

Turnkey firmware to program STNRG328S for switched tank converters (STC) / hybrid switched tank converters (HSTC) topologies'



Features

- Main controls of SMED states
- SMED initialization
- PMBUS initialization and I2C communication
- ZCD matrix definition
- Parameters and utility definition
- Provide variables to register access
- Interrupts management

Description

The **STSW-STC** is turnkey software for the STNRG328S product, distributed as a binary file to install in the STNRG328S to fit STC/HSTC topologies for server applications in the whole range of conversion ratios from 2:1 to 10:1 from a 48 V supply bus.

The STNRG328S provides UART communication for external programming of parameters and STC/HSTC control.

STSW-STC firmware supports both types of boards: U2J discrete components and ZCD/HTSC, where ZCD means Zero Current Detection.

At the power-on, it recognizes the board configuration setting the right parameters, controls PWMs frequency, checks the fault conditions, triggers the protections and initializes the peripherals of the device, implements the SMEDs (State Machine Events Driven), communication on I2C; for the HTSC configuration it defines the matrix ZCD in the RAM&E²PROM memories containing the frequencies and deadtimes selected by the input voltage.

It also defines the functions of writing, reading and search algorithm in ZCD tables in order to apply the correct frequency and deadtime according to the input voltage; implements the software requests depending on the board configuration selected; defines the programmable parameters and structures stored in NVM memory; contains the variables to access the registers of the device; schedules the ADC sequence and processes the relative operations, sets the timeout of each system state and reports an error on I2C in case of error, collects 7 samples for each ADC conversion sequence; handles the data bytes of PMBUS command from/to I2C; detects if the pin ENABLES is high or low to turn on or off the device, detects the events corresponding to undervoltage condition, Vdrive undervoltage and overvoltage condition for triggering the protections.

Product status link

[STSW-STC](#)

Revision history

Table 1. Document revision history

Date	Version	Changes
22-Feb-2022	1	Initial release.



Contents

Revision history	2
Contents	3

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.

© 2022 STMicroelectronics – All rights reserved