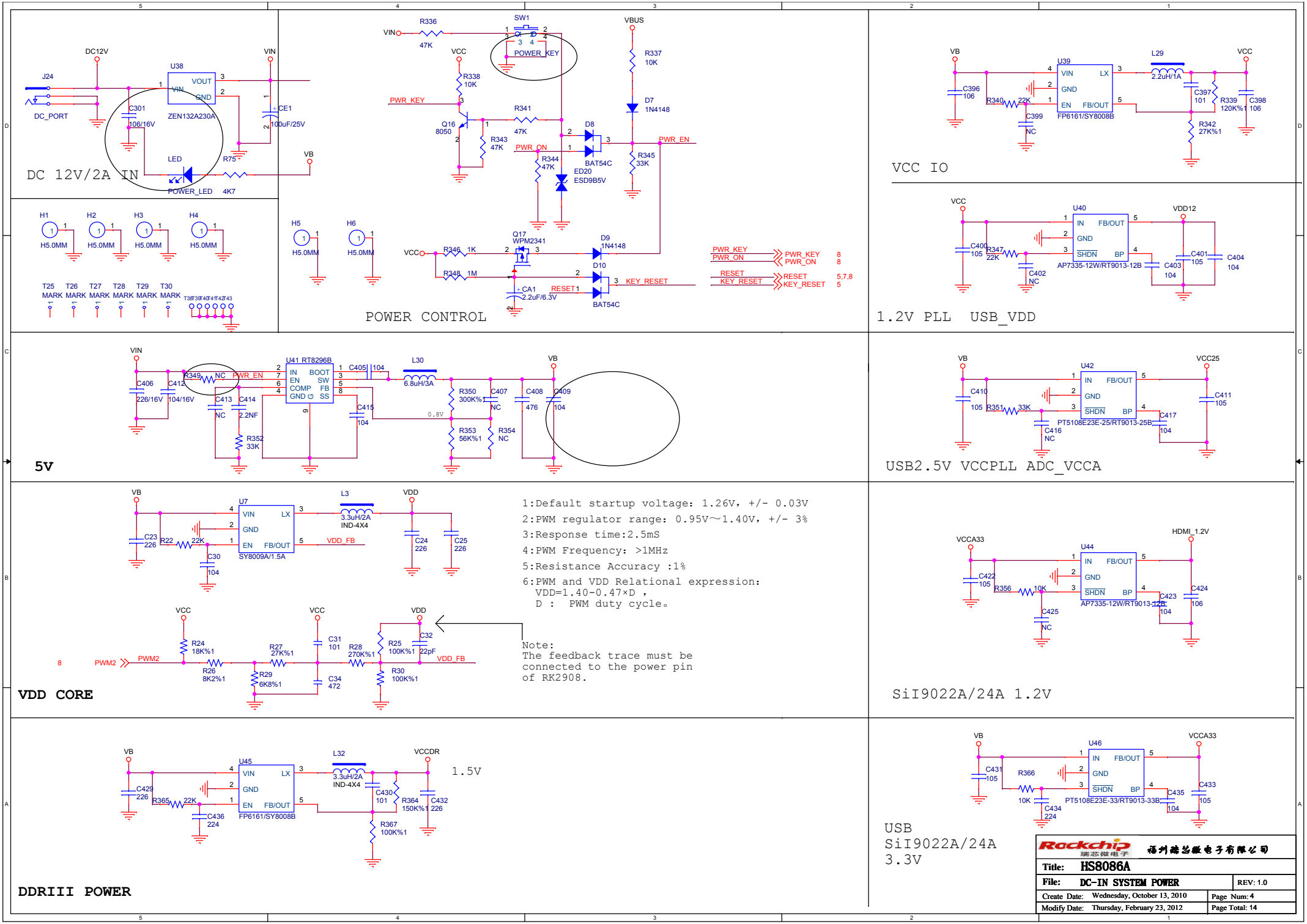
| Version | Date | Author | Change Note | Approved |
|---|---|---|---|---|
| V1.0 | 20111201 | | | |
| | | | | |
| | | | | |

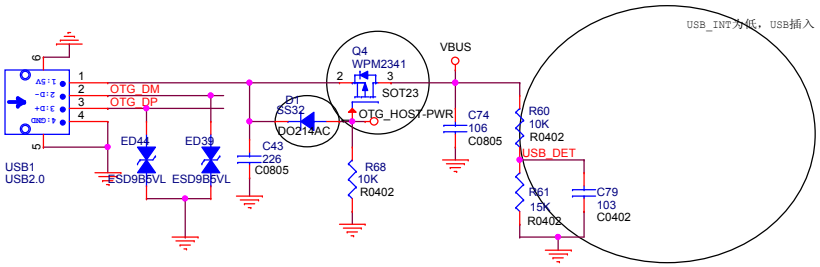

01. INDEX
02.Block Diagram
03.SYSTEM POWER DIAGRAM
04.DC-IN & SYSTEM POWER
05.USB OTG2.0&RTC
06.DDRIII
07.NAND Flash
08.GPIO&POWER-IN
09.HDMI OUT
10.RMII_Ethernet
11.USB WIFI&2.4G Remote


NOTES:
1.I2C0, I2C1 only used for the regular power supply module ;
2.UART1 only use for debugging;
3.The IO be defauled as input port, please note that the pull-up port can not be set to pull-down function;
the drop-down port can not be set to pull-up function;
4.The default status of GPIO please reference RK2918 IO list from ROCKCHIP;

| | |
|---|---|
| Rockchip 瑞芯微电子 | 福州瑞芯微电子有限公司 |
| Title: HS8086A | |
| File: Modify note | REV:1.0 |
| Create Date: Saturday, October 23, 2010 | Page Num:1 |
| Modify Date: Wednesday, February 22, 2012 | Page Total:14 |

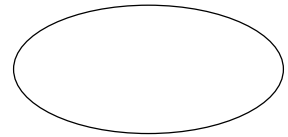

DC 12V/2A IN
POWER CONTROL
VCC IO
1.2V PLL USB_VDD
5V
USB2.5V VCCPLL ADC_VCCA
VDD CORE
SiI9022A/24A 1.2V
DDRIII POWER
USB
SiI9022A/24A
3.3V
1:Default startup voltage: 1.26V, +/- 0.03V
2:PWM regulator range: 0.95V~1.40V, +/- 3%
3:Response time:2.5mS
4:PWM Frequency: >1MHz
5:Resistance Accuracy :1%
6:PWM and VDD Relational expression:
VDD=1.40-0.47×D ,
D : PWM duty cycle。
Note:
The feedback trace must be
connected to the power pin
of RK2908.
Rockchip 瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: DC-IN SYSTEM POWER
REV: 1.0
Create Date: Wednesday, October 13, 2010
Page Num: 4
Modify Date: Thursday, February 23, 2012
Page Total: 14

## USB OTG 2.0 Device




USB OTG

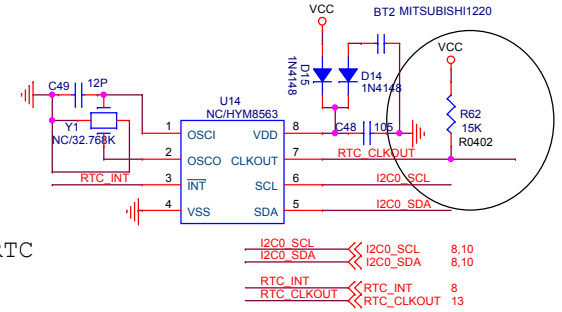
## HOST And Device Switch



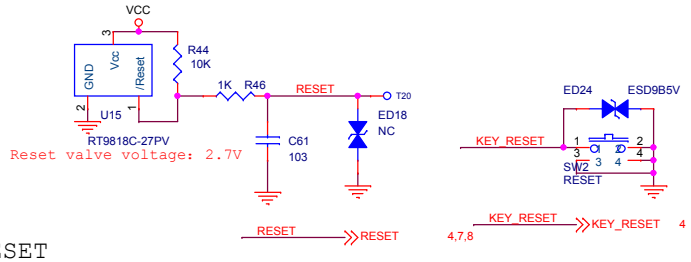
**Truth Table**

| S | $\overline{OE}$ | Function |
|---|---|---|
| X | H | Disconnect |
| L | L | $D+, D- = HSD1_n$ |
| H | L | $D+, D- = HSD2_n$ |

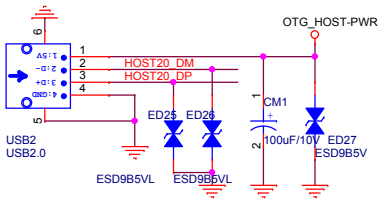
## RTC

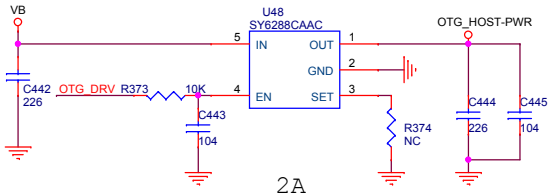



## RESET

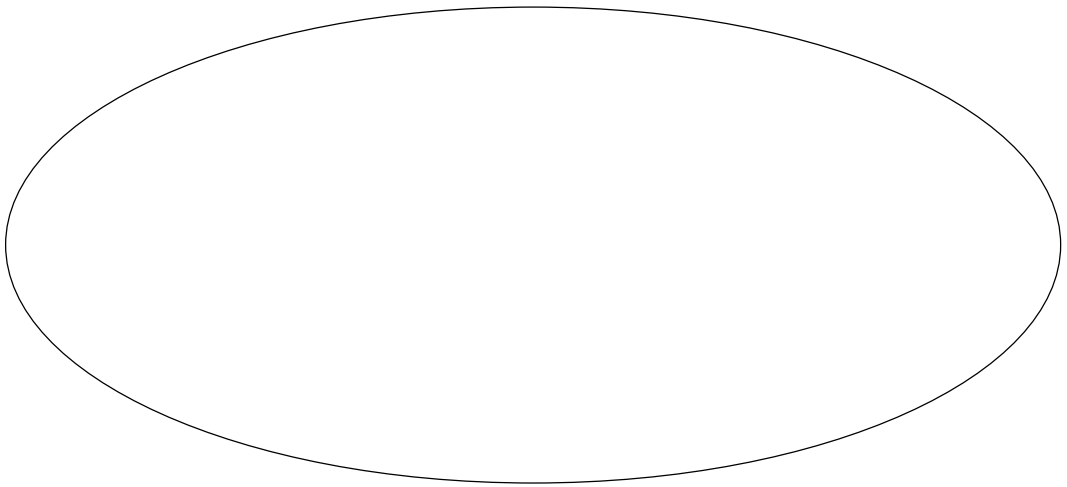



## USB HOST



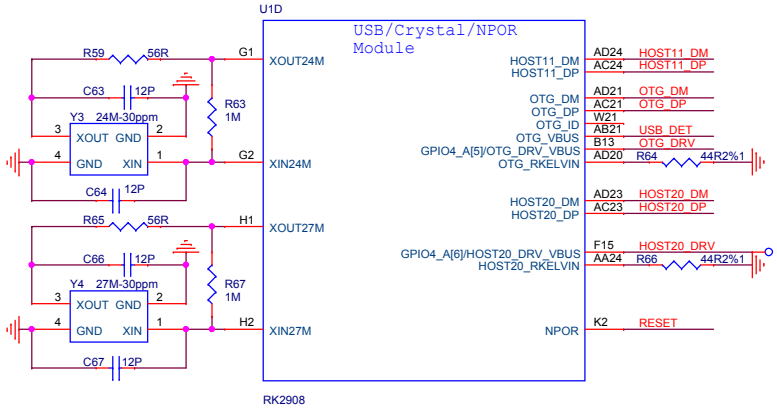



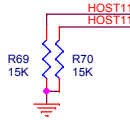

2A



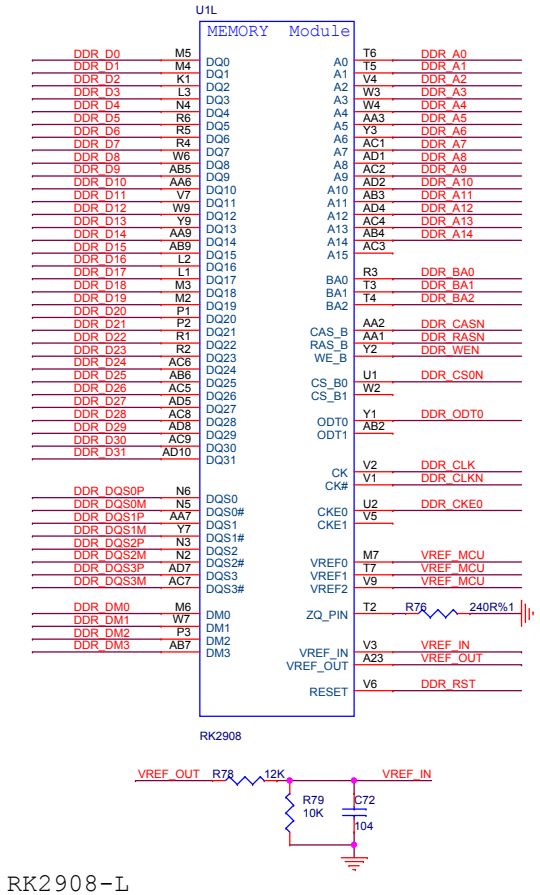
USB OTG HUB

## RK2908-D

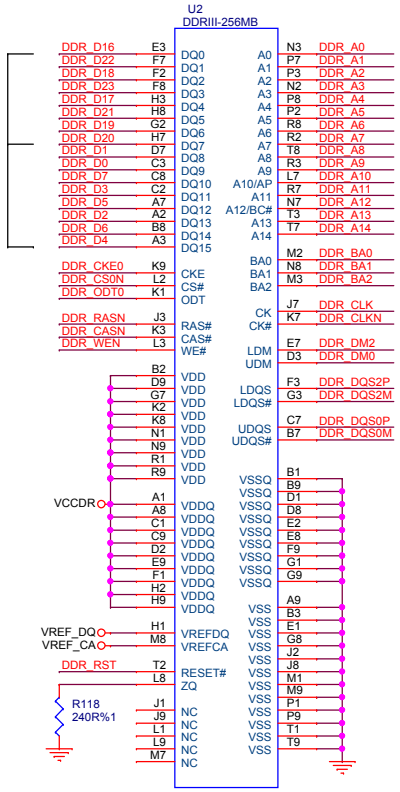


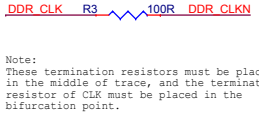

| | | |
|---|---|---|
| Rockchip 瑞芯微电子 | 福州瑞芯微电子有限公司 | |
| Title: | HS8086A | |
| File: | USB OTG2. 0 | REV:1.0 |
| Create Date: | Wednesday, October 13, 2010 | Page Num:5 |
| Modify Date: | Wednesday, February 22, 2012 | Page Total:14 |



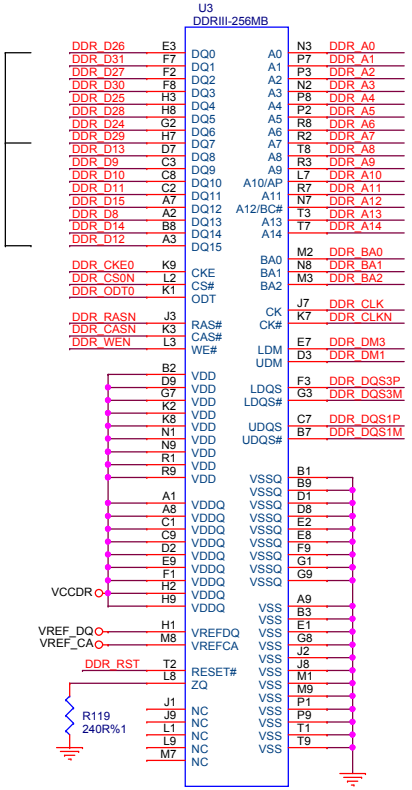

RK2908-L

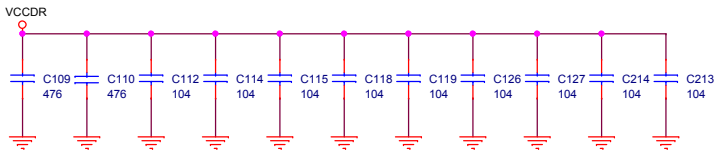


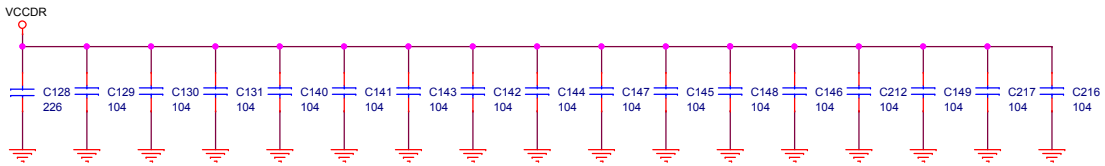

DDR3

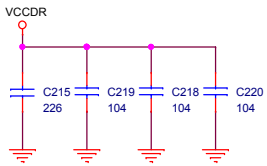



Note:
These termination resistors must be placed in the middle of trace, and the termination resistor of CLK must be placed in the bifurcation point.

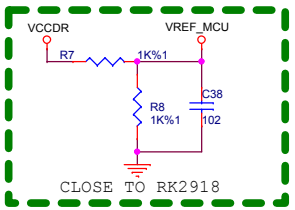


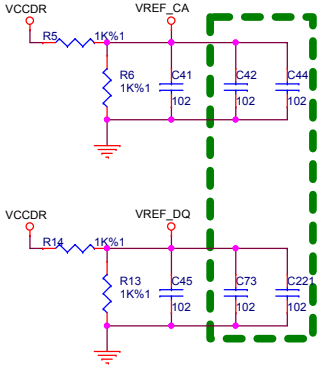




DDR3 POWER FILTER

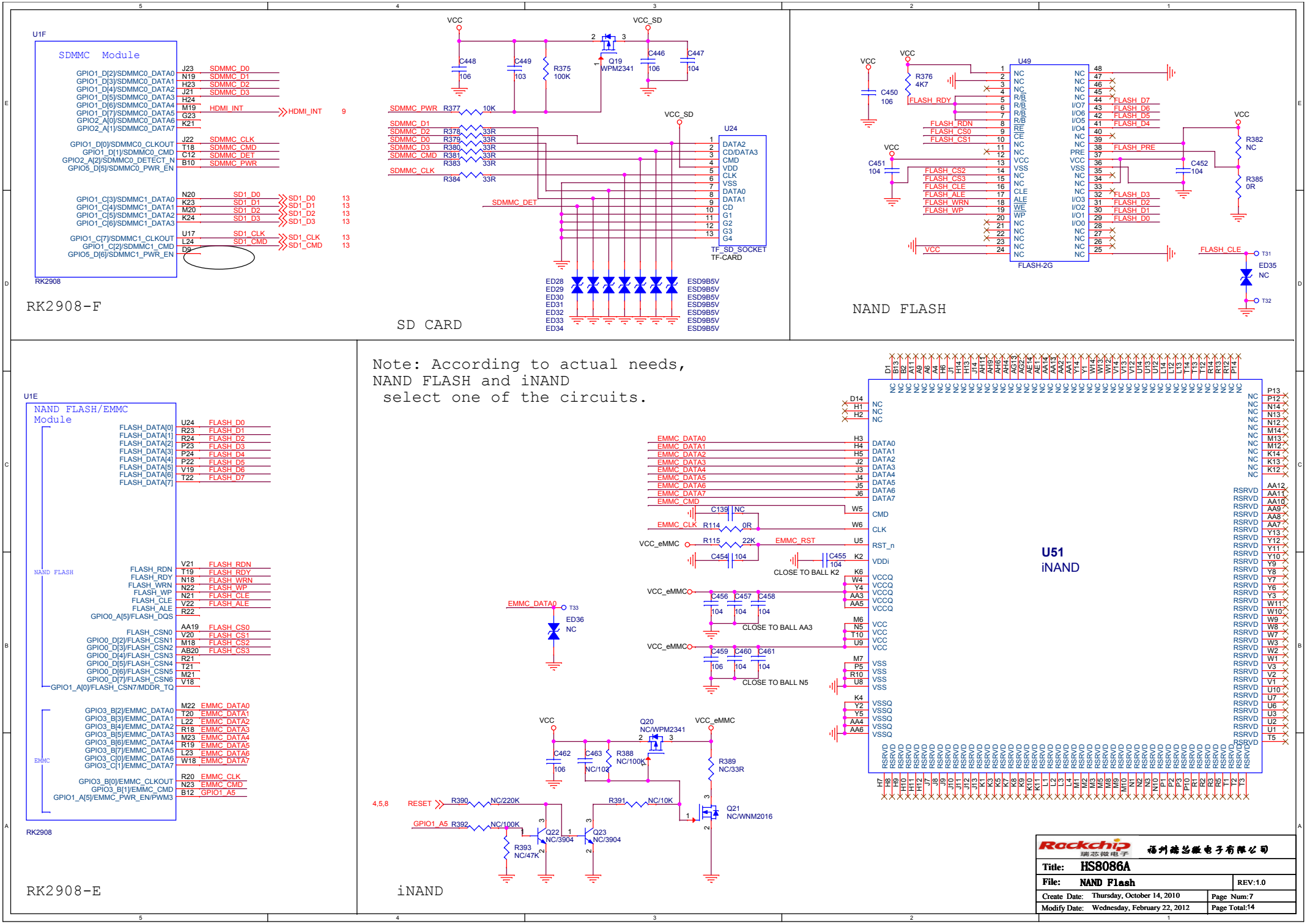


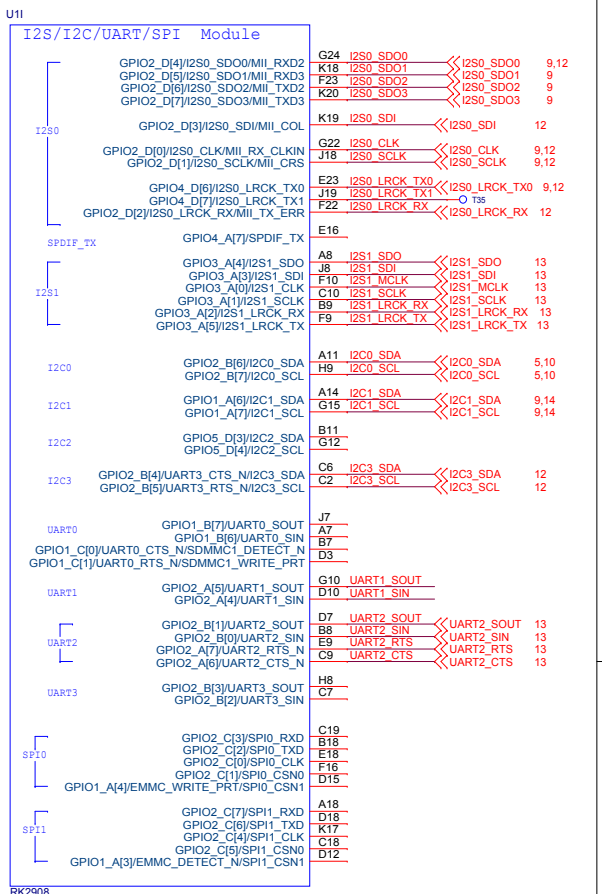

CLOSE TO RK2918



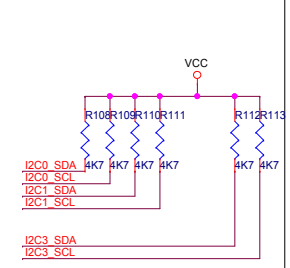

CLOSE TO DDR3

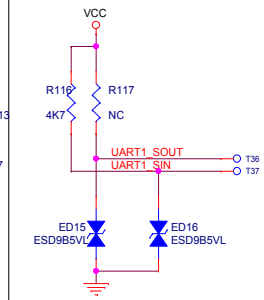
| | | | |
|---|---|---|---|
| Rockchip 瑞芯微电子 | 福州瑞芯微电子有限公司 | | |
| Title: | HS8086A | | |
| File: | DDRIII | | REV:1.0 |
| Create Date: | Tuesday, November 09, 2010 | Page Num:6 | |
| Modify Date: | Wednesday, February 22, 2012 | Page Total:14 | |


U1F
SDMMC Module
RK2908
RK2908-F
SD CARD
VCC
VCC_SD
U24
TF_SD_SOCKET
TF-CARD
U49
FLASH-2G
NAND FLASH
U1E
NAND FLASH/EMMC Module
RK2908-E
Note: According to actual needs,
NAND FLASH and iNAND
select one of the circuits.
U51
iNAND
iNAND
Rockchip
瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: NAND Flash
REV:1.0
Create Date: Thursday, October 14, 2010
Page Num:7
Modify Date: Wednesday, February 22, 2012
Page Total:14

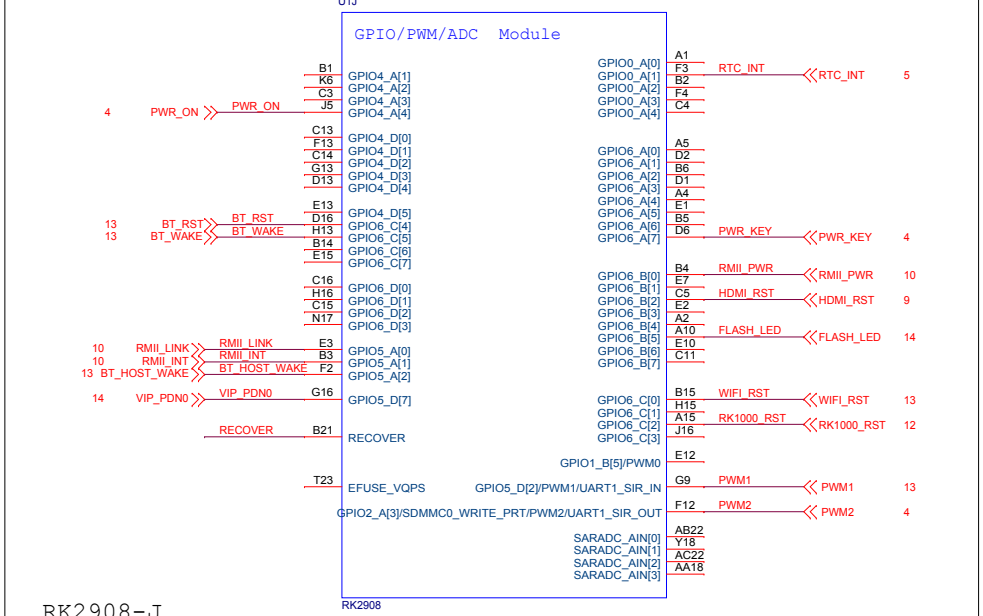



RK2908-I

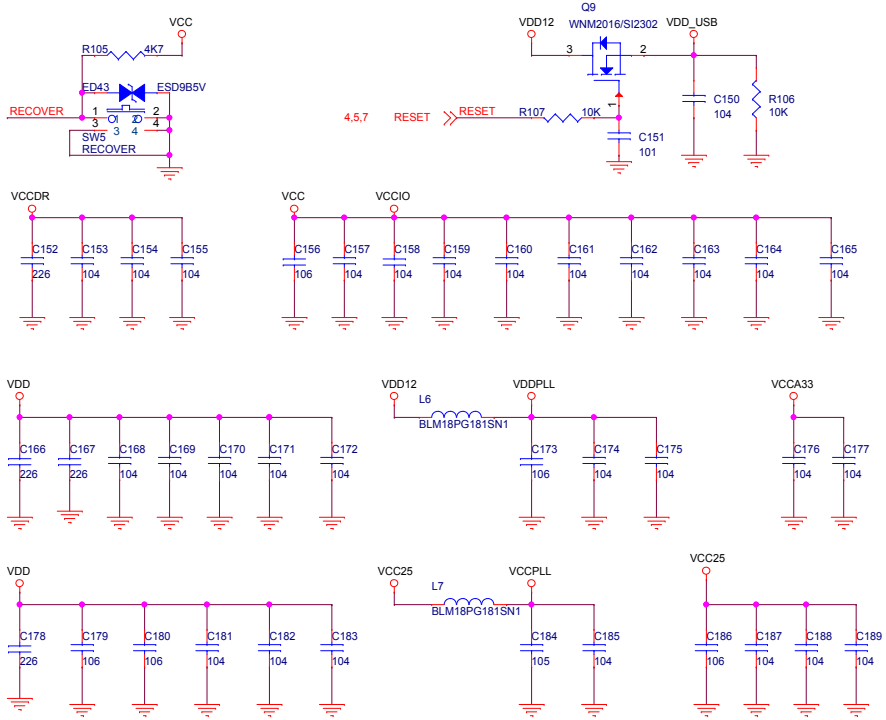


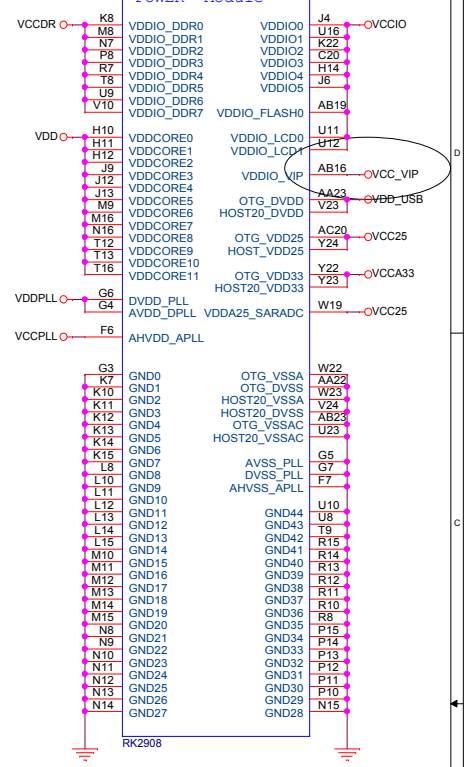




UART1 Debug

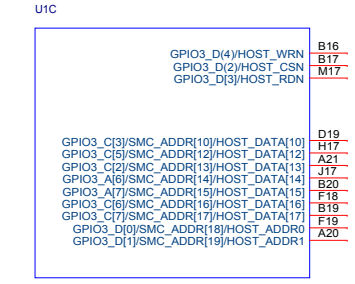



RK2908-J



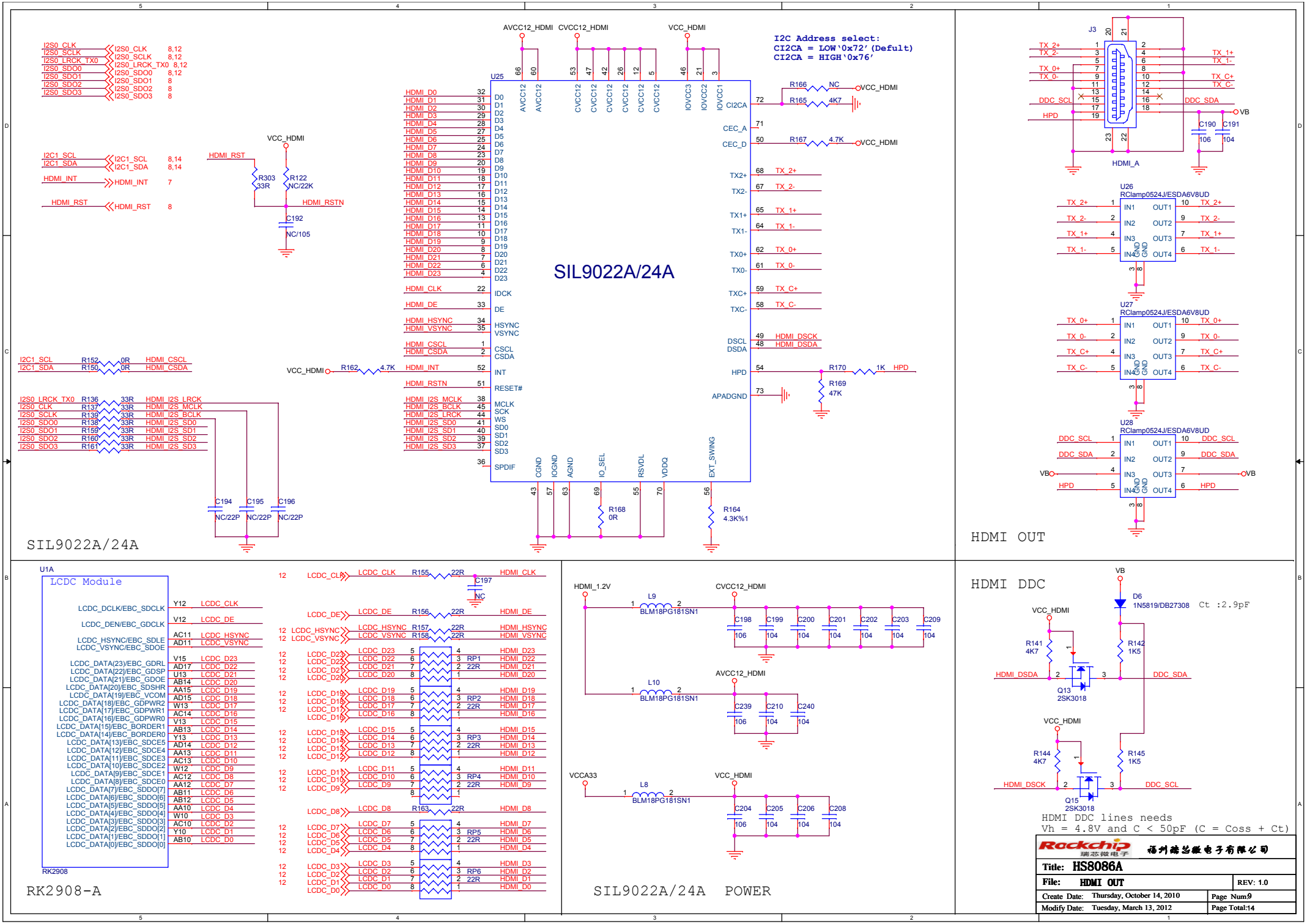



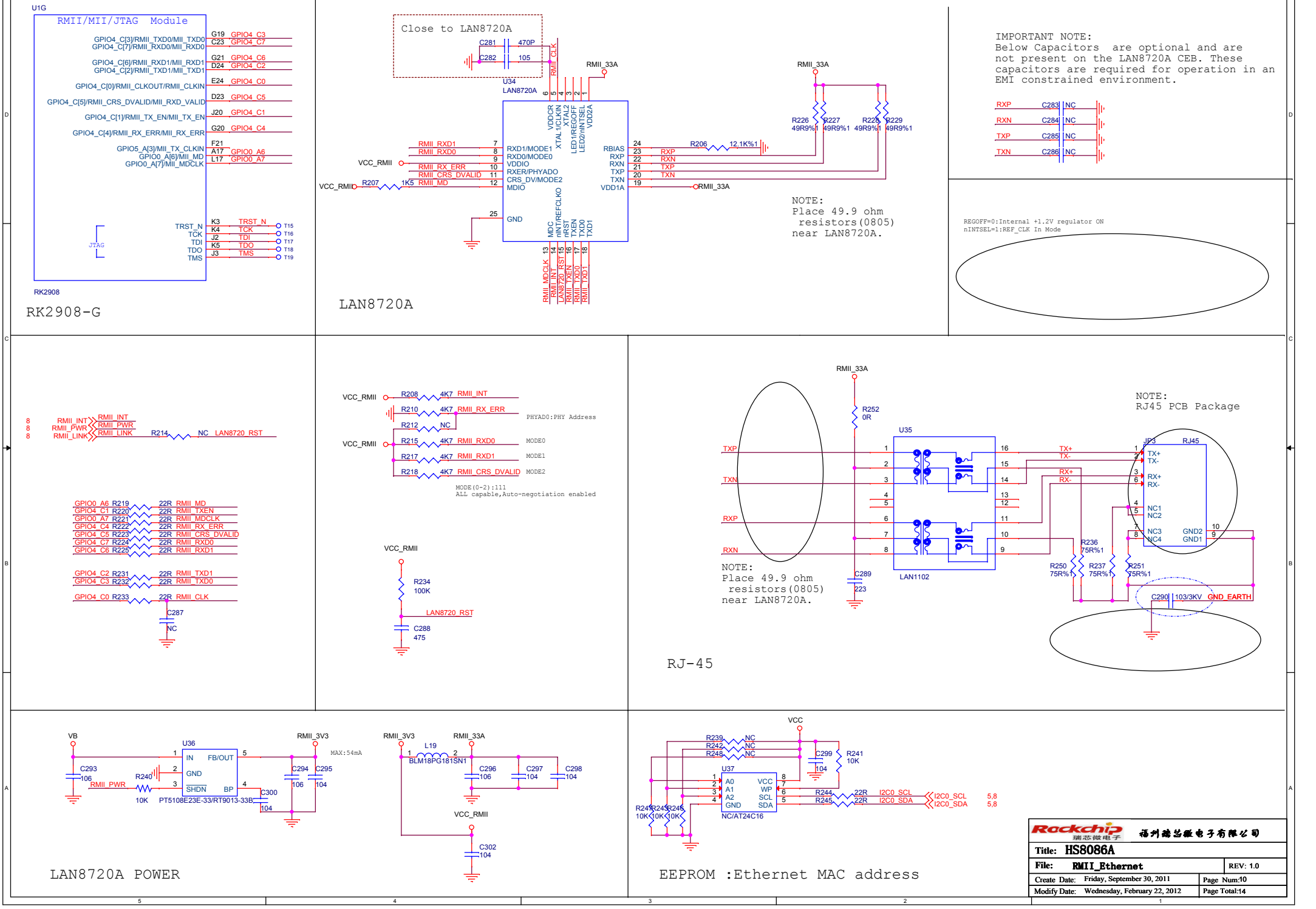

RK2908-K

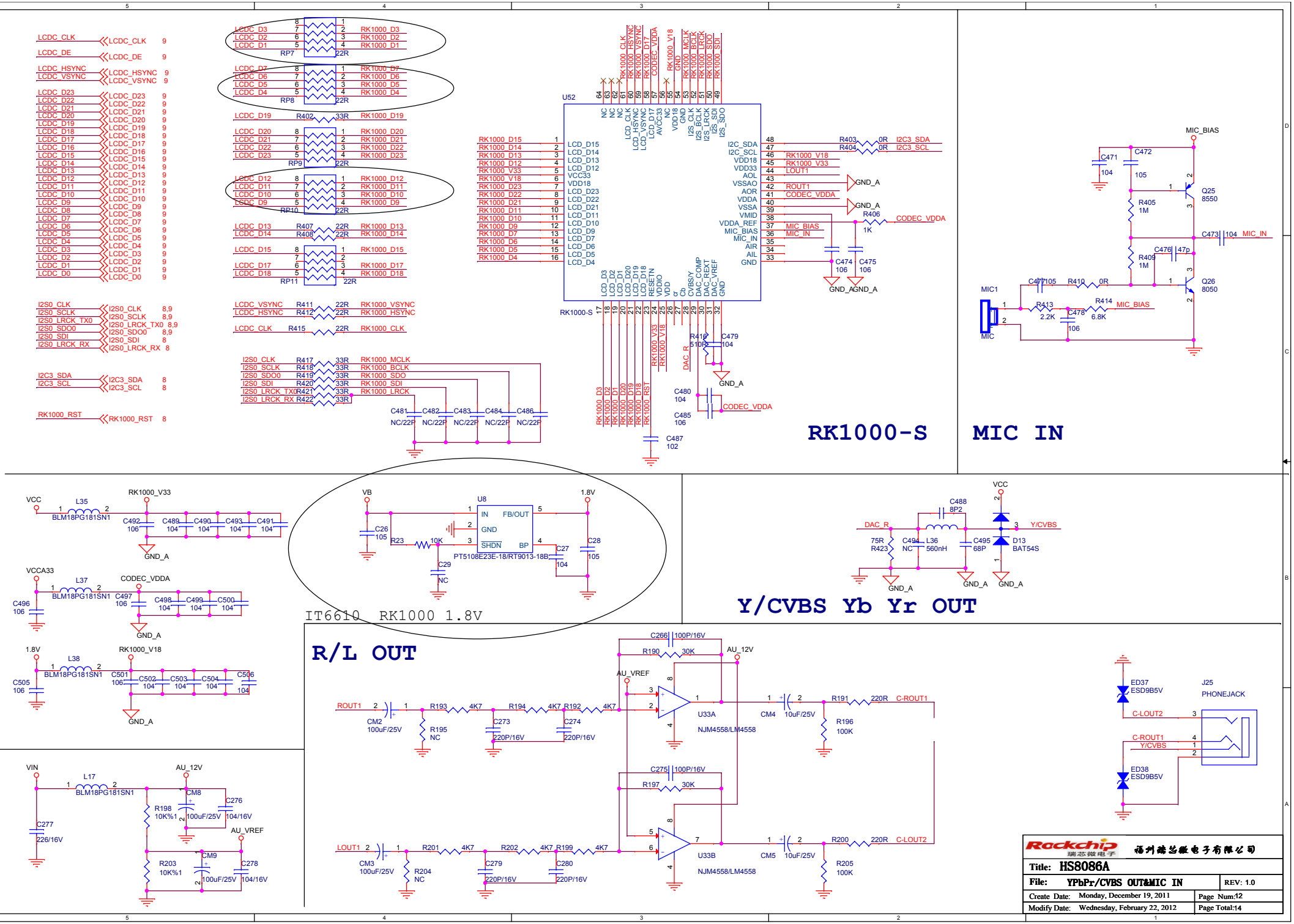


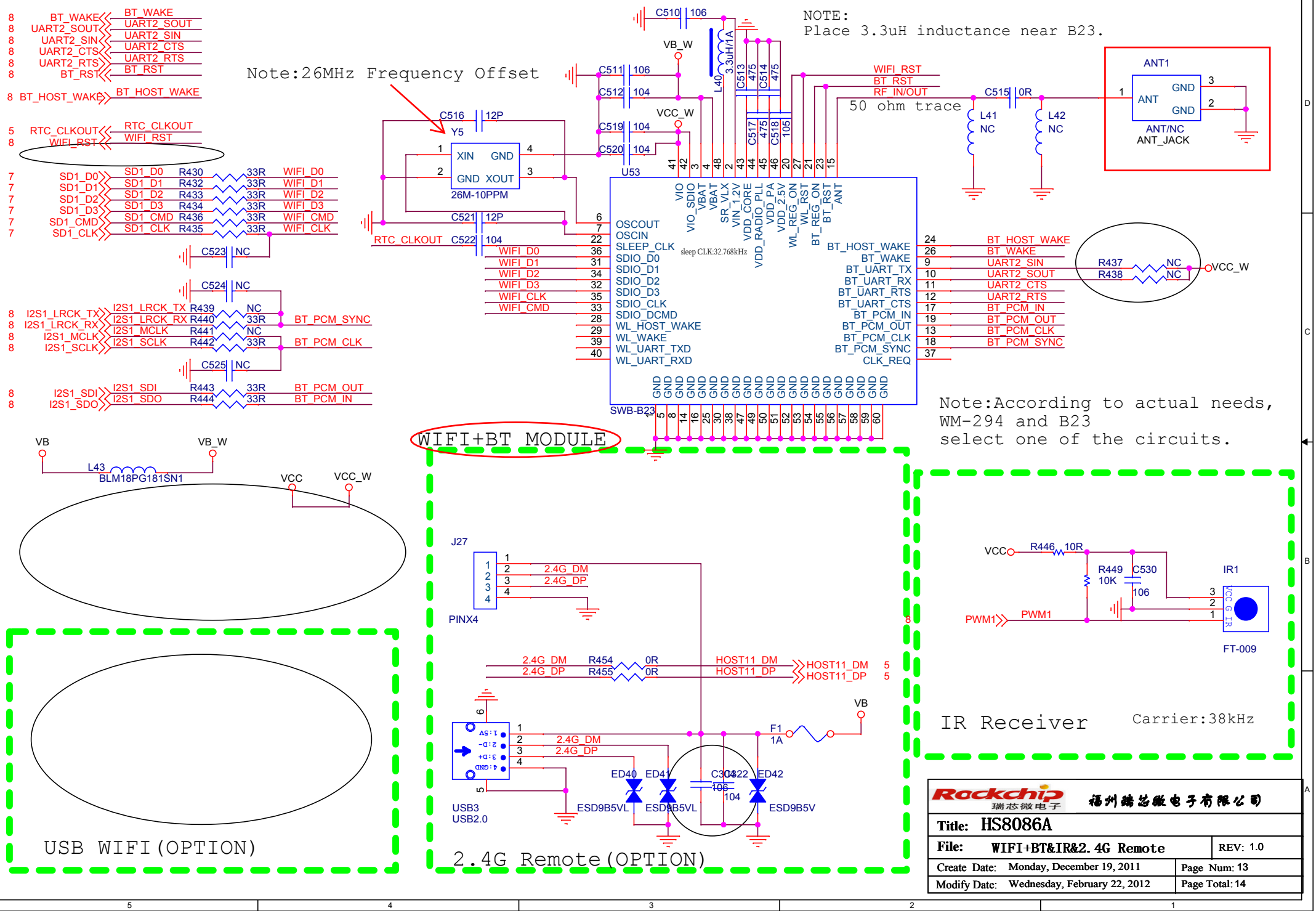

RK2908-C

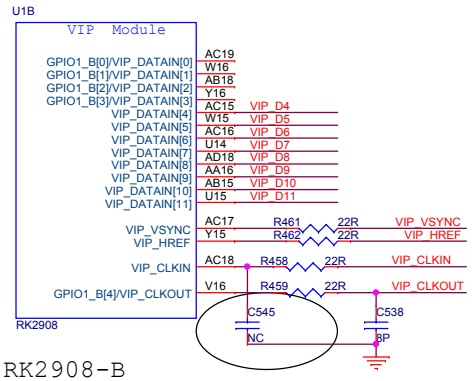
| | | |
|---|---|---|
| Rockchip 瑞芯微电子 | 福州瑞芯微电子有限公司 | |
| Title: HS8086A | | |
| File: GPIO&POWER-IN | | REV:1.0 |
| Create Date: Monday, October 18, 2010 | | Page Num: 8 |
| Modify Date: Wednesday, February 22, 2012 | | Page Total: 14 |


I2C Address select:
CI2CA = LOW'0x72' (Defult)
CI2CA = HIGH'0x76'
SIL9022A/24A
SIL9022A/24A
HDMI OUT
RK2908-A
SIL9022A/24A POWER
HDMI DDC
HDMI DDC lines needs
Vh = 4.8V and C < 50pF (C = Coss + Ct)
Rockchip 瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: HDMI OUT
REV: 1.0
Create Date: Thursday, October 14, 2010
Page Num:9
Modify Date: Tuesday, March 13, 2012
Page Total:14

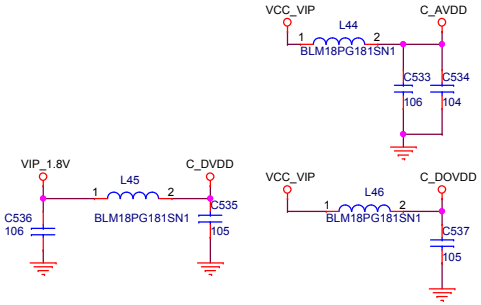

U1G
RMII/MII/JTAG Module
GPIO4_C[3]/RMII_TXD0/MII_TXD0
GPIO4_C[7]/RMII_RXD0/MII_RXD0
GPIO4_C[6]/RMII_RXD1/MII_RXD1
GPIO4_C[2]/RMII_TXD1/MII_TXD1
GPIO4_C[0]/RMII_CLKOUT/RMII_CLKIN
GPIO4_C[5]/RMII_CRS_DVALID/MII_RXD_VALID
GPIO4_C[1]/RMII_TX_EN/MII_TX_EN
GPIO4_C[4]/RMII_RX_ERR/MII_RX_ERR
GPIO5_A[3]/MII_TX_CLKIN
GPIO0_A[6]/MII_MD
GPIO0_A[7]/MII_MDCLK
TRST_N
TCK
TDI
TDO
TMS
JTAG
RK2908
RK2908-G
Close to LAN8720A
C281 470P
C282 105
RMII_CLK
RMII_33A
U34
LAN8720A
RMII_RXD1
RMII_RXD0
VCC_RMII
RMII_RX_ERR
RMII_CRS_DVALID
VCC_RMII
R207 1K5
RMII_MD
RXD1/MODE1
RXD0/MODE0
VDDIO
RXER/PHYADO
CRS_DV/MODE2
MDIO
GND
RBIAS
RXP
RXN
TXP
TXN
VDD1A
R206 12.1K%1
R226 49R9%1
R227 49R9%1
R225 49R9%1
R229 49R9%1
NOTE:
Place 49.9 ohm resistors(0805) near LAN8720A.
LAN8720A
IMPORTANT NOTE:
Below Capacitors are optional and are not present on the LAN8720A CEB. These capacitors are required for operation in an EMI constrained environment.
RXP C283 NC
RXN C284 NC
TXP C285 NC
TXN C286 NC
REGOFF=0:Internal +1.2V regulator ON
nINTSEL=1:REF_CLK In Mode
RMII_INT
RMII_PWR
RMII_LINK
R214 NC LAN8720_RST
GPIO0_A6 R219 22R RMII_MD
GPIO4_C1 R220 22R RMII_TXEN
GPIO0_A7 R221 22R RMII_MDCLK
GPIO4_C4 R222 22R RMII_RX_ERR
GPIO4_C5 R223 22R RMII_CRS_DVALID
GPIO4_C7 R224 22R RMII_RXD0
GPIO4_C6 R225 22R RMII_RXD1
GPIO4_C2 R231 22R RMII_TXD1
GPIO4_C3 R232 22R RMII_TXD0
GPIO4_C0 R233 22R RMII_CLK
C287 NC
R208 4K7 RMII_INT
R210 4K7 RMII_RX_ERR
PHYAD0:PHY Address
R212 NC
R215 4K7 RMII_RXD0
MODE0
R217 4K7 RMII_RXD1
MODE1
R218 4K7 RMII_CRS_DVALID
MODE2
MODE(0-2):111
ALL capable,Auto-negotiation enabled
R234 100K
LAN8720_RST
C288 475
RMII_33A
R252 0R
U35
TXP
TXN
RXP
RXN
LAN1102
C289 223
NOTE:
Place 49.9 ohm resistors(0805) near LAN8720A.
NOTE:
RJ45 PCB Package
JP3 RJ45
TX+
TX-
RX+
RX-
NC1
NC2
NC3
NC4
GND2
GND1
R236 75R%1
R250 75R%1
R237 75R%1
R251 75R%1
C290 103/3KV GND_EARTH
RJ-45
VB
U36
IN
FB/OUT
GND
SHDN
BP
PT5108E23E-33/RT9013-33B
C293 106
R240 10K
RMII_PWR
C300 104
C294 106
C295 104
RMII_3V3
MAX:54mA
L19
BLM18PG181SN1
C296 106
C297 104
C298 104
C302 104
LAN8720A POWER
VCC
R239 NC
R242 NC
R248 NC
C299 104
R241 10K
U37
A0
A1
A2
GND
VCC
WP
SCL
SDA
NC/AT24C16
R244 22R
R245 22R
I2C0_SCL
I2C0_SDA
R243 10K
R247 10K
R246 10K
EEPROM :Ethernet MAC address
Rockchip 瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: RMII_Ethernet
REV: 1.0
Create Date: Friday, September 30, 2011
Page Num:10
Modify Date: Wednesday, February 22, 2012
Page Total:14


RK1000-S
MIC IN
IT6610 RK1000 1.8V
Y/CVBS Yb Yr OUT
R/L OUT
U52
RK1000-S
U8
PT5108E23E-18/RT9013-18B
U33A
U33B
NJM4558/LM4558
Rockchip 瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: YPbPr/CVBS OUT&MIC IN
REV: 1.0
Create Date: Monday, December 19, 2011
Page Num:12
Modify Date: Wednesday, February 22, 2012
Page Total:14

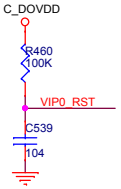

NOTE:
Place 3.3uH inductance near B23.
Note:26MHz Frequency Offset
50 ohm trace
WIFI+BT MODULE
Note:According to actual needs,
WM-294 and B23
select one of the circuits.
USB WIFI(OPTION)
2.4G Remote(OPTION)
IR Receiver
Carrier:38kHz
FT-009
Rockchip
瑞芯微电子
福州瑞芯微电子有限公司
Title: HS8086A
File: WIFI+BT&IR&2.4G Remote
REV: 1.0
Create Date: Monday, December 19, 2011
Page Num: 13
Modify Date: Wednesday, February 22, 2012
Page Total: 14



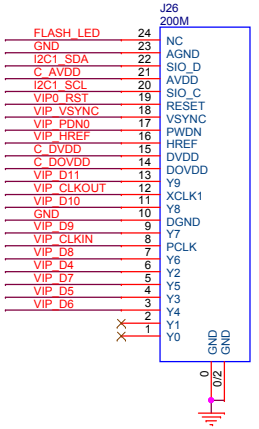

RK2908-B

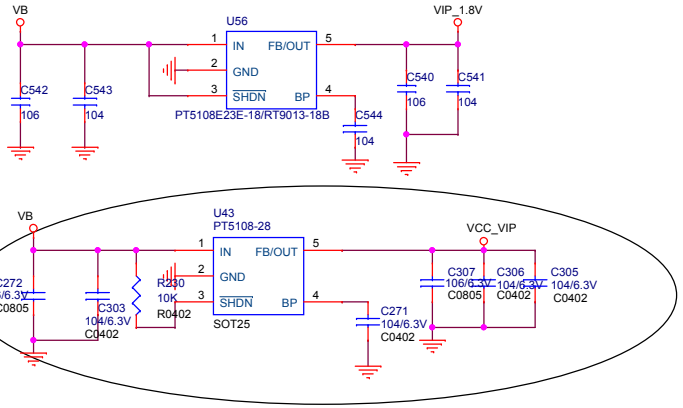

Note: If using other sensor modules,follow to the requirements of SPEC on the power supply.



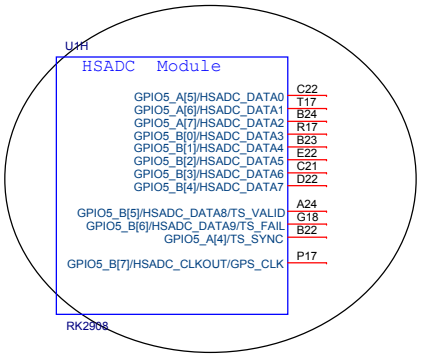

Note:If using other sensor modules, follow to the requirements of SPEC : Reset Active high or Active low




CAMERA




POWER

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| Title: HS8086A | | |
| File: Internal Camera | | REV: 1.0 |
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