



i.MX51L + 8"LCD Development Platform Introduction





Please visit the following website for more information:

--- i.MX51L: based on i.mx51 with Linux OS development platform:

http://www.yuan-ying.com/product_catalog/i.MX51L.htm

--- i.MX51W: based on mx51 with Wince6.0 OS development platform:

http://www.yuan-ying.com/product_catalog/i.MX51W.htm

--- i.MX51A: based on i.mx51 with Android2.2 OS development platform:

http://www.yuan-ying.com/product_catalog/i.MX51A.htm

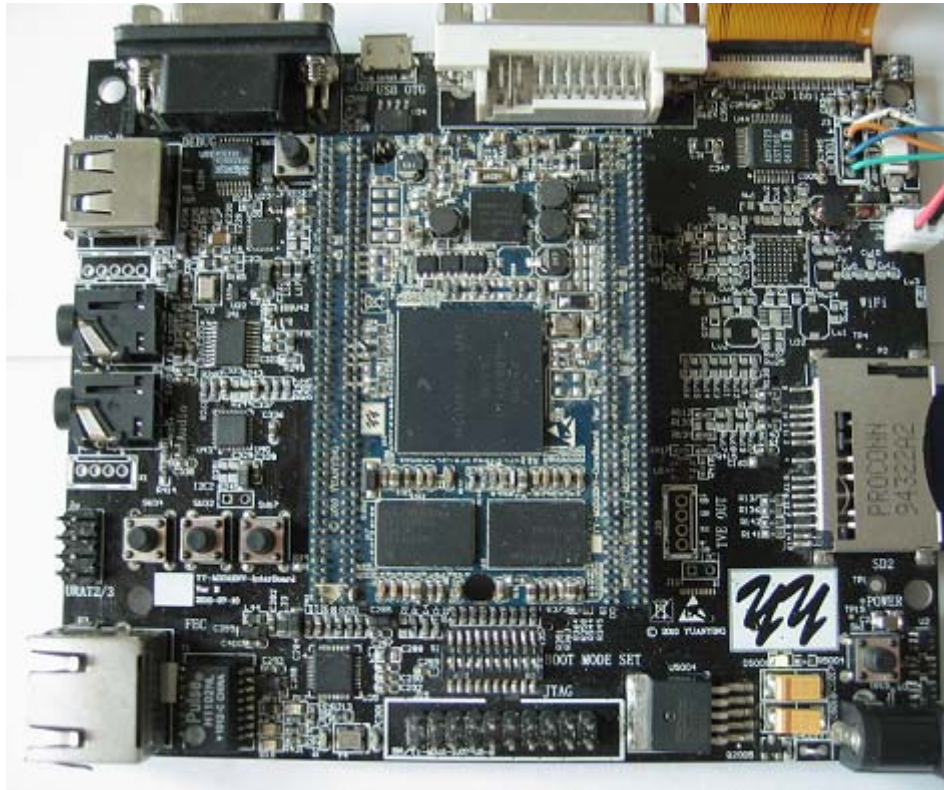
--- i.MX51U: based on i.mx51 with Ubuntu OS development platform:

http://www.yuan-ying.com/product_catalog/i.MX51U.htm





◆ System Introduction:



Starting from Oct., 2009, Yuan-ying Technology invest to design MX51 platform, by now we have successfully launched i.MX25 and i.MX35 development platform and the related turn key solution. To meet the market demand and the end user request, Yuan-ying Technology has launched MX51 Linux OS development platform --- i.MX51L.

The i.MX51 processor is based on an ARM Cortex A8 as core architecture (with Trust Zone), CPU frequency is 800M~1Ghz, own 32 Kbyte L1 Instruction Cache and 32 Kbyte L1 Data Cache, also 256 Kbyte L2 Cache as well. Integrate Neon Coprocessor to enhance its Vector floating point operation ability. To boost multimedia performance, the following hardware accelerators are integrated: VPU – Video processing unit, IPU – Image processing unit, GPU 3D – Graphic Processing Unit (OpenGL ES 2.0 AMD Z430) and GPU 2D – Graphic Processing Unit (OpenVG1.1 AMD Z160). Support multiple format of HD720P video decode and multiple format of D1 video encode, also support 720P/1080i CVBS analog video signal output directly. Take advantage of DVFS (Dynamic Volt Frequency Scaling) and Smart Speed technology for smart power management, At the equal performance condition, which can run at the lower power consumption, and further reach great multimedia result.

i.MX51L is an Linux Platform EVK based on Linux-2.6.31 kernel , and adopt ext2 file system, designed by Yuan-ying Technology. i.MX51L own plateful peripheral interface, such as



USB HOST, USB OTG, TVE Output, DVI, VGA, LVDS, TFT LCD, SDIO and so on, i.MX5L is widely applied various field, including: Consumer Electronic/Automotive Infotainment, industrial computer and industrial control. Which is the most suitable platform for tablet/Smart Book, Smartphone, MID, E-book, Digital Picture Frame, Home Media Terminal, V2IP, Car Multimedia, Industrial Computer, Factory Automation, HMI design. Customer can only focus on the application software design, and largely shorten the time to market cycle.

◆ **Hardware Brief**

CPU Processor

- ※ **i.MX51**
- ※ **ARM Cortex A8 800M~1GHz**
- ※ **32 Kbyte L1 Instruction Cache and 32 Kbyte L1 Data Cache 256K L-2 Cache**
- ※ **256 Kbyte L2 Cache**
- ※ **NEON Coprocessor for VFPU**
- ※ **Hardware Graphic Accelerator OpenGL ES 2.0 --- 3D**
- ※ **Hardware Graphic Accelerator OpenVG 1.1 – 2D**
- ※ **VPU/IPU for Video Procession Unit and Image Processing Unit**

Memory

- ※ **RAM: 512MB DDR2 (128MB X 4)**
- ※ **Nor Flash: 4MB SPI (For Boot)**
- ※ **NAND/Nor Flash**

Peripheral Interface

- ※ **USB Interface: HS USB OTG, up to 480 Mbps, Integrated USB Phy, HS USB Host**
- ※ **SD: Two SD card slot (one of it for system boot)**
- ※ **FEC: 10/100M Ethernet**
- ※ **UART: UART Connector for debug using**

A-V output

- ※ **LCD: 7" or 8" TFT LCD display interface**
- ※ **DVI: DVI 720P video output interface, also support VGA display connector**
- ※ **Audio-In: MIC-in /LINE-in**
- ※ **Audio-Out: Line out / Headphones**

Clock and Power Supply

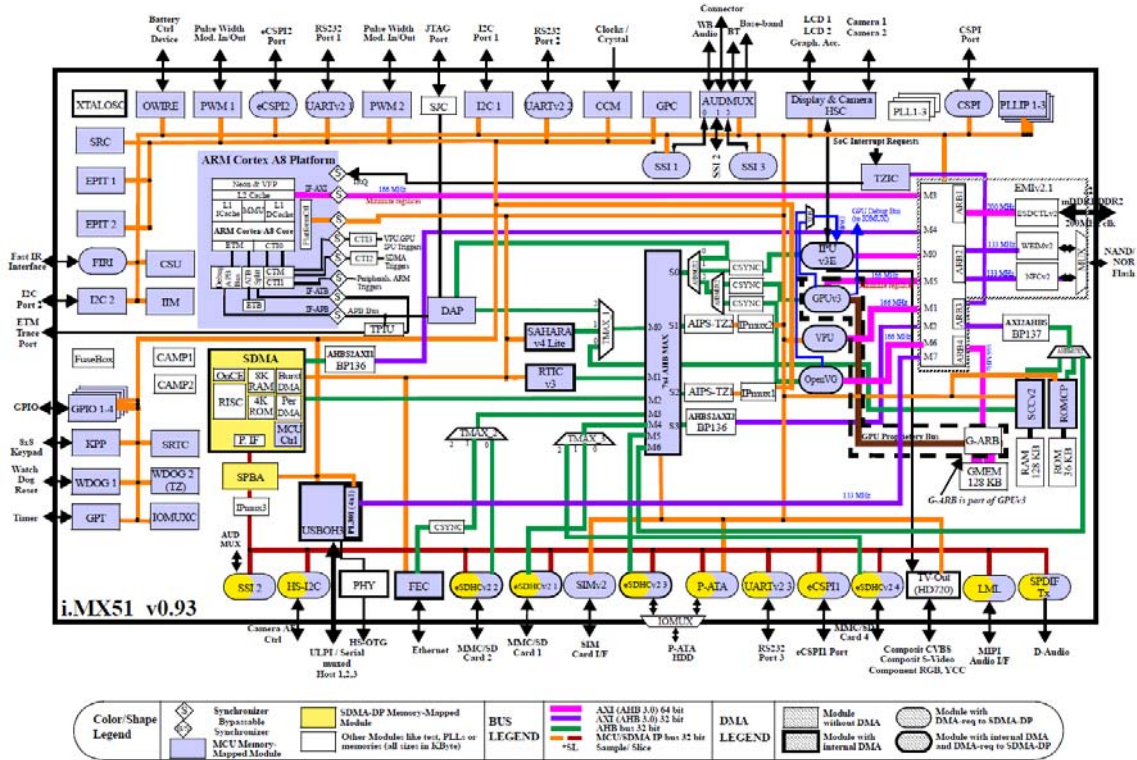
- ※ **RTC: External clock, real time clock supported**
- ※ **Power Supply: 5V, 2A output**



PCB Board Structure and Size

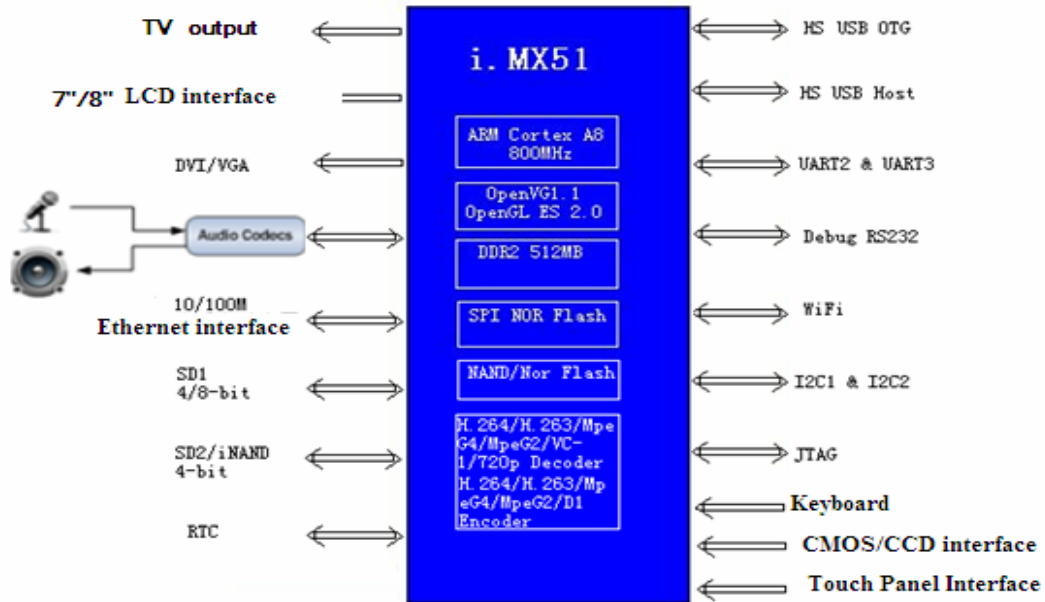
- ✧ Bottom Board: 11cm x 12cm two layers PCB
- ✧ Core System Board: 4cm x 6.5cm 6 layers PCB

◆ i.MX51 SOC Architecture





◆ System Block Diagram

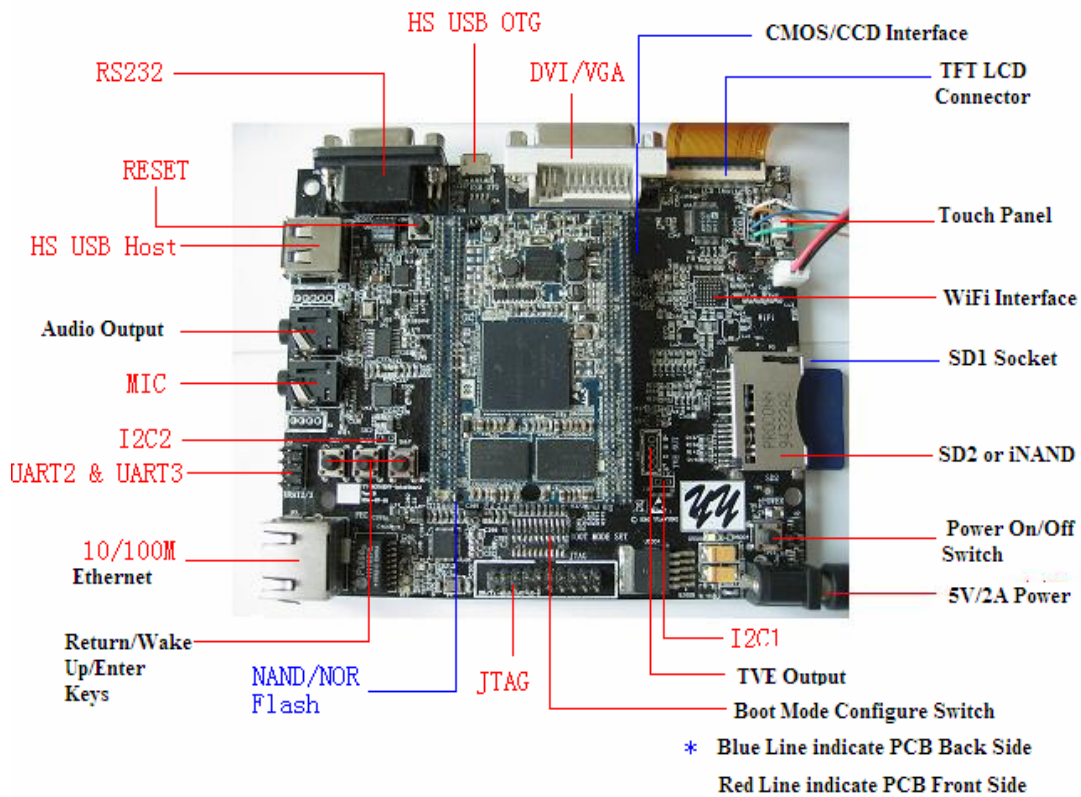


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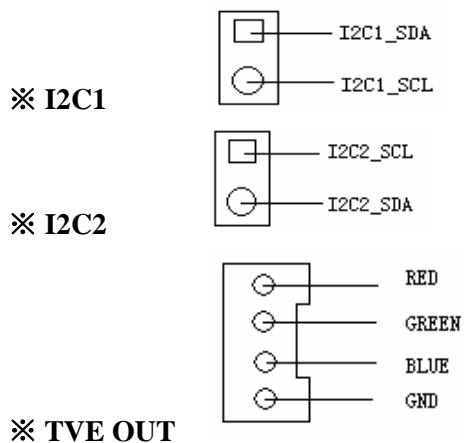
- Regarding TFT LCD, customer can select one of 7" and 8"
- WiFi is an option selection for customer selection
- Touch Panel: customer can select the resistance touch panel or capacitor touch panel
- One of SD1 or iNAND Flash is available



◆ Board External Connection:



◆ The related port definition:





◆ **BOOT mode selection:**

	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Position 7	Position 8	Position 9	Position 10
	BOOT_MODE[1:0]	BT_BUS_WIDTH	BT_MEM_TYPE[1:0]	BT_SRC[0]	BT_MEM_CTL[1:0]	LID_CLOSE_B	PWR_BYP			
SPI-NOR	0	0	1	1	1	0	1	1	X	X
MMC-1	0	0	0	0	0	0	1	1	X	X
MMC-2	0	0	0	0	0	1	1	1	X	X
UART-1	1	1	0	0	0	0	1	1	X	X
USB-OTG	1	1	0	0	0	0	1	1	X	X

◆ **Linux BSP**

Bootloader

Redboot	Support SD card upgrade Kernel and file system, via FEC download Kernel and file system
U-boot	Support SD card upgrade kernel and file system, via FEC network download kernel and file system

Linux Kernel

Linux 2.6.31

System Driver:

FEC Driver	Ethernet driver
USB OTG Driver	USB OTG Driver
USB Host Driver	USB Host driver code
UART Driver	Serial port driver code
Audio Driver	Audio codec driver
IPU Driver	IPU Driver code
VPU Driver	VPU Driver code
GPU Driver	GPU driver code
Camera Driver	Camera driver code
MMC/SD/SDIO Driver	MMC/SD/SDIO driver code
SPI Driver	SPI ROM driver code
TV driver	TVE driver code
I2C Driver	I2C Driver code
1-Wire	1-Wire driver code
PMIC Driver	Power management IC MC13892 Driver code
RTC Driver	RTC driver code
WDOG Driver	Watch dog driver code
PWM Driver	PWM driver code

Multimedia Supporting:



Video Decoding	<ul style="list-style-type: none">● MPEG4 decode: 720p,30fps● H.264 decode: 720,30fps● H.263 decode: 720,30fps● VC-1 decode: 720,30fps● MPEG-2 decode: 720,30fps● MPRG decode: 720p,30fps● Divx decode: 720p,30fps
Video Encoder	<ul style="list-style-type: none">● MPEG-4 encode: D1,25/30fps● H.263 encode: D1, 25/30fps● H.264 encode: D1, 25/30fps● MJPEG encode: baseline mode
Image Decoding	BMP Decode, GIF Decode, JPEG Decode, PNG Decode, JPEG Encode
Audio Encoding	MP3/WMA/SBC

※ **i.MX51 Linux EVK basic package**

- ① i.MX51 Linux EVK board, 1
- ② 7" LCD, 1
- ③ 4G SD card, 1/demo inside
- ④ RS232 data line, 1
- ⑤ USB data line, 1
- ⑥ 5V 2A power supply, 1
- ⑦ Document CD, 1
- ⑧ Hardcopy for EVK brief, 1

※ **i.MX51 Linux EVK Document list**

- ① i.MX51 data sheet, 1
- ② EVK reference schematic (PDF, 1)
- ③ EVK hardware manual, 1
- ④ EVK Linux BSP user manual, 1
- ⑤ i.MX51 Linux guideline, 1

