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

Data brief
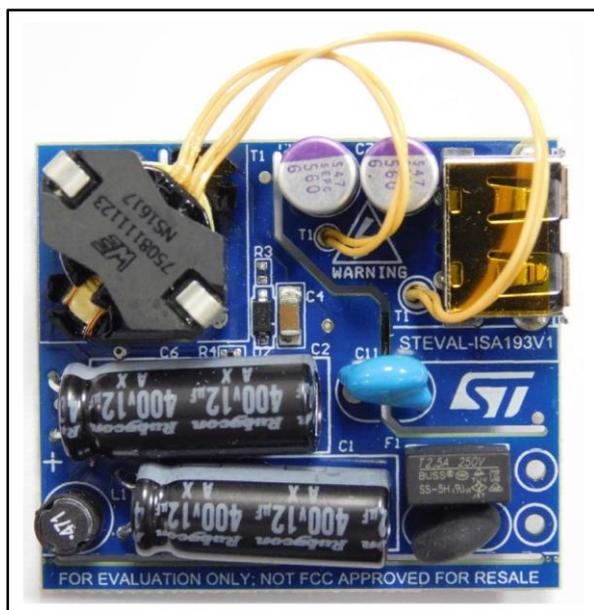
Description

The STEVAL-ISA193V1 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.

Features

- Universal AC Main Input voltage range : 90 V_{AC} to 264 V_{AC}
- 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_{AC}
- Average efficiency: > 81.84%, complies with EuCoC rev. 5 – Tier 2 and EPS of DOE USA
- EMI: According to EN55022-Class-B
- Small form factor: (44 x 35 x 15 mm)
- RoHS compliant

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1 Schematic diagrams

Figure 1: STEVAL-ISA193V1 circuit schematic main PSU

GSPG2507161330SG
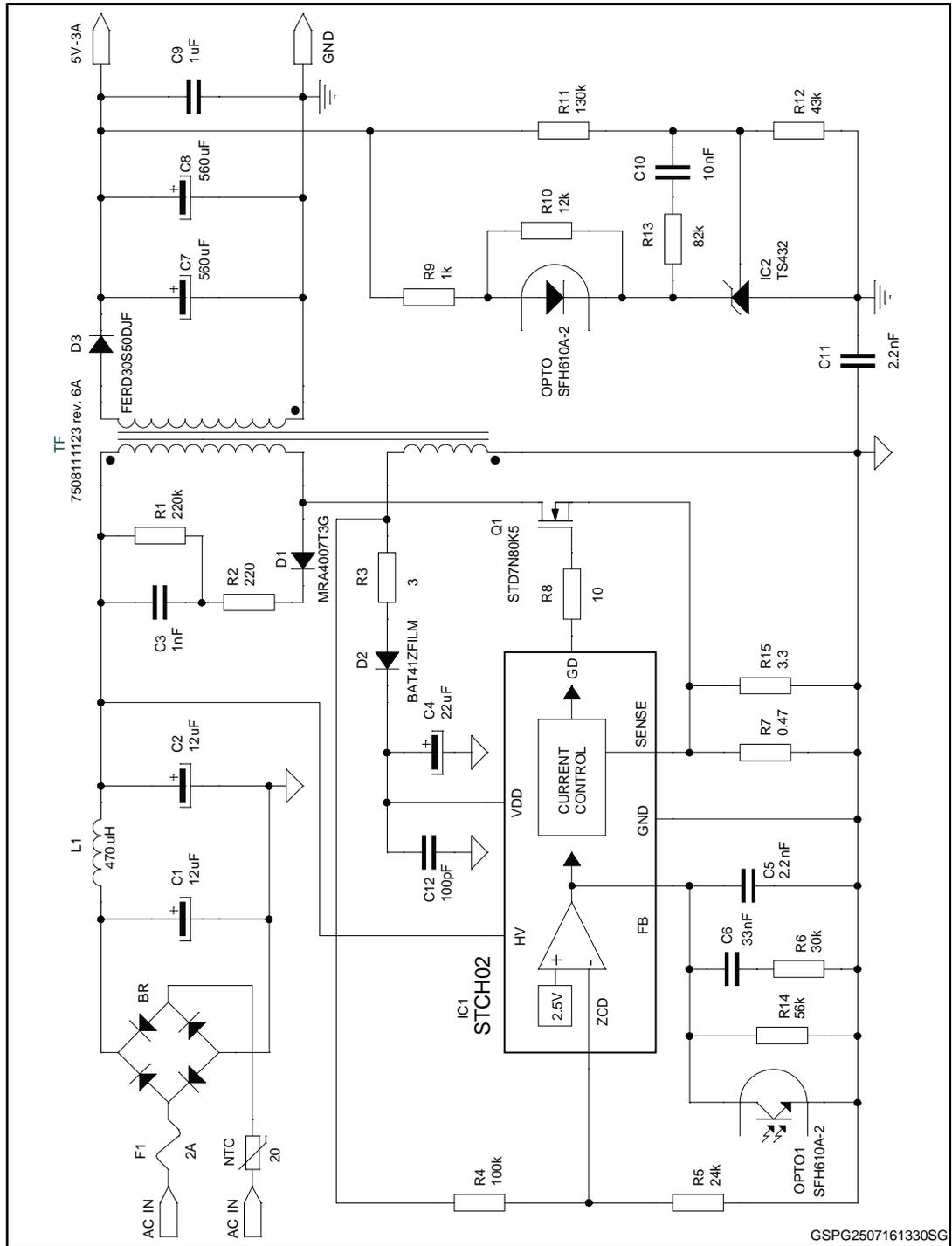
Figure 2: Output characteristic at 115 VAC

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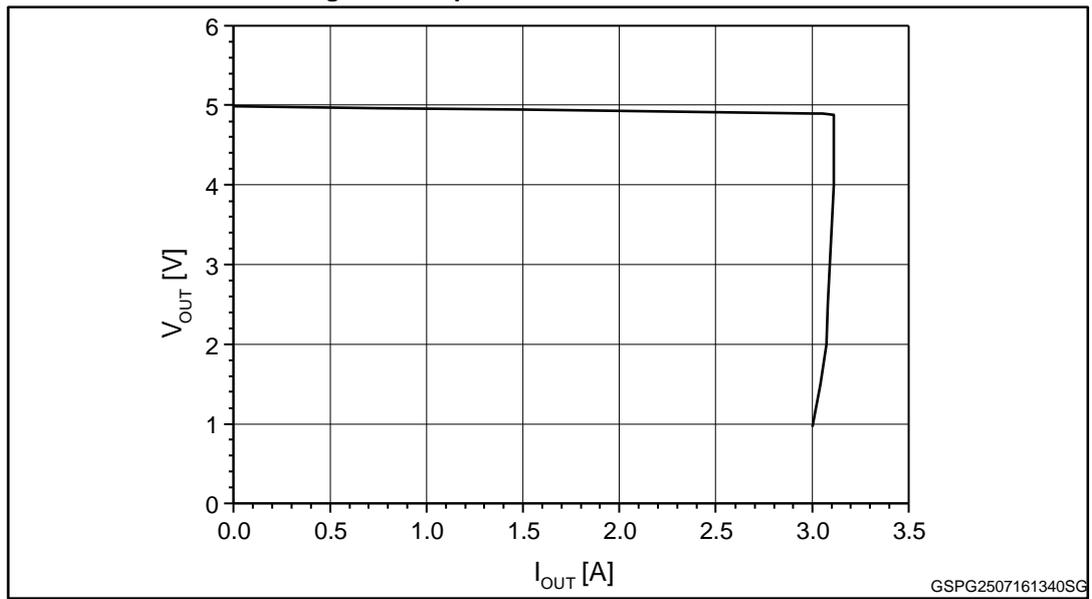
Figure 3: Output characteristic at 230 VAC

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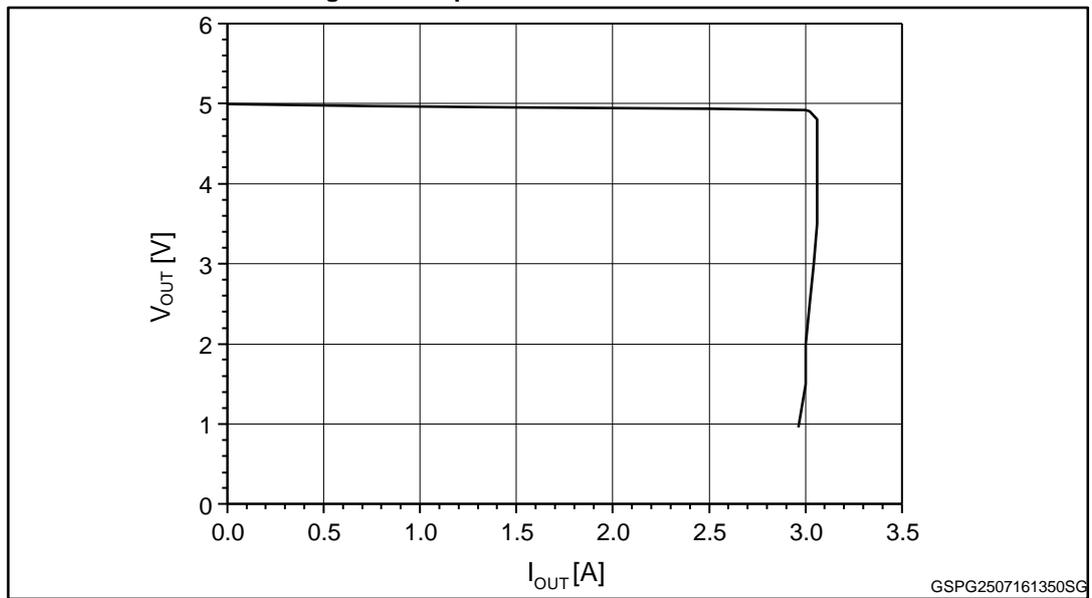
Figure 4: Efficiency vs. output power

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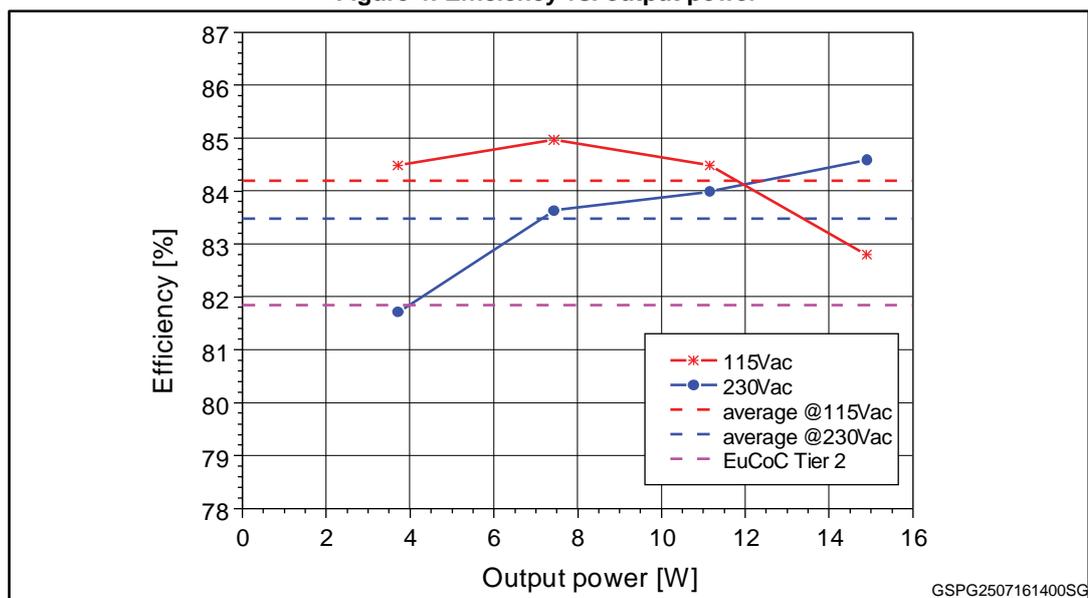
Table 1: Average efficiency of the rated output load

% of rated power	Efficiency	
	115 V$_{AC}$	**230 V$_{AC}$**
25	84.48%	81.71%
50	84.96%	83.63%
75	84.48%	83.98%
100	82.80%	84.58%
Average	84.18%	83.47%
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$_{AC}$	81.20%
230 V$_{AC}$	77.01%
EU Code of Conduct rev. 5 – Tier 2 limit : 72.48%	

Table 3: No load consumption

Input voltage	Input power
115 V$_{AC}$	7.3 mW
230 V$_{AC}$	7.5 mW

2   Revision history

Table 4: Document revision history

Date	Version	Changes
02-Aug-2016	1	Initial release.

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