SONiX 8-Bit MCU MP-III Writer

User Manual

<u>*V1.0*</u>

MANUAL REVISION HISTORY

Version	Date	Description
V1.0	Mar. 2007	First Issue

INDEX

1 MP-III Writer INTRODUCTION

1.1 Guide

MP-III Writer is new generation writer based on MP-I Writer, extends with USB port and ISP (In System Program) function, download program code and updates the programming control procedure through USB port. It changes hardware update to software update and accommodates customer with convenient usage.

1.2 Function outline

■ Adapted Flash Base MCU with ISP function, chip programming control procedure can be updated according to requirement at online status.
■ It's convenient to connect Full Speed USB 1.1 port with PC and then update the writer, connect programming chip or download programming code.
■ Supporting chip connection and operation at offline status.
■ Succeeding all functions of MP-I Writer.
■ New function of reading data from chip online.
■ New functions of reading data from EEPROM and clearing EEPROM.

1.3 Hardware introduction

MP-III Writer contains base control board, programming upper-board and programming transition board and case. Message description is shown in table 1, outward appearance is shown in figure 1.

No.	Feature	Description	Remark
(1)	S3	RESET Key	Reset Writer
(2)	S1	MODE Key	Function Mode Choosing
(3)	D6	Four digits 7 Segment Display	Display Programming Message and Function Indication
(4)	D1~D3	Indicative LED	Programming Status Indication. Green light means programming finished, yellow light means still programming, red light means failure.
(5)	S2	Execution Key	execute the programming procedure or break alarm indication
(6)	JP2	Writer Transition Board Socket	used for connecting wire aboard to programming chip
(7)	JP1&JP3	MP Transition Board	used for insert in programming transition board, it must be matched with MCU series no.
(8)	Text Tool	Programming Base	deposit chips waited for programming (only fitting to DIP or can turn to DIP package)

Table 1

(1)

(2)

(3)

(4)

(5)

(6)   (7)   (8)

Figure 1 MP-III Writer outward appearance

1.4 Accessory Illustration

■ 5 wired Mini USB wire is used to connect MP-III with PC, as shown below

Figure 2 USB Cable

■ DC 7.5V/2A direct current power supply, used for MP-III working power source.
■ Programming extend with 20 pins bus, as shown below

Figure 3 20 pins bus

■ MP programming transition board, match with different chips, used for programming control wire connected with chip programming pin, as shown below. Using the

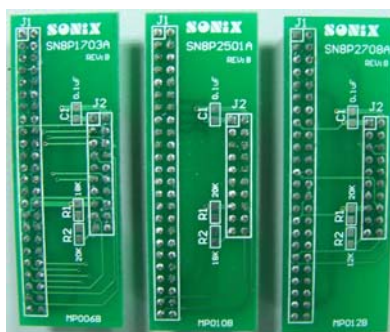programming transition board can directly deposit the chip with DIP package onto 48 pins text tool to program.

Figure 4 MP transition board inserted in JP1 & JP3

■   V3 programming transition board (shared with Writer 3.0), as shown below:
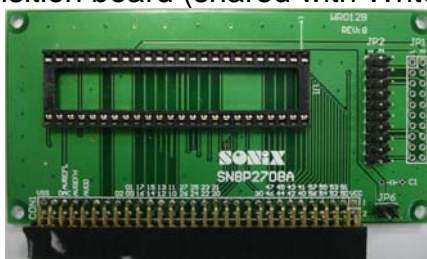
Figure 5 Transition board shared with Writer 3.0

1.5 Software and Hardware Installation

1.5.1 Software Install

1. The software MPIII_Wt.exe supporting to this type of writer is embedded in SN8IDE_1.99W (supporting SN8P1910 series MCU), M2IDE_V112 (supporting Sn8P2000 series MCU) or in compilation software with updated version. User can surf to website of SONiX to download and upgrade this software.
2. Installing driver procedure to use MP-III Writer is needed first time, according PC instruction to choose compile software file SN8USBMP3Wt.inf under the portfolio "\USB_Driver".
3. Using this software with MP-III writer can download the programming code to the EEPROM of writer and proceed with chip programming offline and directly programming online. For detail operation please refer to relative part mentioned lately.

1.5.2 Hardware Install

1. Install corresponding series no. MP programming transition board or V3 programming transition board, as shown in figure 6:
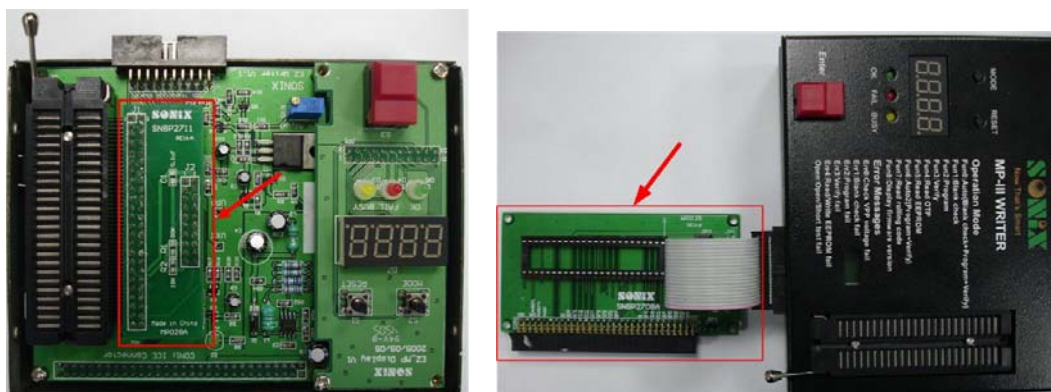
Figure 6 MP-III Writer and programming transition board connection diagram

2. Connecting DC 7.5V/2A DC power.
3. Utilizing Mini USB Cable to connect writer with PC.
4. Execute software file (ex. MPIII_WtV100.exe) supporting this type of writer and download the file .SN8

waited for programming to the EEPROM of writer.

5. The communication operation between programming and PC (operations like downloading the file SN8, programming online etc) need to see the 7-segments displayer display the word "USB" and then proceed with next operation (if the instruction is not shown, please push RESET key or check the connection).

6. Without connecting USB Cable, after the power of writer is on or pushing the RESET key, 7-segments displayer will show "the type of chip version - no. of firmware", then display programming code (including the type of MCU and the value of checksum) restored in EEPROM.

7. If the EEPROM equip with writer is damaged or dismounted artificially, the error message indication "Err4" will be shown.

8. The direction of deposition diagram of OTP MCU is shown below or refer to the case identification of writer.

Figure 7 The diagram of chip deposition

2   OFFLINE PROGRAMMING OPERATION OF CHIP

2.1   Offline programming steps of chip

- Step1: download the programming code
- Step2: offline programming of chip

2.2   Download programming code

- Connecting DC 7.5V/2A power line, USB wire with MP-III Writer respectively:
- Switching writer to USB online mode:
- Open the programming software online and download the programming code .SN8 to EEPROM, and note the checksum value, for detail operation please refer to chapter 3:
- Remove USB Cable, writer will reset and enter the offline mode automatically. Choosing Fun5 through pressing "Mode" and "Enter" keys and check the checksum of EEPROM to see if it is same with the record value.
- Programming code download is finished.

2.3   Chip offline programming

- Dismount the case of writer and then stick to MP programming transition board or using 20pins bus to connect V3 transition board:
- Connect DC 7.5V/2A power, the default working mode of writer is FUN6:
- After 7-segments displayer show "the type of chip waited for programming - Checksum value", then deposit the MCU waited for programming, press the "Enter" key to program, the execution action is "Program + Verify", OK indication light brighten after programming successfully:
- For detail operation please refer to chapter 4.

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3 ONLINE PROGRAMMING OPERATION OF CHIP

3.1 The online programming steps of chip

■ Start the operation interface of MP-III Writer software, default selection "programming MCU", the Simplified Chinese interface.
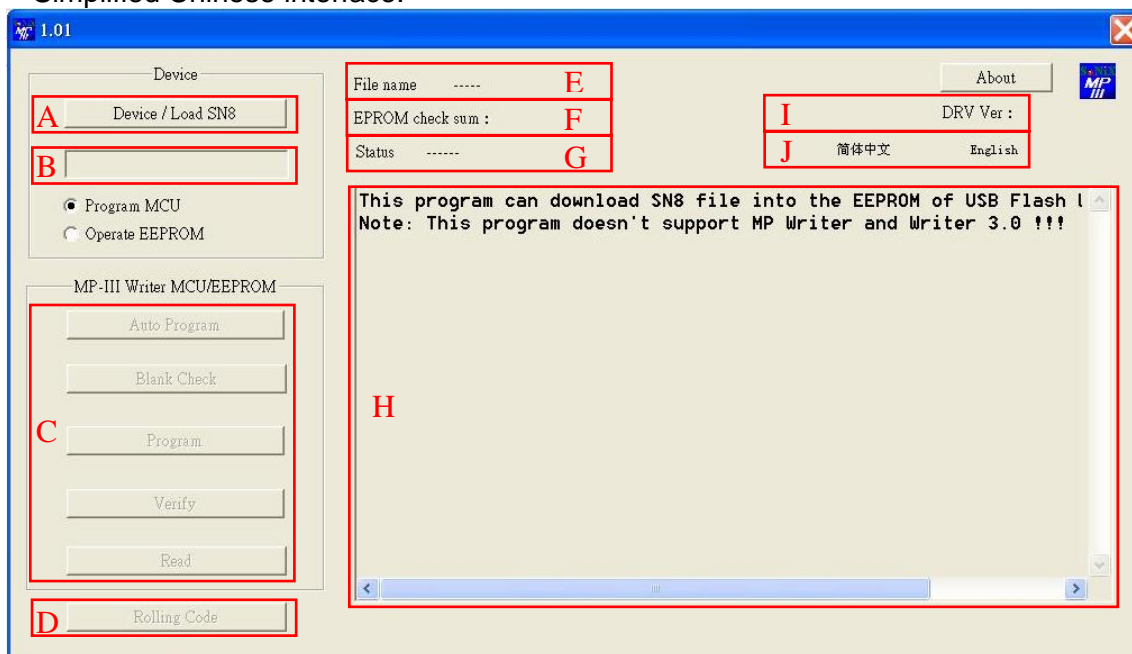
Figure 8 MP-III software opening frame

■ Interface message illustration:

A	Installation of chip programming code button.
B	The display frame of chip type.
C	Function button choosing area.
D	Setting Rolling Code function button, only can be configured after starting rolling code.
E	Path display area of chip programming code.
F	Display area of chip programming code, indicate whether the function of encryption is opened simultaneously..
G	Status display area, like Program, Read …etc.
H	Programming message indication frame.
I	The firmware version of programming procedure.
J	Language selection button providing with Simplified Chinese and English to choose.

■ Click "Device/Load SN8" button, choose programming code of the needed chip type, shown as below:
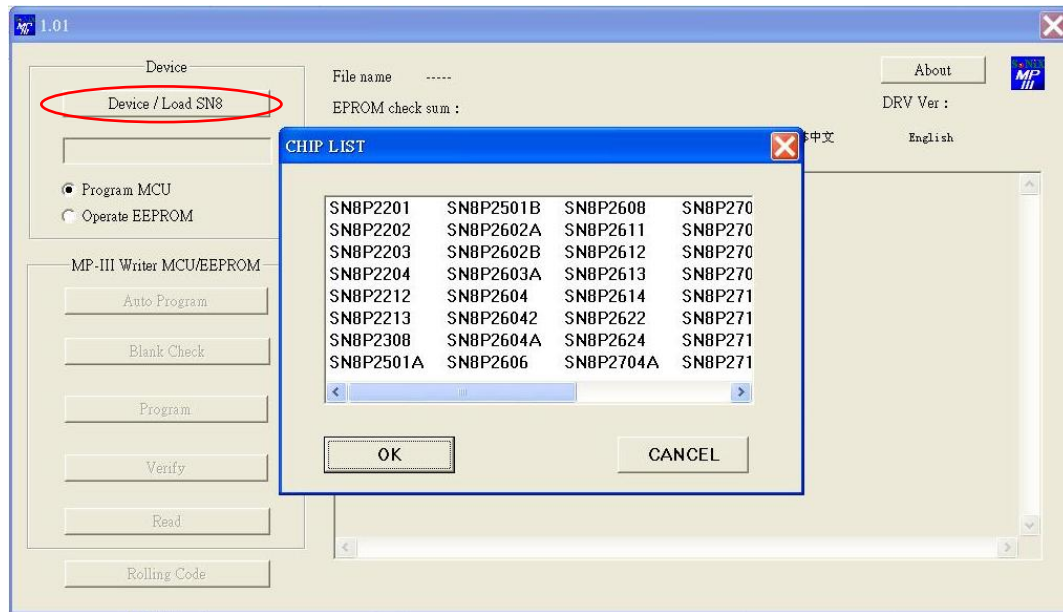
Figure 9 choose chip type & programming code

■ If the connection of MP-III Writer and PC is normal, after finishing last step, programming code will be automatically downloaded to EEPROM of writer, programming indication message is shown in figure 10. The function button will bulge out to echo operation.
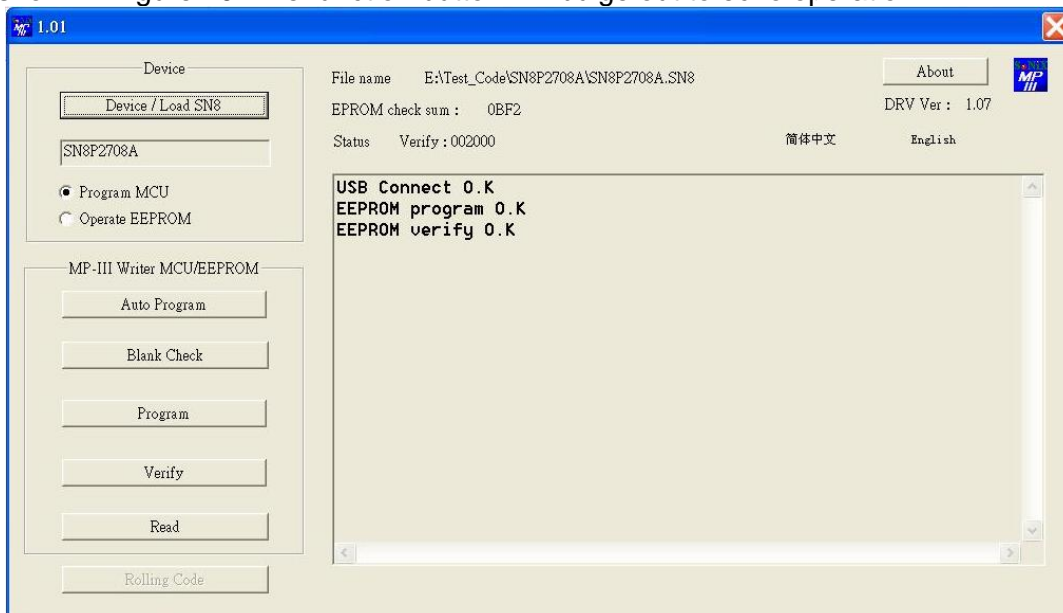
Figure 10 download the programming code to EEPROM

■ If only choose type of chip, choose to cancel programming code, interface will back to opening status, all function button will be invalid, as shown in figure 8.

■ After chip waited for programming deposited to fixture correctly and click "Auto Program" button, writer will execute "Blank Check", "Program", "Verify" at once, indication message is shown as figure 11:
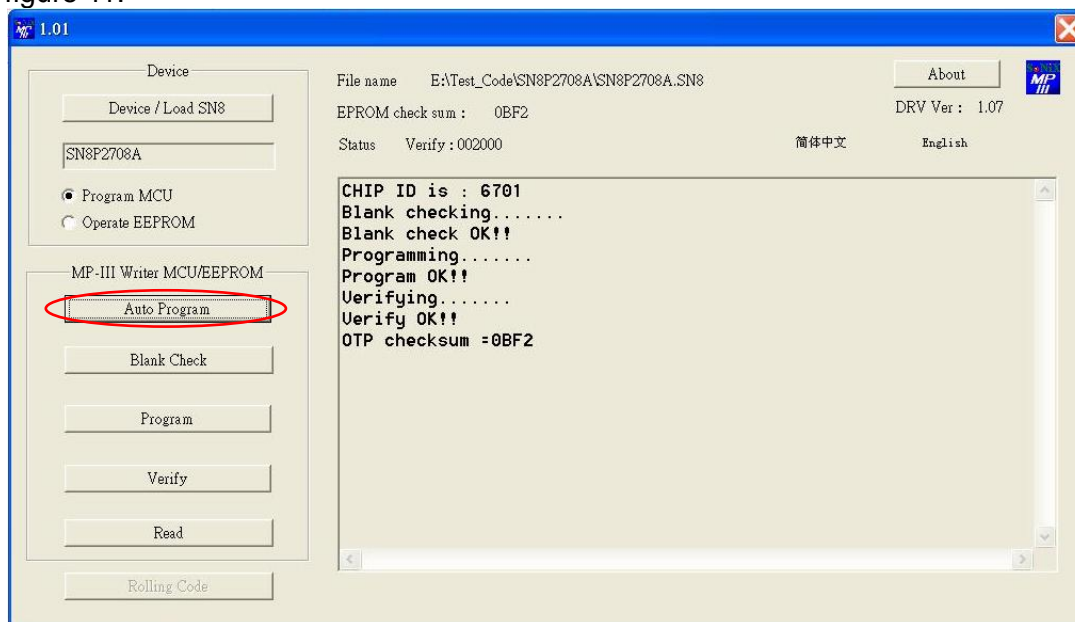
Figure 11 Execute "Auto Program"

■ Click "Blank Check" button, only make a blank check to chip, shown as figure 12:
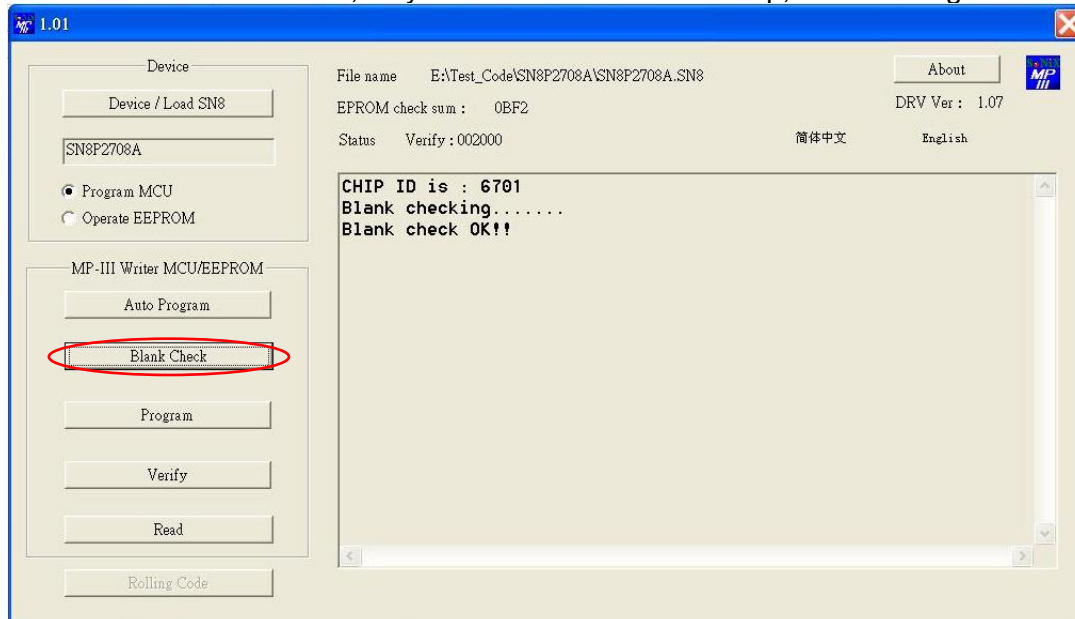
Figure 12 execute "Blank Check" function

■ Click "Program" button, only execute chip programming action, shown as below:
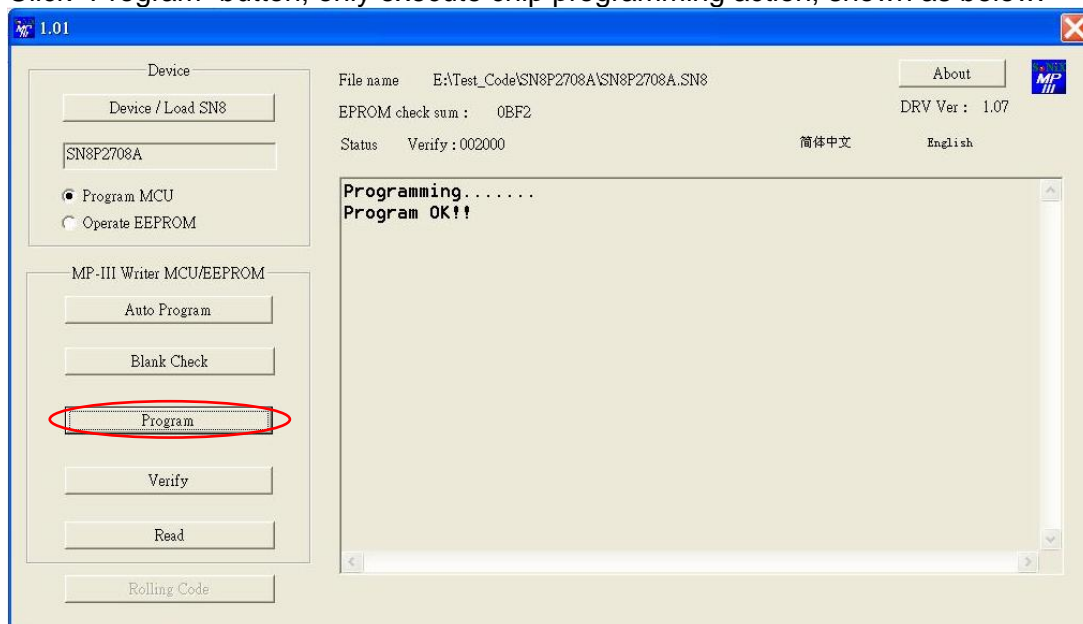
Figure 13 Programming OTP finished

■ Click "Verify" button, only check whether the code programmed to chip is correct or not, correct data verification is shown in figure 14, error data verification will show error address and error data as shown in figure 15:
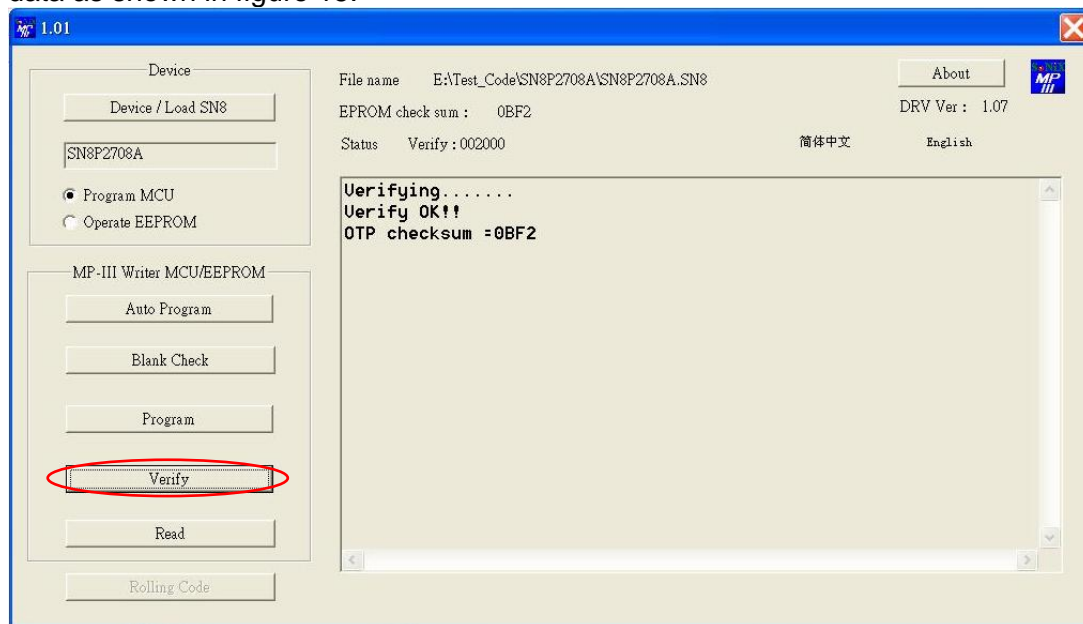
Figure 14 Verification, data correct
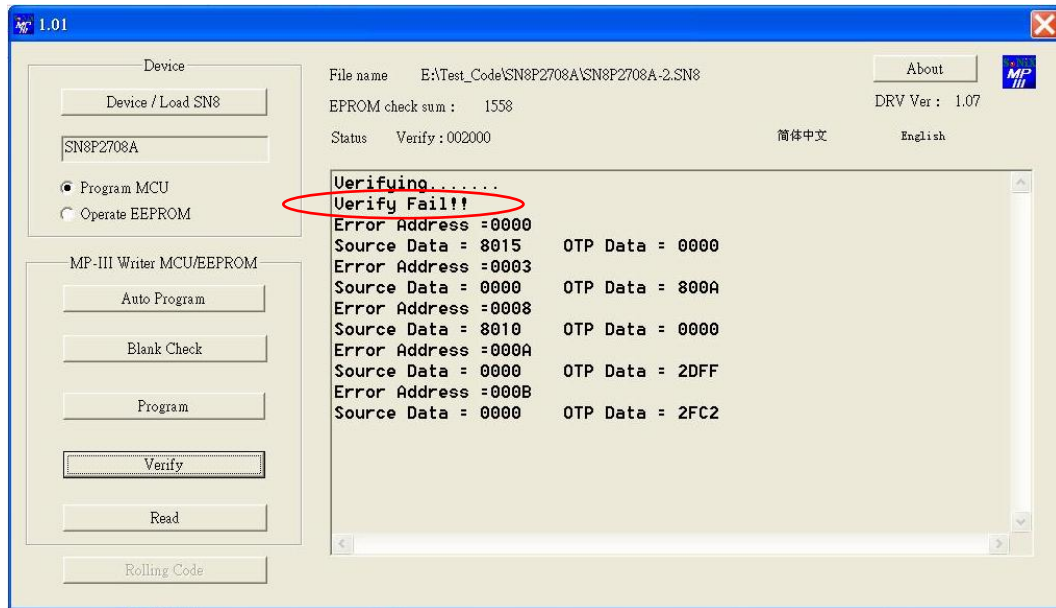
Figure 15 Verification, data error

- Click "Read OTP" button, will read message from chip (if chip is encrypted then only part of data can be read), and shown in message frame, as shown below. In addition, one file .BBB will automatically generate and be restored under the portfolio of the compilation software called "Wirter_log".
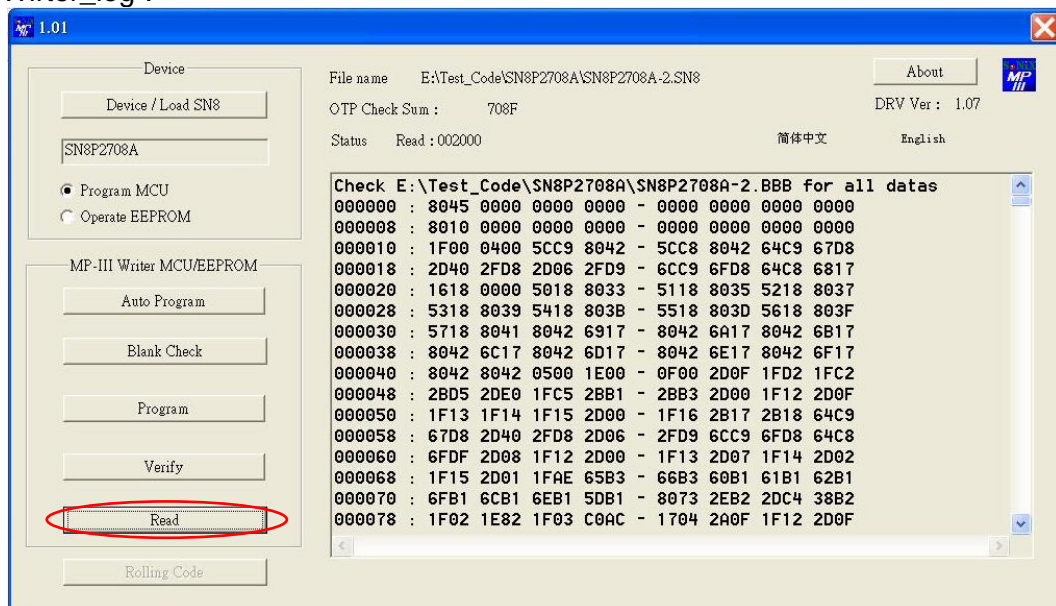
Figure 16 Read the data of OTP

3.2 Rolling code setting

- Only the function of Rolling Code is used, the button "Rolling Code" is effect.
- Click "Rolling Code" button, the dialogue box is shown as next figure, the option of initial address, length, initial value and step value can be modified.
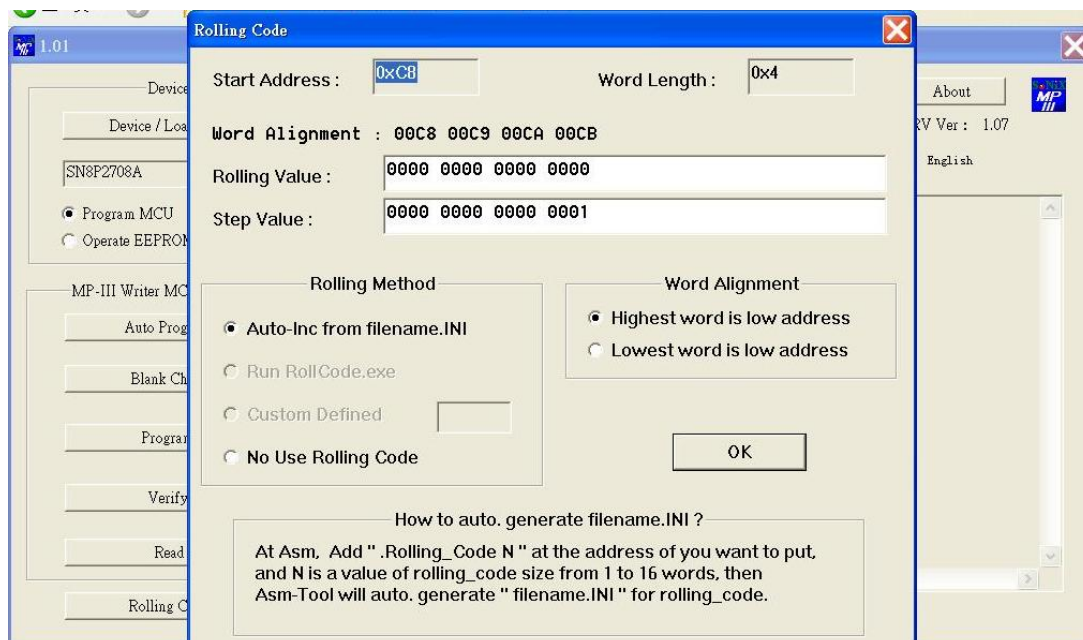
Figure 17 Rolling Code setting

- After finishing rolling code setting, click "ok", the setting of data will be updated synchronous in writer and INI deposition file.
- In the process of programming rolling code, writer switch the online mode to offline mode, don't affect the correct variation of rolling code. For example: initial value is 0001, after programming two chip online, then the value of rolling code will start from 0003.

3.3 EEPROM operation

■ At MP-III Writer online status, after choosing the option "Operation of EEPROM", the options of "read EEPROM", "clear EEPROM" can be carried out with the EEPROM of Writer.
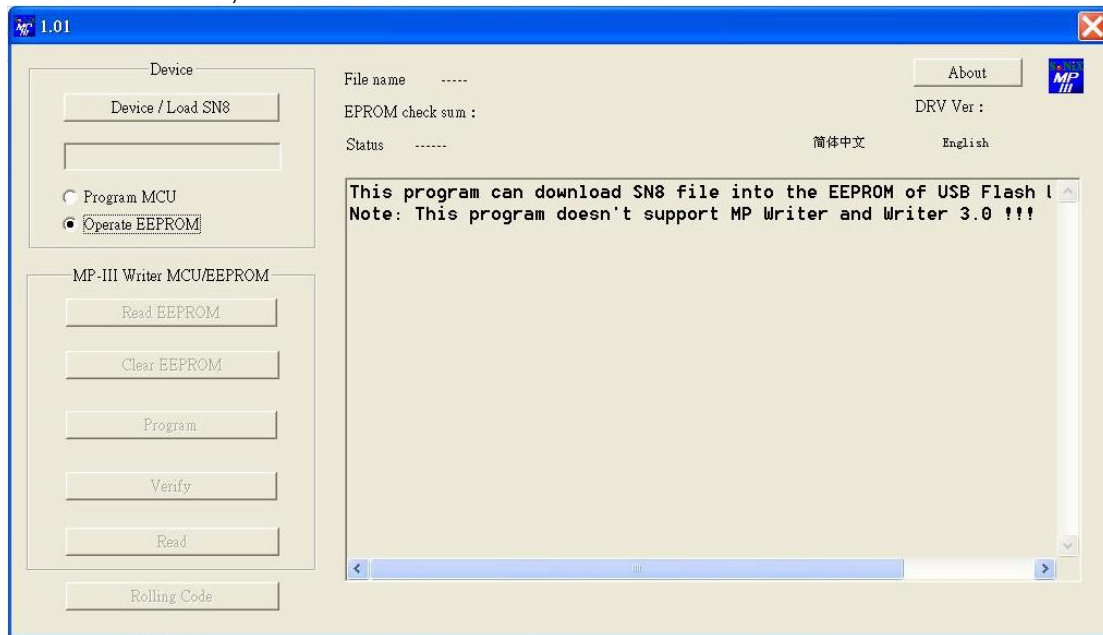
Figure 18 the interface of EEPROM operation

■ After clicking "Device/Load SN8" button, the chip type and programming code can be selected, as shown below:
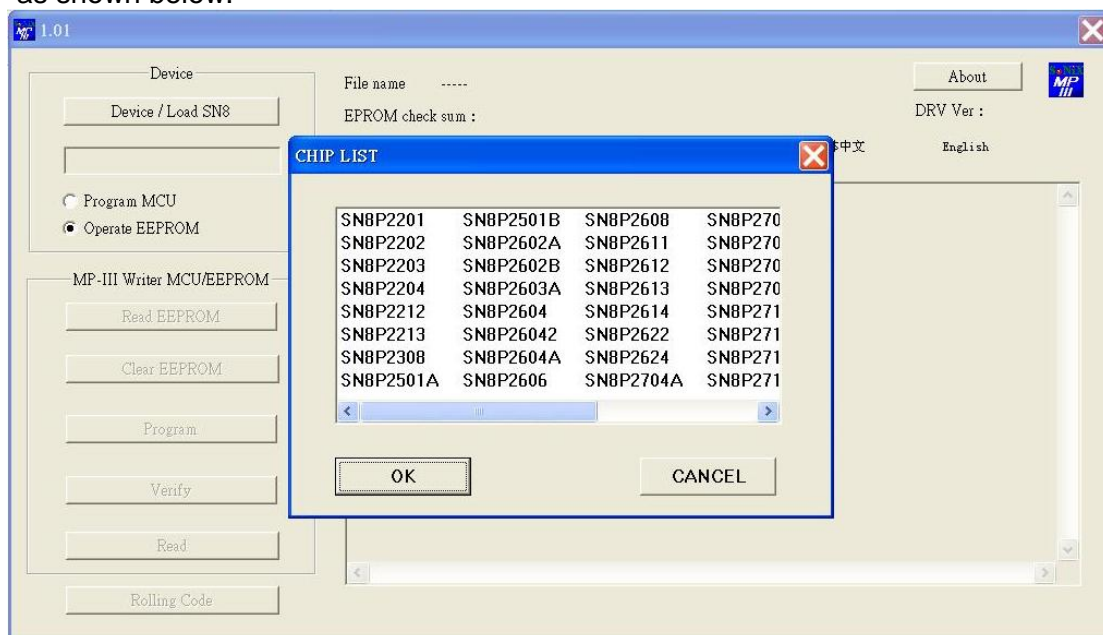
Figure 19 Choose MCU type and programming code in the interface of operating EEPROM

- Clicking "read EEPROM" button can read the data from EEPROM and shown in message frame, as shown below. A .BBB file will be generated automatically and restored under the portfolio of compilation software called "Writer_log".
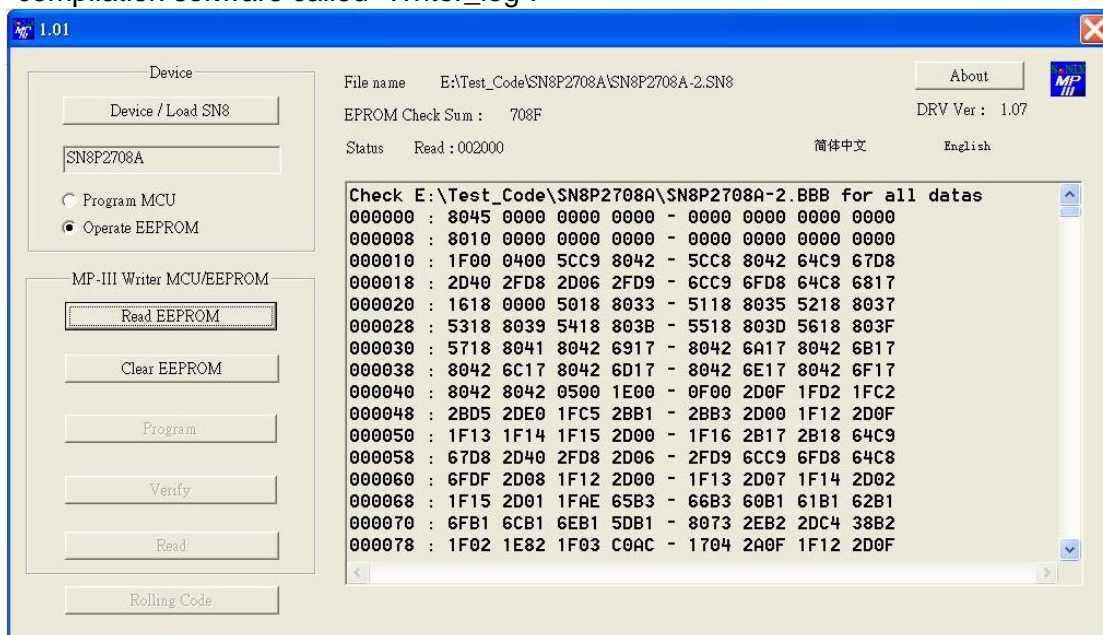
Figure 20 read EEPROM

- Clicking "clear EEPROM" button will clear the valid data of EEPROM, as shown below:
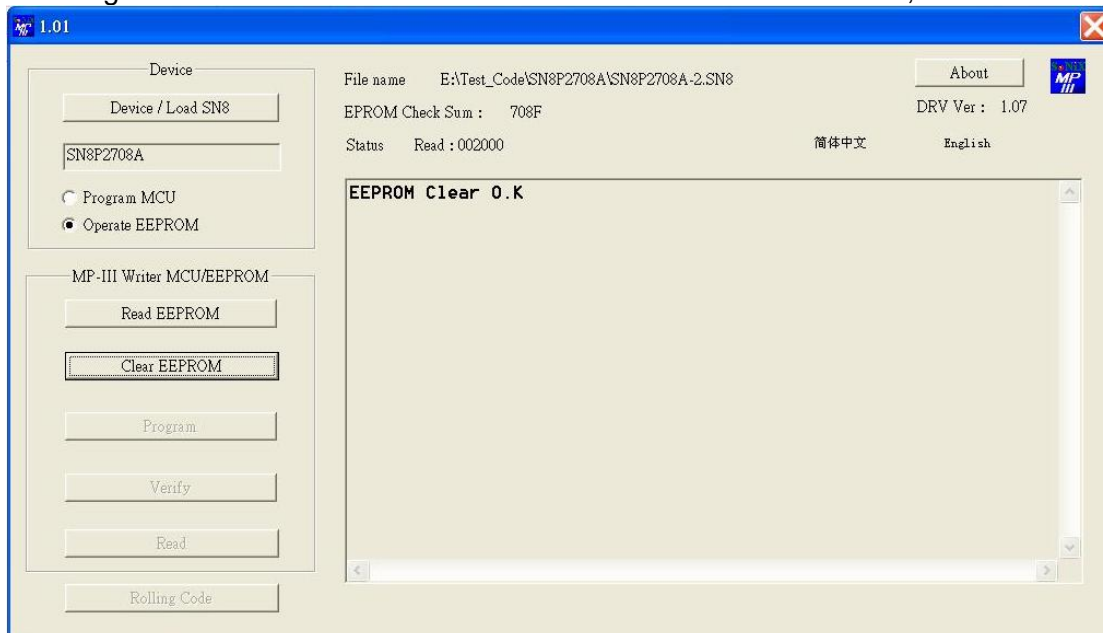
Figure 11 clear EEPROM

NOTE：After clearing EEPROM, if don't download SN8 file to writer and execute the programming, writer will alarm and display "Err4".

4 MP-III Writer Offline Operation Illustration

4.1 MP-III Writer offline operation menu and relative message illustration

| Mode	Function Outline	Executing		Success		Failure	
		7-segments displayer	LED	7-segments displayer	LED	7-segments displayer	LED
FUN0	Auto1： Blank + Program + Verify	none	Yellow	Checksum value or Rolling Code	Green	Err1,Err2,Err3	Red
FUN1	Blank Check	none	Yellow	FUN1	Green	Err1	Red
FUN2	Program	none	Yellow	FUN2 or Rolling Code	Green	Err2	Red
FUN3	Verify	none	Yellow	Checksum	Green	Err3	Red
FUN4	Read OTP	none	Yellow	Checksum	Green	Uncertain value	-
FUN5	Read EEPROM	none	Yellow	Checksum	Green	Err4	Red
FUN6	Auto2： Program + Verify	none	Yellow	Checksum or Rolling Code	Green	Err2 or Err3	Red
FUN7	Display Rolling Code value	none	Yellow	Lowest word	Green	-	-
FUN8	Display firmware name and version no.	none	Yellow	ex ： 2704A-F101	Green	-	-
Remark	1. After starting writer, the default is "FUN6", different mode can be selected through clicking "MODE" button.						
	2. Checksum value: choose it equal to Security checksum with encryption, equal to EEPROM checksum without encryption.						
	2. Rolling Code: In Fun0, Fun2 and Fun6 mode, if Rolling Code is used, show the lowest bit value of Rolling Code.						
	3. FUN8 can check chip type and the firmware version of writer, ex: "2704A-F101", "2704A" are MCU type, "F101" are the firmware version of writer.						

No.	Error Message	Message description
1	Err0	VPP voltage error
2	Err1	OTP Blank Check failure
3	Err2	OTP programming failure
4	Err3	OTP programming verification failure
5	Err4	EEPROM vacant or data unusual
6	Err6	Programming pin with bad contact or error direction deposition.

4.2 MP-III Writer option description

■ After downloading SN8 file to EEPROM of MP-III Writer, insert MP transition board or V3 transition board, deposit chip correctly then proceed with the operation of offline programming (need to remove USB Cable).

■ MP-III Writer is power on, check whether the data of EEPROM is correct or not, the message "Err4" is shown if data is error, if data is correct then display MCU type and the firmware version of writer, then display the word "EEP-", display the type of MCU waited for programming and checksum consequently.

■ After power on, the default operation mode is FUN6 (Auto2), press "Enter" button to proceed programming. Auto2 means execute Program + Verify action, if programming error occur, 7-segments displayer will show error message, meanwhile, the buzzer alarm, press "Enter" key or dismount IC to cancel the alarm.

■ Utilizing "MODE" and "Enter" keys to select execution functions.

■ Executing the operations "Blank Check", "Program", "Verify", "Read" to chip, 7-segments displayer display nothing, yellow indication light brighten, after finishing the corresponding message will show.

■ MP-III Writer can support Rolling Code programming, only need to open Rolling Code function while downloading programming code to EEPROM, and set the relative parameters at the same time. Every time after programming one chip, 7-segments displayer will display the message of the lowest word of programming Rolling Code. If the programming failed, the value of Rolling Code will remain invariable, after programming success, the value of Rolling Code will be modified at next programming time, the value of programming rolling code of the current writer can be enquired through FUN7.

■ MP_III Writer leave the factory equipped with 24LC256 typed EEPROM, space is up to 16K word. Please don't change other type in order to avoid error.

■ MP_III Writer need some specified message in the aspect of message setting, so the corresponding programming software have to be used.

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5 Common Troubleshooting

5.1 Enter Test Mode

Open the case of MP-III writer, remove the transition board and chip waited for programming, push "Enter" button and don't release, push "RESET" button again, the "Test mode" can be entered. Three green, red and yellow indicative LED display in circle in "Test Mode" status, buzzer can generate regular indicative sound. User can utilize adjusted multi-meter to measure the value of voltage VPP whether the value of voltage is about 12.7V or not. Push "RESET" key again, make the writer back to normal operation mode.

5.2 Common Troubleshooting Method

- Err0 represent the voltage VPP or VXX is error.
  Possible trouble source: upper-board (the part of step up circuit in transition board, L1, D1, U1, Q1 etc).
- Err1 represent Blank Check Fail.
  Possible trouble source: text tool, transition board.
- Err2 represent Program Fail
  Possible trouble source: text tool, transition board or upper-board (R41~43, R56).
- Err3 represent Verify Fail.
  Possible trouble source: upper-board (R41~43, R56).
- Err4 represent Read or Write EEPROM fail
  Possible trouble source: the fluctuating voltage lead to data changing in EEPROM (reload .SN8 file is ok), EEPROM is damaged, EEPROM.
- Err6 represent IC is not contact well.
  Possible trouble source: text tool, transition board.

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6 APPENDIX

Appendix Ⅰ MP-III Writer Master Control Procedure Driver Update

■ It's very simple to upgrade MP-III Writer software. Please surf to SONiX website constantly to check if upgraded IDE software is released, re-install can finish the software upgrading. Chip mater driver name, version, driver and the programming supported MCU type table is shown below:

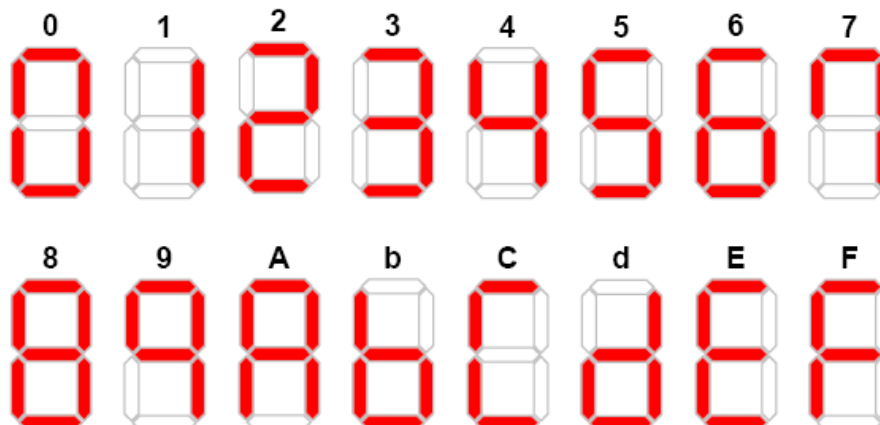| Chip Mater Driver Name	Driver	Supporting MCU type
2501B-F101	SN8P2501B.drv	SN8P2501B
2602B-F101	SN8P2602B.drv	SN8P2602B
And So On	…	…

■ MP-III Writer and MPI Writer, EZ Writer and Writer3.0 comparison table

Writer	Supporting Online Programming	Port	Supporting Online Programming	7-segments displayer interface	Power	48-pins Test Tool	SupportingRolling Code
MP-III	Yes	USB	Yes	Yes	DC 7.5V	Yes	Yes
MPI	No	Printer	Yes	Yes	DC 7.5V	Yes	Yes
EZ	No	ICE Port	No	No	None	Yes	Yes
Writer 3.0	No	Printer	Yes	No	DC 15V	No	No

Appendix Ⅱ Accessory listing

Name of Accessory	Status	Description
MP-III Writer	Standard Equipment	Consist of programming upper-board, control lower-board and case
USB Cable	Standard Equipment	Used for connecting with PC
DC Power	Standard Equipment	7.5V/2.0A
MP Transition Board	Additional Equipment	Attach to writer, deposited according to MCU type customer indicated
20-Pins双母座排线	Standard Equipment	Used for bus connected to V3 transition board

AppendixⅢ 7-segments display 0~9, A~F font

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Appendix Ⅴ transition board pins correspondent

JP1/JP2 of writer

VSS	2 1	VDD
CE	4 3	CLK/PGCLK
OE/ShiftDat	6 5	PGM/OTPCLK
D0	8 7	D1
D2	10 9	D3
D4	12 11	D5
D6	14 13	D7
VPP	16 15	VDD
RST	18 17	HLS
ALSB/PDB	20 19	-

JP1 for MP transition board

JP3 of writer (Mapping to 48-pin text tool)

DIP1	1 48	DIP48
DIP2	2 47	DIP47
DIP3	3 46	DIP46
DIP4	4 45	DIP45
DIP5	5 44	DIP44
DIP6	6 43	DIP43
DIP7	7 42	DIP42
DIP8	8 41	DIP41
DIP9	9 40	DIP40
DIP10	10 39	DIP39
DIP11	11 38	DIP38
DIP12	12 37	DIP38
DIP13	13 36	DIP36
DIP14	14 35	DIP35
DIP15	15 34	DIP34
DIP16	16 33	DIP33
DIP17	17 32	DIP32
DIP18	18 31	DIP31
DIP19	19 30	DIP30
DIP20	20 29	DIP29
DIP21	21 28	DIP28
DIP22	22 27	DIP27
DIP23	23 26	DIP26
DIP24	24 25	DIP25

JP3 for MP transition board

- JP2: Connecting to V3 transition board through 20pins bus, if making V3 transition board artificially is needed, please refer to every type programming corresponding pins table in next article.
- JP1/JP3: Utilizing TEXT TOOL to program IC, be sure to insert the corresponding type of MP transition board in JP1/JP3, OTP pin1 waited for programming is corresponded to JP3 pin1, OTP pin2 is corresponded to JP3 pin2 and so on.
- Please pay attention: Making MP transition board artificially, the pin1 of JP1 and JP3 is shown in next figure (near right):
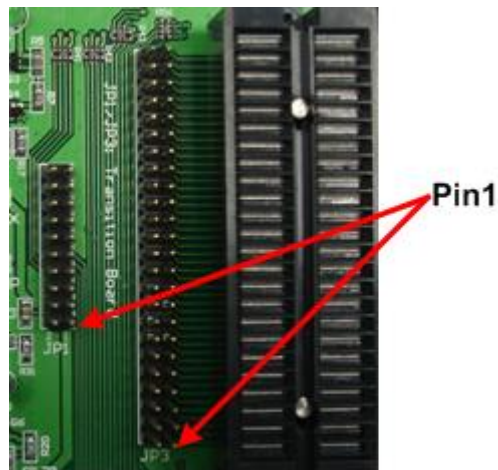
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