ENGG1100 Introduction to Engineering Design

Faculty of Engineering

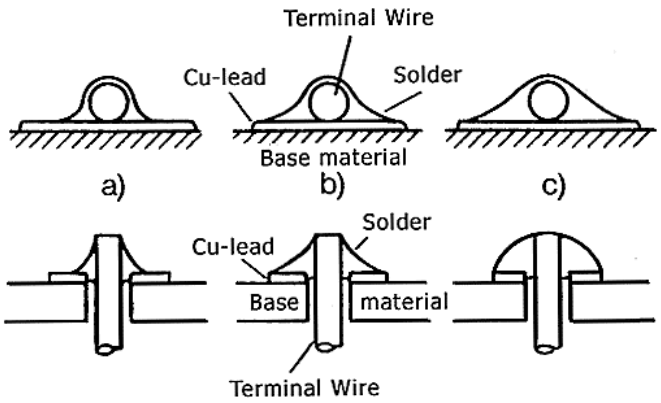
The Chinese University of Hong Kong

Project Board: Soldering

Introduction

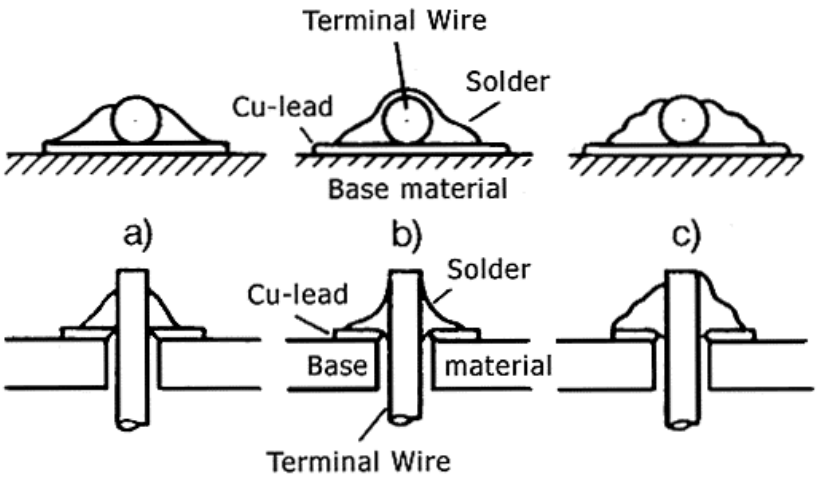
The project board ENGG1100-IE-09D is for Lab-4 to Lab-7 and the mini-project, you have to complete the soldering before Lab-4.

The following web page can help you to do soldering; https://www.elexp.com/soldering.



a. Minimum amount of solder
b. Optimal
c. Excessive solder

Figure-1: Right Amount of Solder



a. Bad solderability of terminal wire
b. Bad soldering of PCB
c. Bad soldering of terminal wire and PCB

Figure-2: Solderability

Equipment

1. Main board PCB x1 (Figure-3, ENGG1100-IE-09D);
2. Diode (1N4007) x1 (Figure-4, D1);
3. Switch x1 (Figure-5, SW1);
4. 2-pin (2510-type) socket x1 (Figure-6, J1);
5. 3-pin (2510-type) socket x8 (Figure-7, J2 to J9);
6. 4-pin (2510-type) socket x6 (Figure-8, J10 to J21);
7. 5-V switching-mode regulator x1 (Figure-9, U2);
8. Arduino Nano x1 and 15-pin header x2 (Figure-10, U1);
9. 15-pin socket x2 (Figure-11, for U1);
10. 2.54mm 4-pin header x1 (Figure-12, for U2).
11. 600mil IC socket x1 (Figure-13, for U1)

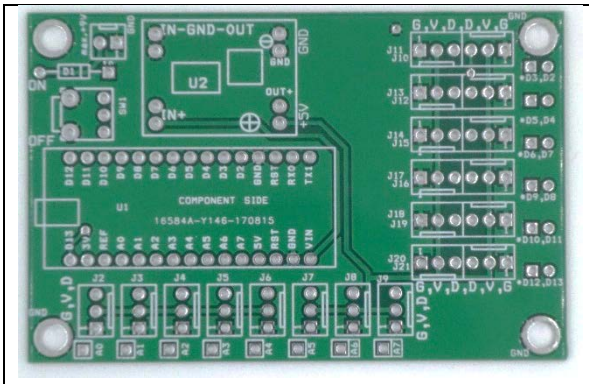


Figure-3: Main board


Figure-4: Diode 1N4007 (D1)

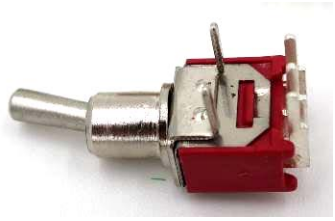


Figure-5: Switch (SW1)


Figure-6: 2-pin 2510-type socket (J1)


Figure-7: 3-pin 2510-type socket (J2 to J9)

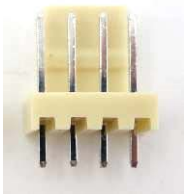


Figure-8: 4-pin 2510-type socket (J10 to J21)

Figure-9: 5-V switching-mode regulator (U2)

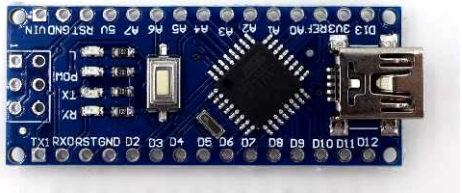


Figure-10: Arduino Nano (U1)
(15-pin headers are not shown)

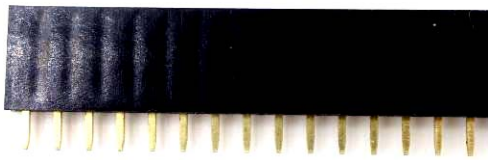


Figure-11: 15-pin socket (for U1)

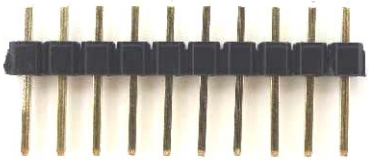


Figure-12: 2.54mm header (for U2)

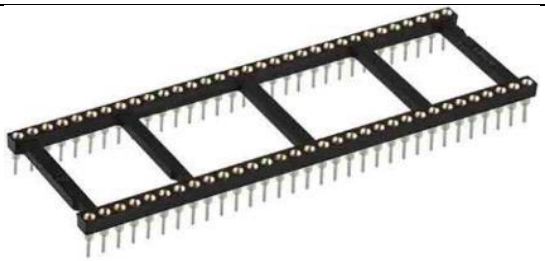


Figure-13: 600mil IC socket (for U1)

Procedures:

1. Insert diode D1 as close to the board and solder it.
2. Insert switch SW1 and solder it.
3. Cut 2.54mm header into 4 pieces (2 pins each) and insert them to the U2 location. Place the switching-mode regulator U2 into the pins, and solder the point on U2. Place the main board upside-down and solder the headers to fix the U2 board.
4. Solder the 2-pin 2510-type socket J1. You can place a ball of tissue paper to hold the sockets perpendicularly and close to the PCB for soldering (Figure-14).
5. Insert the two 15-pin sockets for U1 and solder them. 600mil IC socket can help you to hold the 15-pin sockets in place perpendicularly (Figure-15).
6. Solder the rest of 2510-type sockets J2 to J21. You can use the same technique in procedure-4 to hold the sockets in place.
7. Insert the two 15-pin headers to the socket at U1. Place the Arduino Nano on the headers and solder U1 onto the header (Figure-16). **Note: Do not solder the header into the socket!**

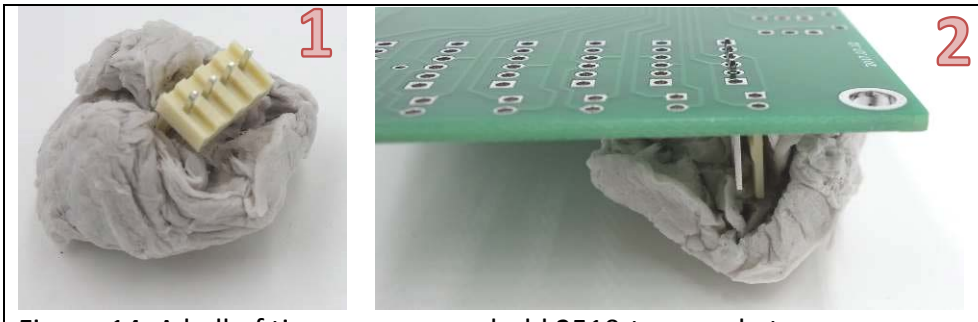


Figure-14: A ball of tissue paper can hold 2510-type socket.

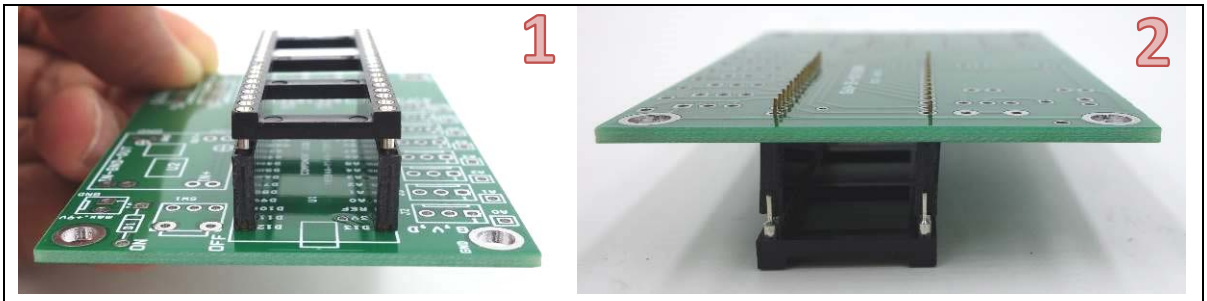


Figure-15: 600mil IC socket can be helpful for soldering the 15-pin sockets.

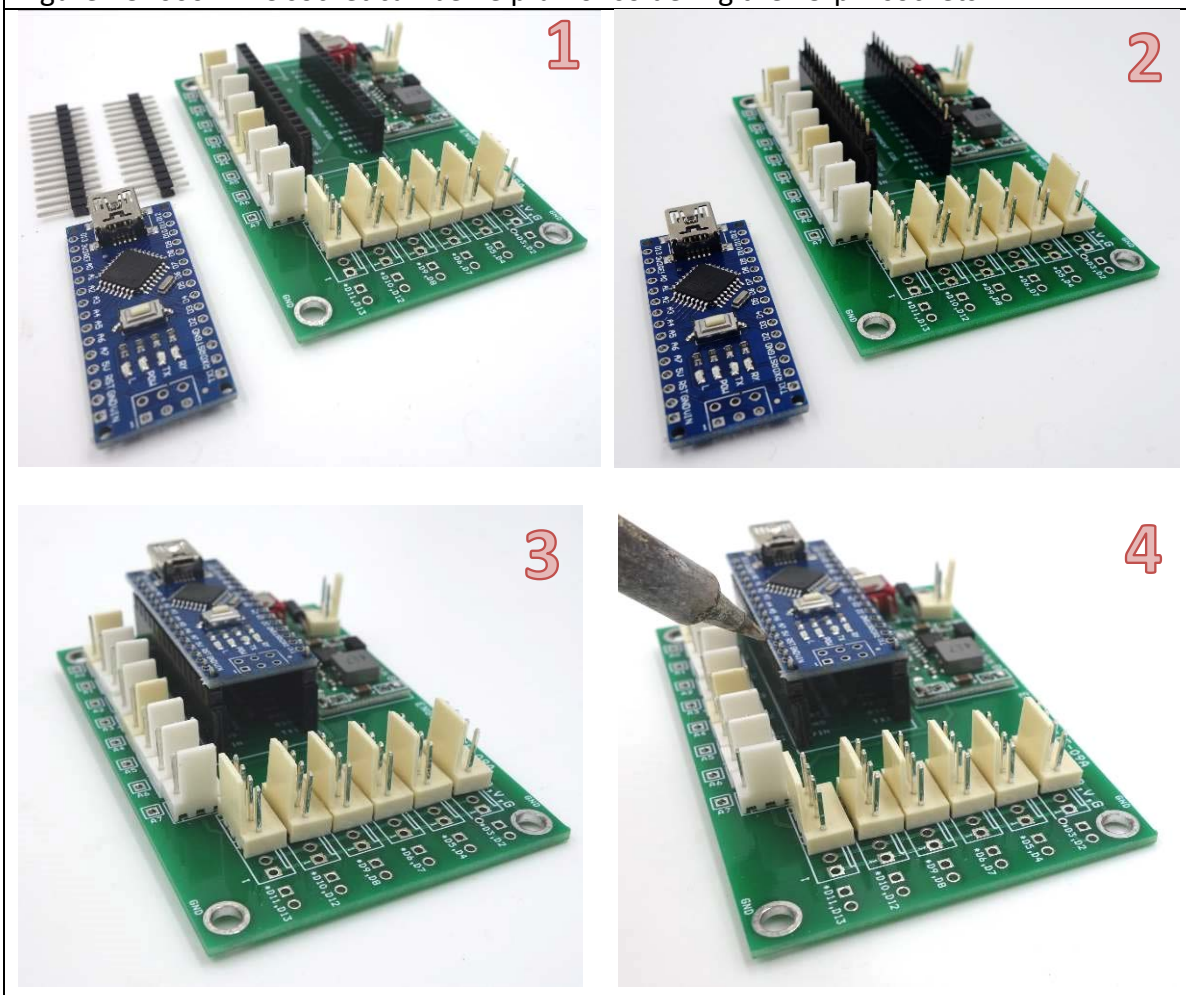


Figure-16: Solder the headers of Arduino Nano.