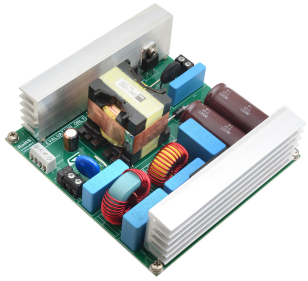
EVL4985-350W

Data brief

Low-THD 350W CCM-PFC pre-regulator based on L4985



Features

- Universal input voltage range: 90 to 265 Vac, 45 to 65 Hz
- Regulated output voltage: 400 Vdc
- Rated output power: 350 W
- Total Harmonic Distortion (THD): <6% at full load and <10% down to 15% load
- Switching frequency: 65 kHz
- Efficiency peak: 97.8%
- Mains harmonics: meets EN61000-3-2 Class-D and JEITA-MITI Class-D
- EMI: according to EN55022 Class-B

Description

The EVL4985-350W evaluation board, based on the new L4985 continuous conduction mode power factor controller, implements a 350 W wide-range input PFC pre-regulator.

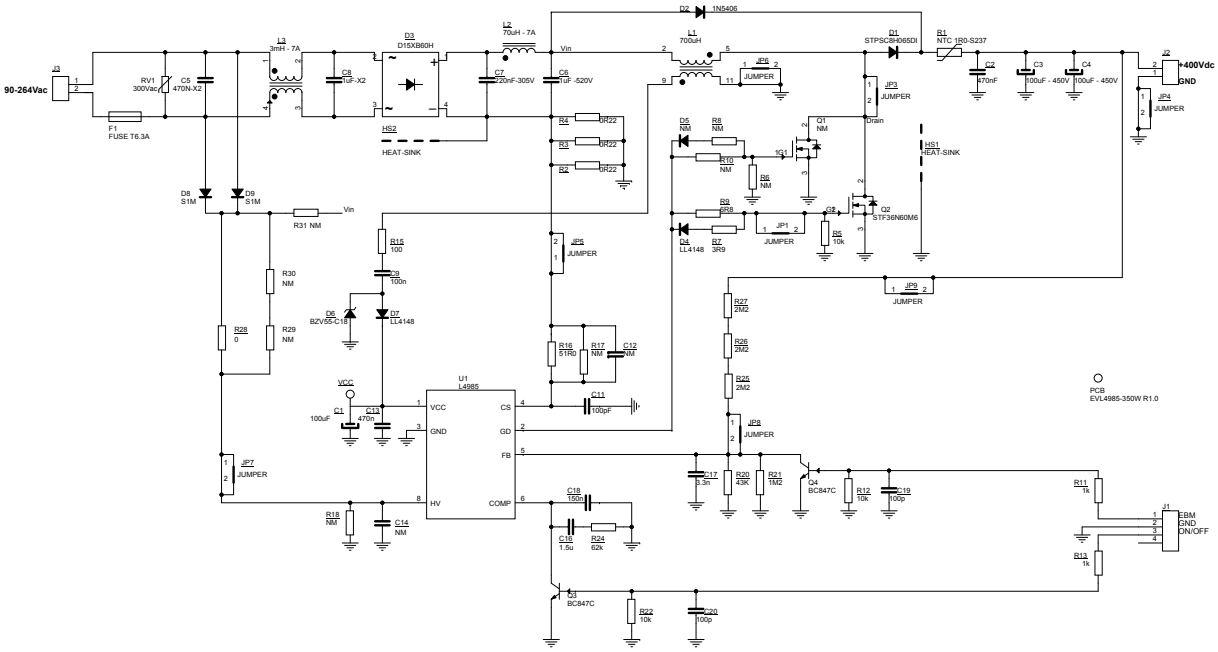
It is suitable for all SMPS from 150 W to several kW and is compliant with IEC61000-3-2 and JEITA-MITI standards.

Thanks to the embedded 800 V high voltage start-up circuitry (that includes also the X-capacitor discharger) and the new patented control method, the main features of this design are the minimal component counts, the simple and easy design and very low input current distortion (THD) in all operating conditions.

Product status link
EVL4985-350W

1 Evaluation board schematic

Figure 1. **EVL4985-350W evaluation board schematic**



2 PCB connectors

Table 1. **EVL4985-350W evaluation board connectors**

Schematic Reference	Description
J1	Input/output signal: 1. EBM (external burst-mode input) 2. GND (signal ground) 3. ON/OFF (enable/disable input)
J2	DC regulated output voltage
J3	AC input voltage

3 Bill of material

Table 2. **EVL4985-350W evaluation board BOM**

Sch. Ref.	Part no.	Case	Description	Supplier
C1	100uF	Rad. 8X11.5 mm	Electrolytic capacitor, 105°C - 50 V	
C2	470nF	6X26.5 mm	Film capacitor, 630 V - B32673P6474K000	Epcos
C3	100uF	Rad. 18X40 mm	Electrolytic capacitor, 105°C - 450 V - EKXG451ELL101MM40S	United Chemicon
C4	100uF	Rad. 18X40 mm	Electrolytic capacitor, 105°C - 450 V - EKXG451ELL101MM40S	United Chemicon
C5	470nF	8.5X26.5 mm	Film capacitor, X2 - B32923C3474M000	Epcos
C6	1uF	10.5X26.5 mm	Film capacitor, 520 V - B32673Z5105	Epcos
C7	220nF	7.5X26.5 mm	Film capacitor, 305 V - B32933A3224	Epcos
C8	1uF	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	NM	SMD 1206		
C16	1.5uF	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	ST Microelectronics
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	
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	
JP3	Shorted	Wire	Isolated wire jumper	

Sch. Ref.	Part no.	Case	Description	Supplier
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	
L1	700uH	DWG	PFC inductor - 2097.0002	Magnetica
L2	70uH - 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	ST Microelectronics
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	1R0	Rad. 15x7 p7.5 mm	NTC resistor, B57237S0109M000	Epcos
R2	0R22	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R3	0R22	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R4	0R22	PTH	Metal film resistor, 1 W - 5%	Koa Speer
R5	10K	SMD 0805	Resistor, 1/8 W - 5%	
R6	NM	SMD 0805		
R7	3R9	SMD 0805	Resistor, 1/8 W - 5%	
R8	NM	SMD 0805		
R9	6R8	SMD 0805	Resistor, 1/8 W - 5%	
R10	NM	SMD 0805		
R11	1k	SMD 0805	Resistor, 1/8 W - 5%	
R12	10K	SMD 0805	Resistor, 1/8 W - 5%	
R13	1k	SMD 0805	Resistor, 1/8 W - 5%	
R15	100	SMD 1206	Resistor, 1/8 W - 5%	
R16	51R0	SMD 0805	Resistor, 1/8 W - 1%	
R17	NM	SMD 0805		
R18	NM	SMD 1206		
R20	43k	SMD 0805	Resistor, 1/8 W - 1%	
R21	1M2	SMD 0805	Resistor, 1/8 W - 1%	
R22	10K	SMD 0805	Resistor, 1/8 W - 5%	
R24	62k	SMD 0805	Resistor, 1/8 W - 1%	
R25	2M2	SMD 1206	Resistor, 1/8 W - 1%	
R26	2M2	SMD 1206	Resistor, 1/8 W - 1%	
R27	2M2	SMD 1206	Resistor, 1/8 W - 1%	

Sch. Ref.	Part no.	Case	Description	Supplier
R28	0	SMD 1206	Resistor, 1/8W - 5%	
R29	NM	SMD 1206		
R30	NM	SMD 1206		
R31	NM	SMD 1206		
VCC	Test Point		Strip contact - 1	Samtec
U1	L4985A	SO8	CCM PFC controller	ST Microelectronics
Z1	EVL4985-350W R1.0		Printed circuit board	

Revision history

Table 3. **Document revision history**

Date	Version	Changes
06-Sep-2021	1	Initial release.
28-Sep-2023	2	Updated Table 2 (D1 part number, Z1 part number).

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