

12 V - 5 W isolated flyback converter based on VIPer122LS



Features

- Universal input mains range: 85–265 V_{AC}
- Frequency: 50-60Hz
- Output voltage: 12 V
- Output current: 416 mA
- Highly compact size
- Stand-by mains consumption: < 30 mW at 230 V_{AC}
- Average efficiency: > 77%
- Tight line and load regulation over the entire input and output range
- Meets IEC55022 Class B conducted EMI even with reduced EMI filter, thanks to the frequency jittering feature
- RoHS compliant

Description

The STEVAL-VP12201F evaluation board implements a 12 V - 5 W isolated flyback converter developed for general purpose applications supplied from 85 to 265 V_{AC}.

The reference design is built around the new VIPer122LS offline high-voltage converter from the VIPerPlus family, with embedded 730 V Power MOSFET and PWM current-mode control.

The main characteristics of the evaluation board are its small size and minimal BOM, high efficiency, low stand-by consumption and tight line and load regulation over the entire input and output range. Extremely low consumption under no-load condition is ensured thanks to burst mode operation, which reduces the average switching frequency and minimizes all frequency related losses.

VIPer122LS operates at fixed frequency 60kHz with frequency jittering to meet the standards regarding electromagnetic disturbance.

Product summary	
12 V/5 W power supply in isolated flyback topology featuring the VIPer122 offline HV converter	STEVAL-VP12201F
high performance, high voltage converter with embedded Power MOSFET and PWM control	VIPER122
Applications	Isolated Auxiliary Power Supply up to 20W

1 Standby consumption and efficiency

Figure 1. STEVAL-VP12201F standby consumption

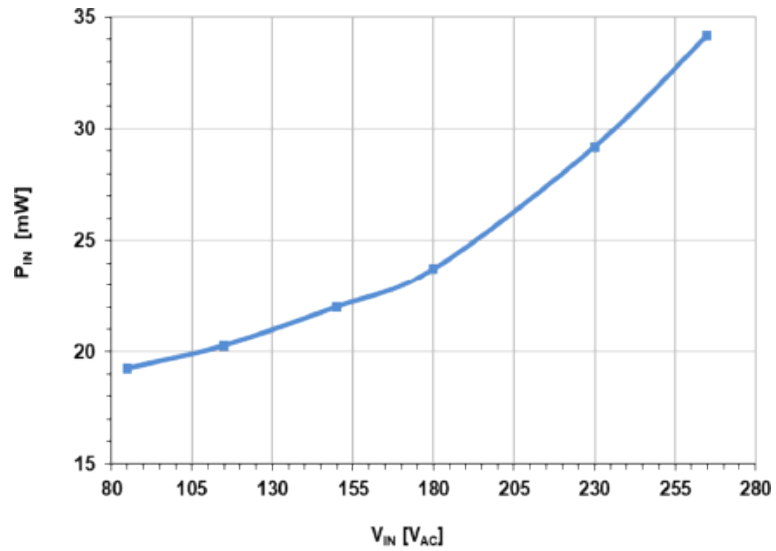
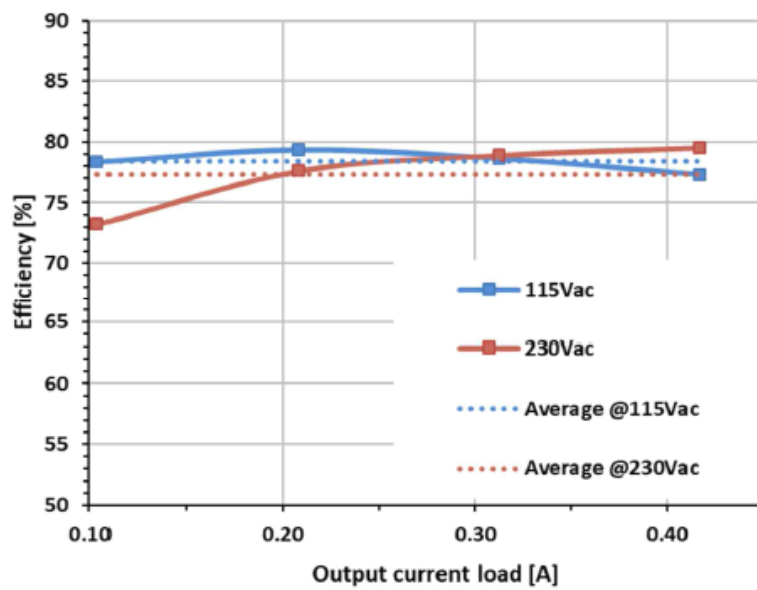


Figure 2. STEVAL-VP12201F efficiency



2 Noise measurements

The VIPer122 frequency jittering feature allows the spectrum to be spread over frequency bands rather than being concentrated on single frequency value. Especially when measuring conducted emission with the average detection method, the level reduction can be several dB μ V.

A pre-compliance test for the EN55022 (Class B) European normative was performed and the average measurements of the conducted noise emissions at full load and nominal mains voltages are shown in the following figures.

Figure 3. CE average measurement at 115 V_{AC} full load

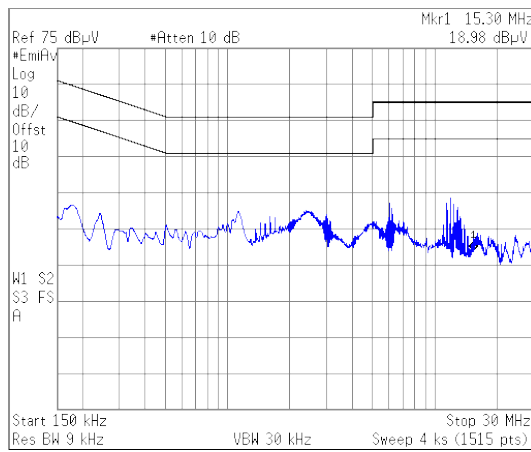
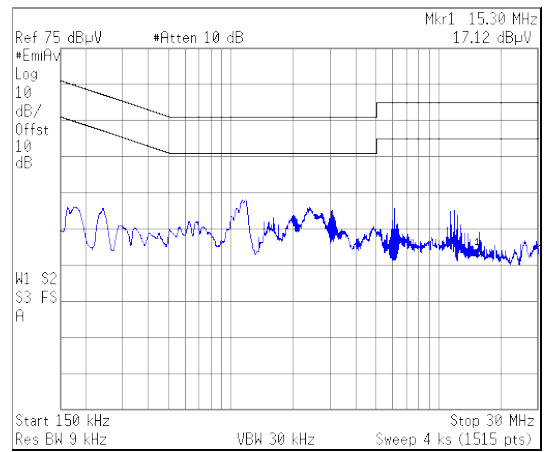
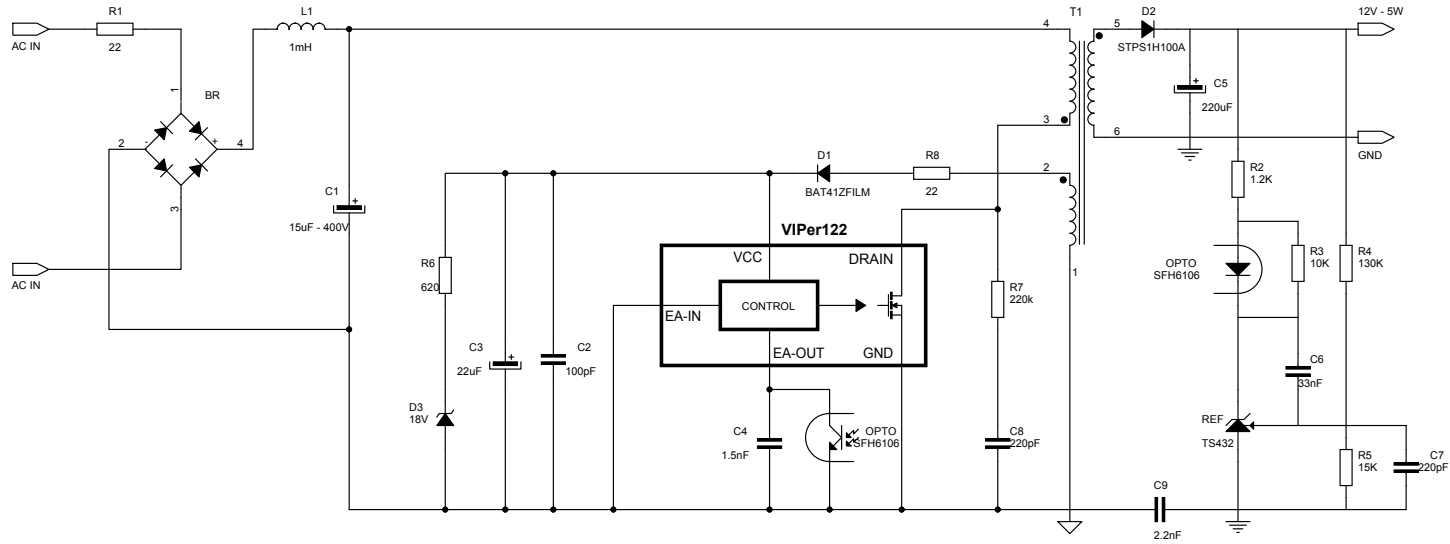


Figure 4. CE average measurement at 230 V_{AC} full load



3 Schematic diagrams

Figure 5. STEVAL-VP12201F circuit schematic



Revision history

Table 1. Document revision history

Date	Version	Changes
23-Oct-2020	1	Initial release.