

Dear customer

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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

ML22594
Reference Board
User's Manual

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1 . Overview

This is the instruction manual for ML22594 Reference Board

ML22594 Reference Board supports following functions in combination with Sound Device Control Board.

1. Voice Playback by ML22594.
2. Writing voice data to the Serial FLASH ROM on the Reference Board.

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

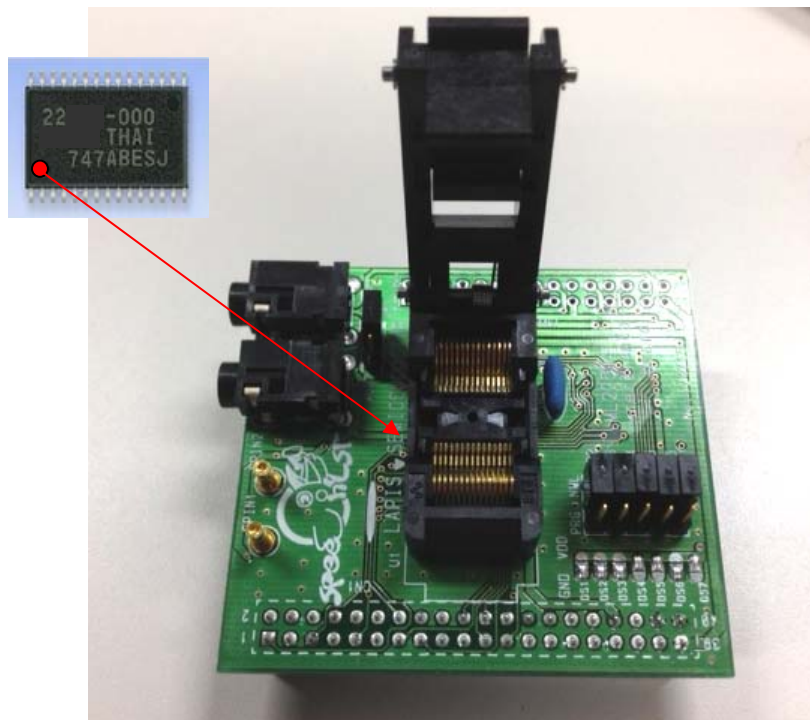
It is not guaranteed as a mass-produced quality.

2 . Operating Suggestions

It is the operating suggestions for ML22594 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.

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 Jumper specifications

① AMP

Jumper Pin No.	SPAMP	AOUT
JP1	Fixed on the right side	Fixed on the left side

② Playback / Write

Jumper Pin No.	Playback (NML)	Write / Verify (PRG)
JP2	Fixed on the right side	Fixed on the left side
JP3	Fixed on the right side	Fixed on the left side
JP4	Fixed on the right side	Fixed on the left side
JP5	Fixed on the right side	Fixed on the left side
JP6	Fixed on the right side	Fixed on the left side

3.2 Circuit Diagram

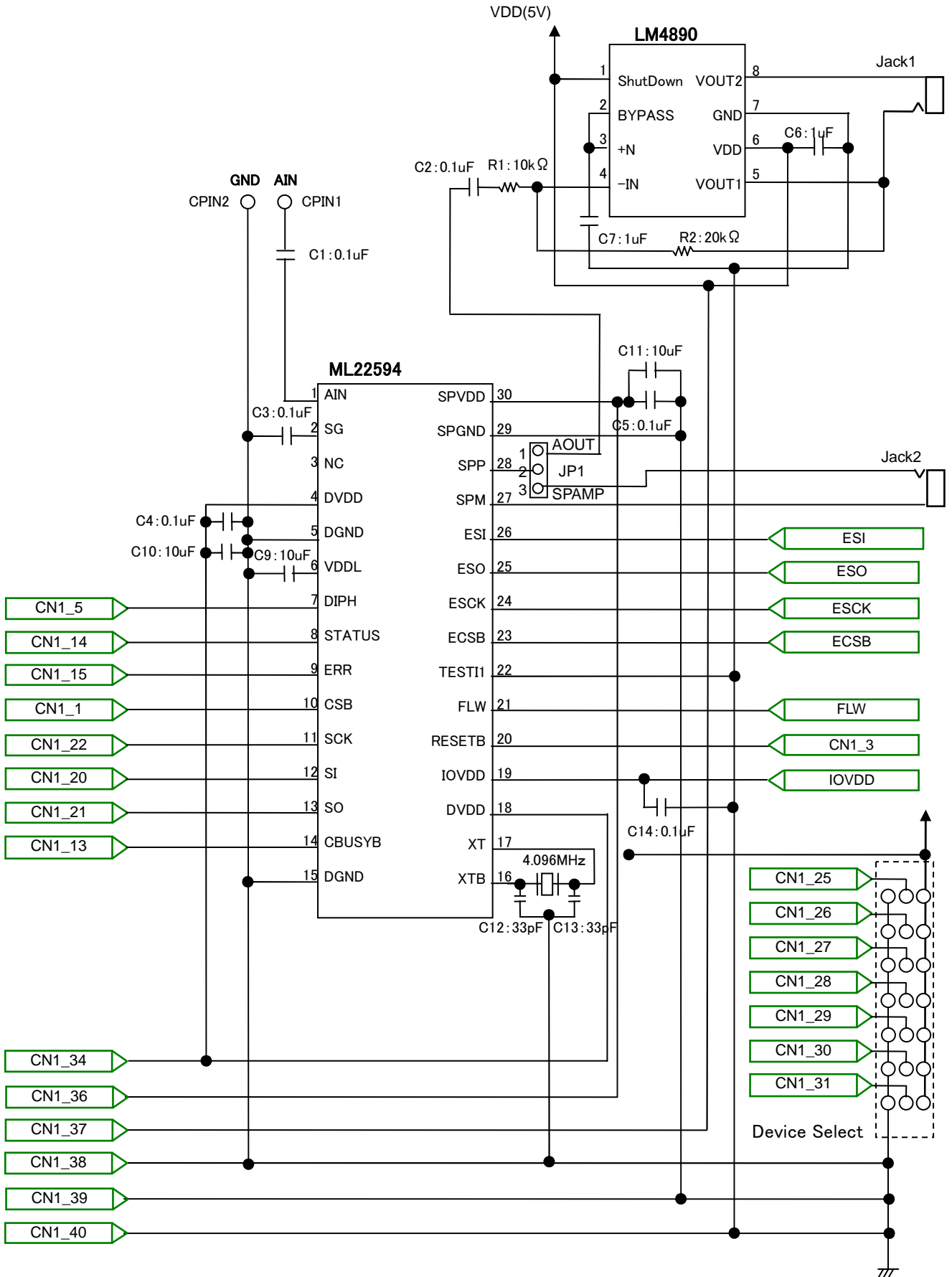


Figure 1, ML22594 reference board circuit diagram

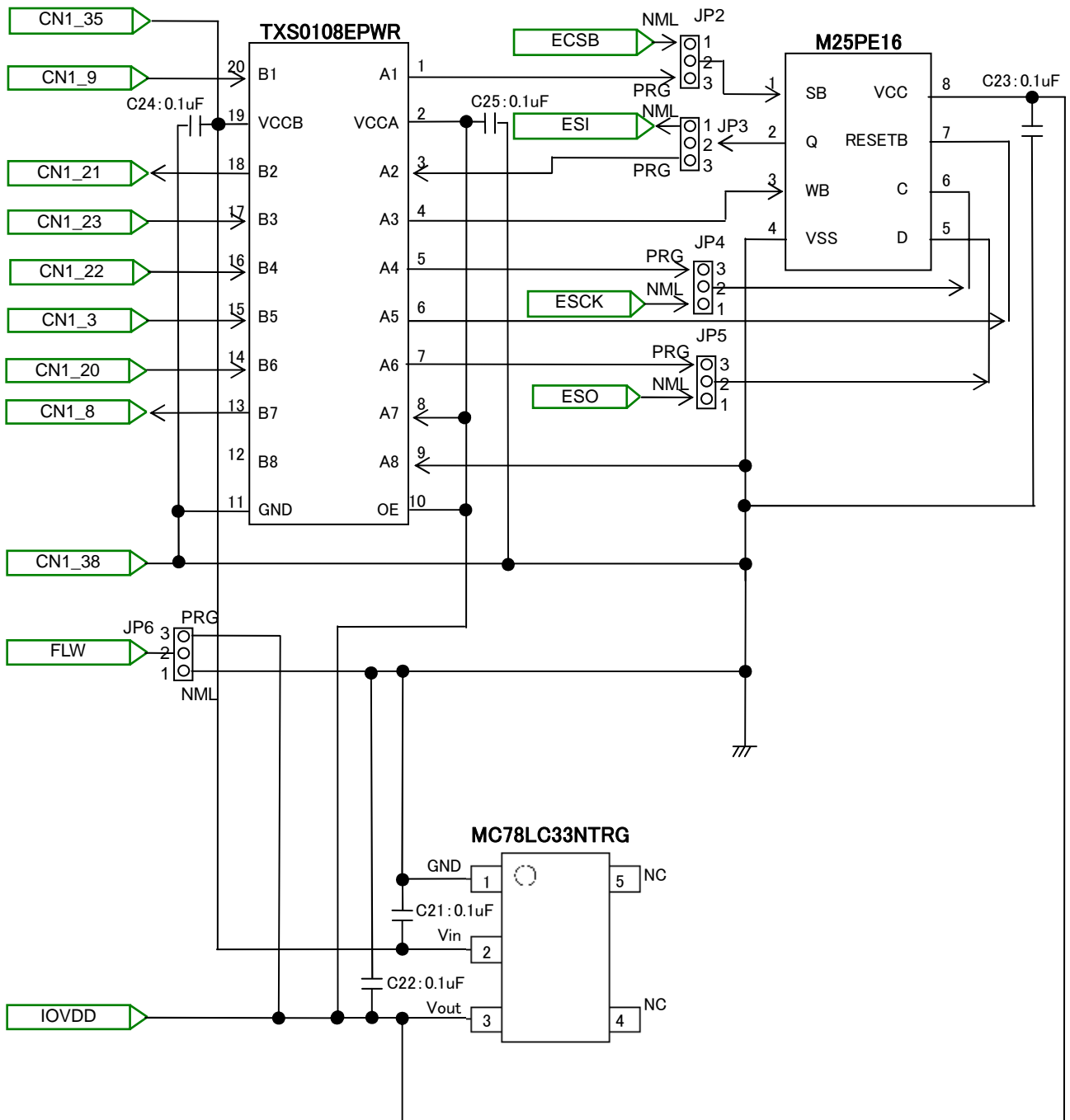


Figure 1, ML22594 reference board circuit diagram

3.3 Rough PCB layout

ML22594 reference board rough layout is described on figure 2.

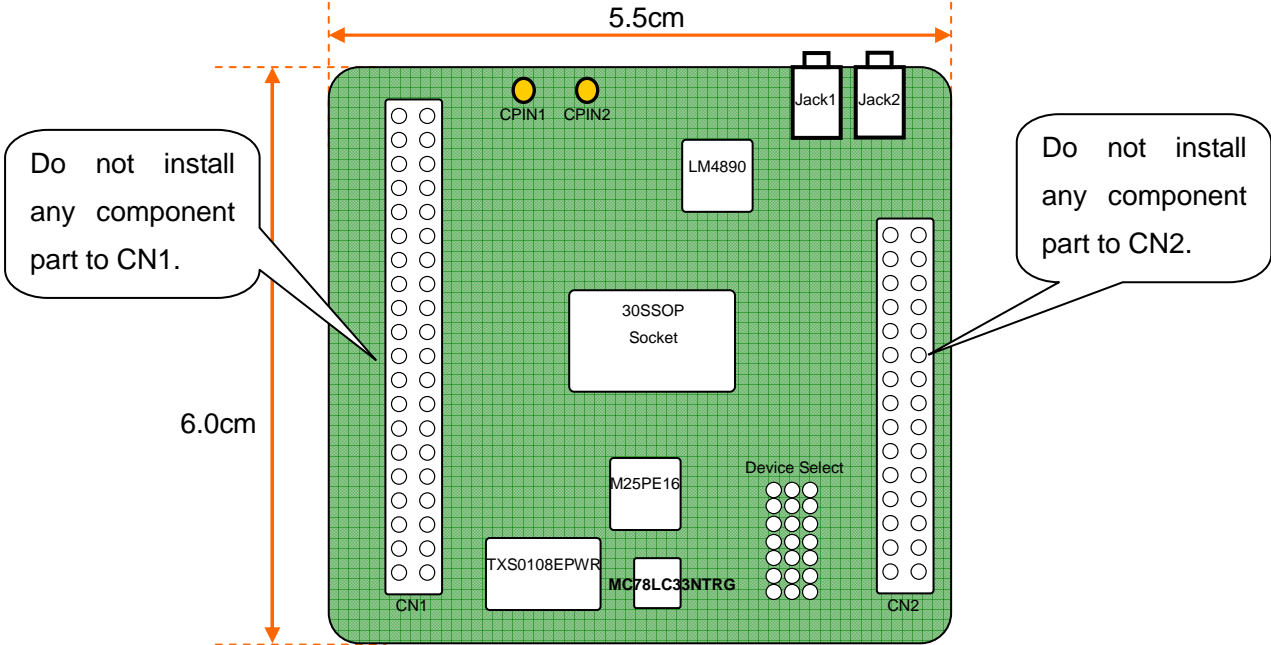


Figure2. ML22594 reference board rough layout

3.4 CN1 connector specification

This is connector for connecting to ML22594 control signal lines. It has two rows 40 pins.

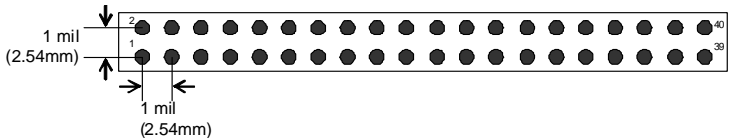


Figure 3, CN1 connectors hole pattern

3.5 CN1 connector pin connections

CN1 Pin No		Connect LSI	LSI Pin No	LSI Pin Name
1	I/O	ML22594	10	CSB
2	I/O	—	—	—
3	I/O	ML22594	20	RESETB
		TXS0108EPWR	15	B5
4	I/O	—	—	—
5	I/O	ML22594	7	DIPH
6	I/O	—	—	—
7	I/O	—	—	—
8	I/O	TXS0108EPWR	13	B7
9	I/O	TXS0108EPWR	20	B1
10	I/O	—	—	—
11	I/O	—	—	—
12	I/O	—	—	—
13	I/O	ML22594	14	CBUSYB
14	I/O	ML22594	8	STATUS
15	I/O	ML22594	9	ERR
16	I/O	—	—	—
17	I/O	—	—	—
18	I/O	—	—	—
19	I/O	—	—	—
20	I/O	ML22594	12	SI
		TXS0108EPWR	14	B6
21	I/O	ML22594	13	SO
		TXS0108EPWR	18	B2
22	I/O	ML22594	11	SCK
		TXS0108EPWR	16	B4
23	I/O	TXS0108EPWR	17	B3
24	I/O	—	—	—
25	Device Select	GND	—	—
26	Device Select	GND	—	—
27	Device Select	GND	—	—
28	Device Select	VDD	—	—
29	Device Select	VDD	—	—
30	Device Select	GND	—	—
31	Device Select	VDD	—	—
32	VPP	—	—	—
33	VDD	—	—	—
34	VDD	ML22594	4,18	DVDD
35	VDD	TXS0108EPWR	19	VCCB
		MC78LC33NTRG	2	Vin
36	VDD	ML22594	30	SPVDD
37	VDD	LM4890	1,6	ShutDown,VDD
38	GND	ML22594	5,15	DGND
		TXS0108EPWR	11	GND
		MC78LC33NTRG	1	GND
		M25PE16	4	VSS
39	GND	ML22594	29	SPGND
40	GND	ML22594	22	TESTI1
		LM4890	7	GND

3.6 CN2 connector specification

CN2 is connecting to all ML22594 terminals. It has two rows 30 pins.

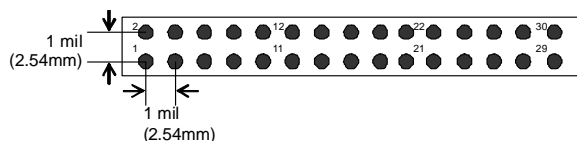


Figure 4, CN2 connectors hole pattern

3.7 CN2 connector pin connections

CN2 Pin No	Connect To	LSI Pin No	LSI Pin Name
1	ML22594	1	AIN
2	ML22594	2	SG
3	ML22594	3	(NC)
4	ML22594	4	DVDD
5	ML22594	5	DGND
6	ML22594	6	VDDL
7	ML22594	7	DIPH
8	ML22594	8	STATUS
9	ML22594	9	ERR
10	ML22594	10	CSB
11	ML22594	11	SCK
12	ML22594	12	SI
13	ML22594	13	SO
14	ML22594	14	CBUSYB
15	ML22594	15	DGND
16	ML22594	16	XTB
17	ML22594	17	XT
18	ML22594	18	DVDD
19	ML22594	19	IOVDD
20	ML22594	20	RESETB
21	ML22594	21	FLW
22	ML22594	22	TESTI1
23	ML22594	23	ECSB
24	ML22594	24	ESCK
25	ML22594	25	ESO
26	ML22594	26	ESI
27	ML22594	27	SPM
28	ML22594	28	SPP
29	ML22594	29	SPGND
30	ML22594	30	SPVDD

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Revision NO.	Date	Page		Description
		Previous Edition	Current Edition	
1	2012.08.27	—	—	Formally edition 1

ML22594 Reference Board User's Manual

Issue Date: August 27, 2012

Revision: 1

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