# Core746I, STM32 MCU core board

Overview

Core746I is an STM32 MCU core board designed for **STM32F746IGT6**, supports further expansion. It is ideal for starting application development with STM32F family.

- Minimal ready-to-run system, integrates clock circuit, USB power management, USB connector, etc.
- Onboard 64M Bit SDRAM
- All the I/O ports are accessible on the pin headers
- JTAG/SWD programming/debugging interface
- **2.0mm** header pitch, allowed to be plugged-in your application board

What's on the Core746I
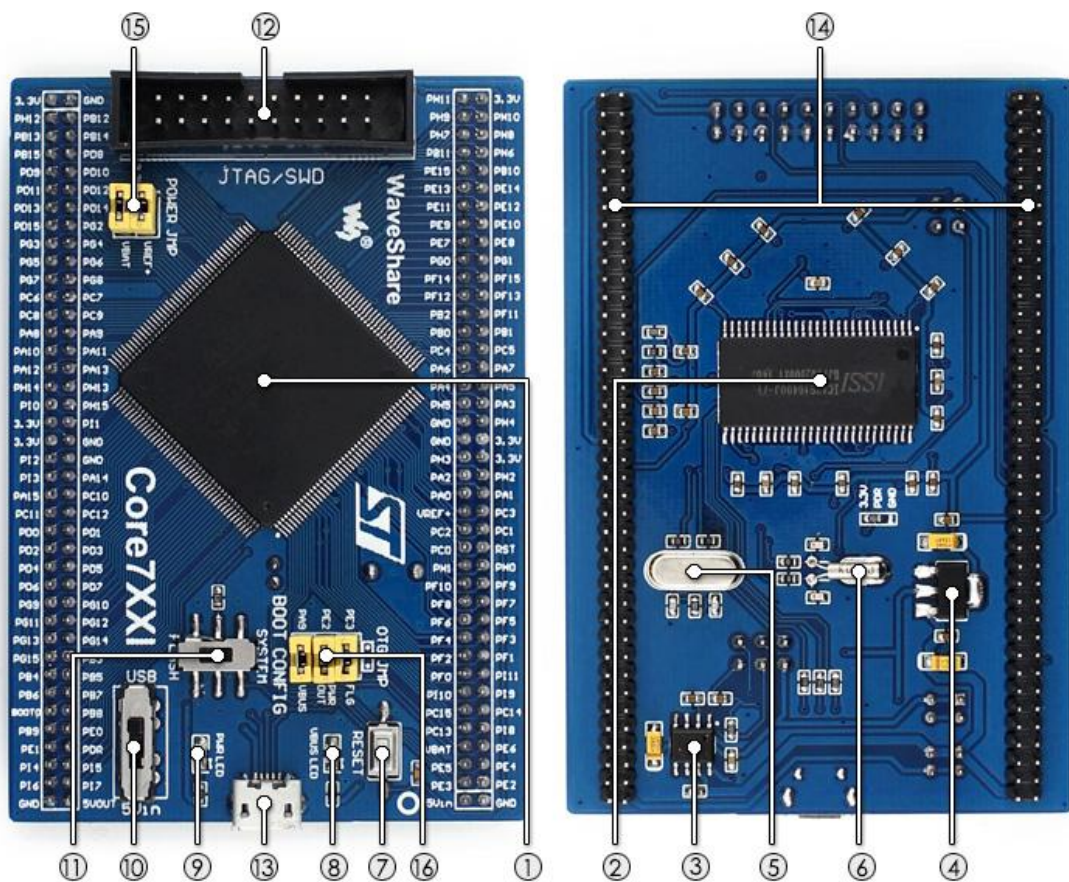
1. STM32F746IGT6: the high performance STM32 MCU which features:
   - **Core:** Cortex-M7 32-bit RISC + FPU + Chrom-ART graphic accelerator
   - **Feature:** single-cycle DSP instructions

- o **Operating Frequency:** 216MHz, 462 DMIPS/2.14 DMIPS/MHz
- o **Operating Voltage:** 1.7V-3.6V
- o **Package:** LQFP176
- o **Memories:** 1024kB Flash, 320+16+4kB SRAM
- o **MCU communication Interfaces:**
  - 6 x SPI, 4 x USART, 4 x UART, 3 x I2S, 4 x I2C
  - 2 x CAN, 1 x QUAD-SPI, 1 x DCMI, 2 x SAI
  - 1 x FMC, 1 x SDMMC, 14 x TIM , 1xLPTIM
  - 1 xLCD-TFT, 1xSPDIFRX, 1xHDMI-CEC
  - 1 x USB 2.0 OTG FS
  - 1 x USB 2.0 OTG HS (supports external HS PHY through ULPI)
  - 1 x 10/100 Ethernet MAC
- o **AD & DA converters:** 3 x AD (12-bit); 2 x DA (12-bit)
- o **Debugging/Programming:** supports JTAG/SWD interfaces, supports IAP
2. IS42S16400J: SDRAM 1 Meg Bits x 16 Bits x 4 Banks (64-MBIT)
3. MIC2075: onboard USB power management device
4. AMS1117-3.3: 3.3V voltage regulator
5. 8M crystal
6. 32.768K crystal, for internal RTC with calibration
7. Reset button
8. VBUS LED
9. Power indicator
10. Power supply switch, powered from 5Vin or USB connection
11. Boot mode selection, for configuring BOOT0 pin
12. JTAG/SWD interface: for debugging/programming
13. USB connector, supports Device and/or Host
14. MCU pins expander, VCC, GND and all the I/O pins are accessible on expansion connectors for further expansion
15. Power jumper
    - o VBAT: short the jumper to use system power supply, open it to connect external power, such as battery
    - o VREF: short the jumper to connect VREF+ to VCC, open it to connect VREF+ to other custom pin via jumper wire
16. OTG jumper
    - o short the jumper when using USB OTG/HOST
    - o open the jumper to disconnect from related I/O port

Note: Core746I provides JTAG/SWD debugging interface, yet does NOT integrate any debugging function, a debugger is required.

JTAG/SWD interfaces

The figure 1, and 2 show the header pinouts of JTAG/SWD interface
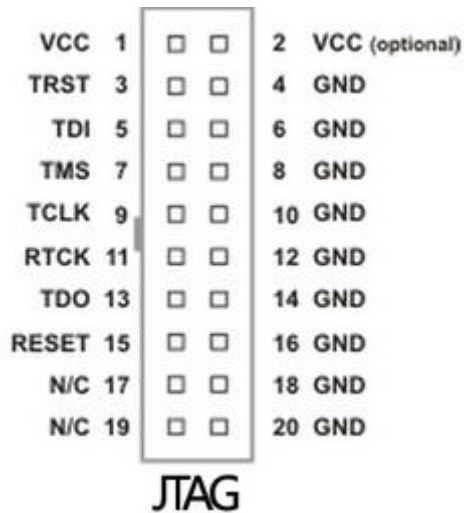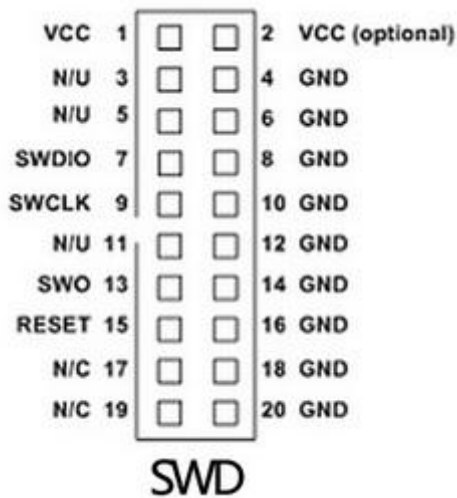
Figure 1. JTAG Header Pinout

VCC	1	□ □	2	VCC (optional)
TRST	3	□ □	4	GND
TDI	5	□ □	6	GND
TMS	7	□ □	8	GND
TCLK	9	□ □	10	GND
RTCK	11	□ □	12	GND
TDO	13	□ □	14	GND
RESET	15	□ □	16	GND
N/C	17	□ □	18	GND
N/C	19	□ □	20	GND

JTAG

Figure 2. SWD Header Pinout

VCC	1	□ □	2	VCC (optional)
N/U	3	□ □	4	GND
N/U	5	□ □	6	GND
SWDIO	7	□ □	8	GND
SWCLK	9	□ □	10	GND
N/U	11	□ □	12	GND
SWO	13	□ □	14	GND
RESET	15	□ □	16	GND
N/C	17	□ □	18	GND
N/C	19	□ □	20	GND

SWD

Development Resources

- Schematic
- Demo code (examples in C, FreeRTOS, µC/OS-III)
- STM32 development software (KEIL, STM32CubeMX, etc.)
- STM32 datasheets
- STM32 development documentations

Wiki: www.waveshare.com/wiki/Core746I

Dimensions

Unit: mm