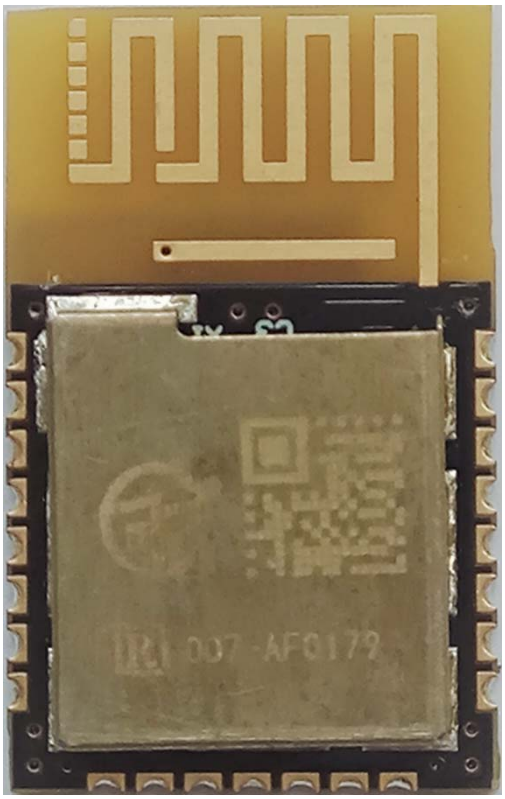
Bluetooth Module

SLEEP TRAINER Datasheet V1.0



P/N：SLEEP TRAINER

CONTENTS

KEY FEATURES

- Bluetooth 5 ready multi-protocol radio
- Bluetooth 5 datarate support 2Mbps, 1Mbps
- Supports Bluetooth 5 Advertising Extensions
- ARM® Cortex-M4 @ 64MHz
- 192kB flash and 24kB RAM
- Software stacks available as download
- Programmable output power +4dBm to -20dBm
- -96dBm sensitivity for Bluetooth low energy (1Mbps)
- -93dBm sensitivity for Bluetooth 5 (2Mbps)
- On-air compatible with nRF52, nRF51 and nRF24 SoCs
- Supply voltage range
- Programmable Peripheral Interconnect - PPI
- Full range of interfaces SPI/2-wire/UARTE
- High speed SPI 32MHz
- Easy DMA for all digital interfaces
- RAM mapped FIFO using Easy DMA
- 12 bit/200ksps ADC
- On-chip DC-DC buck converter
- Quadrature demodulator
- On-chip balun with 50Ω single-ended output

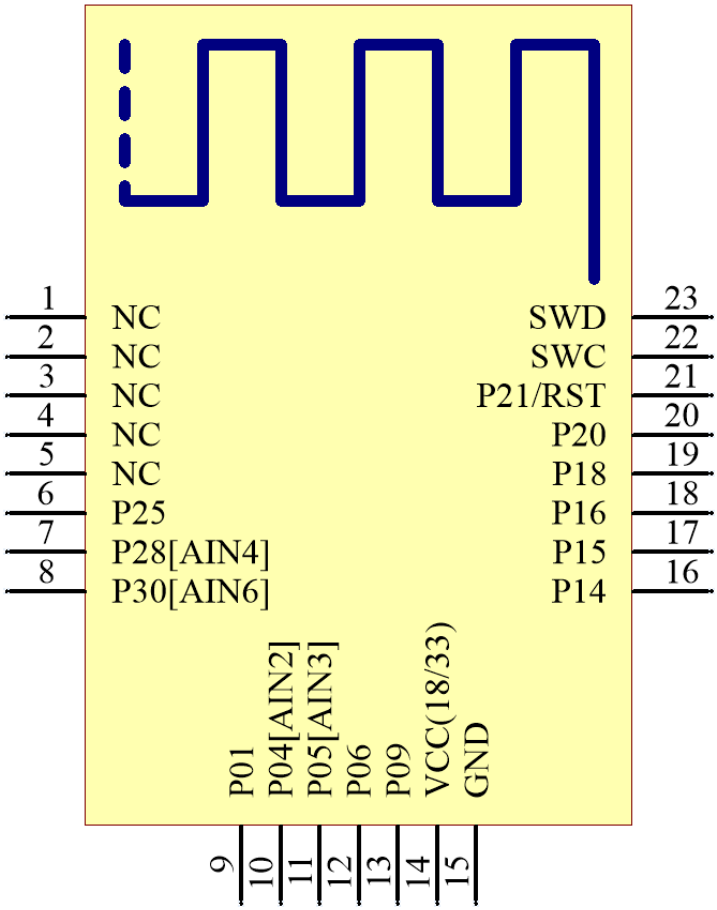
APPLICATIONS

- Network connectivity processor
- Smart RF remote controls
- PC peripherals
- Medical sensors
- Fitness sensors
- Toys
- Smart home sensors and actuators
- Logistics and tagging
- Airfuel wireless charging

SPECIFICATIONS

Frequency band	2.4GHz ISM (2.36000 – 2.4835GHz)
Protocol support	Bluetooth 5/ANT/2.4GHz proprietary
On-air data rate	2Mbps/1Mbps/250kbps
Output power	Programmable: +4 to -20dBm in 4dB steps
bandwidth	≤2MHz
Spurious emission limits	≤-30dBm
Sensitivity	Bluetooth 5: -93dBm at 2Mbps, -96dBm at
	1Mbps
	ANT: -92.5dBm at 1Mbps
	2.4GHz: -93dBm at 2Mbps, -96dBm at 1Mbs
Radio current	7.5mA TX at +4dBm output power,
consumption DC-DC	5.3mA – TX at 0dBm output power,
at 3V	5.4mA – RX at 1Mbs
Microcontroller	32-bit ARM Cortex-M4
Program memory	192kB Flash
RAM	24kB
Oscillators	32MHz crystal oscillator, 64MHz RC oscillator,
	32kHz crystal oscillator, 32kHz RC oscillator
System current	0.3mA no RAM retention, 1.4mA All peripher-
consumption	als in IDLE mode, 1.8μA All peripherals in IDLE
	mode with 32kHz XO and RTC running, 40nA per
	4kB RAM retention
Hardware security	128-bit AES ECB/CCM/AAR co-processor
GPIO	32 configurable
Digital I/O	3 x hardware SPI mater, 3 x hardware SPI slave,
	2 x 2 wire master, 2 x 2 wire slave, UARTE,
	Quadrature demodulator
Peripherals	12-bit/200ksps ADC, RNG, Temperature sensor,
	GP comparator
PPI	20-channel
Voltage regulator	LDO(1.7 to 3.6V), Buck DC-DC (1.7 to 3.6V)
Timers/counters	5 x 32-bit, 3 x 24-bit RTC

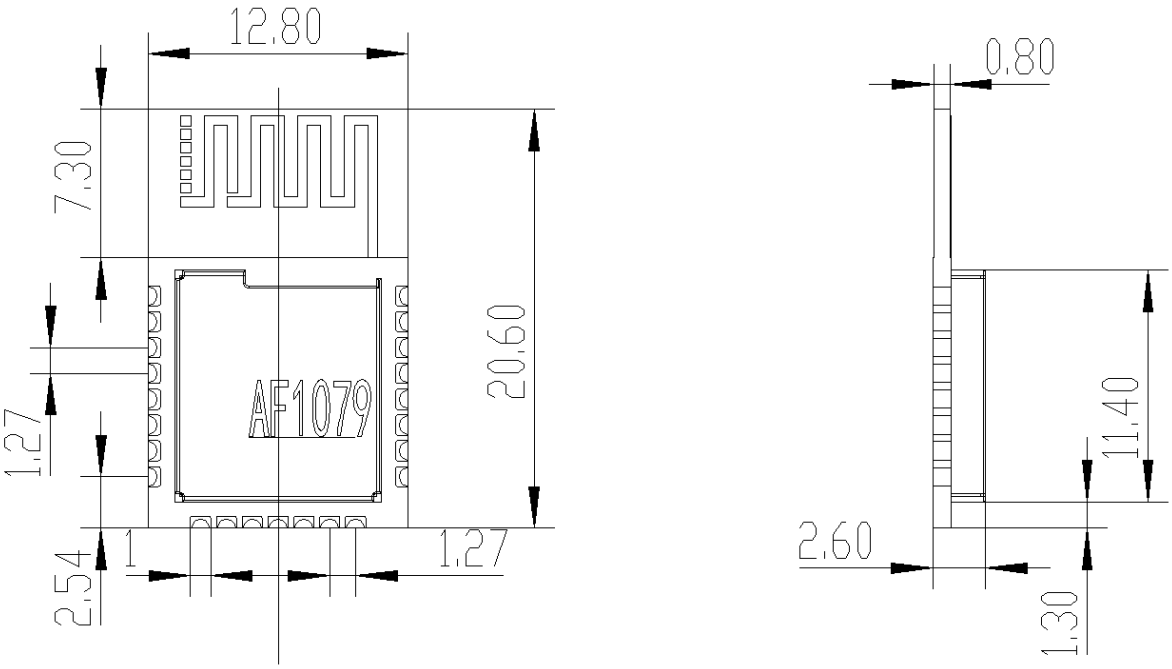
PIN ASSIGNMENTS



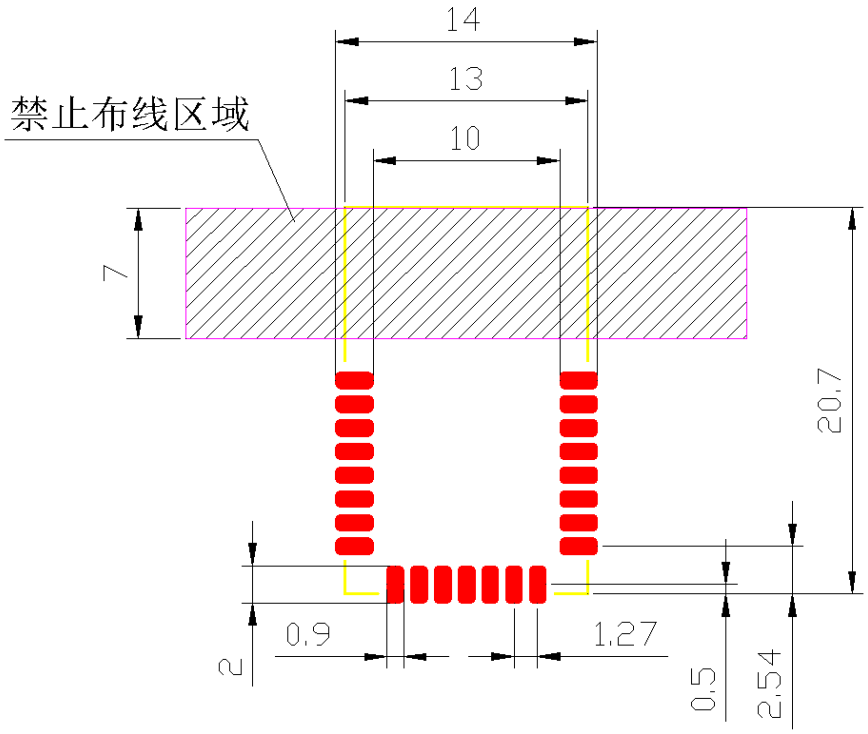
Pin	Name	Type	Description
1-5	NC		None
6	P25	Digital I/O	General purpose I/O
7	P28 AIN4	Digital I/O Analog input	General purpose I/O COMP input ,SAADC input
8	P30 AIN6	Digital I/O Analog input	General purpose I/O COMP input ,SAADC input
9	P01	Digital I/O	General purpose I/O
10	P04 AIN2	Digital I/O Analog input	General purpose I/O COMP input ,SAADC input
11	P05 AIN3	Digital I/O Analog input	General purpose I/O COMP input ,SAADC input
12	P06	Digital I/O	General purpose I/O
13	P09	Digital I/O	General purpose I/O
14	VCC	Power	Power supply(1.8V/3.3V)

15	GND	Power	Ground pad
16	P14	Digital I/O	General purpose I/O
17	P15	Digital I/O	General purpose I/O
18	P16	Digital I/O	General purpose I/O
19	P18	Digital I/O	General purpose I/O
20	P20	Digital I/O	General purpose I/O
21	P21 RST	Digital I/O	General purpose I/O Configurable as pin reset
22	SWC	Digital input	Serial wire debug clock input for debug and programming
23	SWD	Digital I/O	Serial wire debug I/O for debug and programming

PHYSICAL DIMENSIONS（unit:mm）



RECOMMENDED FOOTBIN



FCC statement

FCC Label: The FCC ID is on the front of the device. It is easily visible.

The device FCC ID is 2AUSK-882011.

A label with the following statements must be attached to the host end product:

This device contains FCC ID: 2AUSK-882011.

The manual provides guidance to the host manufacturer will be included in the documentation that will be provided to the OEM.

The module is limited to installation in mobile or fixed applications.

The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations.

The OEM integrators are responsible for ensuring that the end-user has no manual or instructions to remove or install module.

Module grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for ensuring compliance with the Part 15 Subpart B requirements.

The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with the Part 15 Subpart B requirements, the host manufacturer is required to show compliance with the Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions) with the Radio essential requirements. The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in the Part 15 Subpart B or emissions are complaint with the Radio aspects.

FCC RF Exposure Requirements

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter and must be installed to provide a separation distance of at least 20cm from all persons.

FCC Regulations

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.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other

antenna or transmitter.

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 and used 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.