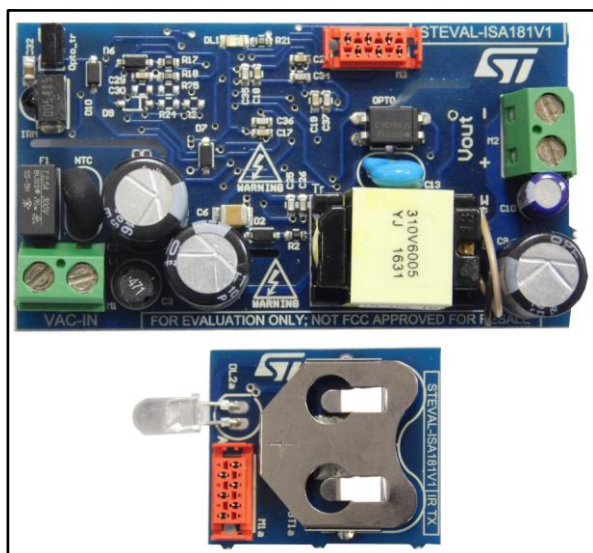


12 V / 600 mA high voltage flyback converter with remote standby control using the VIPer0P

Data brief



- Meets IEC61000-4-2(ESD), IEC61000-4-4 (EFT) and IEC61000-4-5 (Surge)
- RoHS compliant

Description

This SMPS system features an isolated flyback converter based on VIPer0P and special STM32 core logic to manage the VIPer0P for extremely low power consumption during ZPM while supplying the microcontroller and IR receiver and still maintaining relatively high overall efficiency during normal operation. The IR remote interface consists of a dedicated IR TX board and very low consumption TIA / band pass filter RX.

In the ZPM idle state, the device is shut down fully and the residual consumption from the 230V_{AC} mains is below 5 mW. The IC enters ZPM by pulling the OFF pin to SGND for more than 10 ms and exits ZPM (resuming normal switching) by pulling the ON pin to SGND for more than 20 μ s.

This function can be tested by acting on the tactile switches connected to the ON and OFF pins.

The proposed power supply is set in isolated flyback topology with 12 V output voltage and 7.2 W nameplate power.

Features

- Smart standby architecture using Zero Power Mode (ZPM) with IR remote on/off control suitable for Air Conditioning subsystems and other applications
- Based on VIPer0P high voltage converter with embedded 800V avalanche rugged power MOSFET and a current mode PWM controller with a set of protections for enhanced system reliability
- Input power consumption in Zero Power Mode lower than 8 mW at 230V_{AC} (switched-off by remote IR control) while supplying microcontroller and IR receiver
- Input power consumption at no load less than 30 mW at 230V_{AC}, including microcontroller consumption
- Average efficiency > 80.2% compliant with EuCoC rev. 5 – Tier 2 and EPS of DOE USA
- Meets IEC55022 Class B conducted EMI even with reduced EMI filter, thanks to the frequency jittering feature

1 Specifications

- Topology: flyback
- Isolation: yes
- Input power consumption:
 - Less than 8 mW at 230 V_{AC} in Zero-Power Mode
 - Less than 30 mW at 230 V_{AC} in no-load condition
 - compliant with EuCoC rev. 5 – Tier 2 and EPS of DOE USA input voltage: 85 V_{AC} - 265 V_{AC}
- Output voltage: 12 V, 600 mA
- Converter frequency: 120 kHz with jittering
- Max ambient temperature: 60 °C
- Automatic restart protections: OLP, VCC clamp, max duty cycle counter, thermal shutdown
- Pulse-skip protection to prevent the flux-runaway
- SMPS board dimensions: 68 mm x 36 mm
- IR TX control board: 28 mm x 25 mm

2 Schematic diagrams

Figure 1: SMPS board schematic

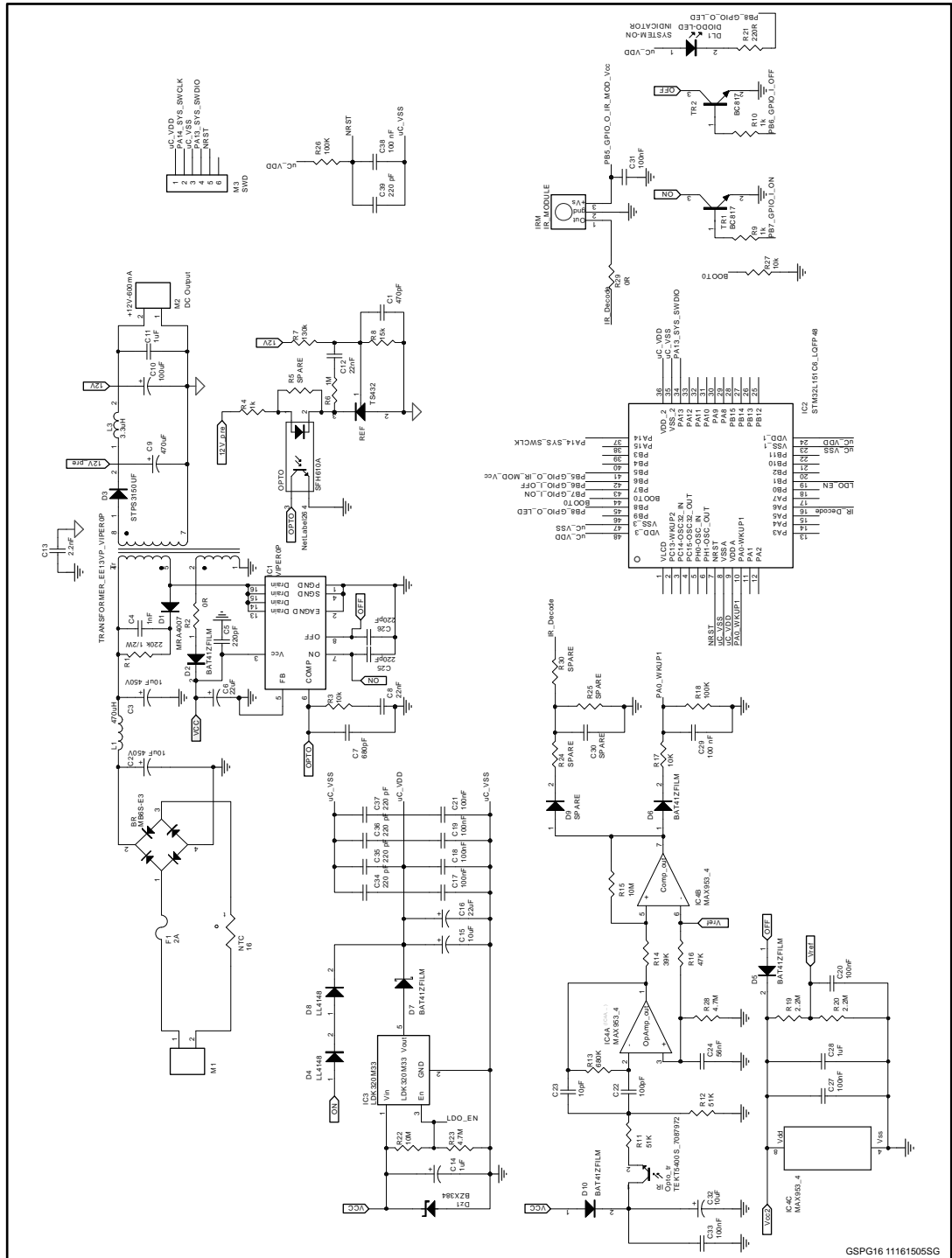
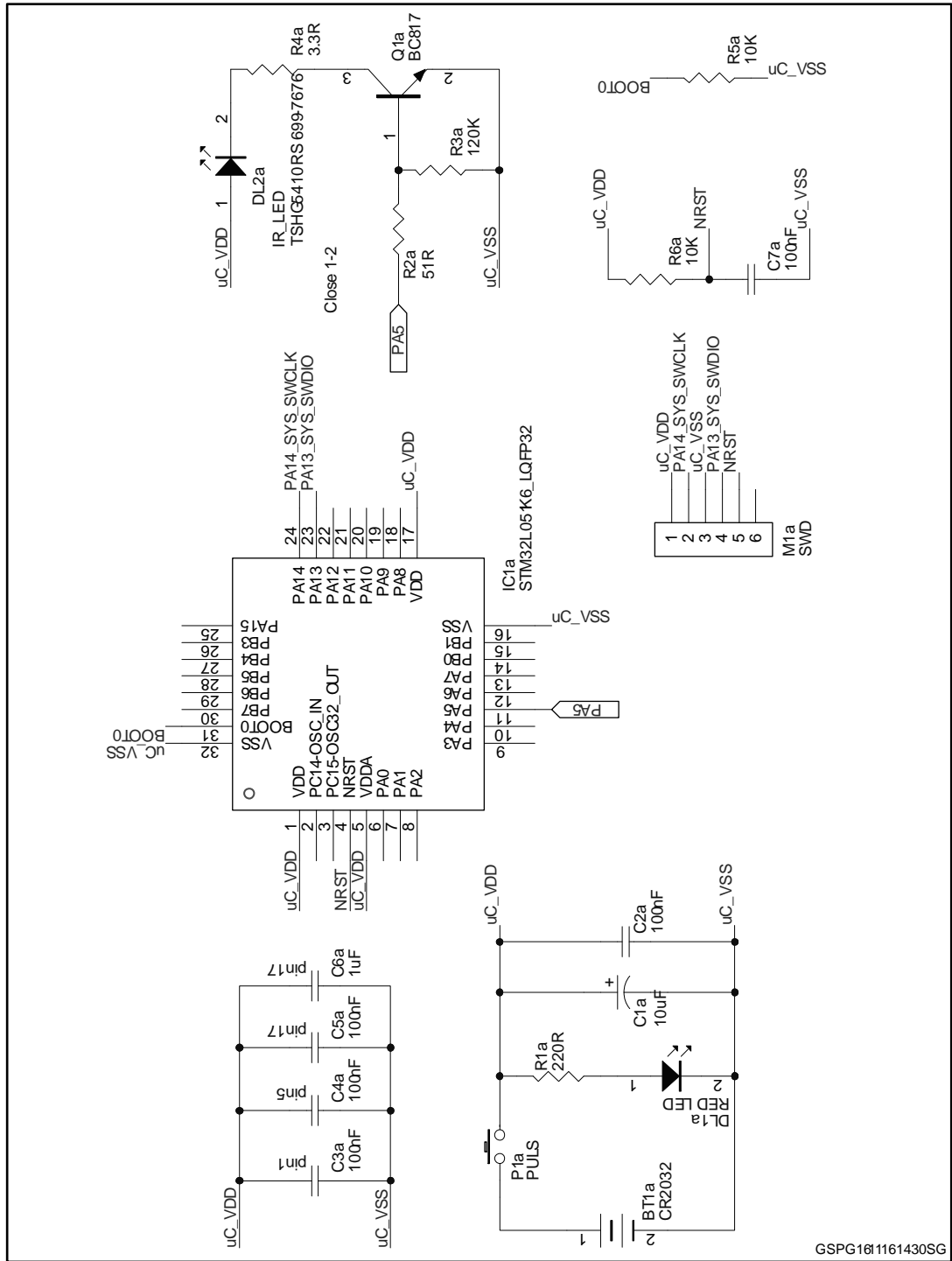


Figure 2: IR TX remote control board schematic



GSPG16I1161430SG

3 Revision history

Table 1: Document revision history

Date	Version	Changes
17-Nov-2016	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2016 STMicroelectronics – All rights reserved