

MINI DSP EVM KIT Application Manual

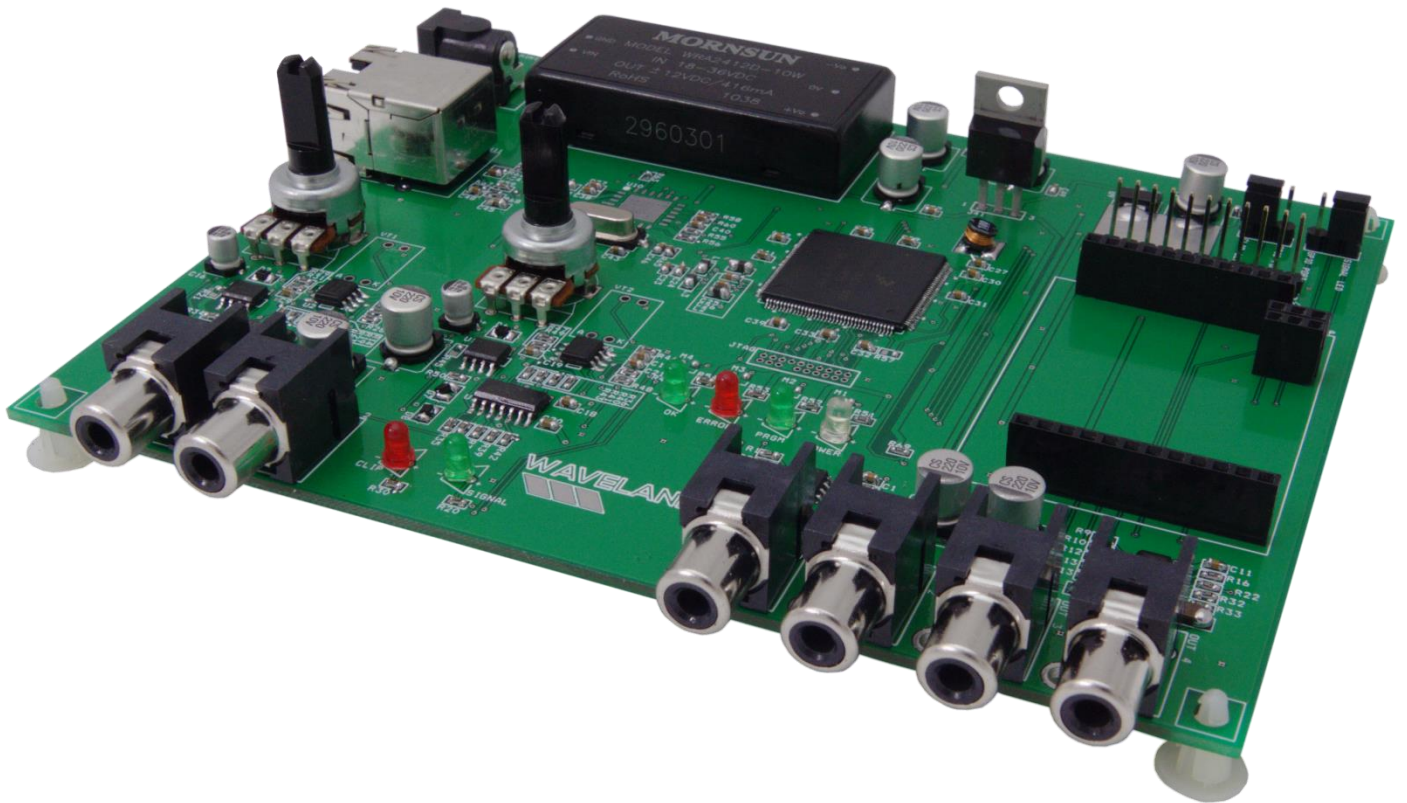


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1. System overview

MINI DSP EVM KIT is an evaluation board for MINI DSP. With this board it's possible for the customer test and evaluate all the functionality of MINI DSP Family.

The MINI DSP EVM KIT have a MINI DSP BURNER integrated for program the MINI DSP BOARD, so the customer only have to plug and play the system. Customers that want to meet MINI DSP FAMILY, this board it's the perfect solution.

The MINI DSP EVM acts like a little 2x4 audio processor without balanced audio in/out. With his board Its possible to test all the filters, crossovers, dynamics, LED's and more capabilities of the MINI DSP board.

For MINI DSP EVM KIT, Waveland Team have designed a layout with 2 audio inputs and 4 audio outputs, with input mixer-matrix, and full EQ and dynamics processing in every channel.

GPIO port can be used for developer for test external peripheral controls like potentiometers on GPI 3 and 6.

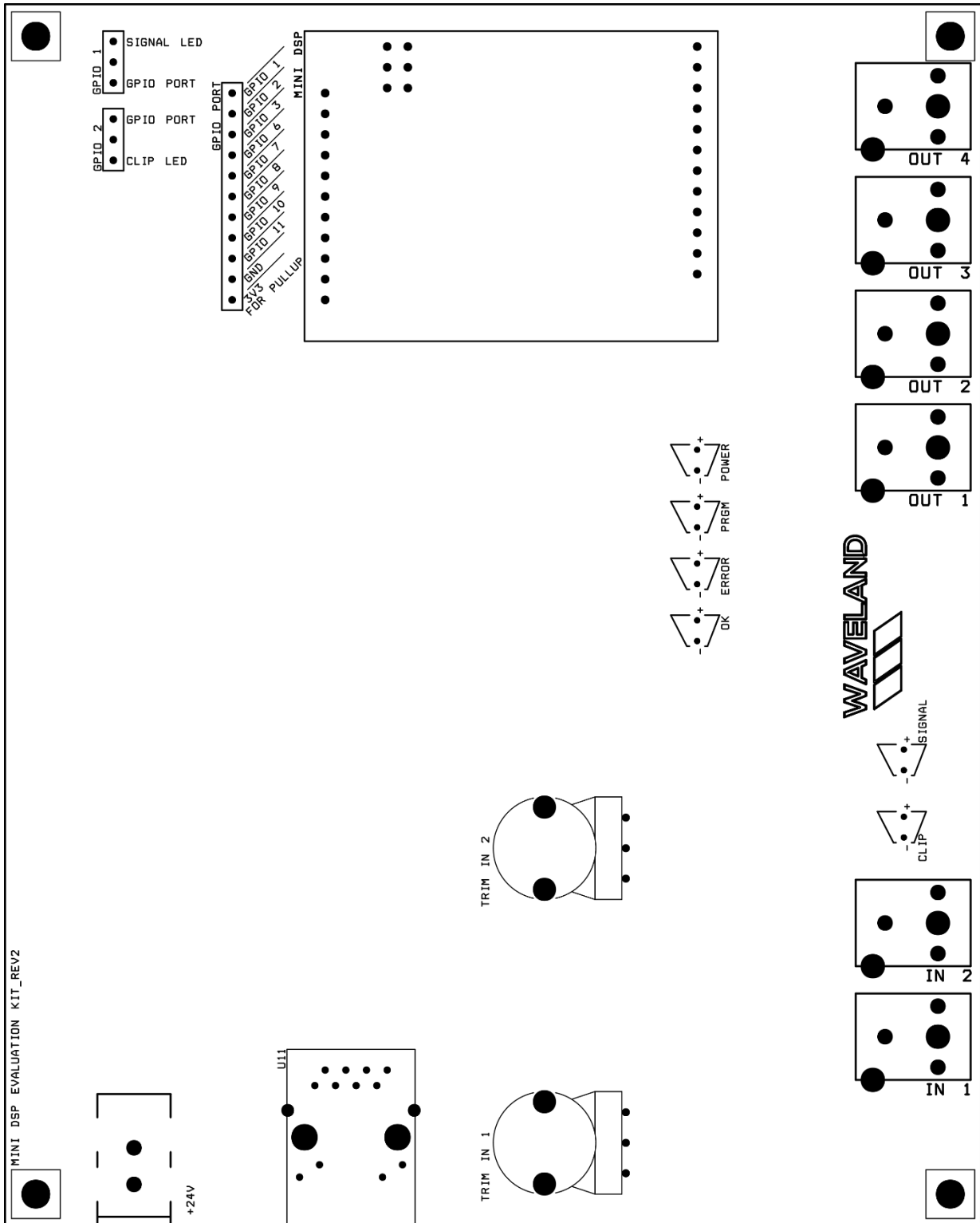
For use the system, connect the board to a computer trough Ethernet, open the Waveland Designer Layout and play. Connect audio inputs and outputs and start to sound.

For all details of audio processing, or DSP features, have a look to MINI DSP Application Manual.

2. Features

- 2 unbalanced audio inputs.
- 4 unbalanced audio outputs
- Full DSP audio processing with dynamics processing, EQ and effects.
- 24 bit – 48 KHz audio conversion.
- 28 Bit internal processing.
- Easy integration, only 38x50mm board.
- 9 GPIO with 4 auxiliary ADC on a specific connector for development.

3. MINI DSP module connections and controls



GPIO PORT 11 x 2.54mm pin pitch			
Name	DIRECTION	PIN	Description
GPIO 1	OUTPUT	1	For control SIGNAL led or GPIO PORT, depending on jumper config.
GPIO 2	OUTPUT	2	For control SIGNAL led or GPIO PORT, depending on jumper config.
GPIO 3	ADC INPUT	3	For connect external liner potentiometer to attenuate input 1.
GPIO 6	ADC INPUT	4	For connect external liner potentiometer to attenuate input 2.
GPIO 7	OUTPUT	5	For active high output with virtual button on Waveland Designer layout
GPIO 8	OUTPUT	6	For active high output with virtual button on Waveland Designer layout
GPIO 9	INPUT	7	Input high switches on a virtual led on Waveland Designer layout.
GPIO 10	INPUT	8	Input high switches on a virtual led on Waveland Designer layout.
GPIO 11	INPUT	9	Input high switches on a virtual led on Waveland Designer layout.
GND	-	10	Ground
3V3	OUTPUT	11	3.3V output only for pull HI or for ADC inputs.

3.1. External device connections

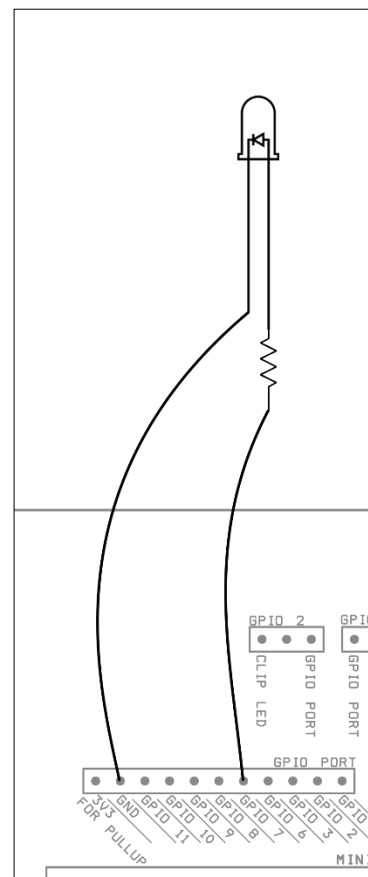
3.1.1. For GPIO output high

Output levels are 3V3 and 20mA compliant.

For connect LEDs, put anode on GPIO output and cathode to GND. We recommend to put a resistor in series with the led to control the maximum current. To test the LEDs push the virtual buttons on the Waveland Designer layout to turn on/off the LED's.

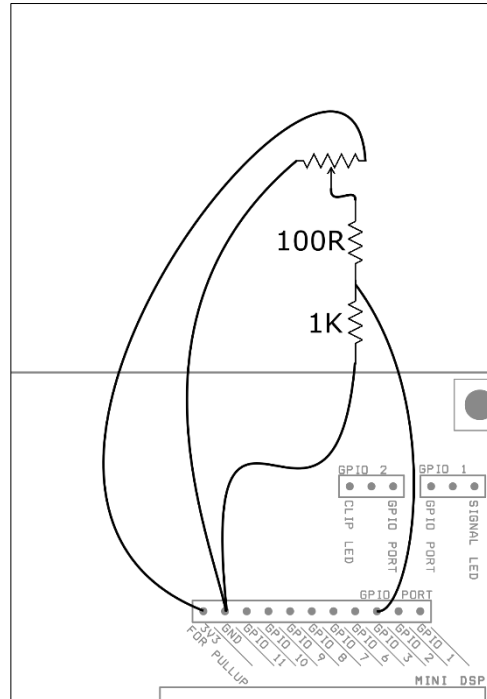
Signal an CLIP LED's are fixed by Waveland, the customer only can select which channel manage the LED's. It can be selected between CH1, CH2 or higher level, in Waveland Designer Layout.

If another devices wants to be managed with output GPIO, we recommend to use MOSFET transistors in order to isolate output GPIO pins and more current can be managed, depending on transistor used. For example, for manage relays.



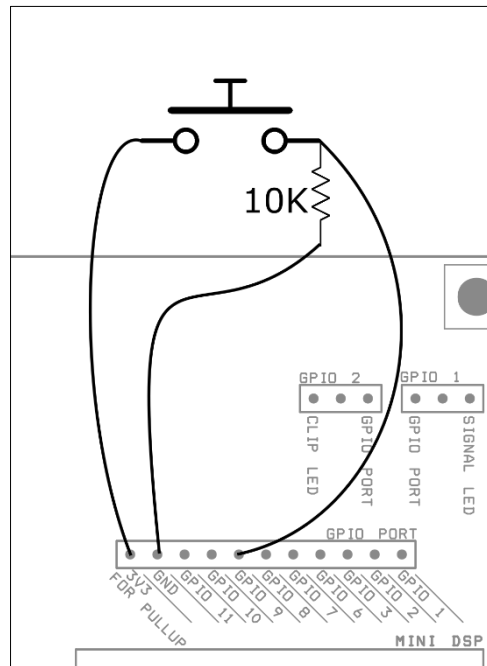
3.1.2. For ADC input

For ADC is necessary to adapt input level to avoid full scale saturation before the maximum range of the potentiometer. To adapt 3V3 level to 3V, we recommend to use a simple voltage divider. 10K, 20K or 50K potentiometers can be used, and it's important to use linear potentiometers to use better all of the potentiometer range. Linear faders can be used too, same as a rotary potentiometer. For using potentiometers is necessary to activate potentiometer input on Waveland Designer layout.



3.1.3. For GPIO input

For GPIO inputs, is necessary to put a pull down resistor to stabilize the logic state at non pushing situations. When a GPIO is pushed a virtual led will blink on Waveland designer layout. If an external device like a MCU want to be used to pull up/down a GPIO input, is very important to check the logic level values to avoid electrical damages in MIDI DSP Board. The maximum input level to GPIO inputs is 3V3.

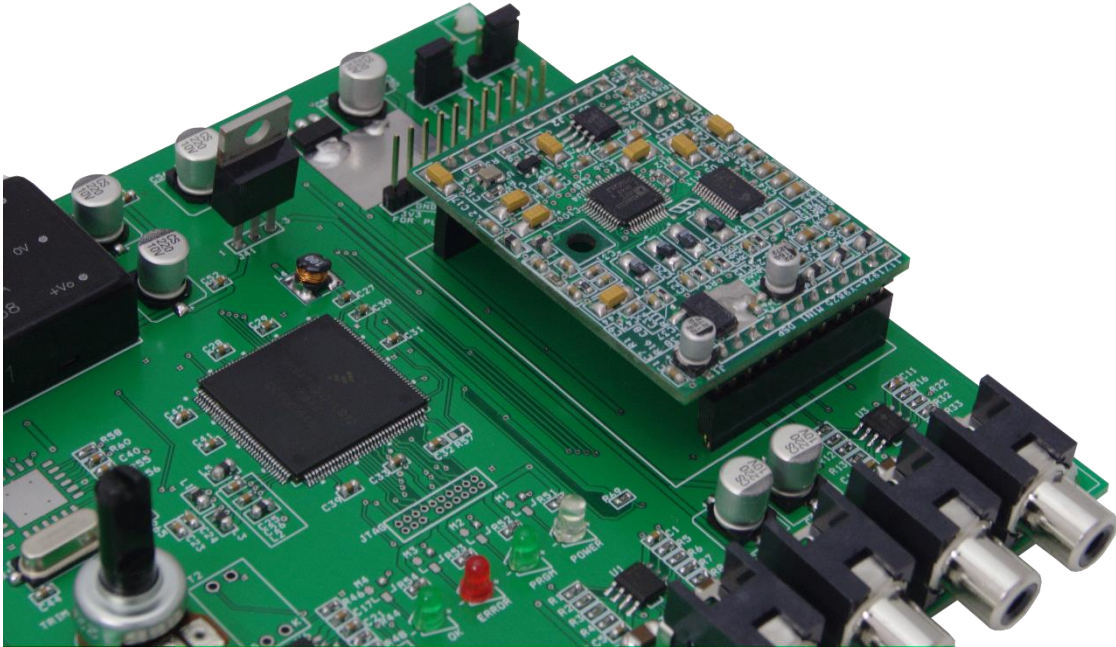


3.2. Indication LEDs

Name	Description
Power	Power OK on MINI DSP BURNER
Error	Problems on communication or programming process.
Prgm	This LED blinks during programming process or real time operation.
OK	The download process went well.

4. MINI DSP installation

For using the MINI DSP EVM is necessary to connect a MINI DSP board. This process is very easy, and only consists in plugging the MINI DSP board over the MINI DSP EVM KIT.



MINI DSP EVM is ready to work with MINI DSP board, only plugging both boards and starts to play.

5. Values and specification

5.1. Voltage and Current ratings

Name	Description	MIN	TYP	MAX	UNIT
Vin +24V	Main input voltage.	24	24	24	V
Audio Inputs	Audio inputs pins. Value per pin.	-	-	3	V
GPIO	Input voltage per pin.	-	3.3	3.3	V
GPIO	Output Current per pin	-	-	20	mA

5.2. Electrical characteristics

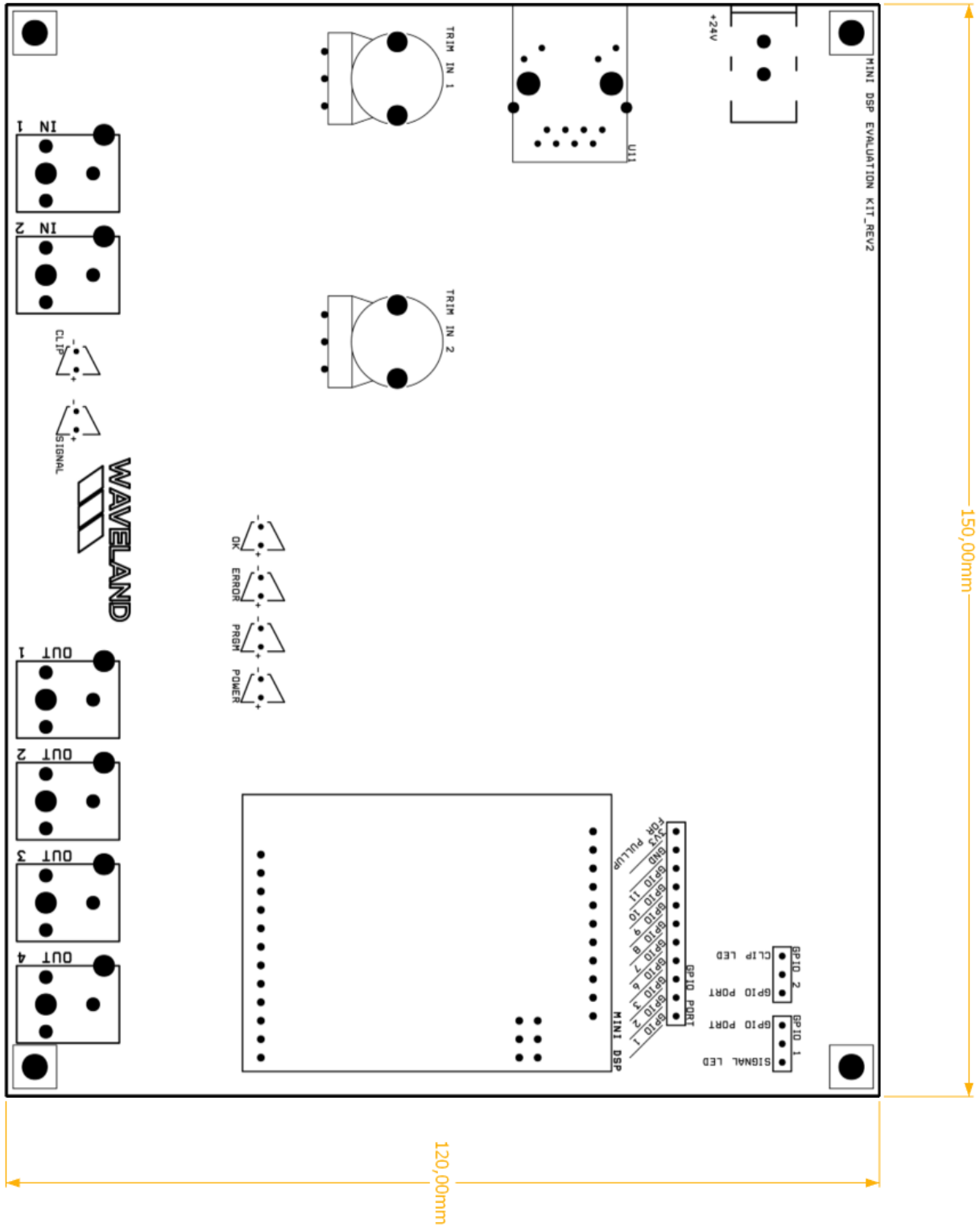
Parameter	MIN	TYP	MAX	UNIT
Full scale audio input	-	2.1	-	Vrms
Full scale GPIO ADC input*	-	3	-	Vp
GPIO output current per pin**	-	-	20	mA
Recommended current for main input power	-	350	-	mA
Full scale audio output (OUT 1@4)		0.9		Vrms

6. Specifications

Parameter	Value	Units
System sample rate	48000	Hz
AD bit depth	24	bit
DSP internal processing bit depth	28	bit
Input SNR	110	dB
Output SNR	104	dB
Total memory available for presets	1	kB

7. Drawings

*All measures are in mm.



Additional information	
PCB thickness	1.6 mm
Solder mask	Green