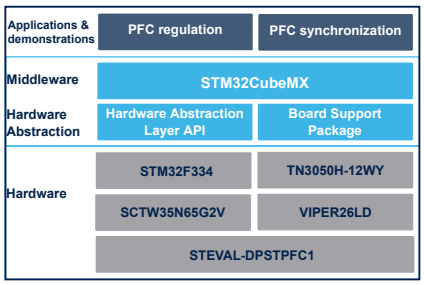
STSW-DPSTPFC1FW

Data brief

Firmware for the STEVAL-DPSTPFC1 Totem Pole PFC with inrush current limiter



Features

- Runs on STM32F334 mixed-signal MCU with
  - High-resolution timer
  - Ultra-fast comparators and ADC
  - DSP and FPU
- Inrush current limitation without NTC
  - Inrush current reduction at board startup
  - SCR progressive phase control
  - Inrush current control for AC line dips
  - Adjustable SCR step turn-on delay reduction
- AC-DC rectifier mode
  - Power Factor Control (PFC)
  - DC bus regulation to 400 V_{DC}
  - Soft inrush current control
- Overcurrent and overvoltage protection
- AC line zero crossing synchronization via digital PLL
- Zero cross AC line voltage smart current spike control to reduce EMI

Description

The STSW-DPSTPFC1FW firmware allows controlling the STEVAL-DPSTPFC1 3.6 kW bridgeless totem pole boost circuit. It runs on the STM32F334 microcontroller offering a high performance in terms of efficiency, THD, power factor and reliability by controlling the inrush current at board startup.

The firmware is ready to be used at first power on or immediately after a board reset event.

The STSW-DPSTPFC1FW provides an environment to configure and control parameters (SCR turn-on delay step, protection thresholds and current/voltage controller coefficients).

The firmware package is based on STM32CubeMX (v 4.22) and has been designed for IAR/EWARM workspace (version 7.70).

Product summary	
Firmware for STEVAL-DPSTPFC1 3.6 kW PFC totem pole	STSW-DPSTPFC1FW
3.6 kW PFC totem pole with inrush current limiter reference design using TN3050H-12WY and SCTW35N65G2V	STEVAL-DPSTPFC1
Mixed-signal MCU with DSP and FPU for digital power conversion applications	STM32F334
Applications	AC-DC Converters Industrial Power Supply Server and Telecom Power

Revision history

Table 1. **Document revision history**

Date	Version	Changes
11-Dec-2020	1	Initial release.
16-Dec-2020	2	Minor text changes.