Course Content of Processor Board Design (COM) Personal Training

*Each Session will be conducted on alternate days.

*Course timing will be in b/w 7:00AM to 10:00AM IST, or 8:00PM to 11:00PM IST (we'll decide after group will be final).

*Each Session will be for 2 Hours.

*Total number of Days for this course will be 30 days (15 Sessions).

*Recording will be provided after each session, either you can watch online or download as per your convenience.

Day-1 Discuss the requirement sheet and Processor RK3399 in very details

Details:

- a- Introduction of single page requirement sheet.
- b- Discuss the Datasheet of Processor RK3399
  - We'll understand How to Choose Processor, Core, Cache, Bandwidth, Clock etc.)
  - Architecture of Processor, and Memory Organization.
  - Types of Internal and External SDRAMs (DDRX, LPDDRX, and their Enhanced versions).
- c- Comparisons of External SDRAMs up-to DDR5 and LPDDR5.
- d- Different Signal Groups of SDRAM (Data, Address & command, Control and Clock Groups).

Day-3 Discussion on How to Choose a SDRAM? from Very Scratch and Its Pin Mapping.

Details:

- a- Develop a Set Procedure on selection of SDRAM for Mobile Application.
- b- Discussion of DATASHEET of LPDDR4 SDRAM, in very Details
- c- Pin Mapping of SDRAM on an Excel Sheet.
- d- Design the Schematic from Datasheet of LPDDR4 SDRAM.

Day-5 Selection and Schematic Design of PMIC (Power Management IC) in very Details.

Details:

- a- Develop a Set Procedure for Selection of PMIC Chip for any Application.
- b- Discussion of DATASHEET of PMIC Chip, in very Details
- c- Discuss why we are using PMIC, instead of other Voltage Chip.
- d- Protections of PMIC Discussion in details.
- e- Design the Schematic from Datasheet of PMIC.

Day-7 EMMC (Embedded Multimedia Card) Chip Selection, Pin Mapping and Schematic Design.

Details:

- a- Develop a set Procedure for Selection of EMMC Chip.
- b- Discussion of DATASHEET of EMMC Chip, in very Details.
- c- Pin Mapping of EMMC with all the Pins going to Processor.
- d- Discussion on Layout Design Rules and Impedances.
- e- Design the Schematic Design for EMMC.

Day-9 WIFI/BT Module Selection, Certification, Selection and Schematic Design

Details:

- a- Selection of WIFI/BT Module and develop a Set Procedure to do it.
- b- Discussion of Different WIFI/BT Module Certification.
- c- Discussion of Impedances of Traces, and Design Rule,
- d- Discussion of Datasheet in very Details.
- e- Schematic Design of WIFI/BT Module from Datasheet.

Day-11 Selection of other Regulators and Their Schematic Design in very Details.

Details:

- a- Selection of DC-DC Buck and Boost Converters.
- b- Quickly go through the datasheets of Each Regulators.
- c- Schematic design of every regulator.
- d- Discussion and Pin Mapping of Req. Resets/Enable of Regulators.

Day-13 Schematic Design of RK3399, Pin Mapping and Impedances Planning on Schematic through Classes.

Details:

- a- Pin Mapping of Processor Chip on an Excel. (Here we'll go through each 828 Pins on RK3399)
- b- Impedance planning of different signal lines.
- c- Schematic Design of RK3399, with different Diff Pair Classes and Bypass Caps.
- d- Schematic of Different Shut down, Reset, Recovery Buttons, and Cooling FAN.

Day-15,17 To Cover Anything Left on above Lessons.

Day-19, 21 & 23 Layer Stack up(4/6/8/12L), Finish the Components Placement Planning and its Execution.

Details:

- a- Layer Stack-up Discussion and its Field Solver Solution.
- b- Components Placement Planning on Paint (Here we'll discuss the different Constrains of Placement).
- c- Start the Components placement with Processor, SDRAM Memory, EMMC, WIFI/BT, PMIC and Regulators etc.
- d- Discussion of Different Isolation on Placement.
- e- Discussion on Signal GND, Chassis GND, Earth GND.

Day-25, 27 & 29 Layout Planning, Preliminary Layout, High Speed Design Rules and Length Matching, Power Plane Planning by Sections, Optimization of Layout Loop-1 and Loop-2

Details:

a- Discussion of Board Planning and Board Design in Very Details.
b- Planning of Layout for Power and High-Speed Tracks.
c- High Speed Design Rules and its Implementation on AD20 CAD Tool.
d- Finish the Preliminary Layout of Board (Firstly we'll target all the High-Speed Tracks.
e- Length Matching of Layout and try to Finalize every High Speed Net.
f- Power Plane Planning and Its Sectioning in Very Details.
g- Optimization of Layout -1
h- Optimization of Layout -2

Day-30 To Cover Anything Left on above Lessons.

-Aviral

EsteemPCB