Wistron Confidential

Somerset

2015-09-25

REV : A00

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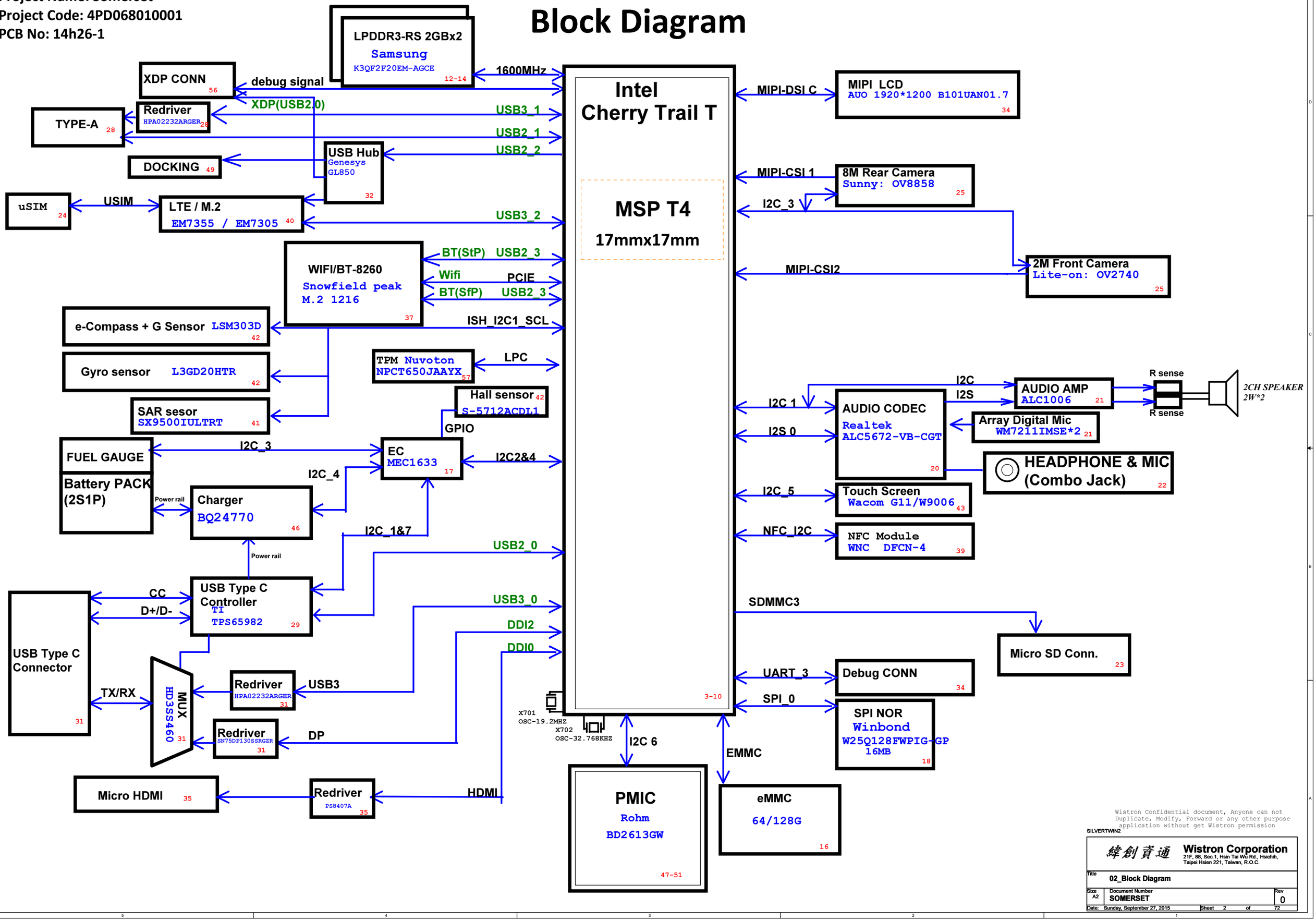
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title	01_Cover	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 1 of 72	

Project Name: Somerset
Project Code: 4PD068010001
PCB No: 14h26-1

Block Diagram



SILVERTWIN2

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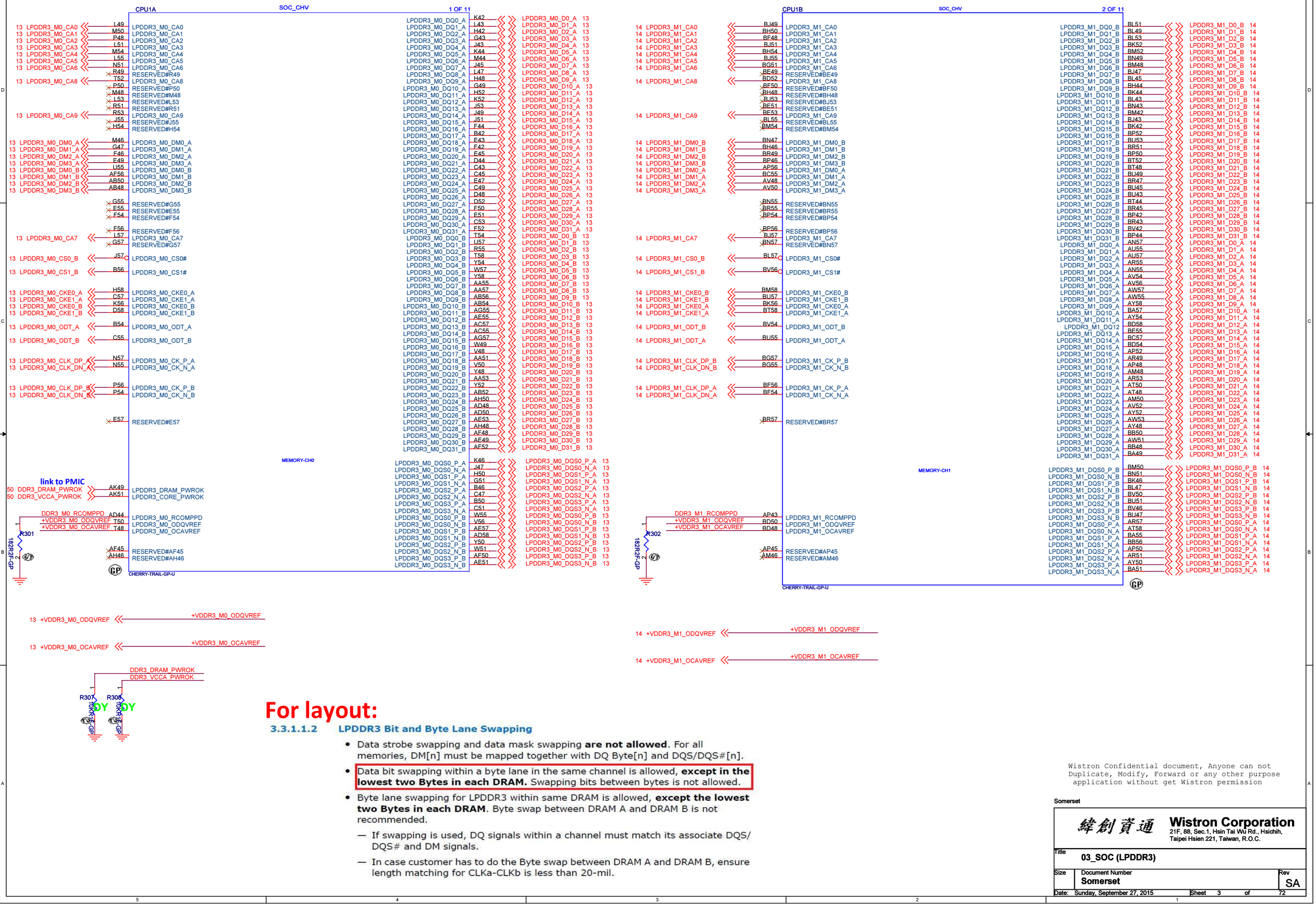
Title: 02_Block Diagram		
Size: A2	Document Number: SOMERSET	Rev: 0
Date: Sunday, September 27, 2015	Sheet 2 of 72	

SOC MEM SECTION : 1&2

20130923 modify



For layout:

3.3.1.1.2 LPDDR3 Bit and Byte Lane Swapping

- Data strobe swapping and data mask swapping **are not allowed**. For all memories, DM[n] must be mapped together with DQ Byte[n] and DQS/DQS#[n].
- Data bit swapping within a byte lane in the same channel is allowed, **except in the lowest two Bytes in each DRAM.** Swapping bits between bytes is not allowed.
- Byte lane swapping for LPDDR3 within same DRAM is allowed, **except the lowest two Bytes in each DRAM**. Byte swap between DRAM A and DRAM B is not recommended.
  - — If swapping is used, DQ signals within a channel must match its associate DQS/DQS# and DM signals.
  - — In case customer has to do the Byte swap between DRAM A and DRAM B, ensure length matching for CLKa-CLKb is less than 20-mil.

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Title	03_SOC (LPDDR3)		
Size	Document Number: Somerset		Rev: SA
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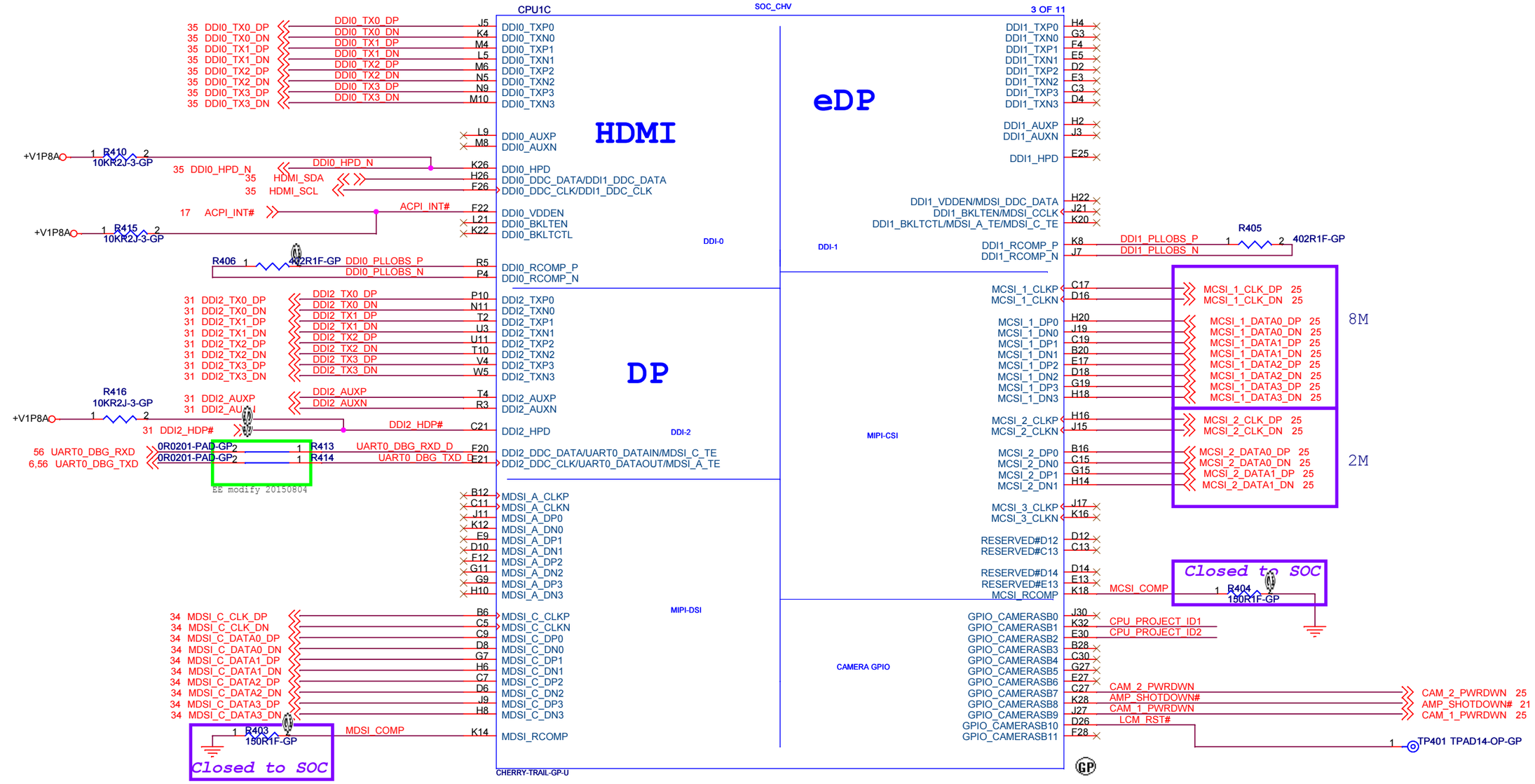
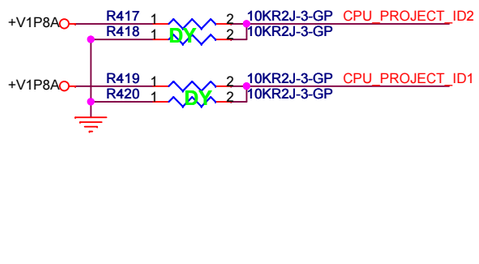
SOC : DDI 0&1 / MIPI-DIS/MIPI-CSI/MIPI-GPIO

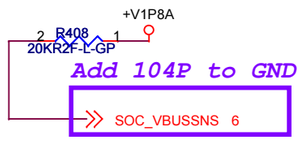


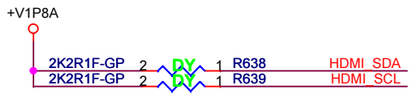
PROJECT ID

EE modify 20150618



PROJECT	PROJECT_ID2	PROJECT_ID1
Blackwell-T3	0	0
Blackwell-T4	0	1
Somerset-T3	1	0
Somerset-T4	1	1





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Title	04_SOC (eDP/HDMI/MIPI)	
Size	Document Number: Somerset	Rev: SA
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SOC : eMMC/SD/GPIO/I2S

EE modify 20150813
BOM control!!
WWAN : PD
Non-WWAN: PH

R508 1 GPIO_SW78
10KR1J-GP

+V1P8A
R509 1 DY 2 10KR1J-GP SPI3_CS0_N
R511 1 DY 2 10KR1J-GP GPIO_SW78
16 EMMC_RESET#
R506 1 2 10KR1J-GP UART0_DBG_RXD_C
+V1P8A
C502 SC68P25V1JN-GP
C503 SC47P25V1JN-GP
EE modify 20150812
TPAD14-OP-GP TP501 1 S_RCOMP_P
TPAD14-OP-GP TP502 1 S_RCOMP_N

eMMC

16 EMMC_CLK
16 EMMC_DATA_0
16 EMMC_DATA_1
16 EMMC_DATA_2
16 EMMC_DATA_3
16 EMMC_DATA_4
16 EMMC_DATA_5
16 EMMC_DATA_6
16 EMMC_DATA_7

Closed to SOC
R501 1 2 100R1F-GP
16 EMMC_CMD
16 EMMC_RCLK
EMMC_RCOMP

uSD

23 MC1CK
23 MC1DA0
23 MC1DA1
23 MC1DA2
23 MC1DA3
23 MC1CMD
50 SDMMC3_1P8_EN
50 SDIO_PWR_EN#
R504 1 SDIO3_RCOMP
80D6R1F-GP
Closed to SOC

SD3_CD# R510 1 2 1KR1J-GP MC1CD# MC1CD# 23
C501 1 2 SCD1U6D3V1KX-GP

+V1P8A
R507 1 DY 2 10KR1J-GP EMMC_CMD

CPU1D — SOC_CHV — 4 OF 11

AR9	RESERVED#AR9		
AT8	RESERVED#AT8		
AT2	RESERVED#AT2		
AR3	RESERVED#AR3		
BR37	ISH_GPIO12/ISH_UART_CTS#		
BM38	SPI3_CS0_N		
BU37	GPIO_SW78		
BV38	MMC1_RESET#/SPI3_CS1#		
BJ37	UART0_DATAIN		
AT4	S_RCOMP_P		
AU3	S_RCOMP_N		
BN15	MMC1_CLK		
BM12	MMC1_D0	EMMC	
BK14	MMC1_D1		
BM14	MMC1_D2		
BK12	MMC1_D3		
BR13	MMC1_D4		
BU15	MMC1_D5		
BP14	MMC1_D6		
BT14	MMC1_D7		
BJ15	MMC1_CMD		
BU13	MMC1_RCLK		
BH14	MMC1_RCOMP		
BL11	SD2_CLK		
BT10	SD2_D0	SD-COMM	
BR11	SD2_D1		
BU11	SD2_D2		
BP12	SD2_D3_CD_N		
BN11	SD2_CMD		
BL17	SD3_CLK		
BK16	SD3_D0	SD-CARD	
BP16	SD3_D1		
BH18	SD3_D2		
BL15	SD3_D3		
BU17	SD3_CD_N		
BR15	SD3_CMD		
BT22	SD3_1P8_EN		
BU23	SD3_PWREN_N		
BH16	SD3_RCOMP		

CHERRY-TRAIL-GP-U

PCIE_REFCLK0_P	BA5	PCIE_REFCLK0_P	PCIE_REFCLK0_P 37
PCIE_REFCLK0_N	BB4	PCIE_REFCLK0_N	PCIE_REFCLK0_N 37
PCIE_TXP0	AU11	PCIE_TXP0	PCIE_TXP0 37
PCIE_TXN0	AV10	PCIE_TXN0	PCIE_TXN0 37
PCIE_RXP0	AY4	PCIE_RXP0	PCIE_RXP0 37
PCIE_RXN0	AW3	PCIE_RXN0	PCIE_RXN0 37
PCIE_REFCLK1_P	BC3		
PCIE_REFCLK1_N	BD2		
PCIE_TXP1	AT10		
PCIE_TXN1	AU9		
PCIE_RXP1	AU5		
PCIE_RXN1	AV4		
PCIE_CLKREQ0_N	BR39	PCIE_CLKREQ0#	PCIE_CLKREQ0# 37
PCIE_CLKREQ1_N/GPIO_SW91	BU39	AUDIO_CODEC_IRQ_BU39	
GPIO_SW93	BP38	VOLUME_UP_SOC#	VOLUME_UP_SOC# 17
SD3_WP	BT40	HOME_BTN_SOC#	HOME_BTN_SOC# 54
P_RCOMP_P	AY2	P_RCOMP_P	
P_RCOMP_N	BA3	P_RCOMP_N R502 1 2 402R2F-GP	
LPE_I2S0_CLK	BH32		
LPE_I2S0_FRM	BK32		
LPE_I2S0_DATAOUT	BM32		
LPE_I2S0_DATAIN	BU30		
LPE_I2S1_CLK	BR30	I2S_1_SOC_CLK	I2S_1_SOC_CLK 20
LPE_I2S1_FRM	BV28	I2S_1_SOC_FS	I2S_1_SOC_FS 20
LPE_I2S1_DATAOUT	BP28	I2S_1_SOC_TXD	I2S_1_SOC_TXD 20
LPE_I2S1_DATAIN	BJ30	I2S_1_SOC_RXD	I2S_1_SOC_RXD 20
LPE_I2S2_CLK	BK38	I2S_2_CLK	I2S_2_CLK 20
LPE_I2S2_FRM	BH40	I2S_2_FS	I2S_2_FS 20
LPE_I2S2_DATAOUT	BK40	I2S_2_TXD	I2S_2_TXD 20
LPE_I2S2_DATAIN	BL39	I2S_2_RXD	I2S_2_RXD 20
RESERVED#AK41	AK41		
RESERVED#AK39	AK39		
RESERVED#AK16	AK16		
RESERVED#AK18	AK18		
PROCHOT#	H32	PROCHOT#	PROCHOT# 46,50

I2S — THERMAL

WI-FI

Audio Codec(DY)

Audio Codec

EE modify 20150804
R503
AUDIO_CODEC_IRQ_BU39 2 1 0R0402-PAD-1-GP AUDIO_CODEC_IRQ 6,20

+V1P8A
R514 1 DY 715R2F-GP
Q501 2N7002W-7-GP 2222
EC_PROCHOT 17

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Title	05_SOC (EMMC/SD/GPIO/I2S)	
Size	Document Number: Somerset	Rev: SA
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SOC : USB/ULPI/HSIC/LPC/SMBUS/HSI/I2C

CPU1E — SOC_CHV — 5 OF 11 — CHERRY-TRAIL-GP-U

USB SSIC / USB 3.0

AE9	USB_SSIC_TX_P	
AF10	USB_SSIC_TX_N	
AC3	USB_SSIC_RX_P	
AD4	USB_SSIC_RX_N	
AE11	RESERVED#AE11	
AD10	RESERVED#AD10	
AB4	RESERVED#AB4	
AC5	RESERVED#AC5	
AF8	USB_SSIC_RCOMP_P	UFS SSIC
AG9	USB_SSIC_RCOMP_N	
AE3	RESERVED#AE3	
AD2	RESERVED#AD2	

USB3_TXP0	AN11	USB3_TXP0
USB3_TXN0	AP10	USB3_TXN0
USB3_RXP0	AN5	USB3_RXP0
USB3_RXN0	AP4	USB3_RXN0
USB3_TXP1	AN7	USB3_TXP1
USB3_TXN1	AP6	USB3_TXN1
USB3_RXP1	AH2	USB3_RXP1
USB3_RXN1	AG3	USB3_RXN1
USB3_TXP2	AK9	WWAN_USB3_TXP
USB3_TXN2	AM10	WWAN_USB3_TXN
USB3_RXP2	AM4	WWAN_USB3_RXP
USB3_RXN2	AK5	WWAN_USB3_RXN
USB3_TXP3	AM8	
USB3_TXN3	AN9	
USB3_RXP3	AE5	
USB3_RXN3	AF4	
USB3_RCOMP_P	AK3	USB3_RCOMP_P
USB3_RCOMP_N	AH4	USB3_RCOMP_N

USB3_RCOMP_P — R648 402R2F-GP — USB3_RCOMP_N

USB3_TXP0 31 / USB3_TXN0 31 / USB3_RXP0 31 / USB3_RXN0 31 — **TYPE C**

USB3_TXP1 28 / USB3_TXN1 28 / USB3_RXP1 28 / USB3_RXN1 28 — **TYPE A**

WWAN_USB3_TXP 40 / WWAN_USB3_TXN 40 / WWAN_USB3_RXP 40 / WWAN_USB3_RXN 40 — **LTE**

USB 2.0

USB_DP0	V12	USB2_OTG_DP
USB_DN0	W11	USB2_OTG_DN
USB_DP1	W9	
USB_DN1	V10	
USB_DP2	Y4	USB2_DP1
USB_DN2	W3	USB2_DN1
USB_DP3	Y6	USB2_WIFI_DP
USB_DN3	AA5	USB2_WIFI_DN

29 USB2_OTG_DP / 29 USB2_OTG_DN — **TYPE-C**

55 USB_TYPE_A_DP / 55 USB_TYPE_A_DN — **TYPE-A**

32 USB2_DP1 / 32 USB2_DN1 — **USB HUB**

37 USB2_WIFI_DP / 37 USB2_WIFI_DN — **BT**

USB_OTG_ID	U7	
USB_VBUSSNS	T8	SOC_VBUSSNS
USB_OC0#	BP22	CPU_USB_OC#
USB_OC1#	BU21	WL_DEV_EN
USB_RCOMP	AB12	
RESERVED#U9	U9	

4 SOC_VBUSSNS — R602 10KR2F-L1-GP — +V1P8A

29 CPU_USB_C_OC# / 28 CPU_USB_A_OC# — D601 BAW56-9-GP

37 WL_DEV_EN — R643 113R2F-GP — USB_RCOMP

CPU_USB_C_OC# — D602 RB751VM-40TE-17-GP — WL_DEV_EN

83.R2004.J8F

USB-HSIC

USB_HSIC_0_DATA	AA9	
USB_HSIC_0_STROBE	AA7	
USB_HSIC_1_DATA	AB8	
USB_HSIC_1_STROBE	AB10	
USB_HSIC_RCOMP	AD12	USB_HSIC_RCOMP

R603 45D3R2F-L-GP — USB_HSIC_RCOMP

Closed to SOC — R644 100R1F-GP — LPC_RCOMP

LPC

LPC_RCOMP	BH22	LPC_RCOMP
LPC_AD0/ISH_GPIO12/ISH_UART_CTS#	BU19	LPC_AD0
LPC_AD1/ISH_GPIO13/ISH_UART_RTS#	BR19	LPC_AD1
LPC_AD2/ISH_GPIO14	BP20	LPC_AD2
LPC_AD3/ISH_GPIO15/SPI2_MOSI	BR21	LPC_AD3
LPC_FRAME_N/UART0_DATAIN/SPI2_MISO	BJ19	LPC_FRAME#
LPC_CLKOUT0/ISH_GPIO10/ISH_UART_DATAOUT	BK20	LPC_CLKOUT_0
LPC_CLKOUT1/ISH_GPIO11/ISH_UART_DATAIN	BM20	
LPC_CLKRUN_N/UART0_DATAOUT/SPI2_CLK	BL21	LPC_CLKRUN#
LPC_SERIRQ/SPI2_CS0#	BM24	JACK_DET_R#_SOC

56,57 LPC_AD0 / 56,57 LPC_AD1 / 56,57 LPC_AD2 / 56,57 LPC_AD3 / 56,57 LPC_FRAME# / 56,57 LPC_CLKOUT_0

57 LPC_CLKRUN# / 20,22 JACK_DET# — JACK_DET# — R641 0R0402-PAD-1-GP — JACK_DET_R#_SOC

EE modify 20150804

TPM/XDP

SPI3_MOSI	BK36	
SPI3_MISO	BN37	
SPI3_CLK/UART0_DATAOUT	BL37	UART0_DBG_TXD_C

4,56 UART0_DBG_TXD — 0R1J-GP — R601 — UART0_DBG_TXD_C

5,20 AUDIO_CODEC_IRQ — R505 0R2J-2-GP — JACK_DET_R#_SOC

ISH

ISH_I2C1_DATA/ISH_SPI_MOSI/I2S5_DATAOUT	BM8	ISH_I2C1_SDA
ISH_I2C1_CLK/ISH_SPI_CLK/I2S5_DATAIN	BN3	ISH_I2C1_SCL
ISH_GPIO0/I2S3_CLK	BR3	DE303_INT1
ISH_GPIO1/I2S3_FS	BN5	DE303_INT2
ISH_GPIO2/I2S3_DATAOUT	BT2	PROX_DET#
ISH_GPIO3/I2S3_DATAIN	BM4	GYRO_INT1
ISH_GPIO4/I2S4_CLK	BT4	
ISH_GPIO5/I2S4_FS	BP4	GNSS_DISABLE#
ISH_GPIO6/I2S4_DATAOUT	BK10	WWAN_WAKE#
ISH_GPIO7/I2S4_DATAIN	BM2	SAR_INT#
ISH_GPIO8/I2S5_CLK	BL9	SAR_RST#
ISH_GPIO9/ISH_SPI_MISO/I2S5_FS	BK8	GYRO_INT2

ISH_I2C1_SDA 41,42 / ISH_I2C1_SCL 41,42 — **GYRO 0x6b**

DE303_INT1 42 / DE303_INT2 42 / PROX_DET# 40 / GYRO_INT1 42

GNSS_DISABLE# 40 / WWAN_WAKE# 40 / SAR_INT# 41 / SAR_RST# 41 / GYRO_INT2 42

I2C

I2C0_DATA	BU35	I2C0_SDA
I2C0_CLK	BT36	I2C0_SCL
I2C1_DATA	BR35	I2C1_SDA
I2C1_CLK	BP36	I2C1_SCL
I2C2_DATA	BH36	I2C2_SDA
I2C2_CLK	BL35	I2C2_SCL
I2C3_DATA	BU33	I2C3_SDA
I2C3_CLK	BV34	I2C3_SCL
I2C4_DATA/DDI2_DDC_DATA	BT32	I2C4_SDA
I2C4_CLK/DDI2_DDC_CLK	BP34	I2C4_SCL
I2C5_DATA	BR33	I2C5_SDA
I2C5_CLK	BK34	I2C5_SCL
I2C6_DATA/SD3_WP	BL33	I2C6_SDA
I2C6_CLK/NMI#	BH34	I2C6_SCL
NFC_I2C_DATA	BN33	I2C_SEC_NFC_SDA
NFC_I2C_CLK	BJ33	I2C_SEC_NFC_SCL

I2C1_SDA 20,21 / I2C1_SCL 20,21 — **Codec 0x38h/ AMP 0x24**

I2C2_SDA 17,40 / I2C2_SCL 17,40 — **LTE/EC**

I2C3_SDA 25 / I2C3_SCL 25 — **Rear CAM 0xC / Front CAM 0x36**

I2C4_SDA 17 / I2C4_SCL 17 — **EC&SOC**

I2C5_SDA 43 / I2C5_SCL 43 — **Touch Screen 0x70**

I2C6_SDA 50 / I2C6_SCL 50 — **PMIC 0x6E**

I2C_SEC_NFC_SDA 39,56 / I2C_SEC_NFC_SCL 39,56 — **XDP, NFC**

+V1P8A

I2C0_SDA	R624	DV	2K2R1F-GP
I2C0_SCL	R625	DV	2K2R1F-GP
I2C1_SDA	R626	EVT	2K2R1F-GP
I2C1_SCL	R627	EVT	2K2R1F-GP
I2C2_SDA	R628	EVT	2K2R1F-GP
I2C2_SCL	R629	EVT	2K2R1F-GP
I2C3_SDA	R630	EVT	2K2R1F-GP
I2C3_SCL	R631	EVT	2K2R1F-GP
I2C4_SDA	R632	EVT	2K2R1F-GP
I2C4_SCL	R633	EVT	2K2R1F-GP
I2C5_SDA	R634	EVT	2K2R1F-GP
I2C5_SCL	R635	EVT	2K2R1F-GP
I2C6_SDA	R636	EVT	2K2R1F-GP
I2C6_SCL	R637	EVT	2K2R1F-GP
ISH_I2C1_SDA	R645	EVT	2K2R1F-GP
ISH_I2C1_SCL	R647	EVT	2K2R1F-GP
I2C_SEC_NFC_SDA	R666	EVT	2K2R1F-GP
I2C_SEC_NFC_SCL	R667	EVT	2K2R1F-GP

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Title	06_SOC (USB/HSIC/LPC/HIS/I2C)	
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SOC : CLK/ITP/SPI NOR/GPIO SUS/HSUART/PMU/RTC

C701 SC5D6P25V1CN-GP
XTAL-19D2MHZ-21-GP X701
R716 200KR1J-GP
C702 SC5D6P25V1CN-GP
R721 49D9R1F-GP ICLK_RCOMP
R715 2K49R2F-GP ICLK_ICOMP
XTAL19_2_IN
XTAL19_2_OUT

CPU1F
SOC_CHV
6 OF 11

AY8 ICLK_OSCIN
BA9 ICLK_OSCOUT
BC9 RESERVED#BC9
BB12 ICLK_RCOMP
AV12 ICLK_ICOMP
AY12 RESERVED#AY12
BD8 RESERVED#BD8
AC28 RESERVED#AC28
AF28 RESERVED#AF28
AH27 RESERVED#AH27
iCLK

EE modify 20150811
R723 0R2J-2-GP PLT_CLK1_CAM1_1
R722 0R2J-2-GP PLT_CLK1_CAM2_1
R728 0R2J-2-GP CLK_I2S_MCLK_1
25 PLT_CLK1_CAM1
25 PLT_CLK1_CAM2
20,21 CLK_I2S_MCLK
56 ISH_I2C0_SDA
56 ISH_I2C0_SCL
ISH_I2C0_SDA
ISH_I2C0_SCL
link to XDP

BP8 PMC_PLT_CLK0/ISH_GPIO10/ISH_UART_DATAOUT
BR9 PMC_PLT_CLK1/ISH_GPIO11/ISH_UART_DATAIN
BU7 PMC_PLT_CLK2/ISH_GPIO12/ISH_UART_CTS#
BU9 PMC_PLT_CLK3/ISH_GPIO13/ISH_UART_RTS#
BR7 PMC_PLT_CLK4/ISH_GPIO14/ISH_I2C0_DATA
BT6 PMC_PLT_CLK5/ISH_GPIO15/ISH_I2C0_CLK
PLT CLOCK

56 XDP_H_TCK F34 JTAG_TCK
56 XDP_H_TRST# E35 JTAG_TRST#
56 XDP_H_TMS B34 JTAG_TMS
56 XDP_H_TDI E33 JTAG_TDI
56 XDP_H_TDO J33 JTAG_TDO
56 XDP_H_PRDY# G33 JTAG_PRDY#
56 XDP_H_PREQ# H34 JTAG_PREQ#
TAP PORT/ITP

BN9 RESERVED#BN9

18 SPI_CLK BP24 FST_SPI_CLK
18 FST_SPI_SOCK_D3 BL25 FST_SPI_D3
18 FST_SPI_SOCK_D2 BJ25 FST_SPI_D2
18 SPI_MISO BK26 FST_SPI_D1
18 SPI_MOSI BN25 FST_SPI_D0
18 SPI_CS# BU25 FST_SPI_CS0#
BR23 FST_SPI_CS1#
BV24 FST_SPI_CS2#
FAST SPI

29 USB_OTG_SOC_ID USB_OTG_SOC_ID

50 PMIC_INT PMIC_INT E37
GPIO_SUS2_C K38 GPIO_SUS1/SEC_MSTR_TCK
GPIO_SUS3_C J37 GPIO_SUS2/SEC_MSTR_TMS
SPI_MODE C37 GPIO_SUS3/SEC_MSTR_TDI
TOUCH_RESET# G37 GPIO_SUS4/SEC_MSTR_TDO
link to XDP 43 TOUCH_RESET# C35 GPIO_SUS5/PMC_SUSCLK1
56 MODEM_SLPCLK MODEM_SLPCLK D36 GPIO_SUS6/PMC_SUSCLK2
GPIO_SUS7 K36 GPIO_SUS7/PMC_SUSCLK3
GPIO SUS

39 NFC_HOST_INT_SEC NFC_HOST_INT_SEC F36 GPIO_SUS8
39 NFC_DWL_REQ NFC_DWL_REQ J35 GPIO_SUS9
39 NFC_EN_SEC NFC_EN_SEC K34 GPIO_SUS10

TPAD14-OP-GP TP701 1 TP_FUSE_PWRMON BF8 RESERVED#BF8
BD10 RESERVED#BD10
BE9 RESERVED#BE9
CHERRY-TRAIL-GP-U

UART1_DATAOUT/UART0_DATAOUT BU27 SOC_TXD
UART1_DATAIN/UART0_DATAIN BT26 SOC_RXD
UART1_RTS# BR25 SOC_RTS
UART1_CTS# BR27 SOC_CTS
HSUART

SOC_TXD 37
SOC_RXD 37
SOC_RTS 37
SOC_CTS 37
BT UART

UART2_DATAOUT BK28
UART2_DATAIN BH28
UART2_RTS# BH26
UART2_CTS# BL27

PMC_SUSPWRDNACK BK22 SUS_PWRDOWNACK
PMC_SUSCLK0 BM6 SUS_CLK_WLAN
PMC_SLP_S0IX# BL3 SLP_S0IX#
PMC_SLP_S4# BJ9 SLP_S4#
PMC_SLP_S3# BJ3 SLP_S3#
PMU

SUS_PWRDOWNACK 50
SUS_CLK_WLAN 37
SLP_S0IX# 17,50,52,56
SLP_S4# 17
SLP_S3# 17,28,52

Net: SUSPWRDNACK link to PMIC
Net: SLP_S0IX_N link to XDP,Touch Panel, PMIC
Net: SLP_S3_N link to camera, PMIC

PMC_ACPRESENT BK4 AC_PRESENT
PMC_BATLOW# BH4 PMU_BATTLOW#
PMC_PWRBTN# BH10 SOC_PWRBTN#
PMC_RSTBTN# BH24 DBG_RESETBTN#
PMC_PLTRST# BJ5 PLTRST#
PMC_WAKE# BJ7 WIFI_HOST_WAKE#
PMC_SUS_STAT# BH6 PMU_SLP_S0I3_N

AC_PRESENT 50
PMU_BATTLOW# 50
SOC_PWRBTN# 50
TP702 TPAD14-OP-GP
PLTRST# 17,37,50,56,57
WIFI_HOST_WAKE# 37
PMU_SLP_S0I3_N 56

Net: AC_PRESENT link to PMIC
PMU_BATTLOW_N link to PMIC
SOC_PWRBTN_N link to PMIC
PLTRST_N link to PMIC, XDP
SOC wakeup from WIFI
PMU_SLP_S0I3_N link to XDP

RTC_TEST# BD4 SOC_RTEST#
RESERVED#BE5 BE5
PMC_RSMRST# BE3 RSMRST#
PMC_CORE_PWROK BG3 CORE_PWROK
RTC

SOC_RTEST# 50,56
RSMRST# 50,56
CORE_PWROK 50,56

Net: SOC_RTEST_N link to PMIC and XDP
RSMRST_N link to PMIC and XDP
CORE_PWROK link to PMIC and XDP

RTC_RST# BF4 SRT_CRST#
RTC_X1 BG9 RTC_XTAL_IN
RTC_X2 BF10 RTC_XTAL_OUT
RTC_EXTPAD BG11 BRTC_EXTPAD

SRT_CRST# 56
C706 SCD1U10V1KX-GP

Net: SRT_CRST_N link to XDP

SVID_ALERT# C33 SVID_ALERT#
SVID_DATA D32 SVID_DATA
SVID_CLK F32 SVID_CLK
SVID

SVID_ALERT# 49
SVID_DATA 49
SVID_CLK 49

PWM0 BV4
FG_ALERT BU5
PWM PWM1/ISH_GPIO10/ISH_UART_DATAOUT

R747 0R0402-PAD-1-GP
FG_ALERT_EC 17
EE modify 20150804

GPIO_DFX0/C0_BPM0_TX D40 MODEM_PWR_ON
GPIO_DFX1/C0_BPM1_TX/C1_BPM1_TX B38 BT_DEV_EN
GPIO_DFX2/C0_BPM2_TX/ISH_GPIO13 C39 EC_SMI#
GPIO_DFX3/C0_BPM3_TX E39
GPIO_DFX4 H38 TYPC_CC_PD_INT#
GPIO_DFX5/C0_BPM0_TX/C1_BPM0_TX G38 2_4_Lane
GPIO_DFX6/C0_BPM1_TX/C1_BPM1_TX K40 VOLUME_DOWN_SOC#
GPIO_DFX7/C0_BPM4_TX F38 MODEM_RESET_BB_N
GPIO_DFX8/C0_BPM3_TX/C1_BPM3_TX J39 RF_WWAN_DISABLE#_1P8

R748 0R2J-2-GP

MODEM_PWR_ON 40
BT_DEV_EN 37
EC_SMI# 17
TYPC_CC_PD_INT# 29
2_4_Lane_Det 31
VOLUME_DOWN_SOC# 17
MODEM_RESET_BB_N 40
RF_WWAN_DISABLE#_1P8 40,41
link to XDP

GPIO_ALERT/ISH_GPIO11/ISH_UART_DATAIN BJ21 TOUCH_INT#
GPIO DFX
GPIO0_RCOMP M40 GPIO_RCOMP
100R1F-GP R749
TOUCH_INT# 43

SPI 1
SPI1_MISO BL19
SPI1_MOSI BK18
SPI1_CLK BN19
SPI1_CS0# BT18
SPI1_CS1# BR17

TOUCH_INT# R713 1 DY 2 10KR1J-GP +V1P8A
EC_SMI# R731 1 2 10KR1J-GP +V1P8A
FG_ALERT_EC R732 1 2 10KR1J-GP +V1P8A
RSMRST# R717 1 2 100KR1J-GP

+VRTC
R739 20KR1J-GP
SRT_CRST#
C709 SC1U6D3V1MX-GP

X703 XTAL-32D768KHZ-60-GP
R730 10MR1J-GP
C707 SC10P25V1JN-GP
C708 SC10P25V1JN-GP

BT_DEV_EN R703 DY 100KR1J-GP

+V1P8A
R735 DY Non-2X 51R1F-GP XDP_H_TMS
R736 DY Non-2X 51R1F-GP XDP_H_TDI
R740 DY Non-2X 51R1F-GP XDP_H_TDO
R751 DY Non-2X 51R1F-GP XDP_H_PREQ#
R753 DY 10KR1J-GP SPI_MODE
R737 51R1F-GP XDP_H_TCK
R738 51R1F-GP XDP_H_TRST#
R754 DY 10KR1J-GP MODEM_SLPCLK

NFC_DWL_REQ 2K2R1F-GP R705 +V1P8A
NFC_EN_SEC 2K2R1F-GP R724
NFC_HOST_INT_SEC 2K2R1F-GP R729

C712 DY SC10P50V2JN-4GP PLT_CLK1_CAM1
C711 DY SC10P50V2JN-4GP PLT_CLK1_CAM2
C710 DY SC10P50V2JN-4GP CLK_I2S_MCLK

EE modify 20150807
D701 RB751VM-40TE-17-GP 83.R2004.J8F
17,58 DOCK_DET1
GPIO_SUS7

EE modify 20150804
TOUCH_RESET# R755 0R0402-PAD-1-GP TXE_WP#

R704 DY 0R2J-2-GP
AC_PRESENT_C AC_PRESENT

U702 UM6K1N-GP
PWR_CHG_ACOK PWR_CHG_ACOK 46,49
TXE_WP TXE_WP 17

+V1P8A
R720 10KR2J-3-GP TOUCH_RESET#
R707 DY 10KR1J-GP GPIO_SUS3_C
STRAPS
R711 DY 10KR1J-GP GPIO_SUS2_C

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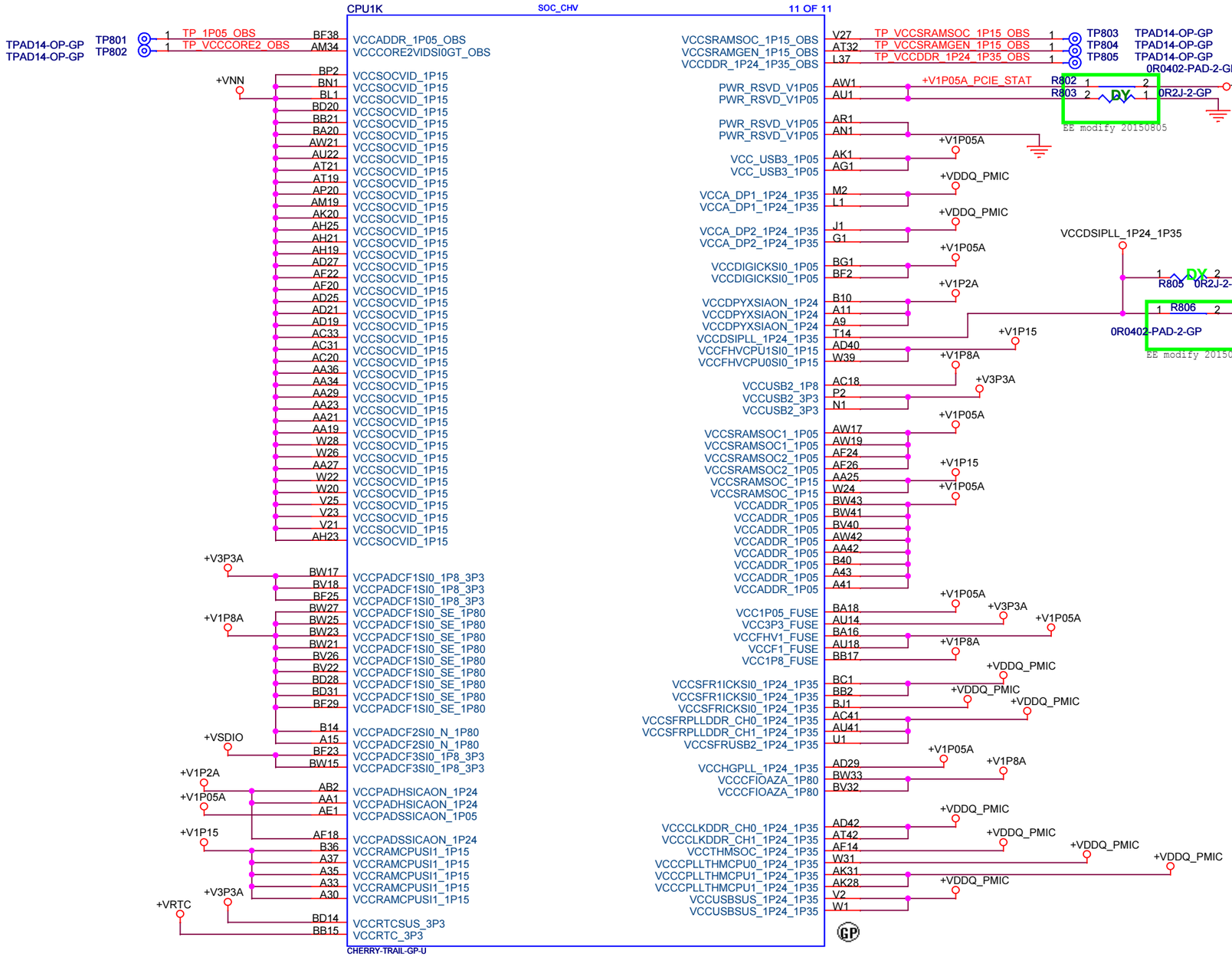
Title	07_SOC (CLK/ITP/SPI/MISC/PMU)		Somerset
Size	Document Number: Somerset	Custom	Rev: SA
Date: Sunday, September 27, 2015	Sheet 7 of 72		

SOC : VCCIO

20130924 modify



Somerset

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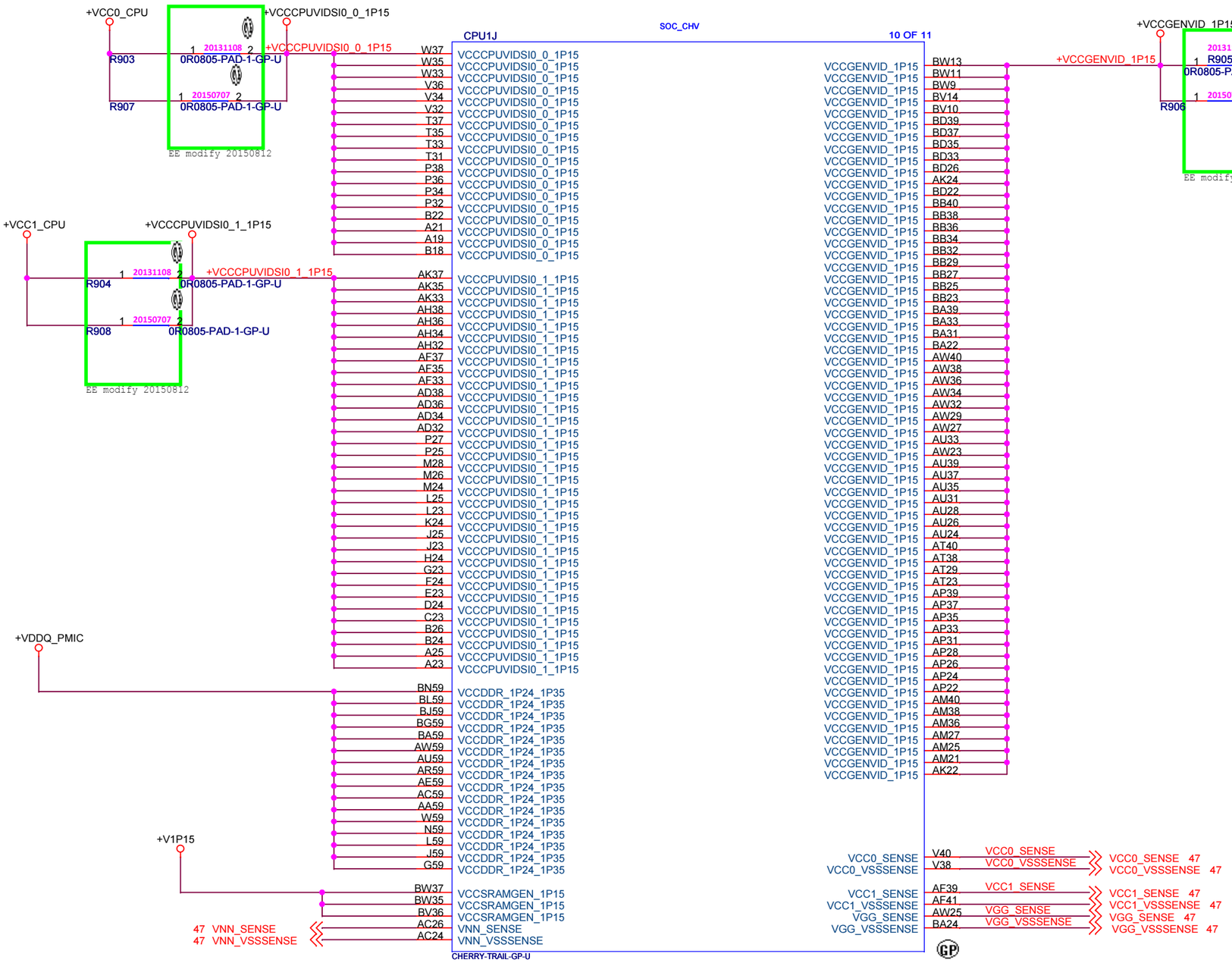
Title	08_SOC (VCCIO)	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 8 of 72	

SOC : VCC/VNN



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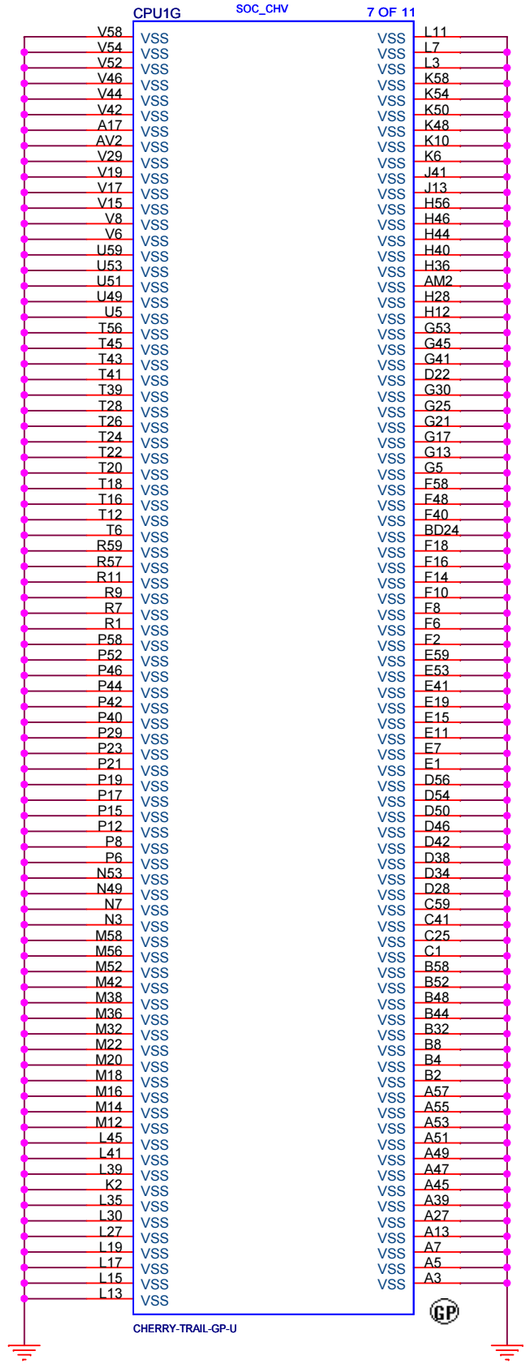
Title: 09_SOC (VCC/VNN)

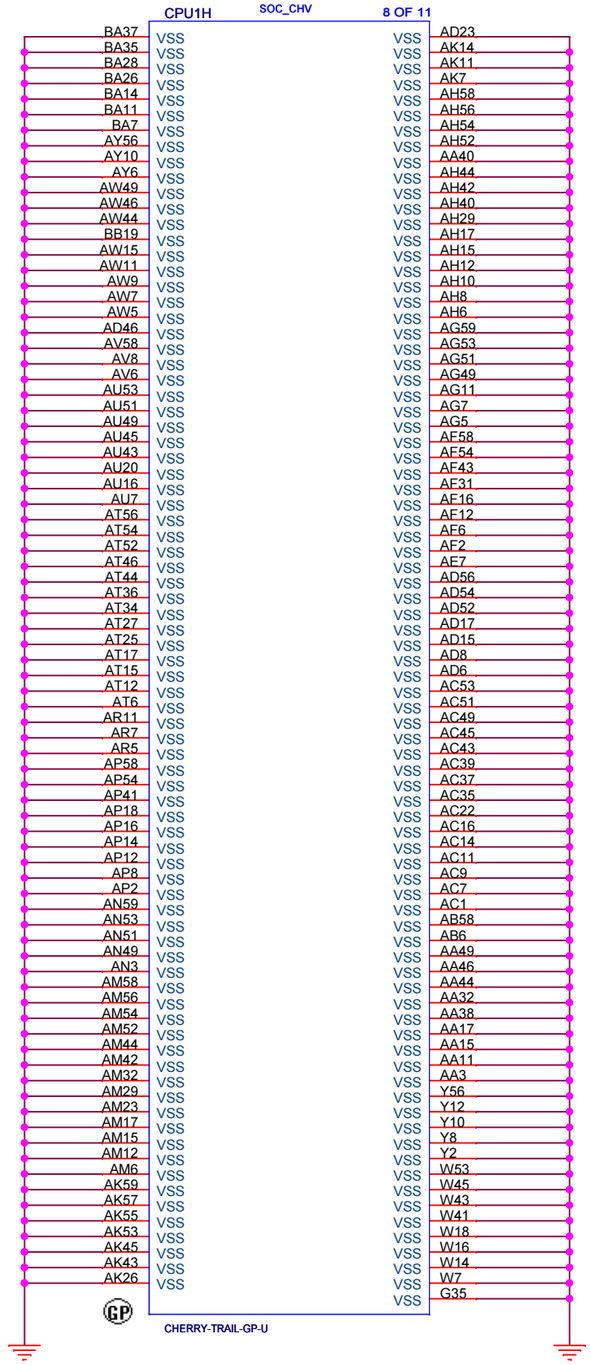
Size	Document Number	Rev
	Somerset	SA

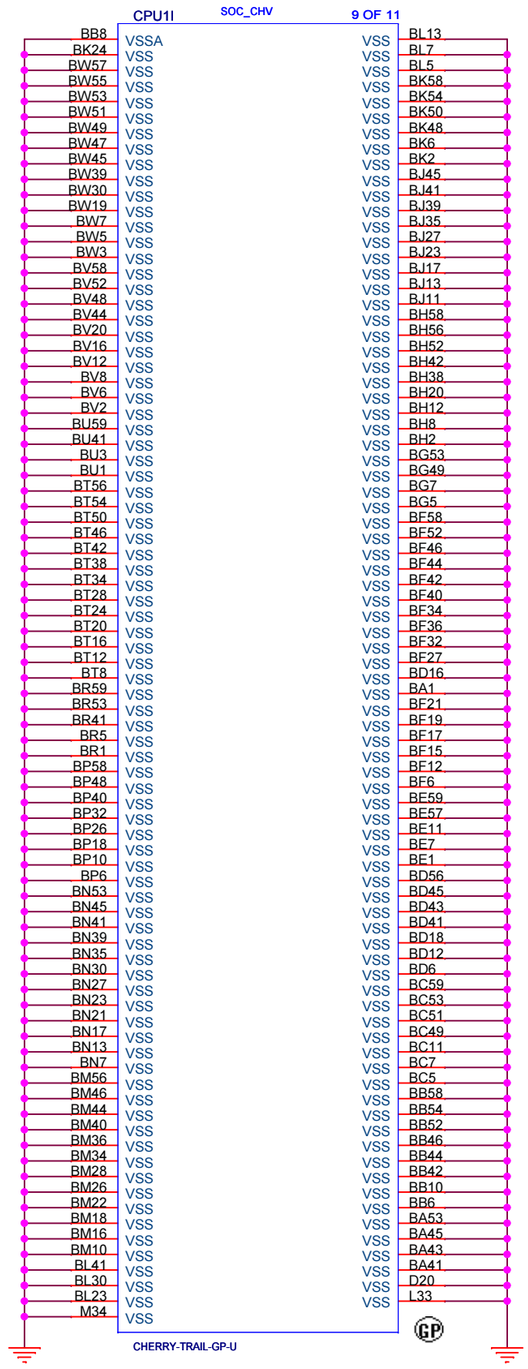
Date: Sunday, September 27, 2015 Sheet 9 of 72

SOC : GROUND

20130923 modify







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Title	10_SOC (VSS)	
Size	Document Number: Somerset	Rev: SA
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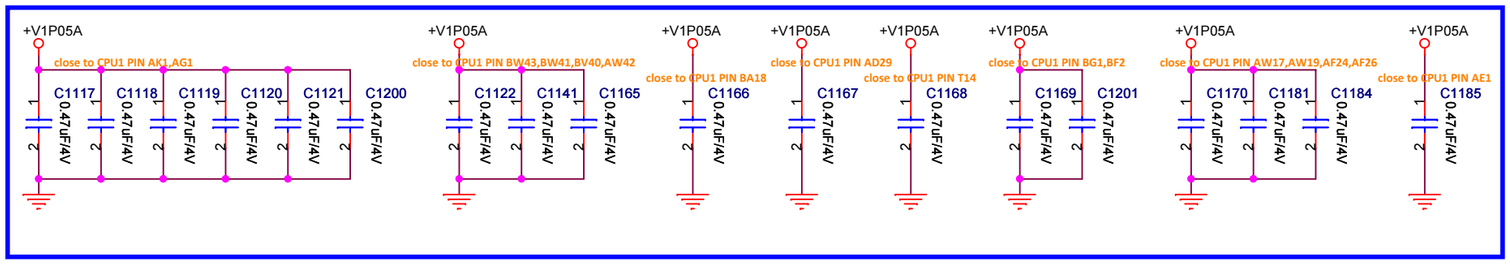
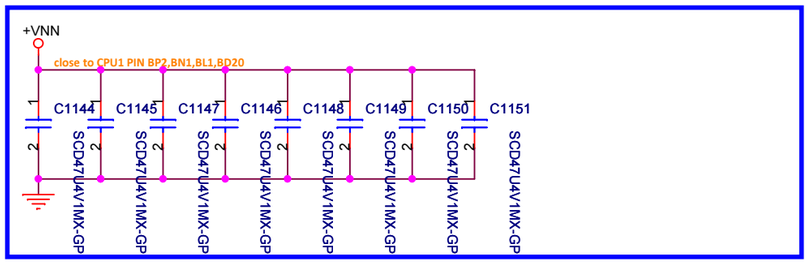
SOC DECOUPLING

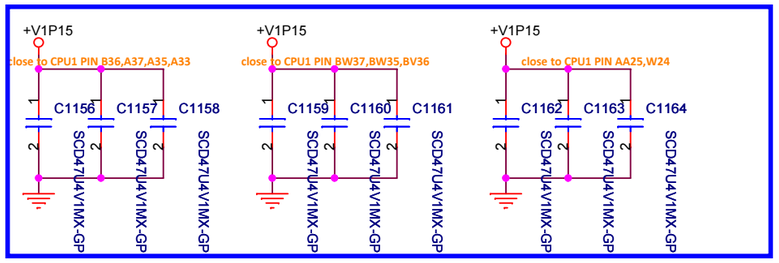
+V1P05A



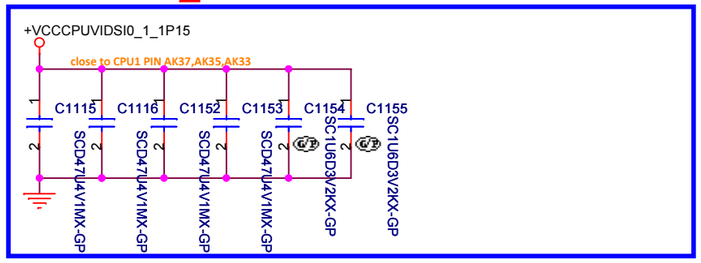
+VNN



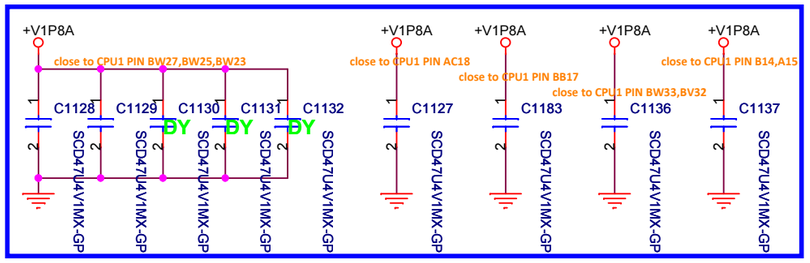
+V1P15



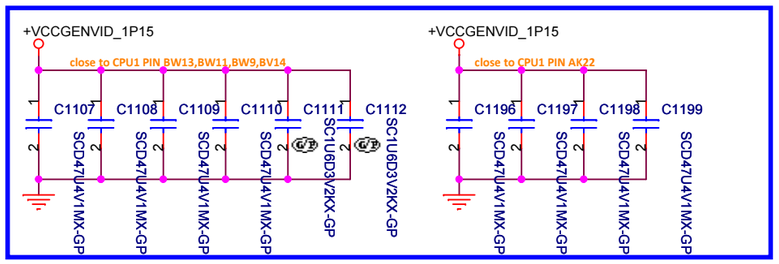
+VCC1_CPU



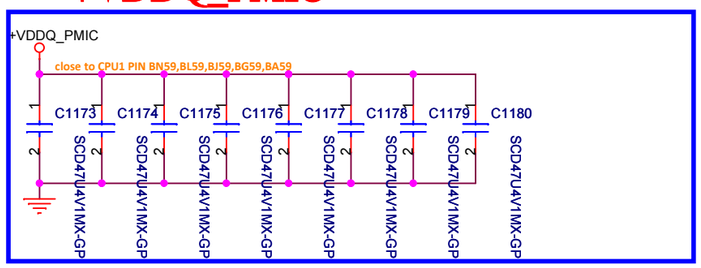
+V1P8A



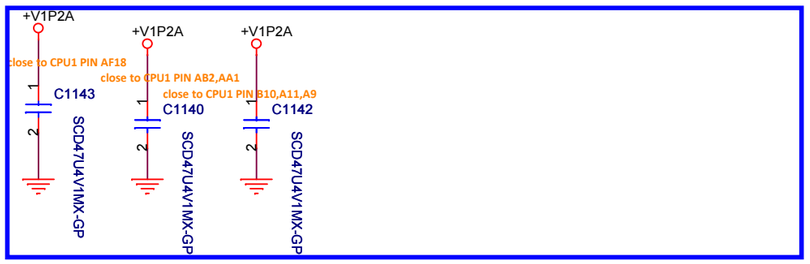
+VGG



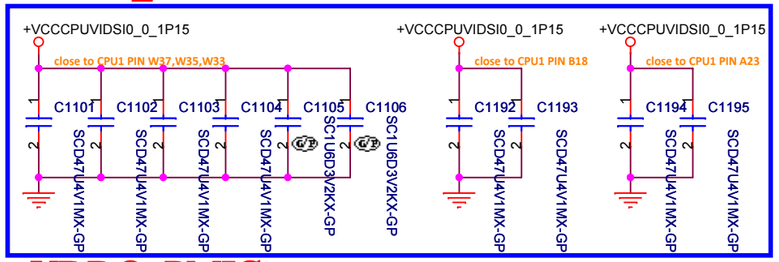
+VDDQ_PMIC



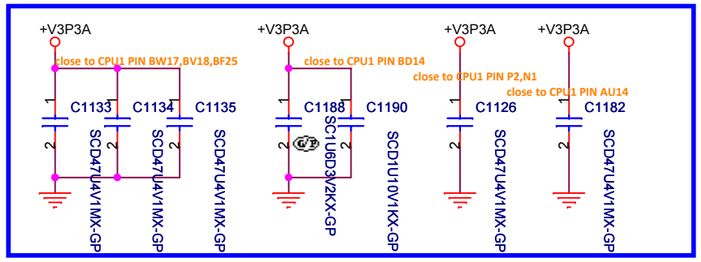
+V1P2A



+VCC0_CPU

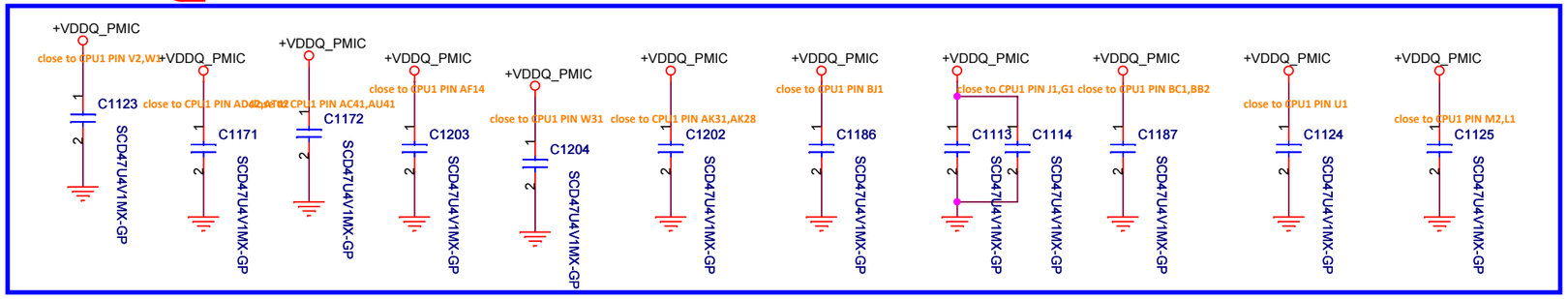


+V3P3A

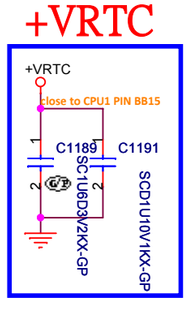


+VSDIO

+VDDQ_PMIC



+VRTC



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Title	11_CPU (VLV2 Decoupling)	
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Somerset

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Title: **12_LPDDR3 (Reserved)**

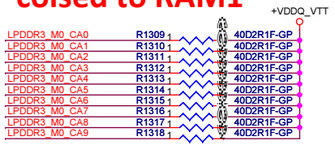
Size	Document Number	Rev
	Somerset	SA

Date: Sunday, September 27, 2015 Sheet 12 of 72

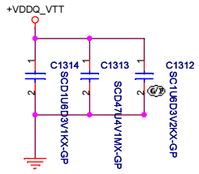
LPDDR3 MEMORY CHANNEL A

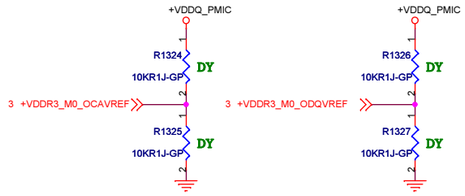
K3QF2F20EM-AGCE-GP

for layout:
colsed to RAM1

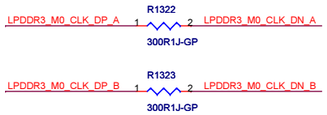


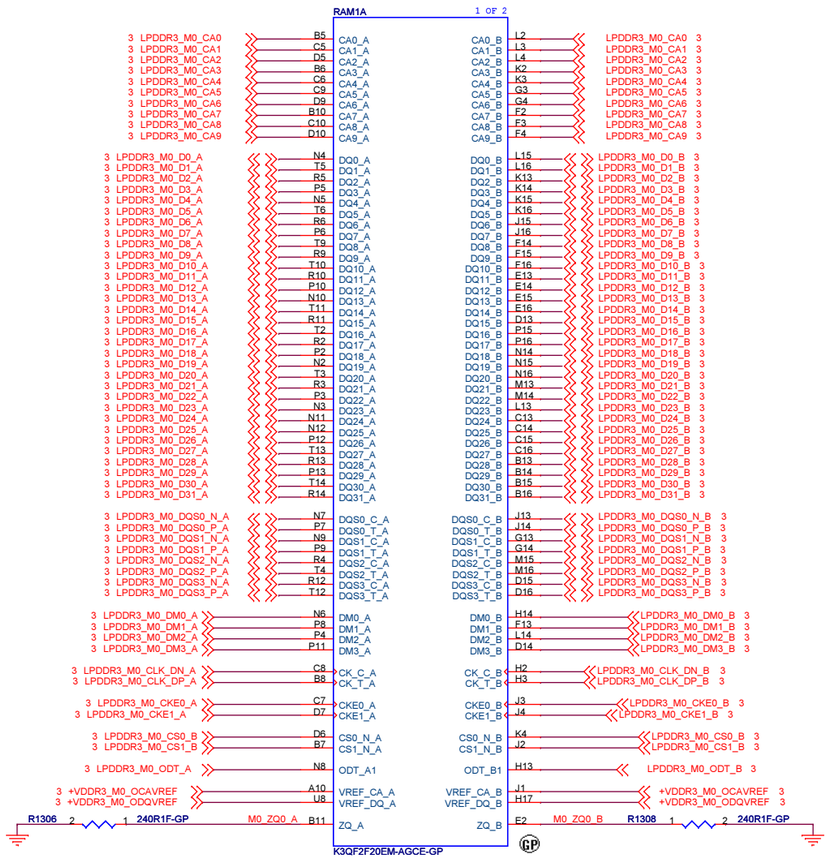
LPDDR3 CA TERMINATION

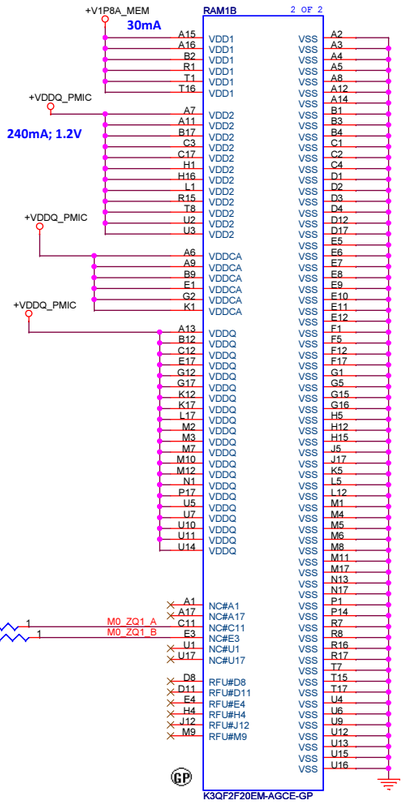




LPDDR3 CLK TERMINATION
for layout:close to RAM1







Somerset

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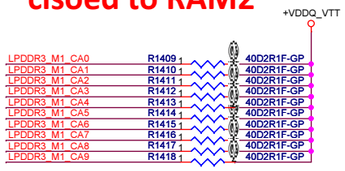
Title	13_LPDDR3_RAM1(H9CCNNN8KTMLBR)	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 13 of 72	

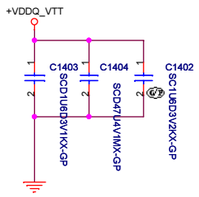
LPDDR3 MEMORY CHANNEL B

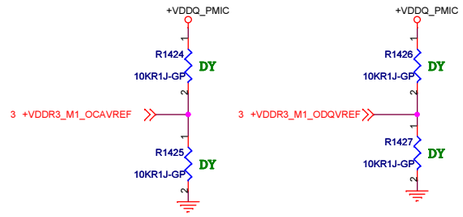
K3QF2F20EM-AGCE-GP

for layout:
clsoed to RAM2



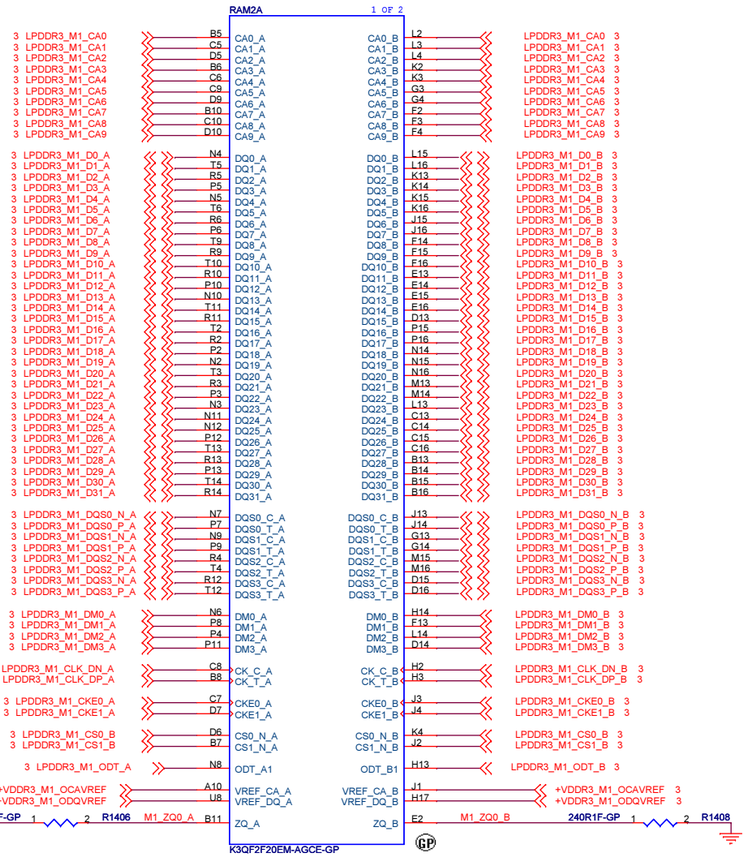
LPDDR3 CA TERMINATION

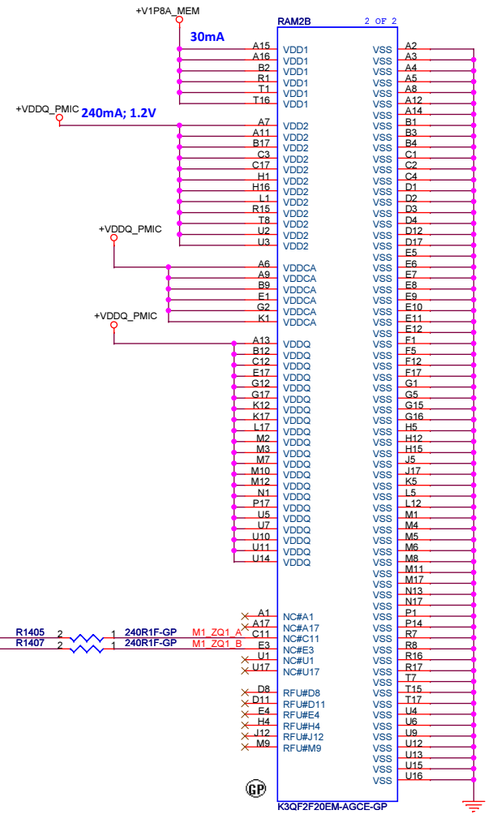




LPDDR3 CLK TERMINATION

for layout:close to RAM2





Somerset

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21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title	14_LPDDR3_RAM2(H9CCNNN8KTMLBR)	
Size	Document Number: Somerset	Rev: SA
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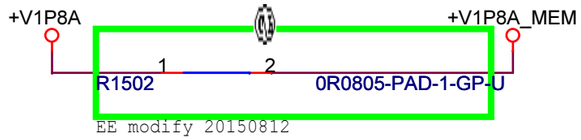
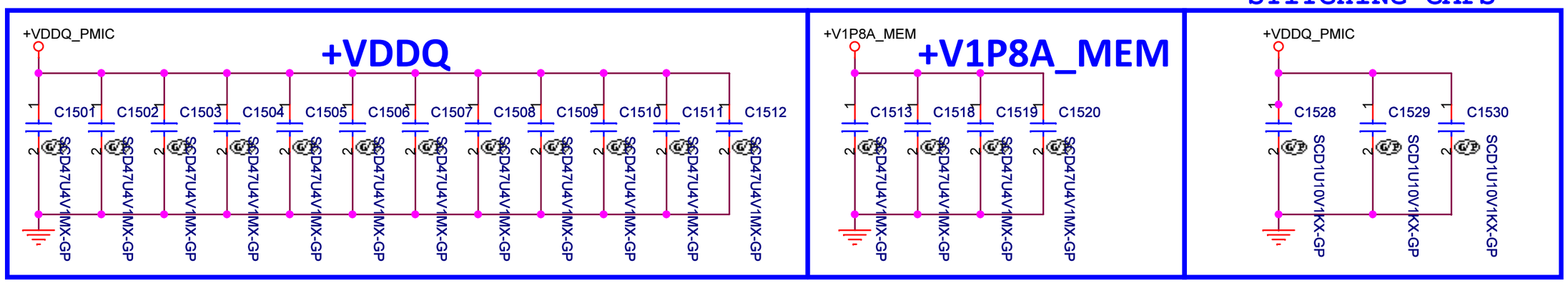
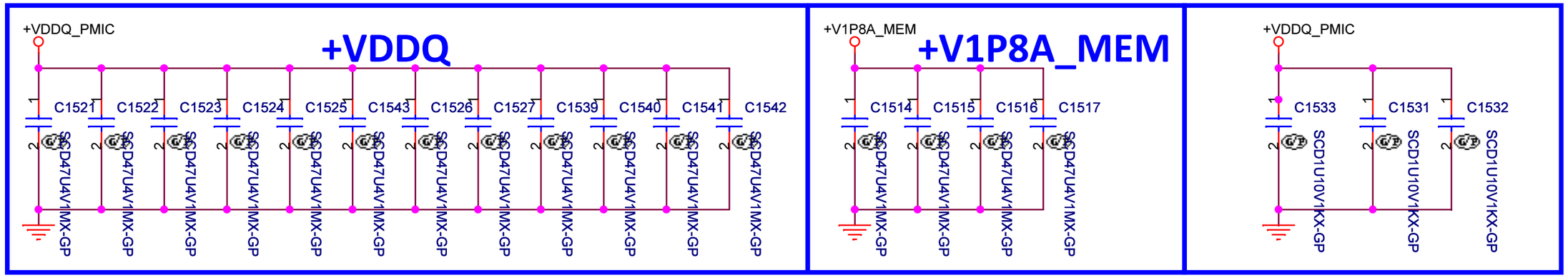
LPDDR3 DECOUPLING CAPACITORS



LPDDR3 MEMORY CHANNEL A



LPDDR3 MEMORY CHANNEL B



Somerset

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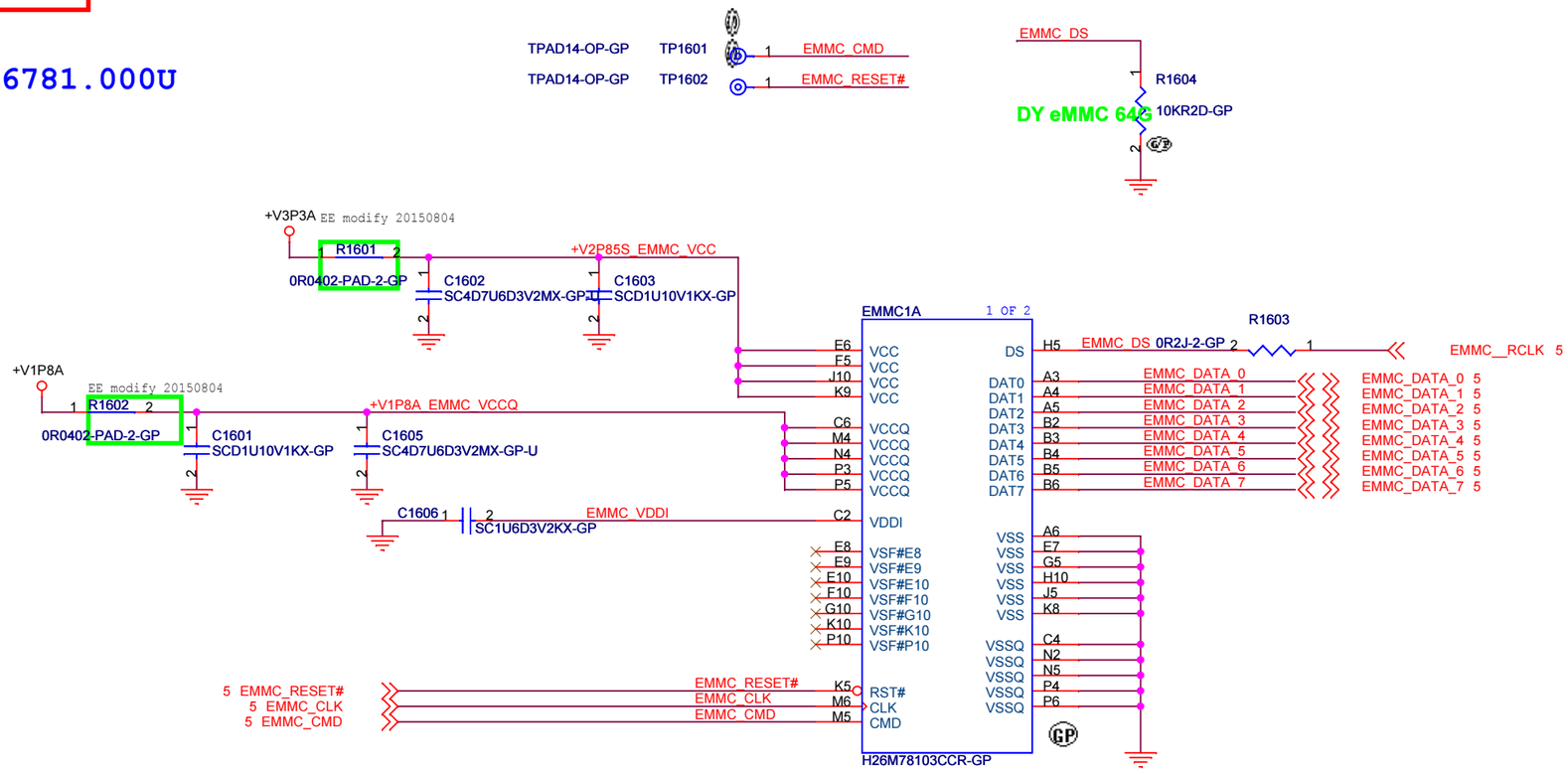
Title	15_LPDDR3_TERMINATIONS	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 15 of 72	

eMMC

64GB

072.26781.000U



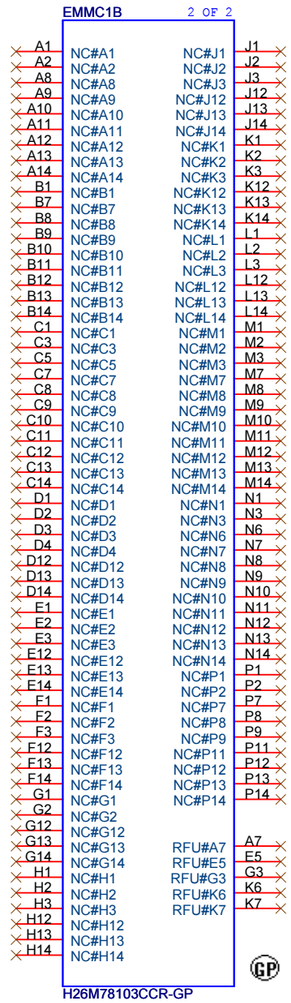
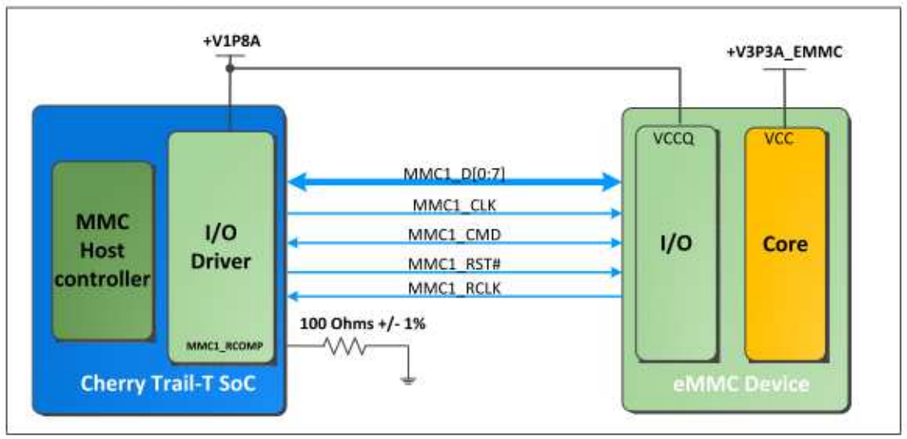


Figure 3-44.eMMC Interface Topology



Somerset

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Title	16_eMMC	
Size	Document Number: Somerset	Rev: SA
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EC

Battery

PS2 Interface

JTAG Interface

FAN PWM & TACH

BC-LINK

Host Interface

VCI Interface

GANG Control

Timer Interface

Master Clock

Misc. Interface

SMBus & GPIO

SPI Controllers

Thermal Interface

ADC Interface

CEC Interface

TYPE-C 3.3V

Charger 3.3V

EC debug connector

Level shift

CPU 1.8V

Pull up/down

EC Power

預留與EC並存

NFC	NFC_ID1	NFC_ID2
	0	0
NON-NFC SKU	0	1
	1	0
NFC SKU	1	1

BOARD_ID		
REV	R	C
EVT1	240K	4700p
EVT2	130K	4700p
DVT1	62K	4700p
DVT2	33K	4700p
PVT1	8.2K	4700p
MP	4.3K	4700p
	2K	4700p
	1K	4700p

PROJECT_ID		
PROJECT	PROJECT_ID2	PROJECT_ID1
Blackwell-T3	0	0
Blackwell-T4	0	1
Somerset-T3	1	0
Somerset-T4	1	1

Somerset

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Title: 17_EC

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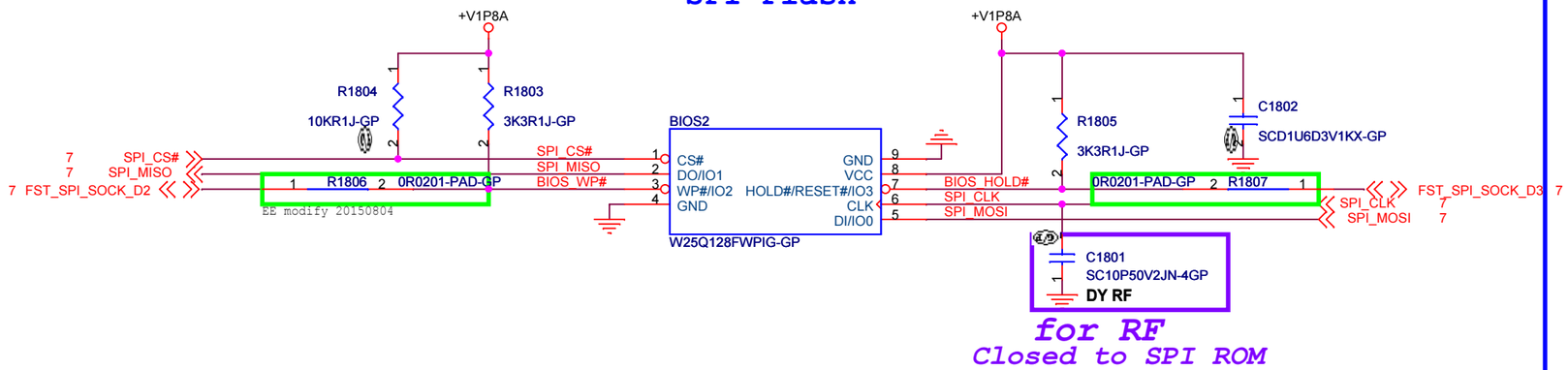
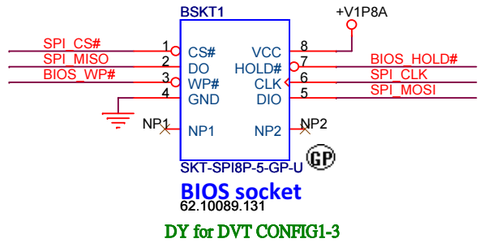
SPI ROM

SPI Flash



SPI SOCKET



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Title: 18_ SPI NOR

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Thermal Protect

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Title	19_Thermal Protect	
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AUDIO CODEC

(AVDD+CPVDD+DBVDD)1.8V=200mA(max)
(MICVDD)3.3= 50mA (max)
(SPKVDDL+R) 5V = 2A(max)

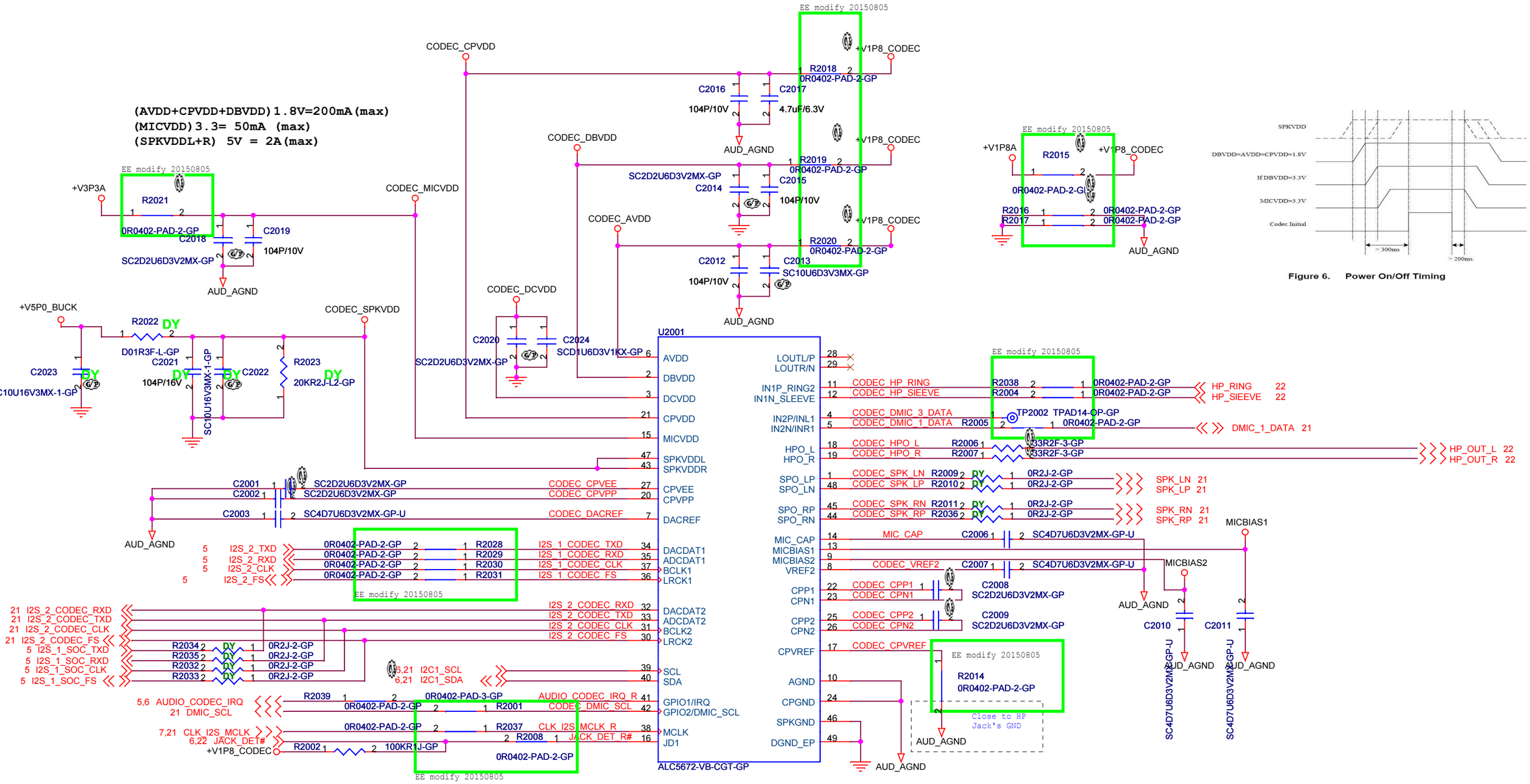

Figure 6. Power On/Off Timing

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Title	20_AUDIO CODEC	
Size	Document Number: Somerset	Rev: SA
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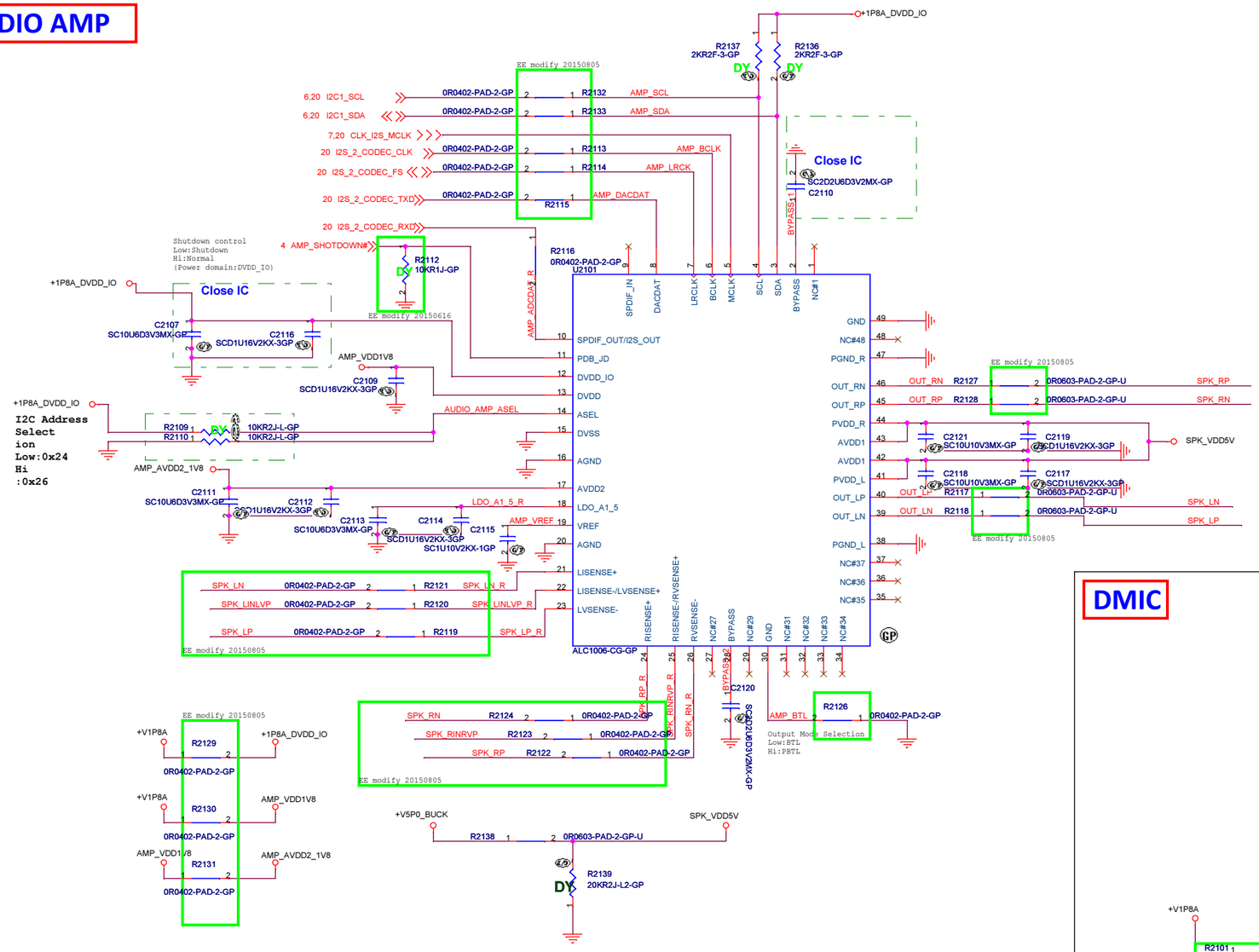
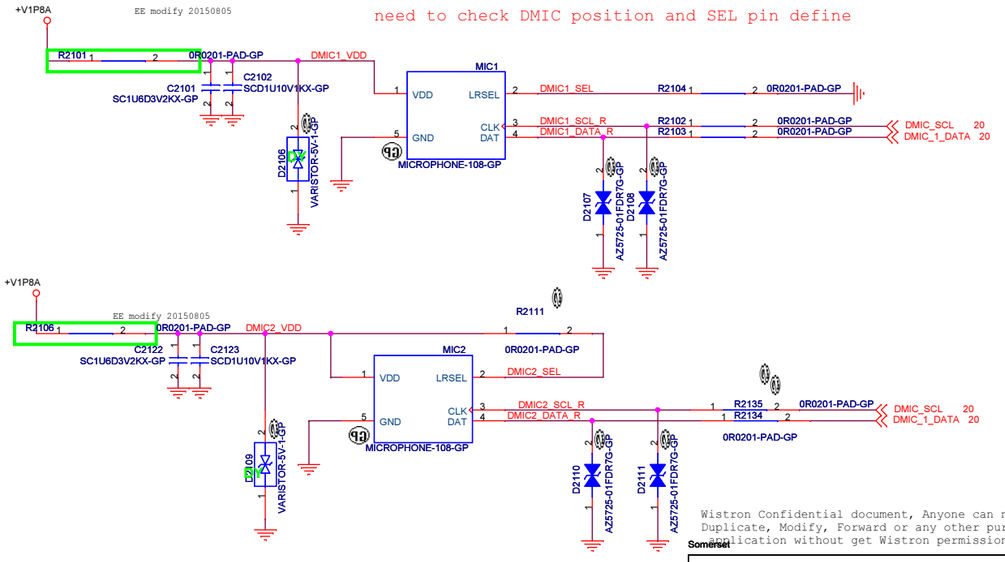
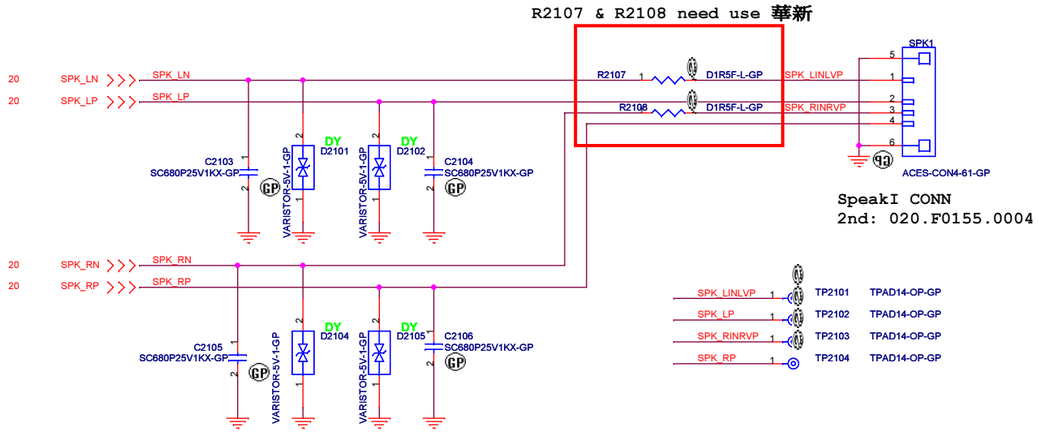
AUDIO AMP



DMIC



SPEAKER



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Title	21_AUDIO AMP/DMIC/SPK	
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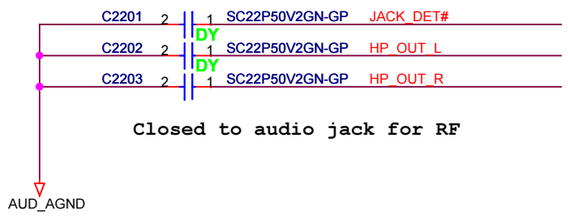
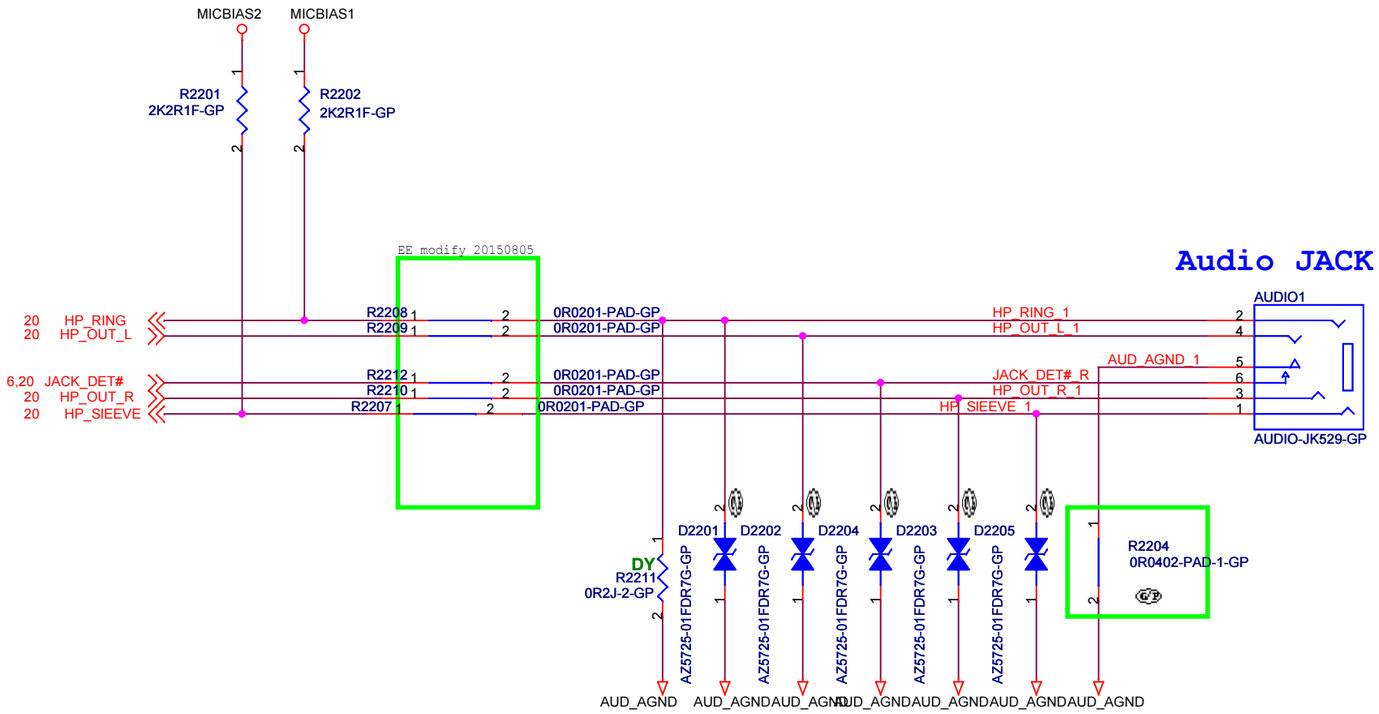
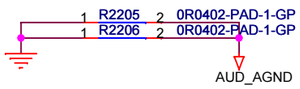
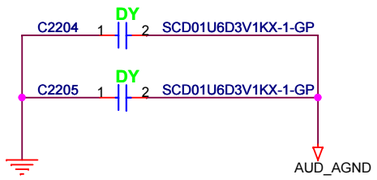
Device :AUDIO JACK









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Title	22_Audio JACK	
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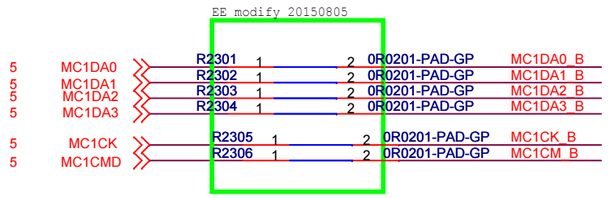
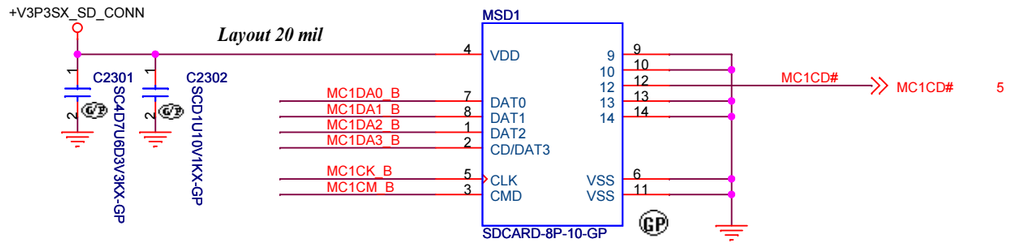
SD Controller

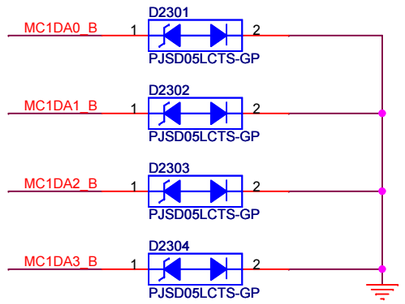
SD CARD

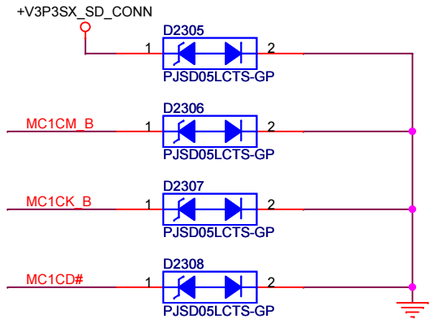
EE modify 20150805





for ESD/RF *Closed to SDC1*





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Title	23_uSD Card CONN	
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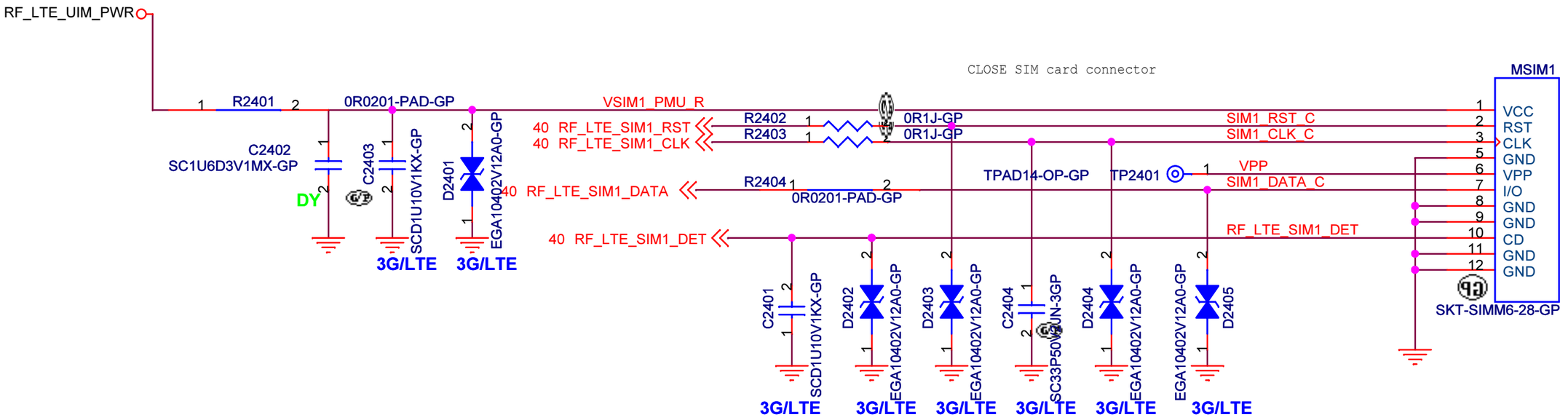
SIM CARD



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Title	24_uSIM CONN	
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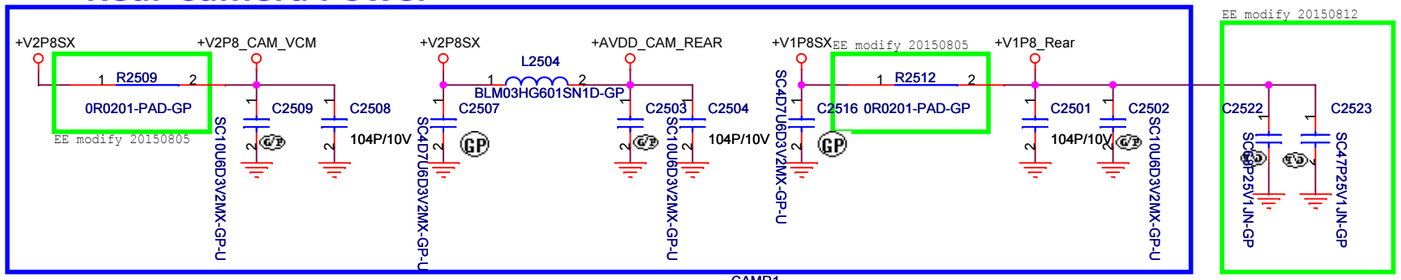
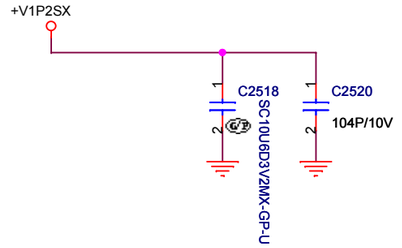
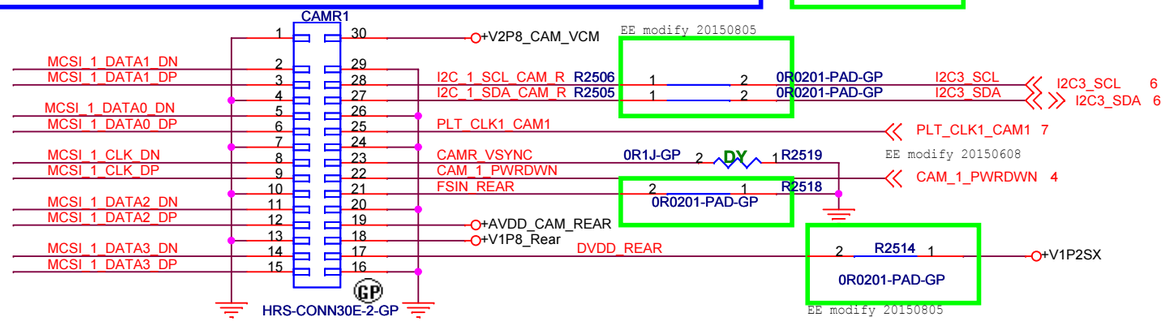
Rear Camera

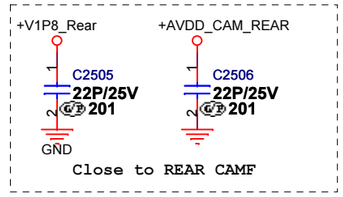
Rear Camera
OV08858-G04A(8M)
P8V12F-203(8M)

Rear Camera Power









4 MCSI_1_CLK_DP — MCSI_1_CLK_DP
4 MCSI_1_CLK_DN — MCSI_1_CLK_DN
4 MCSI_1_DATA0_DN — MCSI_1_DATA0_DN
4 MCSI_1_DATA0_DP — MCSI_1_DATA0_DP
4 MCSI_1_DATA1_DP — MCSI_1_DATA1_DP
4 MCSI_1_DATA1_DN — MCSI_1_DATA1_DN
4 MCSI_1_DATA2_DN — MCSI_1_DATA2_DN
4 MCSI_1_DATA2_DP — MCSI_1_DATA2_DP
4 MCSI_1_DATA3_DP — MCSI_1_DATA3_DP
4 MCSI_1_DATA3_DN — MCSI_1_DATA3_DN

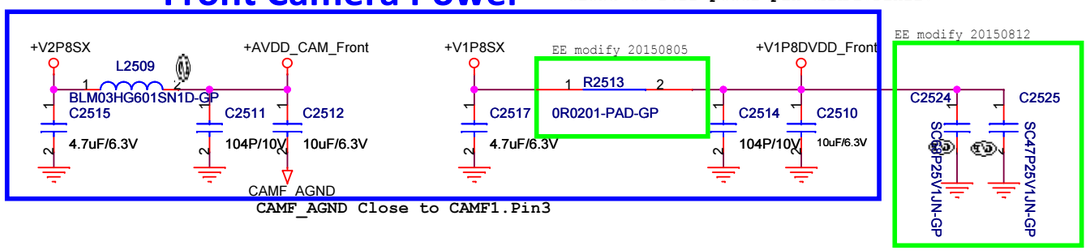
Front Camera

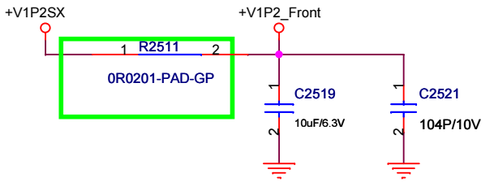
Front Camera
OV2740(2M)

need to check the connector & pin define

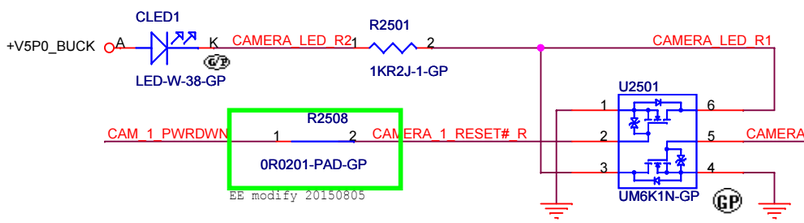
Front Camera Power

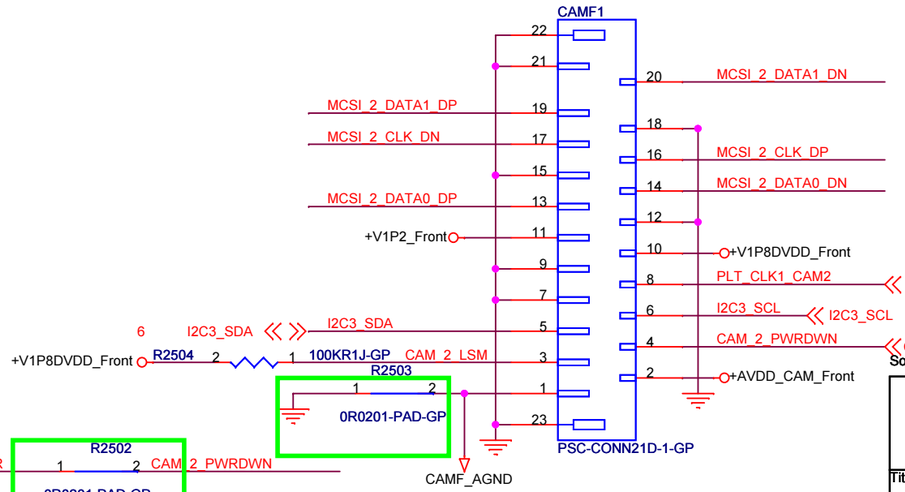
C2514&2510
Close to DVDD power pin CAMF1.Pin11.

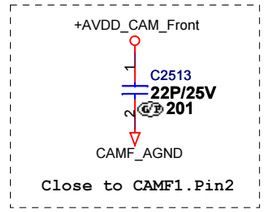




4 MCSI_2_CLK_DP — MCSI_2_CLK_DP
4 MCSI_2_CLK_DN — MCSI_2_CLK_DN
4 MCSI_2_DATA0_DP — MCSI_2_DATA0_DP
4 MCSI_2_DATA0_DN — MCSI_2_DATA0_DN
4 MCSI_2_DATA1_DP — MCSI_2_DATA1_DP
4 MCSI_2_DATA1_DN — MCSI_2_DATA1_DN







PLT_CLK1_CAM1 7
CAM_1_PWRDWN 4
PLT_CLK1_CAM2 7
I2C3_SCL 6
CAM_2_PWRDWN 4

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Title	25_MIPI CAMERA CONN	
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3D Camera

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Title	26_Camera_3D	
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Title	**27_USBPHY/SW**	
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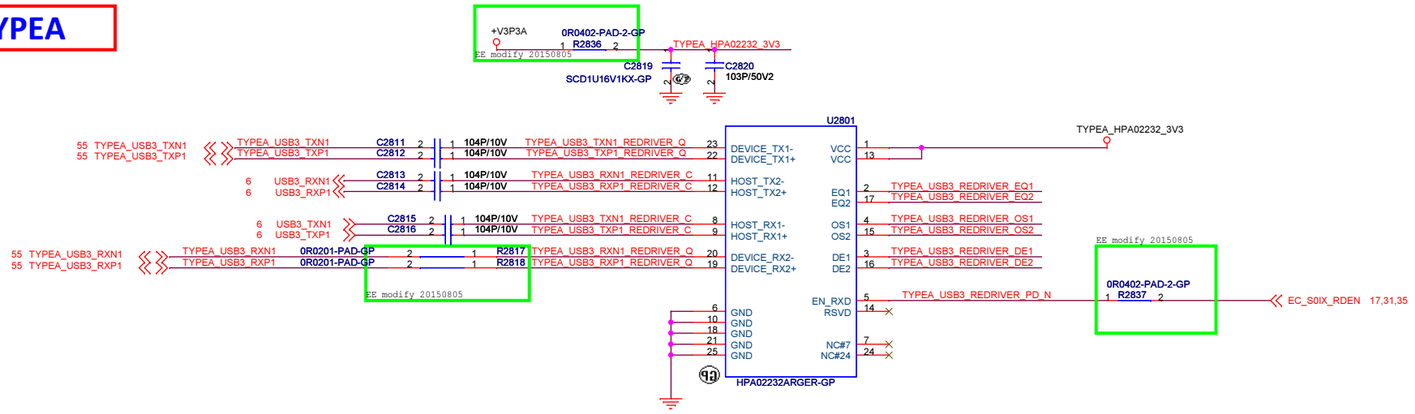
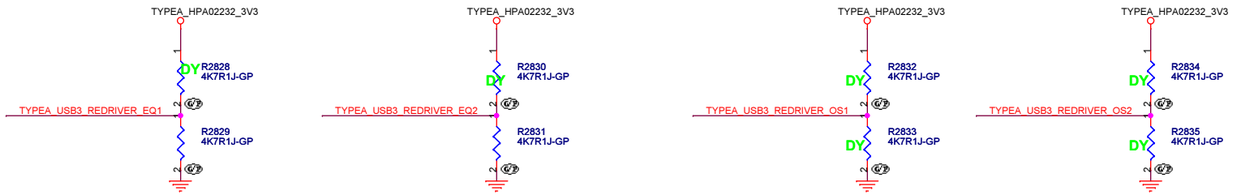
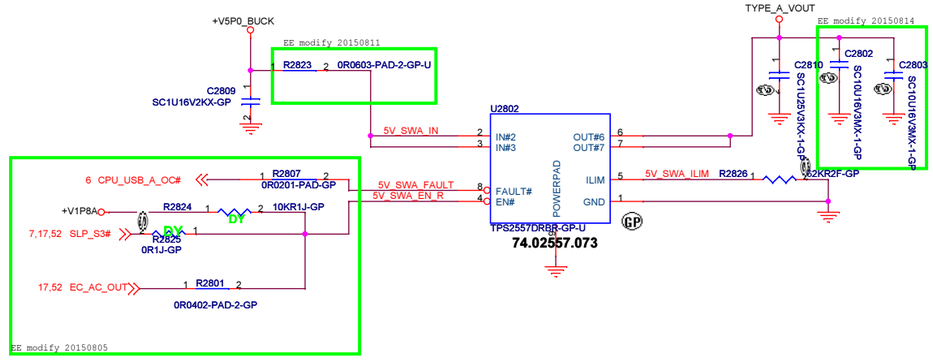
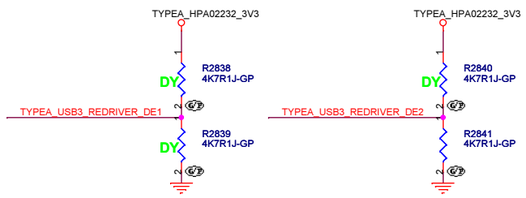
TYPEA









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Title	28_Full/MICRO USB CONN	
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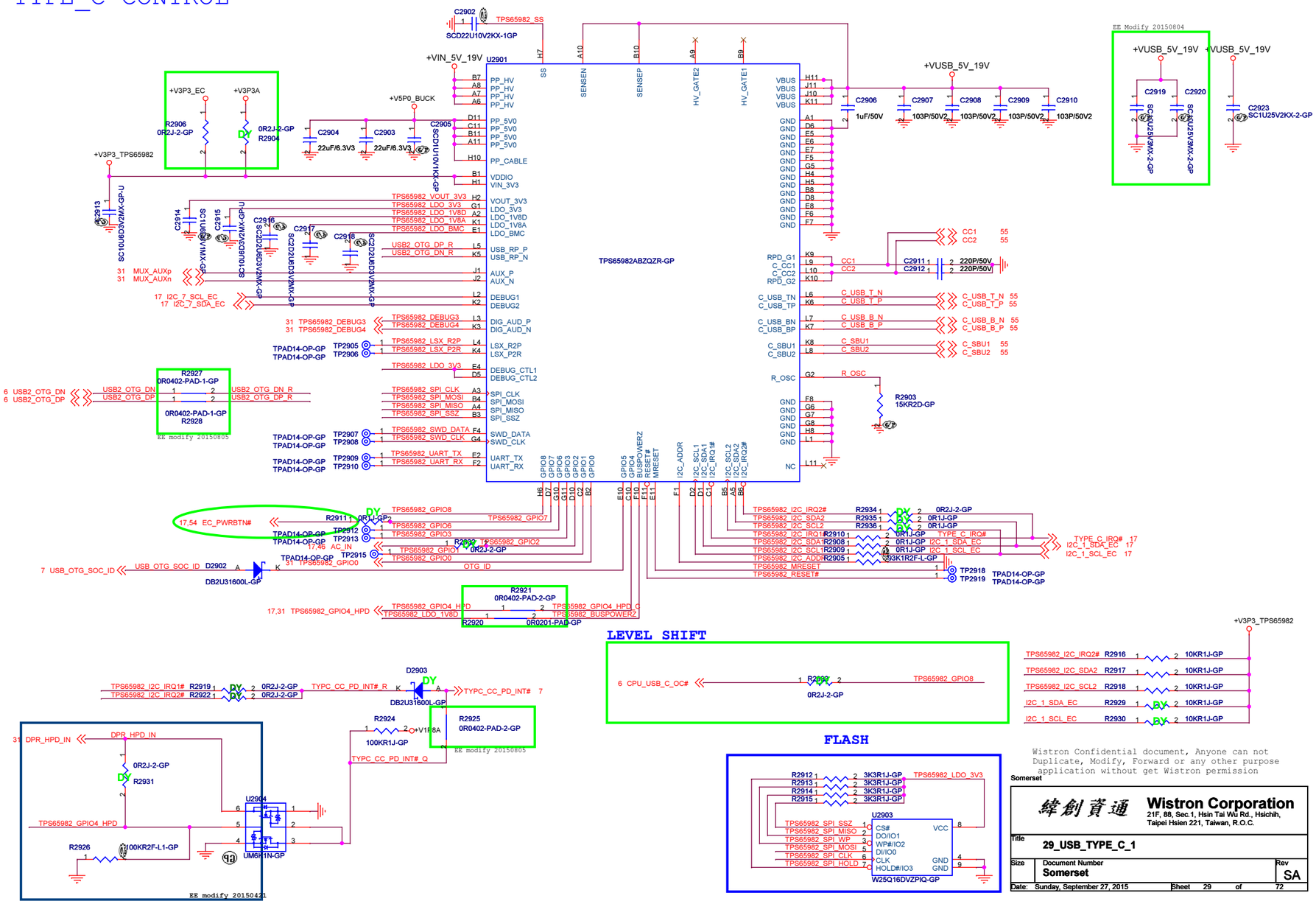
TYPE_C CONTROL



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Title	29_USB_TYPE_C_1	
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Title	30_RESERVED_USB_TYPE_C_2	
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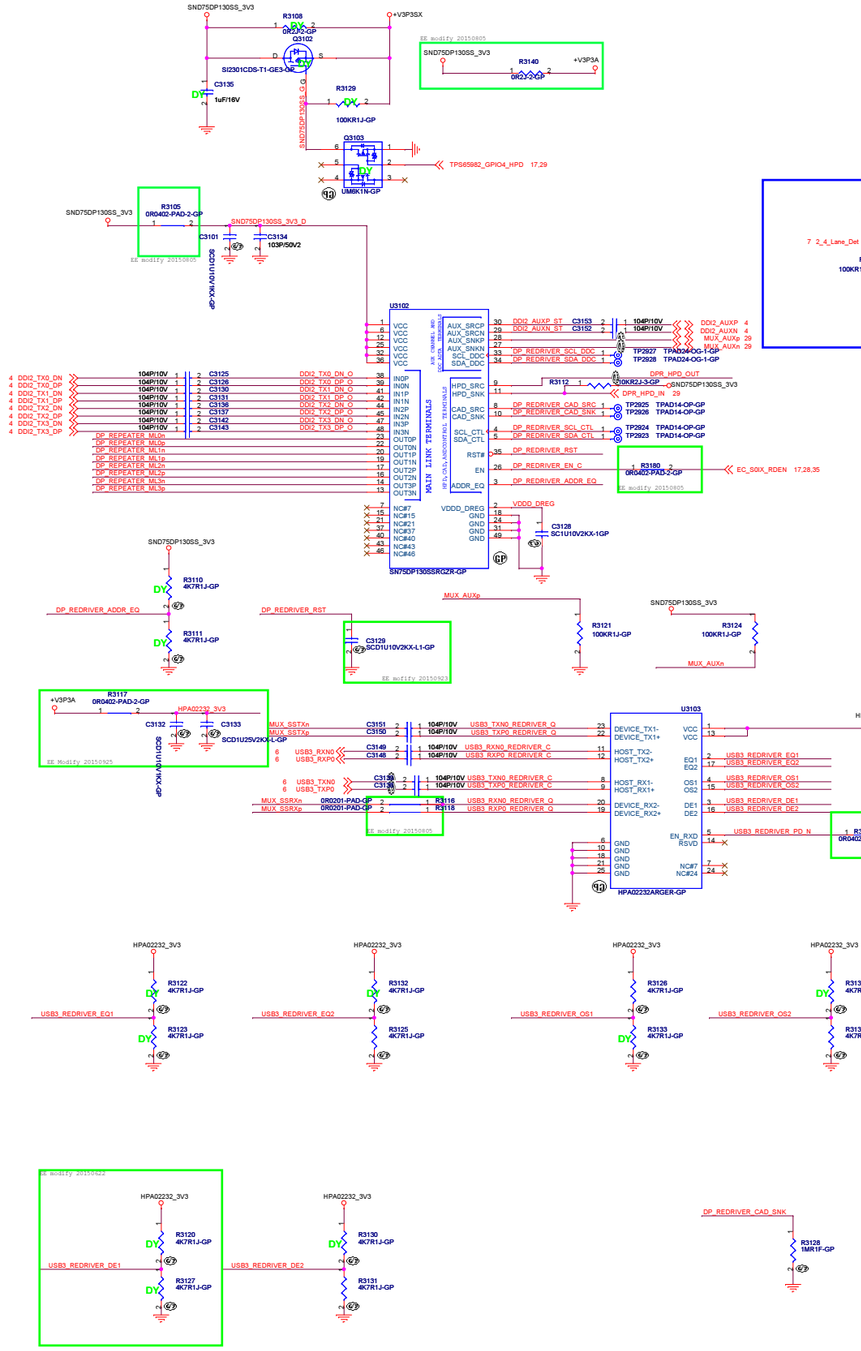

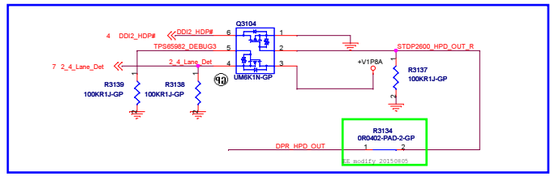

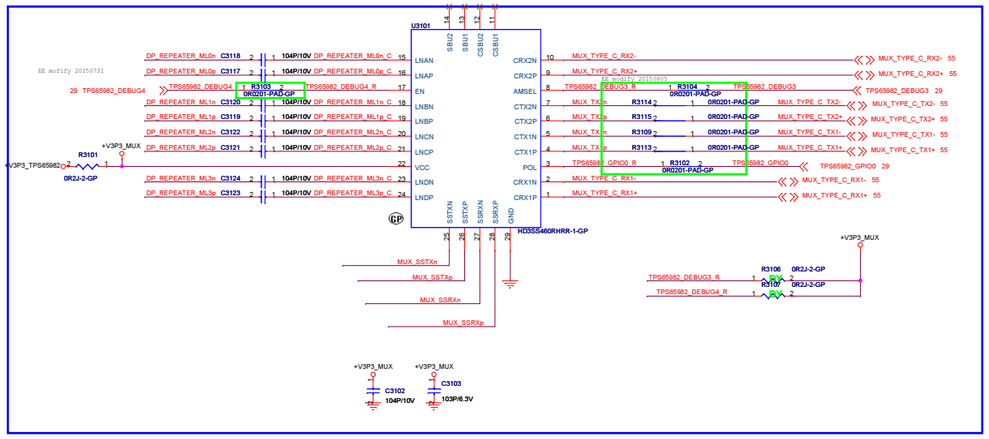

Table 2. Signal Control Pin Setting

OUTPUT SWING AND EQ CONTROL (at 2.5 GHz)			
OSx(1)	TRANSISTION BIT AMPLITUDE (TYP mVpp)	EQx(1)	EQUALIZATION (dB)
NC (default)	1042	NC (default)	0
0	908	0	7
1	1127	1	15
OUTPUT DE CONTROL (at 2.5 GHz)			
DEx(1)	OSx(1) = NC	OSx(1) = 0	OSx(1) = 1
NC (default)	0 dB	0 dB	0 dB
0	–3.5 dB	–2.2 dB	–4.4 dB
1	–6.0 dB	–5.2 dB	–6.0 dB
CONTROL PINS SETTINGS			
EN_RXD	DEVICE FUNCTION		
1 (default)	Normal Operation		
0	Sleep Mode		

(1) Where x = Channel 1 or Channel 2

					DESCRIPTION
1	x	VIL	0	same as Lane 0 to 2	DP mode; EQ fully programmable by AEQ(L1) levels; default AEQ(L1) EQ setting at 6dB At 2.7GHz
			AEQ(L1) = 6dB at 2.7GHz AEQ(L1) I²C programmable		
		VIH	x	3dB at 1.35GHz	TMDS mode; fixed EQ

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Title: 31_USB_TYPE_C_3

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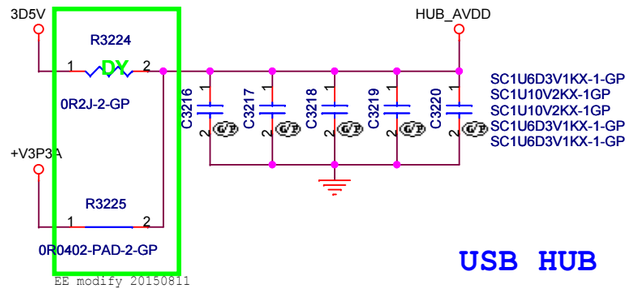
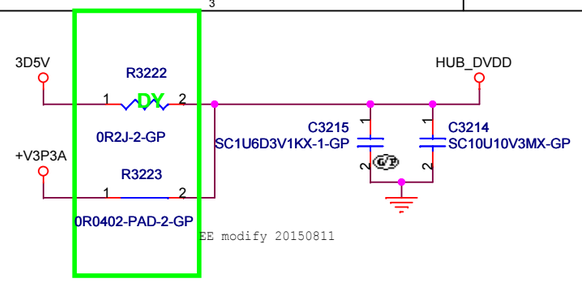
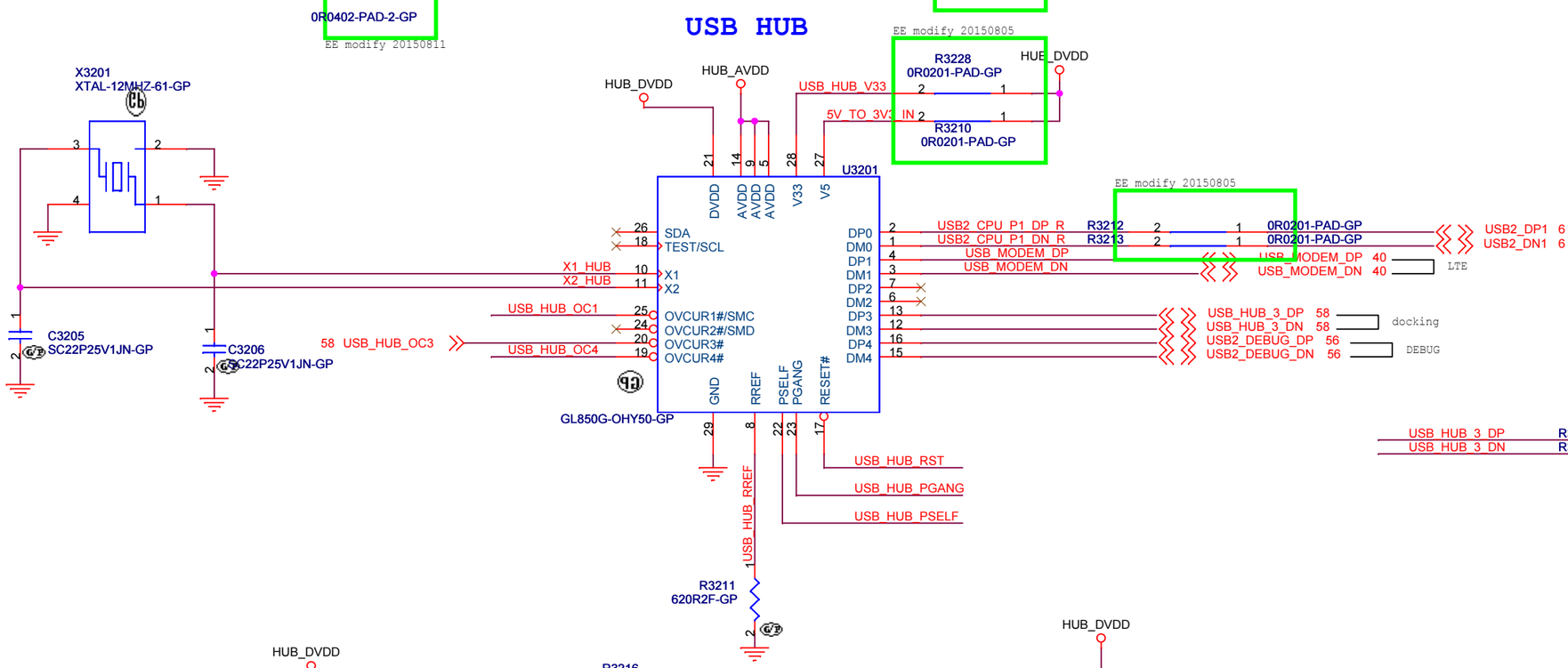
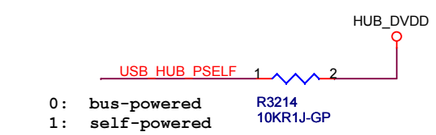
USB HUB



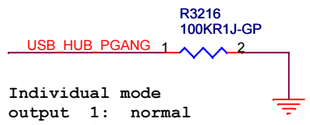


USB HUB

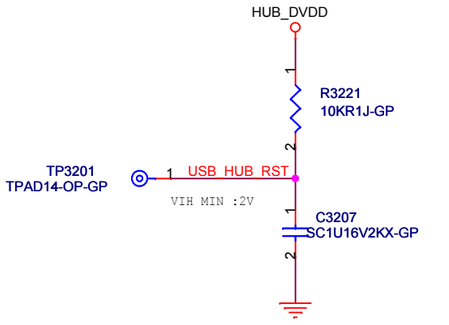




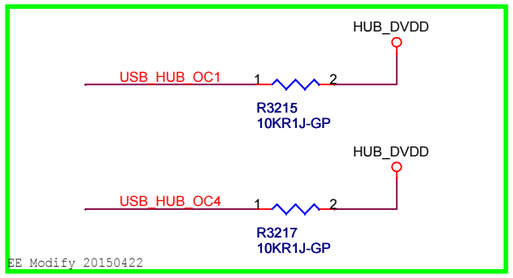
0: bus-powered
1: self-powered



Individual mode
output 1: normal
output 0 : suspend



need to check during System Reset



OVCURn#
Floating : Non-removable
Pull high : Removable

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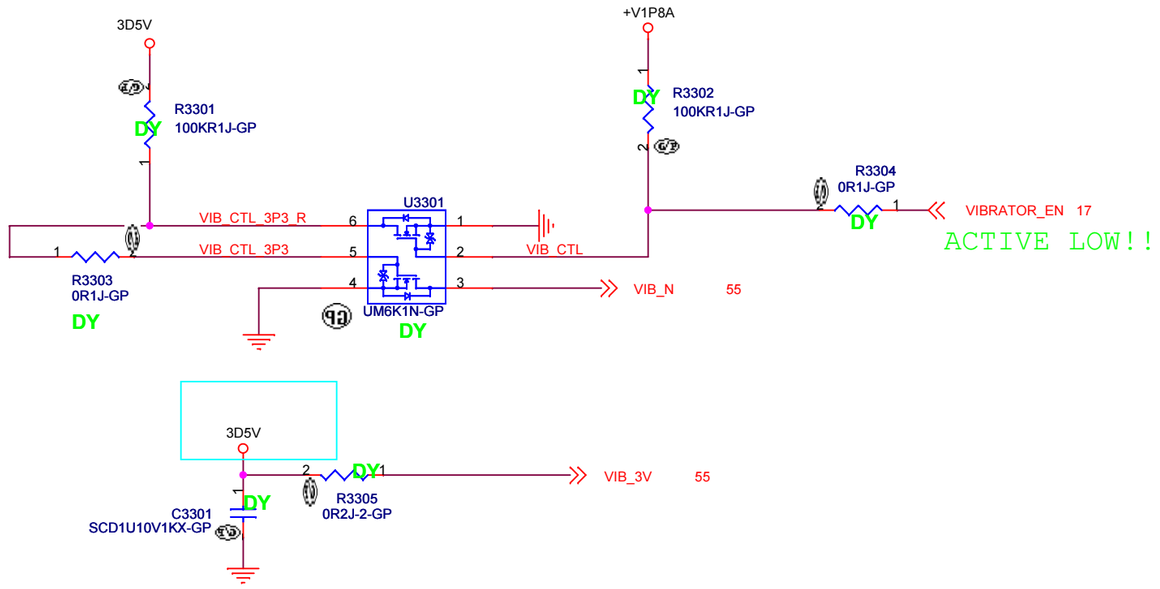
Vibrator



Somerset

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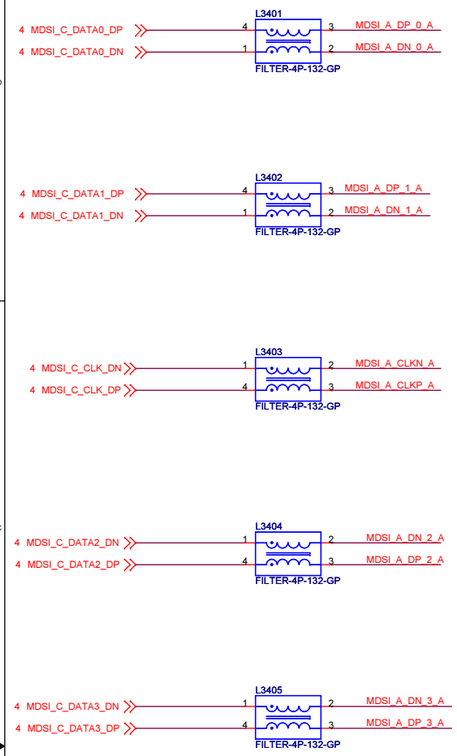
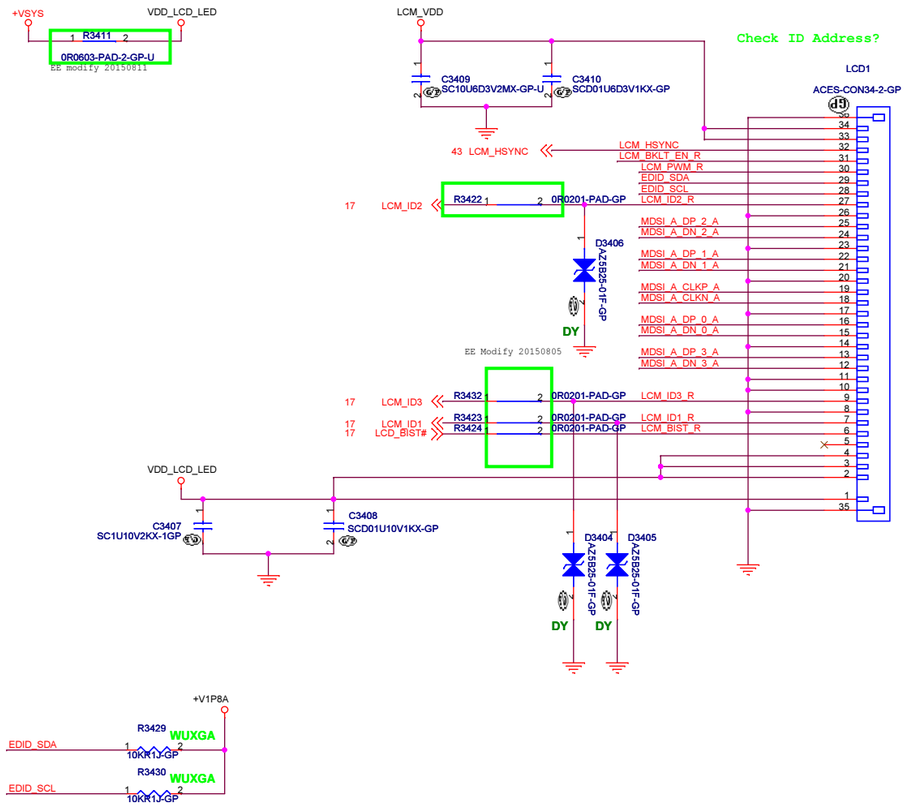
Taipei Hsien 221, Taiwan, R.O.C.

Title	33_Vibrator	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 33 of 72	

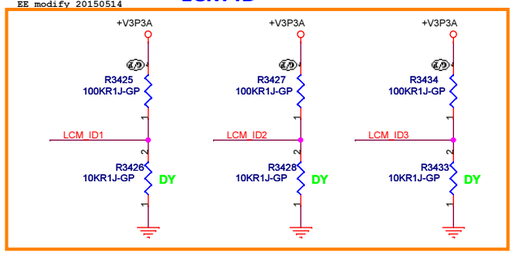
MIPI LCM 19x12

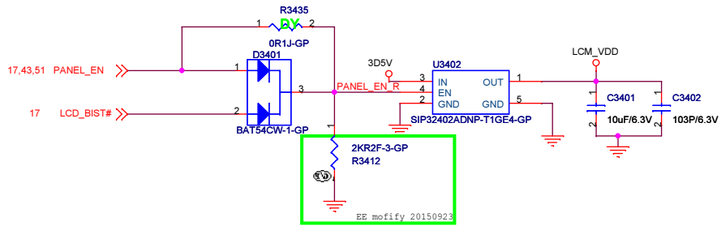


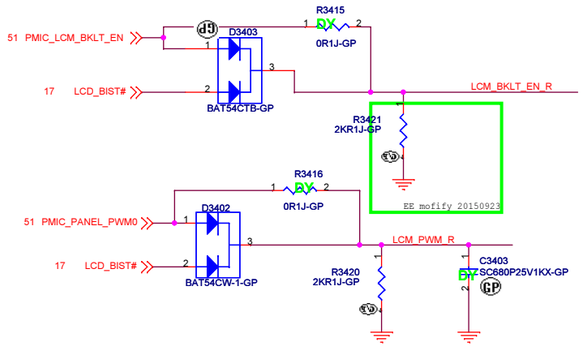


No.	Pin Name	Pin Name Description
1	VDD	DC-DC circuit supply voltage (3V~3.6V)
2	VDD	DC-DC circuit supply voltage (3V~3.6V)
3	H-sync	H-sync
4	LED EN	LED driver Enable Input (VIH=1.8V)
5	LED PWM	Backlight LED driver PWM Input (VIH=1.8V)
6	EDID SDA	EDID Data Input (VIH=1.8V)
7	EDID SCL	EDID Clock Input (VIH=1.8V)
8	ID	NC
9	GND	Ground
10	DSI_D2P/Rx-IN2P	MIPI data pair 2 positive signal
11	DSI_D2N/Rx-IN2N	MIPI data pair 2 negative signal
12	GND	Ground
13	DSI_D1P/Rx-IN1P	MIPI data pair 1 positive signal
14	DSI_D1N/Rx-IN1N	MIPI data pair 1 negative signal
15	GND	Ground
16	DSI_CLKP/Rx-CLKP	MIPI Clock positive signal
17	DSI_CLKN/Rx-CLKN	MIPI Clock negative signal
18	GND	Ground
19	DSI_D0P/Rx-IN0P	MIPI data pair 0 positive signal
20	DSI_D0N/Rx-IN0N	MIPI data pair 0 negative signal
21	GND	Ground
22	DSI_D3P/Rx-IN3P	MIPI data pair 3 positive signal
23	DSI_D3N/Rx-IN3N	MIPI data pair 3 negative signal
24	GND	Ground
25	GND	Ground
26	GND	Ground
27	GND	Ground
28	ID	Ground
29	BIST	Aging Mode Power Supply
30	NC	Not Connection
31	LED+	LED Power Supply (3V - 5V)
32	LED+	LED Power Supply (3V - 5V)
33	LED+	LED Power Supply (3V - 5V)
34	LED+	LED Power Supply (3V - 5V)

LCM ID







	LCM_ID1	LCM_ID2	LCM_ID3
AUO	H	H	L
BOE	H	L	L
NO Panel	H	H	H

Each port I/O has an internal
10 k Ω pull-up resistor to VCC(A)/VCC(B)

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Title	34_MIPI LCM CONN	
Size	Document Number: Somerset	Rev: SA
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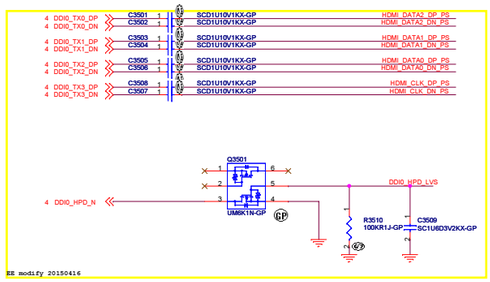
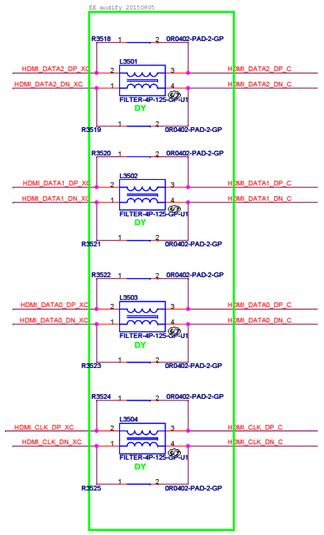
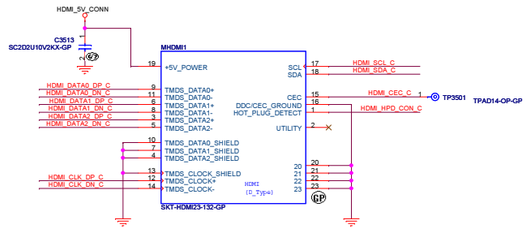
Device :uHDMI

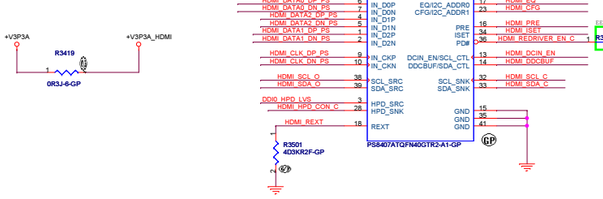


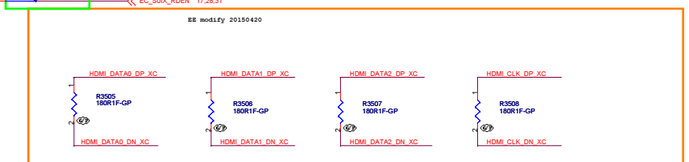


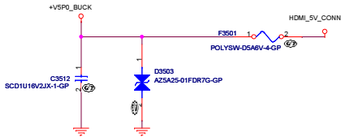


Pin	Pin定義
1	Hot Plug Detect
2	Utility
3	TMDS Data2+
4	TMDS Data2 Shield
5	TMDS Data2-
6	TMDS Data1+
7	TMDS Data1 Shield
8	TMDS Data1-
9	TMDS Data0+
10	TMDS Data0 Shield
11	TMDS Data0-
12	TMDS Clock+
13	TMDS Clock Shield
14	TMDS Clock-
15	CEC
16	DDC/CEC Ground
17	SCL
18	SDA
19	+5V Power

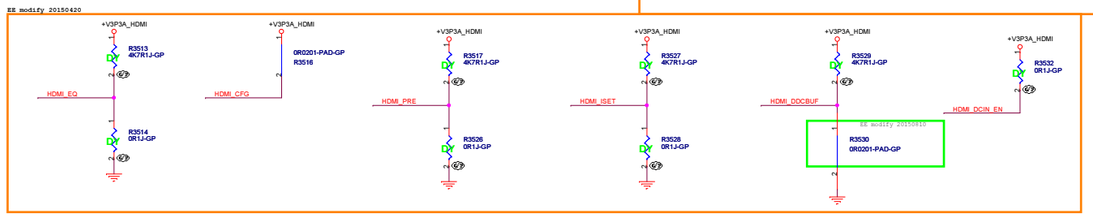
EE modify 20150420

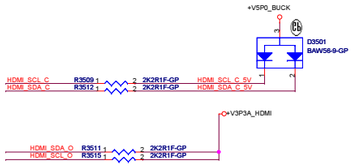




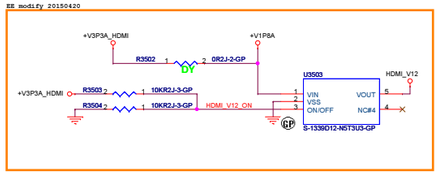


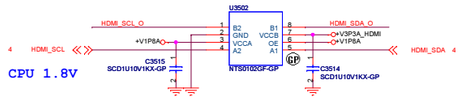
EE modify 20150420





EE modify 20150420





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Title	35_uHDMI CONN	
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Title **36_Display Port**

Size	Document Number	Rev
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WIFI/BT 2X2SFP

+V3P3A
WR3701 0R2J-2-GP
WC3701 SC1U10V2KX-1GP
WC3702 SC4D7U6D3V2MX-GP
WC3703 SC1U10V2KX-1GP
wifi 2x2
wifi 2x2
+VDD3V3_WIFI
WC3704 SC1U10V2KX-1GP
WC3715 SC47B50V2GN-GP
WC3719 SC47B50V2GN-GP
WR3703 0R0402-PAD-2-GP
+V1P8A
+V1P8A_WIFI
WC3711 SC1U10V2KX-1GP
EE modify 20150805

WU3701
WLAN-MODULE-96-GP

PERP0 WC3713 SCD1U10V1KX-GP PCIE_TXP0 5
PERN0 WC3712 SCD1U10V1KX-GP PCIE_TXN0 5
PETP0 WR3719 0R0201-PAD-GP PCIE_RXP0 5
PETN0 WR3720 0R0201-PAD-GP PCIE_RXN0 5
EE modify 20150811
EE modify 20150805
PCIE_REFCLK0_P 5
PCIE_REFCLK0_N 5
WIFI_PERST# WR3711 0R1J-GP
PEWAKE# WR3702 0R1J-GP
PCIE_CLKREQ0#
WR3716
+V1P8A_WIFI
10KR2J-3-GP

+V1P8A_WIFI
WR3718 10KR1J-GP
DY
10KR1J-GP
WR3721
PLTRST# 7,17,50,56,57
PCIE_CLKREQ0# 5
WIFI_HOST_WAKE# 7
EE modify 20150818

10KR2J-3-GP DY WR3704 +V1P8A
W_DISABLE1# 28
SUSCL_32KHZ 27 RTC_CLK WR3708 0R1J-GP WL_DEV_EN 6 SUS_CLK_WLAN 7

7 SOC_RTS WR3712 DY 0R2J-2-GP BT_CTS
7 SOC_RXD WR3713 DY 0R2J-2-GP BT_TXD
7 SOC_TXD WR3714 DY 0R2J-2-GP BT_RXD
7 SOC_CTS WR3715 DY 0R2J-2-GP BT_RTS

7 BT_DEV_EN WR3705 0R1J-GP BT_SHUTDOWN_N
+V1P8A_WIFI WR3706 DY 100KR1J-GP WIFI_LED_EN#
WR3707 DY 100KR1J-GP BT_LED_EN#

6 USB2_WIFI_DN WR3709 0R1J-GP USB2_WIFI_DN_R
6 USB2_WIFI_DP WR3710 0R1J-GP USB2_WIFI_DP_R

+VDD3V3_WIFI

WLAN_RESERVED
WR3717 DY 0R2J-2-GP +V1P8A_WIFI

+VDD3V3_WIFI
WC3718 104P/10V
WC3717 104P/10V
WC3716 SC1U6D3V2KX-GP

IPEX1 IPEX-CON2-GP
RF_WIFI_ANT1
0R1J-GP WC3709
ANT1_GND
ANT1 ANT-2P-29-GP
WC3710 SC1P25V1BN-GP
RF_WIFI_ANT_AUX_3
WC3708 SCD5P25V1BN-GP
EE modify 20150813
By RF request

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Title	37_WIFI/BT	
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GPS

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Title	**38_GPS**	
Size	Document Number **Somerset**	Rev SA
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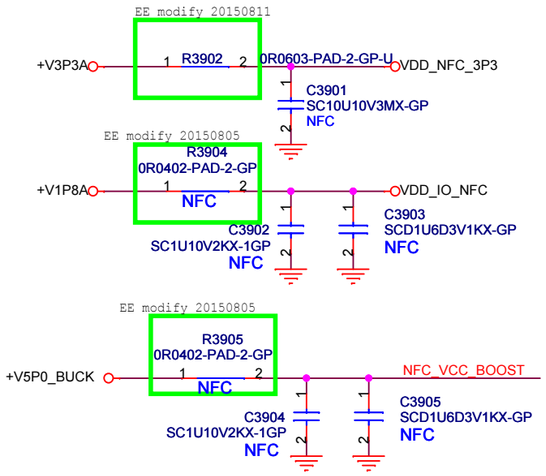
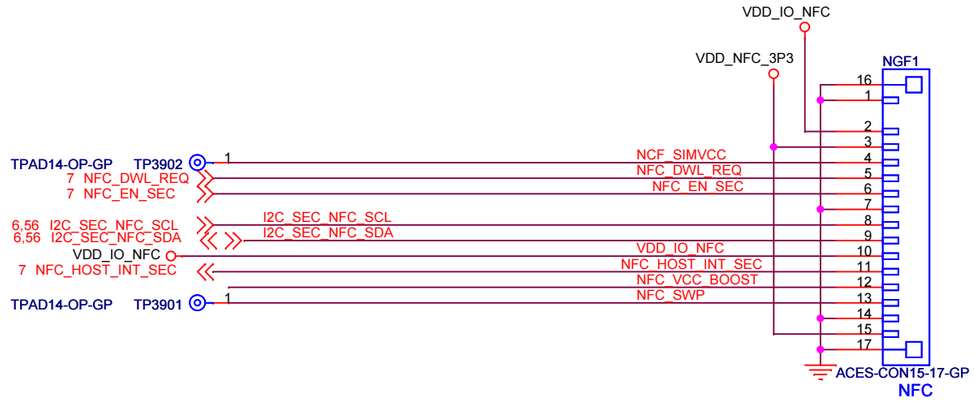
NFC





NFC used Module Type

Pin number	Name
1	MOD_VDD
2	MOD_GND
3	SWP
4	VCC_BOOST
5	IRQ
6	PMUVCC
7	I^2C_SDA
8	I^2C_SCL
9	MOD_GND
10	Reset/Wakeup
11	DWL_REQ
12	SIMVCC
13	MOD_VDD
14	VDD_IO
15	MOD_GND

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Title	39_NFC	
Size	Document Number: Somerset	Rev: SA
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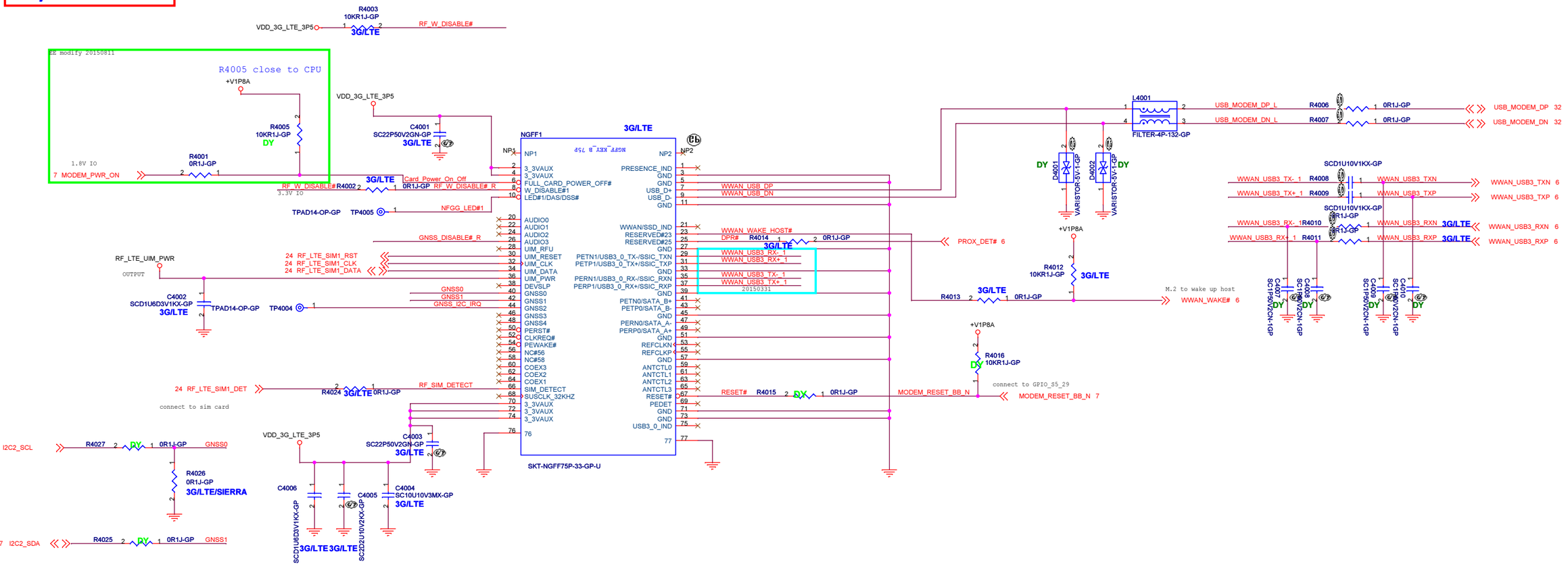
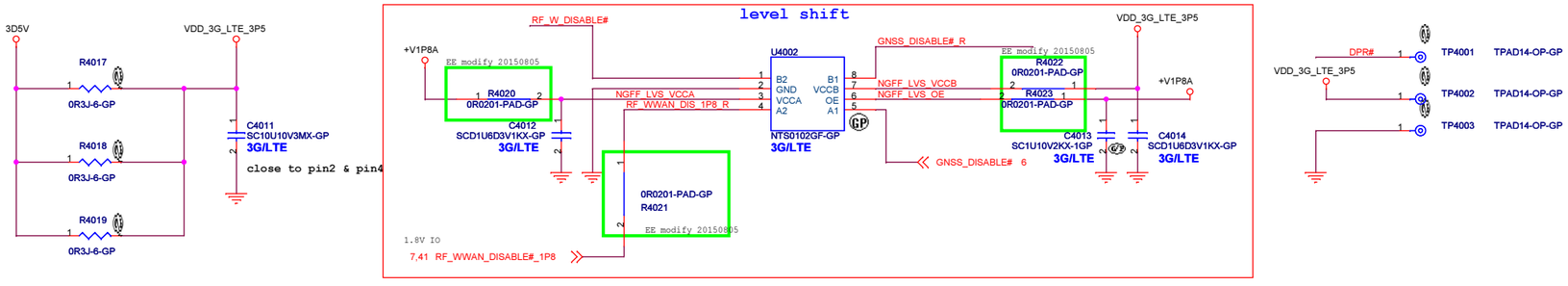
3G/LTE module





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Title		
	40_3G/LTE	
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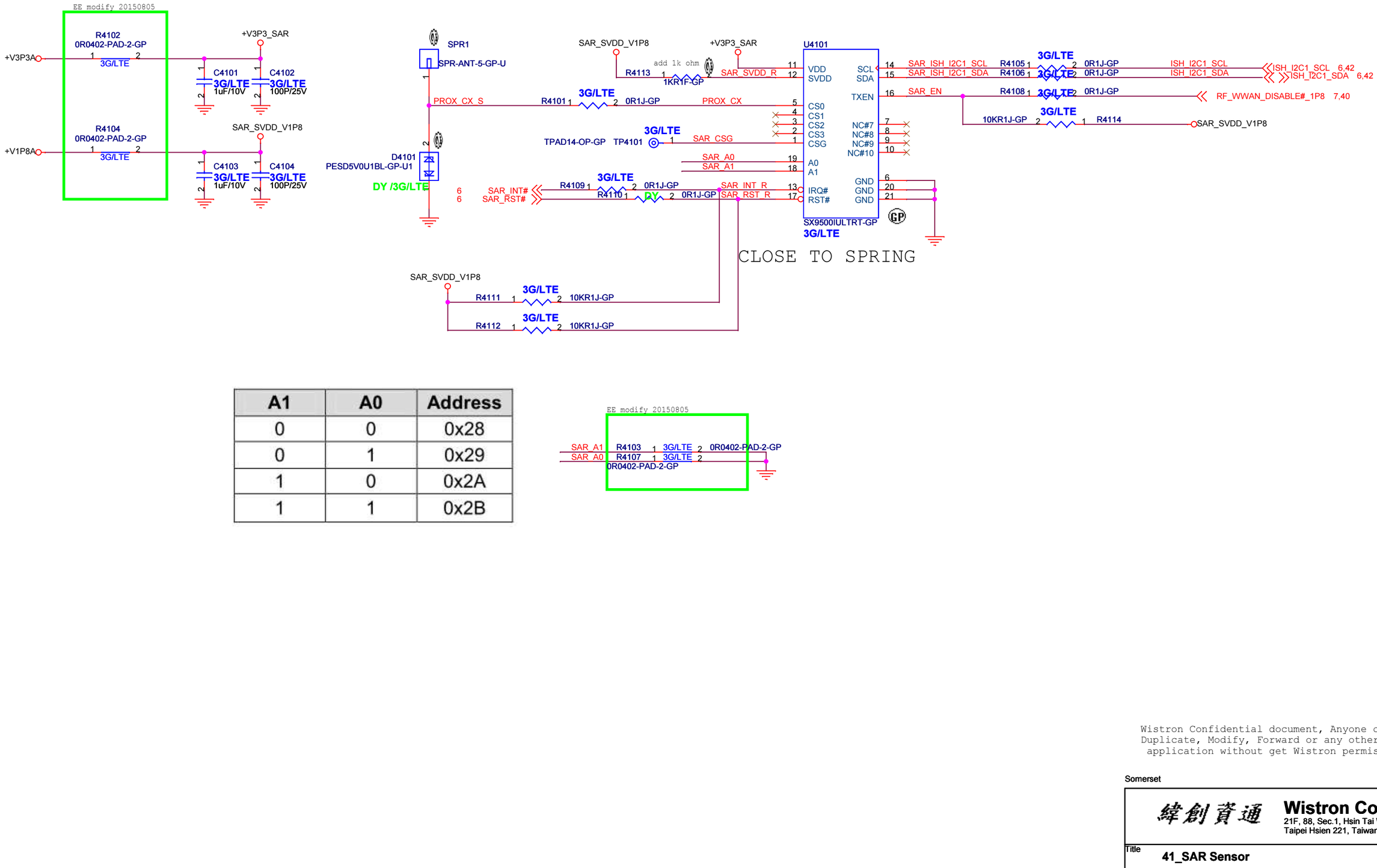
SAR sensor for 3G/LTE



A1	A0	Address
0	0	0x28
0	1	0x29
1	0	0x2A
1	1	0x2B

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Title	41_SAR Sensor	
Size	Document Number: Somerset	Rev: SA
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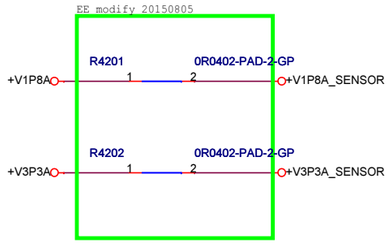
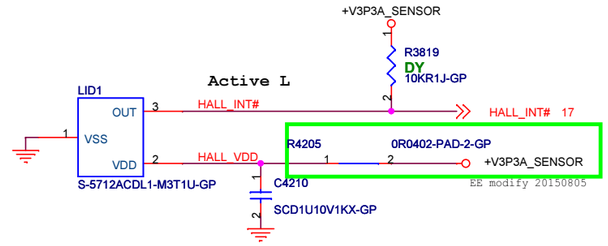
Sensor

EE modify 20150805



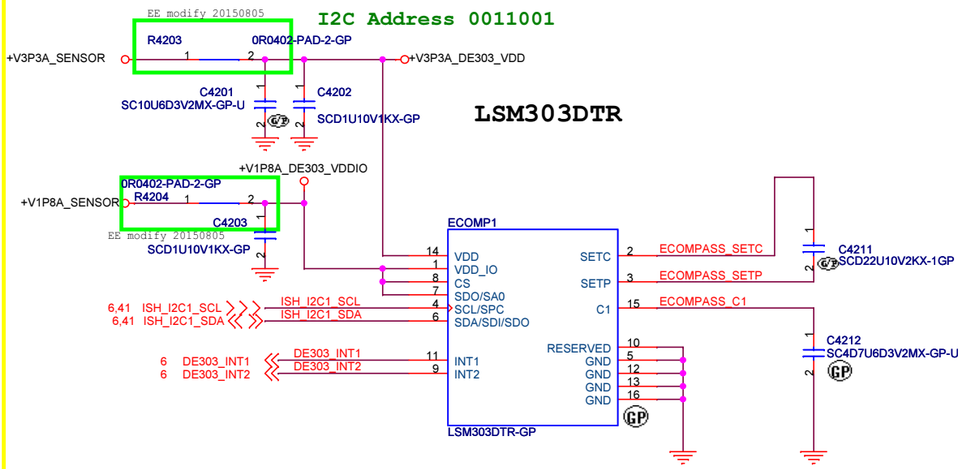
HALL Sensor



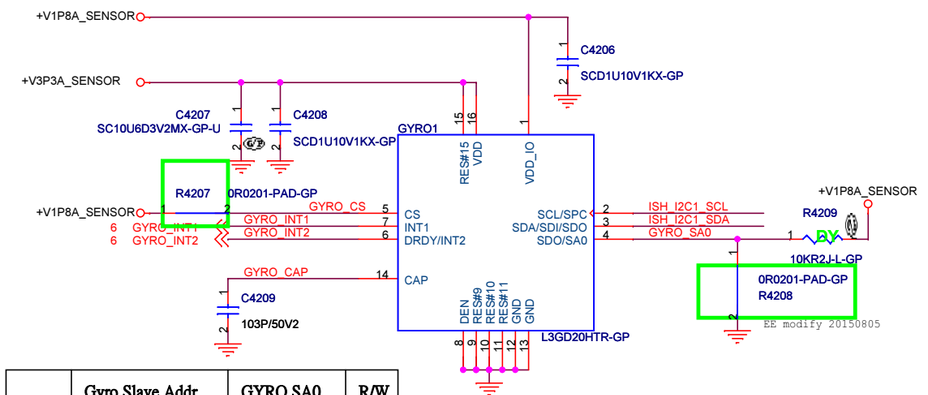
EE mofify 20150416

G Sensor + E-Compass

I2C Address 0011001



Gyro Sensor I2C Address 1101010



		Gyro Slave Addr	GYRO SA0	R/W
D4	Write	110101	0	0
D5	Read	110101	0	1

		G-Sensor Slave Addr	R/W
3A	Write	0011,101	0
3B	Read	0011,101	1

		e-Compass Slave Addr	R/W
3C	Write	0011,110	0
3D	Read	0011,110	1

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Title: 42_Sensor

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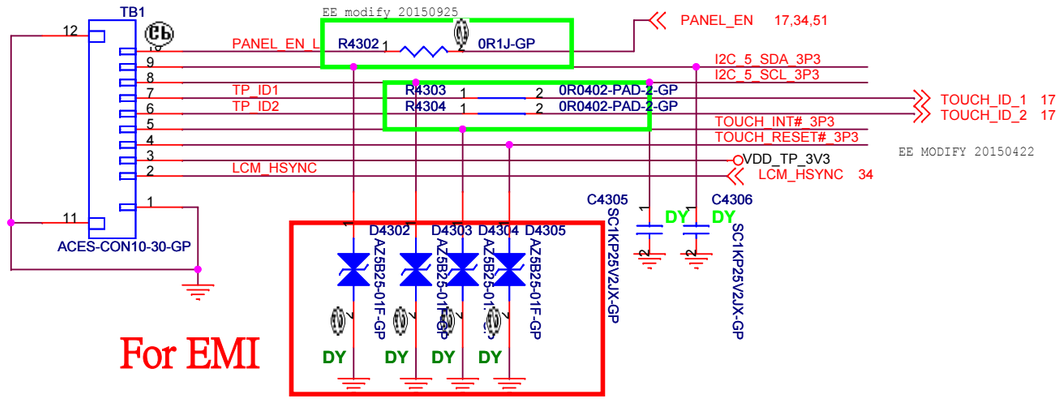
Touch Panel

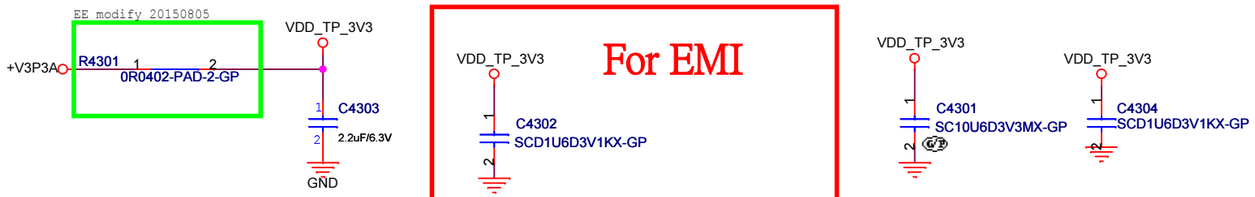
CN1 PIN #	Host 接続時	Description
1	NC	Keep Open
2	SDA	IIC Data Open drain; pull-up resister at Host is needed
3	SCL	IIC Clock Open drain; pull-up resister at Host is needed
4	ID01	Touch Sensor Identification Pin 01
5	ID02	Touch Sensor Identification Pin 02
6	IRQ	IIC Data Ready Output "LOW" when data ready to send Open drain; pull-up resister at Host is needed
7	RESET	RESET Stop operation when pull "LOW" Build-in pull-up resister 100kohm
8	VDD +3.3V	3.3volt power input
9	HSYNC	LCD Hsync input
10	GND	Ground

Touch Screen 0x?

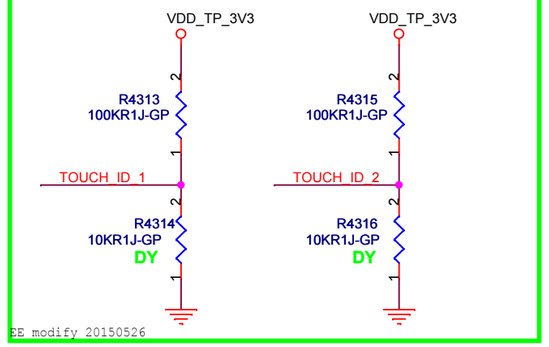


ID1 ID2

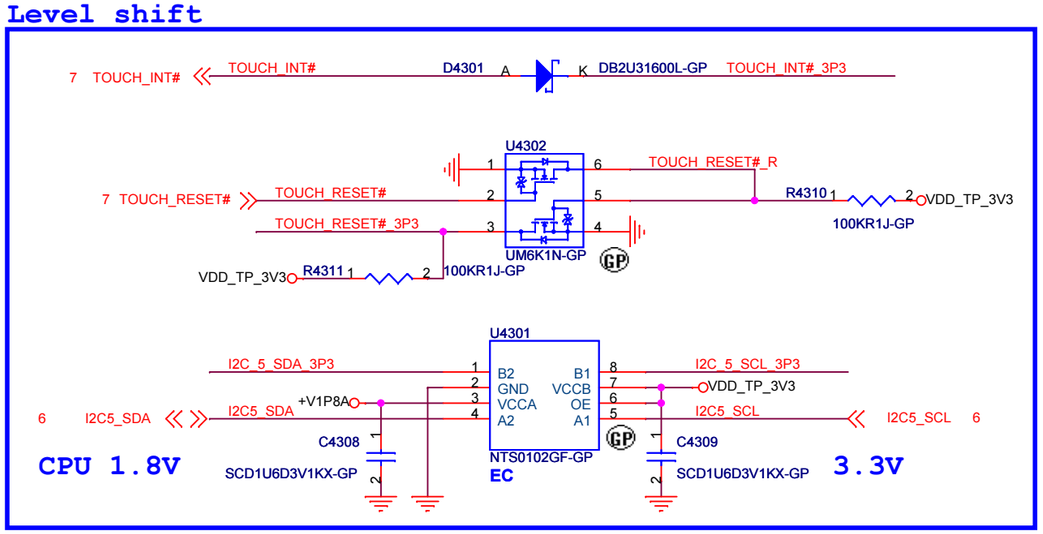
	ID0 (Pin 4)	ID1 (Pin 5)
HH	NC	NC
TPK	NC	GND
O-Film	GND	NC
Option2	GND	GND



Touch ID



Level shift



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Title: 43_Touch Panel

Size | Document Number: Somerset | Rev: SA

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Title: **44_LED BOOST**

Size	Document Number	Rev
B	**Somerset**	0

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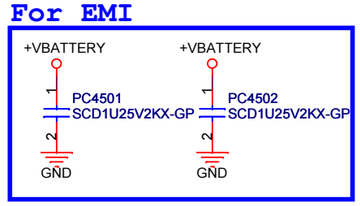
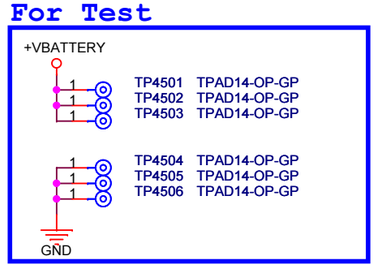
BATTERY CONN

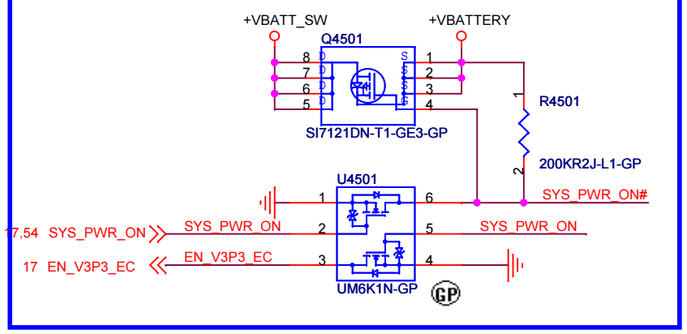
For EMI



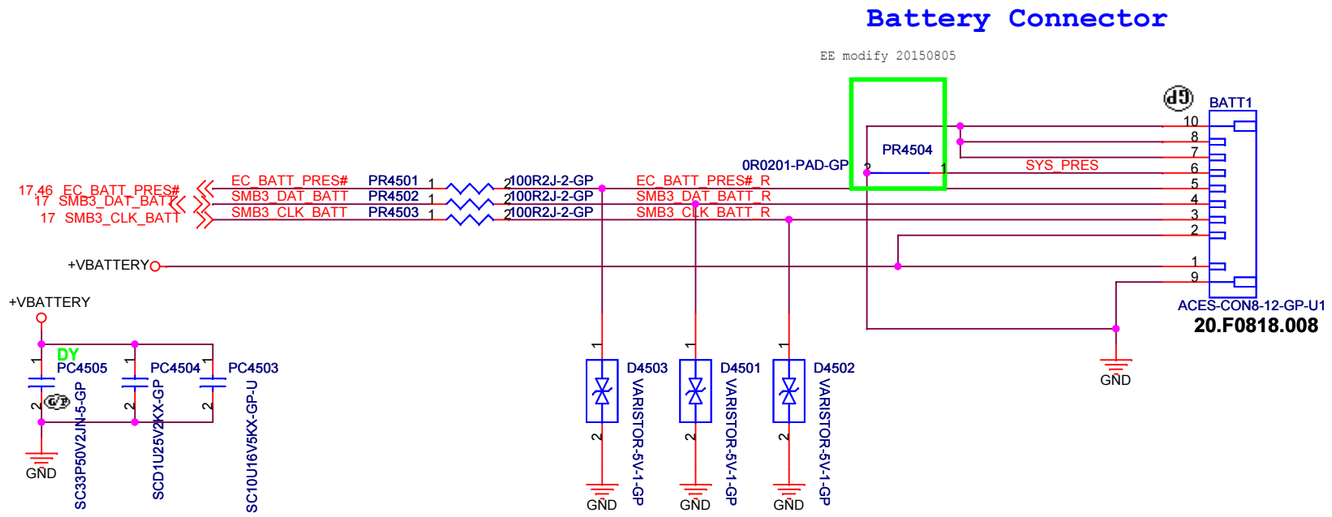
For Test



S5/Shipping mode



Battery Connector



Pin #	Signal	Description/Function	Color
1	BATT+	Power, Batt +, Positive terminal of battery stack	Red
2	BATT +	Power, Batt +, Positive terminal of battery stack	Red
3	CLK_SMB	System Management Bus Clock	Blue
4	DAT_SMB	System Management Bus Data	White
5	BATT_PRS*	Battery Present (This is tied to ground on the Battery Pack)	Yellow
6	SYS_PRES*	System Present (This is tied to ground on the system side)	Green
7	GND	Power, Batt -, Negative terminal of battery stack	Black
8	GND	Power, Batt -, Negative terminal of battery stack	Black

Somerset	Connecter type: WTB, 8Pin
	Connecter: Aces 50280-010H0H0-001
	Per. Pin Rating: 1.8A/Per pin

WIRELESS CHARGE

EE modify 20150605
delete Wireless charger related circuit

Somerset

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title	45_BATT CONN	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 45 of 72	

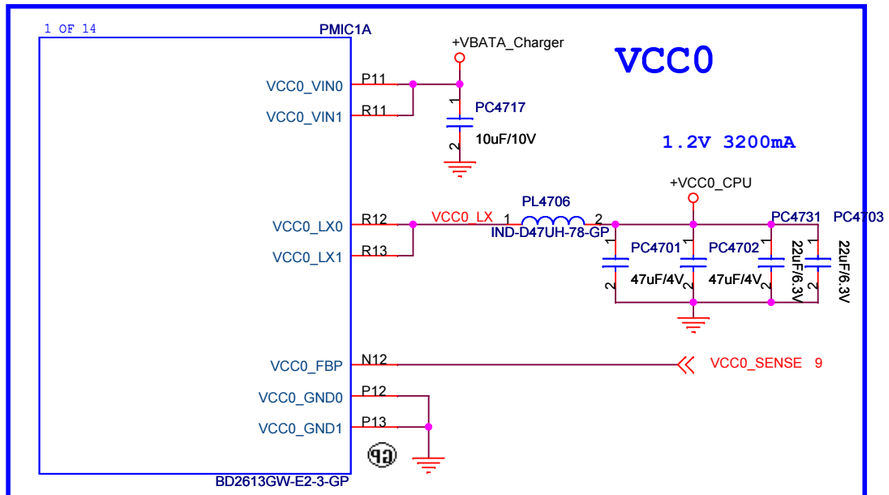
Charger

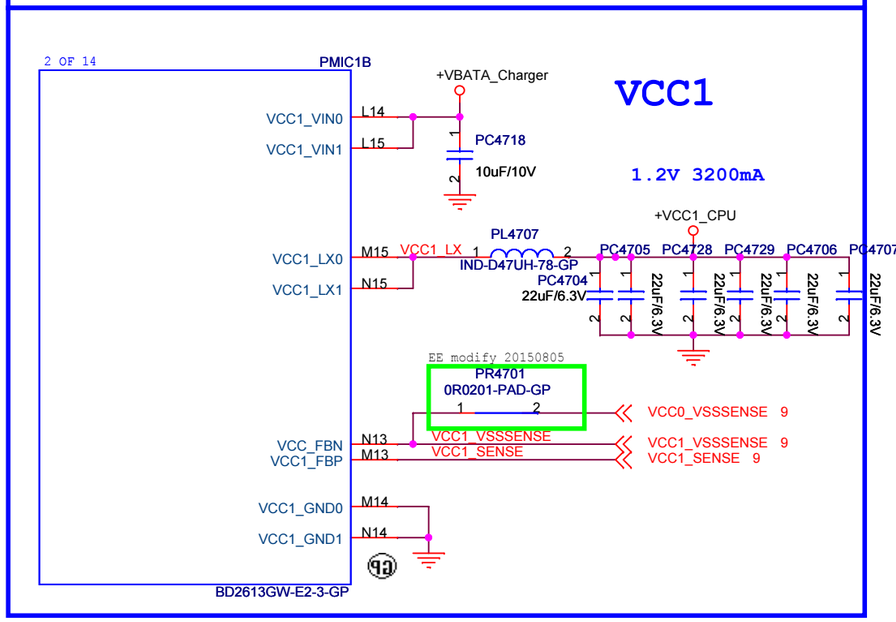
V_{REGN_REG}	REGN Regulator Voltage	VVCC > 6.5V, VACDET>0.6V		5.4		V

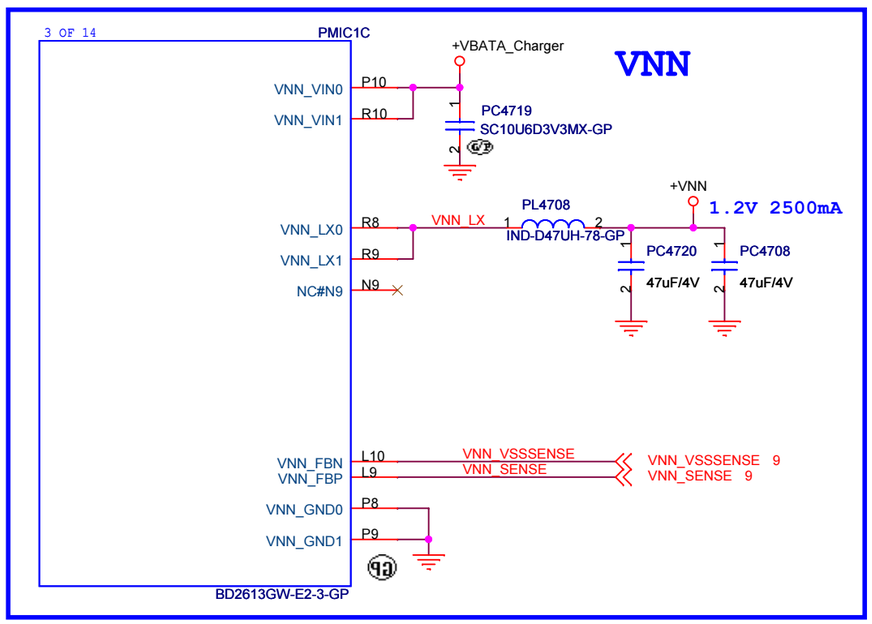
Somerset

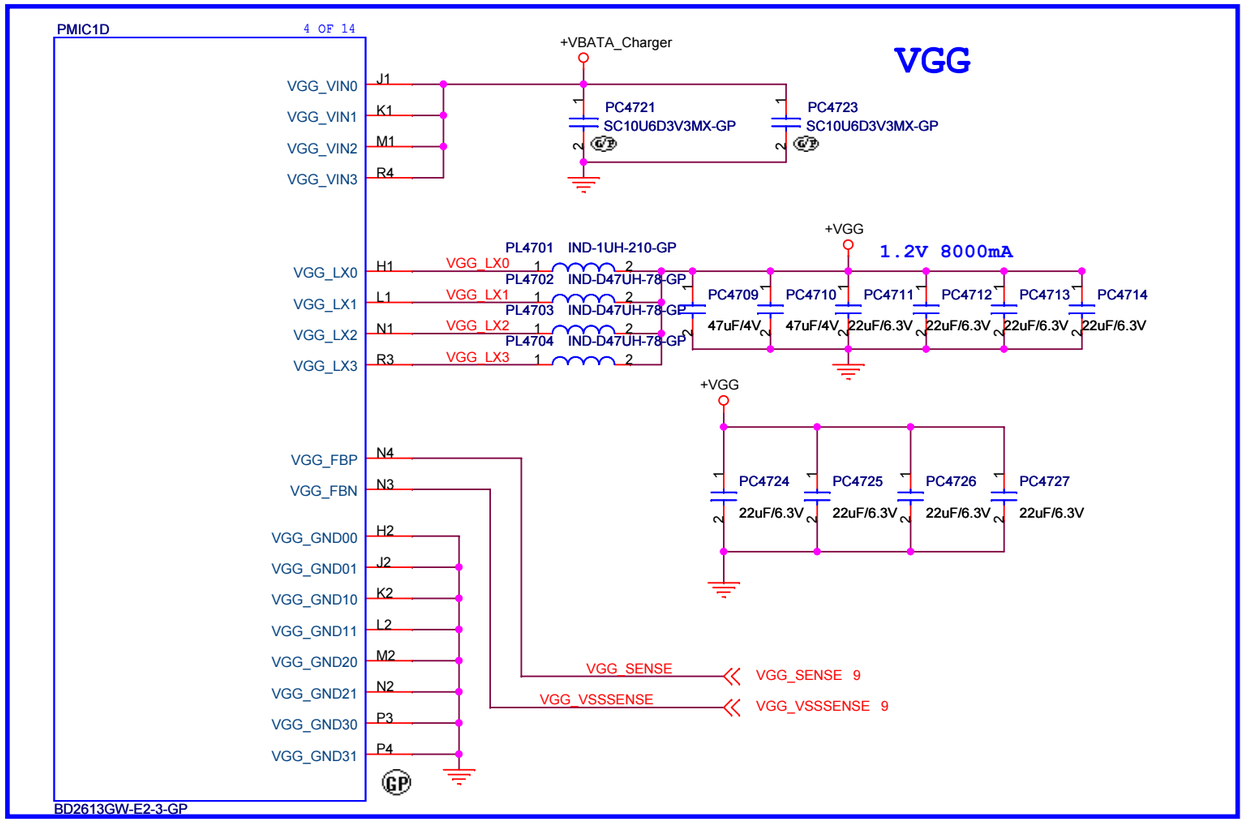
綽創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

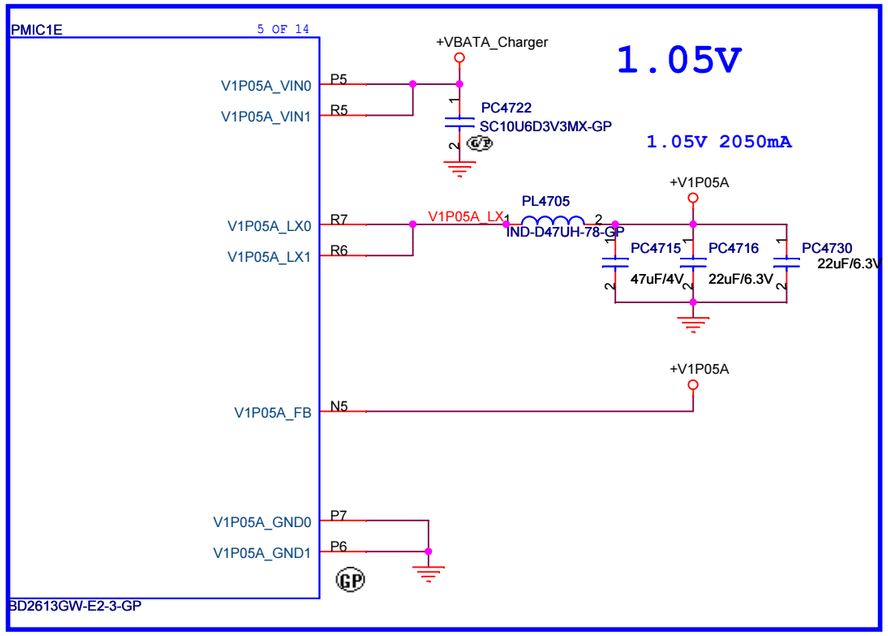
Title	46_CHARGER	
Size	Document Number: Somerset	Rev: SA
Date: Sunday, September 27, 2015	Sheet 46 of 72	











Somerset

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Taipei Hsien 221, Taiwan, R.O.C.

Title: 47_PMIC(1/5)_(BD2613)

Size	Document Number	Rev
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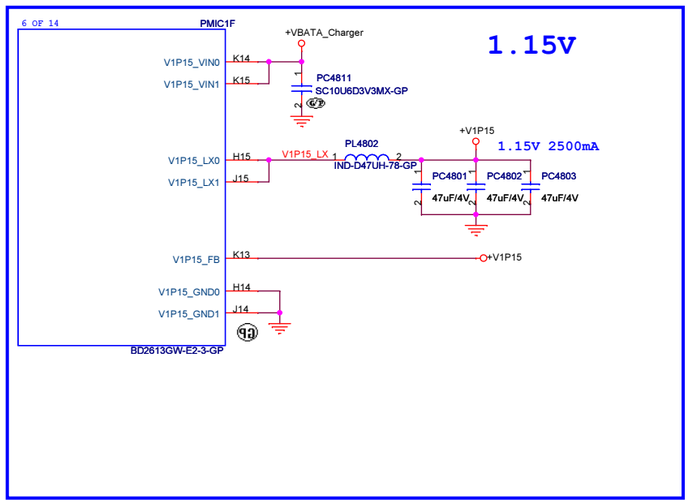
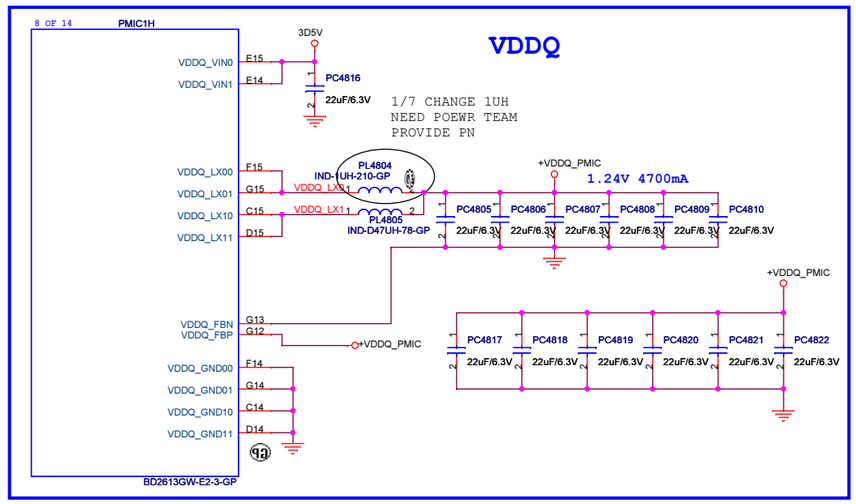
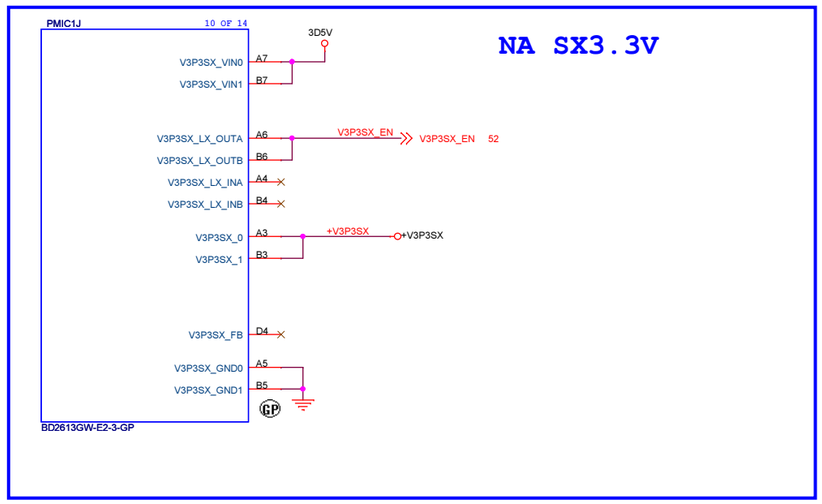
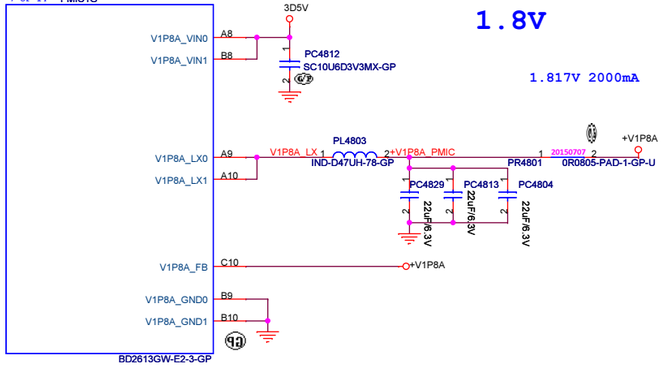
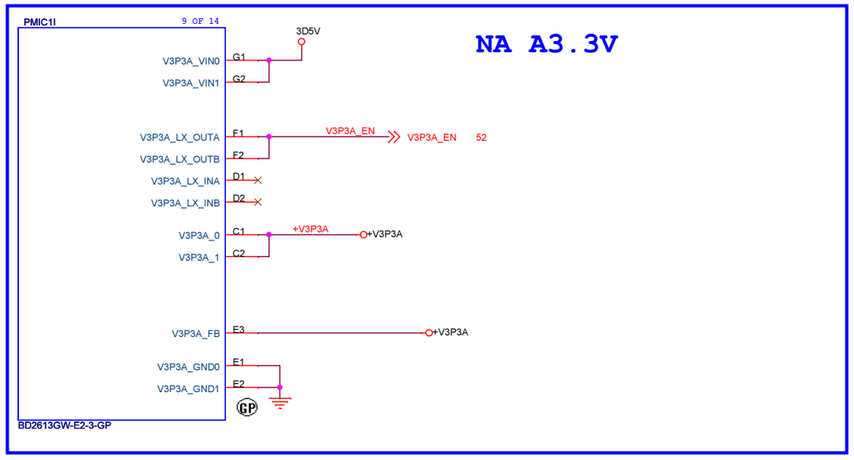
Date: Sunday, September 27, 2015 Sheet 47 of 72

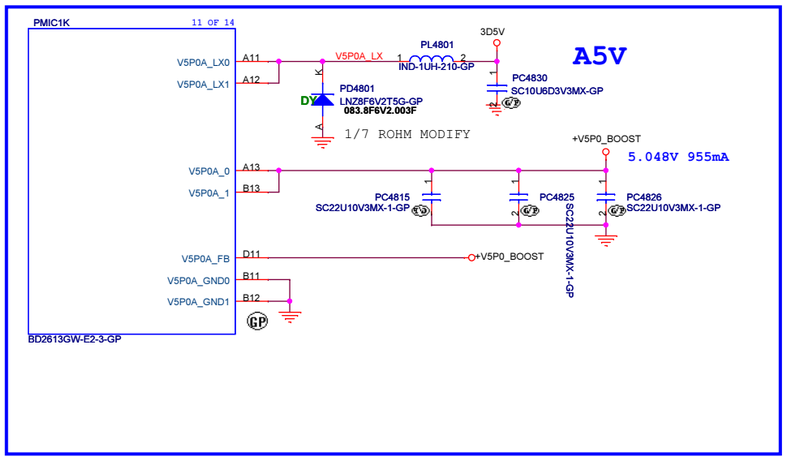












Somerset

緯創資通 **Wistron Corporation**
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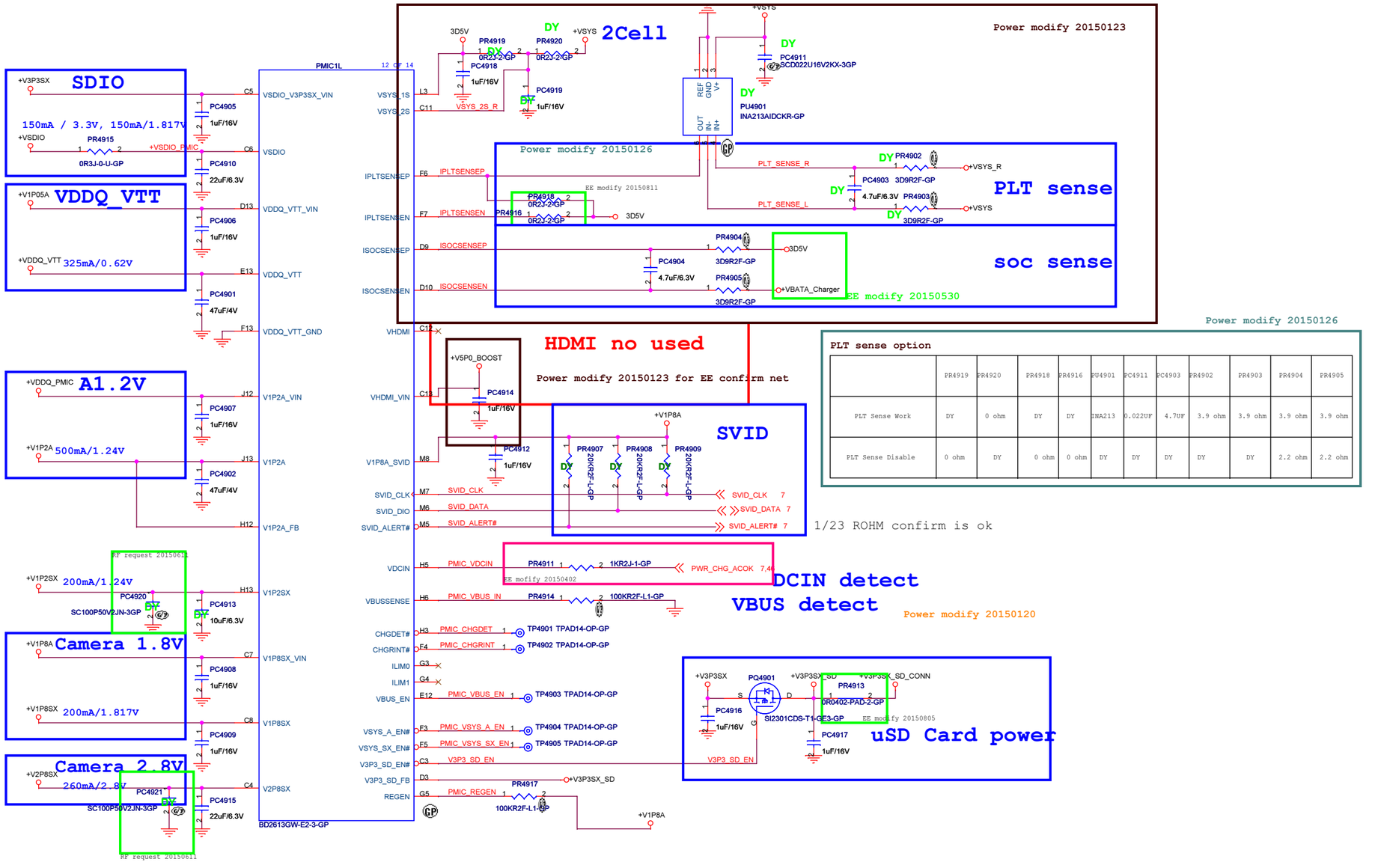
Title: 48 PMIC(2/5) (BD2613)

Size	Document Number	Rev
	Somerset	SA

Date: Sunday, September 27, 2015 Sheet 48 of 72



Power modify 20150126

PLT sense option

	PR4919	PR4920	PR4918	PR4916	PU4901	PC4911	PC4903	PR4902	PR4903	PR4904	PR4905
PLT Sense Work	DY	0 ohm	DY	DY	INA213	0.022UF	4.7UF	3.9 ohm	3.9 ohm	3.9 ohm	3.9 ohm
PLT Sense Disable	0 ohm	DY	0 ohm	0 ohm	DY	DY	DY	DY	DY	2.2 ohm	2.2 ohm

1/23 ROHM confirm is ok

Somerset

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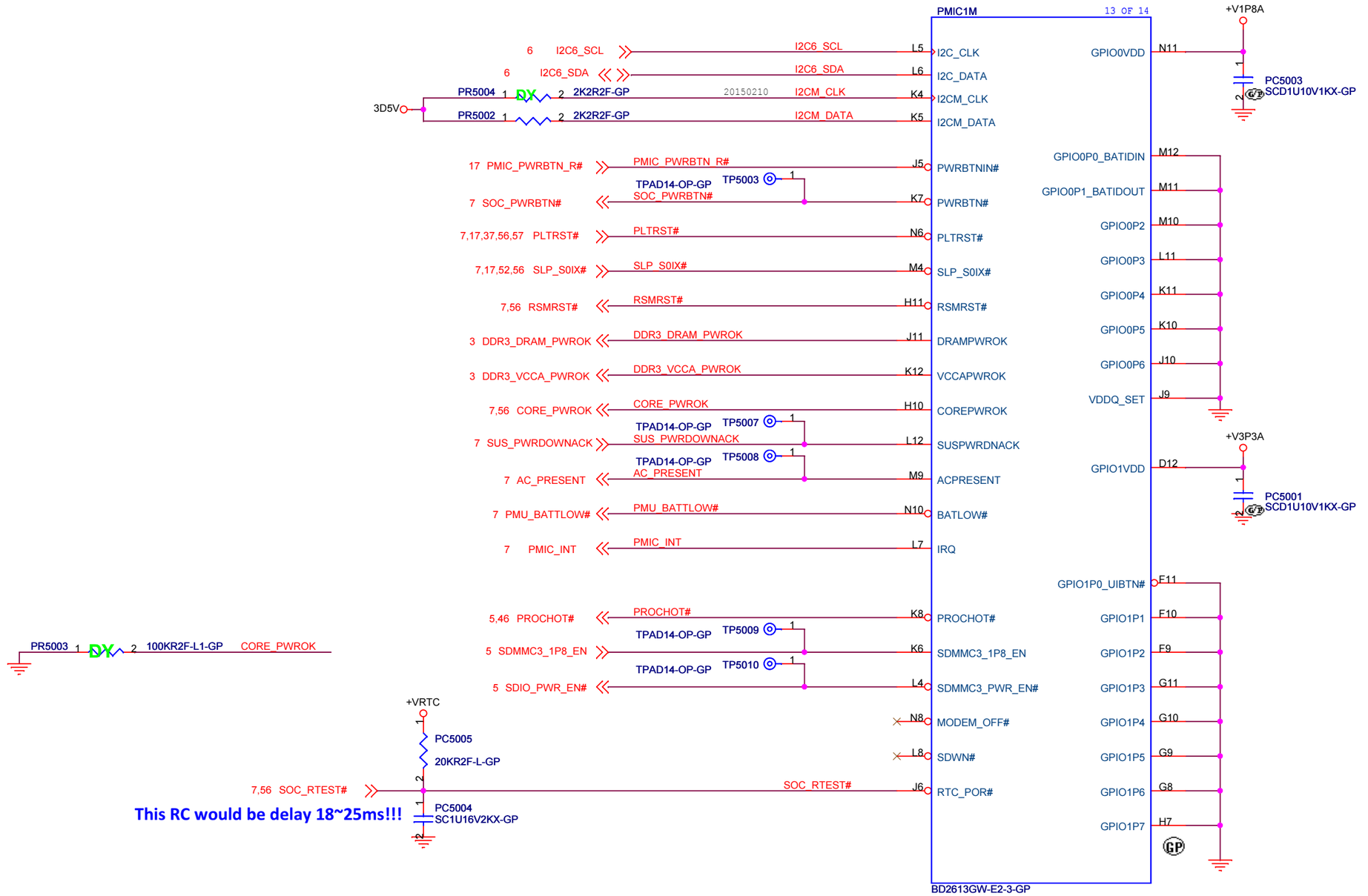
Taipei Hsien 221, Taiwan, R.O.C.

Title: 49_PMIC(3/5)_(BD2613)

Size | Document Number: Somerset | Rev: SA

Date: Sunday, September 27, 2015 | Sheet 49 of 72



Somerset

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Taipei Hsien 221, Taiwan, R.O.C.

Title: 50_PMIC(4/5)_(BD2613)

Size	Document Number	Rev
	Somerset	SA

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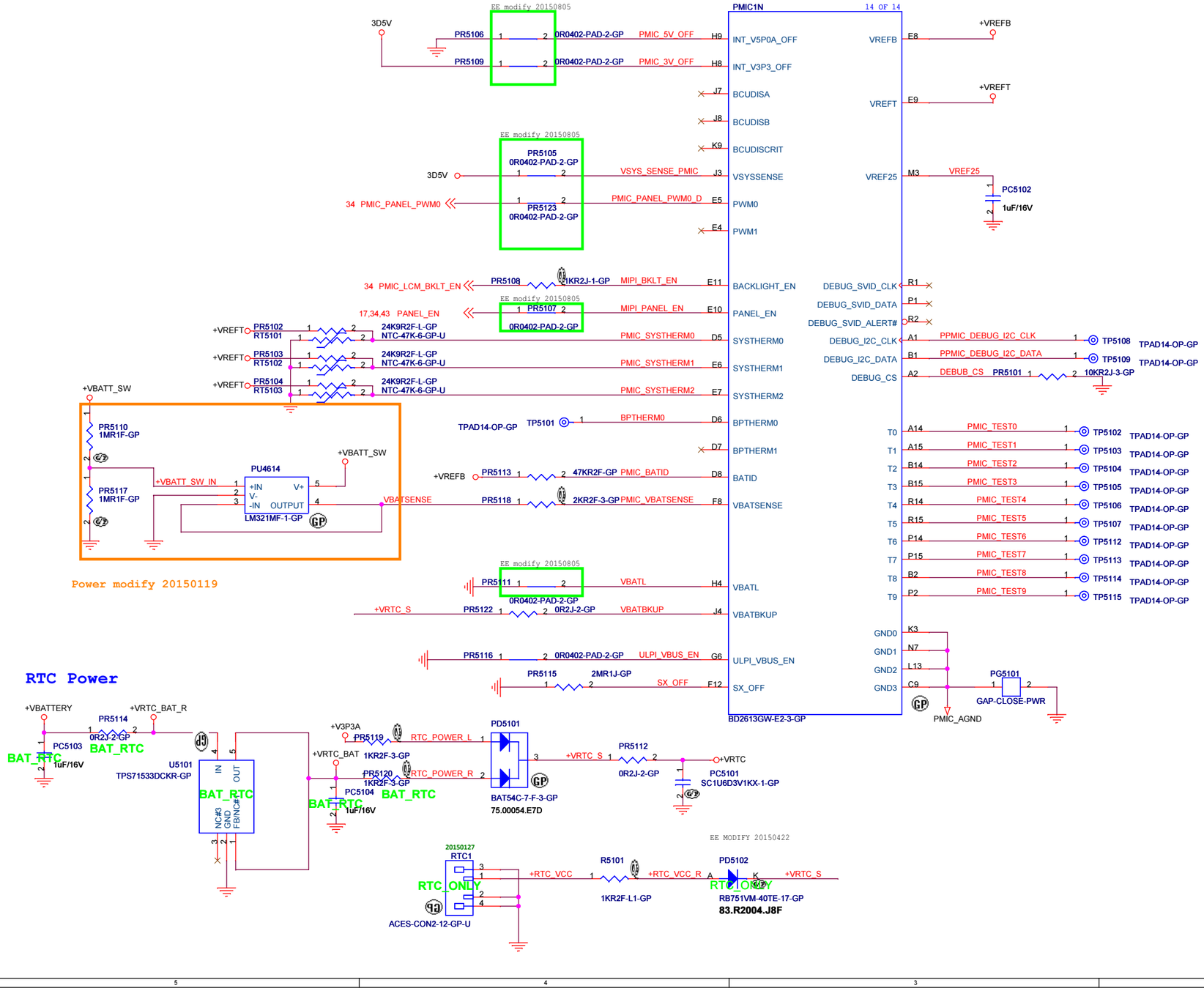

Somerset

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Taipei Hsien 221, Taiwan, R.O.C.

Title	51_PMIC(5/5)_(BD2613)	
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5V BUCK

SSID = PWR.Plane.Regulator_3D5V

SY8206D for 3D5V

Design Current=5A

Power modify 20150116

Power modify 20150526

Power modify 20150812

Power modify 20150126

Power modify 20150130

EE Modify20150402

A3.3V

SX3.3V

Trace used 10 mil

MagLayer. 4x 4 x 1.2mm
DCR: 43~47mOhm
Idc : 4.2A , Isat : 5.2A

EN rating 33V
EN Rising Threshold : 0.8V
Ilimt :8A

OCP setting	
High	12A
Float	8A
Low	6A

Vo=0.6x(1+R1/R2)
=0.6x(1+90.9/20)
=3.327V

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Title: 52_5V_BOOST & 3.3V

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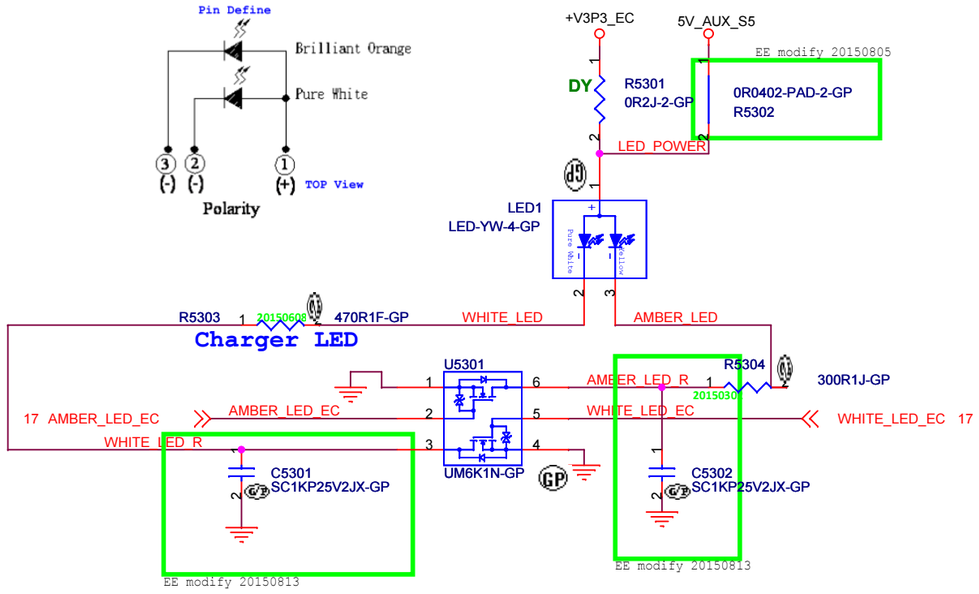
POWER LED



WIRELESS LED

USB HSIC HUB

Somerset

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Title	53_POWER LED/DOCK CONN	
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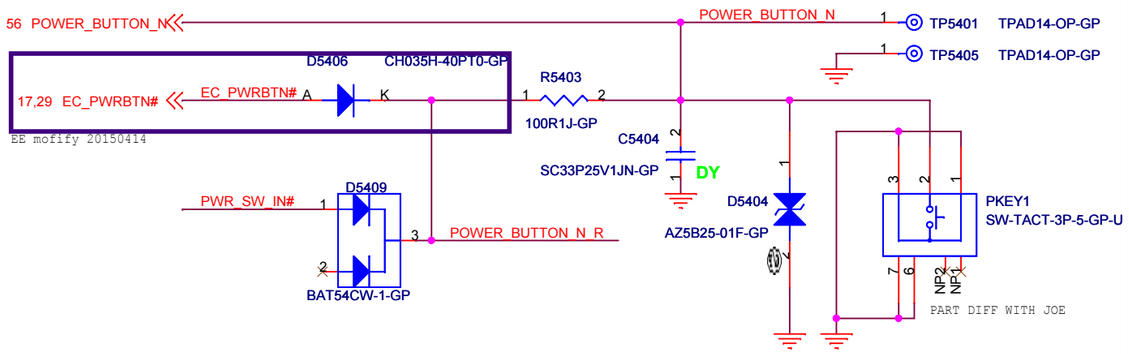
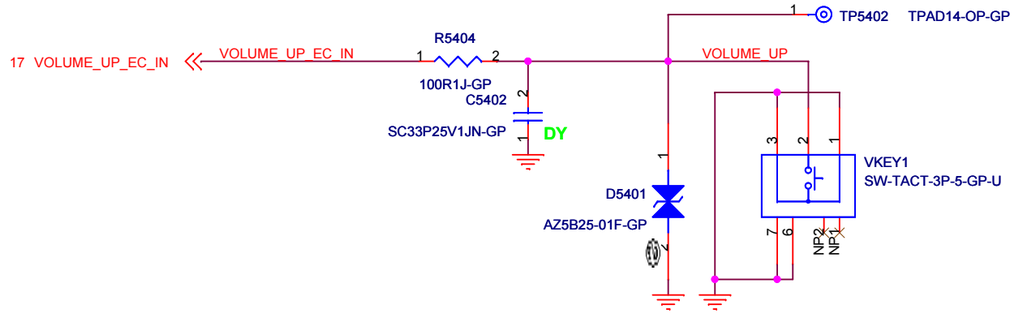
PWR Button / Volum Key / Home key

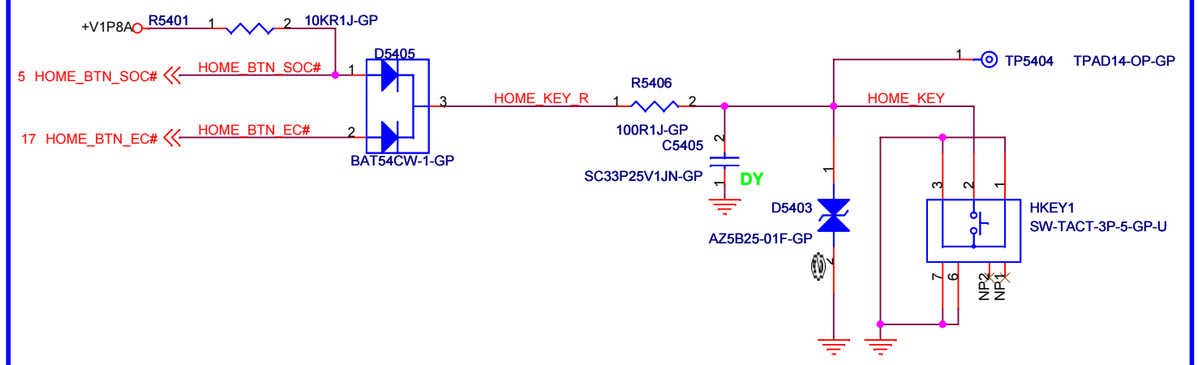
POWER KEY



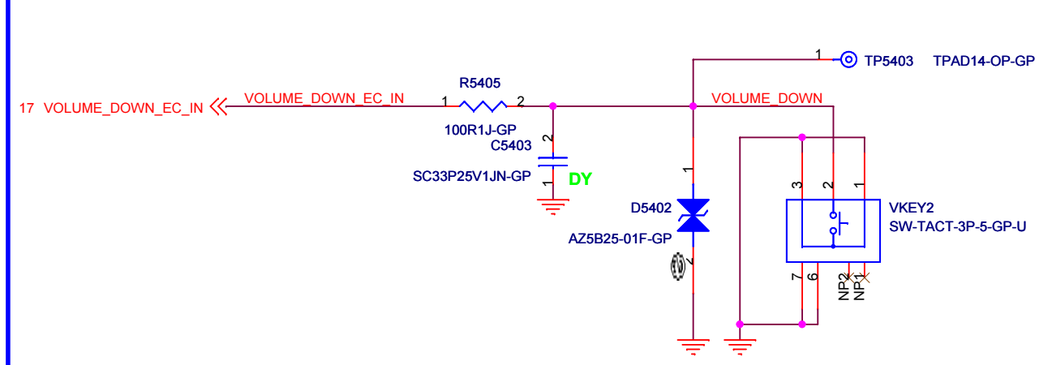
VOLUME UP KEY



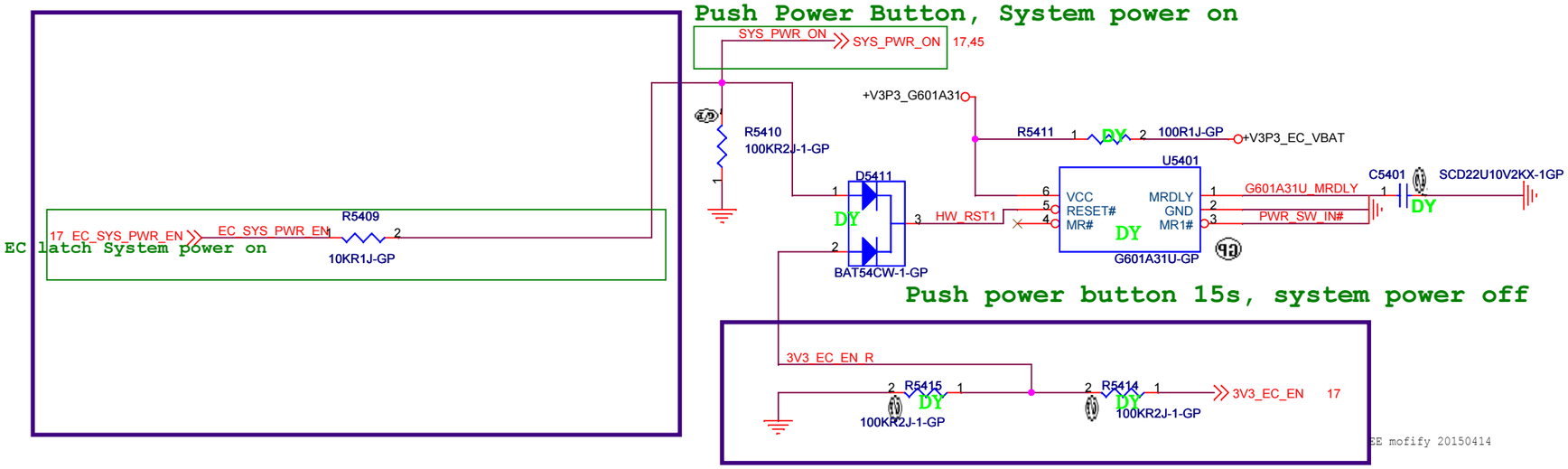
HOME KEY



VOLUME DOWN KEY



SYSTEM POWER ON



Somerset

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Title	54_PWR/Volume/Home Button	
Size	Document Number: Somerset	Rev: SA
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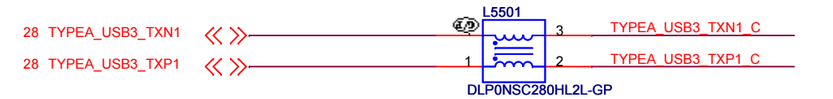
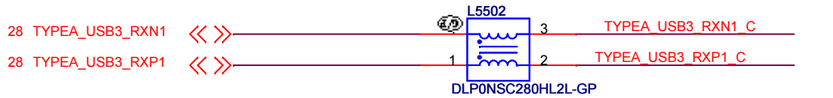
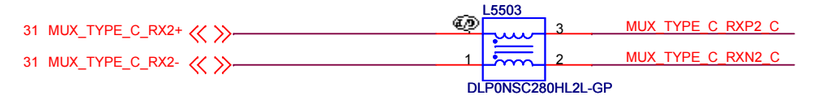
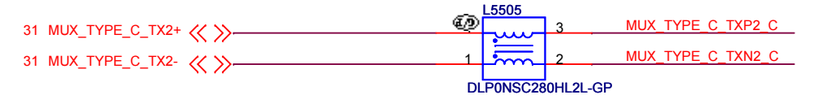
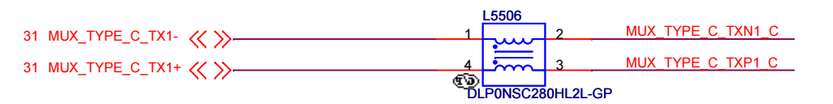
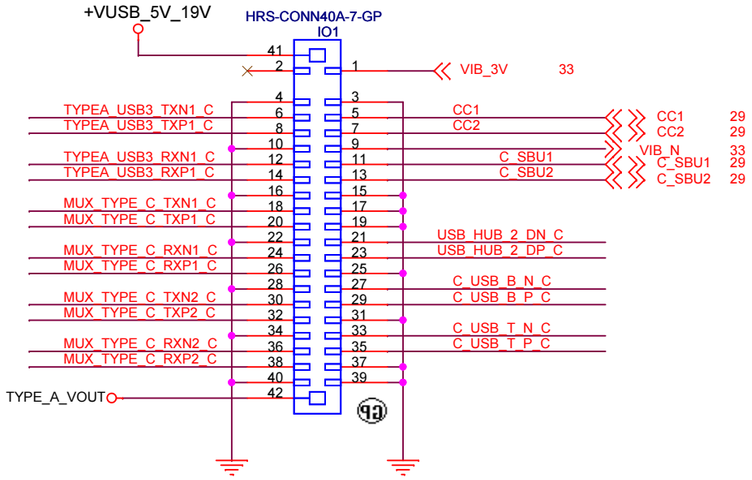




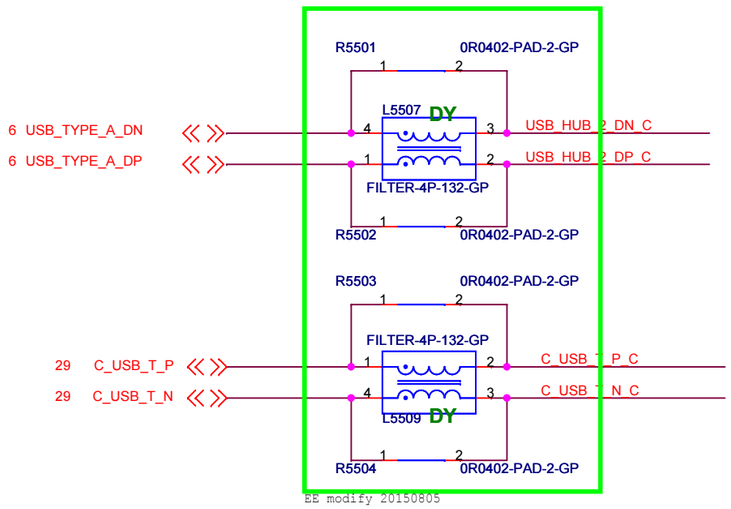




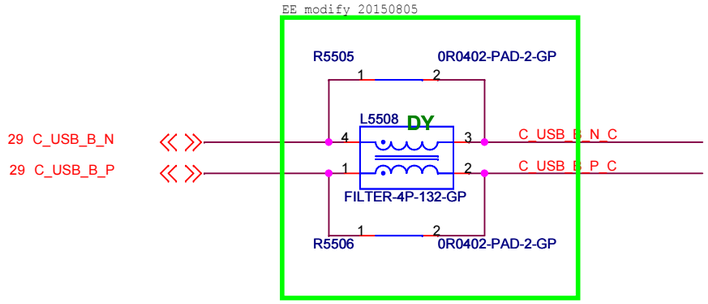




EE modify 20150805



EE modify 20150805



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Title	55_IO Board Connector	
Size	Document Number: Somerset	Rev: SA
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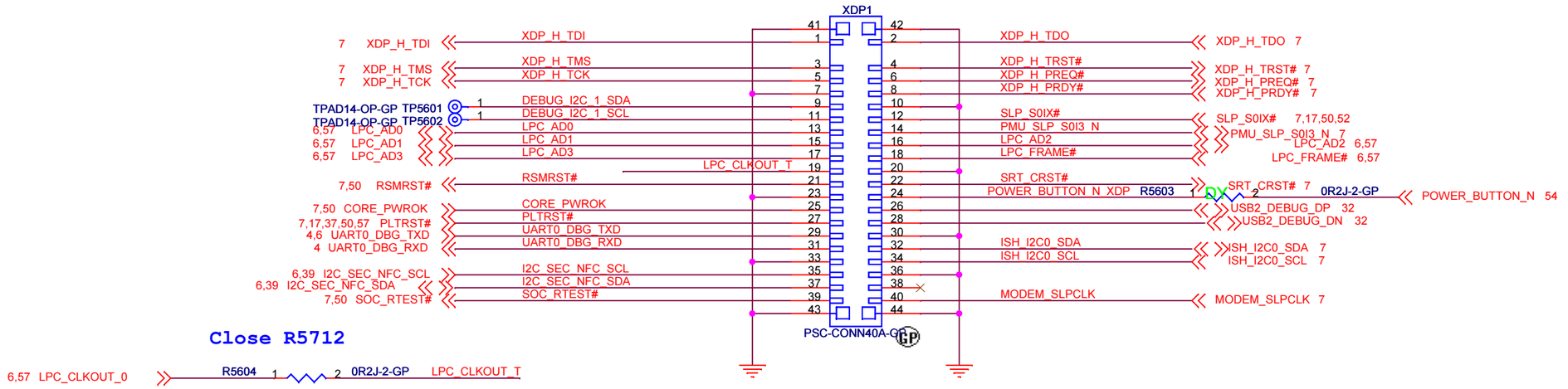
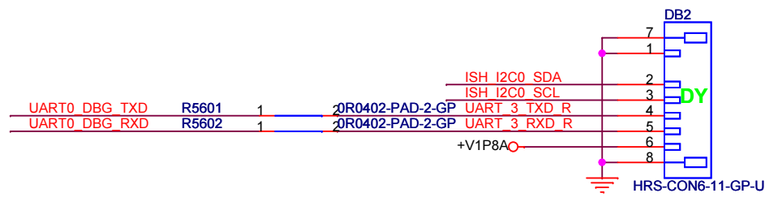
XDP Debug Connector

Debug Connector with XDP



SW Debug Connector



Somerset

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Taipei Hsien 221, Taiwan, R.O.C.

Title	56_XDP Connector	
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Default LPC

+V3P3_TPM +V3P3_TPM +V3P3_TPM

C5704 104P/10V

C5705 104P/10V

C5706 104P/10V

+V3P3_TPM_VSB

C5703 104P/10V

EE modify 20150805

+V3P3SX R5701 1 DY 2 0R2J-2-GP +V3P3_TPM

R5702 0R0402-PAD-2-GP

R5703

+V3P3A 1 2 +V3P3_TPM_VSB

0R2J-2-GP

+V3P3_TPM U5702

8	VDD	GPIO0/SDA/XOR_OUT	29
14	VDD	GPIO1/SCL	30
22	VDD	GPX/GPIO2	3
		GPIO3/BADD	6
+V3P3_TPM_VSB 1	VSB	CLKRUN#/GPIO4/SINT#	13
24	LAD0/MISO	NC#2	2
21	LAD1/MOSI	NC#7	7
18	LAD2/SPI_IRQ#	NC#10	10
15	LAD3	NC#11	11
		NC#25	25
27	SERIRQ	NC#26	26
19	LCLK/SCLK	NC#31	31
28	LPCPD#		
20	LFRAME#/SCS#		
17	SRESET#/LRESET#/SPI_RST#	GND	9
		GND	16
4	PP	GND	23
5	TEST	GND	32
12	RESERVED	GND	33

NPCT650JAAYX-GP

TPM_CLKRUN# 1 R5714 2 LPC_CLKRUN# 0R0201-PAD-GP

LPC_CLKRUN# 6

EE modify 20150805

6,56 LPC_AD0	R5707	0R0201-PAD-GP	TPM_LAD0	
6,56 LPC_AD1	R5708	0R0201-PAD-GP	TPM_LAD1	
6,56 LPC_AD2	R5709	0R0201-PAD-GP	TPM_LAD2	
6,56 LPC_AD3	R5710	0R0201-PAD-GP	TPM_LAD3	
6,56 LPC_CLKOUT_0	R5712	0R0201-PAD-GP	TPM_SERIRQ / TPM_SCLK	
6,56 LPC_FRAME#	R5713	0R0201-PAD-GP	TPM_LFRAME#	
PLTRST_N_3P3	R5724	0R0201-PAD-GP	PLTRST_N_3P3_C	

+V3P3_TPM

R5730 1 2 10KR1J-GP

TPM_SERIRQ

R5732 1 2 10KR1J-GP DY

R5731 0R0201-PAD-GP

U5706

7,17,37,50,56 PLTRST# PLTRST# 1 2 PLTRST# G 2 5 PLTRST_N_3P3_R

R5717 1 2 +V3P3_TPM 100KR1J-GP

PLTRST_N_3P3 3 4

UM6K1N-GP

+V3P3_TPM R5720 1 2 100KR1J-GP

C5707 DY 104P/10V

EE modify 20150611

Somerset

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Title	57_TPM	
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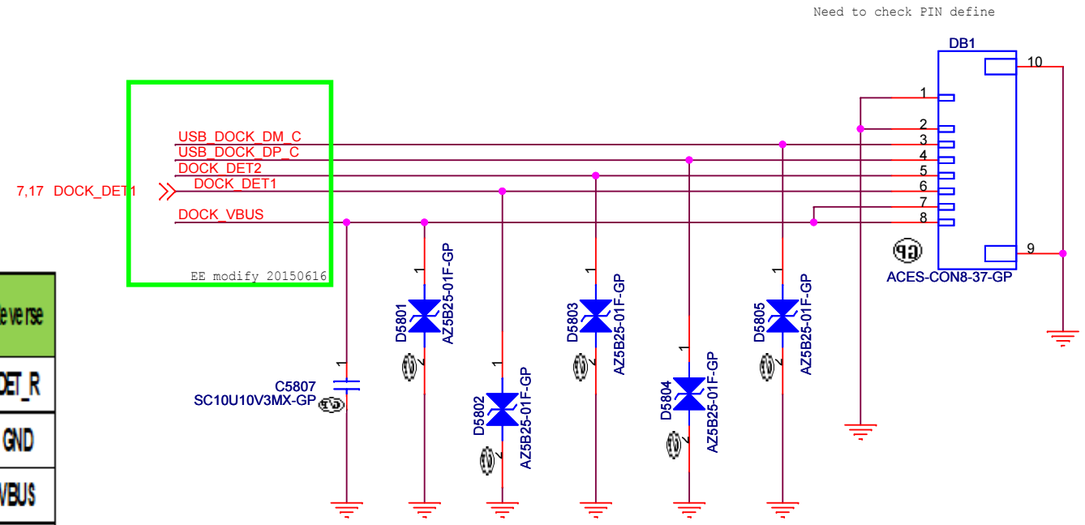
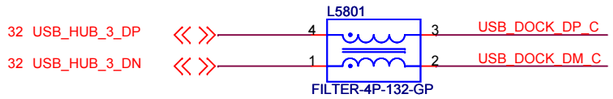
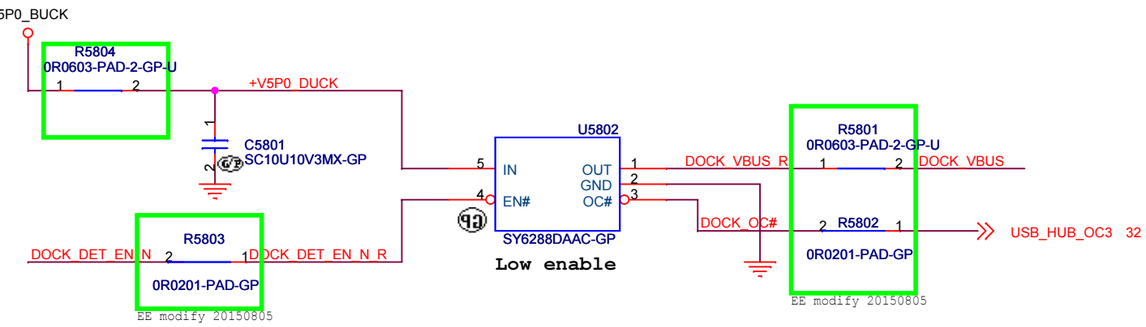
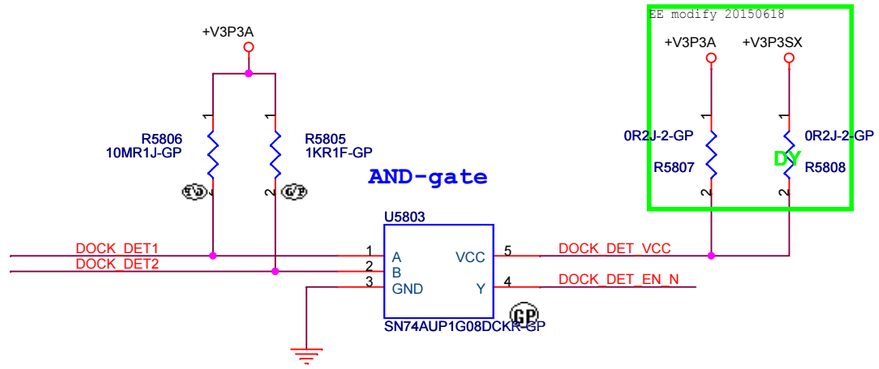
Docking CONN

PIN Number	POGO Pin Define	Reverse
1	DET_L	DET_R
2	GND	GND
3	VBUS	VBUS
4	USB1D-	USB2D+
5	USB1D+	USB1D-
6	VBUS	VBUS
7	GND	GND
8	DET_R	DET_L









	Before		After	
Detect Pin	DET1	DET2	DET1	DET2
Un Dock	H	H	H	H
Dock	H	L	L	H
Reverse Dock	L	L	H	L

	Before		After	
MB	R5805	R5806	R5805	R5806
Value	51Kohm	51Kohm	1Kohm	10Mohm
Dock	R2	R7	R2	R7
Value	0	1.8Mohm	0	1.4Kohm

Somerset

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

Title: 58_Docking Connector

Size | Document Number: Somerset | Rev: SA

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Somerset

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Title: **59_CPU_XDP**

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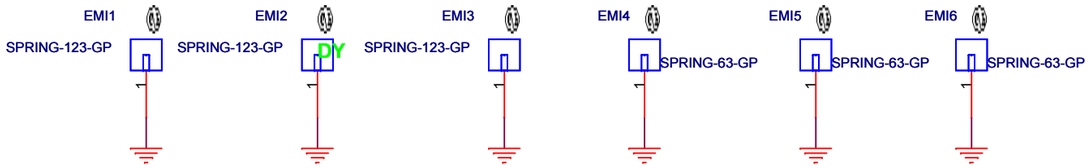
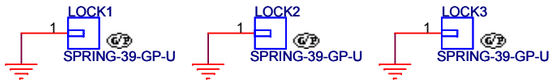
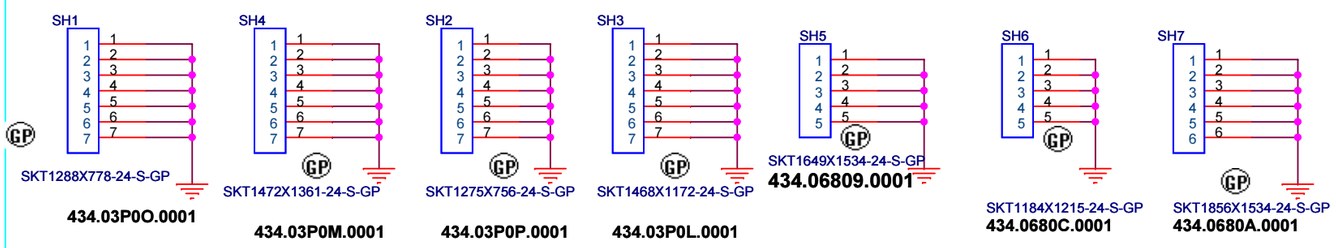
Spring

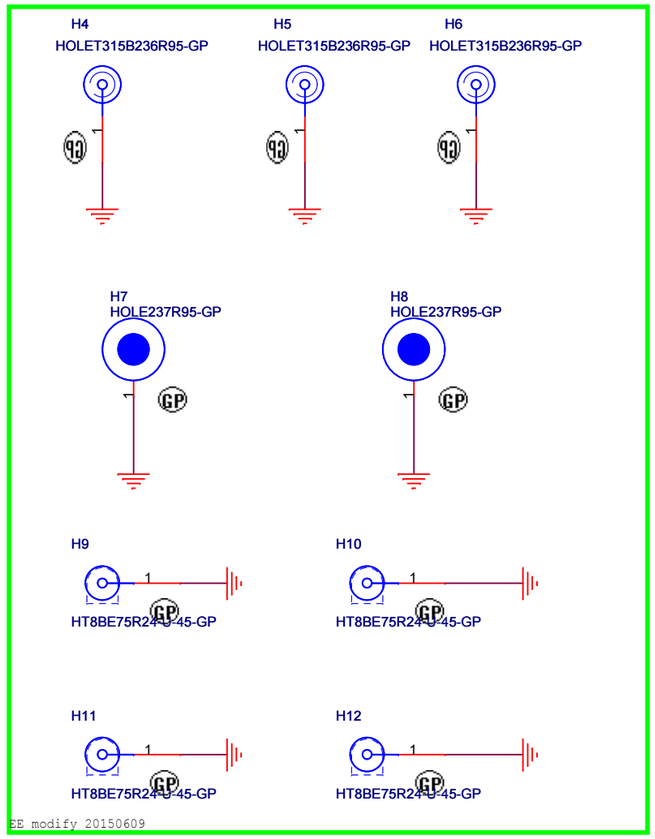




Shielding Can



Screw Hole



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Title: 60_ME/EMI		
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Title: **61_RF**

Size	Document Number	Rev
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SOC Cherry Trail POWERMAP

(5 to 19V) USB TYPE C CONNECTOR
(5V/19V)
BOOST IC RT8525AZS
(12V/19V)
CHARGER BQ24770
Battery PACK (2S1P)
+VBATTERY
(6 to 8.4V) +VSYS
BUCK IC SY8206DQNC
rating:4200mA
3.5V
BUCK IC RT9022GU6
BUCK IC RT9022GU6
3D3V AUX
RTC
EC MEC1633X

3G LTE SKT NGFF — average:1.1A, peak:2.5A, max in-rush:5.1A
VIBRATOR — avg:100mA
USB HUB GL850G — avg:52mA

5V BUCK SYX196C1QNC
rating:3000mA
- TYPE C USB — avg:1400mA
- AUDIO AMP ALC1006 — avg:1500mA
- SWITCH → TYPE A CONNECTOR — avg:1400mA
- SWITCH → DOCK — avg:450mA
- CAMERA LED — avg:10mA
- HDMI — avg:55mA

LCM Backlight — avg:700mA

SWITCH +V3P3A
- NFC MODULE — 47.8mA
- WIFI/BT — MAX:127mA
- SOC Cherry Trail — 196 mA
- eMMC — AVG:230mA
- SAR SENSOR SX9500IULTRT — AVG:170uA
- HDMI Level Shifter/Repeater — AVG:200mA
- PMIC

SWITCH +V3P3SX
- TYPE C CONTROLLER TPS65982 / VDDIO, VIN_3V3
- TPM NPCT650JAAYX / VDD
- TOUCH PANEL
- LCD AUO WUXGA B101UAN01.7 — avg:316mA

PMIC (BD2613GW)

BUCK1	rating:3200mA	+VCC0_CPU	SOC Cherry Trail	Max:2700 mA //1022.7
BUCK2	rating:3200mA	+VCC1_CPU	SOC Cherry Trail	avg:900mA
BUCK3	rating:2500mA	+VNN	SOC Cherry Trail	avg:825mA
BUCK4	rating:8000mA	+VGG	SOC Cherry Trail	avg:600mA
BUCK5	rating:2050mA	+V1P05A	SOC Cherry Trail	avg:800mA (total 4 pcs)
BUCK6	rating:2500mA	+V1P15	SOC Cherry Trail	XDP CONNECTOR
BUCK7	rating:4700mA	+VDDQ_PMIC	SOC Cherry Trail	avg:5000mA
BUCK8	rating:2000mA	+V1P8A	SOC Cherry Trail	avg:80mA

+V1P8A:
- SENSORS, HALL/E-COMPASS /G&GYRO — avg:200mA
- AUDIO CODEC ALC5672 / DMIC WM7211IMS/ AMP
- SPI FLASH W25Q128FVSIQ — avg:25mA
- MUX/HD3SS460
- WIFI/BT
- eMMC — avg:150mA
- SAR sensor — avg:170uA
- NFC MODULE — avg:100mA

Disable

Buck-Boost Regulator1	+V3P3A	rating:1700mA
Buck-Boost Regulator2	+V3P3SX	rating:1900mA

Boost Regulater	rating:955mA	+V5P0A		
Liner Regulator1	rating:260mA	+V2P8SX	CAMERA	
Liner Regulator2	rating:325mA	+VDDQ_VTT	LPDDR3	
Liner Regulator3	rating:200mA	+V1P2SX		
Liner Regulator4	rating:500mA	+V1P2A	SOC Cherry Trail	Max:67mA
Liner Regulator5	rating:1mA	VREFT/VREFB	CAMERA	

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Title: 62_Power Block Diagram
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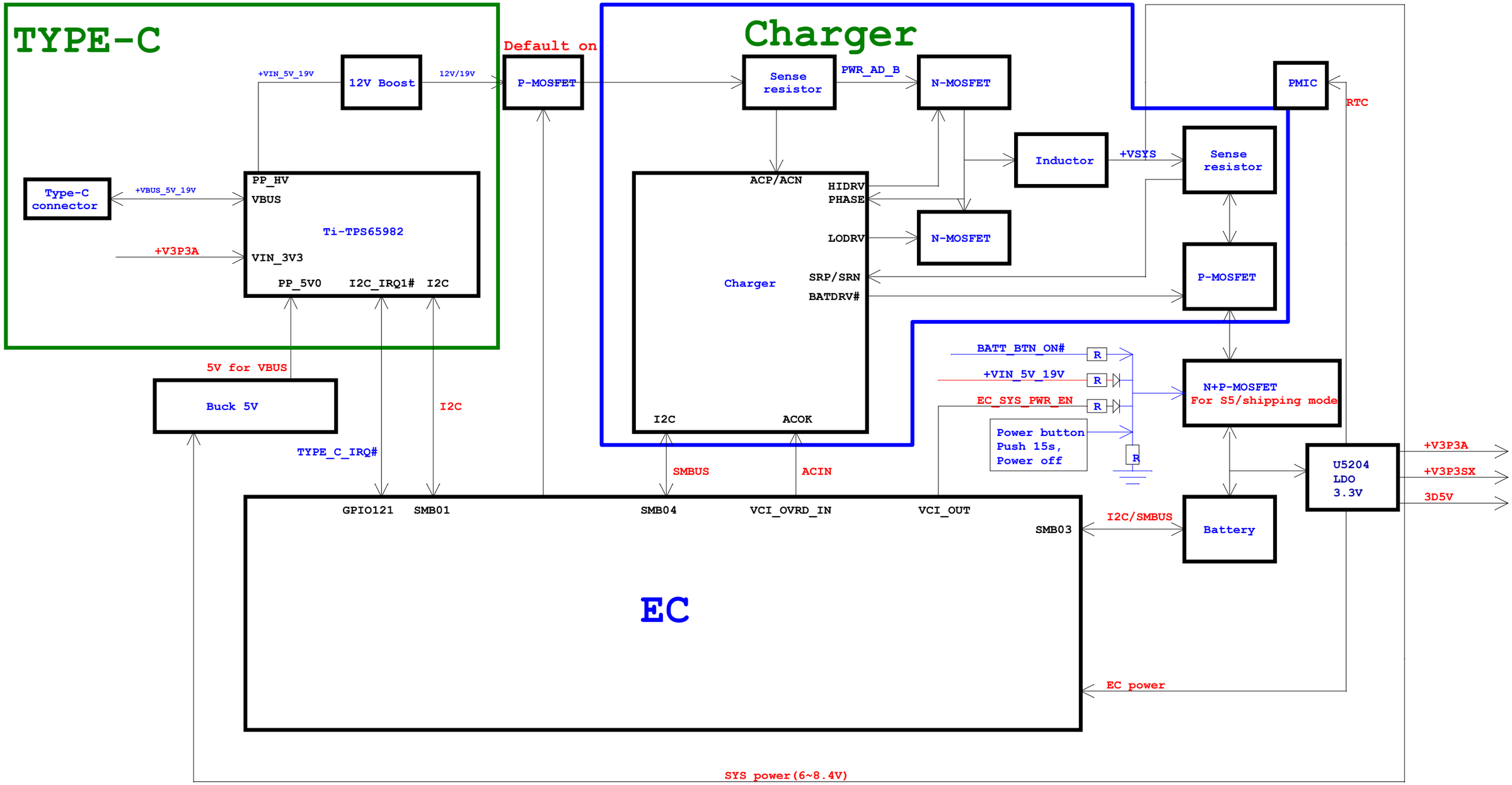
Power block dialgram



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Title: 62_Power Block Diagram		
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charging

USB TYPE C Conn.

PWR_SRC_12V

+VUSB_CONN (5V)

PL4809

BOOST PU4803

12V_BOOST_S0

-2

+VBATTERY

-3

DCIN

CHGOUT#

THERM

Charger BQ24770

SDA

SCL

SW#

I2C0_SCL

I2C0_SDA

BAT_NTC

ID

DC Battery 2S1P(6~8.4V)

+VSYS

Buck PU4804

3D3V

-2

Reserve

Reserve

3D7V_EN

EC MEC1633X

Power Button (PWRSW1)

0

Power Button (PWRSW1)

PWRBTNIN#

3D3V

-1

VCC0_VIN

VCC1_VIN

VNN_VIN

VGG_VIN

V1P15_VIN

VDDQ_VIN

V1P8A_VIN

V3P3SX_VIN

V5P0A_LX

PWRBTN#

SLP_S0IX#

PLTRST#

DRAMPWROK

VCCAPWROK

COREPWROK

SUSPWRDNACK

RSMRST#

SOC_PWRBTN#

SLP_S0IX#

PLTRST#

DDR3_DRAM_PWROK

DDR3_VCCA_PWROK

CORE_PWROK

SUS_PWRDOWNACK

RSMRST#

9

12

23

11

21

22

10

8

PMC_PWRBTN#

PMC_SLP_S0IX#

PMC_PLTRST#

DDR3_DRAM_PWROK

LPDDR3_CORE_PWROK

PMC_CORE_PWROK

PMC_SUSPWRDNACK

PMC_RSMRST#

PMIC (BD2613)

V1P8A

V1P2A

V3P3A

V1P15

VDDQ

VNN

VGG

VCC0

VCC1

V1P05A

V1P8SX

V1P2SX

V3P3SX

+V2P8SX

+V1P8A

+V1P2A

+V3P3A

+V1P15

+VDDQ

+VNN

+VGG

+VCC0_CPU

+VCC1_CPU

+V1P05A

+V1P8SX

+V1P2SX

+V3P3SX

+V3P3SX

6

5

7

13

4

2

14

15

15

3

17

16

18

19

UNCORE_V1P0_G3

UNCORE_V1P8_G3

HSIC_V1P24_G3

PCU_V3P3_G3

DRAM_VDD_S4

Cherry Trail (SOC)

UNCORE_VNN_S4

CORE_VCC_S0IX

CORE_V1P0_S4

UNCORE_V1P8_S4

VCCPADSI0_1P20

DRAM_V1P24_S0IX

+V5P0A

1

+V5P0A

EMMC1

+V3P3A_EMMC_VCC

7

+V3P3A

RAM1/RAM2

+VDDQ_VTT

+VDDQ

20

4

VDDQ_VTT

VDDQ

uHDMI

+VHDMI

VHDMI

PMIC_BATID

BATID

SPI

SPI

BSKT1

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Title: 63_Power Up Sequence Diagram

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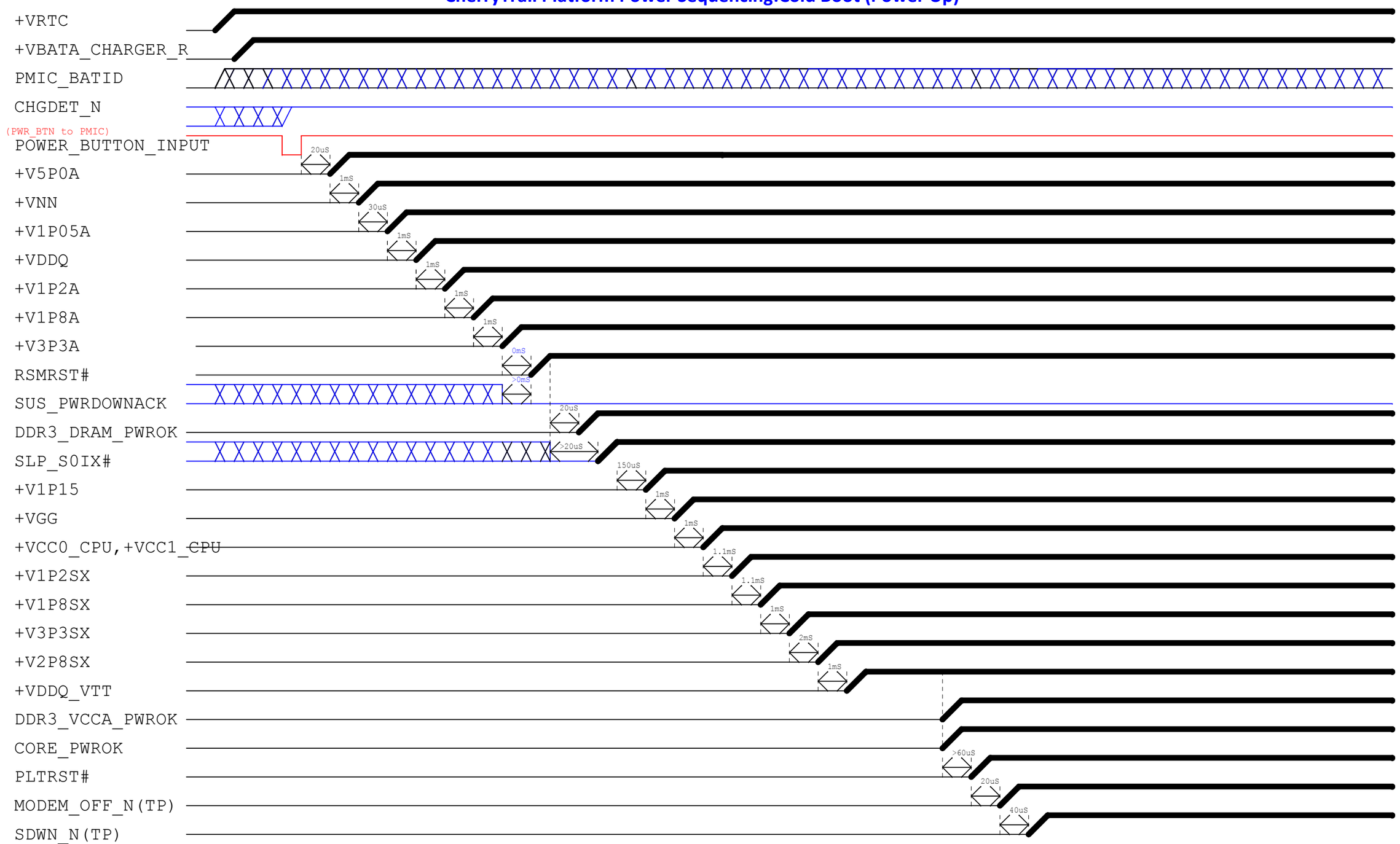
CherryTrail Platform Power Sequencing:Cold Boot (Power Up)



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Title	**64_Power Sequence Timing**	
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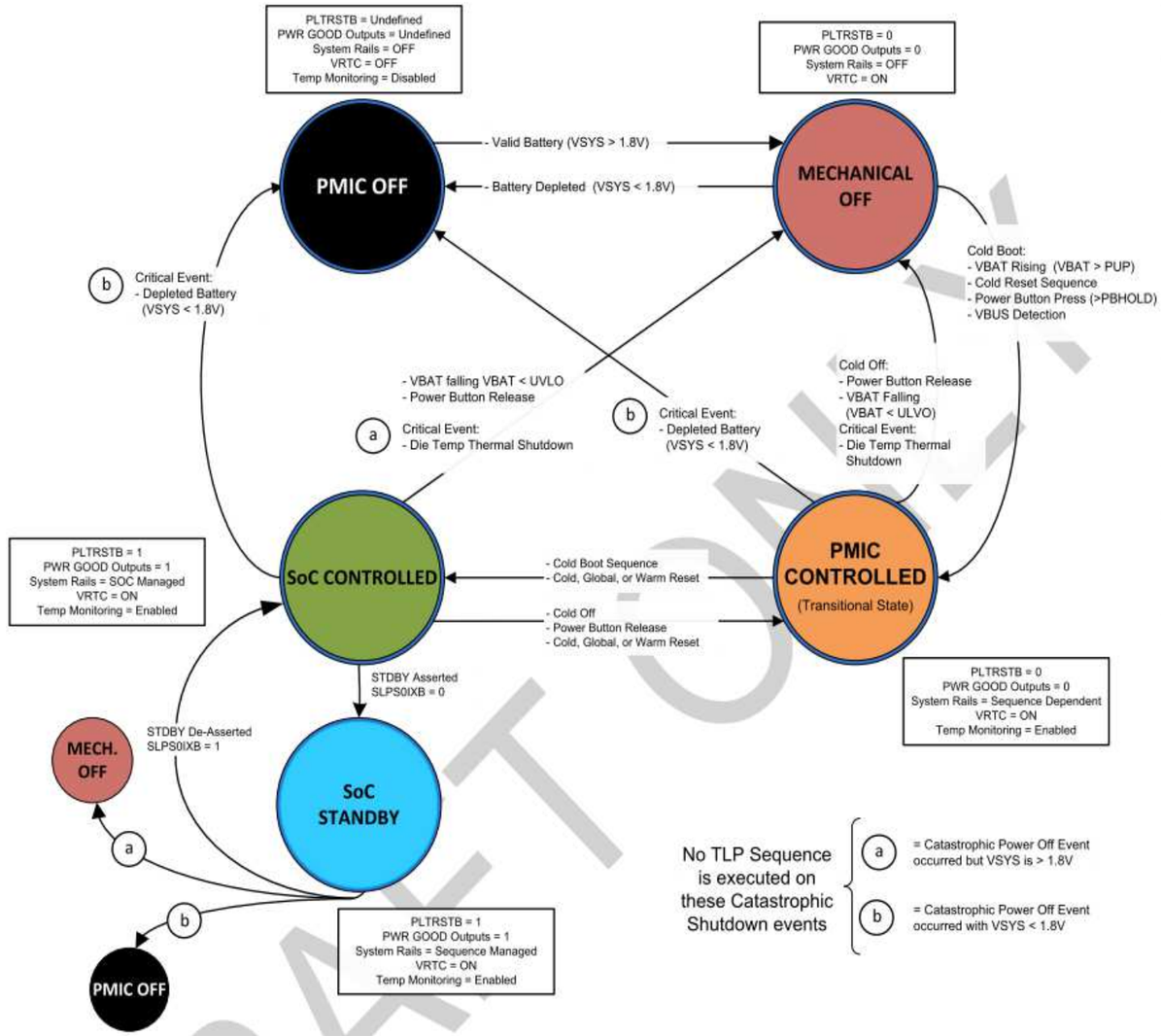

	PART	BUCK1	BUCK2	BUCK3	BUCK4	BUCK5	BUCK6	LDO1	LDO2	LDO3	VRTC LDO4	VREFDQ LDO5	LDO6	LDO7	LDO8	LDO9	LDO10	LDO11	LDO12	LDO13	LDO14	Comment
PMIC OFF	BYT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
	CHT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
Mechanical Off	BYT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
	CHT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
SoC Controlled	BYT	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	Disabled by default. SoC can enable/disable according to system activity								VREFT can be turned ond and off for thermistor and GPADC biasing
	CHT	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	Disabled by default. SoC can enable/disable according to system activity								
SoC Stand-by	BYT	OFF	OFF	ON V_{SLEEP}	ON	ON V_{SLEEP}	ON	OFF	ON	ON	ON	ON	ON	Will keep whatever state had before entering standby								I2C is operational VREFT can be turned ond and off for thermistor and GPADC biasing
	CHT	OFF	ON V_{SLEEP}	ON V_{SLEEP}	ON	OFF	ON	ON	ON	ON	ON	ON	ON	Will keep whatever state had before entering standby								

LDO7-LDO14 will keep whatever state before entering standby , it's up to the user whether to enable/disable. State machine won't enforce the behavior in this case.

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Title: 65_Power State

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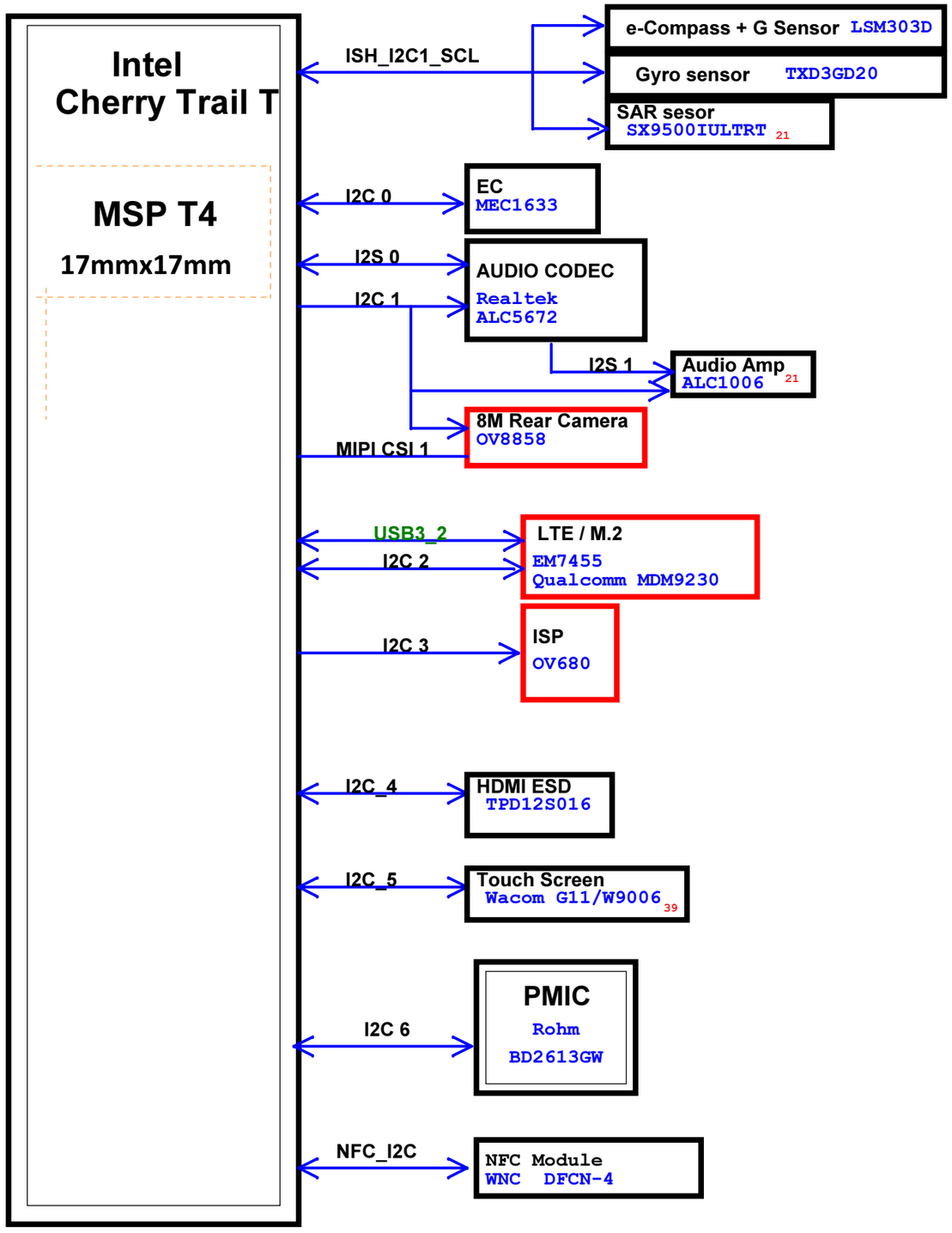
I2C Block Diagram



I2C	Function	Device	address(7-bits)
ISH_I2C1_SCL	e-Compass + G Sensor	LSM303D	0x1E
	Gyro sensor	L3GD20HTR	0x6B
	SAR sesor	SX9500	0x28
0	EC	MEC1633X	
1	AUDIO CODEC	ALC5672	1CH
	8M Rear Camera	OV8858	
2	LTE / M.2	EM7455	
3	ISP	OV680	0x35
4	HDMI ESD	TPD12S016	
5	Touch Screen	Wacom G11/W9006	
6	PMIC	BD2613GW	06E
NFC_I2C	NFC	WNC DFCN-4	29H

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Title: 66_I2C BLOCK DIAGRAM

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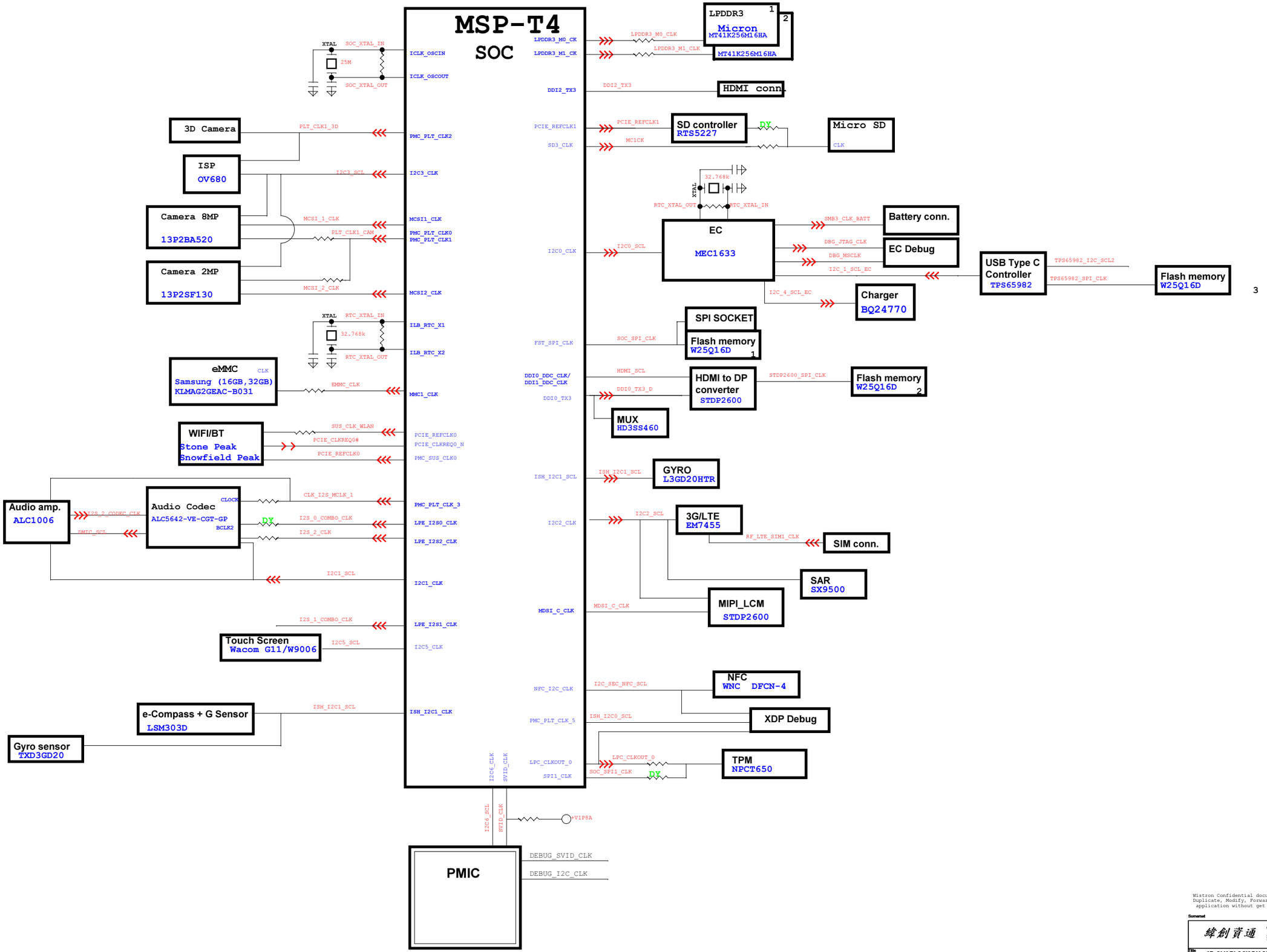
CLOCK Block Diagram



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Title: 67_CLK BLOCK DIAGRAM		
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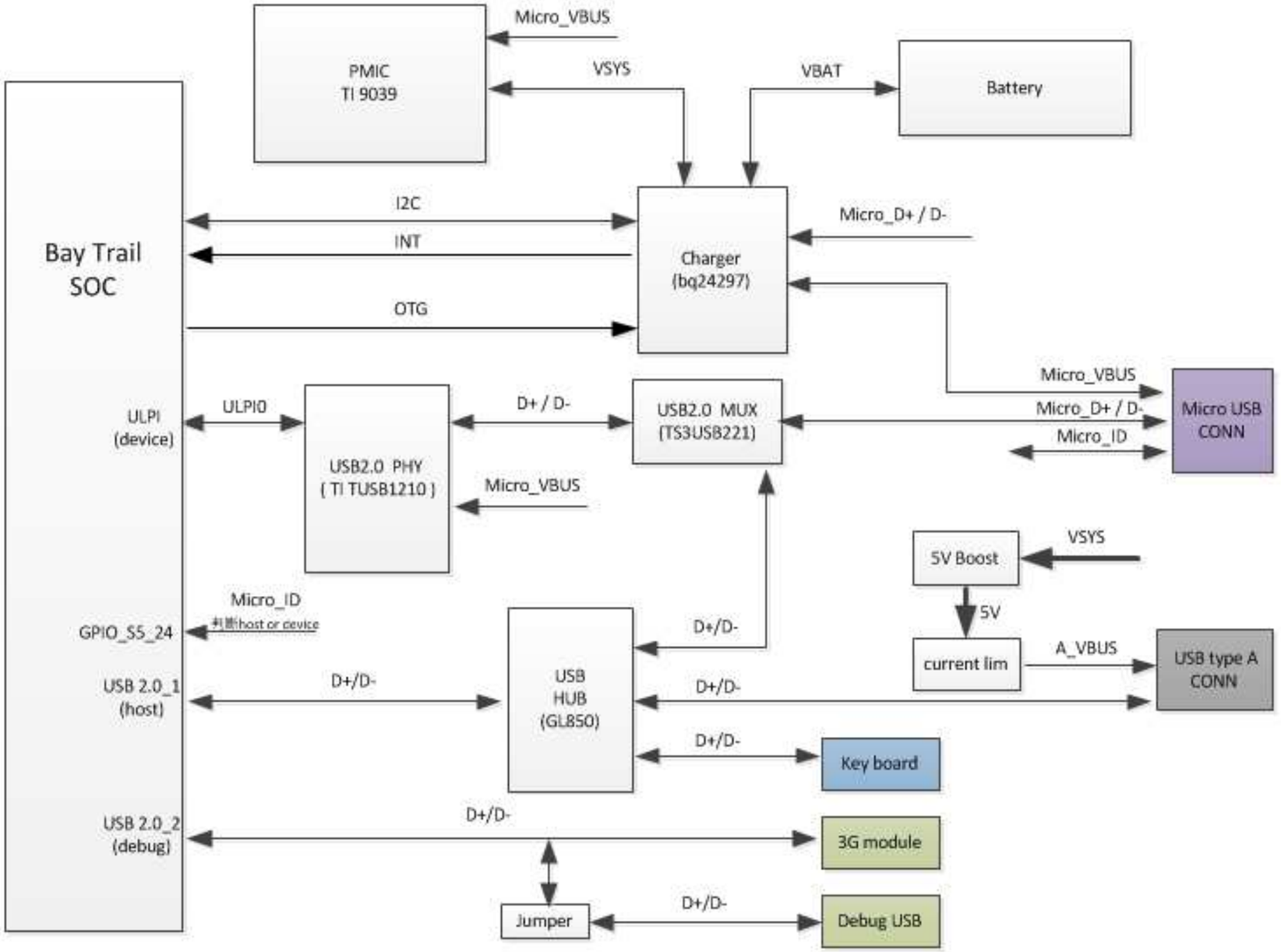

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Title: **68_USB IO BLOCK DIAGRAM**

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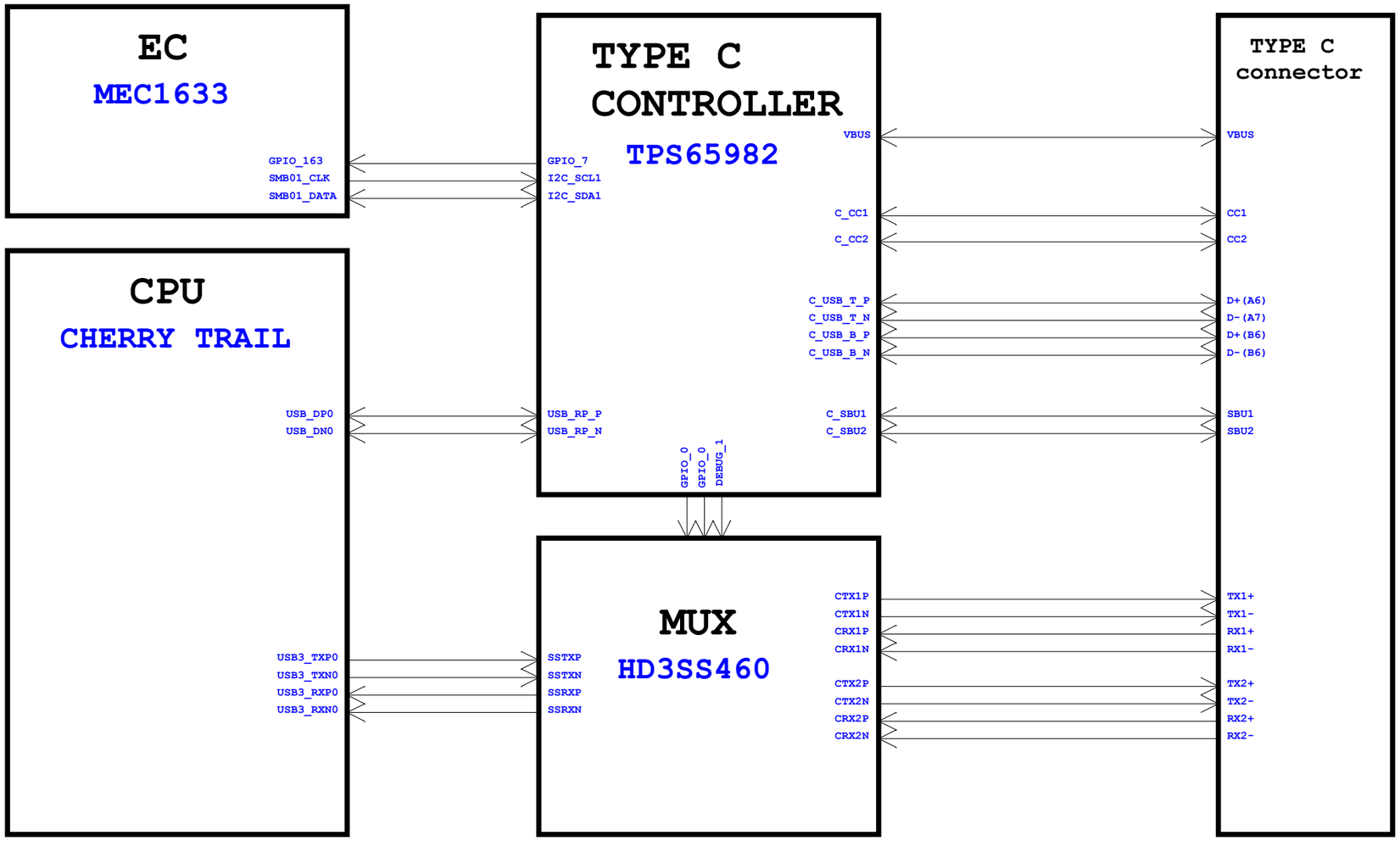

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Title: 69_TYPE C BLOCK DIAGRAM(1/2)

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Title	**70_TYPE C BLOCK DIAGRAM(2/2)**	
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Reversion History

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Title	**71_Change History**	
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