

## 12 V - 5 W isolated flyback converter based on VIPer122LS



### Features

- Universal input mains range: 85–265 V<sub>AC</sub>
- Frequency: 50-60Hz
- Output voltage: 12 V
- Output current: 416 mA
- Highly compact size
- Stand-by mains consumption: < 30 mW at 230 V<sub>AC</sub>
- 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<sub>AC</sub>.

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

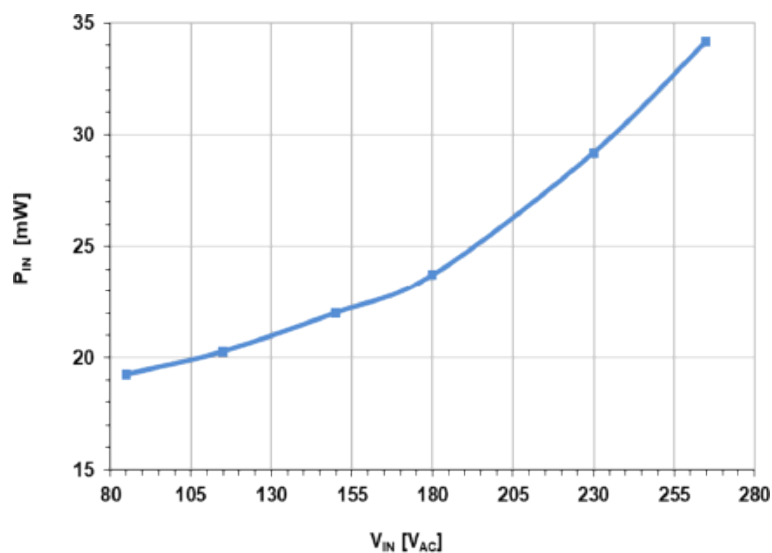
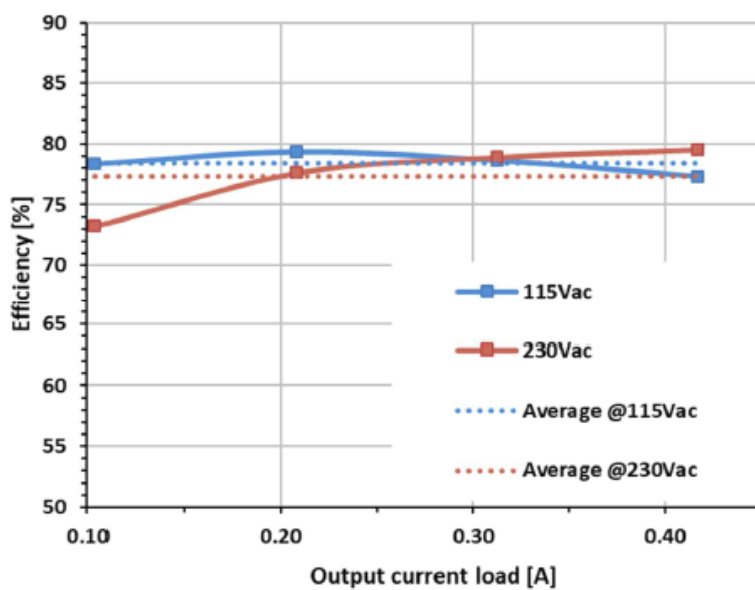


Figure 2. STEVAL-VP12201F efficiency

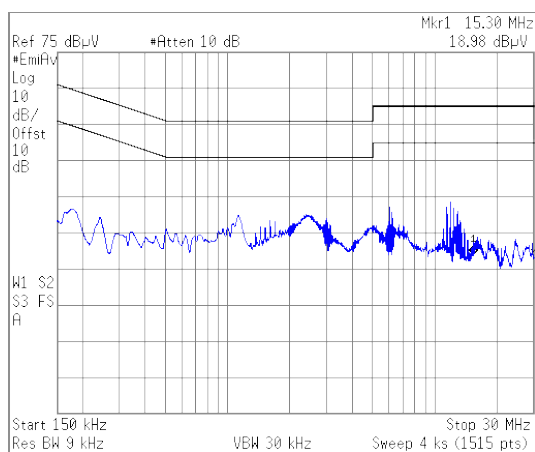


## 2 Noise measurements

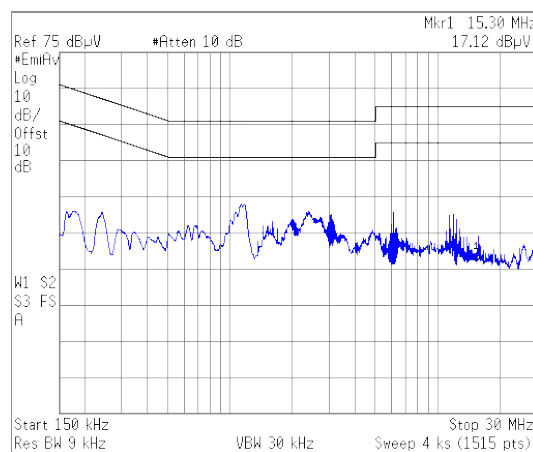
The **ViPer122** frequency jittering feature allows the spectrum to be spread over frequency bands rather than being concentrated on single frequency value. Especially when measuring conducted emission with the average detection method, the level reduction can be several dB $\mu$ V.

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<sub>AC</sub> full load**



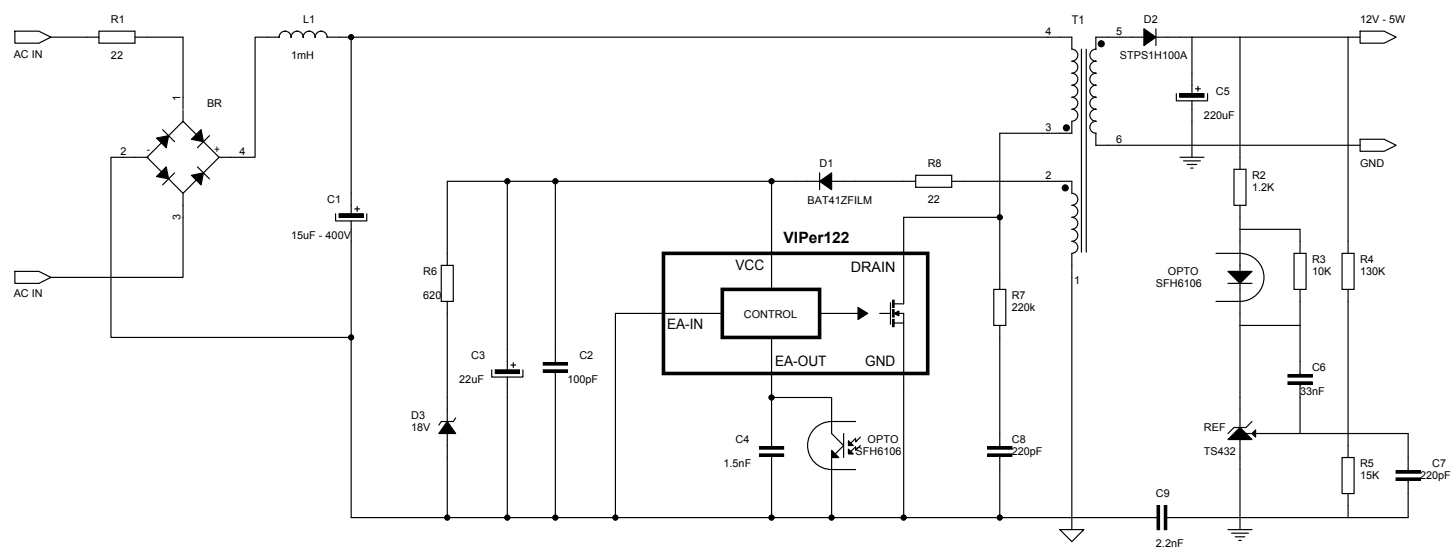
**Figure 4. CE average measurement at 230 V<sub>AC</sub> full load**



## 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.

**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. For additional information about ST trademarks, please refer to [www.st.com/trademarks](http://www.st.com/trademarks). 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.

© 2020 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STEVAL-VP12201F](#)