



STEVAL-IHP001V2

SmartPlug demonstration board
based on the STM32, SN260 (ZigBee® transceiver) and STPM01

Data brief

Features

- Energy consumption monitoring
- Time-band configuration
- Network/standalone modes
- ZigBee® well suited for home automation application
- Ground fault detection (in the "safety" version)
- Dimming (in the "dimming" version)
- RoHS compliant

Description

The STEVAL-IHP001V2 is a SmartPlug board based on an STM32F10x microcontroller, an SPZB260 ZigBee® module, and an STPM01 energy metering IC.

It implements a ZigBee® metering node which allows the final user to monitor and manage energy consumption.

The board has been developed to provide a guideline to build a home/building automation subsystem for energy management. In a typical home system implementation, the board is plugged into an electrical wall socket and supplies a home appliance or other generic electrical load.

The current, power, energy and other information related to the electrical load connected to the SmartPlug board can be displayed locally on an LCD screen, or send to a ZigBee® data concentrator through the home/building ZigBee® network.



Figure 2. Jumpers configuration

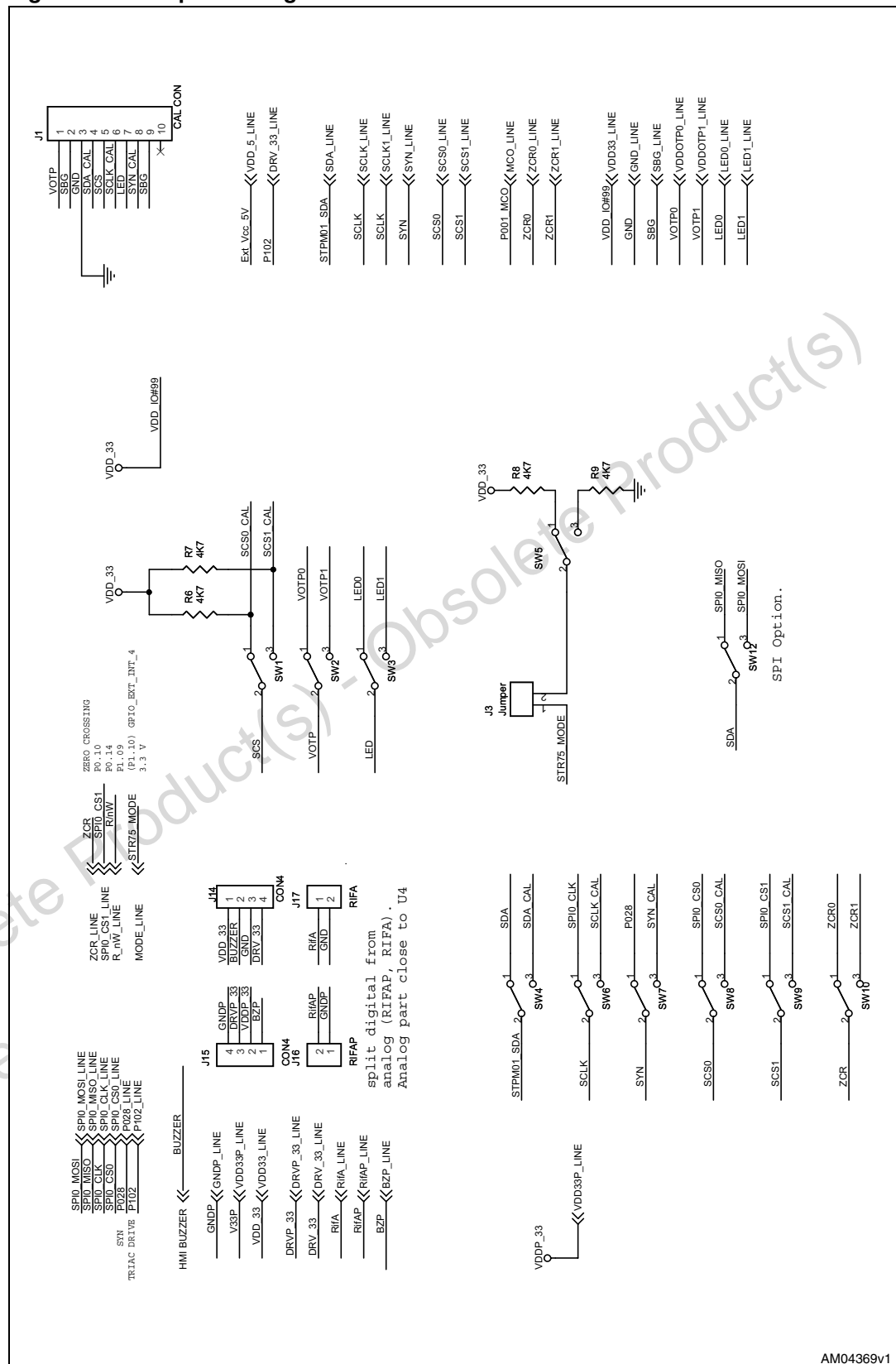
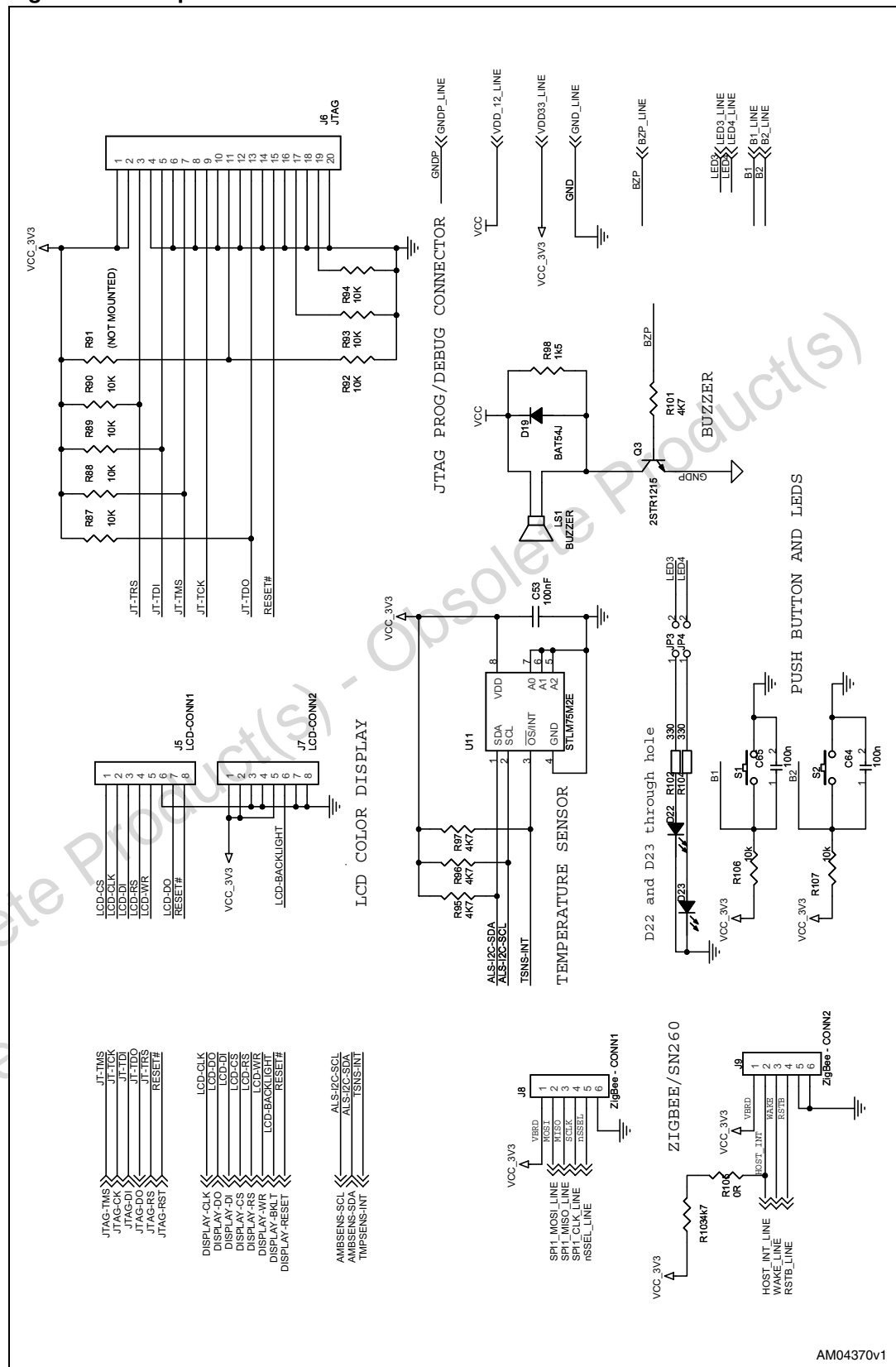
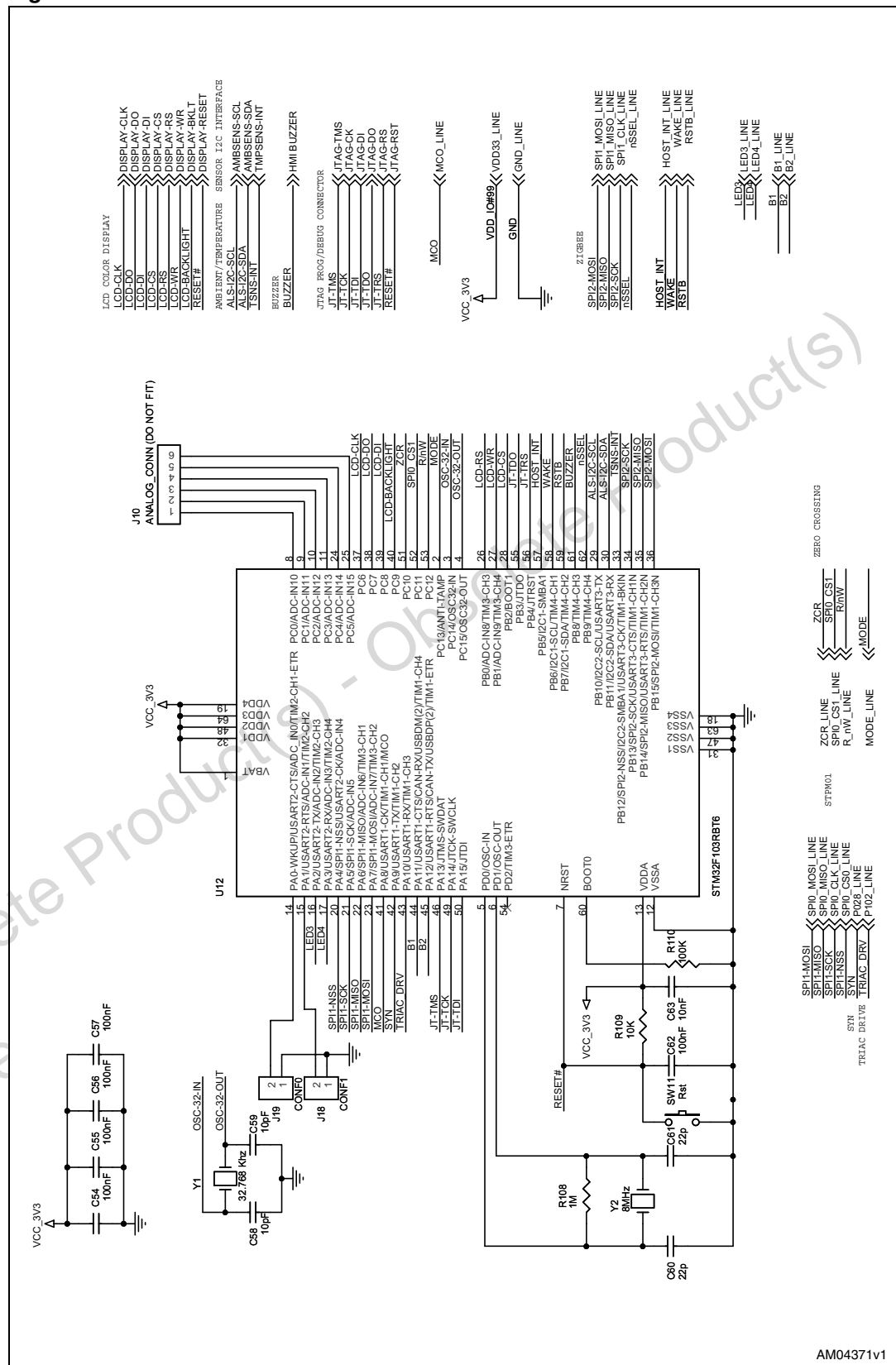


Figure 3. Temperature sensor and connectors



AM04370v1

Figure 4. Microcontroller



AM04371v1

The schematic diagram illustrates the internal circuitry of the STPM01 module and its connections to external components. The module's internal components include a current transformer (T1), a diode (D6), capacitors (C3-C8), resistors (R14-R21), and a microcontroller (U4). The module is connected to a mains supply (W3 W2) and various signal lines (SDA, SCL, SYN, SCS, P001 MCO, ZCR0, VDD, GND, VOTPO, SBG, LED0, RIFA, RIAP).

Internal Components and Connections:

- Current Transformer (T1):** Connected to the mains supply (W3 W2) and the module's input (X).
- Diode (D6):** 1N4148, connected to the module's input (X) and the module's output (Y).
- Capacitors (C3-C8):** C3 (1nF), C4 (100nF), C5 (100nF), C6 (100nF), C7 (100nF), C8 (100nF).
- Resistors (R14-R21):** R14 (1k), R15 (6.8k), R16 (1k), R17 (2M), R18 (475), R19 (281K), R20 (281K), R21 (281K).
- Microcontroller (U4):** STPM01, with pins connected to various signal lines and power supply rails.

External Connections:

- Mains Supply (W3 W2):** Connected to the module's input (X) and the module's output (Y).
- Signal Lines:** SDA, SCL, SYN, SCS, P001 MCO, ZCR0, VDD, GND, VOTPO, SBG, LED0, RIFA, RIAP.
- Power Supply:** VDD_33, VDD_IOM99, VDD_OTPO_LINE, VDD_SBG_LINE, VDD_LED0_LINE, VDD_RIFA_LINE, VDD_RIAP_LINE.

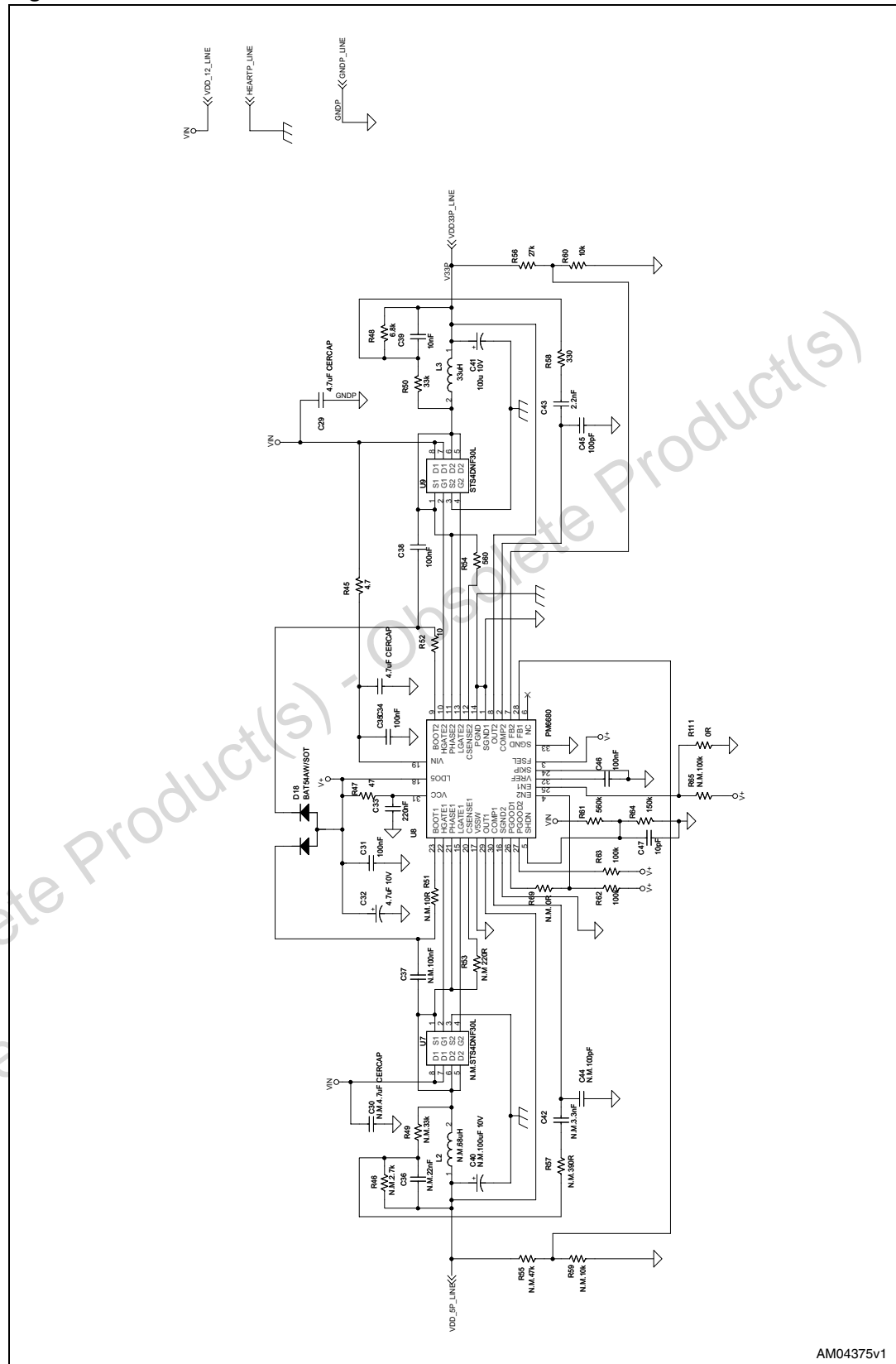
The schematic diagram illustrates the internal circuitry of the STPM01 module. The central component is the STPM01 chip, which is connected to various external components and signal lines. Key components include:

- Capacitors:** C12 (1nF), C13 (100nF), C14 (100nF), C15 (100nF), C16 (100nF), C17 (100nF), C18 (10nF), C20 (10nF).
- Resistors:** R30 (1k), R31 (100), R32 (1k), R33 (2M), R38 (43K), R39 (100), R67 (0R), R26 (560).
- Diodes:** D7, D11 (1N4148).
- Inductor:** T2 (Current Transformer).
- Signal Lines:** SDA, SCL, SYN, SCS, P001, MCO, ZCR1, VDD, GND, VDDTP1, SBG, LED1, Ri/A.
- Power and Ground Connections:** VDD_33, VDD_I0#99, VDDTP1, SBG, GND, VDD33, GND, VDDTP1, SBG, LED1, Ri/A.

The diagram shows the internal connections of the STPM01 chip to these components and signal lines, including the internal pull-up resistors (R30, R31, R32) and the current transformer (T2) used for current sensing.

[illegible]

Figure 8. DC/DC converter



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
01-Jul-2009	1	Initial release.

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