



# ECLB40W-110 SERIES 33-40 WATT 4:1 INPUT ISOLATED DC-DC CONVERTER

## Features

- Efficiency Up to 91%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Low No Load Power Consumption
- Fully Protected (OTP/OCP/OVP/UVLO)
- 3000 Vdc I/O Isolation
- Operating Case Temperature -40 to +105°C
- No Tantalum Capacitor Inside
- 2.05"x1.2"x0.4" Six-Sided Shield Metal Case  
Standard 2"x1" Pin Out Compatible
- UL 60950-1 2nd (Basic Insulation) Approval
- EN 50155 Compliant with External Circuits
- Shock & Vibration EN 50155 (EN 61373) Compliant
- Fire & Smoke EN 45545-2 Compliant
- 3000m Operating Altitude
- Full Load Operation up to 69°C with Heat Sink  
LBT127 (M-C655) Natural Convection
- Safety Meets IEC/EN/UL 62368-1



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF. (1)	CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD		
ECLB40W-110S33	43-160 VDC	3.3 VDC	0 mA	10 A	6 mA	340 mA	88	10000µF
ECLB40W-110S05	43-160 VDC	5 VDC	0 mA	8 A	6 mA	409 mA	88.5	8000µF
ECLB40W-110S12	43-160 VDC	12 VDC	0 mA	3.333 A	6 mA	404 mA	90	3300µF
ECLB40W-110S15	43-160 VDC	15 VDC	0 mA	2.666 A	6 mA	399 mA	91	2700µF
ECLB40W-110D12	43-160 VDC	±12 VDC	0 mA	±1.667 A	6 mA	408 mA	88	1650µF
ECLB40W-110D15	43-160 VDC	±15 VDC	0 mA	±1.333 A	6 mA	408 mA	88.5	1350µF
ECLB40W-110D24	43-160 VDC	±24 VDC	0 mA	±0.833 A	6 mA	408 mA	89	850µF

NOTE:

1. Nominal Input Voltage 110 VDC
2. To Meet EN50155 and RIA12 refer to Application Note.

## PART NUMBER

Series	Nominal Input Voltage	Number of Outputs	Nominal Output Voltage	Remote On/Off Logic
ECLB40W-110	II	O	XX	L
ECLB40W	110 : 110 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

Part Number Example:

**ECLB40W-110S12N:** LB Case, 40W, 4:1 9-36Vdc Input, Single 12Vdc Output, Negative Logic



# ECLB40W-110 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	All	-0.3		160	V <sub>dc</sub>
Input Surge Voltage	100ms max.	All			200	V <sub>dc</sub>
Operating Ambient Temperature	At the center part of case plate (with derating)	All	-40		105	°C
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		All	43	110	160	V <sub>dc</sub>	
Input Under Voltage Lockout							
Turn-On Voltage Threshold		All	38.5	40V	41.5	V <sub>dc</sub>	
Turn-Off Voltage Threshold		All	36.5	38V	39.5	V <sub>dc</sub>	
Lockout Hysteresis Voltage		All		2		V <sub>dc</sub>	
Maximum Input Current	V <sub>in</sub> =43V, Full load	All		1.1		A	
No-Load Input Current	V <sub>in</sub> =110V, I <sub>o</sub> =0A	See Model Number Table					mA
Input Filter	Pi filter	All					
Inrush Current (I <sup>2</sup> t)	As per ETS300 132-2	All			0.1	A <sup>2</sup> 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 <sub>in</sub> =110V, Full load, T <sub>c</sub> =25°C	All	-1.0		+1.0	%	
Output Voltage Balance	V <sub>in</sub> =110V, Full load, T <sub>c</sub> =25°C	Dual	-1.0		+1.0	%	
Output Voltage Regulation							
Load Regulation	Full Load to no load	Single Dual			±0.5 ±1.0	%	
Line Regulation	V <sub>in</sub> =High line to low line, full load	All			±0.2	%	
Cross Regulation	Load cross variation 10%/100%	Dual			±5.0	%	
Temperature Coefficient	T <sub>c</sub> =-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	3.3Vo 5Vo ±24Vo Others			100 100 200 150	mV	
Output Current Range	V <sub>in</sub> = 43 to 110V	See Model Number Table					A
Over Current Protection	Hiccup mode. Auto recovery	All	110	135	170	%	
Short Circuit Protection		All	Continuous, auto recovery.				
External Load Capacitance	Full load (resistive)	See Model Number Table					uF
Output Voltage Trim Range	P <sub>o</sub> ≤ max. rated power, I <sub>o</sub> ≤ I <sub>o,max.</sub>	All	-10		+10	%	
Over Voltage Protection	Zener or TVS clamp	3.3Vo 5.0Vo 12Vo 15Vo ±12Vo ±15Vo ±24Vo		3.9 6.2 15 18 ±15 ±18 ±30		V <sub>dc</sub>	



# ECLB40W-110 Series

## EFFICIENCY

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
100% Load	$V_{in}=110V$ , Full load	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						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				7	ms
Turn-On Delay Time, From Input	$V_{in\_min}$ . to 10% $V_{o\_set}$ , Power up	All				7	ms
Output Voltage Rise Time	10% $V_{o\_set}$ to 90% $V_{o\_set}$	Single				8	ms
		Dual				18	

## 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				1800	$V_{ac}$
						3000	$V_{dc}$
	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	All	225	250	275	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 $I_{on/off}=0.0\mu A$ , 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 $I_{on/off}=0.0\mu A$ , Pin open=Off	All	3.5 or Open Circuit			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	
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	



# ECLB40W-110 Series

## GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I <sub>o</sub> =100% of I <sub>o_max</sub> ; MIL-HDBK - 217F_Notice 1, GB, 25°C	3.3Vo		889		K hours
		5.0Vo		722		
		12Vo		798		
		15Vo		874		
		±12Vo		889		
		±15Vo		1007		
Weight		All		36		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/EN 61373 Compliant					
Humidity	95% RH max. Non Condensing					
Altitude	3000m 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	Meet EN 55011/EN 55032/EN 50155 (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 3: 80~1000MHz, 20V/m	Perf. Criteria A
Fast Transient	EN 61000-4-4 Level 4: On power input port, ±4kV, external components required	Perf. Criteria A
Surge	EN 61000-4-5 Level 4: Line to line, ±1kV, external components required	Perf. Criteria A
Conducted Immunity	EN 61000-4-6 Level 3: 0.15~80MHz, 10V	Perf. Criteria A
Interruptions of Voltage Supply	EN 50155 Class S3: 20ms interruptions with external hold up circuit and capacitor required	Perf. Criteria A
Supply Change Over	EN 50155 Class C2: During a supply break of 30ms with external hold up circuit and capacitor required	Perf. Criteria A
Application Note Link	<a href="#">ECLB40W-110 Series App Notes</a>	
Packaging Information Link	<a href="#">Packaging Information</a>	



# ECLB40W-110 Series

## Immunity to Environmental Conditions

Phenomenon	EN50155; 2017 Reference Clause(s)	Reference Standard	Test Conditions	Result
Low Temperature Start-up test	13.4.4	EN 60068-2-1	Class OT4 Temperature: -40°C Duration: 2 hrs	Pass
Dry Heat Test	13.4.5	EN 60068-2-2	Class OT4 & Cycle B Temperature: 70°C Duration: 6 hrs Extended temperature: 85°C Extended Duration: 10min	Pass
Low Temperature Storage Test	13.4.6	EN 60068-2-1	Temperature: -40°C Duration: 16 hrs	Pass
Cyclic Damp Heat Test	13.4.7	EN 60068-2-30	Temperature: 25°C - 55°C Humidity: 90% RH Duration: 48 hrs	Pass
Random Vibration Test	13.4.11	EN 61373	Temperature: 25°C +/- 10°C Humidity: 50% +/-25% RH Frequency range: 5 ~ 150 Hz Vertical: 0.98 m/s <sup>2</sup> Transverse: 0.44 m/s <sup>2</sup> Longitudinal: 0.69 m/s <sup>2</sup> Duration: 10 min / axis	Pass
Simulated Long Life Test at Increased Random Vibration Levels	13.4.11	EN 61373	Temperature: 25°C±10°C Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz Vertical: 5.72 m/s <sup>2</sup> Transverse: 2.5 m/s <sup>2</sup> Longitudinal: 3.96 m/s <sup>2</sup> Duration: 5 hrs / axis	Pass
Shock Test	13.4.11	EN 61373	Temperature: 25°C±10°C Humidity: 50% ±25% RH Frequency range: 5 ~ 150 Hz ±Vertical: 30 m/s <sup>2</sup> ±Transverse: 30 m/s <sup>2</sup> ±Longitudinal: 50 m/s <sup>2</sup> Duration: 30ms x18 (Each axis 3 shocks)	Pass

## EN45545-2 Fire & Smoke Test Conditions

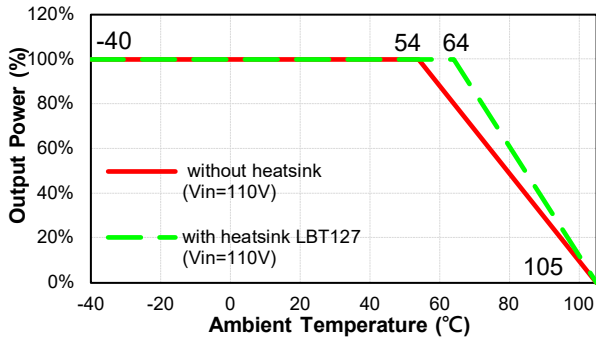
Item		Standard	Hazard Level
R22	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, HL2, HL3
	Smoke Density Test	EN 45545-2: 2013 EN ISO 5659-2: 2013	HL1, HL2, HL3
	Smoke Toxicity Test	EN 45545-2: 2013 NF X70-100: 2006	HL1, HL2, HL3
R23	Oxygen Index Test	EN 45545-2: 2013 EN ISO 4589-2: 2006	HL1, 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



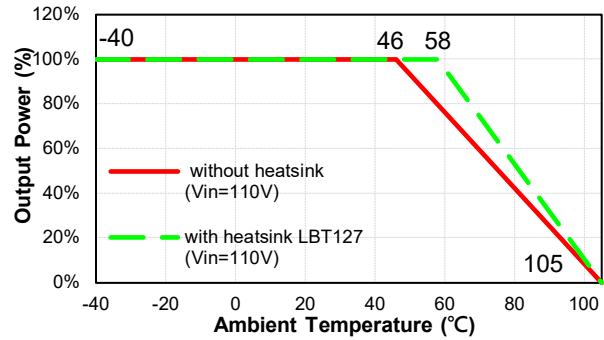
## CHARACTERISTIC CURVE

### Power Derating Curve

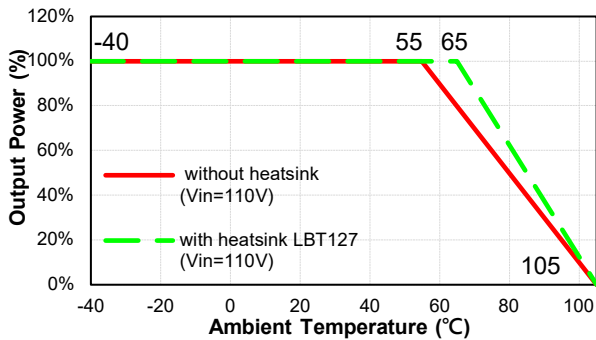
**ECLB40W-110S33 Derating Curve**



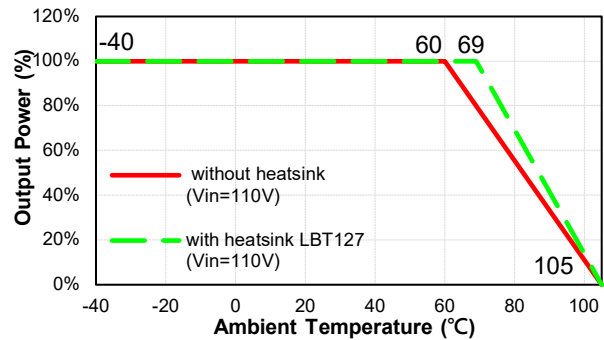
**ECLB40W-110S05 Derating Curve**



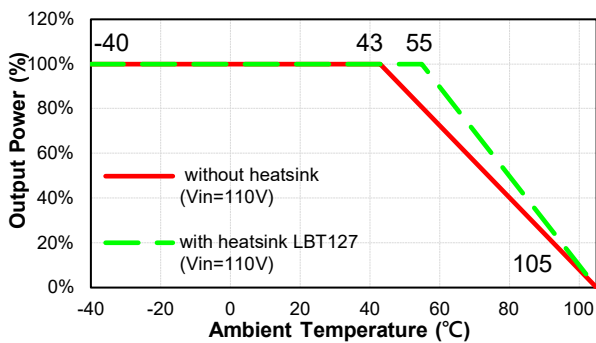
**ECLB40W-110S12 Derating Curve**



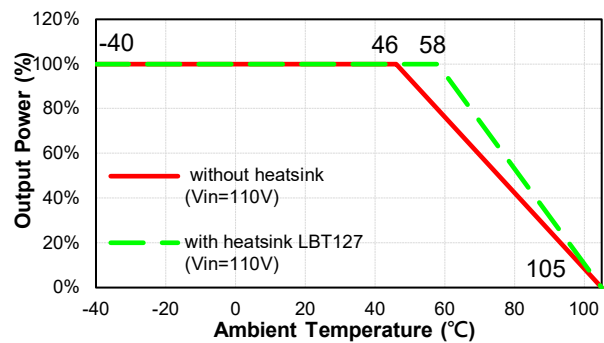
**ECLB40W-110S15 Derating Curve**



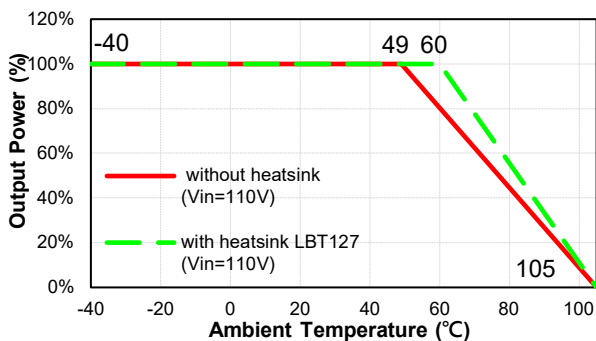
**ECLB40W-110D12 Derating Curve**



**ECLB40W-110D15 Derating Curve**



**ECLB40W-110D24 Derating Curve**

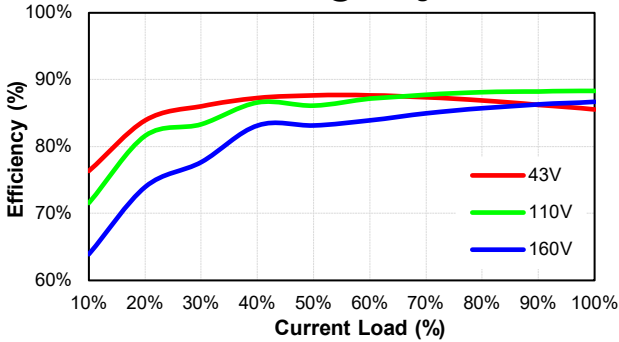




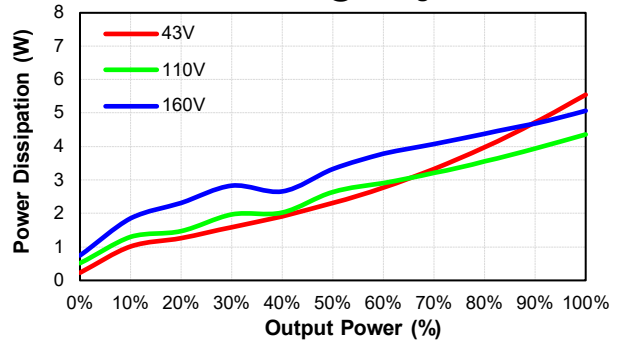
# ECLB40W-110 Series

## Performance Data

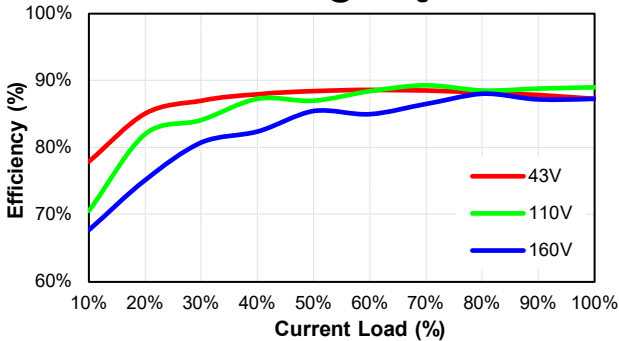
**ECLB40W-110S33**  
Eff Vs Io @25 Deg. C



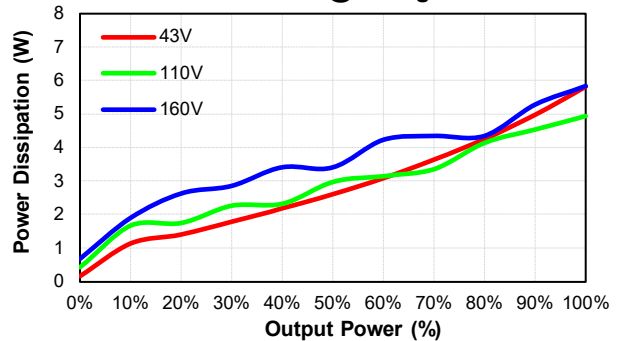
**ECLB40W-110S33**  
Pd Vs Po @25 Deg. C



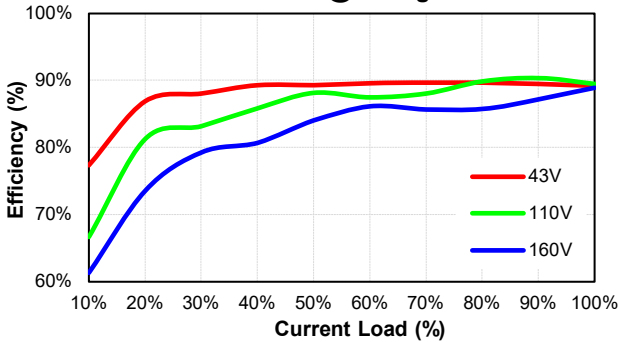
**ECLB40W-110S05**  
Eff Vs Io @25 Deg. C



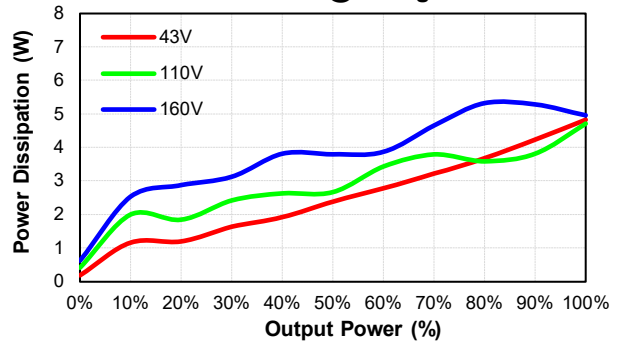
**ECLB40W-110S05**  
Pd Vs Po @25 Deg. C



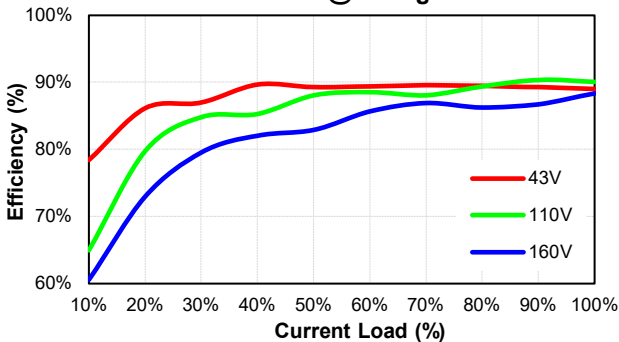
**ECLB40W-110S12**  
Eff Vs Io @25 Deg. C



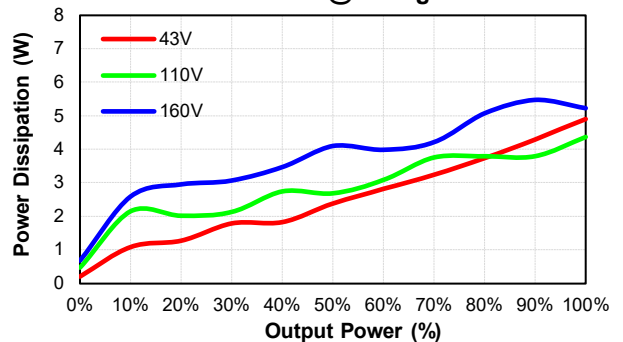
**ECLB40W-110S12**  
Pd Vs Po @25 Deg. C



**ECLB40W-110S15**  
Eff Vs Io @25 Deg. C



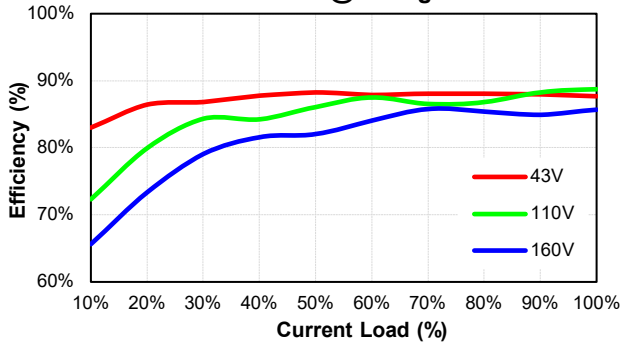
**ECLB40W-110S15**  
Pd Vs Po @25 Deg. C



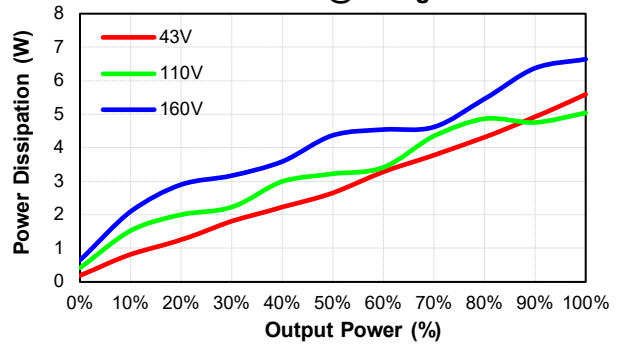


# ECLB40W-110 Series

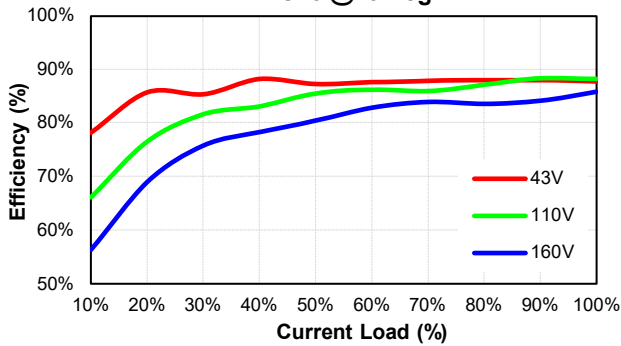
**ECLB40W-110D12**  
Eff Vs Io @25 Deg. C



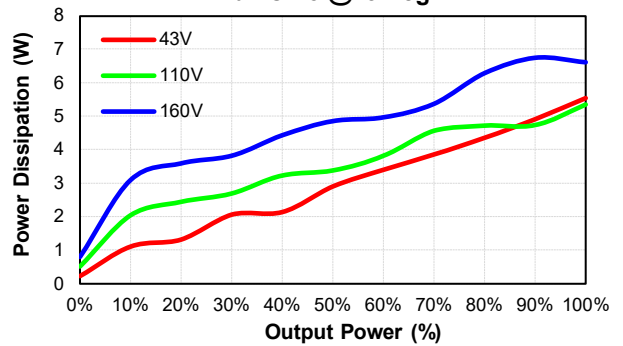
**ECLB40W-110D12**  
Pd Vs Po @25 Deg. C



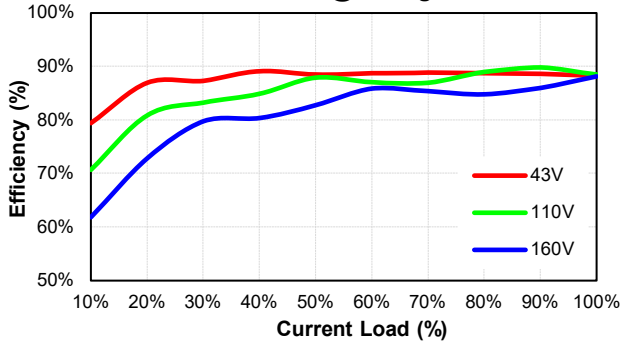
**ECLB40W-110D15**  
Eff Vs Io @25 Deg. C



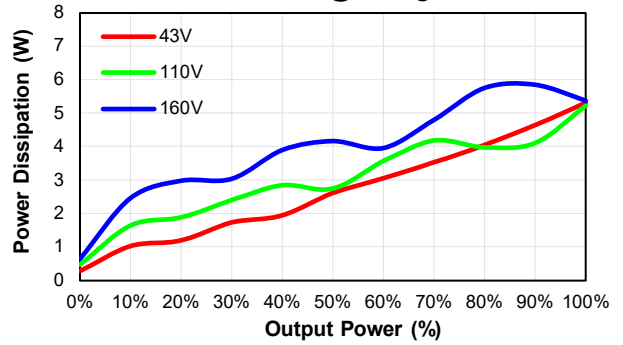
**ECLB40W-110D15**  
Pd Vs Po @25 Deg. C



**ECLB40W-110D24**  
Eff Vs Io @25 Deg. C



**ECLB40W-110D24**  
Pd Vs Po @25 Deg. C

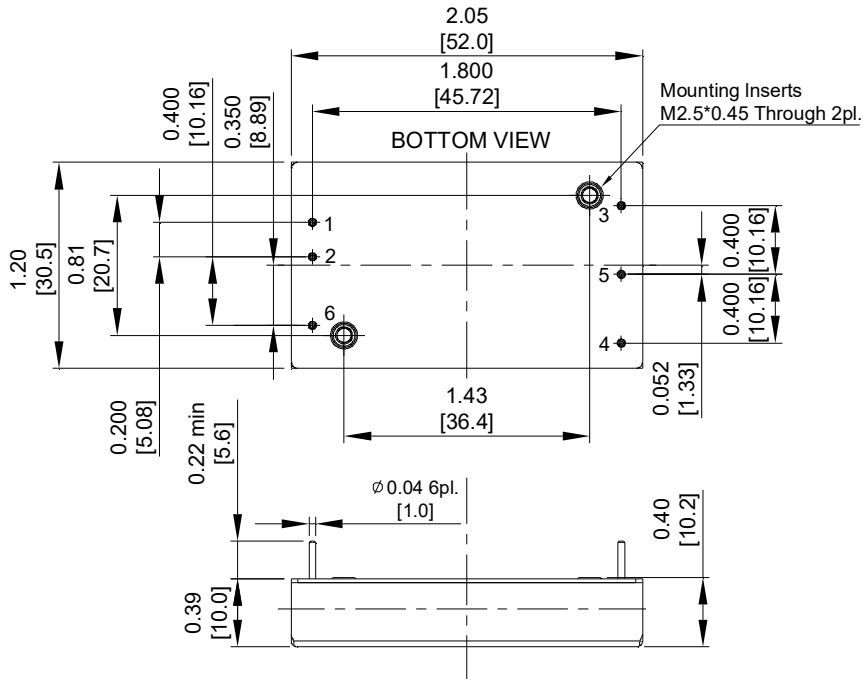






# ECLB40W-110 Series

## 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	

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

CINCON Electronics Co. Ltd.  
 Add: 14F, No. 306, Sec.4, Hsin Yi Rd., Taipei, Taiwan  
 Tel: 886-2-27086210  
 Fax: 886-2-27029852  
 E-mail: [sales@cincon.com.tw](mailto:sales@cincon.com.tw)  
 Web: [www.cincon.com](http://www.cincon.com)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Cincon:

[ECLB40W-110S33](#) [ECLB40W-110D15](#) [ECLB40W-110D12](#) [ECLB40W-110S05](#) [ECLB40W-110D24](#) [ECLB40W-110S15](#) [ECLB40W-110S12](#) [ECLB40W-110D15N](#) [ECLB40W-110S15N](#) [ECLB40W-110S05N](#) [ECLB40W-110D12N](#) [ECLB40W-110S12N](#) [ECLB40W-110D24N](#) [ECLB40W-110S33N](#)