



ARM-based MCUs SYSTEMS

Atmel MCU SAMC,D EVM USER GUIDE

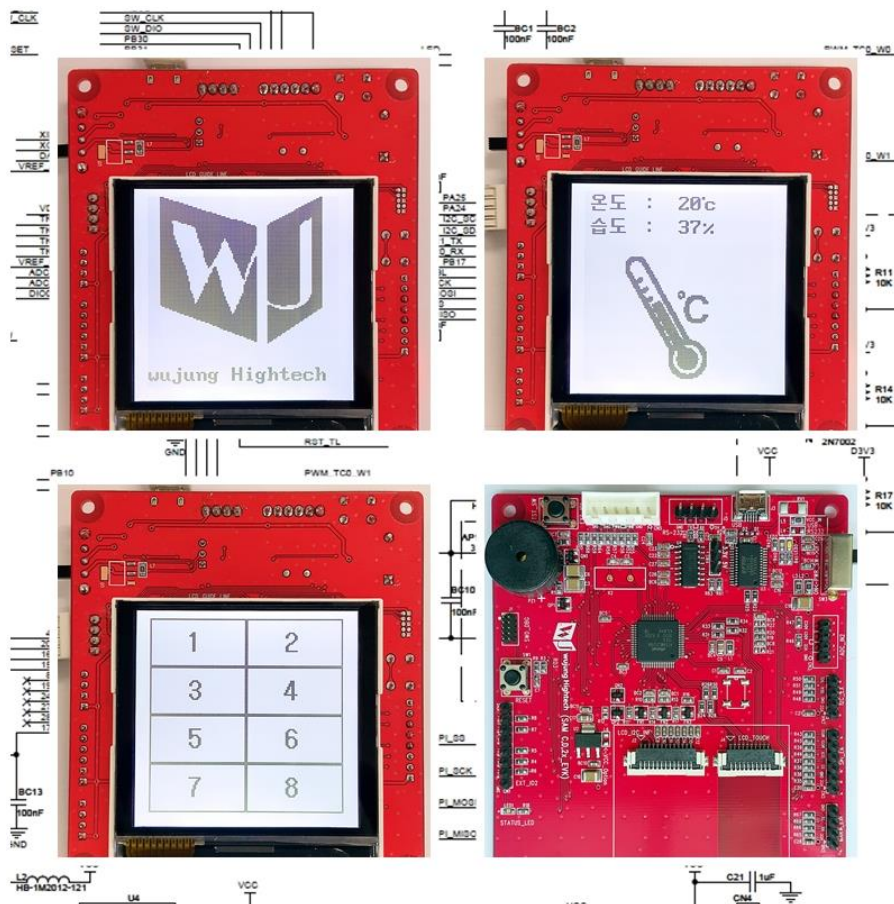


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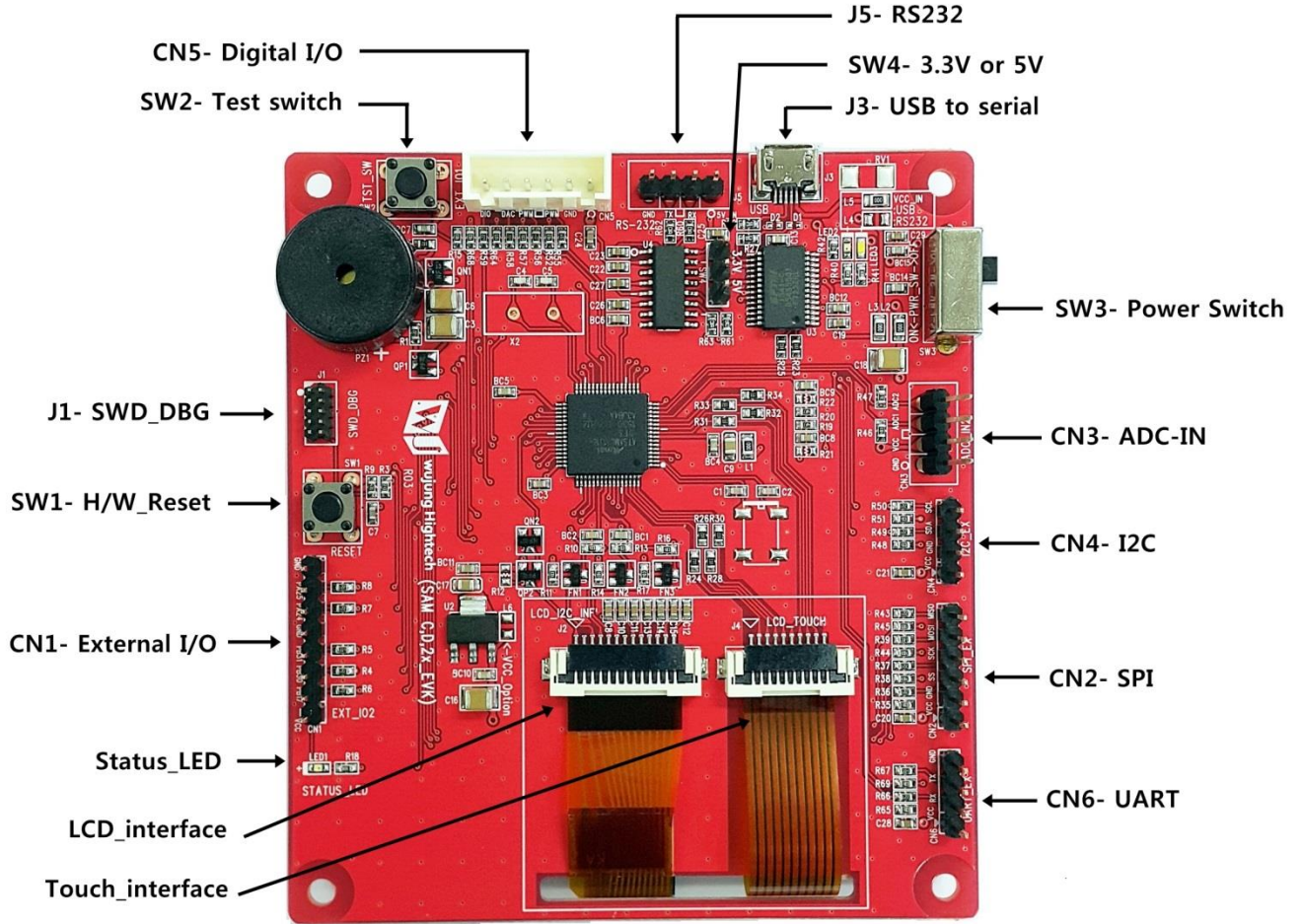
1 Introduction

Atmel ARM-based MCU SAMC,D를 적용하여 우정하이텍에서 제작한 EVM-Board 사용자 가이드

2 Features

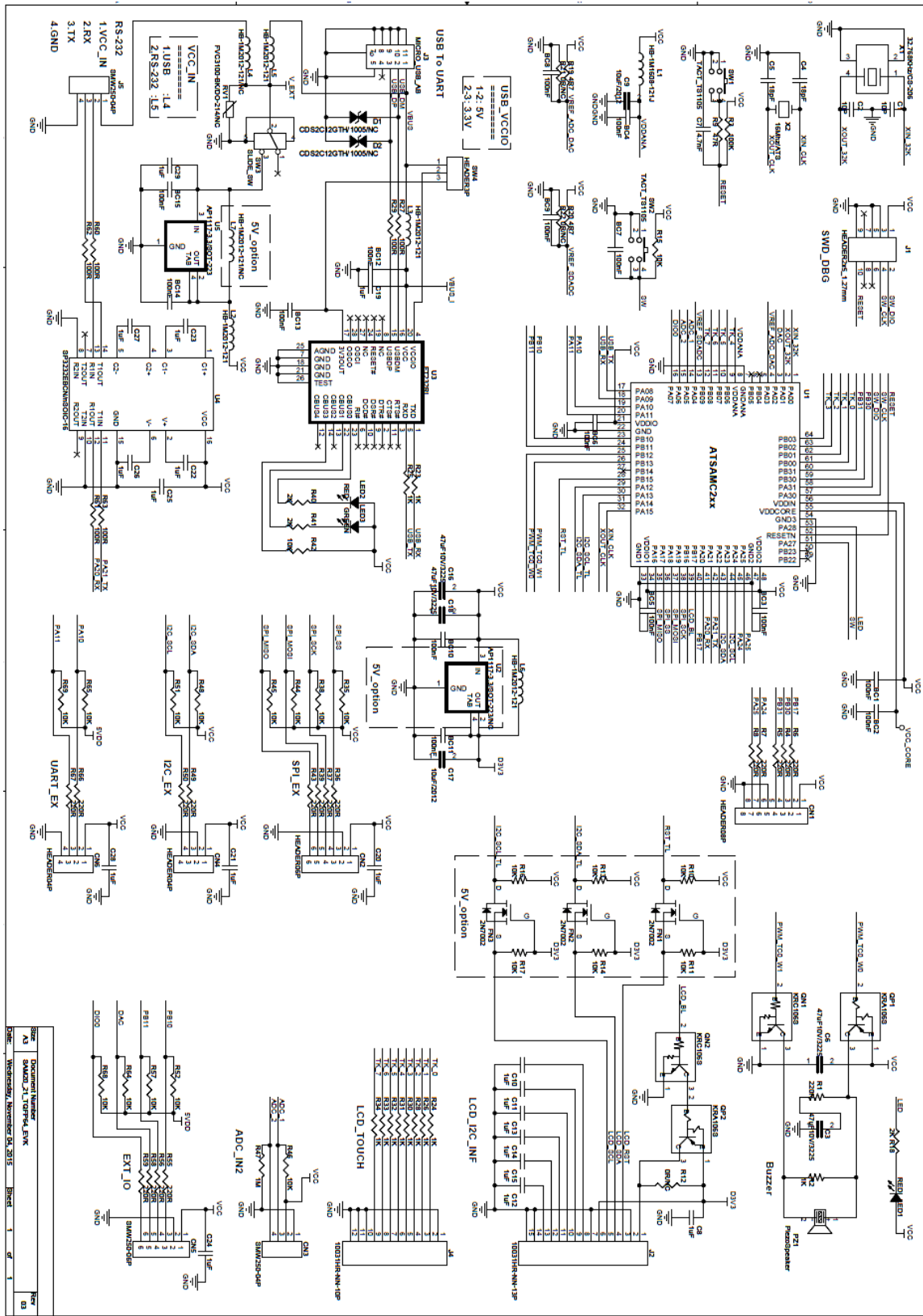
- 2.1 UART (SERCOM)
 - 2.1.1 USB to Serial
 - 2.1.2 RS-232
 - 2.1.3 SPI
 - 2.1.4 I2C
- 2.2 I/O
 - 2.2.1 ADC
 - 2.2.2 DAC (Option)
 - 2.2.3 GPIO 9
 - 2.2.4 STATUS_LED
 - 2.2.5 GPIO TEST Tact Switch
- 2.3 HW-RESET Tact Switch
- 2.4 Power Slide Switch
- 2.5 32.768KHz crystal (Not mounted)
- 2.6 16MHz crystal (Not mounted)
- 2.7 LCD
 - 2.7.1 Graphic 128x128
 - 2.7.2 I2C Interface
 - 2.7.3 On-cell Capacitive Touch 8Key
- 2.8 Two selectable target voltages
 - 2.8.1 3.3V
 - 2.8.2 5.0V
- 2.9 Buzzer

3 EVM Overview



View-1

4 Schematic



5 Connectors

5.1 J1 : SWD DBG (Serial Wire Debug – ARM)

Pin number	Name	PORT	Description
1	VCC		VCC
2	SW_DIO	PA31	Program Data
3	GND		GND
4	SW_CLK	PA30	Program Clock
5	GND		GND
6	NC		
7	NC		
8	NC		
9	GND		GND
10	RESET		RESET

5.2 J2 : LCD Interface (CMG3048W01BBW, 2.8inch, 128x128)

Pin number	Name	PORT	Description
1	VCC		VCC
2	GND		GND
3	RST_TL	PB15	LCD RESET
4	I2C_SDA_TL	PA12	LCD I2C interface SDA (DATA)
5	I2C_SCL_TL	PA13	LCD I2C interface SCL (CLOCK)
6	VCC		Power
7	GND		GND
8	CAP		
9	CAP		
10	CAP		
11	CAP		
12	CAP		
13	CAP		
14	GND		GND
15	GND		GND

5.3 J3 : USB to Serial (UART)

Pin number	Name	PORT	Description
1	VBUS		USB 전원 입력 (5V)
2	DM	PA08	DATA MINUS
3	DP	PA09	DATA PLUS
4	-		NC
5	GND		GND

5.4 J4 : TOUCH Interface

Pin number	Name	PORT	Description
1	GND		GND
2	K0	PB00	Touch Key 0
3	K1	PB01	Touch Key 1
4	K2	PB02	Touch Key 2
5	K3	PB03	Touch Key 3
6	K4	PB06	Touch Key 4
7	K5	PB07	Touch Key 5
8	K6	PB08	Touch Key 6
9	K7	PB09	Touch Key 7
10	GND		GND
11	GND		GND
12	GND		GND

5.5 J5 : RS-232 (UART)

Pin number	Name	PORT	Description
1	VCC		VCC
2	RX	PA20	RS-232 receiver input
3	TX	PA21	RS-232 driver output
4	GND		GND

5.6 CN1 : External I/O

Pin number	Name	PORT	Description
1	VCC		VCC
2	PB17	PB17	GPIO
3	PB30	PB30	GPIO
4	PB31	PB31	GPIO
5	GND		GND
6	PB17	PB17	GPIO
7	PB30	PB30	GPIO
8	GND		GND

5.7 CN2 : SPI_EX

Pin number	Name	PORT	Description
1	VCC		VCC
2	GND		GND
3	SPI_SS	PA17	SPI slave select / GPIO
4	SPI_SCK	PA19	SPI clock / GPIO
5	SPI_MOSI	PA18	SPI master out slave in / GPIO
6	SPI_MISO	PA16	SPI master in slave out / GPIO

5.8 CN3 : ADC_IN

Pin number	Name	PORT	Description
1	GND		GND
2	VCC		VCC
3	ADC1	PA05	Analog input 1 (NTC Temperature) / GPIO
4	ADC2	PA06	Analog input 2 (Humidity) / GPIO

5.9 CN4 : I2C_EX

Pin number	Name	PORT	Description
1	VCC		VCC
2	GND		GND
3	I2C_SDA	PA22	I2C interface SDA (DATA) / GPIO
4	I2C_SCL	PA23	I2C interface SCL (CLOCK) / GPIO

5.10 CN5 : EXT_IO

Pin number	Name	PORT	Description
1	VCC		VCC
2	GND		GND
3	PB10	PB10	GPIO
4	PB11	PB11	GPIO
5	DAC	PA02	Digital to analog converter / GPIO
6	DIO0	PA07	GPIO

5.11 CN6 : UART_EX

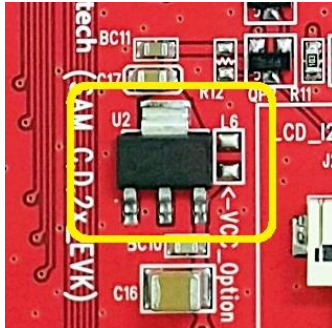
Pin number	Name	PORT	Description
1	VCC		VCC
2	RX	PA10	RX / GPIO
3	TX	PA11	TX / GPIO
4	GND		GND

5.12 SW4 : USB_VCCIO SELECT

Pin number	Name	PORT	Description
1-2	5V		VCC 5V Jumper pin connection
2-3	3.3V		VCC 3.3V Jumper pin connection

6 Power supply select option

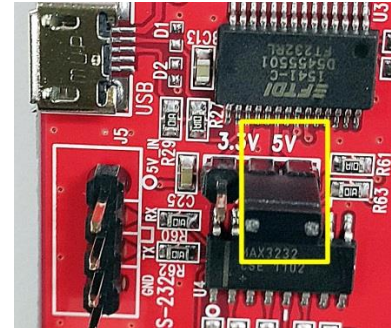
6.1 VCC 5.0V (SAM C)



U2 : Mount, L6 : Not mount

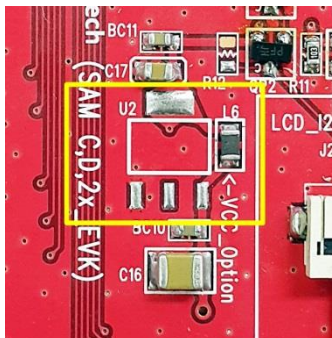


U5 : Not mount, L7 : Mount

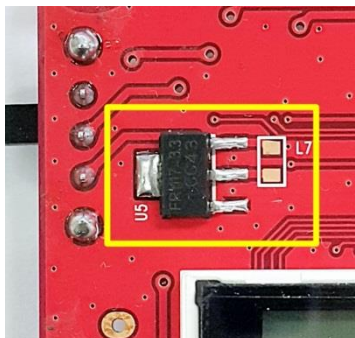


SW4 : 5V Jumper

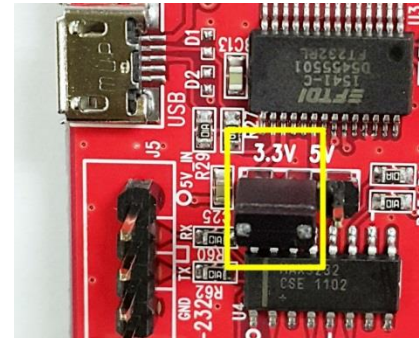
6.2 VCC 3.3V (SAM D)



U2 : Not mount, L6 : Mount



U5 : Mount, L7 : Not mount



SW4 : 3.3V Jumper

7 Programming JTAGICE3

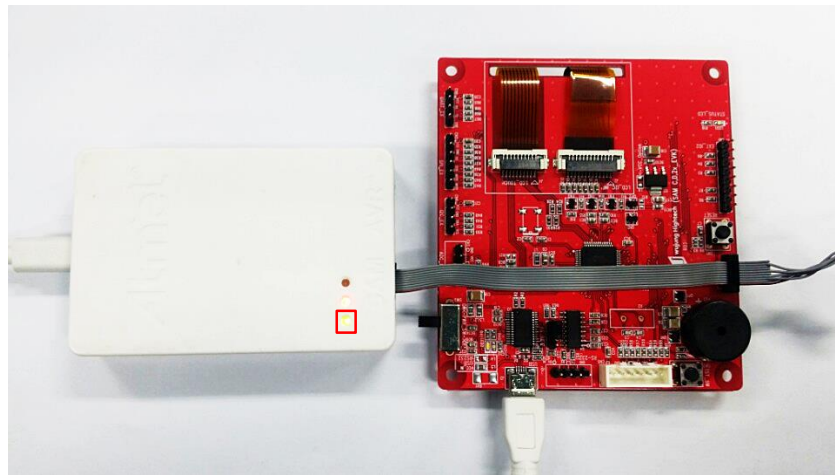


8 Programming 방법

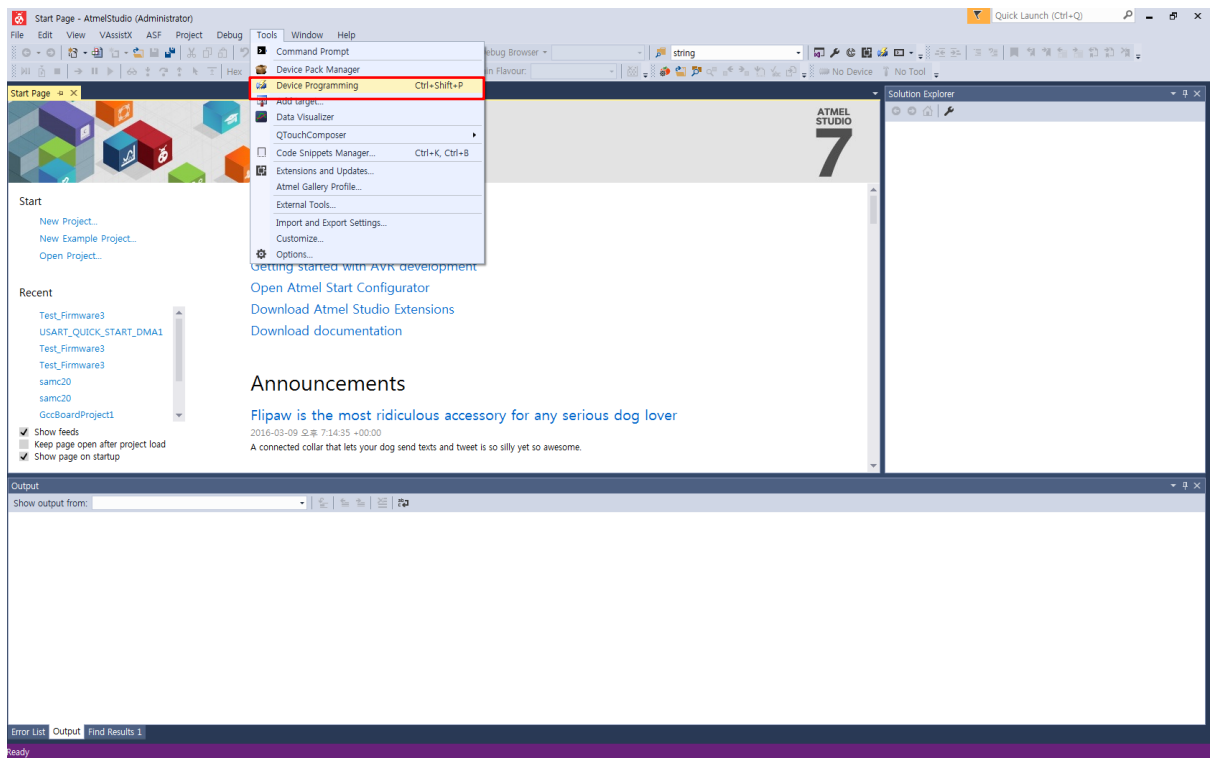
8.1 Atmel Studio 7 다운로드

<http://www.atmel.com/tools/atmelstudio.aspx>

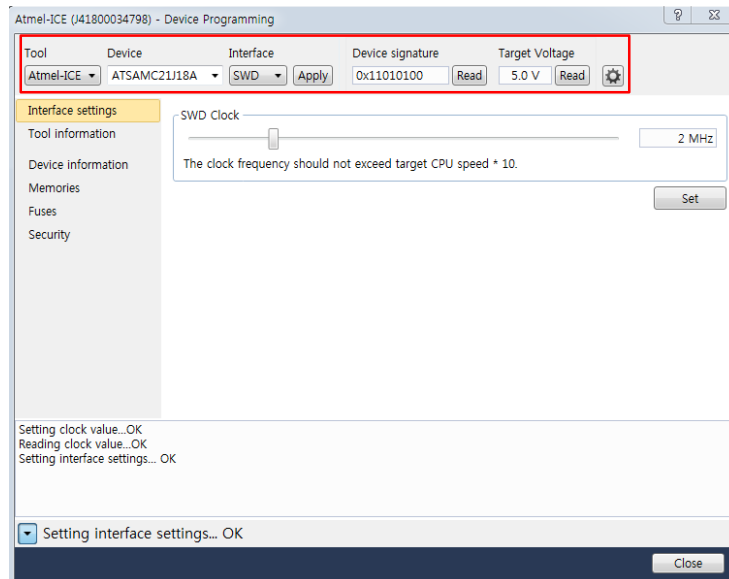
8.2 아래와 같이 JTAGICE3 를 Target Board 에 연결하고, Led(녹색) 점등 확인



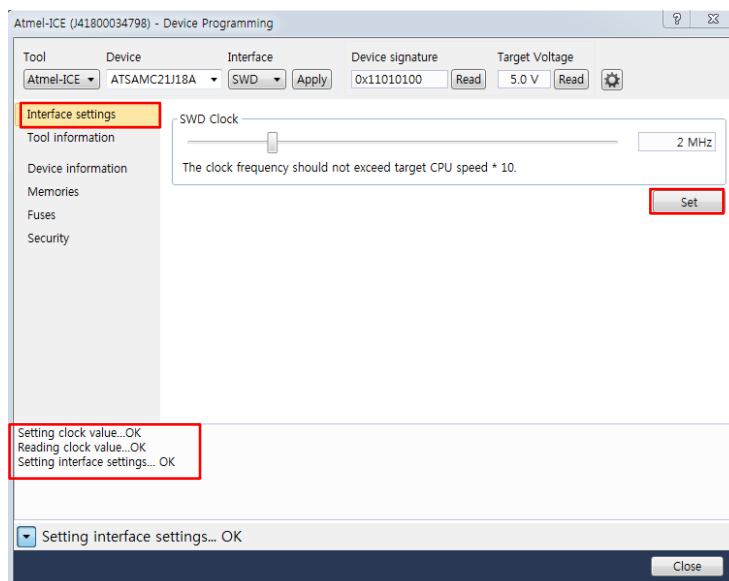
8.3 Atmel Studio 7 – Tools – Device Programming 실행



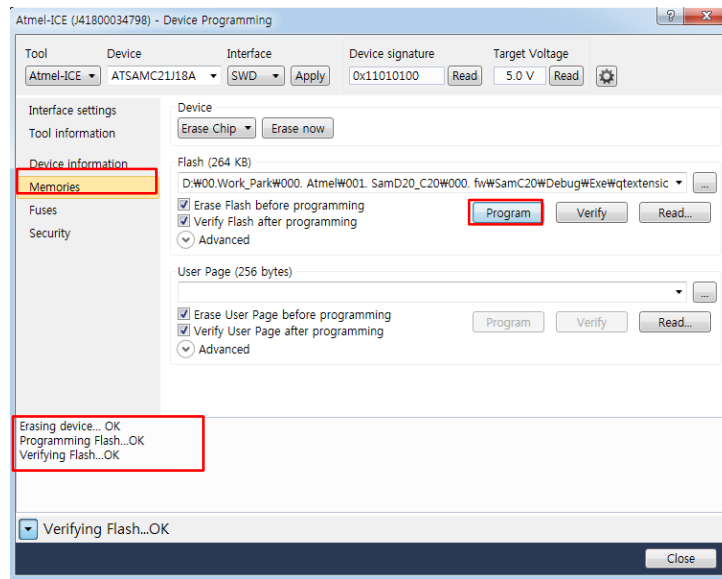
8.4 Tool → Atmel-ICE , Device → ATSAMC21J18A , Interface → SWD 선택 후, Apply 클릭하여 Device signature 및 Target Voltage 값 확인



8.5 Interface settings 에서 SWD Clock 2MHz 설정 후 Set 클릭



8.6 Memories - Flash 에서 샘플 제공한 Hex 파일 혹은 User Code 경로 설정하고, Program 클릭



8.7 Verifying Flash OK 확인하면 다운로드 완료

9 자료 다운로드 링크

9.1 회로도,소스코드,HEX 파일 및 LCD User guide

<http://wujunghightech.com/samc/evm.php>

9.2 Atmel SAM-C datasheet

<http://www.atmel.com/products/microcontrollers/arm/sam-c.aspx?tab=documents>

9.3 Basic source code

Basic source code 는 IAR EW-ARM ver7.4 compiler 를 사용하였으며 다음과 같은 기능이 포함되어 있으며 습니다.

9.3.1 LCD 128x128 display

9.3.2 LCD control I2C 통신 (SERCOM)

9.3.3 LCD on-cell touch 8key (PTC)

9.3.4 DBUG 용 USB to serial 통신 (SERCOM)

9.3.5 온/습도센서 (ADC)

9.3.6 Buzzer (Piezo speaker)

10 Layout

