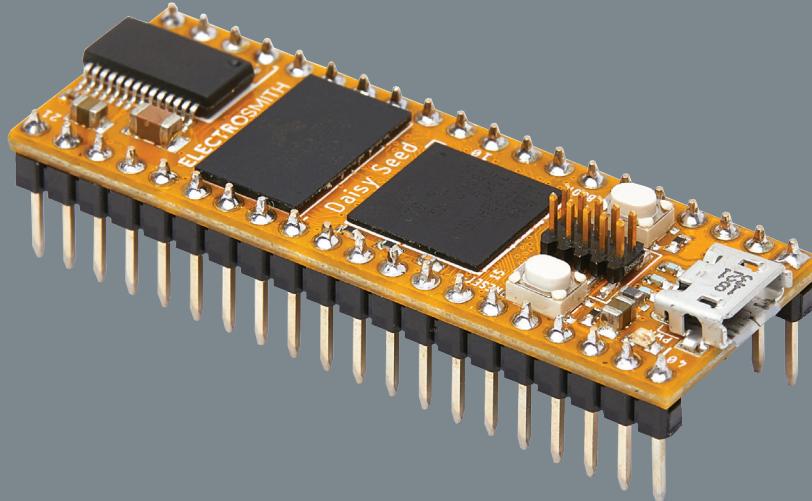


Daisy Seed

Embedded DSP Platform



Features:

- Embedded platform for audio applications
- 96kHz / 24-bit audio hardware
- 64MB of SDRAM for up to 10 minute long audio buffers
- ARM Cortex-M7 MCU, running at 480MHz
- 31 total GPIO pins with configurable functionality
- 12-bit Digital to Analog Converters (x2)
- SD card interfaces
- PWM outputs
- Serial Protocols for connecting external sensors and devices (SPI, UART, I2S, I2C)
- Dedicated VIN pin for power
- Micro USB port, and additional USB pins for full OTG-support as host and device

Description:

Daisy is an embedded platform for music. It features everything you need for creating high fidelity audio hardware devices. Just plug in a USB cable and start making sound! No soldering required.

Programming the Daisy is a breeze with support for a number of languages including Arduino, and Max/MSP Gen~. To get started, simply upload an example program over USB, and start tweaking!

Documentation, and examples are hosted on our Github repository for easy download. All firmware that we develop is released for free under a permissive open source license(MIT).

Applications:

- Electronic Instruments (Eurorack modules, synthesizers, samplers, drum machines)
- Effects Units (Desktop Effects, Effects Pedals)
- Audio Playback (Sound Installations, Audio Feedback Devices)



Colophon

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
this device may not cause harmful interference, and
this device must accept any interference received, including interference that may cause undesired operation.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

WARNING

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Disclaimer: Electrosmith products should not be used in medical or life saving devices, or any uses requiring fail-safe performance. Electrosmith reserves the right to change, add, or remove any information and assets included in the Daisy Seed datasheet at any time without prior notice.

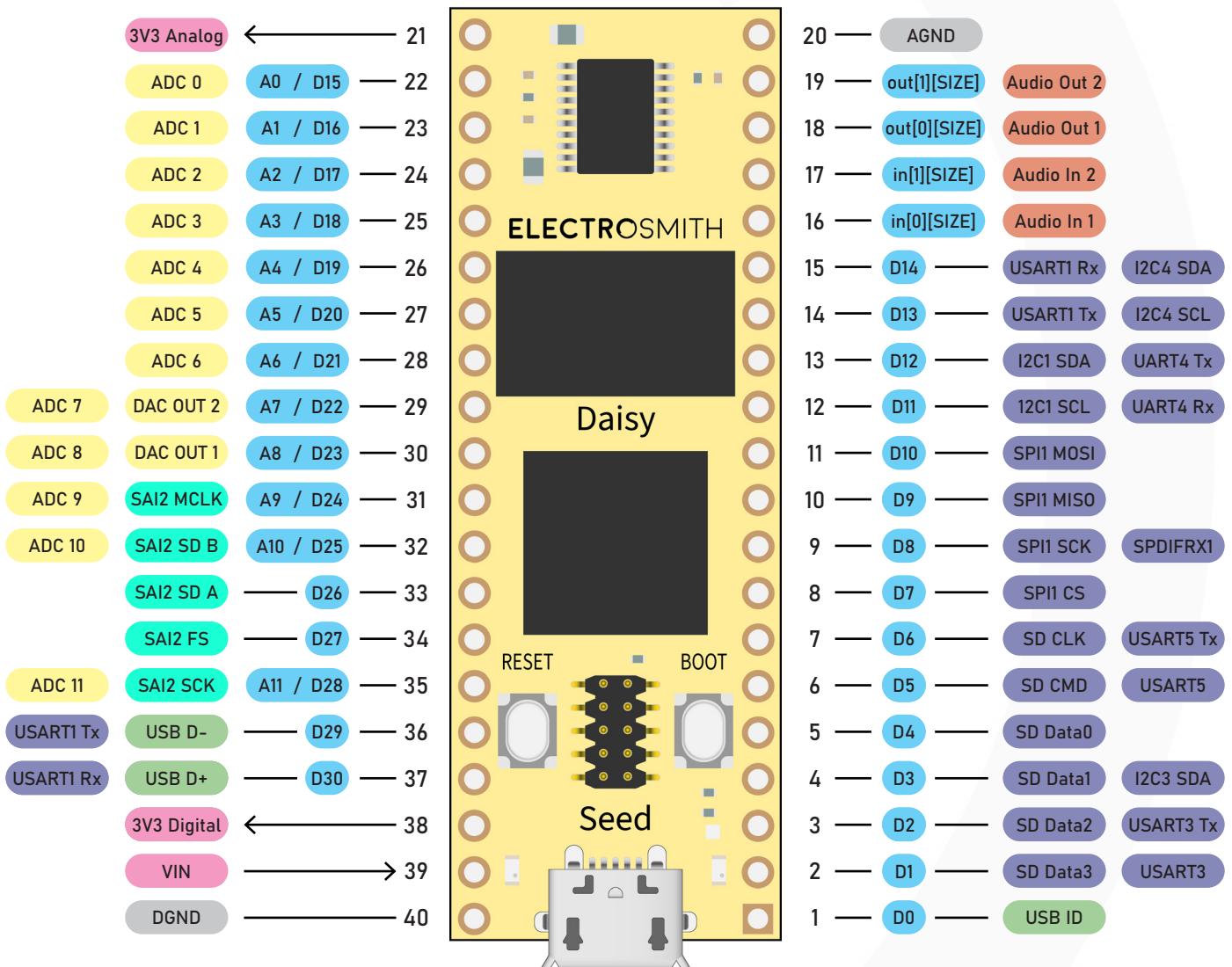
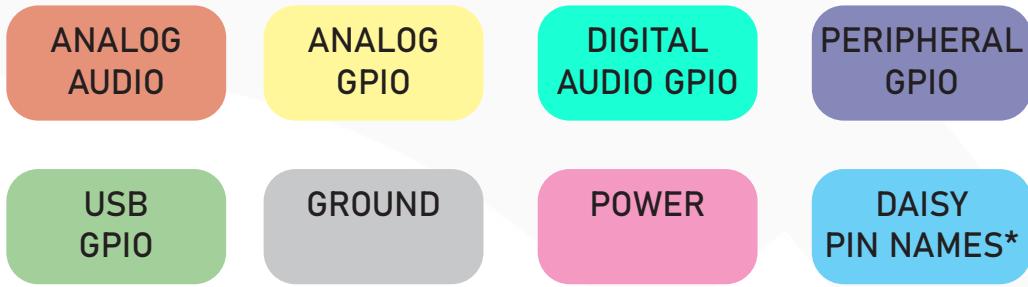


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Pinout



* "D" for Digital GPIO or "A" for Analog I/O, depending on use case.

| PIN TYPE | MIN | MAX | UNIT |
|-------------|-----|------|------|
| VIN Range | +4 | +17 | V |
| ADC Input | 0 | +3V3 | V |
| DAC Output | 0 | +3V3 | V |
| GPIO Output | 0 | +5 | V |
| GPIO Input | 0 | +5 | V |

All GPIO Pins are 5V tolerant I/O except for the following pins which are 3.3V tolerant I/O:

- Pin 24 - (PB1, ADC2)
- Pin 25 - (PA7, ADC3)
- Pin 28 - (PC4, ADC6)
- Pin 29 - (PA5, ADC7)
- Pin 30 - (PA4, ADC8)

| PINOUT | DAISY PIN NAME* | STM32 PIN NAME | PRIMARY FUNCTION | ALT. FUNCTION 1 | ALT. FUNCTION 2 | ALT. FUNCTION 3 |
|--------|-----------------|----------------|------------------|-------------------------------|--|-------------------|
| 1 | D0 | PB12 | USB_HS_ID | UART5_RX | SPI2_NSS/I2S2_WS | TIM1_BKIN |
| 2 | D1 | PC11 | SDMMC1_D3 | USART3_RX/UART4_RX | SPI3_MISO/I2S3_SDI | HRTIM_FLT2 |
| 3 | D2 | PC10 | SDMMC1_D2 | USART3_TX/UART4_TX | SPI3_SCK/I2S3_CK | HRTIM_EEV1 |
| 4 | D3 | PC9 | SDMMC1_D1 | I2C3_SDA | | MCO2 |
| 5 | D4 | PC8 | SDMMC1_D0 | TRACED1 | | |
| 6 | D5 | PD2 | SDMMC1_CMD | UART5_RX | | TRACED2 |
| 7 | D6 | PC12 | SDMMC1_CK | UART5_TX | SPI3_MOSI/I2S3_SDO | TRACED3 |
| 8 | D7 | PG10 | SPI1 NSS | | SPI1_NSS/I2S1_WS | HRTIM_FLT5 |
| 9 | D8 | PG11 | SPI1_SCK | | SPI1_SCK/I2S1_CK | LPTIM1_IN2 |
| 10 | D9 | PB4 | SPI1_MISO | UART7_TX | SPI1_MISO/I2S1_SDI/SPI3_MISO/I2S3_SDI/SPI2_NSS/I2S2_WS/SPI6_MISO | NJTRST |
| 11 | D10 | PB5 | SPI1_MOSI | UART5_RX | SPI1_MOSI/I2S1_SDO/SPI3_MOSI/I2S3_SDO/SPI6_MOSI | TIM17_BKIN |
| 12 | D11 | PB8 | I2C1_SCL | I2C1_SCL/I2C4_SCL | UART4_RX | TIM16_CH1 |
| 13 | D12 | PB9 | I2C1_SDA | I2C1_SDA/I2C4_SDA | UART4_TX, SPI2_NSS/I2S2_WS | TIM17_CH1 |
| 14 | D13 | PB6 | USART1_TX | USART1_TX/LPUART1_TX/UART5_TX | I2C1_SCL/I2C4_SCL | TIM16_CH1N |
| 15 | D14 | PB7 | USART1_RX | USART1_RX/LPUART1_RX | I2C1_SDA/I2C4_SDA | TIM17_CH1N |
| 16 | NC | x | AUDIO IN L | | | |
| 17 | NC | x | AUDIO INR | | | |
| 18 | NC | x | AUDIO OUT L | | | |
| 19 | NC | x | AUDIO OUT R | | | |
| 20 | NC | x | AGND | | | |
| 21 | NC | x | +3V3A | | | |
| 22 | A0, D15 | PC0 | ADC0 | | | DFSDM1_CKIN0 |
| 23 | A1, D16 | PA3 | ADC1 | USART2_RX | | TIM2_CH4 |
| 24 | A2, D17 | PB1 | ADC2 | | | TIM1_CH3N |
| 25 | A3, D18 | PA7 | ADC3 | SPI1_MOSI/I2S1_SDO/SPI6_MOSI | | TIM1_CH1N |
| 26 | A4, D19 | PA6 | ADC4 | SPI1_MISO/I2S1_SDI/SPI6_MISO | | TIM1_BKIN |
| 27 | A5, D20 | PC1 | ADC5 | SPI2_MOSI/I2S2_SDO | | TRACED0 |
| 28 | A6, D21 | PC4 | ADC6 | | | DFSDM1_CKIN2 |
| 29 | A7, D22 | PA5 | ADC7 | DAC1_OUT2 | SPI1_SCK/I2S1_CK/SPI6_SCK | D2PWREN |
| 30 | A8, D23 | PA4 | ADC8 | DAC1_OUT1 | SPI1_NSS/I2S1_WS/SPI3_NSS/I2S3_WS/SPI6_NSS | D1PWREN |
| 31 | A9, D24 | PA1 | ADC9 | SAI2_MCLK_B | UART4_RX | TIM2_CH2 |
| 32 | A10, D25 | PA0 | ADC10 | SAI2_SD_B | UART4_TX | TIM2_CH1/TIM2_ETR |
| 33 | D26 | PD11 | SAI2_SD_A | | | LPTIM2_IN2 |
| 34 | D27 | PG9 | SAI2_FS_B | USART6_RX | SPI1_MISO/I2S1_SDI | |
| 35 | A11, D28 | PA2 | ADC11 | SAI2_SCK_B | USART2_TX | TIM2_CH3 |
| 36 | D29 | PB14 | USB_HS_D_- | USART1_TX | SPI2_MISO/I2S2_SDI | TIM1_CH2N |
| 37 | D30 | PB15 | USB_HS_D_+ | USART1_RX | SPI2_MOSI/I2S2_SDO | RTC_REFIN |
| 38 | NC | x | +3V3D | | | |
| 39 | NC | x | VIN | | | |
| 40 | PG3 | x | GND | | | |

* Pin names are the same indices preceded by "D" for Digital GPIO or "A" for Analog I/O

* The min/max rating in this table represents the expected operating range for the device. Signals outside of this range will not necessarily damage the Daisy Seed. See [Table 1](#) for Absolute min/max ratings.

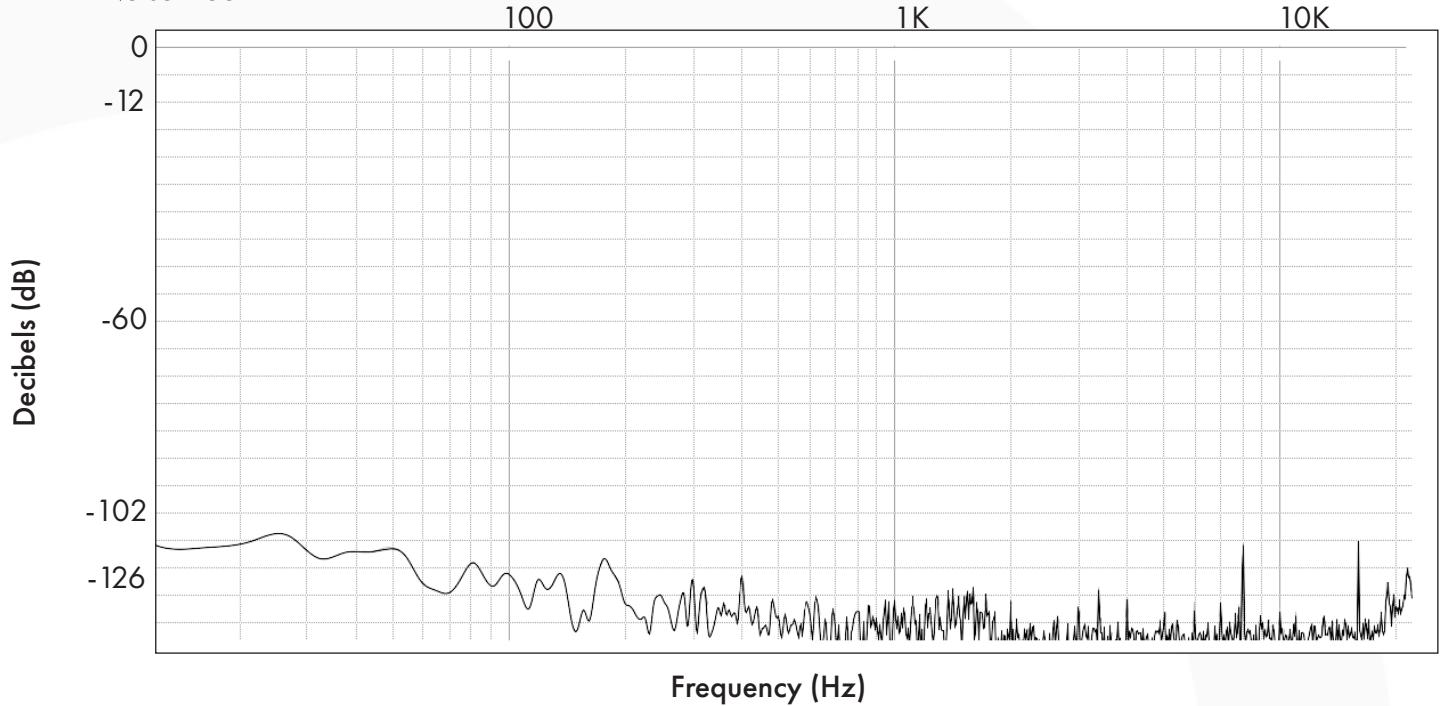
| PIN NAME | PRIMARY NAME | Min | Max | Typical |
|----------|--------------|-----|------|--------------------|
| 1 | USB_HS_ID | 0V | +3V3 | 0 to +3V3 |
| 2 | SDMMC1_D3 | 0V | +3V3 | 0 to +3V3 |
| 3 | SDMMC1_D2 | 0V | +3V3 | 0 to +3V3 |
| 4 | SDMMC1_D1 | 0V | +3V3 | 0 to +3V3 |
| 5 | SDMMC1_D0 | 0V | +3V3 | 0 to +3V3 |
| 6 | SDMMC1_CMD | 0V | +3V3 | 0 to +3V3 |
| 7 | SDMMC1_CK | 0V | +3V3 | 0 to +3V3 |
| 8 | SPI1_NSS | 0V | +3V3 | 0 to +3V3 |
| 9 | SPI1_SCK | 0V | +3V3 | 0 to +3V3 |
| 10 | SPI1_MISO | 0V | +3V3 | 0 to +3V3 |
| 11 | SPI1_MOSI | 0V | +3V3 | 0 to +3V3 |
| 12 | I2C1_SCL | 0 | +3V3 | 0 to +3V3 |
| 13 | I2C1_SDA | 0 | +3V3 | 0 to +3V3 |
| 14 | USART1_TX | 0 | +3V3 | 0 to +3V3 |
| 15 | USART1_RX | 0 | +3V3 | 0 to 3V3 |
| 16 | AUDIO IN L | 0 | +3V3 | 0 to 3V3 |
| 17 | AUDIO INR | -3V | +3V | -3V to +3V |
| 18 | AUDIO OUT L | -3V | +3V | -3V to +3V |
| 19 | AUDIO OUT R | -3V | +3V | -3V to +3V |
| 20 | AGND | | | GND |
| 21 | +3V3A | | | +3V3 (output only) |
| 22 | ADC0 | 0V | +3V3 | 0 to +3V3 |
| 23 | ADC1 | 0V | +3V3 | 0 to +3V3 |
| 24 | ADC2 | 0V | +3V3 | 0 to +3V3 |
| 25 | ADC3 | 0V | +3V3 | 0 to +3V3 |
| 26 | ADC4 | 0V | +3V3 | 0 to +3V3 |
| 27 | ADC5 | 0V | +3V3 | 0 to +3V3 |
| 28 | ADC6 | 0V | +3V3 | 0 to +3V3 |
| 29 | ADC7 | 0V | +3V3 | 0 to +3V3 |
| 30 | ADC8 | 0V | +3V3 | 0 to +3V3 |
| 31 | ADC9 | 0V | +3V3 | 0 to +3V3 |
| 32 | ADC10 | 0V | +3V3 | 0 to +3V3 |
| 33 | SAI2_SD_A | 0 | +3V3 | 0 to +3V3 |
| 34 | SAI2_FS_B | 0 | +3V3 | 0 to +3V3 |
| 35 | ADC11 | 0 | +3V3 | 0 to +3V3 |
| 36 | USB_HS_D_- | 0 | +3V3 | 0 to 3V3 |
| 37 | USB_HS_D_+ | 0 | +3V3 | 0 to 3V3 |
| 38 | +3V3D | | | +3V3 (output only) |
| 39 | VIN | +4V | +17V | +4V to +17V |
| 40 | DGND | | | GND |



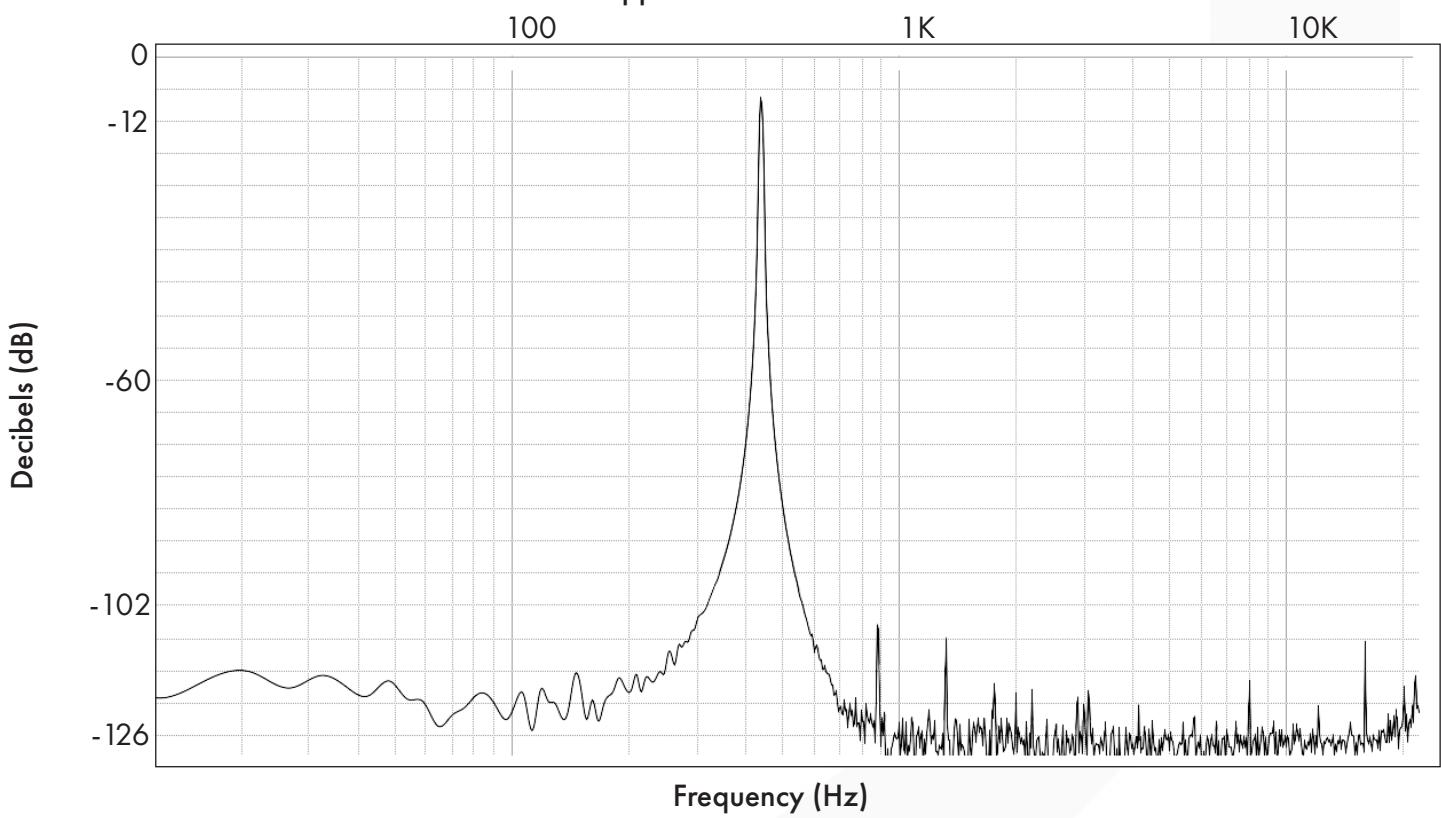
ELECTROSMITH

Audio Performance

Noise Floor



SNR: 1kHz Reference Sine Wave - 9.5Vpp

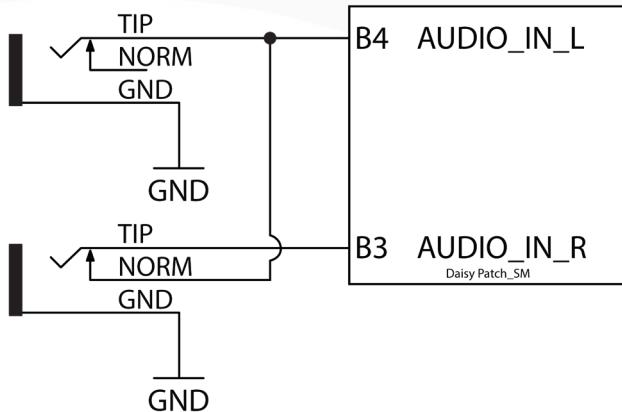




Typical Applications

For electrical characteristics, see Table 2

Figure 1.1 - Stereo Audio Input application example



Jack 1 normals to Jack 2 to maintain stereo inputs when nothing is connected to channel 2.

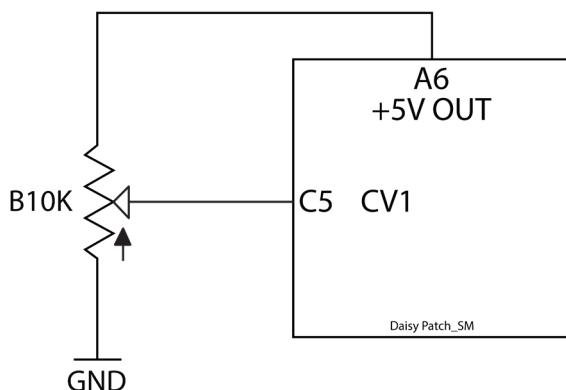
Input Impedance: 100K

Example Parts:

[Thonkiconn 3.5mm Mono Eurorack Jack](#)

MPN: WQP-WQP518MA

Figure 1.2 - Potentiometers application example



Available Pins:

CV_1 to CV_8

ADC_9 to ADC_12*

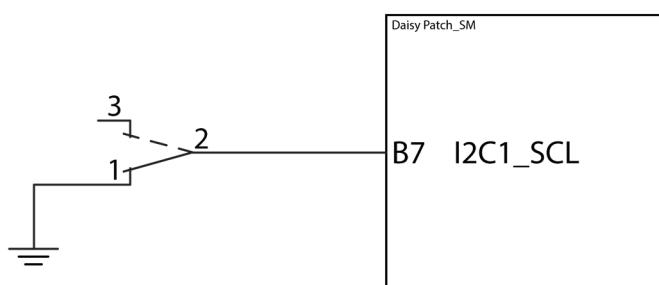
Example Parts:

[Alpha 9mm Linear 10K D Shaft](#)

MPN: RD901F-40-15F-B10K-00D70

* When using ADC_9 to ADC_12, use +3V3 OUT (A10) instead of +5V OUT (A6)

Figure 1.6 - Toggle Switch application example



Available Pins: Any GPIO

Example Parts:

[Toggle Switch](#)

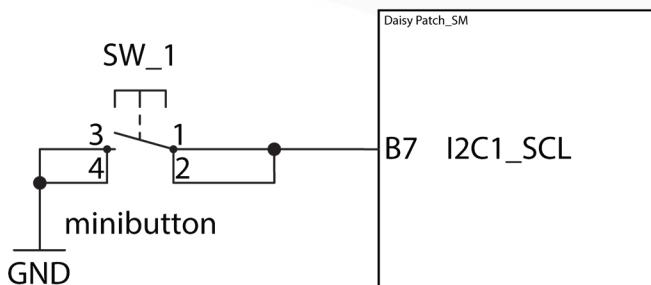
MPN: 2MS1T1B1M2QES



Typical Applications

For electrical characteristics, see Table 2

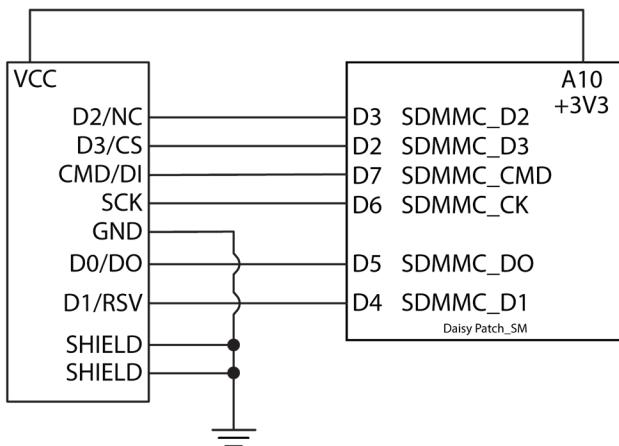
Figure 1.5 - Tactile Switch application example



Available Pins: Any GPIO

Example Parts:
[Tactile Switch](#)
 MPN: TL1105SPF250Q

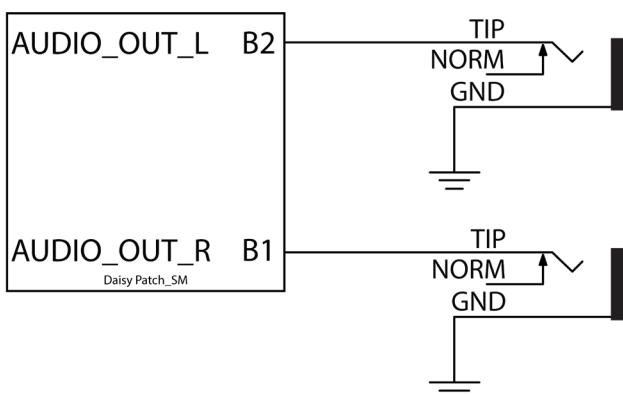
Figure 1.7 - Micro SD application example



No pullup resistors necessary.

Example Parts:
[Vertical MicroSD Card Connector](#)
 MPN: PJS008U-3000-0

Figure 1.8 - Stereo Audio Output application example



Output Impedance: 100R

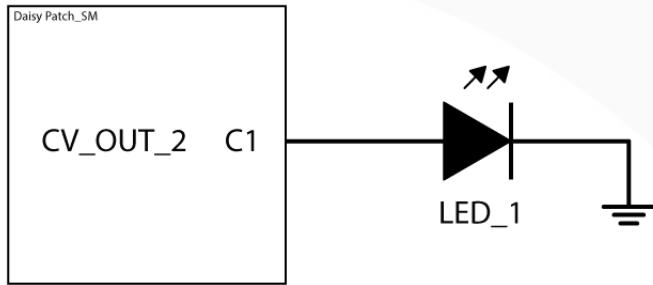
Example Parts:
[Thonkiconn 3.5mm Mono Eurorack Jack](#)
 MPN: WQP-WQP518MA



Typical Applications

For electrical characteristics, see Table 2

Figure 1.12 - LED application example



Output Impedance: 100R

Available Pins:

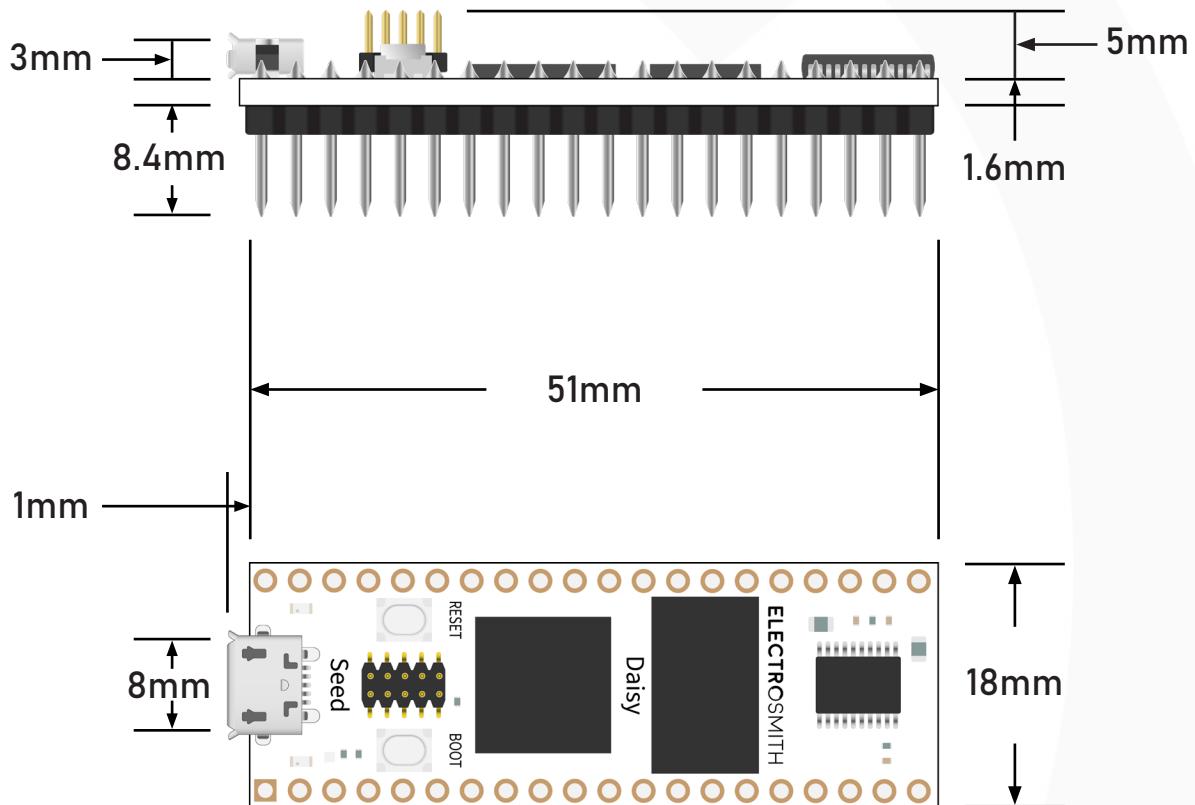
CV_OUT_1, CV_OUT_2
GATE_OUT_1, GATE_OUT_2
Any GPIO*

Example Parts:

[3mm LED](#)

MPN: WP132XND

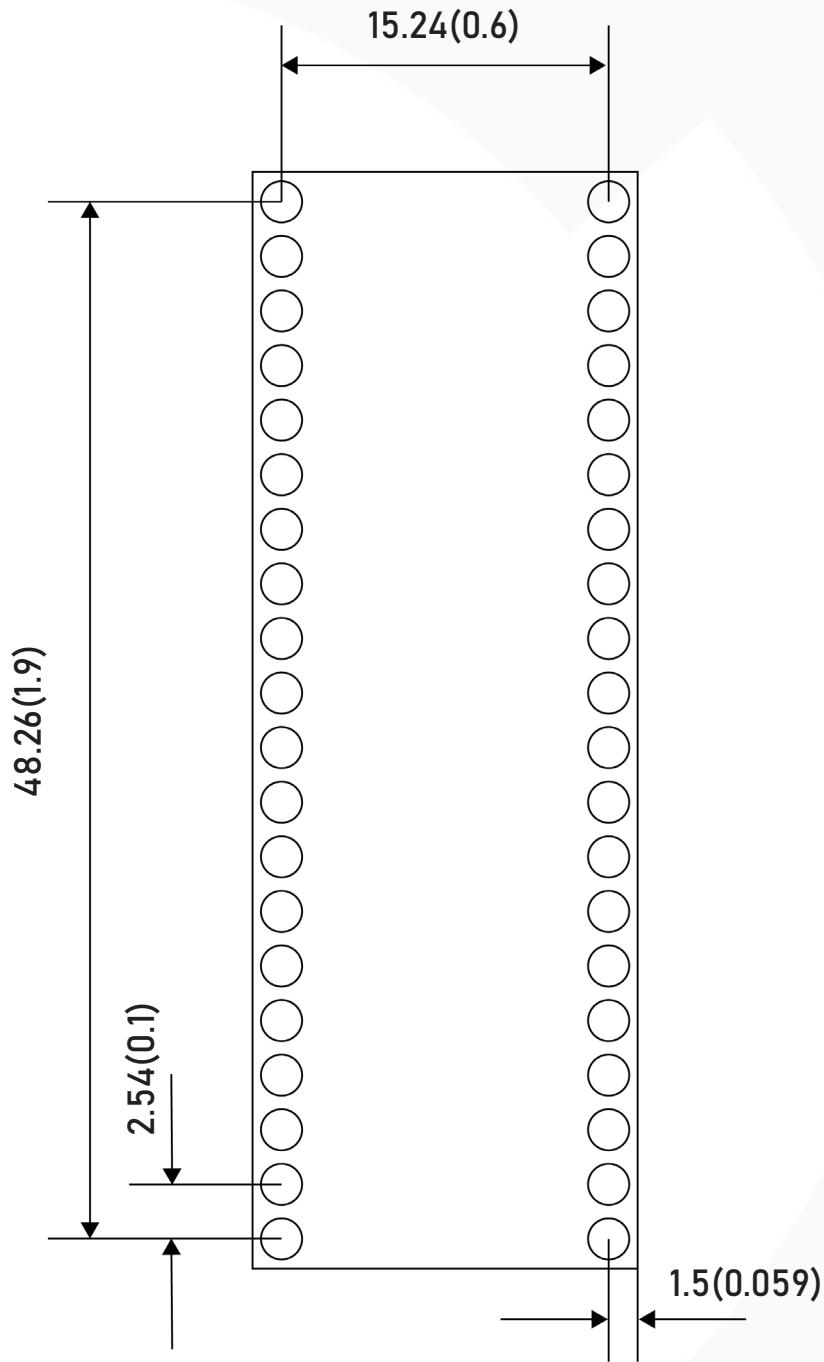
* GPIO require an external resistor





Landing Pattern

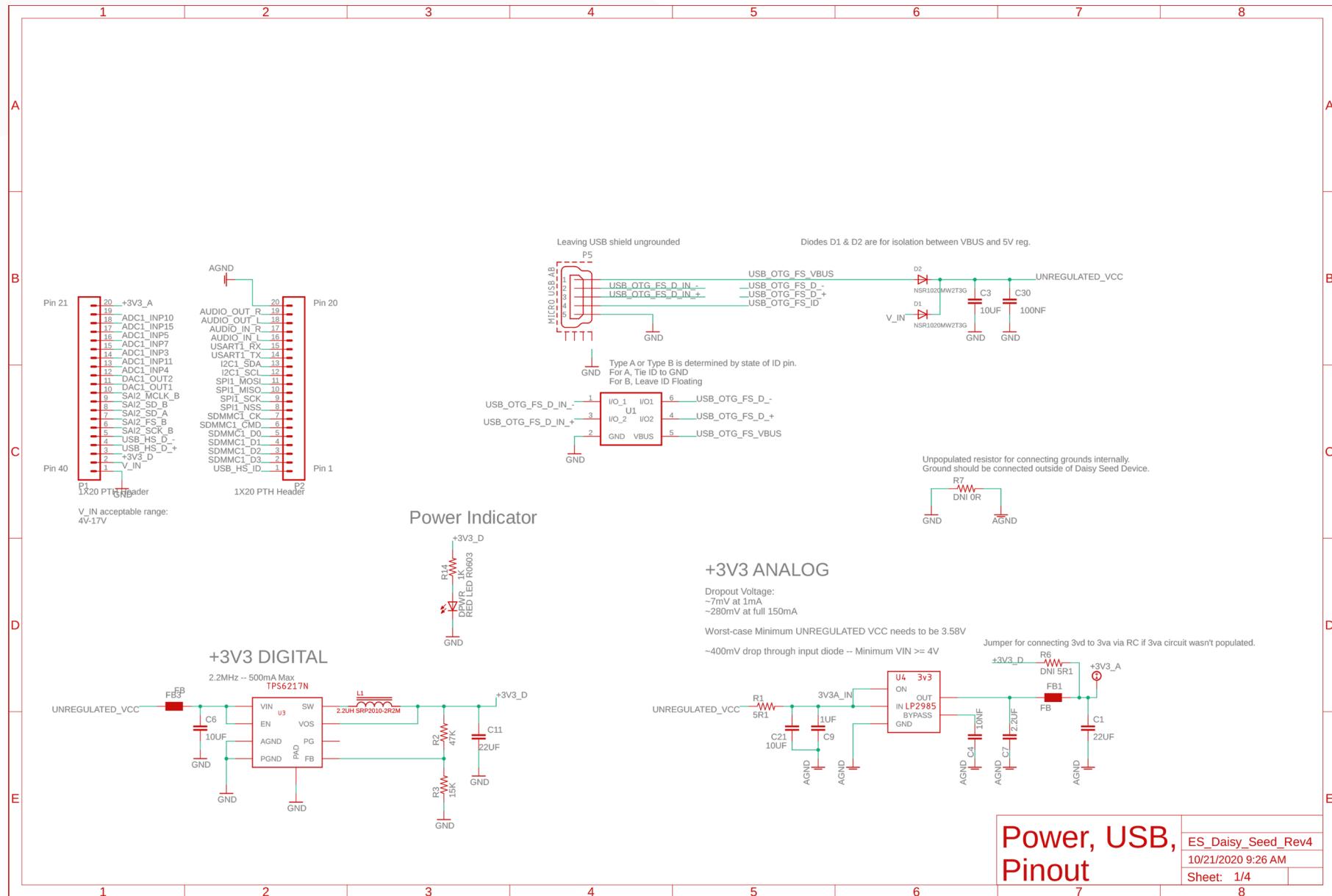
Dimensions in mm (inches)



Find the EAGLE part [here](#).

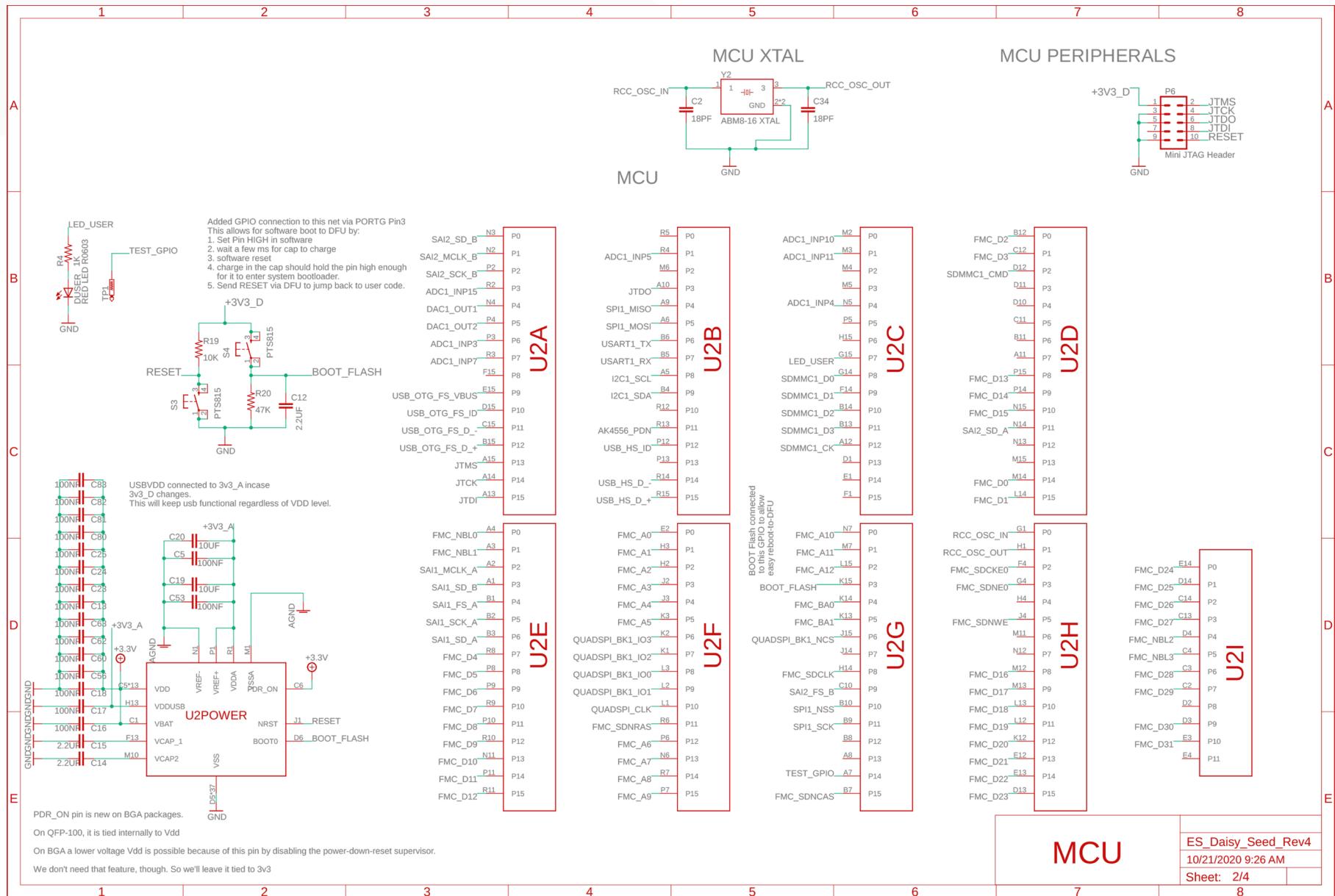


Schematic



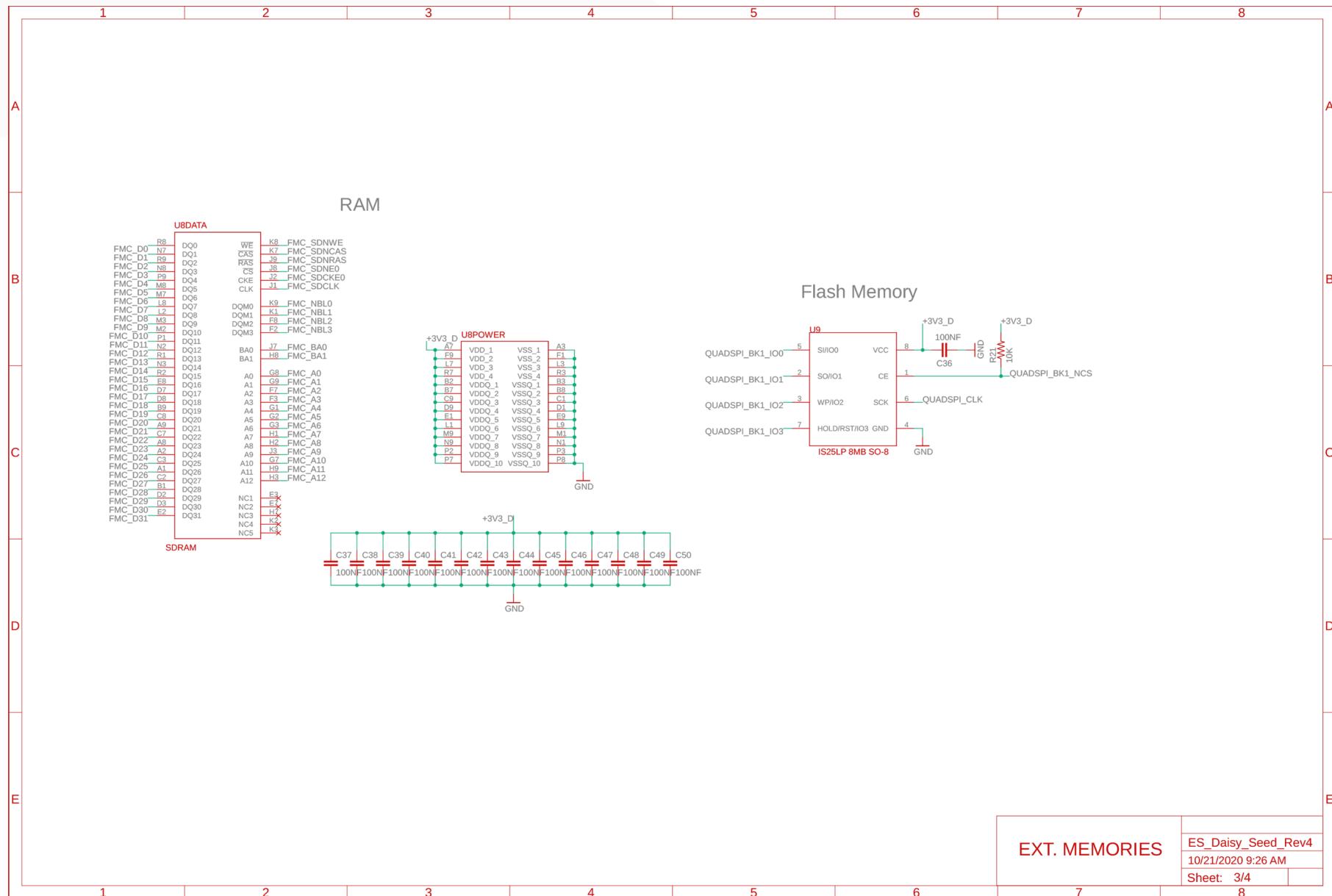


Schematic



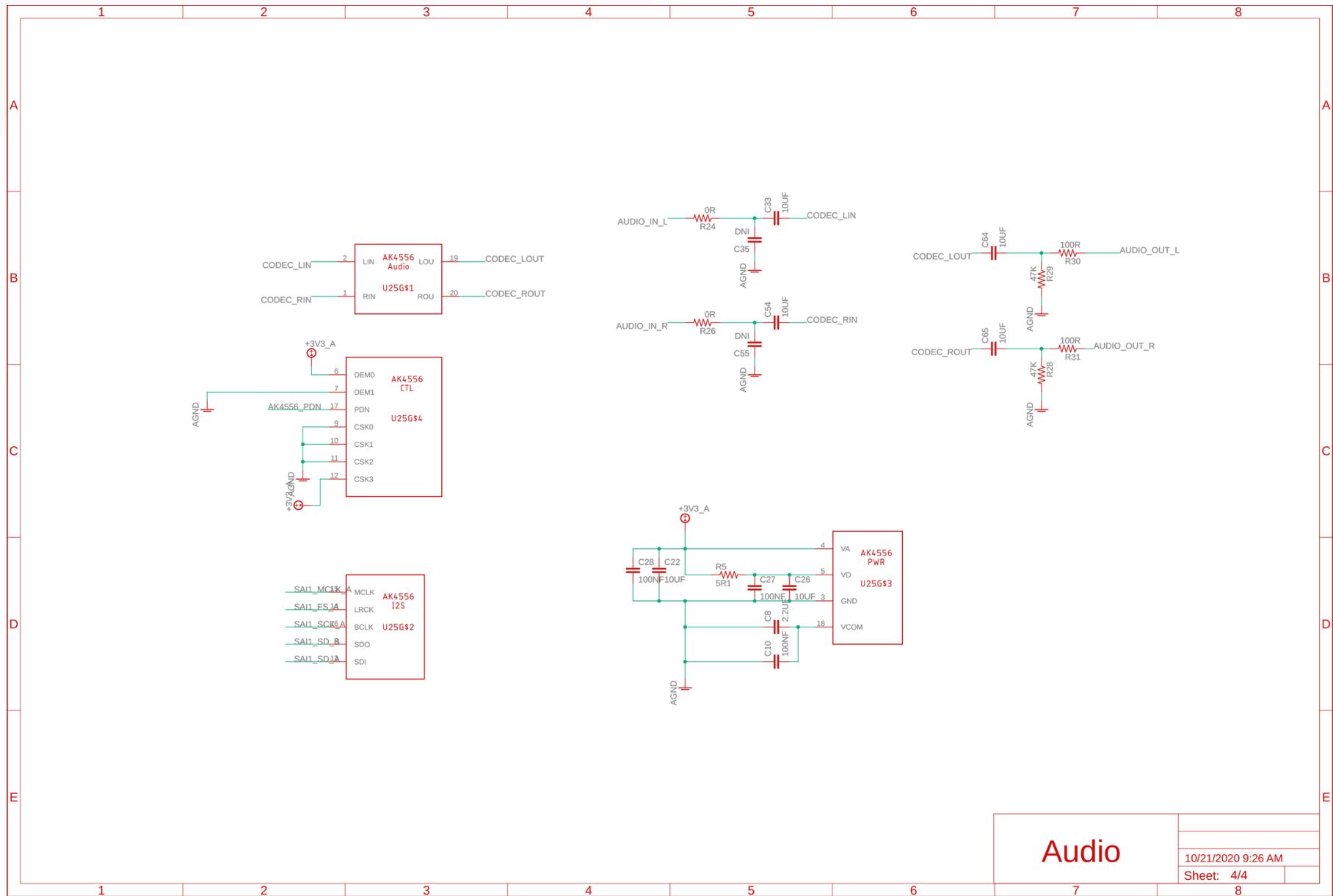


Schematic





Schematic





Availability

The Daisy Seed is guaranteed to be manufactured and supported until _.

Support

For commercial Daisy support, submit an email inquiry with hello@electro-smith.com, or reach out on the [Daisy Forum](#) or via the submission form on our [website](#).

Volume Price List

| MODEL | SKU | MINIMUM ORDER QUANTITY | PRICE PER UNIT |
|------------|---------------|------------------------|----------------|
| Daisy Seed | ES_Daisy_Seed | 1 | US\$29.95 |
| | | 50 | US\$28.45 |
| | | 100 | US\$26.96 |
| | | 250 | US\$26.21 |
| | | 500 | US\$25.46 |
| | | 1000 | US\$23.96 |
| | | 2500 | US\$22.46 |



Why The Daisy Seed?

Made In The USA

The Daisy Seed is built by the Electrosmith team in San Clemente, CA. We take pride in knowing that each stage of our manufacturing process is handled in house so that we can provide the best quality, lead time, and pricing.

RoHS Compliant

Electrosmith manufacturing is 100% RoHS compliant. All Electrosmith products are free from RoHS defined hazardous materials.

FCC Certification

The Daisy Seed is currently undergoing testing for FCC certification. The associated paperwork will be available for download on our website once the certification is obtained.

CE/REACH Compliant

The Daisy Seed is assembled with parts and materials that are compliant with CE/REACH standards. Design with the Patch SM knowing that it upholds the highest environmental standards for electronic products.

