



i.MX53 Android Embedded System Platform





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:

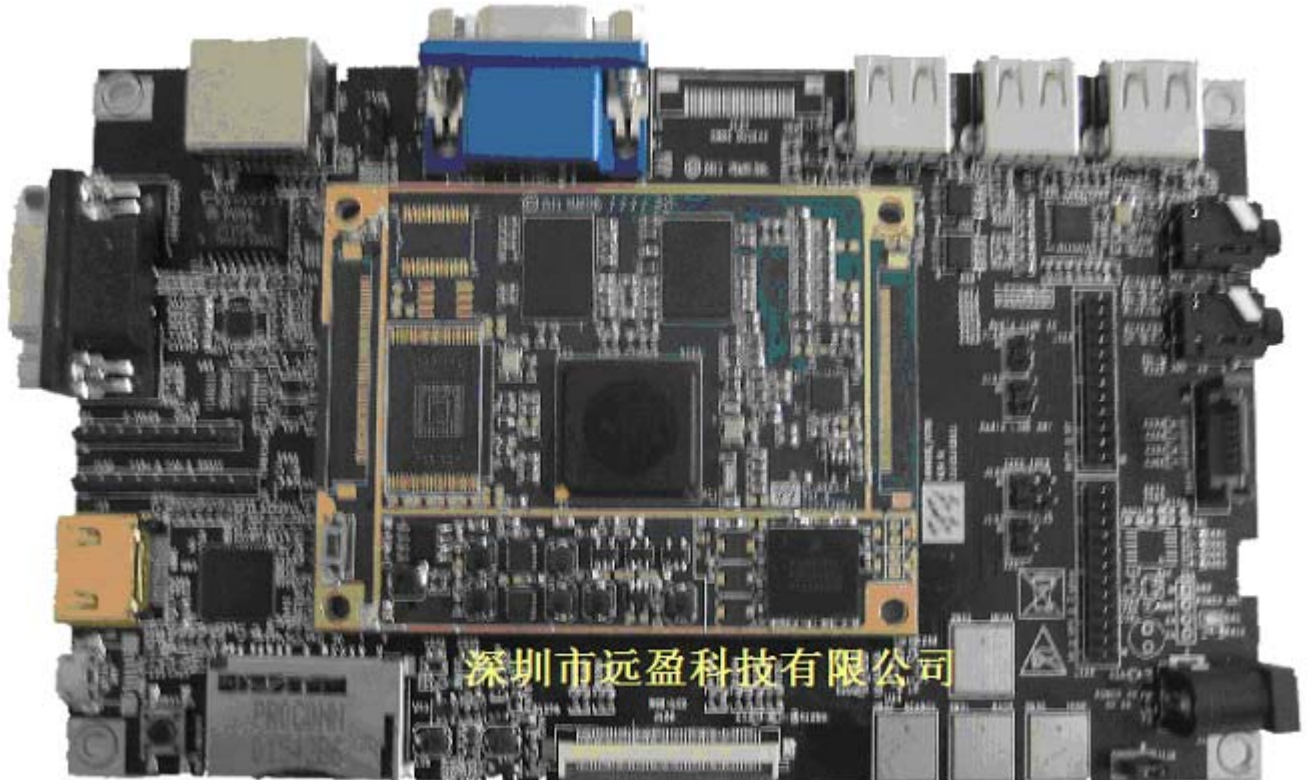
http://www.yuan-ying.com/product_catalog/i.MX51A.htm

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

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



◆ System Introduction:



Yuanying Tech is one advanced technical company, in past few year we focus on embedded system solution offering, from low end to high end. Our platform including MX25, MX28, MX35 and MX51. From Nov of last year, Yuanying Tech. have started to design MX53 platform based on Linux OS. Now, we have successfully finished this project and launched MX53 Android2.3 embedded system platform --- YY- i.MX53A.

i.MX53 is Soc processor based on an ARM Cortex A8 as core architecture (with Trust Zone), CPU frequency up to 1Ghz ~1.2Ghz, own 32 Kbyte L1 Instruction Cache and Data Cache, and 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 HD1080P video decode and multiple format of 720P video encode, also support 1080P TV analog video signal output directly. Dual camera CSI interface and dual display interface largely enhance MX53 application field. By means of DVF and Smart Speed technology for smart power management, At the equal



performance condition, which can run at the lower power consumption, and perform the great multimedia result.

MX53A is an Android System Platform based on Android2.3, adopt ext2 file system, designed by Yuanying Technology. i.MX53A own plentiful peripheral interface, such as USB HOST, USB OTG, TVE Output, DVI, VGA, LVDS, Camera CSI input, SDIO and so on, i.MX53L is widely applied various field, including: internet multimedia center/Automotive Infotainment, thin client machine(cloud computer), MID, Home Media Terminal, V2IP, Factory Automation, TV STB, etc. The dual display feature is the most suitable platform for education equipment. Customer need only focus on the application software design, and largely shorten the time to market cycle.

Also, Yuanying offers the mini system board sale alone, to speed up end customer project design.

◆ Hardware Brief

CPU Processor

- MX535/6
- ARM Cortex A8 1~1.2GHz
- 32 Kbyte L1 I-Cache and D-Cache, 256K L-2 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: 1GB DDR3 (256MB X 4)
- NAND Flash: 2GB
- SD card or NAND Flash boot

Peripheral Interface

- USB Interface: 1 x HS USB OTG, up to 480 Mbps, Integrated USB Phy, 3 x HS USB Host
- SD: Two SD card slot (one of it for system boot)
- FEC: 10/100M Ethernet with IEEE 1588 QUICC engine
- UART: 5 x UART Connector
- PATA with U-DMA mode 5 and SATA II supported
- 2 x CAN interface and MLB interface
- 3x I2S/SSI/AC97 interface

A-V output

- LCD: 7" LVDS 1024X600
- VGA/HDMI interface
- LVDS: support dual LVDS display the same time (default one 7" LVDS panel)



- 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

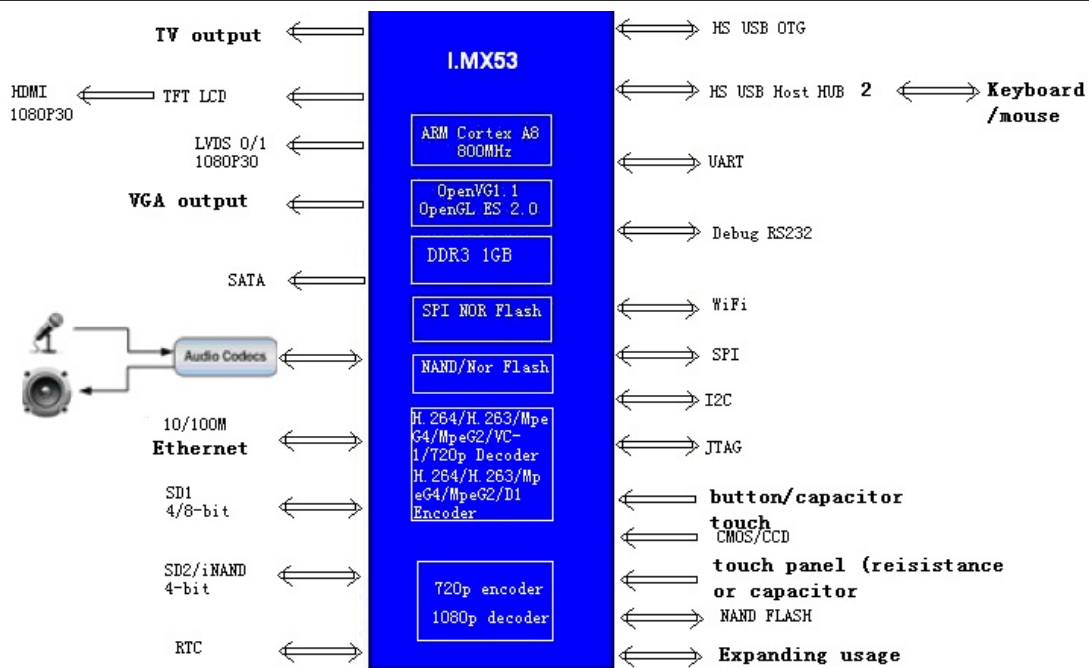
Wireless Communication

- Wifi: 802.11 b/g/n (option)
- 3G: WCDMA (optional for customer)

PCB Board Structure and Size

- Bottom Board: 10cm x 16.5cm 2- layers
- Mini System Board: 8cm x 6cm 6- layers

◆ System Block Diagram

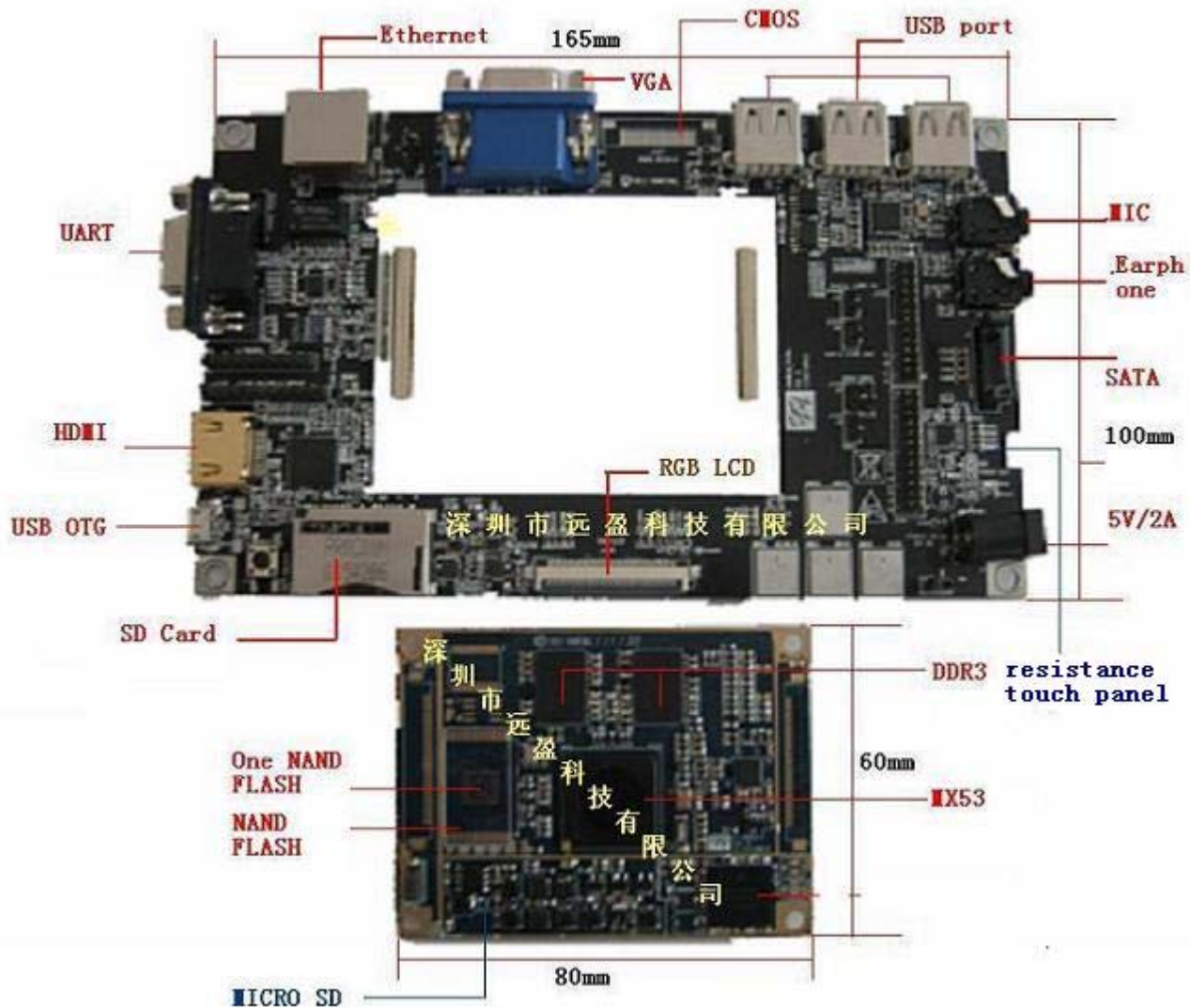


Note:

- 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:



◆ BOOT mode selection:

SW26	7	6	5	4	3	2	1
	BOOT_CFG1 [6]	BOOT_CFG1 [5]	BOOT_CFG1 [4]	BOOT_CFG1 [3]	BOOT_CFG2 [7]	BOOT_CFG2 [6]	BOOT_CFG2 [5]
Serial-ROM	0	1	1	Serial ROM select: 0 - I2C 1 - SPI	Reserved	Reserved	SPI Addressing: 0 - 2-bytes (16-bit) 1 - 3-bytes (24-bit)
SD/eSD	1	0	Fast Boot: 0 - Regular 1 - Fast Boot	Reserved	Reserved	Reserved	Bus Width: 0 - 1-bit 1 - 4-bit
MMC/eMMC	1	1	Fast Boot: 0 - Regular 1 - Fast Boot	Reserved	Bus Width: 000 - 1-bit 001 - 4-bit 010 - 8-bit 101 - 4-bit DDR (MMC 4.4) 110 - 8-bit DDR (MMC 4.4) Else - reserved.		
HD	0	1	0	HD Type: 0 - PATA 1 - SATA	Reserved	Reserved	Reserved



SW28	8	7	6	5
	BOOT_CFG3 [5]	BOOT_CFG3 [4]	BOOT_CFG3 [3]	BOOT_CFG3 [2]
Serial-ROM	Port Select: 00 - I2C1 / eCSP11 01 - I2C2 / eCSP12 10 - I2C3 / CSPI 11 - Reserved		CS select (SPI only): 00 - CS#0 (default) 01 - CS#1 10 - CS#2 11 - CS#3	
SD/eSD	Port Select: 00 - eSDHC1 01 - eSDHC2 10 - eSDHC3 11 - eSDHC4		Reserved	Reserved
MMC/eMMC	Port Select: 00 - eSDHC1 01 - eSDHC2 10 - eSDHC3 (eMMC4.4) 11 - eSDHC4		DLL Override: 0 - Boot ROM default. 1 - Apply value per fuse field MMC_DLL_DLY[3:0]	Reserved
HD	Reserved	Reserved	Reserved	Reserved

◆ 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 2.6.35

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 Decoder	<ul style="list-style-type: none"> ● MPEG4/Xvid: 1080p,30fps, AP/ASP profile, 40M bit rate ● H.264: HD1080p,30fps, BP/MP/HP profile, 40M bps bit rate ● H.263: HD1080p,30fps, P0/P3 profile, 40M bps bit rate ● VC-1/WMV9: HD1080p,30fps,SP/MP/AP profile, 40M bps bit rate ● MPEG-2: HD1080p,30fps, Main-high profile,40M bps bit rate ● Divx3/4/5/6 : HD1080p,30fps, HT/HD profile, 40M bps bit rate ● RV10: HD1080p,30fps, 8/9/10 profile, 40M bps bit rate ● MJPEG decode: 8Kx8K,baseline, 40M bps bit rate
Video Encoder	<ul style="list-style-type: none"> ● MPEG-4 encode: 720p,30fps, simple, 20M bps bit rate ● MPEG-2 encode: 720p,30fps, main-main, 20M bps bit rate ● H.263 encode: 720p, 30fps, P0/P3 profile, 20M bps bit rate ● H.264 encode: 720p, 30fps, baseline, 20M bps bit rate ● MJPEG encode: baseline mode
Image Decoding	BMP Decode, GIF Decode, JPEG Decode, PNG Decode, JPEG Encode
Audio Encoding	MP3/WMA/SBC

※ **i.MX53 Linux EVK basic package**

-
- ① i.MX53 Linux EVK board, 1
 - ② 7" LCD LVDS1024X600, 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.MX53 Linux EVK Document list**

-
- ① i.MX53 data sheet, 1
 - ② EVK reference schematic (partial)
 - ③ EVK hardware manual, 1
 - ④ EVK Linux BSP user manual, 1
 - ⑤ i.MX53 Linux guideline, 1