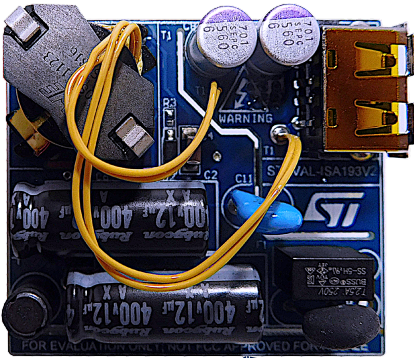


15 W, 5 V - 3 A output CC primary sensing USB adapter based on STCH02



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
- 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	STEVAL-ISA193V2
Offline PWM quasi resonant controller for ultra-low standby power supplies	STCH02
N-channel 800 V, 0.95 Ohm typ., 6 A MDmesh K5 Power MOSFET in DPAK package	STD7N80K5
Field effect rectifier	FERD20U60DJFD

1 Schematic diagram

Figure 1. STEVAL-ISA193V2 board schematic

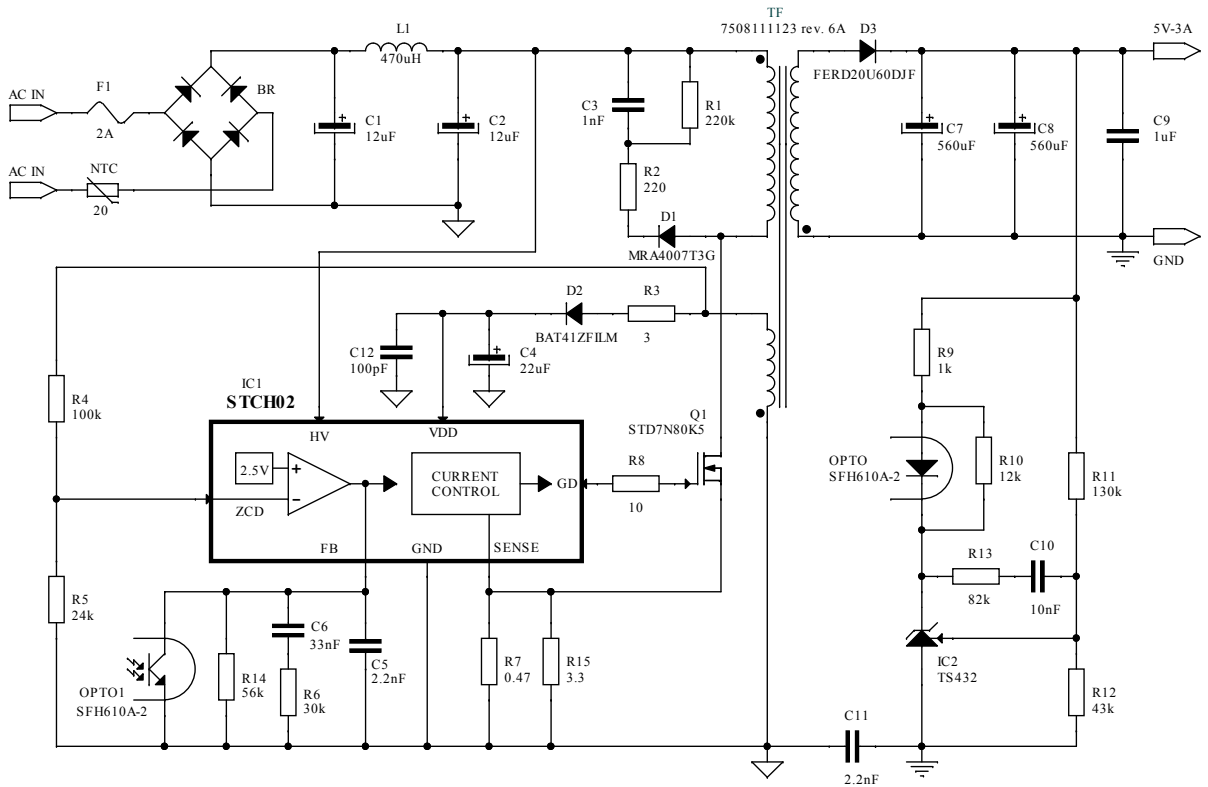


Figure 2. Output characteristic at 115 V_{AC}

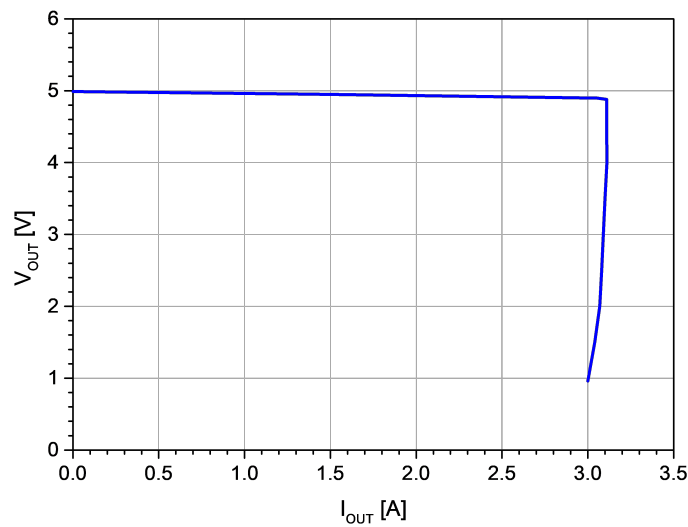
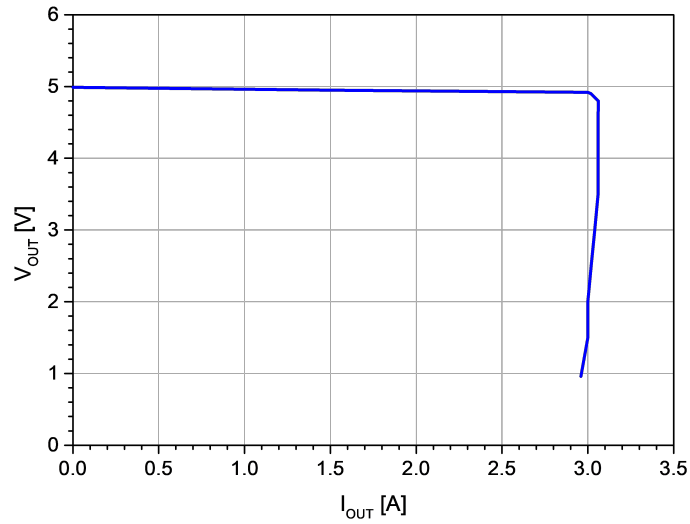
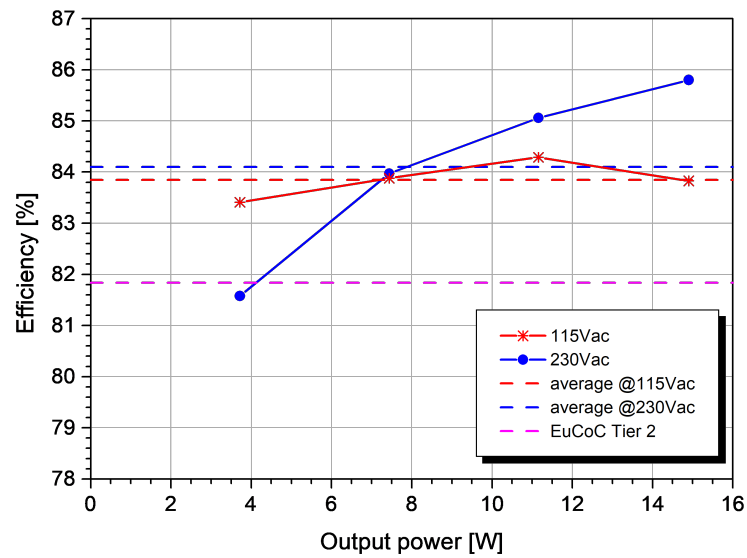


Figure 3. Output characteristic at 230 V_{AC}

Figure 4. Efficiency vs. output power

Table 1. Average efficiency of the rated output load

% of rated power	Efficiency	
	115 V _{AC}	230 V _{AC}
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 _{AC}	80.44 %
230 V _{AC}	76.51 %
EU Code of Conduct rev. 5 – Tier 2 limit : 72.48%	

Table 3. No load consumptions

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

Revision history

Table 4. Document revision history

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