=±0.25

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