SM2400-EVK1

Evaluation Kit for SM2400 Multi-Standard Narrowband Power Line Communication Modem

Communication technology by: Semitech Semiconductor

Product Overview

The SM2400-EVK1 is a complete evaluation kit for the SM2400 multi-standard Narrowband Power Line Communication (N- PLC) modem. The SM2400-EVK1 is configurable to any of the major OFDM based N-PLC standards, such as PRIME, G3-PLC and IEEE 1901.2, as well as to a number of robust proprietary modes. The SM2400-EVK1 includes a modem module (SM2400-EV1Mx-x), a base board for the module featuring various interfaces to facilitate engineering evaluation and a PC-based GUI application (SM2400Control.exe), which enables comprehensive configuration, control and monitoring/testing of the communication performance of the modem subsystem.

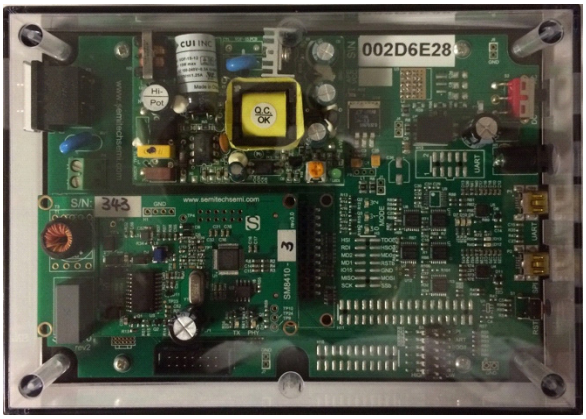

Figure 1: SM2400-EVK1 Evaluation Kit

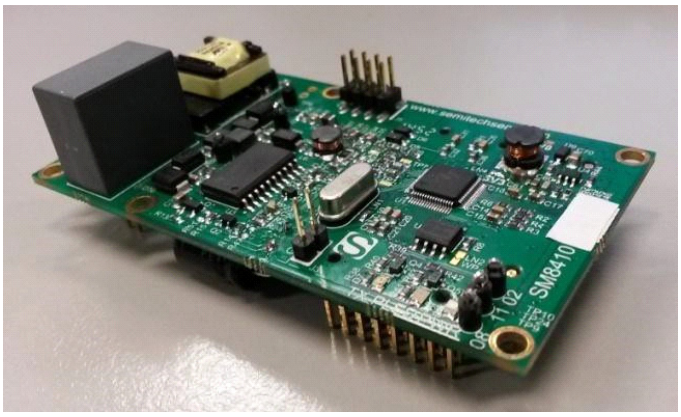

Figure 2: SM2400-EV1Mx-x Modem Modules

The SM2400-EV1Mx-x N-PLC module is a complete communications modem card. It contains the SM2400 modem chip as well flash memory, line driver, coupling circuitry and all the analog filtering necessary for an optimal design. It is intended to be used as a reference design for the implementation of an N-PLC modem product. The base board of the EVK features a mini-USB connector for connecting to a PC or other controller, a JTAG interface for debugging and various options for the power supply.

The SM2400-EVK1 is offered in several variations as outlined in this document.

Features

- Standardized PLC module, dimensions: *83mm L x 45mm W*
- UART interface with handshaking for flow control
- Built-in power-line coupling circuit
- Multitude of downloadable firmware builds
    - All major OFDM standards: PRIME, G3-PLC, IEEE 1901.2
    - Special robust modes: XR, XXR
    - Optional mesh networking (SMESH)

- Various modules optimized for different operational bands
  - CENELEC A
  - CENELEC B/BC
  - FCC/ARIB

Benefits

- Facilitates evaluation of various communication schemes. This is accomplished by downloading firmware and using various versions of the modem modules.
- GUI software application (SM2400Control.exe) to control the SM2400 modem and monitor communication performance
- Enables quick modem subsystem implementation by making schematics and bill of materials available for reference.

Applications

- Advanced Metering Infrastructure (AMI)
- Automated Meter Reading (AMR)
- Smart grid communication
- Street lighting control
- Solar and alternative energy management
- Smart home energy monitoring
- Building automation (BA)
- SCADA (Supervisory Control And Data Acquisition)
- Industrial IoT (I-IoT)

Kit Content & Configurations

The SM-2400-EVK1 evaluation kits include:

- Base board
- SM2400-EV1Mx-x module
- USB Cables
- User Guide (available for download)
- Firmware + GUI (available for download)

Evaluation Kit	Line Driver	Band
SM2400-EVK1M1-A	TI-OPA564	CENELEC A
SM2400-EVK1M1-B	TI-OPA564	CENELEC B/BC
SM2400-EVK1M1-C	TI-OPA564	FCC

Modem Modules	Line Driver	Band
SM2400-EV1M1-A	TI-OPA564	CENELEC A
SM2400-EV1M1-B	TI-OPA564	CENELEC B/BC
SM2400-EV1M1-C	TI-OPA564	FCC

Interfaces

There are four headers on the back of the SM2400-EV1Mx-x modules. The designator Pin 1 and the location of each header can be found in Figure 3. The pin out and description of each header is described below.

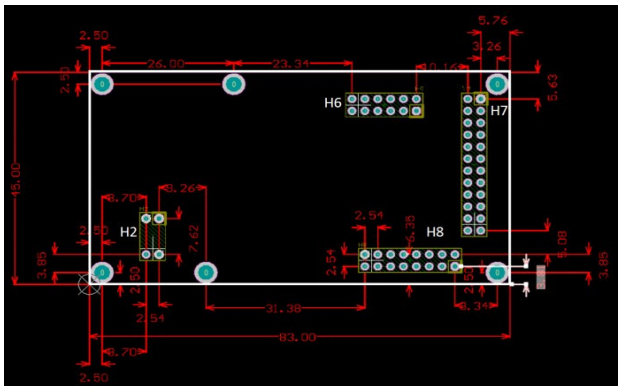

Figure 3: SM2400-EV1Mx-x Top View

Table 1: Header H2

Pin#	Name	Functionality
1,2	ACTIVE	Mains active
3,4,5,6	NC	
7,8	NEUTRAL	Mains neutral

Table 2: Header H6 (DSP)

Pin#	Name	Dir	Functionality
1	JTDO	O	JTAG Interface
2	JTMS	I	JTAG Interface
3	JTDI	I	JTAG Interface
4	JTCK	I	JTAG Interface
5	JTRSTB	I	JTAG Interface
6	GND	P	Ground
7	COREIO14	IO	COREIO
8	COREIO10	IO	COREIO
9	COREIO12	IO	COREIO
10	COREIO13	IO	COREIO
11	NC		
12	GND	P	Ground

Table 3: Header H7

Pin#	Name	Dir	Functionality
1	1VB	P	External 1.8V Power (Optional)
2	PSU_SHDNb	I	Active low 3.3V SMPS disable (input)
3, 4	3V3	P	External 3.3V Supply, PSU_)SHDNb must be pulled if being used
5, 6	AFE_VCC	P	15V @ 125mA
7, 8, 9	GND	P	Ground
10	UART_TDO	O	SM2400 UART TXD
11	pulled_RDI	I	SM2400 UART RXD
12	UART_HSI	I	SM2400 UART Handshake Input
13	UART_HSO	O	SM2400 UART Handshake Outpu
14	Mode2	I	Boot mode pin 2
15	Mode1	I	Boot mode pin 1
16	Mode0	I	Boot mode pin 0
17	RESETb	I	Reset
18	RESETb	IO	COREIO
19	GND	P	Ground
20	SPIS_OUT	O	Host SPI Slave Interface
21	SPIS_SCK	I	Host SPI Slave Interface
22	SPIS_IN	I	Host SPI Slave Interface
23	GND	P	Ground
24		I	Host SPI Slave Interface

Table 4: Header H8 (DNP)

Pin#	Name	Dir	Functionality
1	NC		NC for SM2400 based module
2	SPIM_OUT	O	SPI Master Interface
3	SPIM_SCK	O	SPI Master Interface
4	SPIM_IN	I	SPI Master Interface
5	SPIM_SS0b	O	SPI Master Interface (Mapped to on board SPI boot memory)
6	SPIM_SS1b	O	SPI Master Interface
7	SPIM_SS2b	O	SPI Master Interface
8	GND	P	Ground
9	COREIO02	IO	PHYLED (Output)
10	COREIO01	IO	RXRANGE1 (output)
11	COREIO00	IO	RXRANGE0 (output)
12	COREIO11	IO	Overcurrent Flag (Output)
13	COREIO09	IO	COREIO
14	COREIO08	IO	TX Enable (Output)
15	GND	P	Ground
16	LDO PD	I	Active high LDO power down

Firmware & Reference Material

Available firmware for various versions of the SM2400-EVK1 evaluation kit includes the following packages:

- PRIME PHY and MAC
- G3/IEEE PHY and MAC
- IEEE 1901.2 FCC PHY and MAC
- IEEE PHY and SMESH
- Proprietary XXR PHY and SMESH

Additional firmware packages become available from time to time. These and other reference material such as schematics and bill of material is downloadable from the Adesto technologies website.

Contact Information

For more information regarding the SM2400 including application notes, product samples, demonstration modules, pricing and ordering please contact:

Adesto Technologies
http://www.adestotech.com

Communication technology by:
Semitech Semiconductor

Corporate Office

California | USA
Adesto Headquarters
3600 Peterson Way
Santa Clara, CA 95054
Phone: (+1) 408.400.0578
Email: contact@adestotech.com

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