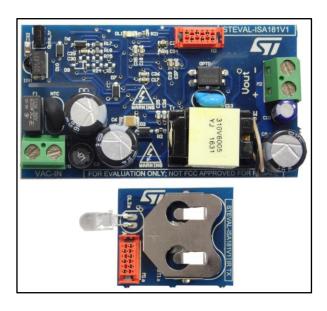


STEVAL-ISA181V1

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

Data brief



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 MOSEFET 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} (switchedoff 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

- 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.

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Specifications STEVAL-ISA181V1

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

STEVAL-ISA181V1 Schematic diagrams

2 Schematic diagrams

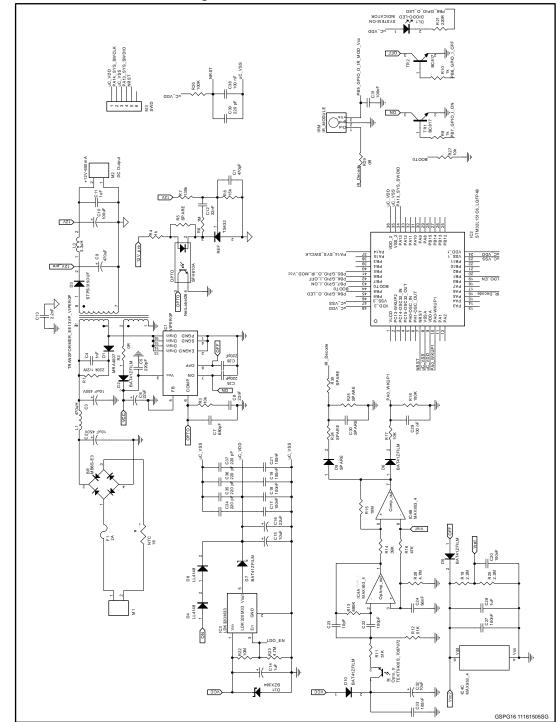


Figure 1: SMPS board schematic



Q1a BC817 R4a 3.3R R5a 10K uC_VSS DL2a IR_LED TSHŒ410RS 6997676 BOOT0 R3a 120K uC_VDD R6a 10K NRST uC_VDD 1 Close 1-2 R2a 51R uC_VDD PAI4 SYS_SWCLK uC_VSS PAI3_SYS_SWDIO NRST PA14_SYS_SWCLK PA13_SYS_SWDIO IC1a STM32L051K6_LQFP32 uC_VDD -0 m 4 m 0 VSS POOTO 789 789 889 489 489 \$183 _uC_VSS 2A9 2A9 2A9 3A9 7A9 0B9 1B9 9l 9l 7l 11 0l 25 27 28 30 30 31 35 35 31 14-OSC_IN 15-OSG32_OUT 9∀4 BOOT0 0 NRST uC_VDD uC_VDD UC VDD C2a 100nF C6a 1uF 7 f uiq 10uf C5a 100nF 71 uiq C4a 100nF S RED LED DL18 Guiq P1a PULS C3a 100nF ۲uiq uC_VDD

Figure 2: IR TX remote control board schematic



GSPG1611161430SG

STEVAL-ISA181V1 Revision history

3 Revision history

Table 1: Document revision history

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

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