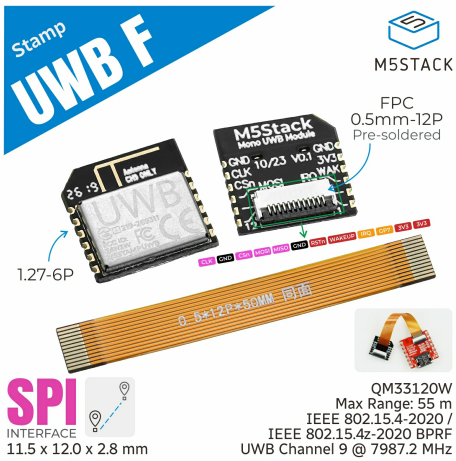
Stamp UWB F

SKU:S017-F























Description

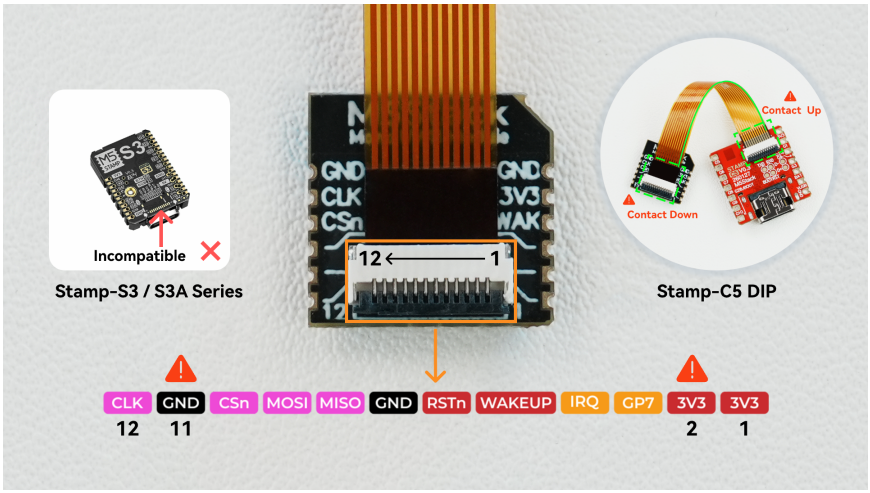
Stamp UWB F is an ultra-compact embedded UWB ranging module. **A 0.5mm-12P FPC connector is pre-soldered on the back of the module, allowing external connection through a 0.5mm-12P FPC cable**. It integrates the low-power QM33120W UWB transceiver, is compatible with IEEE 802.15.4-2020 and IEEE 802.15.4z-2020 BPRF, and operates on UWB Channel 9 with a center frequency of 7987.2 MHz. With its compact size and stable RF performance, the module supports TWR and TDoA positioning solutions for centimeter-level ranging and high-precision positioning. The current driver library supports both Single-Sided Two-Way Ranging (SS-TWR) and Double-Sided Two-Way Ranging (DS-TWR). It is suitable for indoor personnel positioning, cargo and asset tracking, proximity detection, robot navigation, and other applications.

Note

Wiring Instructions

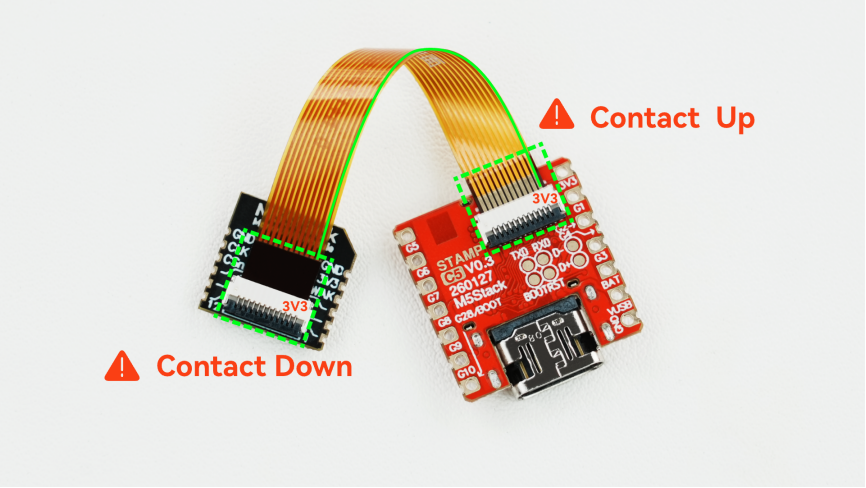
This module can be used with **Stamp-C5 DIP**. When connecting it, be sure to **distinguish the front and back of the FPC cable**. Do not insert it in reverse, as this will damage the device.

The FPC connector pinout of this Stamp UWB F module is incompatible with the FPC pinout on the back of Stamp-S3 / S3A. Direct connection is strictly prohibited, as it may cause permanent damage to the device.



FPC Cable Instructions

The illustration below uses the FPC cable supplied with Stamp UWB F. If you replace it with a third-party cable, **carefully verify the cable pinout and contact orientation**. An incorrect pinout or orientation will damage the hardware.



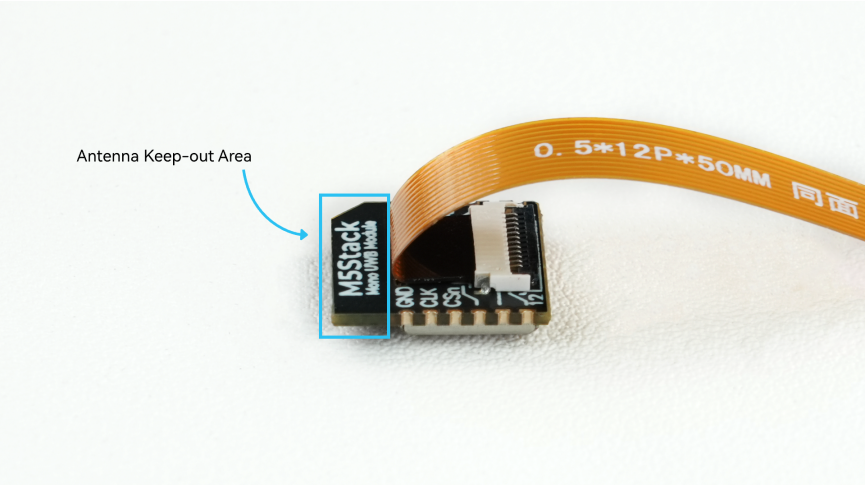
Power Supply

To ensure communication quality, power Stamp UWB F using a high-PSRR LDO or a power supply with ripple within 12mVpp.

PCB Antenna Clearance

When designing the complete device, pay attention to the impact of the FPC cable and its connector on the module antenna performance. The FPC cable must not pass beneath the module's PCB antenna or through the antenna clearance area, as this may alter the antenna impedance and radiation characteristics, degrade RF performance, and introduce ranging errors. Route the FPC cable outside the antenna area and perform actual testing after assembly to ensure the product's communication range and ranging accuracy meet the design requirements.

For improved RF performance, the SMT version of Stamp UWB is recommended.



Features

- Integrated QM33120W UWB transceiver with enhanced secure Time-of-Flight mode and integrated AES-256
- Supports UWB Channel 9
- Supports IEEE 802.15.4-2020 / IEEE 802.15.4z-2020 BPRF
- Supports TWR and TDoA positioning solutions
- Supports 850 kbps / 6.81 Mbps wireless communication data rates
- SPI communication interface
- Supports 0.5mm-12P FPC connection

Includes

- 1 x Stamp UWB F
- 1 x 0.5mm-12P FPC Cable

Applications

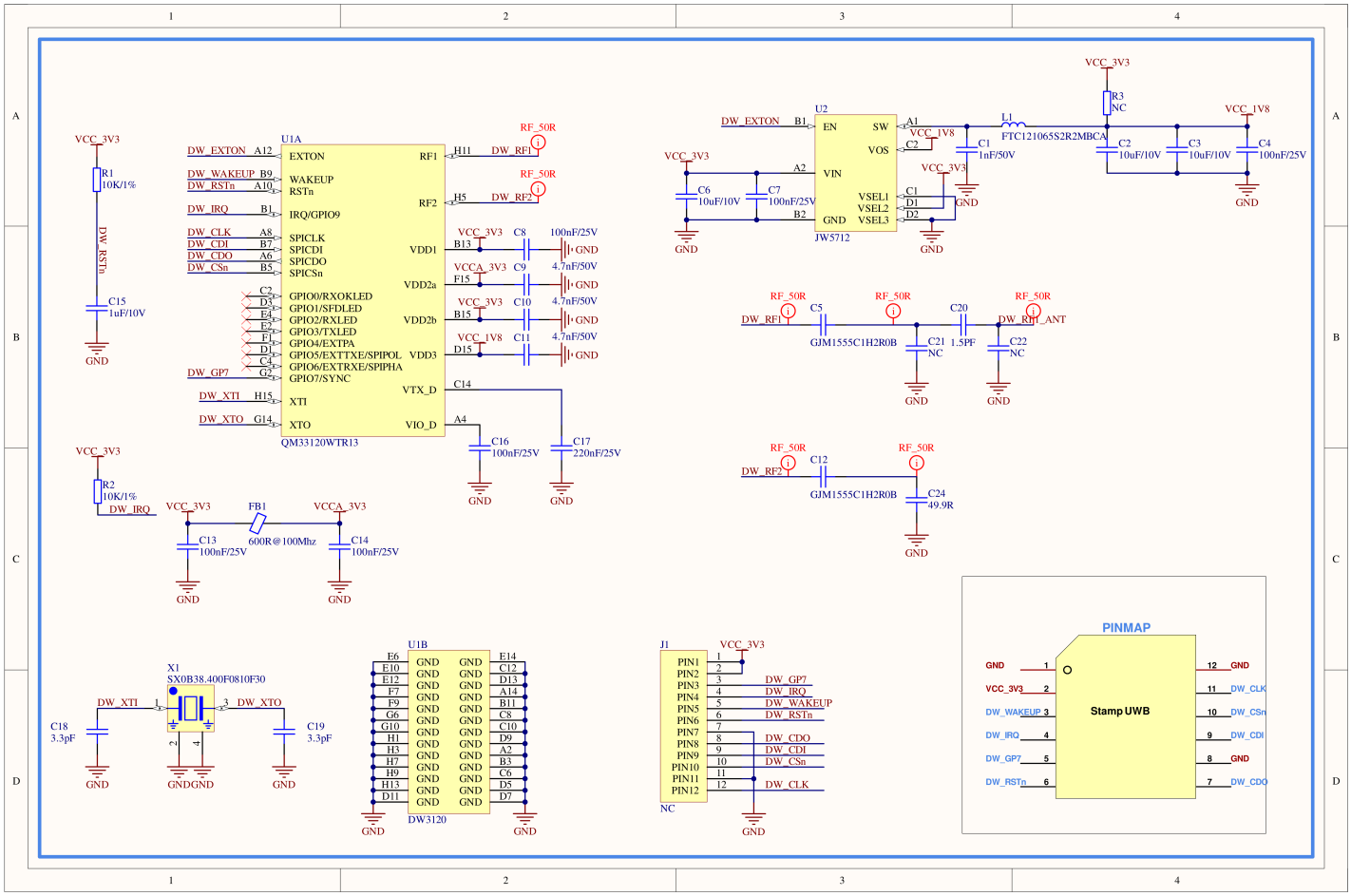
- Indoor personnel positioning
- Cargo and asset tracking
- Proximity detection
- Robot navigation

Specifications

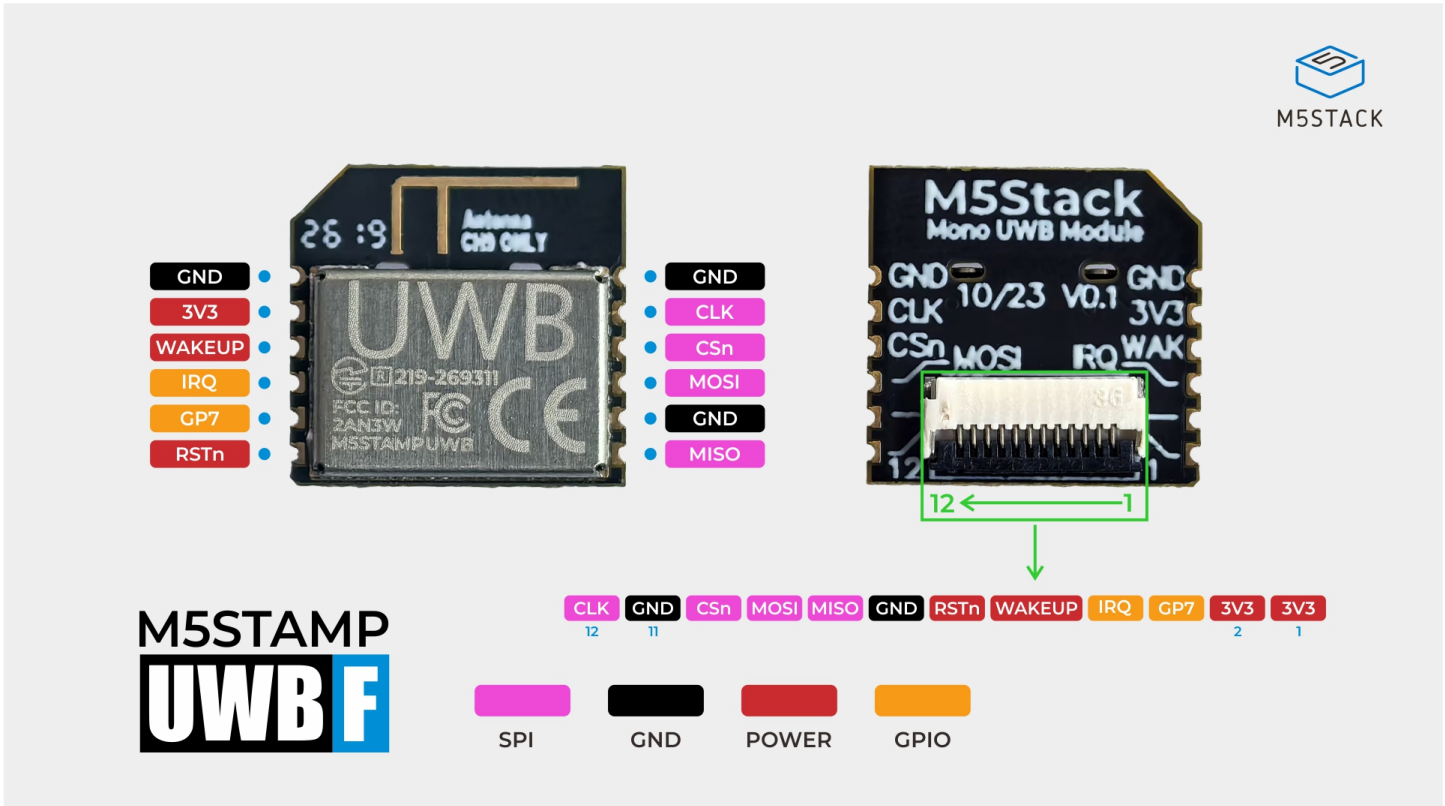
Specification	Parameter
UWB Chip	QM33120W
UWB Frequency Range	8GHz (7987.2 MHz) **Channel 9: 7987.2 MHz** Low frequency: 7737.6 MHz Mid frequency: 7987.2 MHz High frequency: 8236.8 MHz Bandwidth: 499.2 MHz
UWB Communication Interface	SPI
Supported Standards	IEEE 802.15.4-2020 / IEEE 802.15.4z-2020 BPRF
Wireless Communication Data Rate	850 kbps / 6.81 Mbps
Ranging Function	Supports SS-TWR / DS-TWR ranging
Maximum Communication Distance	55m (when facing directly)
Positioning Function	Supports TWR and TDoA positioning solutions
Measurement Error	DS-TWR: approximately 0.14m
Rear Expansion Interface	FPC 0.5mm-12P
Sleep Power Consumption	DC 3.3V@75.9uA
Operating Power Consumption	As base station: DC 3.3V@5.23mA As slave: DC 3.3V@58.0mA
Product Size	11.5 x 12.0 x 2.8mm
Product Weight	0.6g
Package Size	138.0 x 93.0 x 17.0mm
Gross Weight	4.8g

Schematics

- Stamp UWB F Schematics PDF

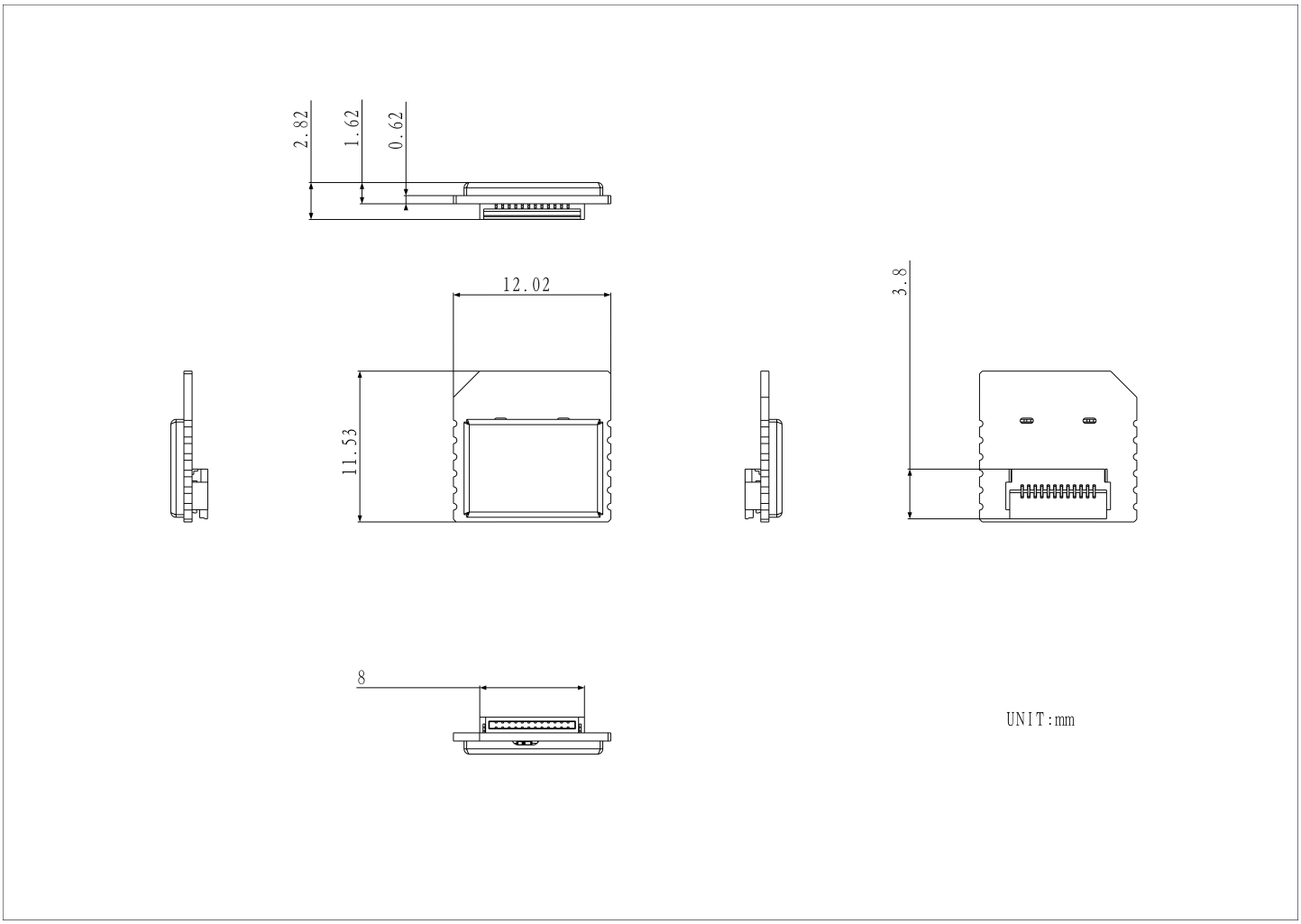

VCC_3V3
R1
10K/1%
DW_RSTn
C15
1uF/10V
GND
U1A
DW_EXTON A12
DW_WAKEUP B9
DW_RSTn A10
DW_IRQ B1
DW_CLK A8
DW_CDI B7
DW_CDO A6
DW_CSn B5
DW_GP7 G2
DW_XTI H15
DW_XTO G14
EXTON
WAKEUP
RSTn
IRQ/GPIO9
SPICLK
SPICDI
SPICDO
SPICSn
GPIO0/RXOKLED
GPIO1/SFDLED
GPIO2/RXLED
GPIO3/TXLED
GPIO4/EXTPA
GPIO5/EXTTXE/SPIPOL
GPIO6/EXTRXE/SPIPHA
GPIO7/SYNC
XTI
XTO
RF1
RF2
VDD1
VDD2a
VDD2b
VDD3
VTX_D
VIO_D
QM33120WTR13
RF_50R
DW_RF1
DW_RF2
H11
H5
VCC_3V3
VCCA_3V3
VCC_1V8
C8 100nF/25V
C9 4.7nF/50V
C10 4.7nF/50V
C11 4.7nF/50V
C14
C16 100nF/25V
C17 220nF/25V
R2
10K/1%
FB1
600R@100Mhz
C13 100nF/25V
C14 100nF/25V
X1
SX0B38.400F0810F30
C18 3.3pF
C19 3.3pF
U1B
DW3120
U2
DW_EXTON
EN
SW
VOS
VIN
VSEL1
VSEL2
VSEL3
GND
JW5712
L1
FTC121065S2R2MBCA
R3
NC
C1 1nF/50V
C2 10uF/10V
C3 10uF/10V
C4 100nF/25V
C6 10uF/10V
C7 100nF/25V
D1
D2
C5
GJM1555C1H2R0B
C20
C21 NC
1.5PF
C22 NC
DW_RF_ANT
C12
C24 49.9R
J1
NC
DW_GP7
DW_IRQ
DW_WAKEUP
DW_RSTn
DW_CDO
DW_CDI
DW_CSn
DW_CLK
PINMAP
Stamp UWB
DW_CLK
DW_CSn
DW_CDI
DW_CDO

PinMap


M5STACK
GND
3V3
WAKEUP
IRQ
GP7
RSTn
CLK
CSn
MOSI
MISO
M5Stack
Mono UWB Module
12
1
CLK GND CSn MOSI MISO GND RSTn WAKEUP IRQ GP7 3V3 3V3
M5STAMP
UWB F
SPI
GND
POWER
GPIO

Model Size

- Stamp UWB F Model Size PDF



PCB

- Stamp UWB PcbDoc
- Stamp UWB KiCad Footprint Library

Structure

- Stamp UWB KiCad 3D

Datasheets

- QM33120W Datasheet
- QM33120W Product Brief

Softwares

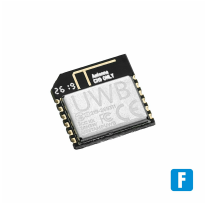
Arduino

- Stamp UWB F Arduino Tutorial

- Stamp UWB F Driver Library

Video

Product Comparison

Product Comparison		
	Stamp UWB F	Stamp UWB
0.5mm-12P FPC Connector Soldered by Default	✅	❌
Comes with 0.5mm-12P FPC cable as standard	✅	❌