
MV V210 CPU Module Hardware Specification Brief

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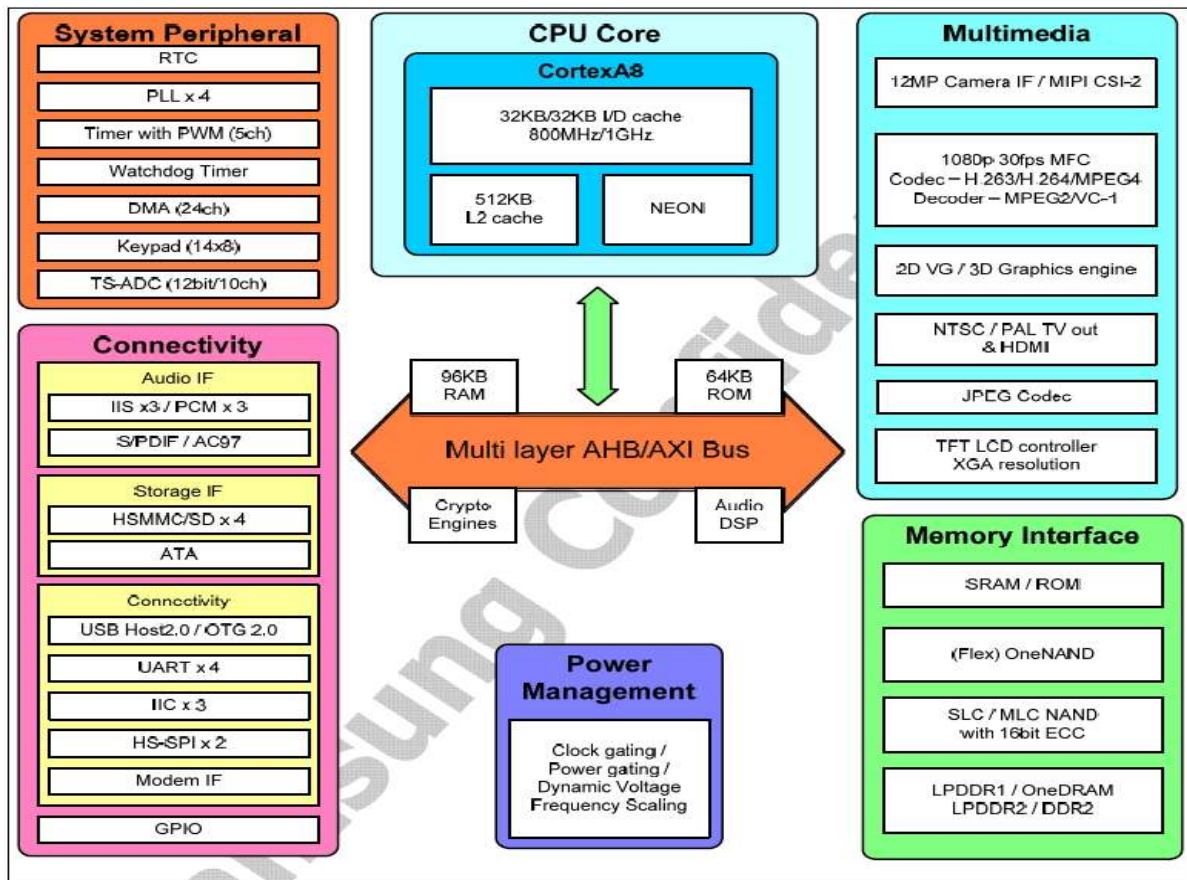
1. MV V210 CPU Module 소개

본 제품은 Samsung S5PV210 Cortex-A8 32Bit RISC Processor CPU를 기반으로 DDR2 Memory 및 Nand Flash, Power PMIC로 구성 된 Total Embedded Solution Board이다.

기본적으로 ARM사의 Cortex-A8 Core를 채택한 CPU로 제작된 CPU Module이기 때문에 기존에 ARM9, ARM11기반의 Binary Compatibility를 제공 해 주면서 Single-Core로써는 최고인 1GHz까지의 CPU 구동 Clock Frequency 성능과 Internal 64bit Bus구조를 가진 제품이다.

MV V210 CPU 보드는 이러한 Cortex-A8 코어를 내장한 S5PV210 CPU의 모든 기능을 확장해서 구현할 수 있도록 거의 모든 Peripheral Pin을 Connector로 Pin OUT하여 설계 되어 있다. 즉, USB Host2.0, USB Client 2.0 과 기본적으로 내장된 HD급, Multi-Format Codec 1080p@30fps MPEG2/4, H.264/H.263, VC-1, XviD등이 지원되는 것은 물론이고, TV-OUT, HDMI1.3, Camera interface, LCD 24bit interface, MiPi CSI 및 DSI가 가능하게 되어 있다. 또한 400MHz DDR2 까지 지원하는 SDRAM 인터페이스를 CPU모듈에 내장하고 있으며, 물리적 사이즈는 512MB의 메모리를 장착하고 있다.

CPU 내부구조



2. MV V210 CPU 모듈 제품 사양

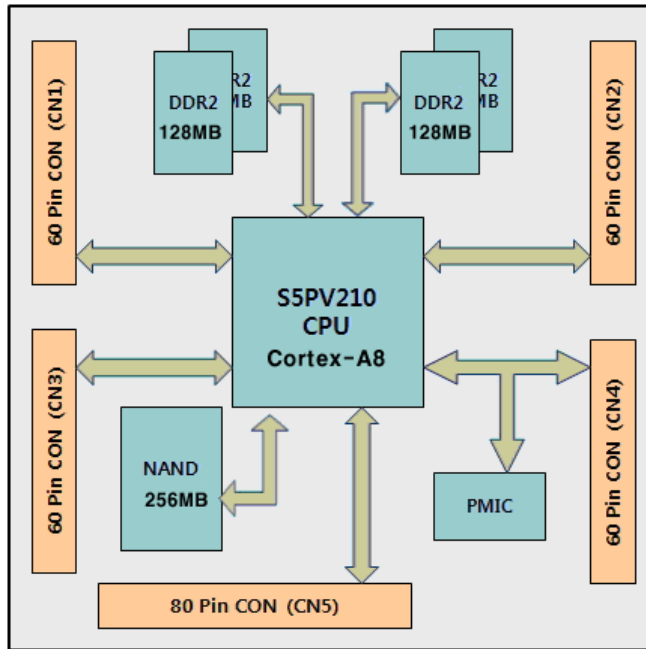
ITEM	Specification	Description
CPU	S5PV210	ARM Cortex A8 Core base CPU 32/32KB/ I/D Cache, 512KB L2 Cache 800Mhz/1Ghz Operating Frequency 0.65 ball pitch, 584-FCFBGA, 17mm x 17mm
Main Memory	DDR2	M1 Port : 256MB (64M x 16 x 2개) M2 Port : 256MB (64Mx 16 x 2개) 200Mhz System Bus Clock, 84ball FBGA
FLASH	NAND	256MB 이상(48-TSOP), 용량 확장 가능 (optional)
PMIC	MAX8698C	Step-Down Convertor 3 Port, 9-LDO 제공 1 Back up Battery Charger 1-Cell Battery Power input 가능 42-Pin 3.53mm x 3.53mm WLP Package
Connector A	LWBS008-60C-3.0H	240 pin (0.8mm pitch 60pin x 4)
Connector B	LWBS008-80C-3.0H	80 pin (0.8mm pitch 80pin x 1)
Dimension	(L x W x T)	60mm x 60mm x 1.2mm, Connector 장착 시 보드 Main CPU 모듈 과 Beas 보드 높이 4mm.
PCB 사양		8-Layer, Build-Up

※ OS: Windows CE 6.0 / Linux 2.6.x / Android 2.3 포팅 지원

- CPU가 제공하는 모든 기능 구현 가능하도록 확장 커넥터 제공
- 응용분야: NAVI/DMB, 모바일제품/PMP, 지능형로봇, 홈네트워크, 첨단의료기기, 보안시스템, 시스템제어, 자동화 단말기, 산업제어 및 기타.

3. MV V210 CPU모듈 Block Diagram

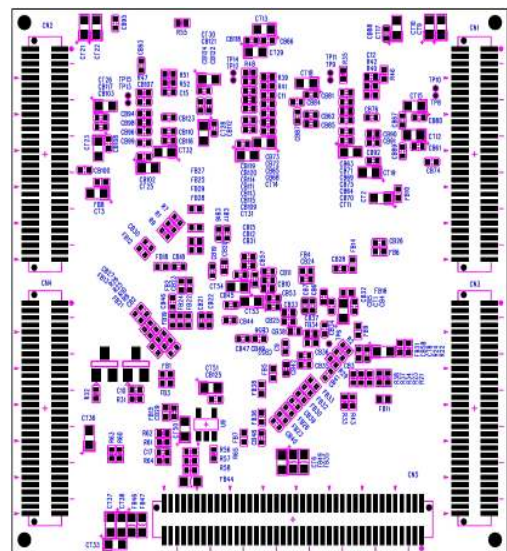
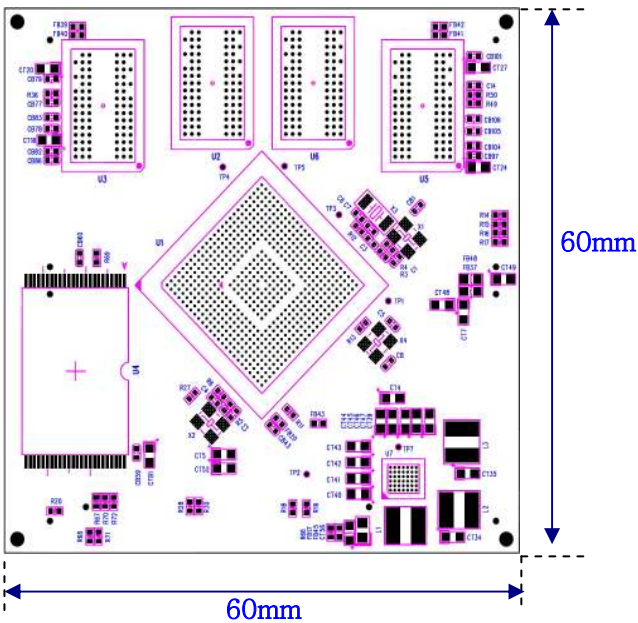
본 제품은 CPU보드에 DDR2 메모리, NAND Flash Memory, PMIC를 제외한 나머지 모든 기능을 BASE 보드에서 구현 할 수 있도록 board connector형태로 만들어져 있다. 아래 그 Block Diagram을 간단히 예시 한다.



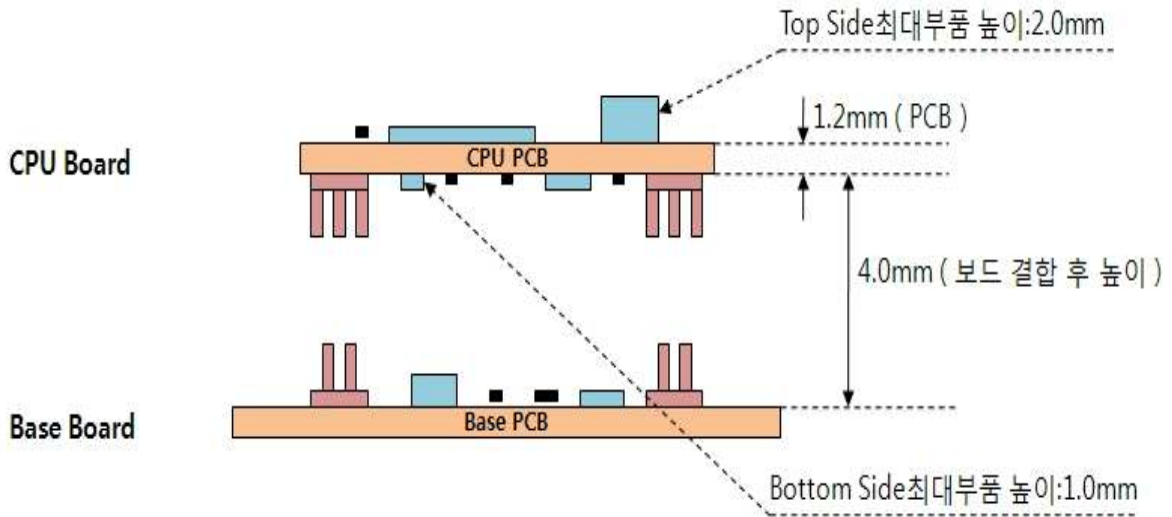
MV V210 CPU Module Block Diagram

TOP Side Image

Bottom Side Image



CPU Board – Base Board 조립 구조



4. Board Connector Pin Map

CN1								
기능	핀 이름	GPIO	핀 번호		GPIO	핀 이름	기능	
SPI 0	XspiMOSI0	GPB3	2	1	GPB7	XspiMOSI1	SPI 1	
	XspiMISO0	GPB2	4	3	GPB6	XspiMISO1		
	XspiCSn0	GPB1	6	5	GPB5	XspiCSn1		
	XspiCLK0	GPB0	8	7	GPB4	XspiCLK1		
PWM	XpwmTOUT3	GPDO_3	10	9	GPA0_0	XuRXD0	UARTs	
	XpwmTOUT2	GPDO_2	12	11	GPA0_1	XuTXD0		
	XpwmTOUT1	GPDO_1	14	13	GPA0_4	XuRXD1		
	XpwmTOUT0	GPDO_0	16	15	GPA0_5	XuTXD1		
GND	GND	GND	18	17	GPA0_2	XuCTS0		
MMC1	Xmmc1CDn	GPG1_2	20	19	GPA0_3	XuRTSn0		
	Xmmc1CMD	GPG1_1	22	21	GPA0_7	XuRTSn1		
	Xmmc1CLK	GPG1_0	24	23	GPA0_6	XuCTS1		
	Xmmc1DATA3	GPG1_6	26	25	GND	GND	GND	
	Xmmc1DATA2	GPG1_5	28	27	GPG3_6	Xmmc3DATA3	MMC3	
	Xmmc1DATA1	GPG1_4	30	29	GPG3_5	Xmmc3DATA2		
	Xmmc1DATA0	GPG1_3	32	31	GPG3_4	Xmmc3DATA1		
Xmmc0DATA3	GPG0_6	34	33	GPG3_3	Xmmc3DATA0			
Xmmc0DATA2	GPG0_5	36	35	GPG3_2	Xmmc3CDn			
MMCO	Xmmc0DATA1	GPG0_4	38	37	GPG3_1	Xmmc3CMD		
	Xmmc0DATA0	GPG0_3	40	39	GPG3_0	Xmmc3CLK		
	Xmmc0CMD	GPG0_1	42	41	GPG0_2	Xmmc0CDn	MMCO	
	Xmmc0CLK	GPG0_0	44	43	GND	GND	GND	
	GND	GND	GND	46	45	GPJ4_1	XmsmWEn	CF
	XmsmREn	GPJ4_2	48	47	GPJ4_4	XmsmADVn		
XmsmCSn	GPJ4_0	50	49	GPJ4_3	XmsmIRQn			
XmsmDATA14	GPJ3_6	52	51	GPJ3_7	XmsmDATA15			
XmsmDATA12	GPJ3_4	54	53	GPJ3_5	XmsmDATA13			
XmsmDATA10	GPJ3_2	56	55	GPJ3_3	XmsmDATA11			
XmsmDATA8	GPJ3_0	58	57	GPJ3_1	XmsmDATA9			
XmsmDATA6	GPJ2_6	60	59	GPJ2_7	XmsmDATA7			

CN2							
기능	핀 이름	GPIO	핀 번호		GPIO	핀 이름	기능
BOOT Mode	XOM1	ETCO_1	2	1	GND	GND	GND
	XOM2	ETCO_2	4	3	ETCO_4	XOM4	BOOT
	XOM3	ETCO_3	6	5	ETCO_5	XOM5	Mode
인터럽트 Key-matrix	XEINT3	GPH0_3	8	7	GPH0_2	XEINT2	인터럽트 Key-matrix
	XEINT5	GPH0_5	10	9	GPH0_6	XEINT6	
	XEINT7	GPH0_7	12	11	GPH1_0	XEINT8	
	XEINT9	GPH1_1	14	13	GPH1_2	XEINT10	
	XEINT11	GPH1_3	16	15	GPH1_4	XEINT12	
	XEINT16/KP_COL0	GPH2_0	18	17	GPH1_5	XEINT13	
	XEINT17/KP_COL1	GPH2_1	20	19	GPH2_3	XEINT19	
	XEINT21/KP_COL5	GPH2_5	22	21	GPH2_4	XEINT20/KP_COL4	
	XEINT23/KP_COL7	GPH2_7	24	23	GPH2_6	XEINT22/KP_COL6	
	XEINT25/KP_ROW1	GPH3_1	26	25	GPH3_0	XEINT24/KP_ROW0	
	XEINT27/KP_ROW3	GPH3_3	28	27	GPH3_2	XEINT26/KP_ROW2	
	XEINT29/KP_ROW5	GPH3_5	30	29	GPH3_4	XEINT28/KP_ROW4	
XEINT31/KP_ROW7	GPH3_7	32	31	GPE3_6	XEINT30/KP_ROW6		
Camera	XciFIELD	GPE1_4	34	33	GPE1_3	XciCLKend	Camera
	XciPCLK	GPE0_0	36	35	GPE0_1	XciVSYNC	
	XciHREF	GPE0_2	38	37	GPE0_3	XciYDATA0	
	XciYDATA1	GPE0_4	40	39	GPE0_5	XciYDATA2	
	XciYDATA3	GPE0_6	42	41	GPE0_7	XciYDATA4	
	XciYDATA5	GPE1_0	44	43	GPE1_1	XciYDATA6	
	XciYDATA7	GPE1_2	46	45	GPD1_2	Xi2cSDA1	
I2C	Xi2cSDA0	GPD1_0	48	47	GPD1_3	Xi2cSCL1	I2C
	Xi2cSCL0	GPD1_1	50	49	GND	GND	GND
GND	GND	GND	52	51	XuhDP	XuhDP	USB Host
USB_OTG	XuoDP	XuoDP	54	53	XuhDN	XuhDN	
	XuoDM	XuoDM	56	55	XuhPWRE	XuhPWREN	
	XuoVBUS	XuoVBUS	58	57	XuhOVER	XuhOVERCUR	
	XuoDRVVBUS	XuoDRV	60	59	XuoID	XuoID	USB OTG

CN3							
기능	핀 이름	GP10	핀 번호		GP10	핀 이름	기능
CF	XmsmDATA4/CF_DATA4	GPJ2_4	2	1	GPJ2_5	XmsmDATA5/CF_DATA5	CF
	XmsmDATA2/CF_DATA3	GPJ2_2	4	3	GPJ2_3	XmsmDATA3/CF_DATA3	
	XmsmDATA0/CF_DATA0	GPJ2_0	6	5	GPJ2_1	XmsmDATA1/CF_DATA1	
	XmsmADDR13	GPJ1_4	8	7	GPJ1_4	XmsmADDR12	
	XmsmADDR11	GPJ1_3	10	9	GPJ1_2	XmsmADDR10	
	XmsmADDR9	GPJ1_1	12	11	GPJ1_0	XmsmADDR8	
	XmsmADDR7	GPJ0_7	14	13	GPJ0_6	XmsmADDR6	
	XmsmADDR5	GPJ0_5	16	15	GPJ0_4	XmsmADDR4	
	XmsmADDR3	GPJ0_3	18	17	GPJ0_2	XmsmADDR2	
	XmsmADDR1	GPJ0_1	20	19	GPJ0_0	XmsmADDR0	
GND	GND	GND	22	21	GND	GND	GND
EBI	XmOADDR15	MP05_7	24	23	MP06_0	XmODATA0	EBI
	XmOADDR14	MP05_6	26	25	MP06_1	XmODATA1	
	XmOADDR13	MP05_5	28	27	MP06_2	XmODATA2	
	XmOADDR12	MP05_4	30	29	MP06_3	XmODATA3	
	XmOADDR11	MP05_3	32	31	MP06_4	XmODATA4	
	XmOADDR10	MP05_2	34	33	MP06_5	XmODATA5	
	XmOADDR9	MP05_1	36	35	MP06_6	XmODATA6	
	XmOADDR8	MP05_0	38	37	MP06_7	XmODATA7	
GND	GND	GND	40	39	GND	GND	GND
EBI	XmOADDR7	MP04_7	42	41	MP07_0	XmODATA8	EBI
	XmOADDR6	MP04_6	44	43	MP07_1	XmODATA9	
	XmOADDR5	MP04_5	46	45	MP07_2	XmODATA10	
	XmOADDR4	MP04_4	48	47	MP07_3	XmODATA11	
	XmOADDR3	MP04_3	50	49	MP07_4	XmODATA12	
	XmOADDR2	MP04_2	52	51	MP07_5	XmODATA13	
	XmOADDR1	MP04_1	54	53	MP07_6	XmODATA14	
	XmOADDR0	MP04_0	56	55	MP07_7	XmODATA15	
	XmOWEn	MP01_7	58	57	MP01_6	XmOOWEn	
	XmOWAITn	MP02_2	60	59	MP02_3	XmODATA_RDn	

CN4							
기능	핀 이름	GPIO	핀 번호		GPIO	핀 이름	기능
MIPI	XmiPiMDN0	XmiPiMDN0	2	1	XmiPiSDP0	XmiPiSDP0	MIPI
	XmiPiMDP0	XmiPiMDP0	4	3	XmiPiSDN0	XmiPiSDN0	
	XmiPiMDN1	XmiPiMDN1	6	5	XmiPiSDP1	XmiPiSDP1	
	XmiPiMDP1	XmiPiMDP1	8	7	XmiPiSDN1	XmiPiSDN1	
	XmiPiMDNCLK	XmiPiMDNCLK	10	9	XmiPiSDPCLK	XmiPiSDPCLK	
	XmiPiMDPCLK	XmiPiMDPCLK	12	11	XmiPiSDNCLK	XmiPiSDNCLK	
	XmiPiMDN2	XmiPiMDN2	14	13	XmiPiSDP2	XmiPiSDP2	
	XmiPiMDP2	XmiPiMDP2	16	15	XmiPiSDN2	XmiPiSDN2	
	XmiPiMDN3	XmiPiMDN3	18	17	XmiPiSDP3	XmiPiSDP3	
	XmiPiMDP3	XmiPiMDP3	20	19	XmiPiSDN3	XmiPiSDN3	
GND	GND	GND	22	21	GND	GND	GND
ADC/Touch	TSXPO/XadcAIN5	XadcAIN5	24	23	XadcAIN3	TSYPO/XadcAIN3	ADC/Touch
	TSXMO/XadcAIN4	XadcAIN4	26	25	XadcAIN2	TSYMO/XadcAIN2	
GND	GND	GND	28	27	GND	GND	GND
LCD	XvVD0	GPF0_4	30	29	GPF2_3	XvVD15	
	XvVD4	GPF1_0	32	31	GPF2_6	XvVD18	
	XvVD9	GPF1_5	34	33	GPF3_0	XvVD20	
	XvVD12	GPF2_0	36	35	GPF3_1	XvVD21	
	XvVD8	GPF1_4	38	37	GPF1_6	XvVD10	
	XvVD17	GPF2_5	40	39	GPF2_2	XvVD14	
	XvVD23	GPF3_3	42	41	GPF2_1	XvVD13	
	XvVD1	GPF0_5	44	43	GPF2_4	XvVD16	
GND	GND	GND	46	45	GND	GND	GND
LCD	XvVD7	GPF1_3	48	47	GPF1_2	XvVD6	LCD
	XvVD2	GPF0_6	50	49	GPF1_1	XvVD5	
	XvVD11	GPF1_7	52	51	GPF3_2	XvVD22	
	XvVD3	GPF0_7	54	53	GPF2_7	XvVD19	
	XvVCLK	GPF0_3	56	55	GPF0_0	XvHSYNC	
	XvVDEN	GPF0_2	58	57	GPF0_1	XvVSYNC	
	VSYNC_LDI	GPF3_4	60	59	GPF3_5	SYS_OE/VEN_FIELD	

CN5							
기능	핀 이름	GPIO	핀 번호		GPIO	핀 이름	기능
EBI	XmOCSn0	MP01_0	2	1	MP01_1	XmOCSn1	EBI
	XmOCSn3/NFCSn1	MP01_3	4	3	MP01_4	XmOCSn4/NFCSn2	
	XmOCSn5/NFCSn3	MP01_5	6	5	MP02_0	XmOBEO	
	XmOBE1	MP02_1	8	7	GND	GND	GND
HDMI	Xhdm iTXCP	HDMI	10	9	HDMI	Xhdm iTXOP	HDMI
	Xhdm iTXCN	HDMI	12	11	HDMI	Xhdm iTXON	
	Xhdm iTX1P	HDMI	14	13	HDMI	Xhdm iTX2P	
	Xhdm iTX1N	HDMI	16	15	HDMI	Xhdm iTX2N	
GND	GND	GND	18	17	JTAG	XiTRSTn	JTAG
MMC2	Xmmc2CDn/SPI2_MISO	GPG2_2	20	19	JTAG	XiTMS	
	Xmmc2DATA3	GPG2_6	22	21	JTAG	XiTCK	
	Xmmc2DATA2	GPG2_5	24	23	JTAG	XiTDI	
	Xmmc2DATA1	GPG2_4	26	25	JTAG	XiTDO	
	Xmmc2DATA0/SPI2_MOSI	GPG2_3	28	27	JTAG	XjRESET	
	Xmmc2CMD/SPI2_nSS	GPC2_1	30	29	-	DACOUT	
Xmmc2CLK/SPI2_CLK	GPG2_0	32	31	GND	GND	GND	
GND	GND	GND	34	33	GPI_0	Xi2sSCLK0	I2S
AC97	XpcmEXTCLK0	GPC1_1	36	35	GPI_3	Xi2sSDI0	
	XpcmSCLK0	GPC1_0	38	37	GPI_4	Xi2sSD00_0	
	XpcmFSYNCO	GPC1_2	40	39	GPI_2	Xi2sLRCK0	
	XpcmSINO	GPC1_3	42	41	GPI_6	Xi2sSD00_2	
	XpcmSOUT0	GPC1_4	44	43	GPC0_1	Xi2sSCDCLK1	
	Xi2sLRCK1/AC97_SYNC	GPC0_2	46	45	GPC0_4	Xi2sSDo1	
	Xi2sSCLK1/AC97_BITCL	GPC0_0	48	47	GPC0_3	Xi2sSDi1	
ADC/ Touch	XadcAIN6/TSYM1	XadcAIN6	50	49	GPI_1	Xi2sSCDCLK0	GND
	XadcAIN8/TSXM1	XadcAIN8	52	51	GPI_5	Xi2sSD00_1	
	XadcAIN7/TSYP1	XadcAIN7	54	53	GND	GND	
UART	XuTXD3	GPA1_3	56	55	GPA1_2	XuRXD3	I2C UART
ADC/Touch	XadcAIN0	XadcAIN0	58	57	GPA1_1	XuTXD2	
	XadcAIN1	XadcAIN1	60	59	GPD1_4	Xi2cSDA2	
	XadcAIN9/TSXP1	XadcAIN9	62	61	GPA1_0	XuRXD2	
SYS_Fn	XnRSTOUT	ETC2_2	64	63	GPD1_5	Xi2cSCL2	CLK_Out
	XPWRRGTON	ETC1_7	66	65	-	XCLKOUT	
Interrupt INPUT	XEINT18/KP_COL2	GPH2_2	68	67	-	M_nRESET	PMIC
	XEINT14	GPH1_6	70	69	-	POWER_KEY	PMIC
	XEINT15	GPH1_7	72	71	-	JIG_ON	PMIC
	XEINT4	GPH0_4	72	73	-	EXT_2.6V	+2.6V
GND	GND	GND	76	75	-	VCC_COIN	Vcc_Coin
VDD_3V3	VDD_3V3	-	78	77	-	PVDD_LD09	LD09 PW
Main_BATT	MAIN_BATT	-	80	79	-	MAIN_BATT	Main_BATT