FEBL9800-03

OKI Semiconductor

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Previous version: Mar. 2000

MSM9800/9836 EVA Board

Voice ROM Evaluation Board for MSM9802/9803/9805/9836

GENERAL DESCRIPTION

The MSM9800/36 Evaluation Board is designed to evaluate sound data, created by using OKI's Sound Analysis and Editing tool (AR762/203/204), for use with MSM9802/MSM9803/MSM9805/MSM9836.

FEATURES

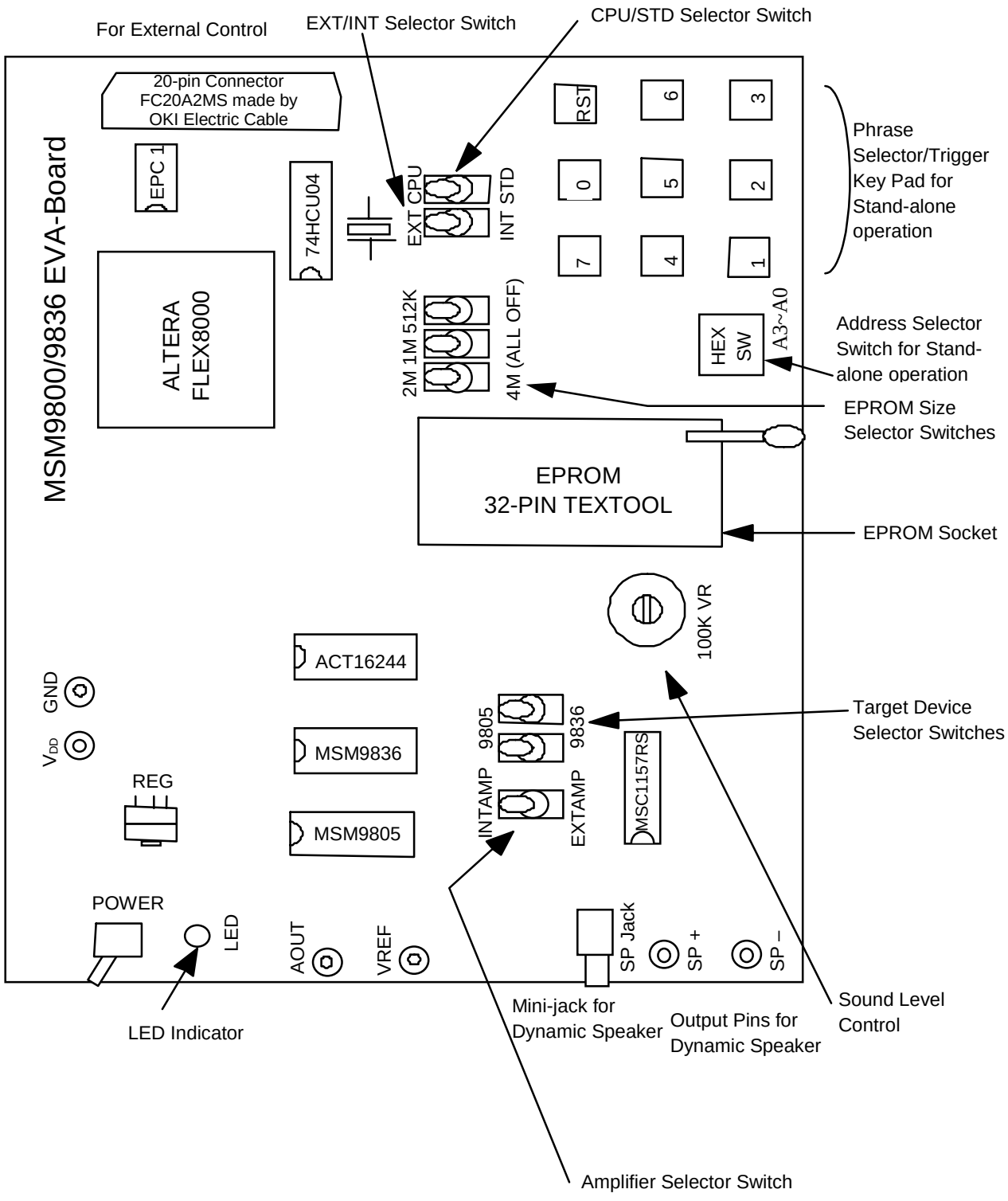
- 512 Kbit/1 Mbit/2 Mbit/4 Mbit EPROM can be used for evaluation.
- Power Supply: 4.75 to 5.25V
- Clock Oscillation: 4.096 MHz Ceramic Oscillation
  The board is not functional with CR oscillation. Input to the XT/$\overline{CR}$ pin is disabled.

NOTE

Some operations may not be identical to those with an actual target device. Further description is given later in this document after Page 9.

BOARD LAYOUT

Board Layout (Top View)



SETTING UP AND OPERATING THE BOARD

Power Supply and Power-On Switch

The following power supply options are available with the board. Be sure to select a right power supply option to your environment before ordering.

- On-board AC 100 V Power Unit
  Hook up power cable from the unit to AC 100 V outlet. Push upward the switch on the unit to turn it ON, and push downward to turn it OFF.
- On-board AC 100 V to 240 V Power Unit
  Hook up power cable from the unit to AC 100 to 240 V outlet. Push upward the on-board Power switch to turn the board ON, and push downward to turn it OFF.
- On-board Battery Box
  Use 4 × AAA batteries. Push upward the on-board Power switch to turn the board ON, and push downward to turn it OFF.
  Lower battery voltage may cause noise to be overlapped with voice. In that case, use new batteries.
- External Power Source
  Input +5 V to the on-board V_{DD} pin and 0 V to the GND pin.

The board's LED indicator goes on when power is supplied properly to it, whichever power option you choose.

20-pin Connector

The connector provides an interface for an external MCU control.
You can input/output control signals via this 20-pin connector when you use an external MCU to control the board. The following table describes the pin connections.

M9800/9836 Connector Pin Layout

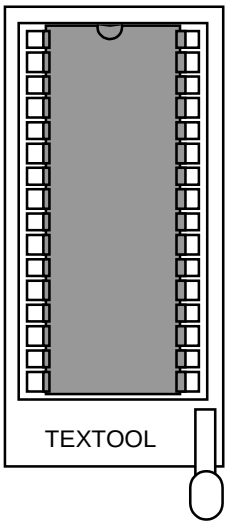
Pin No.	When evaluating MSM9802/03/05 (xxx) represents a physical pin name (Left: STD mode/Right: CPU mode)	When evaluating MSM9836 (xxx) represents a physical pin name
1	V_{CC}	V_{CC}
2	V_{CC}	V_{CC}
3	V_{CC}	V_{CC}
4	EXTCPUSTDB (CPU/$\overline{STD}$)	EXTCPUSTDB (Not applicable)
5	N.C.	BUSYBOUT ($\overline{BUSY}$)
6	EXTI0 (SW0•I0)	EXTI0 (I0)
7	EXTI1 (SW2•I1)	EXTI1 (I1)
8	EXTI2 (SW3•I2)	EXTI2 (I2)
9	EXTI3 (A0•I3)	EXTI3 (I3)
10	EXTI4 (A1•I4)	EXTI4 (I4)
11	EXTI5 (A2•I5)	EXTI5 (I5)
12	N.C.	EXTI6 (I6)
13	N.C.	N.C.
14	EXTRESTB ($\overline{RESET}$)	EXTRESTB ($\overline{RESET}$)
15	EXTSTB (Not applicable•$\overline{ST}$)	EXTSTB ($\overline{ST}$)
16	N.C.	N.C.
17	NAROUT ($\overline{BUSY}$•NAR)	NAROUT (NAR)
18	GND	GND
19	GND	GND
20	GND	GND

Note 1: 1-3 pins of this connector output +5 V. Short circuit with power supply circuit of the external unit may cause damage of the power supply unit and/or the evaluation board. (The connector's 1 - 3 pins should be cut and isolated, as required.)

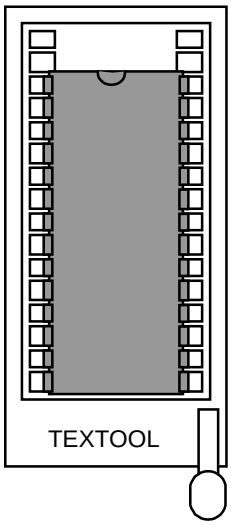
Note 2: Every input pin is either pulled-up or pulled-down with a resistor. Be aware that not every pin function identically to those on your target device, MSM9802/03/05/36.

Evaluation ROM Socket

Use this socket to mount an EPROM containing sound data for evaluation. When using a 512 Kbit EPROM, place the chip so that the pin 14 is inserted to the socket's pin 16 position, as shown in the figure below.
Use EPROM Size Selector Switches to select a proper EPROM size.



Mounting position for a 4 Mbit, 2 Mbit or 1 Mbit EPROM



Mounting position for a 512 Kbit EPROM

EPROM Size Selector Switches

The following table shows the selector switch position for each EPROM size.

EPROM Size	2M/4M Selector	1M/4M Selector	512K/4M Selector
4 Mbit	4Mbit Side	4 Mbit Side	4 Mbit Side
2 Mbit	2 Mbit Side	4 Mbit Side	4 Mbit Side
1 Mbit	4 Mbit Side	1 Mbit Side	4 Mbit Side
512 Kbit	4 Mbit Side	4 Mbit Side	512 Kbit Side

* Use an EPROM of equal or larger size than the target device's on-chip ROM.

Control Selector Switches

Target Device Selector Switches
- M9805 side: To evaluate sound data for use with MSM9802/03/05.
- M9836 side: To evaluate sound data for use with MSM9836.

EXT/INT Selector Switch
- EXT side: To control MCU IF/Stand-alone mode switching and phrase triggering from an external MCU via 20-pin connector.
- INT side: To control MCU IF/Stand-alone mode switching and phrase triggering by using on-board CPU/STD Selector and Phrase Selector/Trigger Key Pad.

CPU/STD Selector Switch:

To select either CPU (MCU IF) mode or Stand-alone mode.

CPU side: The board operates in MCU IF mode.

STD side: The board operates in Stand-alone mode.
This switch is functional only when the EXT/INT switch is set to the INT side. (When being set to the EXT side, you can control this function via No. 4 pin of 20-pin connector.)

Amplifier Selector Switch

INTAMP/EXTAMP Selector Switch:

To select either INTAMP (on-board amplifier) or EXTAMP (external amplifier)

INTAMP: Enables to use on-board amplifier (MSC1157) to drive a speaker. Use the on-board volume control to adjust sound level.

EXTAMP: Enables to use an external amplifier to drive a speaker. You can adjust sound level with variable voltage input to the on-board VREF check pin. When the VREF pin is left open, output is at the maximum level because of a pull-down resistor built in the physical device.

Address Selector Switch and Phrase Selector/Trigger Key Pad for Stand-alone Operation

Address Selector Switch for Stand-alone Operation:

- For MSM9802/03/05
  0h to 7h selected with this switch are equivalent to binary data input to the A2 to A0 pins when a target device is used in stand-alone mode.
- For MSM9836
  0h to 7h selected with this switch are equivalent to binary data input to the I6 to I3 pins.

Phrase Selector/Trigger Key Pad for Stand-alone Operation:

- For MSM9802/03/05
  Pushing a 0 to 7 key causes to start a phrase that corresponds to 0 to 7 of SW2 to SW0.
- For MSM9836
  Pushing a 0 to 7 key causes to start a phrase that corresponds to 0 to 7 of I2 to I0.

RST Key:

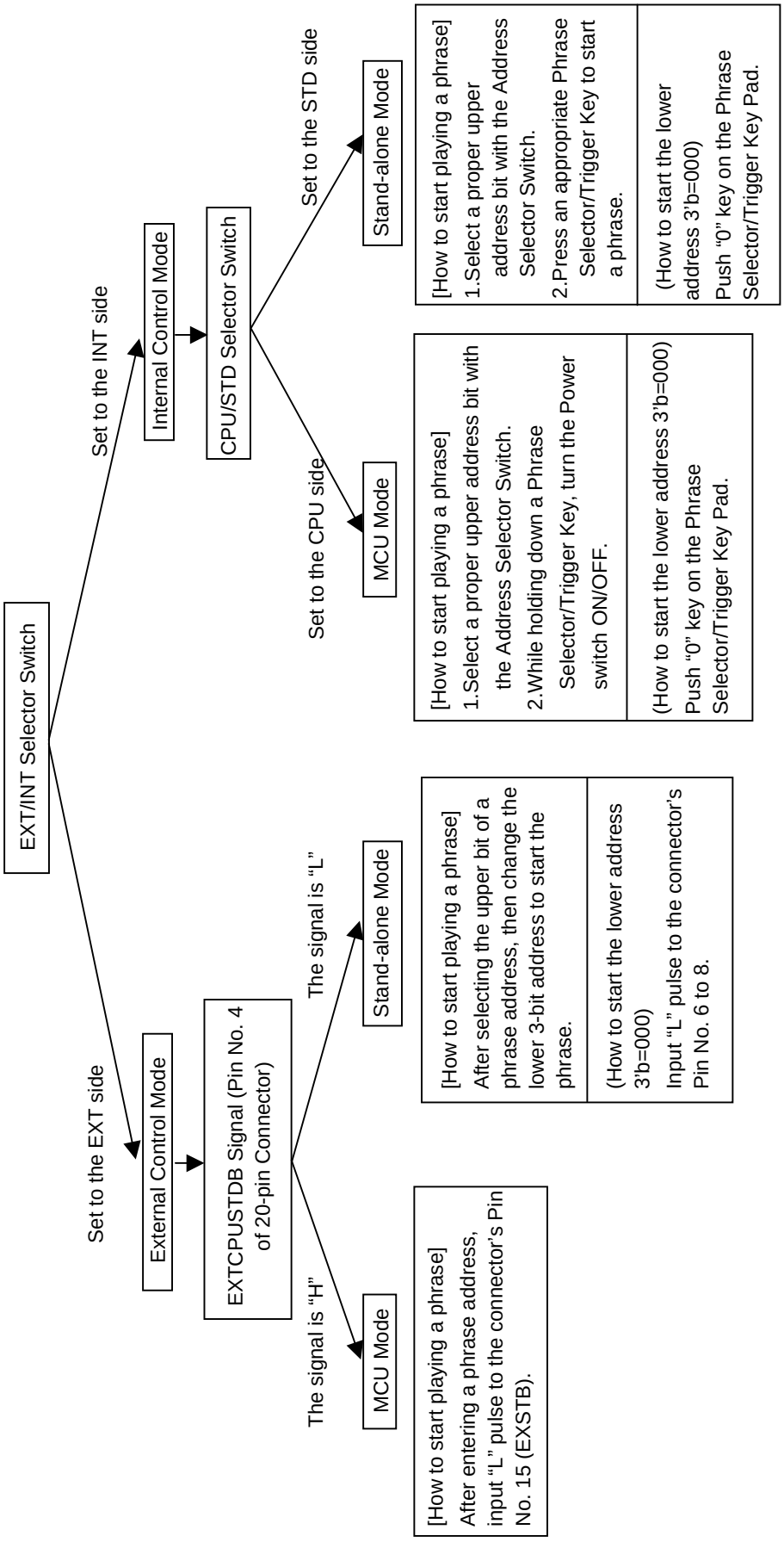
Reset switch

The figure in the next page shows operation flow explaining how to start a phrase both in EXT mode and INT mode.

Sound Level Control

Volume control

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



Operation Flow Explaining How To Start a Phrase

OPERATIONAL DIFFERENCES BETWEEN THE BOARD AND TARGET DEVICES (MSM9802/MSM9803/MSM9805/MSM9836)

Operating Ranges (Both in MCU IF mode and Stand-alone mode)

(GND = 0 V)

Parameter	Symbol	Conditions	Range	Unit
Power Supply Voltage	V_{DD}	—	+4.75 to +5.25	V
Operating Temperature	T_{OP}	—	0 to +50	°C
Clock Oscillation	f_{OSC}	Ceramic Oscillation	3.5 to 4.096 (Typ) to 4.5	MHz

DC Characteristics (Both in MCU IF mode and Stand-alone mode)

(Unless otherwise specified: V_{DD} = 5.0 V, GND = 0 V, Ta = 0 to +50°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
"H" Input Current to Pulled-up Pin	I_{IH1}	$V_{IH} = V_{DD}$	—	—	10	µA
"H" Input Current to Pulled-down Pin	I_{IH2}	$V_{IH} = V_{DD}$	25	50	75	µA
"L" Input Current to Pulled-up Pin	I_{IL1}	V_{IL} = GND	–10	—	—	µA
"L" Input Current to Pulled-down Pin	I_{IL2}	V_{IL} = GND	–75	–50	–25	µA
Power Consumption	I_{DD}	—	Unavailable			mA
Standby Power Consumption	I_{DDS}	—	Unavailable			µA

Functions

The following list describes the board's functional differences from those on MSM9802/9803/9805. Use MSM98P05 to evaluate such functions as listed.

Functional Comparison List of M98xx/M9836 Old/New Evaluation Board

Type			M98xx Device	M9836 Device	(For reference only) M98P05 Device	New Eva. Board (With M98xx/M9836)	
Mode						INT Mode	EXT Mode
Stand-alone	Repeat Play (When holding down a Trigger key)		○		○	× (Single Phrase Only)	× (Single Phrase Only)
	Random Function		○		○	×	×
	When the next phrase triggered halfway of playback	Last Key-push supercedes (A function that enables the 2nd phrase to start while quitting the 1st phrase halfway)	○		○	○	○
MCU/IF		Contiguous Play (A function that enables the 2nd phrase to start after the 1st phrase ends.)	○	○	○	○	○

○ :Available
× : Not Available

Status Signal

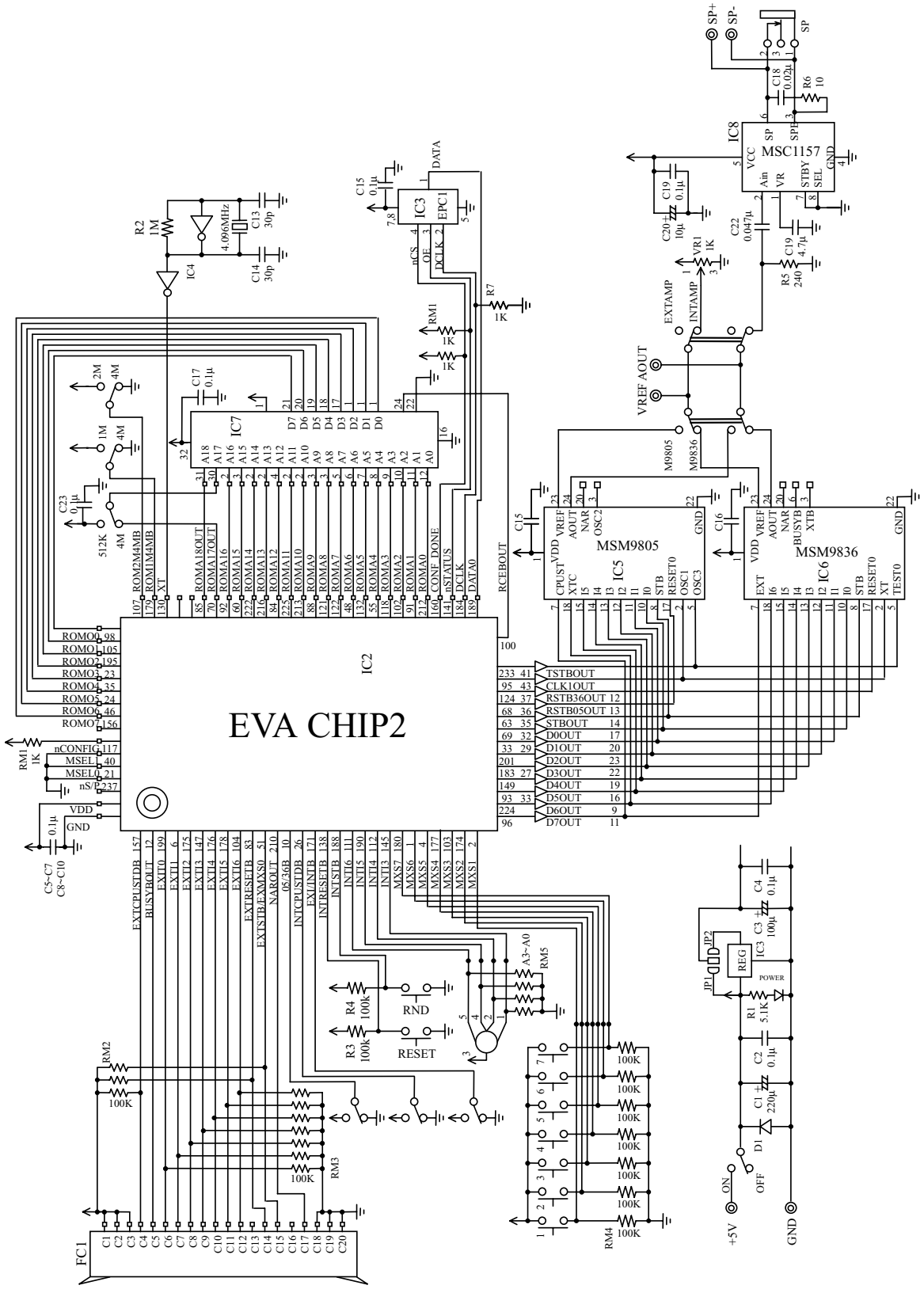
The following list describes status signal output of the board.

M98xx/M9836 Eva. Board Status Signal List

Type	New Eva. Board (With M98xx/M9836)			
Mode	INT Mode		EXT Mode	
Interface	Stand-alone	MCU/IF	Stand-alone	MCU/IF
$\overline{\text{BUSY}}$ (Connector No. 5 Pin)	○	○	○	○
NAR (Connector No. 17 Pin)	M98xx outputs $\overline{\text{BUSY}}$ signal M9836 outputs NAR signal	Outputs NAR	M98xx outputs $\overline{\text{BUSY}}$ signal M9836 outputs NAR signal	Outputs NAR

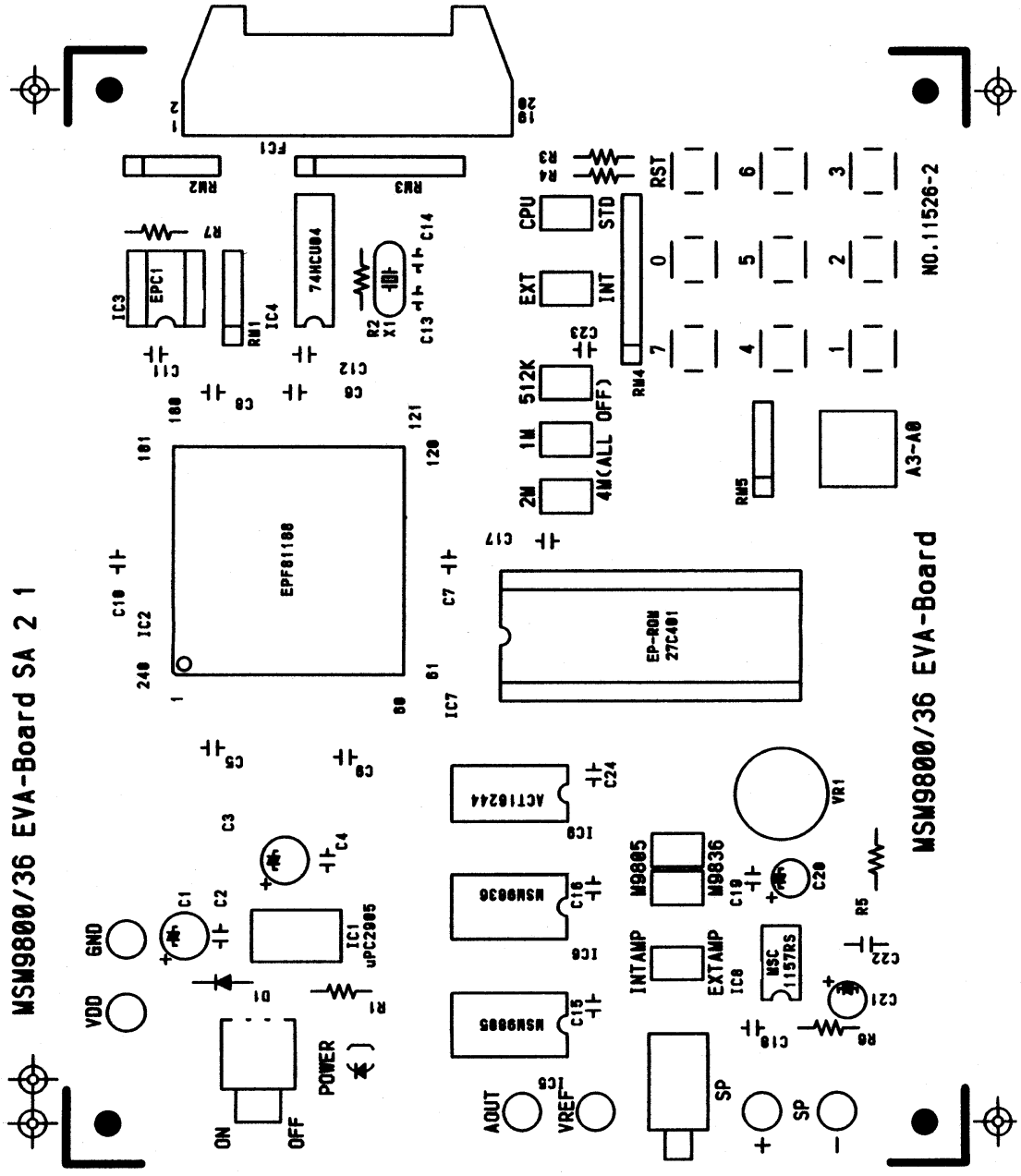
○ :Available

CIRCUIT DIAGRAM

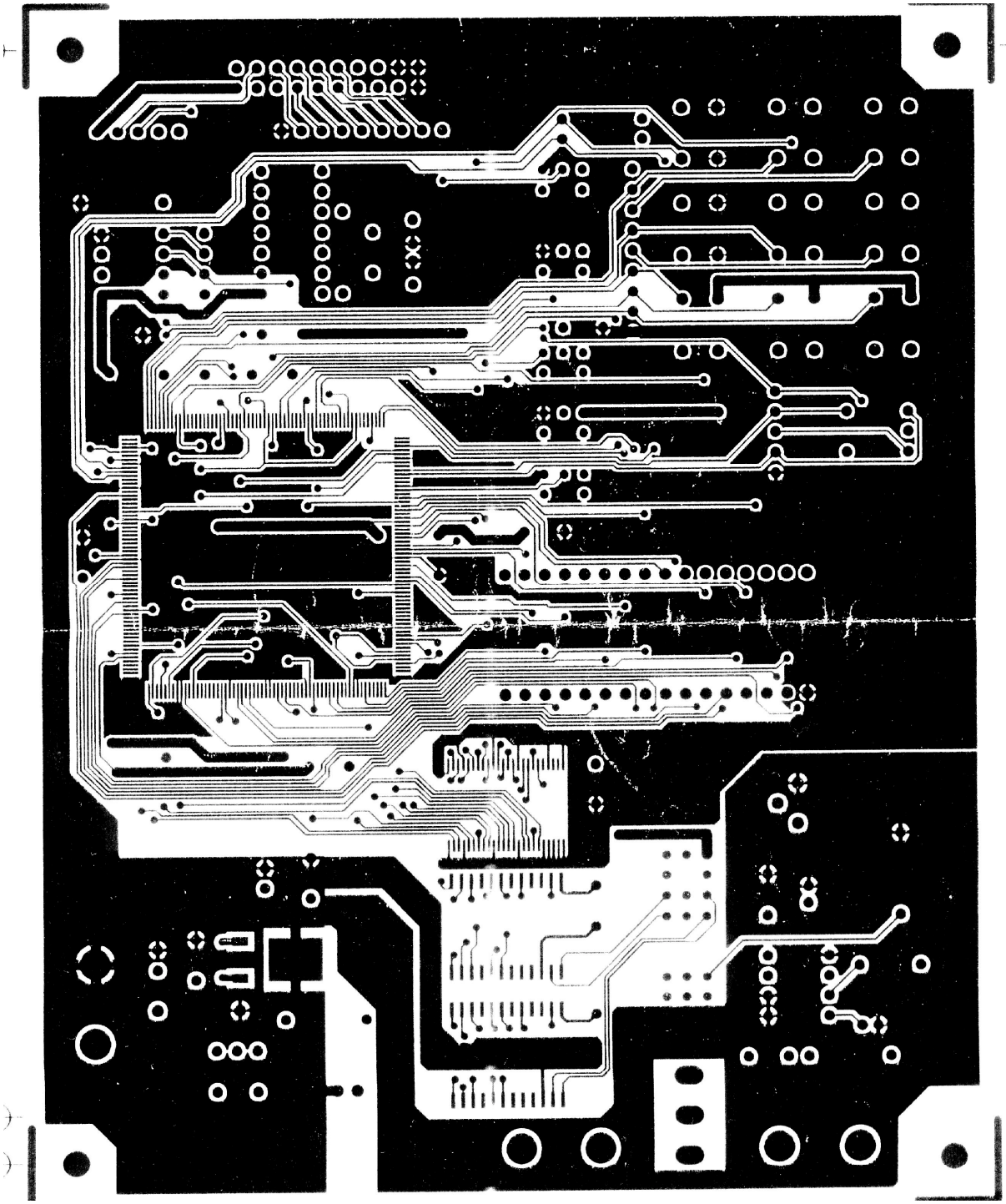


BOARD PCB AND LAYOUT

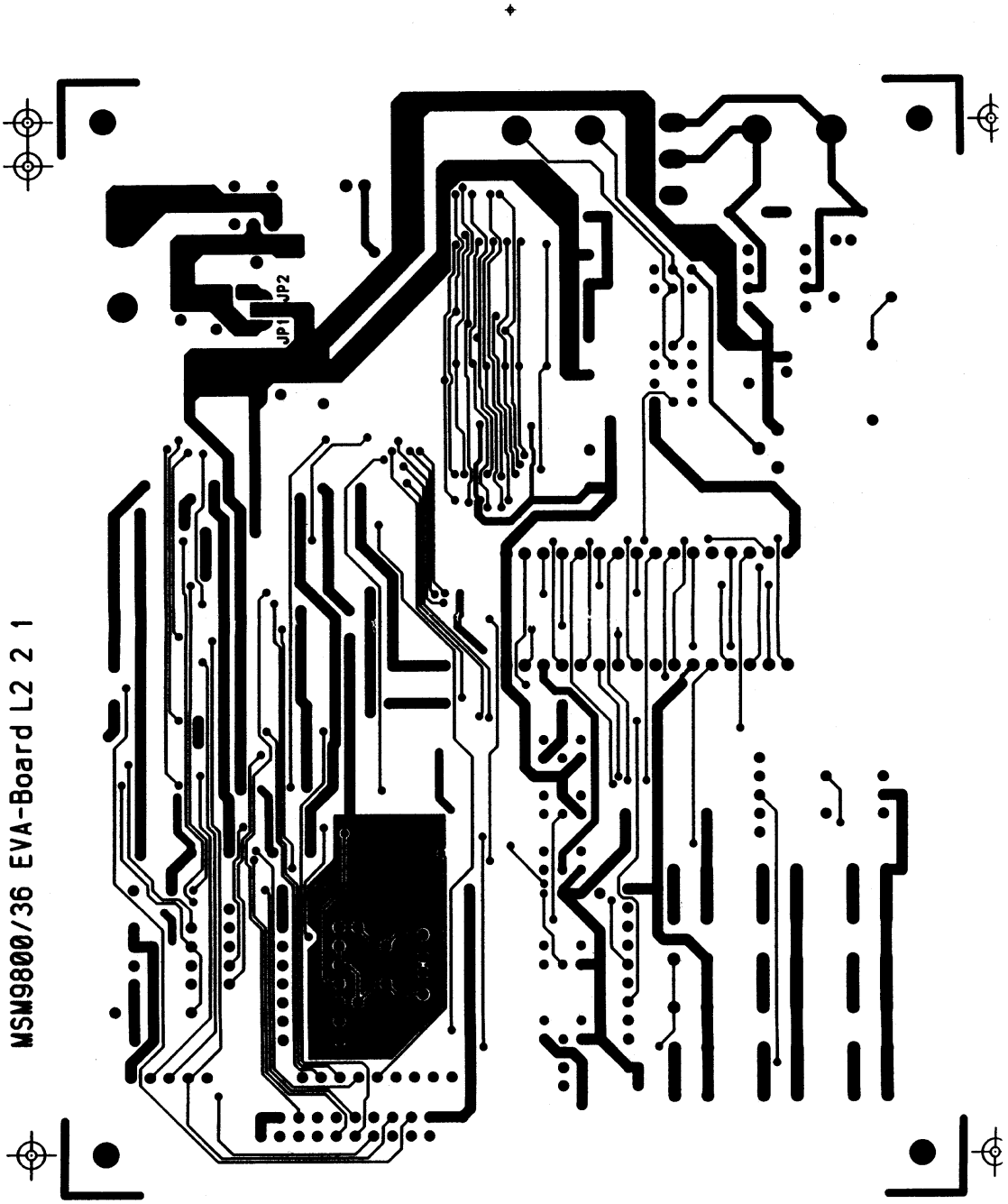
Silk-printed Side



Parts Side



Soldering Side



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