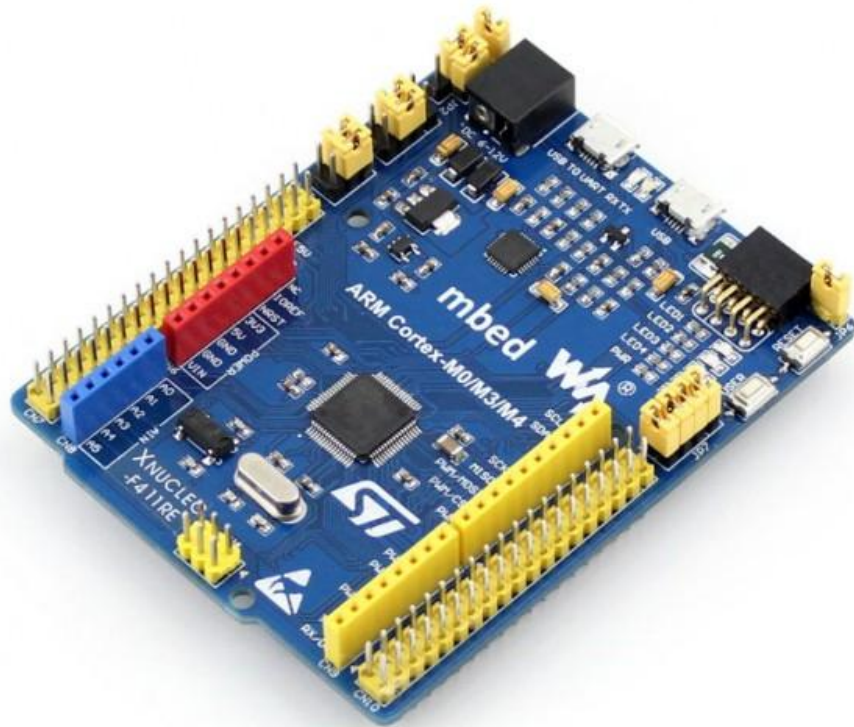


XNUCLEO-F411RE, Improved STM32 NUCLEO Board



STM32 Development Board, Supports Arduino, Compatible with NUCLEO-F411RE

XNUCLEO-F411RE Features

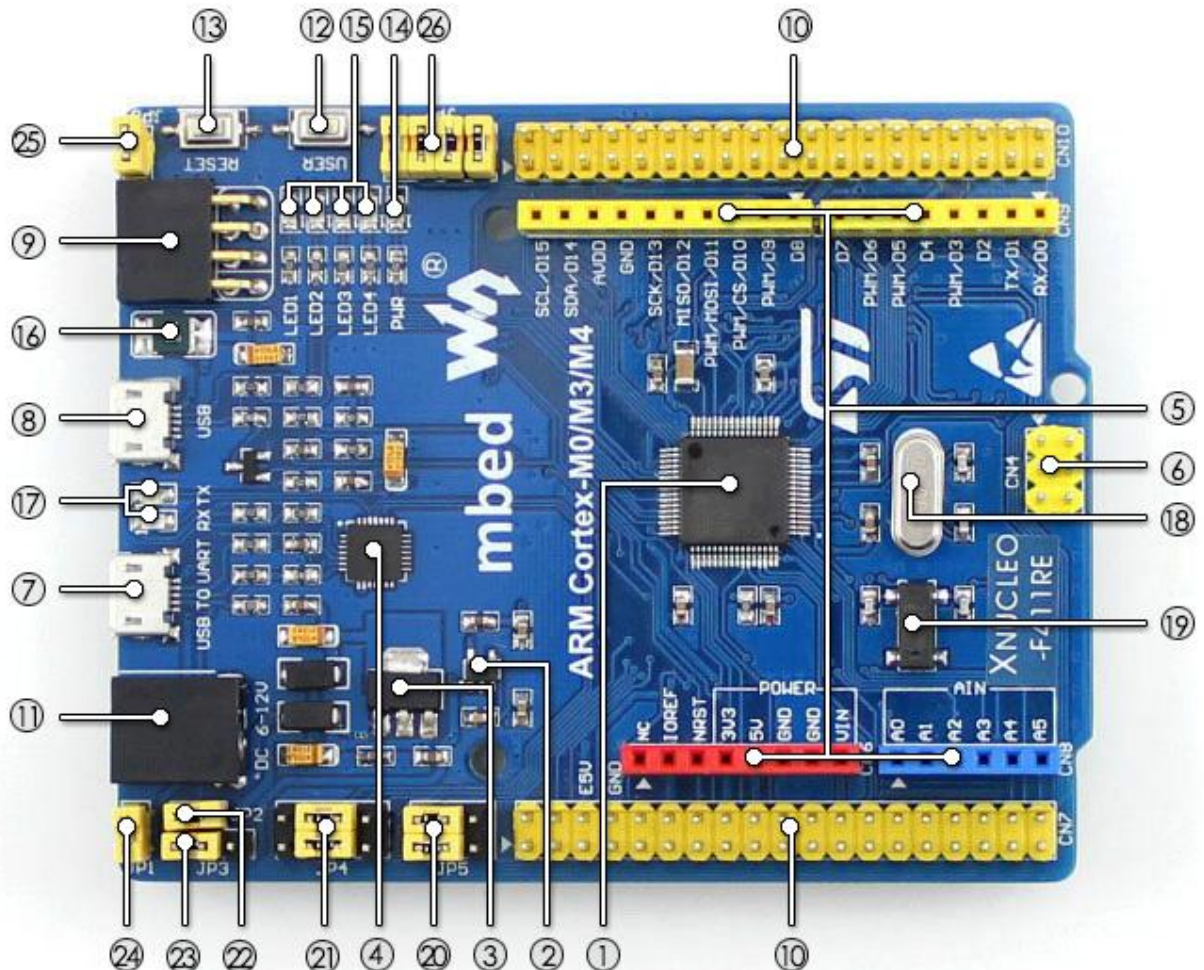
- Compatible with NUCLEO-F411RE, onboard Cortex-M4 microcontroller STM32F411RET6
- Arduino connectivity support, easy to connect with various Arduino shields and access the massive Arduino resources
- ST Morpho headers provide full access to all STM32 I/Os, easy for peripheral expansion
- Supports mbed, build prototype quickly by mbed SDK and online tools
- Comprehensive free software HAL library including a variety of software examples
- Comes with a separated ST-LINK/V2 module

Advantages

Compare	XNUCLEO	NUCLEO	Remarks
Arduino compatibility	UNO, Leonardo	UNO	XNUCLEO can be configured by jumper to compatible with UNO (default) or Leonardo
Arduino ICSP interface	Yes	None	ICSP is required by certain kinds of shields
USB connectivity	Yes	None	The USB connector of NUCLEO is for debugging ONLY, not available for USB connection
USB connector	Micro USB	Mini USB	Micro USB is the advanced USB standard
Morpho headers mark	Most	None	Now you can check the PCB mark instead of datasheet
Common interfaces are connected via	Jumpers	0Ω resistors	Jumpers are much easier to use, need no soldering
UART debugging	Available while in-circuit debugging	Not available while in-circuit debugging	The NUCLEO integrated ST-LINK/V2 functional chip can be simulated as serial port, however, it's not available while in-circuit debugging, whereas XNUCLEO features a stand-alone USB TO UART chip.
8MHz crystal	Yes	None	Timer is more accurate when using external 8MHz crystal
32.768KHz crystal	Yes	None	Required for RTC
USB fuse	Yes (500mA)	None	The computer USB interface might be harmed without fuse
LEDs	4	1	The more LEDs, the easier to monitor program running status
UART indicator	Yes	None	Data communication is visible now
DC input	Yes	None	A convenience
Button position	Close to PCB edge	Close to Arduino connector	The button won't be untouchable when connecting with an Arduino shield if it were close to the PCB edge
ST-LINK	Separated	Integrated	ST-LINK can be used anywhere else

Comes with USB cable	Yes	None	
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What's on the XNUCLEO-F411RE



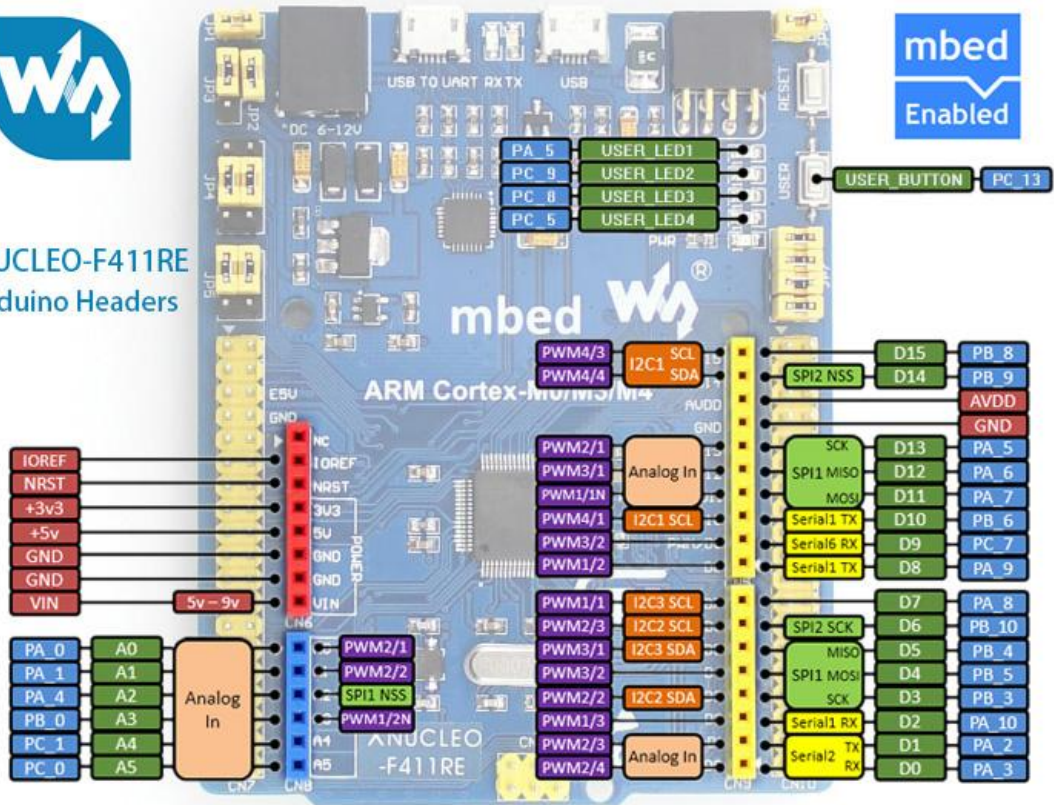
1. STM32F411RET6
 - Core : ARM® 32-bit Cortex™-M4
 - Operating frequency : 100MHz
 - Operating voltage : 1.7V-3.6V
 - Package : LQFP64
 - Memories : 512kB Flash, 128kB SRAM
 - Interfaces : 1 x SDIO, 1 x USB 2.0 FS, 5 x SPI or 5 x I2S, 3 x USART, 3 x I2C
 - AD/DA : 1 x AD (12 bit, 16 channels)
2. SPX3819M5 : 3.3V voltage regulator
3. AMS1117-5.0 : 5.0V voltage regulator
4. CP2102 : USB to UART convertor
5. Arduino connector : for connecting Arduino shields
6. ICSP interface : Arduino ICSP
7. USB TO UART : for debugging
8. USB connector : USB communication interface
9. SWD interface : for programming and debugging
10. ST Morpho headers : access to VCC, GND and all the I/Os, easy for expansion

11. 6-12V DC input
12. User button
13. Reset button
14. Power indicator
15. User LED
16. 500mA fast self-recovery fuse
17. Serial port Rx/Tx indicator
18. 8MHz crystal
19. 32.768KHz crystal
20. ADC/I2C selection jumper
 - short A and B : Arduino A4, A5 is used as I2C
 - short B and C : Arduino A4, A5 is used as ADC
21. UART selection jumper
22. MCU current test jumper : for low power tests
23. Power selection jumper
 - short 5V and U5V : powered from USB connection
 - short 5V and E5V : powered from external power supply
24. USB enable jumper
 - short the jumper to enable
 - open the jumper to disable
25. User button jumper
 - short the jumper to connect to I/Os used in example code
 - open the jumper to connect to other custom pins via jumper wires
26. User LED jumper
 - short the jumper to connect to I/Os used in example code
 - open the jumper to connect to other custom pins via jumper wires

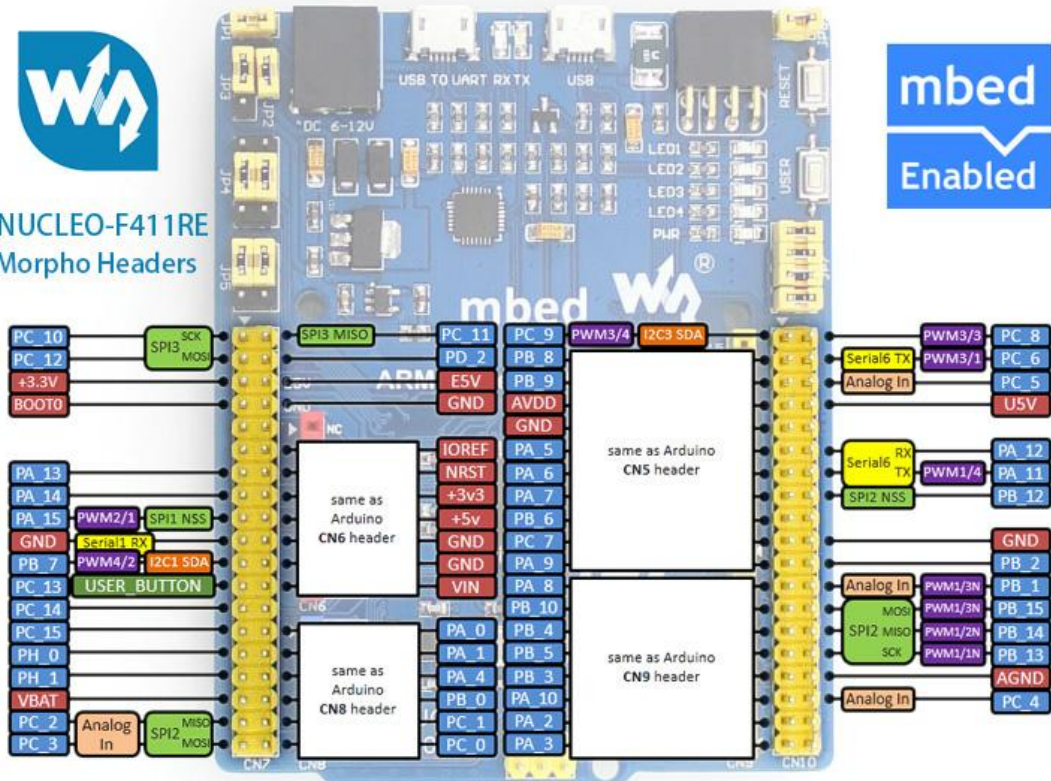
XNUCLEO-F411RE Expansion Headers



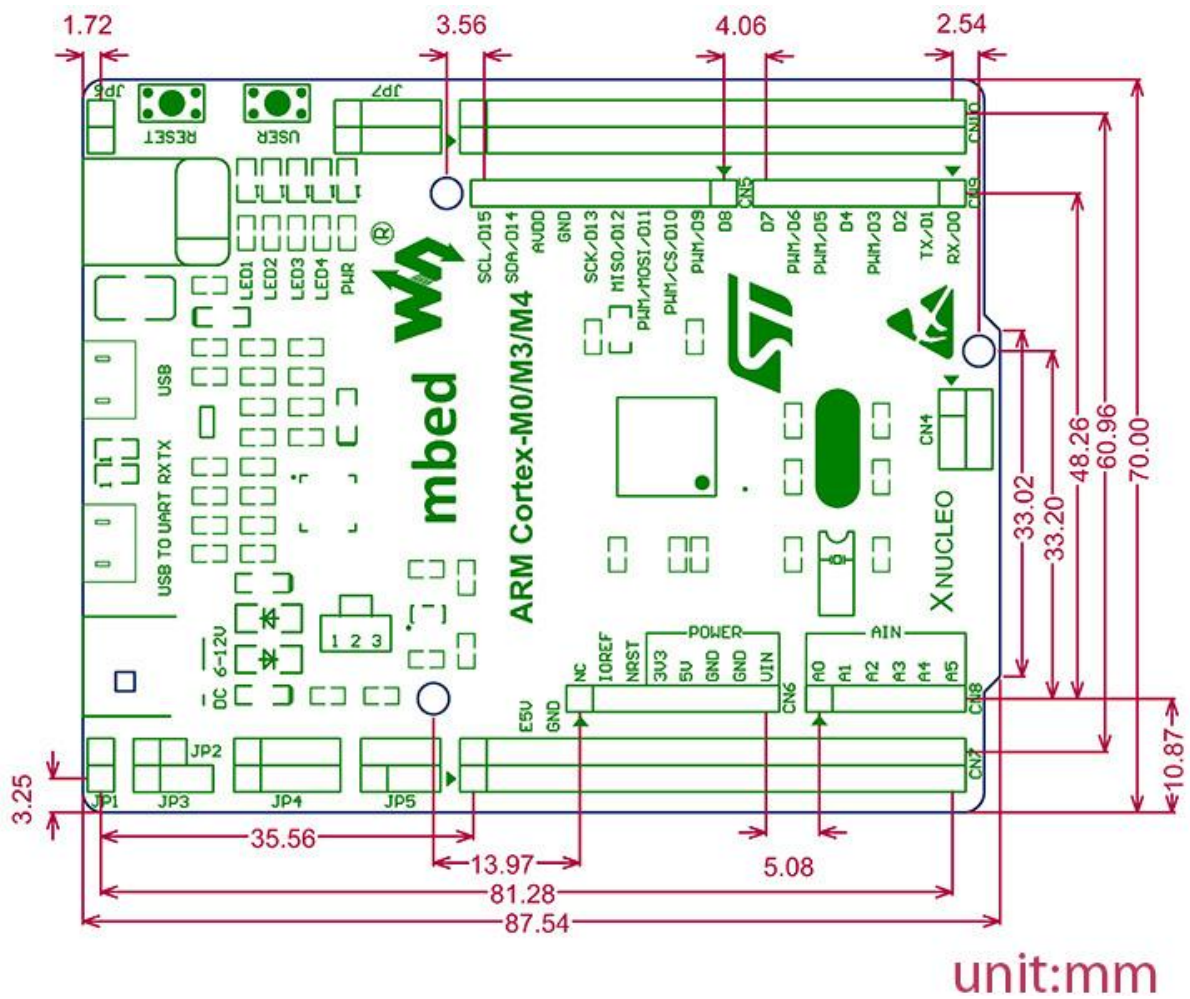
XNUCLEO-F411RE
Arduino Headers



XNUCLEO-F411RE
Morpho Headers



XNUCLEO-F411RE Dimension



Development Resources

Wiki : www.waveshare.com/wiki/XNUCLEO-F411RE