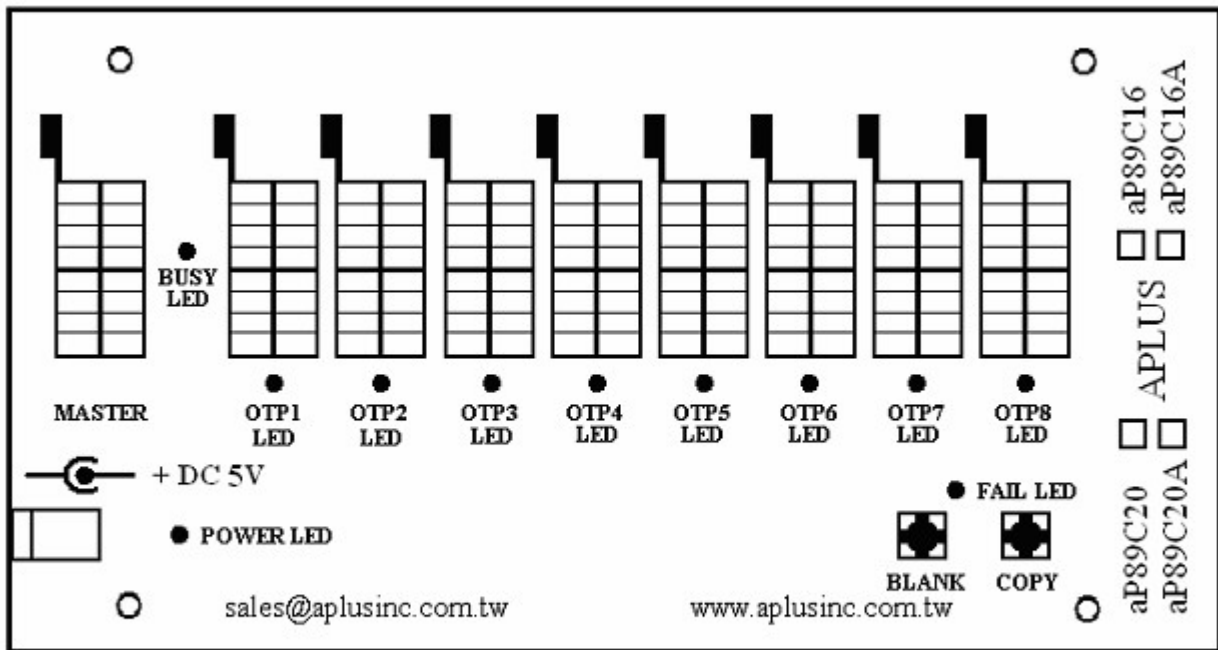**⚡PLUS** Integrated Circuits Inc.

aP89C20/20A/16/16A – M2C
Voice OTP 1-To-8 Copier UserManual

PCB Top View (Not To Scale)

1. INTRODUCTION
The Voice OTP 1-To-8 copier is designed to fast copying Aplus' Voice OTP devices for mass production. Devices supported by this 1-To-8 copier include aP89042/42A, aP89021/21A and aP89010/10Awhich depends on how the copier board is configured. Four different configurations are allowed:

■ **aP89C20** (20-pin configuration) – support **aP89042** device
■ **aP89C20A** (20-pin-A configuration) – support **aP8942A** device
■ **aP89C16** (16-pin configuration) – support **aP89021** and **aP89010** devices
■ **aP89C16A** (16-pin-A configuration) – support **aP8921A** and **aP8910A** devices

Note: If the board is in 16-pin configuration, 16-pin sockets are used. On the other hand, if the board is in

20-pin configuration, 20-pin sockets are used.
Up to eight pieces of blank Voice OTP devices can be copied at a time. To make a copy, a MASTER IC with voice data in it, is inserted in the MASTER socket. Blank devices are inserted into the OTP1 to OTP8 sockets. Finally, the COPY button is pressed to start copying.

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2. BEFORE COPYING
- Power Supply Connection

A regulated DC 5V power supplywith minimum 1Amp capacity should be used as the power source for the 1-To-8 Copier. DC 5V adapter can be used and should be connected to the DC power jack correctly. The centre of the DC jack is positive terminal while the outer contact is the Ground terminal. Incorrect connection to the terminals will damage the copier board. When the power supply is correctly connected, the red POWER LED will turn on. The yellow BUSY LED will flash two times and then turn off. This indicates the copier is ready for use.

- MASTER IC preparation

The MASTER IC inserted into the MASTER socket provides the source of voice data to copy into the blank OTP ICs. The MASTER IC is produced by using Aplus' PC based programmer. One should note that the "Security" check box under the "Writer" menu must NOT be checked. Otherwise, the IC programmed from the PC based programmer will be security protected. The 1-To-8 copier will refuse to do copying on a security protected IC. Please refer to the PC based Voice OTP developing system user guide for the details of how to compile and program an OTP IC.

3. THE BLANK CHECK AND COPY OPERATIONS
A. Power On / Reset the Copier
With no any IC is inserted to the copier, connect the DC 5V power supply to the DC jack of the board. The red POWER LED will turn ON. The yellow READY LED will flash two times and then turn OFF. This indicates the copier is finished power-on self check and is ready to use.

B. Blank Checking the OTP devices
1. Insert from 1 pc up to a maximum of 8 pcs blank OTP IC into the OTP1 to OTP8 sockets (any socket can be left to empty if there is less than 8 pcs blank ICs are used.).

2. Press the BLANK button. The BUSY LED will turn ON which means the blank check operation is in progress.

3. The BUSY LED turns OFF again to indicate blank check operation finishes. When the GREEN OTP LED is ON, it indicates the corresponding OTP IC has passed the blank check. If the GRENN LED is not ON and the FAIL LED is ON, it indicates the corresponding OTP IC is not blank or unable to be copied.

4. The RED FAIL LED will turn ON if any one of the ICs under blank check is failed.

C. Copying the OTP devices

1. A master OTP IC (the IC with original voice data) is inserted into the MASTER socket of the copier board.

2. Insert from 1 pc up to a maximum of 8 pcs blank OTP ICs into the OTP1 to OTP8 sockets (any socket can be left to empty if there is less than 8 pcs blank ICs are used.).

3. Press the COPY button to start copy. The BUSY LED will blink. The BUSY LED stops and turns OFF again when the copying is finished.

4. The GREEN OTP LED under the corresponding OTP socket turns ON to indicate the OTP IC is successfully programmed. When it is OFF, the corresponding OTP IC is not copied successfully. When any one of the programmed OTP IC is failed programming, the RED FAIL LED will turn ON.

3. ERROR CHECKING OF THE MASTER IC

There is error checking mechanism to check the data integrity of the MASTER IC. This is important because if the data of the MASTER IC is corrupted, the copied OTP will have wrong data copied.

Each time during the COPY operation is in progress, the data integrity of the MASTER IC will be checked. If the copier board finds data error in the MASTER IC, the copier board will prevent next COPY operation to begin. That means when you press the COPY button but the copy operation does not begin, i.e. the BUSY LED does not flash.

When this is happened, user should remove all the OTP ICs and the MASTER IC.Power-down the board and power-up again. Insert another MASTER IC to replace the bad IC, insert the blank OTP ICs and press COPY button to try copy again.

4. ELECTRICAL TEST DURING BLANK CHECK OPERATION

When the BLANK check button is pressed, the copier board does not only do the blank check on the OTP IC. It also tries to program one byte of test data into the blank OTP to test program the IC. The test data will not affect the future voice data to be programmed. The blank OTP will be considered remain blank even after this test data byte is programmed. If any OTP IC failed from the BLANK check operation, it means the OTP IC is either not blank or cannot be programmed. This function is particular useful for programming COB which enable the COB to be tested for bonding is good before it is programmed.

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aP89C20/20A/16/16A -M2C
Voice OTP 1-To-8 Copier
QUICK START

1. Connecting Power Supply
   - DC 5V regulated power supply with min. 1Amp current capacity is needed.
   - Connect the +ve to the centre and GND to outer terminal of the power jack.
   - Red POWER LED turns ON and yellow REDY LED flashes and then OFF to indicate
     ready for use.

2. Blank Checking
   - Insert OTP ICs to be blank checked to any one of the empty OTP sockets.
   - Press BLANK button to start.
   - BUSY LED flashes indicate blank check is in progress.
   - Green OTP LED turns ON means OTP under check is passed.
   - Red FAIL LED turns ON when there is any one OTP under check is not passed.

3. Copying
   - Insert OTP with source data into the MASTER socket.
   - Insert OTP ICs to be copied to any one of the empty OTP socket.
   - Press COPY button to start copying.
   - BUSY LED flashes indicate blank check in progress.
   - Green OTP LED turns ON means OTP under check is passed.
   - Red FAIL LED turns ON when there is any one OTP under check is not passed.

4. Master IC Error (When the COPY button is pressed but the BUSY LED does not flashes)
   - This indicates the copier board finds the MASTER IC has certain problem.
   - Remove all OTP ICs including the MASTER IC.
   - Disconnect the DC 5V power supply.
   - Wait for 30 sec and re-connect the power supply.
   - Repeat the Copy procedure above.
   - If the copy process still cannot start, replace the MASTER IC and repeat power down
     and power up again.