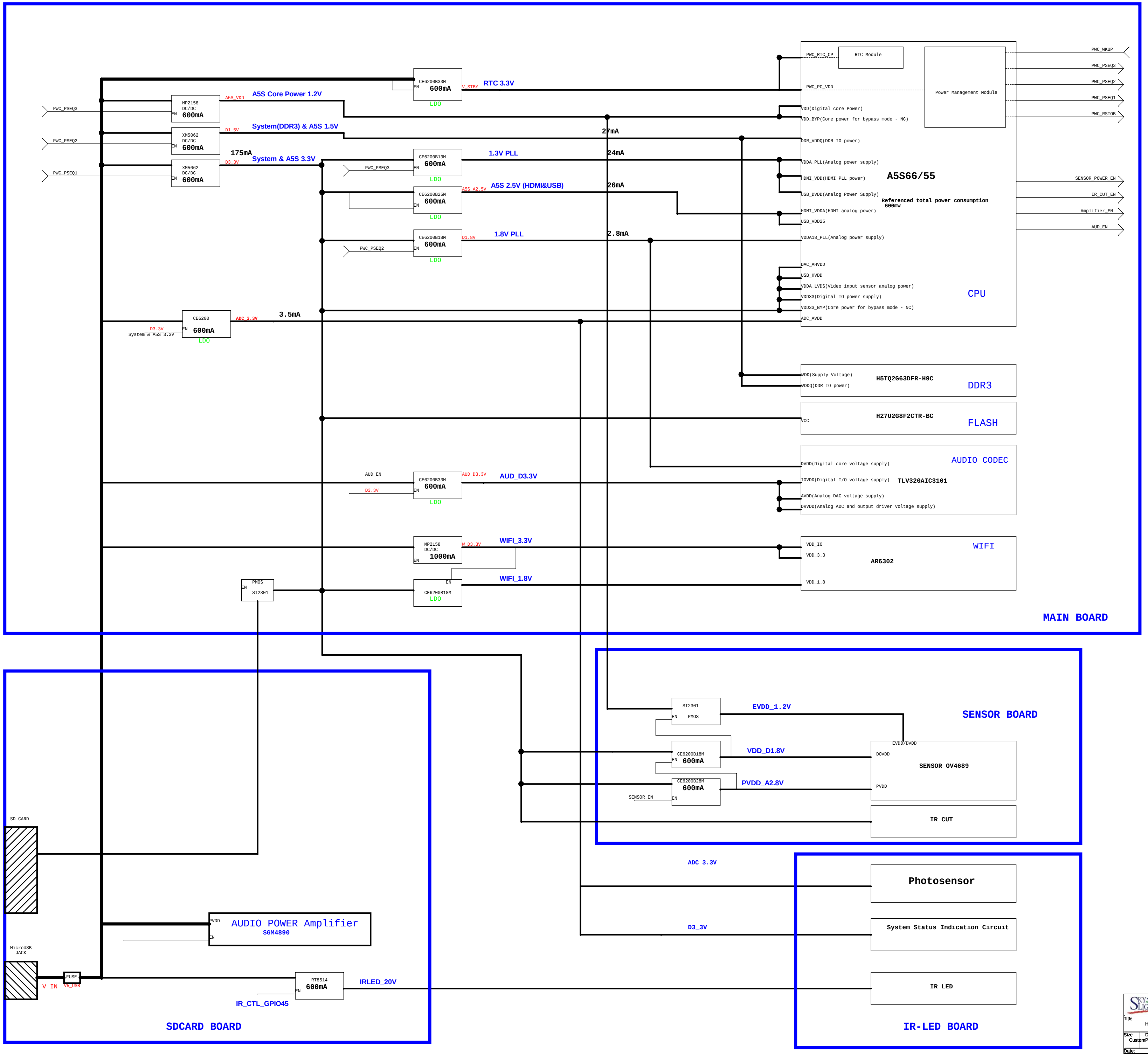

MAIN BOARD
PWC_PSEQ3
PWC_PSEQ2
PWC_PSEQ1
MP2158 DC/DC 600mA EN
A5S_VDD
A5S Core Power 1.2V
XM5062 DC/DC 600mA EN
D1.5V
System(DDR3) & A5S 1.5V
XM5062 DC/DC 600mA EN
D3.3V
175mA
System & A5S 3.3V
CE6200B33M 600mA EN LDO
V_STBY
RTC 3.3V
CE6200B13M 600mA EN LDO
PWC_PSEQ3
1.3V PLL
CE6200B25M 600mA EN LDO
A5S_A2.5V
A5S 2.5V (HDMI&USB)
CE6200B18M 600mA EN LDO
PWC_PSEQ2
D1.8V
1.8V PLL
27mA
24mA
26mA
2.8mA
CE6200 600mA EN LDO
D3.3V
System & A5S 3.3V
ADC_3.3V
3.5mA
PWC_RTC_CP
RTC Module
PWC_PC_VDD
Power Management Module
PWC_WKUP
PWC_PSEQ3
PWC_PSEQ2
PWC_PSEQ1
PWC_RSTOB
VDD(Digital core Power)
VDD_BYP(Core power for bypass mode - NC)
DDR_VDDQ(DDR IO power)
VDDA_PLL(Analog power supply)
HDMI_VDD(HDMI PLL power)
A5S66/55
USB_DVDD(Analog Power Supply)
Referenced total power consumption 600mW
HDMI_VDDA(HDMI analog power)
USB_VDD25
VDDA18_PLL(Analog power supply)
DAC_AHVDD
USB_HVDD
VDDA_LVDS(Video input sensor analog power)
VDD33(Digital IO power supply)
VDD33_BYP(Core power for bypass mode - NC)
ADC_AVDD
CPU
SENSOR_POWER_EN
IR_CUT_EN
Amplifier_EN
AUD_EN
VDD(Supply Voltage)
VDDQ(DDR IO power)
H5TQ2G63DFR-H9C
DDR3
VCC
H27U2G8F2CTR-BC
FLASH
AUD_EN
D3.3V
CE6200B33M 600mA EN LDO
AUD_D3.3V
AUD_D3.3V
AUDIO CODEC
DVDD(Digital core voltage supply)
IOVDD(Digital I/O voltage supply)
TLV320AIC3101
AVDD(Analog DAC voltage supply)
DRVDD(Analog ADC and output driver voltage supply)
MP2158 DC/DC 1000mA EN
W_D3.3V
WIFI_3.3V
PMOS EN SI2301
CE6200B18M EN LDO
WIFI_1.8V
VDD_IO
VDD_3.3
AR6302
VDD_1.8
WIFI
SENSOR BOARD
SI2301 EN PMOS
EVDD_1.2V
CE6200B18M EN 600mA
VDD_D1.8V
CE6200B28M 600mA EN
SENSOR_EN
PVDD_A2.8V
EVDD/DVDD
DOVDD
SENSOR OV4689
PVDD
IR_CUT
ADC_3.3V
D3_3V
Photosensor
System Status Indication Circuit
IR_LED
IR-LED BOARD
SD CARD
AUDIO POWER Amplifier
SGM4890
PVDD
EN
MicroUSB JACK
FUSE
V_IN
V5_USB
RT8514 600mA EN
IRLED_20V
IR_CTL_GPIO45
SDCARD BOARD

SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB	Drawn By Lizhiqiang
Size Custom	Document Number POWER TREE	Rev V02.02
Date: Tuesday, March 08, 2016	Sheet 4 of 17

A5S Power-On-Config Setting

```
A5S Power-On-Config (VD0_OUT0~15)
====================================
VD0_OUT0
Boot Media Select
0: NAND flash
1: Reserved
====================================
VD0_OUT[3:1]
Clock: iDSP / vDSP / DRAM
000: 126 / 108 / 300 MHz
001: 120 / 96 / 300 MHz
010: 108 / 108 / 240 MHz
011: 96 / 96 / 192 MHz
100: 117 / 108 / 300 MHz
101: 117 / 96 / 300 MHz
110: 117 / 108 / 240 MHz
111: 96 / 96 / 192 MHz
====================================
VD0_OUT4
PLL_UNLOCK_TRIG_RESET
0: disable generating GRST when core PLL out of lock (default)
1: enable generating GRST when core PLL out of lock
====================================
VD0_OUT5
NAND Flash Page Size
 0: 512 Bytes
 1: 2K Bytes
====================================
VD0_OUT6
NAND Read Confirm
0: No "Read Confirm" needed
1: Requirs "Read Confirm"
====================================
VD0_OUT7
Select ENET
0: disable
1: enable
====================================
VD0_OUT8
Boot Bypass
0: disable (no boot bypass)
1: enable
====================================
VD0_OUT9
Flash Fast Boot Mode
0: disable
1: enable
====================================
VD0_OUT10
IO Flash BOOT
0: USB
1: Flash
====================================
VD0_OUT11
Reserved
Set to 0
====================================
VD0_OUT12
EMA Select
Set to 0
====================================
VD0_OUT13
ARM Sync Lock Mode
0: disable
1: enable
====================================
VD0_OUT14
ARM Mode Change Issue Reset
0: GRST_L not issued when switching between ARM sync/async modes
1: GRST_L issued when switching between ARM sync/async modes
====================================
VD0_OUT15
RMII Select
Set to 0
====================================
```

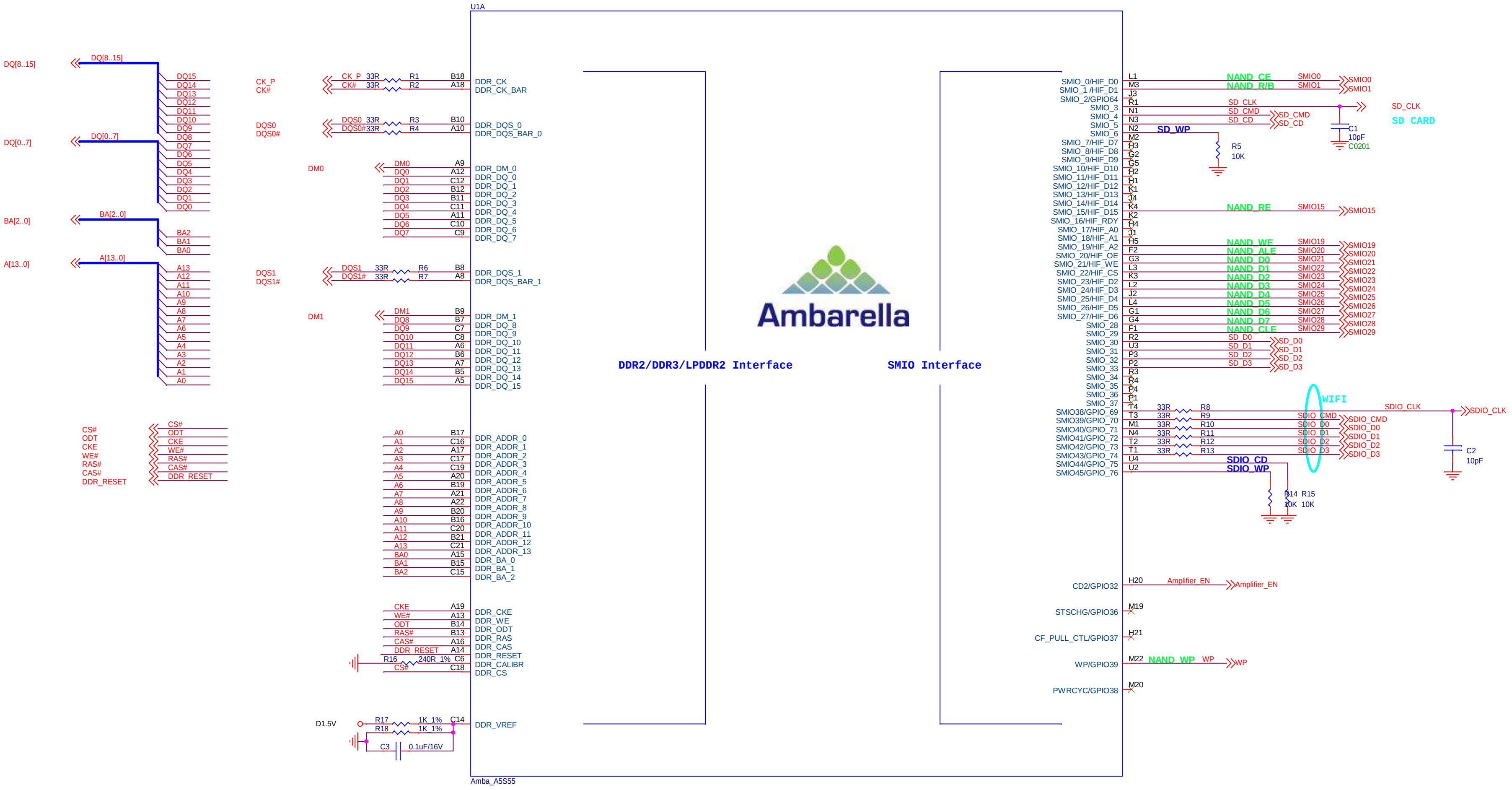
```
A5S Power-On-Config (VD1_OUT0~15)
====================================
VD1_OUT0
SPI Boot
0: USB / Flash
1: SPI
====================================
VD1_OUT1
HIF Enable
0: disable
1: enable host interface
====================================
VD0_OUT2
Reserved
Set to 0
====================================
VD1_OUT3
HIF Type
0: Intel
1: Motorola
====================================
VD1_OUT4
RDY Polarity
0: HIF_RDY active low
1: HIF_RDY active high
====================================
VD1_OUT5
HIF Secure Mode
0: normal
1: secure mode
====================================
VD1_OUT6
Reserved
Set to 0
====================================
VD1_OUT7
USB Clock Source Select
0: choose internal clock for USBPHY
1: choose external clock for USBPHY
====================================
VD1_OUT[9:8]
Reserved
Set to 0
====================================
VD1_OUT[10]
REF_CLK for USB
Set to 1
====================================
VD1_OUT[11]
Reserved
Set to 0
====================================
VD1_OUT[12]
Reserved
Set to 0
====================================
VD1_OUT[14:13]
SYS_CONFIG
00: use power-on-config set on external pins
01: select pre-set option 1
10: select pre-set option 2
11: illegal
====================================
VD1_OUT[15]
Config Source Select
0: depends on that configured by VD1_OUT[14:13]
1: on-chip EEPROM (Efuse)
====================================
```

Note：
all GPIO pins(89 Pins) are in Hi-Z state during reset assertion and are initialized to be inputs.

System GPIO Table

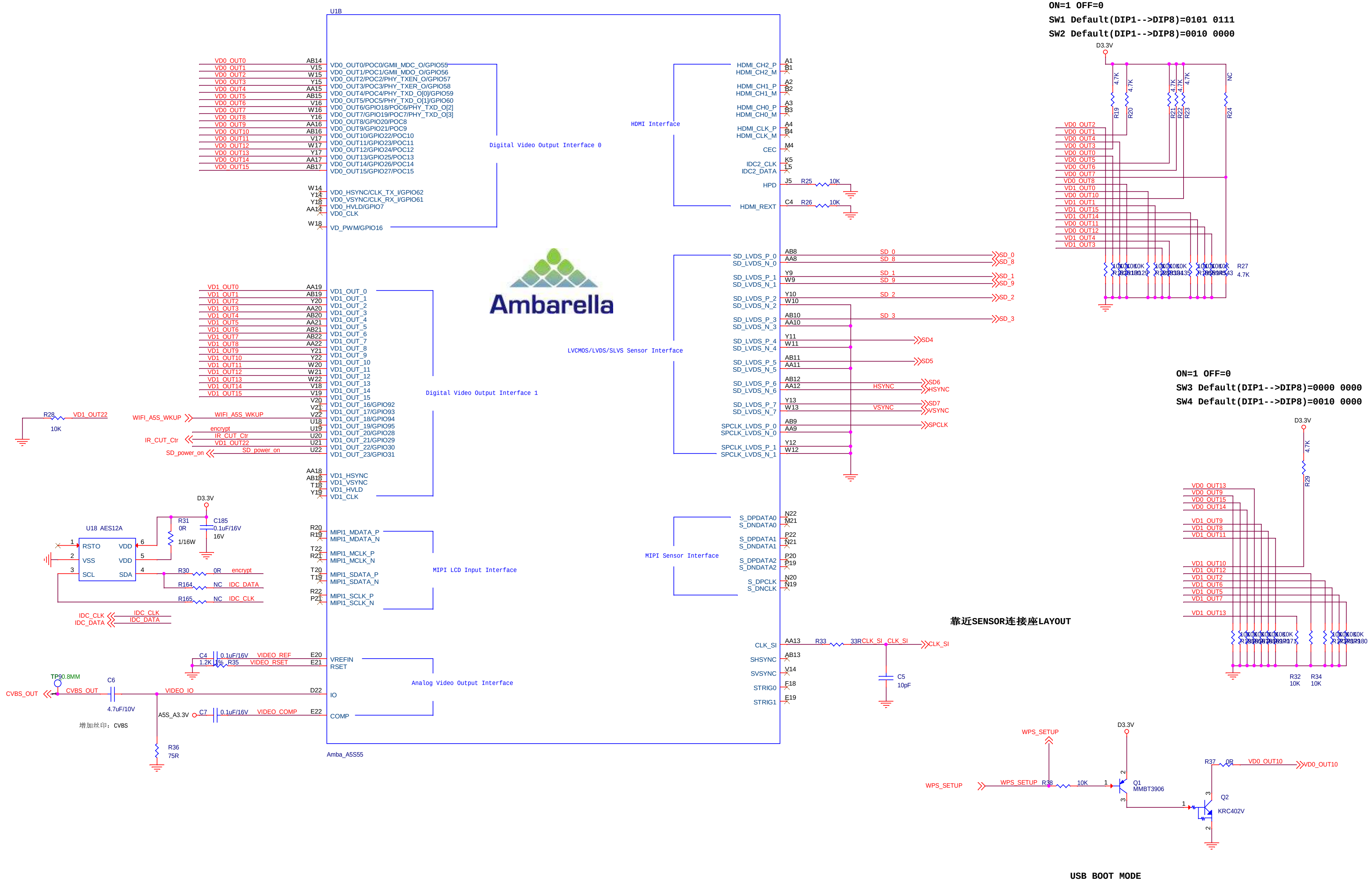
SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB		Drawn By Lizhiqiang
Size C	Document Number GPIO Table	Rev V02.02
Date: Tuesday, March 08, 2016	Sheet 5 of 17	


U1A
Amba_A5S55
Ambarella
DDR2/DDR3/LPDDR2 Interface
SMIO Interface
DQ[8..15]
DQ[0..7]
BA[2..0]
A[13..0]
CK_P
CK#
DQS0
DQS0#
DM0
DQS1
DQS1#
DM1
CS#
ODT
CKE
WE#
RAS#
CAS#
DDR_RESET
R1 33R
R2 33R
R3 33R
R4 33R
R6 33R
R7 33R
R16 240R_1%
R17 1K_1%
R18 1K_1%
C3 0.1uF/16V
D1.5V
DDR_CK
DDR_CK_BAR
DDR_DQS_0
DDR_DQS_BAR_0
DDR_DM_0
DDR_DQ_0
DDR_DQ_1
DDR_DQ_2
DDR_DQ_3
DDR_DQ_4
DDR_DQ_5
DDR_DQ_6
DDR_DQ_7
DDR_DQS_1
DDR_DQS_BAR_1
DDR_DM_1
DDR_DQ_8
DDR_DQ_9
DDR_DQ_10
DDR_DQ_11
DDR_DQ_12
DDR_DQ_13
DDR_DQ_14
DDR_DQ_15
DDR_ADDR_0
DDR_ADDR_1
DDR_ADDR_2
DDR_ADDR_3
DDR_ADDR_4
DDR_ADDR_5
DDR_ADDR_6
DDR_ADDR_7
DDR_ADDR_8
DDR_ADDR_9
DDR_ADDR_10
DDR_ADDR_11
DDR_ADDR_12
DDR_ADDR_13
DDR_BA_0
DDR_BA_1
DDR_BA_2
DDR_CKE
DDR_WE
DDR_ODT
DDR_RAS
DDR_CAS
DDR_RESET
DDR_CALIBR
DDR_CS
DDR_VREF
SMIO_0/HIF_D0
SMIO_1 /HIF_D1
SMIO_2/GPIO64
SMIO_3
SMIO_4
SMIO_5
SMIO_6
SMIO_7/HIF_D7
SMIO_8/HIF_D8
SMIO_9/HIF_D9
SMIO_10/HIF_D10
SMIO_11/HIF_D11
SMIO_12/HIF_D12
SMIO_13/HIF_D13
SMIO_14/HIF_D14
SMIO_15/HIF_D15
SMIO_16/HIF_RDY
SMIO_17/HIF_A0
SMIO_18/HIF_A1
SMIO_19/HIF_A2
SMIO_20/HIF_OE
SMIO_21/HIF_WE
SMIO_22/HIF_CS
SMIO_23/HIF_D2
SMIO_24/HIF_D3
SMIO_25/HIF_D4
SMIO_26/HIF_D5
SMIO_27/HIF_D6
SMIO_28
SMIO_29
SMIO_30
SMIO_31
SMIO_32
SMIO_33
SMIO_34
SMIO_35
SMIO_36
SMIO_37
SMIO38/GPIO_69
SMIO39/GPIO_70
SMIO40/GPIO_71
SMIO41/GPIO_72
SMIO42/GPIO_73
SMIO43/GPIO_74
SMIO44/GPIO_75
SMIO45/GPIO_76
CD2/GPIO32
STSCHG/GPIO36
CF_PULL_CTL/GPIO37
WP/GPIO39
PWRCYC/GPIO38
NAND_CE
NAND_R/B
SD_CLK
SD_CMD
SD_CD
SD_WP
SD CARD
R5 10K
C1 10pF
C0201
NAND_RE
NAND_WE
NAND_ALE
NAND_D0
NAND_D1
NAND_D2
NAND_D3
NAND_D4
NAND_D5
NAND_D6
NAND_D7
NAND_CLE
SD_D0
SD_D1
SD_D2
SD_D3
SMIO0
SMIO1
SMIO15
SMIO19
SMIO20
SMIO21
SMIO22
SMIO23
SMIO24
SMIO25
SMIO26
SMIO27
SMIO28
SMIO29
WIFI
SDIO_CLK
SDIO_CMD
SDIO_D0
SDIO_D1
SDIO_D2
SDIO_D3
SDIO_CD
SDIO_WP
R8 33R
R9 33R
R10 33R
R11 33R
R12 33R
R13 33R
R14 10K
R15 10K
C2 10pF
Amplifier_EN
NAND_WP
WP

SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB	Drawn By Lizhiqiang
Size C	Document Number A5S Part1 -- DDR AND SDIO
Rev	V02.02
Date: Tuesday, March 08, 2016	Sheet 6 of 17


U1B
Amba_A5S55
Ambarella
Digital Video Output Interface 0
Digital Video Output Interface 1
HDMI Interface
LVCMOS/LVDS/SLVS Sensor Interface
MIPI LCD Input Interface
MIPI Sensor Interface
Analog Video Output Interface
VD0_OUT0/POC0/GMII_MDC_O/GPIO55
VD0_OUT1/POC1/GMII_MDO_O/GPIO56
VD0_OUT2/POC2/PHY_TXEN_O/GPIO57
VD0_OUT3/POC3/PHY_TXER_O/GPIO58
VD0_OUT4/POC4/PHY_TXD_O[0]/GPIO59
VD0_OUT5/POC5/PHY_TXD_O[1]/GPIO60
VD0_OUT6/GPIO18/POC6/PHY_TXD_O[2]
VD0_OUT7/GPIO19/POC7/PHY_TXD_O[3]
VD0_OUT8/GPIO20/POC8
VD0_OUT9/GPIO21/POC9
VD0_OUT10/GPIO22/POC10
VD0_OUT11/GPIO23/POC11
VD0_OUT12/GPIO24/POC12
VD0_OUT13/GPIO25/POC13
VD0_OUT14/GPIO26/POC14
VD0_OUT15/GPIO27/POC15
VD0_HSYNC/CLK_TX_I/GPIO62
VD0_VSYNC/CLK_RX_I/GPIO61
VD0_HVLD/GPIO7
VD0_CLK
VD_PWM/GPIO16
VD1_OUT_0 … VD1_OUT_15
VD1_OUT_16/GPIO92
VD1_OUT_17/GPIO93
VD1_OUT_18/GPIO94
VD1_OUT_19/GPIO95
VD1_OUT_20/GPIO28
VD1_OUT_21/GPIO29
VD1_OUT_22/GPIO30
VD1_OUT_23/GPIO31
VD1_HSYNC
VD1_VSYNC
VD1_HVLD
VD1_CLK
MIPI1_MDATA_P
MIPI1_MDATA_N
MIPI1_MCLK_P
MIPI1_MCLK_N
MIPI1_SDATA_P
MIPI1_SDATA_N
MIPI1_SCLK_P
MIPI1_SCLK_N
VREFIN
RSET
IO
COMP
HDMI_CH2_P
HDMI_CH2_M
HDMI_CH1_P
HDMI_CH1_M
HDMI_CH0_P
HDMI_CH0_M
HDMI_CLK_P
HDMI_CLK_M
CEC
IDC2_CLK
IDC2_DATA
HPD
HDMI_REXT
R25 10K
R26 10K
SD_LVDS_P_0 … SD_LVDS_N_7
SPCLK_LVDS_P_0
SPCLK_LVDS_N_0
SPCLK_LVDS_P_1
SPCLK_LVDS_N_1
SD_0
SD_8
SD_1
SD_9
SD_2
SD_3
SD4
SD5
SD6
HSYNC
SD7
VSYNC
SPCLK
S_DPDATA0
S_DNDATA0
S_DPDATA1
S_DNDATA1
S_DPDATA2
S_DNDATA2
S_DPCLK
S_DNCLK
CLK_SI
SHSYNC
SVSYNC
STRIG0
STRIG1
R33 33R
C5 10pF
靠近SENSOR连接座LAYOUT
R28 10K
VD1_OUT22
WIFI_A5S_WKUP
IR_CUT_Ctr
encrypt
SD_power_on
D3.3V
U18 AES12A
RSTO
VSS
SCL
VDD
SDA
R31 0R 1/16W
C185 0.1uF/16V 16V
R30 0R encrypt
R164 NC IDC_DATA
R165 NC IDC_CLK
IDC_CLK
IDC_DATA
C4 0.1uF/16V VIDEO_REF
1.2K 1% R35 VIDEO_RSET
TP0.8MM
C6 4.7uF/10V
CVBS_OUT
VIDEO_IO
A5S_A3.3V
C7 0.1uF/16V VIDEO_COMP
R36 75R
增加丝印：CVBS
R19 R20 R21 R22 R23 4.7K
R24 NC
R27 4.7K
R29 4.7K
R32 10K
R34 10K
WPS_SETUP
R38 10K
Q1 MMBT3906
Q2 KRC402V
R37 0R
VD0_OUT10
USB BOOT MODE

ON=1 OFF=0

SW1 Default(DIP1-->DIP8)=0101 0111

SW2 Default(DIP1-->DIP8)=0010 0000

ON=1 OFF=0

SW3 Default(DIP1-->DIP8)=0000 0000

SW4 Default(DIP1-->DIP8)=0010 0000

Power-On Boot Mode：
NAND
(2048-B block)
(Read confirm)

SKY LIGHT Electronic (ShenZhen) Limited

Title		Drawn By
HPC02AB		Lizhiqiang

Size	Document Number	Rev
C	A5S Part2 -- VIN/VOUT	V02.02

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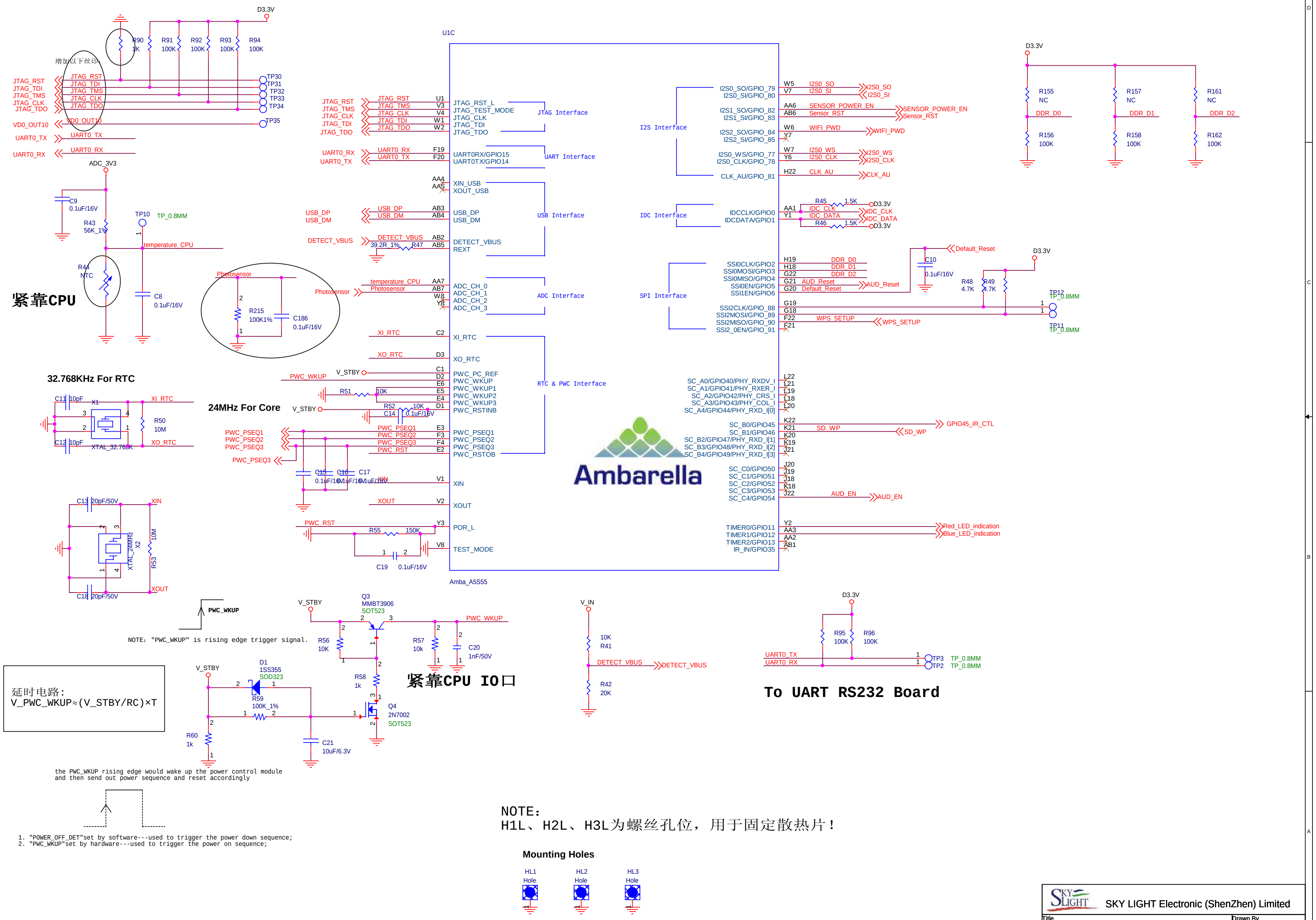

U1C
Amba_A5S55
Ambarella
D3.3V
ADC_3V3
V_STBY
V_IN
JTAG_RST
JTAG_TDI
JTAG_TMS
JTAG_CLK
JTAG_TDO
VD0_OUT10
UART0_TX
UART0_RX
增加以下丝印
TP30
TP31
TP32
TP33
TP34
TP35
R90 1K
R91 100K
R92 100K
R93 100K
R94 100K
JTAG_RST_L
JTAG_TEST_MODE
JTAG Interface
UART0RX/GPIO15
UART0TX/GPIO14
UART Interface
XIN_USB
XOUT_USB
USB_DP
USB_DM
USB Interface
DETECT_VBUS
REXT
39.2R_1% R47
C9 0.1uF/16V
R43 56K_1%
TP10 TP_0.8MM
temperature_CPU
R44 NTC
C8 0.1uF/16V
Photosensor
R215 100K1%
C186 0.1uF/16V
ADC_CH_0
ADC_CH_1
ADC_CH_2
ADC_CH_3
ADC Interface
XI_RTC
XO_RTC
PWC_PC_REF
PWC_WKUP
PWC_WKUP1
PWC_WKUP2
PWC_WKUP3
PWC_RSTINB
PWC_PSEQ1
PWC_PSEQ2
PWC_PSEQ3
PWC_RSTOB
RTC & PWC Interface
R51 10K
R52 10K
C14 0.1uF/16V
C15 0.1uF/16V
C16 0.1uF/16V
C17 0.1uF/16V
PWC_RST
R55 150K
C19 0.1uF/16V
XIN
XOUT
POR_L
TEST_MODE
32.768KHz For RTC
C11 10pF
C12 10pF
X1 XTAL_32.768K
R50 10M
24MHz For Core
C13 20pF/50V
C18 20pF/50V
XTAL_24MHz X2
R53 10M
I2S0_SO/GPIO_79
I2S0_SI/GPIO_80
I2S1_SO/GPIO_82
I2S1_SI/GPIO_83
I2S2_SO/GPIO_84
I2S2_SI/GPIO_85
I2S0_WS/GPIO_77
I2S0_CLK/GPIO_78
CLK_AU/GPIO_81
I2S Interface
I2S0_SO
I2S0_SI
SENSOR_POWER_EN
Sensor_RST
WIFI_PWD
I2S0_WS
I2S0_CLK
CLK_AU
IDCCLK/GPIO0
IDCDATA/GPIO1
IDC Interface
R45 1.5K
R46 1.5K
IDC_CLK
IDC_DATA
SSI0CLK/GPIO2
SSI0MOSI/GPIO3
SSI0MISO/GPIO4
SSI0EN/GPIO5
SSI1EN/GPIO6
SSI2CLK/GPIO_88
SSI2MOSI/GPIO_89
SSI2MISO/GPIO_90
SSI2_0EN/GPIO_91
SPI Interface
DDR_D0
DDR_D1
DDR_D2
AUD_Reset
Default_Reset
C10 0.1uF/16V
R48 4.7K
R49 4.7K
TP12 TP_0.8MM
TP11 TP_0.8MM
WPS_SETUP
SC_A0/GPIO40/PHY_RXDV_I
SC_A1/GPIO41/PHY_RXER_I
SC_A2/GPIO42/PHY_CRS_I
SC_A3/GPIO43/PHY_COL_I
SC_A4/GPIO44/PHY_RXD_I[0]
SC_B0/GPIO45
SC_B1/GPIO46
SC_B2/GPIO47/PHY_RXD_I[1]
SC_B3/GPIO48/PHY_RXD_I[2]
SC_B4/GPIO49/PHY_RXD_I[3]
SC_C0/GPIO50
SC_C1/GPIO51
SC_C2/GPIO52
SC_C3/GPIO53
SC_C4/GPIO54
GPIO45_IR_CTL
SD_WP
AUD_EN
TIMER0/GPIO11
TIMER1/GPIO12
TIMER2/GPIO13
IR_IN/GPIO35
Red_LED_indication
Blue_LED_indication
R155 NC
R157 NC
R161 NC
R156 100K
R158 100K
R162 100K
PWC_WKUP
Q3 MMBT3906 SOT523
R56 10K
R57 10k
C20 1nF/50V
R58 1k
Q4 2N7002 SOT523
D1 1SS355 SOD323
R59 100K_1%
R60 1k
C21 10uF/6.3V
R41 10K
R42 20K
R95 100K
R96 100K
TP3 TP_0.8MM
TP2 TP_0.8MM
Mounting Holes
HL1 Hole
HL2 Hole
HL3 Hole

紧靠CPU

NOTE: "PWC_WKUP" is rising edge trigger signal.

延时电路:
V_PWC_WKUP≈(V_STBY/RC)×T

紧靠CPU IO口

To UART RS232 Board

the PWC_WKUP rising edge would wake up the power control module
and then send out power sequence and reset accordingly

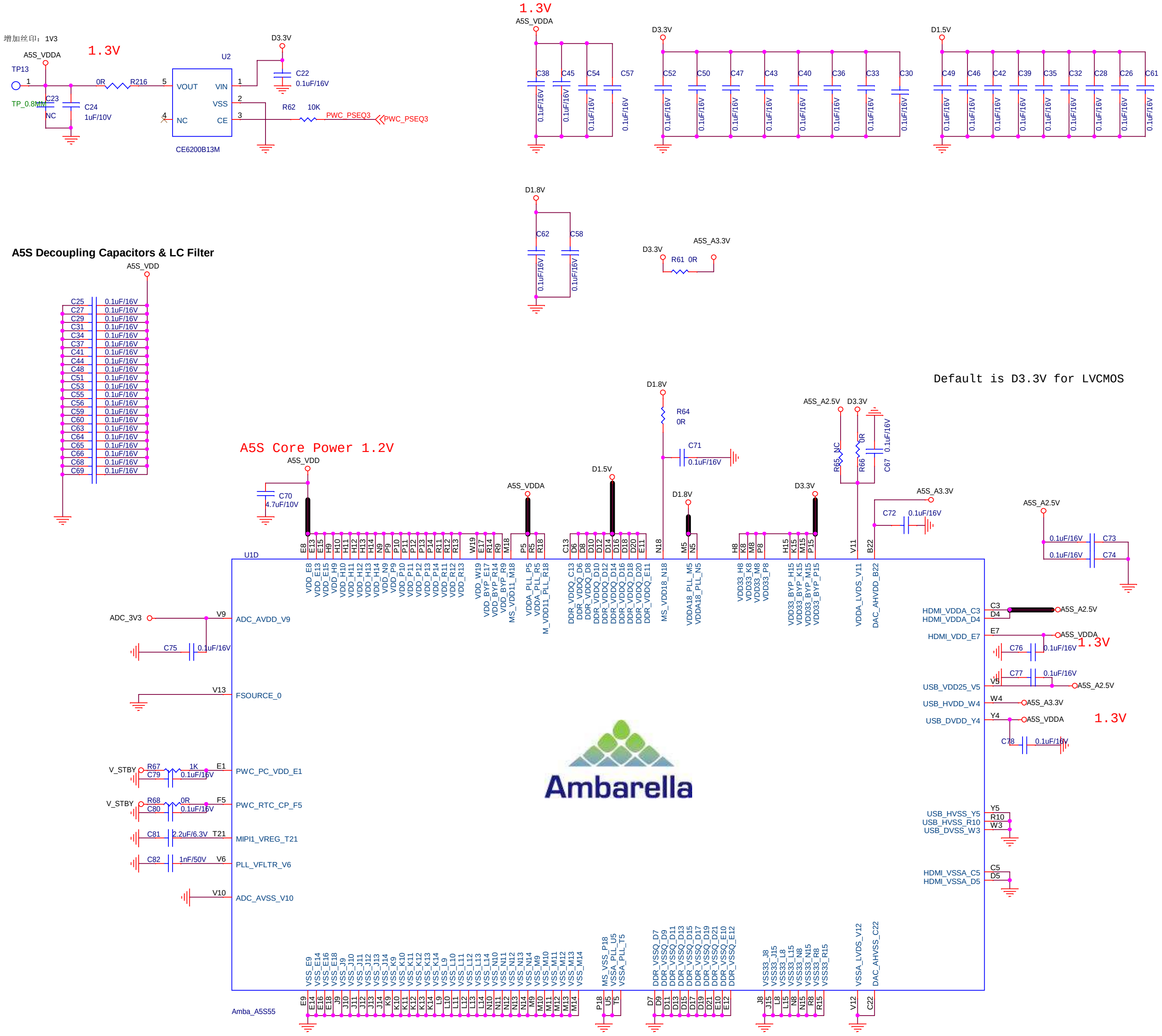
1. "POWER_OFF_DET"set by software---used to trigger the power down sequence;
2. "PWC_WKUP"set by hardware---used to trigger the power on sequence;

NOTE:
H1L、H2L、H3L为螺丝孔位，用于固定散热片！

SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB		Drawn By Lizhiqiang	
Size C	Document Number A5S Part3 -- IOs		Rev V02.02
Date: Tuesday, March 08, 2016		Sheet 8 of 17	

A5S Decoupling Capacitors & LC Filter


增加丝印：1V3
A5S_VDDA
1.3V
TP13
TP_0.8MM
C23
NC
C24
1uF/10V
0R
R216
U2
VOUT
VIN
VSS
NC
CE
CE6200B13M
D3.3V
C22
0.1uF/16V
R62
10K
PWC_PSEQ3
1.3V
A5S_VDDA
C38
C45
C54
C57
0.1uF/16V
D3.3V
C52
C50
C47
C43
C40
C36
C33
C30
D1.5V
C49
C46
C42
C39
C35
C32
C28
C26
C61
D1.8V
C62
C58
D3.3V
R61 0R
A5S_A3.3V
A5S_VDD
C25
C27
C29
C31
C34
C37
C41
C44
C48
C51
C53
C55
C56
C59
C60
C63
C64
C65
C66
C68
C69
A5S Core Power 1.2V
A5S_VDD
C70
4.7uF/10V
A5S_VDDA
D1.5V
D1.8V
R64
0R
C71
0.1uF/16V
D1.8V
A5S_A2.5V
D3.3V
R65_NC
R66
0R
C67
0.1uF/16V
D3.3V
A5S_A3.3V
C72
0.1uF/16V
A5S_A2.5V
C73
C74
U1D
ADC_3V3
ADC_AVDD_V9
C75
0.1uF/16V
FSOURCE_0
V_STBY
R67
1K
C79
PWC_PC_VDD_E1
R68
0R
C80
PWC_RTC_CP_F5
C81
2.2uF/6.3V
MIPI1_VREG_T21
C82
1nF/50V
PLL_VFLTR_V6
ADC_AVSS_V10
HDMI_VDDA_C3
HDMI_VDDA_D4
A5S_A2.5V
HDMI_VDD_E7
A5S_VDDA
1.3V
C76
0.1uF/16V
C77
USB_VDD25_V5
A5S_A2.5V
USB_HVDD_W4
A5S_A3.3V
USB_DVDD_Y4
A5S_VDDA
1.3V
C78
USB_HVSS_Y5
USB_HVSS_R10
USB_DVSS_W3
HDMI_VSSA_C5
HDMI_VSSA_D5
Ambarella
Amba_A5S55

Default is D3.3V for LVCMOS

Parameter	Comments	Minimum	Typical	Maximum	Ripple
ADC_AVDD		3.0 V	3.3 V	3.46 V	2%
DAC_AHVDD		3.0 V	3.3 V	3.46 V	2%
DDR_VDDQ	DDR2 Mode	1.7 V	1.8 V	1.9 V	2%
	DDR3 Mode	1.43 V	1.5 V	1.57 V	2%
	LPDDR2 Mode	1.14 V	1.2 V	1.3 V	2%
	LPDDR Mode	1.7 V	1.8 V	1.9 V	2%
HDMI_VDD		1.25 V	1.3 V	1.35 V	2%
HDMI_VDDA		2.375 V	2.5 V	2.625 V	2%
M_VDD11_PLL		VDDA_PLL	VDDA_PLL	VDDA_PLL	2%
MS_VDD18		1.7 V	1.8 V	1.9 V	2%
USB_DVDD		1.15 V	1.2 V	1.25 V	2%
USB_HVDD		3.0 V	3.3 V	3.46 V	2%
USB_VDD25		2.375 V	2.5 V	2.625 V	2%
VDD		1.15 V	1.2 V	1.25 V	2%
VDD33		2.8 V	3.3 V	3.5 V	2%
VDD_BYP		VDD	VDD	VDD	2%
VDD33_BYP		VDD33	VDD33	VDD33	2%
VDDA_LVDS	LVDS Mode	2.375 V	2.5 V	2.625 V	2%
	1.8-V LVCMOS	1.7 V	1.8 V	1.9 V	2%
	2.5-V LVCMOS	2.375 V	2.5 V	2.625 V	2%
	2.8-V LVCMOS	2.7 V	2.8 V	2.9 V	2%
	3.3-V LVCMOS	2.8 V	3.3 V	3.5 V	2%
VDDA_PLL		1.25 V	1.3 V	1.35 V	2%
VDDA18_PLL (VDDA25_PLL ball map)		1.7 V	1.8 V	1.9 V	2%

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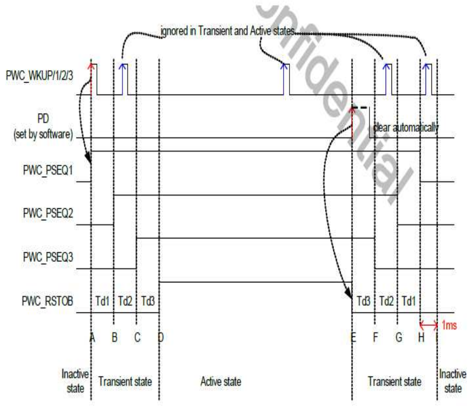

ignored in Transient and Active states
PWC_WKUP/1/2/3
PD
(set by software)
clear automatically
PWC_PSEQ1
PWC_PSEQ2
PWC_PSEQ3
PWC_RSTOB
Td1
Td2
Td3
Td3
Td2
Td1
1ms
A
B
C
D
E
F
G
H
Inactive state
Transient state
Active state
Transient state
Inactive state

Power On/Off Sequence

SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB

Drawn By Lizhiqiang

Size C

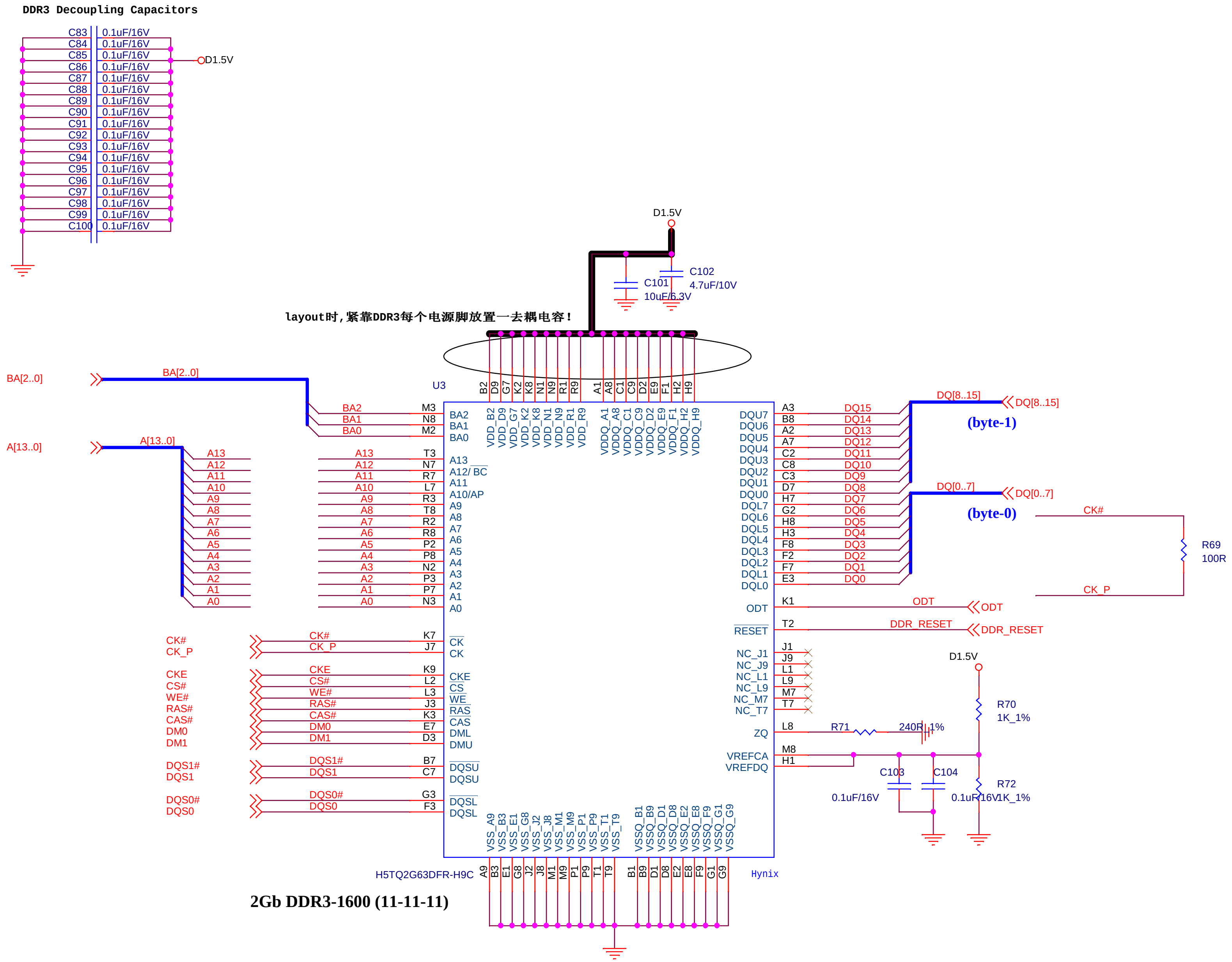
Document Number A5S Part4 -- POWER

Rev V02.02

Date: Tuesday, March 08, 2016

Sheet 9 of 17

DDR3 Decoupling Capacitors


C83 C84 C85 C86 C87 C88 C89 C90 C91 C92 C93 C94 C95 C96 C97 C98 C99 C100
0.1uF/16V
D1.5V
C101
10uF/6.3V
C102
4.7uF/10V
U3
BA[2..0]
A[13..0]
BA2 BA1 BA0
A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
A13 A12/ BC A11 A10/AP
CK# CK_P CKE CS# WE# RAS# CAS# DM0 DM1
DQS1# DQS1 DQS0# DQS0
CK CK CKE CS WE RAS CAS DML DMU DQSU DQSU DQSL DQSL
VDD_B2 VDD_D9 VDD_G7 VDD_K2 VDD_K8 VDD_N1 VDD_N9 VDD_R1 VDD_R9
VDDQ_A1 VDDQ_A8 VDDQ_C1 VDDQ_C9 VDDQ_D2 VDDQ_E9 VDDQ_F1 VDDQ_H2 VDDQ_H9
VSS_A9 VSS_B3 VSS_E1 VSS_G8 VSS_J2 VSS_J8 VSS_M1 VSS_M9 VSS_P1 VSS_P9 VSS_T1 VSS_T9
VSSQ_B1 VSSQ_B9 VSSQ_D1 VSSQ_D8 VSSQ_E2 VSSQ_E8 VSSQ_F9 VSSQ_G1 VSSQ_G9
DQU7 DQU6 DQU5 DQU4 DQU3 DQU2 DQU1 DQU0 DQL7 DQL6 DQL5 DQL4 DQL3 DQL2 DQL1 DQL0
DQ15 DQ14 DQ13 DQ12 DQ11 DQ10 DQ9 DQ8 DQ7 DQ6 DQ5 DQ4 DQ3 DQ2 DQ1 DQ0
DQ[8..15]
(byte-1)
DQ[0..7]
(byte-0)
ODT
RESET
DDR_RESET
NC_J1 NC_J9 NC_L1 NC_L9 NC_M7 NC_T7
ZQ
VREFCA
VREFDQ
R69
100R
R70
1K_1%
R71
240R_1%
R72
1K_1%
C103
C104
0.1uF/16V
H5TQ2G63DFR-H9C
Hynix

layout时,紧靠DDR3每个电源脚放置一去耦电容!

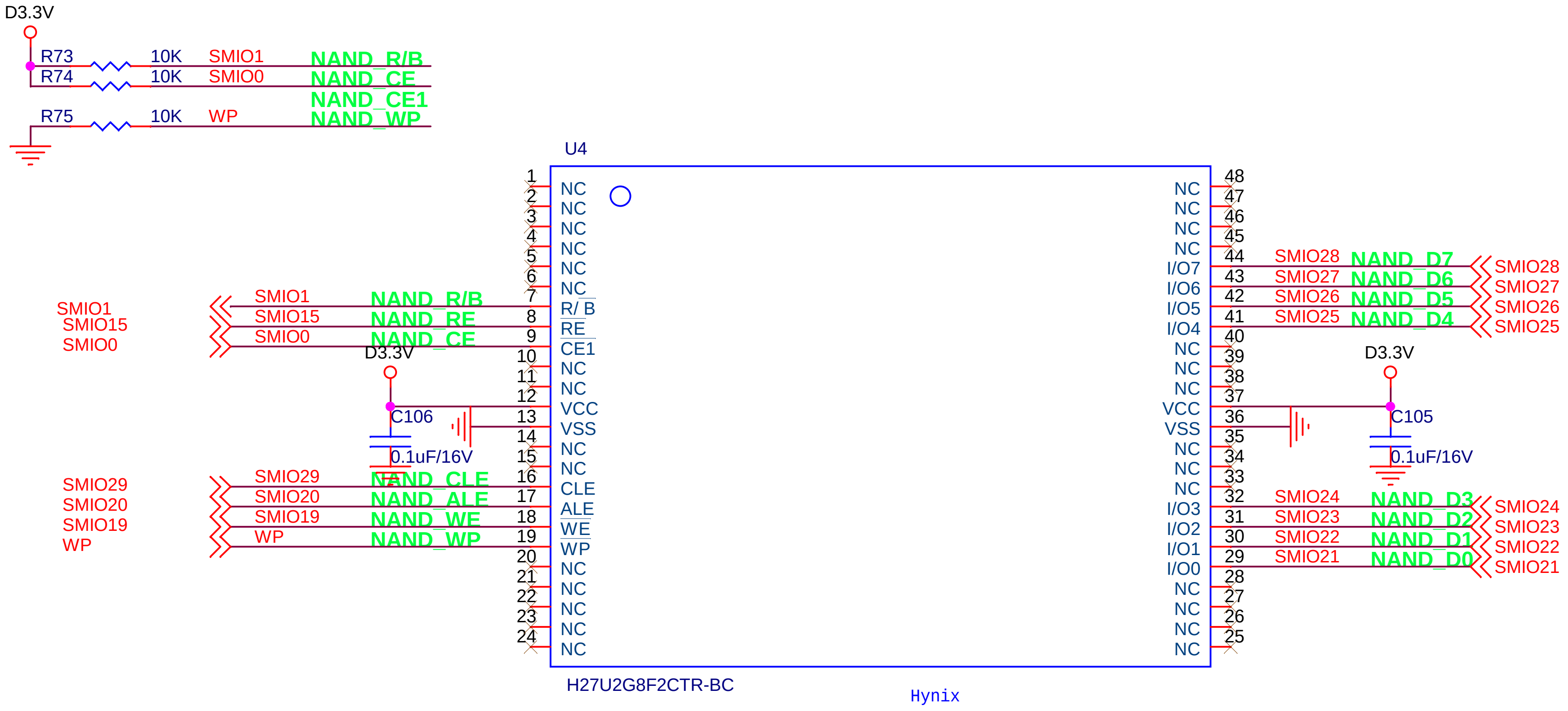
2Gb DDR3-1600 (11-11-11)

SKY LIGHT Electronic (ShenZhen) Limited

Title	Drawn By
HPC02AB	Lizhiqiang

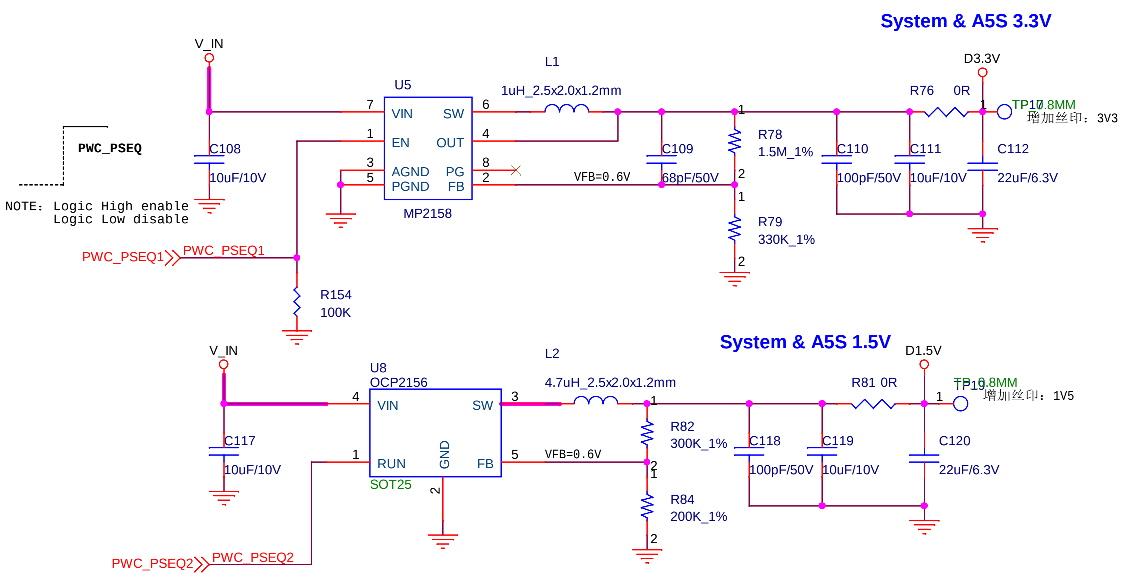
Size	Document Number	Rev
B	DDRIII-128Mx16	V02.02

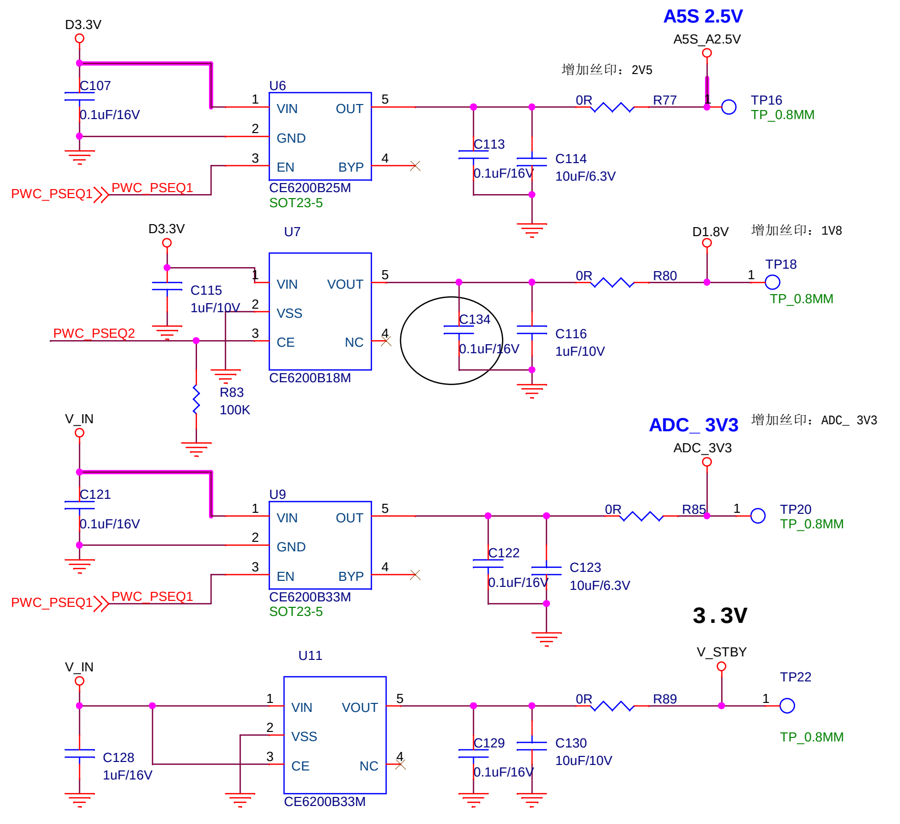
Date: Tuesday, March 08, 2016 Sheet 10 of 17

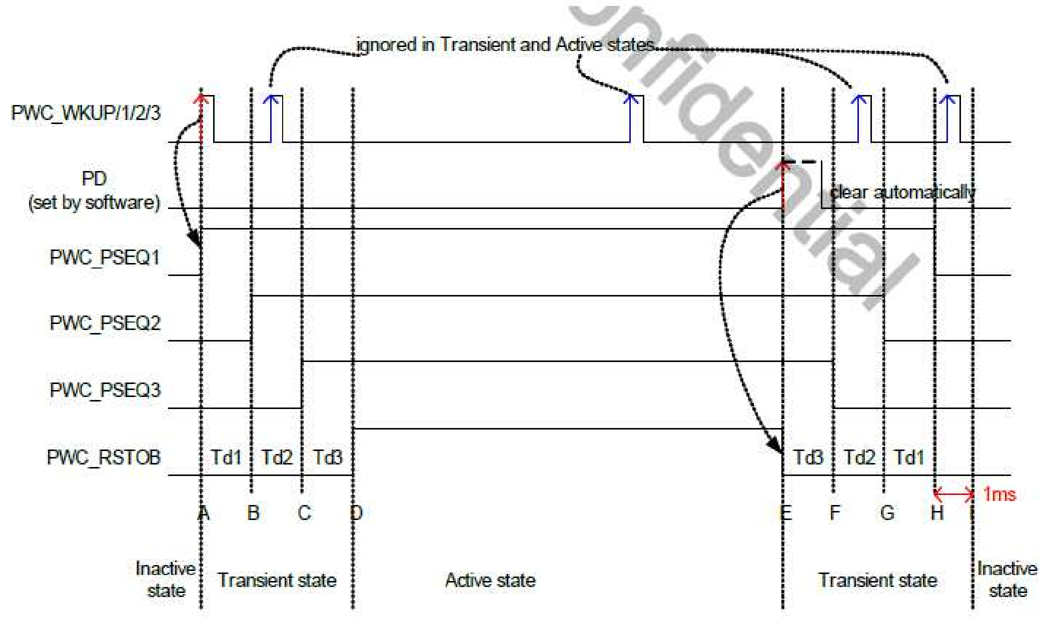

D3.3V
R73
R74
R75
10K
10K
10K
SMIO1
SMIO0
WP
NAND_R/B
NAND_CE
NAND_CE1
NAND_WP
U4
SMIO1
SMIO15
SMIO0
SMIO1
SMIO15
SMIO0
NAND_R/B
NAND_RE
NAND_CE
D3.3V
C106
0.1uF/16V
SMIO29
SMIO20
SMIO19
WP
SMIO29
SMIO20
SMIO19
WP
NAND_CLE
NAND_ALE
NAND_WE
NAND_WP
1 NC
2 NC
3 NC
4 NC
5 NC
6 NC
7 NC
8 R/ B
9 RE
10 CE1
11 NC
12 NC
13 VCC
14 VSS
15 NC
16 NC
17 CLE
18 ALE
19 WE
20 WP
21 NC
22 NC
23 NC
24 NC
48 NC
47 NC
46 NC
45 NC
44 I/O7
43 I/O6
42 I/O5
41 I/O4
40 NC
39 NC
38 NC
37 VCC
36 VSS
35 NC
34 NC
33 NC
32 I/O3
31 I/O2
30 I/O1
29 I/O0
28 NC
27 NC
26 NC
25 NC
SMIO28
SMIO27
SMIO26
SMIO25
NAND_D7
NAND_D6
NAND_D5
NAND_D4
SMIO28
SMIO27
SMIO26
SMIO25
D3.3V
C105
0.1uF/16V
SMIO24
SMIO23
SMIO22
SMIO21
NAND_D3
NAND_D2
NAND_D1
NAND_D0
SMIO24
SMIO23
SMIO22
SMIO21
H27U2G8F2CTR-BC
Hynix

SKY LIGHT Electronic (ShenZhen) Limited

Title	HPC02AB	Drawn By Lizhiqiang	
Size A	Document Number FLASH-256Mx8		Rev V02.02
Date:	Tuesday, March 08, 2016	Sheet 11	of 17


System & A5S 3.3V
V_IN
PWC_PSEQ
NOTE: Logic High enable
Logic Low disable
U5
MP2158
VIN
SW
EN
OUT
AGND
PGND
PG
FB
7
1
3
5
6
4
8
2
L1
1uH_2.5x2.0x1.2mm
C108
10uF/10V
C109
68pF/50V
VFB=0.6V
R78
1.5M_1%
R79
330K_1%
C110
100pF/50V
C111
10uF/10V
C112
22uF/6.3V
R76
0R
D3.3V
TP17
TP_0.8MM
增加丝印：3V3
PWC_PSEQ1
PWC_PSEQ1
R154
100K
System & A5S 1.5V
V_IN
U8
OCP2156
VIN
SW
RUN
GND
FB
SOT25
L2
4.7uH_2.5x2.0x1.2mm
C117
10uF/10V
R82
300K_1%
R84
200K_1%
VFB=0.6V
C118
100pF/50V
C119
10uF/10V
C120
22uF/6.3V
R81 0R
D1.5V
TP19
TP_0.8MM
增加丝印：1V5
PWC_PSEQ2
PWC_PSEQ2

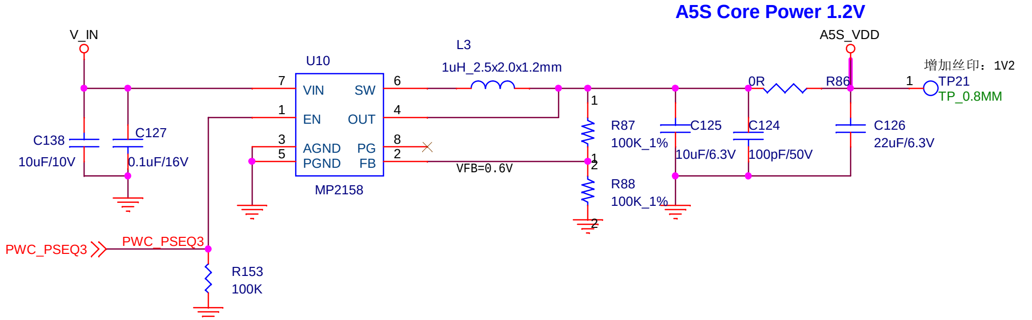

A5S 2.5V
A5S_A2.5V
增加丝印：2V5
D3.3V
C107
0.1uF/16V
U6
VIN
OUT
GND
EN
BYP
CE6200B25M
SOT23-5
C113
0.1uF/16V
C114
10uF/6.3V
0R
R77
TP16
TP_0.8MM
PWC_PSEQ1
PWC_PSEQ1
D3.3V
U7
VIN
VOUT
VSS
CE
NC
CE6200B18M
C115
1uF/10V
PWC_PSEQ2
R83
100K
C134
0.1uF/16V
C116
1uF/10V
D1.8V
增加丝印：1V8
0R
R80
TP18
TP_0.8MM
ADC_ 3V3
ADC_3V3
增加丝印：ADC_ 3V3
V_IN
C121
0.1uF/16V
U9
VIN
OUT
GND
EN
BYP
CE6200B33M
SOT23-5
PWC_PSEQ1
PWC_PSEQ1
C122
0.1uF/16V
C123
10uF/6.3V
0R
R85
TP20
TP_0.8MM
3.3V
V_STBY
V_IN
U11
VIN
VOUT
VSS
CE
NC
CE6200B33M
C128
1uF/16V
C129
0.1uF/16V
C130
10uF/10V
0R
R89
TP22
TP_0.8MM


ignored in Transient and Active states
PWC_WKUP/1/2/3
PD
(set by software)
clear automatically
PWC_PSEQ1
PWC_PSEQ2
PWC_PSEQ3
PWC_RSTOB
Td1
Td2
Td3
Td3
Td2
Td1
1ms
A
B
C
D
E
F
G
H
Inactive state
Transient state
Active state
Transient state
Inactive state

Power On/Off Sequence

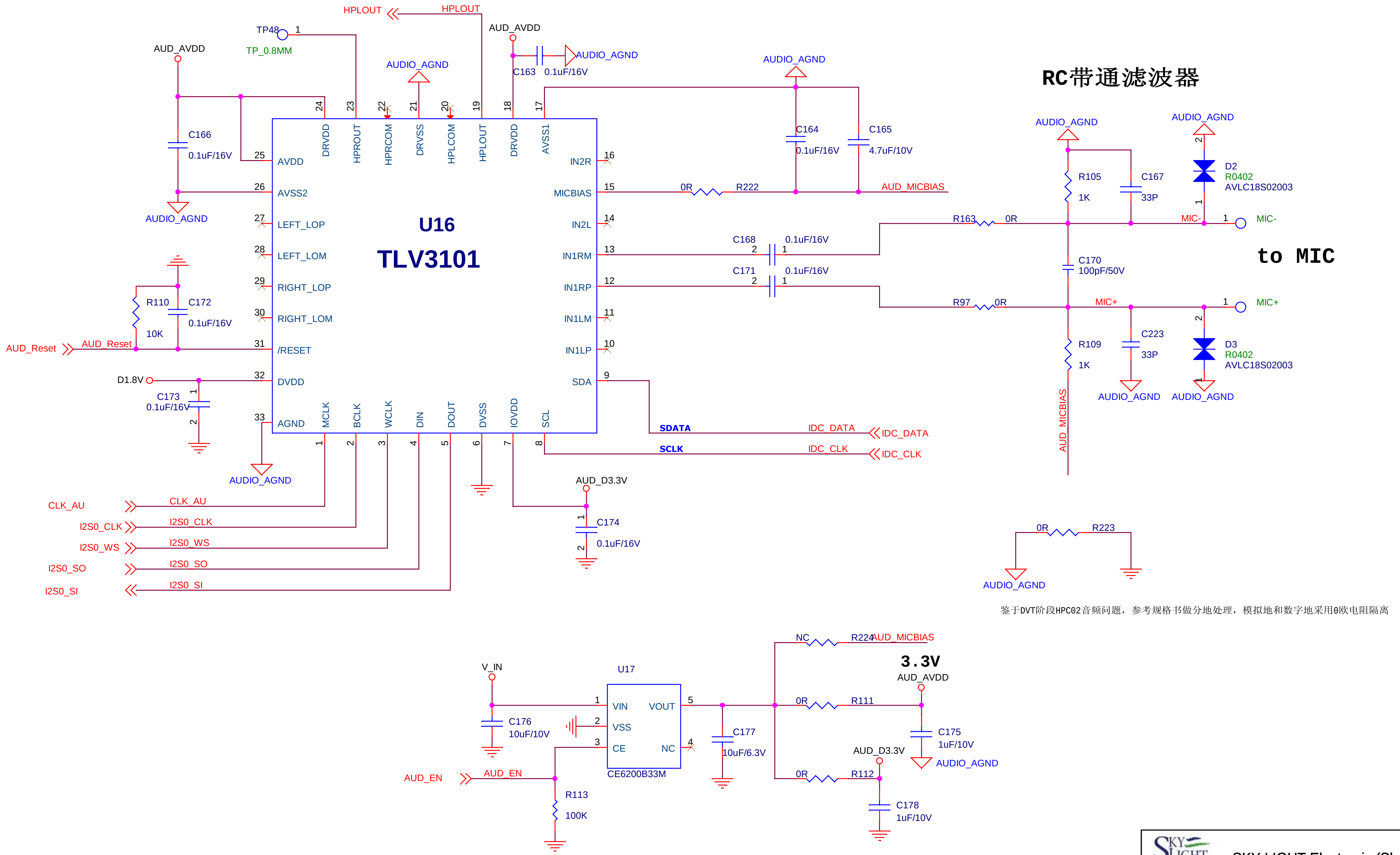
Confidential

RTC Power Circuit


A5S Core Power 1.2V
A5S_VDD
增加丝印：1V2
V_IN
U10
MP2158
VIN
SW
EN
OUT
AGND
PGND
PG
FB
L3
1uH_2.5x2.0x1.2mm
C138
10uF/10V
C127
0.1uF/16V
VFB=0.6V
R87
100K_1%
R88
100K_1%
C125
10uF/6.3V
C124
100pF/50V
C126
22uF/6.3V
0R
R86
TP21
TP_0.8MM
PWC_PSEQ3
PWC_PSEQ3
R153
100K

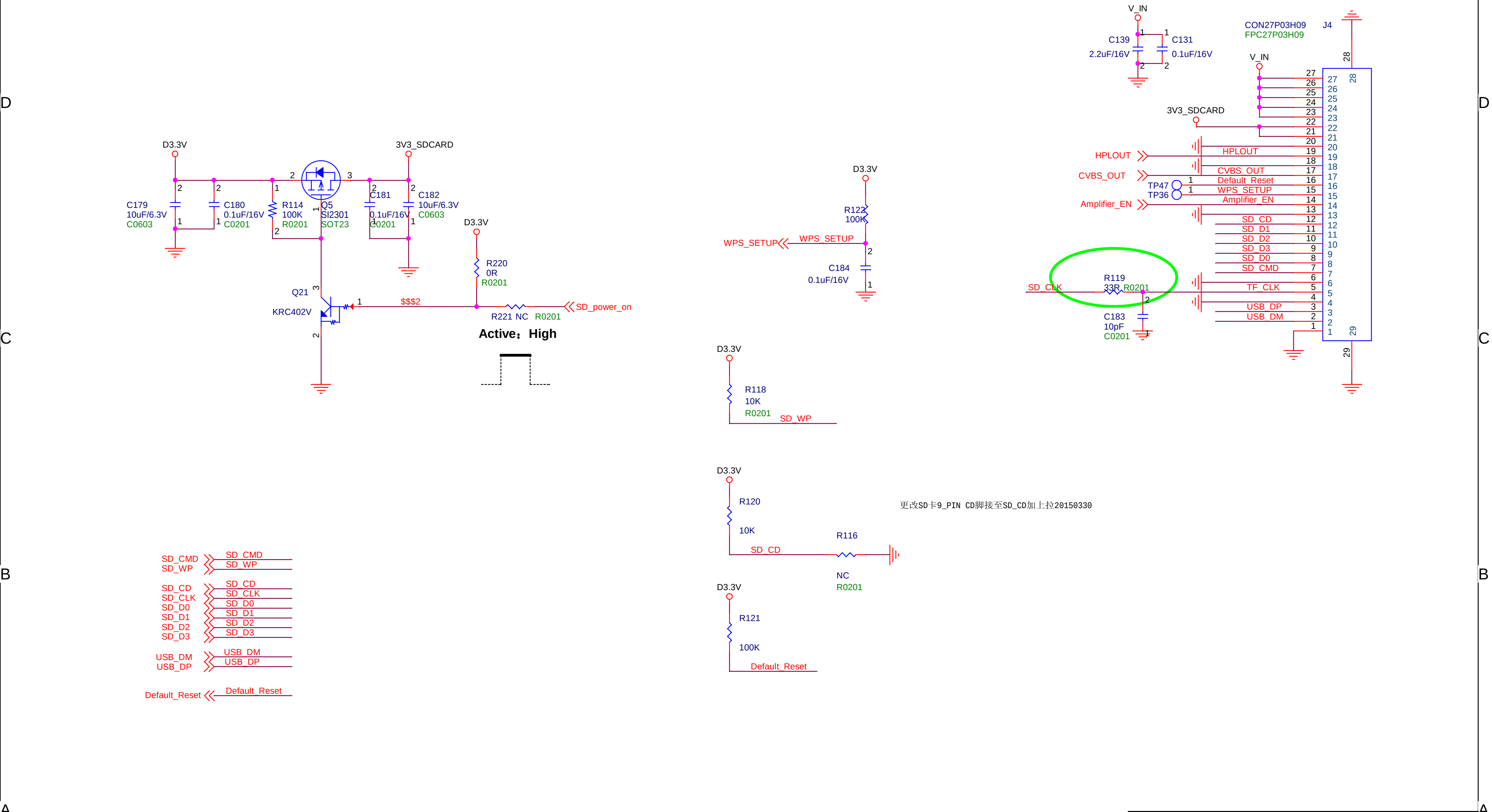
SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB		Drawn By Lizhiqiang
Size B	Document Number Power manager	Rev V02.02
Date: Tuesday, March 08, 2016	Sheet 12 of 17	


RC带通滤波器
to MIC
U16
TLV3101
AVDD
AVSS2
LEFT_LOP
LEFT_LOM
RIGHT_LOP
RIGHT_LOM
/RESET
DVDD
AGND
DRVDD
HPROUT
HPRCOM
DRVSS
HPLCOM
HPLOUT
DRVDD
AVSS1
IN2R
MICBIAS
IN2L
IN1RM
IN1RP
IN1LM
IN1LP
SDA
MCLK
BCLK
WCLK
DIN
DOUT
DVSS
IOVDD
SCL
HPLOUT
TP48
TP_0.8MM
AUD_AVDD
AUDIO_AGND
C163
0.1uF/16V
C164
0.1uF/16V
C165
4.7uF/10V
C166
0.1uF/16V
R222
0R
AUD_MICBIAS
R110
10K
C172
0.1uF/16V
AUD_Reset
D1.8V
C173
0.1uF/16V
R163
0R
R97
0R
C168
0.1uF/16V
C171
0.1uF/16V
R105
1K
C167
33P
D2
R0402
AVLC18S02003
MIC-
C170
100pF/50V
MIC+
R109
1K
C223
33P
D3
R0402
AVLC18S02003
SDATA
IDC_DATA
SCLK
IDC_CLK
AUD_D3.3V
C174
0.1uF/16V
CLK_AU
I2S0_CLK
I2S0_WS
I2S0_SO
I2S0_SI
R223
0R
鉴于DVT阶段HPC02音频问题，参考规格书做分地处理，模拟地和数字地采用0欧电阻隔离
NC
R224
3.3V
V_IN
U17
VIN
VSS
CE
VOUT
NC
CE6200B33M
C176
10uF/10V
C177
10uF/6.3V
R111
0R
C175
1uF/10V
R112
0R
C178
1uF/10V
AUD_EN
R113
100K

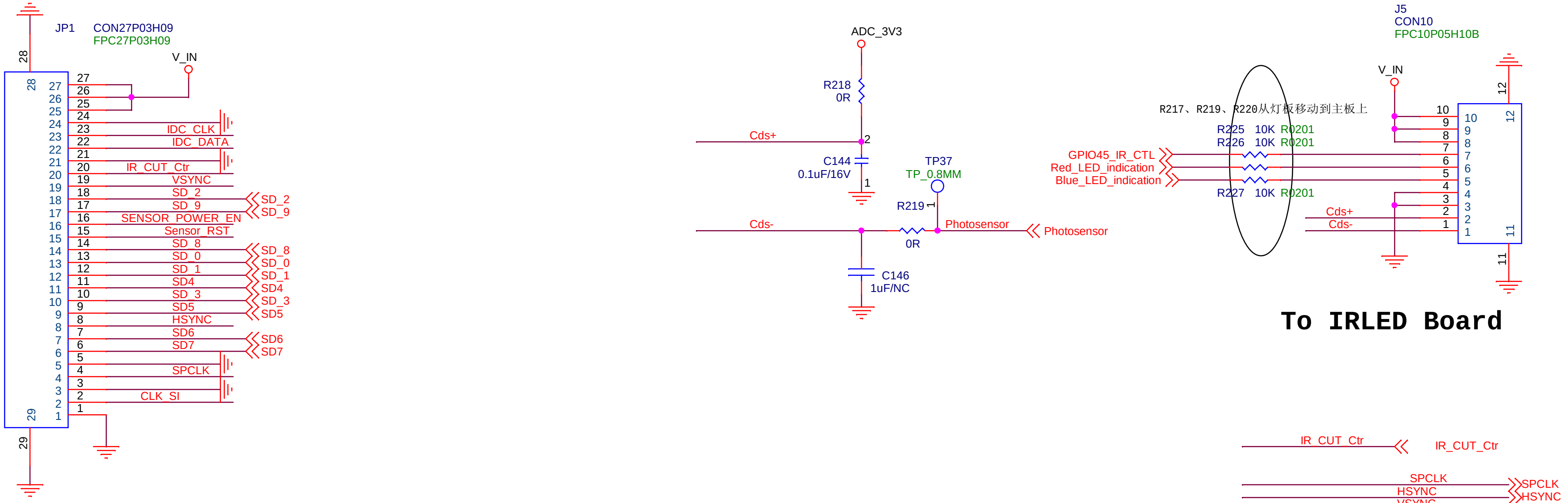
SKY LIGHT Electronic (ShenZhen) Limited

Title: HPC02AB
Drawn By: Lizhiqiang
Size: B
Document Number: Audio Codec
Rev: V02.02
Date: Tuesday, March 08, 2016
Sheet 13 of 17

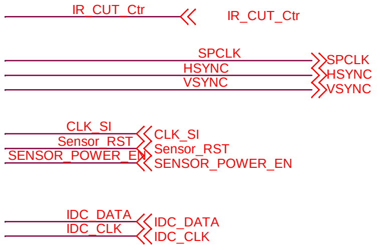

V_IN
C139
2.2uF/16V
C131
0.1uF/16V
CON27P03H09
FPC27P03H09
J4
3V3_SDCARD
HPLOUT
CVBS_OUT
Default_Reset
WPS_SETUP
Amplifier_EN
TP47
TP36
SD_CD
SD_D1
SD_D2
SD_D3
SD_D0
SD_CMD
TF_CLK
USB_DP
USB_DM
SD_CLK
R119
33R R0201
C183
10pF
C0201
D3.3V
C179
10uF/6.3V
C0603
C180
0.1uF/16V
C0201
R114
100K
R0201
Q5
SI2301
SOT23
C181
0.1uF/16V
C0201
C182
10uF/6.3V
C0603
Q21
KRC402V
$$$2
R220
0R
R0201
R221 NC
R0201
SD_power_on
Active：High
R122
100K
C184
0.1uF/16V
R118
10K
R0201
SD_WP
R120
10K
R116
NC
R0201
R121
100K
更改SD卡9_PIN CD脚接至SD_CD加上拉20150330

SKY LIGHT Electronic (ShenZhen) Limited

Title	HPC02AB	Drawn By wangguanming
Size B	Document Number TF Card-Connector	Rev V02.03
Date:	Monday, March 14, 2016	Sheet 14 of 17


JP1
CON27P03H09
FPC27P03H09
V_IN
IDC_CLK
IDC_DATA
IR_CUT_Ctr
VSYNC
SD_2
SD_9
SENSOR_POWER_EN
Sensor_RST
SD_8
SD_0
SD_1
SD4
SD_3
SD5
HSYNC
SD6
SD7
SPCLK
CLK_SI
ADC_3V3
R218
0R
Cds+
C144
0.1uF/16V
TP37
TP_0.8MM
R219
Photosensor
Cds-
0R
C146
1uF/NC
J5
CON10
FPC10P05H10B
R217、R219、R220从灯板移动到主板上
R225 10K R0201
R226 10K R0201
R227 10K R0201
GPIO45_IR_CTL
Red_LED_indication
Blue_LED_indication
Cds+
Cds-

To IRLED Board


IR_CUT_Ctr
SPCLK
HSYNC
VSYNC
CLK_SI
Sensor_RST
SENSOR_POWER_EN
IDC_DATA
IDC_CLK

To Sensor Board（FPC座子）

FPC座 27Pin PH0.3

Sensor型号为：OV9712

Sky Light Electronic (Shen Zhen) Limited

Title HPC02AB

Drawn By wangguanming

Size B

Document Number Sensor-OV9712

Rev V02.02

Date: Tuesday, March 08, 2016

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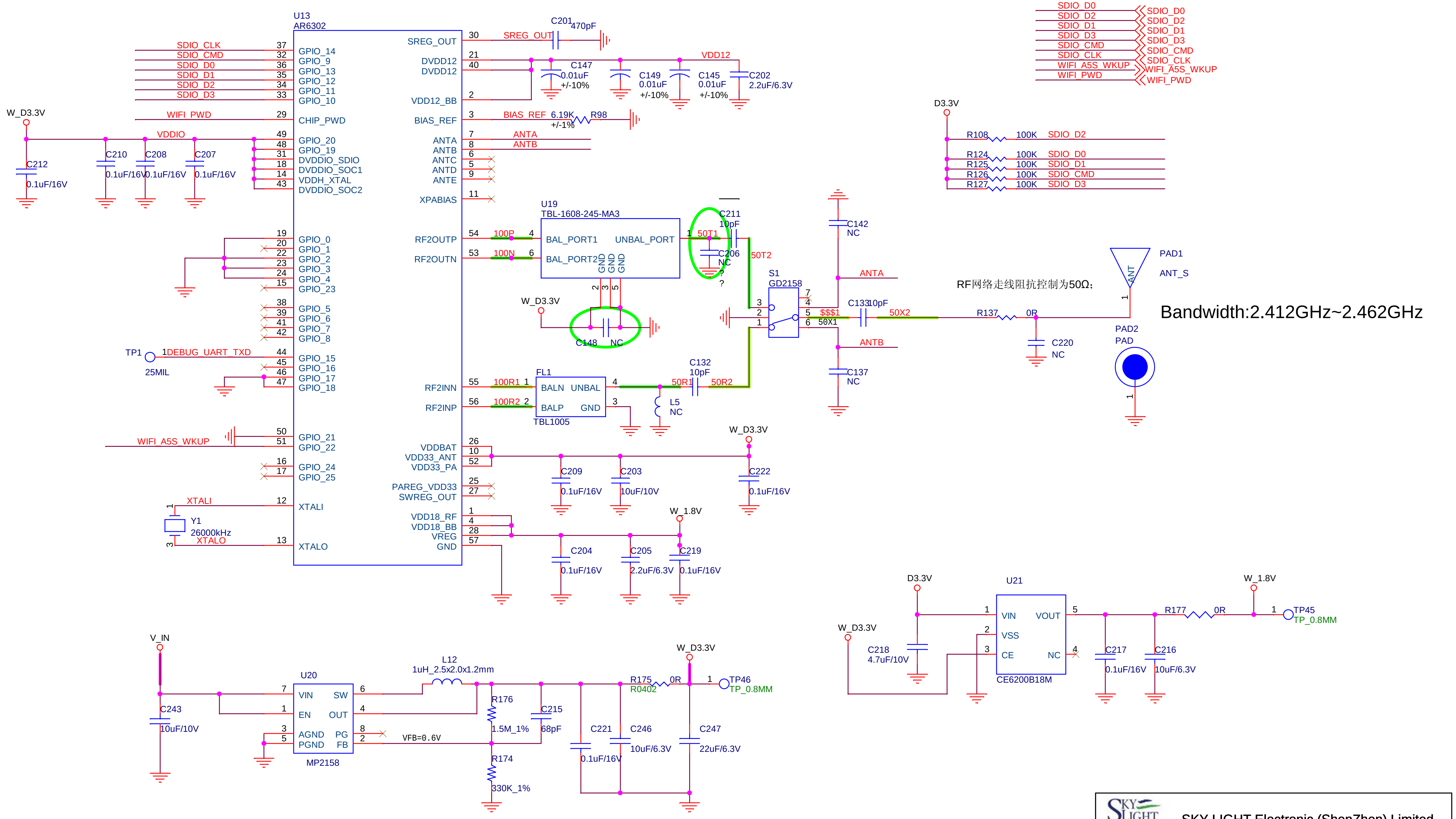
U13
AR6302
SDIO_CLK
SDIO_CMD
SDIO_D0
SDIO_D1
SDIO_D2
SDIO_D3
WIFI_PWD
VDDIO
W_D3.3V
C212
0.1uF/16V
C210
C208
C207
0.1uF/16V
GPIO_14
GPIO_9
GPIO_13
GPIO_12
GPIO_11
GPIO_10
CHIP_PWD
GPIO_20
GPIO_19
DVDDIO_SDIO
DVDDIO_SOC1
VDDH_XTAL
DVDDIO_SOC2
GPIO_0
GPIO_1
GPIO_2
GPIO_3
GPIO_4
GPIO_23
GPIO_5
GPIO_6
GPIO_7
GPIO_8
GPIO_15
GPIO_16
GPIO_17
GPIO_18
GPIO_21
GPIO_22
GPIO_24
GPIO_25
XTALI
XTALO
TP1
DEBUG_UART_TXD
25MIL
WIFI_A5S_WKUP
Y1
26000kHz
SREG_OUT
DVDD12
VDD12_BB
BIAS_REF
ANTA
ANTB
ANTC
ANTD
ANTE
XPABIAS
RF2OUTP
RF2OUTN
RF2INN
RF2INP
VDDBAT
VDD33_ANT
VDD33_PA
PAREG_VDD33
SWREG_OUT
VDD18_RF
VDD18_BB
VREG
GND
C201
470pF
VDD12
C147
0.01uF
+/-10%
C149
0.01uF
C145
0.1uF
C202
2.2uF/6.3V
BIAS_REF 6.19K
+/-1%
R98
U19
TBL-1608-245-MA3
BAL_PORT1
BAL_PORT2
UNBAL_PORT
100P
100N
C148
NC
C211
10pF
50T1
50T2
C206
NC
S1
GD2158
$$$1
50X1
50X2
C133 10pF
C142
NC
C137
NC
FL1
BALN
BALP
UNBAL
GND
TBL1005
100R1
100R2
C132
10pF
50R1
50R2
L5
NC
R137
0R
C220
NC
PAD1
ANT_S
ANT
PAD2
PAD
W_1.8V
C209
0.1uF/16V
C203
10uF/10V
C222
0.1uF/16V
C204
0.1uF/16V
C205
2.2uF/6.3V
C219
0.1uF/16V
D3.3V
R108
R124
R125
R126
R127
100K
SDIO_D0
SDIO_D1
SDIO_D2
SDIO_D3
SDIO_CMD
SDIO_CLK
WIFI_A5S_WKUP
WIFI_PWD
U21
VIN
VOUT
VSS
CE
NC
CE6200B18M
C218
4.7uF/10V
C217
0.1uF/16V
C216
10uF/6.3V
R177
0R
TP45
TP_0.8MM
V_IN
C243
10uF/10V
U20
SW
EN
OUT
AGND
PGND
PG
FB
MP2158
L12
1uH_2.5x2.0x1.2mm
VFB=0.6V
R176
1.5M_1%
R174
330K_1%
C215
68pF
C221
0.1uF/16V
C246
10uF/6.3V
C247
22uF/6.3V
R175
R0402
0R
TP46
TP_0.8MM

RF网络走线阻抗控制为50Ω;

Bandwidth:2.412GHz~2.462GHz

SKY LIGHT Electronic (ShenZhen) Limited

Title	HPC02AB	Drawn By	Lizhiqiang
Size B	Document Number Wifi module		Rev V02.02
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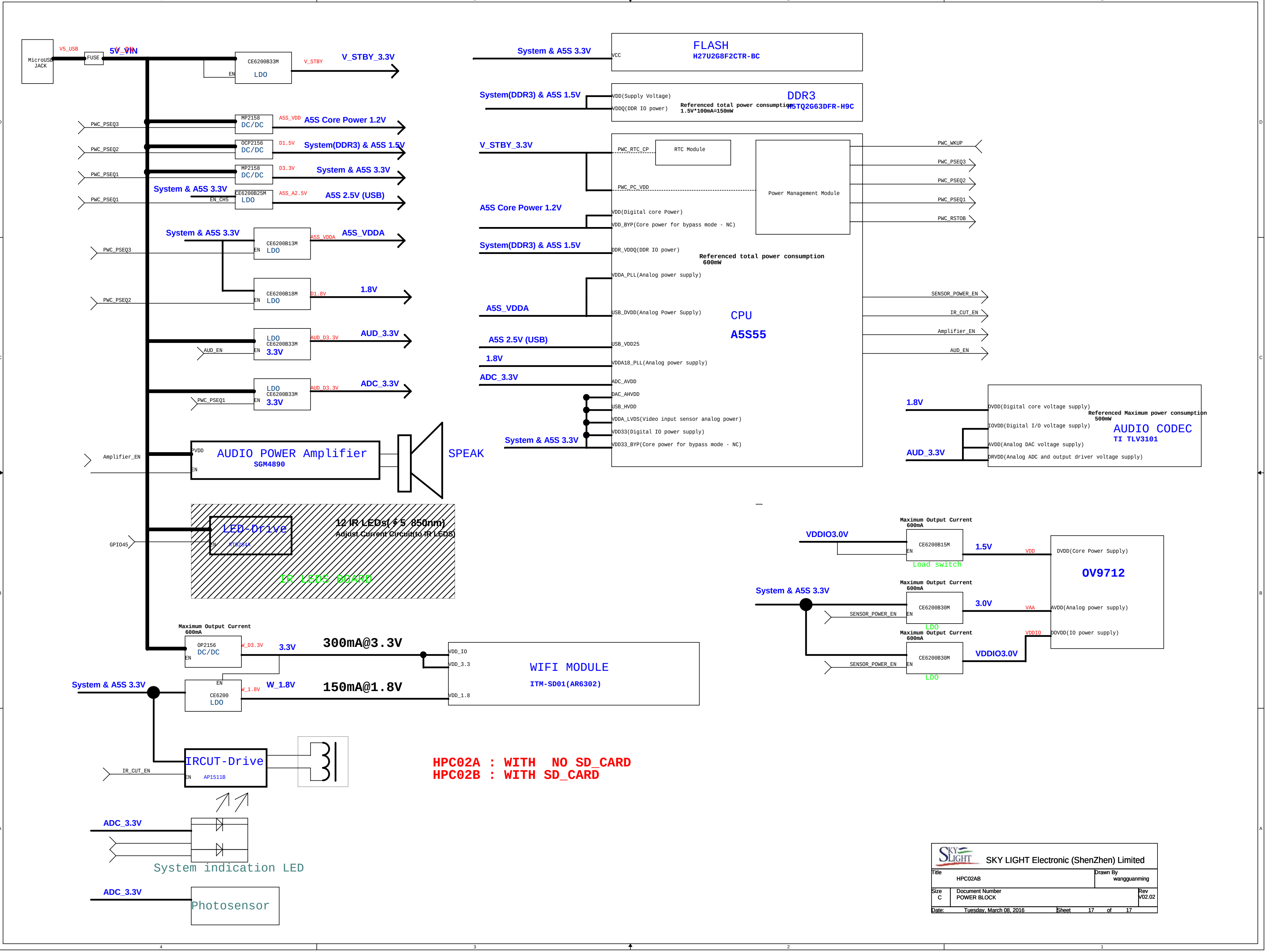
MicroUSB JACK
V5_USB
FUSE
5V_VIN
CE6200B33M
LDO
EN
V_STBY
V_STBY_3.3V
PWC_PSEQ3
MP2158
DC/DC
A5S_VDD
A5S Core Power 1.2V
PWC_PSEQ2
OCP2156
DC/DC
D1.5V
System(DDR3) & A5S 1.5V
PWC_PSEQ1
MP2158
DC/DC
D3.3V
System & A5S 3.3V
PWC_PSEQ1
System & A5S 3.3V
EN_CH5
CE6200B25M
LDO
A5S_A2.5V
A5S 2.5V (USB)
System & A5S 3.3V
PWC_PSEQ3
CE6200B13M
LDO
A5S_VDDA
A5S_VDDA
PWC_PSEQ2
CE6200B18M
LDO
D1.8V
1.8V
AUD_EN
LDO
CE6200B33M
3.3V
AUD_D3.3V
AUD_3.3V
PWC_PSEQ1
LDO
CE6200B33M
3.3V
AUD_D3.3V
ADC_3.3V
Amplifier_EN
PVDD
EN
AUDIO POWER Amplifier
SGM4890
SPEAK
GPIO45
LED-Drive
RT9284A
12 IR LEDs(∮5 850nm)
Adjust Current Circuit(to IR LEDS)
IR LEDS BOARD
Maximum Output Current
600mA
OP2156
DC/DC
EN
W_D3.3V
3.3V
300mA@3.3V
System & A5S 3.3V
EN
CE6200
LDO
W_1.8V
W_1.8V
150mA@1.8V
VDD_IO
VDD_3.3
VDD_1.8
WIFI MODULE
ITM-SD01(AR6302)
IR_CUT_EN
IRCUT-Drive
EN
AP1511B
ADC_3.3V
System indication LED
ADC_3.3V
Photosensor
System & A5S 3.3V
VCC
FLASH
H27U2G8F2CTR-BC
System(DDR3) & A5S 1.5V
VDD(Supply Voltage)
VDDQ(DDR IO power)
Referenced total power consumption
1.5V*100mA=150mW
DDR3
H5TQ2G63DFR-H9C
V_STBY_3.3V
PWC_RTC_CP
RTC Module
PWC_PC_VDD
Power Management Module
PWC_WKUP
PWC_PSEQ3
PWC_PSEQ2
PWC_PSEQ1
PWC_RSTOB
A5S Core Power 1.2V
VDD(Digital core Power)
VDD_BYP(Core power for bypass mode - NC)
System(DDR3) & A5S 1.5V
DDR_VDDQ(DDR IO power)
Referenced total power consumption
600mW
VDDA_PLL(Analog power supply)
A5S_VDDA
USB_DVDD(Analog Power Supply)
CPU
A5S55
SENSOR_POWER_EN
IR_CUT_EN
Amplifier_EN
AUD_EN
A5S 2.5V (USB)
USB_VDD25
1.8V
VDDA18_PLL(Analog power supply)
ADC_3.3V
ADC_AVDD
DAC_AHVDD
USB_HVDD
VDDA_LVDS(Video input sensor analog power)
VDD33(Digital IO power supply)
System & A5S 3.3V
VDD33_BYP(Core power for bypass mode - NC)
1.8V
DVDD(Digital core voltage supply)
Referenced Maximum power consumption
500mW
IOVDD(Digital I/O voltage supply)
AUDIO CODEC
TI TLV3101
AUD_3.3V
AVDD(Analog DAC voltage supply)
DRVDD(Analog ADC and output driver voltage supply)
Maximum Output Current
600mA
VDDIO3.0V
CE6200B15M
EN
Load switch
1.5V
VDD
DVDD(Core Power Supply)
OV9712
System & A5S 3.3V
Maximum Output Current
600mA
CE6200B30M
SENSOR_POWER_EN
EN
LDO
3.0V
VAA
AVDD(Analog power supply)
Maximum Output Current
600mA
VDDIO
DOVDD(IO power supply)
CE6200B30M
SENSOR_POWER_EN
EN
LDO
VDDIO3.0V
4
3
2
1
D
C
B
A

HPC02A : WITH NO SD_CARD
HPC02B : WITH SD_CARD

SKY LIGHT Electronic (ShenZhen) Limited

Title HPC02AB		Drawn By wangguanming
Size C	Document Number POWER BLOCK	Rev V02.02
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