

## **Theory of Operation**

### **\*Description of Circuit Operation**

- Freesia comprises three different functional boards which are main, audio, and CF boards. The following is technical concise theory of each board.

#### **\* Main Board**

- CPU (PXA250) controls system bus which controls SDRAM, SA1111, SNAKE (Nand Flash Controller), EPSON(LCD/CRT controller), AC97, etc.

- External I/O of FREESIA main board consist of USB host port, cradle port [ USB client, CRT I/F, Cradle I/F, Debug UART I/F], external battery connector, DC in jack and reset switch.

- Internal I/O of FREESIA main board consist of CF board Interface connector(100Pin B to B), audio board Interface connector(27 Pin FPC), LCD connector(60 Pin FPC), WLAN module connector(10 Pin B to B), LED backlit connector(4 pin FPC), external keyboard interface connector(10 Pin B to B) and external battery detecting switch.

- The CPU and SNAKE control Nand Flash Memory which is in CF board. This re-writable memory holds operation system (WinCE OS).

- The SA1111 chip consists of two different buffers, one is connected with Wireless LAN module and the other one is connected with CF slot. The CF slot can be used as optional CDMA, memory, CF camera, GPS, etc.

- The EPSON chip controls LCD and CRT and timing generation. The TFT LCD (800\*480, 16bit) is connected by 60pin connector with FPC.

- The CPU also controls keyboard by using UART. The external

keyboard is connected to the main board by 4pin FPC connector.

- The CPU regulates AC97 which controls audio codec, ADC, and TSP interface. The detailed audio part will be explained later.

- In addition, the CPU acts also as USB Client controller that uses 18pin interface connector to synchronize with PC.

- The main board also consists of power unit. The freesia set has an internal battery and external battery. The power unit will be explained later too.

#### **\* Audio Board**

- The main chipset, AC97, is connected to the main board with 27pin FPC. The audio board also has 4pin connector for TSP. These signals are controlled by AC97 chipset.

- Audio board has one power key, one hold key, application keys, and five directional keys to operate the system. These keys are controlled by AC97.

- The audio board is connected to the main board by 27 pin connector and a FPC.

#### **\* CF Board**

- Main technical importance of the CF board is to store WinCE image into 64MB Nand Flash ROM and a connection of Compact Flash type.

- This CF Board is controlled by SA1111 and CPU.

- The CF board is connected to the main board by 100 pin connector.

**\* Power system in main board**

- The power can be supplied by internal or external battery and DC supply. The main VDC generates several different voltages which are 1.1V, 5V, 3.3V, 16V, 3V, etc.

- The generated 1.1V is used for CPU core.

- The power of 5V is used for USB connector option pack using MIC2025 and CF card.

- The 3.3V of power is used as VSTANBY and VCC3 and so on. These power supports power of CPU, Flash ROM, WLAN, and etc.