Mahendra Technical Institute

Advance Diploma In Chip Level Repairing

SYALLBUS

1.Basic Electronics

- Formation of Current, AC/DC Concept, Rules for Flow of Current.
- Resistor- Symbol, Function, Function, Denoting Letter, Solid Type Resistor Color Coding, SMD Type Resistor Coding, Value measurement by Multimeter and SMD Tester.
- Capacitor – Function, Types, Symbol, Identification of Solid Type and SMD Type Capacitor, Testing of Capacitor by MultiMate and SMD Tester, Value measurement by SMD Tester.
- Coil – Function, Symbol, Denoting Letter, Types of material, Properties of Coil, Identification of Solid and SMD type coil, Pack coil, Testing of Coil.
- Diode: Function, Symbol, Denoting letter, Identification of Solid and SMD Type Diode, Types of Diode, Testing of Diode, Anode and Cathode Concept
- Transistor: Introduction, Types, Symbol, Denoting Letter, PNP and NPN Concept, Testing of Transistor, Function etc
- Mosfet: Introduction, Types, 3 leg Mosfet, 8 Leg Mosfet, Identification of N-Channel and P-Channel Mosfet, Testing of Mosfet, Dual Mosfet Concept, Switching Concept Etc
- Crystal: Introduction, Concept of Quartz, Clock and Pulse, Measuring unit, Types and Real Shape, Testing of Crystal etc.
- Transformer and IC. Types of transformer , step-up transformer ,step down transformer

Module 2: SMPS (switch mode power supply)

- Introduction of basic component.
- Introduction to SMPS • Working principle of smps. block diagram
- Understanding the 11 circuit's function of SMPS with the help of schematic diagrams.
- Description of electronic components found in smps.
- Finding the right equivalent components in smps circuit
- Understanding the six common problem Found in smps
- How to easily charge discharge the main capacitor in smps.
- How to easily perform voltage testing on smps
- Find out how useful is series light bulb trick in smps repair.
- The five method for troubleshooting & repairing smps. • Different voltage pin out or different cable &use.

• Trace out rectifier , filter ,Oscillator , Sm Transformer

• Tracing & Fault Finding Of SMPS, Basic Problem & solution.

3 LCD / TFT: Monitor

• Introduction of LCD , Types Of LCD.

• Working Of Deflection of Coil, Rotation of Coil & Signal cable Connector Description.

• Circuit Diagram of LCD Monitor section (power supply stage & System driver stage, Horizontal Deflection stage, vertical driver & output stage, EHt stage, Vertical driver & output stage.)

• Understanding inverter board , understanding the start circuit, understanding the blacklight (lamps). Understanding LCD monitor panel lcd monitor panel< lcd monitor factory mode, different between plasma and lcd.

• Tools and test equipments, secret of opening lcd monitor cover, understanding smd resistor codes and testing, understanding smd transistor and diode codes and testing schottky diode rectifier application and testing stuck and dead pixel in lcd monitor.

• Repair lcd monitor power adopter

• Tracing & fault finding of lcd

4: Motherboard

1. Motherboard overview and Block Diagram of Motherboard.

2. Identification of all types of chip, ports, socket, slots etc.

3. Working Concept of Motherboard. Concept of RESET, READY, CLOCK Signal.

4. VRM Circuit- Overview, Tracing, Hot Testing, Shorting Problem in VRM Circuit, Troubleshooting, Internal Structure of VRM Chip, Volt Sense Circuit Concept, Programmable circuit, VID Concept.

5. RAM Supply: Identification of all Types of Desktop RAM, RAM Operating Voltage, RAM Supply Pin, All types of possible circuit of RAM Supply. Hot Testing.

6. Clock Generator Circuit: Identification of Clock Generator, Tracing, Use of Frequency Counter to measure Clock, Troubleshooting.

7. USB Port Circuit: USB Port Supply Pin Tracing, Data Pin Tracing.

8. Sound Circuit: Tracing, Supply Circuit of Sound Chip.

9. PS 2 Port Circuit: Pin Details of PS 2 Port, Supply Circuit, DATA and CLOCK Circuit.

10. SATA Port: Data Pin Tracing of Sata Port.

11. Sound Circuit – Tracing, Supply, Troubleshooting.

12. Standby Circuit: Standby Mosfet, Circuit tracing.

13. PCI Slot: Voltage, Data and Signal Testing.

14. Diagnostic Card: LED Status, Coding Concept

15. CRO Machine: Complete Operating of CRO for Voltage, Data and Signal Testing.

16. ROM Circuit: Identification of all Types of ROM, ROM Pin Details and Circuit Tracing.

17. ROM data and RAM Data: Data Testing on ROM and RAM Data Pin.

18. South Bride Supply Circuit.

19. Repairing of RAM.

20. PS ON and Trigger Circuit.

21. BIOS Programming by Mini and Universal BIOS Programmer.

22. How to Check CPU Socket by CPU Socket Tester.

5 : Laptop

Assembling and Dissembling of Laptop. Identification of all parts of Laptop. Identification and Function of all Ports and Socket of Laptop.

1. Volt in Circuit. Tracing and Troubleshooting.

2. VRM Circuit. Tracing and Troubleshooting.

3. Ram Supply Circuit. Tracing and Troubleshooting.

4. Step Down Circuit – 5 Volt and 3.3 Volt. Primary and Secondary Step down.

5. Battery Charging and Discharging Circuit. Tracing and Fault Finding.

6. Clock Generator Circuit.

7. Fan Controller Circuit.

8. USB Supply and Data Circuit.

9. SATA Supply and Data Circuit.

10. HDMI

11. LAN

12. AUDIO – Mike, Headphone and Internal Speaker Circuit Tracing.

13. E-Sata Port Circuit Tracing

14. CPU Thermal Circuit.

15. ROM – Identification of all types of ROM and Circuit Tracing.

16. Schematic Diagram – Laptop Motherboard Circuit Tracing through Schematic Diagram.

17. North Bridge Supply

18. South Bridge Supply

19. Graphics Chip Supply

20. Concept of PCH.

21. Keyboard and Touchpad Circuit.

22. Laptop BIOS Programming.

23. BGA Machine Operation, Chip Reballing.

24. How to Download BIOS File from Internet.

25. Laptop CPU Socket Details.

26. Password Removal Tips.

27. VGA Port.

28. Input Output Controller chip Connection Circuit,

29. Use of DC Supply Machine.

30. Laptop Display Assembly.

31. Concept of RESET.

32. Identification of all chip of laptop motherboard.

33. Common Faults of Laptop and Troubleshooting.

LAPTOP

• Introduction of Laptop, Comparison of various Laptop, Difference between Desktop & Laptop, Category of laptop

Adapter Section:

• Basic working idea, Block Diagram of Adapter, How to open Adapter, how to Check Input & Output, Fuse Capacitor, Rectifier, Diode, Transformer, Output etc.. Testing Point of Adapter, Basic Troubleshooting of Adapter, Difference Between original & china Adapter, Repairing Concept of Adapter.

Battery Stage:

• Basic Working Idea, Different Pin Detail & Testing, Block Diagram of Battery, Operating Battery, how to check cells, Charging Discharging battery cells, cell connection concept series, parallel, AMP volt series & parallel, EEPROM chip, chips circuit tracing, charging discharging mosfet, battery IC repairing concept of battery.

LCD:

• Basic working idea, rows, color, pixel, RGB, block diagram LCD TFT pin out detail, testing LCD with logic test, operating LCD panels, common problems, line of LCD repairing concepts, CCFL testing, changing of CCFL, different size of LCD, pin details of LCD, repairing concept of LCD identification of laptop sections: Identification of laptop sections, parts, slot & interface connector.

• Used of inverter, block and circuit diagram of inverter, DC in signals, pin details, VCC, basic problems, contrast, on, ground, AC output, Testing Inverter with direct power supply, MOSFET coil fuse of Inverter, Troubleshooting of inverter.

RAM:

• Types of RAM, pin detail of RAM, RAM EEPROM.

KEYBOARD/TOUCHPAD:

• Working details of keyboard and touchpad, row, column concept of keyboard, basic problems & solution of keyboard and touch pad.

LAPTOP MOTHERBOARD REPAIRING

• Block diagram of laptop & its description of al sections.

• Basic power signal details.

• Some important signals name and identify.

• Tracing different section of motherboard.

• Clock generator, CPU processor, CPU temperature Control, north bridge chips, graphics chips, south bridge chips, I/O chips.

• Ethernet chip, sound audio chip, PC card chip, PC card power supply chips, main power chips.

• Secondary power supply chips, power supply chips, CPU power supply chips, charge discharge chips.

• COM port chips, LCD backlight control, memory power supply, other common chipset, MODEM, mosfets used.

• Tracing different connectors and socket with pin out details.

• Volt in stage: Working of volt in section, testing & fault finding.

• VRM Stage: Working of VRM section (Voltage Regular Module) testing & fault finding (Control Circuit, Oscillator section sensor & VID selector stage.

• PCI Controller: Working of PC card controller stage, PC card socket & PCMCIA slot.

• Audio Section: Working of Audio section, testing & fault finding.

• DSP Stage: Working of DSP section (Digital Signal Processor), testing & fault finding.

Laptop chip Level Fault & Trouble shooting

• Laptop M/B DC to DC Conversion Voltage Generation Problems, main Power Supply short Problems, Diagnosis, isolation and solution.

• Laptop M/B Diagnosing, isolating problem between power and other sections, diagnosing the problem in systematic way or short cut way.

• Diagnosing and solve the critical problems like hanging, Battery not charging, Drives not detecting, K/B not detecting, AC Adapter not detecting and all other Semi working problems of the Laptops.

• Laptop Dim display problem isolating the problem between screen, inverter board and the main M/B.

• Laptop internal and external display Problem, difference and its fault finding.

• Laptop K/B problem, isolating the problem between K/B and M/B. finding the solution for it or keyboard connector pin details.

• Laptop USB Device not working problem, isolating the problem between power section and data section and its solution or pin details.

• Laptop drives (HDD/DVD) not detecting problems and drives pin details in the M/B's, checking points and solution.

• Laptop Network port problem, isolating the problem between port and network IC. Its pin details and solution.

• Laptop display screen working technology, isolating the problem between screens, cable, M/B. further isolating the problem between power and logic section in the M/B.

• Understanding of stand by voltages and its requirement in the laptop M/B.

• BIOS up gradation using different methods.

• Laptop password Break of different method, its storage and removal steps.

• Laptop adapter working technology and its fault finding.

• Laptop Battery Refurbish technology.

• Laptop sound problem. Isolating the problem between sound jeck, sound Ic, component and its fault finding.

• Touch pad not work problem. Isolating the problem between Touchpad, cable, I/O, SMD component and its solution or pin detail.

• Camera not open problem. Isolating the problem between cameras, cable, IC's and its fault finding or pin detail.

• Usage of Digital and analog CRO and its importance in fault finding

• Mini PCI slot, LAN IEEE 1394, audio connection, modern Acc, RTL, I/O controller KBC, CD Rom connection, HDD connection, VGA connection, key board connection, touch pad connection, power board DVD panel top.

• Understanding laptop power stages.

CLOCK GENERATOR CIRCUITS

• Clock working details.

LPT, PCI Post Error Code

• Finding fault using post debug card

6: POWER SUPPLY TO DIFFERENCE CHIPS VCC CORE, 5VSUS,3V,1.5V,1.8VSUS,5V,2.5V

- 1ST Power stage primary 5v,3v (always on)
- 2nd power stage secondary 2.5v 1.5v 1.8v
- 3rd power stage VRM CPS CORE 1.3v
- Battery Charging/Discharging Section

7:BIOS CHIPS SECTION,

- Update Bios Method USB – EXE
- BIOS working details

8: TESTING MOTHERBOARD USING MULTIMETER/CRO

- CPU CORE VOLTAGE, VID SIGNALS, VRM SECTION, MOSFET OF VRM
- POWER GOOD, RESET, CLOCK, BIOS SIGNALS
- HOW TO READ DIFFERENT COMPONENT DATASHEET
- BASIC CLEANING AND WASHING METHOD OF MOTHERBOARD
- SMD COMONENT PRACTICE REMOVING AND INSERTING DIFFERENT COMPENETS.

9: USING BGA MACHINE

- Training using BGA soldering station
- Removing BGA chips and Reballing it using Reball Steneil.

ICS REBALLING, BGA BALL ARRANGEMENT, PRACTICE

- Two methods 1 by applying balls with help of BGA station.
- 2nd applying liquid paste and heat with BGA blower.

BIOS PASSOWRD RESETTING

- IBM Dell etc. password removing steps.
- SEARCHING DATA SHEET OF DIFFERENT ICS.
- COMMON PROBLEM OF DIFFERENT MOTHERBOARD
- Common fault details.

10: PRACTICE WITH DEVICE

IC removing practice, component practice, BGA infra re machine, removing chip to reball, reballing chip using different method, BGA ball arrange, BGA soldering station, using liquid paste, solder bath tub, removing sockets, connectors.

Thanks And Regards

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