LM48100_FA Bench Test

1. Configuration and Setup

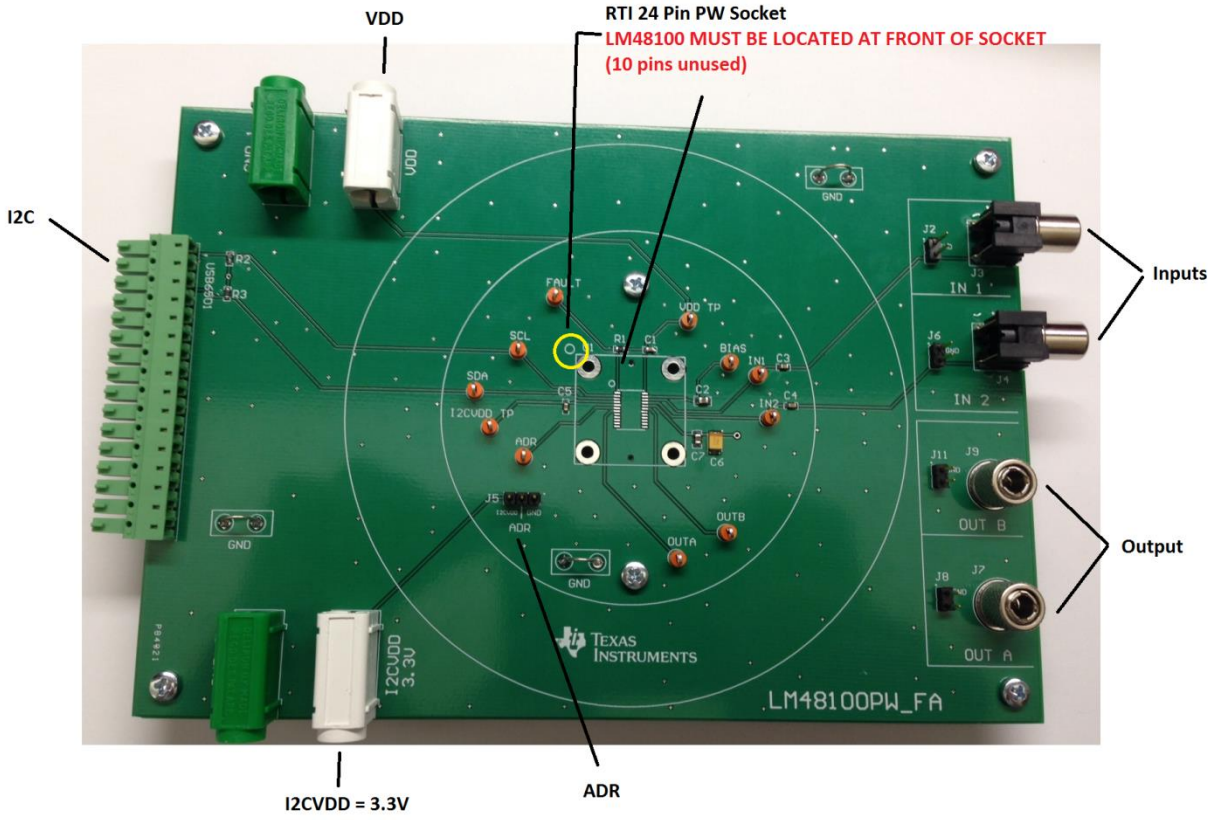
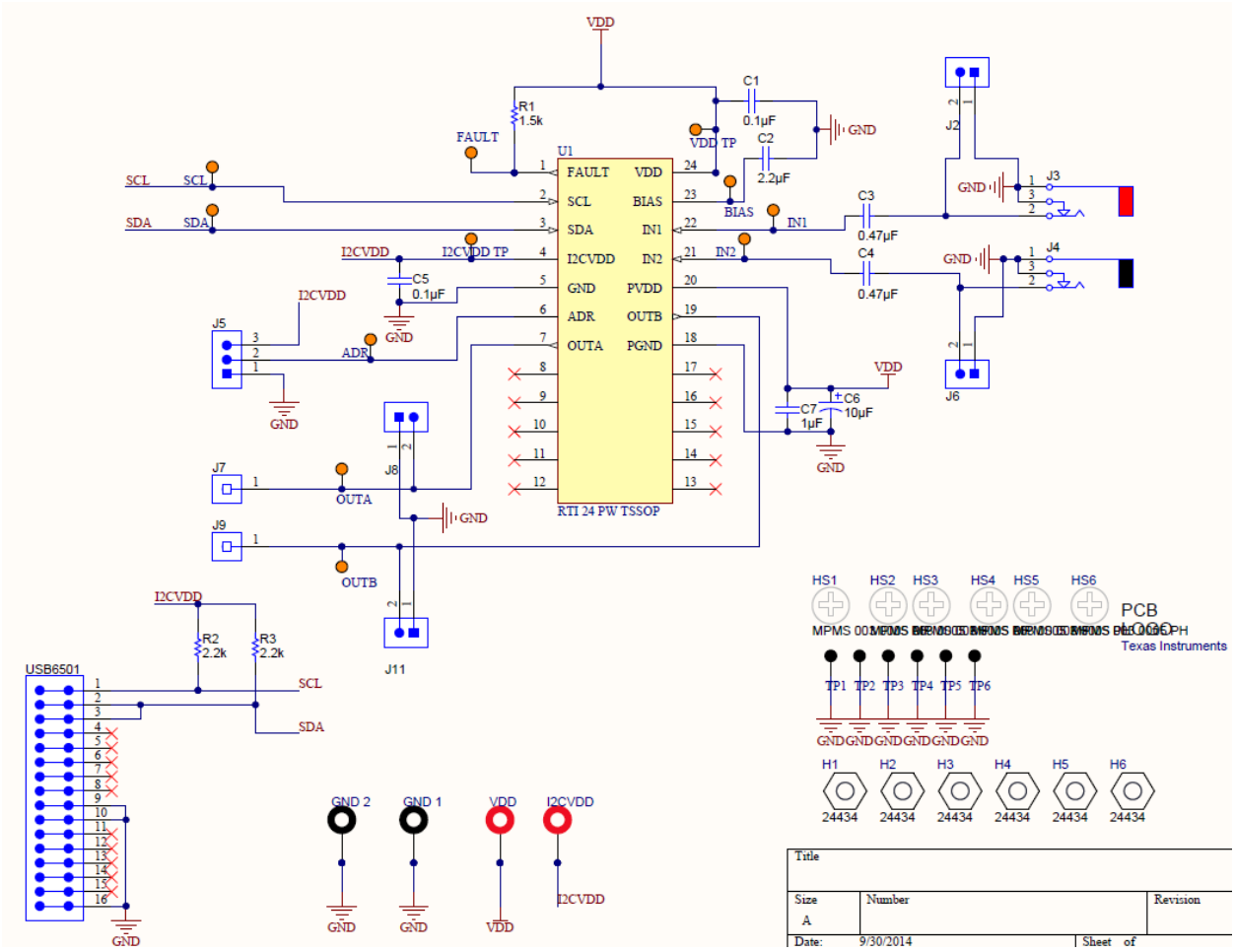


Figure 1 Board Layout

The board should be configured as described in figure 1 above with the addition of the RTI PW socket. VDD can be selected between 3.0V and 5.5V depending on customer use case.

a. **Inputs:** are analog single ended. Connection is made via the self-grounding RCA jacks. (Note: Both SE inputs are not necessary for operation)
b. **Output:** OUTA and OUTB is a differential speaker output. The load must be connected between these two terminals as there is only one output on this part. This part has various load detection conditions that will trip the FAULT line. See datasheet
c. **I2C:** The I2C configuration registers control mode, diagnostic, fault and volume control. **This is a write only device!**
d. **ADR:** Controls the parts I2C address
e. **VDD:** 3.0V – 5.5V MAX
f. **I2CVDD:** 3.3V

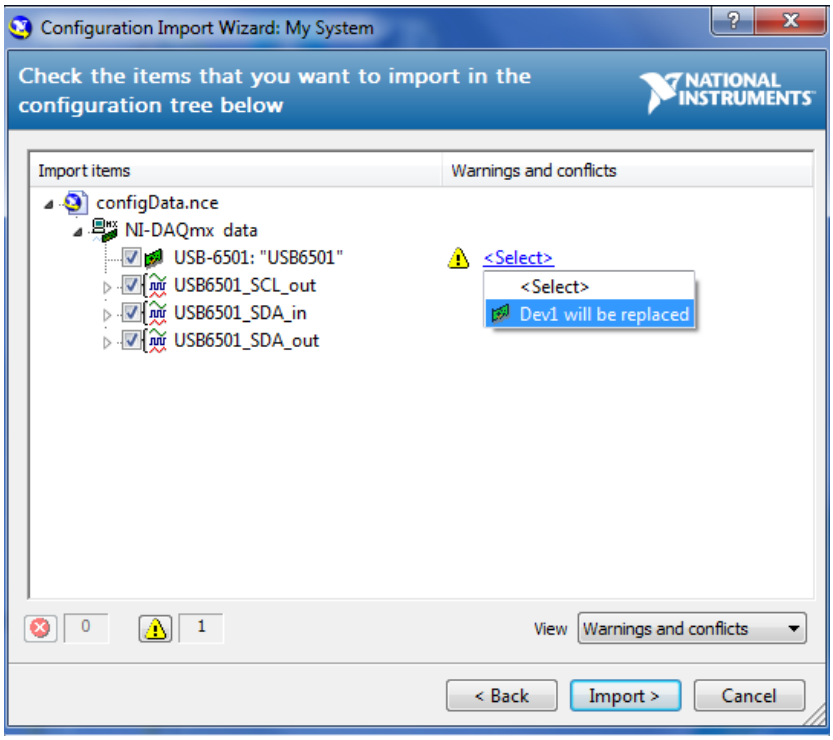
2. LM48100 Test Board Schematic



3. LM48100 GUI

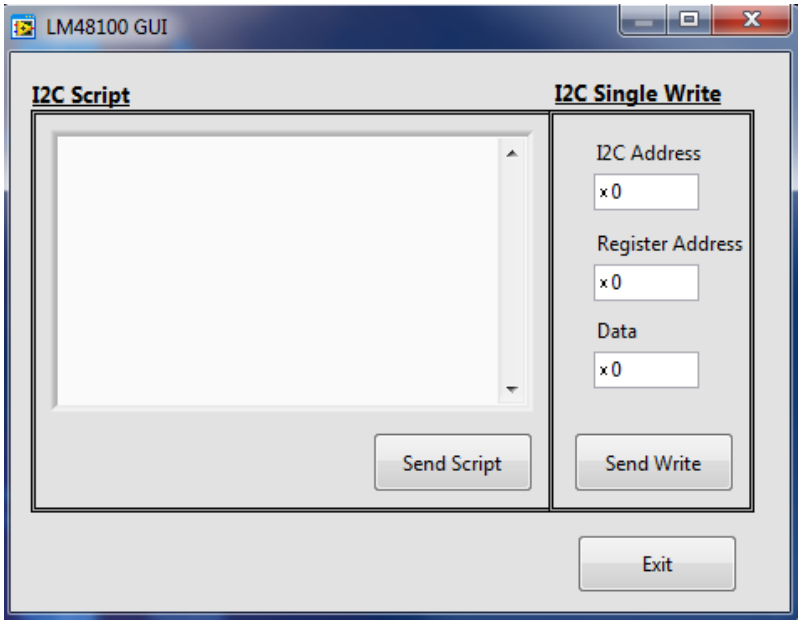
1/ Installation

- ✓ Run the setup file as an administrator
- ✓ Restart now the Computer
- ✓ Select the NI device, see below



2/ GUI

LM48100 is an "**Only writes**" device..



The left window allow you to send a script via I2C

The right window allow you to send a single write and change the I2C configuration of the LM48100

4. Example Run Script

```
# LM48100Q FA Board Test Script


# set Vol 1 for odB
w f8 03 72
# set Vol 2 for 0dB
w f8 04 92
# clear reg 0
w f8 00 00
# power amp on with input 1 only
w F8 00 14
```

5. I2C Control

Table 1. Device Address

	B7	B6	B5	B4	B3	B2	B1	B0 R/$\overline{W}$
ADR = 0	1	1	1	1	1	0	0	0
ADR = 1	1	1	1	1	1	0	1	0

Table 2. I^2C Control Registers

Register Address	Register Name	B7	B6	B5	B4	B3	B2	B1	B0
0	MODE CONTROL	0	0	0	POWER_ON	INPUT_2	INPUT_1	0	0
1	DIAGNOSTIC CONTROL	0	0	1	DG_EN	DG_CONT	DG_RESET	ILIMIT	0
2	FAULT DETECTION CONTROL	0	1	0	TSD	OCF	RAIL_SHT	OUTPUT _OPEN	OUTPUT _SHORT
3	VOLUME CONTROL 1	0	1	1	VOL1_4	VOL1_3	VOL1_2	VOL1_1	VOL1_0
4	VOLUME CONTROL 2	1	0	0	VOL2_4	VOL2_3	VOL2_2	VOL_2	VOL2_0

Table 3. Mode Control Registers

BIT	NAME	VALUE	DESCRIPTION
B0, B1	RESERVED	0	Unused
B2	INPUT_1	0	IN1 Input unselected
		1	IN1 Input selected
B3	INPUT_2	0	IN2 Input unselected
		1	IN2 Input selected
B4	POWER_ON	0	Device Disabled
		1	Device Enabled

Bit B2, DG_RESET, restores the LM48100Q to normal operation after an output fault is detected. Toggle DG_RESET to re-enable the device outputs and set $\overline{FAULT}$ high.

Table 4. Diagnostic Control Register

BIT	NAME	VALUE	DESCRIPTION
B0	RESERVED	0	Unused
B1	ILIMIT	0	Fixed output current limit
		1	Supply dependent output current limit
B2	DG _RESET	0	Normal operation. $\overline{FAULT}$ remains low and device is disabled once a fault occurs.
		1	Reset $\overline{FAULT}$ output. Device returns to pre-fault operation.
B3	DG _CONT	0	One shot diagnostic
		1	Continuous diagnostic
B4	DG_EN	0	Disable diagnostic
		1	Enable diagnostic

Table 5. Fault Detection Control Register

BIT	NAME	VALUE	DESCRIPTION
B0	OUTPUT_SHT	0	Normal operation
		1	Ignore output short circuit fault (outputs shorted together)
B1	OUTPUT_OPEN	0	Normal operation
		1	Ignore output short circuit fault
B2	RAIL _SHT	0	Normal operation
		1	Ignore output short to V_{DD} or GND fault
B3	OVF	0	Normal operation
		1	Ignore output over-current fault
B4	TSD	0	Normal operation
		1	Ignore thermal overload fault

Table 6. Input Multiplexer Control

INPUT_1	INPUT_2	LM48100Q OUTPUT
0	0	MUTE. No input selected
1	0	IN1 ONLY
0	1	IN2 ONLY
1	1	IN1 + IN2

VOLUME CONTROL

Table 7. Volume Control

Volume Step	VOL4	VOL3	VOL2	VOL1	VOL0	Gain (dB)
1	0	0	0	0	0	–80
2	0	0	0	0	1	–54
3	0	0	0	1	0	–40.5
4	0	0	0	1	1	–34.5
5	0	0	1	0	0	–30
6	0	0	1	0	1	–27
7	0	0	1	1	0	–24
8	0	0	1	1	1	–21
9	0	1	0	0	0	–18
10	0	1	0	0	1	–15
11	0	1	0	1	0	–13.5
12	0	1	0	1	1	–12
13	0	1	1	0	0	–10.5
14	0	1	1	0	1	–9
15	0	1	1	1	0	–7.5
16	0	1	1	1	1	–6
17	1	0	0	0	0	–4.5
18	1	0	0	0	1	–3
19	1	0	0	1	0	–1.5
20	1	0	0	1	1	0
21	1	0	1	0	0	1.5
22	1	0	1	0	1	3
23	1	0	1	1	0	4.5
24	1	0	1	1	1	6
25	1	1	0	0	0	7.5
26	1	1	0	0	1	9
27	1	1	0	1	0	10.5
28	1	1	0	1	1	12
29	1	1	1	0	0	13.5
30	1	1	1	0	1	15
31	1	1	1	1	0	16.5

Table 7. Volume Control (continued)

Volume Step	VOL4	VOL3	VOL2	VOL1	VOL0	Gain (dB)
32	1	1	1	1	1	18