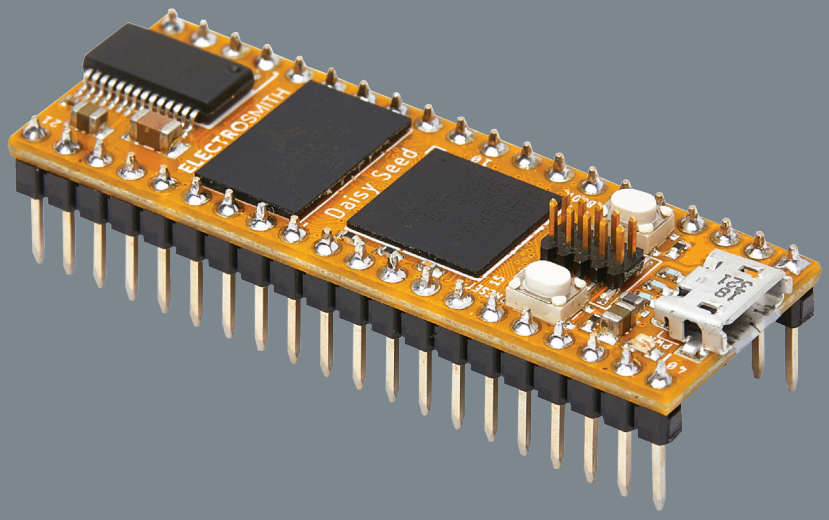
Daisy Seed

High-Fidelity Audio 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

Applications:

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

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).

Colophon

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.

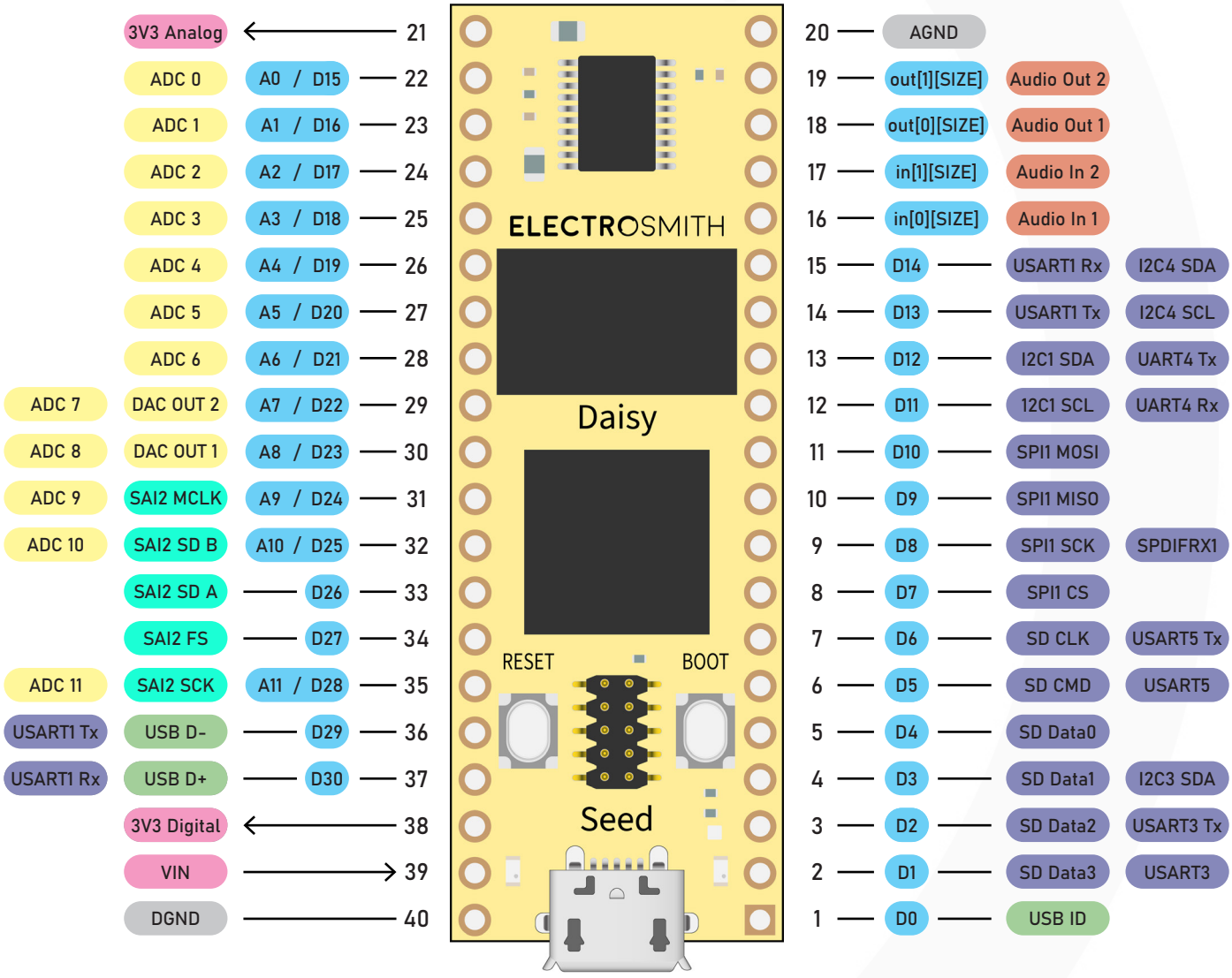
Disclaimer: Electrosmith products should not be used in medical or life saving devices, or any uses requiring failsafe performance. Electrosmith reserves the right to change, add, or remove any information and assets included in the Daisy Seed datasheet at any time without prior notice.

Table of Contents

Pinout

ANALOG AUDIO | ANALOG GPIO | DIGITAL AUDIO GPIO | PERIPHERAL GPIO

USB GPIO | GROUND | POWER | DAISY PIN NAMES*



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

Absolute Maximum Ratings - Table 1

PIN TYPE	MIN	MAX	UNIT
VIN Range	+4	+17	V
ADC Input	0	+3.3	V
DAC Output	0	+3.3	V
GPIO Output	0	+3.3	V
GPIO Input	0	+3.3	V

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
2	D1	PC11	SDMMC1_D3		USART3_RX/UART4_RX	SPI3_MISO/ I2S3_SDI
3	D2	PC10	SDMMC1_D2		USART3_TX/UART4_TX	SPI3_SCK/I2S3_CK
4	D3	PC9	SDMMC1_D1	I2C3_SDA		
5	D4	PC8	SDMMC1_D0			
6	D5	PD2	SDMMC1_CMD		UART5_RX	
7	D6	PC12	SDMMC1_CK		UART5_TX	SPI3_MOSI/I2S3_SDO
8	D7	PG10	SPI1_NSS			SPI1_NSS/I2S1_WS
9	D8	PG11	SPI1_SCK			SPI1_SCK/I2S1_CK
10	D9	PB4	SPI1_MISO		UART7_TX	SPI1_MISO/I2S1_SDI/SPI3_MISO/ I2S3_SDI/SPI2_NSS/I2S2_WS/ SPI6_MISO
11	D10	PB5	SPI1_MOSI		UART5_RX	SPI1_MOSI/I2S1_SDO/SPI3_MOSI/ I2S3_SDO/SPI6_MOSI
12	D11	PB8	I2C1_SCL	I2C1_SCL/I2C4_SCL	UART4_RX	
13	D12	PB9	I2C1_SDA	I2C1_SDA/I2C4_SDA	UART4_TX	SPI2_NSS/I2S2_WS
14	D13	PB6	USART1_TX	I2C1_SCL/I2C4_SCL	USART1_TX/LPUART1_ TX/UART5_TX	
15	D14	PB7	USART1_RX	I2C1_SDA/I2C4_SDA	USART1_RX/LPUART1_RX	
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			
23	A1, D16	PA3	ADC1		USART2_RX	
24	A2, D17	PB1	ADC2			
25	A3, D18	PA7	ADC3			SPI1_MOSI/I2S1_SDO/SPI6_MOSI
26	A4, D19	PA6	ADC4			SPI1_MISO/I2S1_SDI/SPI6_MISO
27	A5, D20	PC1	ADC5			SPI2_MOSI/I2S2_SDO
28	A6, D21	PC4	ADC6			
29	A7, D22	PA5	ADC7	DAC1_OUT2		SPI1_SCK/I2S1_CK/SPI6_SCK
30	A8, D23	PA4	ADC8	DAC1_OUT1		SPI1_NSS/I2S1_WS/SPI3_NSS/ I2S3_WS/SPI6_NSS
31	A9, D24	PA1	ADC9	SAI2_MCLK_B	UART4_RX	
32	A10, D25	PA0	ADC10	SAI2_SD_B	UART4_TX	
33	D26	PD11	SAI2_SD_A			
34	D27	PG9	SAI2_FS_B		USART6_RX	SPI1_MISO/I2S1_SDI
35	A11, D28	PA2	ADC11	SAI2_SCK_B	USART2_TX	
36	D29	PB14	USB_HS_D_-		USART1_TX	SPI2_MISO/I2S2_SDI
37	D30	PB15	USB_HS_D_+		USART1_RX	SPI2_MOSI/I2S2_SDO
38		x	+3V3D			
39		x	VIN			
40	PG3	x	GND			

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

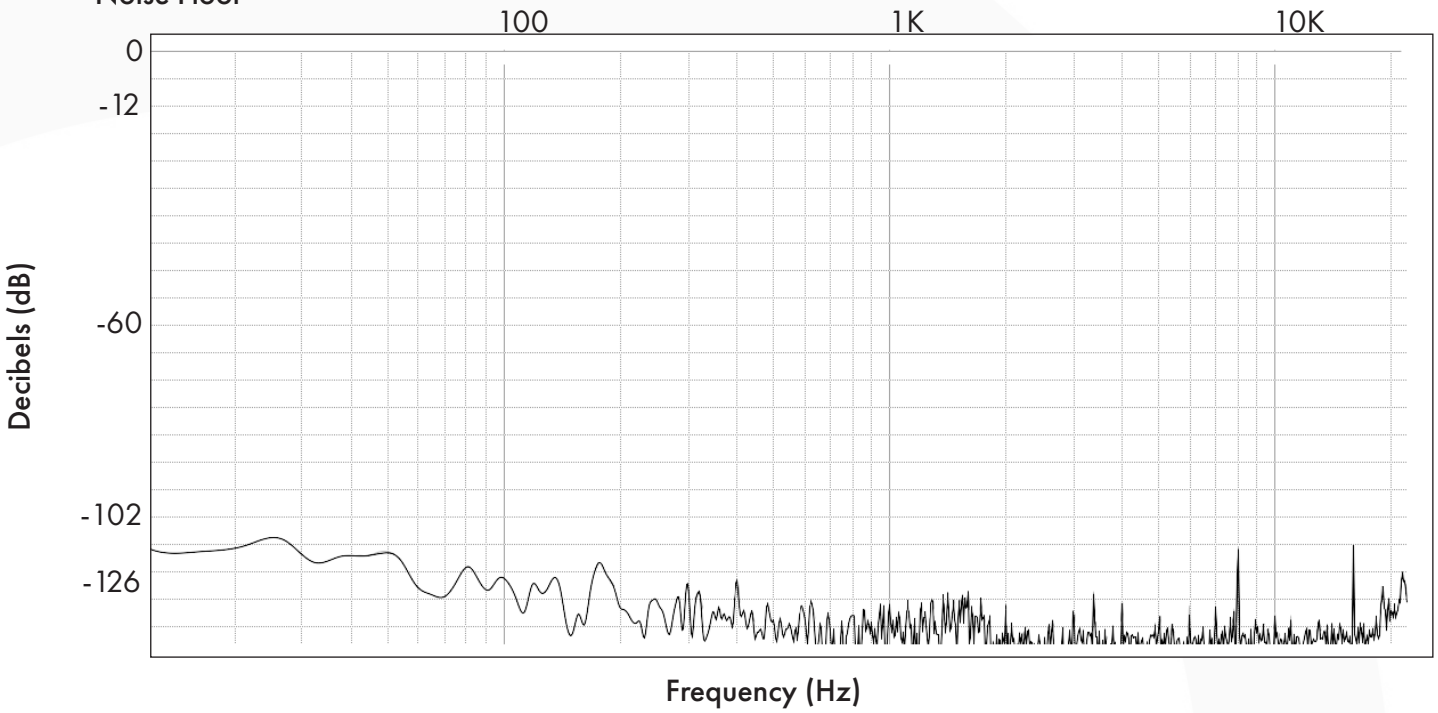
Electrical Characteristics - Table 3

* 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.

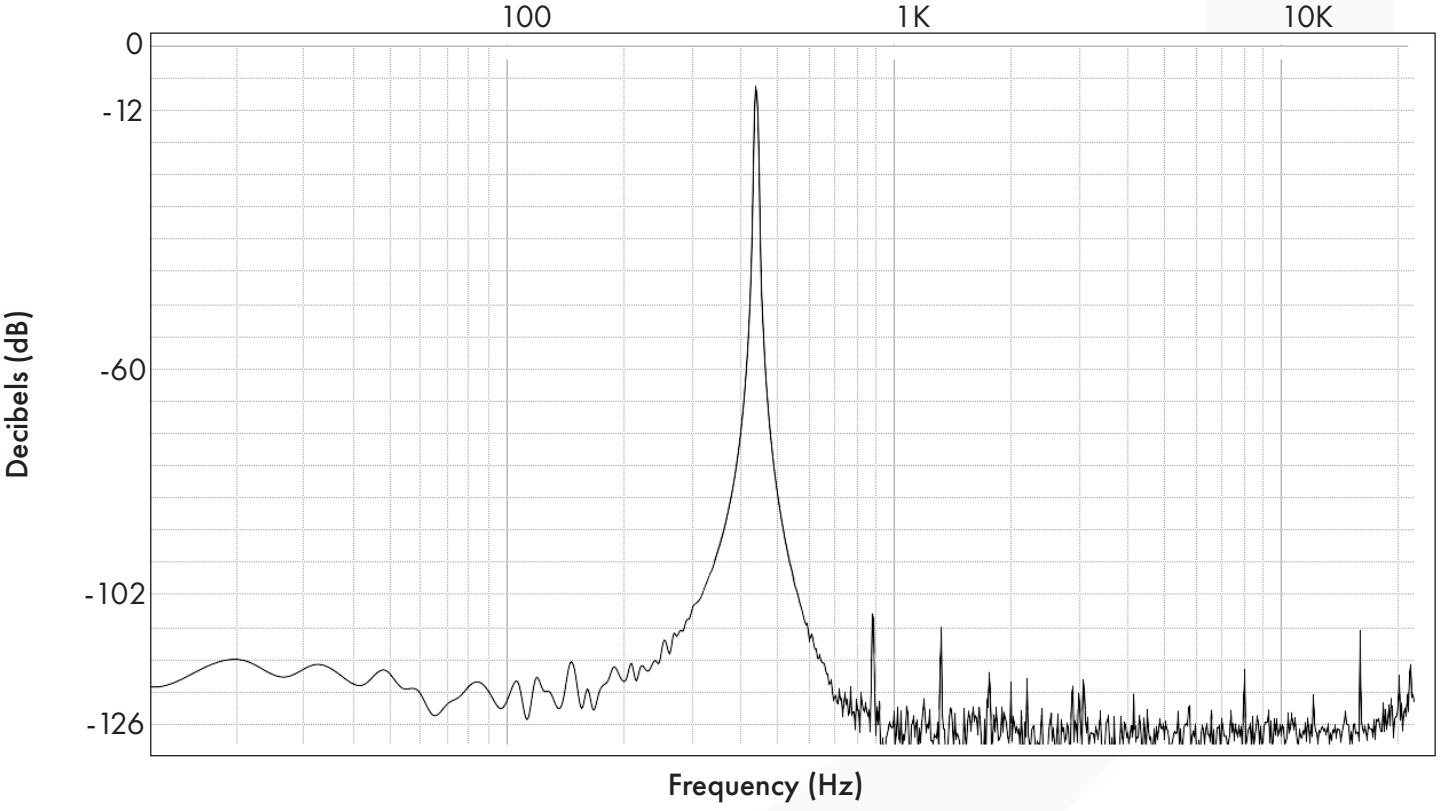
PIN NAME	PRIMARY NAME	Min	Max	Typical
1	USB_HS_ID	0V	+3V3	0 to +3V3
2	SDMMC1_D3	0V	+3V3	0 to +3V3
3	SDMMC1_D2	0V	+3V3	0 to +3V3
4	SDMMC1_D1	0V	+3V3	0 to +3V3
5	SDMMC1_D0	0V	+3V3	0 to +3V3
6	SDMMC1_CMD	0V	+3V3	0 to +3V3
7	SDMMC1_CK	0V	+3V3	0 to +3V3
8	SPI1_NSS	0V	+3V3	0 to +3V3
9	SPI1_SCK	0V	+3V3	0 to +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

Performance

Noise Floor

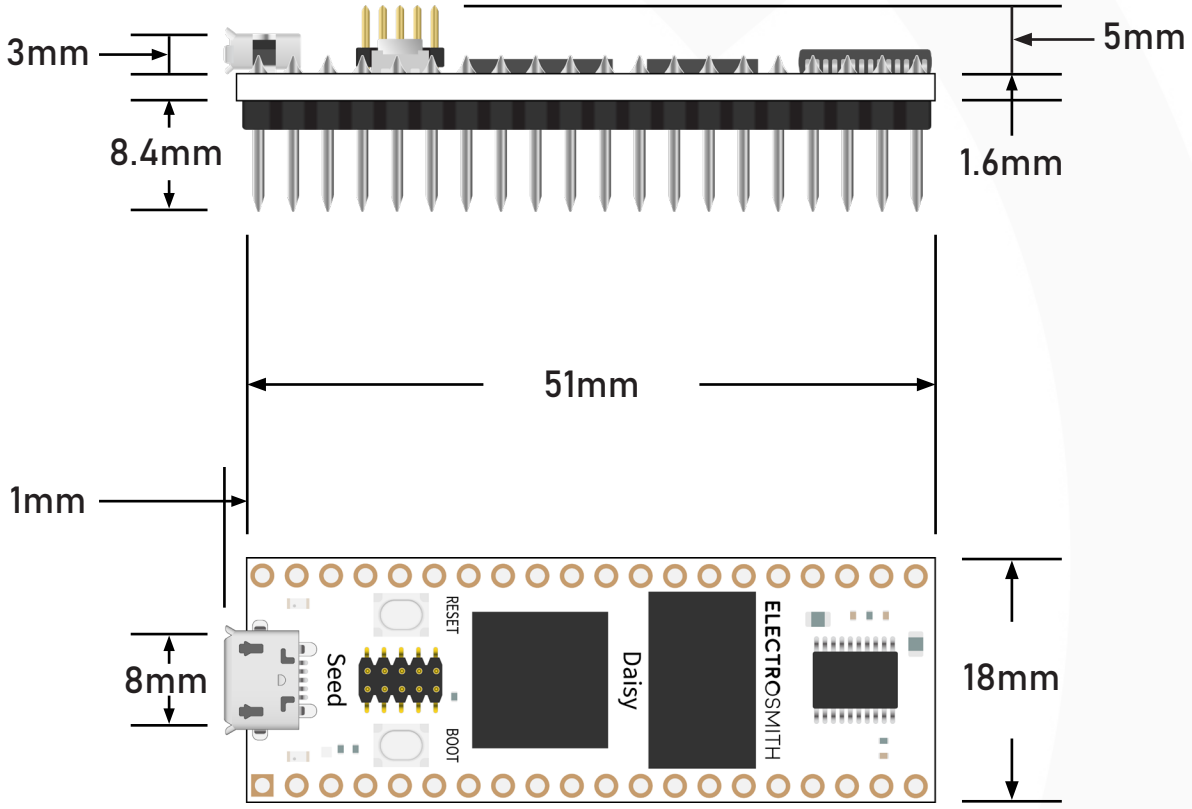


SNR: 1kHz Reference Sine Wave - 9.5Vpp



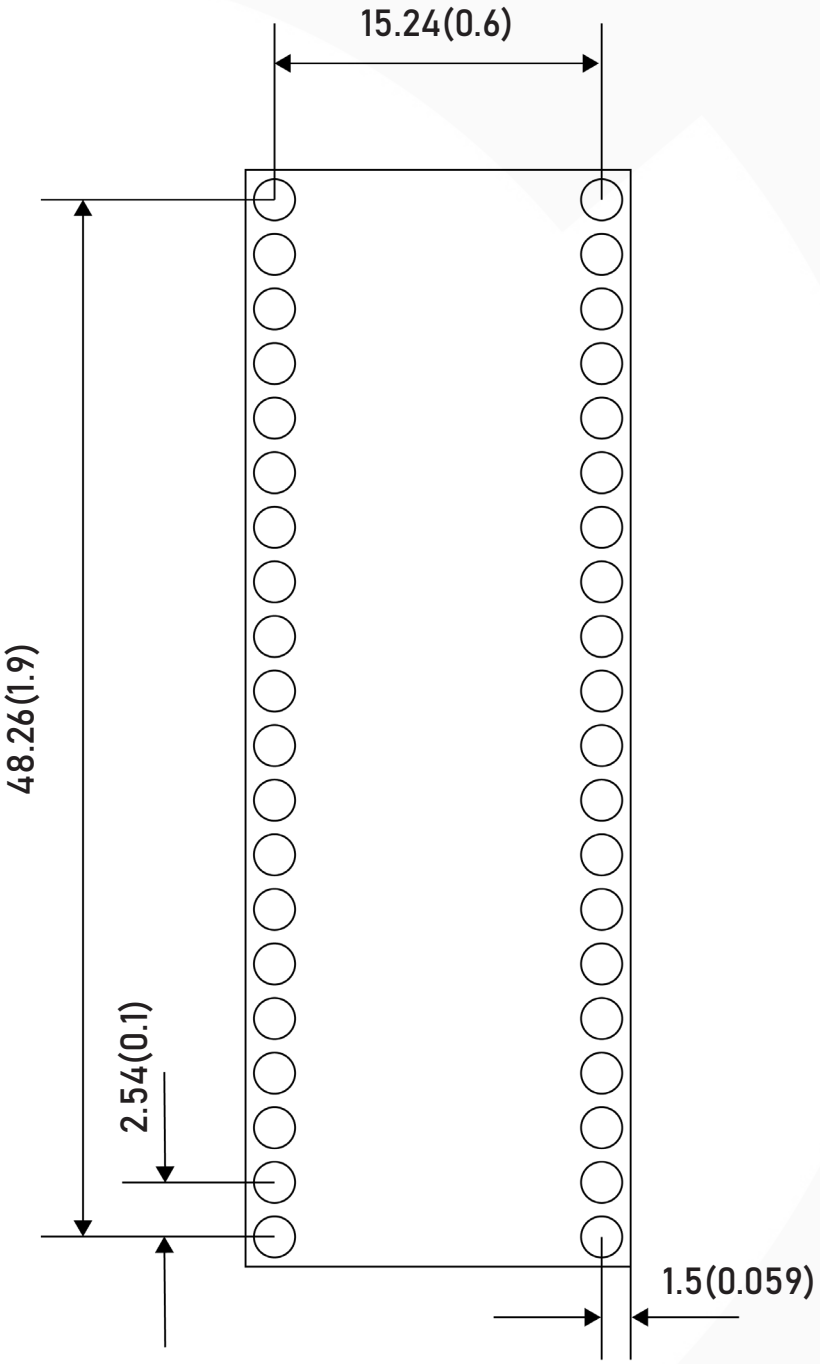
Typical Applications

Technical Drawing



Landing Pattern

Dimensions in mm (inches)



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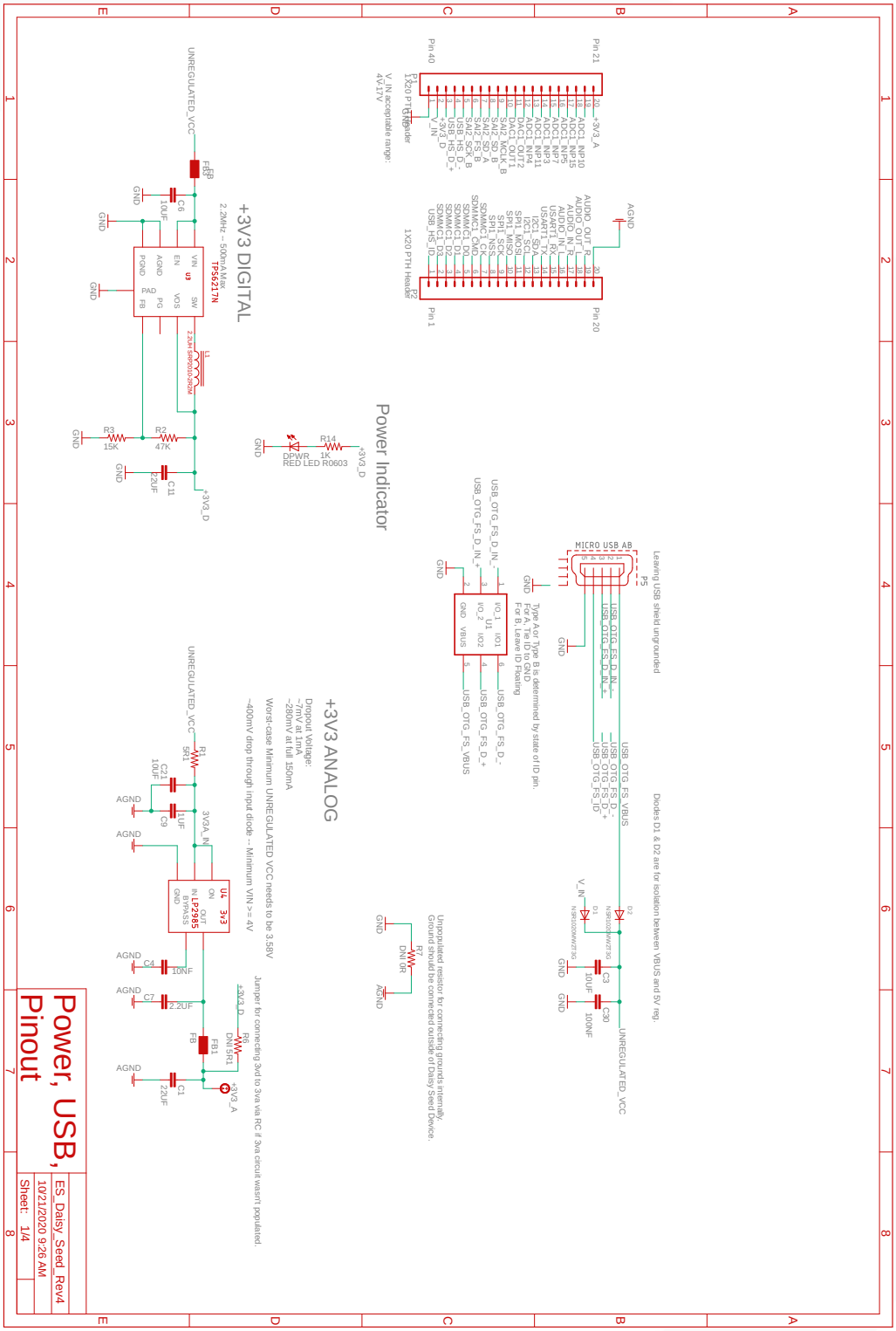
Schematic


Power, USB, Pinout
ES_Daisy_Seed_Rev4
10/21/2020 9:26 AM
Sheet: 1/4
Power Indicator
+3V3 DIGITAL
+3V3 ANALOG
MICRO USB AB
Leaving USB shield ungrounded
Diodes D1 & D2 are for isolation between VBUS and 5V reg.
Type A or Type B is determined by state of ID pin.
For A: Tie ID to GND
For B: Leave ID Floating
Unpopulated resistor for connecting grounds internally.
Ground should be connected outside of Daisy Seed Device.
Dropout Voltage:
~7mV at 1mA
~280mV at full 150mA
Worst-case Minimum UNREGULATED VCC needs to be 3.58V
~400mV drop through input diode -- Minimum V/IN >= 4V
Jumper for connecting 3vd to 3va via RC if 3va circuit wasn't populated.
UNREGULATED_VCC
V_IN acceptable range:
4V-17V
TPS62177N
2.2MHz ~ 500mA Max
LP2985
3V3
3V3A_IN
3V3_D
3V3_A
AGND
GND
VBUS
USB_OTG_FS_VBUS
USB_OTG_FS_D_IN_-
USB_OTG_FS_D_IN_+
USB_OTG_FS_D_-
USB_OTG_FS_D_+
USB_OTG_FS_ID

Pricing/Availabillity

Availability

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

Support

For Daisy support, submit an email inquiry with hello@electro-smith.com, or reach out on the Daisy Forum.

Volume Price List

MODEL	SKU	MINIMAL 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.