STEVAL-IHP005V1

General purpose power line modem module based on the ST7540 PLM and STM32 microcontroller

Databrief

Features

- Communication interfaces
  - Configurable FSK power line modem interface with an embedded firmware stack for a complete power line communication management.
  - SPI and USART interfaces for module interfacing
- Module hardware
  - Internal configurable RTC time-clock with lithium backup battery
  - Up to 8 user-configurable general purpose input/output pins
  - Programmable user data and PLM parameters Flash memory area
- PLM communication protocol
  - Configurable PLM data link stack working model (master/slave, multimaster)
  - Unicast and broadcast data frame capability
  - CSMA/CA and repetitions management
  - Up to 100 bytes of user data payload
- SPI, USART communication protocol
  - Programmable communication interface (SPI, SCI)
  - Embedded data, programming and service APIs
- RoHS compliant

Description

The general purpose power line modem module is based on an ST7540 FSK power line modem transceiver and an STM32 microcontroller. The PLM module board is a fully functional communication module, with 8 programmable I/Os, a real-time clock and a Flash memory area for modem parameters and user data storage.

The firmware structure is made up of several layers, each dealing with a different feature. The


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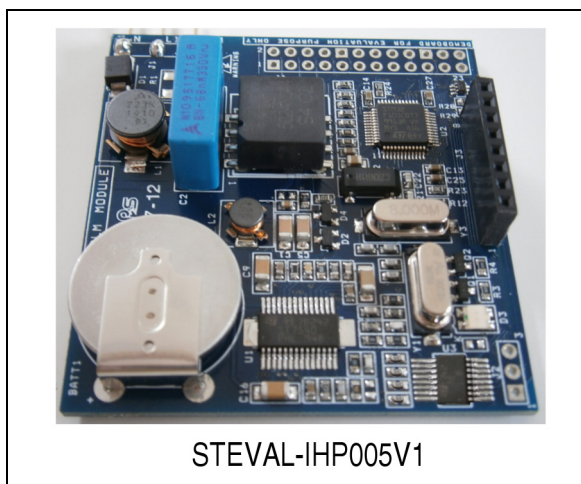
application layer engine is the general interface between the user program and all the parts of the module. It deals with the communication ports, the module peripherals such as SPI, SCI, RTC, I/Os, LEDs and timing management. It is also the interface between the PLM stack and the user program. The PLM stack, itself made up of several layers, implements and manages the power line communication, manages the conflicts, timing and repetitions, the addressing, and so on.

Some features are managed directly by the application engine, and are transparent to the user, such as the RTC management or the module parameter update, as well as the module programming and configuration, which is done by particular programming or service commands managed and acknowledged directly by the application engine.

The user layer is fully customizable by using some easy to use APIs available for user application implementation. User data can be easily addressed to the PLM or to the other communication interface by simply changing the destination channel in the user data structure.
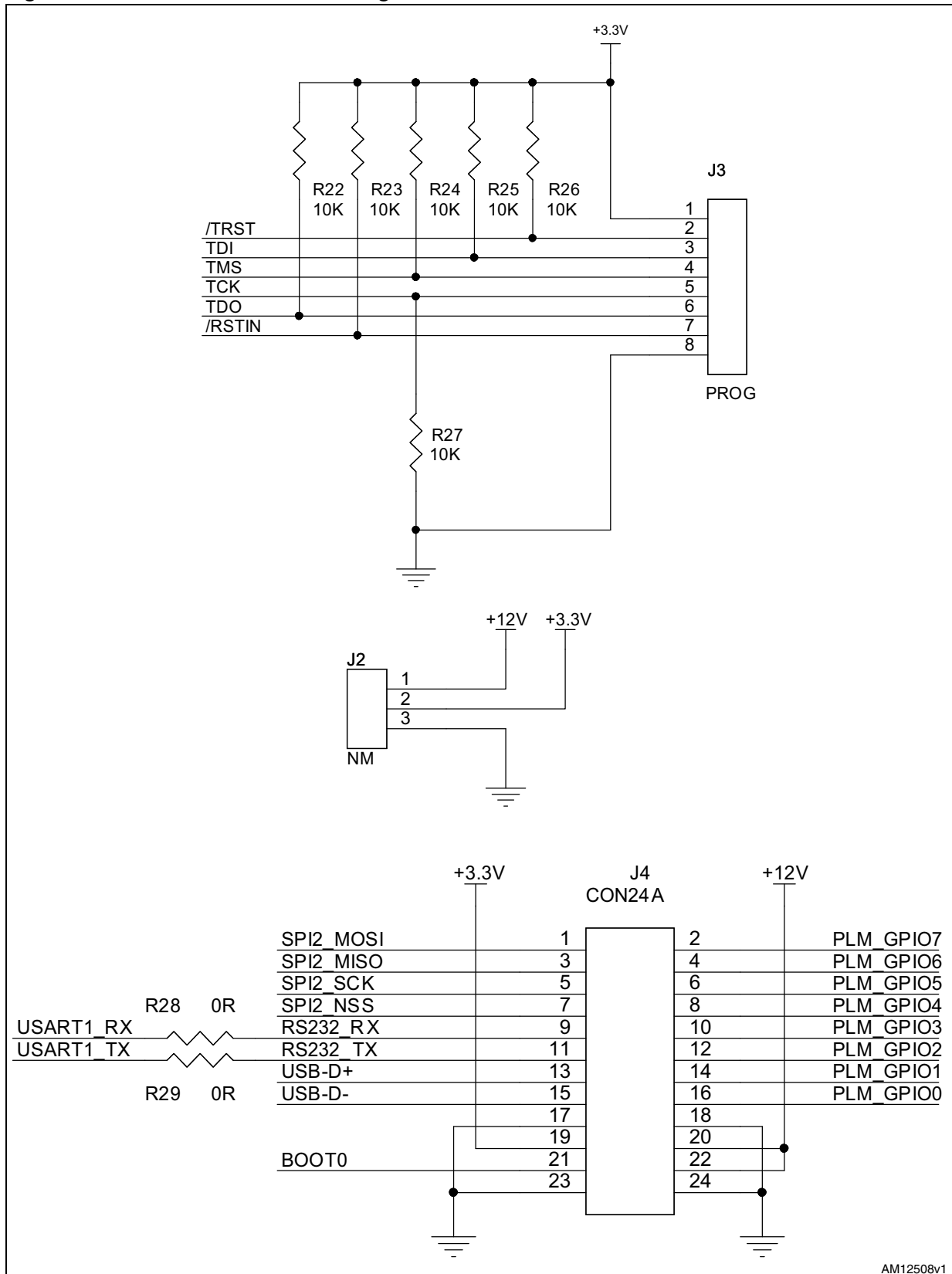
1   Schematic diagram

Figure 1.   PLM schematic diagram

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Figure 2.   Microcontroller schematic diagram
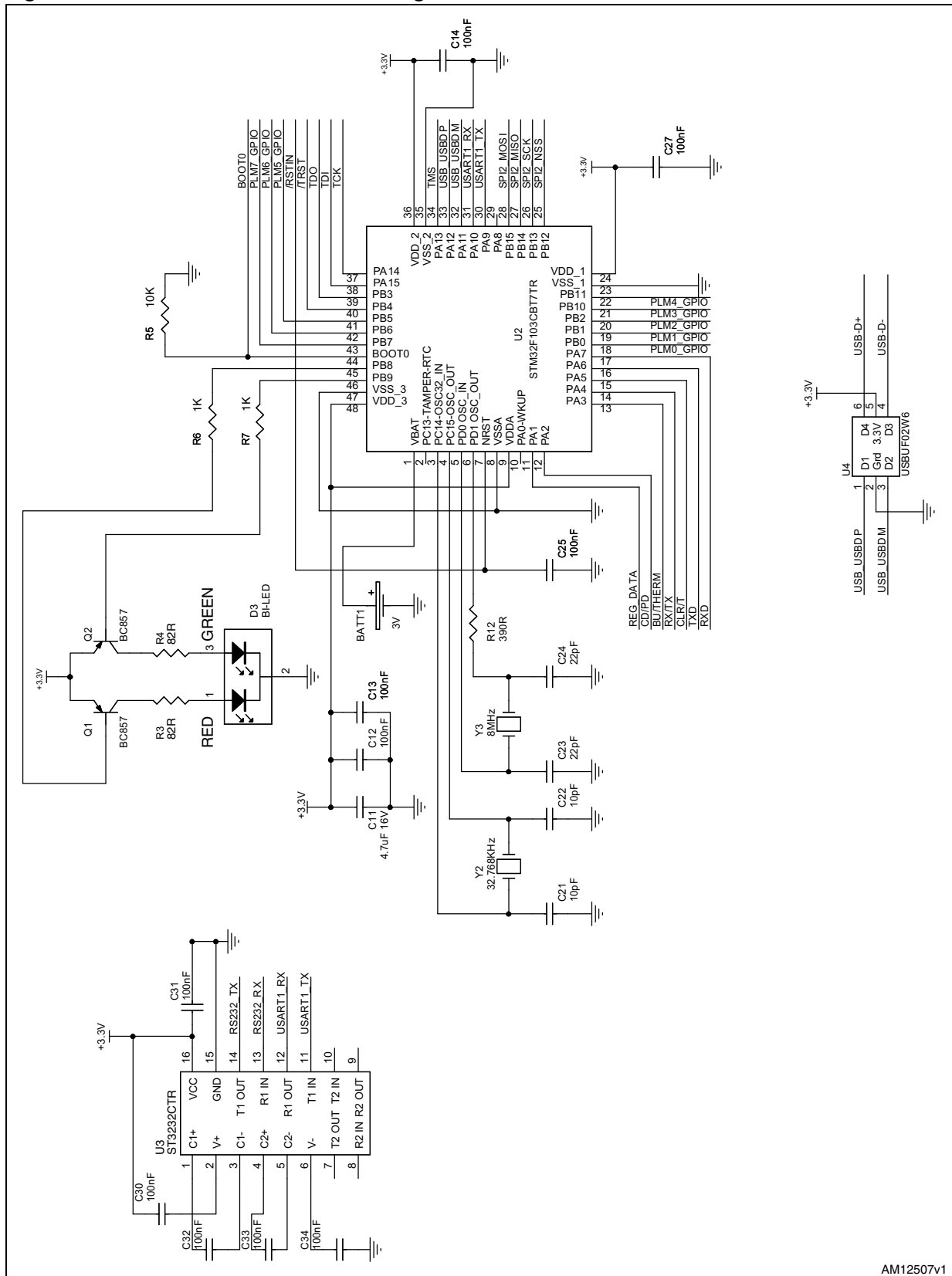
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Figure 3. Connectors schematic diagram

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2   Revision history

Table 1.   Document revision history

Date	Revision	Changes
06-Aug-2012	1	Initial release.

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