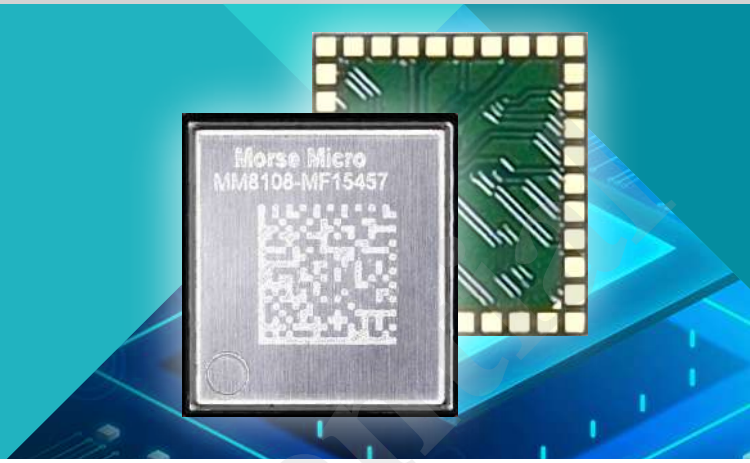
DATASHEET

IEEE 802.11ah Wireless Module

MM8108-MF15457



1. Description

Wi-Fi HaLow (pronounced “HEY-low”) is the first global Wi-Fi standard (IEEE 802.11ah) specifically designed to meet the needs of the Internet of Things (IoT). It’s an open standard wireless network technology operating in the sub-1 GHz license-exempt RF bands (850-950 MHz range), so it doesn’t incur ongoing monthly costs like cellular/mobile network connections. By operating in the sub-1 GHz range, this low-power wireless protocol can connect more IoT devices over much longer distances and with significantly lower power than traditional Wi-Fi.

AsiaRF, the world’s leading Wi-Fi HaLow solutions provider, offers several Wi-Fi HaLow connectivity solutions. The MM8108-MF15457 is a fully integrated Wi-Fi HaLow module with long range, low power consumption, and excellent RF performance, featuring our second-generation MM8108 Wi-Fi HaLow SoC. It is compliant with IEEE 802.11ah, supporting PHY rates up to 43.3 Mbps, and provides for operation in the sub-1 GHz license-exempt RF bands. The radio in the MM8108 supports programmable operation in these bands worldwide, spanning from 850 MHz to 950 MHz.

The MM8108’s integrated power amplifier (PA) offers world-leading transmit performance and energy efficiency with on-chip amplification of up to 26 dBm, which is ideal for low-cost devices. The ultra-high linearity integrated low-noise amplifier (LNA) offers exceptional receive sensitivity. These innovations, combined with digital transmit filtering and pre-distortion circuits, result in an advanced transceiver design that ensures out-of-the-box compatibility with all global Wi-Fi HaLow regulatory environments.

MM8108-MF15457 supports a USB 2.0 High-Speed host interface and an SDIO host interface, offering solution architects flexibility when integrating Wi-Fi HaLow connectivity into their existing solution.With a footprint of only 11 mm x 10 mm, the MM8108-MF15457 module has been designed to showcase the cost and size benefits of the higher level of integration of our second-generation SoC.

MM8108-MF15457 supports WPA3 and all standard security features required for Wi-Fi HaLow product certifications.

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For more detailed information, please contact our sales team: sales@asiarf.com / +886 2 2940 7880

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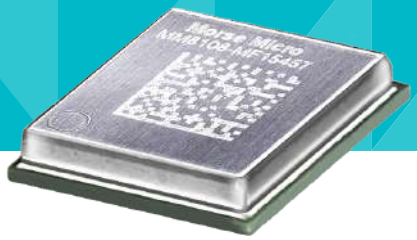

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2. Features

- Single-stream maximum PHY rate of 43.3 Mbps at 8 MHz bandwidth
- Radio supporting worldwide Sub-1 GHz frequency bands
  - Frequency range: 850-950 MHz
  - Channel bandwidth options of 1/2/4/8 MHz
  - High power and extremely high efficiency integrated PA with maximum 26 dBm (400 mW) output power at 45% PA efficiency and 37% SoC efficiency
  - Novel PA architecture maintains efficiency at power backoff
  - Low-power receiver with integrated LNA, NF < 4 dB
- 802.11ah OFDM PHY with Wi-Fi Alliance Wi-Fi HaLow certification
  - BPSK & QPSK, 16-QAM, 64-QAM and 256-QAM Modulation
  - Automatic frequency and gain control
  - Packet detection and channel equalization
  - Forward Error Correction (FEC) coding and decoding
  - Modulation and Coding Scheme (MCS) levels 0-10
  - 1 MHz duplicate mode
  - Optional traveling pilots
- 802.11ah MAC with Wi-Fi Alliance Wi-Fi HaLow certification
  - Support for Station (STA) and Access Point (AP) roles
  - Listen-Before-Talk (LBT) access with energy detection
  - 802.11 power save
  - 802.11 fragmentation and defragmentation
  - Power-Saving Target Wake Time (TWT) support for extended battery life
  - Automatic and manual MCS rate selection
- On-chip software stack assisting with host offload of Wi-Fi connection management
- USB 2.0 High-Speed compliant device interface
  - Integrated USB 2.0 PHY and device interface supporting High-Speed mode at 480 Mbps
- SDIO 2.0 compliant device interface
  - SDIO 2.0 High-Speed at 50 MHz max for 200 Mbps
  - Support for 1-bit and 4-bit data mode
- Power Management Unit (PMU) supporting various modes of operation
  - Single supply 3.0-3.6 V for integrated DC-DCs and LDOs
  - Multiple low-power modes (hibernate, deep sleep, snooze) support extreme power-constrained applications
- Broad spectrum of security features
  - Wi-Fi layer security, including Wi-Fi Protected Access version 3 (WPA3), Protected Management Frames (PMF), and Opportunistic Wireless Encryption (OWE)
  - Hardware support for Advanced Encryption Standard (AES) and Secure Hash Algorithm version 2 (SHA-2) functions (SHA-256, SHA-384, SHA-512)

3. Applications

- Surveillance cameras and sensors
- Cloud connectivity
- Low-power sensor networks
- Building automation systems
- Asset tracking and management
- Machine performance monitors and sensors
- Building access control and security
- Drone video and navigation communications
- Connected toys and games
- Rural internet access
- Agricultural networks
- Utility smart meter and intelligent grid
- Proximity sensors
- Industrial automation controls
- Smart home automation
- EV car chargers
- Appliances
- Construction site connectivity
- Smart signs and kiosks
- Retail point-of-sale terminals
- Vehicle-to-vehicle communications
- IP sensor networks
- Biometric IDs and keypads
- Warehouse connectivity
- Intelligent lighting controls
- BT/ZigBee™/Z-Wave™ to Wi-Fi HaLow gateways
- Wi-Fi to Wi-Fi HaLow bridges
- Wi-Fi HaLow client adapters/dongles
- Smart city networks

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