Renesas R7FA4M1AB:: ARM Cortex M4

th muda engineering

The Renesas R7FA4M1AB is a general-purpose Arm Cortex-M4 32-bit MCUs running up to 48 MHz, with FPU, DSP instructions, and MPU for memory protection. They feature up to 256 KB Flash, 32 KB SRAM, and 8 kB data flash for non-volatile storage. The MCU integrates extensive peripherals, including a 14-bit ADC, 12-bit DAC, CAN, USB 2.0 (FS), LCD controller, Capacitive Touch sensing, RTC, multiple 16-bit and 32-bit timers, and GPT timers with PWM support for motor-control applications.

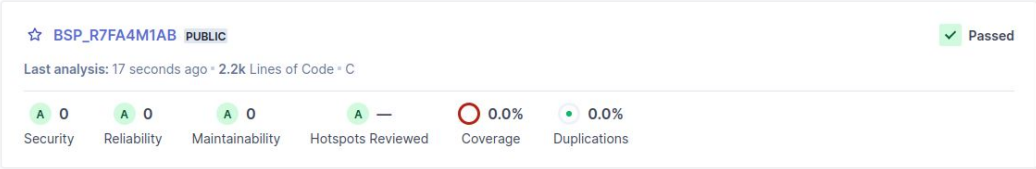
The BSP development is made with Renesas EK-RA4M1 development board. The BSP features a CMake build system, GCC toolchain supports and built based on our Hardware Abstraction Layer (HAL). It requires an application configuration file, which allows the user to specify the CPU clock frequency, enable or disable RTOS, and further define project-level I/O and settings.

The software is architected with long-term maintainability and adherence to high software quality standards as core design principles.

✅ Layered architecture with clear HAL abstraction
✅ Conforms to ISO C99 standard
✅ Supports both RTOS and bare-metal environments
✅ CMake build system for scalable integration
✅ Seamless integration with GCC toolchain
✅ Statically analyzed for MISRA, CERT, and CWE compliance

Features	Remarks
FPU support	Yes
Max. clock speed	48 MHz
Flash size	256 kB
SRAM	32 kB
NVM	8 kB

Peripherals	Total Channels
ADC	18
DAC	3
GPIO	50
CAN	1
I2C	2
PWM	8
RTCC	1
SPI	2
Timer	8
UART	4



Support Package:
LQFP64