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IPD 2 Click

PID: MIKROE-6314

IPD 2 Click is a compact add-on board for efficient and reliable high-side switching in automotive applications. This board features the BV2HD070EFU-C, an automotive-grade two-channel high-side switch from ROHM Semiconductor with advanced protection and diagnostic functionalities. This 70mΩ on-resistance high-side switch supports an input voltage range from 6V to 28V and includes built-in protection mechanisms such as overcurrent detection, thermal shutdown, undervoltage lockout, and open load detection. Additionally, it offers configurable overcurrent limits and diagnostic output for real-time fault feedback, ensuring enhanced system reliability. Suitable for controlling resistive, inductive, and capacitive loads, IPD 2 Click is ideal for applications such as automotive lighting, motor control, and solenoid operation.

How does it work?

IPD 2 Click is based on the BV2HD070EFU-C, an automotive-grade two-channel high-side switch from ROHM Semiconductor, designed to handle resistive, inductive, and capacitive loads in automotive applications. The BV2HD070EFU-C features a 70mΩ on-resistance high-side switch and incorporates advanced protection and diagnostic functionalities to ensure reliable operation in demanding environments. This Click board™ is particularly suitable for automotive applications, supporting various types of loads such as lights, solenoids, and motors. It provides an efficient, reliable, and compact solution for high-side switching requirements, ensuring stable performance and enhanced safety in automotive systems.

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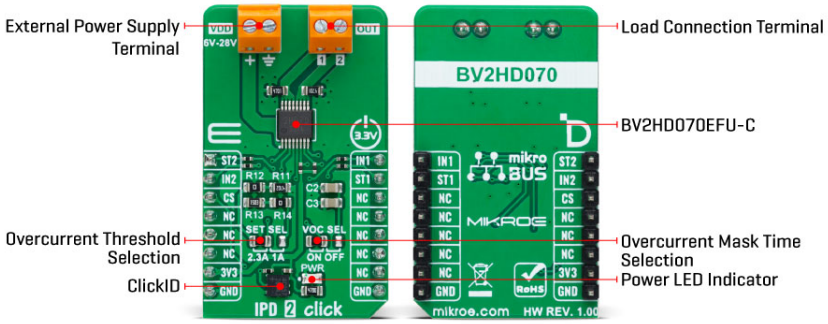

The BV2HD070EFU-C is AEC-Q100 qualified (Grade 1) and operates across a wide input voltage range of 6V to 28V, supplied via the VDD terminal. Its comprehensive protection suite includes overcurrent detection (OCD) with a configurable mask function, ensuring precise fault management and preventing unintended load disconnection. Additional safety features include thermal shutdown protection, which halts operation under excessive temperature conditions, and undervoltage lockout (UVLO) to safeguard against unstable power supply conditions. Moreover, the switch includes an open load detection function, providing feedback when the load is disconnected or the circuit is incomplete.

This Click board™ uses several pins of the mikroBUS™ socket for control and diagnostics. The IN1 and IN2 pins serve as control signals, enabling activation of the respective outputs marked as 1 and 2 on the output OUT terminal. For monitoring and fault detection, the board includes a diagnostic output function accessible via the ST1 and ST2 pins of the mikroBUS™ socket, providing real-time feedback on abnormalities.

In addition to these control and diagnostic pins, the board features two configuration jumpers. The first, SET SEL, allows users to configure the overcurrent limit between 1A and the default value of 2.3A. While the BV2HD070EFU-C supports overcurrent limits of up to approximately 10A, users can achieve this by replacing the selected resistance as specified in the datasheet recommendations. The second jumper, VOC SEL, activates a functionality that optimizes the time required to achieve precise overcurrent protection for the connected load. This feature is enabled by default, ensuring enhanced load safety and performance without additional configuration.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	Power Switch
Applications	Suitable for controlling resistive, inductive, and capacitive loads such as automotive lighting, motor control, and solenoid operation
On-board modules	BV2HD070EFU-C - automotive two-channel

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	high-side switch from ROHM Semiconductor
Key Features	AEC-Q100 qualified (Grade 1), 70mΩ on-resistance, wide operating voltage range, overcurrent detection (OCD) with configurable limits, thermal shutdown, undervoltage lockout (UVLO), open load detection, configurable overcurrent limit and timing, and more
Interface	GPIO
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V,External

Pinout diagram

This table shows how the pinout on IPD 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Channel 2 Diagnostic	**ST2**	1	AN	PWM	16	**IN1**	Channel 1 Control
Channel 2 Control	**IN2**	2	RST	INT	15	**ST1**	Channel 1 Diagnostic
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	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
JP1	SET SEL	Left	Overcurrent Threshold Selection 2.3A/1A: Left position 2.3A, Right position 1A
JP2	VOC SEL	Left	Overcurrent Mask Time Selection ON/OFF: Left position ON, Right position OFF

IPD 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
External Power Supply	6	-	28	V
Current Limit	-	-	2.3	A

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Software Support

We provide a library for the IPD 2 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

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

Library Description

This library contains API for IPD 2 Click driver.

Key functions

- ipd2_enable_out1 This function enables OUT1 by setting the IN1 pin to high logic state.
- ipd2_disable_out1 This function disables OUT1 by setting the IN1 pin to low logic state.
- ipd2_get_st1_pin This function returns the ST1 pin logic state.

Example Description

This example demonstrates the use of IPD 2 Click by toggling the output state.

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

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.IPD2

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 MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE 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™

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mikroSDK

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IPD 2 click example on Libstock

IPD 2 click 2D and 3D files v100

BV2HD070EFU-C datasheet

IPD 2 click schematic v100