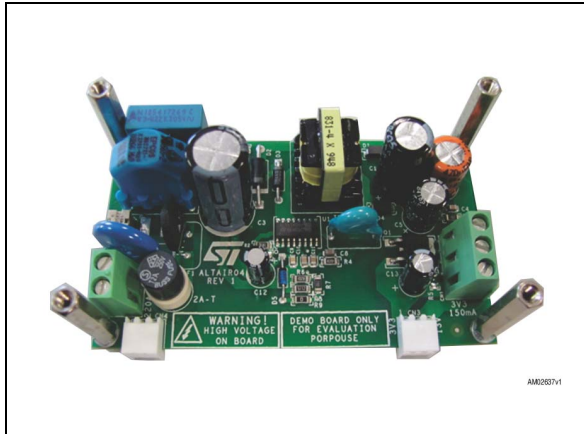


Double output SMPS for power line applications using the ALTAIR04-900 primary controller

Data brief



Features

- Universal input mains range: 90 264 V_{ac} - frequency 45 65 Hz
- Double output voltage: 13V @ 0.55 A and 3.3 V @ 100 mA peak power
- Optoless constant-voltage/constant-current output regulation
- Meets power line communication system specifications with the ST7580
- Average efficiency: > 70%
- EMI: in accordance with EN55022-Class-B

Description

The STEVAL-ISA133V1 demonstration board implements a 7.5 W double output wide range mains adapter with constant-voltage/constant-current, designed as an innovative AC-DC adapter to supply a complete power line communication system based on the ST7580.

The power supply provides a 13 V output voltage to supply the power line modem (PLM) and the analog circuitry, and a post-regulated 3.3 volts to supply digital circuitry and an optional external microcontroller.

The STEVAL-ISA133V1 demonstration board uses the new ALTAIR04-900, a quasi-resonant (QR) current-mode controller IC specifically designed for QR ZVS (zero voltage switching at switch turn-on) flyback converters, which combines a high-performance low-voltage PWM controller chip and a typical 16 R_{DSon}, 900 V, avalanche-rugged power MOSFET in the same package.

The device is capable of providing constant output voltage regulation using primary-sensing constant voltage loop (CV loop). This eliminates the need for the optocoupler and the secondary voltage reference while maintaining very accurate regulation.

Also, using the primary constant current loop, it is possible to set the maximum deliverable output current without using secondary components or current sensor.

The board implements several protection features that considerably increase end-product safety and reliability: auxiliary winding disconnection (or brownout) detection, shorted secondary rectifier detection, and transformer saturation protection, all of which are auto-restart mode.

1 Schematic diagram and electrical characteristics

Figure 1. STEVAL-ISA133V1 schematic diagram

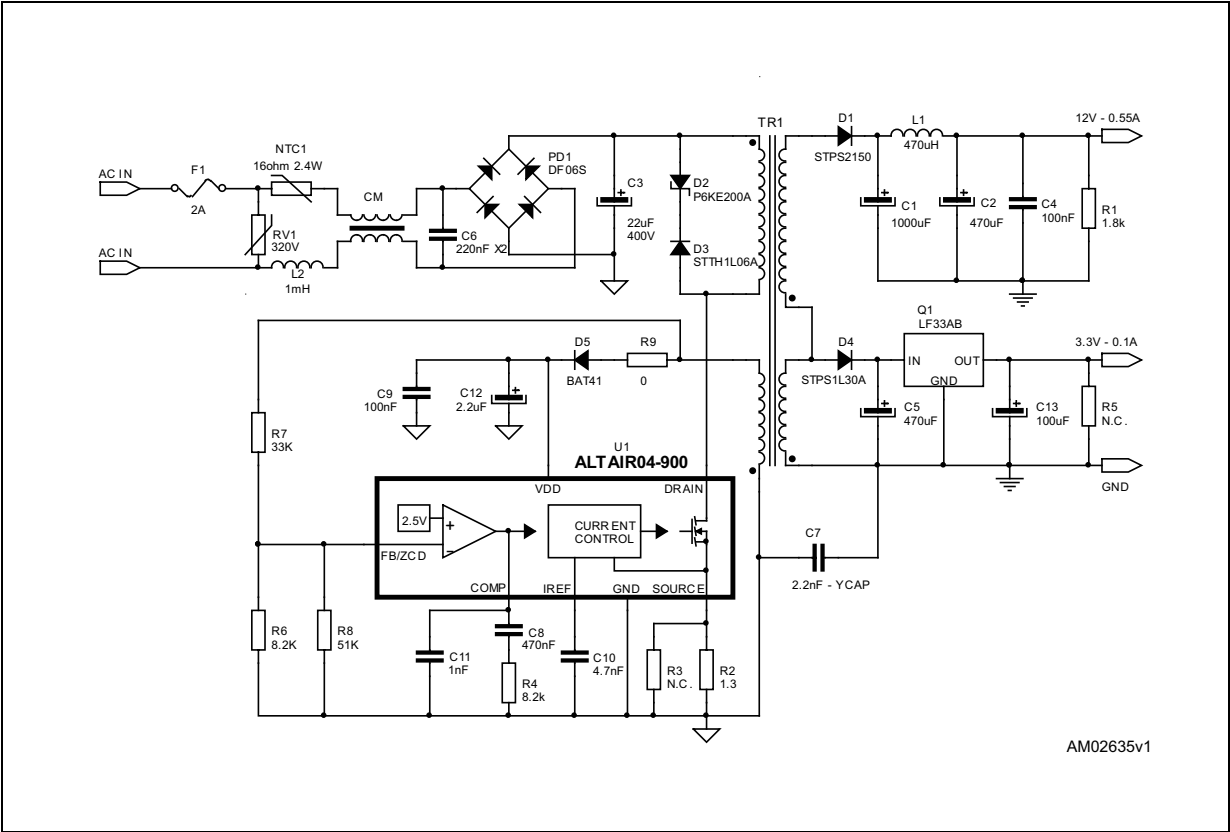


Figure 2. Output voltage with 3V3 @ 40 mA

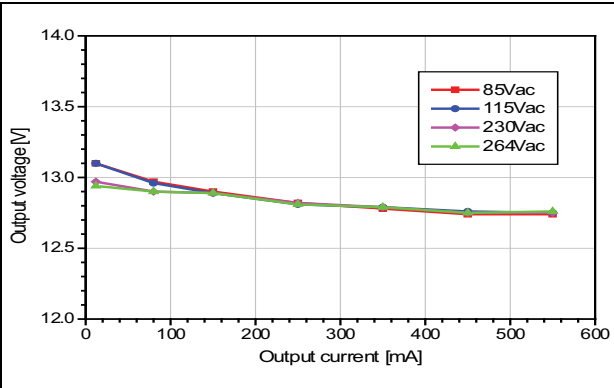
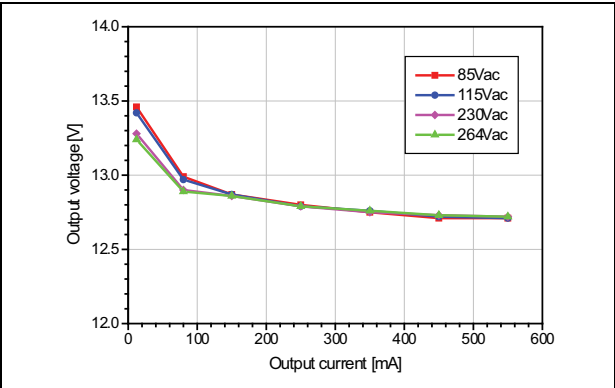


Figure 3. Output voltage with 3V3 @ 80 mA



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
16-Apr-2013	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

ST PRODUCTS ARE NOT AUTHORIZED FOR USE IN WEAPONS. NOR ARE ST PRODUCTS DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2013 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com