

# **STEVAL-NRG011TV**

Data brief

### 200 W power supply based on STNRG011 digital combo controller for LED TV



#### **Features**

- STNRG011 digital controller:
  - TM PFC with resonant HB-LLC converter
- Input voltage range: 90 264 V<sub>AC</sub>
- 12 V/4 A, 65 V/2.3 A output voltage
- Full load power: 200 W continuous operation
- Full load efficiency greater than 91% at 115 and 230 V<sub>AC</sub>
- No load mains consumption: less than 120 mW
- Full set of programmable parameters
- High flexibility thanks to the configurable NVM
- Black box functionality with the embedded EEPROM

### **Description**

The STEVAL-NRG011TV is a 200 W LED TV SMPS providing 12 V regulated output voltage (for MCU supply and audio system applications) and 65 V output voltage for LED back lighting.

The design is based on the STNRG011 IC digital combo controller that controls a two-stage AC/DC SMPS.

The front-end is a transition mode PFC pre-regulator and the second stage is an LLC HB resonant converter.

Thanks to the STNRG011 IC, the user can take full advantage of digital implementation without the need of writing code.

A complete set of parameters, stored in the controller non-volatile memory (NVM), allows the configuration and fine tuning of the application.

Product summary		
200 W power supply based on STNRG011 digital combo controller for LED TV	STEVAL- NRG011TV	
Digital combo controller multi- mode PFC and time-shift LLC resonant controller	STNRG011	
Applications	LED / OLED TV	

### Schematic diagrams

3

R70 R69 STTH5L06FP 2 D10 ......Ů.:. DB201 R25 3M nductor 4 LLC\_OVP  $\alpha$ C50 1nF/1KV R71 33K uF/450 STF24N60M2 ΧX R26 3M 1N4148 +C17a +C17a +C17b 68uF/450V 68uF/450V TR3 ti de la companya de la comp La companya de la  ${}_{i} \Delta^{\nu_{1.5}}_{BAV23}$ SOR R24 100K PGNI R20 MOV202 R27 BM TVR14561-V D3 AUX VCC VAC R23a R23b 0.12R 0.12R R28 68K 150K D1 1 1N4007 D2 1 1 n F/5CM3 PGND 1N4007 CM Choke R6 10R STTH1R06 CX3 R2 10R X2-0.33u BOOT VAC 2 100nF/50 19 HVG VCC -220pF Y1-22 Earth VCC FGND NC PFC GD CM2 PGND LVG 4 CM Choke CX1 X2-0.2uF RJ3 0R SGND ΤХ TX 5 1uF/50V 14 RX -RX Vcore K PGNI 13 PFC\_FB LLC\_CS R5 22K 15R 220R R C13 330pF/1KV C16 33nF/800V 12 R14 PFC\_CS LLC\_AUX R7 11 PFC\_ZCD LLC\_FB 10 220pF/25 R12 20R CY1 STNR G01 C10 -C4 220pF/25 2.2nF/25V INALAS

Figure 1. STEVAL-NRG011TV circuit schematic



1

## **Revision history**

#### Table 1. Document revision history

Date	Version	Changes
14-May-2021	1	Initial release.
16-June-201	2	Updated depscription. Updated product summary

#### 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. 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.

© 2021 STMicroelectronics - All rights reserved