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Aspire5_NB8513_M/B Schematics Document

Intel Whiskey Lake U-Processor with DDR4

REV3.0

2019-03-14

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Huaqin Telecom Technology Com.,Ltd.

Page name: Cover page

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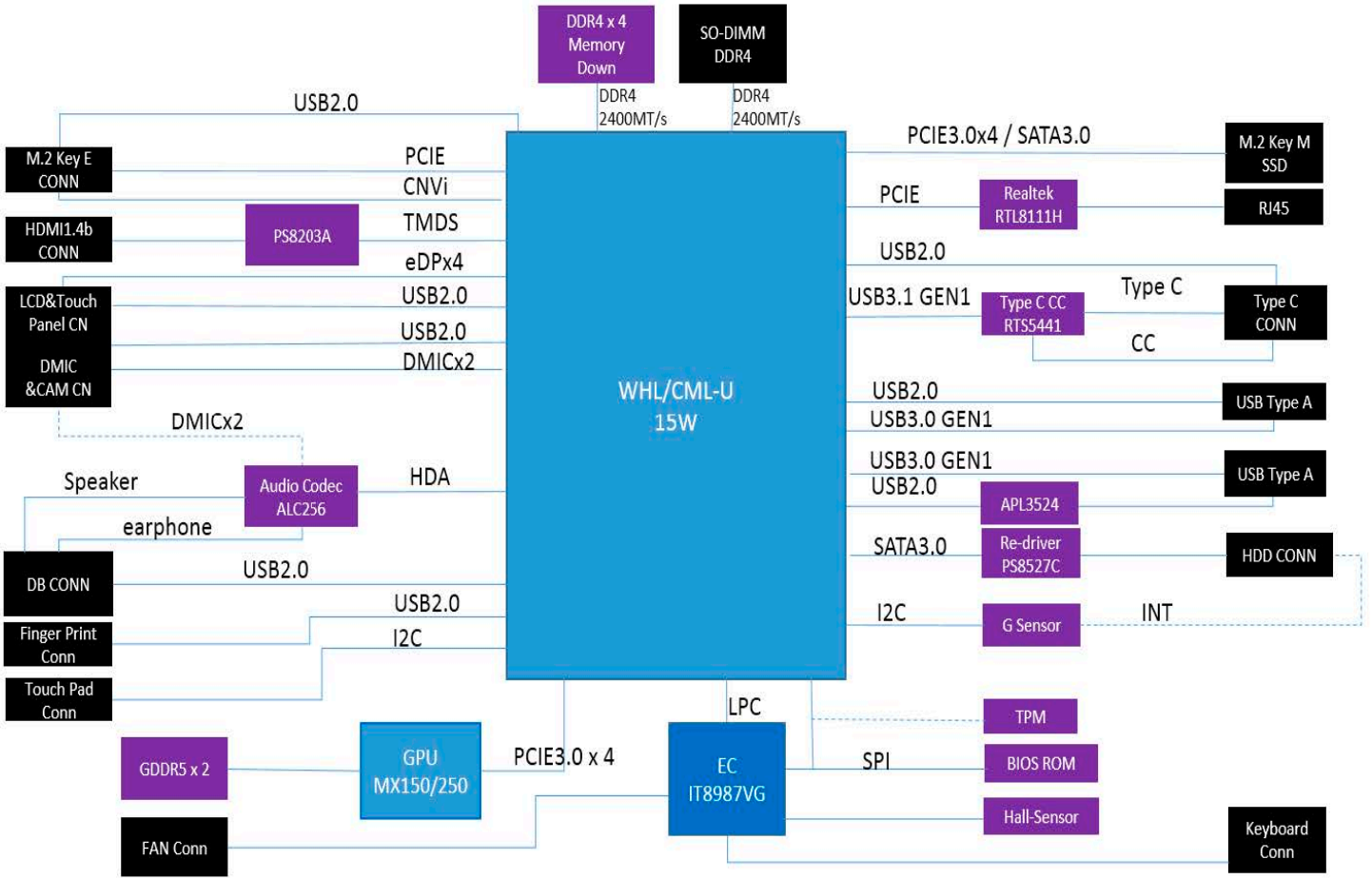
EE MB Block Diagram



Huaqin Telecom Technology Com.,Ltd.		
Page name:	Block Diagram	
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MEM ID

HW_ID0	HW_ID1	HW_ID2	Description	Total
0	0	0	4x Micron 8Gbx16 MT40A512M16TB-062E:J	4GB
1	0	0	4x Micron 8Gbx16 MT40A512M16LY-075:E	4GB
0	1	0	4x Hynix 8Gbx16 H5AN8G6NCJR-VKC	4GB
1	1	0	NA	NA
0	0	1	4x 16Gb(reserve)	8GB
1	0	1	4x 16Gb(reserve)	8GB
0	1	1	4x 16Gb(reserve)	8GB

GPU ID

HW_ID3	HW_ID4		Description
0	0		UMA
1	0		N17-G0
0	1		N17-G1
1	1		N17-G2

G-sensor ID

HW_ID5	Description
0	no g-sensor
1	G-sensor on board

FP ID

HW_ID6	Description
0	no FP
1	FP on board

TPM and fTPM ID

HW_ID7	Description
0	fTPM
1	TPM

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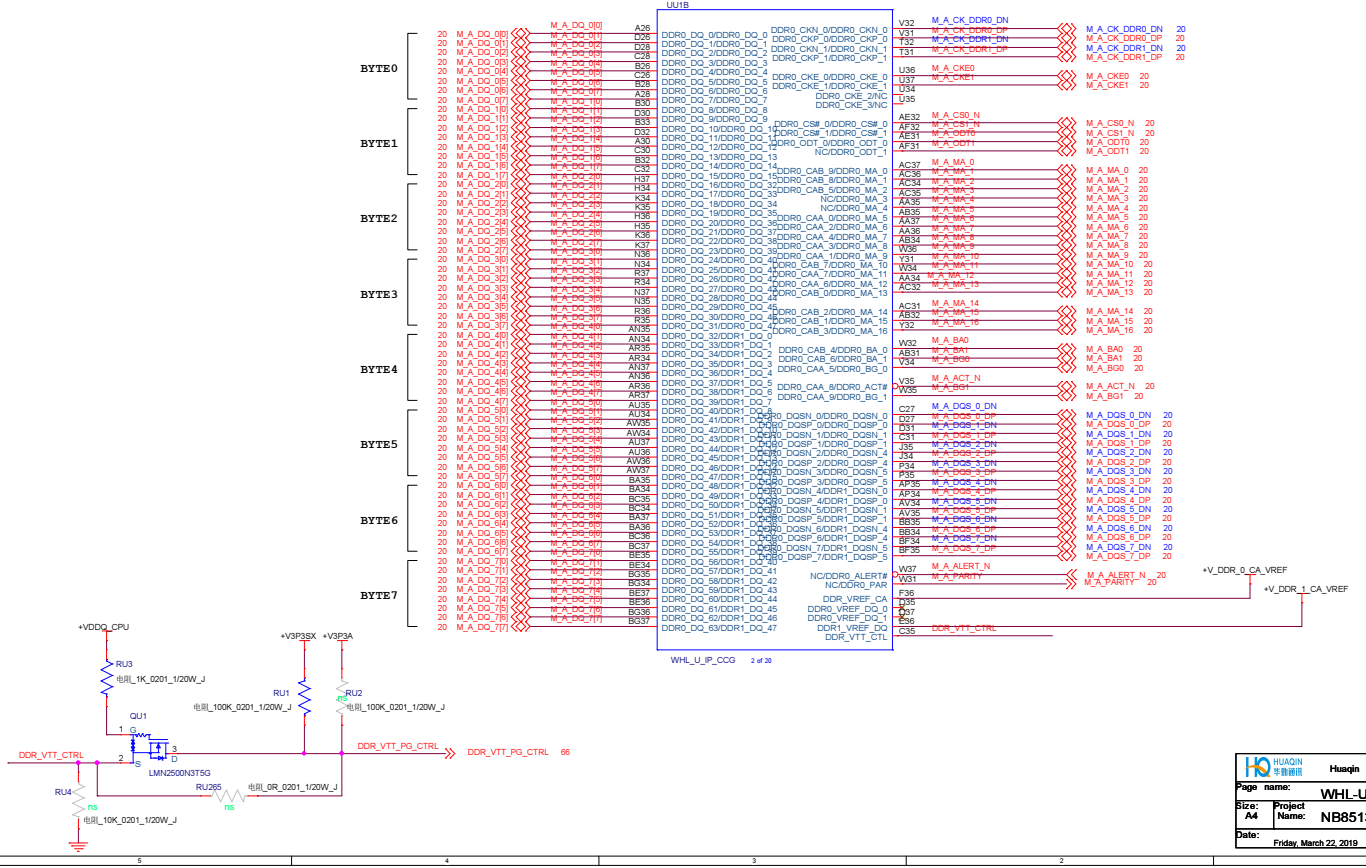
CHA_SODIMM



Huaqin Telecom Technology Com.,Ltd.	
Page name:	WHL-U42(CHA)
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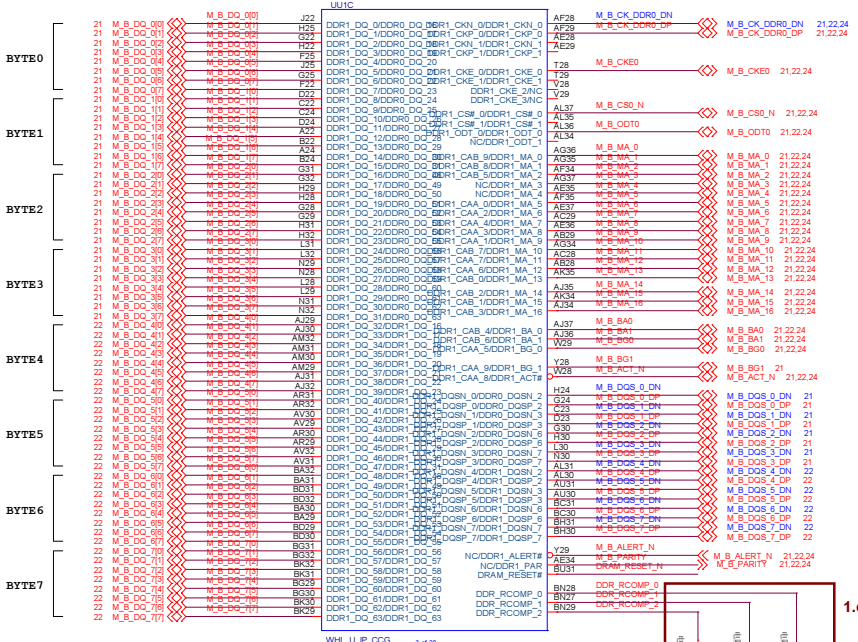
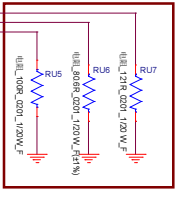
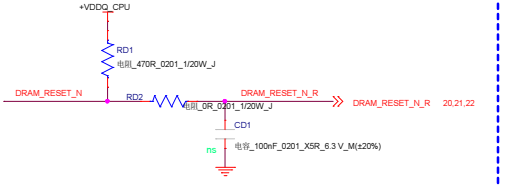
CHB_MD





1.change RU7 to 121Ω 2018 06 06



PLACE RESET COMPONENTS CLOSE TO CPU

BOM NOTE

CFL-U43e/WHLU42:
[0]:121
[1]:80.6
[2]:100
CNL-U22:
100/100/100

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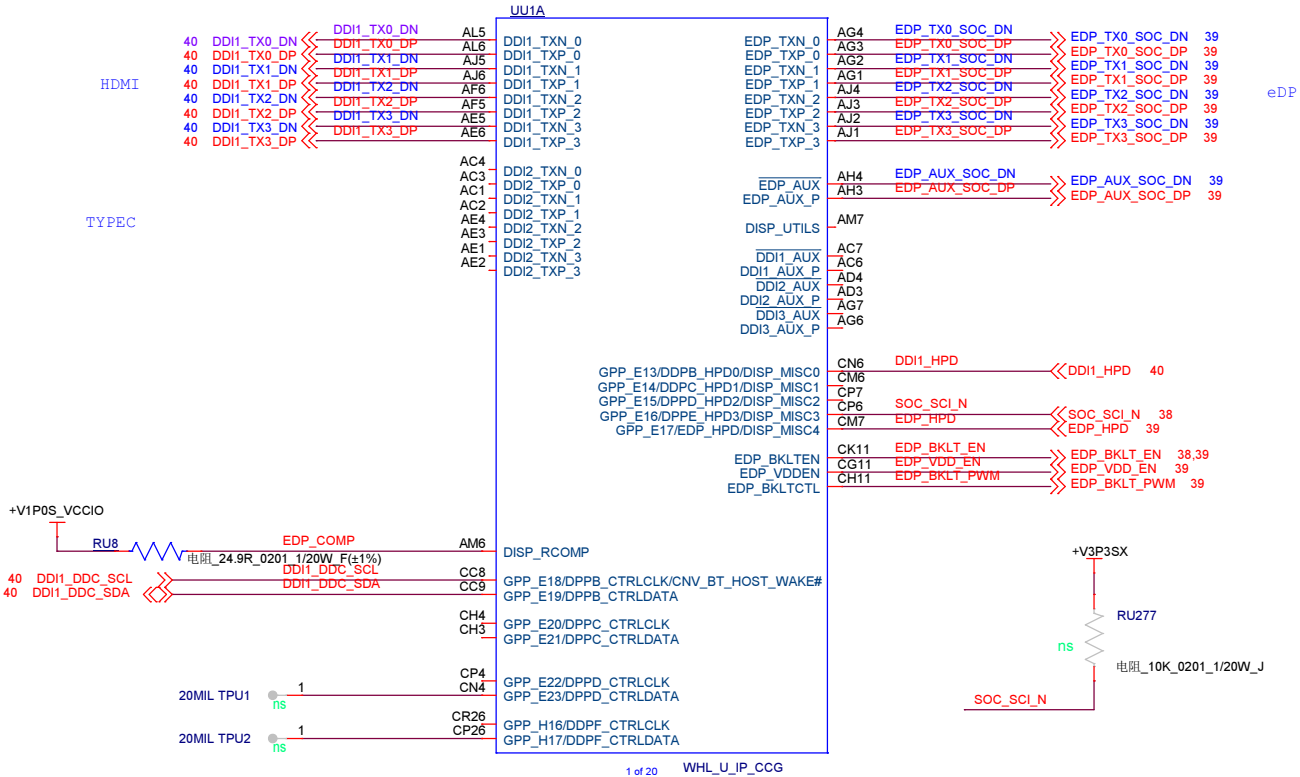

DISPLAY PORT STRAP

	Strap	How to Enable Port	How to Disable Port
DDI Port 1	DDPB_CTRLDATA(L12)	Pull up to 3.3 V	No Connect
DDI Port 2	DDPC_CTRLDATA(N8)	Pull up to 3.3 V	No Connect

HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.		
Page name:	WHL-U42(DISPLAY)		
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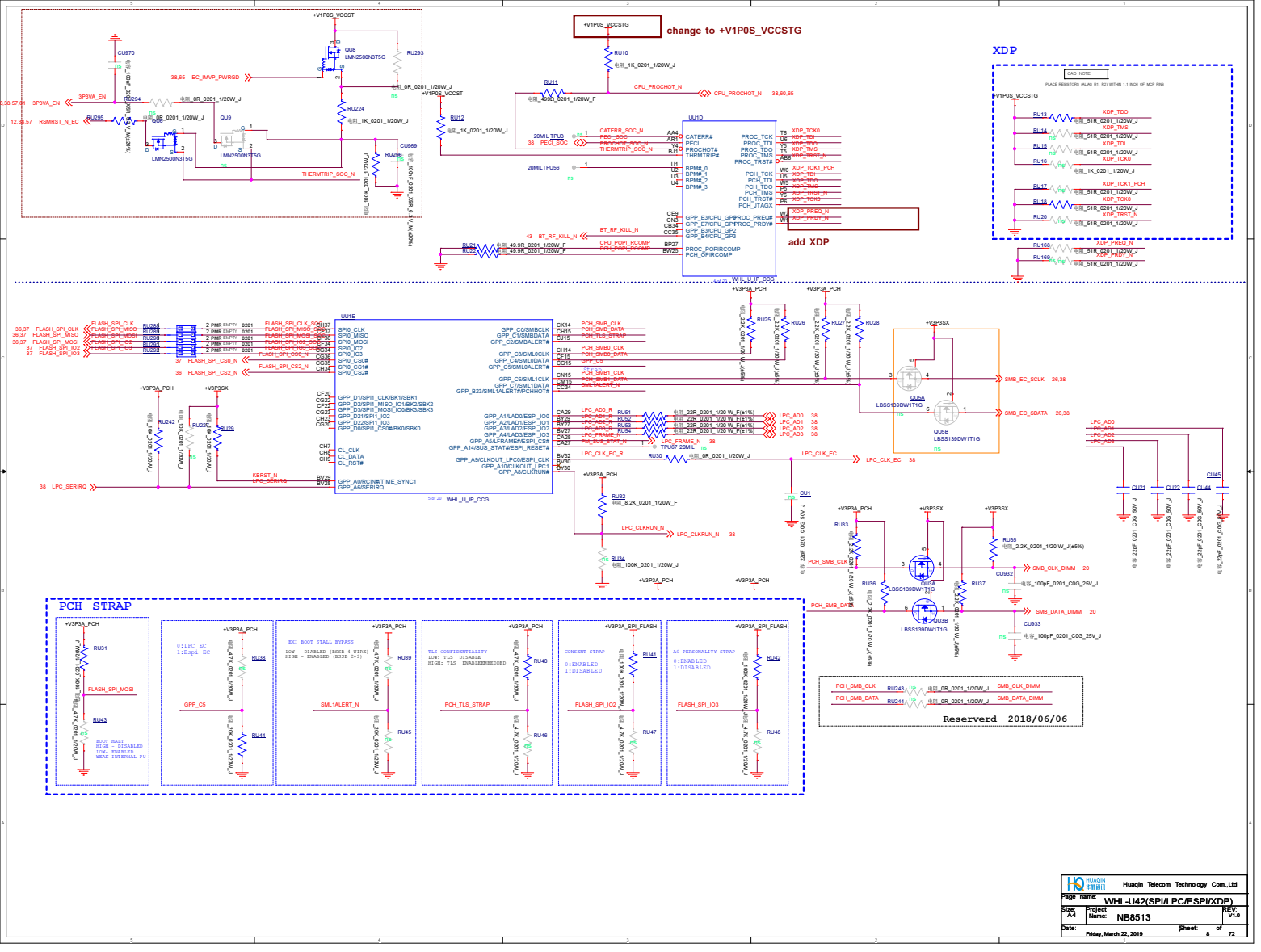
change to +V1P0S_VCCSTG
XDP
add XDP
PCH STRAP
Reserverd 2018/06/06
Huaqin Telecom Technology Com.,Ltd.
Page name: WHL-U42(SPI/LPC/ESPI/XDP)
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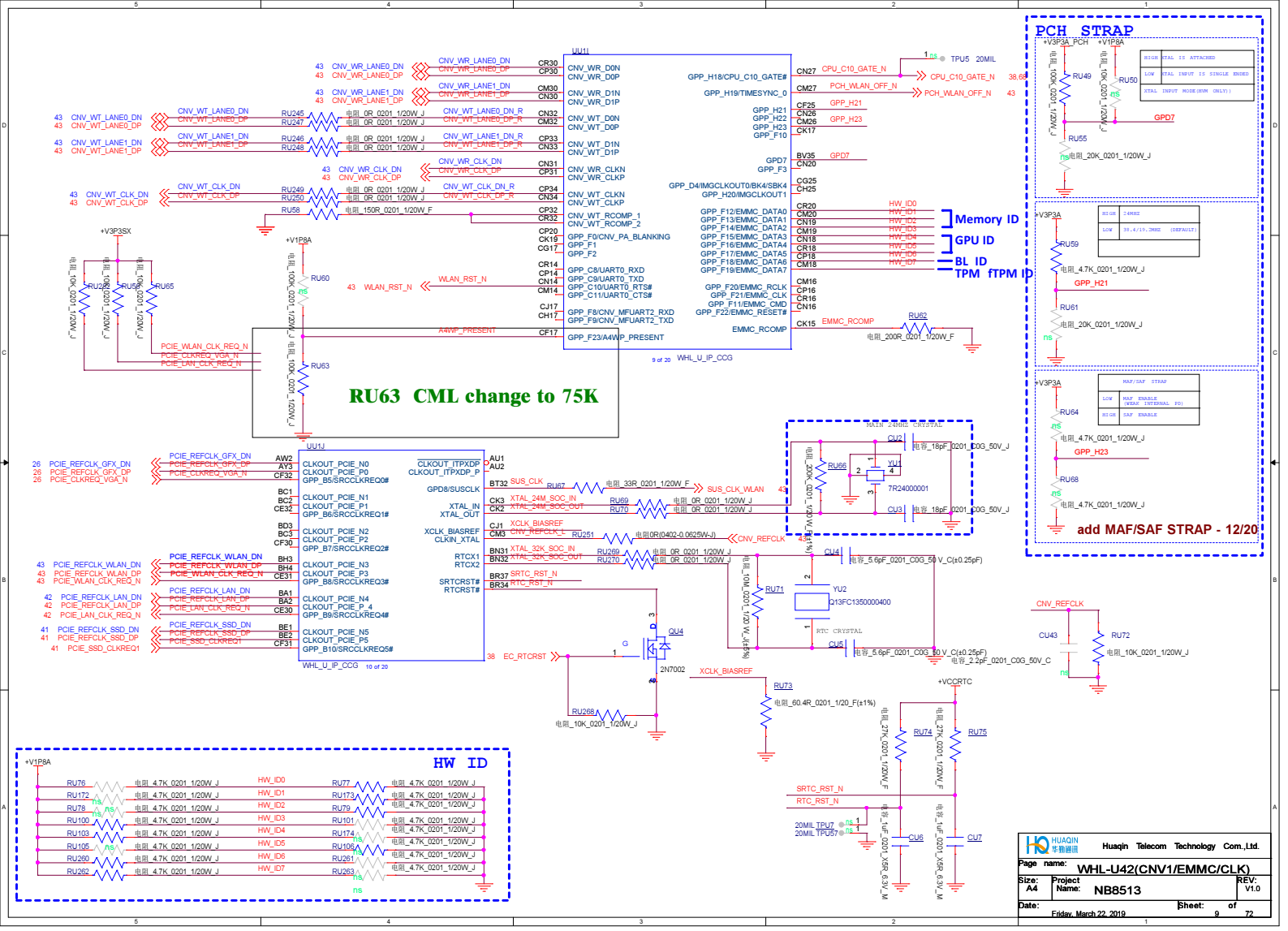
PCH STRAP
+V3P3A_PCH
+V1P8A
电阻_100K_0201_1/20W_J
RU49
电阻_10K_0201_1/20W_J
RU50
RU55
电阻_20K_0201_1/20W_J
HIGH XTAL IS ATTACHED
LOW XTAL INPUT IS SINGLE ENDED
XTAL INPUT MODE(HWM ONLY!)
GPD7
+V3P3A
RU59
电阻_4.7K_0201_1/20W_J
GPP_H21
RU61
电阻_20K_0201_1/20W_J
HIGH 24MHZ
LOW 38.4/19.2MHZ (DEFAULT)
+V3P3A
RU64
电阻_4.7K_0201_1/20W_J
GPP_H23
RU68
电阻_4.7K_0201_1/20W_J
MAF/SAF STRAP
LOW MAF ENABLE (WHEN INTERNAL PD)
HIGH SAF ENABLE
add MAF/SAF STRAP - 12/20
UU1J
CNV_WR_LANE0_DN
CNV_WR_LANE0_DP
CNV_WR_LANE1_DN
CNV_WR_LANE1_DP
CNV_WT_LANE0_DN
CNV_WT_LANE0_DP
CNV_WT_LANE1_DN
CNV_WT_LANE1_DP
CNV_WR_CLK_DN
CNV_WR_CLK_DP
CNV_WT_CLK_DN
CNV_WT_CLK_DP
RU245
RU247
RU246
RU248
RU249
RU250
RU58
电阻_0R_0201_1/20W_J
电阻_150R_0201_1/20W_F
CNV_WT_LANE0_DN_R
CNV_WT_LANE0_DP_R
CNV_WT_LANE1_DN_R
CNV_WT_LANE1_DP_R
CNV_WT_CLK_DN_R
CNV_WT_CLK_DP_R
CNV_WT_RCOMP_1
CNV_WT_RCOMP_2
GPP_F0/CNV_PA_BLANKING
GPP_F1
GPP_F2
GPP_C8/UART0_RXD
GPP_C9/UART0_TXD
GPP_C10/UART0_RTS#
GPP_C11/UART0_CTS#
GPP_F8/CNV_MFUART2_RXD
GPP_F9/CNV_MFUART2_TXD
GPP_F23/A4WP_PRESENT
9 of 20
WHL_U_IP_CCG
GPP_H18/CPU_C10_GATE#
GPP_H19/TIMESYNC_0
CPU_C10_GATE_N
PCH_WLAN_OFF_N
TPU5 20MIL
GPP_H21
GPP_H22
GPP_H23
GPP_F10
GPD7
GPP_F3
GPP_D4/IMGCLKOUT0/BK4/SBK4
GPP_H20/IMGCLKOUT1
GPP_F12/EMMC_DATA0
GPP_F13/EMMC_DATA1
GPP_F14/EMMC_DATA2
GPP_F15/EMMC_DATA3
GPP_F16/EMMC_DATA4
GPP_F17/EMMC_DATA5
GPP_F18/EMMC_DATA6
GPP_F19/EMMC_DATA7
GPP_F20/EMMC_RCLK
GPP_F21/EMMC_CLK
GPP_F11/EMMC_CMD
GPP_F22/EMMC_RESET#
EMMC_RCOMP
HW_ID0
HW_ID1
HW_ID2
HW_ID3
HW_ID4
HW_ID5
HW_ID6
HW_ID7
Memory ID
GPU ID
BL ID
TPM fTPM ID
RU62
电阻_200R_0201_1/20W_F
+V3P3SX
+V1P8A
RU60
WLAN_RST_N
A4WP_PRESENT
RU63
RU65
PCIE_WLAN_CLK_REQ_N
PCIE_CLKREQ_VGA_N
PCIE_LAN_CLK_REQ_N
RU63 CML change to 75K
CLKOUT_PCIE_N0
CLKOUT_PCIE_P0
GPP_B5/SRCCLKREQ0#
CLKOUT_PCIE_N1
CLKOUT_PCIE_P1
GPP_B6/SRCCLKREQ1#
CLKOUT_PCIE_N2
CLKOUT_PCIE_P2
GPP_B7/SRCCLKREQ2#
CLKOUT_PCIE_N3
CLKOUT_PCIE_P3
GPP_B8/SRCCLKREQ3#
CLKOUT_PCIE_N4
CLKOUT_PCIE_P_4
GPP_B9/SRCCLKREQ4#
CLKOUT_PCIE_N5
CLKOUT_PCIE_P5
GPP_B10/SRCCLKREQ5#
CLKOUT_ITPXDP
CLKOUT_ITPXDP_P
GPD8/SUSCLK
XTAL_IN
XTAL_OUT
XCLK_BIASREF
CLKIN_XTAL
RTCX1
RTCX2
SRTCRST#
RTCRST#
WHL_U_IP_CCG 10 of 20
PCIE_REFCLK_GFX_DN
PCIE_REFCLK_GFX_DP
PCIE_CLKREQ_VGA_N
PCIE_REFCLK_WLAN_DN
PCIE_REFCLK_WLAN_DP
PCIE_WLAN_CLK_REQ_N
PCIE_REFCLK_LAN_DN
PCIE_REFCLK_LAN_DP
PCIE_LAN_CLK_REQ_N
PCIE_REFCLK_SSD_DN
PCIE_REFCLK_SSD_DP
PCIE_SSD_CLKREQ1
SUS_CLK
SUS_CLK_WLAN
XTAL_24M_SOC_IN
XTAL_24M_SOC_OUT
XCLK_BIASREF
CNV_REFCLK
XTAL_32K_SOC_IN
XTAL_32K_SOC_OUT
SRTC_RST_N
RTC_RST_N
EC_RTCRST
RU67
RU69
RU70
RU251
RU269
RU270
RU271
RU268
电阻_33R_0201_1/20W_F
电阻_0R_0201_1/20W_J
电阻OR(0402-0.0625W-J)
电阻_10K_0201_1/20W_J
MAIN 24MHZ CRYSTAL
RU66
YU1
7R24000001
CU2
CU3
电容_18pF_0201_C0G_50V_J
RU71
YU2
Q13FC1350000400
RTC CRYSTAL
CU4
CU5
电容_5.6pF_0201_C0G_50V_C(±0.25pF)
电容_2.2pF_0201_C0G_50V_C
QU4
2N7002
RU73
电阻_60.4R_0201_1/20_F(±1%)
CNV_REFCLK
CU43
RU72
电阻_10K_0201_1/20W_J
+VCCRTC
RU74
RU75
电阻_27K_0201_1/20W_F
SRTC_RST_N
RTC_RST_N
20MIL TPU7
20MIL TPU57
CU6
CU7
电容_1uF_0201_X5R_6.3V_M
HW ID
+V1P8A
RU76
RU172
RU78
RU100
RU103
RU105
RU260
RU262
RU77
RU173
RU79
RU101
RU174
RU106
RU261
RU263
电阻_4.7K_0201_1/20W_J
HW_ID0
HW_ID1
HW_ID2
HW_ID3
HW_ID4
HW_ID5
HW_ID6
HW_ID7
HUAQIN 华勤通讯
Huaqin Telecom Technology Com.,Ltd.
Page name: WHL-U42(CNV1/EMMC/CLK)
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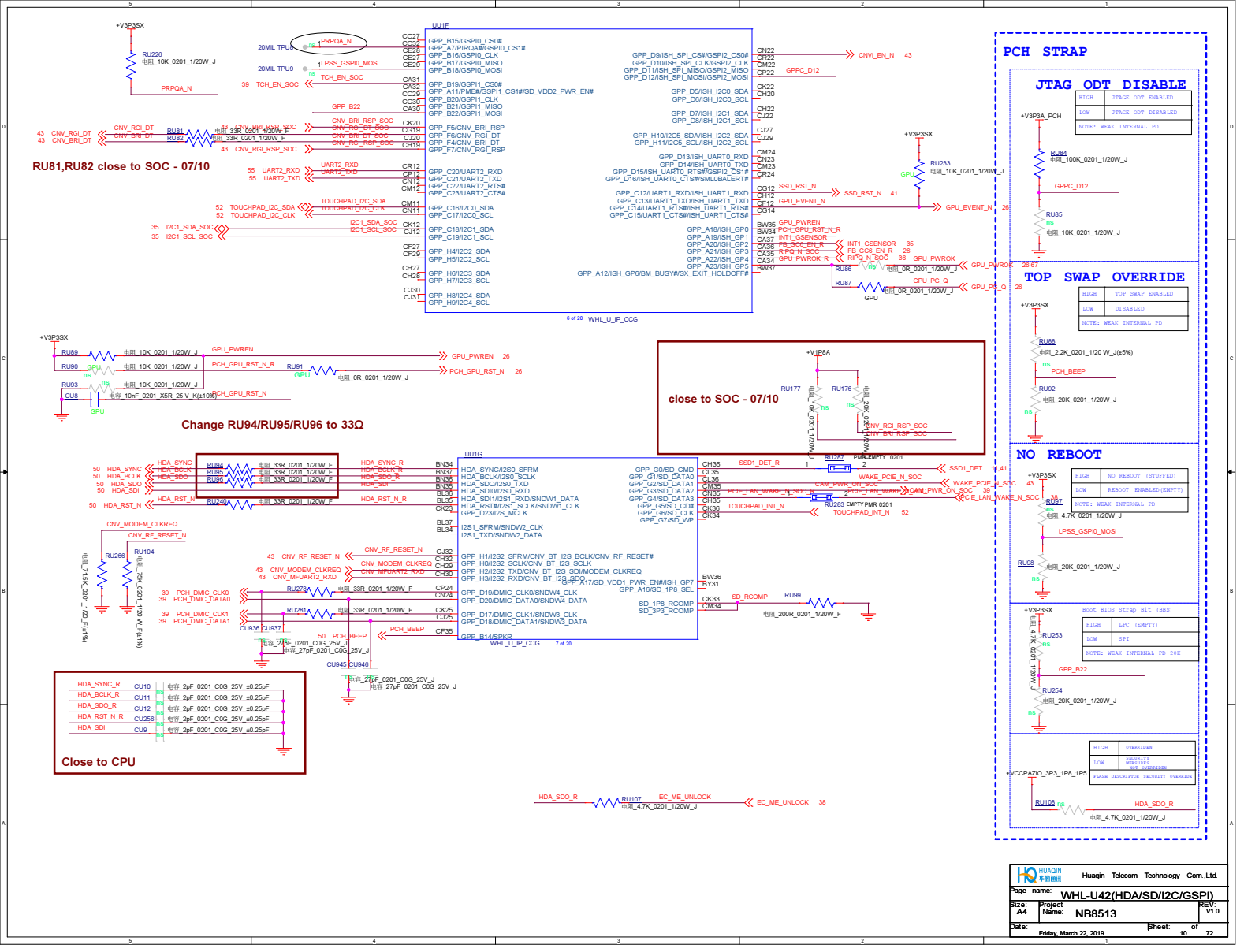
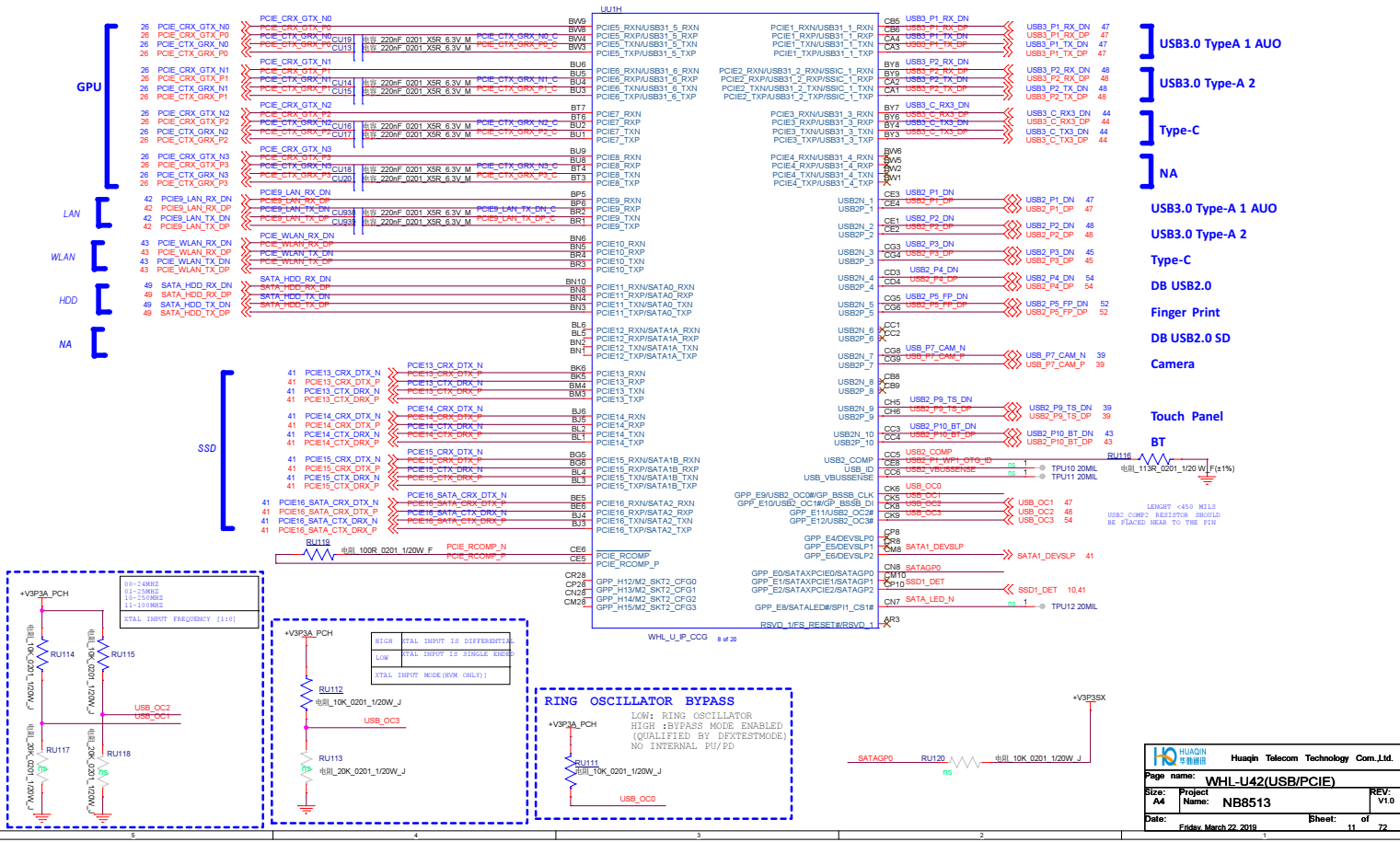

RU81,RU82 close to SOC - 07/10
Change RU94/RU95/RU96 to 33Ω
close to SOC - 07/10
Close to CPU
PCH STRAP
JTAG ODT DISABLE
TOP SWAP OVERRIDE
NO REBOOT
UU1F
UU1G
WHL_U_IP_CCG


GPU
LAN
WLAN
HDD
NA
SSD
USB3.0 TypeA 1 AUO
USB3.0 Type-A 2
Type-C
NA
USB3.0 Type-A 1 AUO
USB3.0 Type-A 2
Type-C
DB USB2.0
Finger Print
DB USB2.0 SD
Camera
Touch Panel
BT
UU1H
WHL_U_IP_CCG 8 of 20
RING OSCILLATOR BYPASS
LOW: RING OSCILLATOR
HIGH :BYPASS MODE ENABLED
(QUALIFIED BY DFXTESTMODE)
NO INTERNAL PU/PD
LENGHT <450 MILS
USB2 COMP2 RESISTOR SHOULD
BE PLACED NEAR TO THE PIN
HUAQIN
Huaqin Telecom Technology Com.,Ltd.
Page name: WHL-U42(USB/PCIE)
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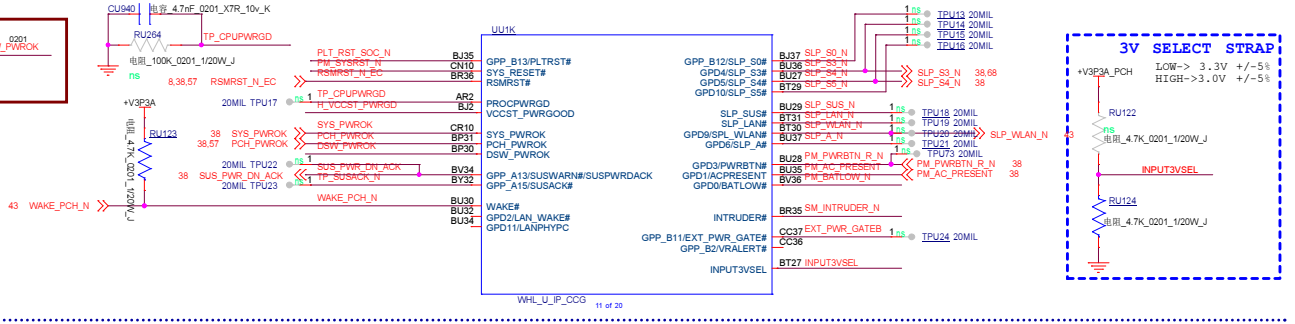
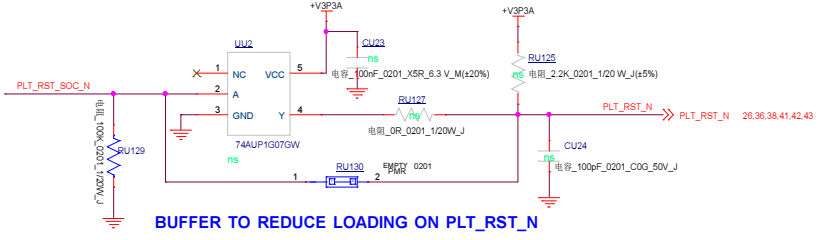
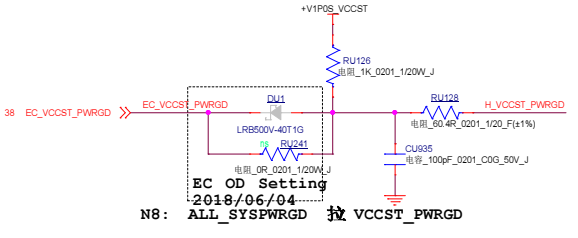
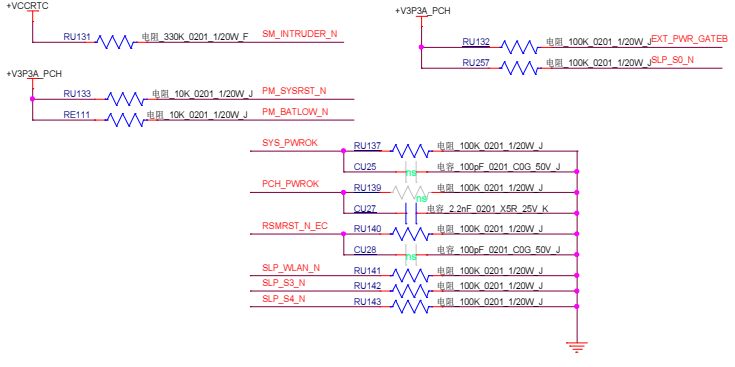


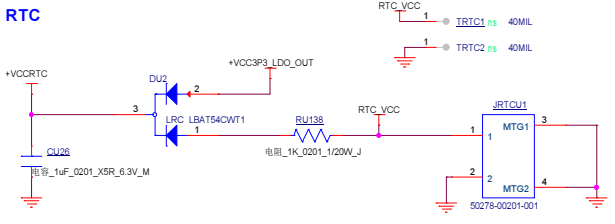


BUFFER TO REDUCE LOADING ON PLT_RST_N





RTC



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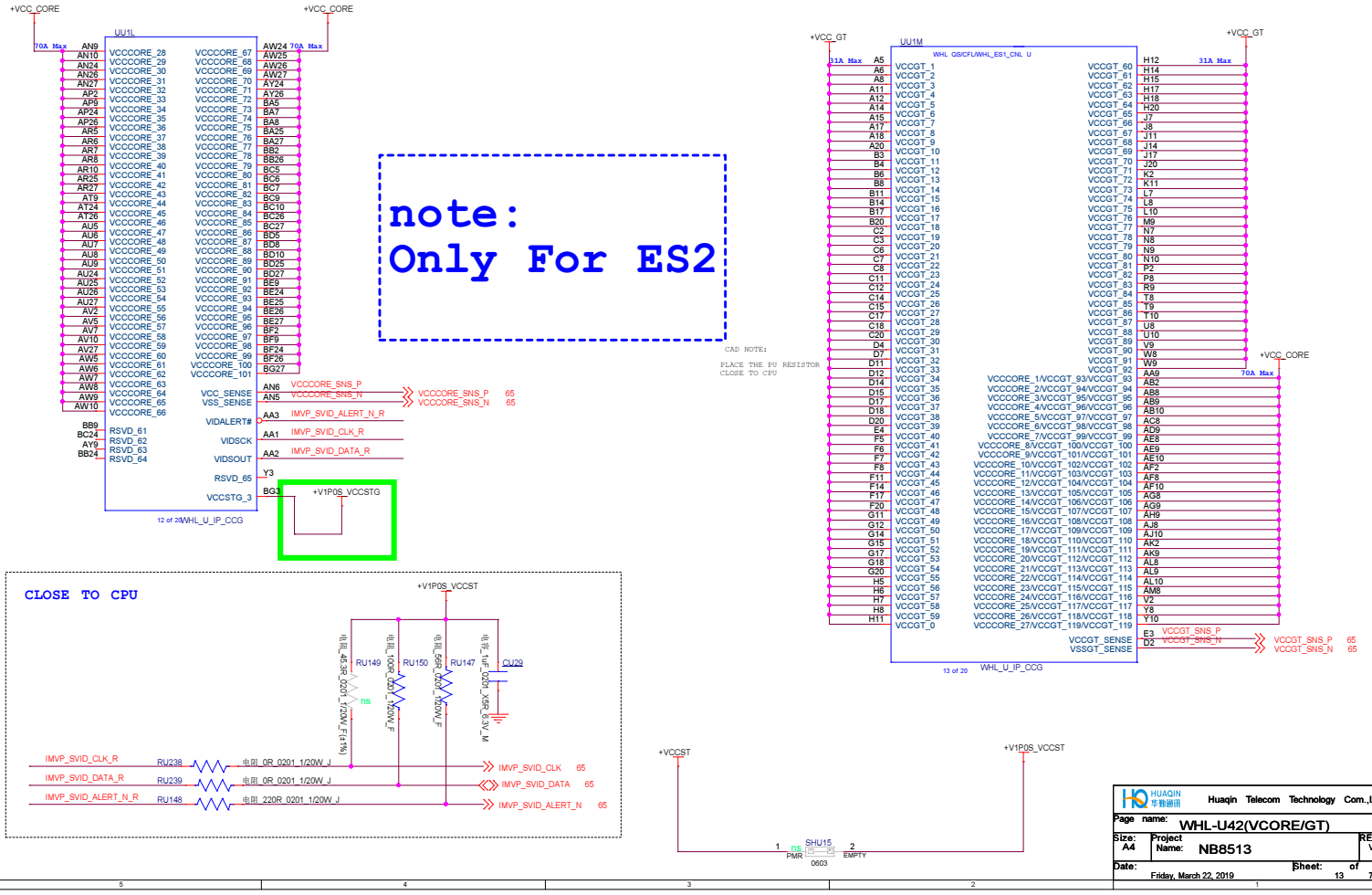
+VCC_CORE
+VCC_CORE
UU1L
70A Max
AN9
AN10
AN24
AN26
AN27
AP2
AP9
AP24
AP26
AR5
AR6
AR7
AR8
AR10
AR25
AR27
AT9
AT24
AT26
AU5
AU6
AU7
AU8
AU9
AU24
AU25
AU26
AU27
AV2
AV5
AV7
AV10
AV27
AW5
AW6
AW7
AW8
AW9
AW10
VCCCORE_28
VCCCORE_29
VCCCORE_30
VCCCORE_31
VCCCORE_32
VCCCORE_33
VCCCORE_34
VCCCORE_35
VCCCORE_36
VCCCORE_37
VCCCORE_38
VCCCORE_39
VCCCORE_40
VCCCORE_41
VCCCORE_42
VCCCORE_43
VCCCORE_44
VCCCORE_45
VCCCORE_46
VCCCORE_47
VCCCORE_48
VCCCORE_49
VCCCORE_50
VCCCORE_51
VCCCORE_52
VCCCORE_53
VCCCORE_54
VCCCORE_55
VCCCORE_56
VCCCORE_57
VCCCORE_58
VCCCORE_59
VCCCORE_60
VCCCORE_61
VCCCORE_62
VCCCORE_63
VCCCORE_64
VCCCORE_65
VCCCORE_66
VCCCORE_67
VCCCORE_68
VCCCORE_69
VCCCORE_70
VCCCORE_71
VCCCORE_72
VCCCORE_73
VCCCORE_74
VCCCORE_75
VCCCORE_76
VCCCORE_77
VCCCORE_78
VCCCORE_79
VCCCORE_80
VCCCORE_81
VCCCORE_82
VCCCORE_83
VCCCORE_84
VCCCORE_85
VCCCORE_86
VCCCORE_87
VCCCORE_88
VCCCORE_89
VCCCORE_90
VCCCORE_91
VCCCORE_92
VCCCORE_93
VCCCORE_94
VCCCORE_95
VCCCORE_96
VCCCORE_97
VCCCORE_98
VCCCORE_99
VCCCORE_100
VCCCORE_101
AW24
AW25
AW26
AW27
AY24
AY26
BA5
BA7
BA8
BA25
BA27
BB2
BB26
BC5
BC6
BC7
BC9
BC10
BC26
BC27
BD5
BD8
BD10
BD25
BD27
BE9
BE24
BE25
BE26
BE27
BF2
BF9
BF24
BF26
BG27
70A Max
BB9
BC24
AY9
BB24
RSVD_61
RSVD_62
RSVD_63
RSVD_64
AN6
AN5
VCCORE_SNS_P
VCCORE_SNS_N
VCC_SENSE
VSS_SENSE
VCCORE_SNS_P 65
VCCORE_SNS_N 65
AA3
IMVP_SVID_ALERT_N_R
VIDALERT#
AA1
IMVP_SVID_CLK_R
VIDSCK
AA2
IMVP_SVID_DATA_R
VIDSOUT
Y3
RSVD_65
BG3
VCCSTG_3
+V1P0S_VCCSTG
12 of 20
WHL_U_IP_CCG
note:
Only For ES2
CAD NOTE:
PLACE THE PU RESISTOR
CLOSE TO CPU
+VCC_GT
+VCC_GT
UU1M
WHL QS/CFL/WHL_ES1_CNL U
31A Max
A5
A6
A8
A11
A12
A14
A15
A17
A18
A20
B3
B4
B6
B8
B11
B14
B17
B20
C2
C3
C5
C7
C8
C11
C12
C14
C15
C17
C18
C20
D4
D7
D11
D12
D14
D15
D17
D18
D20
E4
F5
F6
F7
F8
F11
F14
F17
F20
G11
G12
G14
G15
G17
G18
G20
H5
H6
H7
H8
H11
VCCGT_1
VCCGT_2
VCCGT_3
VCCGT_4
VCCGT_5
VCCGT_6
VCCGT_7
VCCGT_8
VCCGT_9
VCCGT_10
VCCGT_11
VCCGT_12
VCCGT_13
VCCGT_14
VCCGT_15
VCCGT_16
VCCGT_17
VCCGT_18
VCCGT_19
VCCGT_20
VCCGT_21
VCCGT_22
VCCGT_23
VCCGT_24
VCCGT_25
VCCGT_26
VCCGT_27
VCCGT_28
VCCGT_29
VCCGT_30
VCCGT_31
VCCGT_32
VCCGT_33
VCCGT_34
VCCGT_35
VCCGT_36
VCCGT_37
VCCGT_38
VCCGT_39
VCCGT_40
VCCGT_41
VCCGT_42
VCCGT_43
VCCGT_44
VCCGT_45
VCCGT_46
VCCGT_47
VCCGT_48
VCCGT_49
VCCGT_50
VCCGT_51
VCCGT_52
VCCGT_53
VCCGT_54
VCCGT_55
VCCGT_56
VCCGT_57
VCCGT_58
VCCGT_59
VCCGT_0
VCCGT_60
VCCGT_61
VCCGT_62
VCCGT_63
VCCGT_64
VCCGT_65
VCCGT_66
VCCGT_67
VCCGT_68
VCCGT_69
VCCGT_70
VCCGT_71
VCCGT_72
VCCGT_73
VCCGT_74
VCCGT_75
VCCGT_76
VCCGT_77
VCCGT_78
VCCGT_79
VCCGT_80
VCCGT_81
VCCGT_82
VCCGT_83
VCCGT_84
VCCGT_85
VCCGT_86
VCCGT_87
VCCGT_88
VCCGT_89
VCCGT_90
VCCGT_91
VCCGT_92
VCCGT_1/VCCGT_93/VCCGT_93
VCCGT_2/VCCGT_94/VCCGT_94
VCCGT_3/VCCGT_95/VCCGT_95
VCCGT_4/VCCGT_96/VCCGT_96
VCCGT_5/VCCGT_97/VCCGT_97
VCCGT_6/VCCGT_98/VCCGT_98
VCCGT_7/VCCGT_99/VCCGT_99
VCCGT_8/VCCGT_100/VCCGT_100
VCCGT_9/VCCGT_101/VCCGT_101
VCCGT_10/VCCGT_102/VCCGT_102
VCCGT_11/VCCGT_103/VCCGT_103
VCCGT_12/VCCGT_104/VCCGT_104
VCCGT_13/VCCGT_105/VCCGT_105
VCCGT_14/VCCGT_106/VCCGT_106
VCCGT_15/VCCGT_107/VCCGT_107
VCCGT_16/VCCGT_108/VCCGT_108
VCCGT_17/VCCGT_109/VCCGT_109
VCCGT_18/VCCGT_110/VCCGT_110
VCCGT_19/VCCGT_111/VCCGT_111
VCCGT_20/VCCGT_112/VCCGT_112
VCCGT_21/VCCGT_113/VCCGT_113
VCCGT_22/VCCGT_114/VCCGT_114
VCCGT_23/VCCGT_115/VCCGT_115
VCCGT_24/VCCGT_116/VCCGT_116
VCCGT_25/VCCGT_117/VCCGT_117
VCCGT_26/VCCGT_118/VCCGT_118
VCCGT_27/VCCGT_119/VCCGT_119
VCCGT_SENSE
VSSGT_SENSE
31A Max
H12
H14
H15
H17
H18
H20
J7
J8
J11
J14
J17
J20
K2
K11
L7
L8
L10
M9
N7
N8
N9
N10
P2
P8
R9
T8
T9
T10
U8
U10
V9
W8
W9
AA9
AB2
AB8
AB9
AB10
AC8
AD9
AE8
AE9
AE10
AF2
AF8
AF10
AG8
AG9
AH9
AJ8
AJ10
AK2
AK9
AL8
AL9
AL10
AM8
V2
Y8
Y10
E3
D2
VCCGT_SNS_P
VCCGT_SNS_N
VCCGT_SNS_P 65
VCCGT_SNS_N 65
13 of 20
WHL_U_IP_CCG
+VCC_CORE
70A Max
CLOSE TO CPU
+V1P0S_VCCST
电阻_45.3R_0201_1/20W_F(±1%)
RU149
ns
电阻_100R_0201_1/20W_F
RU150
电阻_56R_0201_1/20W_F
RU147
电容_1uF_0201_X5R_6.3V_M
CU29
IMVP_SVID_CLK_R
RU238
电阻_0R_0201_1/20W_J
IMVP_SVID_CLK 65
IMVP_SVID_DATA_R
RU239
电阻_0R_0201_1/20W_J
IMVP_SVID_DATA 65
IMVP_SVID_ALERT_N_R
RU148
电阻_220R_0201_1/20W_J
IMVP_SVID_ALERT_N 65
+VCCST
+V1P0S_VCCST
1
PMR
SHU15
ns
2
EMPTY
0603
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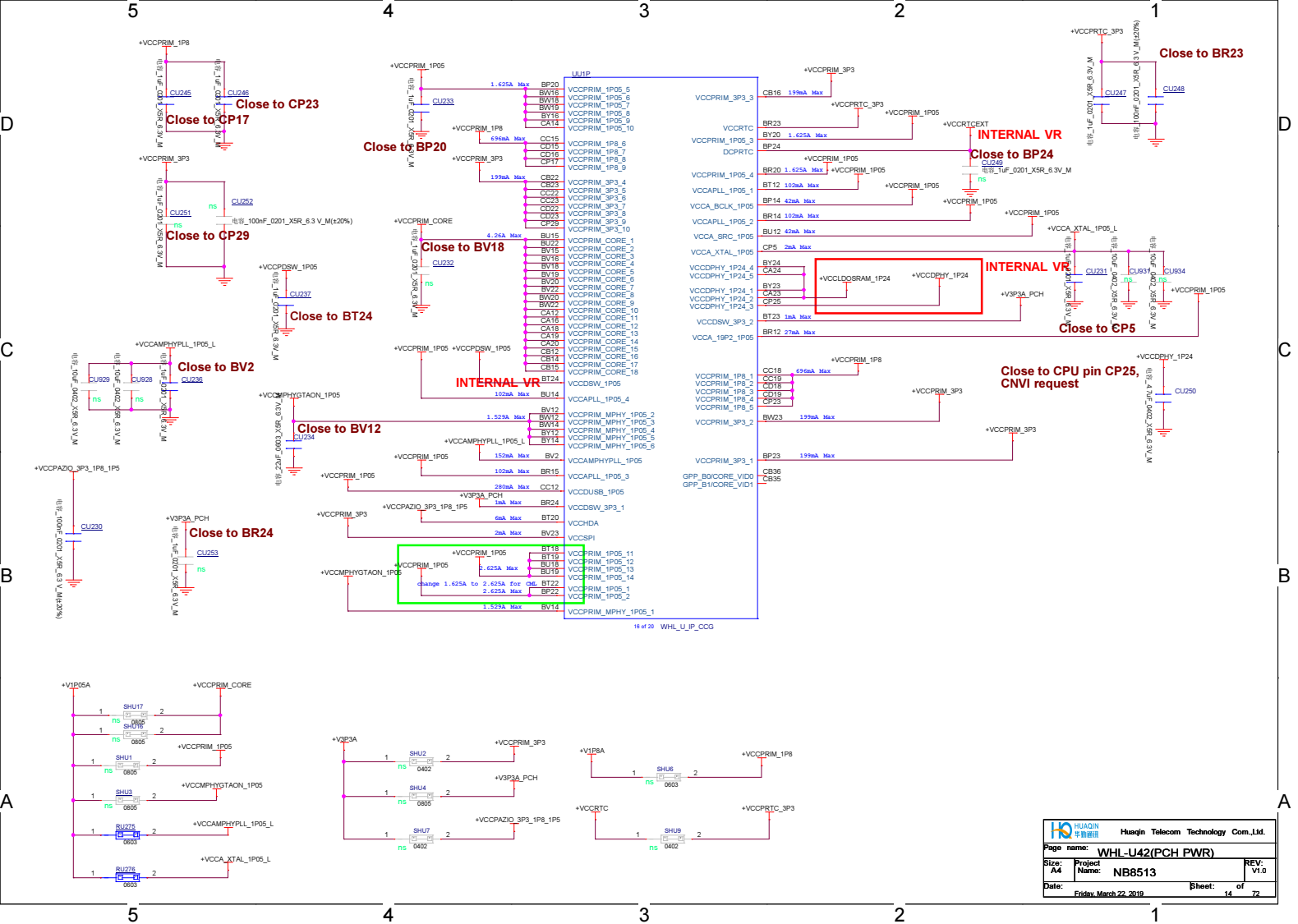
Close to CP23
Close to CP17
Close to CP29
Close to BT24
Close to BV2
Close to BV12
Close to BR24
Close to BP20
Close to BV18
INTERNAL VR
Close to BR23
INTERNAL VR
Close to BP24
INTERNAL VR
Close to CP5
Close to CPU pin CP25, CNVI request
UU1P
WHL_U_IP_CCG
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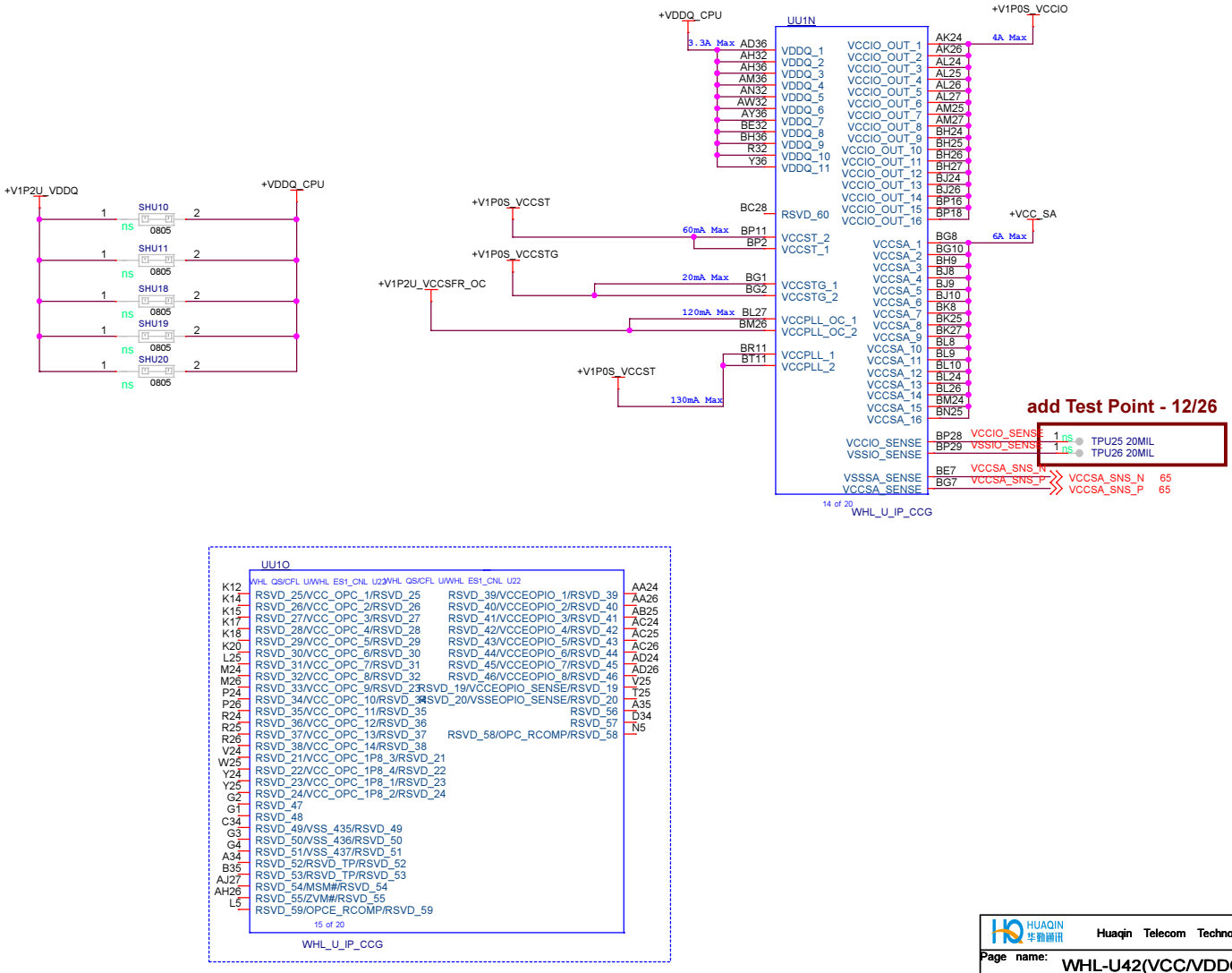

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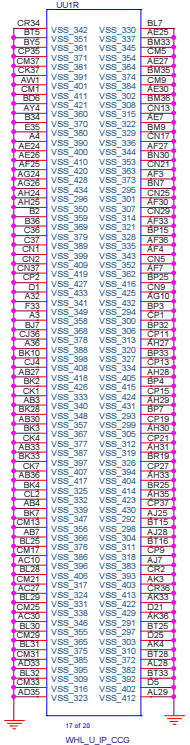

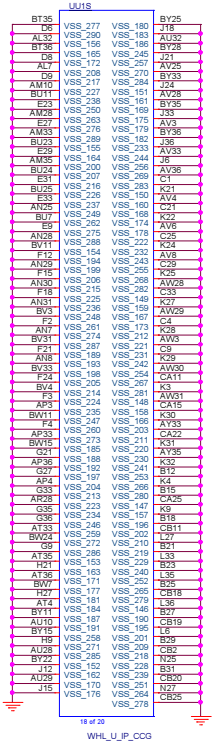

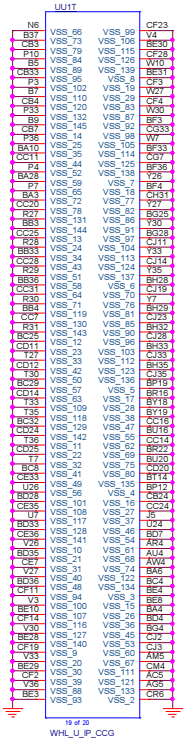

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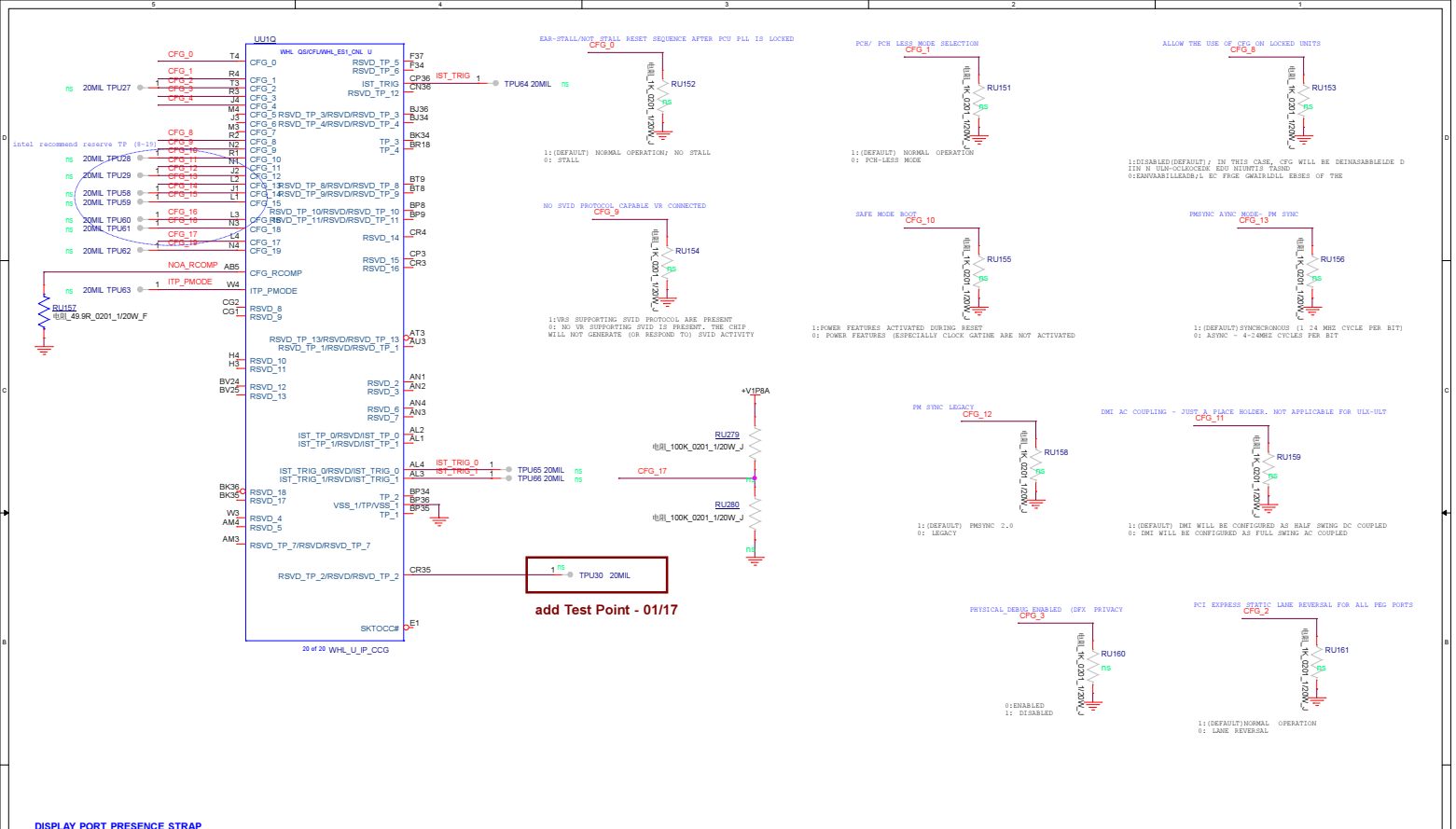

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Page name:	WHL-U42(CFG)
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PLACE THESE CAPS UNDERNEATH BGA AREA

+VCCCORE

PDG:35 x 1uF
22 x 10uF
9x 22uF
18x 47uF

VENDOR:33x 22uF-->35 X1uF+30X22uF+7X10uF

+VCCGT

PDG:15 x 10uF
11 x 1uF
15 x 22uF
8 x 47uF
7x(0603)
2x(0805)

VENDOR:26x 22uF-->11X1uF+26x 22uF

PLACE THESE CAPS UNDERNEATH BGA AREA

7 x 10uF
7 x 1uF

+VCCEOPIO delete

Huaqin Telecom Technology Com.,Ltd.			
Page name:	WHL-U42(DECOUPLING1)		
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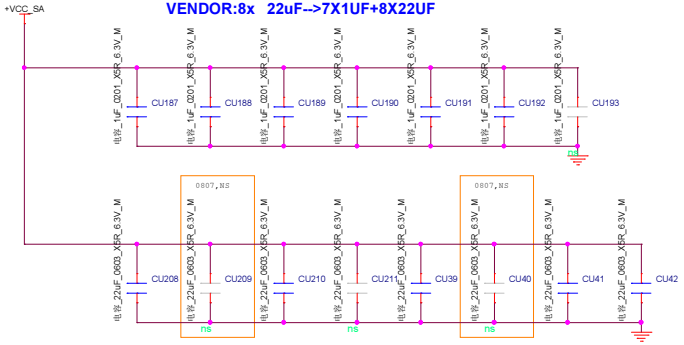
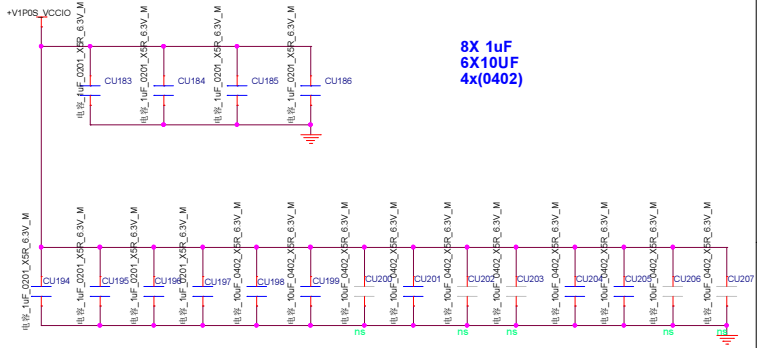
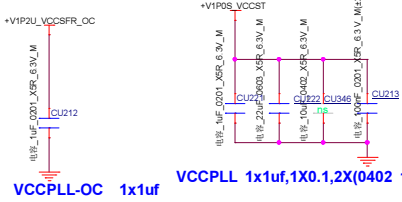
PDG:7x 1uF
15X 10uF
2 x 47 uF
2 x (0805)

VENDOR:8x 22uF-->7X1UF+8X22UF



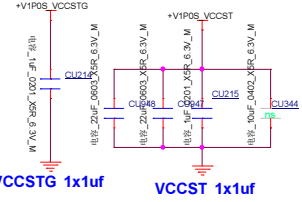


8X 1uF
6X10UF
4x(0402)



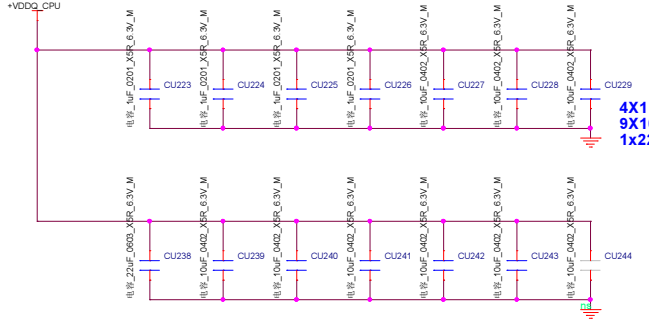
VCCPLL-OC 1x1uf

VCCPLL 1x1uf,1X0.1,2X(0402 10uF)



VCCSTG 1x1uf

VCCST 1x1uf



4X1UF
9X10UF
1x22UF

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Page name:	WHL-U42(DECOUPLING2)		
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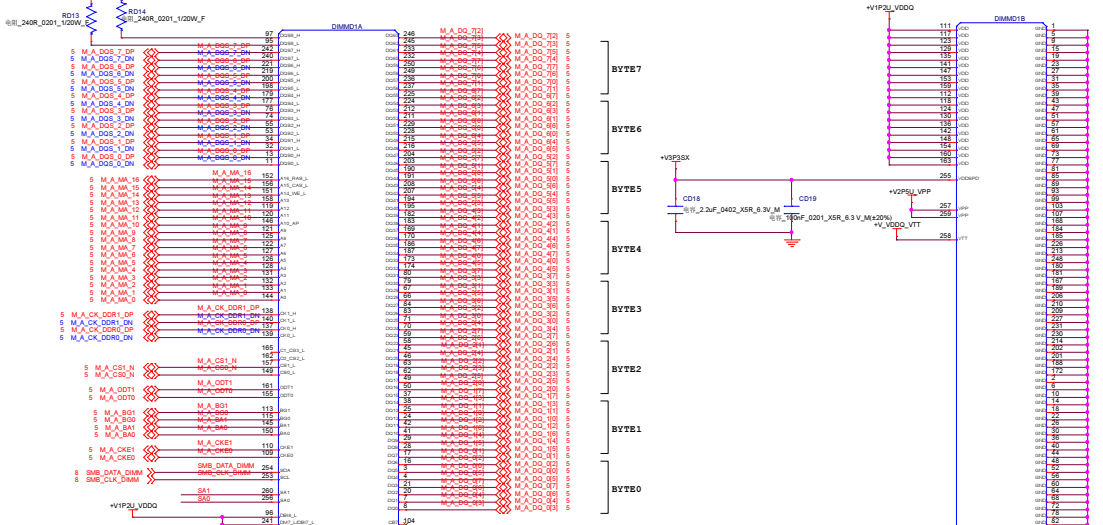

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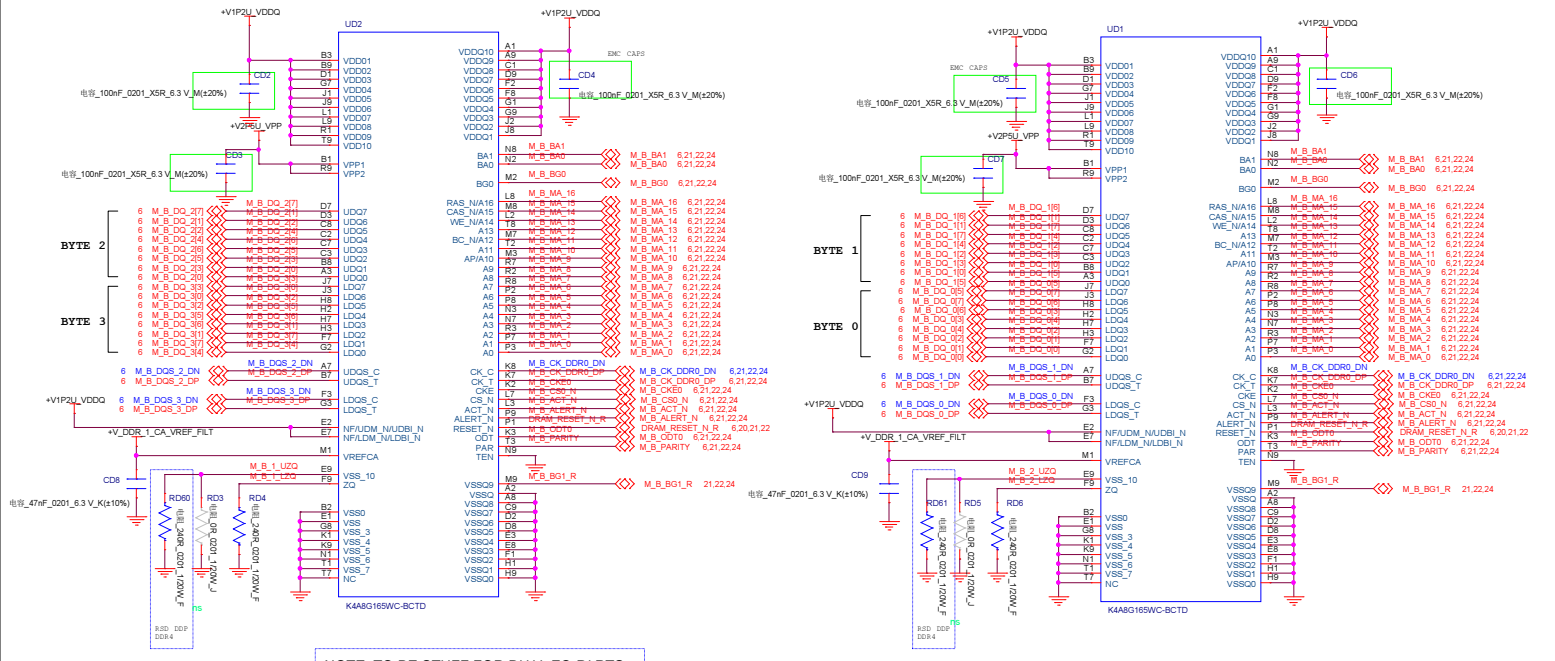

BOM NOTE

DDR PINS		SDP	DDP
E9	UZQ	GND	240E PD
M9	BG1	GND	BG1 SIG FROM CONTROLLER

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Page name:	DDR4 CH-B(DEVICE0)	
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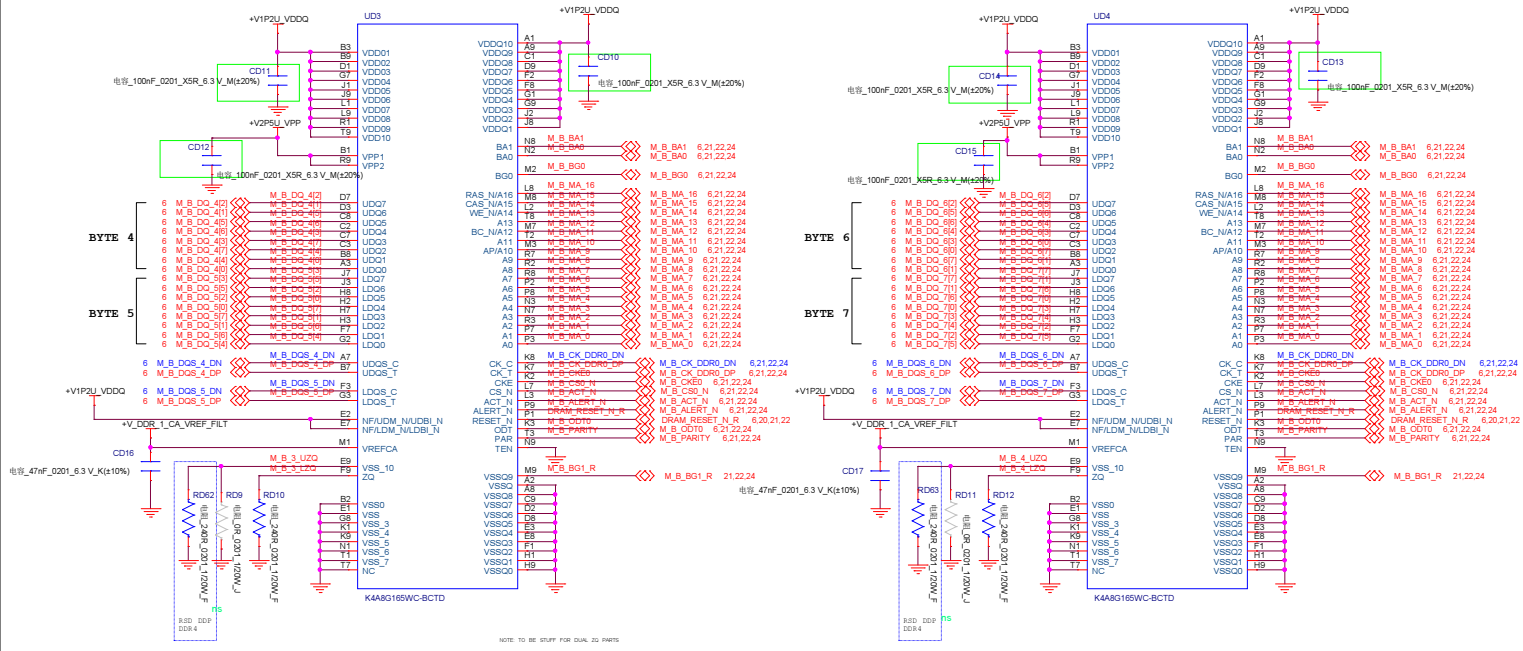

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Page name:	DDR4 CH_B(DEVICE1)		
Size: A4	Project Name: NB8513	REV: V1.0	
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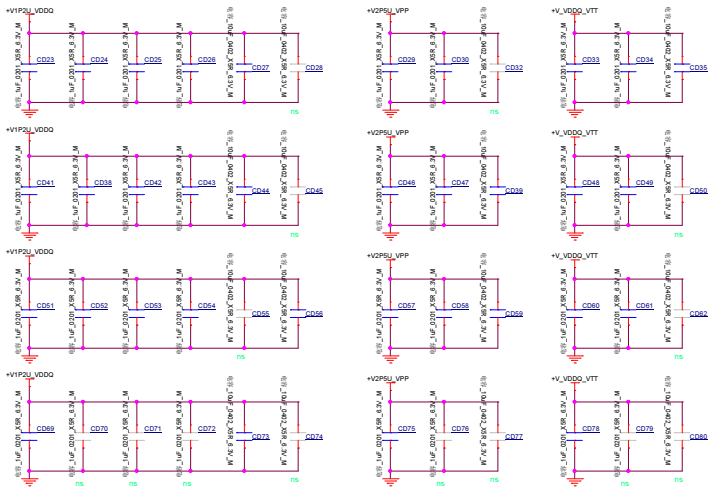
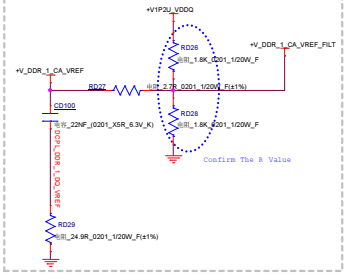
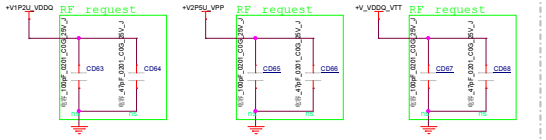
DECOUPLING CAPACITORS FOR DDR CHANNEL B MD



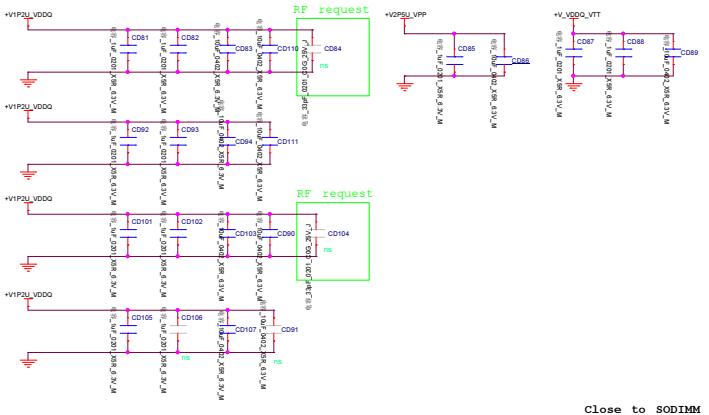
DDR4 CH B MD REF GENERATION



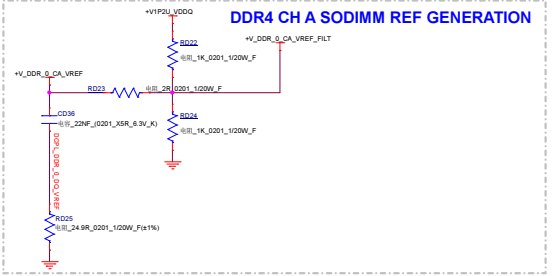
CHB MD



DECOUPLING CAPACITORS FOR DDR CHANNEL A SODIMM



DDR4 CH A SODIMM REF GENERATION



Huaqin Telecom Technology Com.,Ltd.			
Page name:	DDR4(DECAPS)		
Size: A4	Project Name: NB8513		REV: V1.0
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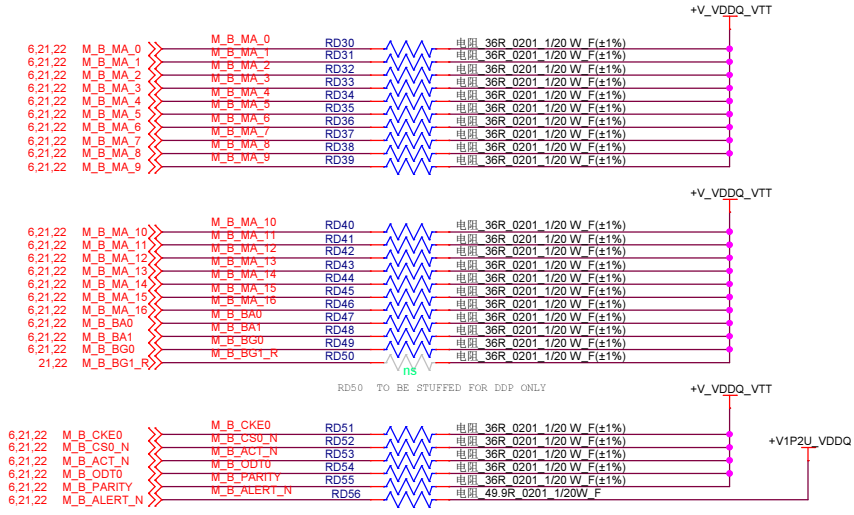
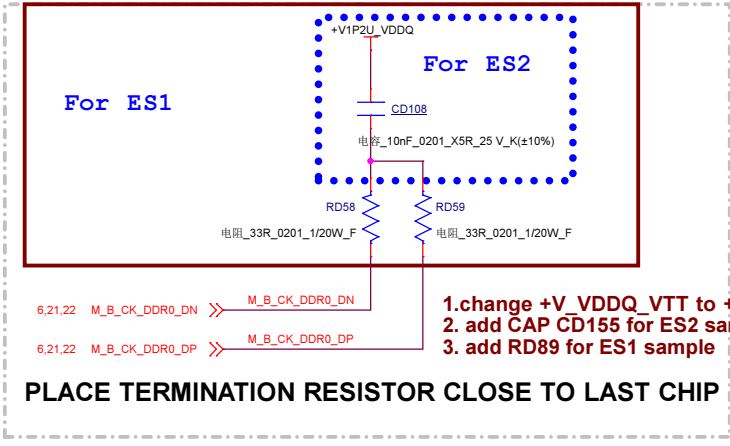
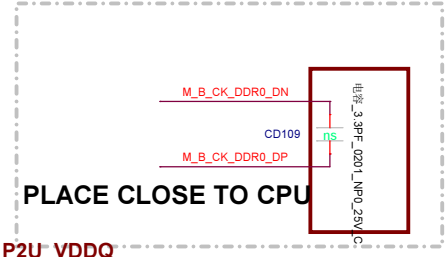
MEMORY TERMINATIONS CHANNEL B MD







1.change +V_VDDQ_VTT to +V1P2U_VDDQ
2. add CAP CD155 for ES2 sample - 01/04
3. add RD89 for ES1 sample -01/23

change CD146 to 3.3pF - 01/04

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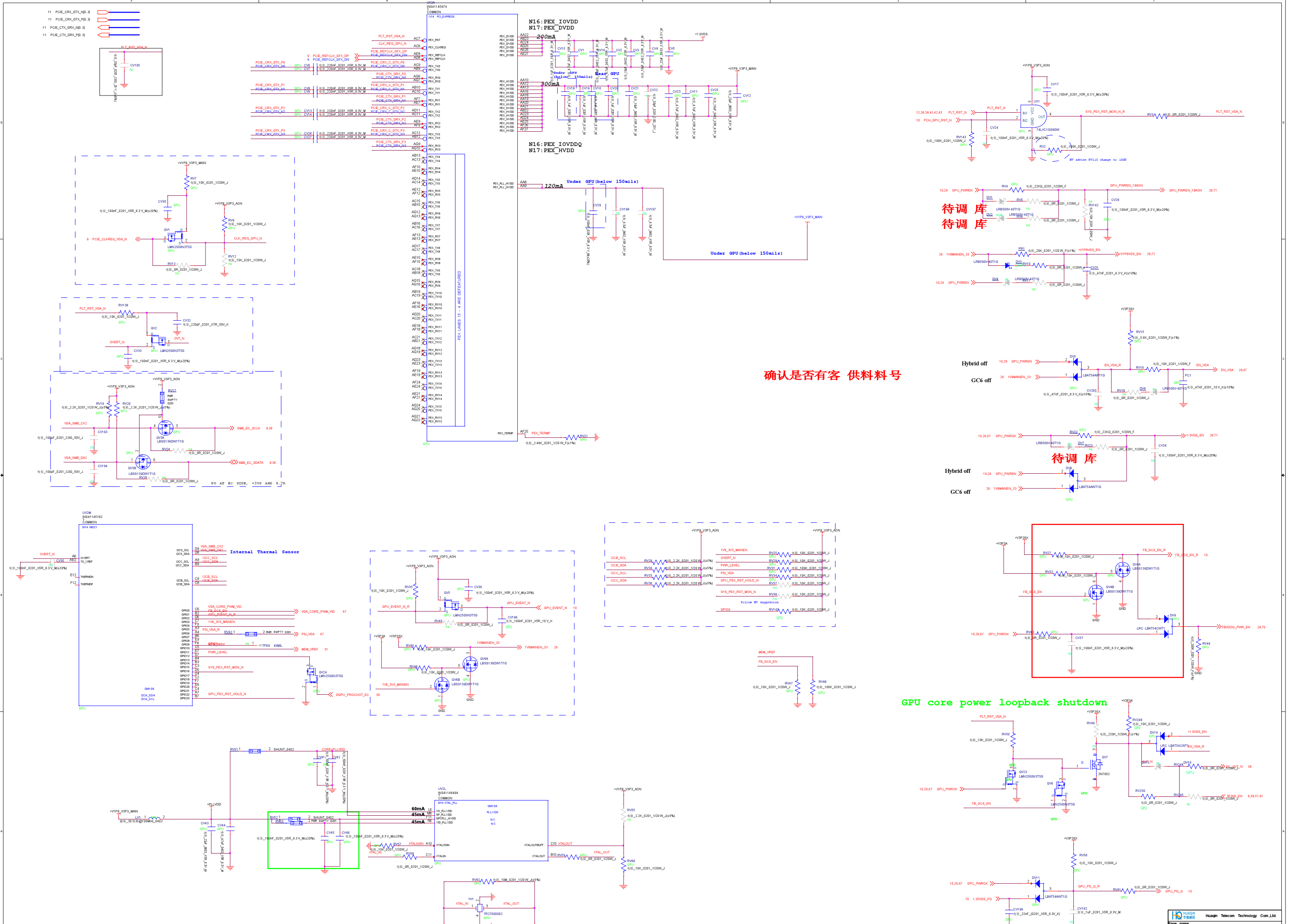

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Size: A4	Project Name: NB8513
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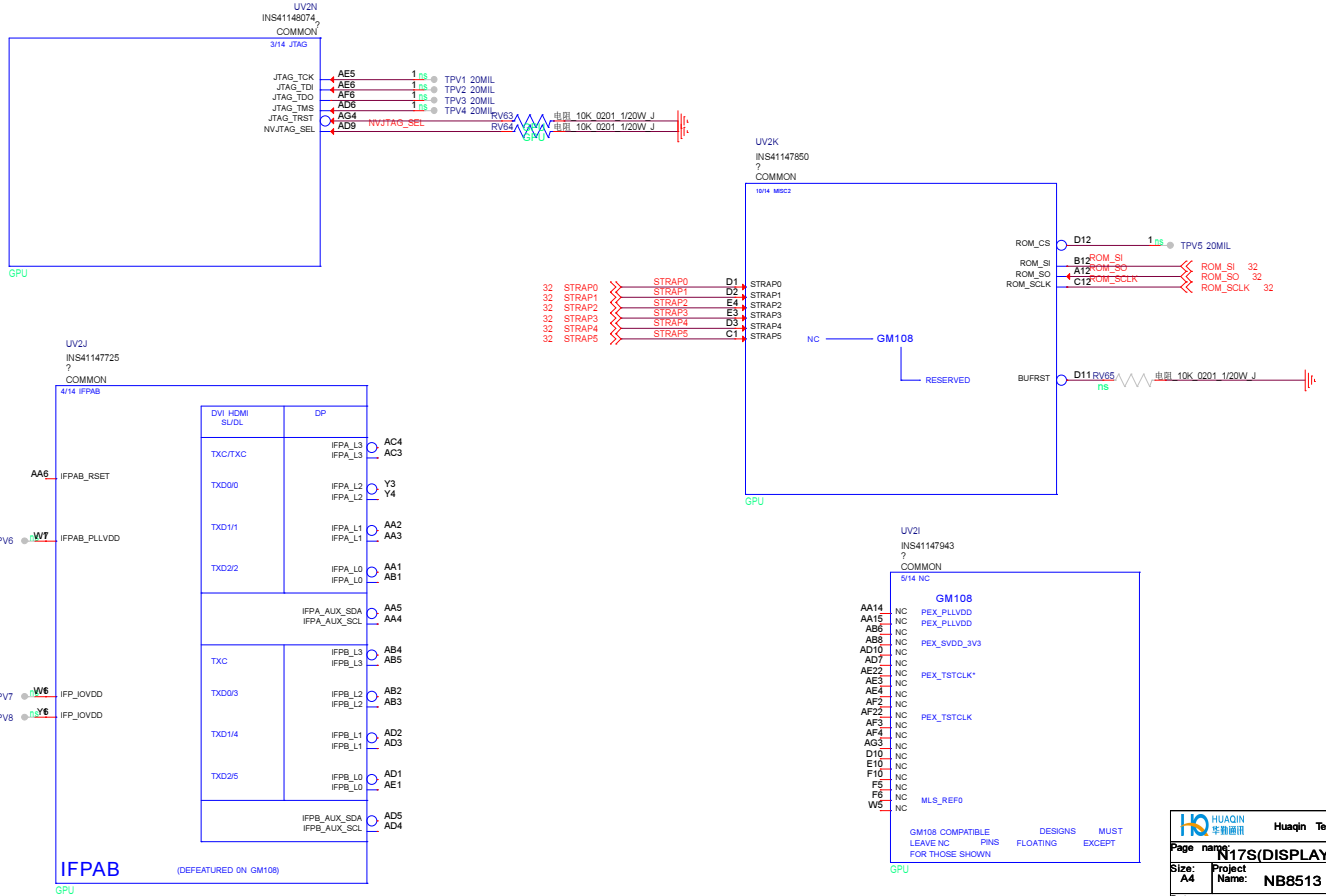
UV2N
INS41148074
?
COMMON
3/14 JTAG
JTAG_TCK
JTAG_TDI
JTAG_TDO
JTAG_TMS
JTAG_TRST
NVJTAG_SEL
AE5
AE6
AF6
AD6
AG4
AD9
NVJTAG_SEL
TPV1 20MIL
TPV2 20MIL
TPV3 20MIL
TPV4 20MIL
RV63
RV64
电阻 10K 0201 1/20W J
GPU
UV2K
INS41147850
?
COMMON
10/14 MISC2
STRAP0
STRAP1
STRAP2
STRAP3
STRAP4
STRAP5
D1
D2
E4
E3
D3
C1
NC
GM108
RESERVED
ROM_CS
ROM_SI
ROM_SO
ROM_SCLK
D12
B12
A12
C12
TPV5 20MIL
BUFRST
D11
RV65
UV2J
INS41147725
?
COMMON
4/14 IFPAB
DVI HDMI SL/DL
DP
TXC/TXC
TXD0/0
TXD1/1
TXD2/2
TXC
TXD0/3
TXD1/4
TXD2/5
IFPA_L3
IFPA_L2
IFPA_L1
IFPA_L0
IFPA_AUX_SDA
IFPA_AUX_SCL
IFPB_L3
IFPB_L2
IFPB_L1
IFPB_L0
IFPB_AUX_SDA
IFPB_AUX_SCL
AA6
IFPAB_RSET
20MIL TPV6
W7
IFPAB_PLLVDD
20MIL TPV7
W6
IFP_IOVDD
20MIL TPV8
Y6
IFP_IOVDD
IFPAB
(DEFEATURED ON GM108)
GPU
UV2I
INS41147943
?
COMMON
5/14 NC
GM108
PEX_PLLVDD
PEX_SVDD_3V3
PEX_TSTCLK*
PEX_TSTCLK
MLS_REF0
GM108 COMPATIBLE DESIGNS MUST
LEAVE NC PINS FLOATING EXCEPT
FOR THOSE SHOWN
GPU
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Huaqin Telecom Technology Com.,Ltd.
Page name: N17S(DISPLAY/ STRAP/ JTAG)
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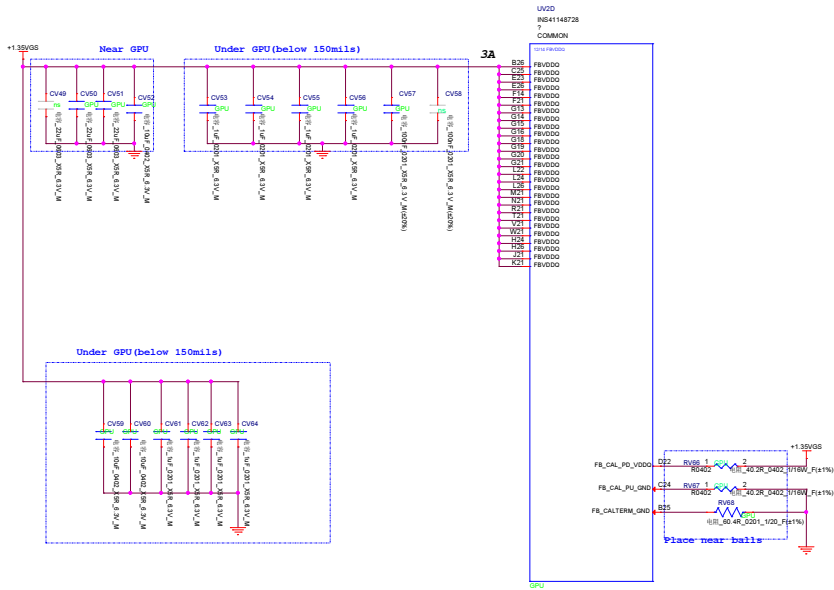
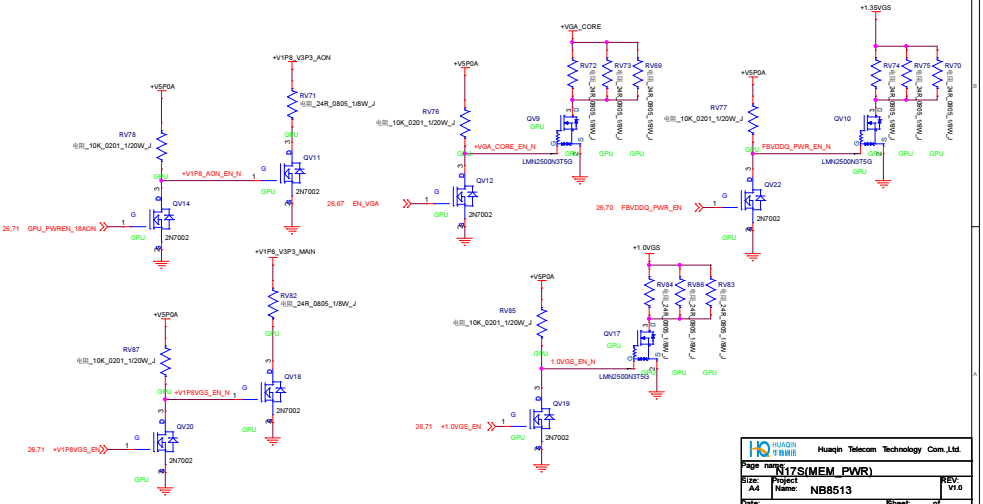


Table 9.18 GPU-Side FBVDDQ Decoupling Requirements

Decoupling Capacitor		Recommended Quantity and Placement (for all supported partitions combined)	
Capacitance	Type Size	Quantity	Placement
For N17x GPU Package: GB2C-64 (preliminary)			
1.0 uF	X6S [0402]	8	Under GPU FBVDDQ ball (evenly distributed throughout partition)
10 uF	X6S [0603]	2	
10 uF	X6S [0603]	1	Near GPU device
22 uF	X6S [0603]	3	
For N17x GPU Package: GB4C-128 (preliminary)			
1.0 uF	X6S [0402]	12	Under GPU FBVDDQ ball (equally distributed across partitions)
10 uF	X6S [0603]	4	
10 uF	X6S [0603]	2	Near GPU device
22 uF	X6S [0603]	5	
For N17x GPU Package: GB4-256			
1.0 uF	X6S [0402]	24	Under GPU FBVDDQ ball (equally distributed across partitions)
10 uF	X6S [0603]	5	
10 uF	X6S [0603]	7	Near GPU device
22 uF	X6S [0603]	9	

+V1P8A TO +V1P8_AON

Move to Power Page 2018/06/07



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Page name:	N17S(MEM_PWR)
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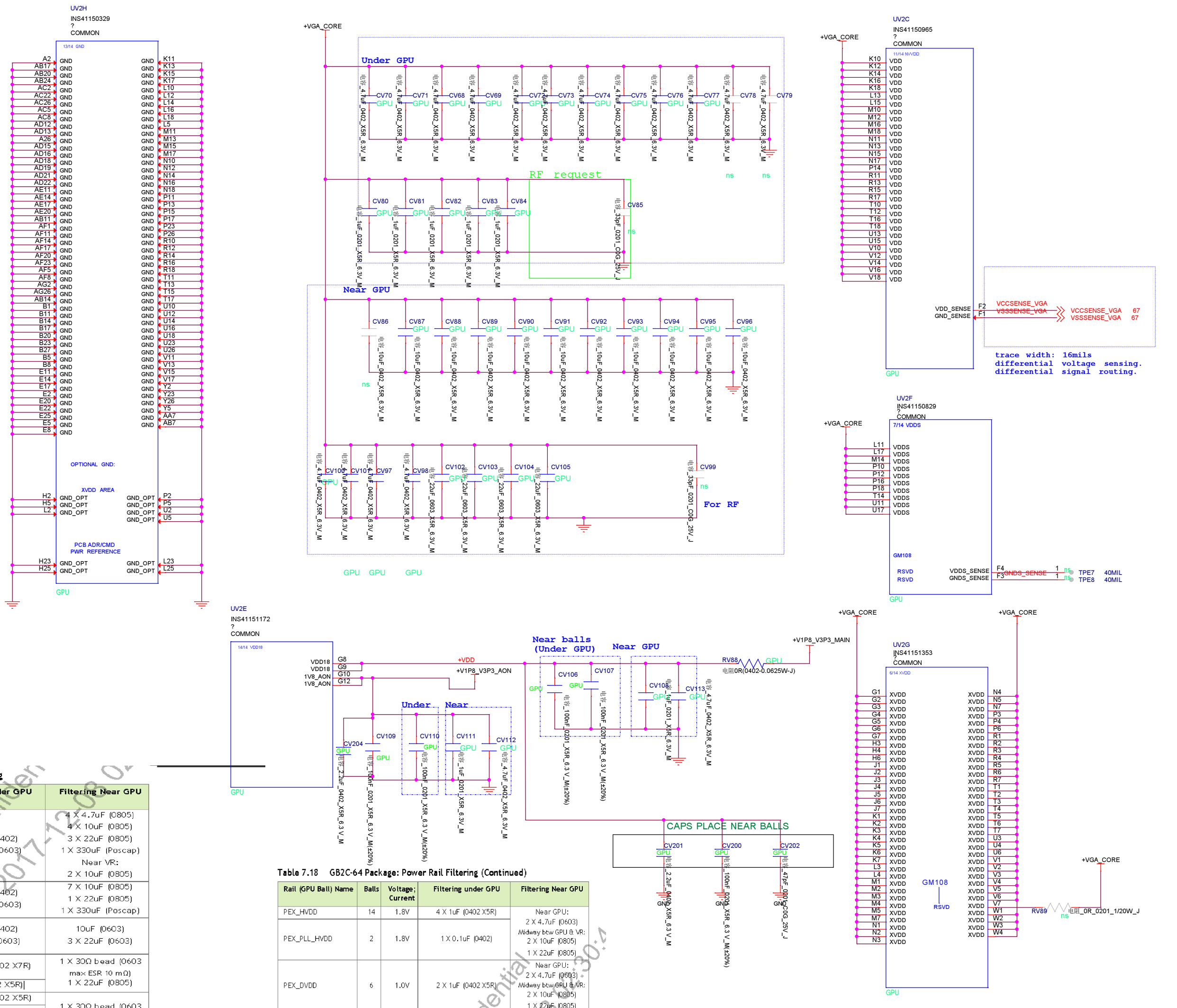

Table 7.18 GB2C-64 Package: Power Rail Filtering

Rail (GPU Ball) Name	Balls	Voltage; Current	Filtering under GPU	Filtering Near GPU
NVVDD	31	Varies	3 X 1uF (0402) 8 X 4.7uF (0603)	4 X 4.7uF (0805) 4 X 10uF (0805) 3 X 22uF (0805) 1 X 330uF (Poscap) Near VR: 2 X 10uF (0805)
NVVDDS	10	Varies	2 X 1uF (0402) 4 X 4.7uF (0603)	7 X 10uF (0805) 1 X 22uF (0805) 1 X 330uF (Poscap)
FBVDDQ (GPU side)[1]	27	1.35V 1.5V 1.55V	8 X 1uF (0402) 2 X 10uF (0603)	10uF (0603) 3 X 22uF (0603)
FBA_PLL_AVDD	1	1.8V	2 X 0.1uF (0402 X7R)	1 X 30Ω bead (0603 max ESR 10 mΩ) 1 X 22uF (0805)
FBB_PLL_AVDD	1			
FB_REFPLL_AVDD	1	1.8V	0.1uF (0402 X5R)	
IFPAB_PLLVDD	1	1.8V	1 X 0.1uF (0402 X5R)	1 X 30Ω bead (0603 max ESR 0.01 Ω) 1 X 22uF (0805) 1 X 4.7uF (0402)
GPCPLL_AVDDx XS_PLLVDD	2		2 X 0.1uF (0402 X5R)	
SP_PLLVDD	1		1 X 0.1uF (0402 X5R)	
VID_PLLVDD	1		1 X 0.1uF (0402 X5R)	
IFP_IOVDD	2	1.0V	2 X 0.1uF (0402 X6S)	1 X 4.7uF (0603) 1 X 1uF (0402)

Table 7.18 GB2C-64 Package: Power Rail Filtering (Continued)

Rail (GPU Ball) Name	Balls	Voltage; Current	Filtering under GPU	Filtering Near GPU
PEX_HVDD	14	1.8V	4 X 1uF (0402 X5R)	Near GPU: 2 X 4.7uF (0603) Midway btw GPU & VR: 2 X 10uF (0805) 1 X 22uF (0805)
PEX_PLL_HVDD	2	1.8V	1 X 0.1uF (0402)	
PEX_DVDD	6	1.0V	2 X 1uF (0402 X5R)	Near GPU: 2 X 4.7uF (0603) Midway btw GPU & VR: 2 X 10uF (0805) 1 X 22uF (0805)
1V8_MAIN	2	1.8V	2 X 0.1uF (0402)	1 X 1uF (0402) 1 X 4.7uF (0603)
1V8_AON	2	1.8V	2 X 0.1uF (0402)	1 X 1uF (0402) 1 X 4.7uF (0603)

Note:
1. Also see Section 9.2.2.1.10.1

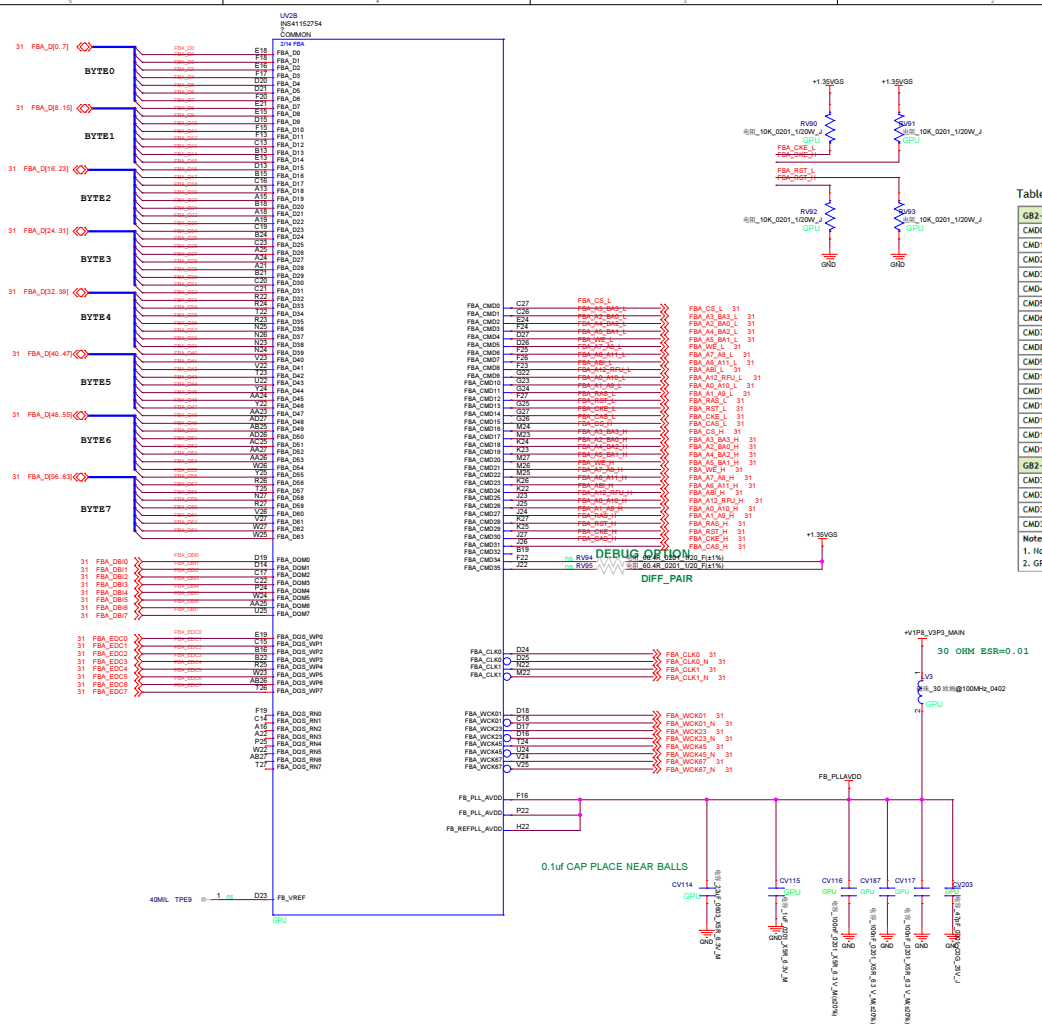

Table 7-4. GDDR5 Mode H Mapping

GB2-64, GB2B-64, GB4B-128	Channel 0 0..31	GB2-64, GB2B-64, GB4B-128	Channel 1 32..63
CMD0	CS*	CMD16	CS*
CMD1	A3_BA3	CMD17	A3_BA3
CMD2	A2_BA0	CMD18	A2_BA0
CMD3	A4_BA2	CMD19	A4_BA2
CMD4	A5_BA1	CMD20	A5_BA1
CMD5	WE*	CMD21	WE*
CMD6	A7_A8	CMD22	A7_A8
CMD7	A6_A11	CMD23	A6_A11
CMD8	ABI*	CMD24	ABI*
CMD9	A12_RFU	CMD25	A12_RFU
CMD10	A0_A10	CMD26	A0_A10
CMD11	A1_A9	CMD27	A1_A9
CMD12	RAS*	CMD28	RAS*
CMD13	RST*	CMD29	RST*
CMD14	CKE*	CMD30	CKE*
CMD15	CAS*	CMD31	CAS*
GB2-64, GB2B-64, GB4B-128	**Channel 0 & 1**		
CMD32	Not used		
CMD33[1]	Not used		
CMD34	DEBUG0[2]		
CMD35	DEBUG1[2]		

Notes:
1. Not available in GB2-64 and GB2B-64 packages.
2. GPU debug pins; not connected to DRAM. See section 7.1.13.

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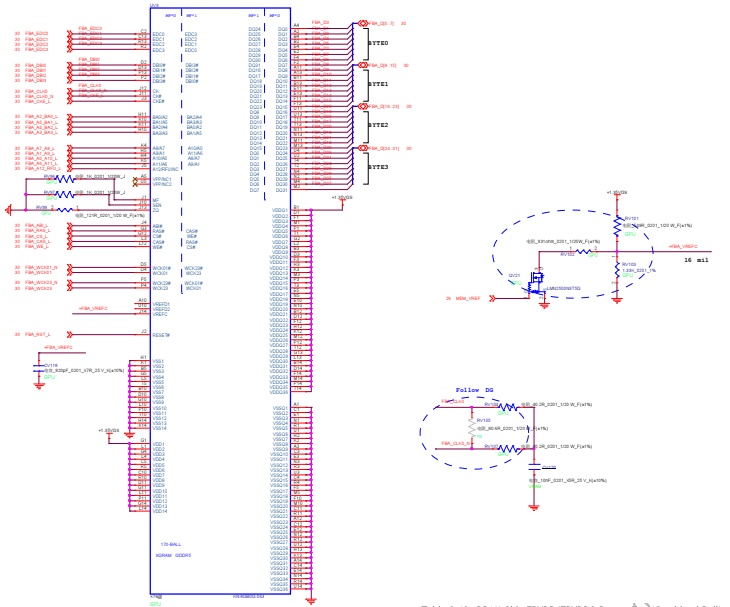
Memory - Lower 32 bits



Memory - Upper 32 bits

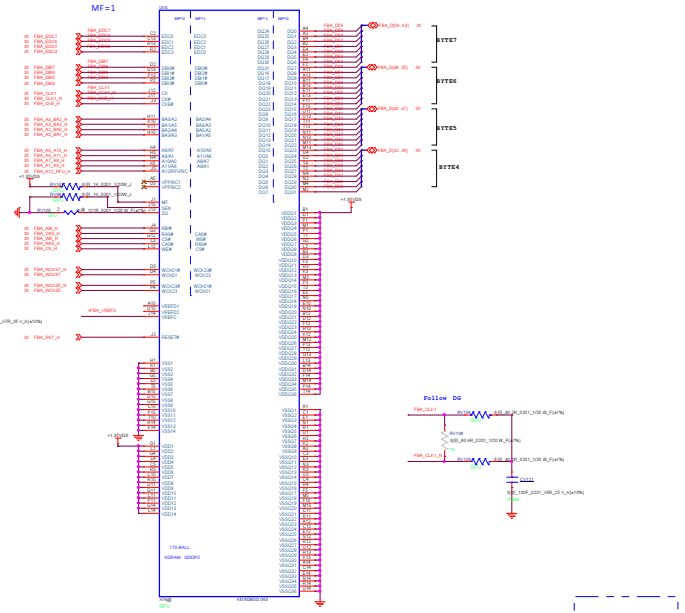


Table 9.19 DRAM-Side FBVDD/FBVDDQ Decoupling (Combined Rail)

Decoupling Capacitors		Recommended Quantity and Placement (per DRAM device)	
Capacitance	Type [Size]	Quantity	Placement (by DRAM Interface Mode)
Combined FBVDD-FBVDDQ Rail			
1.0 uF	X6S [0402]	10	**For x32 DRAM:** Under the DRAM FBVDD or FBVDDQ ball. **For x16 DRAM in a "clamshell" PCB configuration:** As close to DRAM periphery as possible. Ensure at least 2 GND vias and 2 power vias for each decoupling capacitor.
10 uF	X6S [0603]	4	
1.0 uF	X6S [0402]	8 additional	**For x32 DRAM:** Choose x32 interface to achieve max POR DRAM speeds. Add these additional decoupling caps under the DRAM FBVDD/Q ball; should share existing FBVDD/Q ball via if possible. See Figure 9.23 for an example.
10 uF	X6S [0603]	2	Near DRAM device. Ensure at least 2 GND vias and 2 power vias for each capacitor.
22 uF	X6S [0603]	5	For 4 GHz WCK (8 Gbps data rates): Near DRAM device. Ensure at least 2 GND vias and 2 power vias for each capacitor.

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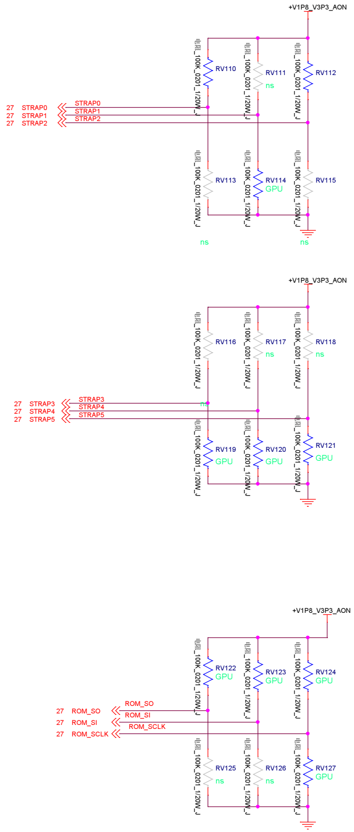

For N17

GPU	Vendor	Manufacturer	Strap	Strap2	Strap1	Strap0
N17S-G1	Samsung	K4G80325FB-HC25	0x0	L	L	L
	Micron	MT51J256M32HF-70:A	0x1	L	L	H
	Hynix	H5GC8H24MJR-ROC	0x2	L	H	L
	Micron	MT51J256M32HF-70:B	0x4	H	L	L
	Hynix	H5GC8H24AJR-ROC	0x5	H	L	H
N17S_G0/G2	Micron	MT51J256M32HF-80:B	0x9	L	M	L
	Hynix	H5GC8H24AJR-R2C	0xA	L	M	H

N17S_G0/G2 follow N17S_G1 with NV confirm

PN	MPN	STRAP	Vendor
HQ11121854000	MT51J256M32HF-70:B	0x4	Micron
HQ11121852000	H5GC8H24AJR-R0C	0x5	Hynix
HQ11121870000	K4G80325FB-HC28	0x0	Samsung

Physical Strapping pin	Power Rail	RAM_CFG[3]	RAM_CFG[0x02]	RAM_CFG[1]	RAM_CFG[0x00]
STRAP0			L		L
STRAP1			H		L
STRAP2			L		L

SMBUS_ALT_ADDR	
0	0x9E (Default)
1	0x9C (Multi-GPU usage)

DEVID_SEL	
0	(Default)
1	

PCIE_CFG	
0	(Default)
1	

VGA_DEVICE	
0	3D Device (Class Code 302h)
1	VGA Device (Default)

Physical Strapping pin	Power Rail	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
ROM_SCLK	M	Disable	Disable	Disable	Disable
ROM_SI	H				
ROM_SO	H				

Table 5.3 RAMCFG

Strap Pins see Note			RAMCFG Setting Number
STRAP2	STRAP1	STRAP0	(see Memory RVL for memory configs corresponding to these numbers)
L	L	L	0 (0x0000)
L	L	H	1 (0x0001)
L	H	L	2 (0x0002)
L	H	H	3 (0x0003)
H	L	L	4 (0x0004)
H	L	H	5 (0x0005)
H	H	L	6 (0x0006)
H	H	H	7 (0x0007)
L	L	M	8 (0x0008)
L	M	L	9 (0x0009)
L	M	H	10 (0x000A)
L	H	M	11 (0x000B)
M	L	L	12 (0x000C)
M	L	H	13 (0x000D)

Table 5. N17S-G0/G2 GDDR5 Recommended Memories

Memory Density	Allowed Memory Configuration	FBVDD/Q	Vendor	Manufacturer Part Number	Die Revision	Strap	Memory Speed Grade	Date Code Alert	Qual Plan	Status
8 Gb	256Mx32 512Mx16	1.35V	Micron	MT51J256M32HF-80:B	B-die	0x9	8 Gbps	N/A	Full	Production ready
			Hynix	H5GC8H24AJR-R2C	A-die	0xA	8 Gbps	N/A	Full	Production ready

Notes:

1. For N17S-G0/G2, the maximum allowable memory case temperature is 85 °C.
2. N17S-G0/G2 running at 3.0 GHz (without intent to run 3.5 GHz at a later stage) can also use the memory configurations in Table 4 for N17S-G1.

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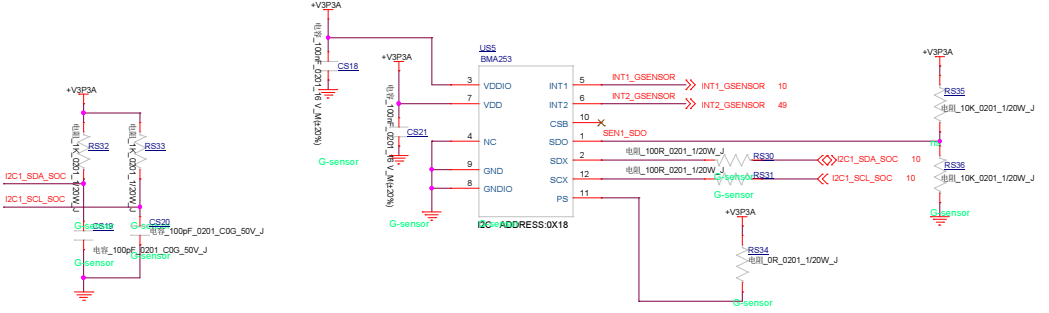

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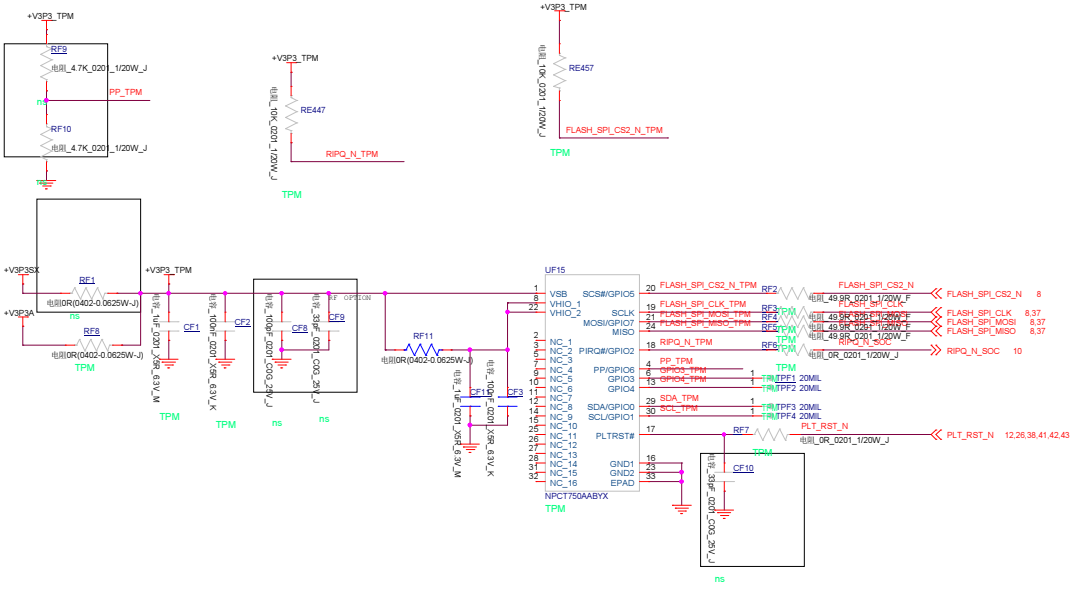

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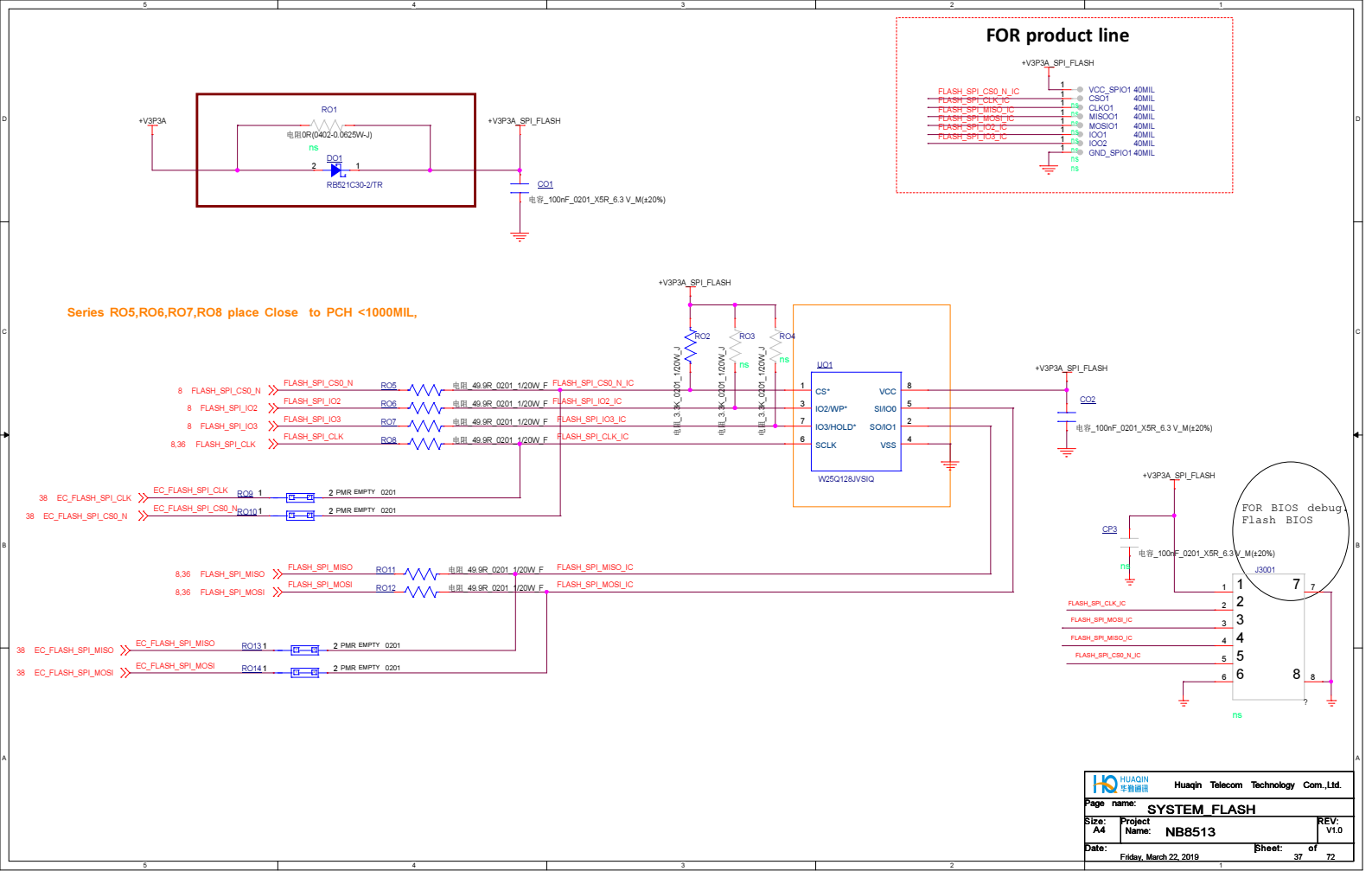
FOR product line
+V3P3A_SPI_FLASH
FLASH_SPI_CS0_N_IC
FLASH_SPI_CLK_IC
FLASH_SPI_MISO_IC
FLASH_SPI_MOSI_IC
FLASH_SPI_IO2_IC
FLASH_SPI_IO3_IC
VCC_SPIO1 40MIL
CSO1 40MIL
CLKO1 40MIL
MISOO1 40MIL
MOSIO1 40MIL
IOO1 40MIL
IOO2 40MIL
GND_SPIO1 40MIL
+V3P3A
RO1
电阻0R(0402-0.0625W-J)
DO1
RB521C30-2/TR
+V3P3A_SPI_FLASH
CO1
电容_100nF_0201_X5R_6.3 V_M(±20%)
Series RO5,RO6,RO7,RO8 place Close to PCH <1000MIL,
+V3P3A_SPI_FLASH
RO2
RO3
RO4
电阻_3.3K_0201_1/20W_J
UO1
CS*
IO2/WP*
IO3/HOLD*
SCLK
VCC
SI/IO0
SO/IO1
VSS
W25Q128JVSIQ
+V3P3A_SPI_FLASH
CO2
电容_100nF_0201_X5R_6.3 V_M(±20%)
8 FLASH_SPI_CS0_N
8 FLASH_SPI_IO2
8 FLASH_SPI_IO3
8,36 FLASH_SPI_CLK
FLASH_SPI_CS0_N
FLASH_SPI_IO2
FLASH_SPI_IO3
FLASH_SPI_CLK
RO5
RO6
RO7
RO8
电阻_49.9R_0201_1/20W_F
FLASH_SPI_CS0_N_IC
FLASH_SPI_IO2_IC
FLASH_SPI_IO3_IC
FLASH_SPI_CLK_IC
38 EC_FLASH_SPI_CLK
38 EC_FLASH_SPI_CS0_N
EC_FLASH_SPI_CLK
EC_FLASH_SPI_CS0_N
RO9
RO10
2 PMR EMPTY 0201
8,36 FLASH_SPI_MISO
8,36 FLASH_SPI_MOSI
FLASH_SPI_MISO
FLASH_SPI_MOSI
RO11
RO12
FLASH_SPI_MISO_IC
FLASH_SPI_MOSI_IC
38 EC_FLASH_SPI_MISO
38 EC_FLASH_SPI_MOSI
EC_FLASH_SPI_MISO
EC_FLASH_SPI_MOSI
RO13
RO14
+V3P3A_SPI_FLASH
CP3
电容_100nF_0201_X5R_6.3 V_M(±20%)
J3001
FLASH_SPI_CLK_IC
FLASH_SPI_MOSI_IC
FLASH_SPI_MISO_IC
FLASH_SPI_CS0_N_IC
FOR BIOS debug
Flash BIOS
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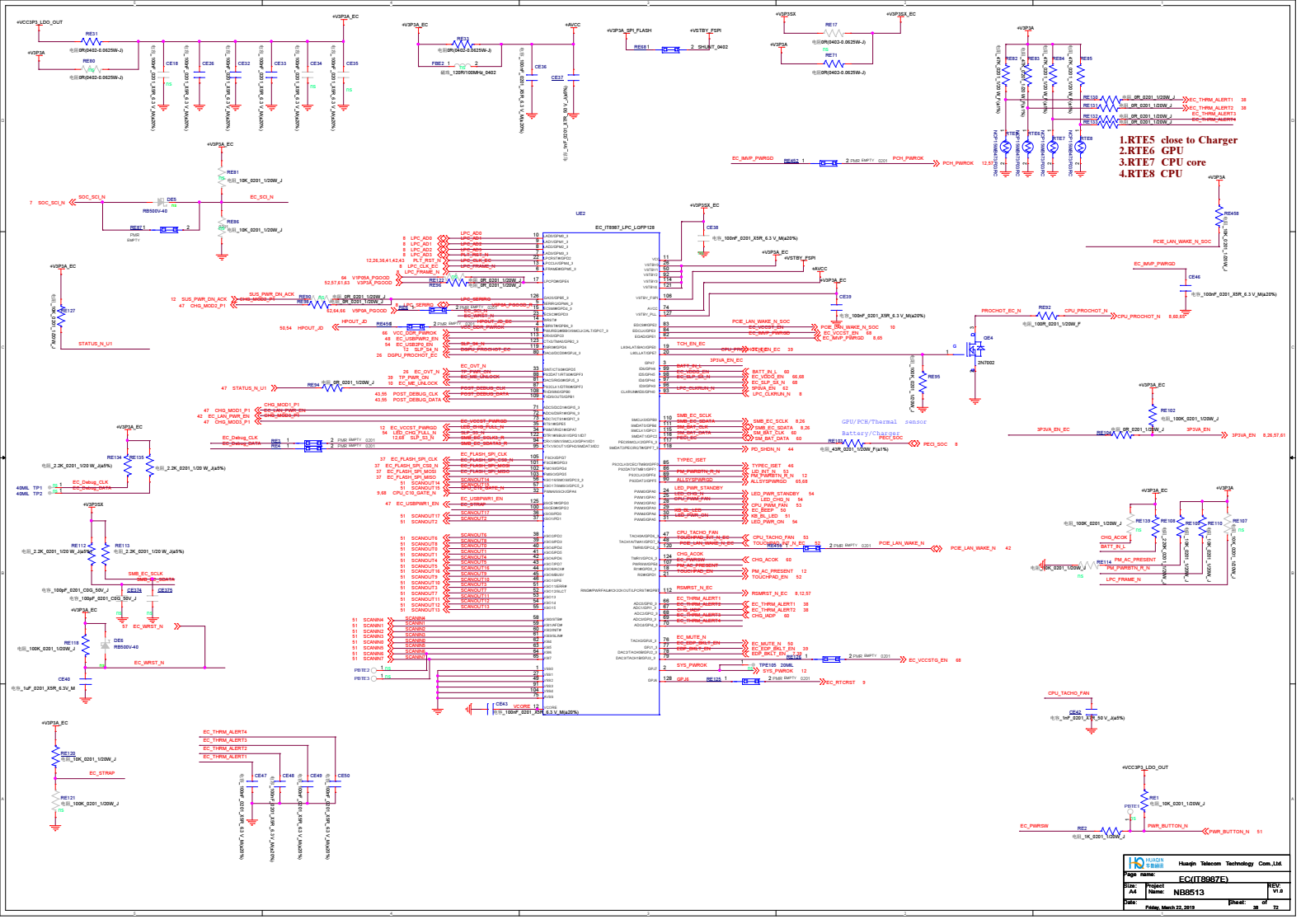
1.RTE5 close to Charger
2.RTE6 GPU
3.RTE7 CPU core
4.RTE8 CPU
EC(IT8987E)
NB8513
Huaqin Telecom Technology Com.,Ltd.
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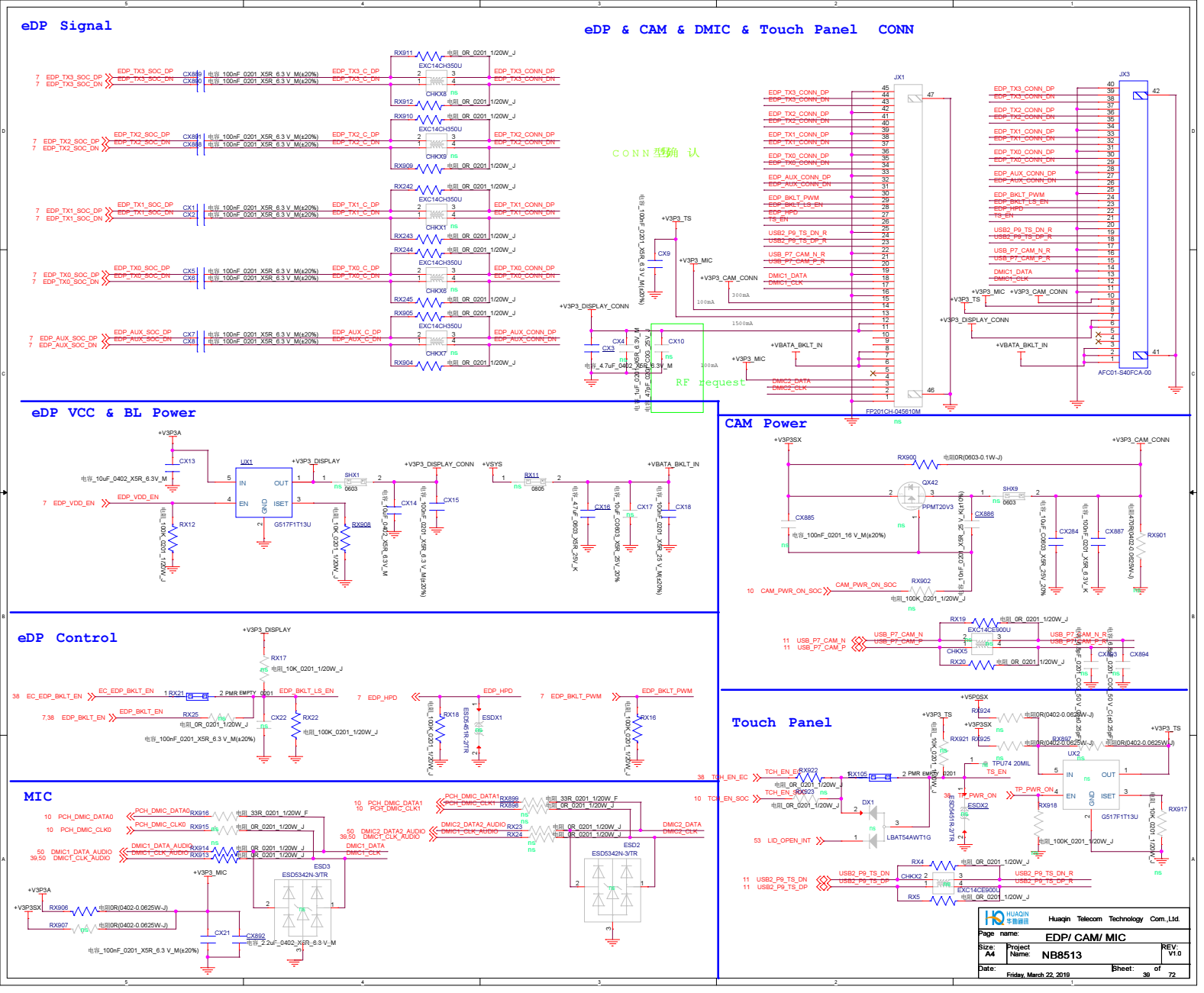
eDP Signal
eDP & CAM & DMIC & Touch Panel CONN
CONN型确 认
RF request
eDP VCC & BL Power
CAM Power
eDP Control
Touch Panel
MIC
JX1
JX3
FP201CH-045810M
AFC01-S40FCA-00
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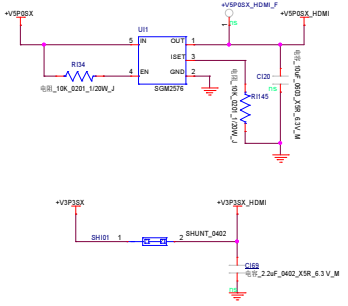
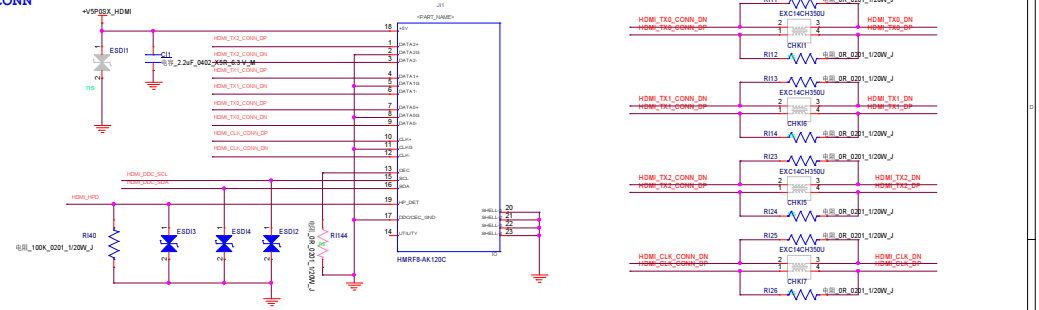
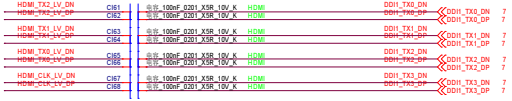
Power 1

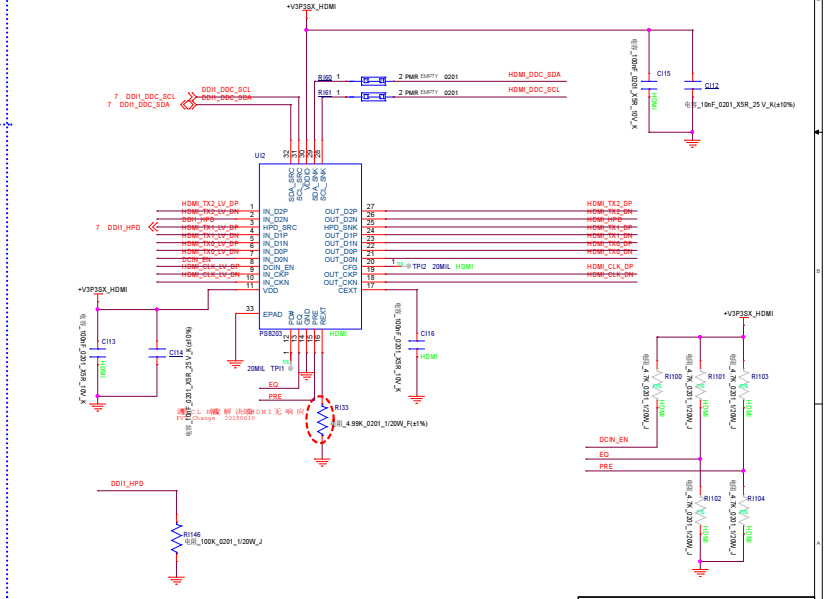


HDMI CONN



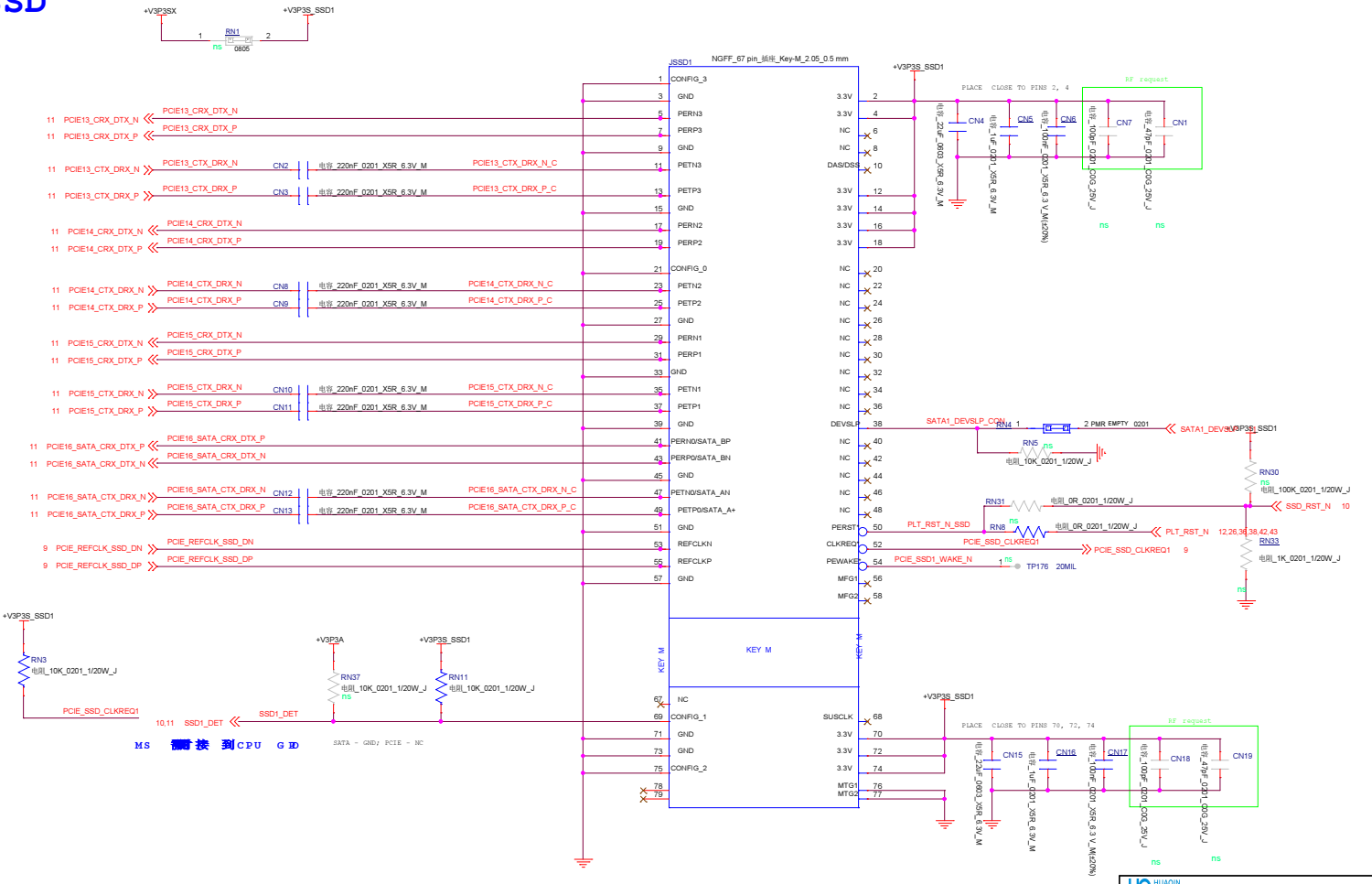
Signal





ESD

SSD



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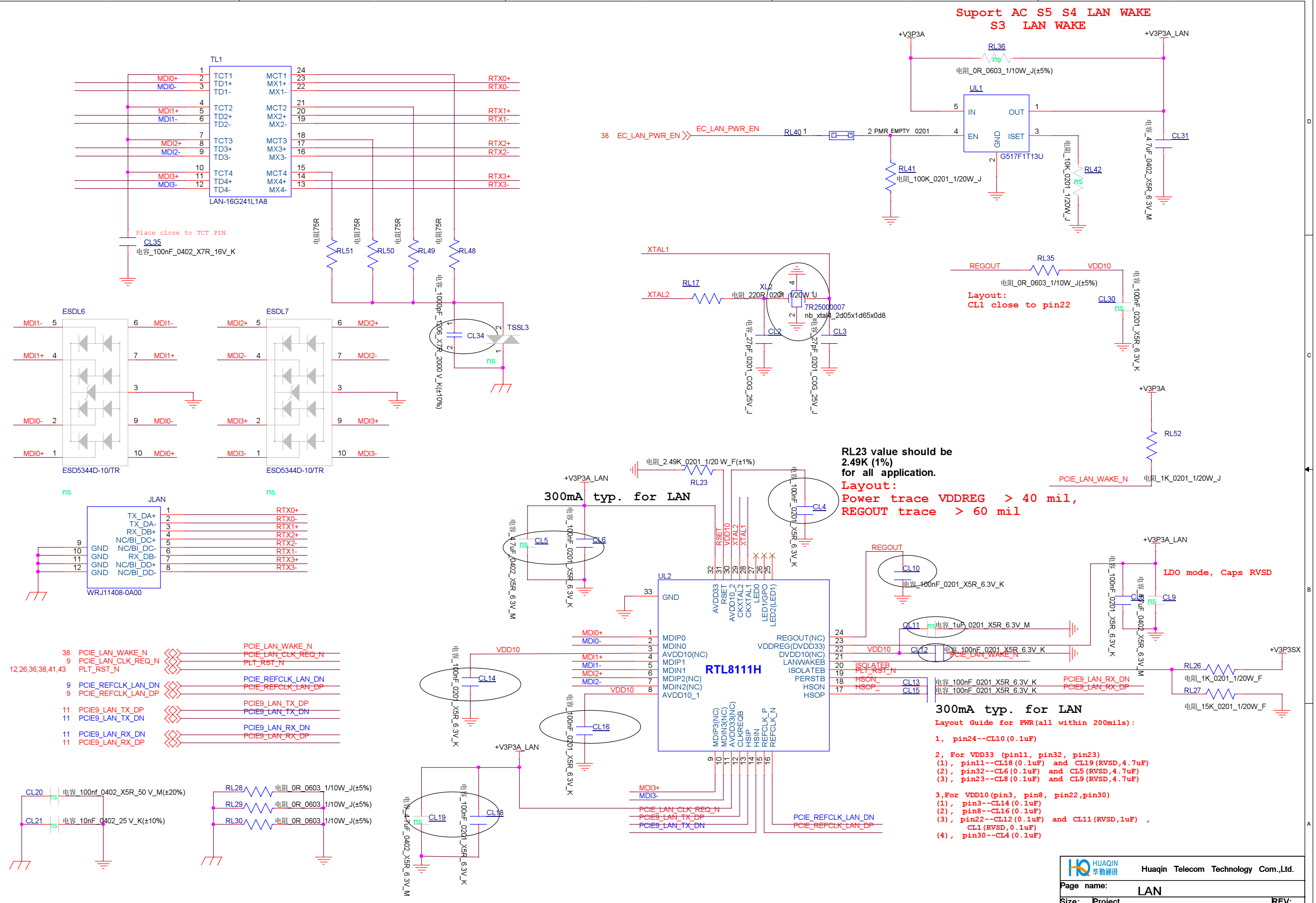

Suport AC S5 S4 LAN WAKE
S3 LAN WAKE
+V3P3A
+V3P3A_LAN
RL36
ns
电阻_0R_0603_1/10W_J(±5%)
UL1
IN
OUT
EN
GND
ISET
G517F1T13U
38 EC_LAN_PWR_EN
EC_LAN_PWR_EN
RL40
2 PMR_EMPTY 0201
RL41
电阻_100K_0201_1/20W_J
RL42
电阻_10K_0201_1/20W_J
CL31
电容_4.7uF_0402_X5R_6.3V_M
TL1
TCT1
TD1+
TD1-
TCT2
TD2+
TD2-
TCT3
TD3+
TD3-
TCT4
TD4+
TD4-
MCT1
MX1+
MX1-
MCT2
MX2+
MX2-
MCT3
MX3+
MX3-
MCT4
MX4+
MX4-
LAN-16G241L1A8
MDI0+
MDI0-
MDI1+
MDI1-
MDI2+
MDI2-
MDI3+
MDI3-
RTX0+
RTX0-
RTX1+
RTX1-
RTX2+
RTX2-
RTX3+
RTX3-
Place close to TCT PIN
CL35
电容_100nF_0402_X7R_16V_K
电阻75R
RL51
RL50
RL49
RL48
电容_1000pF_1206_X7R_2000 V_K(±10%)
CL34
TSSL3
ns
XTAL1
XTAL2
RL17
电阻_220R_0201_1/20W_J
XL2
7R25000007
nb_xtal4_2d05x1d65x0d8
CL2
CL3
电容_27pF_0201_C0G_25V_J
REGOUT
RL35
VDD10
电阻_0R_0603_1/10W_J(±5%)
Layout:
CL1 close to pin22
CL30
ns
电容_100nF_0201_X5R_6.3V_K
ESDL6
ESDL7
ESD5344D-10/TR
ns
+V3P3A
RL52
PCIE_LAN_WAKE_N
电阻_1K_0201_1/20W_J
JLAN
TX_DA+
TX_DA-
RX_DB+
NC/BI_DC+
NC/BI_DC-
RX_DB-
NC/BI_DD+
NC/BI_DD-
GND
WRJ11408-0A00
电阻_2.49K_0201_1/20 W_F(±1%)
RL23
+V3P3A_LAN
300mA typ. for LAN
RL23 value should be
2.49K (1%)
for all application.
Layout:
Power trace VDDREG > 40 mil,
REGOUT trace > 60 mil
CL4
电容_100nF_0201_X5R_6.3V_K
CL5
CL6
ns
电容_4.7uF_0402_X5R_6.3V_M
电容_100nF_0201_X5R_6.3V_K
RSET
VDD10
XTAL2
XTAL1
UL2
GND
AVDD33
RSET
AVDD10_2
CKXTAL2
CKXTAL1
LED0
LED1/GPO
LED2(LED1)
MDIP0
MDIN0
AVDD10(NC)
MDIP1
MDIN1
MDIP2(NC)
MDIN2(NC)
AVDD10_1
RTL8111H
REGOUT(NC)
VDDREG(DVDD33)
DVDD10(NC)
LANWAKEB
ISOLATEB
PERSTB
HSON
HSOP
MDIP3(NC)
MDIN3(NC)
AVDD33(NC)
CLKREQB
HSIP
HSIN
REFCLK_P
REFCLK_N
REGOUT
CL10
电容_100nF_0201_X5R_6.3V_K
CL11
ns
电容_1uF_0201_X5R_6.3V_M
CL12
电容_100nF_0201_X5R_6.3V_K
PCIE_LAN_WAKE_N
ISOLATEB
PLT_RST_N
HSON_
HSOP_
CL13
CL15
电容_100nF_0201_X5R_6.3V_K
PCIE9_LAN_RX_DN
PCIE9_LAN_RX_DP
+V3P3A_LAN
LDO mode, Caps RVSD
CL8
CL9
ns
电容_100nF_0201_X5R_6.3V_K
电容_4.7uF_0402_X5R_6.3V_M
+V3P3SX
RL26
电阻_1K_0201_1/20W_F
RL27
电阻_15K_0201_1/20W_F
38 PCIE_LAN_WAKE_N
9 PCIE_LAN_CLK_REQ_N
12,26,36,38,41,43 PLT_RST_N
9 PCIE_REFCLK_LAN_DN
9 PCIE_REFCLK_LAN_DP
11 PCIE9_LAN_TX_DP
11 PCIE9_LAN_TX_DN
11 PCIE9_LAN_RX_DN
11 PCIE9_LAN_RX_DP
VDD10
CL14
CL16
电容_100nF_0201_X5R_6.3V_K
300mA typ. for LAN
Layout Guide for PWR(all within 200mils):
1, pin24--CL10(0.1uF)
2, For VDD33 (pin11, pin32, pin23)
(1), pin11--CL18(0.1uF) and CL19(RVSD,4.7uF)
(2), pin32--CL6(0.1uF) and CL5(RVSD,4.7uF)
(3), pin23--CL8(0.1uF) and CL9(RVSD,4.7uF)
3,For VDD10(pin3, pin8, pin22,pin30)
(1), pin3--CL14(0.1uF)
(2), pin8--CL16(0.1uF)
(3), pin22--CL12(0.1uF) and CL11(RVSD,1uF) ,
CL1(RVSD,0.1uF)
(4), pin30--CL4(0.1uF)
CL20
ns
电容_100nf_0402_X5R_50 V_M(±20%)
CL21
ns
电容_10nF_0402_25 V_K(±10%)
RL28
RL29
RL30
电阻_0R_0603_1/10W_J(±5%)
+V3P3A_LAN
CL19
CL18
ns
电容_4.7uF_0402_X5R_6.3V_M
电容_100nF_0201_X5R_6.3V_K
MDI3+
MDI3-
PCIE_LAN_CLK_REQ_N
PCIE9_LAN_TX_DP
PCIE9_LAN_TX_DN
PCIE_REFCLK_LAN_DN
PCIE_REFCLK_LAN_DP

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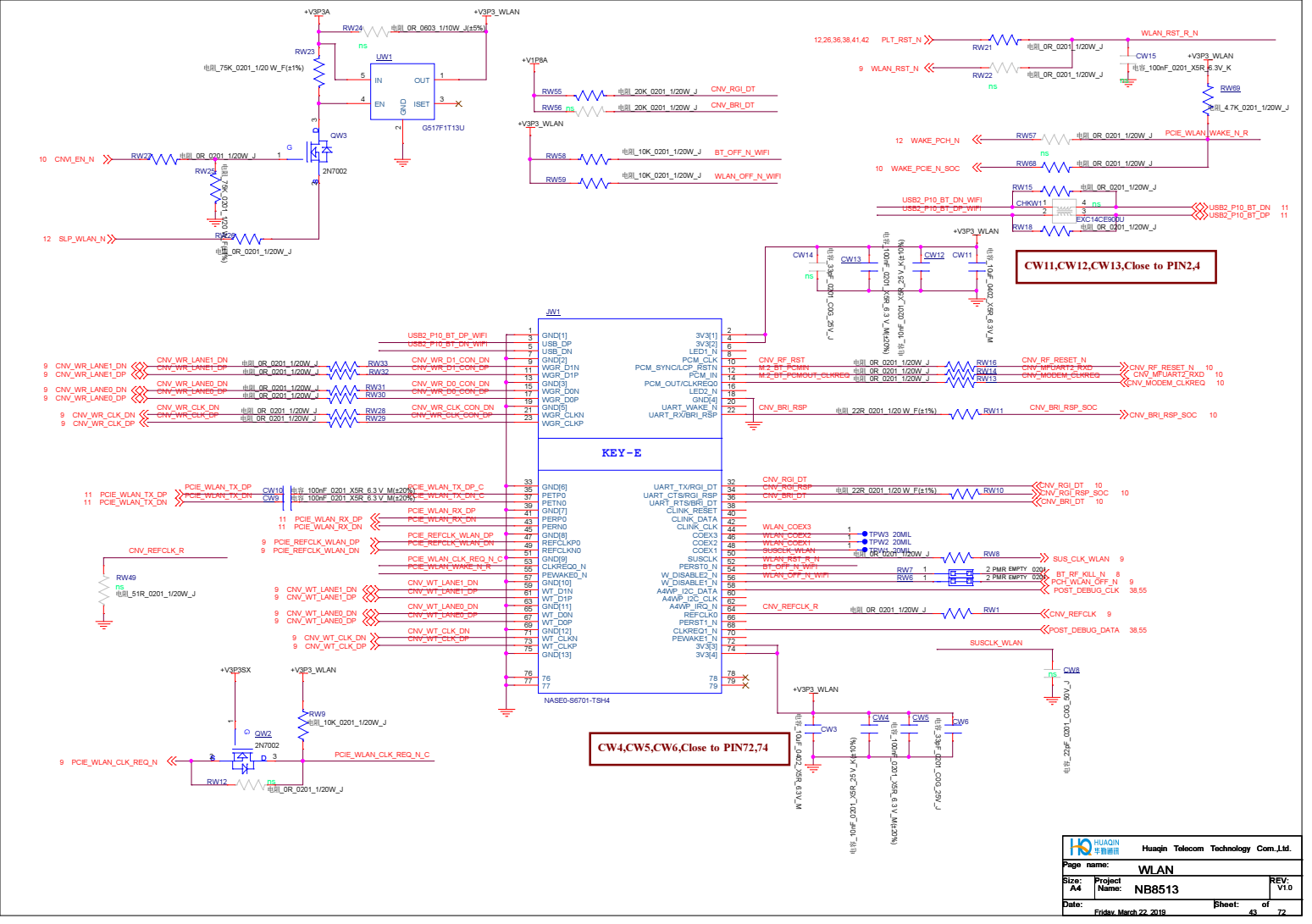
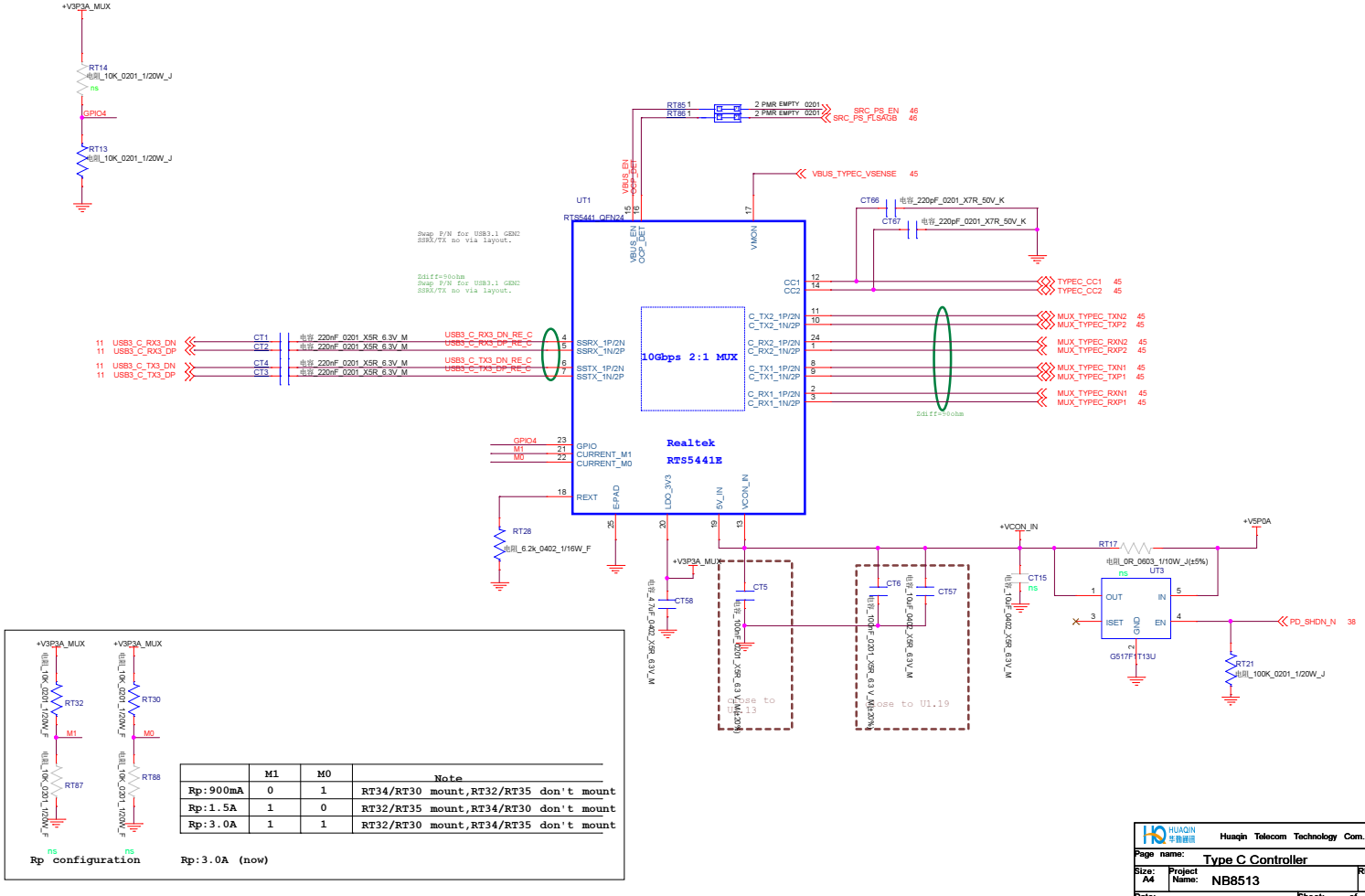


HUAQIN 华勤科技	Husqin Telecom Technology Com.,Ltd.		
Page name:	WLAN		
Size: A4	Project Name: NB8513	REV: V1.0	
Date: Friday, March 22, 2019	Sheet: 43 of 72		



	M1	M0	Note
Rp:900mA	0	1	RT34/RT30 mount,RT32/RT35 don't mount
Rp:1.5A	1	0	RT32/RT35 mount,RT34/RT30 don't mount
Rp:3.0A	1	1	RT32/RT30 mount,RT34/RT35 don't mount

Huaqin Telecom Technology Com.,Ltd.		
Page name:	Type C Controller	
Size: A4	Project Name: NB8513	REV: V1.0
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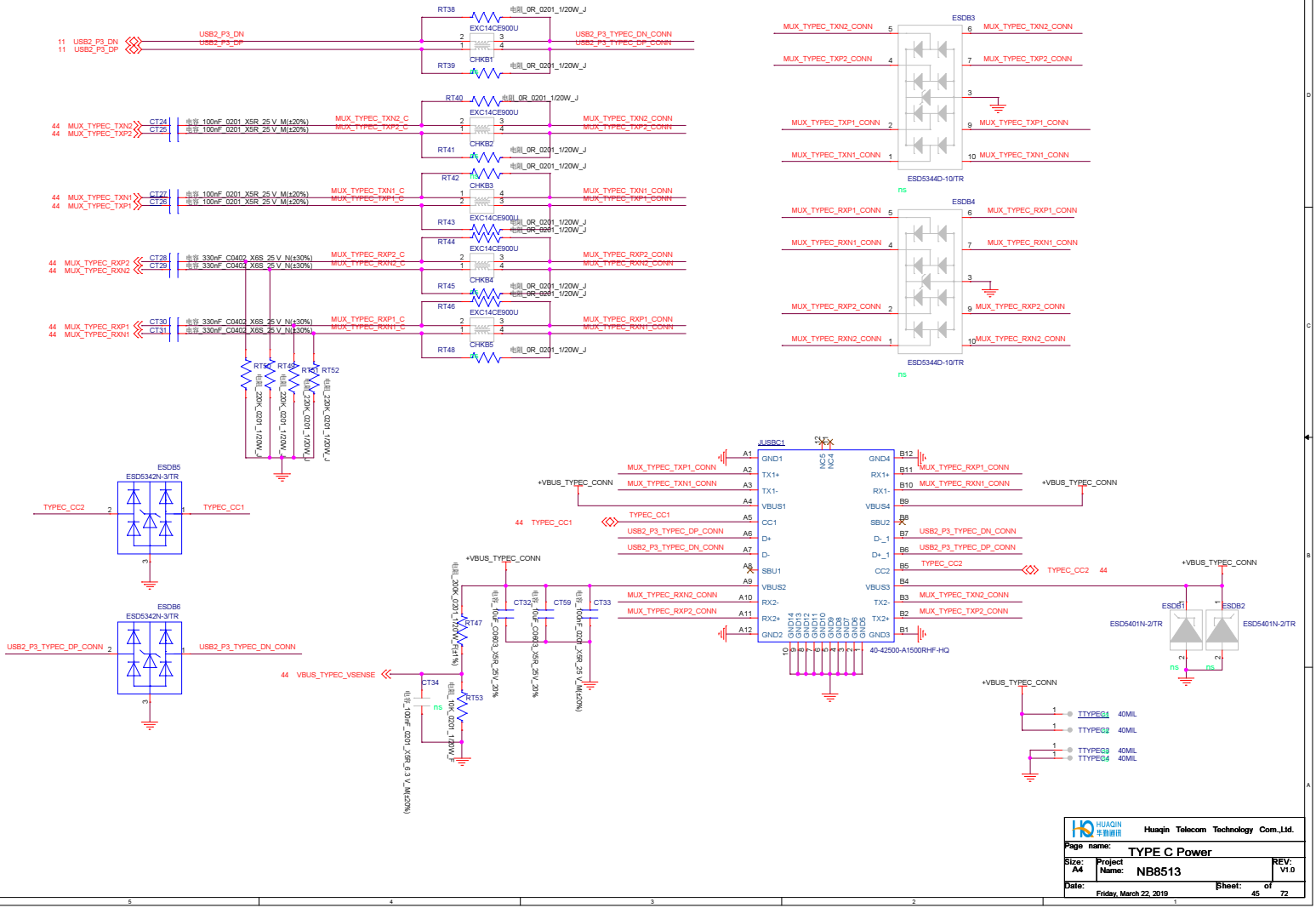
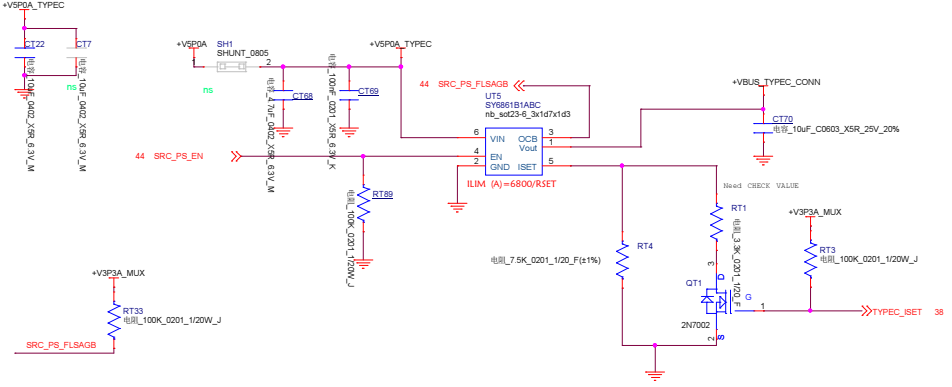
TYPE-C_ESD

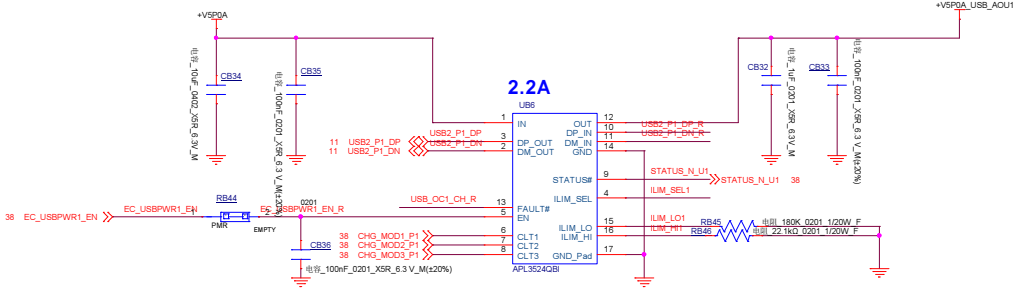


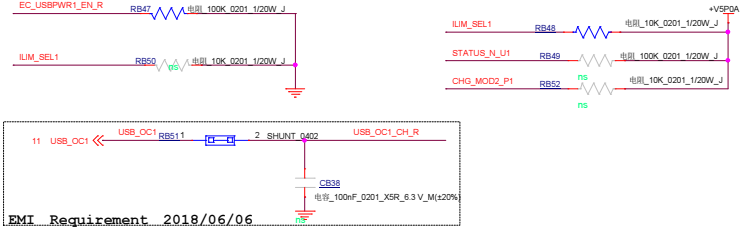
HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.	
Page name:	TYPE C Power	
Size: A4	Project Name: NB8513	REV: V1.0
Date: Friday, March 22, 2019	Sheet: 45 of 72	

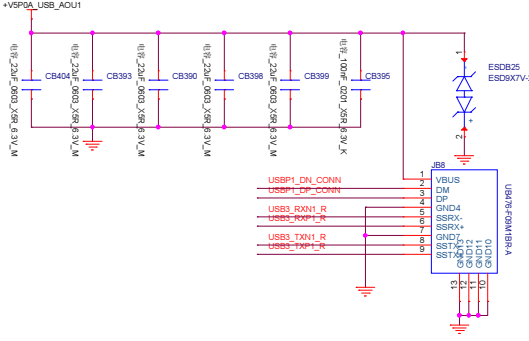


HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.	
Page name:	Type C CONN	
Size: A4	Project Name: NB8513	REV: V1.0
Date: Friday, March 22, 2019	Sheet: 46 of 72	

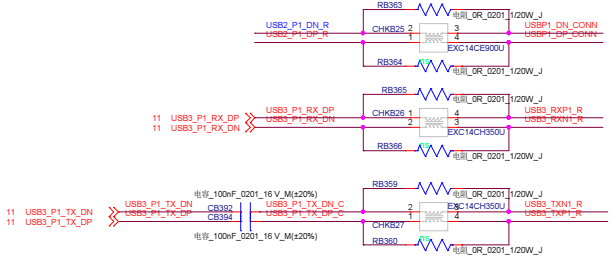
USB3.1 POWER Port1



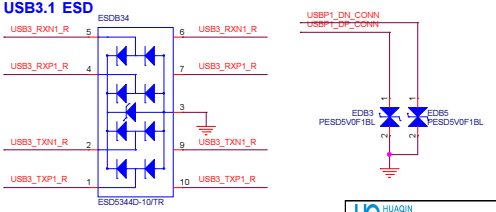




USB3.1 Signal



USB3.1 ESD



HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.	
Page name:	TYPE-C PD & MUX	
Size: A4	Project Name: NB8513	REV: V1.0
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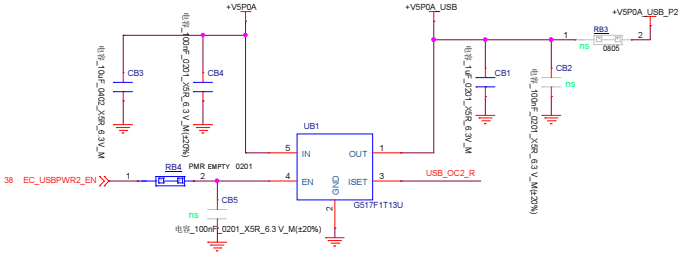
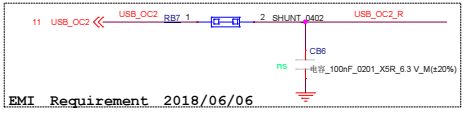
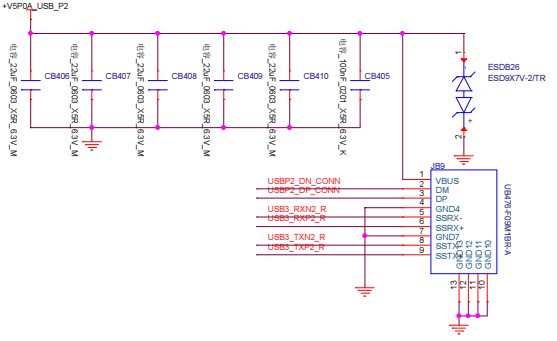
USB3.1 POWER Port2

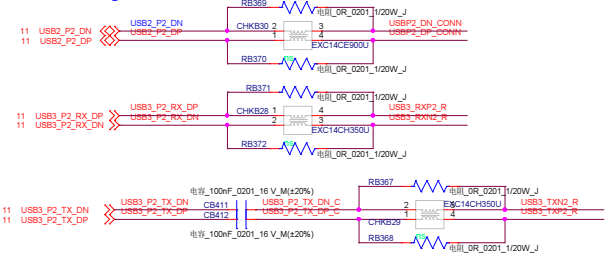




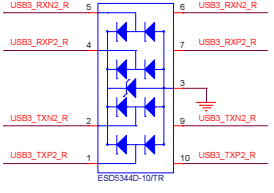
HUANWULIAO

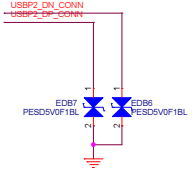


USB3.1 Signal



USB3.1 ESD





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Page name:	USB3.0	
Size: A4	Project Name: NB8513	REV: V1.0
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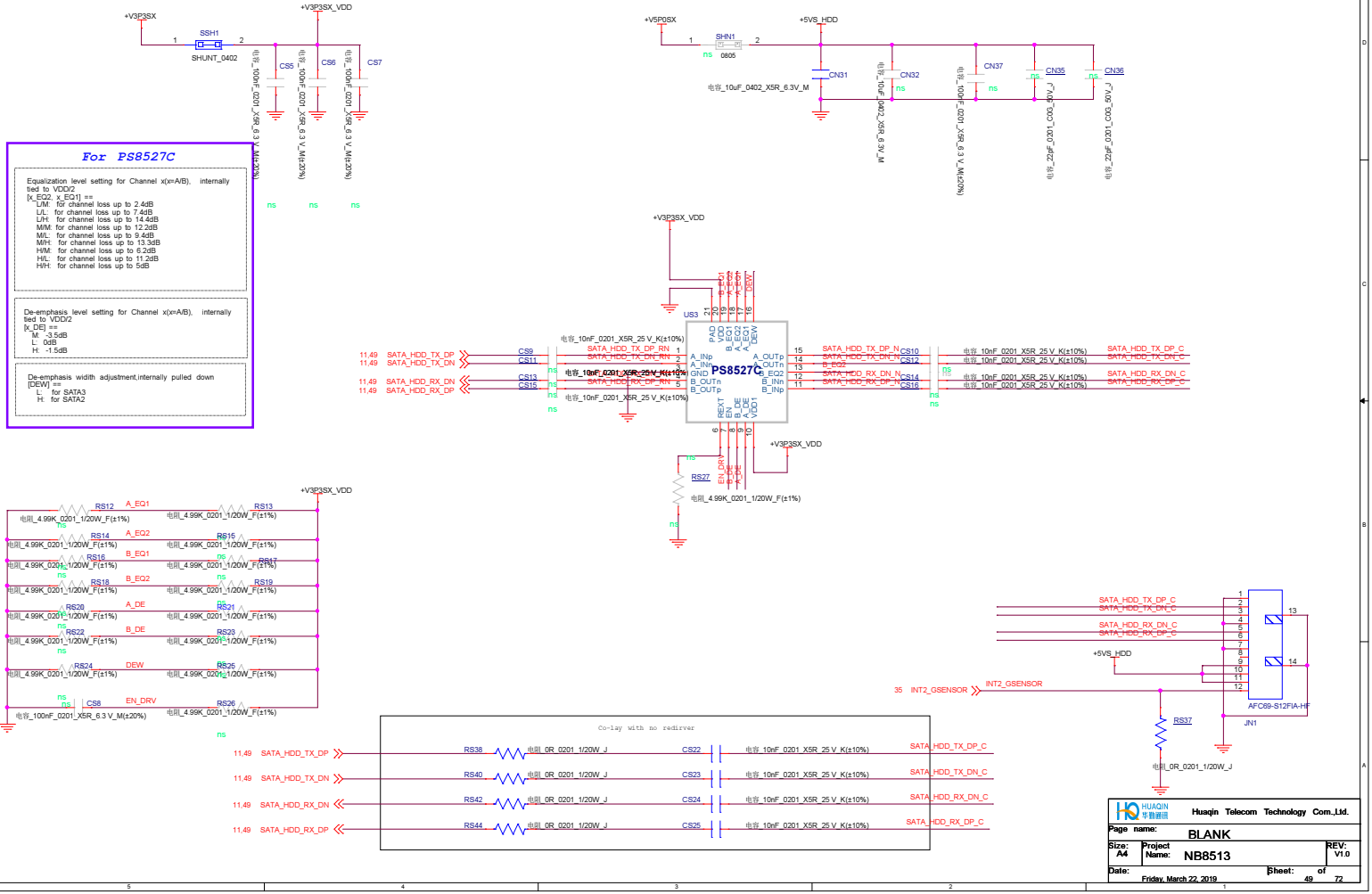
HDD


+V3P3SX
SSH1
SHUNT_0402
+V3P3SX_VDD
CS5
CS6
CS7
电容_100nF_0201_X5R_6.3 V_M(±20%)
For PS8527C
Equalization level setting for Channel x(x=A/B), internally tied to VDD/2
[x_EQ2 ,x_EQ1] ==
L/M: for channel loss up to 2.4dB
L/L: for channel loss up to 7.4dB
L/H: for channel loss up to 14.4dB
M/M: for channel loss up to 12.2dB
M/L: for channel loss up to 9.4dB
M/H: for channel loss up to 13.3dB
H/M: for channel loss up to 6.2dB
H/L: for channel loss up to 11.2dB
H/H: for channel loss up to 5dB
De-emphasis level setting for Channel x(x=A/B), internally tied to VDD/2
[x_DE] ==
M: -3.5dB
L: 0dB
H: -1.5dB
De-emphasis width adjustment,internally pulled down
[DEW] ==
L: for SATA3
H: for SATA2
+V5P0SX
SHN1
0805
+5VS_HDD
CN31
CN32
CN37
CN35
CN36
电容_10uF_0402_X5R_6.3V_M
电容_10uF_0402_X5R_6.3V_M
电容_100nF_0201_X5R_6.3 V_M(±20%)
电容_22pF_0201_C0G_50V_J
电容_22pF_0201_C0G_50V_J
US3
PS8527C
A_INp
A_INn
GND
B_OUTn
B_OUTp
A_OUTp
A_OUTn
B_EQ2
B_INn
B_INp
SATA_HDD_TX_DP
SATA_HDD_TX_DN
SATA_HDD_RX_DN
SATA_HDD_RX_DP
SATA_HDD_TX_DP_RN
SATA_HDD_TX_DN_RN
SATA_HDD_TX_DP_N
SATA_HDD_TX_DN_N
SATA_HDD_RX_DP_N
SATA_HDD_RX_DN_N
CS9
CS11
CS13
CS15
CS10
CS12
CS14
CS16
电容_10nF_0201_X5R_25 V_K(±10%)
RS27
电阻_4.99K_0201_1/20W_F(±1%)
RS12
RS13
RS14
RS15
RS16
RS17
RS18
RS19
RS20
RS21
RS22
RS23
RS24
RS25
RS26
A_EQ1
A_EQ2
B_EQ1
B_EQ2
A_DE
B_DE
DEW
EN_DRV
CS8
电容_100nF_0201_X5R_6.3 V_M(±20%)
Co-lay with no redriver
RS38
RS40
RS42
RS44
CS22
CS23
CS24
CS25
电阻_0R_0201_1/20W_J
SATA_HDD_TX_DP_C
SATA_HDD_TX_DN_C
SATA_HDD_RX_DN_C
SATA_HDD_RX_DP_C
AFC69-S12FIA-HF
JN1
RS37
INT2_GSENSOR
35 INT2_GSENSOR
HUAQIN 华勤通讯
Huaqin Telecom Technology Com.,Ltd.
Page name: BLANK
Size: A4
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Power requirement:

DVDD must >=DVDD_IO

+3.3V_1.8V_DVDD	+3.3V_1.8V_DVDD_IO	Result
3.3V+/-10%	3.3V+/-10%	support
3.3V+/-10%	1.8V+/-5%	support
1.8V+/-5%	1.8V+/-5%	support
1.8V+/-5%	1.5V+/-5%	support
1.8V+/-5%	3.3V+/-10%	Not support

ANALOG DIGITAL

+5V_CODEC +V5P0SX_AUD

FBA4 BLM18PG181SN1D

CA32 电容_10uF_0402_X5R_6.3V_M

AUD_GND

DA1 PZ3D4V2H-MM3Z5V1-2/TR

Moat

In order to prevent the built-in LDO damaged from over-voltage on +5VSYS or Standby power line, we suggested using this Voltage suppressing device.

CA1 & CA5 靠近06管

CA1 电容_1uF_0201_X5R_6.3V_M

CA5 电容_1uF_0201_X5R_6.3V_M

+VCPVDD

CA4 电容_10uF_0402_X5R_6.3V_M

+V1P8SX

FBA1 磁珠_330 欧姆@100MHz_0603

CA8 电容_10uF_0402_X5R_6.3V_M

AUD_GND

+V5P0SX_AUD

FBA2 NB_B0805_1405 220ohm/100MHz,3000mA

CA11 电容_2uF_0603_X5R_6.3V_M

CA12 电容_100nF_0201_X5R_6.3V_M

+VPVDD

CA13 电容_22uF_0603_X5R_6.3V_M

CA14 电容_100nF_0201_X5R_6.3V_K

CA17 电容_10uF_0603_X5R_6.3V_M

CA18 电容_100nF_0201_X5R_6.3V_K

ALC256

CBP AVSS2 LDO2-CAP AVDD2 PVDD1 SPK-L+ SPK-L- SPK-R- SPK-R+ PVDD2 PDB SPDIFO/GPIO2 DMIC-DATA1/2 DMIC-CLK-in PAD_GND

Maximum Idc=30mA

Maximum Idc=750mA (1.5A peak)

SPKL_P1 SPKL_N1 SPKR_N1 SPKR_P1 PDB

CPVDD CBN CPVEE HP-OUT-R HP-OUT-L LINE1-VREFO-L LINE1-VREFO-R MIC2-VREFO VREF LDO1-CAP AVDD1 AVSS1

LINE2-L LINE2-R LINE1-L LINE1-R 5VSTB MIC-CAP MIC2-R/SLEEVE MIC2-L/RING2 PCBEEP SPDIFO/FRONT JD3/GPIO3 MIC2/LINE2 JD2 HP/LINE1 JD1

DMIC1_DATA_AUDIO DMIC1_CLK_AUDIO DMIC2_DATA2_AUDIO

DMIC_DATA2_R RA46 电阻_0R_0201_1/20W_J

CA57 电容_10pF_0201_C0G_25V_J

RA7 电阻0R(0402-0.0625W-J)

CA20 电容_10uF_0402_X5R_6.3V_M

CA22 电容_100nF_0201_X5R_6.3V_K

DMIC_DATA1_R DMIC_CLK_R

RA10 PMR EMPTY 0201

RA11 电阻_22R_0201_1/20 W_F(±1%)

CA26 电容_10pF_0201_C0G_25V_J

CA56 电容_10pF_0201_C0G_25V_J

RA15 电阻_0R_0201_1/20W_J

DVDD-IO GPIO1/DMIC-CLK GPIO1/DMIC-DATA1/2 DC_DET/EAPD SDATA-OUT BIT-CLK LDO3-CAP SDATA-IN DVDD-IO SYNC I2C_SDA I2C_SCL

CA21 电容_10uF_0402_X5R_6.3V_M

HDA_SDI HDA_SDO HDA_BCLK HDA_SYNC

CA31 电容_22pF_0201_C0G_50V_J

RA13 电阻_33R_0201_1/20W_F

256_I2C_255_BEEP 256_I2C_255_RESETB

RA12 电阻_3.3K_0201_1/20W_J

RA14 电阻_3.3K_0201_1/20W_J

LINE1_VREFO_L LINE1_VREFO_R MIC2_VREFO AUD_GND

CA2 电容_10uF_0402_X5R_6.3V_M

RA1 电阻_100K_0201_1/20W_J

CA3 电容_2.2uF_0402_X5R_6.3 V_M

+5V_CODEC

CA6 电容_10uF_0402_X5R_6.3V_M

CA7 电容_100nF_0201_X5R_6.3V_K

LINE2-L LINE2-R LINE1_L LINE1_R

RA2 SHUNT_0402

CA10 电容_10uF_0402_X5R_6.3V_M

+VCC3P3_LDO_OUT

RA5 电阻_100K_0201_1/20W_J

RA6 电阻_200K_0201_1/20 W_F(±1%)

HPOUT_JD

CA19 电容_100nF_0201_X5R_6.3V_K

+3.3V_1.8V_DVDD

+3.3V_1.8V_DVDD_IO

FBA3 磁珠_330 欧姆@100MHz_0603

FBA5 磁珠_330 欧姆@100MHz_0603

CA29 电容_100nF_0201_X5R_6.3V_K

CA30 电容_2.2uF_0402_X5R_6.3V_M

CA33 电容_100nF_0201_X5R_6.3V_K

CA34 电容_2.2uF_0402_X5R_6.3 V_M

RA16 电阻_100K_0201_1/20W_J

DA2 LBAT54AWT1G

EC_MUTE_N PDB HDA_RST_N

RA38 电阻0R(0402-0.0625W-J)

+VCPVDD

RA36 电阻_1K_0201_1/20W_J

RA3 电阻_1K_0201_1/20W_J

RA4 电阻_1K_0201_1/20W_J

PCBEEP CA15 电容_100nF_0201_X5R_6.3V_K CA16 电容_100pF_0201_C0G_25V_J

PCH_BEEP EC_BEEP

AUD_GND

TO CONN

SPKL_P1 SPKL_N1 SPKR_N1 SPKR_P1 SLEEVE_CON RING2_CON HPOUT_L_CON HPOUT_R_CON

POWER

HDA_SDI HDA_SDO HDA_SYNC

CA23 电容_2pF_0201_C0G_25V_±0.25pF

CA25 电容_10pF_0201_C0G_25V_J

CA27 电容_10uF_0402_X5R_6.3V_M

CA28 电容_100nF_0201_X5R_6.3V_K

CA24 电容_10pF_0201_C0G_25V_J

MIC2_VREFO

RA20 电阻_2.2K_0201_1/20 W_J(±5%)

RA21 电阻_2.2K_0201_1/20 W_J(±5%)

RING2 SH6042 2 0805 RING2_CON

HPOUT_R RA23 电阻_51R_0201_1/20W_F(±1%) HPOUT_R_CON

HPOUT_L RA24 电阻_51R_0201_1/20W_F(±1%) HPOUT_L_CON

SLEEVE SH6070 2 0805 SLEEVE_CON

LINE1_VREFO_L RA44 电阻_4.7K_0201_1/20W_J

LINE1_L CA54 电容_4.7uF_0402_X5R_6.3V_M

LINE1_VREFO_R RA45 电阻_4.7K_0201_1/20W_J

LINE1_R CA55 电容_4.7uF_0402_X5R_6.3V_M

RA17 电阻0R(0402-0.0625W-J)

RA18 电阻0R(0402-0.0625W-J)

RA19 电阻0R(0402-0.0625W-J)

CA35 电容_100nF_0201_X5R_6.3 K

CA36 电容_100nF_0201_X5R_6.3 K

CA37 电容_100nF_0201_X5R_6.3 K

Analog_Ground Digital_Ground

Huaqin Telecom Technology Com.,Ltd.			
Page name:	Codec ALC256		
Size: A4	Project Name: NB8513	REV: V1.0	
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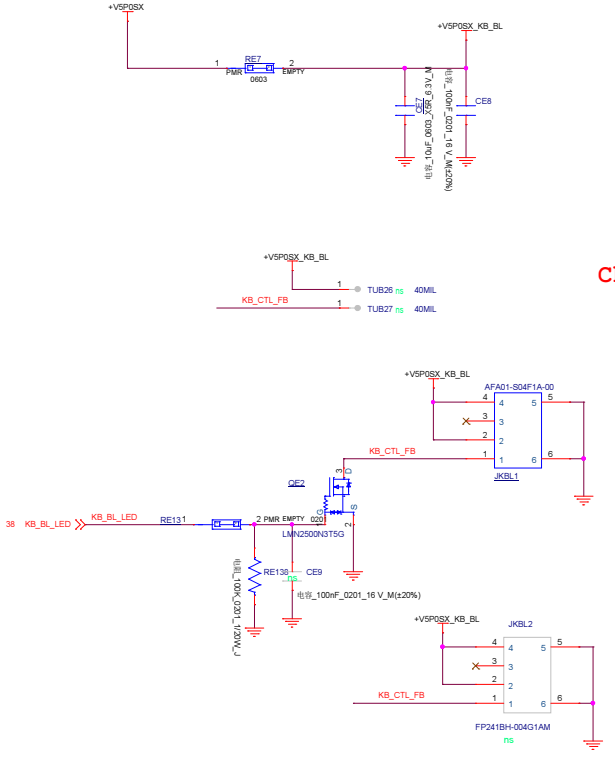
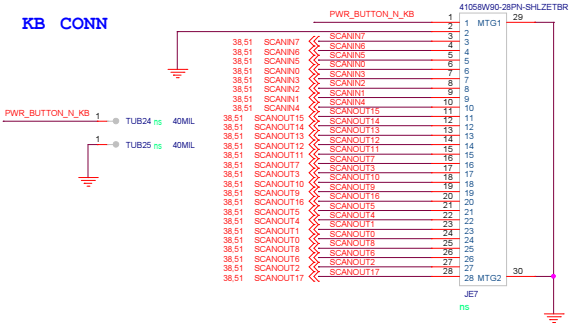
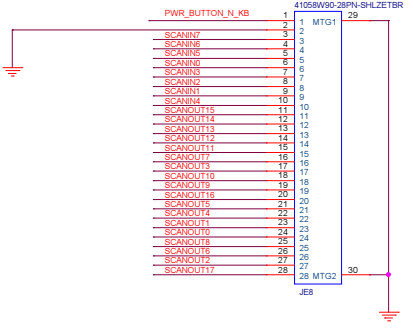
KB Backlight

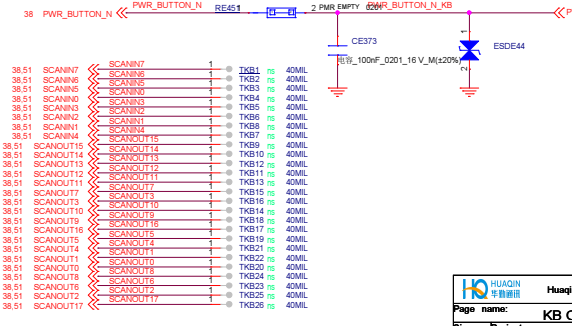


Check PIN define

KB CONN







HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.		
Page name:	KB CON & Backlight		
Size: A4	Project Name: NB8513		REV: V1.0
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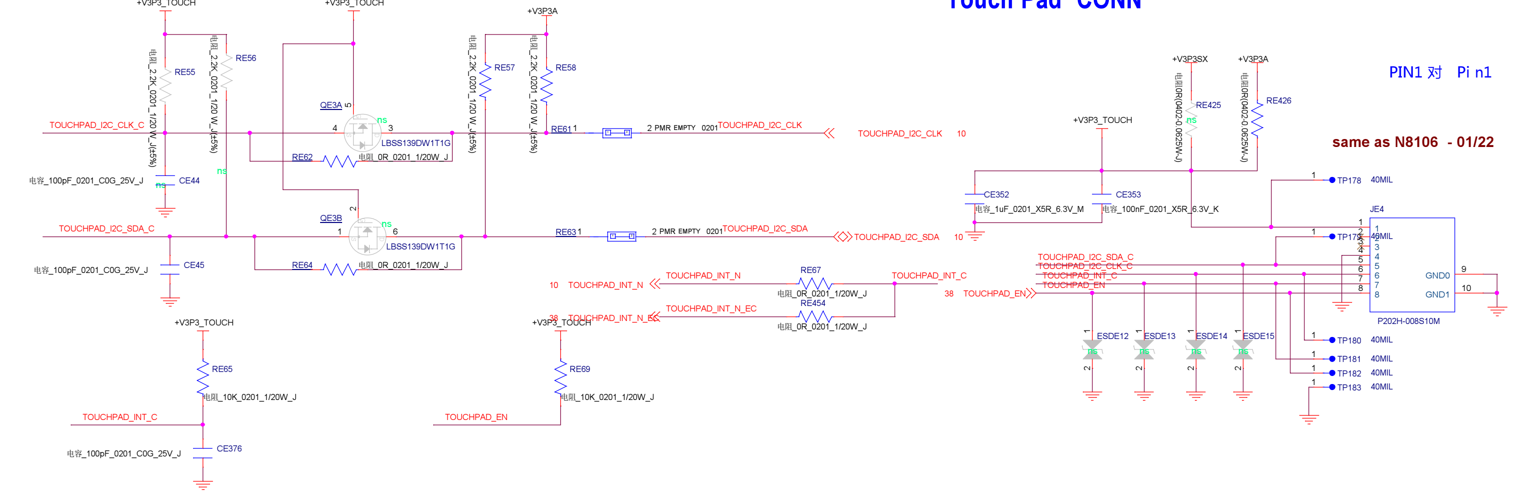
Touch Pad

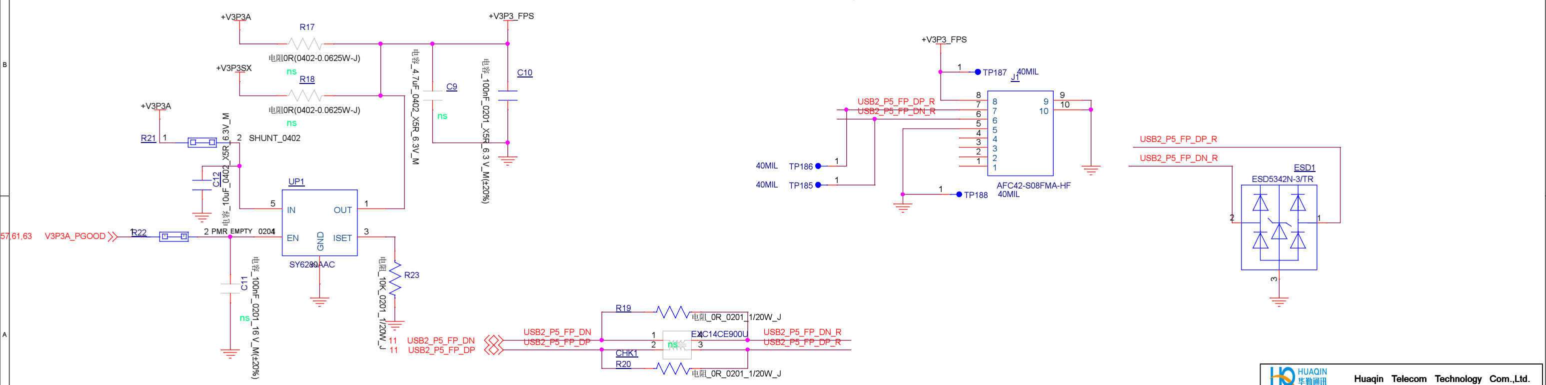
Touch Pad CONN



目 前 按 照 同 面 线定义，待 ME update后 同面线

Finger Print

Finger Print CONN



HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.		
Page name:	TouchPad/ Finger Print		
Size: A4	Project Name: NB8513		REV: V1.0
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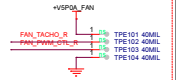
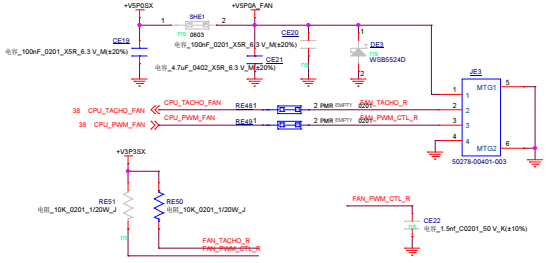
Voice input with LED

FAN CONN

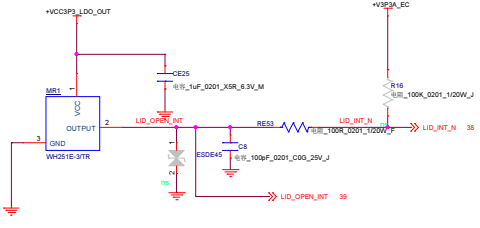
FOR product line





确认 PIN顺序

HALL



Huaqin Telecom Technology Com.,Ltd.			
Page name:	G-SENSOR/FAN/LED/Hall		
Size: A4	Project Name:	NB8513	REV: V1.0
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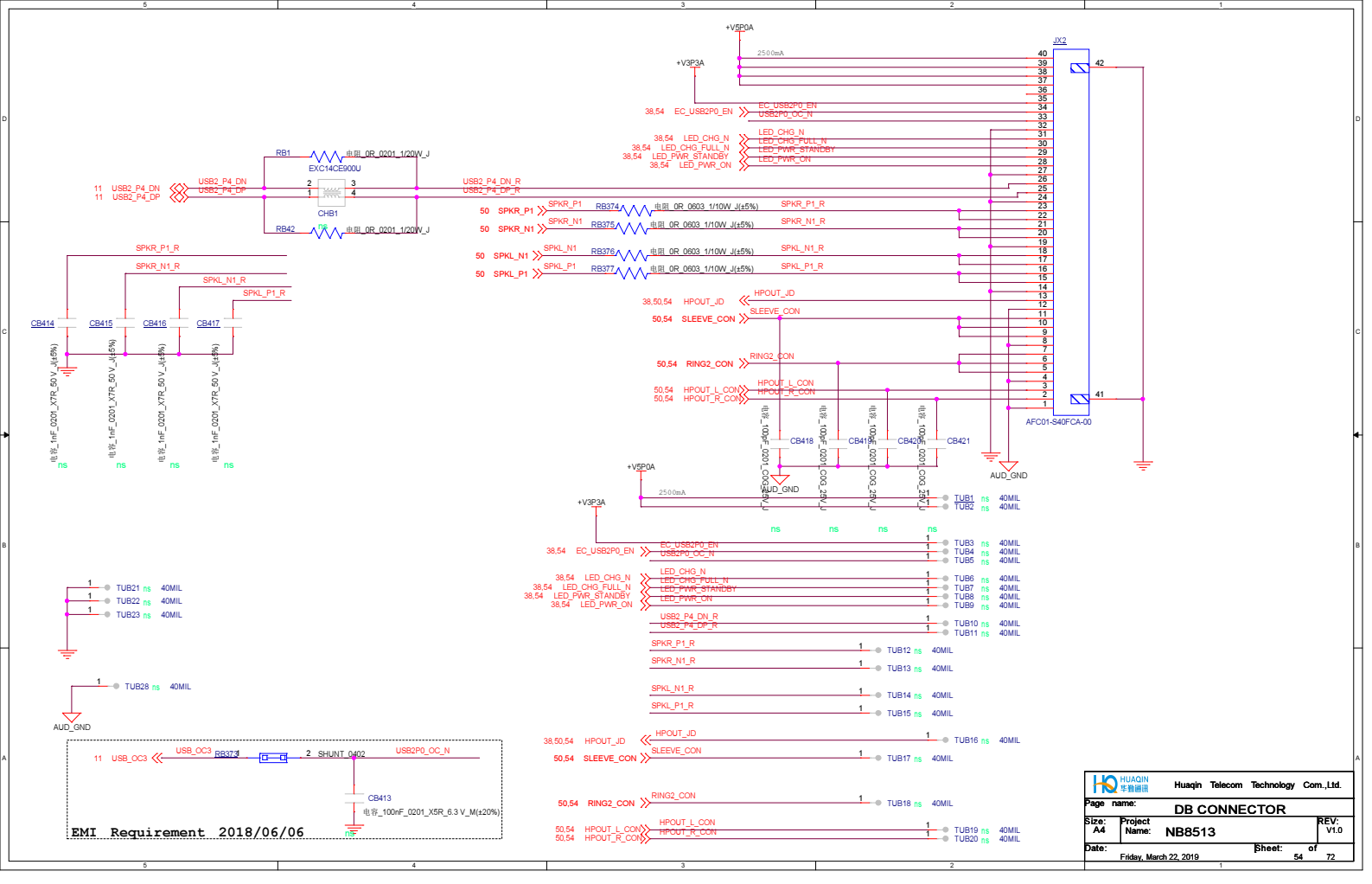

Huaqin Telecom Technology Com.,Ltd.	
Page name:	DB CONNECTOR
Size: A4	Project Name: NB8513
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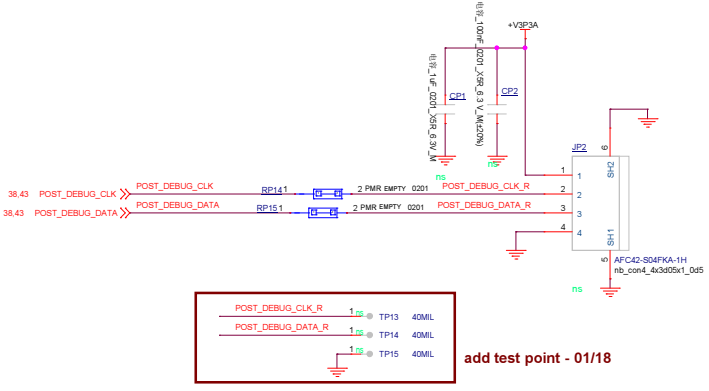
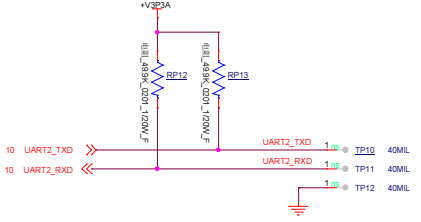


add test point - 01/18



Huaqin Telecom Technology Com.,Ltd.		
Page name: Debug Conn		
Size: A4	Project Name: NB8513	REV: V1.0
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Page name:	Thermal sensor		
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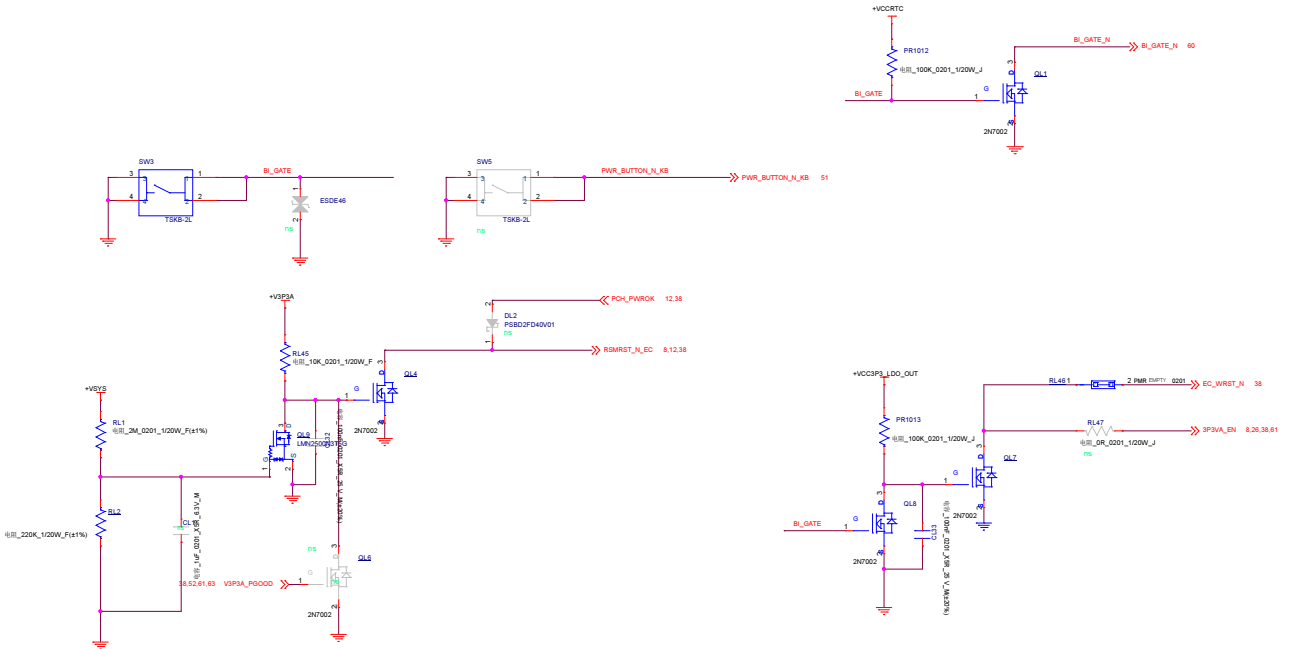
Reset BUTTON



Page name:	Hole/ Mark		
Size: A4	Project Name: NB8513		REV: V1.0
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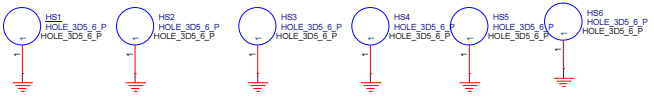
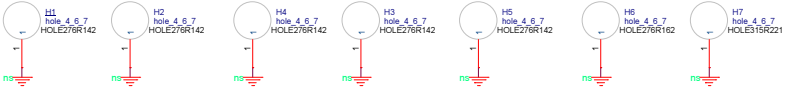
Need add HQ CODE and Stuff

螺母元件



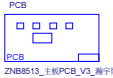
Thermal



HOLE *14

CPU & GPU Boss

WLAN Boss



PCB

HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.	
Page name:	BLANK	
Size: A4	Project Name: NB8513	REV: V1.0
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HUAQIN 华勤通讯	Huaqin Telecom Technology Com.,Ltd.		
Page name:	Power Map		
Size: A4	Project Name:	NB8513	REV: V1.0
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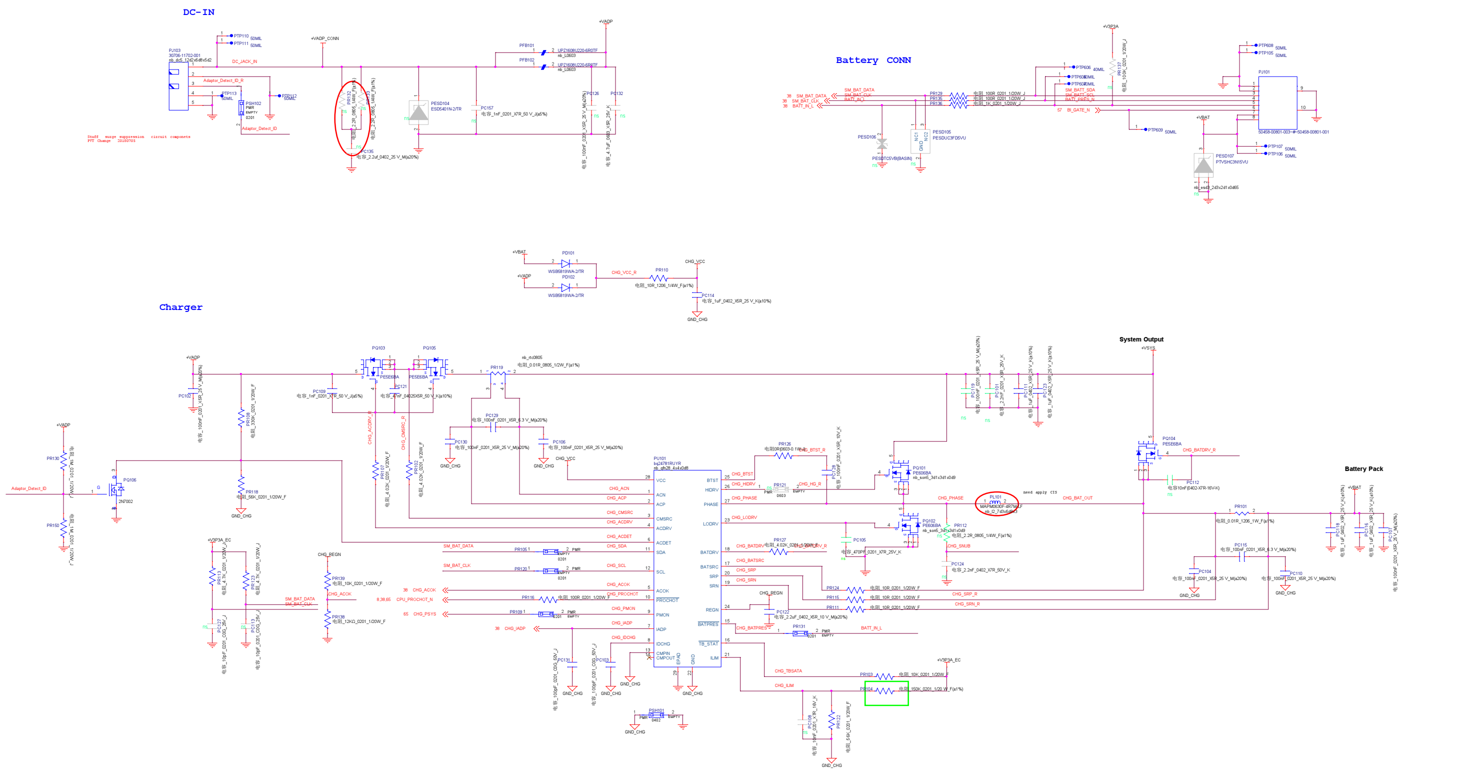


HUAQIN Huaqin Telecom Technology Com.,Ltd.

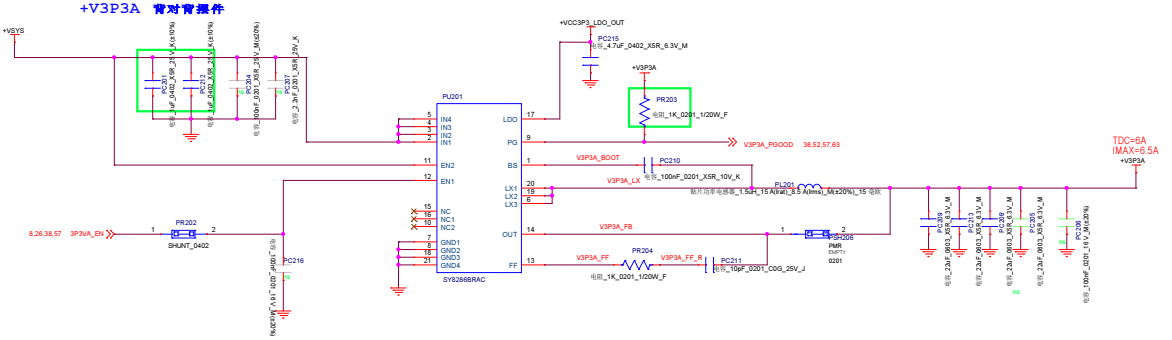
Page name: BATTERY CHARGER

Size: A4

Project Name: NB8513

REV: V1.0

Date: Friday, March 22, 2019



Huaqin Telecom Technology Com.,Ltd.			
Page name:	POWER DELIVERY 3.3V		
Size: A4	Project Name: NB8513	REV: V1.0	
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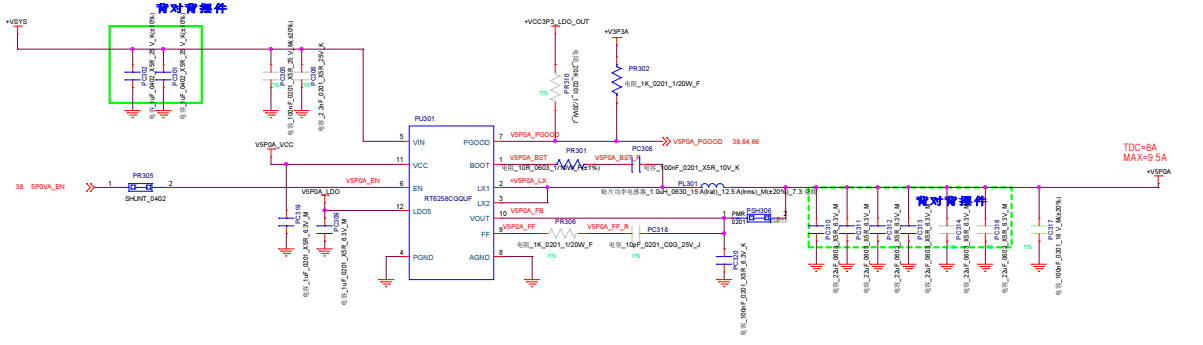

Huaqin Telecom Technology Com.,Ltd.			
Page name:	POWER DELIVERY 5V		
Size: A4	Project Name:	NB8513	REV: V1.0
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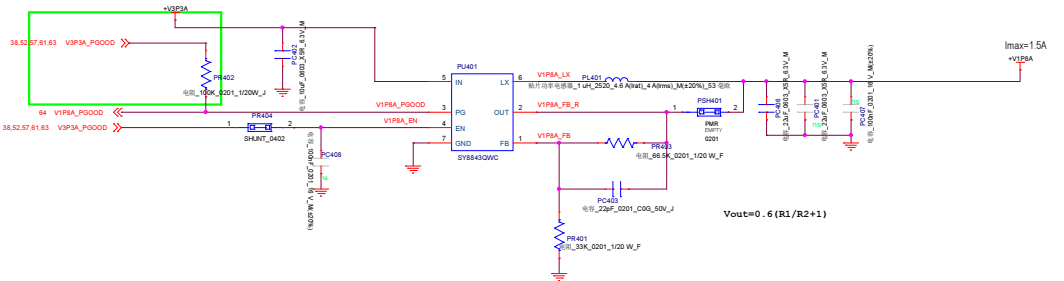
+V1P8A



Huaqin Telecom Technology Com.,Ltd.		
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Size: A4	Project Name: NB8513	REV: V1.0
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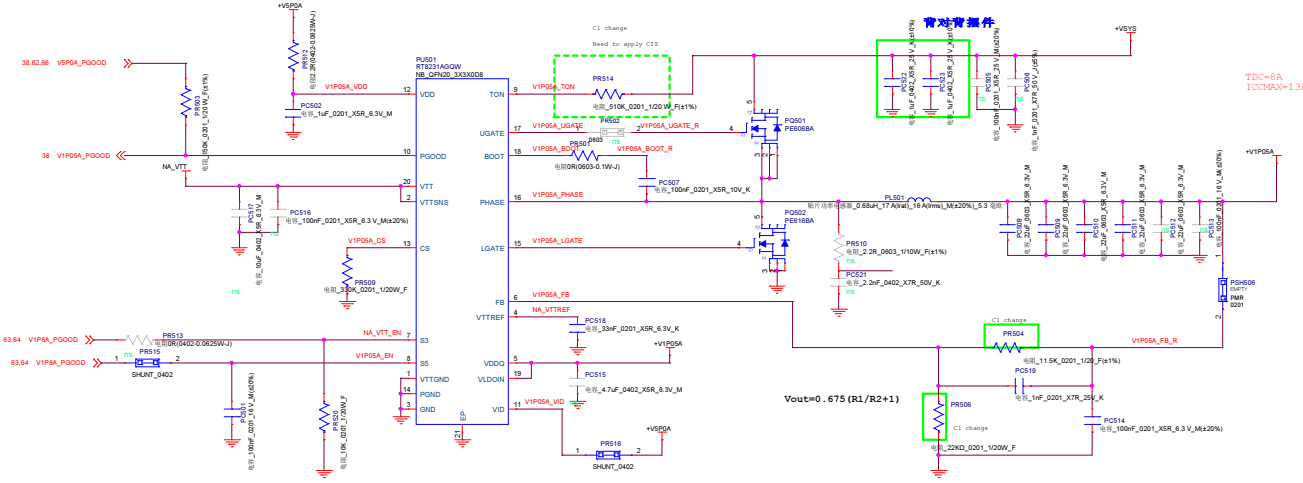

HUAQIN 华勤科技	Huaqin Telecom Technology Com.,Ltd.		
Page name:	POWER DELIVERY 1.0V		
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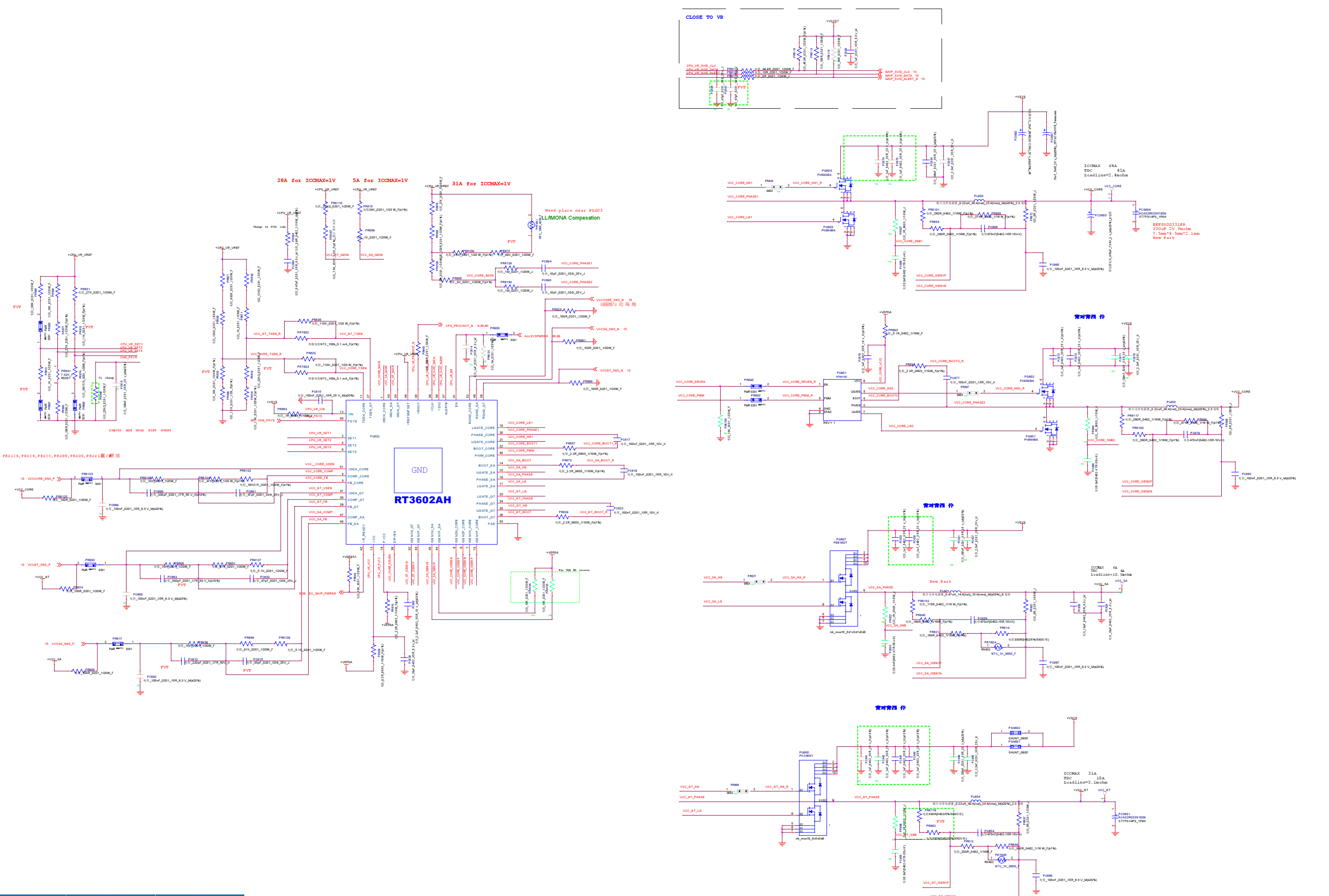
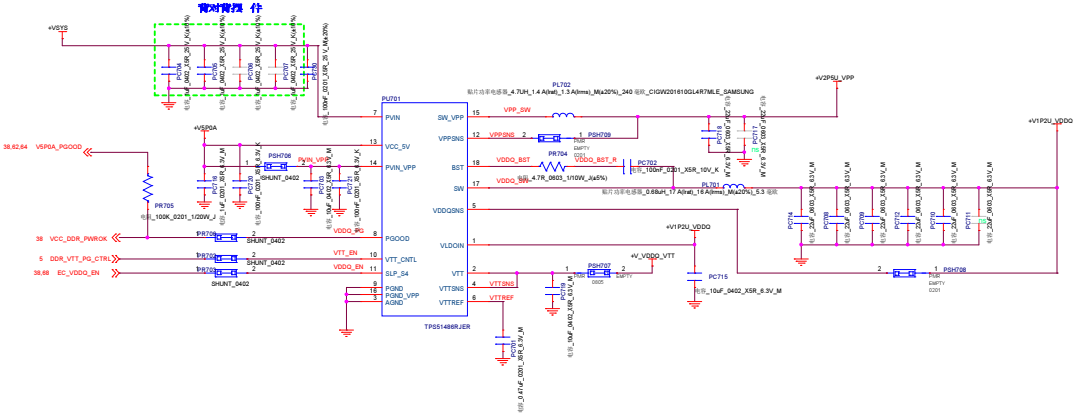


	CML Perf	CML Base	WHL
ICCMAX[A]	85	70	70
IPL2[A]	58	48	48
DC/AC LL[mΩ]	1.8	1.8	1.8
GT ICCMAX [A]	31	31	31
GT IPL2[A]	18	18	18
GT DC/AC LL[mΩ]	3.1	3.1	3.1
SA ICCMAX[A]	6	6	6
SA DC/AC LL[mΩ]	10.3	10.3	10.3
PL2 [W]	64	51	51
PL4 [W]	90	82	71



Page name:	POWER DELIVERY IMVP1		
Size: A4	Project Name: NB8513		REV: V1.0
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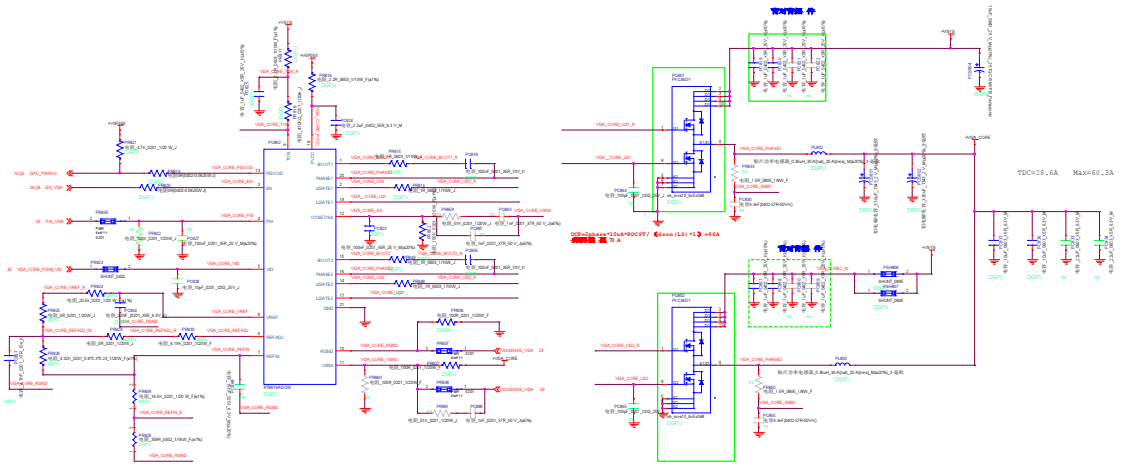
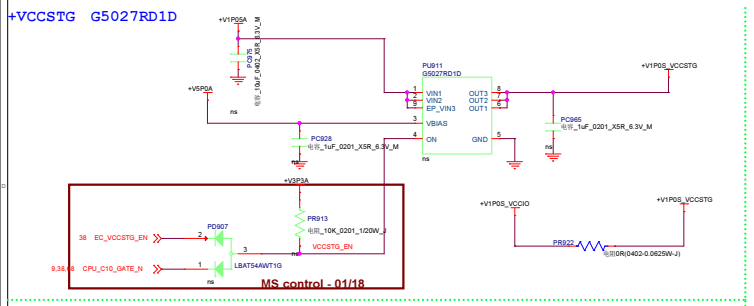


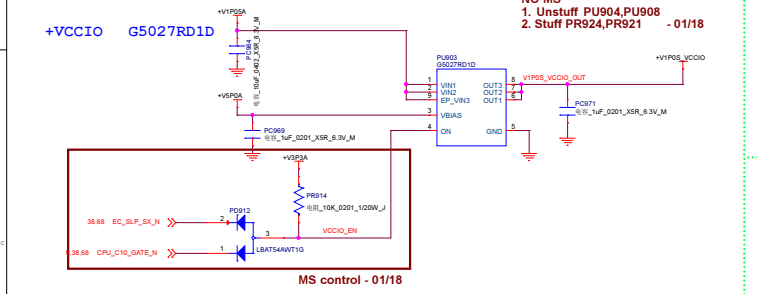
Table 7. Output EDP-Continuous

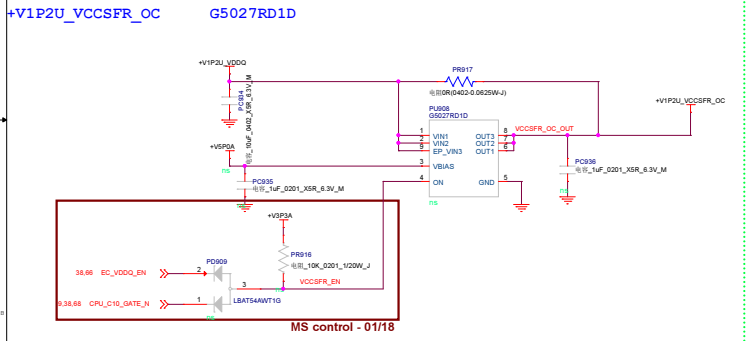
Product	NVVDD — (A)	GPU FBIO 1.35V[4] (A)	FB Total[4] 1.35V[4] (A)	1.0V Total[1] 1.0V[4] (A)	1.8V Total[2] 1.8V[4] (A)
N17S-LG	15.4	2.5	5.0	0.1	0.2
N17S-G1	30.0	3.0	5.6	0.1	0.3
N17S-G0[6]	27.8	3.2	5.8	0.2	0.5
N17S-G2[6]	28.6	3.2	5.8	0.2	0.5

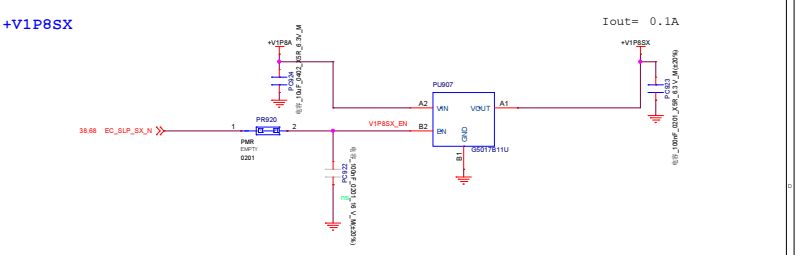
Table 8. Output EDP-Peak

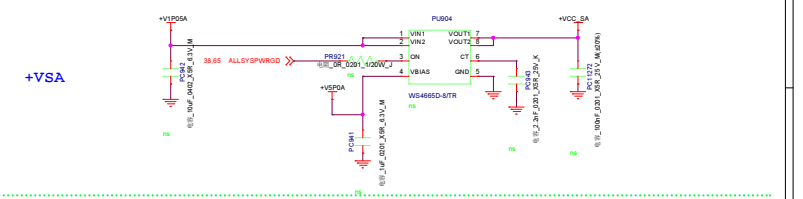
Product	NVVDD — (A)	GPU FBIO 1.35V[3] (A)	FB TOTAL[4] 1.35V[3] (A)	1.0V Total[1] 1.0V[3] (A)
N17S-LG	48.3	2.8	5.8	0.2
N17S-G1	60.1	3.4	6.9	0.2
N17S-G0[5]	42.0	3.9	7.4	0.3
N17S-G2[5]	60.3	3.9	7.4	0.3

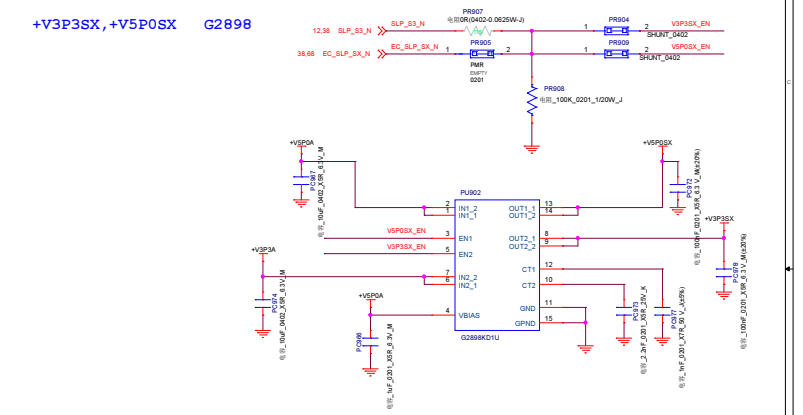


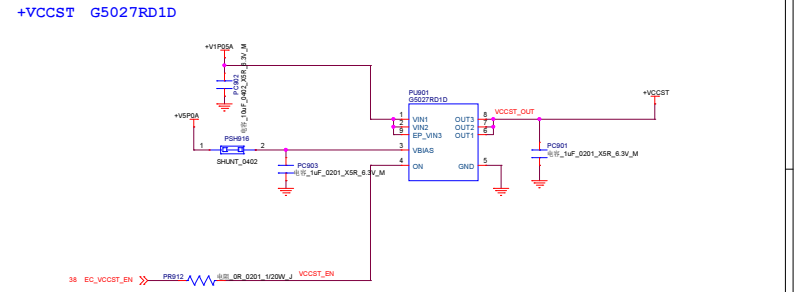












								VCCEOPIO ramp
tCPU33	All	CPU	PLT		240		us	11	CPU_C10_GATE# de-assertion to VCCPLL_OC stable

								Sx transitions
tCPU26	All	CPU	PLT	10	65		us	11	CPU_C10_GATE# de-assertion to VCCSTG stable Note: CPU_C10_GATE# de-assertion to VCCST also needs to meet max 65us on cold boot
tCPU27	All	CPU	PLT	10	240		us	11	CPU_C10_GATE# de-assertion to VCCIO stable
tCPU28a	All	CPU	PLT		200		us	36	SLP_S3# assertion to VCCST_PWRGD de-assertion
tCPU28b	All	CPU	PLT	0			us	37, 38	VCCST_PWRGD low to VCCST

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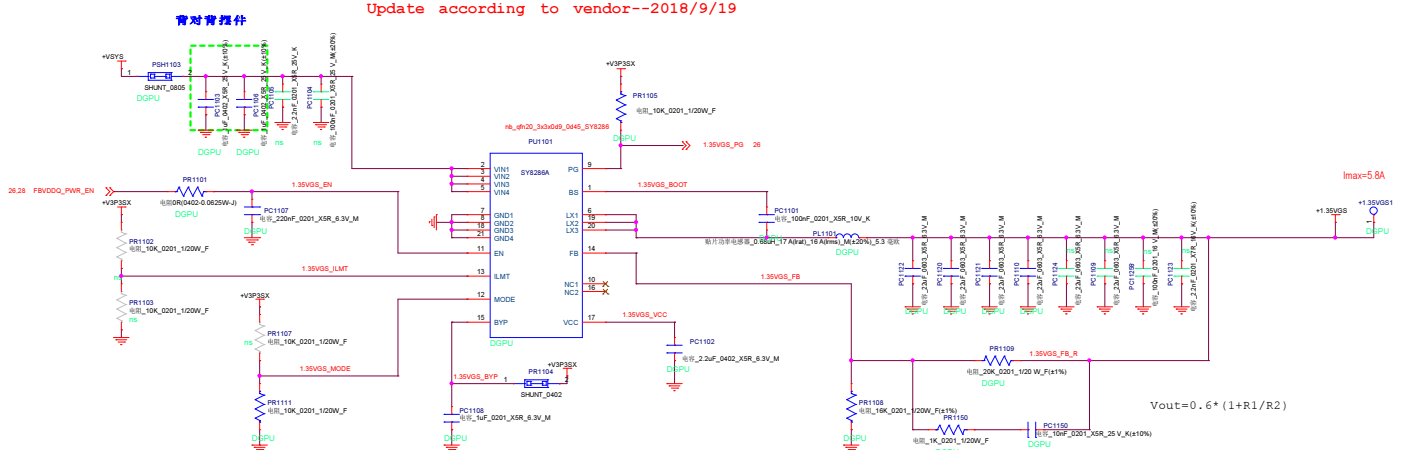
Update according to vendor--2018/9/19



stuff reduce S0 power consumption 11/5

ILMT=Low	6.7	7.8	8.9	A
ILMT=Floating	9.3	10.6	11.9	A
ILMT=High	12	13.3	14.8	A

PR1150:0Ω -10kΩ
PC1150:100pF-1nF 11/5

Huaqin Telecom Technology Com.,Ltd.			
Page name:	POWER DELIVERY_1.35VGS		
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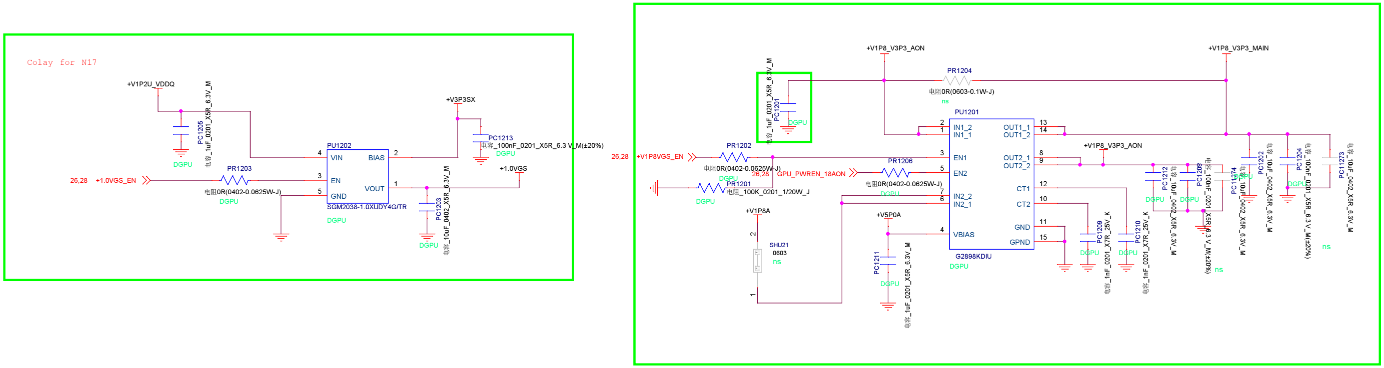

HUAQIN 华勤通讯 Huaqin Telecom Technology Com.,Ltd.

Page name: POWER DELIVERY_1.0VGS&1.8VGS

Size:	Project Name:		REV:
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Page name:	BLANK		
Size: A4	Project Name:	NB8513	REV: V1.0
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