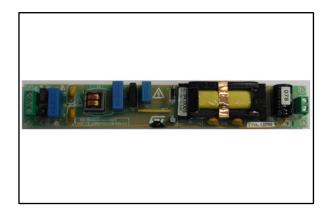
# life.augmented

## STEVAL-ILL076V2

## 18 W wide input range ultra slim flyback converter using HVLED001A quasi resonant flyback controller and STD8N80K5

Data brief



#### **Features**

- Input voltage: Vin: 90 264 Vrms, f: 45 66
  Hz
- Output power:
  - 18 W at wide input range
  - 40 W at European input range
- Output voltage: 56 V ±5 %
- High power factor, low THD
- No-load: better than 400 mW at 230 Vin
- Full load efficiency: greater than 92 %
- Short circuit protection with auto restart
- EMI: pre-compliant with EN55022 (B) limits
- Safety: complies with EN60950
- Dimensions: 183 mm x 28 mm x 17 mm
- PCB: single sided, 35 μm, FR4, mixed PTH/SMD
- RoHS compliant

#### **Description**

This board implements an offline power converter based on a single stage high-PF flyback topology using the HVLED001A controller.

A very slim form factor is achieved with innovative magnetic componentry.

The output voltage is controlled by the primary side, thus reducing the need for costly optocouplers. The HVLED001A PSR precision and the innovative structure of the transformer makes for highly accurate output voltage regulation against load and line changes.

A very high efficiency is obtained and a full set of protections including output short circuit and input overvoltage is included.

Conducted EMI is pre-screened and clearances and creepage distances adhere to EN60950 safety requirements.

Power factor and THD are optimized to be respectively higher than 0.95 and lower than 10% at full load over the entire input voltage range.

The main application for this converter is for bus power supplies in a LED string driver providing 4 kV isolation.

### 1 Schematic diagram and bill of materials

GSPG0609161035SG C2 470µF 63V 300Vac Y2 470pF> C8 (100pF 1kV P6KE300A T STTH108A\_ D5 4 0.125W \7Kn \R8 C13 ★<sup>D11</sup> ★BZV55-B30 >R+ 305VAC X2 1 1000F C5 0.600W 1Kn R11 2× +0 mH/ C 1770.0013 لسسسا V1 ERZEOZA431 300Vac 2Amps (T) F1

Figure 1: STEVAL-ILL076V2 circuit schematic



Table 1: Board bill of materials

Q.ty	Reference	Part / Value	Voltage / Watt / Ampere	Tolerance
1	C1	3.3 nF 50 V		10%
1	C2	470 µF	63 V	10%
2	C3, C4	220 nF	305 Vac X2	10%
1	C5	100 nF	305 Vac X2	10%
2	C6, C7	220 pF	500 Vac Y1	10%
1	C8	100 pF	1 kV	10%
2	C9, C10	470 pF 300 Vac Y2		10%
1	C11	10 pF	100 V	10%
1	C12	47 µF	35 V	10%
2	C13, C14	100 nF 100 V		10%
1	C15	15 µF 10 V		10%
1	C16	220 pF 50 V		10%
1	D1	KBP305G	600 V / 3 A	
1	D2	STPS2200U 200 V / 2 A		
0	D3	NM		
1	D4	P6KE300A	300 V	
1	D5	STTH108A 800 V / 1 A		
2	D6, D10	LL4148GS18		
1	D7	BZV55-C18	Zener 18 V	
2	D8, D11	BZV55-B30	Zener 30 V	
1	D9	BZV55-B27 Zener 27 V		
1	F1	2 Amps (T) 300 Vac		
1	JPX1		20.5 mm	
1	JPX2		171 mm TIW	
1	L1	1770.0013 2x 40 mH/ 0.25 A		
1	P1	SIP header		
1	P2	SIP header		
1	Q1	STD8N80K5	800 V / 8 A	
1	R1	1 ohms		
1	R2	0.82 ohms		
1	R3	1 Kohms	0.125 W	1%
1	R4	10 Mohms	0.125 W	1%
1	R5	47 ohms 0.250 W		1%
1	R6	8.2 ohms	0.250 W	1%
1	R7, R8	47 Kohms	0.125 W	1%

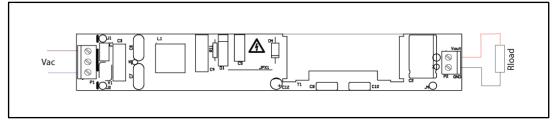


#### STEVAL-ILL076V2

Q.ty	Reference	Part / Value	Voltage / Watt / Ampere	Tolerance
1	R9	24 Kohms	0.125 W	1%
1	R10	100 Kohms	0.125 W	1%
1	R11	1 Kohms	0.600 W	1%
1	R12	470 ohms	0.250 W	1%
1	R13	N.M.		
1	R14	470 ohms	0.125 W	1%
1	T1	2294.0005 590 µH/ 95k Hz/ 40 V		
1	U1	HVLED001A		
1	V1	ERZE07A431	MOV	

## 2 Mechanical drawing and connection

Figure 2: STEVAL-ILL076V2 – connections



Revision history STEVAL-ILL076V2

## 3 Revision history

**Table 2: Document revision history** 

Date	Version	Changes
13-Sep-2016	1	Initial release.

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