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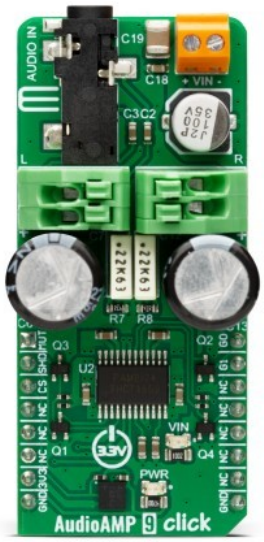
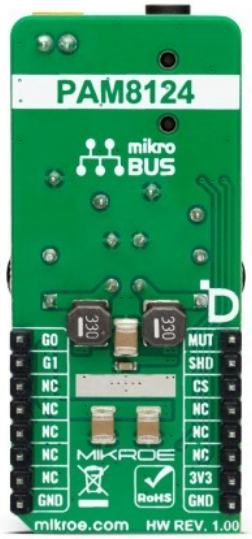
AudioAMP 9 Click





PID: MIKROE-5595

AudioAMP 9 Click is a compact add-on board reproducing input audio signals with desired volume and power levels at sound-producing output elements. This board features the PAM8124, a 10W efficient, Class-D audio power amplifier from Diodes Incorporated for driving stereo speakers in a single-ended configuration. This GPIO configurable audio amplifier can drive 8Ω stereo speakers and provides configurable features such as Mute, Shutdown, and selectable gain of the amplifier. It supports external supply voltage from 12V to 24V, allowing it to be used in many applications. Besides, it is equipped with protection features, allowing a reliable operation. This Click board™ is suited for various types of consumer audio equipment applications.

How does it work?

AudioAMP 9 Click is based on the PAM8124, a stereo class-D audio power amplifier from Diodes Incorporated. Besides an excellent quantity performance, such as high efficiency, the PAM8124 is also characterized by high output power, low quiescent current, and eliminates the need for heat sinks. It can drive 8Ω stereo speakers in a single-ended configuration with 10W of output power per channel from the externally brought supply voltage. Furthermore, the PAM8124 has several protection features like thermal overload, short circuit, and over/under-voltage protection allowing a reliable operation.

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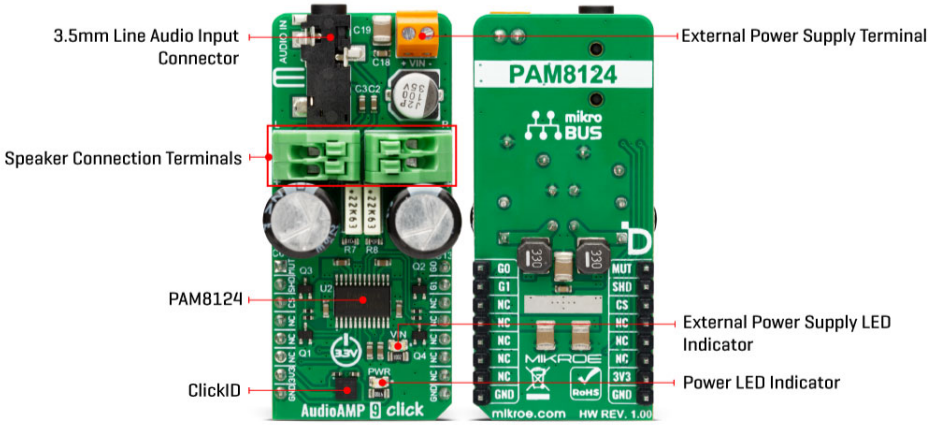

This GPIO configurable audio amplifier provides configurable features such as Mute, Shutdown, and selectable gain of the amplifier. The gain of the amplifier is controlled by two selectable gain pins, G1 and G2 pins of the mikroBUS™ socket, offering 20dB, 26dB, 32dB, and 36dB gain selections. The MUT pin of the mikroBUS™ socket controls the output state of the PAM8124 (quick disable or enable of the outputs). A logic low state on this pin causes the outputs to run at a constant 50% duty cycle. A logic high state on this pin enables the outputs.

The PAM8124 also employs a Shutdown operation mode to reduce supply current to the absolute minimum level during periods of non-use to save power. The SHD pin should be pulled low during normal operation when the amplifier is in use. Pulling the SHD pin high causes the outputs to mute and the amplifier to enter a low-current state. The amplifier should be set in Shutdown mode for the best power-off pop performance before removing the power supply voltage. For the best start-up pop performance, the amplifier should be put in Mute mode before restarting the amplifier.

This Click board™ supports an external power supply for the amplifier, which can be connected to the input terminal labeled as VIN and should be within the range of 12V to 24V, while the input audio can be brought to the input jack labeled as AUDIO IN and after specific processing reproduced on the speakers of the desired L/R channel. In addition, this board has an additional red LED indicator marked with VIN, which can visually detect the presence of an external power supply.

This Click board™ can only be operated with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. 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	Amplifier
Applications	Can be used for various types of consumer audio equipment applications
On-board modules	PAM8124 - stereo class-D audio power amplifier from Diodes Incorporated
Key Features	10W per channel from 24V external supply, single-ended configuration, high efficiency,

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	GPIO configurable, can drive 8Ω stereo speakers, configurable features such as Mute, Shutdown, and selectable gain of the amplifier, protection features, and more
Interface	GPIO
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on AudioAMP 9 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Mute	**MUT**	1	AN	PWM	16	**G0**	Gain Selection
Shutdown	**SHD**	2	RST	INT	15	**G1**	Gain Selection
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
LD2	VIN	-	External Power Supply LED Indicator

AudioAMP 9 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
External Power Supply	12	-	24	V
Output Power	-	-	10	W
Load Impedance	-	8	-	Ω

Software Support

We provide a library for the AudioAMP 9 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.

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Library Description

This library contains API for AudioAMP 9 Click driver.

Key functions

- audioamp9_shutdown_on AudioAmp 9 shutdown on function.
- audioamp9_mute_off AudioAmp 9 mute off function.
- audioamp9_set_gain_level AudioAmp 9 set gain function.

Example Description

This library contains API for AudioAMP 9 Click driver. The library initializes and defines the GPIO drivers.

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.AudioAmp9

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, that needs to be downloaded from the LibStock and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

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Downloads

AudioAMP 9 click example on Libstock

PAM8124 datasheet

AudioAMP 9 click 2D and 3D files v100

AudioAMP 9 click schematic v100

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