



STEVAL-IHP002V1

SmartPlug systems to measure and control AC loads,
based on the STM32, ST7540 PLM, and STPM01

Data brief

Features

- Energy consumption monitoring
- PLM communication
- On/Off or dimming configuration
- CENELEC band C compliant
- System setting by RS232
- RoHS compliant

Description

The STEVAL-IHP002V1 demonstration board is a SmartPlug based on the STM32F10x microcontroller, ST7540 PLM, and STPM01 energy metering ICs. The board is a node of a PLM network which allows the final user to monitor and manage the plugged load energy consumption, and can work in conjunction with the STEVAL-IHP003V1 used as a data concentrator for connection to a PC.

The board has been developed as a guideline to build a home/building automation subsystem for energy management. It is designed to fit the dimensions of a standard box for wall installation and easy integration into home/building electrical plants. The current, power, energy and other information related to the electrical load connected to the SmartPlug board are sent to a PLM data concentrator (such as the STEVAL-IHP003V1) through the home/building PLM network. A protocol stack has been implemented to allow node communication; it includes a PHY layer with FEC, a MAC layer with CSMA/CA and ACK, and a network layer with static addressing and routing topology.



1 Circuit schematics

Figure 1. PLM SmartPlug - top view

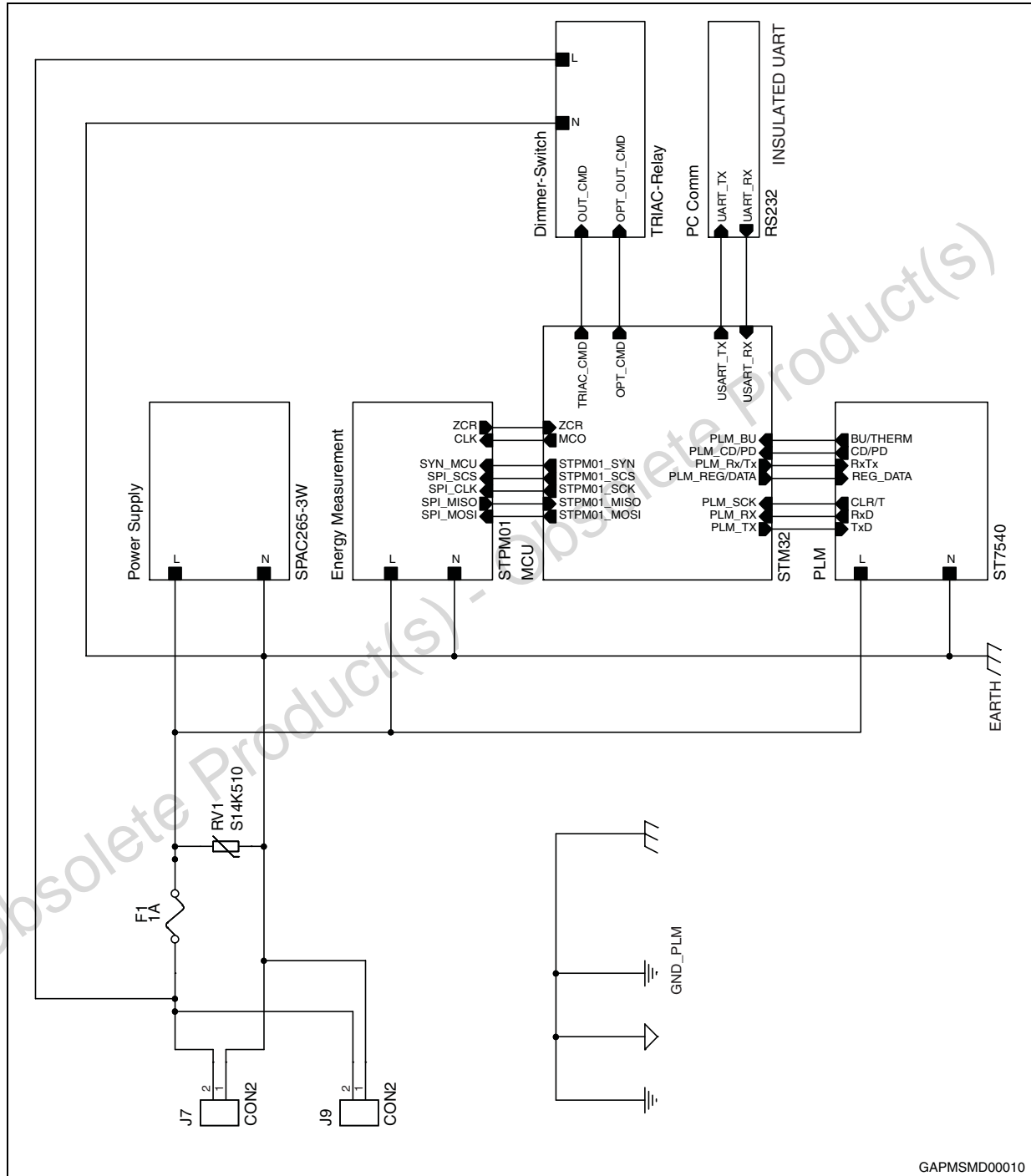


Figure 2. PLM SmartPlug - serial communication

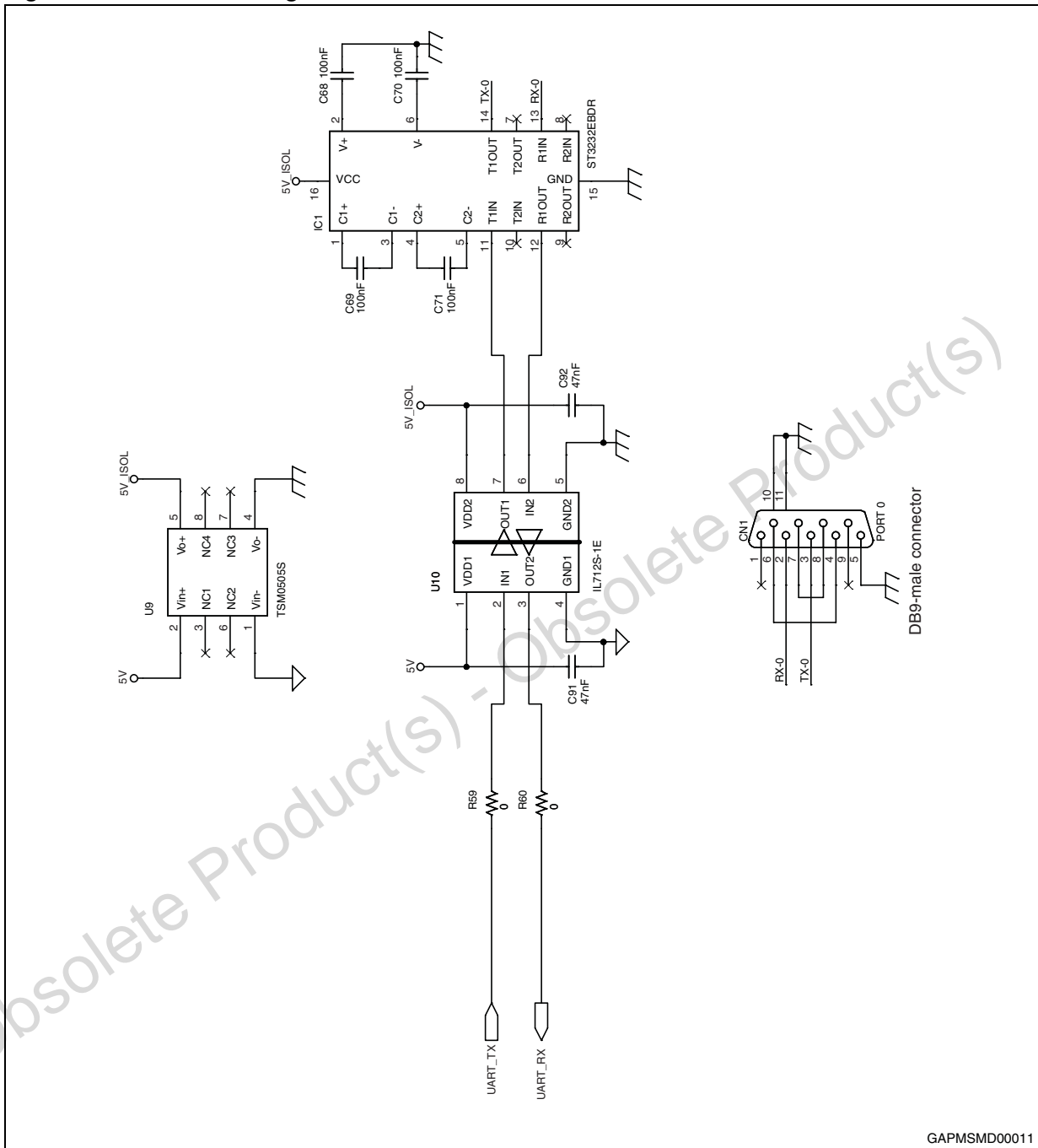
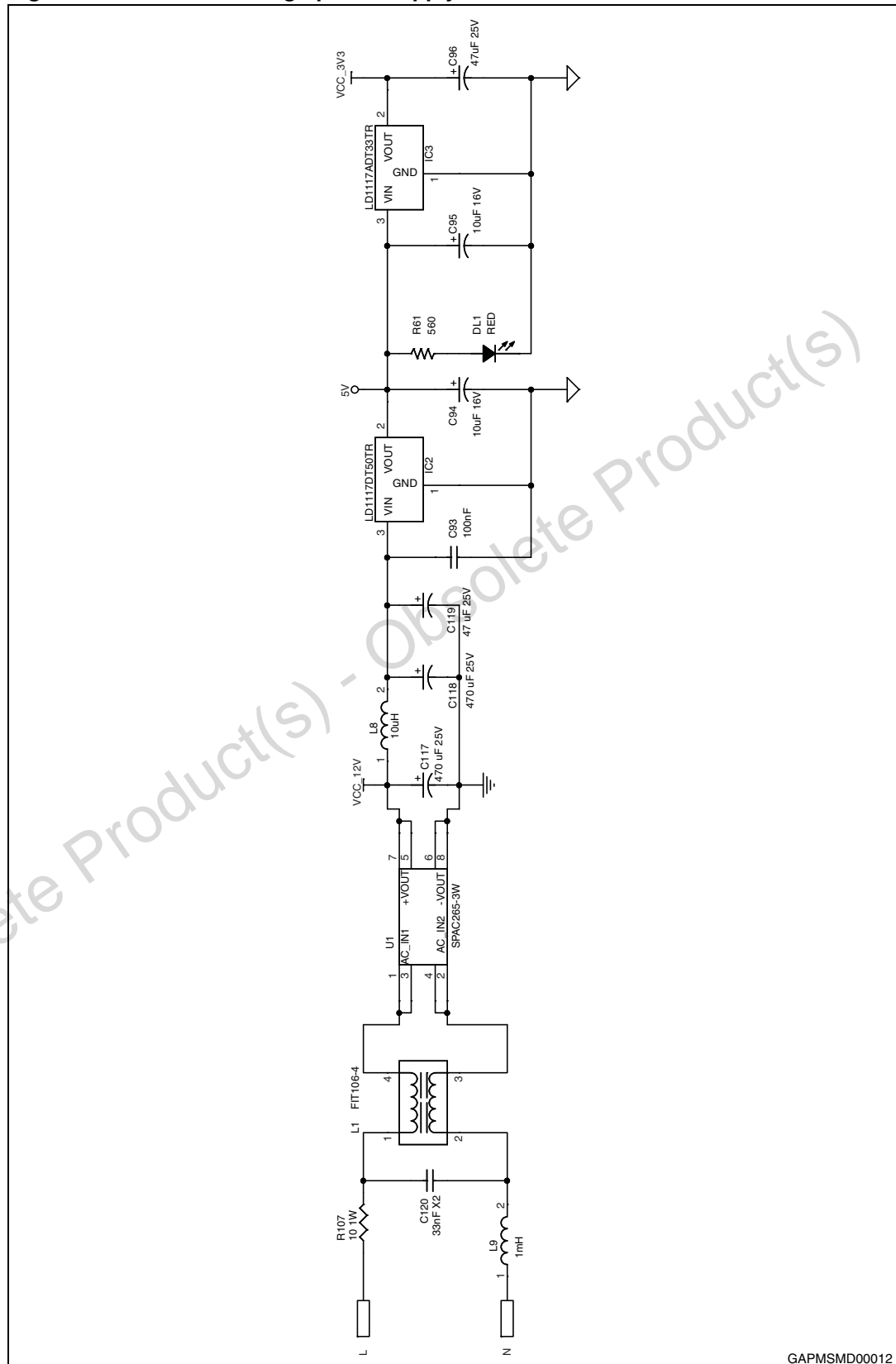
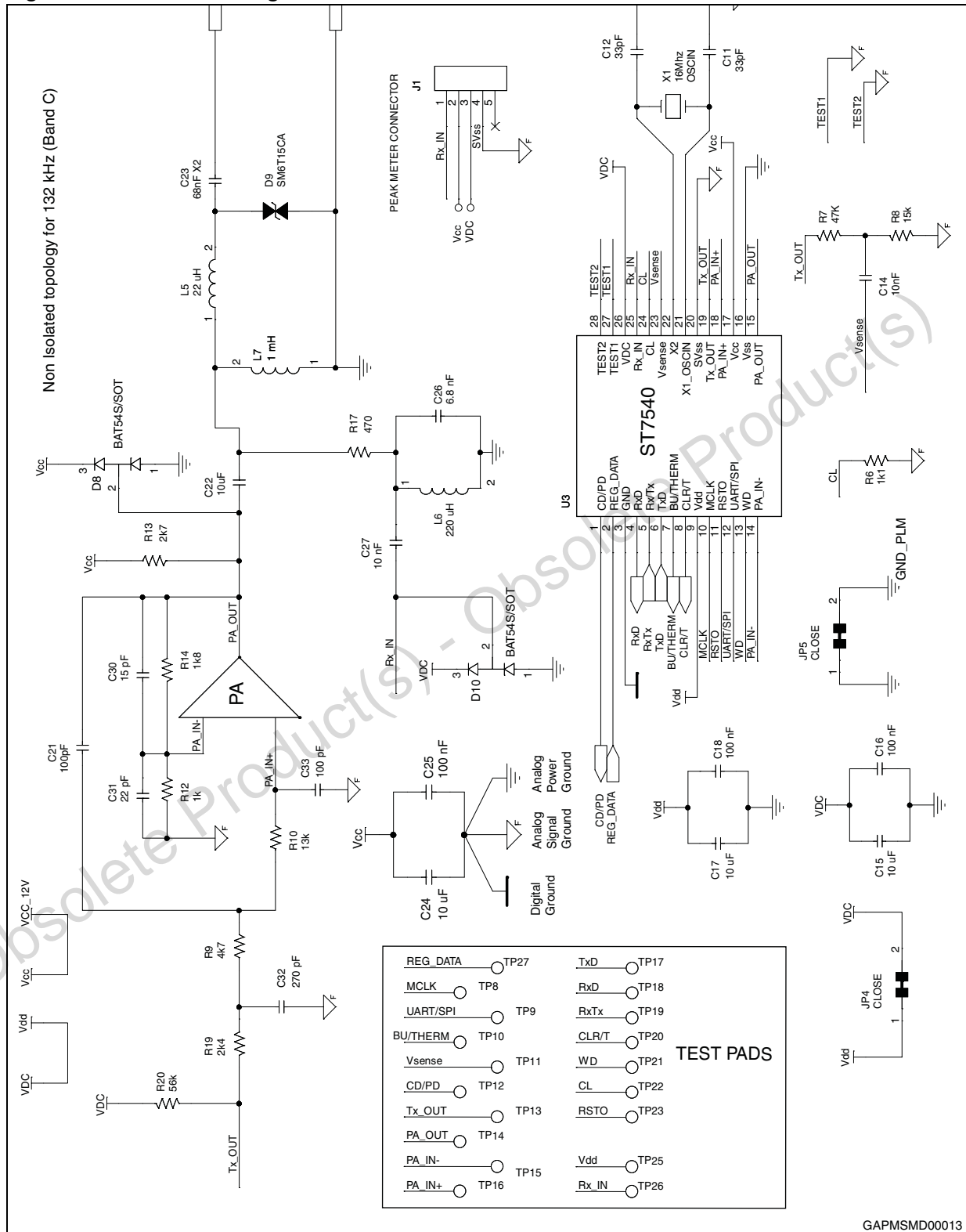


Figure 3. PLM SmartPlug - power supply



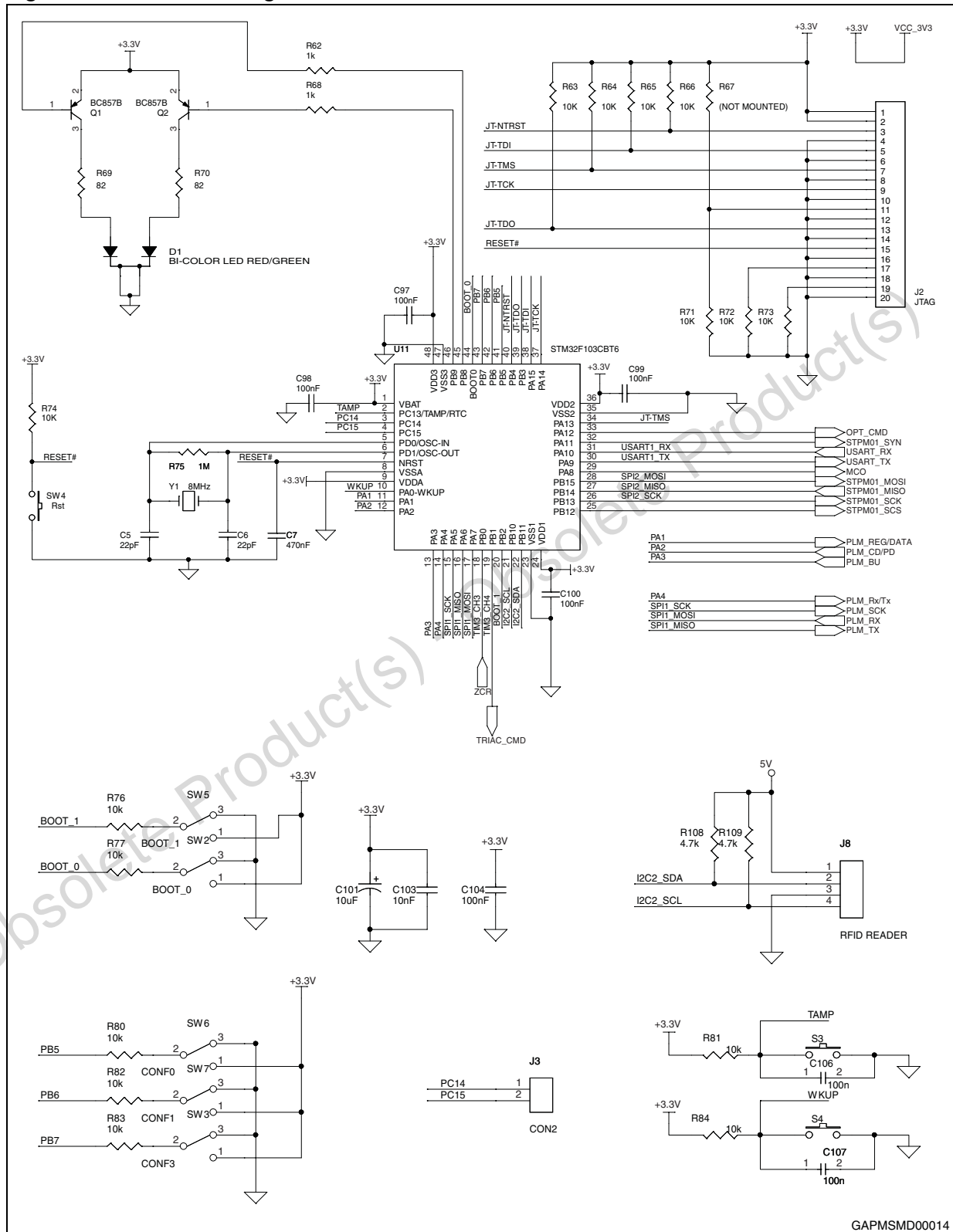
GAPMSMD00012

Figure 4. PLM SmartPlug - PLM communication



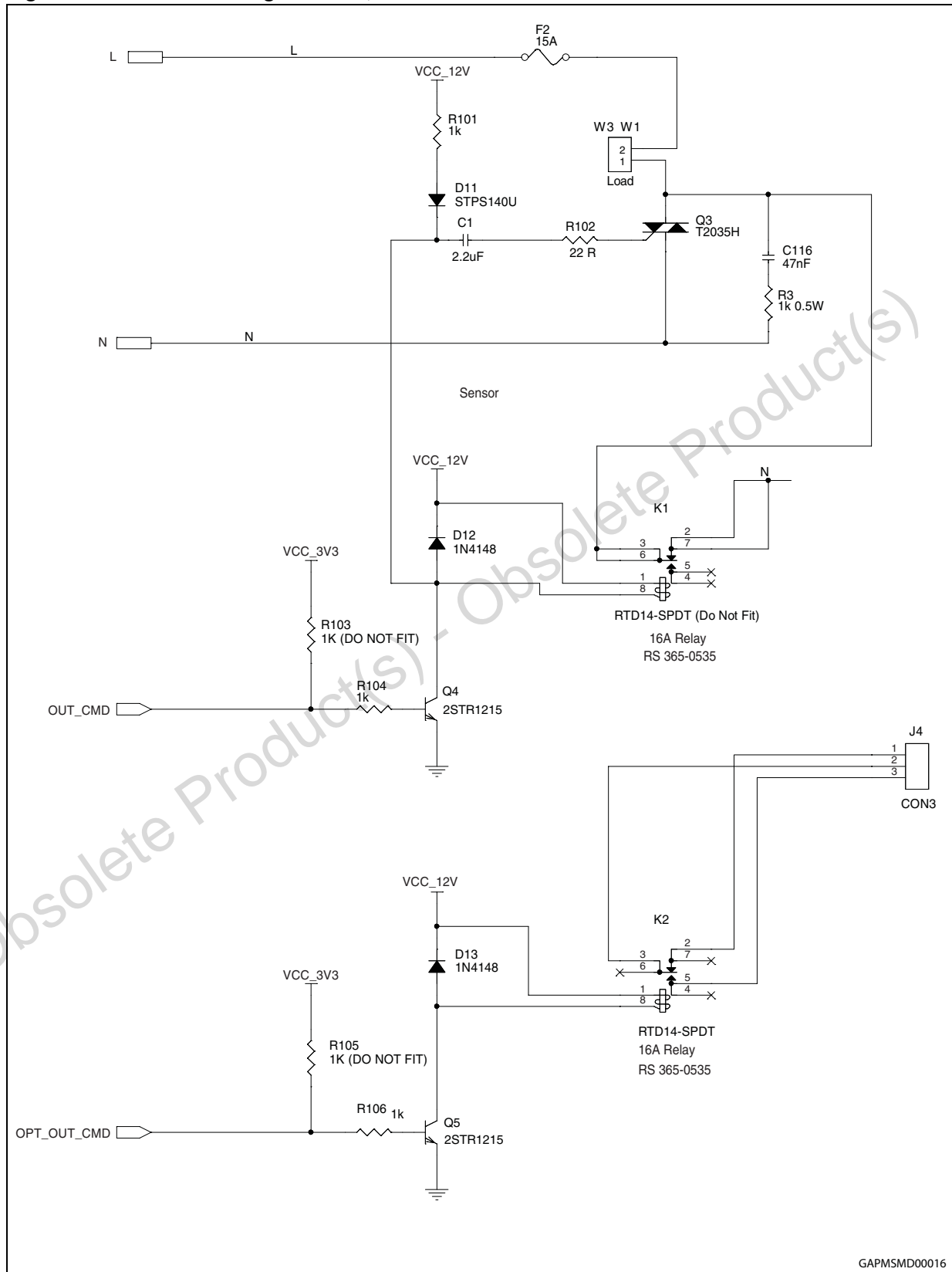
GAPMSMD00013

Figure 5. PLM SmartPlug - MCU



GAPMSMD00014

Figure 7. PLM SmartPlug - dimmer, switch



2 Revision history

Table 1. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 17-Nov-2010 | 1 | Initial release. |
| 08-Mar-2011 | 2 | <ul style="list-style-type: none">– Description on page 1: Added reference to use of the STEVAL-IHP002V1 as a data concentrator.– Resized and reconfigured schematic diagrams to improve readability. |

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