

user's guide to

# GAMING shield

Gaming shield is an extension board for your mikromedia that provides you with standard gaming buttons and audio speakers, so you can build and play your favorite arcade games.



mikromedia

# TO OUR VALUED CUSTOMERS

I want to express my thanks to you for being interested in our products and for having confidence in Mikroelektronika.

The primary aim of our company is to design and produce high quality electronic products and to constantly improve the performance thereof in order to better suit your needs.

A handwritten signature in white ink, appearing to read 'N. Matic', is positioned above the name and title. The signature is fluid and cursive.

Nebojsa Matic  
General Manager

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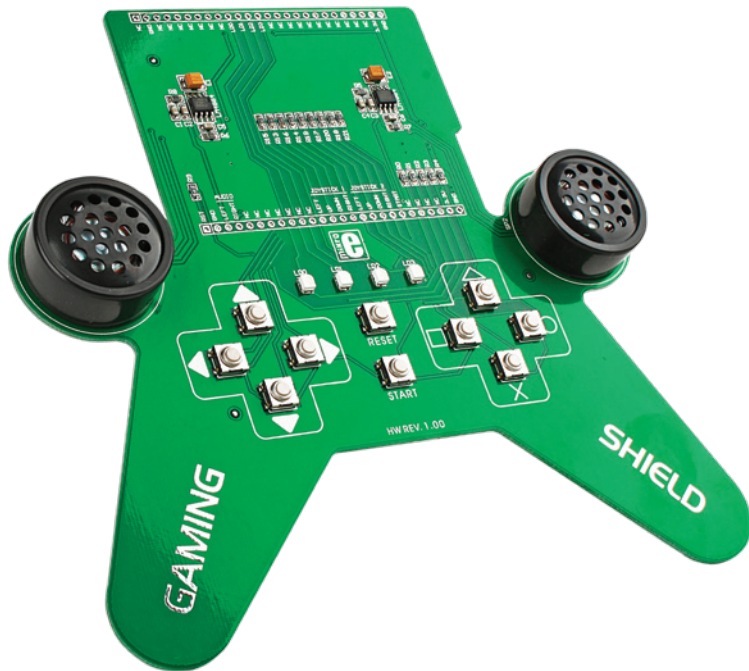
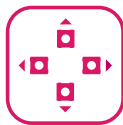
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# Introduction to mikromedia GAMING shield

**mikromedia GAMING shield** is an extension board pin-compatible with several mikromedia boards from mikroElektronika that enables users to provide **button controls** and **audio interface** to your base mikromedia board, which is specially suitable for creating your own gaming console. GAMING Shield comes with convenient **stacking connectors**, so you can easily connect not only mikromedia, but other shields as well, such as **Battery boost shield**. It's carefully designed to fit perfectly into anyone's hands, and it has convenient holders which provide great stability when board is connected to mikromedia.



# Mikromedia compatibility



mikromedia for XMEGA



mikromedia for dsPIC33

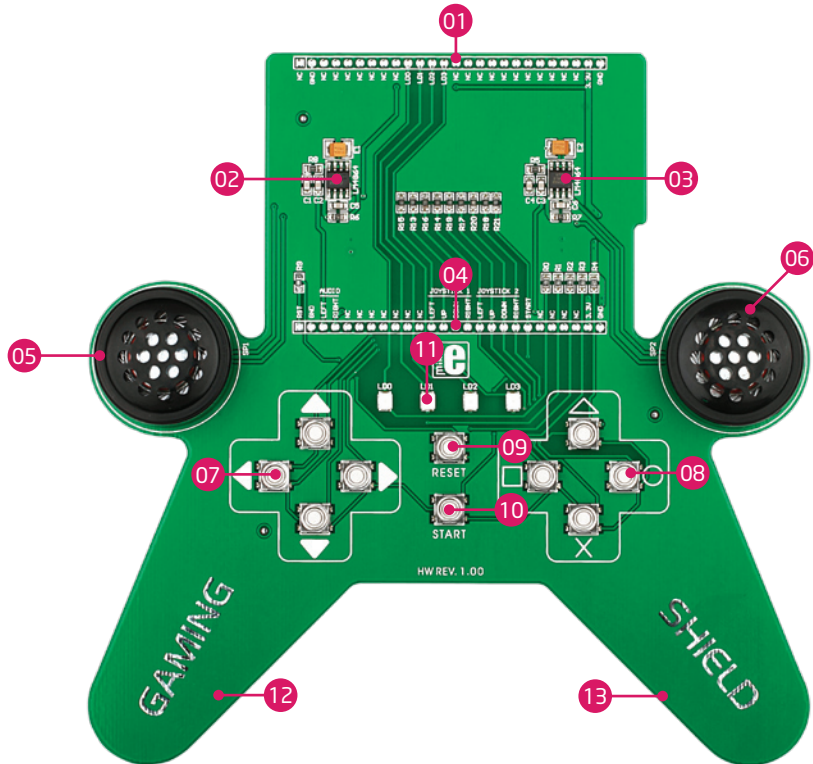


mikromedia for PIC18FJ

Board is compatible with **mikromedia for PIC18FJ v105**, **mikromedia for dsPIC33 v105 & v106** and **mikromedia for XMEGA v110**. All of the mentioned boards can exploit the full potential of the Gaming Shield, including buttons, signal LEDs and audio speakers.

# Key Features

- 01 Top connections pads
- 02 Left Audio Channel amplifier circuit
- 03 Right Audio Channel amplifier circuit
- 04 Bottom connections pads
- 05 Left Speaker
- 06 Right Speaker
- 07 Navigation Joystick
- 08 Action Joystick
- 09 Reset Button
- 10 Start Button
- 11 Indicator LEDs
- 12 Left hand grip
- 13 Right hand grip





## System Specification



### power supply

Over a USB cable (5V DC)



### power consumption

50mA in idle state

(when on-board modules are off)



### board dimensions

15.2 x 15.1cm (5.98" x 5.94")



### weight

~74g (0.16 lbs)

# 1. Soldering stacking headers

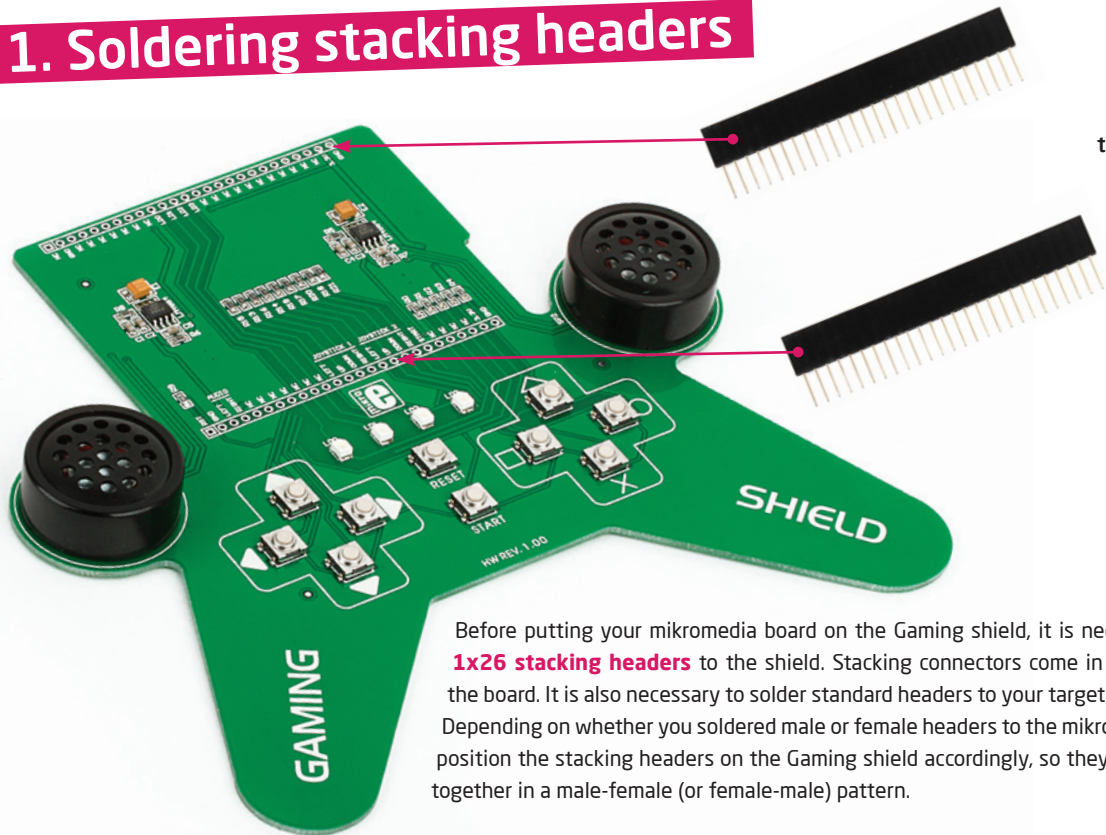
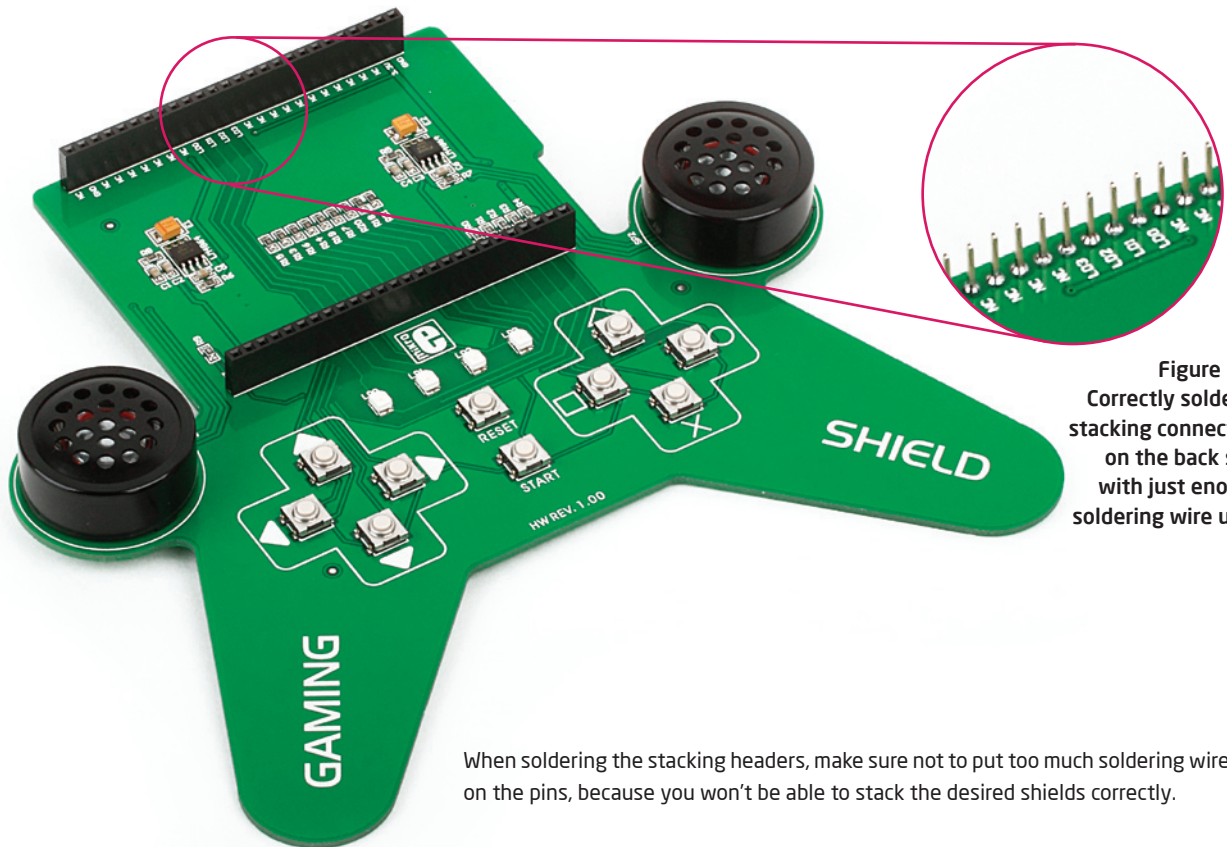


Figure 1-1:  
Positioning  
the stacking  
headers

Before putting your mikromedia board on the Gaming shield, it is necessary to solder **1x26 stacking headers** to the shield. Stacking connectors come in the package with the board. It is also necessary to solder standard headers to your target mikromedia board. Depending on whether you soldered male or female headers to the mikromedia, you should position the stacking headers on the Gaming shield accordingly, so they can be connected together in a male-female (or female-male) pattern.





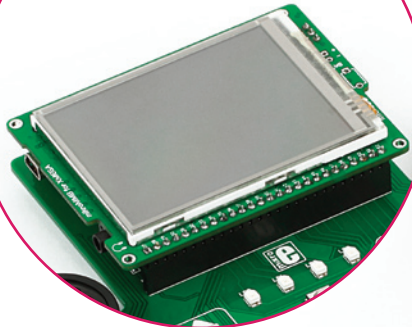
**Figure 1-2:**  
Correctly soldered  
stacking connectors  
on the back side  
with just enough  
soldering wire used

When soldering the stacking headers, make sure not to put too much soldering wire on the pins, because you won't be able to stack the desired shields correctly.

## 2. Connecting to mikromedias

Once you have soldered the stacking headers, you can connect your mikromedia to the gaming shield. Make sure to connect the boards so that the shapes of mikromedia and top of the gaming shields are aligned.

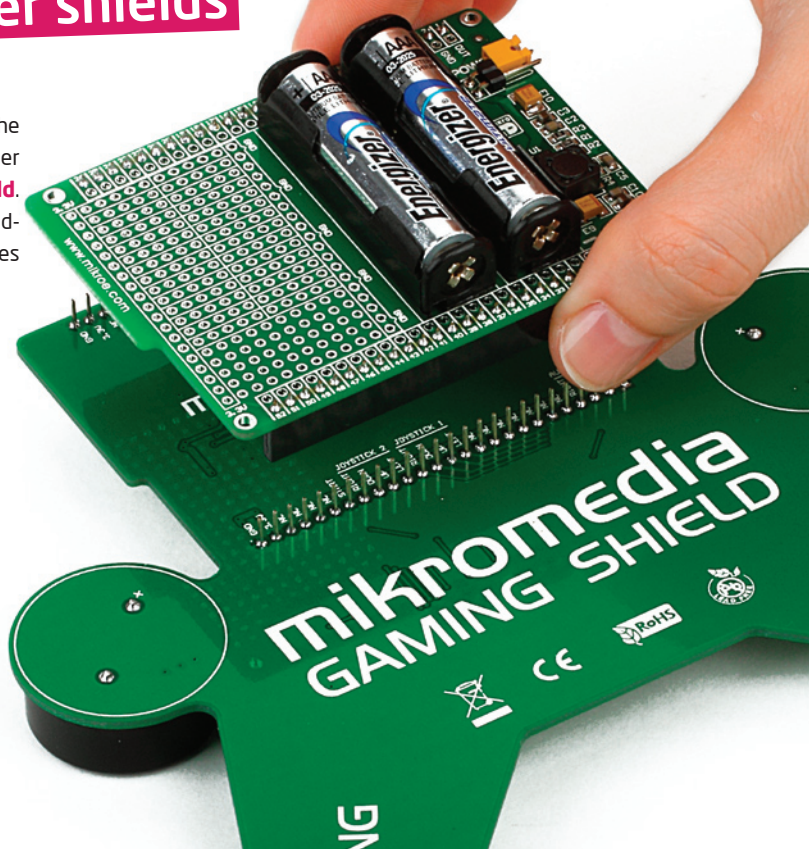
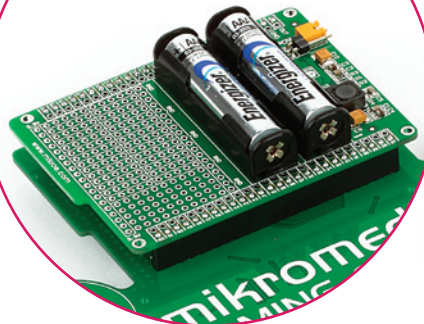
**Figure 2-1: mikromedia board correctly placed on the gaming shield**



### 3. Connecting to other shields

When front side is connected with mikromedia, the rear side of the board can be used for stacking other mikromedia shields, such as the **Battery Boost shield**. Make sure to solder the appropriate headers to this add-on shield, and make sure to match the board outlines when connecting them together.

Figure 3-1: Battery Boost shield correctly placed on the gaming shield



## 4. Control Buttons and signal LEDs

mikromedia Gaming shield provides standard button controls required in most arcade games. There are two sections of buttons for standard gaming functions: **steering** (left, right, up, down), **actions** (triangle, square, x, and circle), but we also added **Start** and **Reset** buttons. Board features four signal LEDs which can be used as indicators of game status, or other activities.

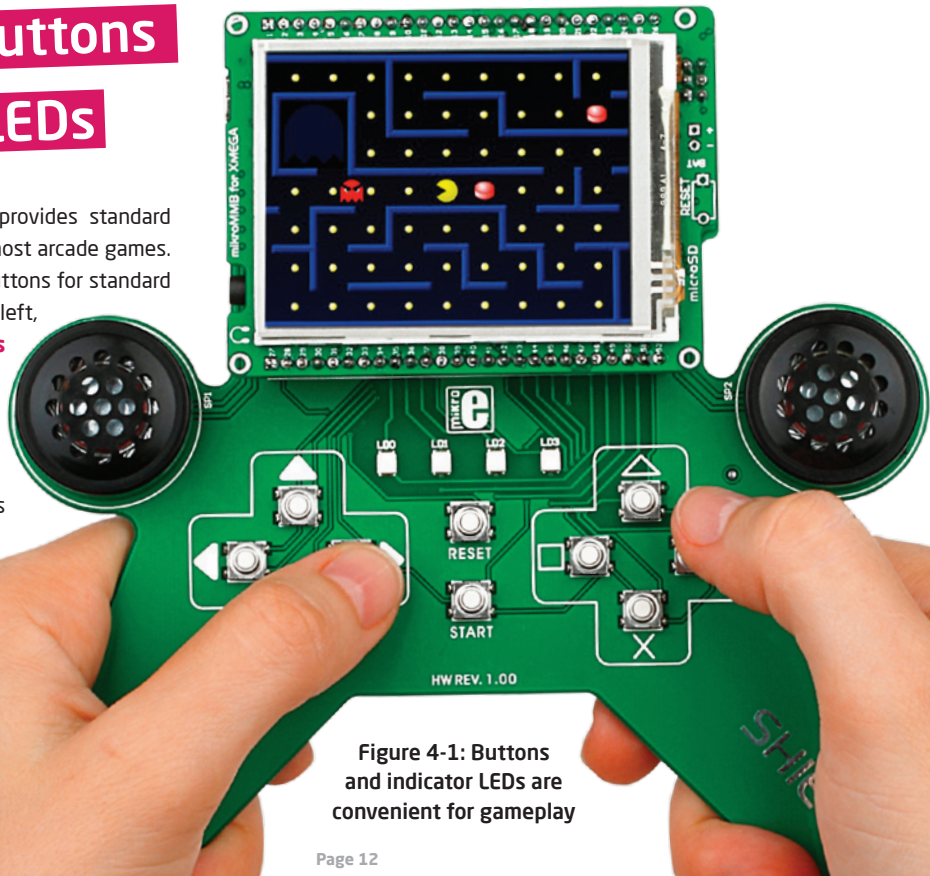


Figure 4-1: Buttons and indicator LEDs are convenient for gameplay

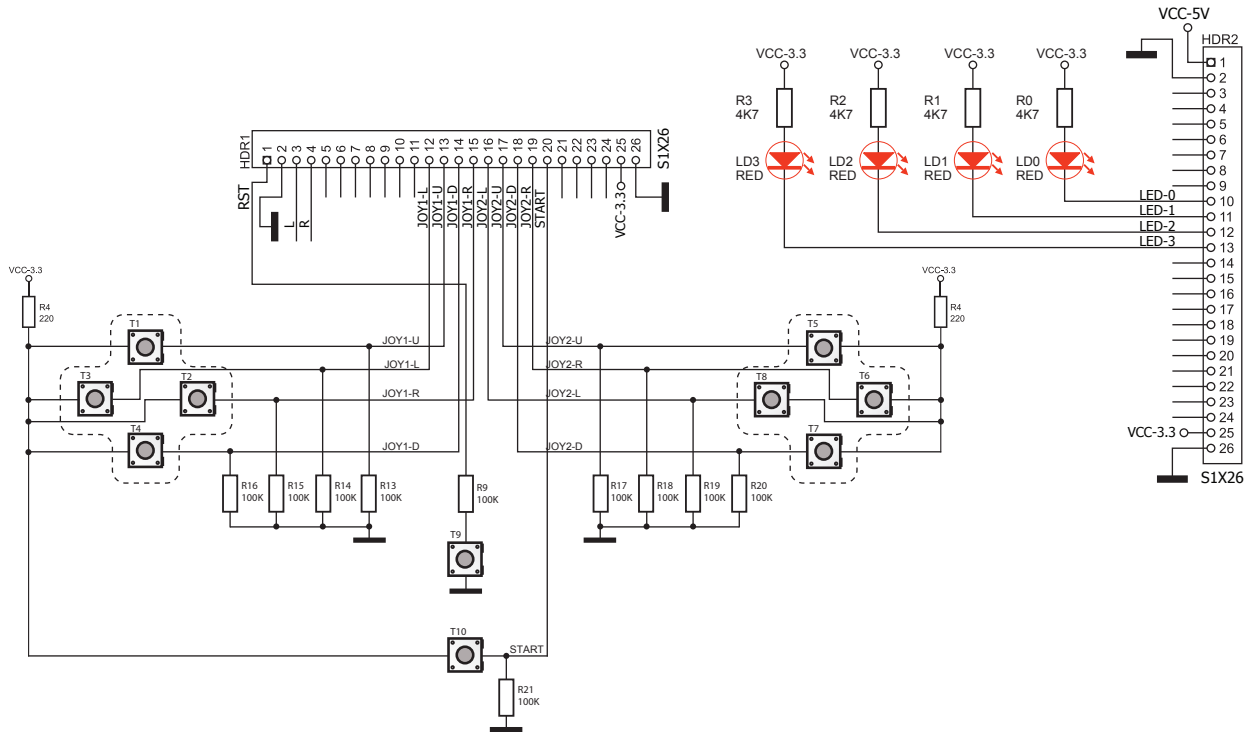


Figure 4-2: Schematics of button and LED connections

## 5. Audio module

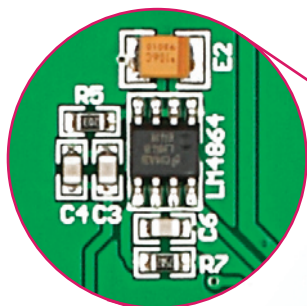
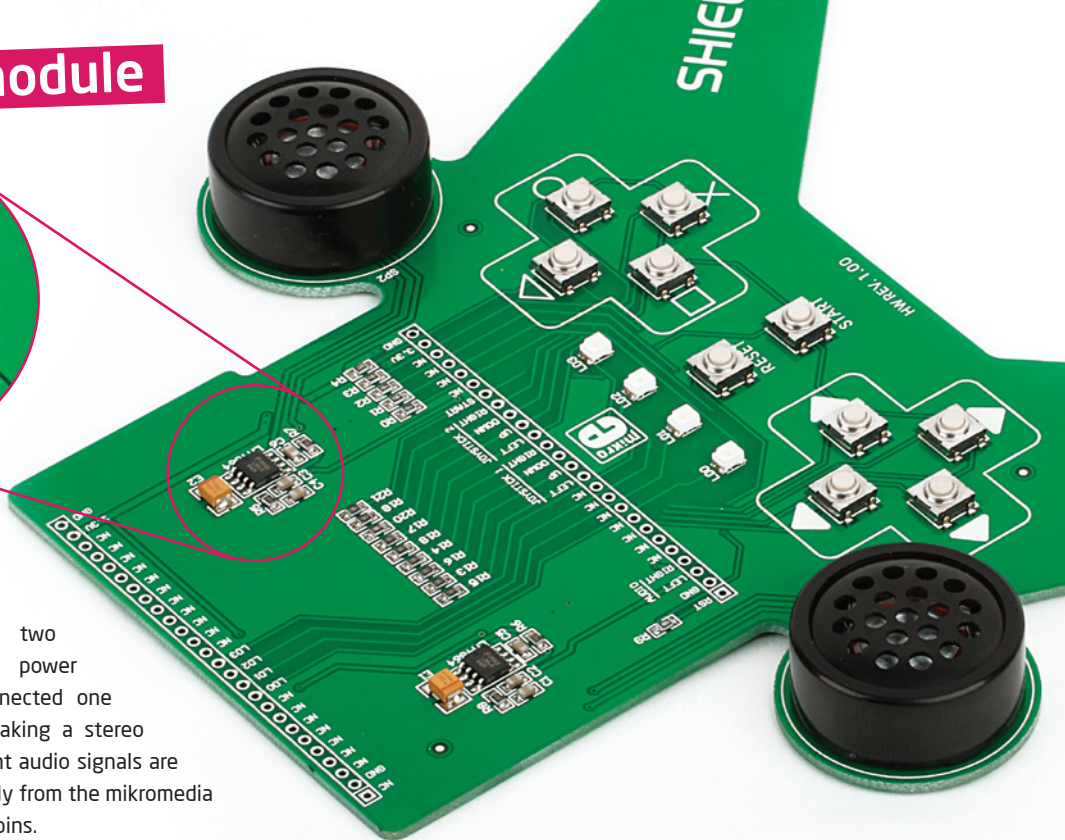


Figure 5-1:  
LM4864 audio  
amplifier circuit

Board is equipped with two **LM4864** 300mW audio power amplifiers, which are connected one to each speakers, thus making a stereo audio system. Left and right audio signals are brought to the board directly from the mikromedia board via two connections pins.



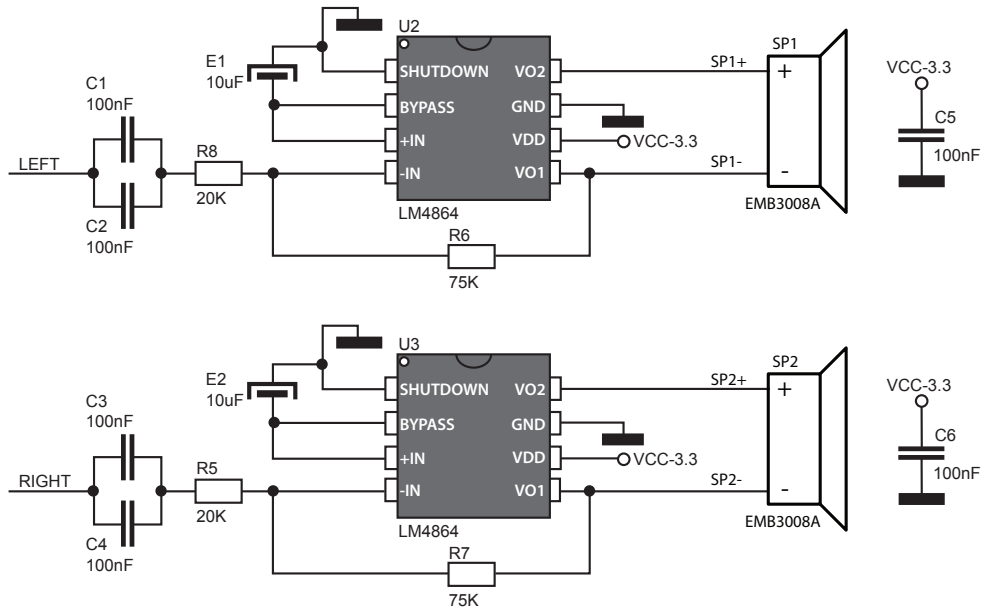
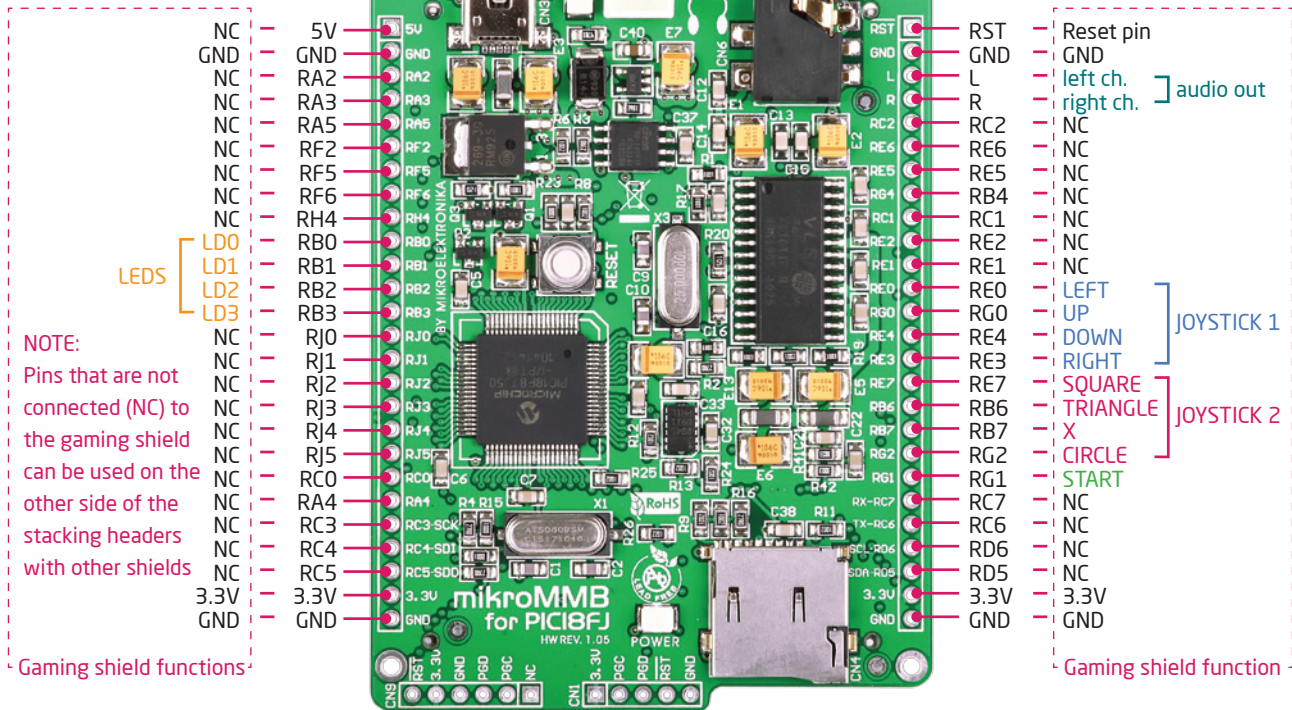


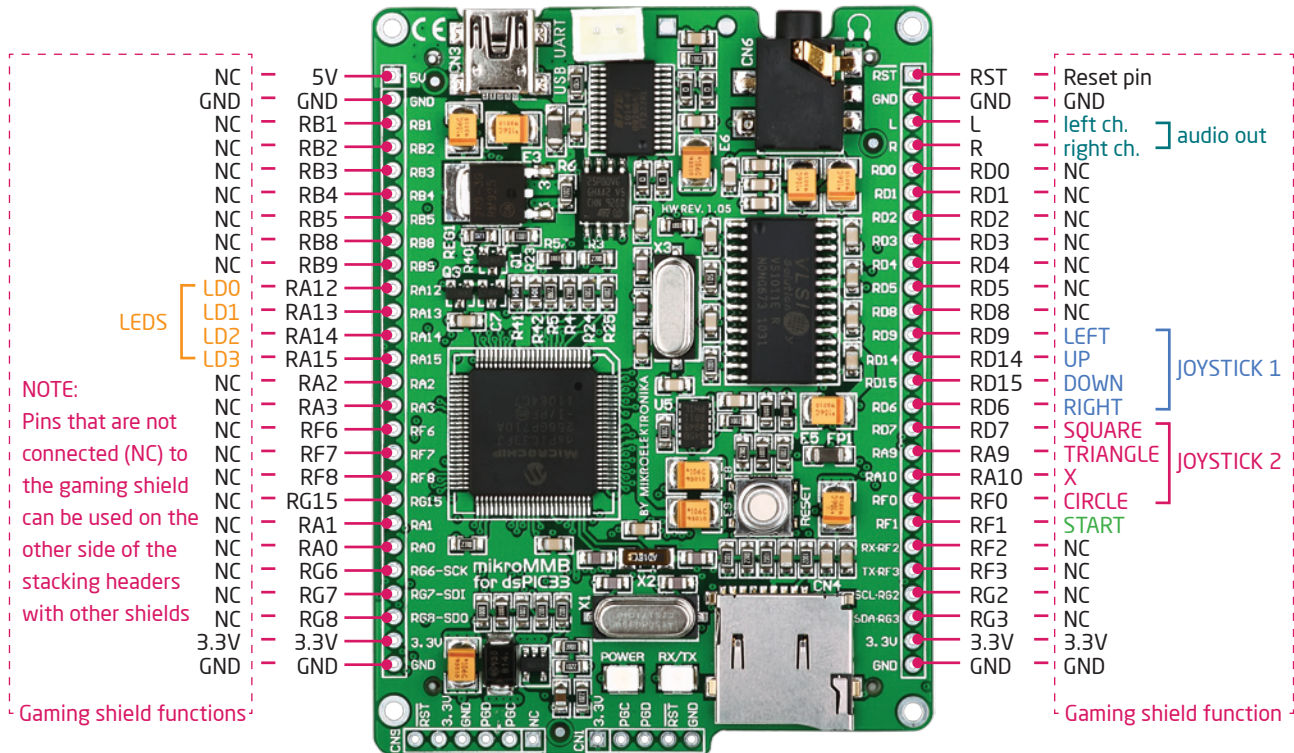
Figure 5-2: Left and right audio amplifier circuit schematics

# Gaming pinout on mikromedia for PIC18FJ





# Gaming pinout on mikromedia for dsPIC33



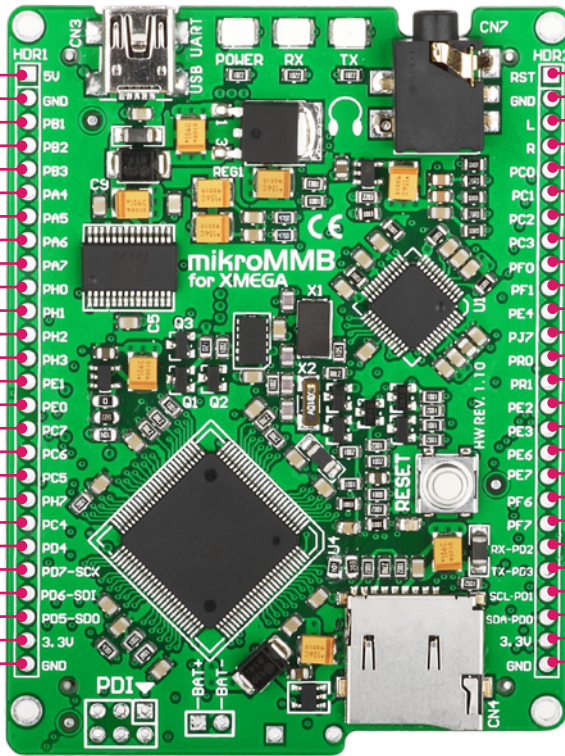
# Gaming pinout on mikromedia for XMEGA

NOTE:  
Pins that are not connected (NC) to the gaming shield can be used on the other side of the stacking headers with other shields

Gaming shield functions

NC  
GND  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
LD0  
LD1  
LD2  
LD3  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
NC  
3.3V  
GND

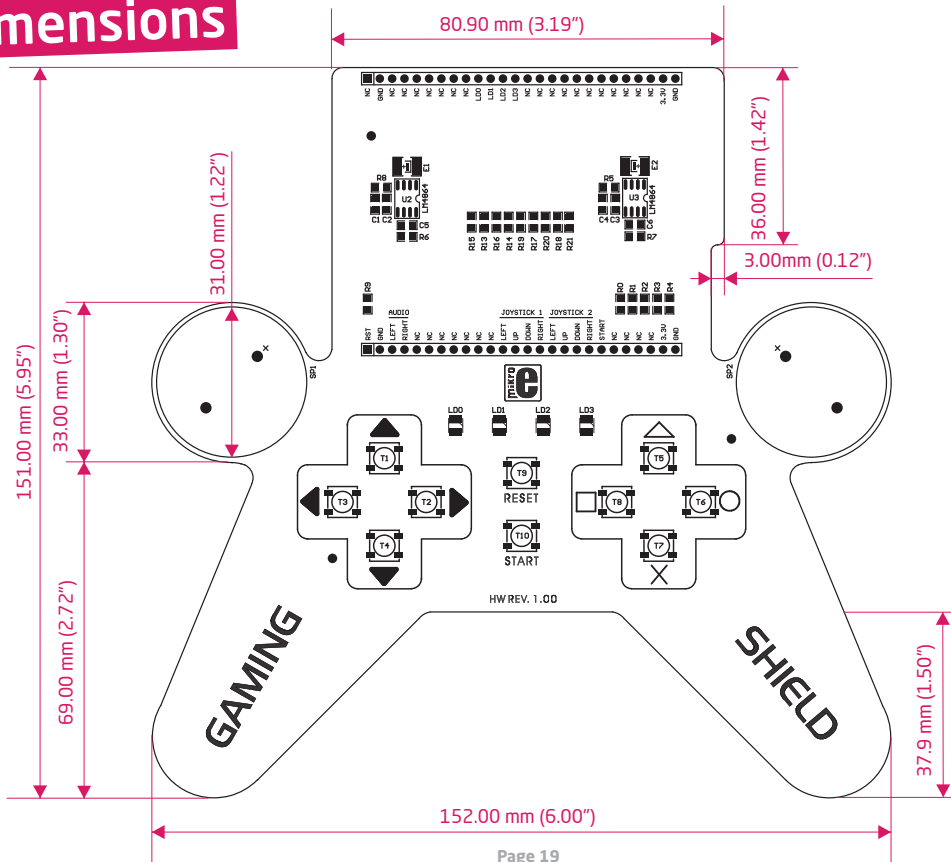
5V  
GND  
PB1  
PB2  
PB3  
PA4  
PA5  
PA6  
PA7  
PH0  
PH1  
PH2  
PH3  
PE1  
PE0  
PC7  
PC6  
PC5  
PH7  
PC4  
PD4  
PD7-SCX  
PD6-SDI  
PD5-SDO  
3.3V  
GND



RST  
GND  
L  
R  
PC0  
PC1  
PC2  
PC3  
PC6  
PC7  
PE1  
PE0  
PE2  
PE3  
PE6  
PE7  
PF6  
PF7  
PD2  
PD3  
PD1  
PD0  
3.3V  
GND

Reset pin  
GND  
left ch.  
right ch. ] audio out  
NC  
NC  
NC  
NC  
NC  
NC  
LEFT  
UP  
DOWN  
RIGHT  
SQUARE  
TRIANGLE ] JOYSTICK 1  
X  
CIRCLE  
START ] JOYSTICK 2  
NC  
NC  
NC  
NC  
3.3V  
GND  
Gaming shield function

# 7. Dimensions



Notes:

Notes:

Notes:

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