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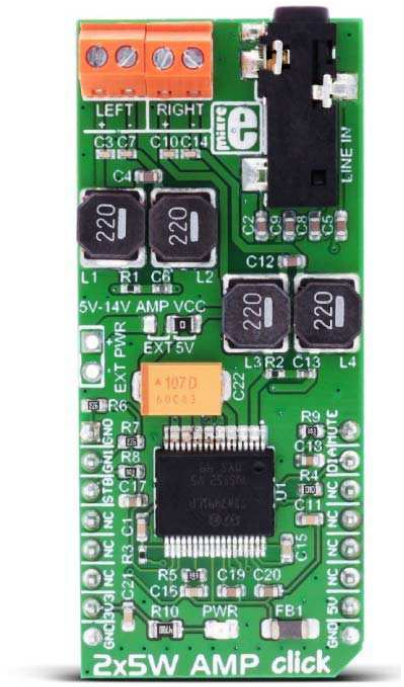
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

2x5W AMP click

PID: MIKROE-2477

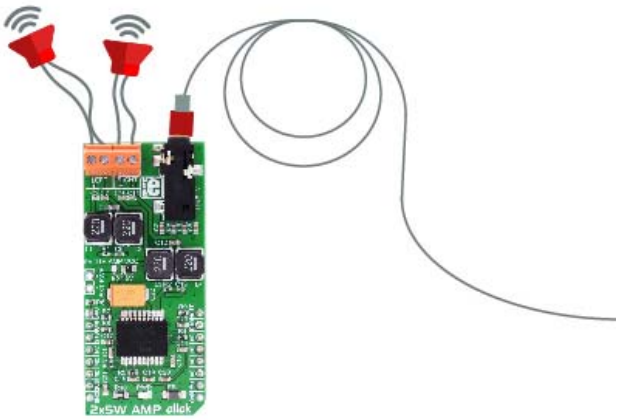


2x5W AMP click functions as an amplifier and features the TDA7491LP 2x5-watt dual BTL class-D audio amplifier. The click is designed to run on either 3.3V or 5V power supply. It communicates with the target MCU over the following pins on the mikroBUS™ line: AN, RST, CS, PWM, INT.

2x5W AMP click features a 3.5mm input jack and four output screw terminals for connecting passive speakers.

Note: In order to achieve full 2x5W output power, keep in mind that you need to supply enough current to the chip.
This is achievable with the EXT PWR header, but you need to switch over the AMP VCC to the left position.

Note: a 3.5mm stereo cable and wired passive speakers are not included in the offer.



Class-D audio amplifier

Class-D audio amplifiers (switching amplifiers) are very energy efficient. They reduce power losses on the output device by operating as an electronic switch, rather than as linear gain devices, like in A or AB amplifiers.

These kinds of amplifiers are ideal for compact, high power applications.

TDA7491LP audio amplifier

The amplifier has three operating modes:

Standby mode: all circuits are turned off, very low current consumption. The amplifier uses a maximum of 10uA in standby mode.

Mute mode: inputs are connected to ground and the positive and negative PWM outputs are at 50% duty cycle.

Play mode: the amplifiers are active.

Simple control

The click does not use a standard serial communication, like I2C or SPI - it's controlled by a few pins on the mikroBUS™ line. The state of these pins can either be HIGH or LOW (mute, gain, enable). The operating modes and gain are set with input pins.

Key features

- TDA7491LP audio amplifier
  - Class-D audio amplifier
  - 2x5W output power
  - Short-circuit protection
  - Thermal overload protection
  - Standby and mute features
- 3.5mm audio jack
- Screw terminals for speaker output
- Interface: AN, RST, CS, PWM, INT
- 3.3V or 5V power supply

SPECIFICATION

Product Type	Amplifier
Applications	Mobile phones, portable sound systems, etc.
On-board modules	TDA7491LP 2x5-watt dual BTL class-D audio amplifier
Key Features	2x5W output power, short-circuit protection, thermal overload protection, 3.5mm audio jack, screw terminals for passive speakers.
Interface	AN, RST, CS, PWM, INT pins
Power Supply	3.3V or 5V
Compatibility	mikroBUS
Click board size	L (57.15 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **2x5W AMP click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
Gain 0 pin	**GN0**	**1**	AN	PWM	**16**	**MUTE**	Mute control
Gain 1 pin	**GN1**	**2**	RST	INT	**15**	**DIA**	Diagnostic pin
Standby control	**STB**	**3**	CS	TX	**14**	NC	Not connected
Not connected	NC	**4**	SCK	RX	**13**	NC	Not connected
Not coneected	NC	**5**	MISO	SCL	**12**	NC	Not connected
Not connected	NC	**6**	MOSI	SDA	**11**	NC	Not connected
Power supply	**+3.3V**	**7**	3.3V	5V	**10**	**+5V**	Power supply
Ground	**GND**	**8**	GND	GND	**9**	**GND**	Ground

Jumpers and settings

Designator	Name	Default Position	Default Option	Description
JP1	AMP VCC	Right	5V	AMP power supply, can be 5V or external (5V-14V)

LEDs, buttons, connectors and switches

Designator	Name	Type (LED, BUTTON...)	Description
EXT PWR	EXT PWR	Connector	two pin non-populated headerfor the external Amp supply

Programming

The library has two helper functions for setting the gain and the mode via output pins.

Code snippet

The demo shows how to initialize, set the mode and the gain of the click.

```
01 void main()
02 {
03     system_init();
04
05     click_2x5W_gain(CLICK_2X5W_AMP_20_DB);
06     click_2x5W_mode(CLICK_2X5W_AMP_MODE_PLAY);
07
08     while( 1 )
09     {
10         if(Button(&GPIOE_IDR, 11, 100, 1))
11         {
12             click_2x5W_gain((click_2x5w_amp_gain_t)(++gain % 4));
13         }
14     }
15 }
```