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Therefore, all references to "LAPIS Semiconductor Co., Ltd.", "LAPIS Semiconductor" and/or "LAPIS" in this document shall be replaced with "LAPIS Technology Co., Ltd."

Furthermore, there are no changes to the documents relating to our products other than the company name, the company trademark, logo, etc.

Thank you for your understanding.

LAPIS Technology Co., Ltd.

October 1, 2020



ML2276X/ML2286X Reference Board User's Manual

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1. Overview

This is the instruction manual for ML2276X /ML2286X Reference Board

ML2276X Reference Board supports following functions in combination with Sound Device Control Board.

1. Voice Playback by ML2276X
2. Writing voice data into ML2276X.

Please notice that the LSI written by this reference board can be used only as a prototype.

It is not guaranteed as a mass-produced quality.

ML2286X Reference Board supports following functions in combination with Sound Device Control Board.

1. Voice Playback by ML2286X
2. Writing voice data into ML2286X.

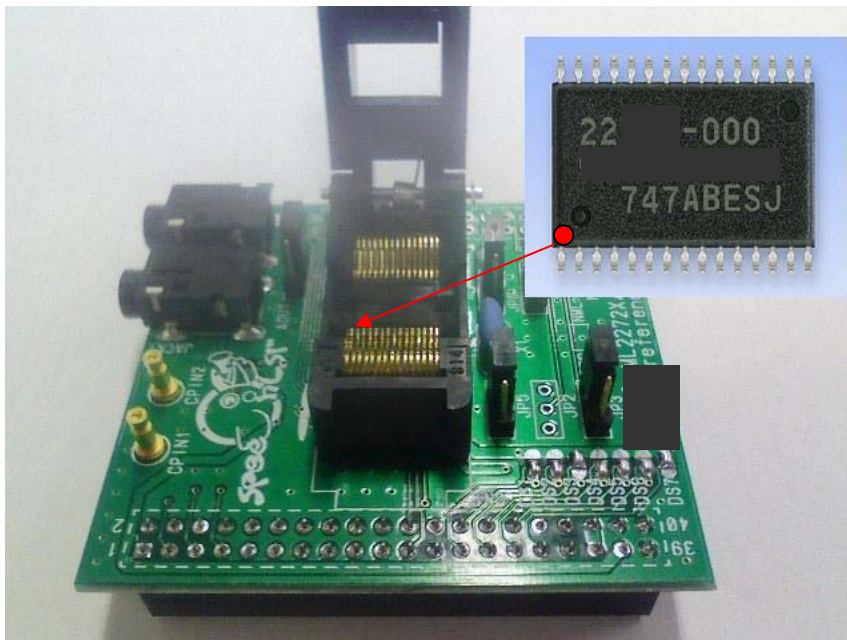
Please notice that the LSI written by this reference board can be used only as a prototype.

It is not guaranteed as a mass-produced quality.

2. Operating Suggestions

It is the operating suggestions for ML2276X/ML2286X Reference Board.

1. Please do not supply a power to sound device control board, when the reference board is being mounted on it.
2. Please do not supply a power to sound device control board, when the LSIs are being mounted in the socket on the reference board. Then please confirm the aspect of the LSIs. The pin no.1 of LSIs must be placed at left near side of the socket.
3. LAPIS SEMICONDUCTOR will not provide any support for this board, but the board can be exchanged with a new product only when it has an initial failure.



3. Reference Board

3.1 Circuit Diagram

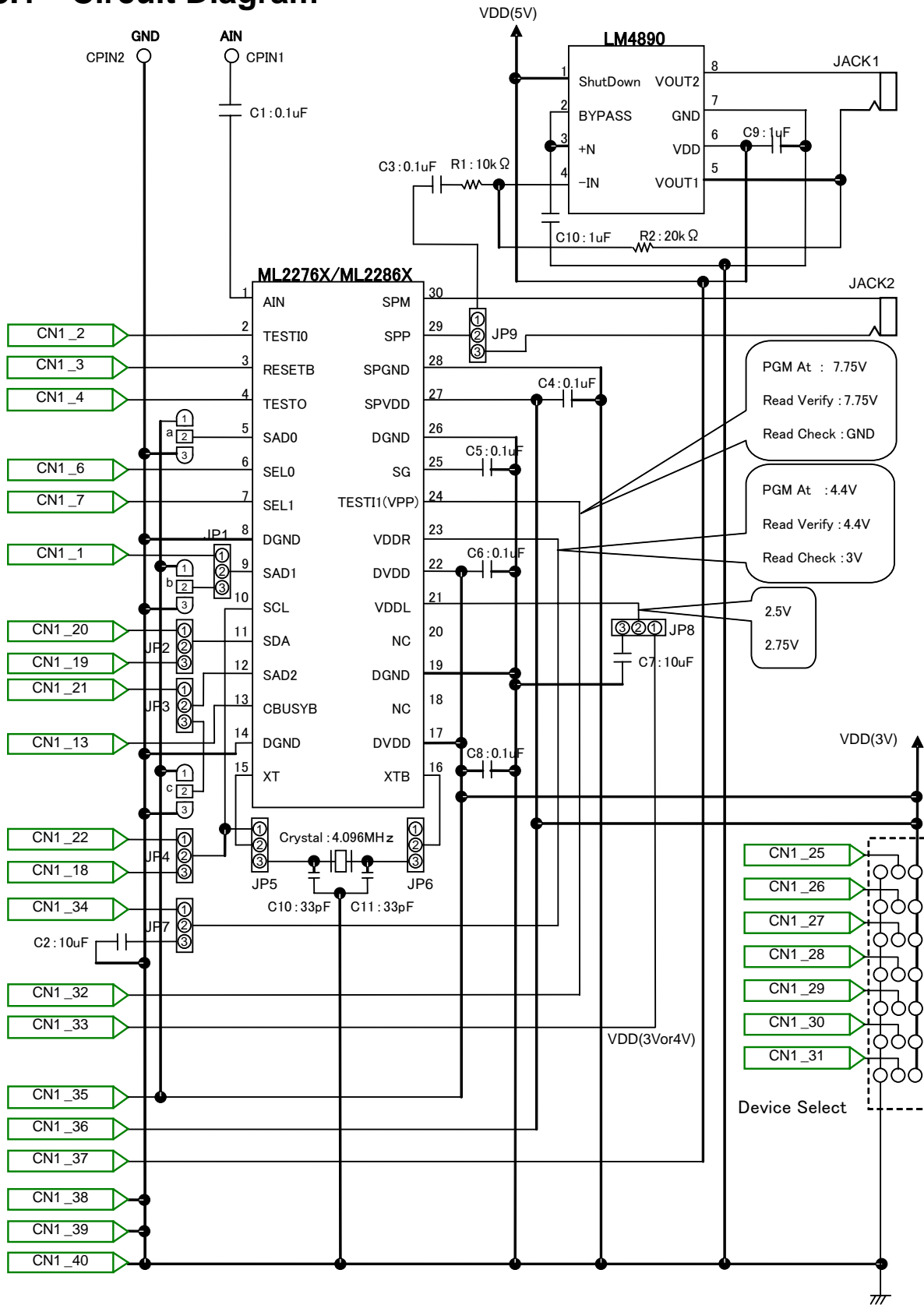


Figure 1, ML2276X/ML2286X reference board circuit diagram

3.2 Rough PCB layout

ML2276X/ML2286X reference board rough layout is described.

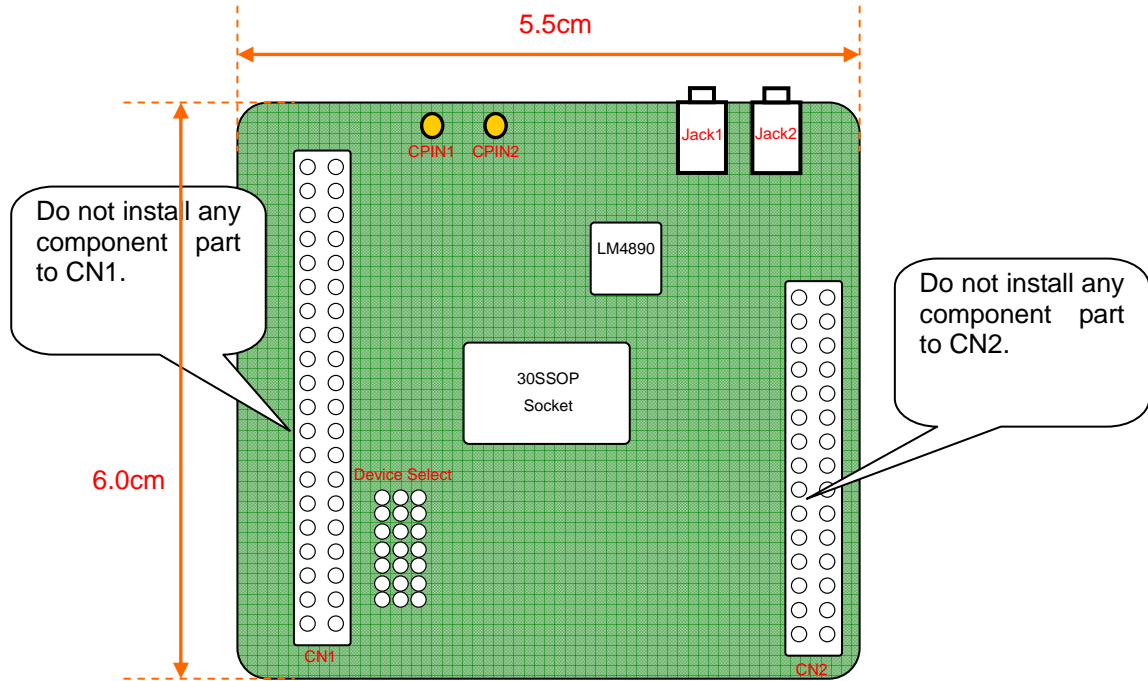
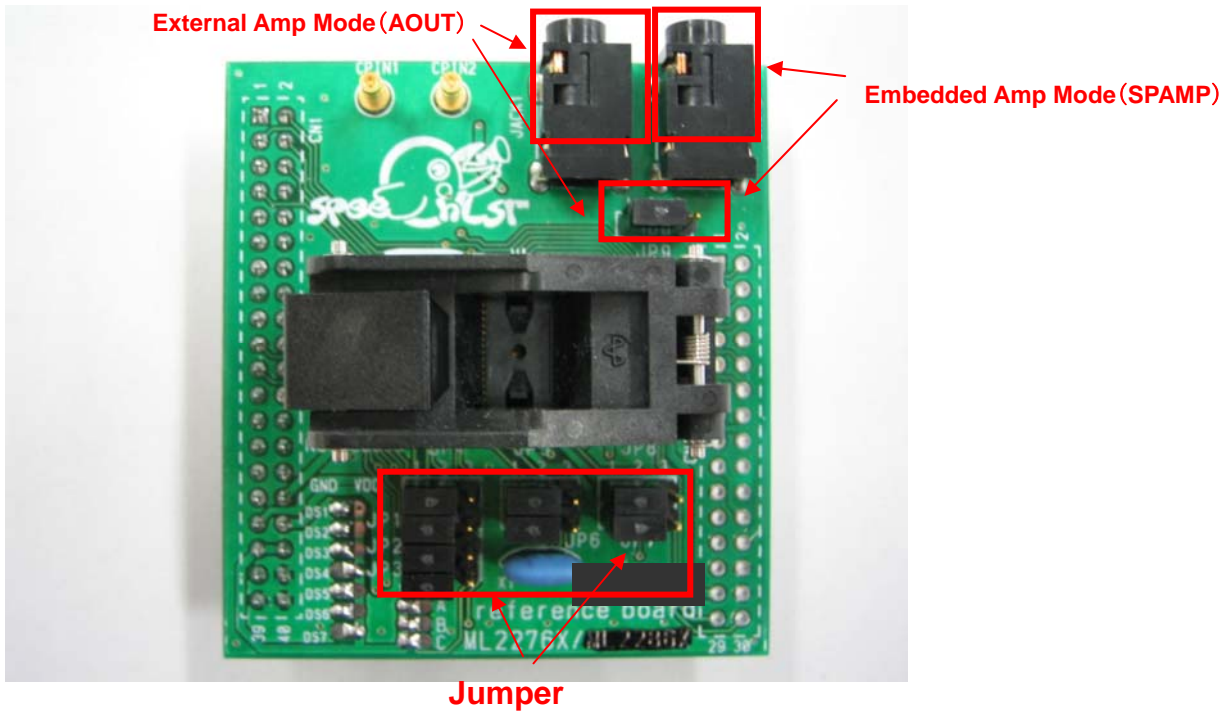
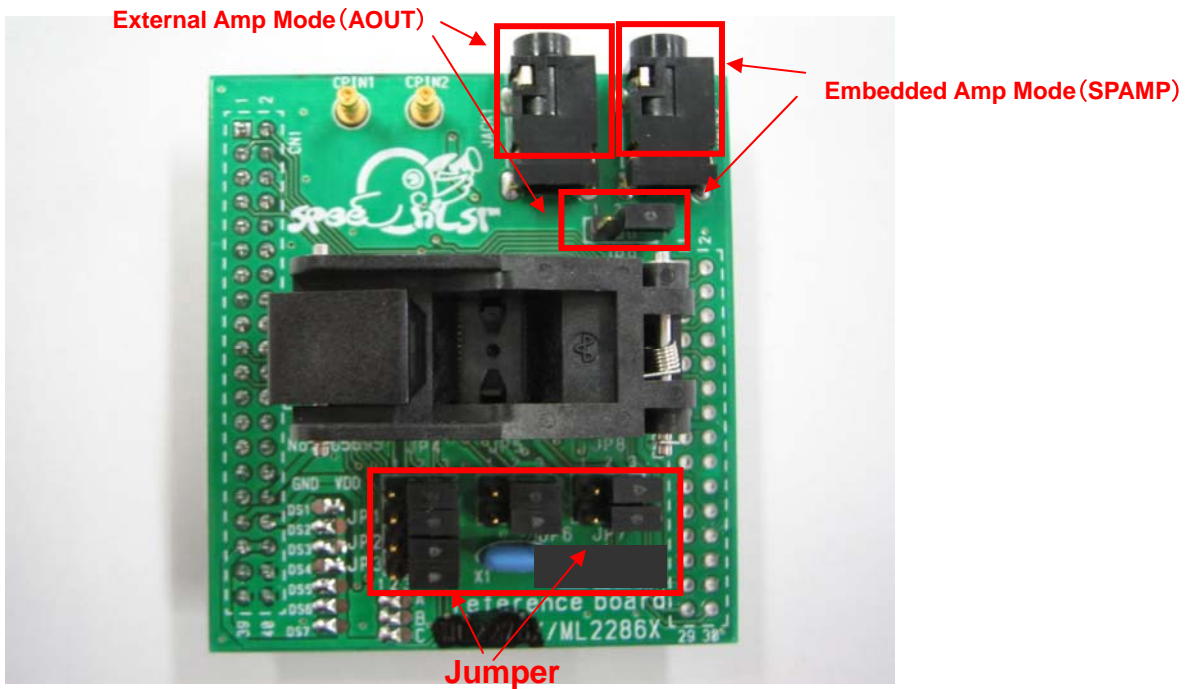


Figure 2, ML2276X/ML2286X reference board rough layout

- ML2276X Reference board



- ML2286X Reference board



3.3 CN1 connector pin connections

CN1 Pin No		Connect LSI	LSI Pin No	LSI Pin Name
1	I/O	JP1	1	—
2	I/O	ML2276X/ML2286X	2	TESTI0
3	I/O	ML2276X/ML2286X	3	RESETB
4	I/O	ML2276X/ML2286X	4	TESTO
5	I/O	—	—	—
6	I/O	ML2276X/ML2286X	6	SEL0
7	I/O	ML2276X/ML2286X	7	SEL1
8	I/O	—	—	—
9	I/O	—	—	—
10	I/O	—	—	—
11	I/O	—	—	—
12	I/O	—	—	—
13	I/O	ML2276X/ML2286X	13	CBUSYB
14	I/O	—	—	—
15	I/O	—	—	—
16	I/O	—	—	—
17	I/O	—	—	—
18	I/O	JP4	3	—
19	I/O	JP2	3	—
20	I/O	JP2	1	—
21	I/O	JP3	1	—
22	I/O	JP4	1	—
23	I/O	—	—	—
24	I/O	—	—	—
25	Device Select	ML2276X:GND,ML2286X:VDD	—	—
26	Device Select	ML2276X:GND,ML2286X:GND	—	—
27	Device Select	ML2276X:GND,ML2286X:GND	—	—
28	Device Select	ML2276X:VDD,ML2286X:VDD	—	—
29	Device Select	ML2276X:GND,ML2286X:GND	—	—
30	Device Select	ML2276X:GND,ML2286X:GND	—	—
31	Device Select	ML2276X:VDD,ML2286X:VDD	—	—
32	VPP	ML2276X/ML2286X	24	TESTI1(VPP)
33	VDD()	JP8	1	—
34	VDD(3V)	JP7	1	—
35	VDD(Variable)	ML2276X/ML2286X	17,22	DVDD
		SAD SEL_a(Connect)	1	—
		SAD SEL_b(Connect)	1	—
		SAD SEL_c(Connect)	1	—
36	VDD(3V)	ML2276X/ML2286X	27	SPVDD
37	VDD(5V)	LM4890	1	ShutDown
		LM4890	6	VDD
38	GND	ML2276X/ML2286X	8,14,19,26	DGND
		SAD SEL_a(Open)	3	—
		SAD SEL_b(Open)	3	—
		SAD SEL_c(Open)	3	—
39	GND	ML2276X/ML2286X	28	SPGND
40	GND	LM4890	7	GND

3.4 CN2 connector specification

CN2 is connecting to all ML2276X/ML2286X terminals. It has two rows 30 pins.

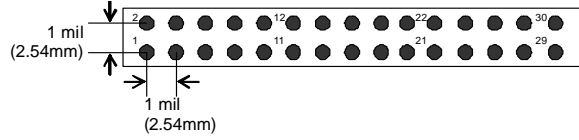


Figure 3, CN2 connectors hole pattern

3.5 CN2 connector pin connections

CN2 Pin No	LSI Pin No	LSI Pin Name
1	1	AIN
2	2	TESTI0
3	3	RESETB
4	4	TESTO
5	5	SAD0
6	6	SEL0
7	7	SEL1
8	8	DGND
9	9	SAD1
10	10	SCL
11	11	SDA
12	12	SAD2
13	13	CBUSYB
14	14	DGND
15	15	XT
16	16	XTB
17	17	DVDD
18	18	NC
19	19	DGND
20	20	NC
21	21	VDDL
22	22	DVDD
23	23	VDDR
24	24	TESTI1(VPP)
25	25	SG
26	26	DGND
27	27	SPVDD
28	28	SPGND
29	29	SPP
30	30	SPM

3.6 Jumper specifications

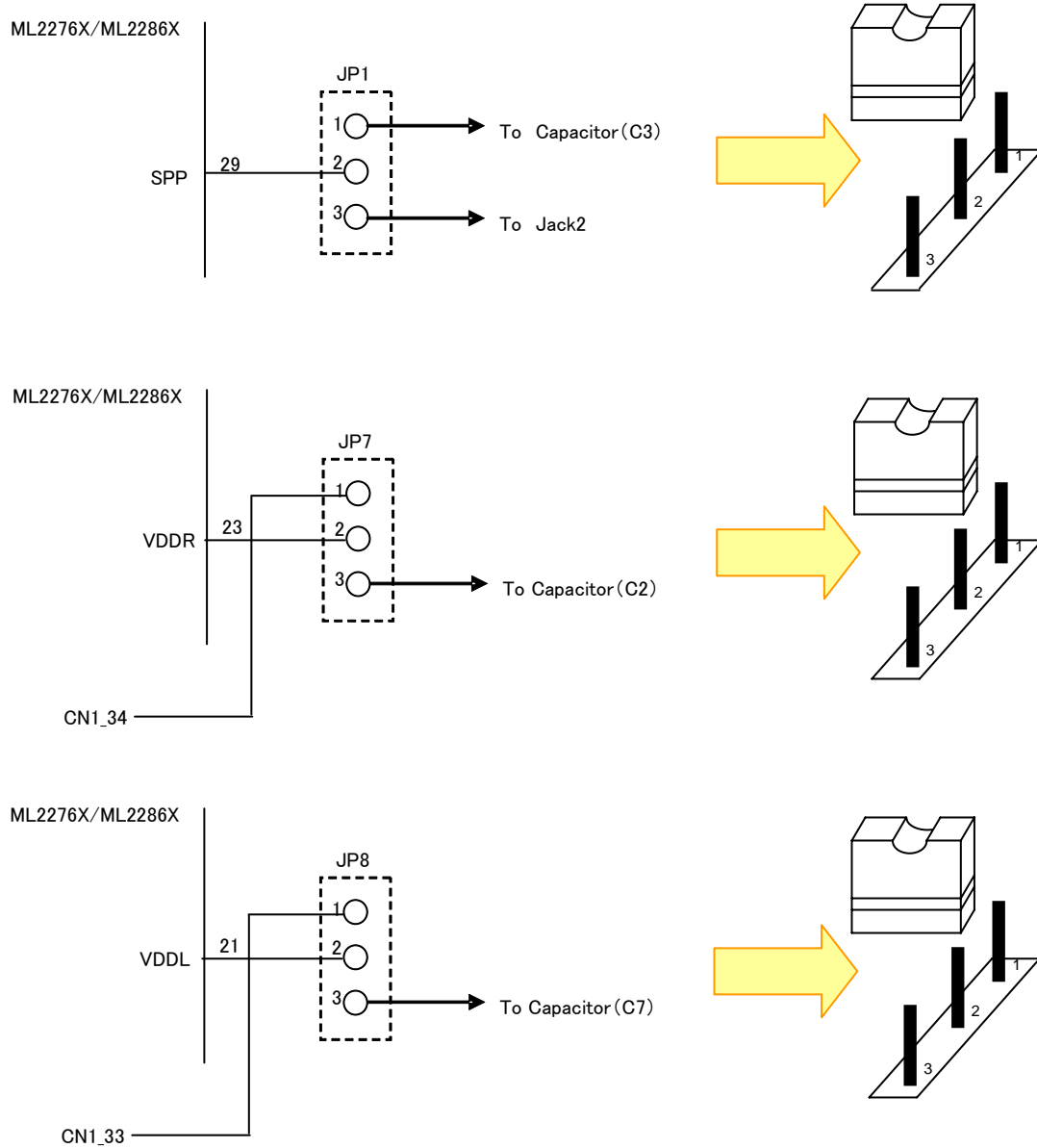
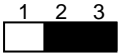


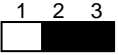
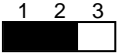
Figure 4, JP1/JP7/JP8 pattern

3.7 ML2276X/ML2286X Jumper Pin Setting

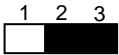
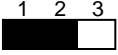
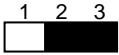
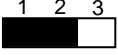
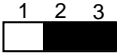
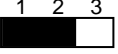
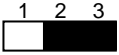
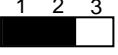
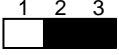
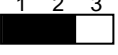
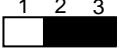
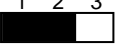
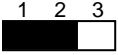
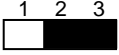
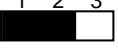
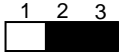
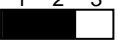

 → Short the pin #1 and #2.


 → Short the pin #2 and #3

① AMP

Jumper Pin No.	SPAMP	AOUT
JP9		

② Playback / Write

Jumper Pin No.	Playback		Write / Verify
	3.3V	5.0V	
JP1			
JP2			
JP3			
JP4			
JP5			
JP6			
JP7			
JP8			

Revision History

Revision NO.	Date	Page		Description
		Previous Edition	Current Edition	
1	2008.10.20	—	—	Preliminary edition 1
2	2009.08.06	5	5	Add the Figure1
		6	6	Change the Figure Number : Figure5 -> Figure2
		8	8	CN1 Pin No 2, 32 : Change the LSI Pin Name
				CN1 Pin No 25-31 : Change the text (Board Select -> Device Select) Fixed condition is specified
				CN1 Pin No 35, 38 : Fixed condition is specified (SAD SEL_a/b/c)
		9	9	Add the Figure3
CH2 Pin No 2, 5, 9, 10, 11, 12, 24 Change the LSI Pin Name				
3	2011.02.02	3	3	Add to operating suggestions

ML2276X/ML2286X Reference Board
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