

## 35W LED driver with very low THD, based on HVLED007 transition mode flyback controller

Data brief



(THD) in flyback converter operating in Transition mode (Quasi-Resonant).

Fast startup and protections with auto-restart are available for safe operation in lighting environments.

### Features

- AC input voltage from 90 V to 265 V (frequency range 45 - 66 Hz)
- Isolated DC bus voltage (Flyback topology): 48 V / 730 mA max.
- High Power Factor Flyback with very low THD:  
100 AC: PF>0.99, THD<3% @ full load  
230 AC: PF>0.98, THD<5% @ full load
- Efficiency: >89 % @ full load
- Mains harmonics: meets EN61000-3-2 and JEITA-MITI Class-C
- EMI: according to EN55022 Class-B
- RoHS compliant

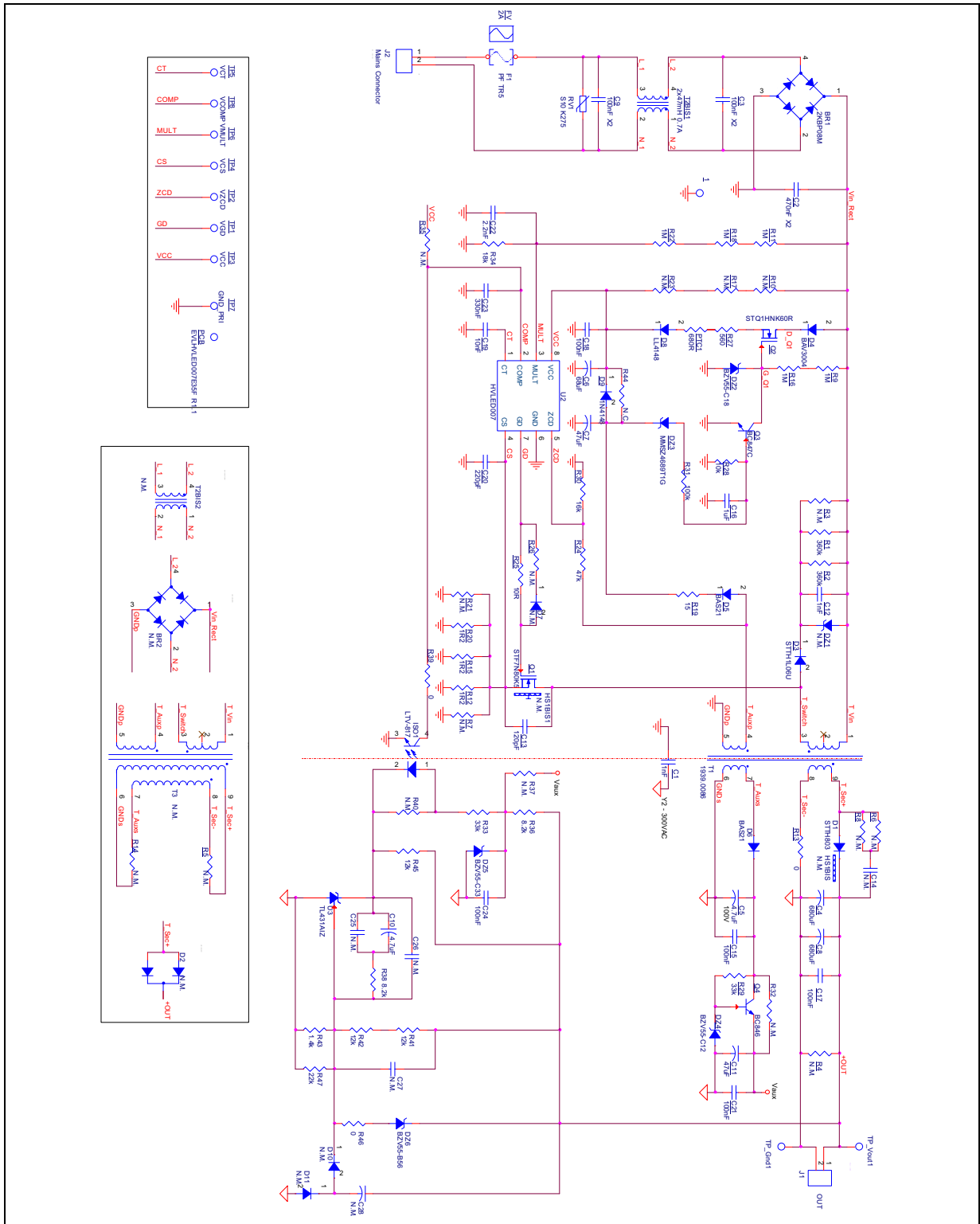
### Description

The EVLHVLED007W35F supplies a stable and isolated 48 V voltage bus suitable for secondary side circuitry (e.g., LED current generators) for a total output power of 35 W when a wide range of input voltages is applied at its input. An auxiliary 12 V output is also present to supply small circuits which absorb a maximum current of 15 mA.

Thanks to an STMicroelectronics patented control embedded on HVLED007, the main feature of this design is the very low input current distortion

# 1 Evaluation board schematic

Figure 1. EVLHVLED007W35F evaluation board schematic



## 2 Bill of material

Table 1. EVLHVLED007W35F evaluation board BOM

Reference	Part no.	Case	Description	Supplier
BR1	2KBP08M	KBPM	Bridge rectifier - 800V / 2A	VISHAY
BR2	N.M.	GBU	-	-
C1	1nF	RAD 5x7 p10	Y2 - 300Vac	VISHAY
C2	470nF X2	9x18 p15	X2 / 305Vac	TDK
C3	100nF X2	5x18 p15	X2 / 305Vac	TDK
C4	680uF	RAD d18 p7.5	Electrolitic 105°C - 63V	Nichicon
C5	4.7uF	RAD d5 p2	Electrolitic 105°C - 100V	United Chemi-Con
C6	68uF	RAD d6.3 p2.5	Electrolitic 105°C - 35V	Panasonic
C7	47uF	RAD d6.3 p2.5	Electrolitic 105°C - 35V	Nichicon
C8	680uF	RAD d18 p7.5	Electrolitic 105°C - 63V	Nichicon
C9	100nF X2	5x18 p15	X2 / 305Vac	TDK
C10	4.7uF	RAD d5 p2	Electrolitic 105°C - 50V	Panasonic
C11	47uF	RAD d5 p2	Electrolitic 105°C - 35V	Nippon Ch.
C12	1nF	SMD 1206	Ceramic X7R - 630V	TDK
C13	120pF	SMD 1206	Ceramic COG - 1kV	-
C14	N.M.	SMD 1206	Ceramic X7R - 50V	-
C15	100nF	SMD 1206	Ceramic X7R - 100V	-
C16	1uF	SMD 0805	Ceramic X7R - 50V	-
C17	100nF	SMD 1206	Ceramic X7R - 100V	-
C18	100nF	SMD 0805	Ceramic X7R - 50V	-
C19	10nF	SMD 0805	Ceramic X7R - 50V	-
C20	220pF	SMD 0805	Ceramic X7R - 50V	-
C21	100nF	SMD 0805	Ceramic X7R - 50V	-
C22	2.2nF	SMD 0805	Ceramic X7R - 50V	-
C23	330nF	SMD 0805	Ceramic X7R - 50V	-
C24	100nF	SMD 0805	Ceramic X7R - 50V	-
C25	N.M.	SMD 1206	Ceramic X7R - 50V	-
C26	N.M.	SMD 0805	Ceramic X7R - 50V	-
C27	N.M.	SMD 0805	Ceramic X7R - 50V	-
C28	N.M.	RAD d5 p2	Electrolitic 105°C - 100V	-
DZ1	N.M.	DO-15	Transil 300V / 600W	-
DZ2	BZV55C18	SMD mini-melf	Zener diode 18V / 500mW - +/-5%	Taiwan S.

Table 1. EVLHVLED007W35F evaluation board BOM (continued)

Reference	Part no.	Case	Description	Supplier
DZ3	MMSZ4689T1G	SMD mini-melf	Zener diode 5.1V / 500mW - +/-5%	On Semiconductor
DZ4	BZV55C12	SMD mini-melf	Zener diode 12V / 500mW - +/-5%	Taiwan S.
DZ5	BZV55C33	SMD mini-melf	Zener diode 33V / 500mW - +/-5%	Taiwan S.
DZ6	BZV55B56	SMD mini-melf	Zener diode 56V / 500mW - +/-2%	Taiwan S.
D1	STTH803	TO-220AC	Ultrafast rectifier 300V / 8A	STMicroelectronics
D2	N.M.	TO-220AB	-	-
D3	STTH1L06U	SMD SMA	Ultrafast rectifier 600V / 1A	STMicroelectronics
D4	BAV3004	SMD SOD 323	Small signal diode 300V / 225mA	Diode
D5	BAS21	SMD SOD 323	Fast rectifier 250V / 200mA	ON-SEMI
D6	BAS21	SMD SOD 323	Fast rectifier 250V / 200mA	ON-SEMI
D7	N.M.	SMD mini-melf	-	-
D8	LL4148	SMD mini-melf	Fast rectifier 75V / 150mA	FAIRCHILD
D9	LL4148	SMD mini-melf	Fast rectifier 75V / 150mA	FAIRCHILD
D10	N.M.	SMD mini-melf	-	-
D11	N.M.	SMD mini-melf	-	-
FV	2A	TR5	TR5 Fuse - 250Vac	Littlefuse
F1	PF TR5	TR5	TR5 Fuse Holder -250Vac	Littlefuse
ISO1	LTV-817	DIL 4PIN	Optocoupler	Lite-ON
J1	LED out	SIP 2P p5.08	PCB screw terminal -10A	Weidmuller
J2	Mains connector	SIP 2P p5.08	PCB screw terminal -10A	Weidmuller
Q1	STF7N80K5	TO-220FP	N-MOSFET 800V / 6A	STMicroelectronics
Q2	STQ1HNK60R	TO-92	N-MOSFET 600V / 400mA	STMicroelectronics
Q3	BC847C	SMD SOT-23	NPN BJT 50V / 100mA	Nexperia
Q4	BC846	SMD SOT-23	NPN BJT 65V/100mA	Nexperia
RV1	S10 K275	RAD 5x12 p15	Varistor 275Vac	EPCOS
R1	360k	SMD1206	Resistor - 1/4W +/-1%	-
R2	360k	SMD1206	Resistor - 1/4W +/-1%	-
R3	N.M.	SMD1206	-	-
R4	N.M.	SMD1210	-	-
R5	N.M.	SMD 0805	-	-
R6	N.M.	SMD1206	-	-
R7	N.M.	SMD1206	-	-
R8	N.M.	SMD1206	-	-
R9	1M	SMD1206	Resistor - 1/4W +/-1%	-
R10	N.M.	SMD1206	-	-

Table 1. EVLHVLED007W35F evaluation board BOM (continued)

Reference	Part no.	Case	Description	Supplier
R11	1M	SMD1206	Resistor - 1/4W +/-1%	-
R12	1R2	SMD1206	Resistor - 1/4W +/-1%	-
R13	0	SMD1206	Resistor - 1/4W +/-1%	-
R14	N.M.	SMD 0805	-	-
R15	1R2	SMD1206	Resistor - 1/4W +/-1%	-
R16	1M	SMD1206	Resistor - 1/4W +/-1%	-
R17	N.M.	SMD1206	-	-
R18	1M	SMD1206	Resistor - 1/4W +/-1%	-
R19	15	SMD1206	Resistor - 1/4W +/-1%	-
R20	1R2	SMD1206	Resistor - 1/4W +/-1%	-
R21	N.M.	SMD1206	-	-
R22	1M	SMD1206	Resistor - 1/4W +/-1%	-
R23	N.M.	SMD1206	-	-
R24	47k	SMD 0805	Resistor - 1/8W +/-1%	-
R25	10	SMD 0805	Resistor - 1/8W +/-1%	-
R26	N.M.	SMD 0805	-	-
R27	560	SMD 0805	Resistor - 1/8W +/-1%	-
R28	10k	SMD 0805	Resistor - 1/8W +/-1%	-
R29	33k	SMD 0805	Resistor - 1/8W +/-1%	-
R30	16k	SMD 0805	Resistor - 1/8W +/-1%	-
R31	100k	SMD 0805	Resistor - 1/8W +/-1%	-
R32	N.M.	SMD 0805	-	-
R33	33k	SMD 0805	Resistor - 1/8W +/-1%	-
R34	18k	SMD 0805	Resistor - 1/8W +/-1%	-
R35	N.M.	SMD 0805	-	-
R36	8.2k	SMD 0805	Resistor - 1/8W +/-1%	-
R37	N.M.	SMD 0805	Resistor - 1/8W +/-1%	-
R38	8.2k	SMD 0805	Resistor - 1/8W +/-1%	-
R39	0	SMD 0805	Resistor - 1/8W +/-1%	-
R40	N.M.	SMD 0805	-	-
R41	12k	SMD 0805	Resistor - 1/8W +/-1%	-
R42	12k	SMD 0805	Resistor - 1/8W +/-1%	-
R43	1.4k	SMD 0805	Resistor - 1/8W +/-1%	-
R44	N.M.	SMD 0805	-	-
R45	12k	SMD 0805	Resistor - 1/8W +/-1%	-

Table 1. EVLHVLED007W35F evaluation board BOM (continued)

Reference	Part no.	Case	Description	Supplier
R46	0	SMD 0805	Resistor - 1/8W +/-1%	-
R47	22k	SMD 0805	Resistor - 1/8W +/-1%	-
PTC1	680ohm - 90deg	SMD 0805	PTC resistor	TDK
T1	1939.0086	TRAFO DIL 9P 26x32	35W flyback transformer	MAGNETICA
T3	N.M.	TRAFO DIL 9P 30x33	-	-
T2BIS1	2x47mH	DIL 4P 24x15	Current compensated choke - 0.7A	TDK
T2BIS2	N.M.	DIL 4P 26x25	-	-
U2	HVLED007	SMD SO-8	Hi-PF flyback controller	STMicroelectronics
U3	TL431 1% 105deg	TO-92	Reference voltage	STMicroelectronics
HS1BIS	N.M.	Heatsink TO-220	-	-
HS1BIS1	N.M.	Heatsink TO-220	-	-

### 3 Revision history

Table 2. Document revision history

Date	Revision	Changes
21-Jan-2019	1	Initial release

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