



8-Bit Micro-Controller

TM57PR40

Learning Remote Control User's Guide

Application Note

**Tenx reserves the right to change or
discontinue this product without notice.**

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PRODUCT NAME

TM57PR40

TITLE**Learning Remote Control user's guide****APPLICATION NOTE****1. The characteristics of learning remote control****1. What is a learning remote control?**

Learning remote control is a remote control that can transmit and receive data through IR and learn to adapt to multiple brands.

2. Comparison of various remote control

- Traditional remote control: Traditional remote control can only control equipments from a particular brand.
- Universal remote control: Universal remote control has the remote control code of each brand built in, but does not the learning capability.
- Learning remote control: Learning remote control can learn the remote control of multiple brands to control their equipments.

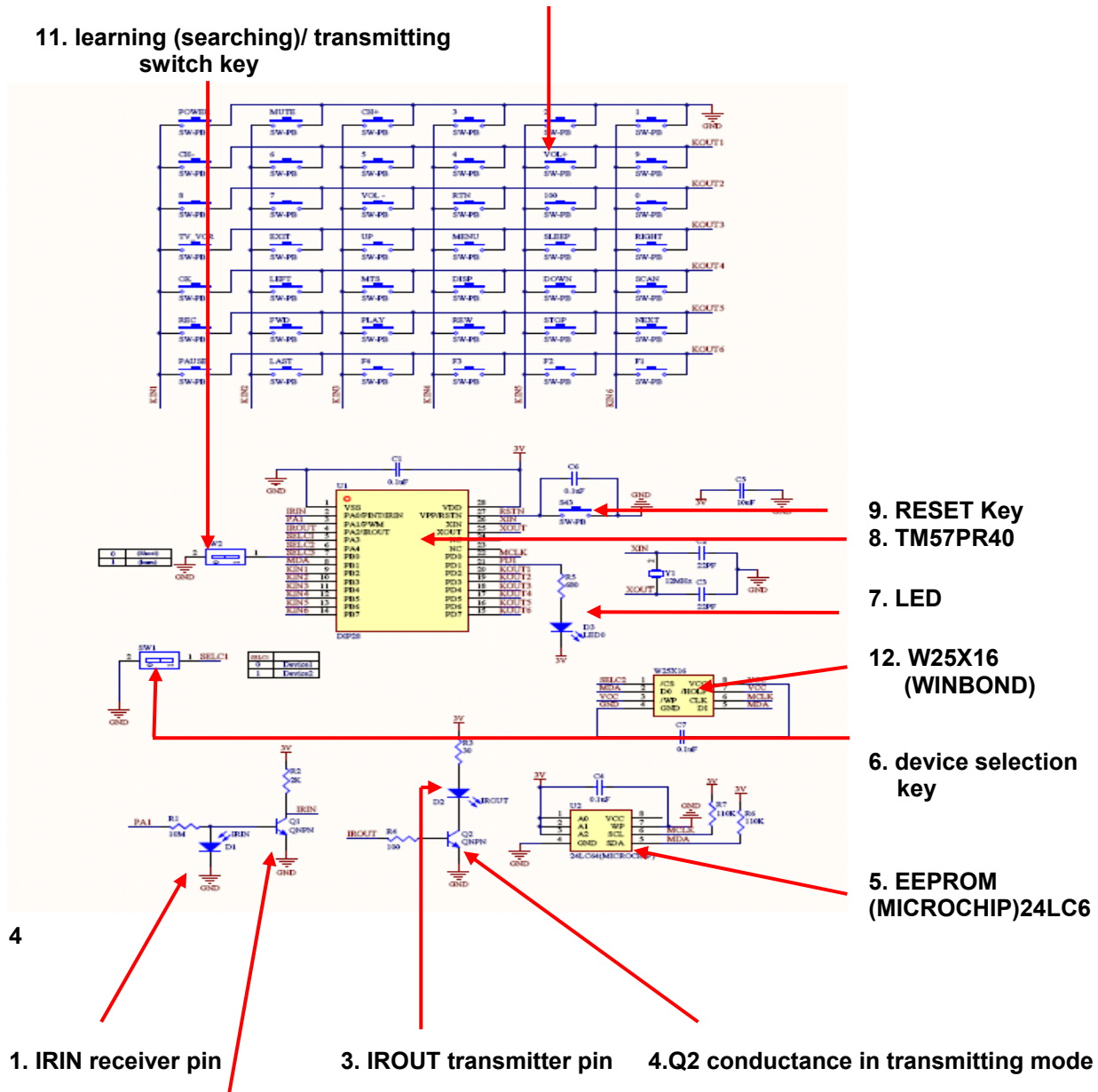
3. The characteristics of learning remote control

- Simple mode of operation makes it easier to use for the user.
- Capable of learning to control as much as 99% of all the Infra-Red remote controls on the market.
- Providing 42 function keys, which allow users to set remote control function on their preference; each function key requires 64 bytes of memory to store.
- Providing options of 3 devices so that users can store up to 3 remote controls; each device requires 2.7k bytes of memory to store.
- Providing functions to search and compare data so that the user can become familiar with all the remote control keys merely by learning the power key.

2. Circuit functions

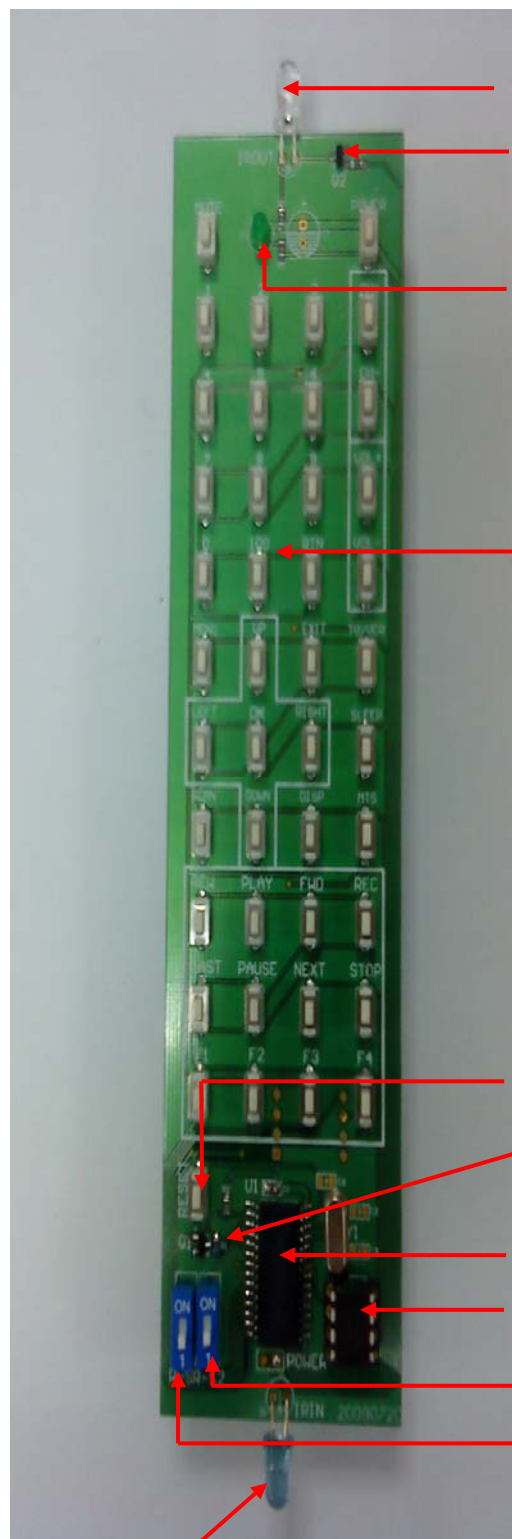
10. Remote control function key

11. learning (searching)/ transmitting switch key



The front of the remote control device

The back of the remote control device



1. IRIN receiver pin

3. IROUT transmitter pin

4. Q2 conductance in transmitting mode

7. LED

10. Remote control function key

12. W25X16 (WINBOND)

9. RESET Key

2. Q1 conductance in learning mode

8. TM57PR40

5.(MICROCHIP)24LC64

6. device selection key

11. learning/transmitting switch key



3. Remote Control operating procedure

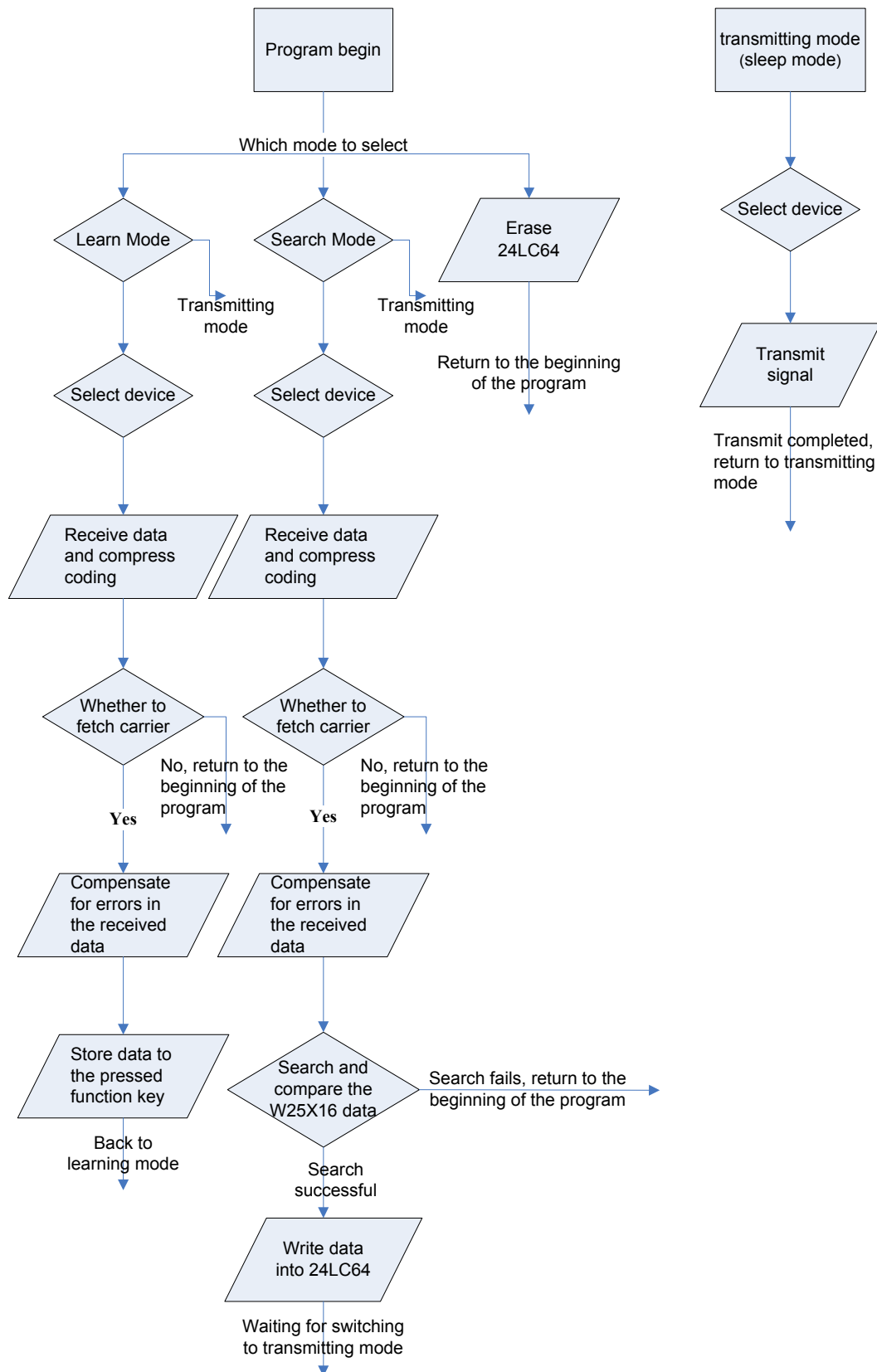
1. LEARN MODE operating procedure

1. Switch to Learning mode (ON), there are three modes to select now.
 - A. Press button 1 is to enter Learning mode. At this time, if the device key is ON, select key 1~3 to save/launch that device, switch the device key OFF after finishing the selection.
 - B. Press button 2 is to enter search mode. At this time, if the device key is ON, select key 1~3 to save/launch that device, switch the device key OFF after finishing the selection.
 - C. Press button 3 to erase EEPROM (MICROCHIP) 24LC64.
2. LED will light up in the learning mode. Aim the IR launch head/ transmitter pin of the remote control device at the IRIN reception head/ receiver pin of the learning remote control device and press the learning key. LED will turn off If the learning is successful. Please select any one key to store the learned data. The LED will turn on again if the data is successfully stored, then you can press the next key to learn.
3. LED will light up in search mode. Aim the IR launch head of the remote control device IR at the IRIN reception head of the learning remote control device. LED will flicker once the POWER key of the remote control device is pressed. If search is successful, LED will stay on and all the key learning for the remote control device is completed.. If search is not successful, LED will turn off.
4. LED will flicker during EEPROM (MICROCHIP)24LC64 erasing. LED will be off once completed.

2. LAUNCH MODE operating procedure

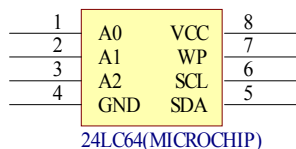
1. Switch to the launch mode (OFF), LED will turn off. At this time, if the device key is ON, select key 1~3 to launch that device. Switch the device key OFF after finishing the selection.
2. Press the successfully learned function key aiming at the equipment (ex. television). If it can not control the equipment remotely, the learning is not successful. Repeat LEARN MODE 1~2 steps. p.s. (if LED is flickering, the device is transmitting data)

4. Program flow chart

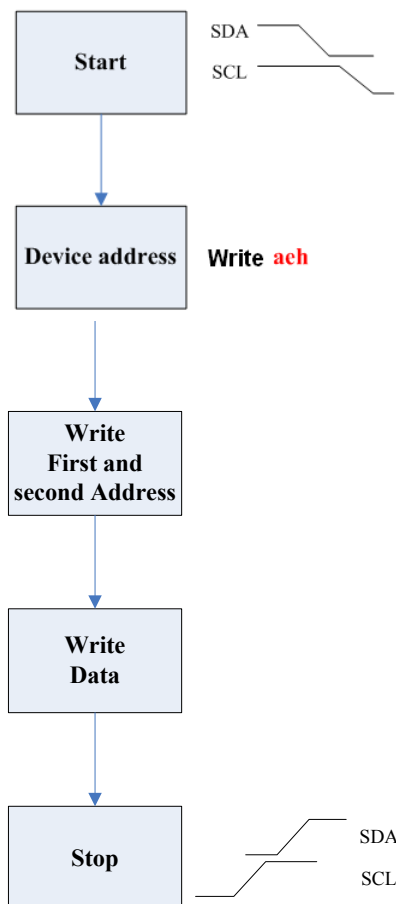


5. Note

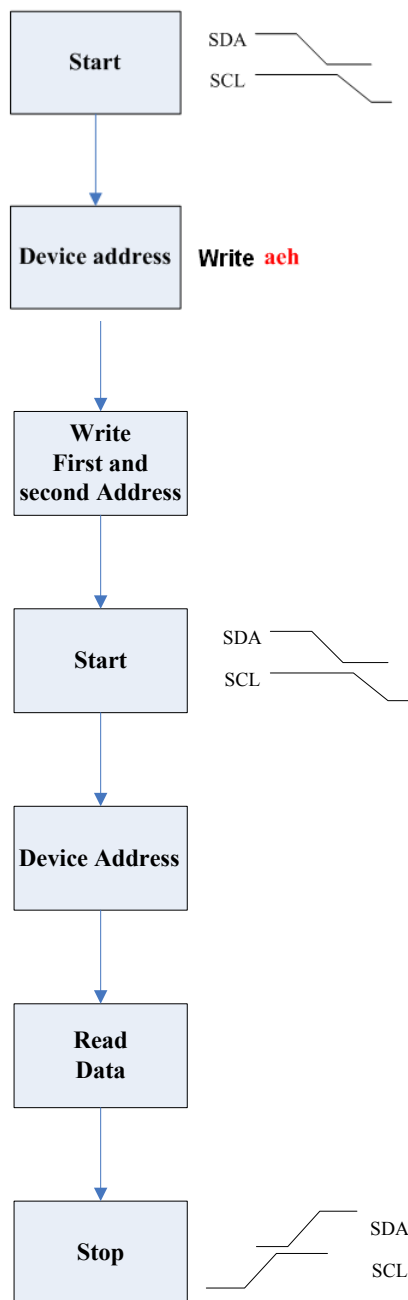
1. EEPROM (MICROCHIP) 24LC64 functions



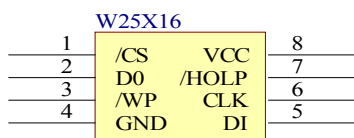
1. Page Write



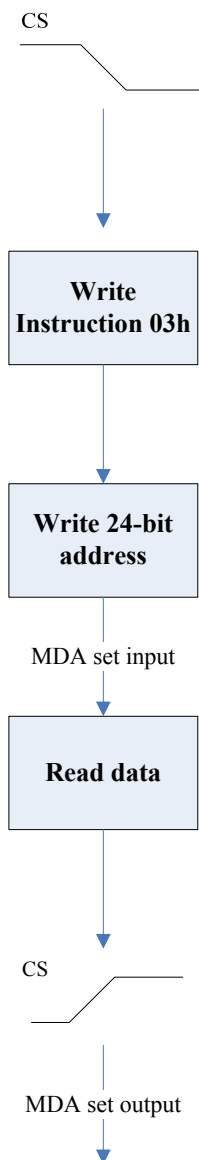
2. Random Read



2. EEPROM (WINBOND) W25X16 functions



1. Read data



(For more complete information, please search (MICROCHIP) 24LC64/ (WINBOND) W25X16 datasheet on internet)