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Flash 8 Click

PID: MIKROE-5293

Flash 8 Click is a compact add-on board representing a highly reliable memory solution. This board features the GD5F2GQ5UEYIGR, a 2Gb high-density non-volatile memory storage solution for embedded systems from GigaDevice Semiconductor. It is based on an industry-standard NAND Flash memory core, representing an attractive alternative to SPI-NOR and standard parallel NAND Flash with advanced features. The GD5F2GQ5UEYIGR also has advanced security features (8K-Byte OTP region), software/hardware write protection, can withstand many write cycles (minimum 100k), and has a data retention period greater than ten years. This Click board™ is suitable for storage and data transfer in consumer devices, and industrial applications.

Flash 8 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

Flash 8 Click as its foundation uses the GD5F2GQ5UEYIGR, a highly reliable serial Flash memory solution offering flexibility designed for use in a wide variety of consumer applications from GigaDevice Semiconductor. It comes with a density of 2Gb based on an industry-standard NAND Flash memory core, representing an attractive alternative to SPI-NOR and standard parallel NAND Flash with advanced features. Organized as 256Mx8, the GD5F2GQ5UEYIGR has advanced security features (8K-Byte OTP region) and specifies a minimum of 100.000 endurance cycles with data retention of a minimum of 10 years, giving it the capability to handle unlimited reads/writes to the memory.

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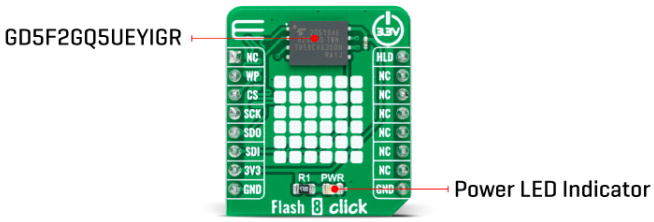

This Click board™ communicates with MCU through an industry-standard SPI interface (Dual and QSPI compatible) that enables high clock speed, supporting the two most common SPI modes, SPI Mode 0 and 3, with a maximum frequency of 104MHz. It is programmed/read in page-based operations and erased in block-based operations. Data is transferred to/from the NAND Flash memory array, page by page, to a data register and a cache register which is closest to I/O control circuits, acting as a data buffer for the I/O data (enable page and random data READ/WRITE and copy back operations). In addition to the SPI communication, this Click board™ also has two additional pins used for Write Protection and HOLD function routed to the RST and PWM pins of the mikroBUS™ socket.

The configurable Write Protection, marked as WP and routed on the RST pin of the mikroBUS™ socket, prevents the block lock bits from being overwritten and must be held low to inhibit all the write operations to registers. When this pin is low, also by setting the appropriate bits, all memory and register write are prohibited, and the address counter is not incremented. On the other hand, the HOLD pin labeled as HLD and routed to the PWM pin of the mikroBUS™ socket stops any serial communications with the device. Still, it doesn’t stop the operation of reading programming or erasing in progress.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. What should be paid special attention to is the fact that if power shortage or power failure happens before Write/Erase operation is complete, it will cause loss or damage to data. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

Type	FLASH
Applications	Can be used for storage and data transfer in consumer devices and industrial applications
On-board modules	GD5F2GQ5UEYIGR - serial Flash memory solution from GigaDevice Semiconductor
Key Features	2Gb NAND flash, Standard/Dual/Quad SPI, high speed clock frequency, protection features, reliability, enhanced access performance, low power consumption, and more

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Interface	QSPI,SPI
ClickID	No
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Flash 8 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	**HLD**	QSPI IO3 / SPI Suspension
QSPI IO2 / Write Protection	**WP**	2	RST	INT	15	NC	
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

Flash 8 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Memory Size	-	-	2	Gb
Write Endurance	100k	-	-	Cycles
Data Retention	10	-	-	Years
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Flash 8 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

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This library contains API for Flash 8 Click driver.

Key functions

- flash8_write_memory Flash 8 write memory function.
- flash8_read_memory Flash 8 read memory function.
- flash8_read_id Flash 8 read ID function.

Example Description

This library contains API for Flash 8 Click driver. The library using SPI serial interface. The library also includes a function for write and read memory as well as write protection control functions.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Flash8

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

GD5F2GQ5UEYIGR datasheet

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Flash 8 click schematic

Flash 8 click 2D and 3D files

Flash 8 click example on Libstock