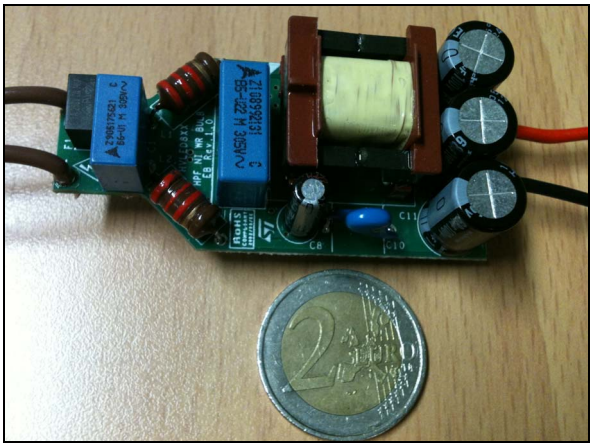
EVLHVLED815W10A

10 W wide range non-isolated high power factor LED driver using HVLED815PF

Data brief



Features

- 10 W LED driver
- Single stage HPF buck-boost
- Primary side regulation - no optocoupler
- Power factor > 0.9
- LED driver efficiency > 85%
- THD < 25%
- Wide input range (85 - 265) Vac

Description

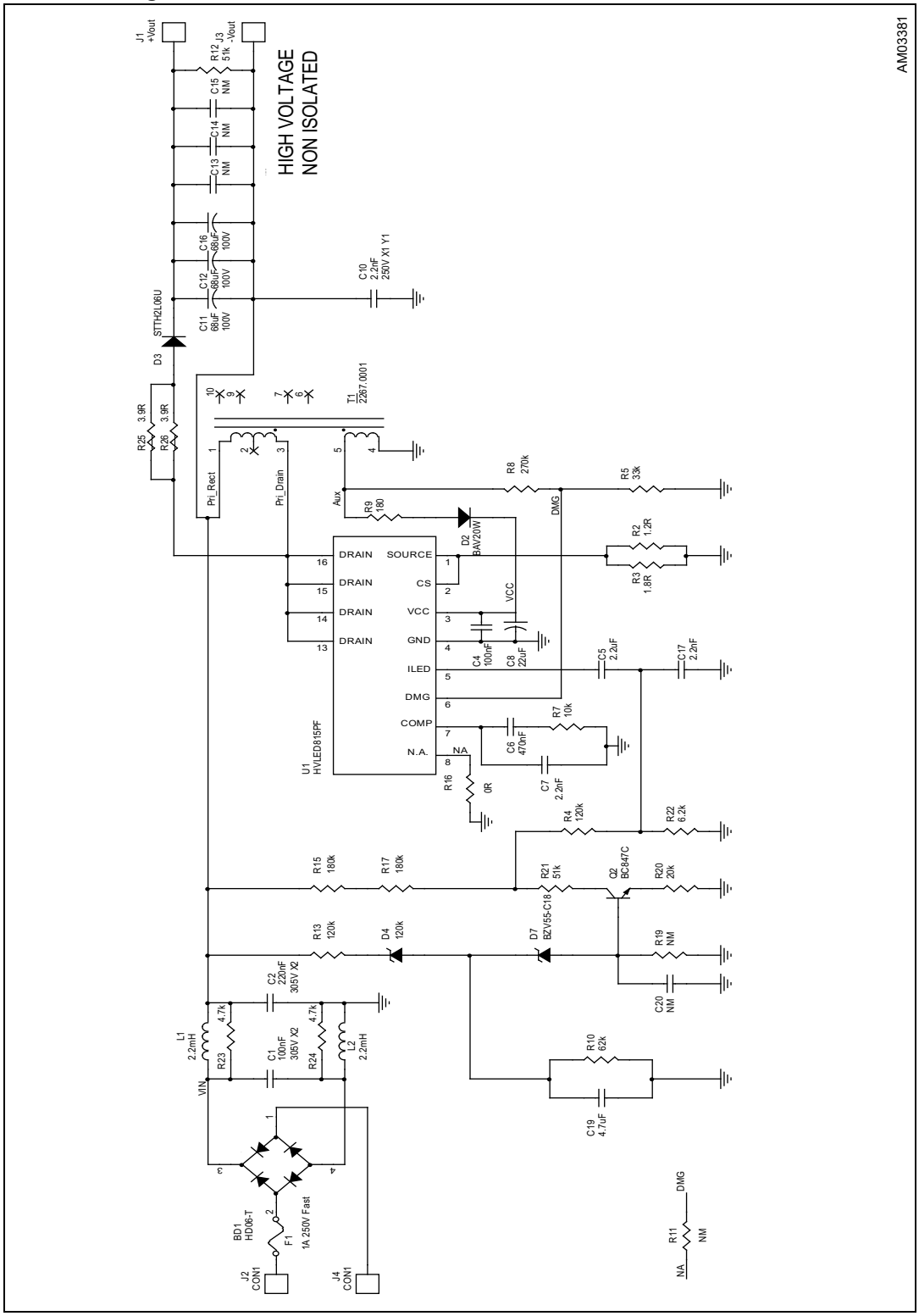
The EVLHVLED815W10A is a non-isolated 10 W, wide range, regulated LED driver using the HVLED815PF device, with a high power factor and a constant output current regulation.

The maximum power and form factor have been designed for the lighting market, facilitating the replacement of the incandescent lamps.

The patented primary side regulation, the internal high voltage primary switcher operating directly from the rectified mains and the high voltage start-up generator contained in the HVLED815PF device allow a very cost-effective solution for LED driving.

1 Electrical diagram

Figure 1. EVLHVLED815W10A demonstration board schematic



2 Bill of material

Table 1. Bill of material

Ref.	Value	Description	Manufacturer
PCB	-	HVLED8XX HPF NI WR BULB EB rev. 2.0	TECNOMETAL
BD1	HD06-T	Bridge diode HD06-T 600 V 0.8 A MINIDIP	Diodes
C1	100 nF	CAP X2 305 V MKP P. 10	EPCOS
C2	220 nF	CAP X2 305 V MKP P. 15	EPCOS
C4	100 nF	Cap. ± 10% X7R 50 V 0805	KEMET
C5	2.2 µF	Cap. ±1 0% X5R 25 V 0805	KEMET
C6	470 nF	Cap. ±1 0% X7R 25 V 0805	KEMET
C7, C17	2.2 nF	Cap. ± 5% C0G 50 V 0805	MURATA
C8	22 µF	Cap. ± 20% EL. 50 V 105 °C rad. D5 P 2.5 mm	Panasonic
C10	2.2 nF	Cap. X1 Y1 250 V CERAMIC P.10	Murata
C11, C12, C16	68 µF	Cap. ± 20% EL. 100 V 105 °C LL LOW ESR rad. D10 P 5 mm	Nichicon
C13, C14, C15, C20	N.M.	-	-
C19	4.7 µF	Cap. ± 10% X5R 50 V 1206	TAIYO YUDEN
D2	BAV20W	Diode rect. 150 V 200 mA SOD123	Diodes
D3	STTH2L06U	Diode rect. UFAST STTH2L06U 600 V 2 A SMB	STMicroelectronics
R13	120 kΩ	Res.1/4 W 1% 100 ppm 1206 SMD	VISHAY
D7	BZV55-C18	Zener 18 V ± 5% 500 mW MINIMELF	NXP
F1	1 A - 250 V - fast	Fuse 1 A 250 V fast radial 8.4 mm x 7.7 mm P 5 mm	MULTICOM
J1	+Vout	Cable color red 0.5 mm^2 L.50 mm, stripped and tinned 5 mm	-
J2	CON1	Cable color brown 0.5 mm^2 L.50 mm, stripped and tinned 5 mm	-
J3	-Vout	Cable color black 0.5 mm^2 L.50 mm, stripped and tinned 5 mm	-
J4	CON1	Cable color brown 0.5 mm^2 L.50 mm, stripped and tinned 5 mm	-
L1 L2	2.2 mH	Choke RF 2.2 mH 250 mA Axial D 6.5 L 12 mm	EPCOS
Q2	BC847C	NPN SML SIG G.P. AMP SOT23	NXP
R2	1.2 Ω	Res. 1/4 W 1% 100 ppm 1206 SMD	Panasonic
R3	1.8 Ω	Res. 1/4 W 1% 100 ppm 1206 SMD	Panasonic
R4	120 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R5	33 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R7	10 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R8	270 kΩ	Res. 1/4 W 1% 100 ppm 1206 SMD	VISHAY
R9	180 Ω	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY

Table 1. Bill of material (continued)

Ref.	Value	Description	Manufacturer
R10	62 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R12, R21	51 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R11, R19	N.M.	-	-
R15, R17	180 kΩ	Res. 1/4 W 1% 100 ppm 1206 SMD	WELWYN
R16	0 Ω	Res. 0 Ω 0603 SMD	VISHAY
R20	20 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R22	6.2 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R23, R24	4.7 kΩ	Res. 1/8 W 1% 100 ppm 0805 SMD	VISHAY
R25, R26	3.9 Ω	Res. 1/4 W 1% 100 ppm 1206 SMD	VISHAY
T1	2267.0001	Inductor L = 1.1 mH 0.6 A core EF20	Magnetica
U1	HVLED815PF	Offline LED driver HVLED815PF SO16	STMicroelectronics

3 Component layout

Figure 2. Top side

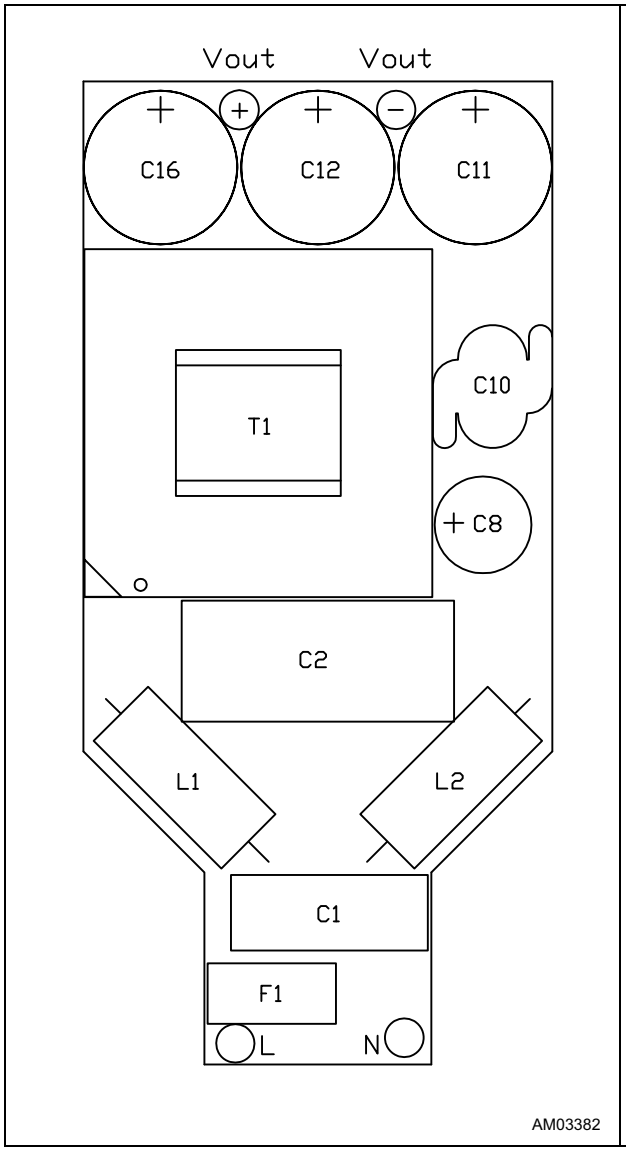
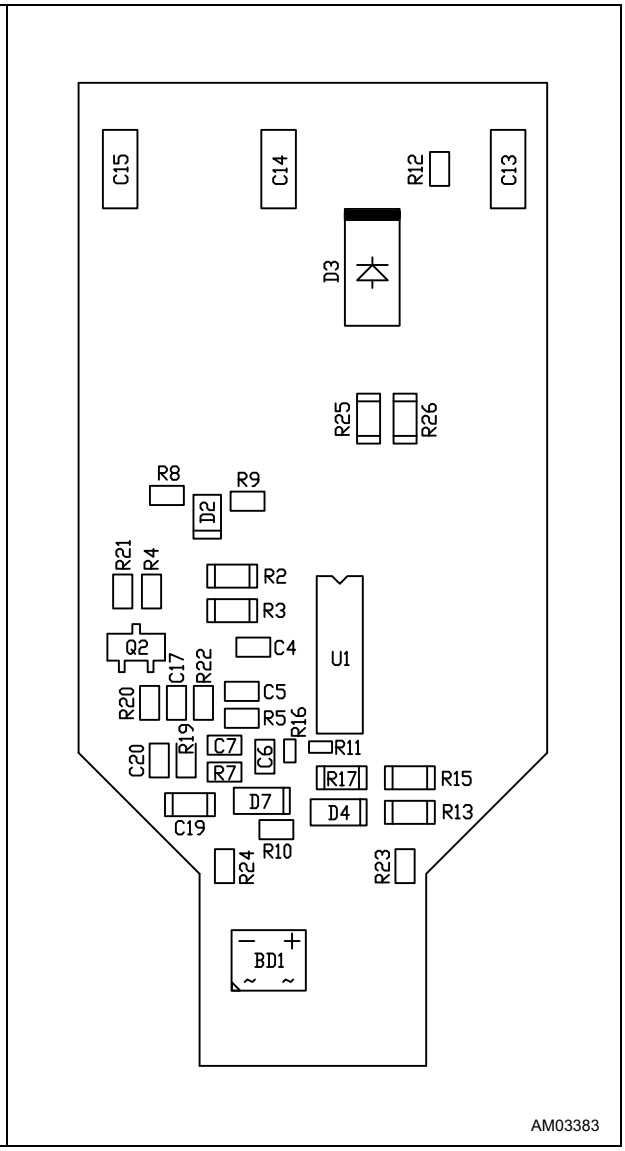


Figure 3. Bottom side



4 Revision history

Table 2. Document revision history

Date	Revision	Changes
09-Jan-2014	1	Initial release.

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