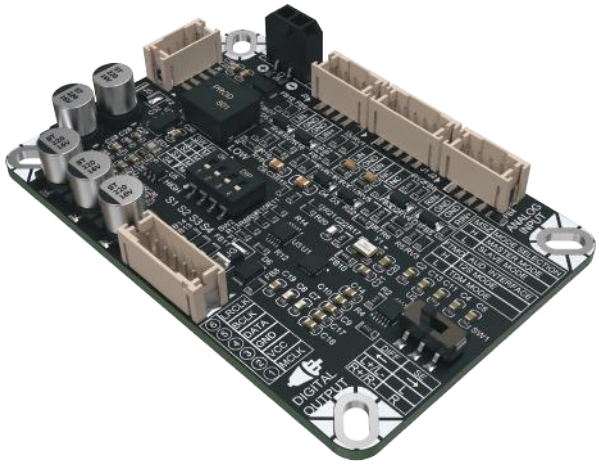
ASCM-A2D

Audio ADC Module - PCM1822

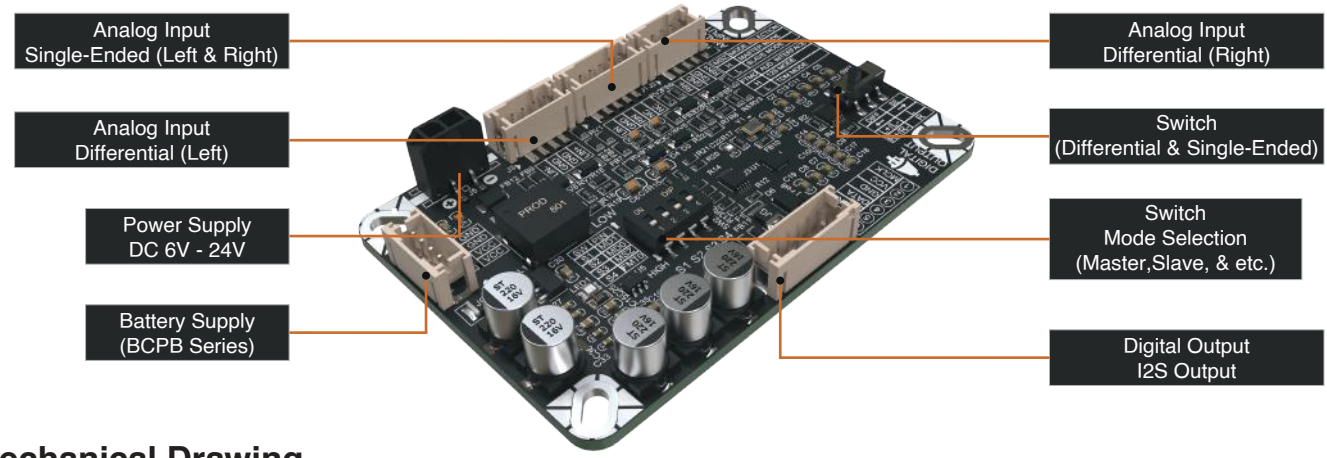


The ASCM-A2D is an audio analog-to-digital module that is designed to enable the sampling two analog channels simultaneously. ASCM-A2D also supports single-ended and differential signals.

Features:

- 2-channel analog line that supports simultaneous sampling.
- Support single-ended and differential line-in(s).
- Support master and slave mode selection for the audio bus interface operation.
- Operating temperature between -20°C and 65°C.

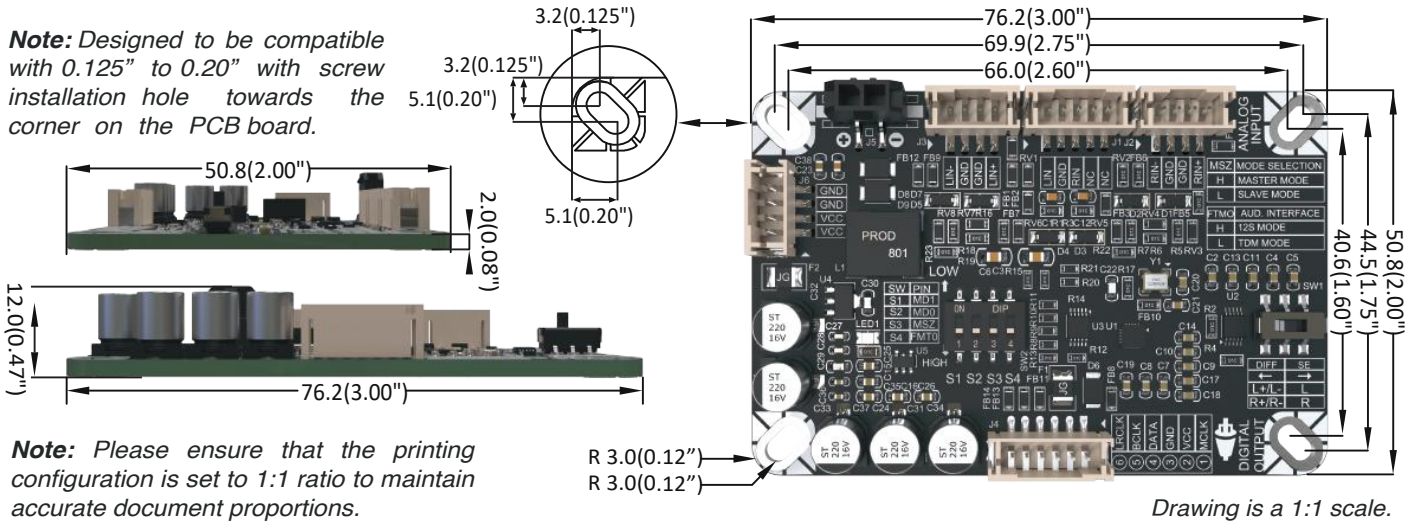
Specification(s) :	
Supply Voltage	:DC 6V - 24V
Power Input Connector(s)	:Micro-Fit 1x2 CKT & JST PH 4 Circuit
Analog Input Connector(s)	:JST PH 4-Circuit (Differential) &
	:JST PH 5-Circuit (Single-Ended)
Digital Output Connector(s)	: JST PH 6-Circuit
Product Size	: 76.20 (W) x 50.80 (D) x 12.00 (H) mm
	: 3.00 (W) x 2.00 (D) x 0.47 (H) Inch
Net Weight	: 21g ± 2g



Mechanical Drawing

(Nominal Dimension, mm(inch))

Note: *Designed to be compatible with 0.125" to 0.20" with screw installation hole towards the corner on the PCB board.*



Note: *Please ensure that the printing configuration is set to 1:1 ratio to maintain accurate document proportions.*

Drawing is a 1:1 scale.

Precautions

Safety Precautions

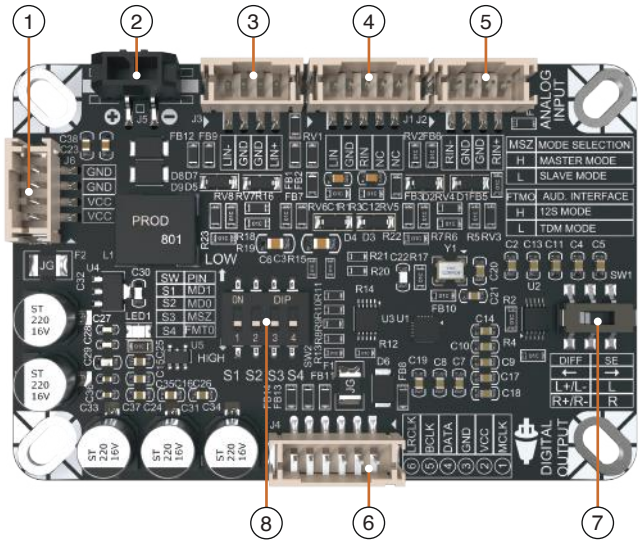
⚠ CAUTION Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

When using the ASCM-A2D audio analog to digital module, prioritize safety for the board, connected devices, and user well-being. Verify power supply voltage and current meet specifications to prevent damage or hazards. Disconnect power before handling cables to avoid electric shock. When connecting external audio sources, ensure they're powered off to prevent surges or interference. Verify compatibility with board's input specs to avoid overload or distortion. Handle the board carefully to avoid damage from moisture or dust. Follow assembly instructions closely, checking connections to prevent issues, ensuring safe operation, and maximizing performance and lifespan.

Connector(s) & Switch(s) Layout

ASCM-A2D Audio ADC Module

SWITCH	CIRCUITS	
S1	1	MD1
S2	2	MD0
S3	3	MSZ
S4	4	FMT0



AUDIO INPUT MODE			
Differential		Single-Ended	
←		→	
L(+ve)	R(+ve)	L(+ve)	R(+ve)
L(-ve)	R(-ve)		

OPERATION MODE		
MSZ	HIGH	LOW
	Master Mode	Slave Mode

SLAVE MODE		
DECIMATION FILTER SELECTION		
MDO	HIGH	LOW
	Low Latency	Linear Phase
DRE SELECTION		
MD1	HIGH	LOW
	Enabled	Disabled

ASI FORMAT		
FMT0	HIGH	LOW
	I2S Mode	TDM Mode

MASTER MODE		
SYS. CLOCK SELECTION		
MDO	HIGH	LOW
	512 * fs	256 * fs
MD1	MCLK	

Connector(s):

1. Battery Supply Input (BCPB Series)(JST PH 4-Circuits):
- Battery support voltage range (6V - 24V).
- Compatible with the BCPB series.

2. Power Supply Input (Micro-Fit 1x2 CKT):
- DC supply voltage range (6V - 24V)
- Reduce the risk of power interruptions.

3. Differential LEFT Audio Input (JST PH 4-Circuits):
- Used for differential audio input signal(s).
- Specified for two(2) complementary signals with opposite polarities for LEFT channels.

4. Single-Ended LEFT & RIGHT Audio Input (JST PH 5-Circuits):
- Used for single-ended audio input signal(s).
- Specified for two(2) single-channels which are LEFT channels and RIGHT channels.

5. Differential RIGHT Audio Input (JST PH 4-Circuits):
- Used for differential audio input signal(s).
- Specified for two(2) complementary signals with opposite polarities for RIGHT channels.

6. I2S Audio Output (JST PH 6-Circuits):
- Used for digital Inter-Integrated Circuit Sound (I2S) output.
- High-quality digital audio data.
- Reliable power supply for audio performance.

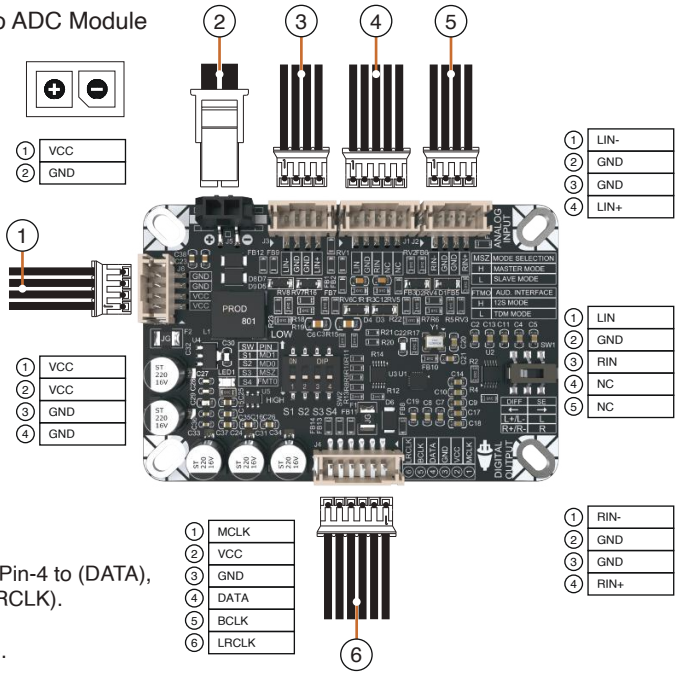
Switch(s):

7. DPDT Switch (Dual Pole Double Throw):
- Able to operate both audio input selection mode between differential mode and single-ended mode.
- Slide Left for differential mode.
- Slide Right for single-ended mode.

8. SPST Switch (Single Pole Single Throw):
- Able to switch mode between master mode and slave mode.
- Support audio bus interface including audio serial interface (ASI) format, system clock selection, decimation filter and dynamic range enhancer (DRE) selection.
- Slide-Up for LOW.
- Slide-Down for HIGH.
- Switch (S1) for MD1 mode.
- Switch (S2) for MD0 mode.
- Switch (S3) for operation mode.
- Switch (S4) for ASI format mode.

Port(s) Layout

Connecting the ASCM-A2D Audio ADC Module



2. Micro-Fit 1x2 CKT (J5)
- Power supply voltage range from 6V to 24V.
- Connect Pin-1 to VCC and Pin-2 to Ground (GND).

1. JST PH 4-Circuits (J6)
- Battery supply voltage range from 6V to 24V.
- Connect Pin-1 and Pin-2 to VCC and Pin-3 and Pin-4 to Ground (GND).
- Support external connection from BCPB series.

6. JST PH 6-Circuits (J4)
- I2S digital audio output signals.
- Connect Pin-1 to (MCLK/MD1), Pin-4 to (DATA), Pin-5 to (BCLK) and Pin-6 to (LRCLK).
- Connect Pin-2 to VCC.
- Connect Pin-3 to Ground (GND).

3. JST PH 4-Circuits (J3)
- Specified for differential signal(s) Left channel.
- Connect Pin-1 to Negative(-) Left channel.
- Connect Pin-4 to Positive(+) Left channel.
- Connect Pin-2 and Pin-3 to Ground (GND).

4. JST PH 5-Circuits (J1)
- Specified for single-ended signal(s) Right and Left channel.
- Connect Pin-1 to Positive(+) Left channel.
- Connect Pin-3 to Positive Right channel.

5. JST PH 4-Circuits (J2)
- Specified for differential signal(s) Right channel.
- Connect Pin-1 to Negative(-) Right channel.
- Connect Pin-4 to Positive(+) Right channel.
- Connect Pin-2 and Pin-3 to Ground (GND).

Electrical and Audio Performance Parameters

Electrical and audio performance specifications are typical at +25°C, powered by 12V DC, unless subject to change without notice. Combination with any add-on module(s) are not tested together.

ASCM-A2D Electrical Performance Parameters

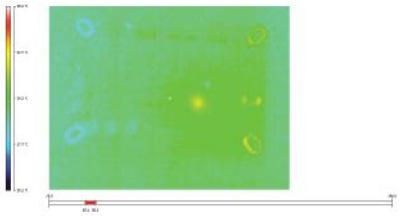
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Voltage	DC Supply Voltage	6	12	24	VDC
Sampling Rate	-	8	48/96	192	kHz
Rated Current	When operating voltage (VCC = 12V)	0.08	0.12	0.3	A
Idle Power	When operating voltage (VCC = 12V)	1.35	1.5	1.65	W
Output I2S Parameter	44.1-48/96kHZ/ 24-bit (Only this parameter has been tested)	-	48	-	kHz
Input Impedance	SE ; DIFF	-	2.5	-	kΩ
Operating Temperature	Operating ambient temperature	-20	25	65	°C

ASCM-A2D Audio Performance Parameters

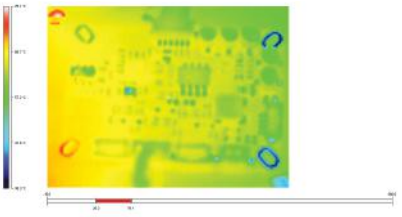
Parameter	Conditions	Min.	Typ.	Max.	Unit
Frequency Response	V_{IN} = 100mVrms, (VCC = 12V)	0.02	-	20	kHz
Gain	SE ; DIFF	-	-0.31	-	dB
Input Sensitivity (RMS)	SE ; DIFF	-	0.1	-	mV
Bandwidth @ ± 3dB	-	20	-	20k	Hz
Total Harmonic Distortion (THD + N)	VCC = 12V ; Generator Level = 100mVrms ; A-weighting	-	0.00047	-	%
Output Noise Level	Input connected to ground (GND) ; A-weighting	-	0.97	-	µVrms
Signal-to-Noise Ratio (SNR)	VCC = 12V ; Generator Level = 1.000Vrms ; A-weighting	-	119.93	-	dB

Thermal Image of ASCM-A2D

Condition 1:
- ***Test Setup:*** *ASCM-A2D board tested at 25°C*
- ***Load:*** *Full load (1kHz audio)*



Condition 2:
- ***Test Setup:*** *ASCM-A2D board tested at 65°C*
- ***Load:*** *Full load (1kHz audio)*

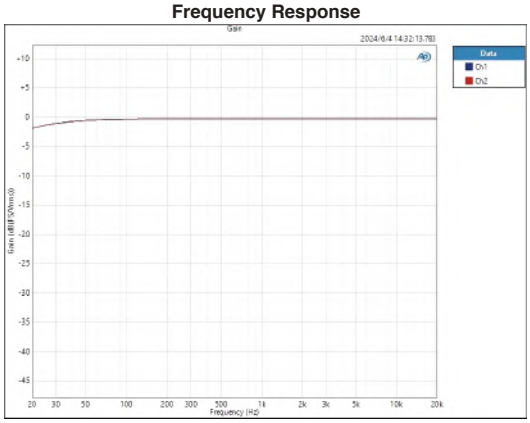


⚠ Note: ASCM-A2D do provide reverse polarity protection, BUT extreme caution must be exercised to ensure correct polarity during connection. Permanent damage caused by reverse polarity will not be covered under warranty.

Audio Performance Metrics

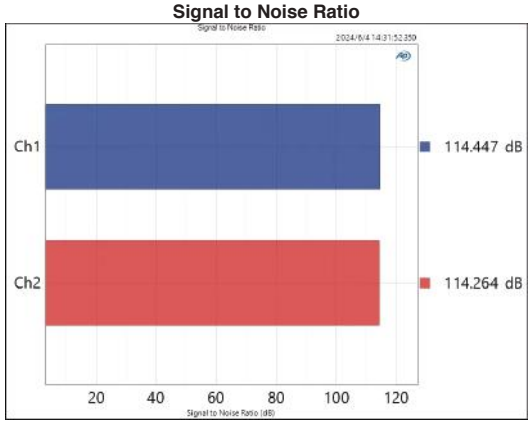
Graphs for Frequency Response, Signal to Noise Ratio, Noise Level, and THD+N Ratio

Frequency Response



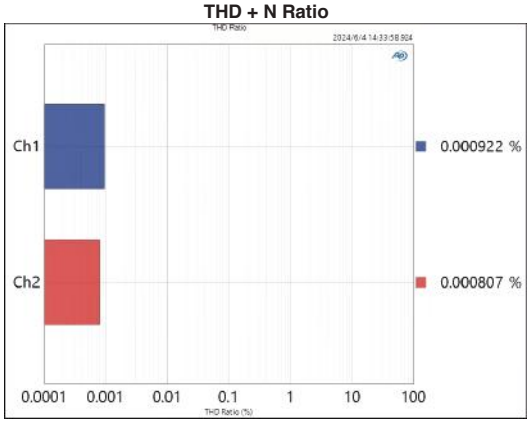
Conditions:	SE ; DIFF

Signal to Noise Ratio



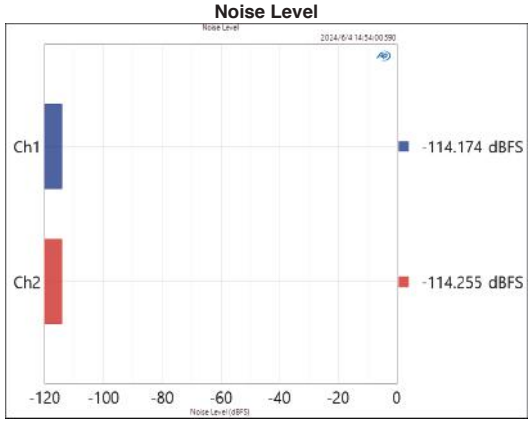
Conditions:	VCC = 12V ; Generator Input Signal Voltage/Level = 1.000Vrms ; Frequency = 1kHz ; A-weighting

THD + N Ratio



Conditions:	VCC = 12V ; Generator Input Signal Voltage/Level = 100mVrms ; Frequency = 1kHz ; A-weighting

Noise Level



Conditions:	Input connected to GND ; A-weighting

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Warranty Terms and Product Usage Restrictions

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Origin and Design Location

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