

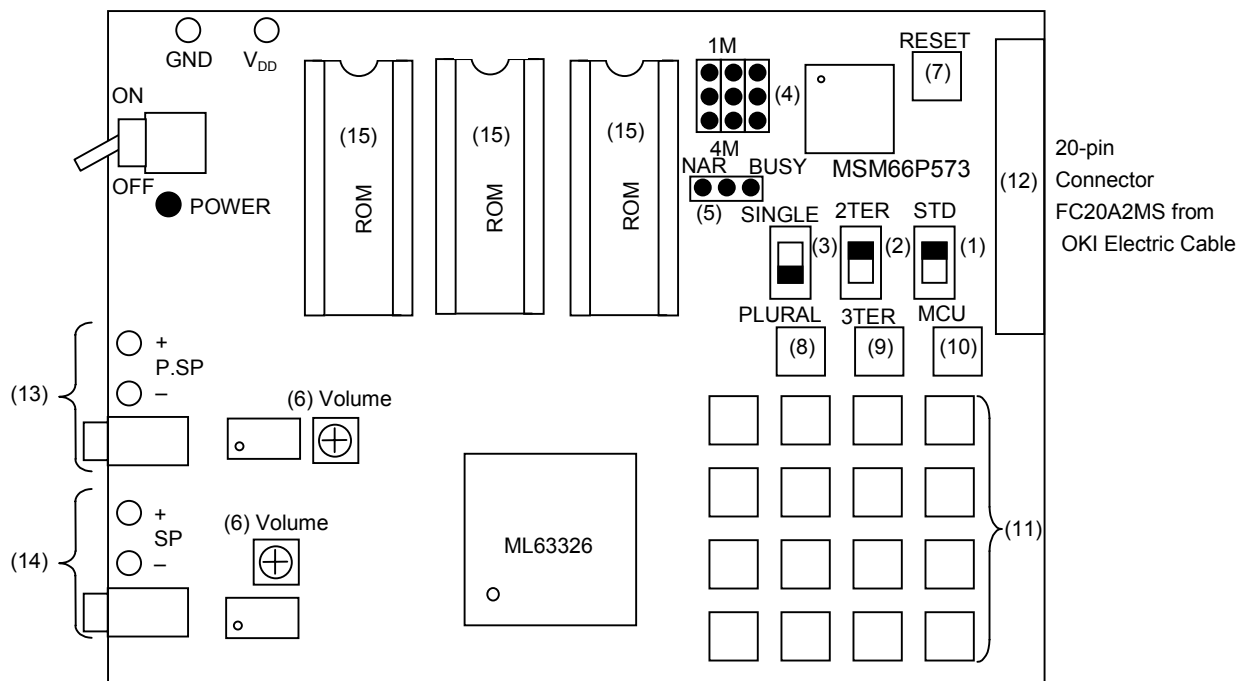
ML2210 EVA Board

ML2210 Family Evaluation Board

GENERAL DESCRIPTION

The ML2210 Family Evaluation Board is used for evaluating the sound quality of EPROM voice data prepared for use in ML2213/ML2215. The board supports two operating modes; Standalone mode where you can play any phrase by selecting a phrase(s) with the key pad, and MCU Interface mode where you can control the board with an external MCU via the 20-pin connector.

BOARD LAYOUT (TOP VIEW)



SETTING UP THE BOARD

This section describes the functions and settings of on-board switches and jumpers.

(1) Standalone/MCU Interface Selector

STD side: Set the selector to this side to use the board in Standalone mode where the board can be controlled by the on-board MCU (MSM66P573).

MCU side: Set the selector to this side to use the board in MCU Interface mode where the board can be controlled by an external MCU via the 20-pin connector.

(2) MCU Control Option Selector

You can select a control option when you use MCU Interface mode (External MCU).

2TER side: Set the selector to this side if you want to send a command to the board using 2-pin control.

3TER side: Set the selector to this side if you want to send a command to the board using 3-pin control.

(3) Playback Mode Selector

You can select a playback mode with this switch.

SINGLE side: Set the selector to this side to play a single phrase only.

PLURAL side: Set the selector to this side to play a multiple of selected phrases in succession.

(4) EPROM Size Selector

You can use a 1 Mbit or 4 Mbit CMOS EPROM. Set all 3 jumpers to the 1M side (Up) for the 1 Mbit, or to the 4 M side (Down) for 4 Mbit EPROM.

(5) BUSY/NAR Signal Selector

Use this jumper to select a status signal output.

NAR side: Set the selector to this side to have NAR signal as status output.

BUSY side: Set the selector to this side to have BUSY signal as status output.

(6) Volume control for the Speaker Amplifier

Turn the control left to increase the sound level, and turn right to decrease the sound level.

(7) RESET Button

To reset the system, push down this button.

(8) STOP Button

To stop playing during playback, push down this button.

(9) ST (Start) Button

To start playing the selected phrase, push down this button.

(10) SET Button

To enter the selected phrase address, push down this button.

(11) Phrase Address Selector Pad

You can select a phrase address between 00 and FF by using this key pad. The board stores the last two digits or key entries.

(12) 20-pin Connector

Use this connector to input control signals when you control the board with an external MCU. The following table shows Pin Layout of the connector pins.

20-pin Connector Pin Layout

Connector Pin	Symbol	Connector Pin	Symbol
1	V _{DD}	11	NC
2	V _{DD}	12	SI
3	V _{DD}	13	NC
4	SD	14	RESET
5	NC	15	NC
6	NC	16	ST
7	NC	17	NAR/BUSY
8	NC	18	NC
9	NC	19	GND
10	NC	20	GND

(13) Connecting Pins for Piezo-speaker

(14) Connecting Pins for Dynamic speaker

(15) EPROM Sockets

Mount EPROM chips prepared with an OKI Analyzing and Editing tool, starting with the socket ROM1 (the leftmost)

USING THE BOARD

<Using the Board in Standalone Mode (On-board MCU Control)>

Set the Standalone/MCU Interface Selector (1) to the STD side.

Single Phrase Play Mode

Set the Playback Mode Selector (3) to the SINGLE side.

Select a phrase address with the Phrase Address Selector Pad (11), and then push down the ST button (9) to start playing the phrase.

To stop playing, push down the STOP button (8).

Multiple Phrases Play Mode (Continuous Play)

Set the Playback Mode Selector (3) to the PLURAL side.

- Entering Phrases Addresses (Up to 32 phrases)

Select a phrase address with the Phrase Address Selector Pad (11), and then push down the SET button (10) to store the address to the Address Buffer. If you want to enter the same phrase address in succession, push down the SET button (10) again (the Key Buffer value remains unchanged).

You can remove the previously-entered address by entering "00" and pushing the SET button (10).

The phrase addresses once entered with the SET button remains unchanged until you reset the addresses using the RESET button (7). Therefore, you can add a phrase address by selecting a phrase and pushing down the SET button (10) even after playback.

Push down the RESET button (7) if you want to redo your selection from the beginning.

- Starting/Stopping Playback

To start playing the entered phrase(s), push down the ST button (9).

To repeat playing the same phrase(s), push down the ST button (9) again.

To stop playing, push down the STOP button (8).

Note: The board cannot accept input from the Phrase Address Selector Pad (11) during playback operation. So, enter a new phrase address after pushing down the STOP button (8), when required.

<Using the Board in MCU Interface Mode (External MCU Control)>

Set the Standalone/MCU Interface Selector (1) to the MCU side and select your control option with the MCU Control Option Selector (2).

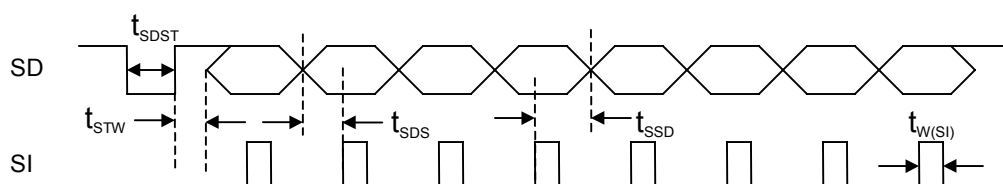
Input control signals to the board via the 20-pin connector.

See the 20-pin Connector Pin Layout table on Page 3 for further details on signal lines.

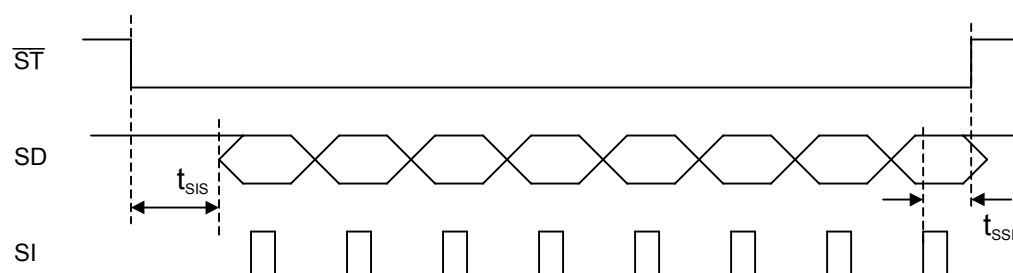
Note: Timings for controlling this Evaluation Board are not identical to those for the commercially available target device. Input control signals according to the timing diagrams shown below.

Control signal Input Timings

2-pin Control



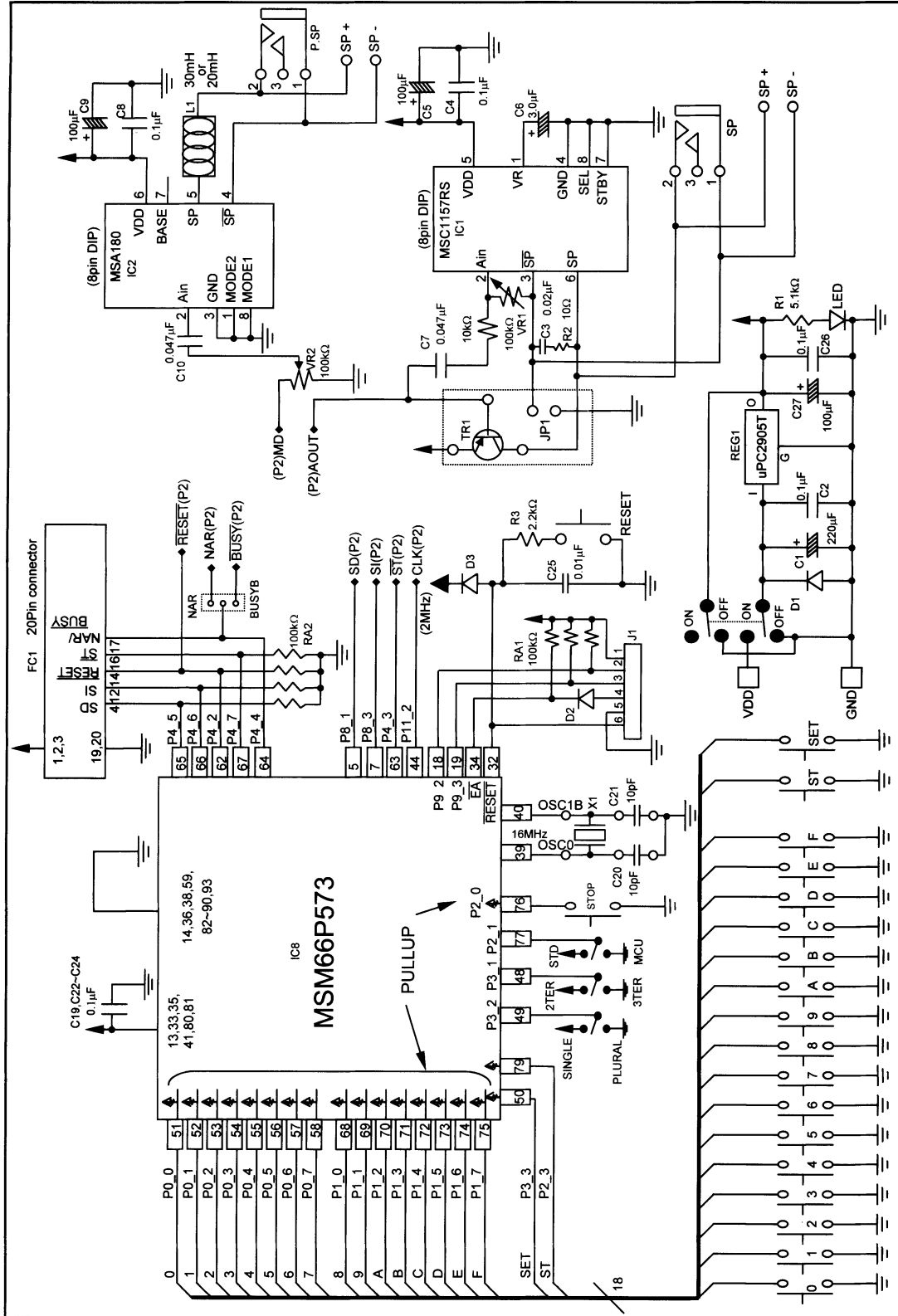
3-pin control

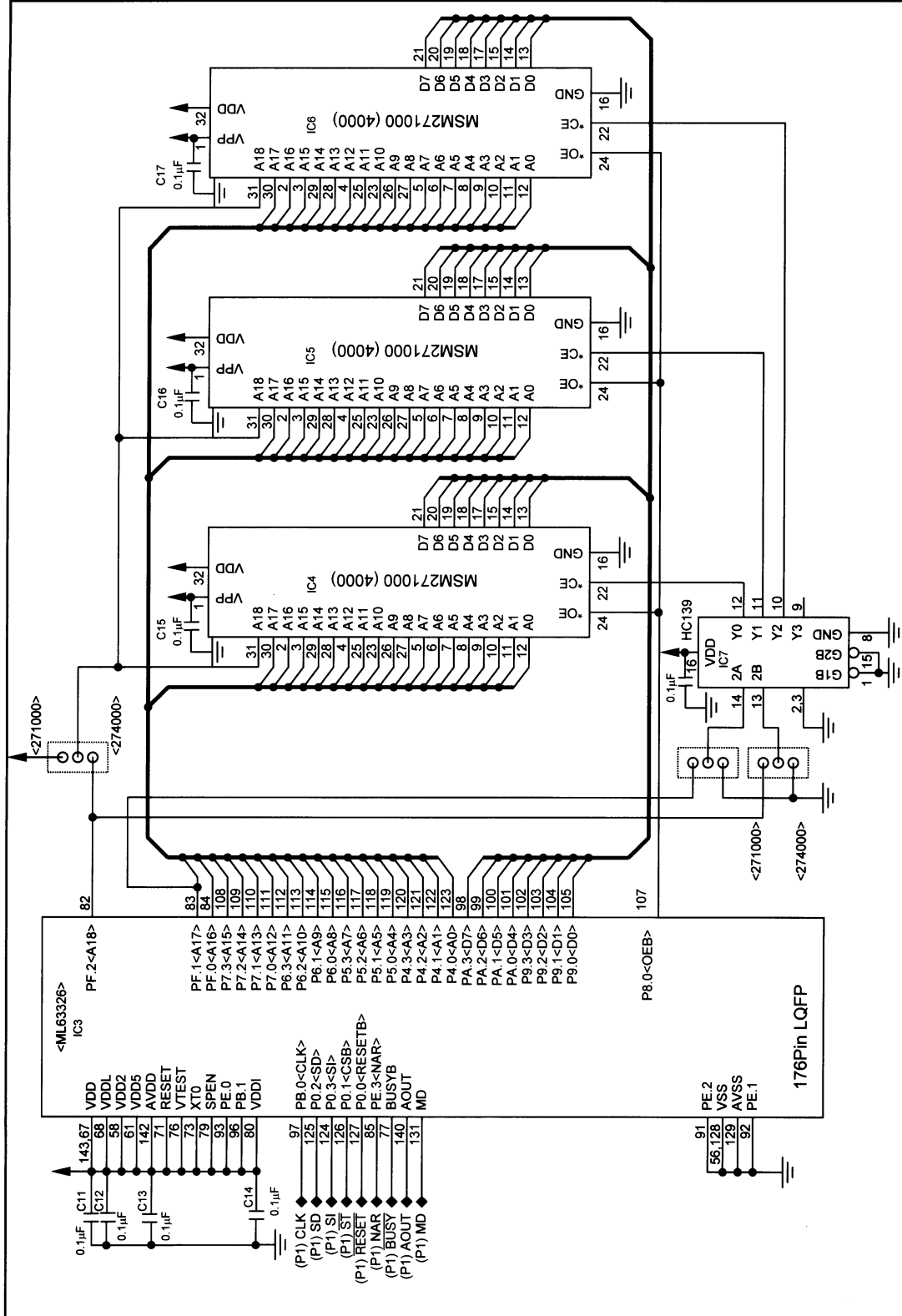


Parameter	Symbol		Eva. Board		Target Device	
			Min.	Unit	Min.	Unit
Start Pulse Width	t_{SDST}		21.0	μs	1.0	μs
Serial Data Setup Time	t_{SDS}	2-pin	8.0	μs	1.0	μs
		3-pin	4.0	μs		
Serial Data Hold Time	t_{SSD}	2-pin	16.0	μs	1.0	μs
		3-pin	8.0	μs		
Serial Clock Width	$t_{W(SI)}$	2-pin	8.0	μs	350.0	ns
		3-pin	4.0	μs		
Serial Clock Setup Time	t_{SIS}	3-pin	8.0	μs	1.0	μs
Serial Clock Hold Time	t_{SSI}	3-pin	8.0	μs	1.0	μs
Start Processing Wait Time	t_{STW}	2-pin	16.5	μs	—	—

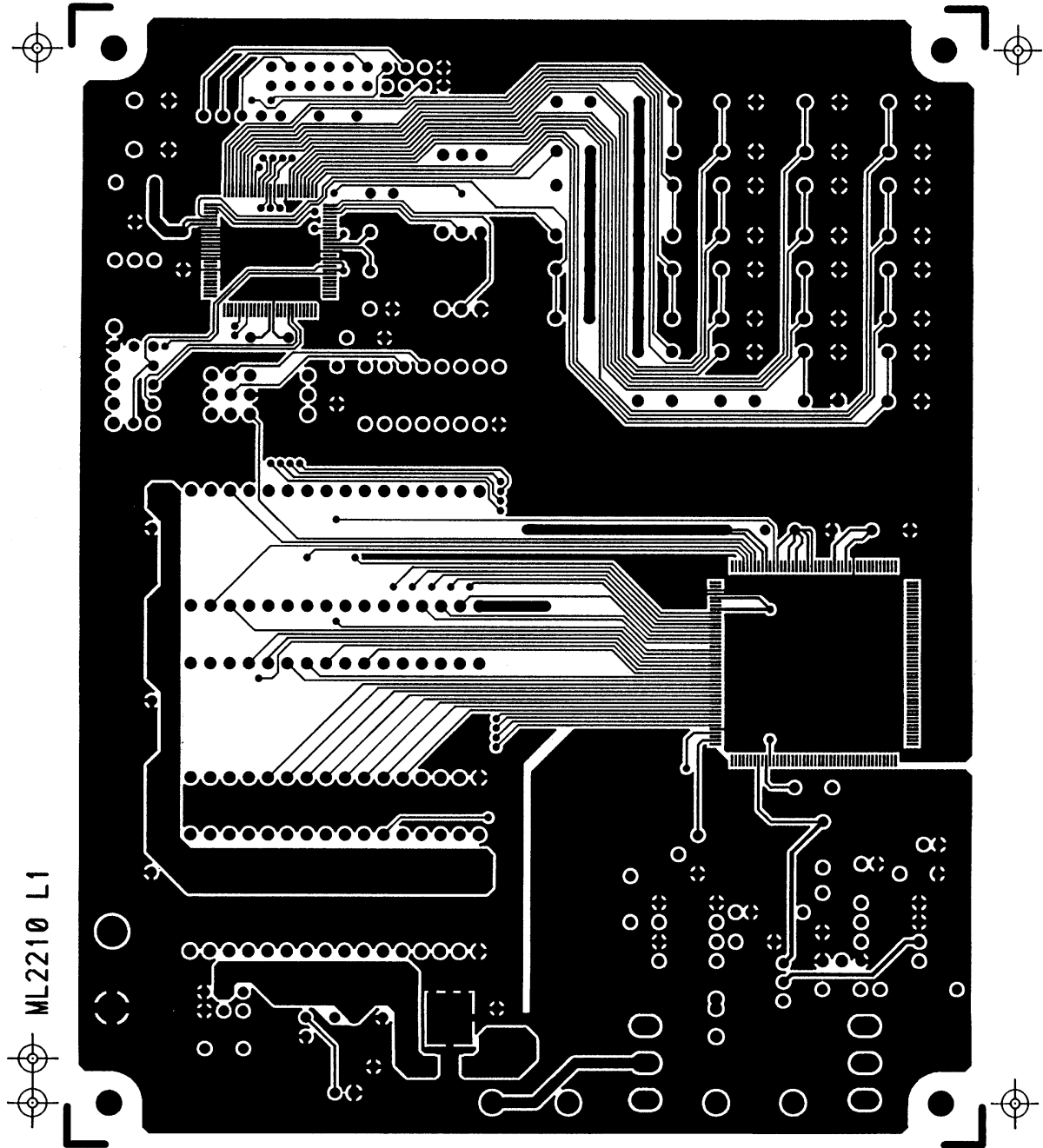
Characteristics of Signal Input Timings

CIRCUIT DIAGRAM

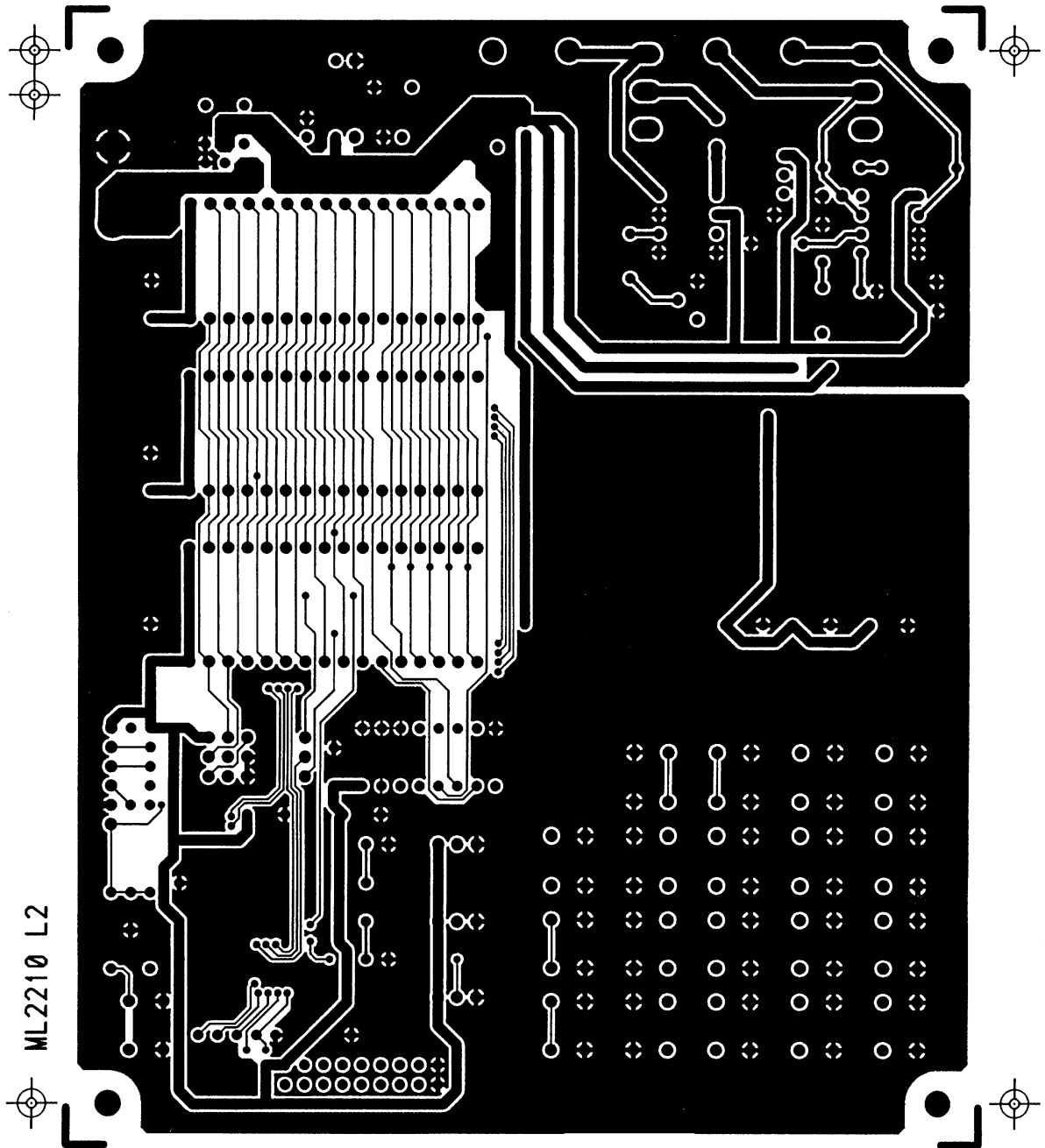




Parts Side



Soldering Side



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