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Silicon Laboratories' EM35x Mini Module Companion Kit

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INTRODUCTION

The MeshConnect™ Ember EM35x Companion Kit, ZICM-EM35X-DEV-KIT, from California Eastern Laboratories (CEL) is designed to work directly with Silicon Laboratories' Development Kits, EM35X-DEV or EM35X-DEV-IAR. CEL's ZICM35x Mini Modules are mounted on interface boards that allow them to be plugged onto the EM35x-DEV Development Kit from Silicon Labs. Each CEL EM35x Companion Kit ships with a variety of modules variations: including high power and low power modules, modules that use the internal antenna as well as modules with U.FL connectors for external antenna designs.

CEL's MeshConnect EM35x Mini Modules combine high performance RF solutions with the market's premier ZigBee® and Thread stacks. Available in low and high output power options (+8dBm and +20dBm), these modules can accommodate variable range and performance requirements. The tiny module footprint makes them suitable for a wide range of ZigBee and Thread applications. The MeshConnect EM35x Mini Modules are certified and qualified, enabling customers to accelerate time to market by greatly reducing the design and certification phases of development.

This document provides the technical specification of the MeshConnect EM35x Mini Modules on the Silicon Labs - specific carrier board. For more information on MeshConnect Modules, contact CEL at meshconnect.cel.com.

MODULE DEFINITION

Each module is soldered on a carrier board making it pin-for-pin compatible with the EM35x Breakout Board.

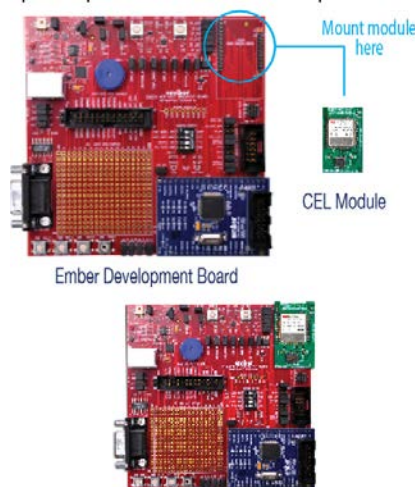


Figure 1. EM35x Breakout Board with CEL Module

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CARRIER BOARD FEATURES

- Access to Ember’s InSight Port connector
- Two debug LEDs
 - LED0 (green) is connected to EM35x GPIO PA6
 - LED1 (red) is connected to EM35x GPIO PA7
- Convenient access to all EM35x GPIOs

Carrier Board Reference Table

Below is a pin-out reference of each CEL MeshConnect EM35x Mini Module:

Carrier Board Pin Number	Module Pin Number	EM357 IC Pin Number	Name	Notes
1	1, 2, 12, 31, 33	49	GROUND	
2	3	11	PC5	ZICM35xSP0: Digital I/O ZICM35xSP2: Dedicated as TX_ACTIVE. The EM35x baseband controls TX_ACTIVE and drives it high when in TX mode; since it is used internally in the module, PC5 is not connected to module I/O pin 3
3	5	13	PC6	ZICM35xSP0 and ZICM35xSP2-1: Digital I/O, OSC32B - 32.768 kHz crystal oscillator, nTX_ACTIVE - Inverted TX_ACTIVE signal ZICM35xSP2-2: Used internally in the module; PC6 is not connected to module I/O pin 5
4	6	14	PC7	Digital I/O OSC32A - 32.768 kHz crystal oscillator OSC32_EXT - Digital 32.768 kHz clock input source
5	7	18	PA7	Digital I/O TIM1C4 - Timer 1 Channel 4 input/output REG_EN - External regulator open drain output
6	8	19	PB3	Digital I/O TIM2C3 - Timer 2 Channel 3 input/output SC1nCTS - UART CTS handshake of Serial Controller 1 SC1SCLK - SPI master/slave clock of Serial Controller 1
7	4	12	RESET	Active Low chip reset (Input)
8	9	20	PB4	Digital I/O TIM2C4 - Timer 2 Channel 4 input/output SC1nRTS - UART RTS handshake of Serial Controller 1 SC1nSSEL - SPI slave select of Serial Controller 1
9	10	21	PA0	Digital I/O TIM2C1 - Timer 2 Channel 1 input/output SC2MOSI - SPI master data out/slave data in of Serial Controller 2 ZICM3588SPx - USBDM - USB D- signal
10	11	22	PA1	Digital I/O TIM2C3 - Timer 2 Channel 3 input/output SC2SDA - TWI data of Serial Controller 2 SC2MISO - SPI master data in/slave data out of Serial Controller 2 ZICM3588SPx - USBDP - USB D+ signal
11	14	24	PA2	Digital I/O TIM2C4 - Timer 2 Channel 4 input/output SC2SCL - TWI clock of Serial Controller 2 SC2SCLK - SPI master/slave clock of Serial Controller 2
12	15	25	PA3	Digital I/O TIM2C2 - Timer 2 channel 2 input/output SC2nSSEL - SPI slave select of Serial Controller 2 TRACECLK - Synchronous CPU trace clock
13	1, 2, 12, 31,33	49	GROUND	
14	16	26	PA4	Digital I/O ADC4 - ADC Input 4 PTI_EN - Frame signal of Packet Trace Interface (PTI) TRACEDATA2 - Synchronous CPU trace data bit 2
15	17	27	PA5	Digital I/O ADC5 - ADC Input 5 PTI_DATA - Data signal of Packet Trace Interface (PTI) nBOOTMODE - Embedded serial bootloader activation out of reset TRACEDATA3 - Synchronous CPU trace data bit 3
16	18	29	PA6	Digital I/O TIM1C3 - Timer 1 channel 3 input/output

Carrier Board Pin Number	Module Pin Number	EM357 IC Pin Number	Name	Notes
17	19	30	PB1	Digital I/O SC1MISO - SPI slave data out of Serial Controller 1 SC1MOSI - SPI master data out of Serial Controller 1 SC1SDA - TWI data of Serial Controller 1 SC1TXD - UART transmit data of Serial Controller 1 TIM2C1 - Timer 2 channel 1 input/output
18	20	31	PB2	Digital I/O SC1MISO - SPI master data in of Serial Controller 1 SC1MOSI - SPI slave data in of Serial Controller 1 SC1SCL - TWI clock of Serial Controller 1 SC1RXD - UART receive data of Serial Controller 1 TIM2C2 - Timer 2 channel 2 input/output
19	1, 2, 12, 31,33	49	GROUND	
20	1, 2, 12, 31,33	49	GROUND	
21	21	32	JTCK	JTAG clock input from debugger SWCLK - Serial Wire clock input/output with debugger
22	22	33	PC2	Digital I/O JTD0 - JTAG data out to debugger SWO - Serial Wire Output asynchronous trace output to debugger TRACEDATA0 Synchronous CPU trace data bit 0
23	23	34	PC3	Digital I/O JTDI - JTAG data in from debugger TRACECLK - Synchronous CPU trace clock
24	24	35	PC4	Digital I/O JTMS - JTAG mode select from debugger SWDIO - Serial Wire bidirectional data to/from debugger
25	25	36	PB0	Digital I/O VREF - ADC reference input/output IRQA - External interrupt source A TRACEDATA2 - Synchronous CPU trace data bit 2 TRACECLK - Synchronous CPU trace clock TIM1CLK - Timer 1 external clock input TIM2MSK - Timer 2 external clock mask input
26	26	38	PC1	Digital I/O ADC3 - ADC Input 3 SWO - Serial Wire Output asynchronous trace output to debugger TRACEDATA3 - Synchronous CPU trace data bit 3
27	27	40	PC0	Digital I/O Jrst - JTAG reset input from debugger IRQD - Default external interrupt source D TRACEDATA1 - Synchronous CPU trace data bit 1
28	28	41	PB7	ADC2 -ADC Input 2 IRQC - Default external interrupt source C TIM1C2 -Timer 1 channel 2
29	29	42	PB6	ADC1 - ADC Input 1 IRQB - External interrupt source B TIM1C1 - Timer 1 channel 1
30	30	43	PB5	ADC0 - ADC Input 0 TIM2CLK - Timer 2 external clock TIM1MSK - Timer 1 external clock mask input
31	1, 2, 12, 31,33	49	GROUND	
32	13	16, 23, 28, 37	V _{CC}	
33	1, 2, 12, 31,33	49	GROUND	

Refer to the *MeshConnect EM35x Mini Module Datasheet* for more details, including module characteristics.

MECHANICAL DETAILS

The interface board overall dimensions and signal connections to the EM35x Breakout Board are shown in Figure 2 below. Dimensions are in inches [mm].

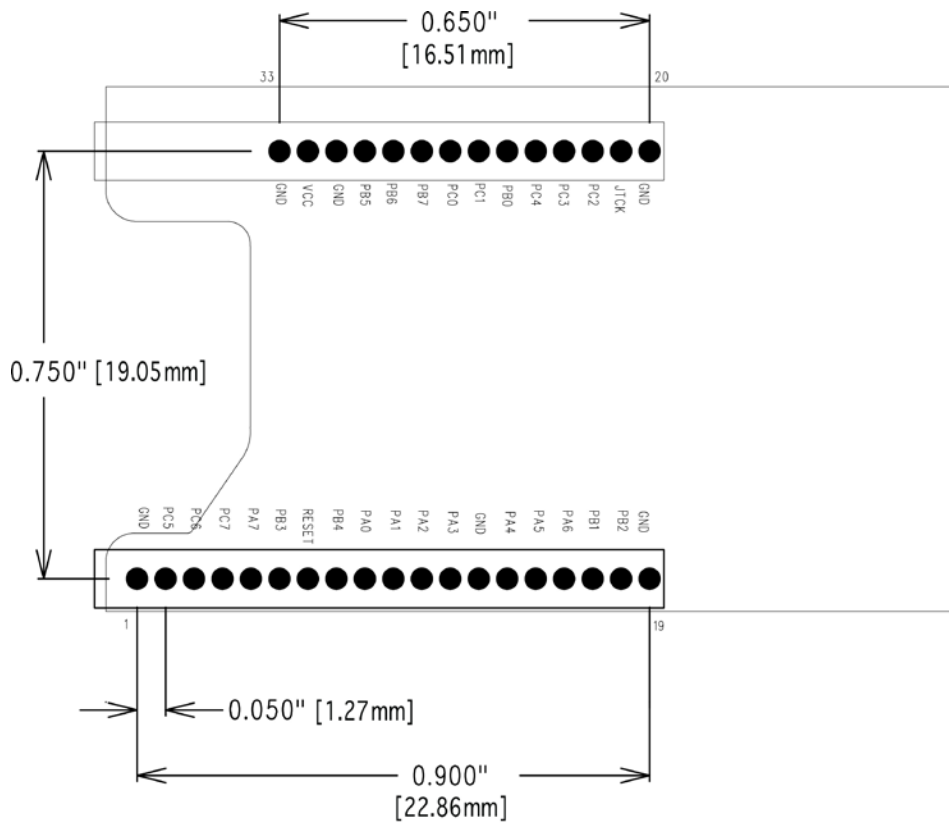


Figure 2. EM35x Breakout Board

REFERENCES

Reference Documents	Download
California Eastern Laboratories	
0011-00-07-00-000 – Mini Module Datasheet	Link

REVISION HISTORY

Previous Versions	Changes to Current Version	Page(s)
0011-02-17-00-000 (Issue A) May 7, 2012	Initial Release	N/A
0011-02-17-00-000 (Issue B) August 25, 2013	Removed About CEL Section and added For More Information and Technical Assistance Sections	8
0011-02-17-00-000 (Issue C) September 25, 2013	Change Ember Development Board to EM35x Breakout Board, Format change	ALL
0011-02-17-00-000 (Issue D) October 5, 2015	Updated with EM35x references and kit-3 information	ALL

DISCLAIMER

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