



STEVAL-IPE008V1

Energy meter (3-phase) demonstration board based on the STPM01 and STR715FR0

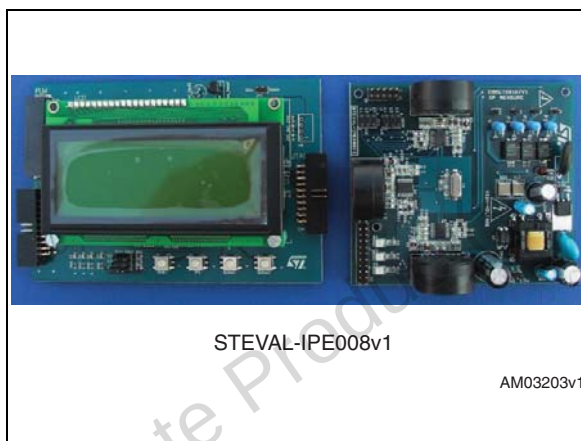
Data Brief

Features

- 3-phase meters
- Multi-chip topology, in which each phase is monitored using a single-phase device
- Common clock network
- Power supply in fly-back topology using a VIPer12ADIP-E

Description

The STEVAL-IPE008V1 demonstration board shows how to design a 3-phase meter using STPM01 as measuring device and a VIPer12ADIP-E as SMPS (switch mode power supply). The STPM01 is a metering ASSP implemented in an advanced 0.35 μm BCD6 technology. It is designed for the effective measurement of active, reactive, apparent energies, V_{RMS} , I_{RMS} , instantaneous voltage and current, and frequency in power line systems that use the current transformer, Rogowski coil and/or shunt principle. This device can be used as a standalone on-board metering device in single-phase energy meter applications or as a peripheral in a microprocessor based single- or 3-phase meter. In a standalone configuration STPM01 outputs a pulse train signal having a frequency proportional to the active power used, while in peripheral mode STPM01 is used in a microprocessor based application. In this case, measured data are read at a fixed interval from the device internal registers by means of SPI interface processed by a microcontroller.

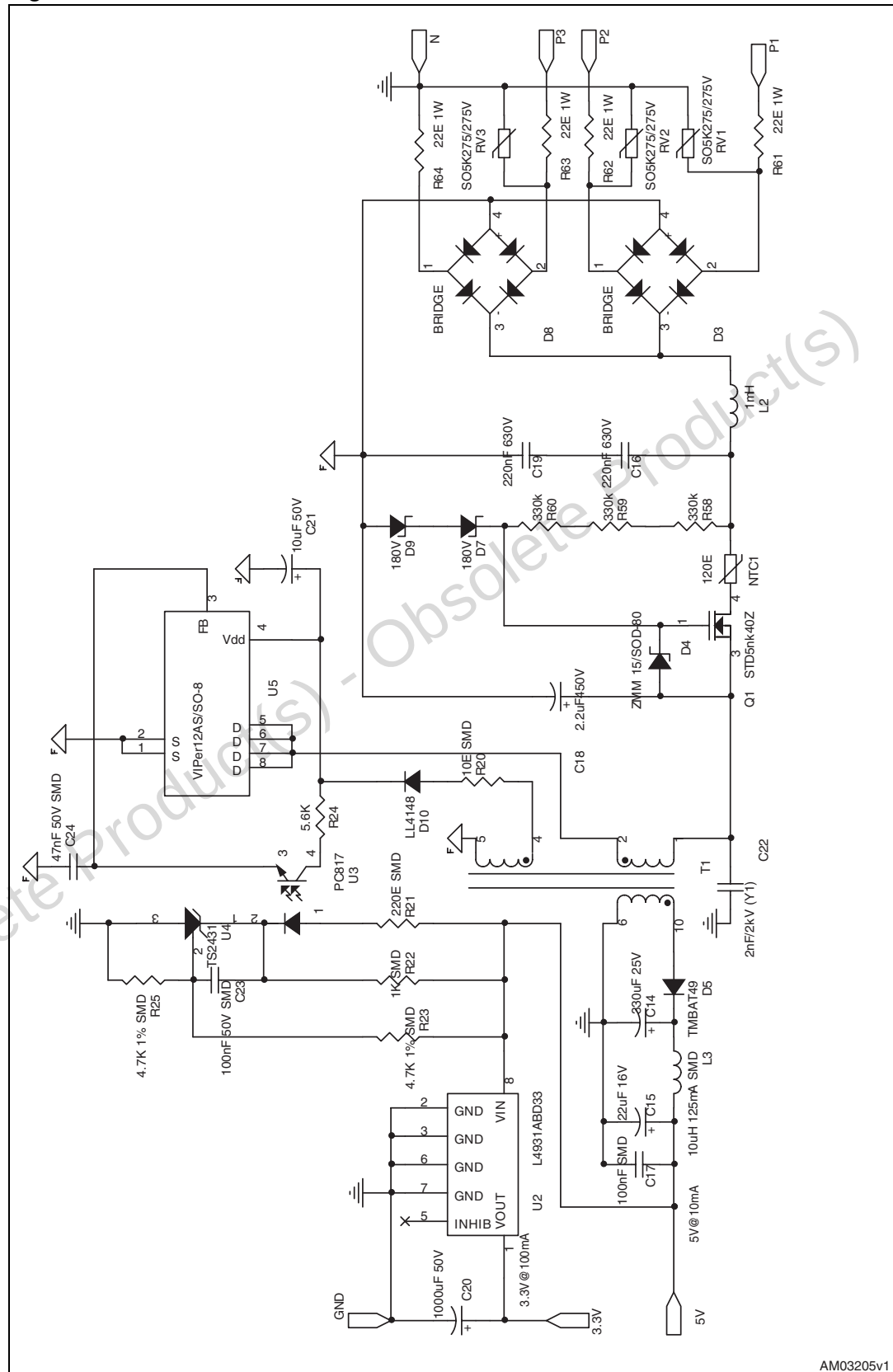


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Figure 1. Top layer circuit schematic



Figure 2. SMPS circuit schematic



The schematic diagram illustrates the internal circuitry of the STPM01_TSSOP20 module. Key components include:

- Capacitors:** C3 (1nF), C4 (1nF), C5 (1M Ω), C6 (1nF), C7 (1nF), C8 (1M Ω).
- Resistors:** R2 (750 Ω), R5 (1k Ω), R6 (3.4 Ω), R8 (1k Ω), R9 (2.2M Ω), R7 (150K Ω), R10 (2.2K Ω), R13 (0 Ω), R17 (470 Ω), R15 (270K Ω), R16 (200K Ω).
- Semiconductors:** D1 (diode), D2 (LL4148 diode), L1 (CT inductor).
- Pin Connections:** The module has 20 pins labeled Sda, Scl, Syn, Vdd, Scl, SCS, SCL, SYN, VDD, CLKIN, CLKOUT, Vin, Vip, Vlp, Iin1, Iin2, Iip2, led, MON, MOP, Vddd, Vss, Vcc, Vdda, Volp, Iip1.
- External Connections:** LEDs are connected to Sda, Scl, and Syn. A GND connection is shown for SCS. A VDD connection is shown for SCL. A SYN connection is shown for VDD. A CLKIN connection is shown for CLKIN. A CLKOUT connection is shown for CLKOUT. A VDD connection is shown for VDD. A GND connection is shown for GND. An LED connection is shown for LED.

Figure 4. Clock management network schematic

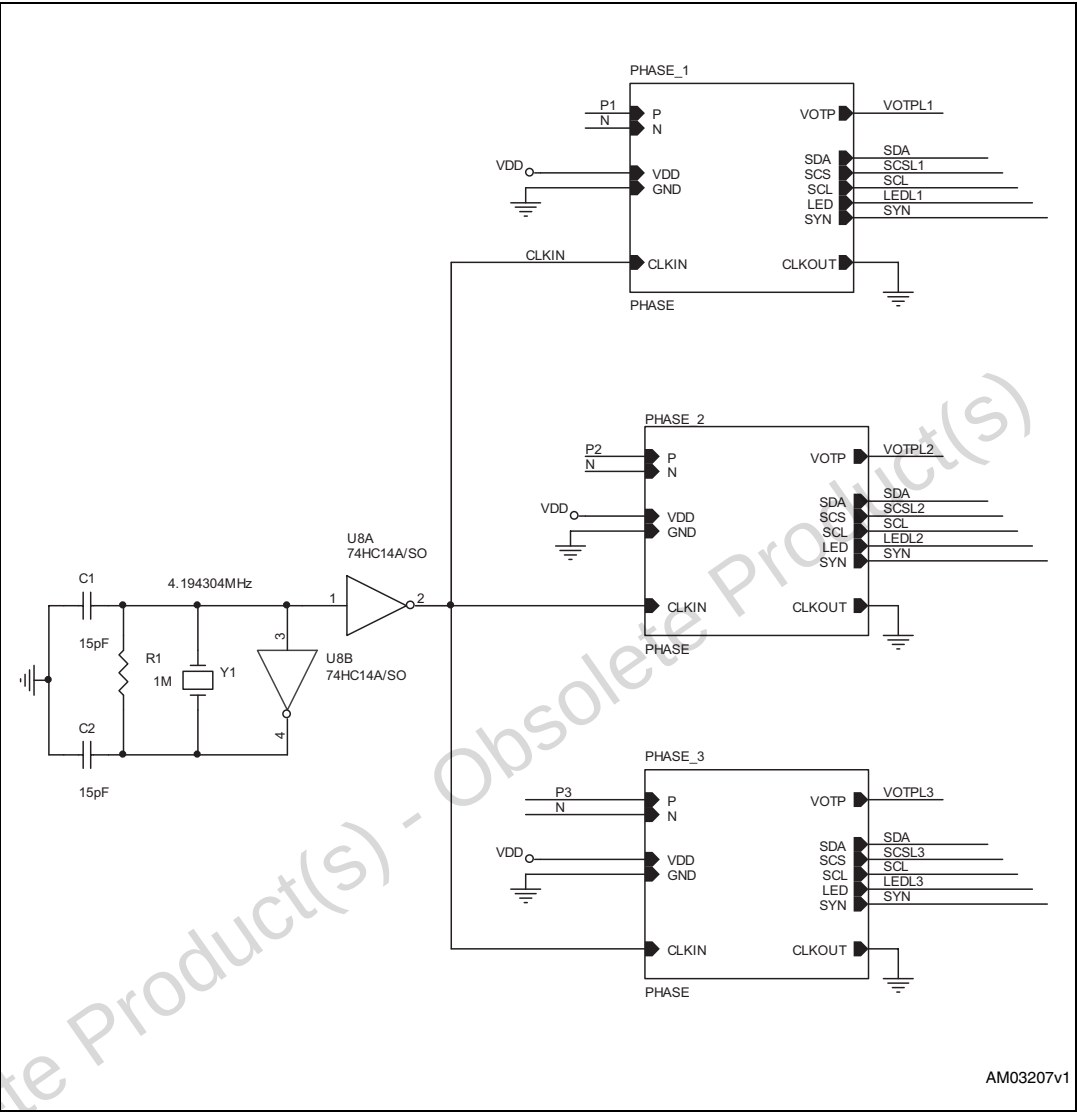
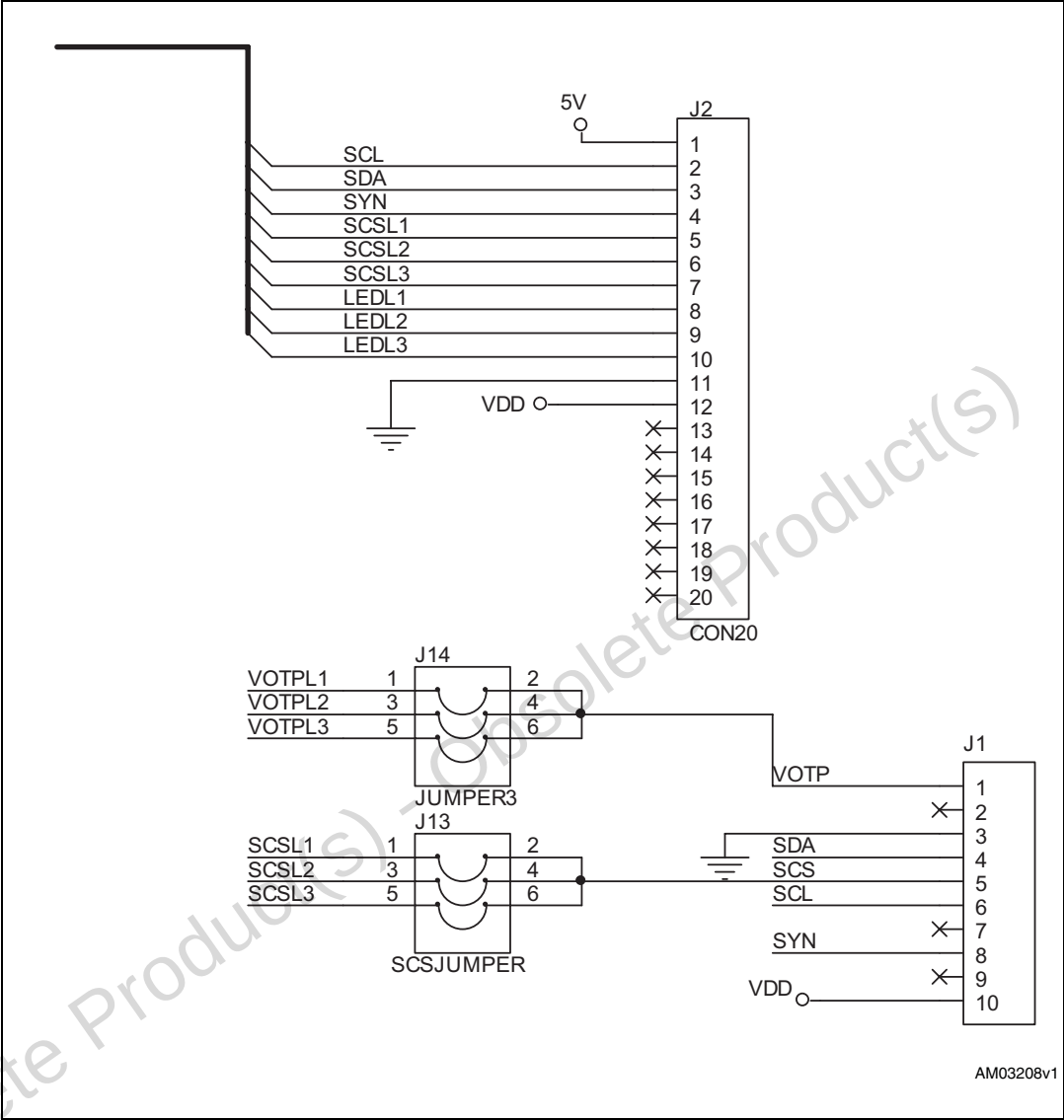


Figure 5. Connectors schematic



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
25-Nov-2008	1	Initial release.

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