aP89W24USB

VOICE OTP DEVELOPMENT SYSTEM

USER GUIDE

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Introduction

aP89W24USB Voice OTP Development System is designed to support Aplus' aP89 series Voice OTP chips. It supports the following devices:

- **aP89042 (42 sec OTP chip)**
- **aP89021 (21 sec OTP chip)**
- **aP89010 (10 sec OTP chip)**
- **aP89085 (85 sec OTP chip)**
- **aP89170 (170 sec OTP chip)**
- **aP89341 (341 sec OTP chip)**
- **aP8942A (42 sec 5V Vdd OTP chip)**
- **aP8921A (21 sec 5V Vdd OTP chip)**
- **aP8910A (10 sec 5V Vdd OTP chip)**

This development system serves two main functions:

- **Compiler**
- **Writer**

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

The **Writer** is used to program the voice data into the OTP devices processed by the Compiler Function. A Writer Board connected to the PC is required.

Installation

Hardware Installation

The aP89W24USB is a USB based writer program. It is intended to be used in Windows XP based computer.

Writer Board Connection

1) Connect USB cable from the writer board to the computer. The computer will show a new hardware is found. 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 sufficient to support the writer port. In this situation, an external 6V DC adapter with at least 700mA should be connected separately to the power jack of the writer board.
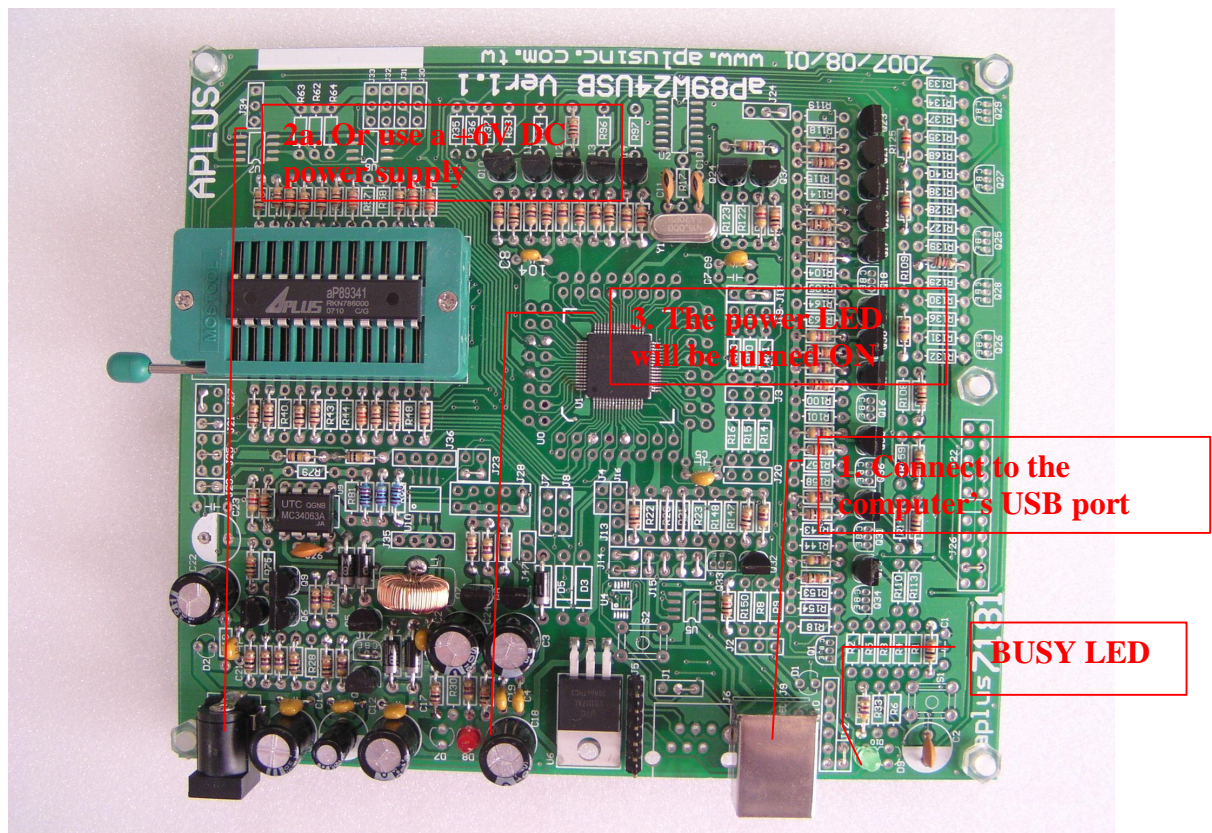

If the computer's USB ports are already connected to many USB devices, it will happen that the USB port does not have enough current output to drive the aP89W24USB programmer. In this situation, an external DC +6V power supply should be used instead of the USB.

Software Installation & Registration

Create a new folder in your computer's Hard Drive. Copy the .ZIP archive file, aP89W24USB_xxx.ZIP to the directory, where "xxx" represents the version number of the software. Unzip the file and you will get all necessary program file in the directory.

Double click the file **INSTALL.EXE** and **CON24USB.EXE** to install the required driver file. You will only see a flash of a black colored window to disappear. That means the drivers installation is completed.

Double click the file **aP89W24USB.EXE** to launch the software. Click the **About** tab and you will see two empty boxes near the bottom of the window. Enter the registration number provided and click the **Enter** button on the left to finish the registration. Successful registration will enable all functions provided by the software. Otherwise, you cannot save your finished work and cannot program the OTP devices.
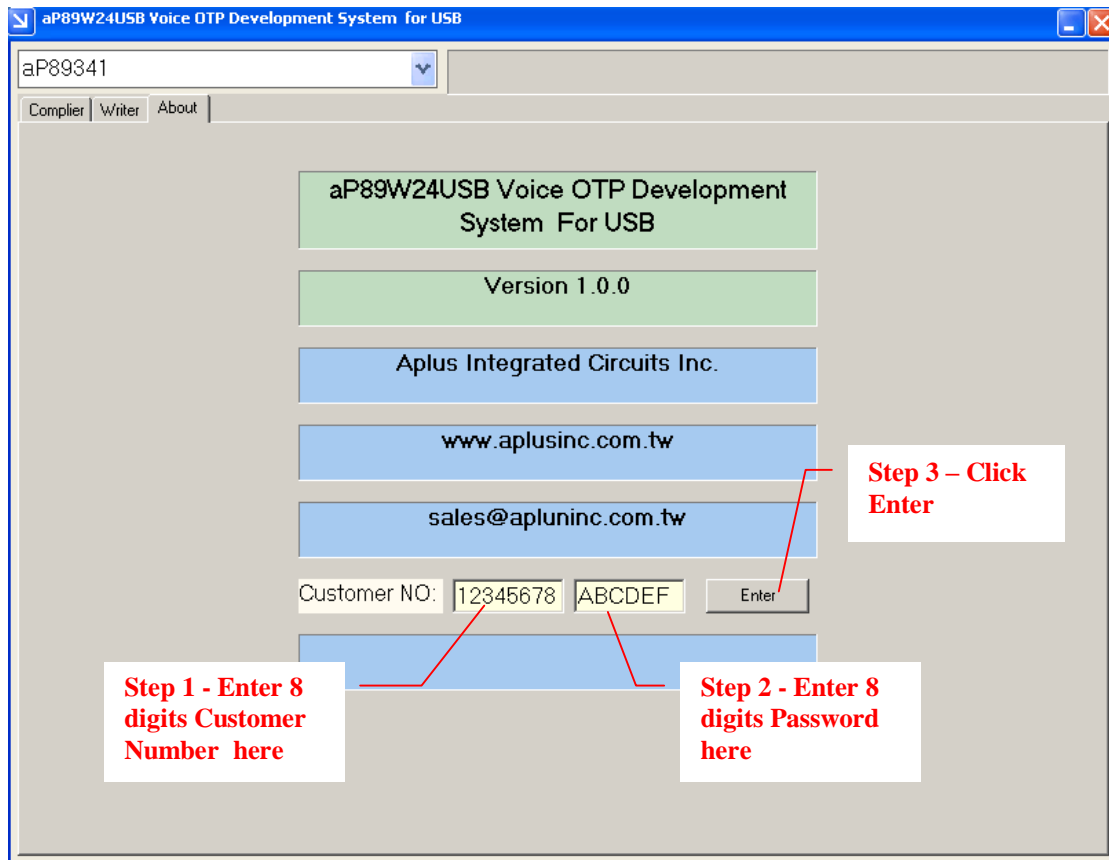
Compiler

When the aP89 Voice OTP Development System is launched, the Compiler Window is displayed. The Compiler Window consists of the following areas:

- **Directory Folder** area: display the current directory path
- **File Display** area: display a list of voice files in the current directory
- **Option Selection** area: show the user selected options
- **File Selection** area: show the selected voice files
- **Table Entry** area: show the combination of voice files in each Voice Group
- **Device Selection** area: allow user to select which OTP chip to be used
- **Function Buttons**: to perform the specific functions
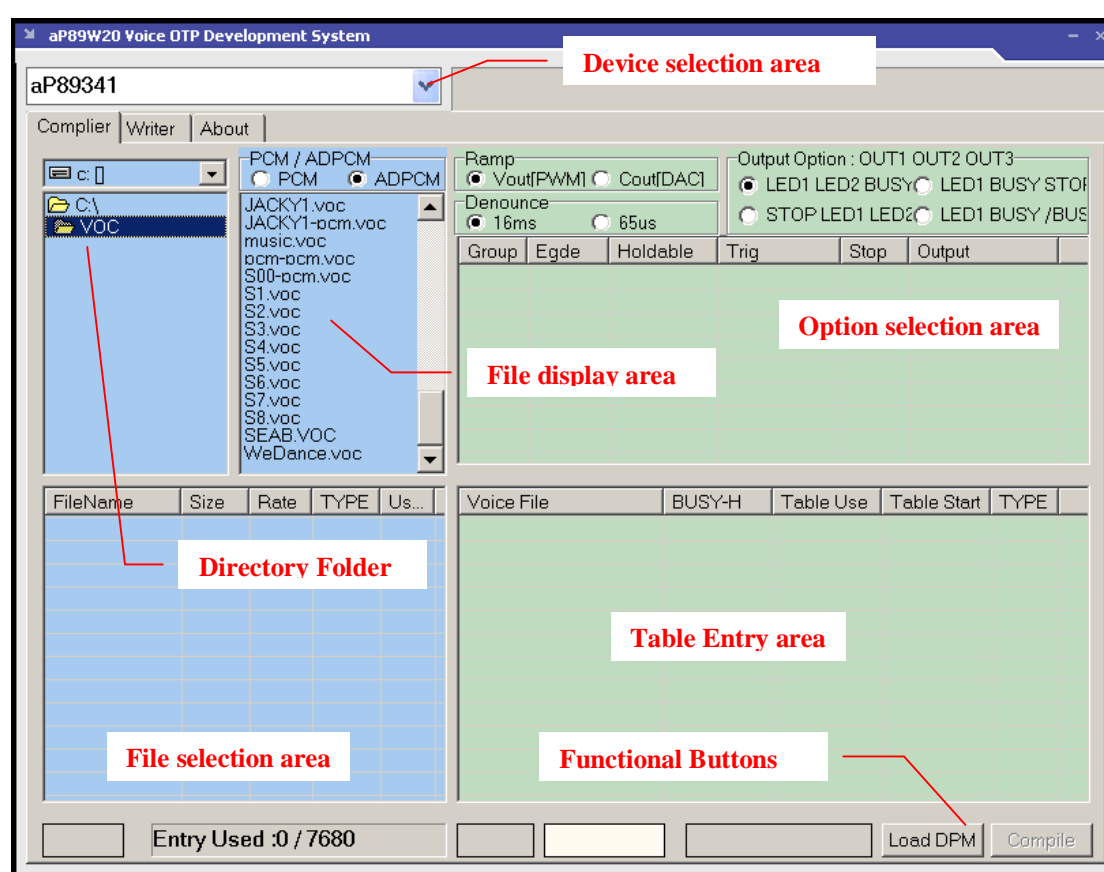
Voice data and user selectable options must be set up and combined together to form a DPM file before it can be programmed into the Voice OTP device. The following procedures describe step by step how to compile the voice data and options to produce the DPM file for programmed into the chip.

Step 1 – Select Device

- click the "down arrow" to show device names and select the device you want to work on.

Step 2 – Adding Voice Files

- set the coding format, "ADPCM" or "PCM", for the input voice file
- click the "down arrow" to select the Hard Drive
- double click the "Folder" where your edited Voice Files are located
- a list of file with ".VOC" or "WAV" file extension is displayed in the File Display area. **The voice file must be saved as 8-bit Mono format.** We recommend using GOLDWAVE, COOLEDIT or SOUND FORGE for voice editing.
- double click the Voice File you want to add
- the selected Voice File will be displayed in the File Selection area
- right click the Voice File, you can playback or remove the selected file

Step 3 – Selecting the Whole Chip options

- Select the Audio Output and Trigger Mode by **clicking** the small dots besides.

Tips: When you connect the speaker or buzzer directly to the VOUT1 or VOUT2 pins, the Ramp Disable (Vout[PWM]) option should be selected. On the other hand, if you connect the speaker through a transistor to the COUT pin, the Ramp Enable (Cout[DAC]) option should be selected.
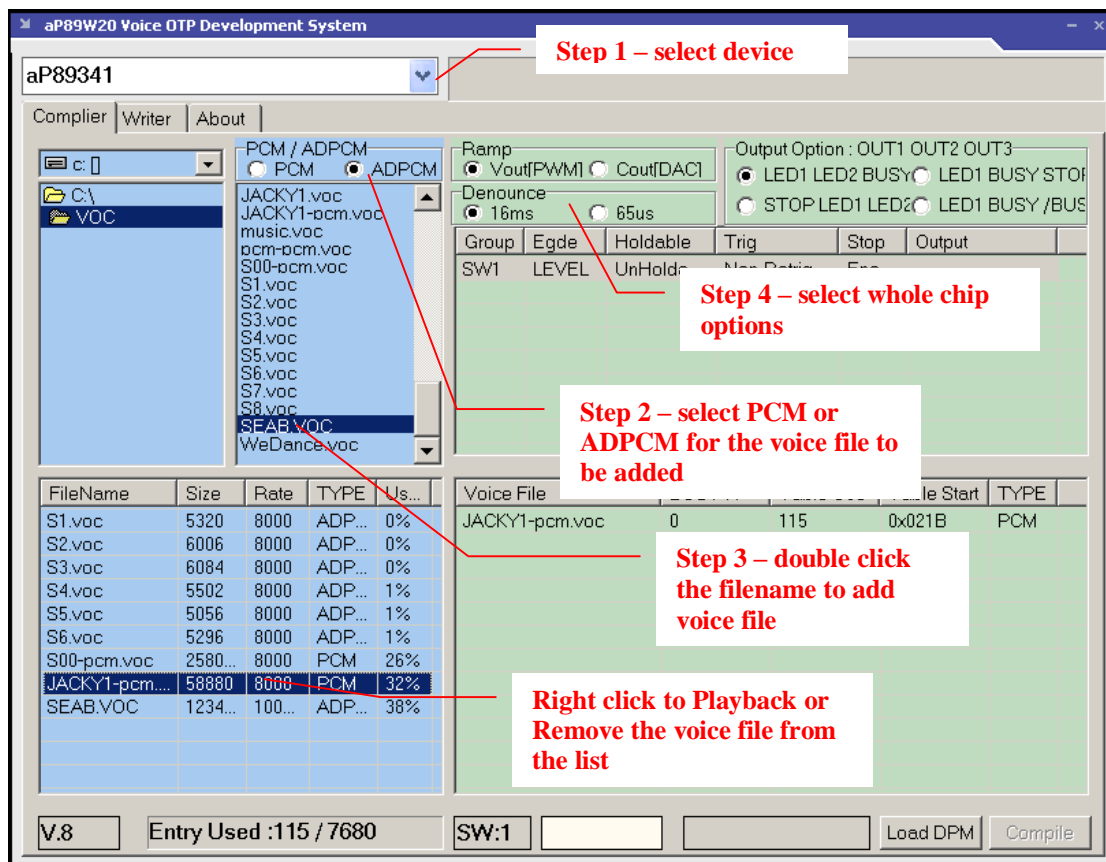
Step 4 – Selecting the Individual Voice Group Options

Each Voice Group can have its only triggering and output setting options.
- double click the empty space in the Group Option Selection area, a details list of available options will be displayed
- click on the small dot besides the option name to select the desired option
- click the "OK" button when finished
- click the "Cancel" button to cancel the current selection

Step 5 – Adding Voice Files to form Voice Group

- click to highlight the Voice Group you want to work on
- double click the selected voice file in the Selected File Display area, the voice file will be added into the Table Entry area
- double click on the number bit below the BUSY-H column to set or reset the busy-high output for this particular voice selection in the Group. "1" to set the busy-high output and "0" to reset the busy-high output.
    - o Note that for devices aP89010/10A and aP89021/21A, BUSY is fixed at busy-high, i.e. the BUSY output cannot be programmed as other devices.
- right click on the voice file allows you to remove the selected voice file
- right click on the Voice Group allows you to playback or remove the group

Step 6 – Generation of the DPM file for Device Programming

Press the "Compile" button to generate the .DPM file for OTP programming.
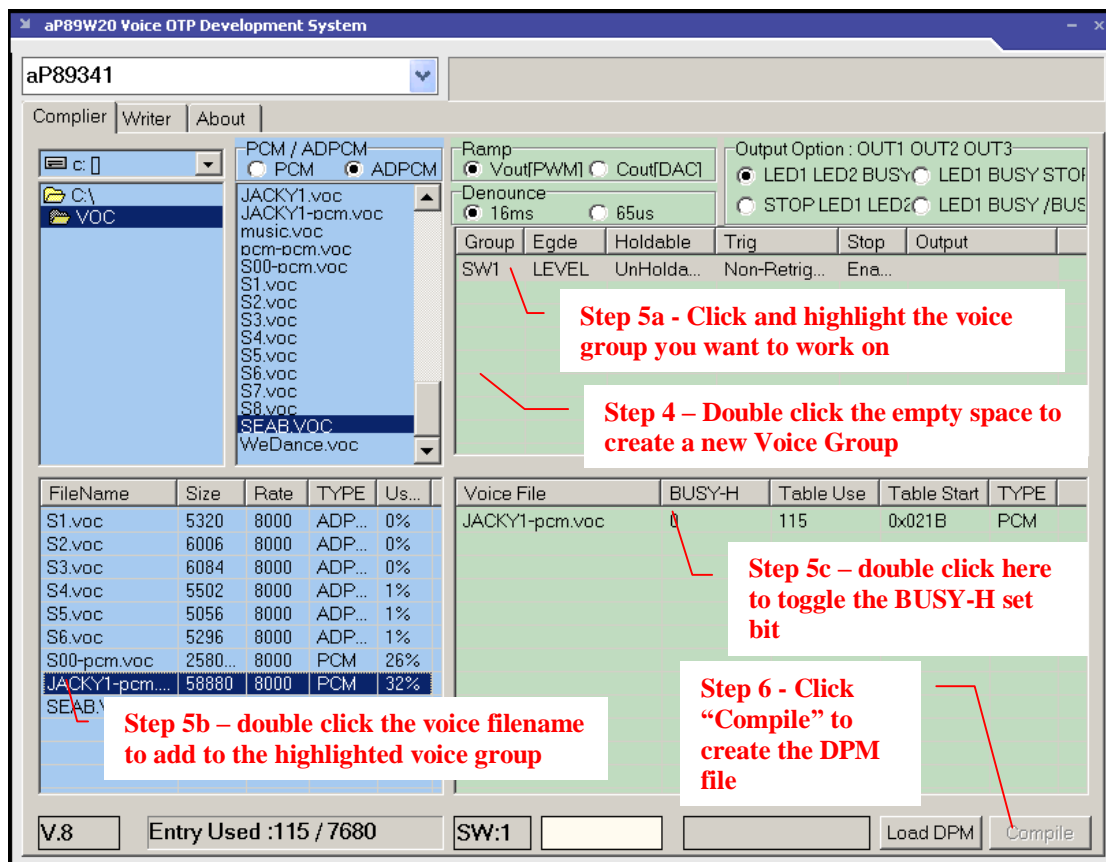
The Load DPM file button

This function allows the DPM file generated from last step to be loaded into the compiler again so that user can change the options setting. Both the trigger options and the output options can be changed.

Note that if the .VOC or .WAV source is changed, using LOAD DPM function will NOT update the sound source file. The sound data in the DPM file was fixed during the pervious compilation action. That means when the .VOC or .WAV sound source file is changed, user has to re-do all of the above six steps to regenerate the DPM file.

Writing OTP device

After finishing DPM file generation, you can program the OTP device. Click the "Write" tab to enter the OTP programming section. There are the following functions:

- **Load File**: load the DPM file from Hard Disk
  After loading DPM file, the Voice Groups and selected options are displayed. The load function will also detect the checksum stored in the DPM file and compare with the checksum calculated from the DPM file contents. If they are different, the DPM file cannot be loaded.

- **Blank Check**: the OTP device inserted on the writer board will be checked whether it is blank and hence available for programming. If the device is blank, the message "Blank Check OK" will be display otherwise number of bytes not blank will be displayed.

- **Verify**: pressing this button will cause the writer to check the contents inside the OTP device against the loaded DPM file. If the device content is match, a message "Verify OK" will be displayed. Otherwise, the number of bytes mis-match will be display.

- **Write OTP**: the load DPM file will be programmed into the OTP inserted in the writer board. If the write operation is successful, a message "Write OK" will be display, otherwise, the number of bytes write error will be displayed.

There is a "Security" check box, in which, when it is checked, the device will be security protected. A security protected device cannot be used as a Master chip for used in our OTP copier for mass production.

Note: Where there is "Prog. Cancel or USB LINK ERROR" message appears at the lower right hand corner of the Writer screen, it may due to either the USB Link is not established or incorrect OTP device is inserted to the writer board.

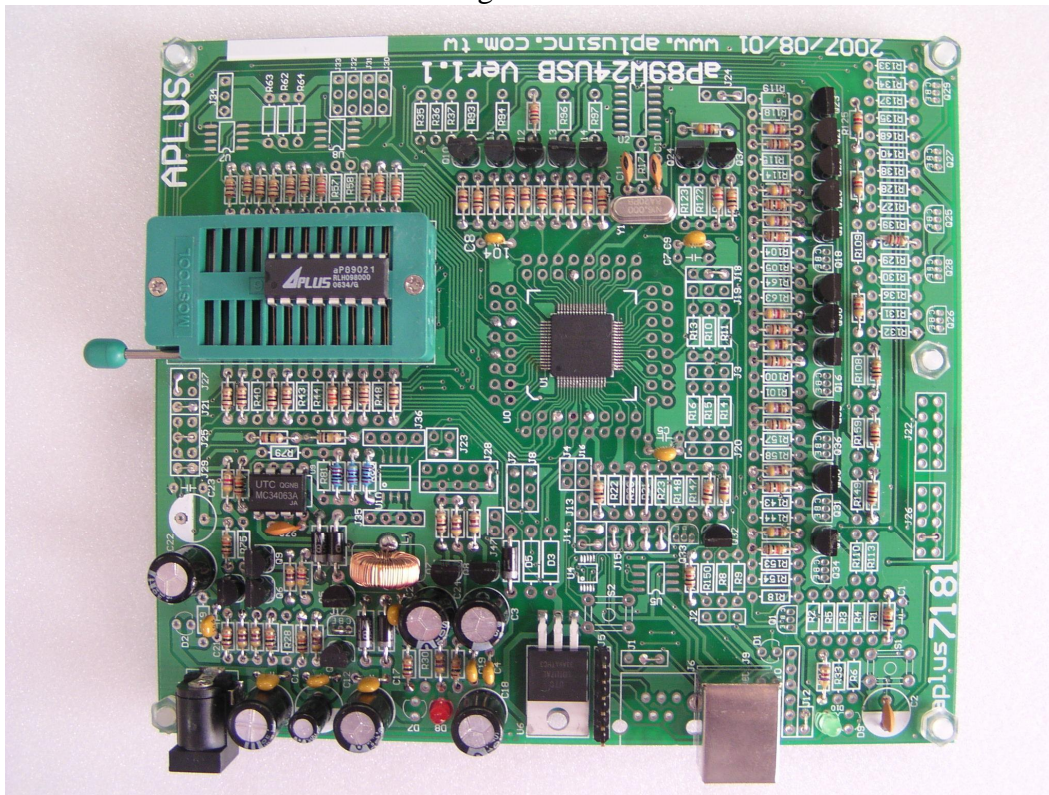# Inserting Devices onto the Programmer Hardware

- **aP89341, 170 and 085 (24-Pin DIP package)**
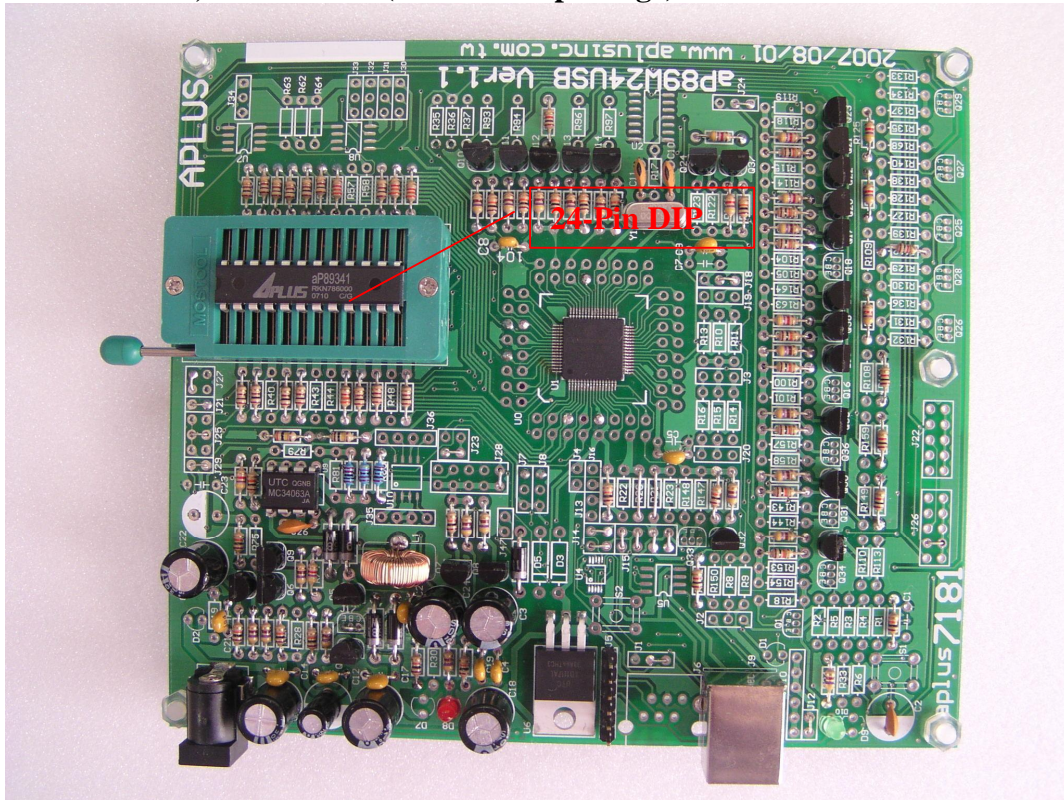
- **aP89042, 42A (20-Pin DIP package)**
- Device should be inserted align to the bottom of the textool socket.
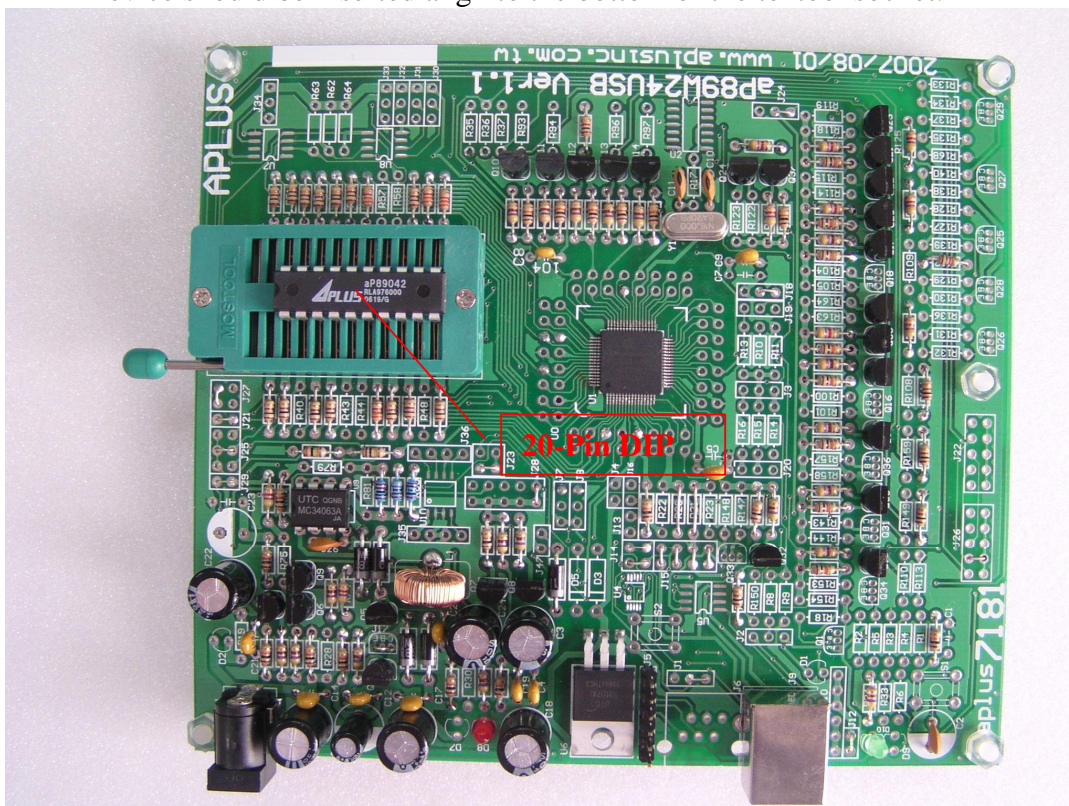
- **aP89021, 010, 21A and 10A (16-Pin DIP package)**
- Device should be inserted to align to bottom of the textool socket.

- **SOP Package**
- Additional SOP adapter should be used and align to bottom of the textool socket.