



# STEVAL-TCS003V1

24-bit port expander demonstration board with LCD, keypad, and PWM interfaces based on the STMPE2403

Data brief

## Features

- Provides a user-friendly environment for use in:
  - Standalone mode
  - PC GUI mode
- Board powered through USB Mini-B connector
- PC GUI supports various power saving modes

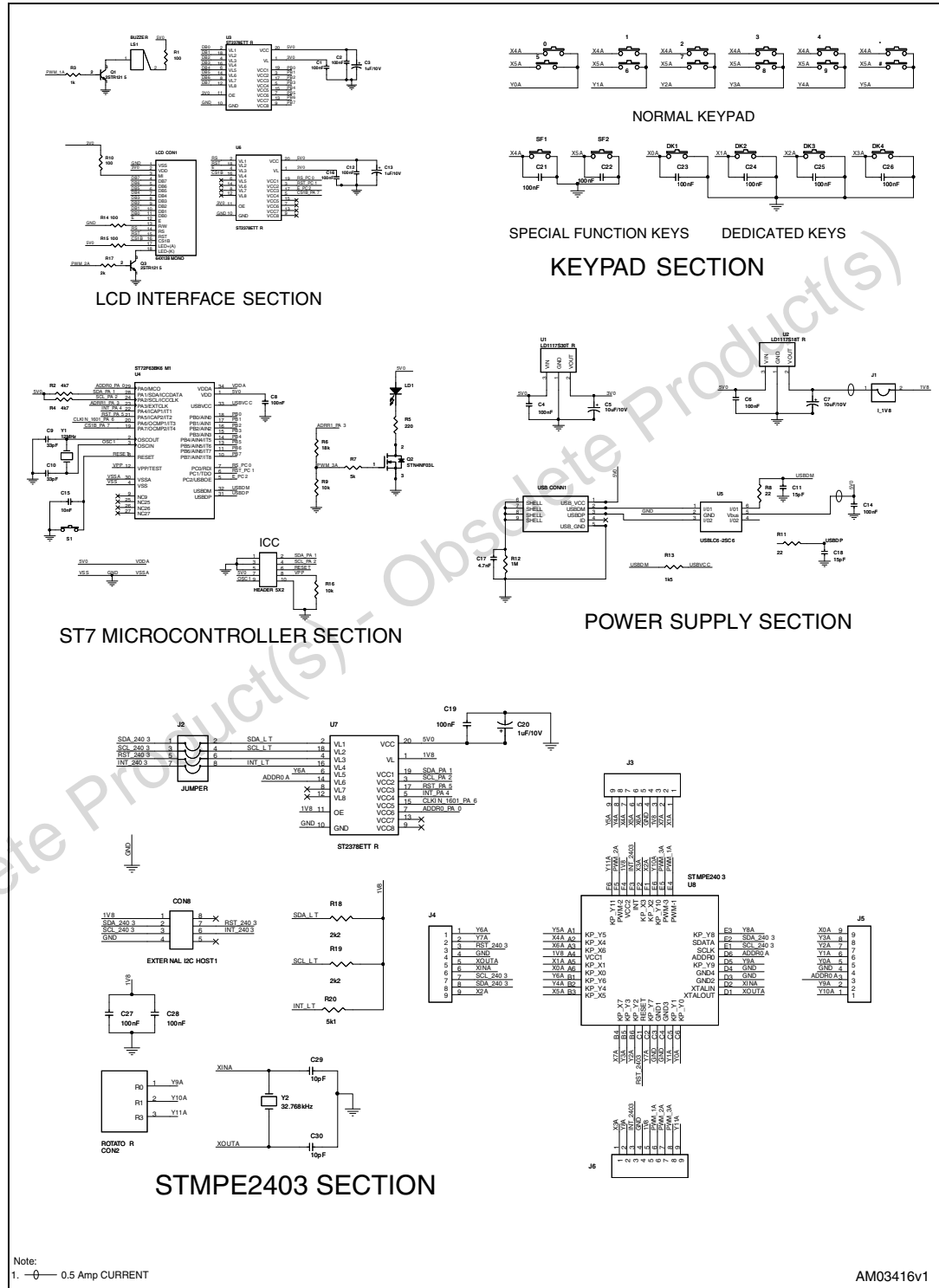
## Description

The STEVAL-TCS003V1 demonstration board is based on the STMPE2403 port expander and the ST7263BK6 microcontroller. It includes a PC GUI (graphical user interface). The objective of the board is to demonstrate the features and capabilities of the STMPE2403 port expander chip using a Windows®-based host software application and one of ST's several USB low-speed microcontrollers (the ST7263BK6 is used in this demonstration board) acting as a control device. In the STEVAL-TCS003V1, the ST7263BK6 microcontroller acts as the I<sup>2</sup>C master and controls the STMPE2403 device, which functions as an I<sup>2</sup>C slave. The STMPE2403 is used to interface the matrix keypad, dedicated keys, special function keys, rotator controller and PWM controllers. These interfaces are controlled using I<sup>2</sup>C communication between the master and slave devices. In run mode, events such as key press (matrix, special function or dedicated keys), rotator controller, power mode, etc. are captured and displayed on the LCD screen and in the scan window of the PC GUI. The capability of the rotator controller is demonstrated using a 3-pin jumper connector. For interfacing with the PC GUI, the application layer is built above the USB core library, making the USB interface hardware control transparent for developers.



# 1 Circuit schematics

Figure 1. Schematic diagrams of the STEVAL-TCS003V1 demonstration board



- Note:
- 1 *ICC interface must be closure to the ST7 device.*
  - 2 *The lenght of the track of ICCDATA and ICCCLK must be same and should be small.*
  - 3 *External OSC must be placed closure to ST7 device.*
  - 4 *All the 100 nF capacitor between any supply pins and GND must be placed near to the regulator outputs.*
  - 5 *C16 and C18 must be placed closure to STMPE2403 device.*
  - 6 *32 kHz OSC must be placed closure to STMPE2403 device.*
  - 7 *All the capacitor connected to device supply pins must be placed closure to the device.*

Obsolete Product(s) - Obsolete Product(s)

## 2 Revision history

Table 1. Document revision history

Date	Revision	Changes
06-Oct-2009	1	Initial release.

Obsolete Product(s) - Obsolete Product(s)

**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.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

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.

© 2009 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](http://www.st.com)