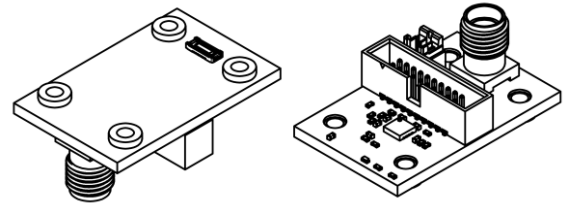


AMS-x1-SMA

PRELIMINARY DATASHEET

Converter to single-ended SMA output for the AMS detection module series



FEATURES

- Compatible with all AMS modules
- Bandwidth: DC to 10 MHz
- Differential gain: x1
- Common mode gain: x1
- Rapid prototyping and proof-of-concept development
- Laboratory measurements using an oscilloscope

GENERAL DESCRIPTION

The AMS-x1-SMA is a differential to single-ended converter for the AMS module series. It provides easy connectivity with typical laboratory equipment for R&D and proof-of-concept work. The board's full CAD project is available upon request.

ELECTRICAL DIAGRAMS

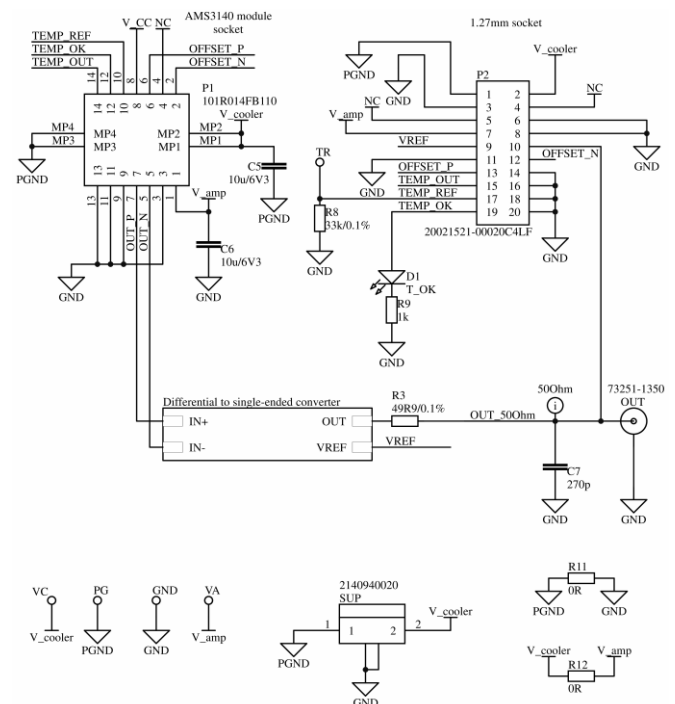


FIGURE 1. General schematic diagram of the AMS-x1-SMA.

CONNECTIVITY

The P1 socket is the interface to the AMS module. Signal output is provided on out SMA socket as well as on P2 which is a standard 1.27mm board-to-wire solution. P2 can be used also for setting the desired temperature of the detector, reading the actual temperature of the detector, adjusting the DC offset and providing a power supply. Additionally, the SUP header (Molex OneBlade 2140940020, mating part number: 2140922020) can also be used for power supply. All unused pins of the P2 socket should be left unconnected to avoid parasitic coupling and electromagnetic interference.

TABLE 1. P2 socket pin functions

Pin number	Symbol	Function
1	PGND	Ground for cooling subsystem. Internally connected to GND with 0R resistor
2	V _{cooler}	3.3V cooling subsystem supply input. Internally connected to V _{amp} with 0R resistor
3, 6, 8, 11, 14, 16, 18, 20	GND	Signal and amplifier supply ground. Internally connected to PGND with 0R resistor
4, 5	NC	Not used. Leave floating
7	V _{amp}	3.3V amplifier supply input. Internally connected to V _{cooler} with 0R resistor
9	VREF	Reference voltage for the output signal. Check chapter REFERENCE VOLTAGE for details
10	OUT	Output signal
12	OFFSET_N	Negative offset adjustment. Please refer to AMS datasheet for more details
13	OFFSET_P	Positive offset adjustment. Please refer to AMS datasheet for more details
15	TEMP_OUT	Analog temperature output
17	TEMP_REF	Temperature reference voltage
19	TEMP_OK	Comparator output signal

POWER SUPPLY

The AMS module and most of its accessories require a separate power supply for the cooling subsystem (V_{cooler}/PGND). Since the AMS-x1-SMA is going to be used on the top of the entire AMS stack of the boards, V_{cooler} and V_{amp} are internally tied together for easier use in the laboratory. If this is not desired, those supplies may be still separated by removing the R11 and R12 resistors (see FIGURE 1).

REFERENCE VOLTAGE

Since only a single positive power supply voltage is used, a small reference voltage is added to the output signal to avoid saturation of the amplifiers.

Internal voltage divider R5/R7 provides reference voltage (0.5V) for differential to single-ended converter (see FIGURE 3). If a different or more accurate reference is required, an external voltage may be applied to pin 9 on the P2 socket.

MECHANICAL REQUIREMENTS

There are four spacers mounted on the PCB to keep the proper distance between the AMS module and AMS-x1-SMA.

Warning! The P1 socket is very sensitive to mechanical stress. The AMS-x1-SMA must be fixed to the AMS detection module with screws and nuts. Caution is required when assembling the adapter with the module.

MECHANICAL LAYOUT

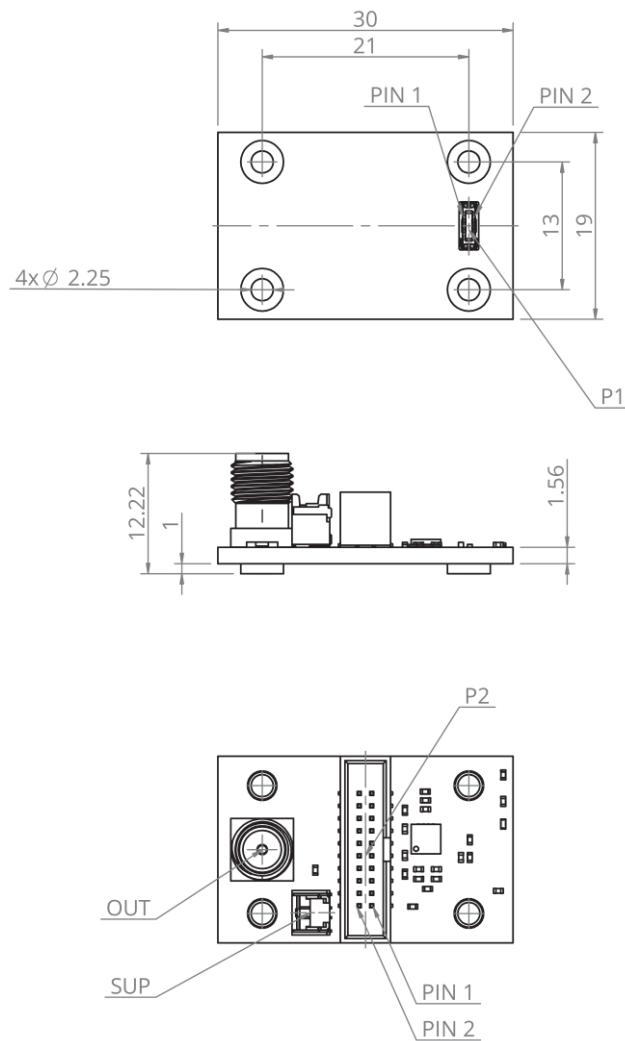


FIGURE 2. Dimensions of the AMS-x1-SMA (given in mm)

DETAILED SCHEMATICS

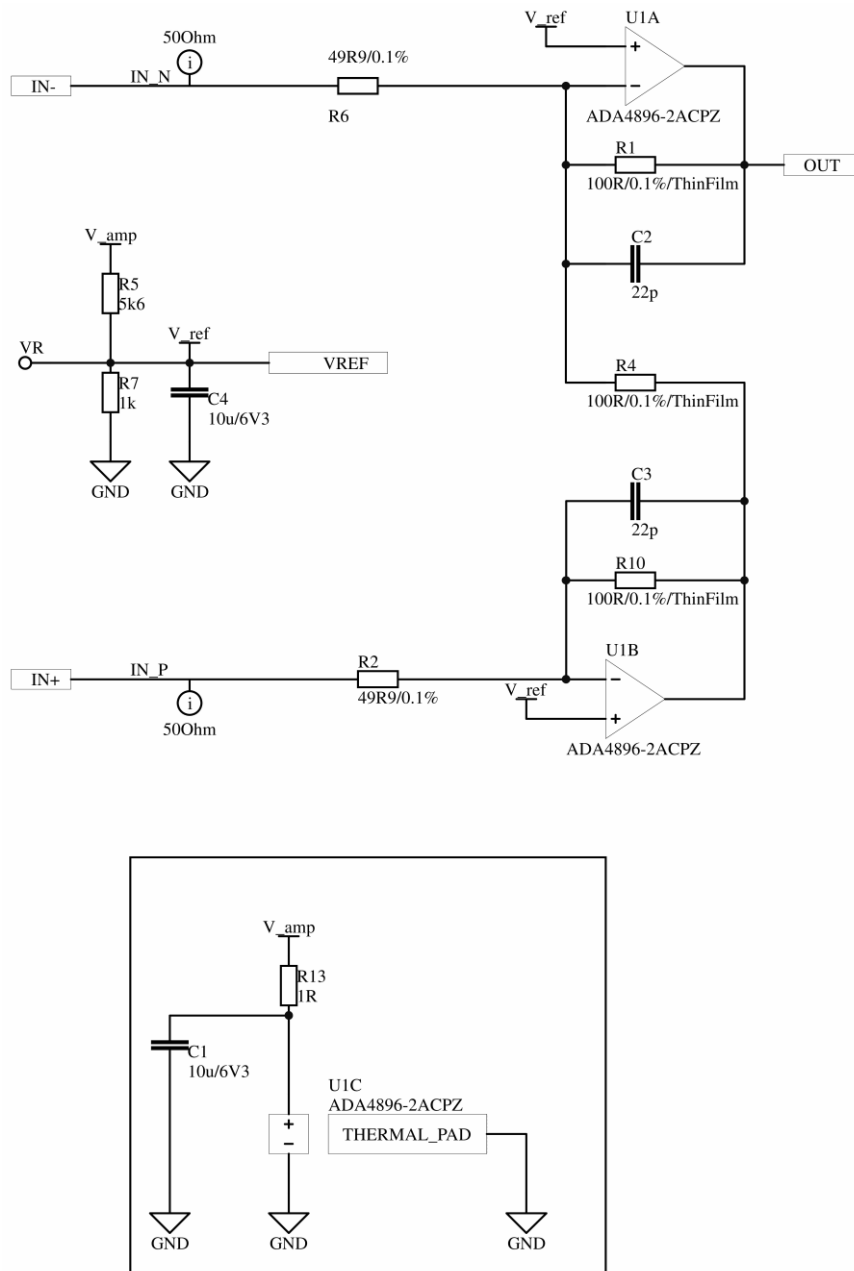


FIGURE 3. Schematic of the differential to single-ended converter of the AMS-x1-SMA