Shenzhen Liangming Technology LM80P2-0001AA Wireless Module User Manual

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Contents

Overview

The LM80 SoC features a fully integrated 2.4GHz radio transceiver and baseband processor for Wi-Fi 802.11b and Bluetooth® Smart applications. The SoC can be used as a standalone application-specific communication processor or as a wireless data link in hosted MCU systems where ultra-low power is critical. The OPL1000 supports flexible memory architecture for storing profiles, stacks and custom application codes, and can be updated using Over-The-Air (OTA)technology. Qualified Bluetooth Smart protocol stack and Wi-Fi TCP/IP stack are stored in a dedicated ROM. The OPL1000 is equipped with dual processors, ARM® Cortex®-M0 and M3, for handling different processes. All software runs on the ARM® Cortex®-M0 processor while more intensive application-specific activities run on the ARM® Cortex®-M3 processor. The OPL1000 can be connected to any external MCU through SPI, I2C or UART interfaces and sensors or other devices through GPIOs. The transceiver interfaces directly to the antenna and is fully compliant with the Wi-Fi 802.11b and Bluetooth 5.0 BLE standards. With integrated antenna switch, RF balun,power amplifier (PA) and low noise amplifier (LNA), the OPL1000 allows both Wi-Fi and Bluetooth Smart to minimize PCB design area and external component requirement.

FEATURES

The OPL1000 complies with ETSI EN 300 328 and EN 300 440 Class 2 (Europe), FCC CFR47 Part 15(US), and ARIB STD-T66 (Japan).

- Processors
- ARM® Cortex®-M3 Application Processor
- ARM® Cortex®-M0 Link Controller
- Wi-Fi
- 802.11b up to 11Mbps
- Supports STA mode
- WPA/WPA2 security supported
- Automatic beacon scanning and discovery
- Built-in TCP/IP stack
- Integrated dual power amplifiers: low (-2 dBm), high (+10 dBm)
- Bluetooth Smart
- Compliant with Bluetooth 5.0 BLE specifications with 2Mbps rate capability

- Slave mode support

- All GATT-based profiles supported

- Built-in BLE stack

- 0 to 10 dBm transmit output power

- 93 dBm receive sensitivity

- HW Crypto Engine

- AES-128/256 bits Encryption

- P-192/256 ECDH (Elliptic Curve Diffie-Hellman) Key Generation

- SHA2

- TRNG

- Power Management

- Integrated Buck DC-DC converter

- General purpose, capture and sleep timers

- FW OTA (Over-The-Air) update support

- Digital Interfaces

- General purpose I/Os: 24

- Two UARTs with hardware flow control up to 3Mbps

- Three SPI+™ interfaces

- One I2C bus at 100 kHz, 400 kHz

- Analog Interfaces

- 10-bit Auxiliary ADC inputs up to 16 channels

- Six GPIO pins with 16mA driving capability

- Six PWMs

- Radio Transceiver

- Fully integrated dual-mode 2.4 GHz CMOS transceiver

- Single wire antenna: no external matching and no external T/R switch required

- Package

- 48-pin QFN, 6 mm x 6 mm

Applications

- WiFi scale ·WiFi intelligent door loc

- Wearable devices or healthcare devices

- Industrial remote control and telemetry

- Traffic, underground positioning and alarm

- Automatic data acquisition system

- Wireless data transmission; banking system

- Building automation, security, wireless monitoring of computer room equipment, access control system

- Intelligent home and industrial control

FCC Modular Usage Statement

The requirement for KDB 996369 D03:

List of applicable FCC rules

FCC CFR Title 47 Part 15 Subpart C Section 15.247

Summarize the specific operational use conditions

The module has been certified for Fix, Mobile, Portable applications. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Limited module procedures

Not applicable

Trace antenna designs

Not applicable

RF exposure considerations

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

Antennas

This module contains three Antenna type. The details information list bellow.
PCB Antenna:1.2dBi
IPEX Antenna:1.5dBi
FPCB Antenna:-3.49dBi

Label and compliance information

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed andused in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio /TV technician for help. If the

FCC identification number is not visible when the module is installed inside another device,

then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AQJL-LM80P2 Or Contains FCC ID: 2AQJLLM80P2"

IC STATEMENT

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Information on test modes and additional testing requirements

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) list on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuity.

Additional testing, Part 15 Subpart B disclaimer

When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements.

Documents / Resources

User Manual *(document thumbnail)*	**Shenzhen Liangming Technology LM80P2-0001AA Wireless Module** [pdf] User Manual LM80P2, 2AQJL-LM80P2, 2AQJLLM80P2, LM80P2-0001AA, LM80S2-0001AA, LM80P2-0001 AA Wireless Module, LM80P2-0001AA, Wireless Module