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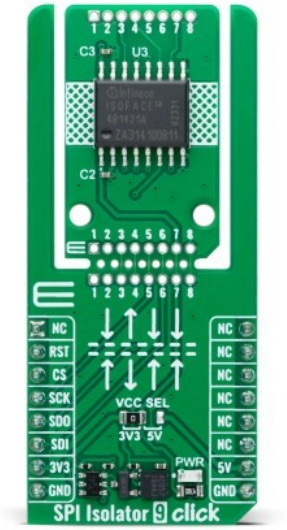
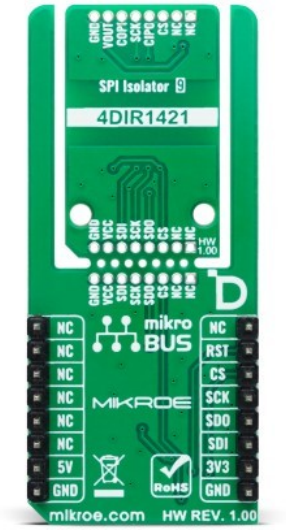
SPI Isolator 9 Click





PID: MIKROE-6430

SPI Isolator 9 Click is a compact add-on board designed for secure and reliable SPI communication across isolated domains. This board features the 4DIR1421H, a quad-channel digital isolator from Infineon, known for precise data communication and low power consumption. Featuring Infineon's ISOFACE™ Coreless Transformer (CT) technology, it provides exceptional noise immunity with a minimum CMTI of 100kV/µs, supports data rates up to 40Mbps, and withstands isolation voltages up to 5700Vrms, ensuring safety and efficiency in industrial environments. Its innovative Click Snap feature allows flexible implementation and autonomous operation by breaking the PCB along designated lines. SPI Isolator 9 Click is ideal for applications in industrial automation, motor drives, server and telecom systems, Switch-Mode Power Supplies (SMPS), and medical devices.

For more information about **SPI Isolator 9 Click** visit the official product page.

How does it work?

SPI Isolator 9 Click is based on the 4DIR1421H, a quad-channel digital isolator from Infineon designed for precise data communication in demanding environments. The device is rated to withstand isolation voltages of up to 5700Vrms and adheres to UL 1577 (Ed. 5) certification standards (certification no. E311313), ensuring compliance with stringent industrial safety requirements. This board has four data channels and ensures robust SPI isolation, making it an ideal solution for systems requiring reliable and safe data transmission across electrically isolated domains.

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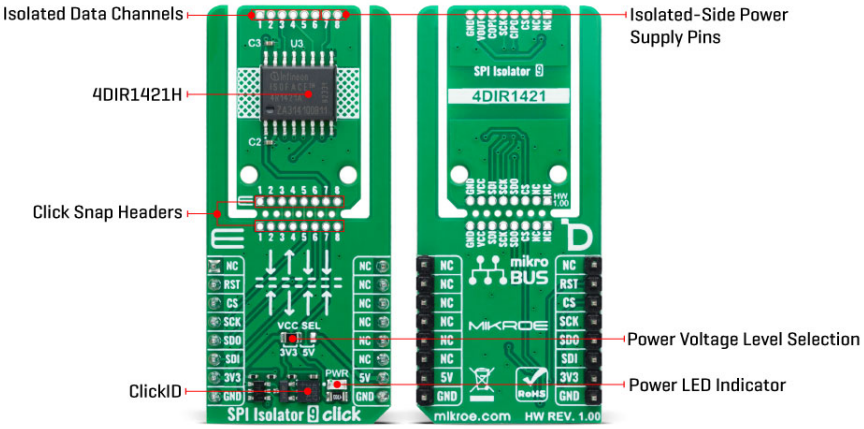

The 4DIR1421H features Infineon's ISOFACE™ Coreless Transformer (CT) technology, which delivers exceptional system noise immunity with a minimum Common Mode Transient Immunity (CMTI) of 100kV/µs, ensuring stable performance in noisy industrial environments. It supports data rates of up to 40Mbps, allowing for high-speed communication, and operates efficiently with low power consumption, contributing to overall system energy savings. Its robust isolation capabilities make it an excellent choice for Switch-Mode Power Supplies (SMPS) in industrial and telecommunications settings, where safety and reliability are critical, as well as in server and telecom systems, industrial automation, motor drives, and medical devices.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main IC area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the 4DIR1421H can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, introducing a new level of flexibility and ease of use. This feature allows for easy detachment of the main sensor area by simply snapping the PCB along designated lines, enabling various implementation possibilities. For detailed information about Click Snap, please visit the official page dedicated to this feature.

Specifications

Type	Isolators,SPI
Applications	Ideal for applications in industrial automation, motor drives, server and telecom systems, Switch-Mode Power Supplies (SMPS), and

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	medical devices
On-board modules	4DIR1421H - quad-channel digital isolator from Infineon,
Key Features	Low power consumption, isolation voltage up to 5700Vrms, certified under UL 1577 (Ed. 5), data rates up to 40Mbps, based on Coreless Transformer (CT) technology, exceptional noise immunity, Click Snap, and more
Interface	SPI
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on SPI Isolator 9 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	NC	
ID SEL	**RST**	2	RST	INT	15	NC	
SPI Select / ID COMM	**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	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

SPI Isolator 9 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Isolated Supply Voltage	2.7	-	6.5	V
Data Rate	-	-	40	Mbps

Software Support

SPI Isolator 9 Click demo application is developed using the NECTO Studio, ensuring compatibility with mikroSDK's open-source libraries and tools. Designed for plug-and-play

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implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a mikroBUS™ socket.

Example Description

This example demonstrates the use of SPI Isolator 9 Click board by reading the device ID of the connected Accel 22 Click board.

Key Functions

- spiisolator9_cfg_setup Config Object Initialization function.
- spiisolator9_init Initialization function.
- spiisolator9_write This function writes a desired number of data bytes by using SPI serial interface.
- spiisolator9_read This function reads a desired number of data bytes by using SPI serial interface.
- spiisolator9_write_then_read This function writes and then reads a desired number of data bytes by using SPI serial interface.

Application Init

Initializes the driver and logger.

Application Task

Reads and checks the device ID of the connected Accel 22 Click board, and displays the results on the USB UART approximately once per second.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following this tutorial.
- UART Terminal - Monitor data via the UART Terminal using a USB to UART converter. For detailed instructions, check out this tutorial.

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the NECTO Studio. The application code can also be found on the MIKROE GitHub account.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

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Downloads

SPI Isolator 9 click 2D and 3D files v100

4DIR1421H datasheet

SPI Isolator 9 Click example package

SPI Isolator 9 click schematic v100