

CEL's MeshConnect™ EM357 Mini Modules are the industry's smallest Silicon Labs® Ember based modules. Based upon the Ember EM357 ZigBee SoC, these modules combine advance silicon architecture (Cortex-M3) and the industry's premier ZigBee stack, EmberZNet PRO. With a small footprint (<400mm²) and advanced RF performance (link budget 123 dB), CEL's Mini Modules challenge the merits of a discrete implementation.

As Silicon Labs' module partner, CEL has companion kits that enable the Mini Modules to be directly integrated into Silicon Labs' own development kits for easy integration and development within the Insight™ tool chain.

These modules are available in low and high output power options (+8dBm and +20dBm), to accommodate various range and performance requirements.

The EM357 SoC IC consists of an RF transceiver with a baseband modem, a hard-wired MAC and an embedded 32-bit ARM® Cortex™-M3 microcontroller with internal RAM (12 kB) and flash (192 kB) memory. It provides numerous general-purpose I/O pins and peripheral functions such as timers and UARTs enabling customers to access its rich mix of on-chip functionality.

CEL's MeshConnect™ line of 802.15.4/ZigBee products delivers industry-leading range, high performance, and a rich feature set at low cost. CEL's design examples, reference designs, and engineering support help customers get their product designs to market quickly. Based upon the industry's premier ZigBee stack (EmberZNet PRO™) key applications include Smart Energy (thermostats, meters, in-home displays and smart plugs), LED lighting control, solar/wind power, HVAC control, and security systems. MeshConnect certified and qualified modules enable customers to reduce their design and certification costs of development as well as development risk, while reducing time to market.

MeshConnect™ EM357 Mini Modules

FEATURES

Part Number:	ZICM357SP0	ZICM357SP2
Transmit Power:	+8 dBm	+20 dBm
Sensitivity:	-100 dBm	-103 dBm
RF link budget:	+108 dB	+123 dB
Temperature Range:	-40°C to +85°C	-40°C to +85 / +110°C



- Industry's premier ZigBee Pro stack: *EmberZNet PRO™*
- Supports Mesh, point-to-point, and point-to-multipoint networks
- Integrated PCB antenna
 - FCC, IC, and CE certifications
 - Optional RF port for external antenna
- Advanced Power Management
- Network Speed: 250 kbps
- 16 RF channels
- Mini footprint: **0.940" x 0.655"** (23.9mm x 16.6mm)
- Advanced Cortex-M3 processor
 - 192 kB Flash; 12 kB RAM
 - SPI Master / Slave, TWI, UART
 - Timers, Serial Wire / JTAG Interface
- 5-channel, 14-bit ADC
- 23 GPIO Pins

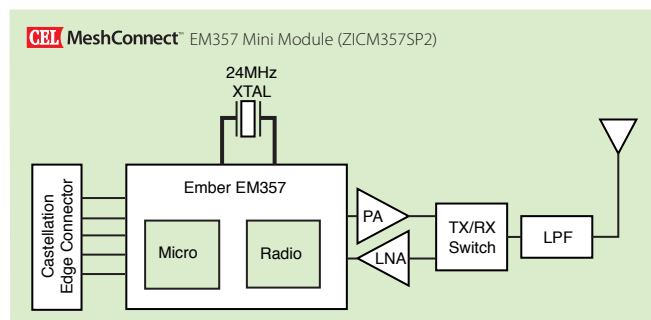
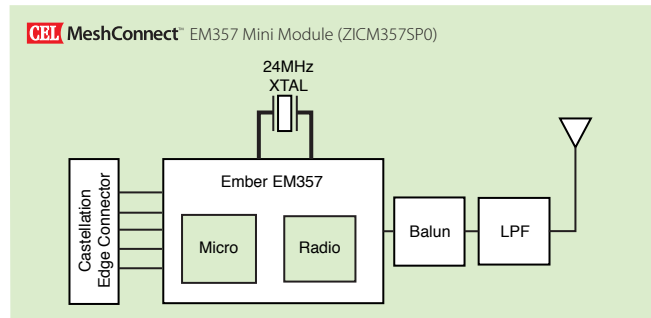
SPECIFICATIONS

- ▶ Frequency : 2405 to 2480 MHz
- ▶ Operating Voltage: 2.1 to 3.6 V
- ▶ Output Power : +8 dBm and +20 dBm
- ▶ Rx Sensitivity : -100 dBm and -103 dBm
- ▶ Power Consumption:
 - Transmit Mode: 44 mA @ +8 dBm
 - 150 mA @ +20 dBm
 - Receive Mode: 30 mA and 34 mA
 - Sleep Mode: 1 μA
- ▶ Operating Temperature:
 - 40°C to +85°C @ +8 dBm and +20 dBm
 - 40°C to +110°C @ +20 dBm
- ▶ AES Encryption
- ▶ RoHS Compliant
- ▶ Regulatory Certification: FCC /IC /CE

APPLICATIONS

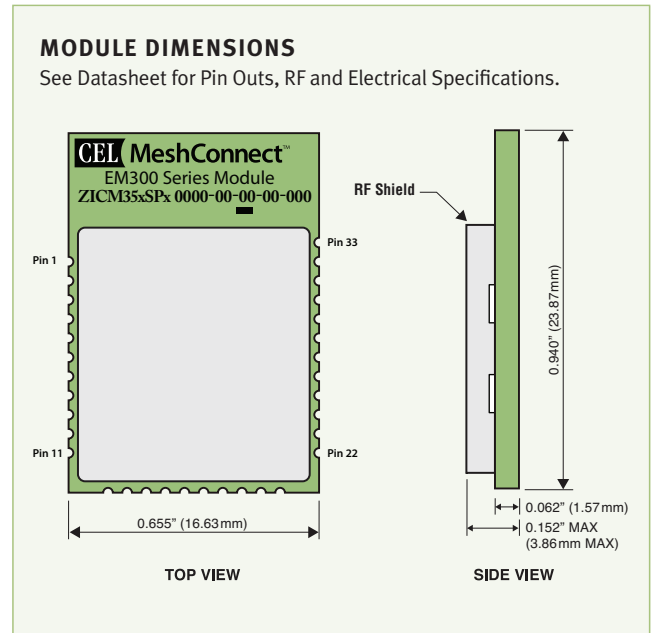
- ▶ Smart Energy / Grid Markets
 - Thermostats, In-Home-Display, Smart Plugs
- ▶ Home Automation and Control
 - Energy Management
 - Security Devices
 - HVAC Control
- ▶ Building Automation and Control
- ▶ Commercial and Residential Lighting
 - Fixtures and Control
- ▶ Solar Inverters and Control
- ▶ General ZigBee Wireless Sensor Networking

BLOCK DIAGRAMS *See Datasheet for more information.*



CEL MeshConnect™ EM357 Mini Module Product Family

MeshConnect™ EM357 Mini Modules (-40°C to +85°C)	
ZICM357SP0-1	+8 dBm Output Power, PCB Trace antenna
ZICM357SP0-1C	+8 dBm Output Power, with RF port castellation pin for external antenna
ZICM357SP2-1	+20 dBm Output Power, PCB Trace antenna
ZICM357SP2-1C	+20 dBm Output Power, with RF port castellation pin for external antenna
ZICM-EM35X-DEV-KIT-2	MeshConnect EM35x Ember Companion Kit for Ember EM35x Dev Kits
MeshConnect™ EM357 High Temp Mini Modules (-40°C to +110°C)	
ZICM357SP2-1-HT	High Temperature; +20 dBm Output power, PCB Trace antenna
ZICM357SP2-1C-HT	High Temperature; +20 dBm Output power, with U.FL Connector for external antenna



MeshConnect™ EM357 Mini Modules

DEVELOPMENT TOOLS

Ember Companion Kit:

CEL's MeshConnect EM35x Ember Companion Kit is designed to work with the Ember development kits [EM35X-DEV and EM35X-DEV-IAR]. Each module in this CEL kit is soldered on a carrier board making it pin-for-pin compatible with the Ember development board.

For more information regarding MeshConnect Development Tools, refer to the respective development tool user guide documents. (Available at CEL's website www.cel.com/MeshConnect)

EM35x EMBER COMPANION KIT



Kit Contents:

- ZICM357SP0-1 Modules (2)
- ZICM357SP0-1C Module (1)
- ZICM357SP2-1 Modules (2)
- ZICM357SP2-1C Module (1)
- Online Documentation