

## STEVAL-IHP001V2

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

Data brief

#### **Features**

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

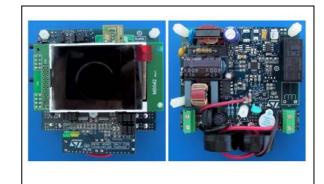
### **Description**

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

It implements a ZigBee<sup>®</sup> 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<sup>®</sup> data concentrator through the home/building ZigBee<sup>®</sup> network.



STEVAL-IHP001V2

**Schematics diagram** STEVAL-IHP001V2

#### **Schematics diagram** 1

Figure 1. AC load driver page

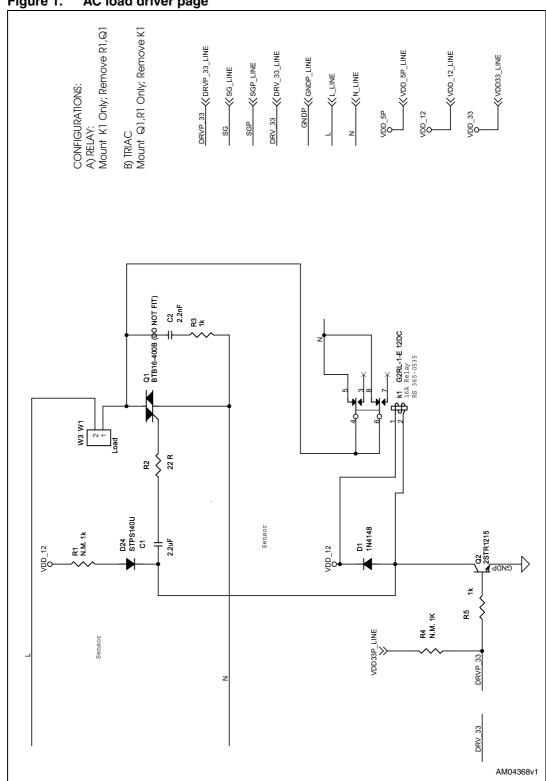


Figure 2. **Jumpers configuration** VOTP0 {\ VDDOTP0\_LINE ₹ DRV\_33\_LINE VDD\_IO#99KVDD33\_LINE SCLK1\_LINE SCLK\_LINE P001 MCO KMCO\_LINE - XZCR0\_LINE STPM01\_SDA KSDA\_LINE SCS1\_LINE - ZCR1\_LINE GND\_LINE KLED1\_LINE SYN\_LINE VOTP1 ZCR0 ZCR1 SCLK SYN SCS1 GND LED0 LED1 SBG 85 5 SCS1 CAL ₽\$ SW5 VOTP0 VOTP1 ED LED1 84 74 SPI Option. ZERO CROSSING PO.10 PO.14 P1.09 (P1.10) GPIO\_EXT\_INT\_4 3.3 V STR75 MODE SCS «STR75 MODE RFA ZCR\_LINE SPIO\_CS1\_LINE of R\_nW\_LINE of MODE\_LINE SCLK\_CAL SPI0 CS1 split digital from analog (RIFAP, RIFA). Analog part close to U4 SYN CAL ZCR0 ZCR1 ZCR HMI BUZZER <<p>BUZZER DRVP\_33 KDRVP\_33\_LINE V33P (VDD33P\_LINE DRV\_33 KDRV\_33\_LINE VDD\_33 KVDD33\_LINE GNDP ( GNDP\_LINE RifAP KRIFAP\_LINE RifA KRifA\_LINE BZP KBZP\_LINE

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Schematics diagram STEVAL-IHP001V2

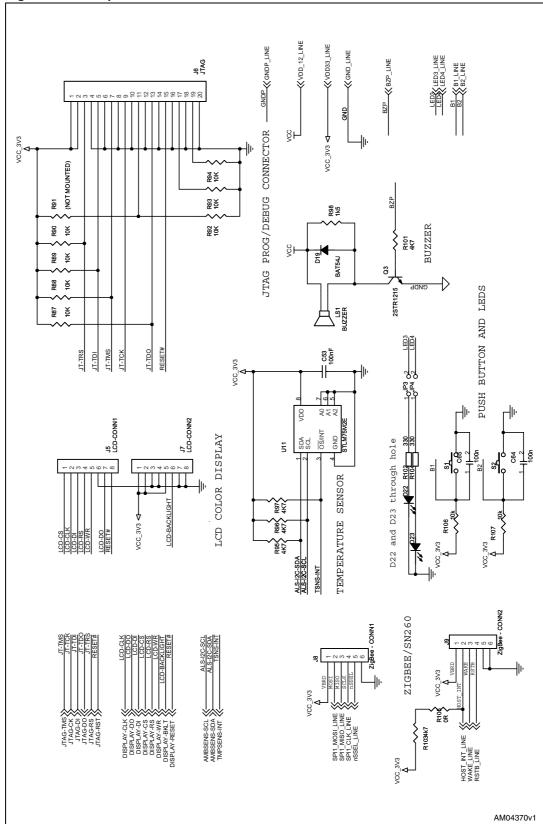
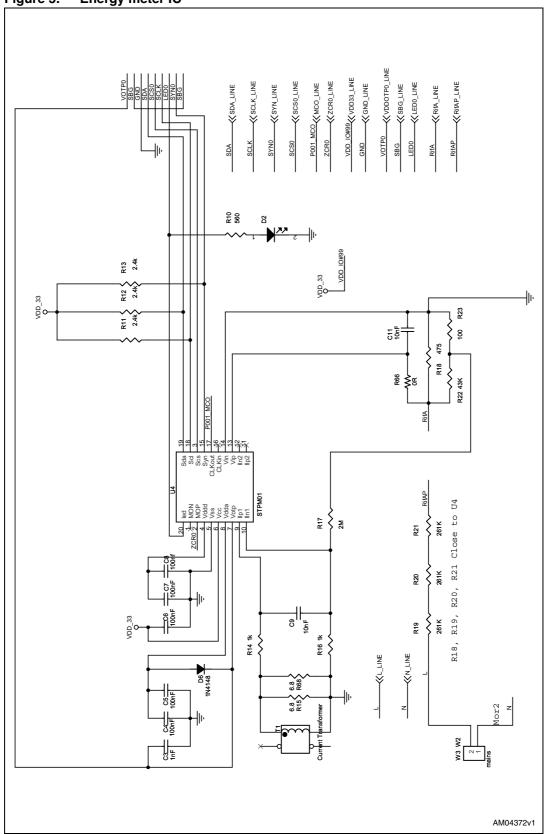


Figure 3. Temperature sensor and connectors

Figure 4. Microcontroller VDD\_IO#99(\VDD33\_LINE →>HMI BUZZER GND\_LINE GND J10 ANALOG\_CONN (DO NOT FIT) STM32F103RBT6 NRST VDDA 112 \$110 \$100K VCC\_3V3 ▲ 100nF 10nF C57 100nF SYN TRIAC DRIVE 88 P SW1 185 1991 1991 \$<sup>5</sup>6 85₹ \$ 2g⊊ 8g 8g

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Figure 5. **Energy meter IC** 



- KVDDOTP1\_LINE VDD\_IO#99 -{\scs1\_LINE - XZCR1\_LINE KLED1\_LINE <p SYN1 KSYN\_LINE </seg\_LINE</pre> SDA\_LINE KRIFA\_LINE ZCR1 GND R26 560 2 R39 10nF 100 85 ≷8 R38 43K Sda Scillar CLKint CLKint Scillar Scil R33 ≥M < R32 1k R30 1k +C12 +C13 + C14 83. 5 AM04373v1

Figure 6. Differential current meter

**Schematics diagram** STEVAL-IHP001V2

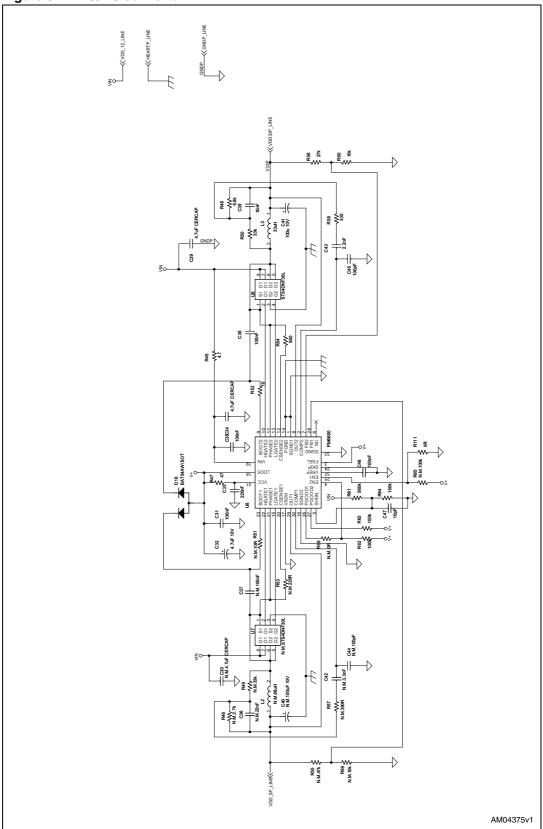
\$\text{VDD\_12\_LINE}\$ COUT1 7-470u 25V Irms 1A ESR=170mohm D13 STPS1H100 D16 ■ BAT46 TRANSFORMER C27 47nF 2.2n 400V 13 8D17 12V ZENER \_ C25 220pF 400V 84 A STTH1L06 4 R42 470K 1W D15 7 SOURCE2 DRAIN1 1N4007 C24 47u 400V SOURCE1 DRAIN2 R43 10 БПАЯП C28 47 nF ΛDD EВ C26 10u 50V 90 VIPER12A 10n 400V X2 C23

Figure 7. AC/DC converter



AM04374v1

Figure 8. DC/DC converter



Revision history STEVAL-IHP001V2

# 2 Revision history

Table 1. Document revision history

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

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