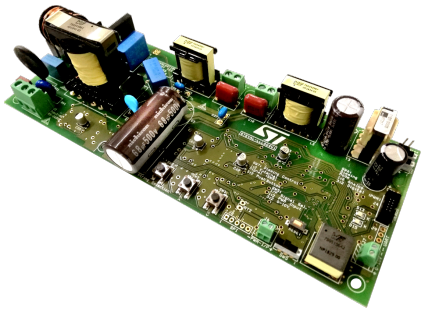
STEVAL-LLL004V1

75 W wide input voltage digitally controlled constant current LED driver



Summary table	
STEVAL-LLL004V1 evaluation board	STEVAL-LLL004V1
Mainstream ARM Cortex-M0 Access line MCU with 128 Kbytes Flash, 48 MHz CPU and CEC functions	STM32F071CBT6
N-channel 600 V, 0.550 Ω typ., 7.5 A MDmesh M2 EP Power MOSFET in a DPAK package	STD11N60M2-EP
VIPerPlus family: Low voltage energy saving fixed frequency high voltage converter	VIPER012LS

Features

- Wide input voltage range 85 – 265 V_{AC}
- Transition Mode PFC
- Two constant current outputs working in transition mode based on different topologies:
  - Buck topology
  - Inverse buck topology
- Output current: 500 mA ±2.5%
  - Number of LEDs connected at output: 16 – 24 white LEDs (3.3 V each)
- PFC > 0.97 and THD < 20% at full load with input voltage 85-265 V_{AC}
- Peak Efficiency at maximum load ≅ 90%
- Comprehensive safety protections:
  - Open/no-load circuit protection
  - Short-/overload circuit protection
- Soft start implementation
- LED dimming range: 0.5% to 100%
  - Analog dimming
  - Digital dimming
- Dimming control options:
  - Push button
  - 0-10 V input
- Meet IEC55022 Class B
- WEEE and RoHS compliant

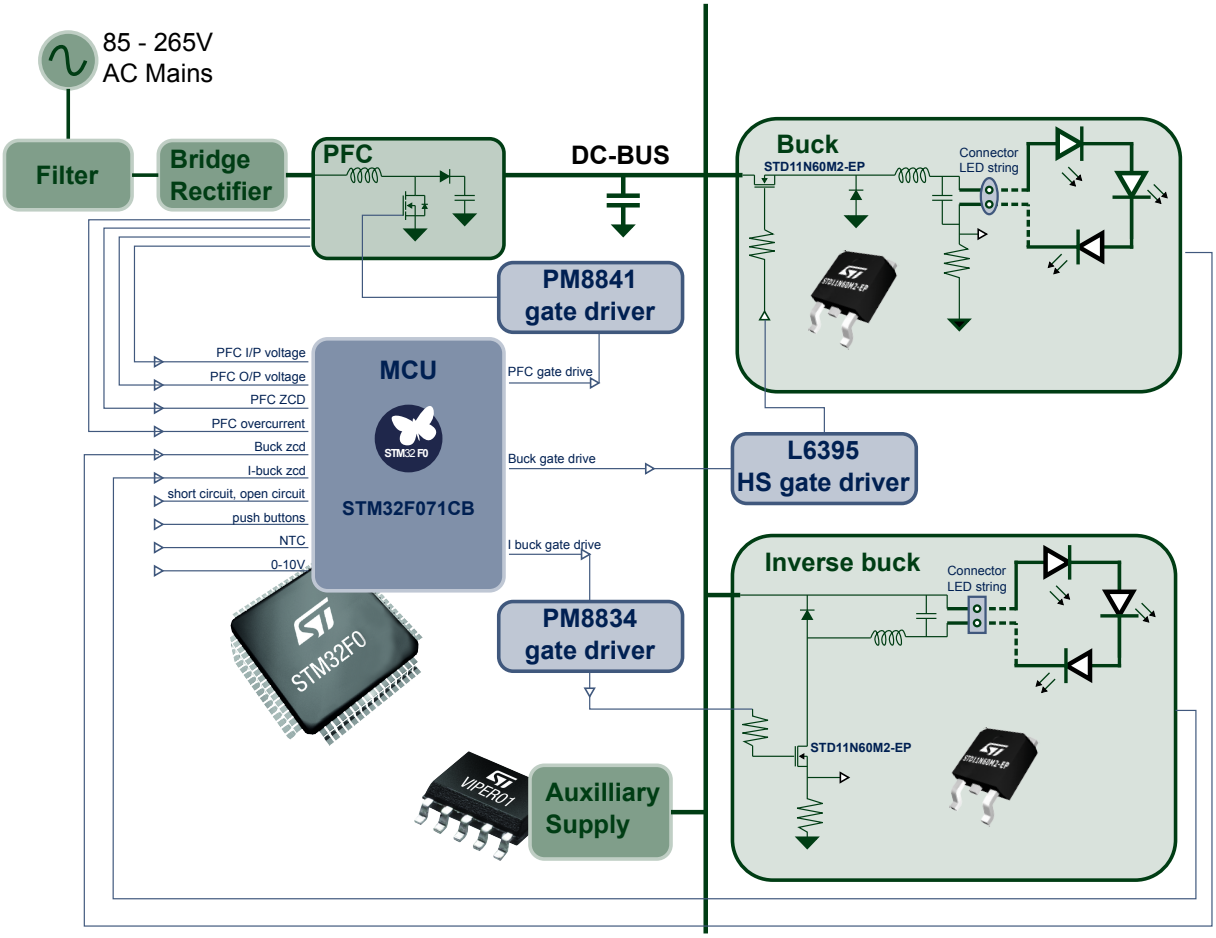
Description

The STEVAL–LLL004V1 is a digitally controlled constant current LED driver. The PFC stage and the two DC-DC converters are designed to work in transition mode (TM) to optimize efficiency.

The LED driver can deliver 75 W output power. It can dim the LEDs down to 0.5% of the maximum brightness level through both analog and digital approaches. The operation is flicker free across the entire dimming range using either of the dimming techniques. The board features high efficiency, a power factor almost equal to one, and a low THD percentage across wide input voltage and load conditions, thanks to the high performance ST power products and the advanced algorithms running on the 32-bit STM32F0 microcontroller.

1 STEVAL-LLL004V1 block diagram

Figure 2. **STEVAL-LLL004V1 block diagram**



2 STEVAL-LLL004V1 schematic diagrams

Figure 3. **STEVAL-LLL004V1 schematic - PFC converter**

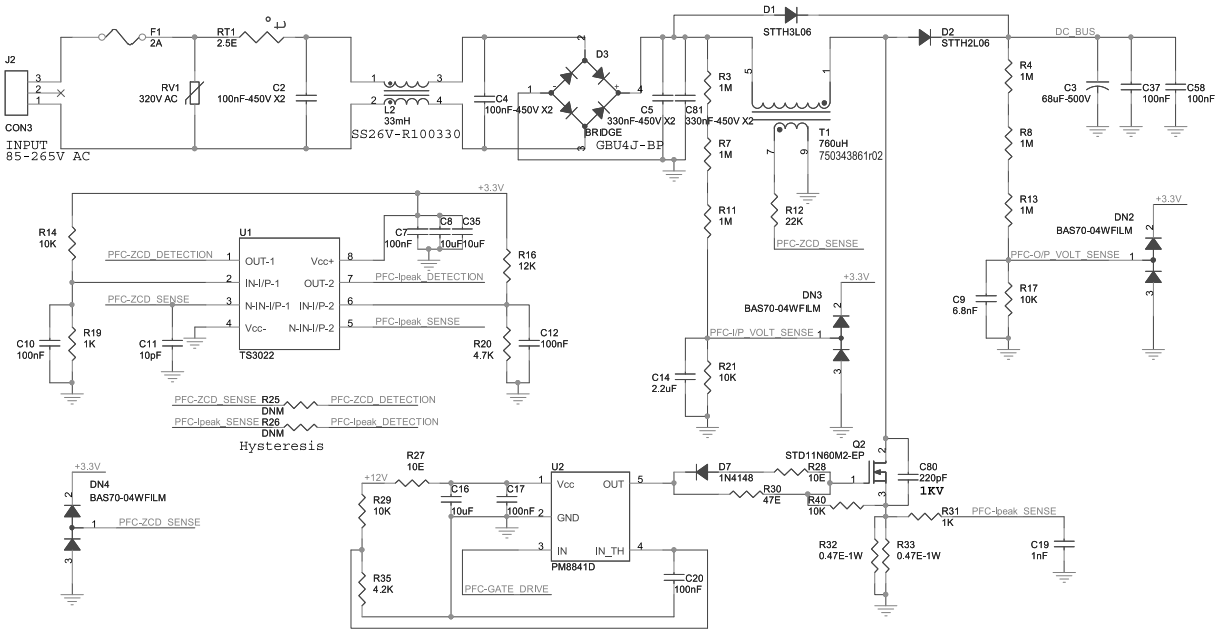


Figure 4. **STEVAL-LLL004V1 schematic - inverse buck converter**

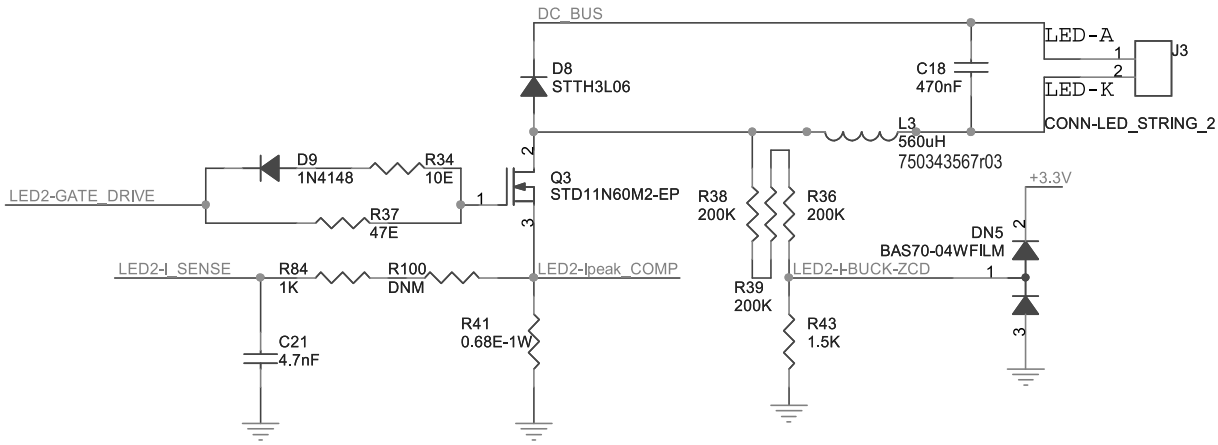


Figure 5. **STEVAL-LLL004V1 schematic - buck converter**

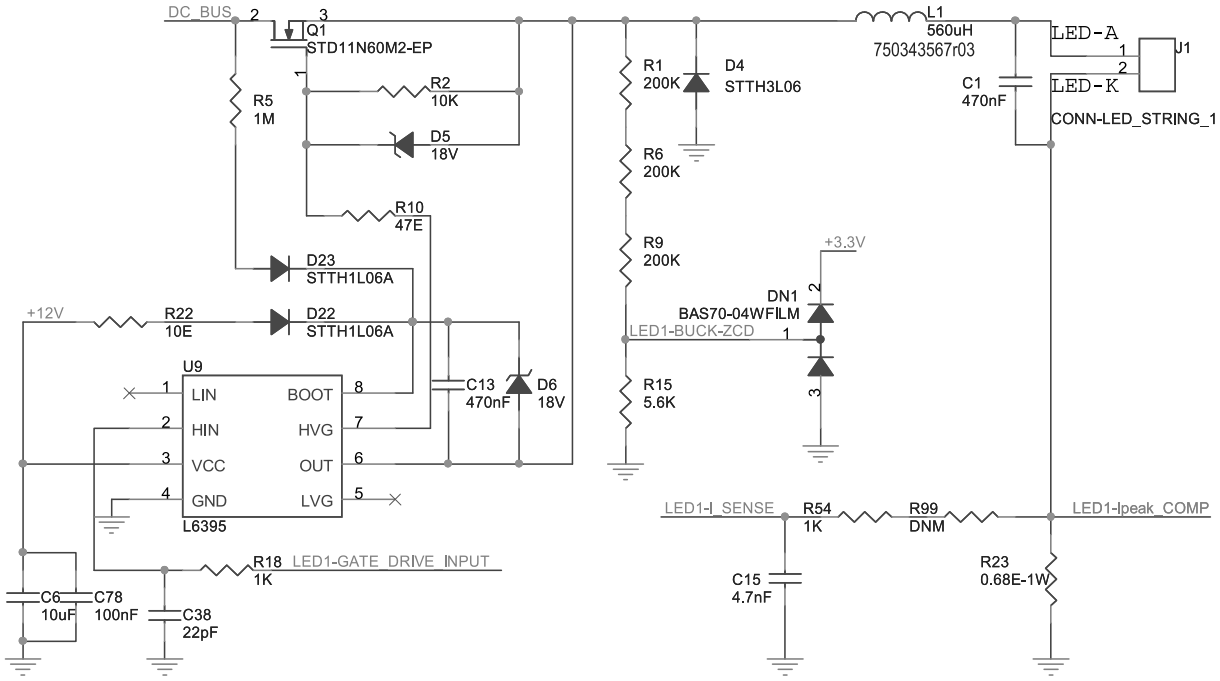


Figure 6. **STEVAL-LLL004V1 schematic - auxiliary power supply**

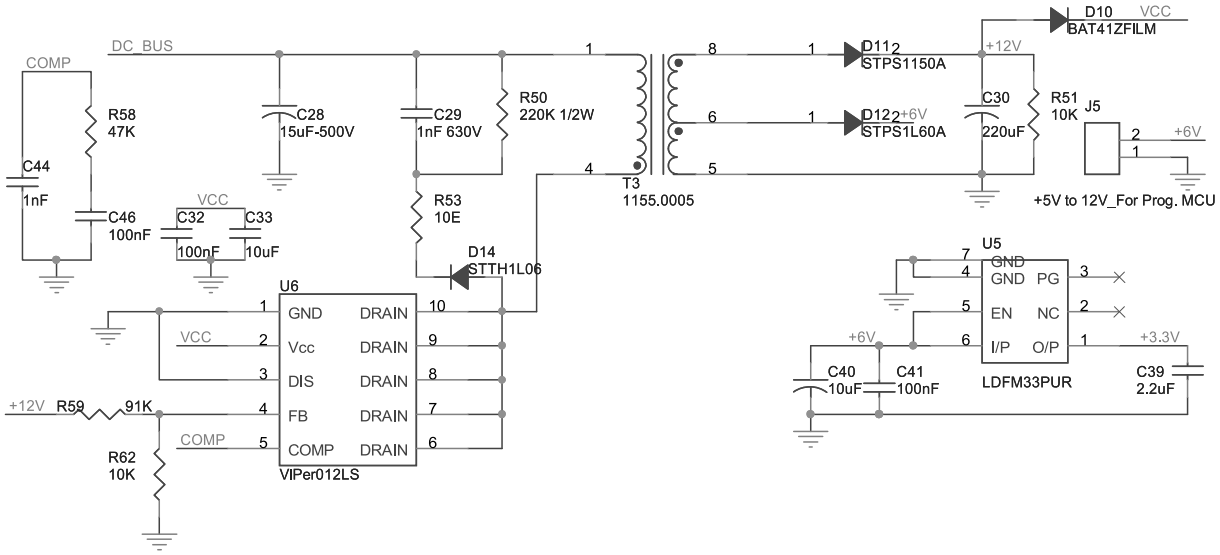


Figure 7. **STEVAL-LLL004V1 schematic - STM32 microcontroller**

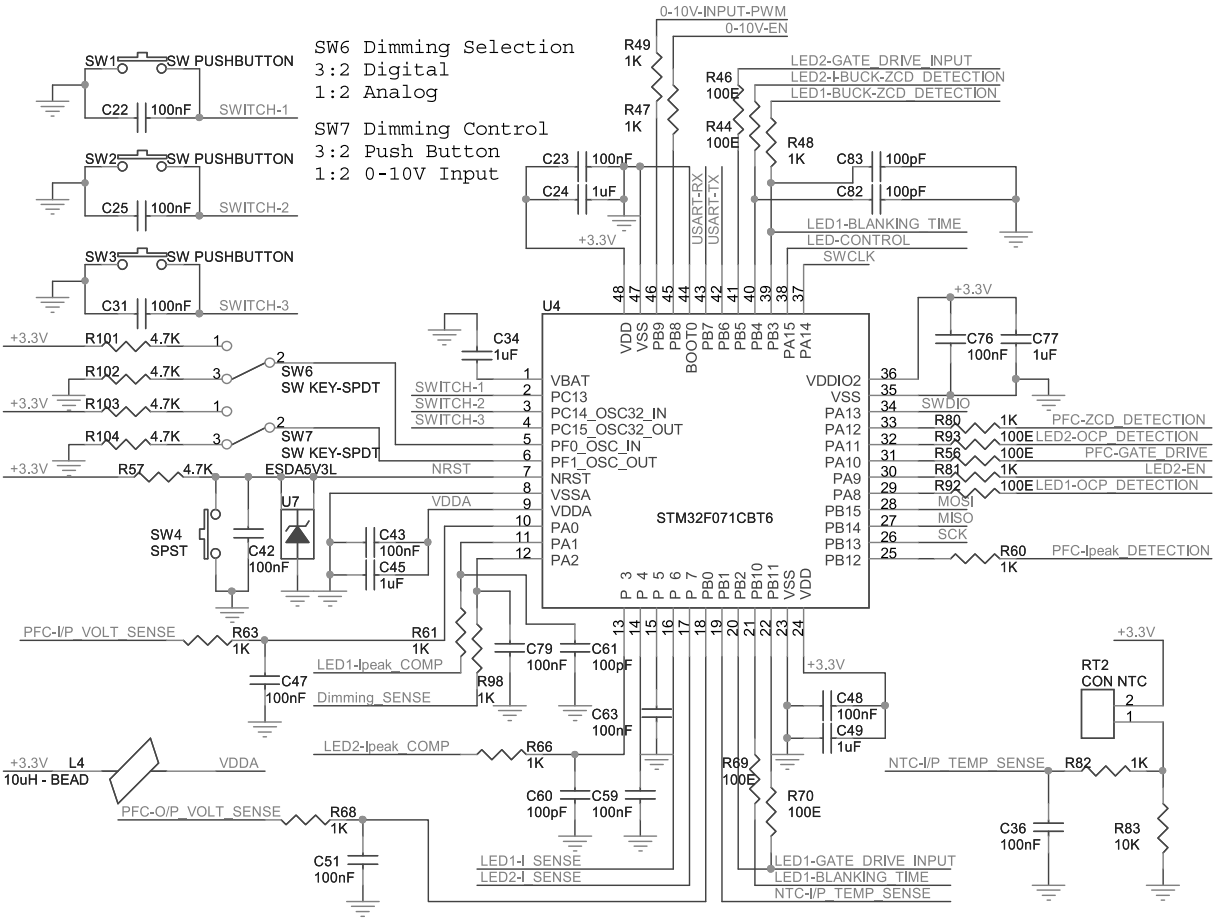
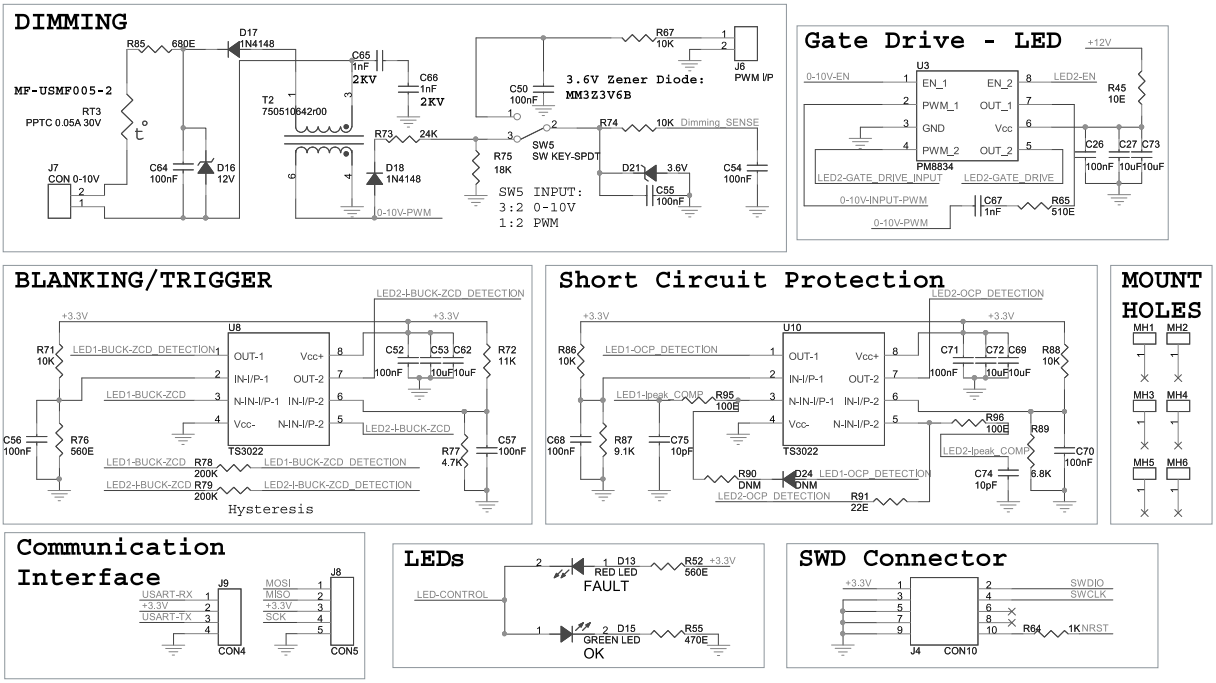


Figure 8. **STEVAL-LLL004V1 schematic - miscellaneous**



Revision history

Table 1. **Document revision history**

Date	Version	Changes
29-Nov-2018	1	Initial release.

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