The **MeshConnect EM357 USNAP Module** is designed to meet the physical dimensions as defined by the USNAP alliance/standard. The alliance was introduced to enable customer device ecosystems for the smart grid.

The **MeshConnect EM357 USNAP Module** leverages all key features and benefits of the industry leading MeshConnect EM357 Module.

The term USNAP is an acronym for Utility Smart Network Access Port, a simple, and cost effective solution that enables any HAN (Home Area Network) standard, present and future, to use any vendor’s Smart Meter as a gateway into the home, without adding additional hardware in the meter. By providing the industry with a protocol independent serial interface, it is possible to extend the Smart Grid directly to energy aware consumer products.

The **MeshConnect™ EM357 USNAP Module** (ZUSNAP357P2) is based on the Ember EM357 system on chip (SoC). The module includes a high performance Renesas power amplifier that increases power out to +20 dBm, making it one of the most powerful modules on the market. With its 120 dB link budget, the module provides range up to 2.5 miles, ensuring reliable transmission even in harsh environments and reducing the number of nodes needed in the network. The increased output power also provides better interior penetration from devices installed outside the home such as smart meters that need to connect to devices inside the home. The MeshConnect EM357 USNAP module also integrates 1 MB of flash memory which enables over-the-air programming updates in the field.

The **MeshConnect™ EM357 USNAP Module** is compliant with ZigBee Alliance specifications and IEEE 802.15.4, making it applicable for all ZigBee applications and profiles. The SoC consists of an RF transceiver with a baseband modem, a hardwired MAC and an embedded 32-bit ARM® Cortex™-M3 microcontroller with internal RAM (12kB) and flash (192kB) memory.

A complete development kit is available including evaluation boards, software tools, and cables which help engineering staff quickly develop their end product. Use the MeshConnect EM357 Module Kit (ZICM357P2-KIT1-1).

**FEATURES**
- Transmit Power: +20 dBm
- 1MB integrated Flash memory for over the air program updates
- Sensitivity: -100 dBm
- RF link budget: up to +120 dB
- Range: up to 2.5 miles (line of sight)
- Network Speed: 250Kbps
- 16 RF channels
- Inverted-F PCB antenna
- Advanced Power Management Scheme w/ Deep Sleep Mode
- Integrated MCU functionality:
  - 32-bit ARM® Cortex™-M3
  - 192KB Flash; 12KB RAM
  - SPI Master / Slave, TWI, UART
  - Timers, Serial Wire / JTAG Interface
  - 5-channel, 14-bit ADC
- Software support: EmberZNet PRO™ (ZigBee PRO)
- Mesh, point-to-point, and point-to-multipoint networks
- Small footprint: 41.021mm x 51.486 mm (1.615” x 2.027”)

**SPECIFICATIONS**
- Frequency: 2405 to 2480 MHz
- Operating Voltage: 2.7 to 3.6 V
- Output Power: +20 dBm
- Rx Sensitivity: –100 dBm
- Power Consumption:
  - Transmit Mode: 170 mA @ 20 dBm
  - Receive Mode: 28 mA
  - Sleep Mode: 6 µA
- Operating Temperature:
  - –40°C to +85°C
- AES encryption
- RoHS Compliant
- Regulatory Certification: FCC / IC / CE

**APPLICATIONS**
- Smart Energy / Grid Markets
  - Smart Meters
- Building automation and control
  - Thermostats
  - Displays
  - Energy Management
  - Security Devices
  - HVAC Control

**BLOCK DIAGRAM**
See Data Sheet for more information.
## MeshConnect™ EM357 USNAP Module

**Module Dimensions (inches)**

See Data Sheet for Pin Outs, RF and Electrical Specifications.

### PIN SIGNALS I/O CONFIGURATION

The USNAP module uses a standard 10-pin 2mm header according to the USNAP specification.

<table>
<thead>
<tr>
<th>USNAP Pin No.</th>
<th>USNAP Name</th>
<th>Ember EM357 IC Pin No.</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1</td>
<td>nSELECT</td>
<td>20</td>
<td>PB4</td>
</tr>
<tr>
<td>2</td>
<td>nATTENTION</td>
<td>36</td>
<td>PB0</td>
</tr>
<tr>
<td>3</td>
<td>SLCK</td>
<td>19</td>
<td>PB3</td>
</tr>
<tr>
<td>4</td>
<td>MOSI</td>
<td>31</td>
<td>PB2</td>
</tr>
<tr>
<td>5</td>
<td>MISO</td>
<td>30</td>
<td>PB1</td>
</tr>
<tr>
<td>6</td>
<td>nRESET</td>
<td>12</td>
<td>nRESET</td>
</tr>
<tr>
<td>7</td>
<td>POWER</td>
<td>16, 23, 28, 37</td>
<td>VCC</td>
</tr>
<tr>
<td>8</td>
<td>GROUND</td>
<td>49</td>
<td>GROUND</td>
</tr>
<tr>
<td>9</td>
<td>RESERVED</td>
<td>-</td>
<td>-</td>
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<td>10</td>
<td>RESERVED</td>
<td>42</td>
<td>PB6</td>
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### REFERENCES

<table>
<thead>
<tr>
<th>Document</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MeshConnect EM357 Data Sheet</td>
<td>The MeshConnect EM357 USNAP Module system-level functional descriptions and specification tables are identical to the MeshConnect EM357 datasheet.</td>
</tr>
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