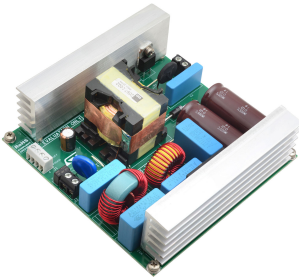


## Low-THD 350W CCM-PFC pre-regulator based on L4983



### Product status link

[EVL4983-350W](#)

### Features

- Universal input voltage range: 90 to 264 Vac with 47 Hz to 63 Hz frequency
- Regulated output voltage: 400 Vdc
- Maximum output power: 350 W
- Total Harmonic Distortion (THD): < 6% at full load and < 10% down to 15% load
- Switching frequency: 65 kHz
- Peak efficiency: 97.4%
- Mains harmonics: meets EN61000-3-2 standard Class-D and JEITA-MITI Class D
- EMI: according to EN55022 standard Class B

### Applications

- PFC pre-regulators for:
  - IEC61000-3-2 and JEIDA-MITI compliant SMPS exceeding of 1 kW
  - Desktop PC, server, web server, game console
  - High-power LED luminaries
  - Industrial and medical SMPS compliant with IEC 60601-1-2

### Description

The [EVL4983-350W](#) demonstration board, based on the new L4983 continuous conduction mode power factor controller, implements a 350 W wide-range input PFC pre-regulator.

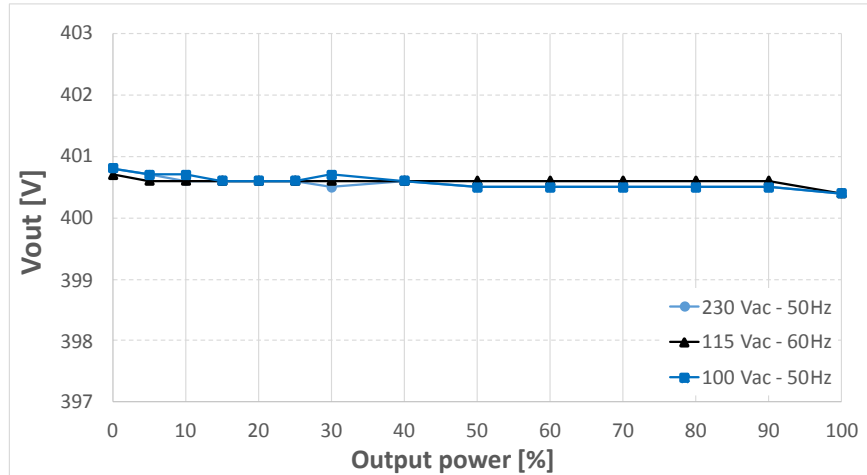
It is suitable for all switched-mode power supplies (SMPS) from 150 W to several kilowatts and complies with the IEC61000-3-2 and JEITA-MITI standards.

The new patented control method enables minimal component count, simple design, and very low input current distortion (total harmonic distortion, THD) in all operating conditions.

# 1 PFC converter's performance

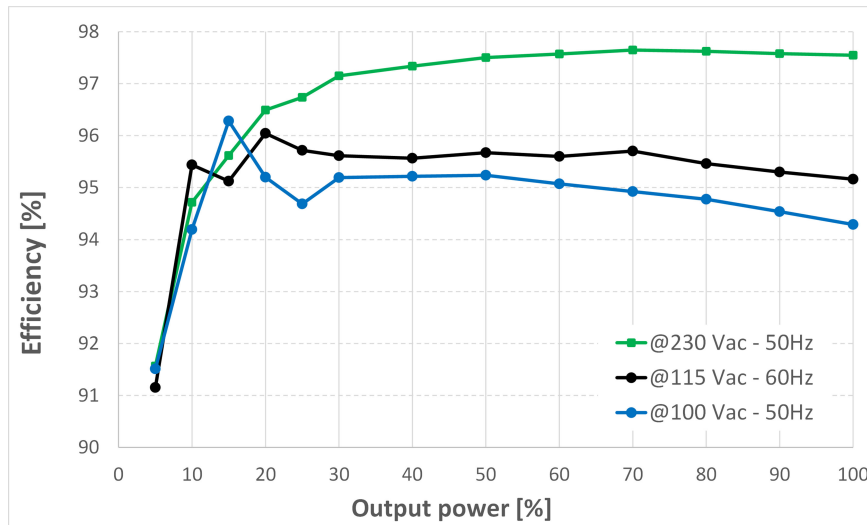
## 1.1 Output voltage

Figure 1. EVL4983-350W output voltage versus load



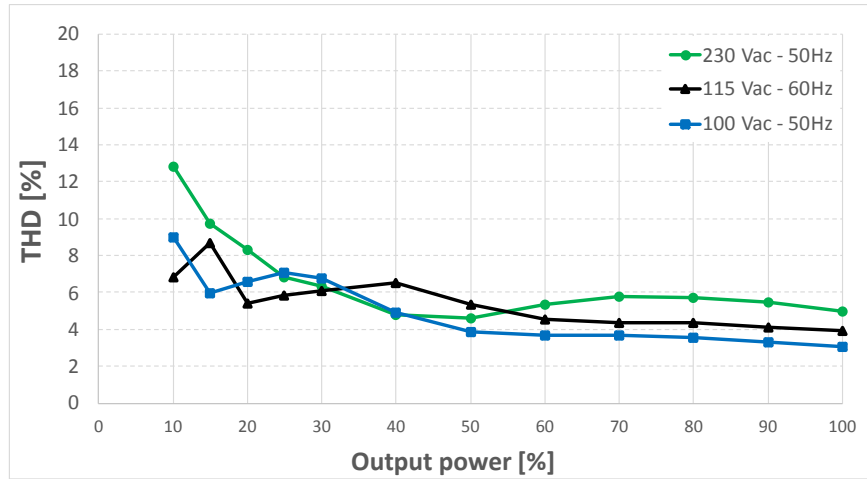
## 1.2 Efficiency

Figure 2. EVL4983-350W efficiency versus load



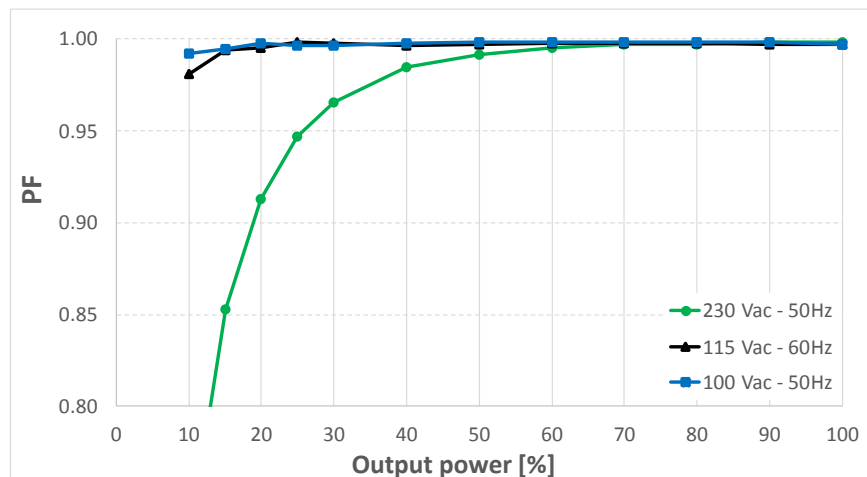
### 1.3 Input current distortion (THD)

Figure 3. EVL4983-350W input current distortion (THD) versus load



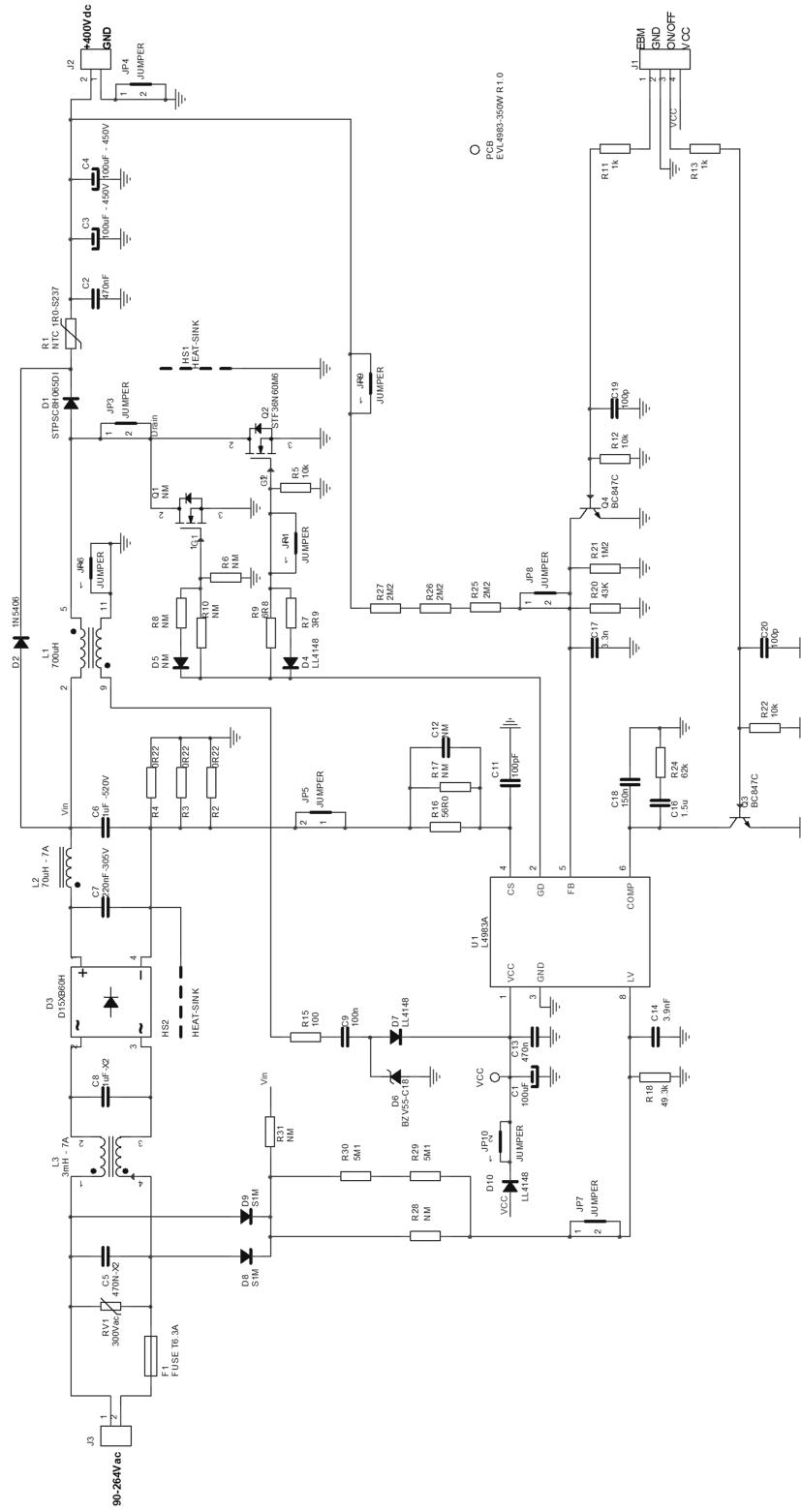
### 1.4 Power Factor (PF)

Figure 4. EVL4983-350W power factor (PF) versus load



## 2 Evaluation board schematic

Figure 5. EVL4983-350W evaluation board schematic



### 3 PCB connectors

**Table 1. PCB connectors**

Schematic Reference	Description
J1	Input/output signal: 1- EBM (external burst-mode input) 2- GND (signal ground) 3- ON/FF (enable/disable input) 4- VCC (supply voltage +15V)
J2	DC regulated output voltage (+400V)
J3	AC input voltage (90-264Vac)

## 4 Bill of material

**Table 2. EVL4983-350W - Bill of material**

Sch. Ref.	Part no.	Case	Description	Supplier
C1	100µF	Rad. 8x11.5 mm	Electrolytic capacitor, 105°C - 50 V	Rubycon
C2	470nF	6x26.5 mm	Film capacitor, 630 V - B32673P6474K000	Epcos
C3	100µF	Rad. 18x35.5 mm	Electrolytic capacitor, 105°C - 450 V - EKXJ451ELL101MMP1S	United Chemicon
C4	100µF	Rad. 18x35.5 mm	Electrolytic capacitor, 105°C - 450 V - EKXJ451ELL101MMP1S	United Chemicon
C5	470nF	8.5x26.5 mm	Film capacitor, X2 - B32923C3474M000	Epcos
C6	1µF	10.5x26.5 mm	Film capacitor, 520 V - B32673Z5105	Epcos
C7	220nF	7.5x26.5 mm	Film capacitor, 305 V - B32933A3224	Epcos
C8	1µF	11x26.5 mm	Film capacitor, X2 - B32923C3105	Epcos
C9	100nF	SMD 1206	Ceramic capacitor, 100 V	
C11	100pF	SMD 0805	Ceramic capacitor, X7R - 25 V	
C12	NM	SMD 0805		
C13	470nF	SMD 1206	Ceramic capacitor, X7R - 50 V	
C14	3.9nF	SMD 1206	Ceramic capacitor, X7R - 25 V	
C16	1.5µF	SMD 0805	Ceramic capacitor, X7R - 25 V	
C17	3.3nF	SMD 0805	Ceramic capacitor, COG - 25 V	
C18	150nF	SMD 0805	Ceramic capacitor, X7R - 25 V	
C19	100pF	SMD 0805	Ceramic capacitor, X7R - 25 V	
C20	100pF	SMD 0805	Ceramic capacitor, X7R - 25 V	
D1	STPSC8H065DI	TO-220AC Ins.	Schottky diode, 8 A/650 V SiC	STMicroelectronics
D2	1N5406	DO-201	Rectifier diode	
D3	D15XB60H	DWG	Bridge rectifier, 600 V-15 A	Shindengen
D4	LL4148	MINIMELF	Signal diode	
D5	NM	MINIMELF		
D6	BZV55-C18	MINIMELF	Zener diode, 18 V - 5%	
D7	LL4148	MINIMELF	Signal diode	
D8	S1M	SMA	Diode rectifier, 1000 V-1 A	
D9	S1M	SMA	Diode rectifier, 1000 V-1 A	
D10	LL4148	MINIMELF	Signal diode	
F1	6.3A	4x8.5 mm P5.08 mm	Fuse, 392/TE5 - Time delay	Littlefuse
HS2	HEATSINK	DWG	Heatsink for D3	Tecnoal
HS1	HEATSINK	DWG	Heatsink for Q1, Q2 & D1	Tecnoal
J1	Signal connector	SIP 4P p3.5	PCB screw terminal - 4	Lumberg
J2	Power connector	SIP 2P p5.08	PCB screw terminal - 2	Weidmuller
J3	Power connector	SIP 2P p5.08	PCB screw terminal - 2	Weidmuller
JP1	Shorted	Wire	Isolated wire jumper	
JP2	Shorted	Wire	Isolated wire jumper	

Sch. Ref.	Part no.	Case	Description	Supplier
JP3	Shorted	Wire	Isolated wire jumper	
JP4	Shorted	Wire	Isolated wire jumper	
JP5	Shorted	Wire	Isolated wire jumper	
JP6	Shorted	Wire	Isolated wire jumper	
JP7	Shorted	Wire	Isolated wire jumper	
JP8	Shorted	Wire	Isolated wire jumper	
JP9	Shorted	Wire	Isolated wire jumper	
JP10	Shorted	Wire	Isolated wire jumper	
L1	700μH	DWG	PFC inductor - 2097.0002	Magnetica
L2	70μH - 7A	DWG	DM Inductor - 1119.0013	Magnetica
L3	3mH - 7A	DWG	EMI filter inductor - 1606.0007	Magnetica
Q1	NM	TO-220FP		
Q2	STF36N60M6	TO-220FP	N-CHANNEL Power MOSFET	STMicroelectronics
Q1a	NM	TO-247		
Q2a	NM	TO-247		
Q3	BC847C	SOT23	BJT - NPN transistor	
Q4	BC847C	SOT23	BJT - NPN transistor	
RV1	300Vac	Rad. 15x5 p7.5 mm	Metal Oxide Varistor, 300 V - B72214S0301K101	Epcos
R1	1Ω	Rad. 15x7 p7.5 mm	NTC resistor, B57237S0109M000	Epcos
R2	0.22Ω	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R3	0.22Ω	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R4	0.22Ω	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R5	10kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R6	NM	SMD 0805		
R7	3.9Ω	SMD 0805	Resistor, 1/8 W - 1%	
R8	NM	SMD 0805		
R9	6.8Ω	SMD 0805	Resistor, 1/8 W - 1%	
R10	NM	SMD 0805		
R11	1kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R12	10kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R13	1kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R15	100Ω	SMD 1206	Resistor, 1/4 W - 1%	
R16	56Ω	SMD 0805	Resistor, 1/8 W - 1%	
R17	NM	SMD 0805		
R18	49.3kΩ	SMD 1206	Resistor, 1/4 W - 1%	
R20	43kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R21	1.2MΩ	SMD 0805	Resistor, 1/8 W - 1%	
R22	10kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R24	62kΩ	SMD 0805	Resistor, 1/8 W - 1%	
R25	2.2MΩ	SMD 1206	Resistor, 1/4 W - 1%	
R26	2.2MΩ	SMD 1206	Resistor, 1/4 W - 1%	

Sch. Ref.	Part no.	Case	Description	Supplier
R27	2.2M $\Omega$	SMD 1206	Resistor, 1/4 W - 1%	
R28	NM	SMD 1206		
R29	5.1M $\Omega$	SMD 1206	Resistor, 1/4W - 1%	
R30	5.1M $\Omega$	SMD 1206	Resistor, 1/4W - 1%	
R31	NM	SMD 1206		
VCC	Test Point		Strip contact - 1	Samtec
U1	L4983A	SO8	CCM PFC controller	STMicroelectronics
Z1	EVL4983-350W R1.0		Printed circuit board	

## Revision history

**Table 3. Document revision history**

Date	Version	Changes
11-May-2026	1	Initial release.

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