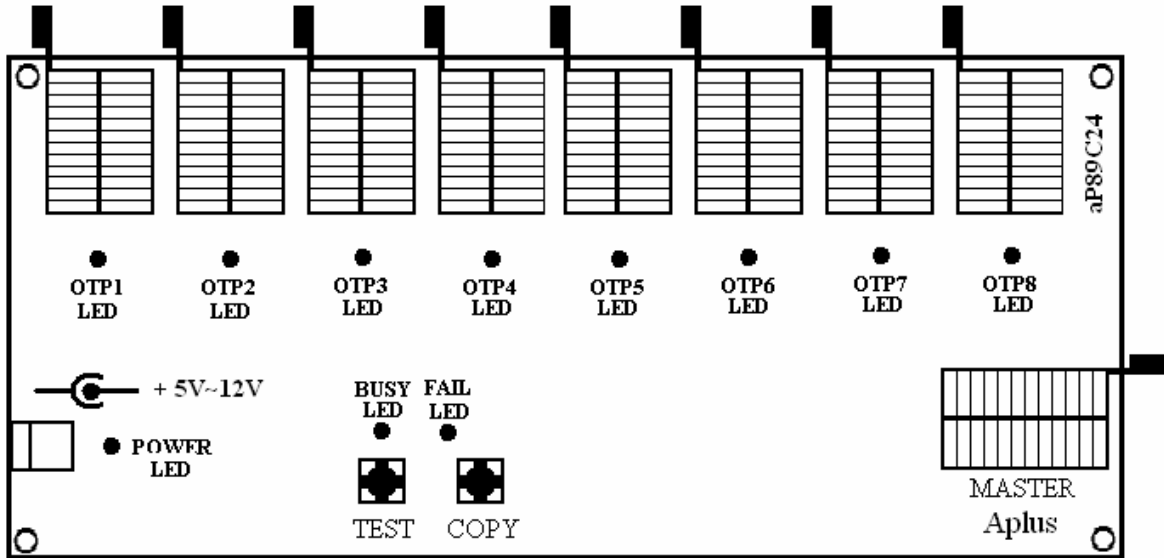


**aP89C24 User Manual**

**Voice OTP Copier for aP89341/170/085**



**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 are aP89341, 170 and 085.

From one and up to eight pieces of blank OTP devices can be copied at a time. To make a copy, a MASTER chip with voice data in it, is inserted in the MASTER socket. Blank chips are inserted into the OTP1 to OTP8 sockets. Finally, the COPY button is pressed to start copying.

	Busy LED (Yellow)	Fail LED (Red)	Status LED (Green) x8
Test Operation	Flash at 1 Hz	Off	Off
Copy Operation	Flash at 2 Hz	Off	Off
System Error	Flash at 4 Hz	Flash at 4 Hz	Flash at 4 Hz
Fail (All)	Off	On	All Off
Test Pass (Not All)	Off	On	Flash at 1 Hz / Off
Test Pass (All)	Off	Off	All Flash at 1 Hz
Copy Pass (Not All)	Off	On	On/Off
Copy Pass (All)	Off	Off	All On

Table 1. Mode of operation

## **2. POWER SUPPLY CONNECTION**

A regulated DC 5V~12V power supply minimum 1Amp capacity should be used as the power source. The centre of the DC jack is positive terminal while the outer contact is the GND terminal. Incorrect connection to the terminals will damage the copier board. When the power supply is correctly connected, the copier board will undergo power-up reset and all LEDs will flash for two times. This represents the copier board is ready for use.

## **3. MASTER CHIPS PREPARATION**

The MASTER chip inserted into the MASTER socket provides the source of voice data to copy into the blank OTP ICs. The MASTER chip is produced by the PC based programmer. The “Security” check box under the “Writer” menu must NOT be checked. Otherwise, the chip will be security protected and the copier will refuse to do copying with a security protected MASTER chip. Please refer to the PC based Voice OTP developing system user guide for the details of how to compile and program an OTP chip.

Note that the chip copied from the copier cannot be used as MASTER chip because it is security protected.

## **4. TEST OPERATION**

This function will blank check the beginning 16K bytes of memory and test program one byte into the chips. Follow the procedures below to do the TEST operation:

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 empty if there is less than 8 pcs blank ICs are used.).
2. Press the TEST button. The BUSY LED will flash when the operation is in progress.
3. The BUSY LED turns OFF again to indicate test operation finishes.
4. When the GREEN OTP LED is Flashing, it indicates the corresponding OTP IC has passed the test. If the GREEN LED is OFF and the FAIL LED is ON, it indicates the corresponding OTP IC is not blank or unable to be copied.
5. The RED FAIL LED will turn ON if any one of the ICs under test is failed.

## **5. COPY OPERATION**

This function will copy the data from the MASTER chip to the chips inserted into the OTP1 to OTP8. Follow the procedures below to do the TEST operation:

1. A master OTP chip (the chip 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 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.).
3. Press the COPY button to start copy and the BUSY LED begins to flash.
4. The BUSY LED stops and turns OFF when the copying is finished.
5. 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 after programming, the RED FAIL LED will turn ON.

## **4. ERROR CHECKING OF THE MASTER IC**

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

At the beginning of the COPY operation, the data integrity of the MASTER chip is checked. If the copier board finds data error in the MASTER chip, it will prevent the COPY operation to process. The whole system will be Halted to prevent any further operation and all LED flash non-stop.

When this happens, user should remove all the OTP ICs and the MASTER chip. Disconnect the DC power supply and reconnect again to reset the board. Insert another MASTER chip to replace the bad one, insert the blank OTP ICs and press COPY button to try copy again.

## **aP89C24 QUICK START GUIDE**

### **Voice OTP Copier for aP89341/170/085**

1. Connecting Power Supply
  - DC 5V to 12V 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.
  - All LEDs flash two times to indicate ready for use.
  
2. TEST Operation
  - Insert OTP ICs to be tested to any one of the empty OTP sockets.
  - Press TEST button to start.
  - BUSY LED flashes indicate testing is in progress.
  - Green OTP LED turns Flash means OTP under check is passed.
  - Red FAIL LED turns ON when there is any one OTP under check is not passed.
  
3. COPY Operation
  - 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 copying is in progress.
  - Green OTP LED turns ON means OTP copy is passed.
  - Red FAIL LED turns ON when there is any one OTP copy is not passed.
  
4. Master IC Error (When the COPY button is pressed but all LED flash non-stop)
  - This indicates the copier board finds the MASTER IC has certain problem.
  - Remove all OTP ICs including the MASTER IC.
  - Disconnect the DC 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 action again.