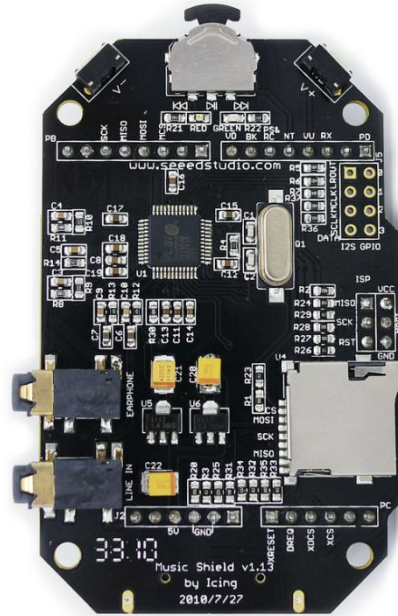


Seed music shield

Introduction

Seed music shield is an ipod/iphone dock compatible shield, can work on ATmega168 and ATmega328 based board like Arduino or Seeeduino v328, Seeeduino Mega and Arduino. It is based on VS1053b, can play variety of music format stored on MicroSD card.



Features

- ipod/iphone dock compatible
- Supported for ATmega168, 328, 1280 based board
- Standard interface for arduino board
- Multi-format "MP3" media player that uses a single VS1053b
- 2 control-push buttons and 1 knob switch
- Plays music from micro SD cards
- Decodes: MP3,WMA,WAV,MIDI,Ogg Vorbis,FLAC(with software plugin)
- I2S interface for external DAC
- Headphone / Line Out for playback
- Line In for recording in OGG format
- Excellent sound quality: over 90 dB dynamic range for playback
- RoHS Complied

Specification

Working voltage	5 V
Weight	18 g
Length	7.5 cm
depth	4.5 cm

NOTE: New demo code [MusicShieldNewSDLib](#) is available for running on Atmega 168 based board. Only ATmega 1280 has enough Flash for recording. Micro SD card more than 2G is not recommended.

New features can be added by the customer because full source code for the VS1053 player

application is available for free!



Hardware and Installation

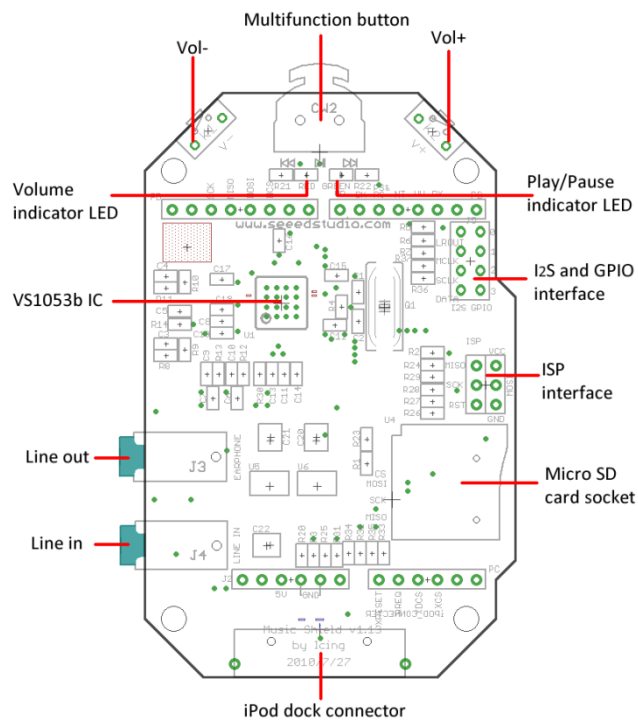


Figure 1

Multifunction button: Left press to previous song, right to next. Push it down to play or pause.

Volume indicator LED (RED): If volume+, the red LED will be brighter.

Play/Pause indicator LED (GREEN): If playing, the green LED blinks.

iPod dock connector can supply 5V power to music shield and arduino board.

Arduino Pins Usage

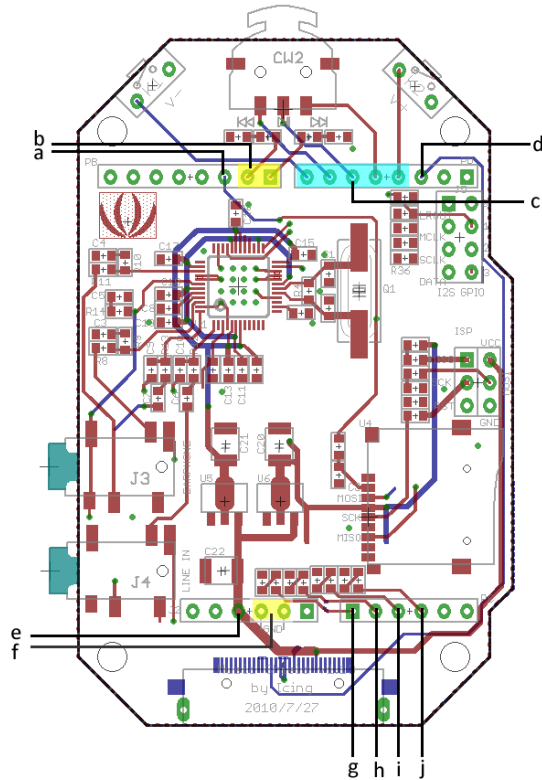


Figure 2

- a) MCS for micro SD socket
- b) Indicator LEDs
- c) Music control button
- d) RX Dock data exchange
- e) 5V power supply
- f) GND
- g) Reset
- h) DREQ for VS1053b
- i) XDACS / BSYNC for VS1053b
- j) XCS for VS1053b

MCS	Chip select input (active low)
DREQ	Data Request Pin
XDACS / BSYNC	Data chip select / byte sync
XCS	Chip select input (active low)

SPI Buses

The SPI Bus has been used for both VS1053b's and Micro SD socket.

The SPI bus specifies four logic signals.

SCLK — Serial Clock (output from master)

MOSI — Master Output, Slave Input (output from master)

MISO — Master Input, Slave Output (output from slave)

CS— Chip Select, Slave Transmit Enable (active low; output from master)

Figure 3 shows that SCLK, MOSI, MISO signals of Micro SD socket and VS1053b are identical and connected with the ISP interface.

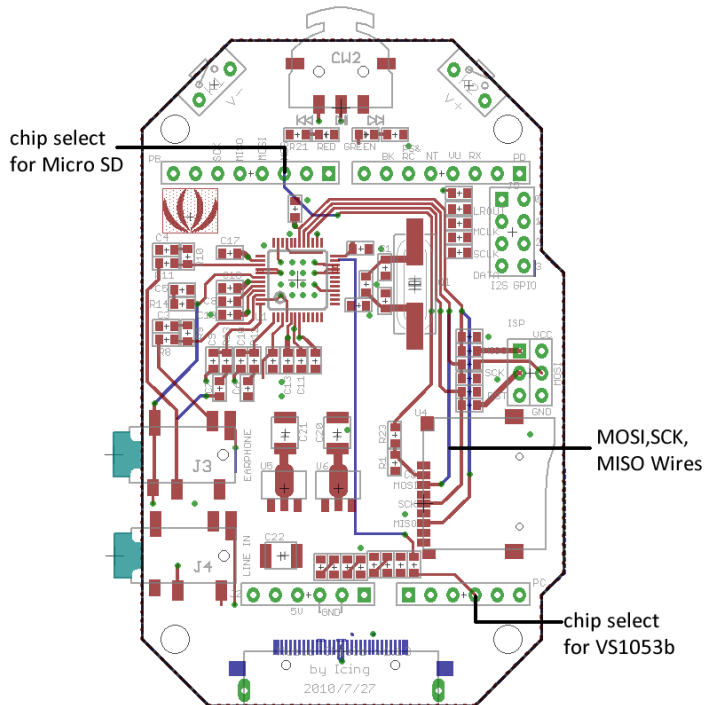


Figure 3

I2S and GPIO interface

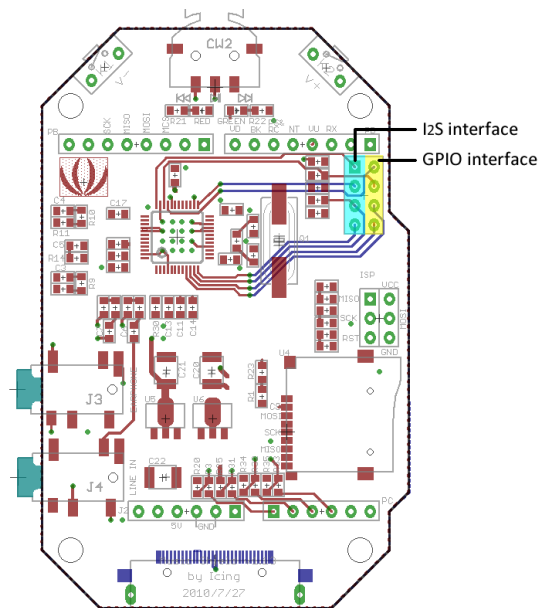


Figure 4

The I2S output interface could be enabled by using “#define ENABLE_I2S_OUTPUT 1” or disabled by using “#define ENABLE_I2S_OUTPUT 0” on top of the file vs10xx.cpp.

Software Installation

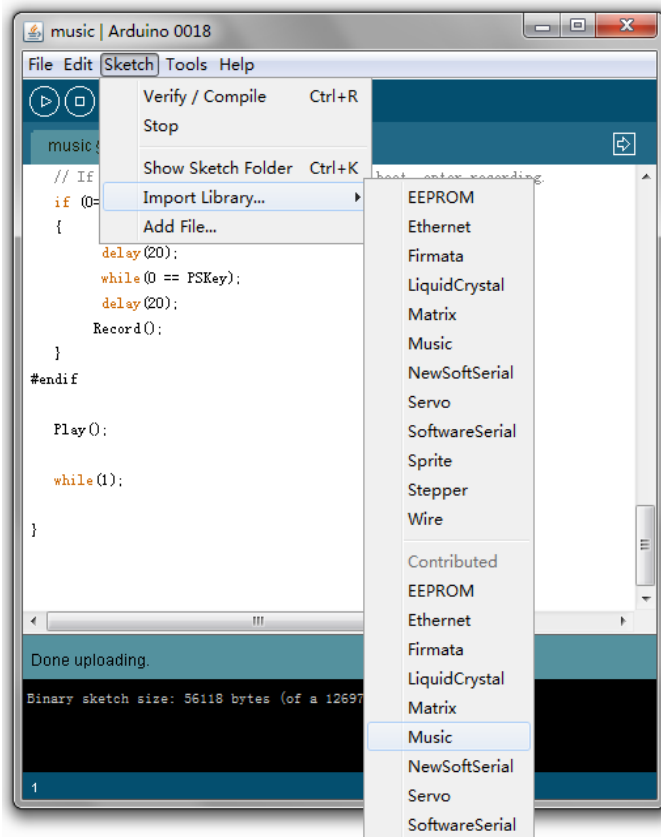
Codes of music shield can be downloaded from here:

<http://code.google.com/p/musicshield/downloads/list>

Note: New demo code [MusicShieldNewSDLib](#) for ATmega168 based board is much easier to use without the following steps.

To use the record function on ATmega1280 based board, you need to do as follows:

- 1) Download music library and NewSoftSerial library for music shield.
- 2) Uncompress these two files and Put these libraries in Arduino-0018 program:
..\arduino-0018\libraries
- 3) Download a new portpins.h file and replace the default portpins.h file of Arduino-0018 program:
..\arduino-0018\hardware\tools\avr\avr\include\avr
- 4) Download the [music v1_13](#) and unzip into your working directory, and then run the arduino program and download the sketch into Arduino board.
- 5) Just enjoy.



How to record?

1. Make sure there is already a micro SD card in the socket.
2. Press play/stop knob before pressing the RESET button of Aruino.
3. Release RESET button for a second and then release play/stop knob. When the music shield is beginning to record, the green and red LEDs will blink synchronous.
4. Press play/stop knob will stop recording.

Recording function works well if the line in of music shield is connected with line out of computer or other device, and you can even record different kinds of signal other than music.

Revision History

Rev.	Descriptions	Release date
1.0	Initial public release	17.06.2010
2.0	Public release 2.0	03.09.2010
2.1	Add info about the new demo for Atemag168 based board.	21.10.2010