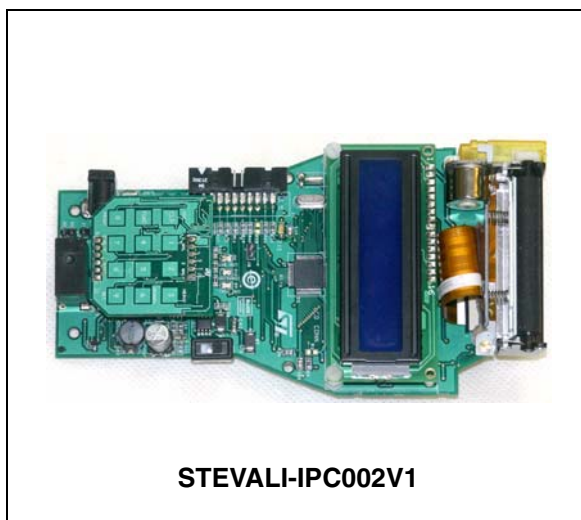


Thermal printer-based parking ticket vending machine

Data brief

Features

- Based on the STM32 microcontroller
- Thermal printer is interfaced through SPI2.
- Stepper motor driver interfaced through SPI1 used to rotate the printer head while printing
- S-Touch™ based keypad available for user interface. S-Touch controller device is interfaced through I²C2. Keypad used to enter vehicle number, setting date, time, etc.
- LED indicators for battery status
- On-board JTAG connector for firmware upgrade and changes
- Alphanumeric LCD displays the numbers or settings entered through the S-Touch keypad
- SPDT switch to turn unit on and off
- Push-button switch for system reset
- Rechargeable battery circuit available
- System can be powered by DC adaptor (9 V, 2.5 A) or batteries (two 3.7 V, 1.8 Ah rated batteries)
- Thermistor monitors the temperature of the thermal head.
- The STM32's built-in RTC (real-time clock) provides date and time of printing
- EEPROM interfaced through I²C1 stores last 20 vehicle numbers
- RoHS compliant



Description

The STEVAL-IPC002V1 demonstration board is a battery-operated hand-held parking ticket vending machine system with a thermal printer interfaced with the STM32.

The objective of this demonstration is to generate and print parking tickets for different types of vehicles. The system can be easily modified for other applications that require paper printing directly from the microcontroller, such as PoS-based applications, railway/bus ticket printing and stand-alone printers.

1 Schematic diagrams

Figure 1. Microcontroller circuit schematic

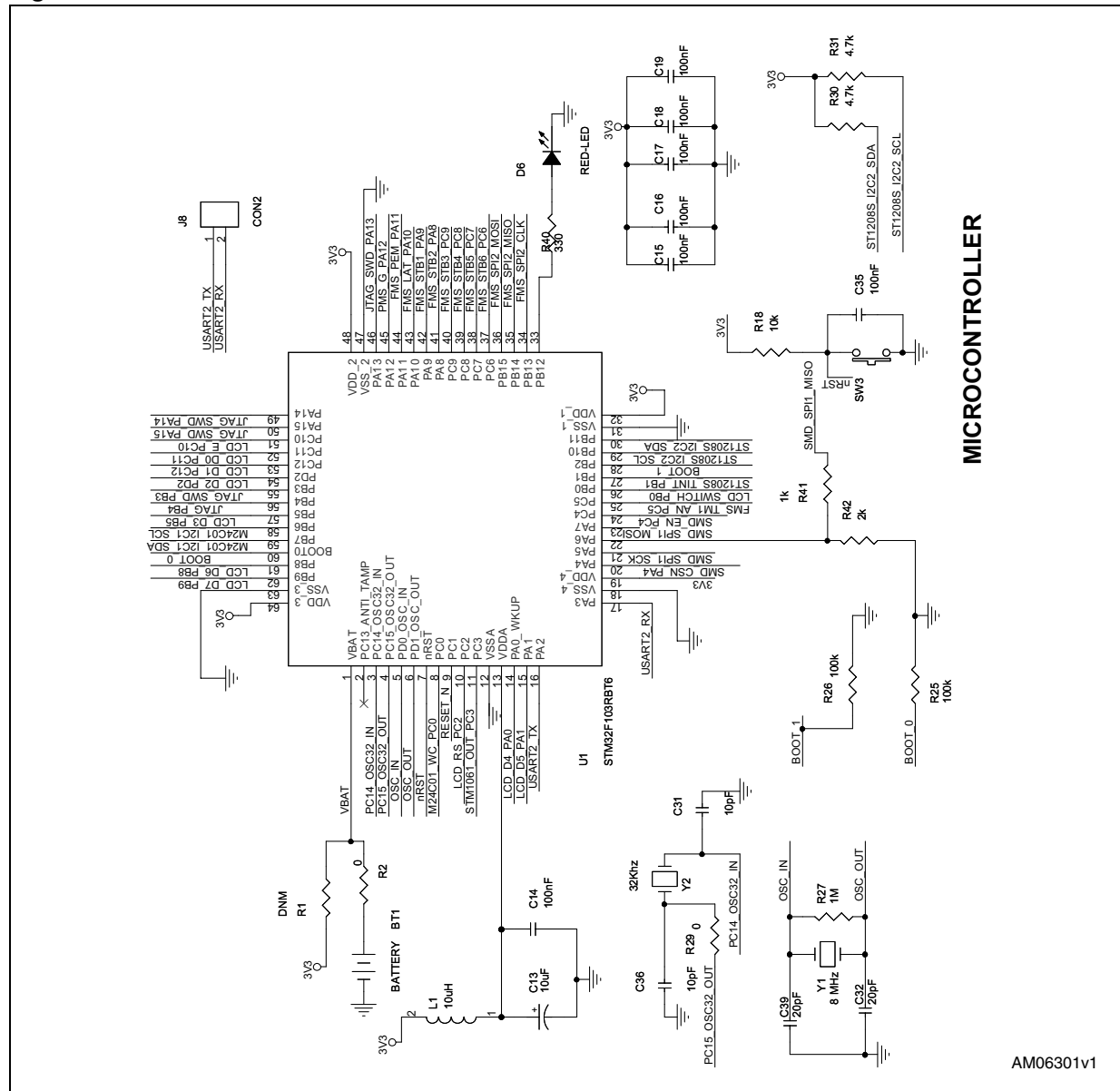


Figure 2. Motor driver circuit schematic

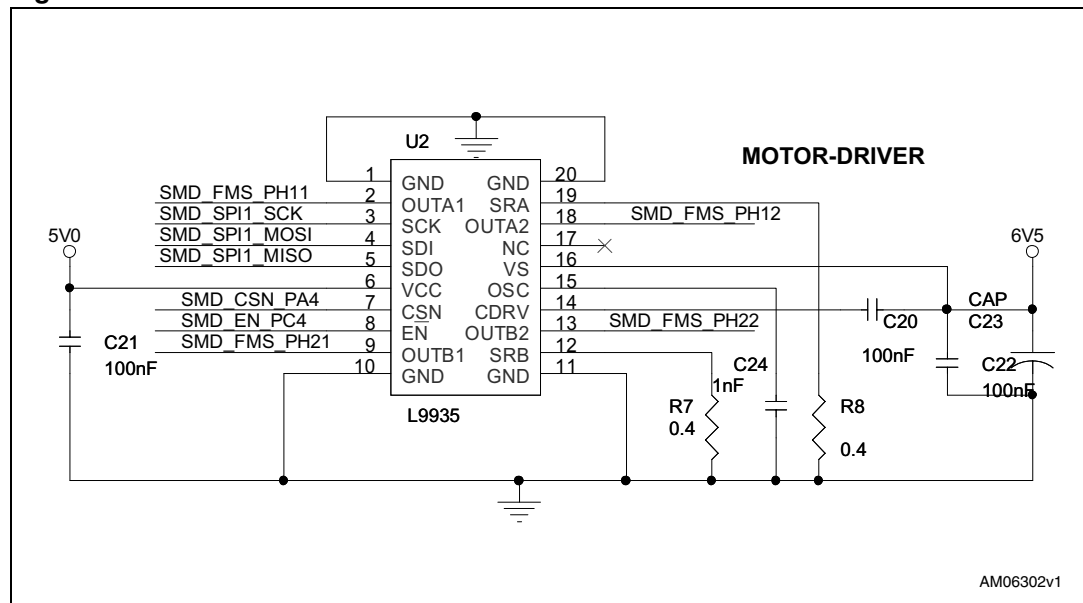
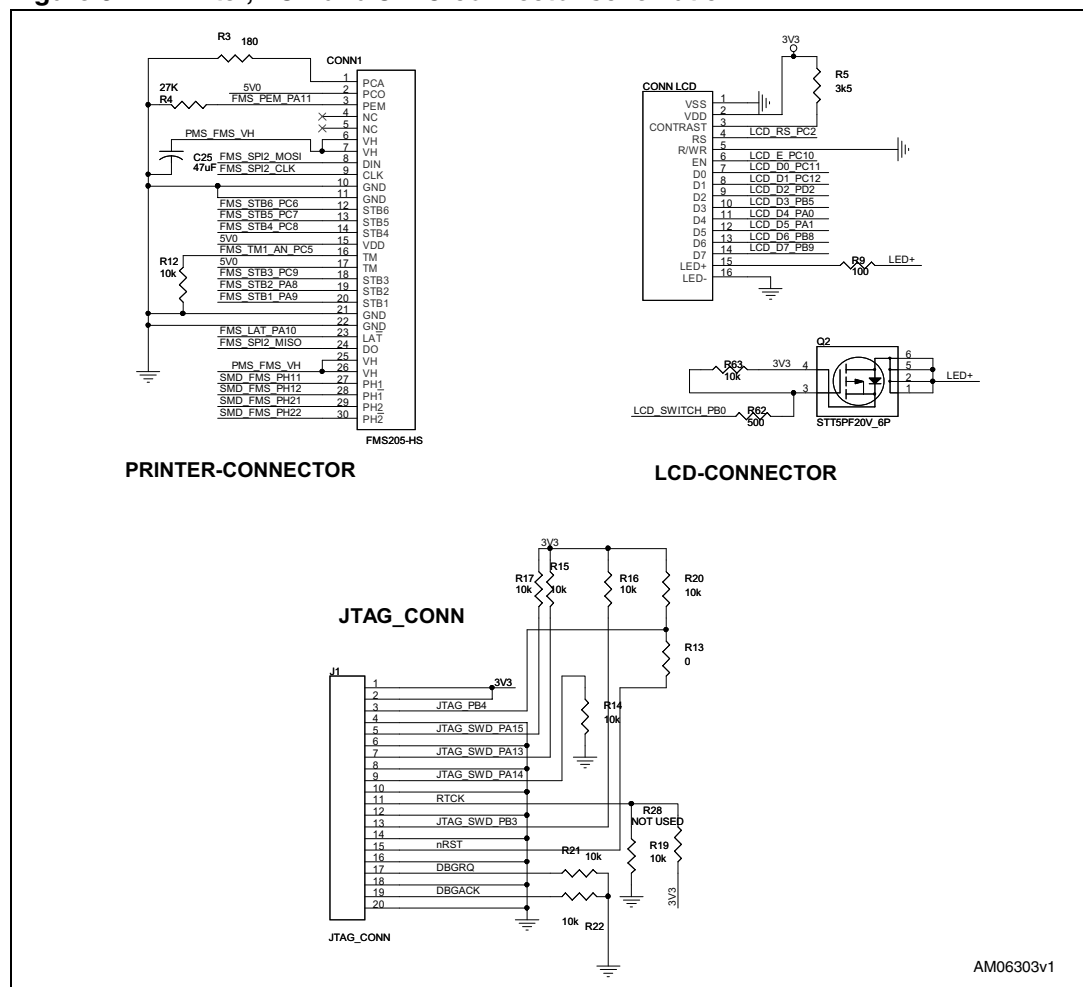


Figure 3. Printer, LCD and JTAG connector schematic

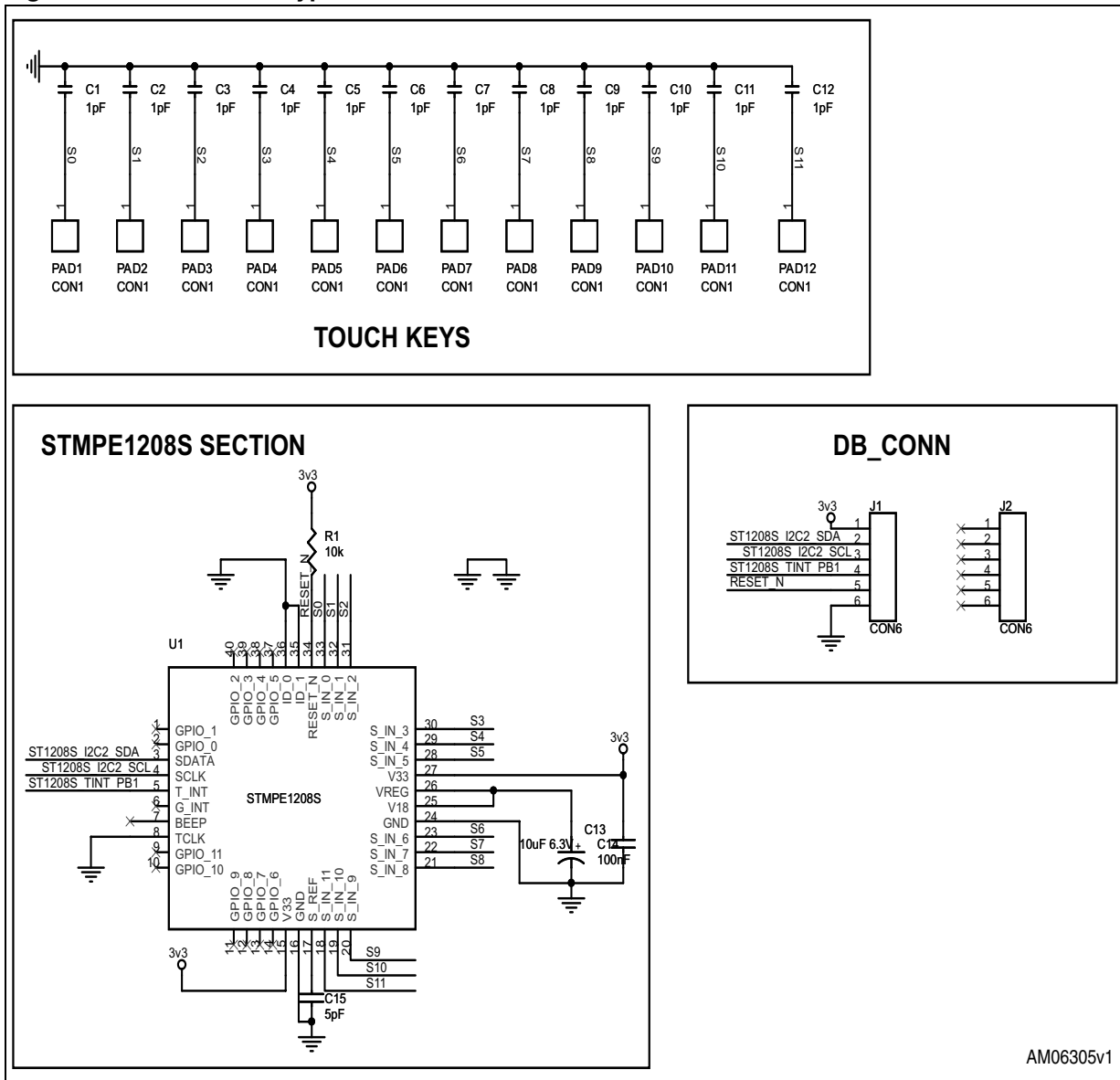


POWER SUPPLY SECTION

The schematic diagram illustrates the power supply section of the AM06304v1. It shows the following components and connections:

- Inputs:** 3V3, 3DC AD, 6V5, VBAT DC AD, and 3V3.
- ICs:**
 - U23: LD1117 DPAK (Voltage Regulator)
 - U22: LD1117 DPAK (Voltage Regulator)
 - U13: L5987A (Precision Centroidal Mode Voltage Detector)
 - U21: STM106IN31 (Microcontroller)
 - U2: STM1061 OUT (Microcontroller)
- Passive Components:**
 - Resistors: R10, R11, R32, R33, R34, R44, R45, R54, R55, R56, R61.
 - Capacitors: C37, C44, C45, C46, C47, C29, C30, C33, C34, C52, C42.
 - Diodes: D1, D8, D7, D11.
 - Relay: LS1.
 - Switch: SW5.
- Outputs:** 3V3, VBAT DC AD, and 3V3.

Figure 5. S-Touch™ keypad section schematic



AM06305v1

2 Revision history

Table 1. Document revision history

Date	Revision	Changes
08-Mar-2010	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.

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.

© 2010 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