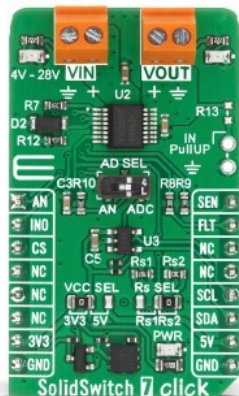


SolidSwitch 7 Click



PID: MIKROE-6721

SolidSwitch 7 Click is a compact add-on board designed for intelligent high-side load switching, protection, and current monitoring in automotive and industrial embedded systems. It is based on the [VN9008AJ](#), a single-channel smart high-side driver from [STMicroelectronics](#) featuring current sense analog feedback and built using the VIPower M0-9 technology, qualified according to the AEC-Q100 automotive standard. This board supports operation from an external supply ranging from 4V to 28V and integrates advanced diagnostic and protection features. The board also provides selectable output current ranges, optional OFF-state open-load detection, and selectable analog or ADC current monitoring through an onboard MCP3221 converter. It is ideal for applications such as automotive lighting, heating systems, smart power distribution, DC motor control, relay replacement, and protected power supply paths for ADAS systems including radar modules and sensors.

For more information about **SolidSwitch 7 Click** visit the official [product page](#).

How does it work?

SolidSwitch 7 Click is based on the VN9008AJ, a single-channel smart high-side driver with current sense analog feedback from STMicroelectronics, built using the proprietary VIPower M0-9 technology and qualified according to the AEC-Q100 automotive standard. The board is designed to drive grounded loads in 12V automotive systems and operates using an external supply connected to the VIN terminal within a wide voltage range from 4V up to 28V, ensuring performance even during extreme low-voltage conditions such as deep cold cranking. For convenient visual monitoring, the board includes two LED indicators placed next to the VIN and VOUT terminals, providing a clear indication of the active state of the input and output channels. The SolidSwitch 7 Click is well suited for applications such as smart power

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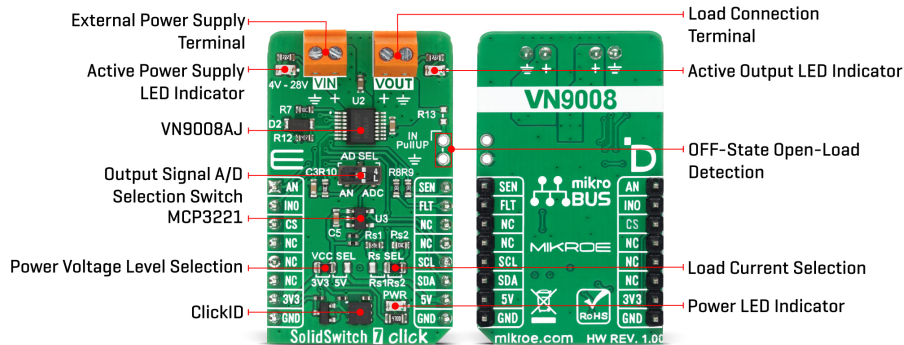


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distribution, automotive lighting systems, heating elements, DC motor control, relay replacement, and protected power supply paths for ADAS systems including radar modules and sensor units.



The VN9008AJ's output signal can be converted to a digital value using [MCP3221](#), a successive approximation A/D converter with a 12-bit resolution from Microchip, using a 2-wire I2C compatible interface, or sent directly to an analog pin of the mikroBUS™ socket labeled as AN (current mirror of channel output current). Selection can be performed via an onboard SMD switch labeled AD SEL, placing it in an appropriate position marked as AN or ADC. To ensure safe and reliable operation, the VN9008AJ incorporates several protection mechanisms such as undervoltage shutdown, overvoltage clamping, load current limitation, and self-limiting behavior during fast thermal transients. It also supports configurable latch-off behavior during overtemperature or power limitation events with recovery through the FLT fault reset pin.

The board also provides output current range selection through the Rs SEL jumper. When the jumper is placed in the Rs1 position, a higher output current range from 11A to 16.6A is selected, while placing the jumper in the Rs2 position enables a lower current range from 3.3A to 5A. Additionally, the board includes an unsoldered IN PullUP header required for OFF-state open-load detection. This external pull-up element allows the device to detect whether the load is disconnected while the driver remains in the inactive state.

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.

Specifications

Type	Power Switch
Applications	Ideal for applications such as automotive lighting, heating systems, smart power distribution, DC motor control, relay replacement, and protected power supply paths for ADAS systems including radar modules and sensors
On-board modules	VN9008AJ - single-channel high-side driver

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	with current sense analog feedback for automotive applications from STMicroelectronics
Key Features	Single-channel smart high-side driver, VIPower M0-9 technology, AEC-Q100 automotive qualification, current sense analog feedback with precise proportional current mirror, selectable analog or digital current monitoring, OFF-state open-load detection support, configurable latch-off behavior, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

This table shows how the pinout on SolidSwitch 7 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	AN	1	AN	PWM	16	SEN	Current Sense Diagnostic Control
Output Switch State Control	INO	2	RST	INT	15	FLT	Fault Reset
ID COMM	CS	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
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
LD2	VIN	-	Active Power Supply LED Indicator
LD3	VOUT	-	Active Output LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	Rs SEL	Right	Load Current Selection Rs1/Rs2: Left position Rs1, Right position Rs2

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SW1	AD SEL	Right	Output Signal A/D Selection AN/ADC: Left position AN, Right position ADC
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SolidSwitch 7 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	4	-	28	V
Output Current (Rs1)	11	-	16.6	A
Output Current (Rs2)	3.3	-	5	A

Software Support

[SolidSwitch 7 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play 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 the SolidSwitch 7 Click board by periodically enabling and disabling the output channel while monitoring and logging the load current.

Key Functions

- `solidswitch7_cfg_setup` This function initializes Click configuration structure to initial values.
- `solidswitch7_init` This function initializes all necessary pins and peripherals used for this Click board.
- `solidswitch7_output_enable` This function sets the IN0 pin to high logic level to enable the output stage.
- `solidswitch7_output_disable` This function sets the IN0 pin to low logic level to disable the output stage.
- `solidswitch7_read_current` This function reads the analog voltage from the diagnostic output and calculates the load current.

Application Init

Initializes the logger and the Click board, enables analog diagnostics and automatic restart features.

Application Task

Alternately enables and disables the output every few seconds, and logs the measured current in each state using the USB UART.

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

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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](#)

Downloads

[SolidSwitch 7 click example package](#)

[SolidSwitch 7 click 2D and 3D files v100](#)

[SolidSwitch 7 click schematic v100](#)

[VN9008AJ datasheet](#)

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