aP23KWC8D

USB Writer

USER GUIDE

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Introduction

The aP23KWC8D USB Writer is designed to support Aplus aP23xxx series Voice chips. It is suitable for:

- aP23682 **(682 sec, 2 I/O chip) – DIP8**
- aP23341 **(341 sec, 2 I/O chip) – DIP8**
- aP23170 **(170 sec, 2 I/O chip) – DIP8**
- aP23085 **(085 sec, 2 I/O chip) – DIP8**

This development system serves three main functions:

Compiler – to created a dp2 file from user's Voice files
Writer – to program the dp2 file into the aP23xx chip
Copier – connect DC 5V adaptor for 1 to 1 programming

The **Compiler** is used to combine the edited voice files into the chip to form the desired Voice Group and to define the playback functions of each Voice Group by selecting different Options and Trigger Modes of each individual Voice Group.

The **Writer** is used to program the voice data into the aP23xx devices that resulted from the Compiler Function. A Writer Board connected to the PC via USB port is required.

The **Copier** is using the compiled .dp2 which loads to writer then disconnect the USB and connect the DC 5V for 1pc. copying.

Installation

Hardware Installation

aP23KWC8D is a USB based writer programmer. It is intended to be used in WindowsXP，Win7，Win8 computer.

Writer Board Connection

1) Connect USB cable from the writer board to the computer. The computer will display a new hardware is found message. The installation will begin automatically.
2) If there are too many USB devices are connected to your computer at the same time, the current supply from USB may not be sufficient to support the writer board.

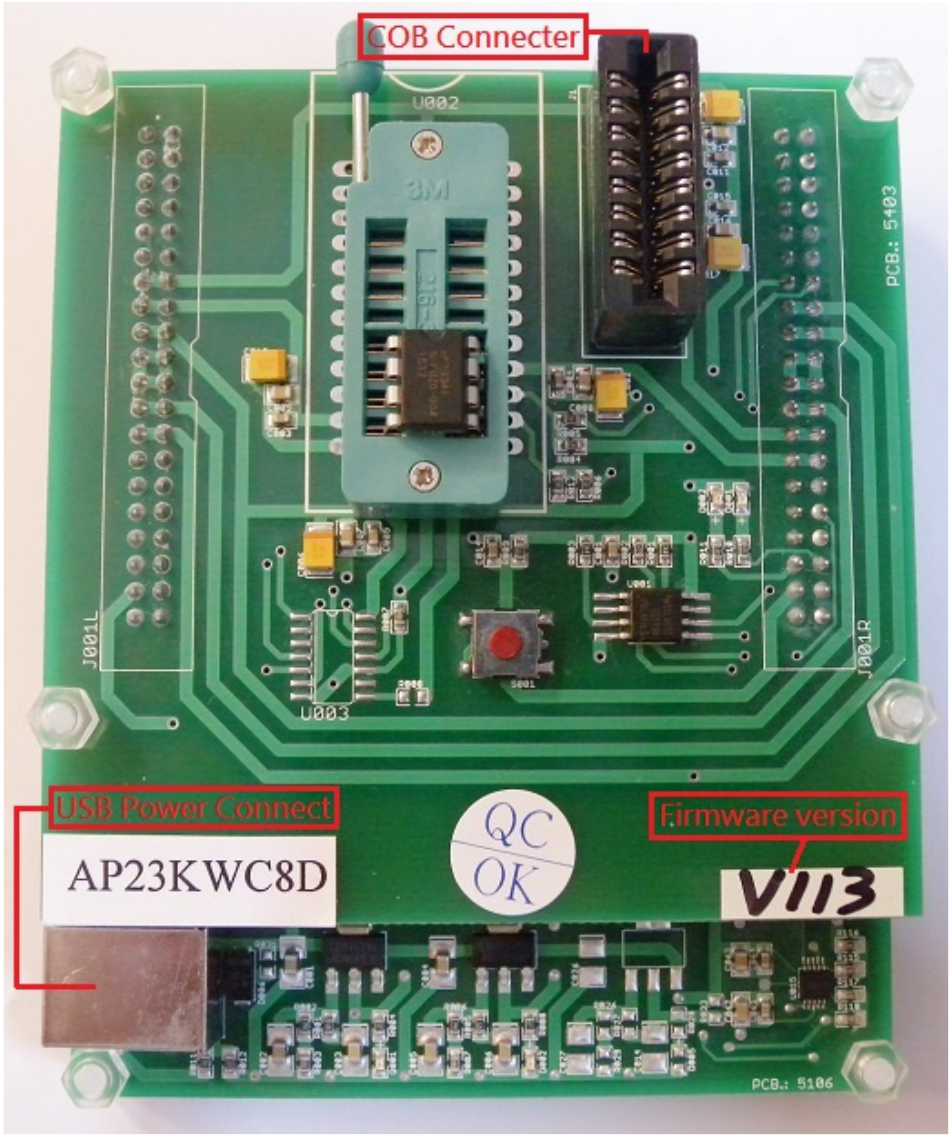
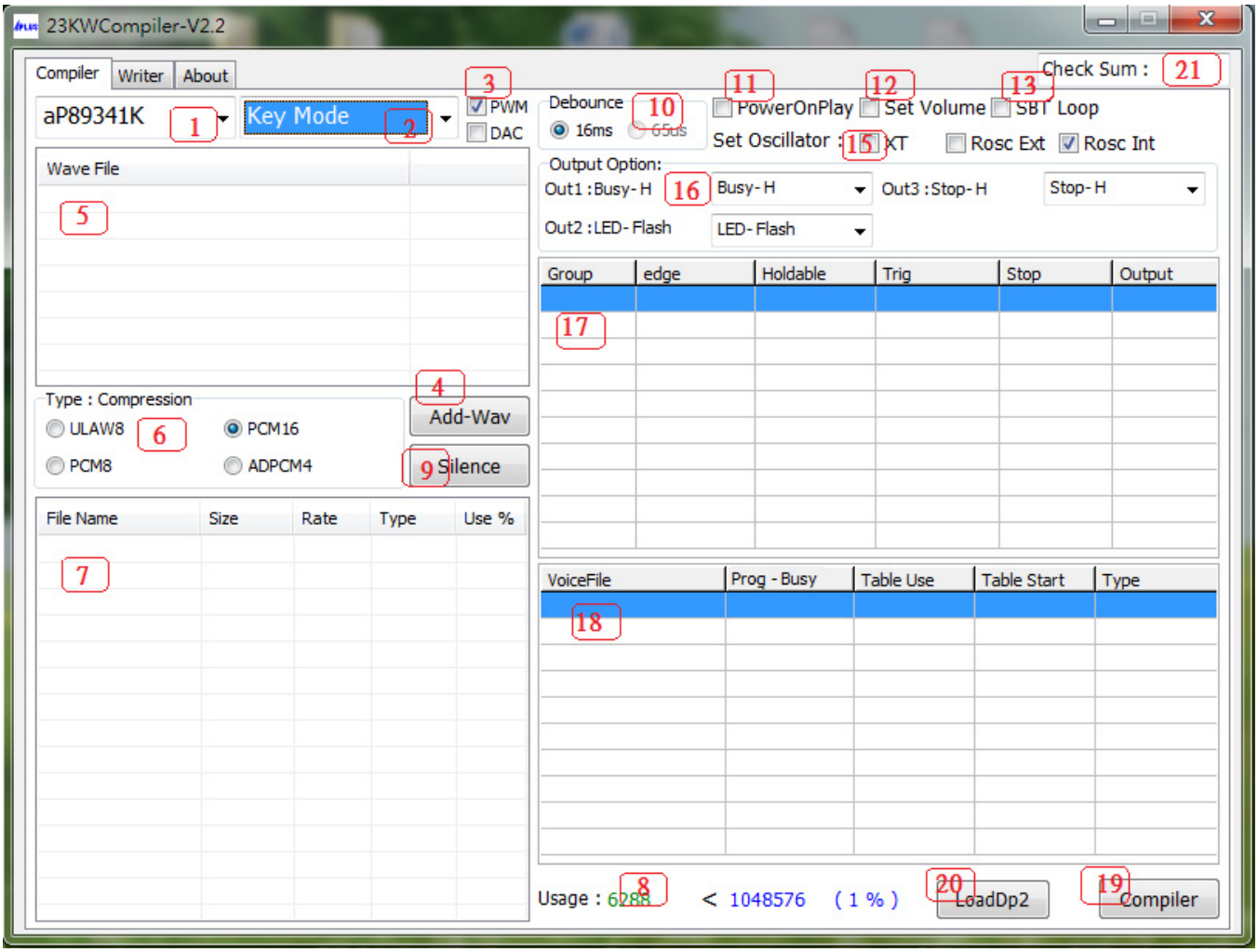


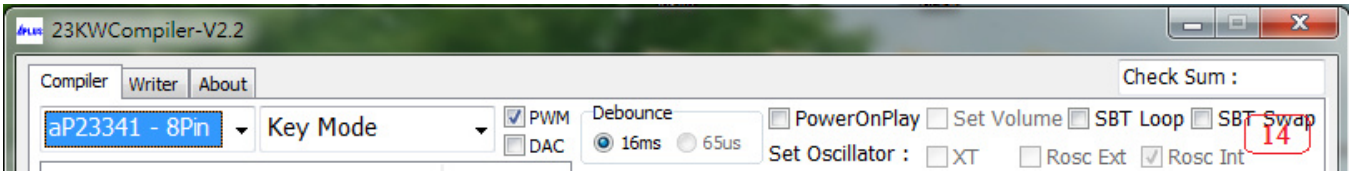
Fig. 1 The aP23KWC8D USB Writer Programmer Board

Running The Software

Double click the file **23KWComplier.exe** to launch the software.

- **COMPILER :**





The steps of compiler :

Select your required IC body.

--- aP23682-8pin , aP23341-8pin , aP23170-8pin , aP23085-8pin

--- aP23682-16pin , aP23341-16pin , aP23170-16pin , aP23085-16pin

--- aP89682K , aP23341K , aP89170K , aP89085K

1. Select your required trigger mode.
   --- Key mode / CPU parallel mode / MP3 mode / SPI mode / I2C mode
2. Select voice output mode.
   --- DAC or PWM

3. Select your required voice file [xxx.wav] folder.
4. Show all your required voice files. (Only wav files acceptable)

--- the [xxx.wav] : 8 bit or 16 bit mono xxx,wav

5. Select the compression mode.
   --- ADPCM4 / ULAW8 / PCM8 / PCM16
7. Loading the required .wav files.
8. Show the memory of your usage.
9. Select if adding the silence.
   --- 1ms ~ 1048ms
10. Select required debounce time.
    --- 65us or 16ms
11. Select power on play.
    --- power on play [sw0] group
12. Volume control setting.
    --- volume level x16 / x8 / x4
13. Select SBT loop. (only for Key mode)
    --- enable : the SBT pin sequential trigger & loop play
    --- disable : the SBT pin sequential trigger & play one times
14. Select SBT pin swap. (for 8pin device only)
    --- select (SBT as OUT1) or (SBT as KEY3)
    [ps : enable the SBT Swap,the SBT loop auto disable]
    --- SBT as OUT1 : busy-H/L,stop-H/L,LED flash(LED high active),
    ~LED flash(LED low active),prog busyH/L

S3 (pin7)	S2 (pin6)	Group		SBT = OUT1
0	1	SW2		Busy-H/L
1	0	SW3		Stop-H/L
1	1	SW10		LED ……

--- SBT as Key3:

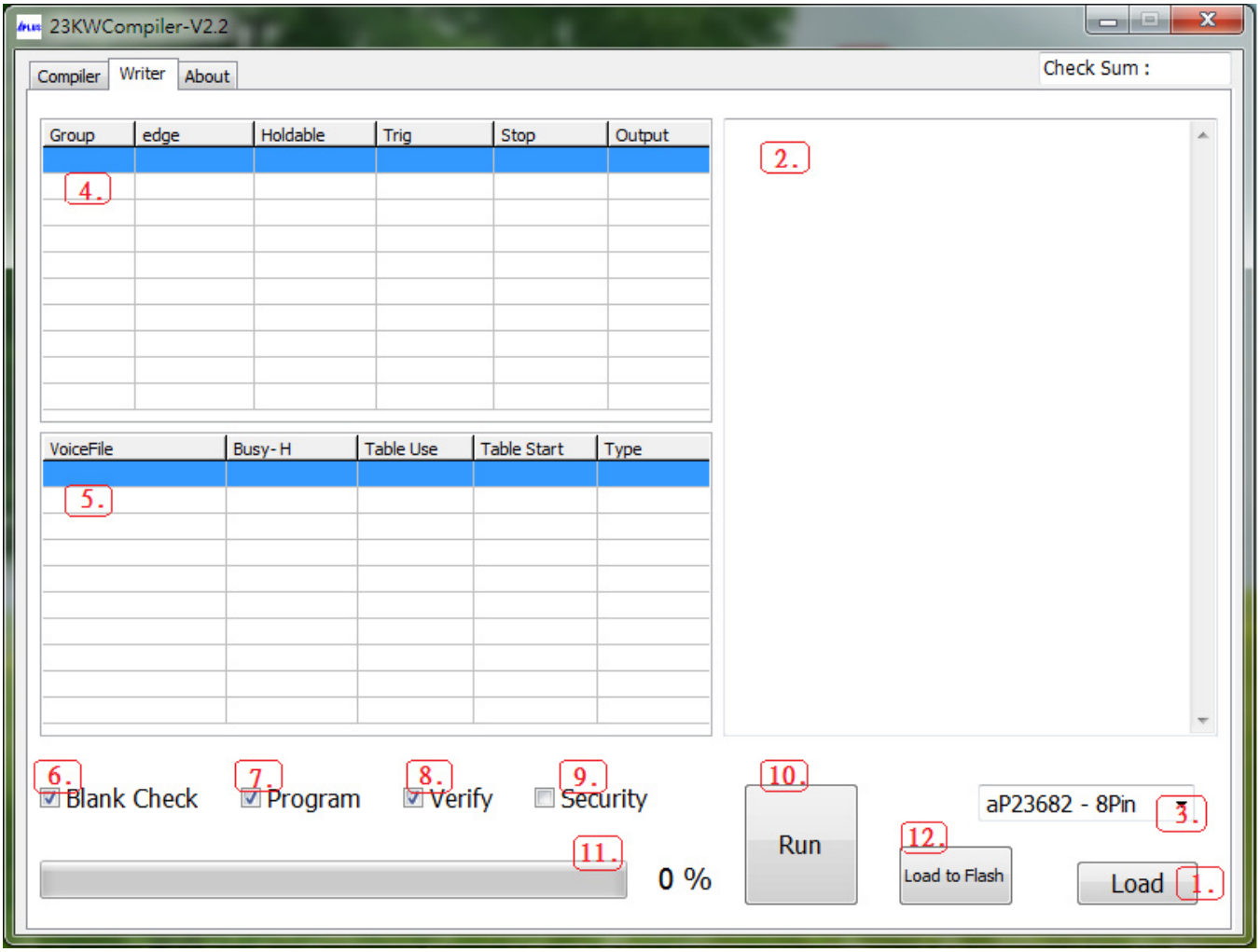
SBT (pin5)	S3 (pin7)	S2 (pin6)	Group
0	0	1	SW1
0	1	0	SW2
0	1	1	SW3
1	0	0	SW4
1	0	1	SW5
1	1	0	SW6
1	1	1	SW7

15. Select if using the oscillator.
    --- XT (X'tal=16MHz) / Rosc ext (68K ohm) / Rosc Int
16. Select the output function for output1, output2, output3.
    --- busy-H , busy-L
    --- LED flash (LED high active) , ~LED flash (LED low active)
    --- stop-H , stop-L
    --- Loadbit : for the play command [094h+A9~A0] = [1001-01A98-7654-3210]
    Same the aP89341 prefetch-071h [no gap loop play]
    --- prog busy-H , prog busy-L can setup the each section of group

17. Setting your required voice sections and function mode.
18. Show your final voice list.

19. Compiler : after setting the voices & function , push the button to create xxx.txt & xxx.dp2 files.
20. re-download & re-editing [xxx.dp2] to setting and function
21. Show Check Sum.

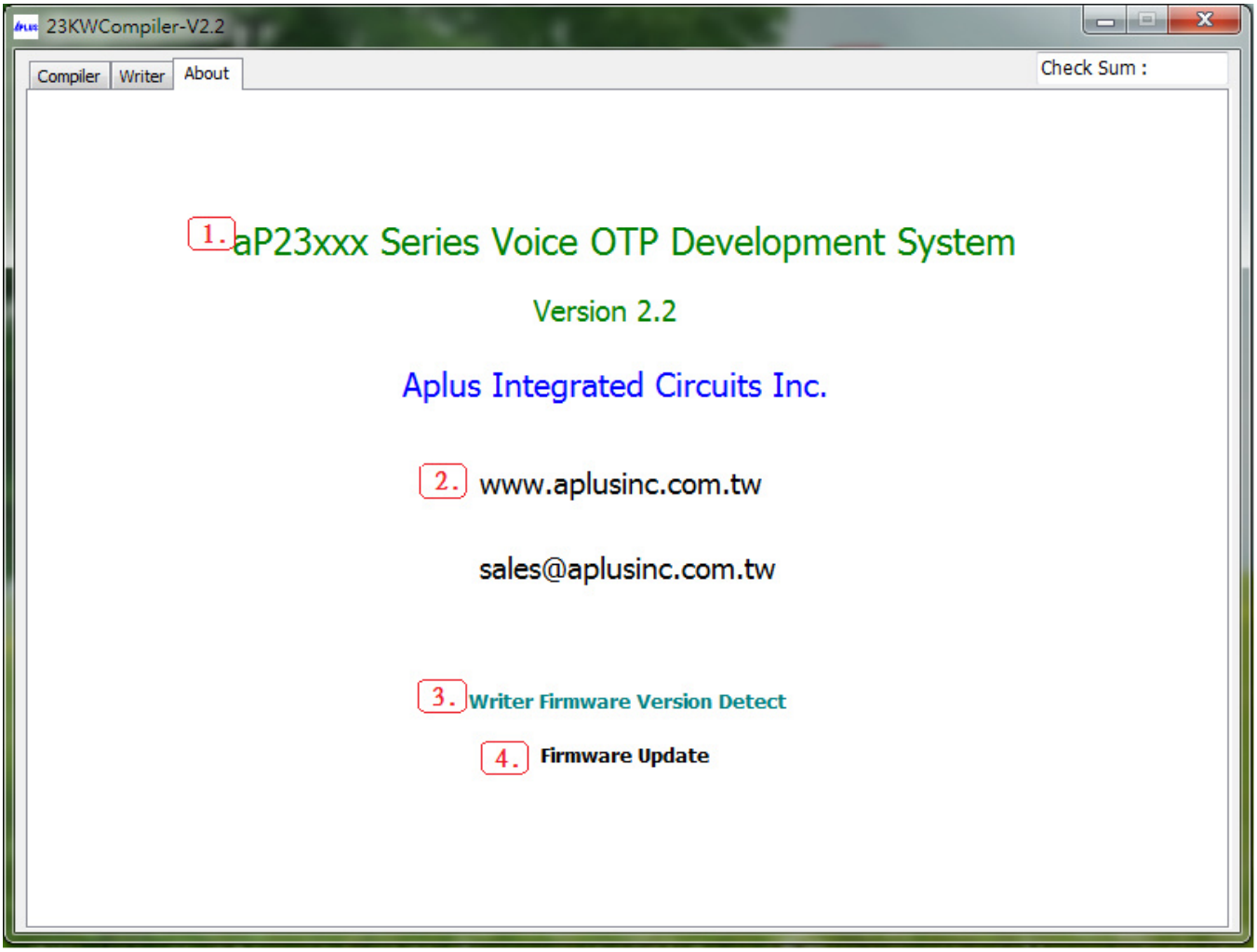
- **WRITER :**



The steps of writer :

1. Loading your programming file. (xxx.dp2)
2. Show setting and function after loading .dp2 file.
3. Show your required IC body.
4. Show voice sections and function mode.
5. Show the content of your selected section of voice list.
6. Select to blank check IC is blank?
7. Select to execute programming.
8. Select to verify the data of your programming.
9. Select if you need security mechanism.
   *** (If do this, it can't be copied; it can not be verified and can't be Master IC)
10. Execute your selected (6.) (7.) (8.) (9.).
11. Show the progress of "blank check", "program" ,"verify" and "load to flash".
12. Load to Flash : download the program file (xxx.dp2) to [1 to 1 copier] writer

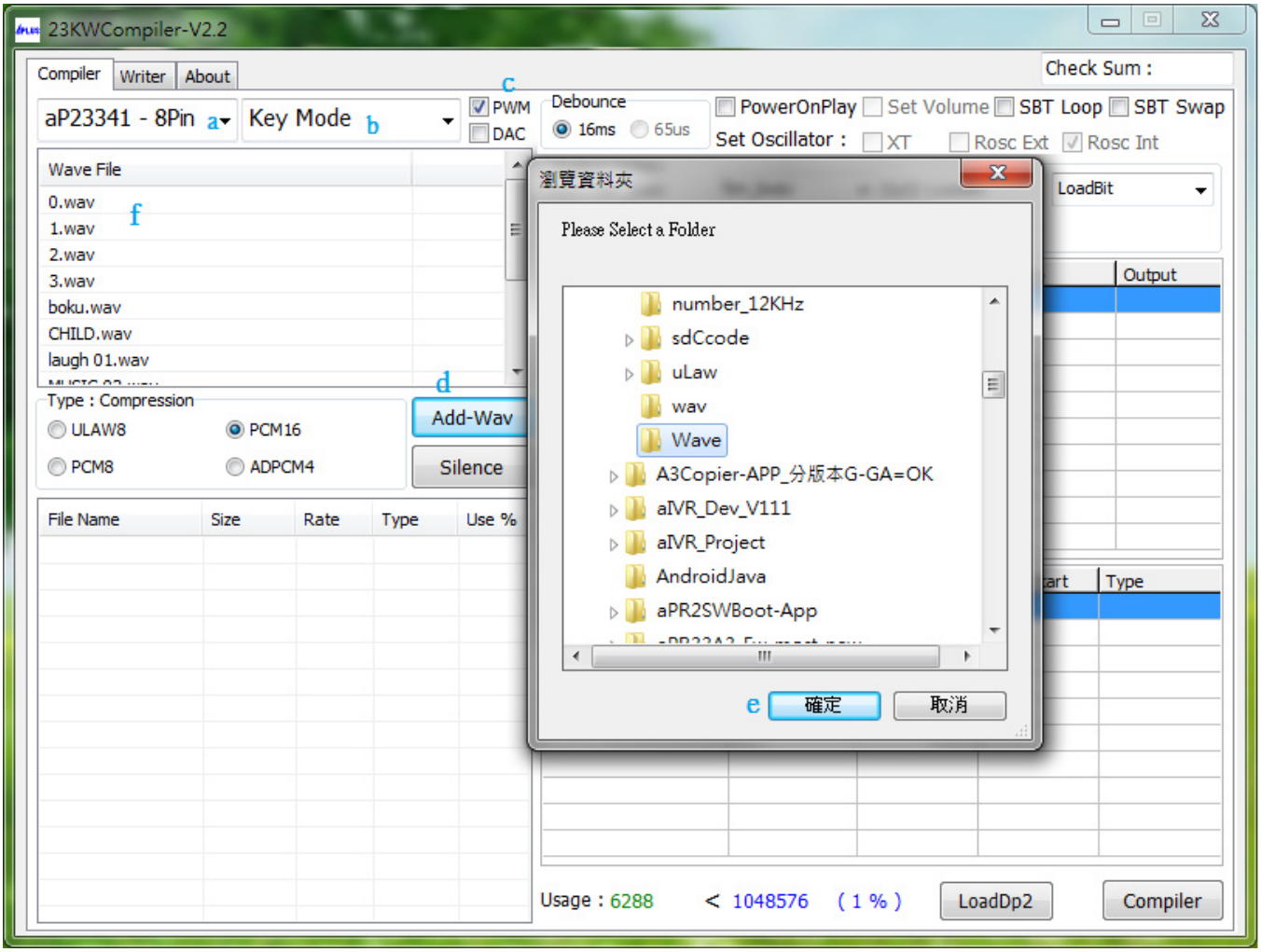
- **About :**



The steps of About :

1. Show software version.
2. Show website of Aplus Integrated Circuits Inc.
3. Detect writer firmware version.
4. Update writer firmware version.

- **Example for Compiler :**



1. Select the IC body is [aP23341 - 8Pin.]

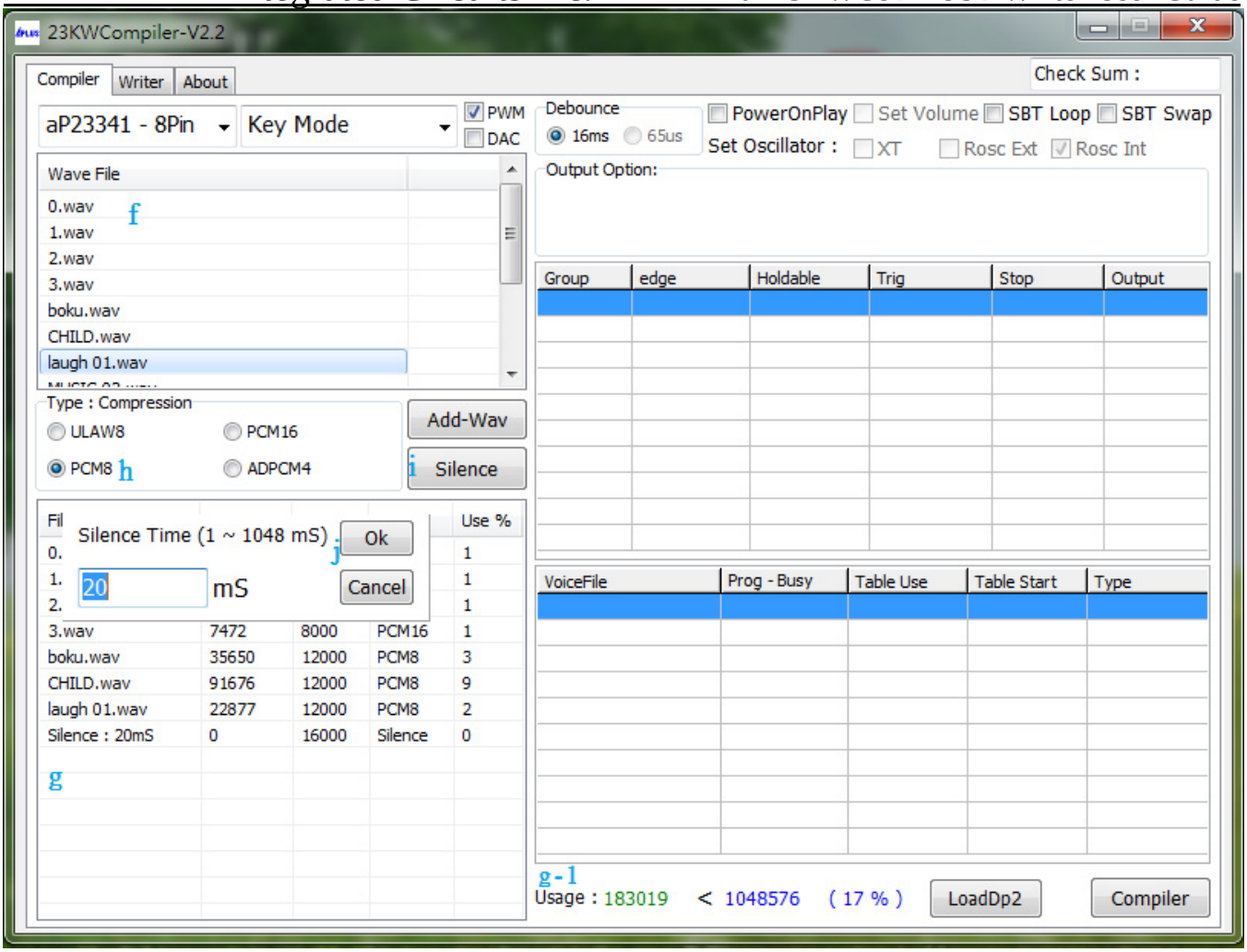
2. Select [Key Mode] to be our trigger mode.

3. Select the voice output is [PWM].

4. Click Add-Wav to pick your required folder.

5. After confirming the folder, click the button.

6. All wav files in the folder will be listed here.



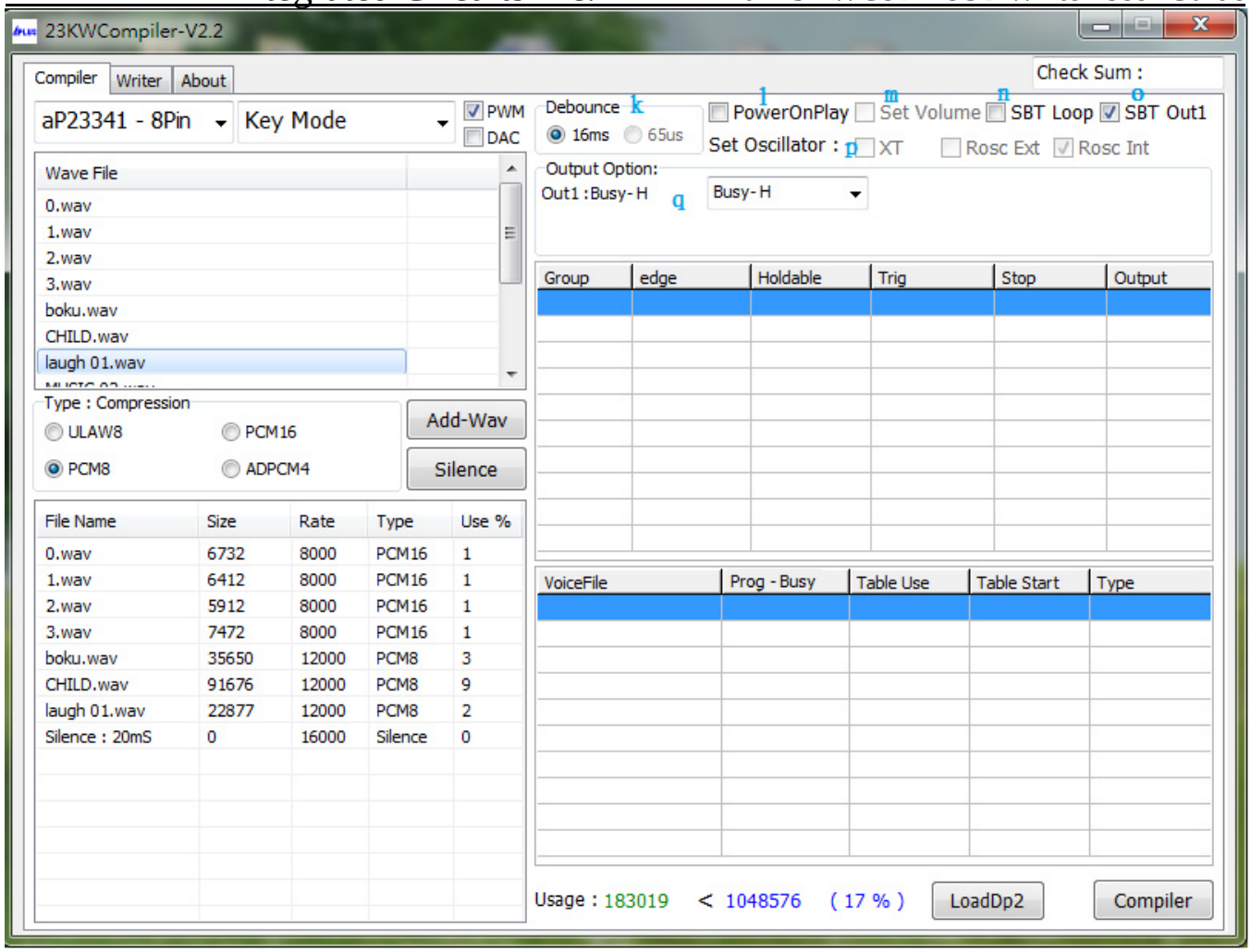
7. Show all your required .wav files. Double click .wav files you required in f, they will be showed in g.

7a. It will show the memory size you has been used.
(Please note the data size you loaded can't exceed the body's memory)
***Please note the data size you loaded can't exceed the body's memory. If so, there are some ways to solve this problem:
1).Change it to a bigger memory size body. ex: aP23341-8Pin to aP23682-8Pin
2).Compressed the wav files to decrease the memory size. ex: from PCM16 to PCM8.
3).Delete some required voice files.

8. If wav file is too big, we can choose compressing files to decrease their sizes.
(UALW compress wav file to 8bits, PCM8 compress wav file to 8bits,
ADPCM compress wav file to 4bits)
*** Please note if your original voice is 16bit wav file which need to be compressed to 8 bit, We suggest you choose ULAW would be better.

9. If you want to add mute voice, click Silence button to set the silence time.

10. If need silence 20ms. ,key in 20 (unit ms) then click OK button.



11. Select the signal timing. (16ms or 65us)

12. enable the power on play function, immediately play [SW0] one time.

13. [Set volume] control function.
- Select the volume control Level x16 / x8 / x4
- The volume control key by the [M1] and [M0] key
- Volume Warp : Volume level increase to the max then begin from the level 1.

Select disable :

M0(pin-12) : volume Level [+ 1]

ex: Level x8, 1→2→3→4→5→6→7→8→8→8→ ….

M1(pin-11) : volume Level [- 1]

ex: Level x8, 8→7→6→5→4→3→2→1→1→1→ ….

Select enable :

M0(pin-12) : volume Level [+ 1]

ex: Level x8, 1→2→3→4→5→6→7→8→1→2→3→ 4→….

M1(pin-11) : volume Level [- 1]

ex: Level x8, 8→7→6→5→4→3→2→1→8→7→6→5→ ….

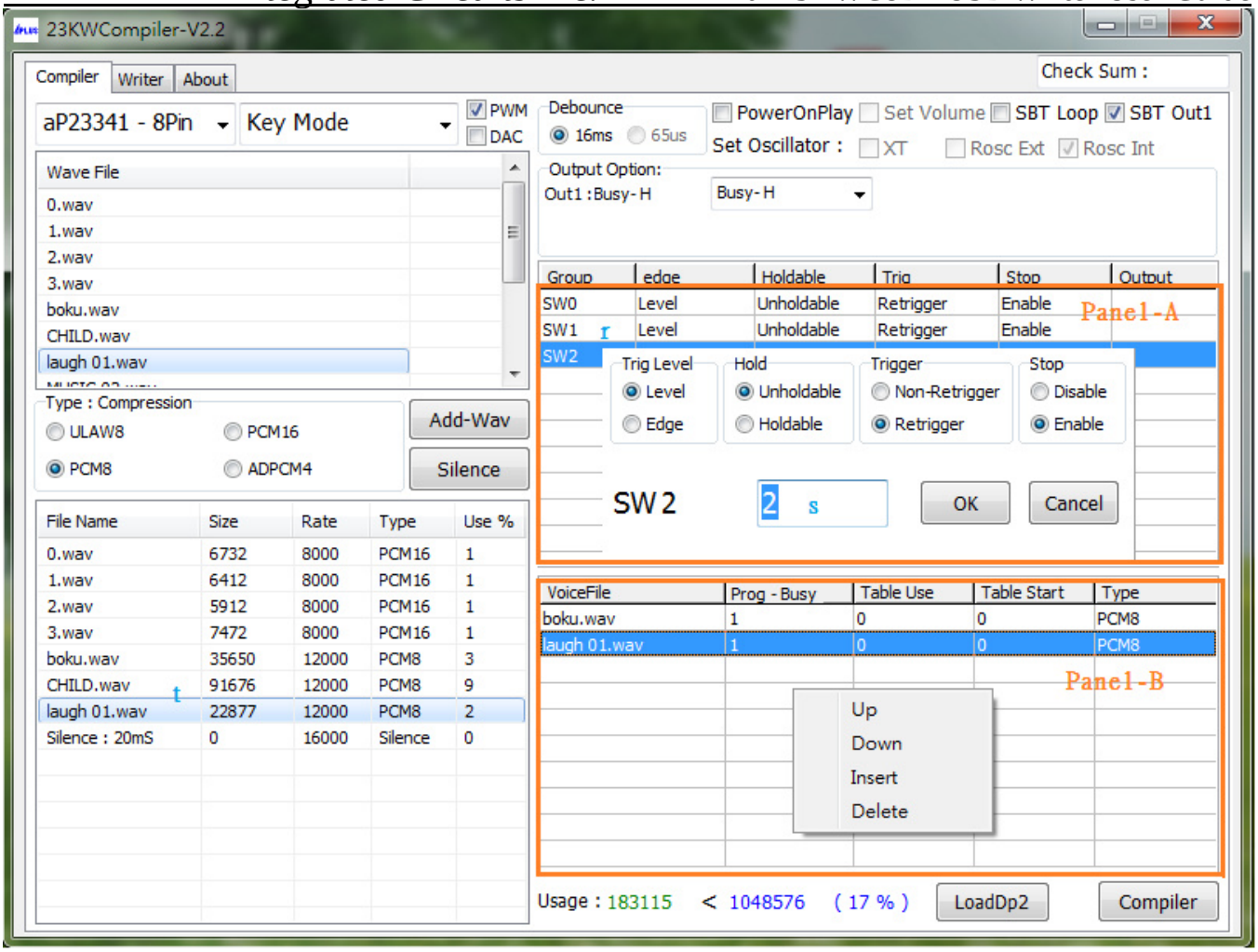
14. When trigger in “Key mode”,
if enable the[SBT Loop]: it will one key sequential trigger and keep loop play in every group.
If disable the [SBT Loop]: it will one key sequential trigger and play one time in every group.
(***note: Trig level must select Level)

15. SBT pin swap other I/O pin function.

ex : SBT pin swap to OUT1 as output use.

16. Select set Oscillator from Crystal mode(x’tal=16MHz), External Rosc mode(68K),
Internal Rosc mode. (if selecting Crystal mode, It must set at pin M0 & pin M1)

17. output Option : setup the out1,out2,out3
Can select the busy-H , busy-L , stop-H , stop-L ,
LED flash (LED high active) , ~LED flash(LED low active)
Prog busy-H , prog busy-L
Loadbit

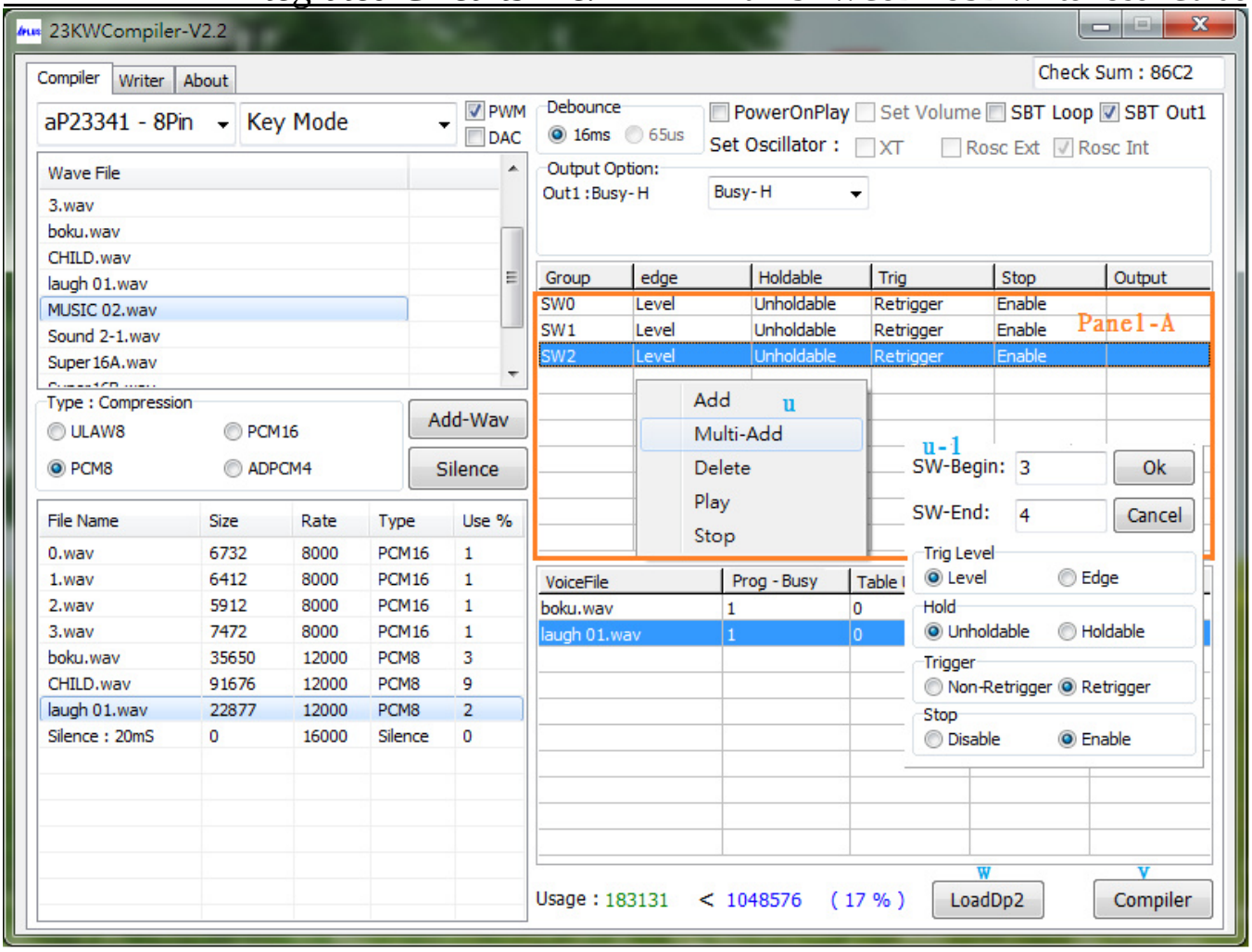


18. Double click Panel – A for your setting the function of each Group.

19. Key in group number.

20. SW means group. ex : Select the second group and double click the wav files you required in (t.) then Panel-B will show them.

    The mouse moves to Panel – B then enter right key for your adjusting the order of the wav files or insert or delete them.



21. If the mouse move to Panel-A and enter right key, it will show there are additional function for add, multi-add, delete, play and stop.

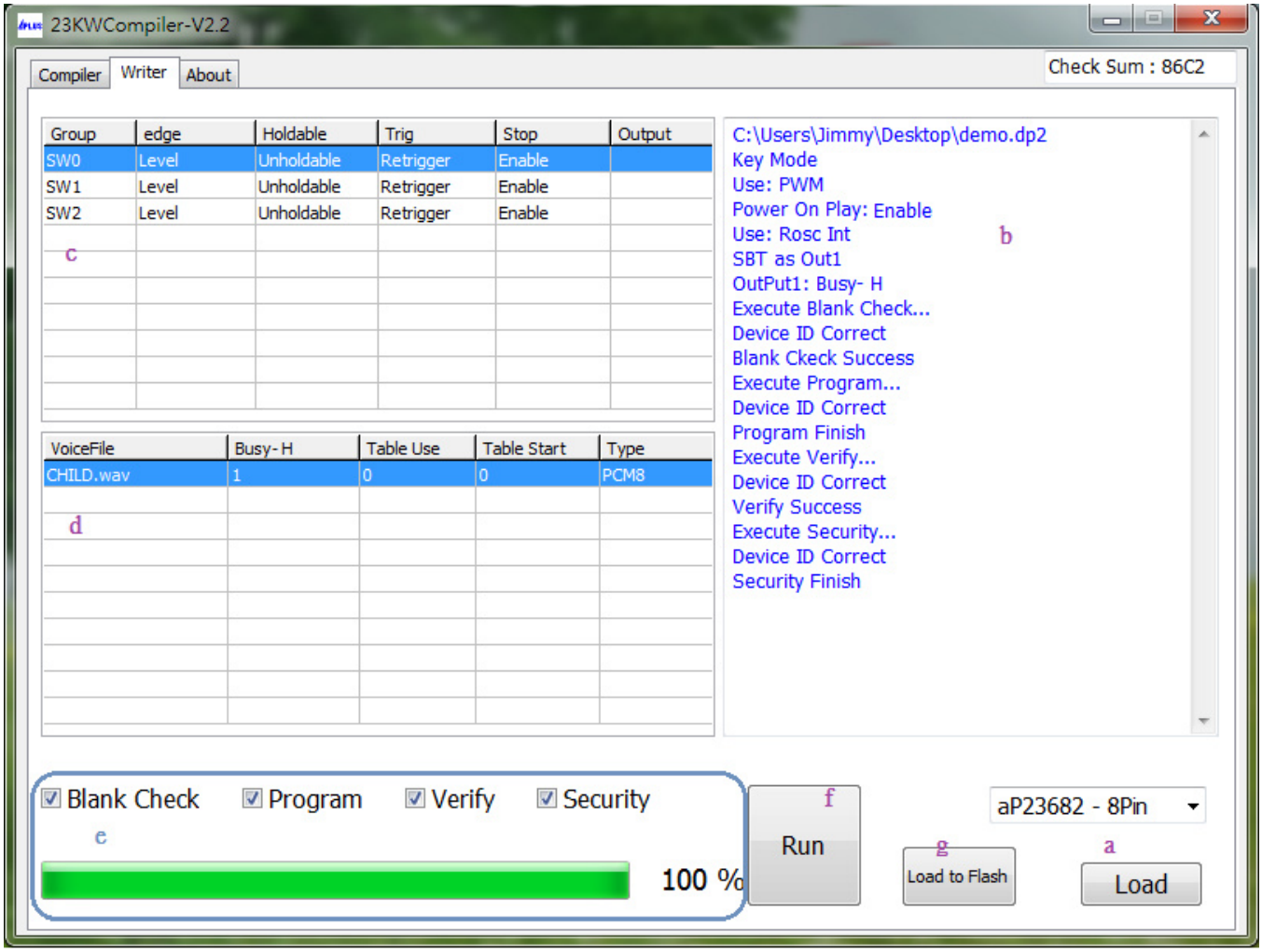
    Add : add single group.
    Multi-Add : Add multi-groups at one time (u-1).
    Delete: delete the group.
    Play : play all voices of the group.
    Stop : stop the voice playback.

22. Finish compiling ,click compiler button.

23. Generate Check Sum number.

24. Loading finished compiled .dp2 file.

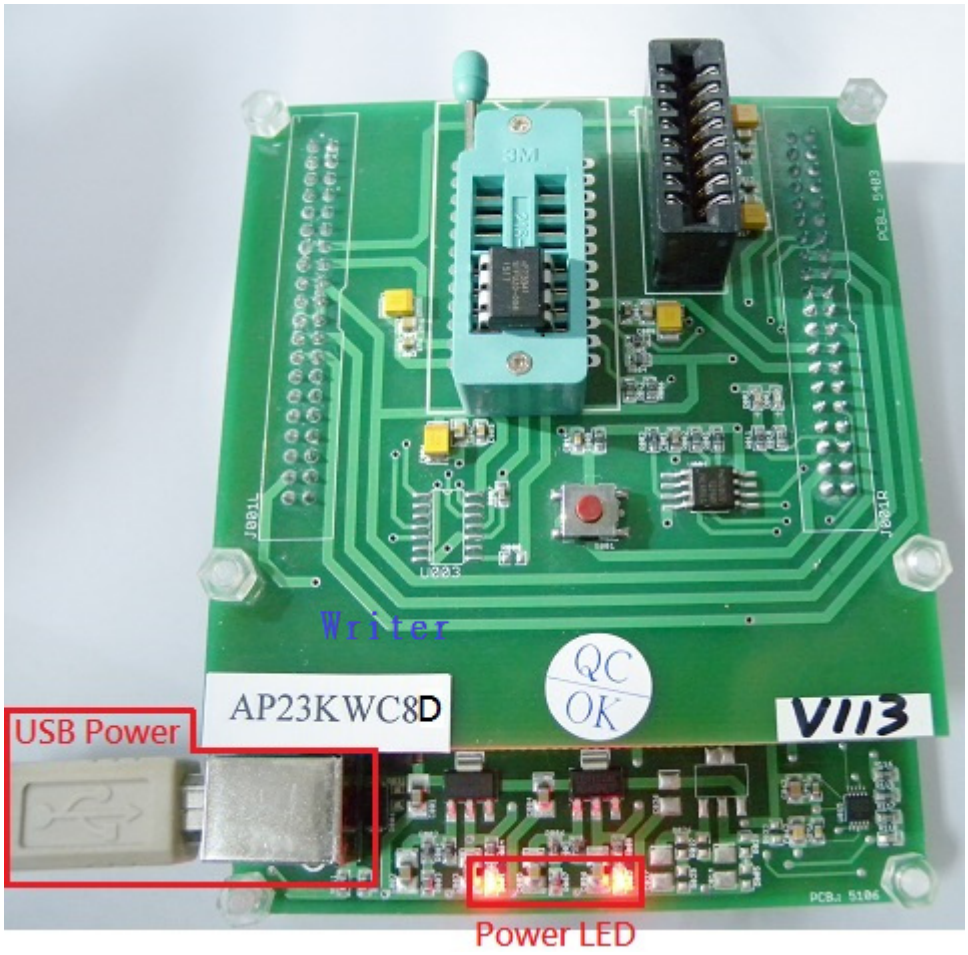
- **Write the program file [xxx.dp2] to IC :**



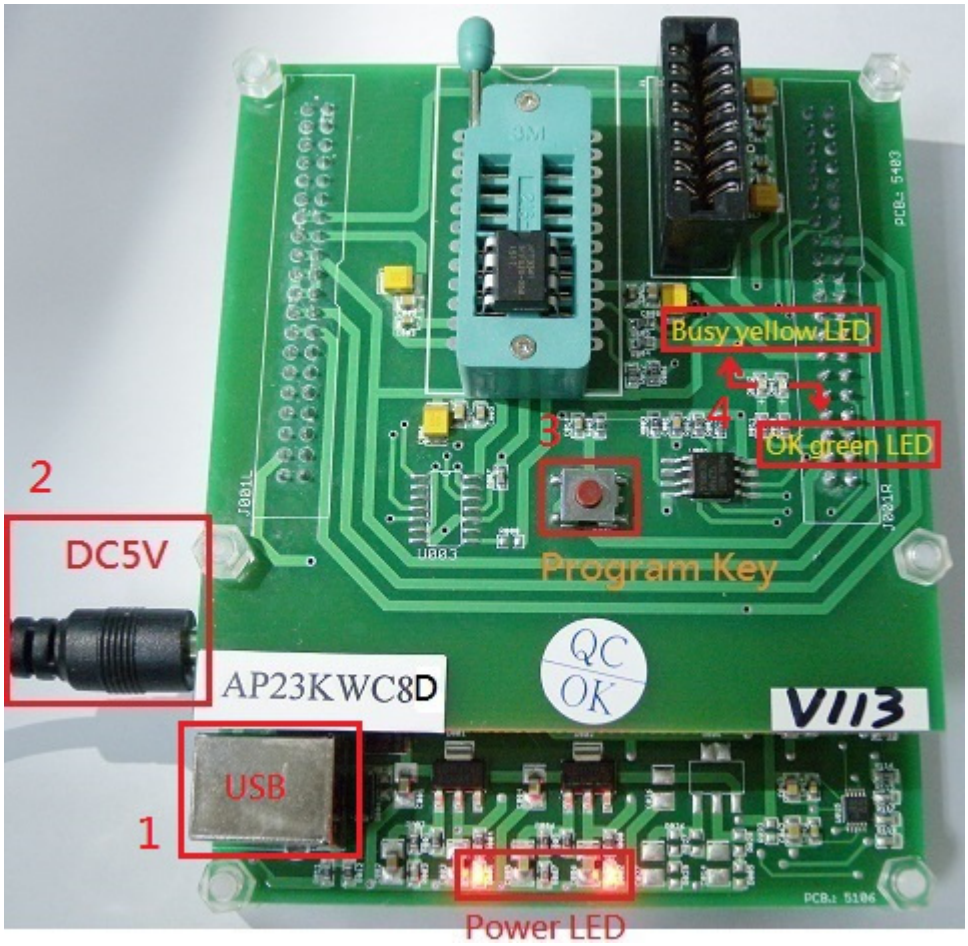
a. Click [Load] button to load the program file [xxx.dp2] file.
After loading, it will show Check Sum 、b、c、d message.

e. Select Blank Check to check if this IC is blank.
Select Program to execute programming.
Select Verify to execute verification.
Select Security to execute IC security mechanism.
***(To avoid the data to be copied and it can't be a master IC)
PS : After the IC selecting Security, this IC can't execute Verify.

f. Click Run button to execute all your selected items in e column.
(It'll show (e.) progress & (b)message)



g. Click Load to Flash button to download .dp2 file to Writer.



When writer is able to be a 1 to 1 copier. *** (You must do g. step at first)

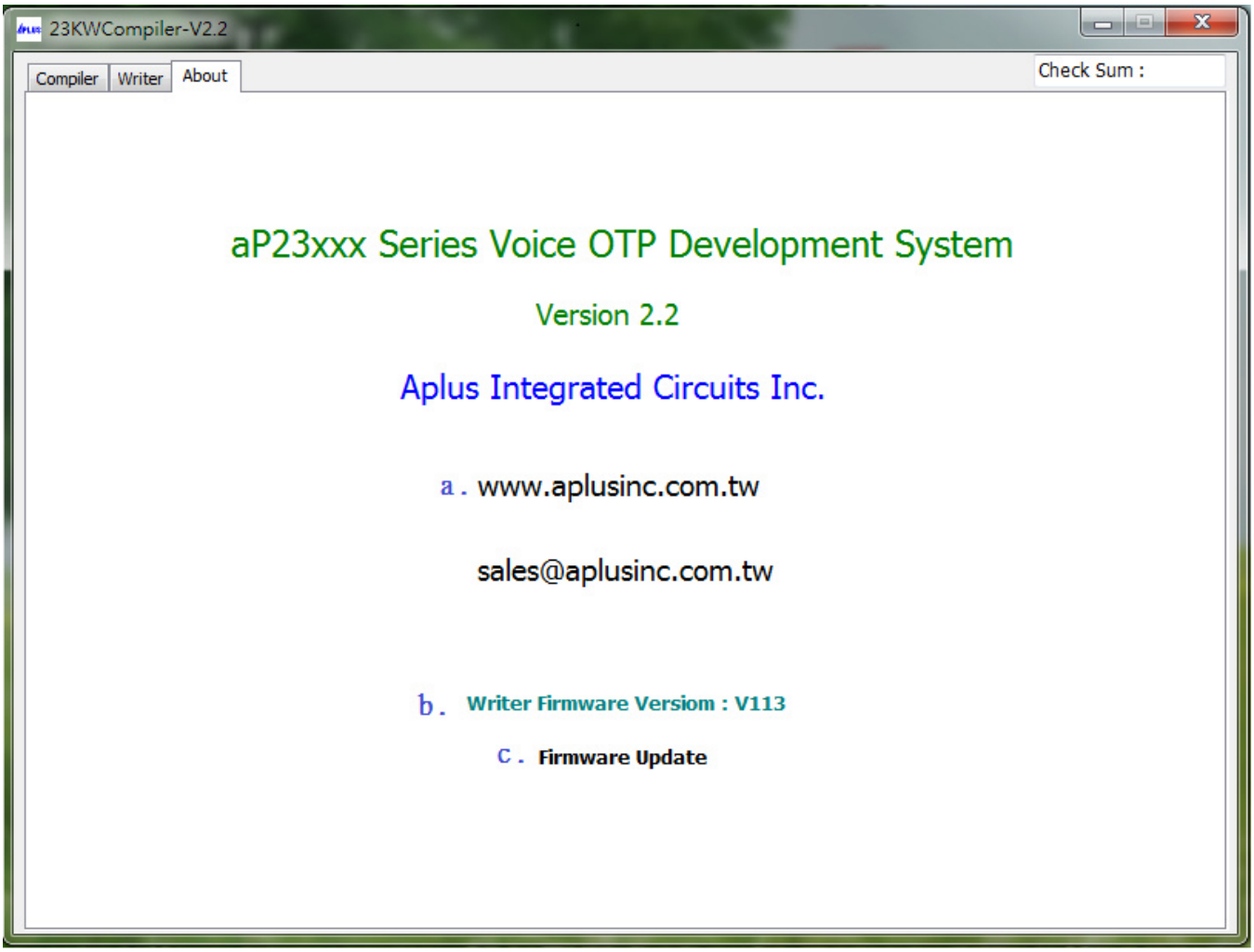
1. Disconnect USB.

2. Connect 5V adapter.

3. Push program key to execute programming.

4. When programming, yellow LED flash.
   When programming finished, green LED light.
   When programming failed , no LED light.

- **Example for About :**



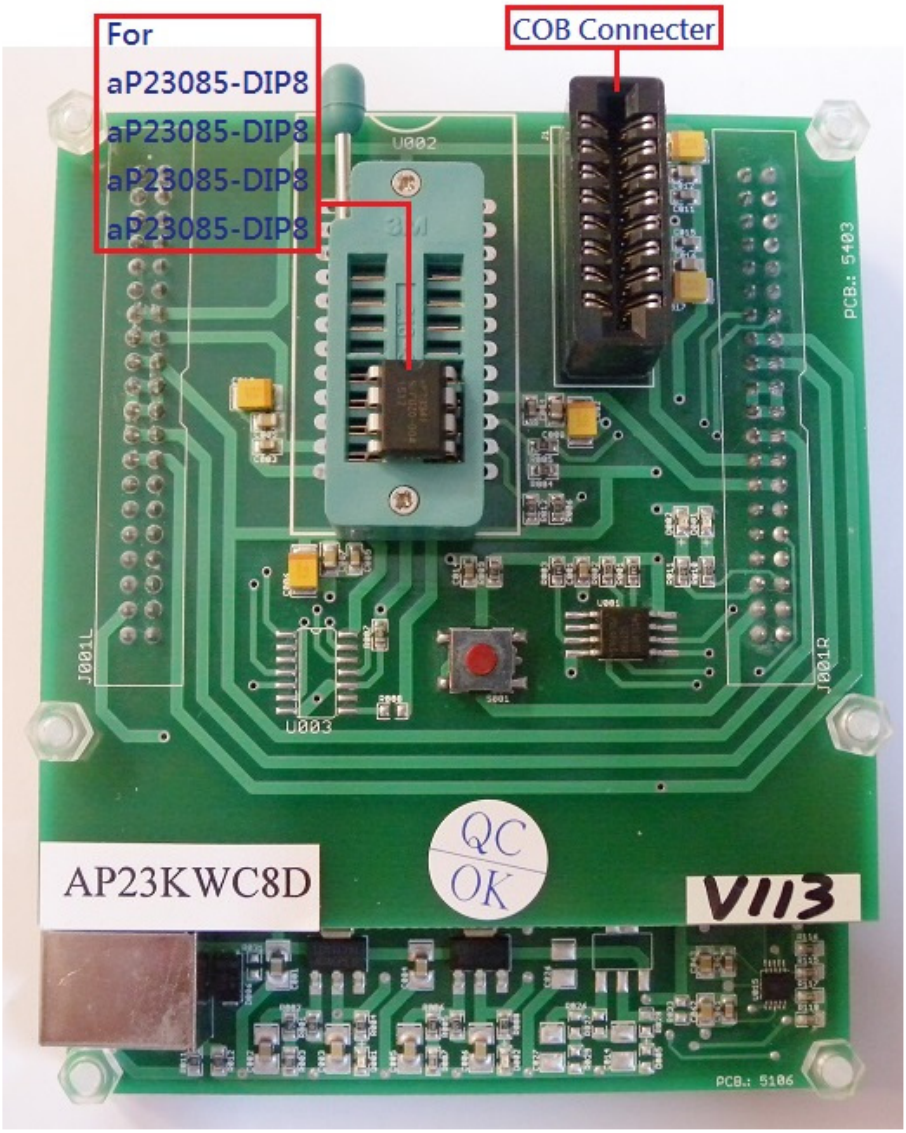
a. Double click the www.aplusinc.com.tw will connect website Aplus Integrate Circuits Inc..

b. Double click the Writer Firmware Version will show writer firmware version.

c. Double click the Firmware Update will load firmware file.

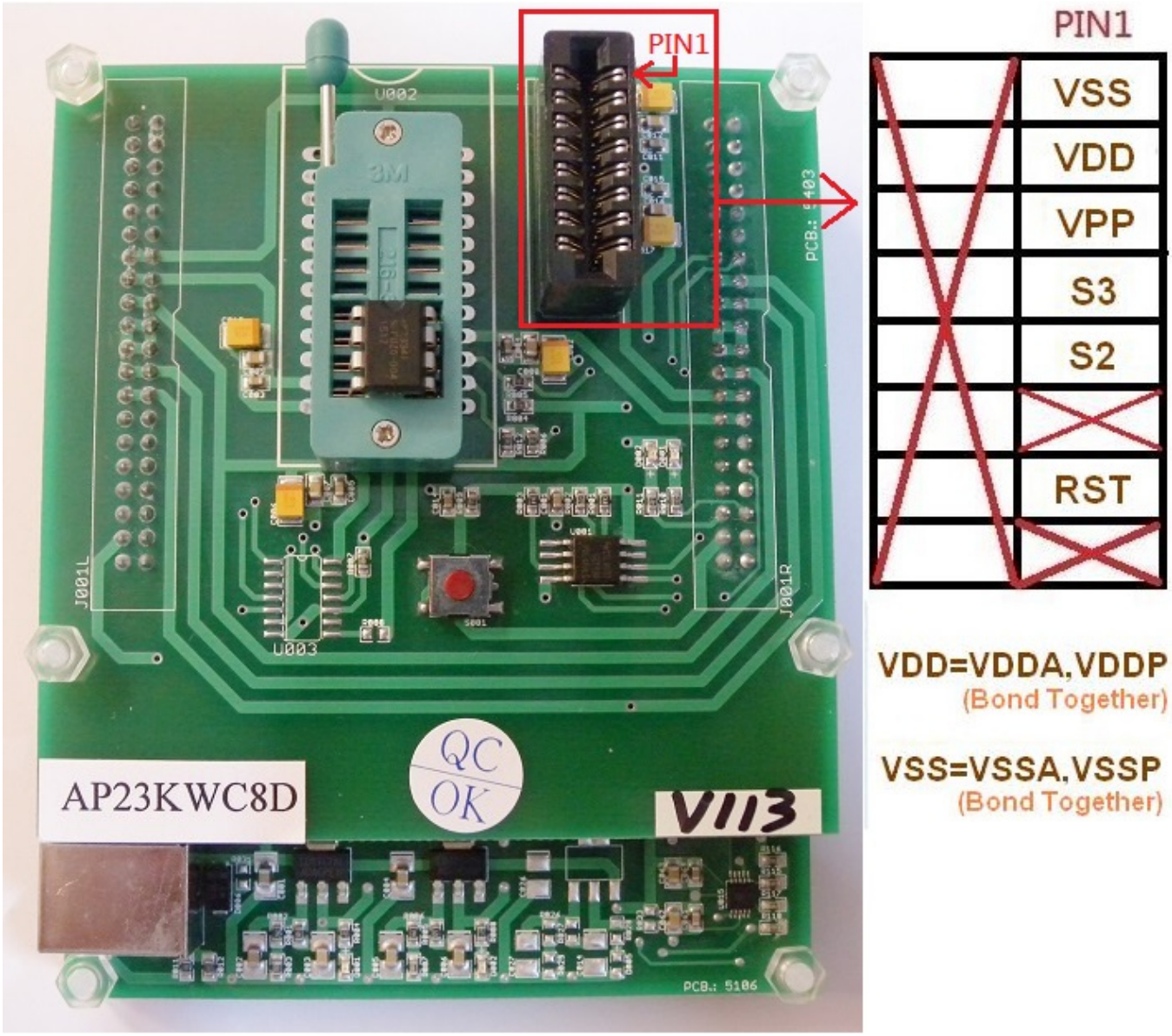
Inserting Devices into the Programmer

- DIP package devices
- Device should be inserted align to the bottom of the 8-pin textool socket.
- If you want to program COB, insert it to the COB Connecter

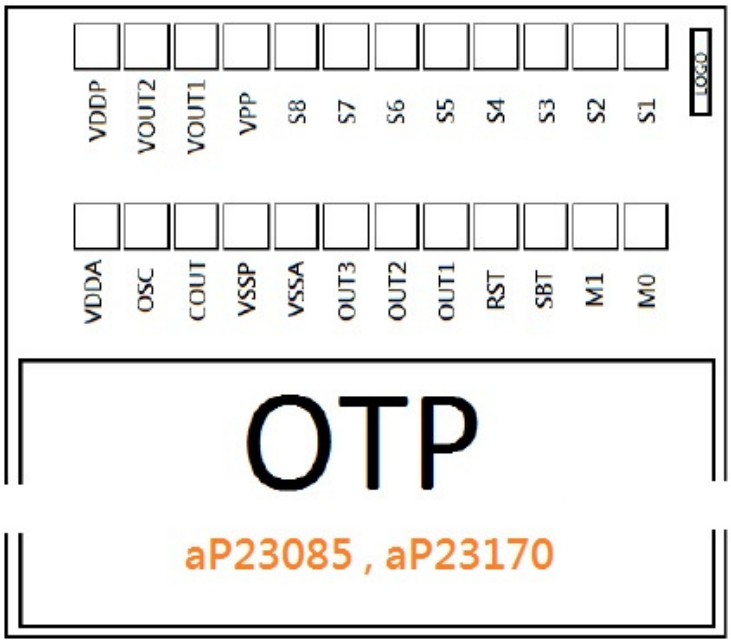


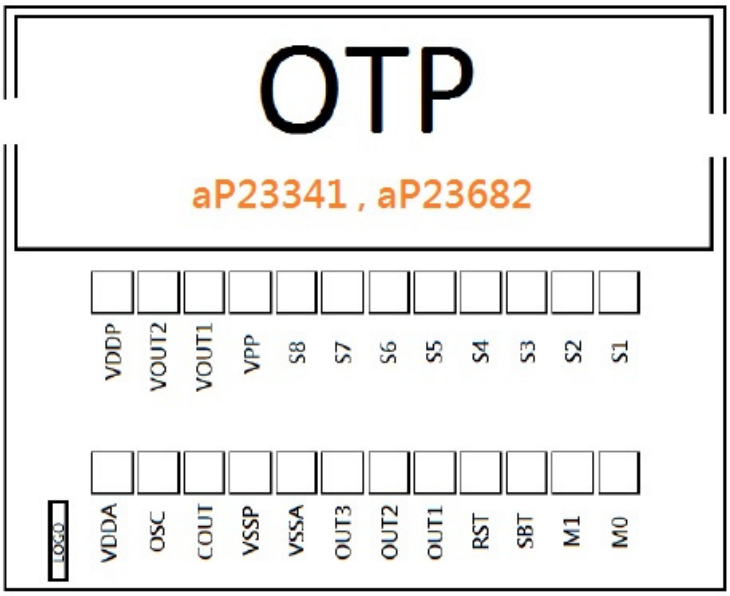
COB Information

AP23xxx_Writer Programmable I/O pin



DIE DIAGRAM：





Programmable pin：

VDD(VDDP、VDDA)、VSS(VSSA、VSSP)、VPP、S2、S3、RST

Notes:

1. Between VPP and GND should add 10KΩ.
2. VDDA and VDDP should be connected to the Positive Power Supply.
3. VSSA and VSSP should be connected to the Power GND.
4. Substrate should be connected to the Power GND.

*PCB dimension for Slot：2.28cm x 0.15cm

COB pad pitch：2.54mm

HISTORY

2015/04/10
aP23KWC8D User Guide.

2015/05/20
Dat file become dp2 file.

2015/07/17
Add→Device map & Check Sum