ESHD Assignment 8 Answers

2. Describe the process of designing a PCBA for turnkey product with detailed outcomes at each step. 3 points

2.1 Schematic Design starts after consideration and approval of the MRD, Functional Requirements, Engineering Specifications and Block Diagram.
2.2 Schematic Design includes assigning attributes (properties) to components (refdes, value/name, footprint), performing DRC.
2.3 The outcome of Schematic Design are generated BOM and Netlist – for PCB design.
2.4 PCB Design includes drawing PCB outline, selecting number of layers, placing components, layout (drawing traces, copper islands, ground/power layers), and performing DRC.
2.5 The outcome of PCB Design are generated Gerber, drill and assembly files.
2.6 BOM, Geber/drill/assembly files, Assembly Instructions, Test Procedures and Report template are sent to the manufacturer.
2.7 Manufacturer sends to the customer a ready-to-go product along with test results and a quality certification report.

3. Create a schematic in LTSpice to simulate User Pushbutton B2 (from page 10 of the STM board schematic) opening process. Run simulation for 30ms and read the voltage on the BUTTON_EXTI13 (or SB3) at 10, 20 and 30ms. 4p. Include screenshots for every task and for LTSpice simulation files (schematic and plots). 4 points

3. Both switches are Normally Open (NO) - they closes, if somebody presses them.

3.1 Control Voltage PS, V2, settings should be (1 -1 0 0 0 1 1 1).
Vinitial Voltage=1 will turn the switch ON (connect), and discharge the caps in ~1ms. To avoid ambiguity the Simulation Command ".tran 0 30ms 0 startup" can be used.
Von voltage =-1 will turn the switch OFF (open), and the caps will start charging.
0, 0, 0 - means no delays.
T period=1 means that Von will be held for 1s (any > 35ms).
Ncycles=1 means only one cycle.
See the attached schematic L8_Q4.asc.

3.2 Another way is to use a Pulsing PS V1 with settings (0 3.3 0 0 0 1 1). And Simulation Command as above ".tran 0 30ms 0 startup".
See the attached schematic L8_Q4_Pulse_PS.asc.

There are other ways to do it as well.