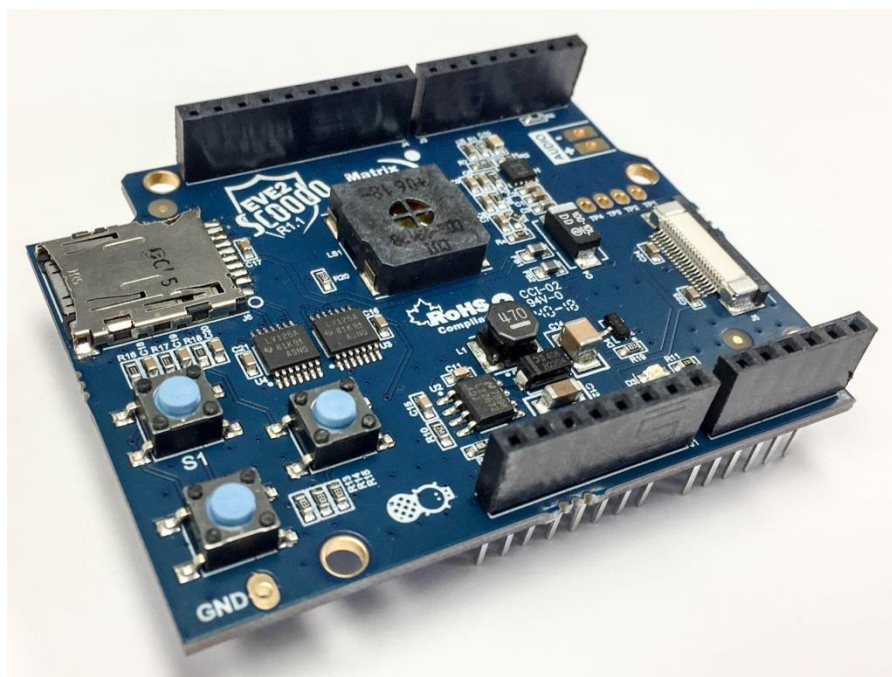


# Scodo EVE Shield

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## Hardware Manual

Revision 1.0



## Revision History

Revision	Date	Description	Author
1.0	January 14, 2019	Initial Release	Divino



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# 1 Introduction

The Matrix Orbital Scoodo EVE Shield is designed to reduce development time by simplifying the process of mating an EVE series display with common microcontrollers. Built to stack on top of an Arduino Uno R3 or similar, the Matrix Orbital Scoodo EVE Shield does not disrupt the Arduino Uno’s functionality, and all unused pins remain accessible for interfacing.

This Kit includes:

- Scoodo EVE Shield
- EVE2 FFC-20P ribbon cable

## 2 Scoodo EVE Shield

### 2.1 Overview

The Scoodo EVE Shield is populated with an SD card holder, allowing image, video, and audio files to be stored for the EVE controller to access during operation. An on board audio amplifier and speaker are provided, enabling audio playback from the EVE. Three buttons are also provided, offering physical user controls. SPI level shifters ensure that the 5V signals generated by the microcontroller won’t damage the 3.3V EVE.

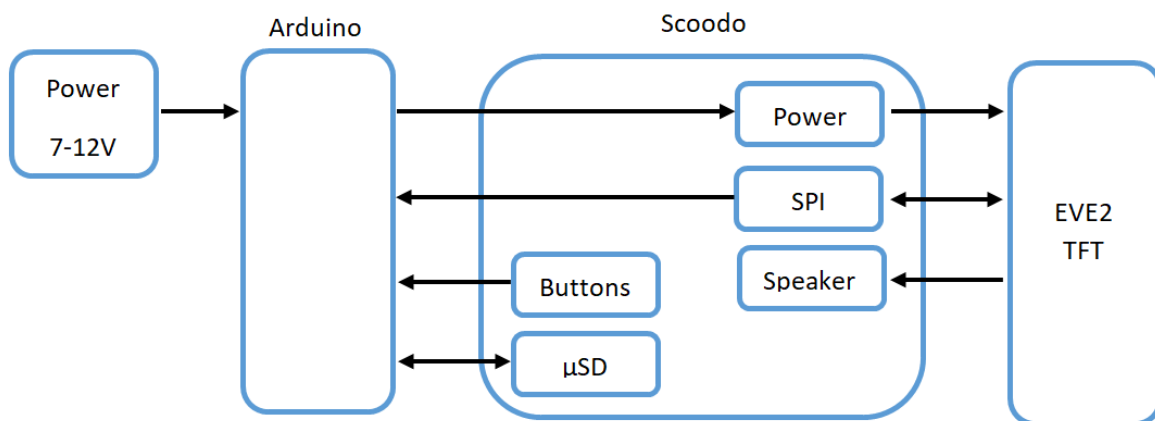


Figure 1: Scoodo EVE Shield Block Diagram



### 3 Scoodo EVE Shield Headers

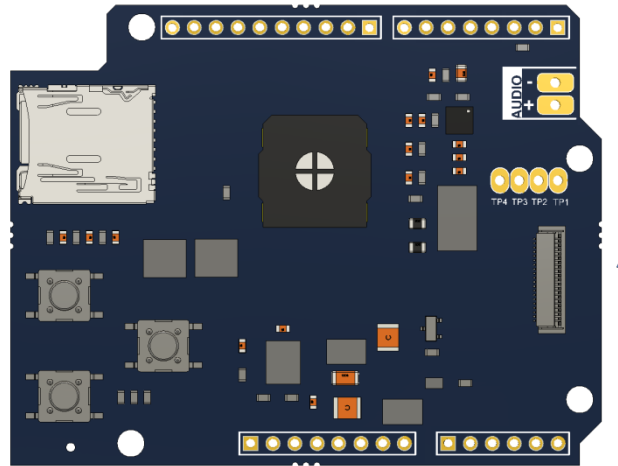


Figure 2: Scoodo EVE Shield Header Locations

Table 1: List of available Headers

#	Header	Standard Mate
1	SPI Communication and Power	FFC-20P*

\*Note: The FFC-20P cable is included with the Scoodo EVE Shield.

#### 3.1 SPI Communication and Power Header

The 20 pin FFC header on the Scoodo EVE Shield is used to interface with an SPI device, such as an EVE2 Display Module. This FFC header will mate with any 20 pin FFC cable with a 0.5mm pitch and bottom contacts, such as the Wurth Electronics INC 687620050002 series ribbon cable.

Table 2 SPI Communication and Power Header Pinout

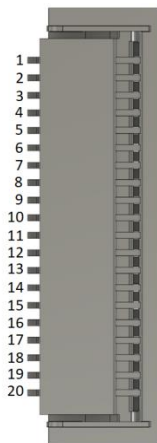


Figure 3: SPI Communication and Power Header

Pin	Symbol	Type	Function
1	Vout	Power	Logic Voltage (3.3V)
2	GND	Ground	Ground Connection
3	SCK	Input	SPI clock input
4	MISO	Input/output	SPI MISO output
5	MOSI	Input/output	SPI MOSI input
6	CS	Input	SPI slave select input
7	$\overline{\text{INT}}$	Level shifted pass-through	Interrupt to host
8	RST		FT81x Reset pin
9	NC	No connection	No connection
10	AUDIO	Output	Audio PWM out
11	IO2	Input/output	General purpose IO 0
12	IO3	Input/output	General purpose IO 1
13	GPIO2	Input/output	General purpose IO 2
14	GPIO3	Input/output	General purpose IO 3
15	GND	Ground	Ground connection
16	Vout	Power	Logic Voltage (3.3V)
17	NC	No connection	No connection
18	NC	No connection	No connection
19	NC	No connection	No connection
20	NC	No connection	No connection



## 4 Scoodo EVE Shield Peripherals and Features

### 4.1 Keys

Three momentary push buttons are available on the Scoodo EVE Shield, and connect directly to the microcontroller's Digital Pins 5, 6 and 7.

### 4.2 Micro SD Card Slot

A micro SD card slot is available on the Scoodo EVE Shield, providing the option to store asset files to be accessed later, during operation. The Scoodo EVE Shield is compatible with SD and SDHC type microSD cards.

## 5 Shield Pinout

### 5.1 Pinout

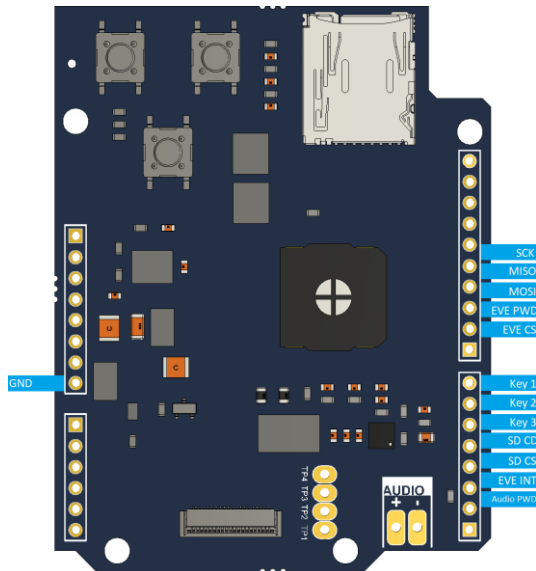


Table 3: Scoodo EVE Shield Pin Assignment

Pin	Function	Pin	Function
GND	GND	PD7	Key 3
PD1	Audio PD	PB1	EVE CS
PD2	EVE Int	PB2	EVE PD
PD3	SD CS	PB3	MOSI
PD4	SD CD	PB4	MISO
PD5	Key 1	PB5	SCK
PD6	Key 2		

Figure 4: Scoodo EVE Shield Pinout

The Scoodo EVE Shield makes use of 13 of the microcontroller's pins. 6 pins are required to communicate with the EVE display directly, and another 7 pins are used to interact with the additional peripherals available on the board.

### 5.2 Power specifications

The Scoodo EVE Shield operates off of the 7 - 12V provided by the microcontroller's Vin pin. A 7 - 12V power supply may need to be connected to the controller board in order for sufficient power to be supplied to the Scoodo and to the attached EVE display. When choosing an adaptor, please ensure it uses a centre positive 2.1mm plug and conforms to the voltage and current requirements of the controller board. A 1 amp power supply is suggested as some EVE backlights require a significant amount of current.

## 6 Board Compatibility

The Scoodo EVE Shield is compatible with the current EVE2 line up offered by Matrix Orbital. The Shield will also fit any microcontroller that shares a similar form factor and pin out as the Arduino Uno. Please check your microcontroller's pin out to ensure compatibility with the Scoodo EVE Shield. If you have any questions, you can [Contact support](#)..

The Scoodo EVE Shield has been tested with the following:

- Arduino Uno
- Parallax Propeller



## 7 Appendix

### 7.1 Environmental

Table 4: Scoodo Limiting Values

Operating Temperature	-20 to +70 °C
Storage Temperature	-30 to +80 °C

### 7.2 Electrical Characteristics

Table 5: Electrical Specifications

Parameter	Min	Max	Unit
Supply Voltage	7	12	V
SPI Pins	0	5	V



## 8 Scoodo EVE Shield Design

### 8.1 Scoodo EVE Shield PCB model

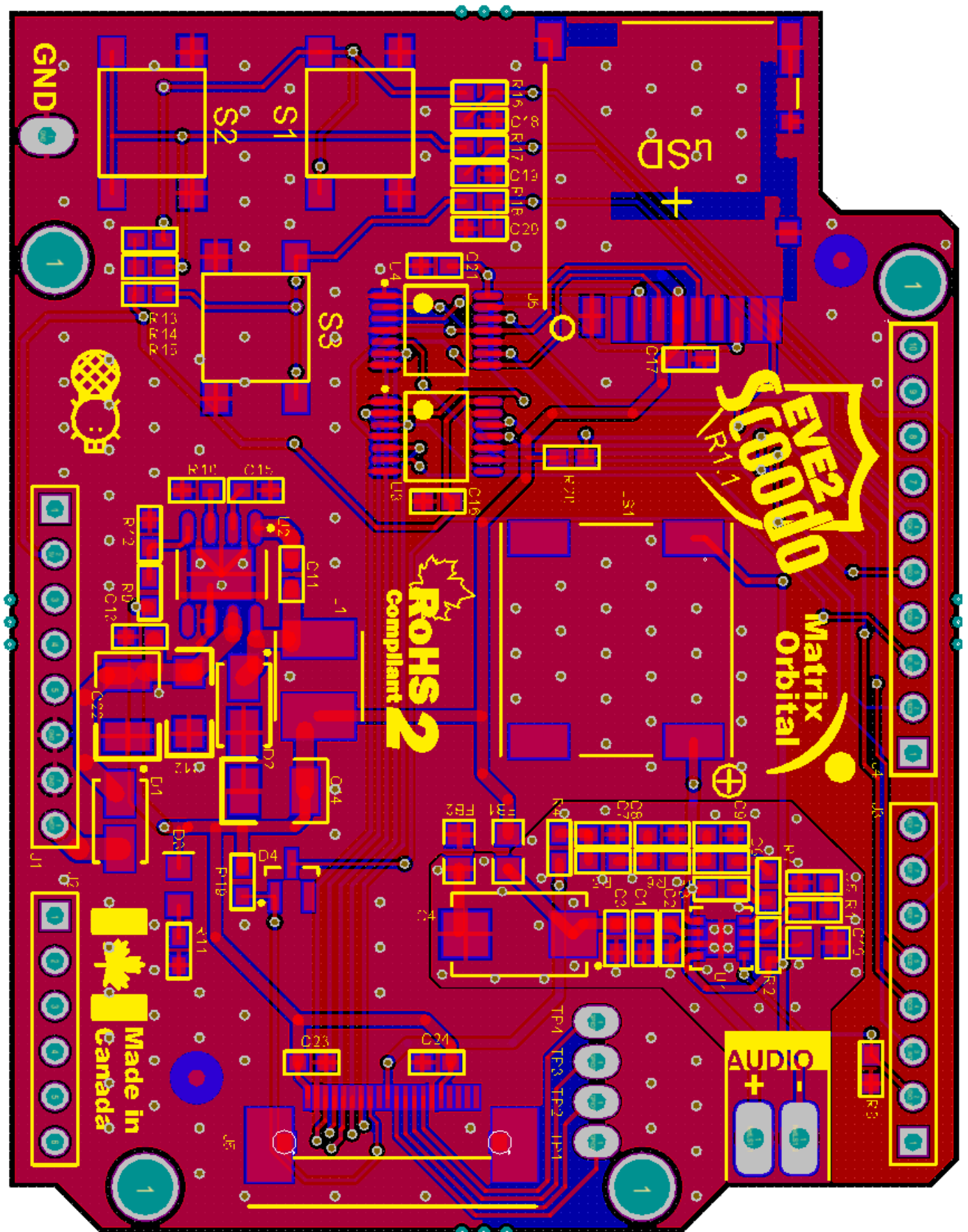


Figure 5: Scoodo EVE Shield PCB





## 8.2 Scoodo EVE Shield Schematic

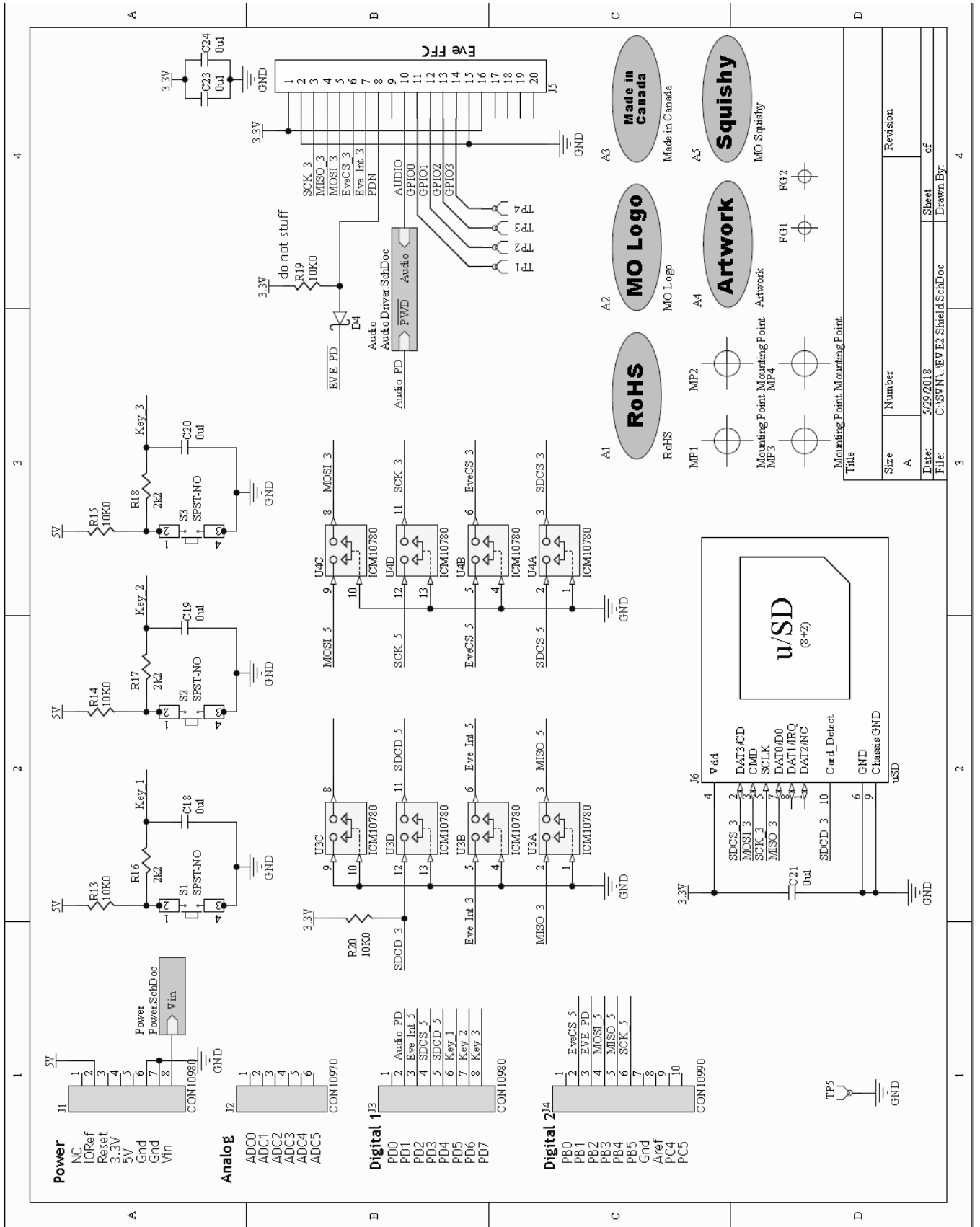


Figure 6: Scoodo EVE Shield Schematics

### 8.3 Scodo EVE Shield Audio Driver

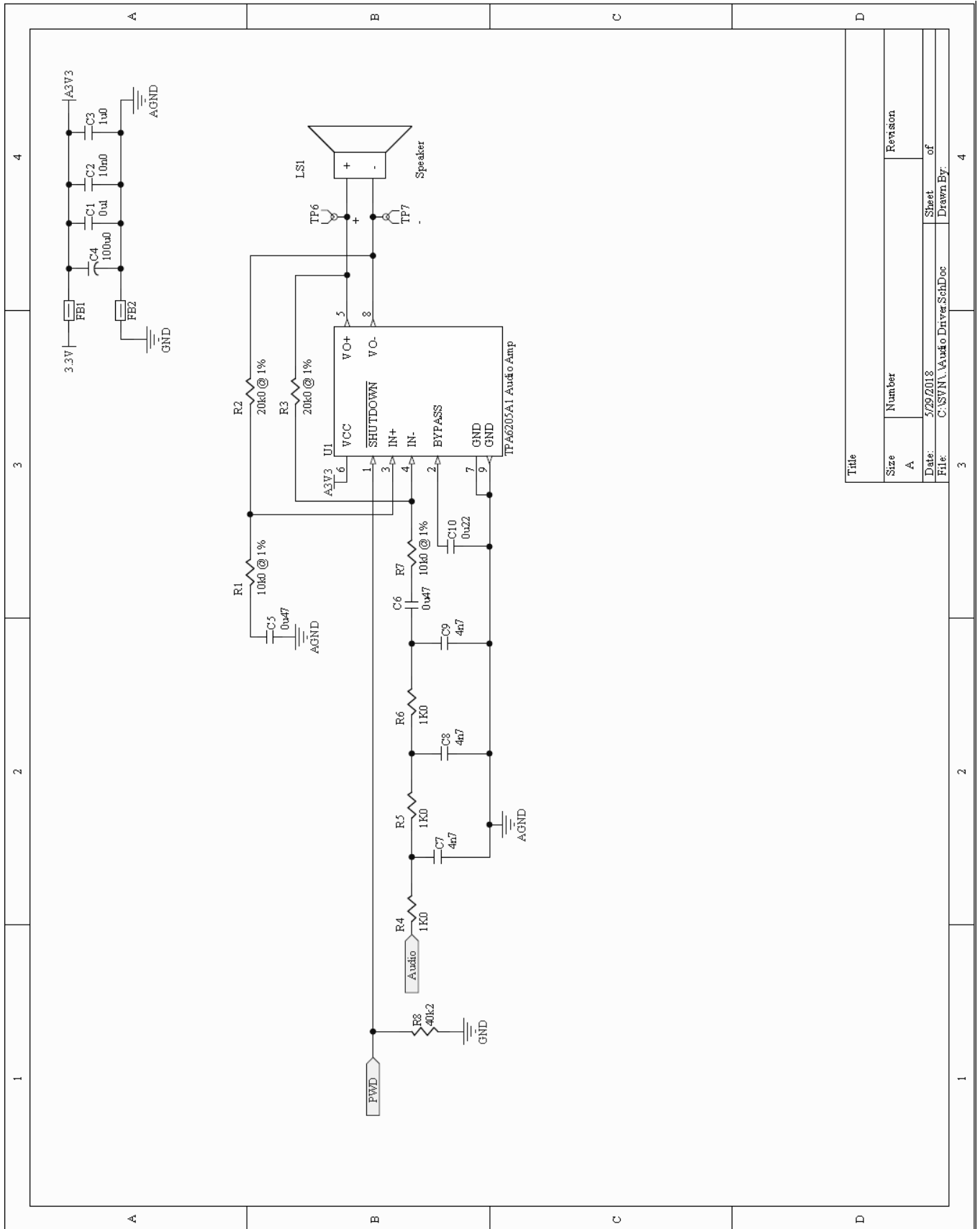


Figure 7: Scodo EVE Shield Audio Amplifier and Speaker



## 8.4 Scoodo EVE Shield Power circuit

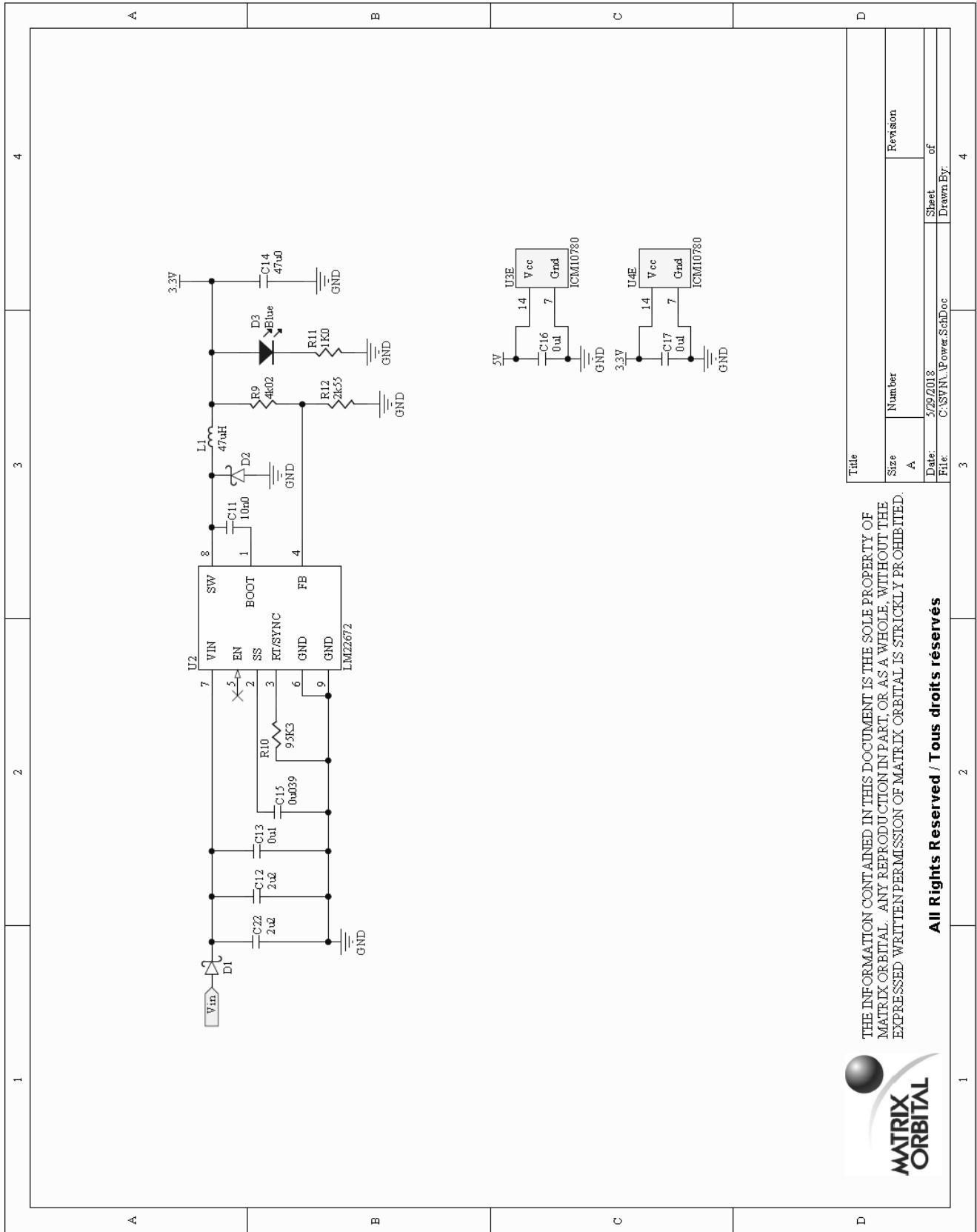


Figure 8: Scoodo EVE Shield Power Circuit Schematic

## 9 Contact

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