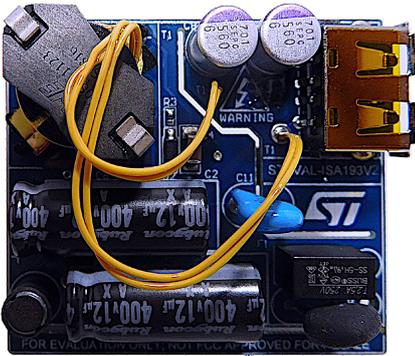


## 15 W, 5 V - 3 A output CC primary sensing USB adapter based on STCH02



### Features

- Universal AC Main Input voltage range : 90 V<sub>AC</sub> to 264 V<sub>AC</sub>
- Output range: 5 V - 3 A continuous operation
- Constant voltage (CV) and constant current (CC) operation with CC primary sensing
- Input power in standby < 10 mW at 230 V<sub>AC</sub>
- Average efficiency: > 81.84%, complies with EuCoC rev. 5 – Tier 2 and EPS of DOE USA
- EMI: According to EN55022-Class
- Small form factor: (44 x 35 x 15 mm)
- RoHS compliant
- WEEE compliant

### Description

The **STEVAL-ISA193V2** evaluation board implements a 15 W USB adapter with primary sensing CC feature, based on the **STCH02** current mode controller designed for offline quasi-resonant flyback converters, capable of providing constant output current (CC) regulation using primary-sensing feedback.

The IC embeds a 650 V, non-dissipative, HV startup cell, which, along with the extremely low quiescent current and burst-mode management, helps minimize residual input consumption, thus achieving less than 10 mW under no-load conditions.

The adapter is designed to meet the most stringent energy saving recommendations (EuCoC rev. 5 – Tier 2 and EPS of DOE USA) as well as EN55022-Class-B Conducted noise emissions.

The extremely small form factor and the output USB connector makes this reference design suitable for small USB chargers and adapters for mobile phones, tablets and other hand held equipment

Product summary	
15 W, 5 V - 3 A output CC primary sensing USB adapter based on STCH02	<a href="#">STEVAL-ISA193V2</a>
Offline PWM quasi resonant controller for ultra-low standby power supplies	<a href="#">STCH02</a>
N-channel 800 V, 0.95 Ohm typ., 6 A MDmesh K5 Power MOSFET in DPAK package	<a href="#">STD7N80K5</a>
Field effect rectifier	<a href="#">FERD20U60DJFD</a>

# 1 Schematic diagram

Figure 1. STEVAL-ISA193V2 board schematic

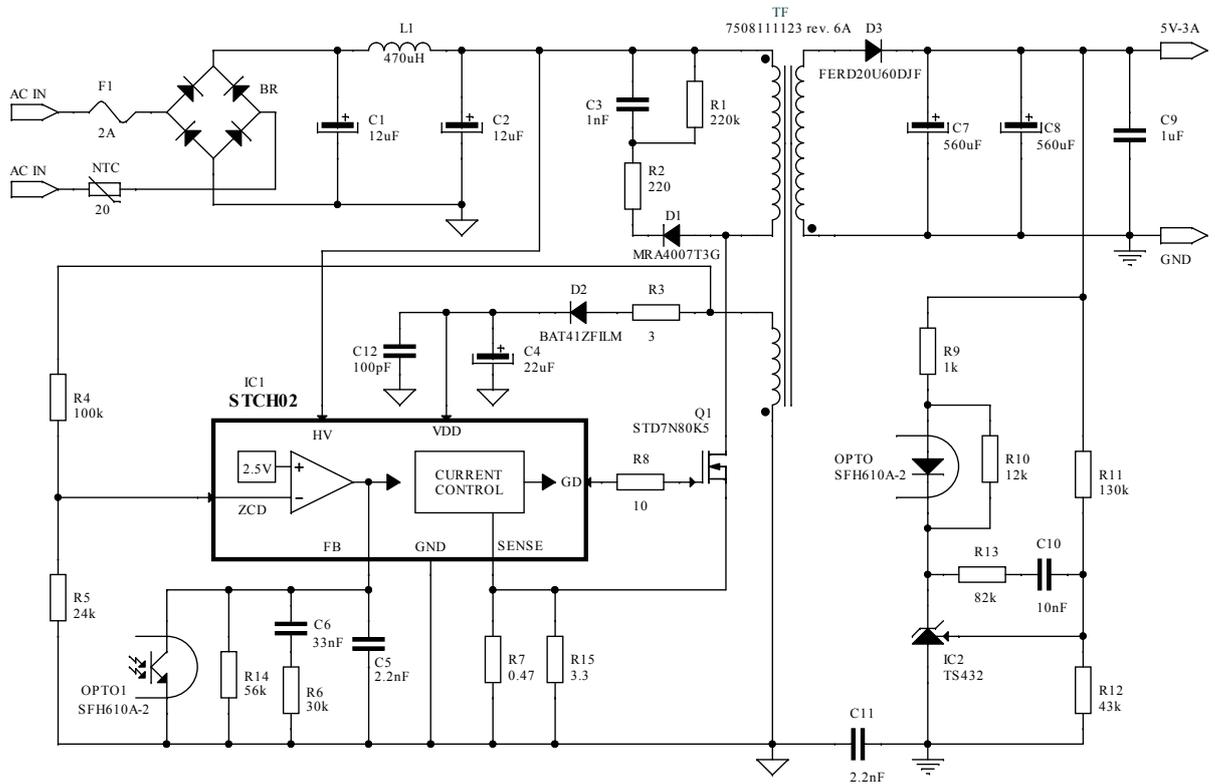
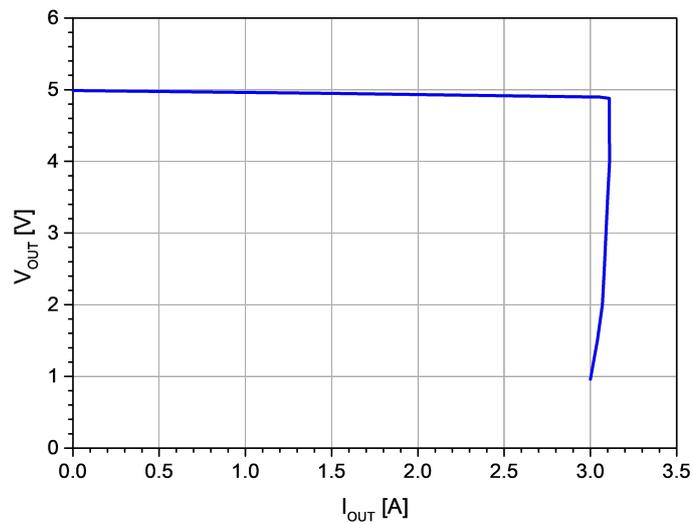
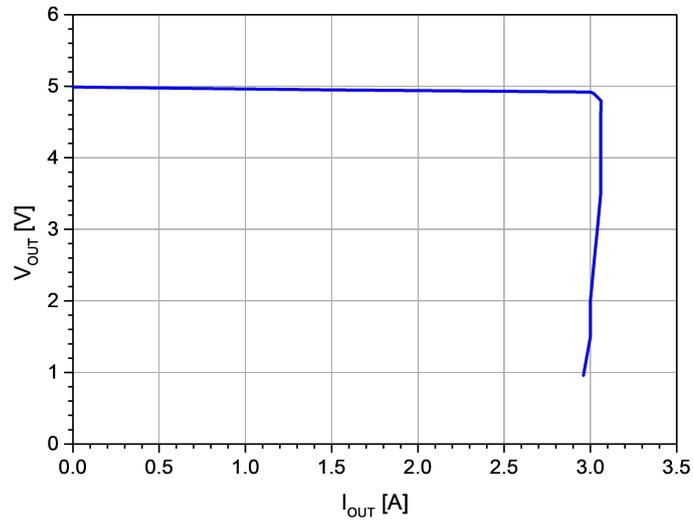
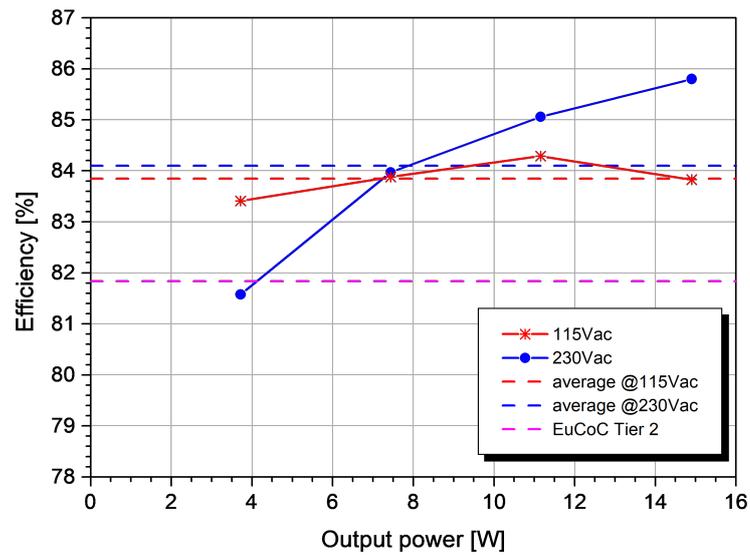


Figure 2. Output characteristic at 115 V<sub>AC</sub>



**Figure 3. Output characteristic at 230 V<sub>AC</sub>**

**Figure 4. Efficiency vs. output power**

**Table 1. Average efficiency of the rated output load**

% of rated power	Efficiency	
	115 V <sub>AC</sub>	230 V <sub>AC</sub>
25%	83.41 %	81.58%
50%	83.88 %	83.97%
75%	84.29 %	85.06%
100%	83.83 %	85.80%
Average	83.85 %	84.10 %
EU Code of Conduct rev. 5 – Tier 2 limit : 81.84%		

**Table 2. Efficiency at 10% of the rated output load**

Input voltage	Efficiency
115 V <sub>AC</sub>	80.44 %
230 V <sub>AC</sub>	76.51 %
EU Code of Conduct rev. 5 – Tier 2 limit : 72.48%	

**Table 3. No load consumptions**

Input voltage	Input power
115 V <sub>AC</sub>	7.3 mW
230 V <sub>AC</sub>	7.5 mW

## Revision history

**Table 4. Document revision history**

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

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