# SAMD21 Lite

One of the most popular microcontrollers is ATSAMD21G18A (abbreviated as SAMD21). It is a powerful MCU with the Cortex M0+ architecture. Module **BOKRA SAMD21 Lite** is the world's smallest development board with this popular MCU, designed in the mikroBUS format and having mikroBUS slot and I^{2}C bus connector.

Frequency – 48 MHz. MCU Flash Memory - 256 kB, RAM - 32 kB. The microcontroller supports up to six serial interfaces (SERCOM), each of which can be configured as I2C, USART, SPI or LIN-slave. One USB 2.0 channel is also available. The microcontroller contains one 12-bit ADC (speed - up to 350 ksps) and 10-bit DAC (speed - up to 350 ksps).

Interface for debugging – SWD. External connectors – I^{2}C and mikroBUS.

Input Power – 5V. The voltage regulator is Microchip's MIC5528, which provides 500 mA output current. The module has a RESET button and three LEDs (power and two program-controlled).

BOKRA SAMD21 Lite makes it easy to implement IoT projects (smart sensors, climate control, industrial automation) using expansion modules with mikroBUS interface, Grove Systems peripherals (sensors and devices), as well as any other I^{2}C bus-controlled modules. You no longer need to mockup the system, and then think first about how to make a prototype, and then how to start serial production. You can assemble the desired configuration and after debugging you only need to put the system into the case and buy the selected boards to start production.
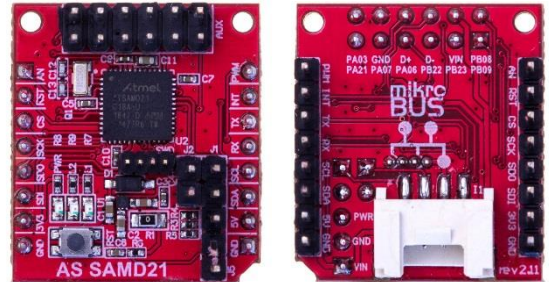
The ATSAMD21G18A microcontroller is widely used in the following areas:

- Industrial applications
- Remote IO
- Consumer devices
- Keyboards and HI-Screens

- Automotive
- Wireless controllers, for example - LoRa
- Household appliances

Specifications

The main characteristics of the **BOKRA SAMD21 Lite** are as follows:

Name	BOKRA SAMD21 Lite
Microcontroller	ATSAMD21G18A
Core	Cortex-M0+
Frequency, MHz	48
Flash Memory, KB	256
RAM, KB	32
Interface for debugging	SWD
Serial interfaces	SPI, I^{2}C, USART
External connectors	
mikroBUS	1
I2C	1
Input power	5V
Voltage regulator	MIC5528
Output current	500 mA
Button	RESET
LED	Red (power) Yellow (software) Green (software)
Size	28,6 x 25,4 mm

The matching of the **BOKRA SAMD21 Lite** contacts and the ATSAMD21G18A microcontroller contacts is as follows:
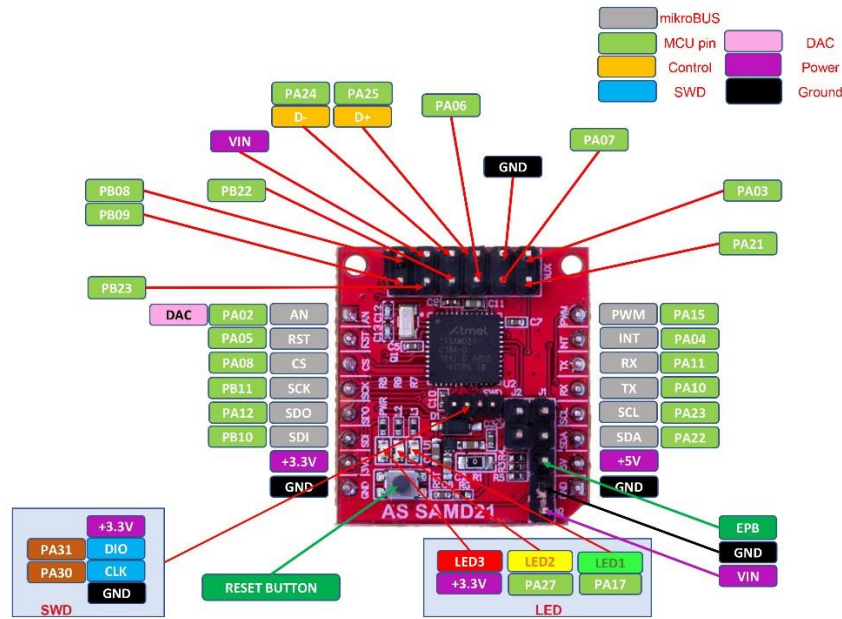
The module has an EPB contact that allows you to turn the VIN on and off on the MIC5528. In addition, using jumpers J1 and J2, you can enable and disable pull-up resistors for I^2C.

The pin assignment (contacts) in the **BOKRA SAMD21 Lite** is almost the same as the assignment in other popular boards based on the ATSAMD21G18A microcontroller. Comparison in the following table:

Pin	BOKRA SAMD21 Lite	BOKRA SAMD11 Lite	Adafruit Feather M0	Sparkfun SAMD21	Neutrino
PA02	AN	AN	AIN0	A0 / DAC	A0
PA03	AREF	AREF	VREFA	REFA	AXREF
PA04	INT	INT	VREFB	REFB	GPIO
PA05	RST	RST	GPIO	GPIO	GPIO
PA06	GPIO	SDI	GPIO / AIN7 / Green LED	GPIO	GPIO
PA07	GPIO	SCK	GPIO / AIN7	GPIO / AIN7	GPIO
PA08	CS	CS	GPIO / NMI / cardCS	GPIO / NMI	GPIO
PA09	-	SDO			GPIO
PA10	TX	TX	TX (Serial 1)	TX (Serial 1)	TX
PA11	RX	RX	RX (Serial 1)	RX (Serial 1)	RX
PA12	MISO	-	MISO	Legacy MISO	Legacy MISO
PA14	-	GPIO	-	GPIO	GPIO
PA15	PWM	PWM	GPIO	GPIO	GPIO
PA16	-	GPIO	GPIO	MOSI	MOSI
PA17	LED1 (green)	LED1 (green)	GPIO / Red LED	SCK / 13 LED	SCK
PA18	-	-	GPIO	SS	SS
PA19	-	-	GPIO	MISO	MISO
PA21	GPIO	-	GPIO / cardCD	GPIO	-
PA22	SDA	SDA	SDA	SDA	SDA
PA23	SCL	SCL	SCL	SCL	SCL
PA24	D-	D-	D-	D-	D-
PA25	D+	D+	D+	D+	D+
PA27	LED2 (yellow)	LED2 (yellow)	TX LED	TX LED	-
PA30	CLK	CLK	SWCLK	SWCLK	SWCLK
PA31	DIO	DIO	SWDIO	SWDIO	SWDIO
PB08	GPIO	-	GPIO/AIN2	A1	A1
PB09	GPIO	-	GPIO/AIN3	A2	A2
PB10	MOSI	-	MOSI	Legacy MOSI	Legacy MOSI
PB11	SCK	-	SCK	Legacy SCK	Legacy SCK
PB22	GPIO	-	-	30 / TX	-
PB23	GPIO	-	-	31 / RX	-

On the bottom side of the module is a Grove I^2C connector.

MikroElekronika manufactures numerous modules with a mikroBUS interface - Click® modules:

Attention! BOKRA SAMD21 Lite is compatible with Click® modules that use 3.3V, compatibility with 5V Click® modules is not guaranteed.

Add to your **BOKRA SAMD21 Lite** one of the many boards for wireless communications, LED or OLED control, stepper driver and much, much more. Almost everything that may be required for your project is already in the range of modules with the mikroBUS interface.
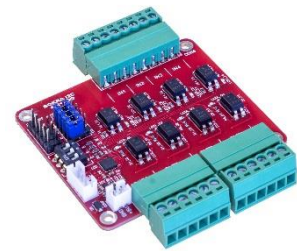
Any modules managed via the I²C bus can be connected to the I²C connector, for example, those we produce in BOKRA.
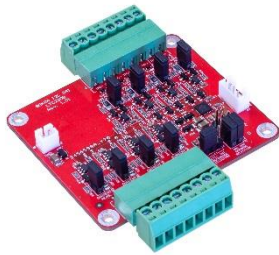
Analog input	Relay	Digital input and output
BOKRA I2C 8AI LTC2309	BOKRA I2C 4RO SRD	BOKRA I2C 4DI+4DO

It is also easy to connect numerous sensors, peripherals and modules from Grove Systems to the **BOKRA SAMD21 Lite** via the I²C connector.

BOKRA SAMD21 Lite, along with several mikroBUS form factor modules, can form stackable or flat designs.

The **BOKRA SAMD21 Lite** package includes contact headers for forming the mikroBUS slot. Before connecting modules with the mikroBUS interface, these headers must be soldered to **BOKRA SAMD21 Lite**. When ordering, you can also optionally indicate the need for presetting these contact headers.

The **BOKRA SAMD21 Lite** scheme is as follows: