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 123dB), 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.

### FEATURES
- **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

### 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 +20dBm
  - -40°C to +110°C @ +20dBm
- **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**

California Eastern Laboratories
4590 Patrick Henry Drive
Santa Clara, CA 95054
408.919.2500
www.cel.com
## MeshConnect™ EM357 Mini Module Product Family

### MeshConnect™ EM357 Mini Modules (-40°C to +85°C)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZICM357SP0-1</td>
<td>+8 dBm Output Power, PCB Trace antenna</td>
</tr>
<tr>
<td>ZICM357SP0-1C</td>
<td>+8 dBm Output Power, with RF port castellation pin for external antenna</td>
</tr>
<tr>
<td>ZICM357SP2-1</td>
<td>+20 dBm Output Power, PCB Trace antenna</td>
</tr>
<tr>
<td>ZICM357SP2-1C</td>
<td>+20 dBm Output Power, with RF port castellation pin for external antenna</td>
</tr>
<tr>
<td>ZICM-EM35X-DEV-KIT-2</td>
<td>ZICM357SP2-1C</td>
</tr>
</tbody>
</table>

### MeshConnect™ EM357 High Temp Mini Modules (-40°C to +110°C)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZICM357SP2-1-HT</td>
<td>High Temperature; +20 dBm Output power, PCB Trace antenna</td>
</tr>
<tr>
<td>ZICM357SP2-1C-HT</td>
<td>High Temperature; +20 dBm Output power, with U.FL Connector for external antenna</td>
</tr>
</tbody>
</table>

### 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