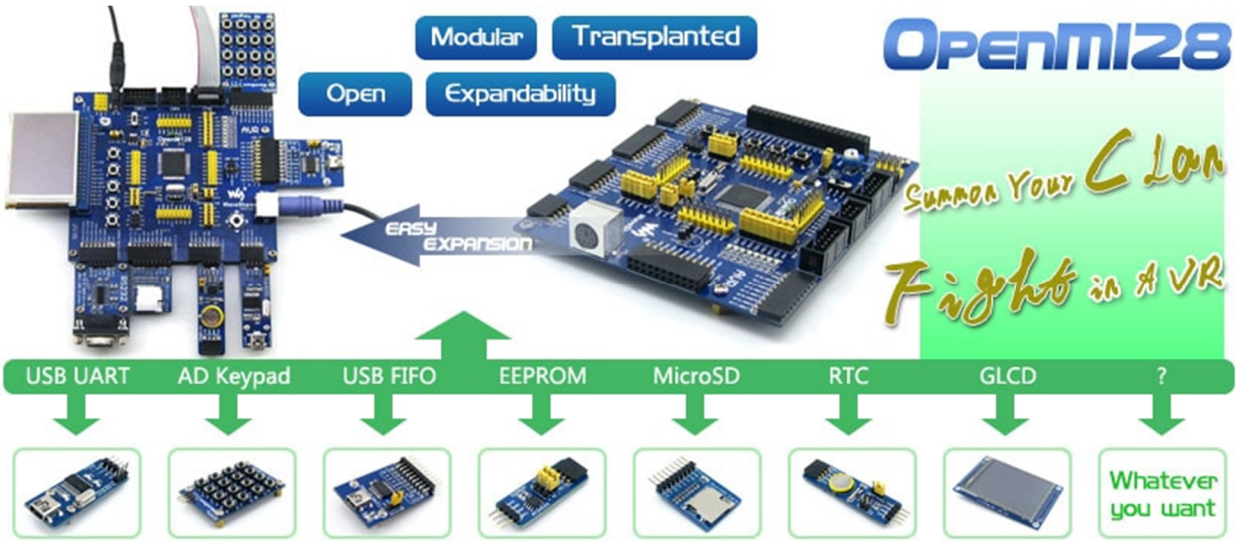
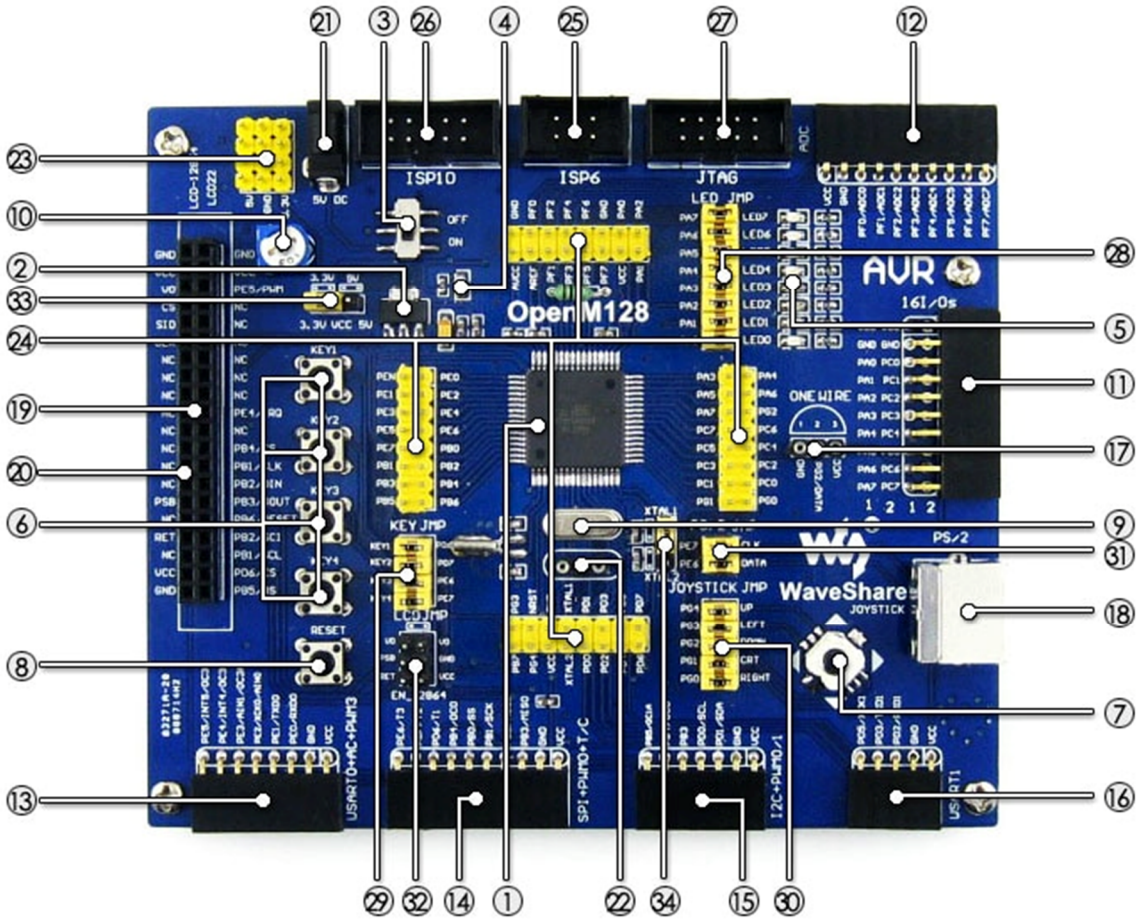



## Overview

OpenM128 is an AVR development board that features a ATmega128 device as the microcontroller. It supports further expansion with various optional accessory boards for specific application. The modular and open design makes it the ideal for starting application development with AVR microcontroller.

## What's On Board



1. **ATmega128A-AU:** the high performance AVR MCU which features:
    - **Core:** AVR 8-bit RISC
    - **Operating Frequency:** 16MHz Max
    - **Operating Voltage:** 2.7-5.5V
    - **Package:** TQFP64
    - **I/Os:** 53
    - **Memories:** 128kB Flash, 4kB SRAM, 4kB EEPROM
    - **Communication Interfaces:** 1 x SPI, 1 x TWI (I2C), 2 x USART, 8 x PWM, 8 x ADC
    - **Debugging/Programming:** JTAG/ISP
2. **AMS1117-3.3:** 3.3V voltage regulator
3. **Power switch**
4. **Power indicator**
5. **LEDs:** convenient for indicating I/O status and/or program running state
6. **User keys:** for I/O input test and/or program control
7. **Joystick:** five positions
8. **Reset button**
9. **Crystal oscillator:** 7.3728M & 32.768K
10. **Adjustable resistor:** for LCD12864 contrast adjustment
11. **16 I/Os interface:** for connecting accessory boards which using I/O control, such as FT245 USB FIFO, 8 SEG LED, etc.
12. **8 I/Os interface | 8-bit AD interface**
    - for connecting accessory boards which using I/O control, such as 8 Push Buttons, Motor, etc.
    - there's also 8-bit AD interface can be used for AD testing
13. **6 I/Os interface | USART0+AC+PWM3 interface**
    - for connecting USART peripherals, such as RS232, RS485, USB TO UART, etc.
    - for connecting accessory boards which using PWM interface, also supports analog comparison through AC interface
14. **SPI+PWM0+T/C interface**
    - for connecting SPI peripherals, such as DataFlash (AT45DBxx), SD card, MP3, etc.
      *the SPI interface includes additional I/O pins (PWM, T/C as regular I/O) which can be used as controlling pins*
    - for connecting accessory boards which using PWM interface, also supports frequency calculation through T/C interface
15. **I2C+PWM0/1 interface**
    - for connecting I2C peripherals, such as I/O expander (PCF8574), EEPROM (AT24Cxx), etc.
      *the I2C interface includes additional I/O pins (PWM as regular I/O) which can be used as controlling pins*
    - for connecting accessory boards which using PWM interface
16. **USART1 interface:** for connecting USART peripherals, such as RS232, RS485, USB TO UART, etc.
17. **1-WIRE interface:** for connecting 1-WIRE devices (TO-92 package), such as temperature sensor (DS18B20), electronic registration number (DS2401), etc.
18. **PS/2 interface:** for connecting PS/2 keyboard and/or mouse
19. **Graphic multi-color LCD interface:** for connecting 2.2 inch multi-color touch screen LCD which using SPI control
20. **Graphic dot matrix LCD interface:** for connecting dot matrix LCD, such as LCD12864 (3.3V blue backlight)
21. **5V DC jack**
22. **Custom crystal socket**
23. **VCC power input/output:** usually used for power supply output, and/or common ground with other application board
24. **MCU pins connector:** all the MCU pins are accessible on expansion connectors for further expansion
25. **ISP6 interface:** for programming

26. **ISP10 interface:** for programming
27. **JTAG interface:** for programming/debugging
28. **LEDs jumper**
29. **User keys jumper**
30. **Joystick jumper**
31. **PS/2 jumper**
32. **LCD selection jumper**
    - short the jumper to use dot matrix LCD
    - open the jumper to use multi-color LCD
33. **VCC selection jumper**
34. **Crystal selection jumper**

**For jumper 28-31:**

- short the jumper to connect to I/Os used in example code;
- open the jumper to connect to other custom pins via jumper wires.

Note: The OpenM128 does NOT integrate any debugging function, a debugger is required.

## Debugging/Programming Interfaces

The figures below show the header pinouts of JTAG, ISP10, ISP6 interface

**Figure 1.** 10-pin JTAG header pinout

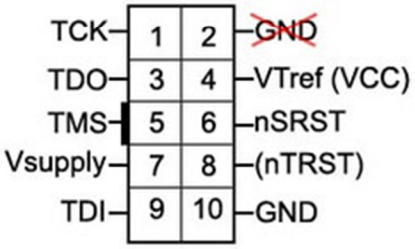



**Figure 2.** 10-pin ISP header pinout

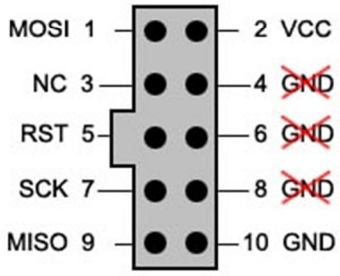
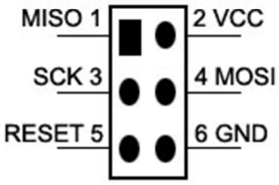



**Figure 3.** 6-pin ISP header pinout




## Development Resources

- Related Software (AVR Studio4, etc.)
- Demo Code (GCC AVR examples)
- Schematic (PDF)
- AVR Development Documentations (Datasheets etc.)

## Standard Package

1. OpenM128 development board x 1
2. 4-pin wire x 2
3. 2-pin wire x 2
4. USB power cable x 1

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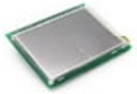
## Accessory Boards Package

1. PL2303 USB UART Board (mini) x 1
2. 2.2inch 320x240 Touch LCD (A) x 1
3. AD Keypad (for testing embedded ADC) x 1
4. FT245 USB FIFO Board (mini) (16 I/Os) x 1
5. AT45DBXX DataFlash Board (SPI) x 1
6. PCF8563 RTC Board (I2C) x 1
7. NRF24L01 RF Board (B) (SPI) 2pcs x 1
8. DS18B20 (ONE WIRE) x 1
9. LCD12864 (3.3V Blue Backlight) (SPI) x 1
10. 8 SEG LED Board (16 I/Os) x 1
11. 8 Push Buttons (8 I/Os) x 1
12. USB type A plug to mini-B plug cable x 1

1 

2 

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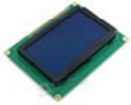
9 

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