Project Name :Cherry Trail-T CR XB0CT05

PAGE CONTENT

1. INDEX
2. SYSTEM BLOCK
3. POWER SEQUENCE
4. GPIO & Power Consumption
5. PLATFORM POWER MAP
6. SOC_ MEMORY
7. SOC_ DISPLAY_CAMERA
8. SOC_ STORAGE_I2S
9. SOC_ USB_I2C
10. SOC_ RTC_PMU_DFX
11. SOC_ GND
12. SOC_ POWER 1
13. SOC_ POWER 2
14. MEMORY_ BLOCK DIAGRAM
15. MEMORY_ DRAM #1
16. MEMORY_ DRAM #2
17. MEMORY_ DRAM #3
18. MEMORY_ DRAM #4
19. MEMORY_ TERMINATION & X32_64
20. PMIC-AXP288_buck_1/2
21. PMIC-AXP288_CHGR_LDO_2/2
22. eMMC/Micro SD
23. Front/Rear MIPI CCD
24. USB OTG/Type A
25. WIFI+BT(AW-NB177NF)
26. LVDS Transfer(ITE6121)
27. LCD Inverter/HDMI
28. Touch Pannel
29. G & Gyro /E-compass/Light
30. NFC/3G/LTE
31. DC/Charger
32. I2S Audio(ALC-5645)
33. Debug Led/EMI/SCREW
34. DEBUG CONN/TPM
35. Docking Connector
36. History

M/B Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

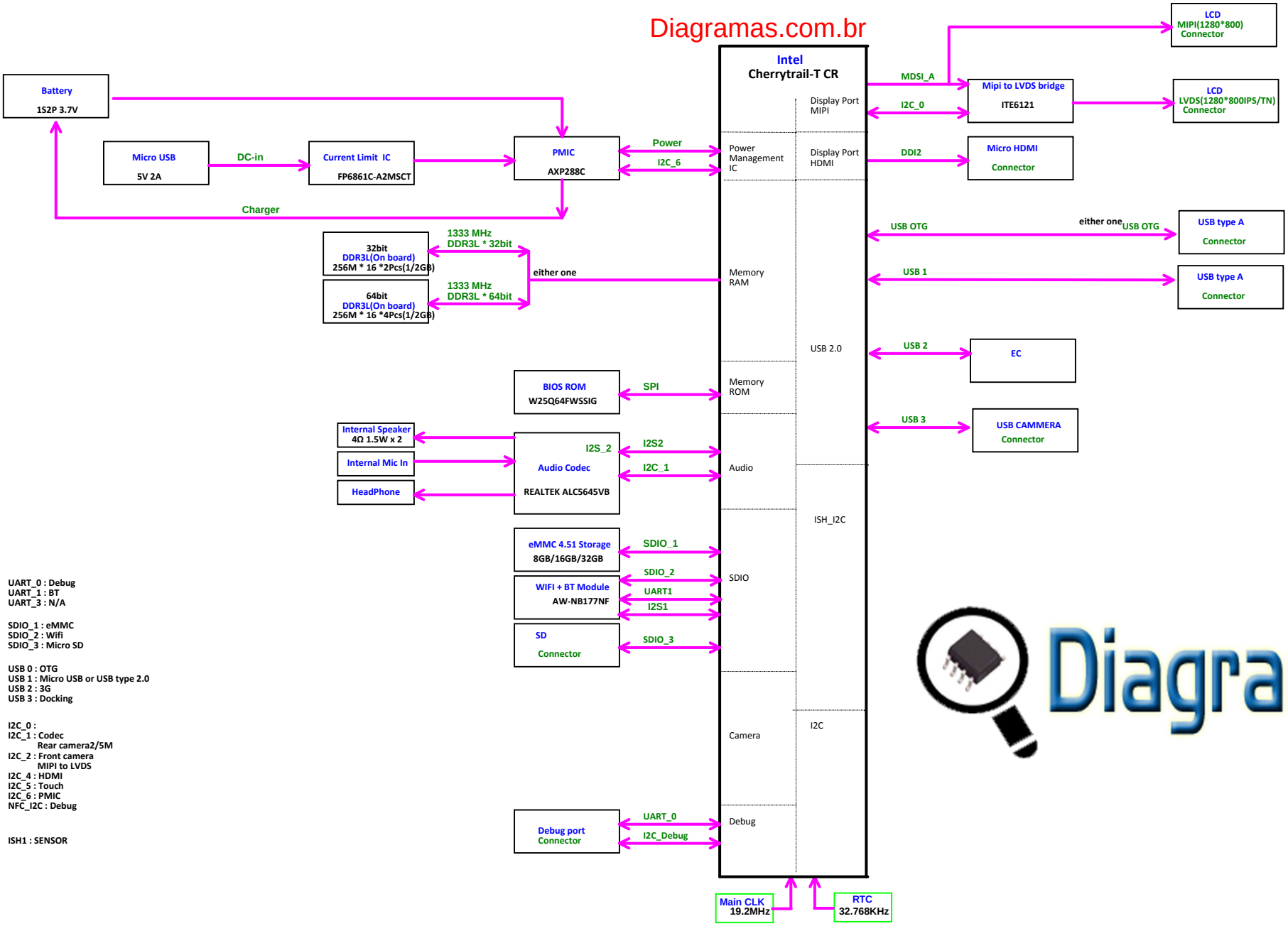
Daughter Board Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

Title: INDEX

Size: A2 | Document Number: S14CT01 | Rev: A

Date: Friday, February 19, 2016 | Sheet 1 of 35



UART_0 : Debug
UART_1 : BT
UART_3 : N/A

SDIO_1 : eMMC
SDIO_2 : Wifi
SDIO_3 : Micro SD

USB 0 : OTG
USB 1 : Micro USB or USB type 2.0
USB 2 : 3G
USB 3 : Docking

I2C_0 :
I2C_1 : Codec
Rear camera2/5M
I2C_2 : Front camera
MIPI to LVDS
I2C_4 : HDMI
I2C_5 : Touch
I2C_6 : PMIC
NFC_I2C : Debug

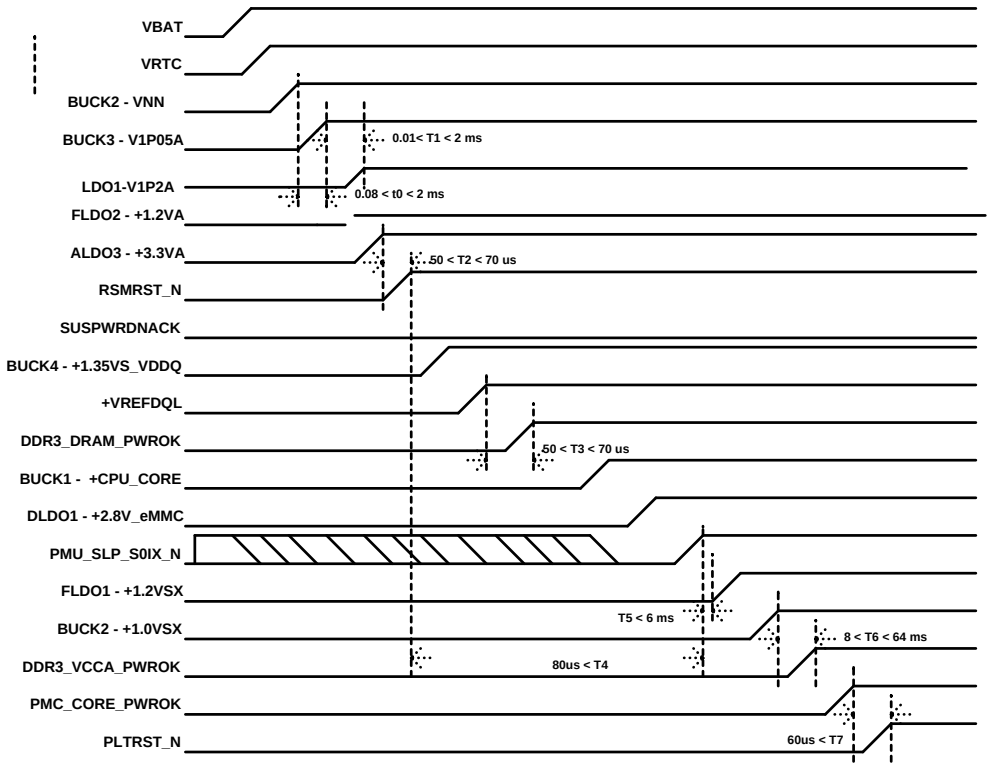
ISH1 : SENSOR

System Block Diagram

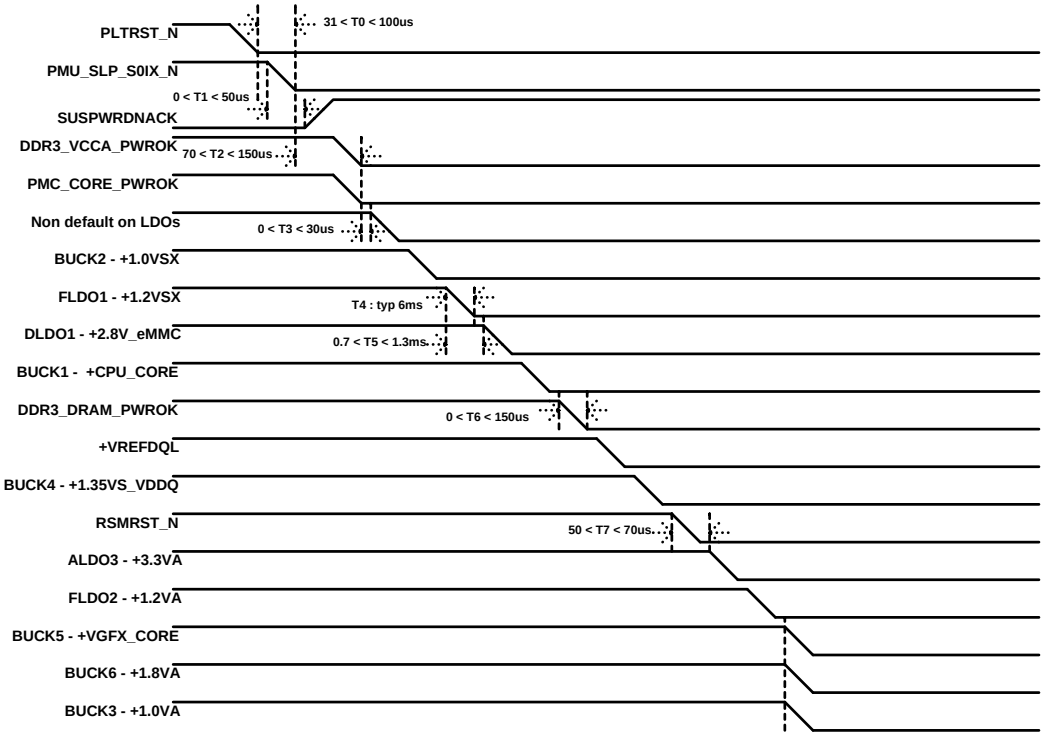
Size A1 | Document Number S14CT01 | Rev A

Date: Friday, February 19, 2016 | Sheet 2 of 35

Power up seuence

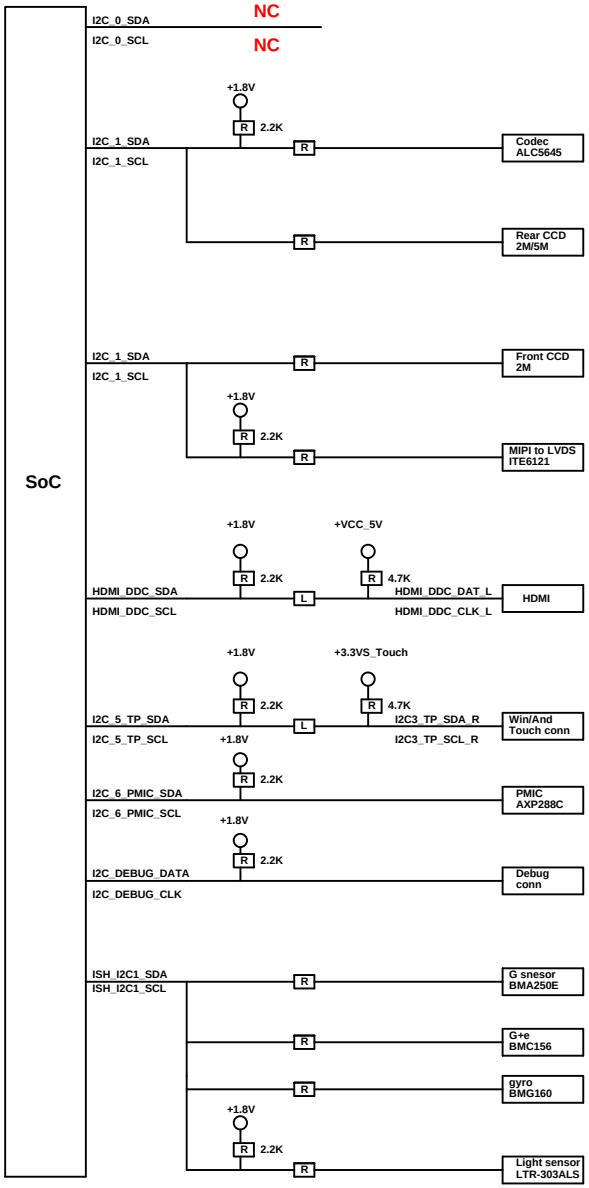


Power off seuence



Diagramas.com.br

Title	POWER SEQUENCE	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 3 of 35	



I2C Bus	Device	PartNumber	7 bit Address	Max Operating Freq.
I2C_0			0x??	KHz
I2C_1	Rear CCD 2M	Module	0x??	KHz
	Rear CCD 5M	Module	0x??	KHz
	Codec	ALC5645	0x??	KHz
I2C_2	MIPI to Lvds	ITE2161	0x??	KHz
	Front CCD 2M	Module	0x??	KHz
I2C_5	Touch Panel	Module	0x??	KHz
I2C_6	PMIC	AXP288	0x??	KHz
ISH	G sensor	BMA250E	0x??	KHz
	G / gyro sensor	BMC156	0x??	KHz
	Light sensor	LTR-303ALS	0x??	KHz

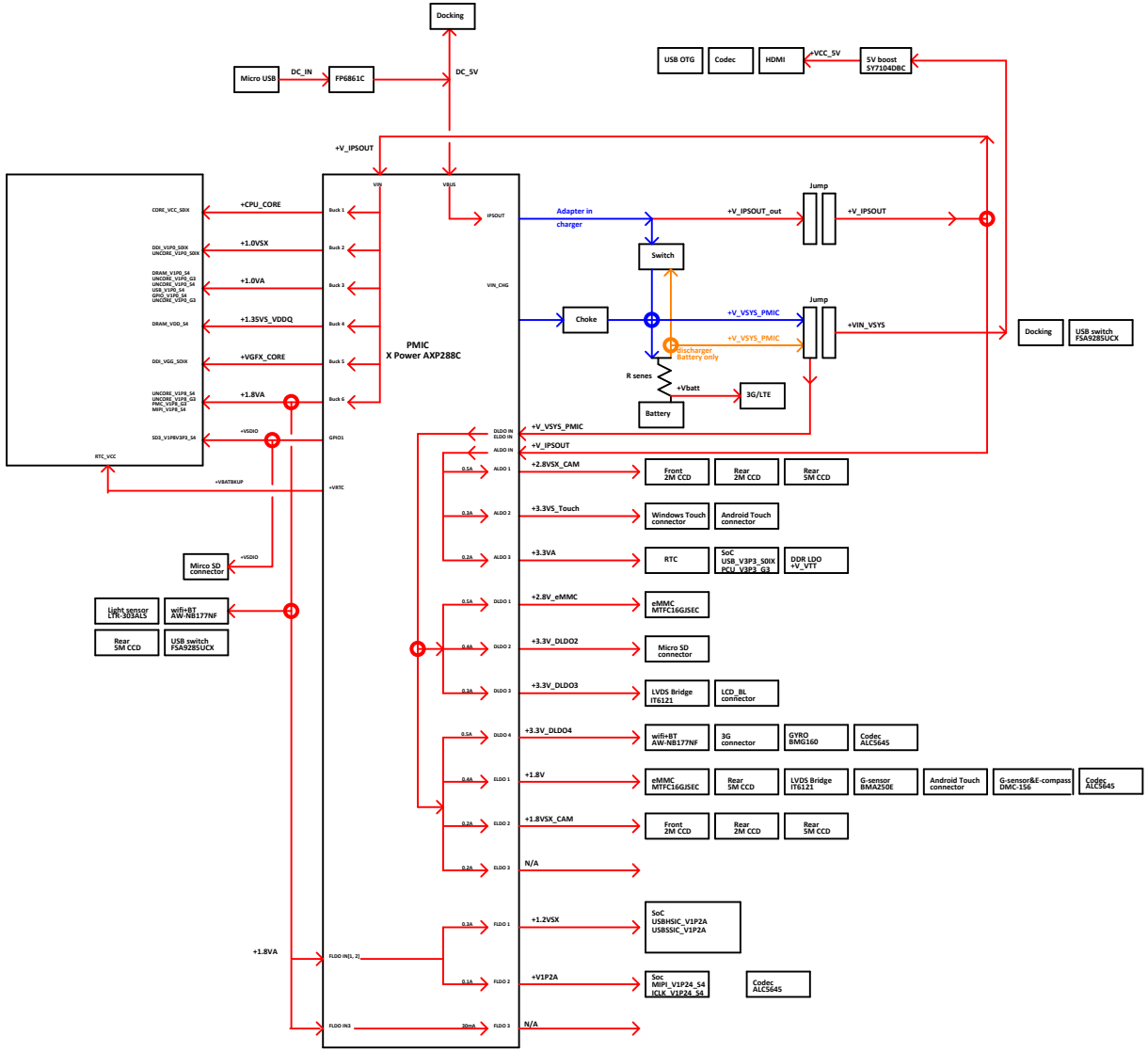
COMPRESSED

IMAGE

GPIO & I2C Map

Size: A1 | Document Number: SI4C701 | Rev: A

Date: Friday, February 19, 2016 | Sheet 4 of 35



DDR3L

Source	Device
+1.35VS_VDDQ	DDR3L 304D16-DJ1C
+1.35VS_VDDQ	+V_VTT → DDR3L TERMINATION

Key Parts

Source	Device
+2.8V_eMMC	+2.8VEMMC
+1.8V	+1.8VEMMC → eMMC MTFC16GJSEC
+1.2VA	+V1P2A_DCVDD
+1.8V	+V1P8S_CODEC
	DACREF → Codec ALC5640-VB
+3.3V_DLDO4	+V3P3S_MICVDD
+VCC_5V	+VSPKVDD_CODEC
+3.3VA	
+3.3V_DLDO4	+3.3V_TPM_IO → TPM NPCT502I
+3.3V_DLDO2	+3.3V_SD
+VSDIO	→ Micro SD connector
	DC_OUT
+VIN_VSYS	PAD_Vsys → Docking connector

USB

Source	Device
+3.3V_DLDO2	HUB_3.3V → USB Hub GL850G-37Y
+VCC_5V	USB_OTG_5V → USB OTG connector
+VCC_5V	USB_OTG_5V → USB 2.0 typeA connector
+1.8VA	
+3.3V_DLDO2	+USB_PHY → USB Phy TUSB1210BRHB
+VCC_5V	USB_OTG_5V
+1.8VA	→ USB switch FSA9285UCX
+VIN_VSYS	

RF

Source	Device
+VCC_5V	+5V_3G
+3.3V_DLDO4	+3.3V_3G → 3G connector
+3.3V_DLDO4	+3.3V_NFC → NFC connector
+1.8VA	1.8V_WL
+3.3V_DLDO4	+3.3V_WL → wifi+BT AW-NB177NF

Touch

Source	Device
+3.3VS_Touch	→ Windows Touch connector
+3.3VS_Touch	→ Android Touch connector

Sensor

Source	Device
+1.8VA	
+1.8V	→ Light sensor AL3320A
+1.8V	1.8V_Sensor → G-sensor&Gyro MPU-6500
+1.8V	1.8V_G-SENSOR → G-sensor BST-BMA250E
+1.8V	1.8V_Sensor
+3.3V_DLDO4	+3.3V_E-compass → E-compass AK8963C

Camera

Source	Device
+1.8VSX_CAM	
+2.8VSX_CAM	→ Front 2M CCD
+1.8VSX_CAM	
+2.8VSX_CAM	→ Rear 2M CCD
+1.8VSX_CAM	
+2.8VSX_CAM	
+1.8VA	→ Rear 5M CCD
+1.8V	

Display

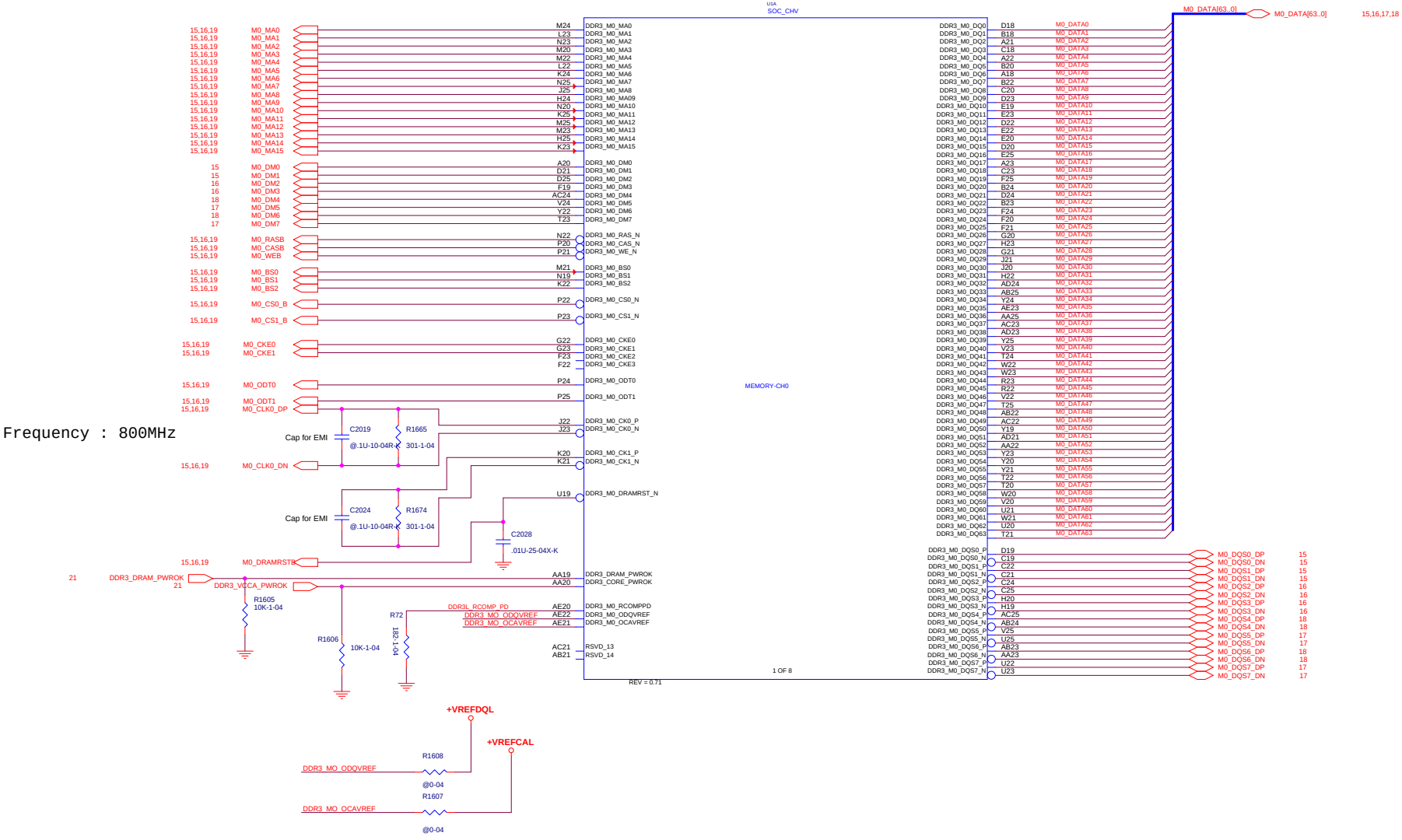
+VCC_5V	+5V_HDMI	→ HDMI connector
+VIN_VSYS	LED+	→ Panel connector
	LED-	
	LCD_VGH	
	LCD_VGL	
	AVDD	
	VCOM	
+3.3V_DLDO3	VCC_LCD	
+3.3V_DLDO3	+3.3V_RTD	→ LVDS Bridge RTD2136R-CG

PLATFORM POWER MAP

Size: A1 | Document Number: SI.4C701 | Rev: A

Date: Friday, February 19, 2016 | Sheet 5 of 35

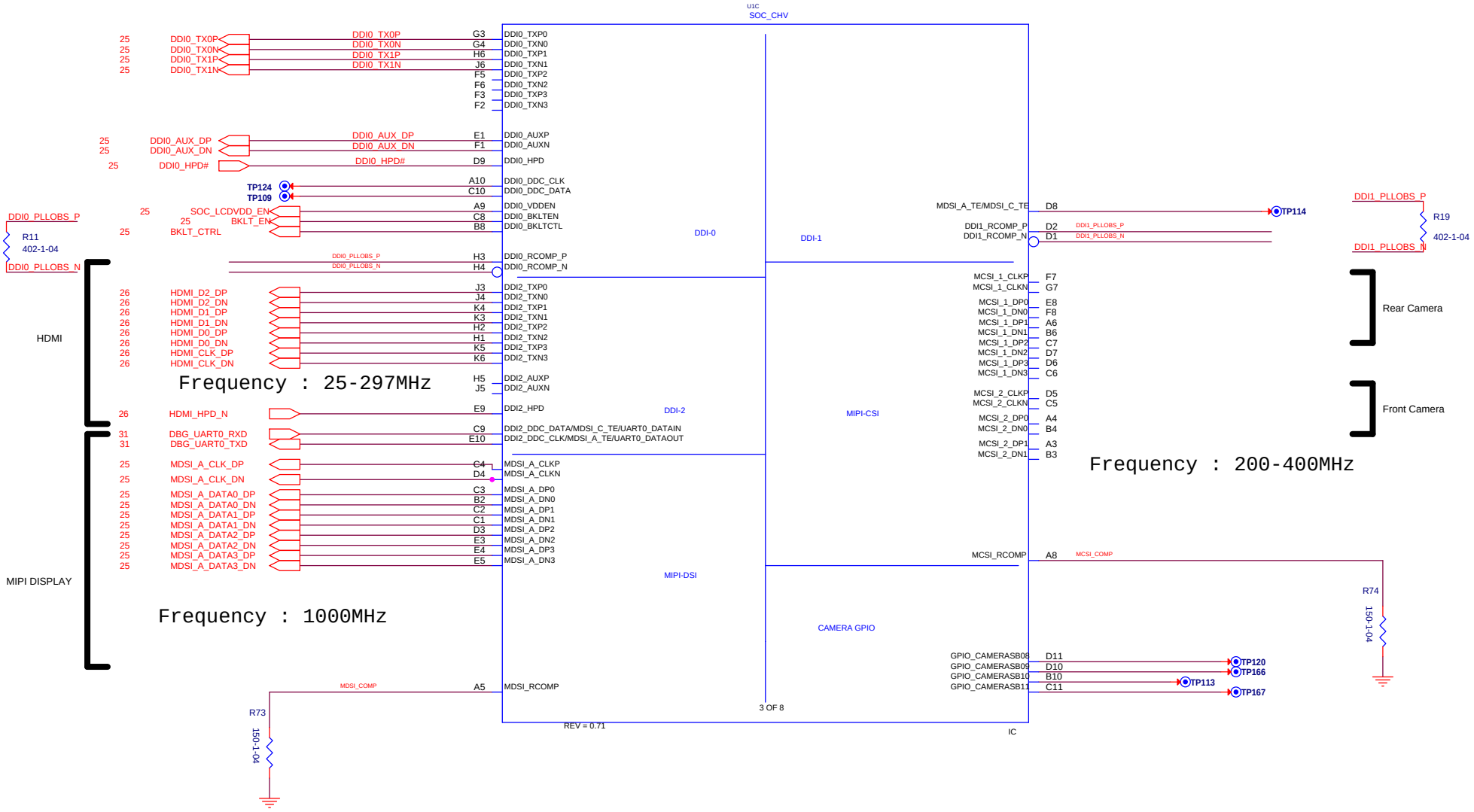
SOC:MEMORY



Frequency : 800MHz

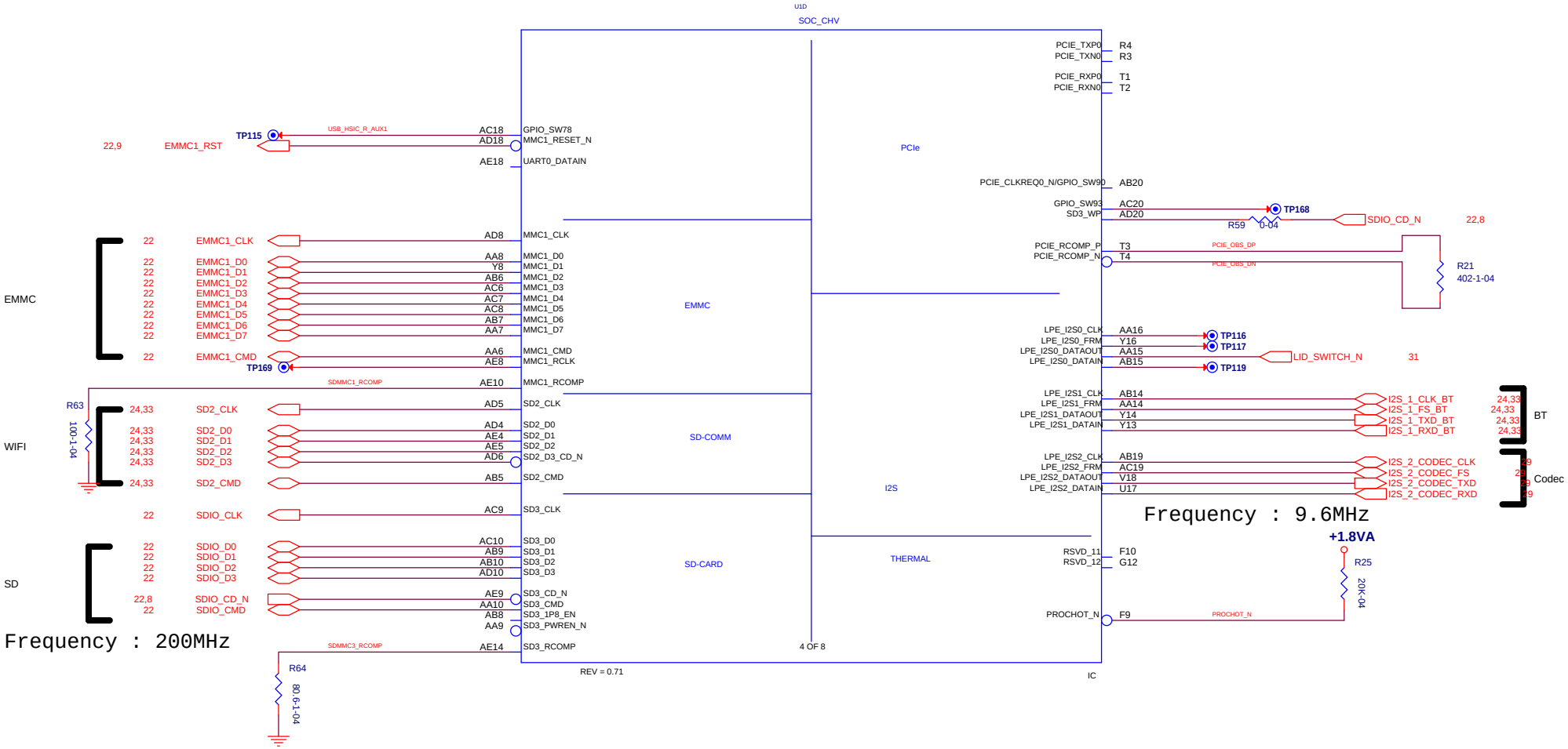
Title	SOC_ MEMORY		
Size C	Document Number S14CT01		Rev A
Date: Friday, February 19, 2016	Sheet 6	of 35	

SOC : DISPLAY/CAMERA



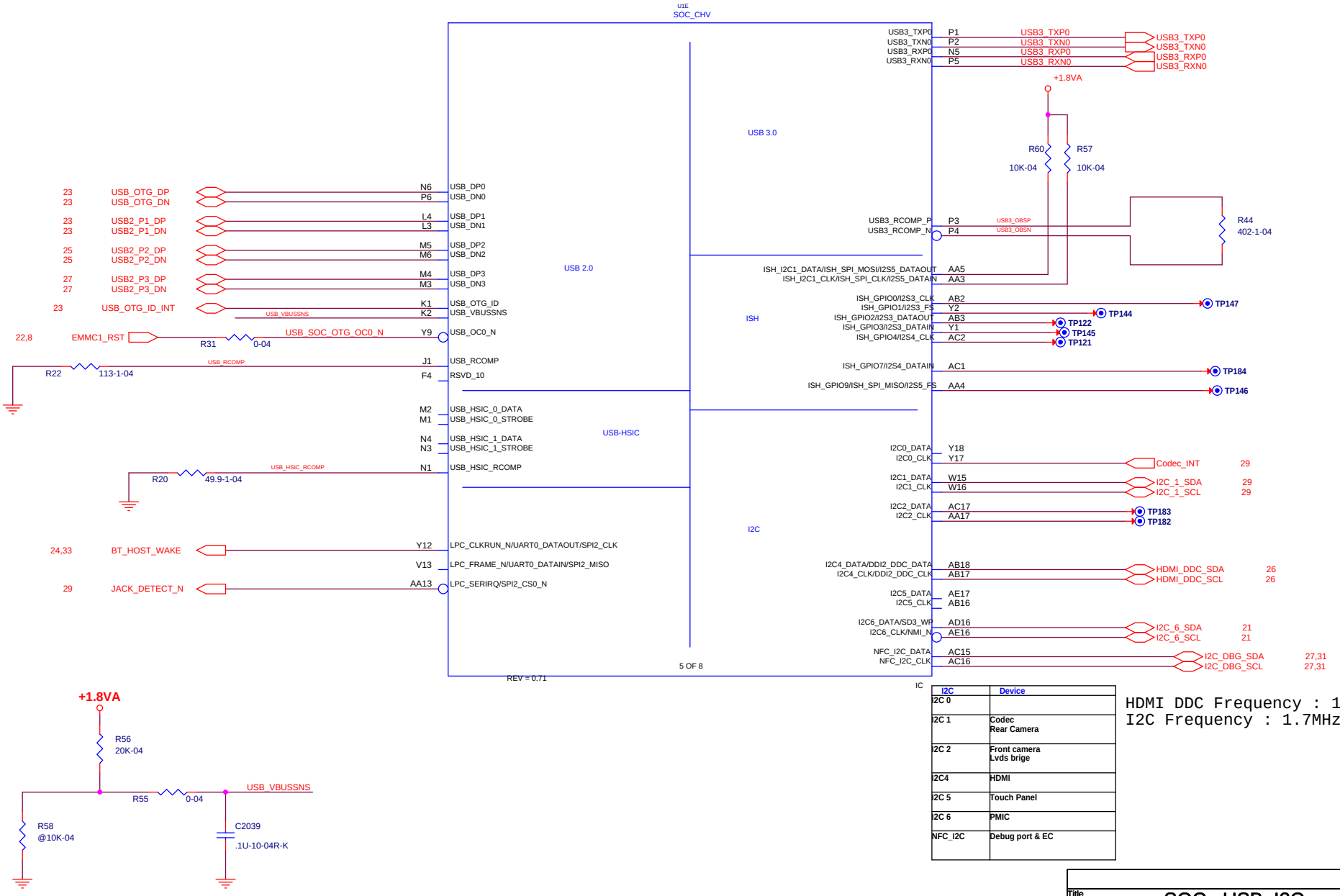
Title	SOC_ DISPLAY_CAMERA		
Size A3	Document Number S14CT01		Rev A
Date: Friday, February 19, 2016	Sheet 7 of 35		

SOC : PCIE/SATA/SDMMC/AUDIO



Title	SOC_ STORAGE_I2S
Size	A3
Document Number	S14CT01
Rev	A
Date:	Friday, February 19, 2016
Sheet	8 of 35

SOC : USB/HSIC/I2C/ISH

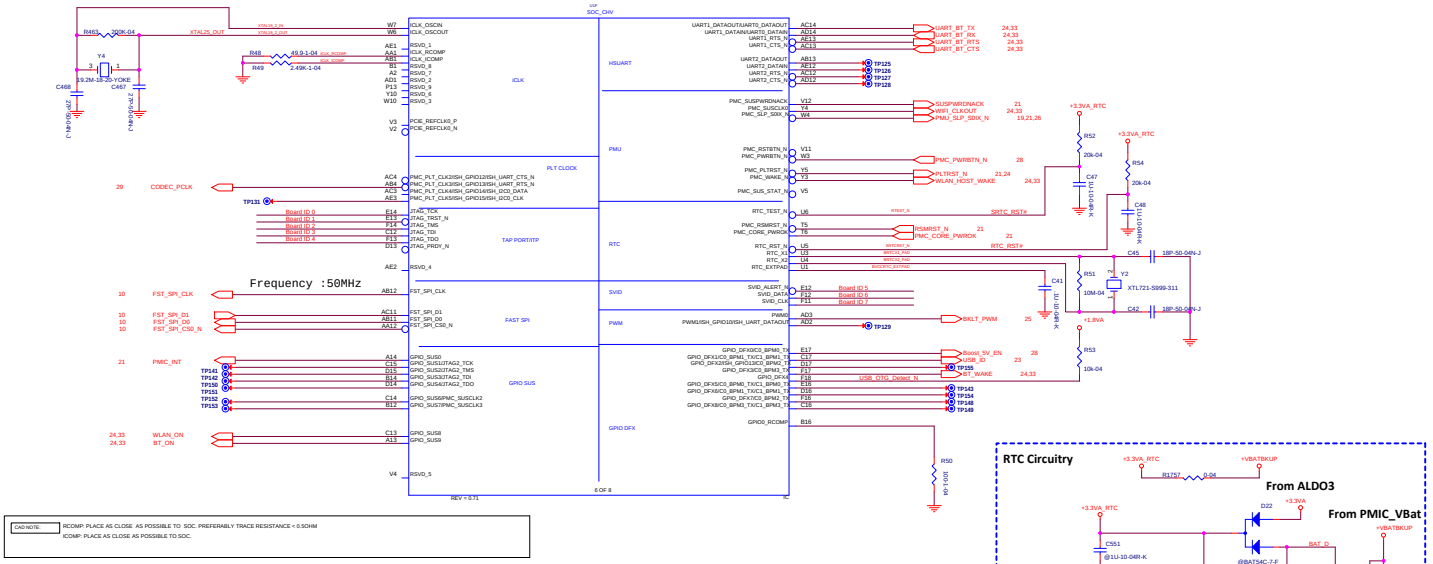


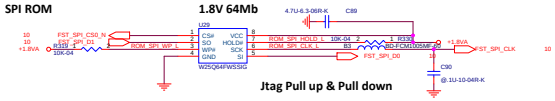
I2C	Device
I2C 0	
I2C 1	Codec Rear Camera
I2C 2	Front camera Lvds brige
I2C4	HDMI
I2C 5	Touch Panel
I2C 6	PMIC
NFC_I2C	Debug port & EC

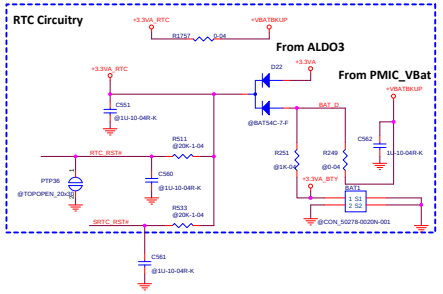
HDMI DDC Frequency : 100KHz
I2C Frequency : 1.7MHz

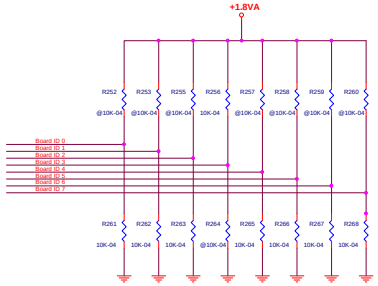
Title	SOC_ USB_I2C	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 9 of 35	

SOC : CLK/ITP/FST SPI/GPIO SUS/DFX/HSUART/PMU/RTC/SPI/SVID





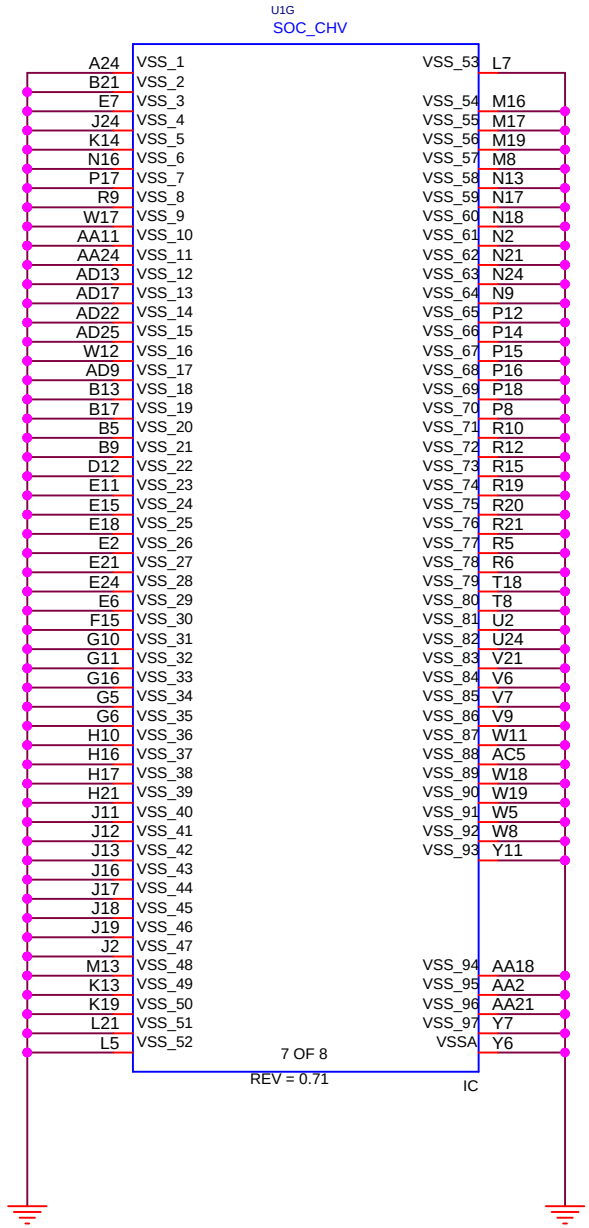




	BOARD ID 0 1 2 3	MODULE NAME
1	0 0 0 0	XB0CT03
2	0 0 0 1	S14CT01
3	0 0 1 0	
4	0 0 1 1	
5	0 1 0 0	
6	0 1 0 1	
7	0 1 1 0	
8	0 1 1 1	
	BOARD ID 5 6 7 8	SKU
1	0 0 0 0	
2	0 0 0 1	
3	0 0 1 0	
4	0 0 1 1	
5	0 1 0 0	
6	0 1 0 1	
7	0 1 1 0	
8	0 1 1 1	

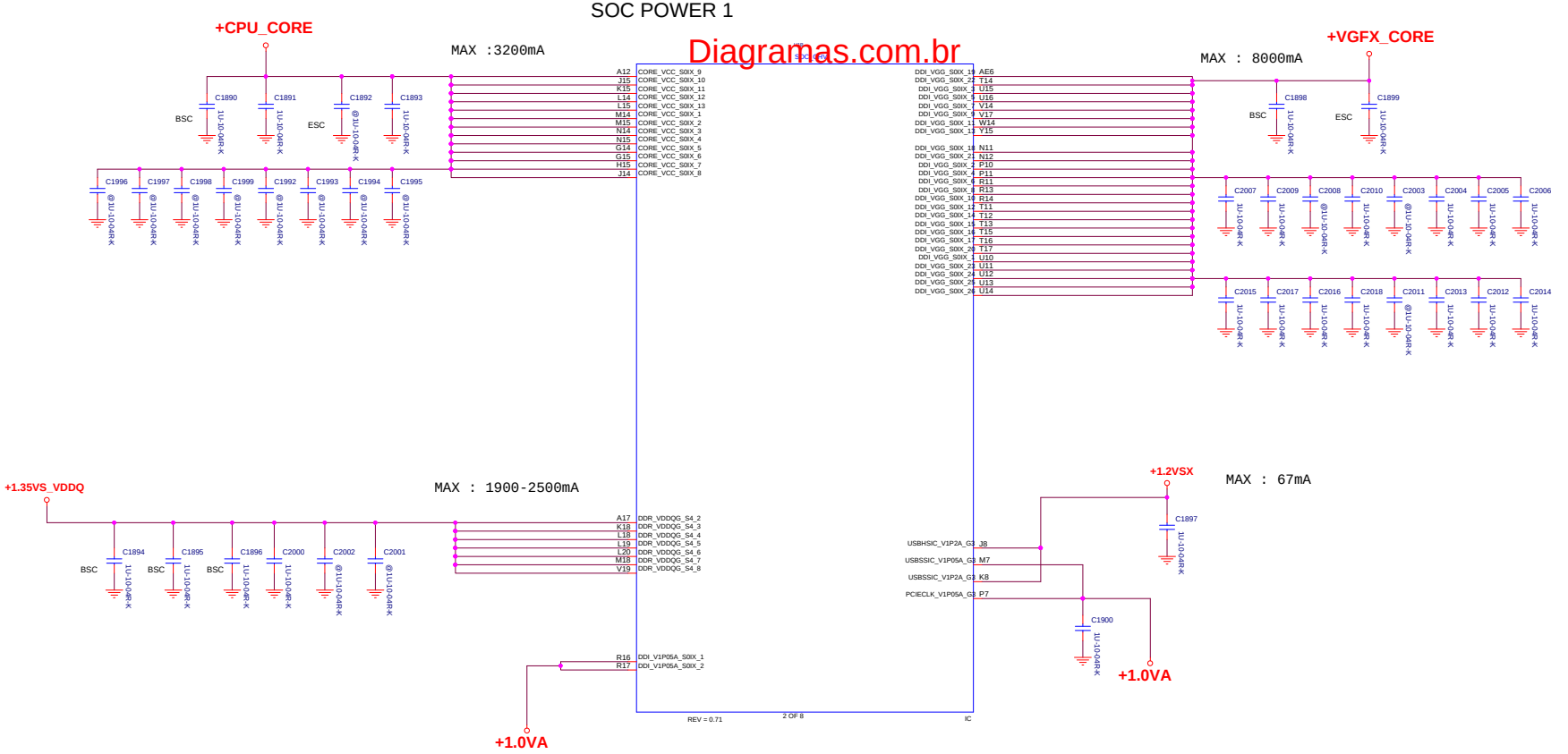
Title	SOC_RTC_PMU_DFX	
Size D	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 10 of 35	

SOC : GND



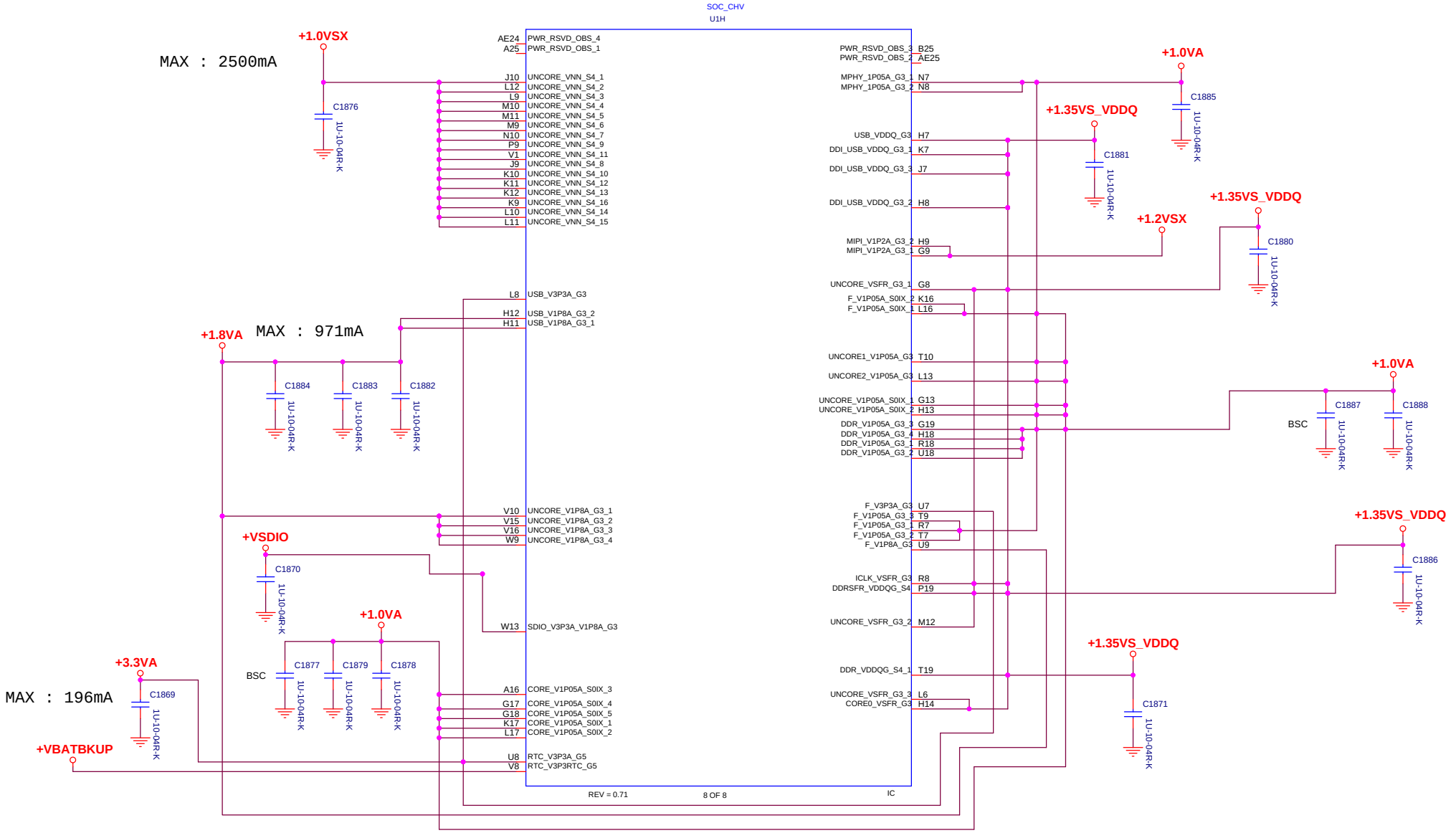
Title	SOC_ GND	
Size A4	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 11 of 35	

SOC POWER 1



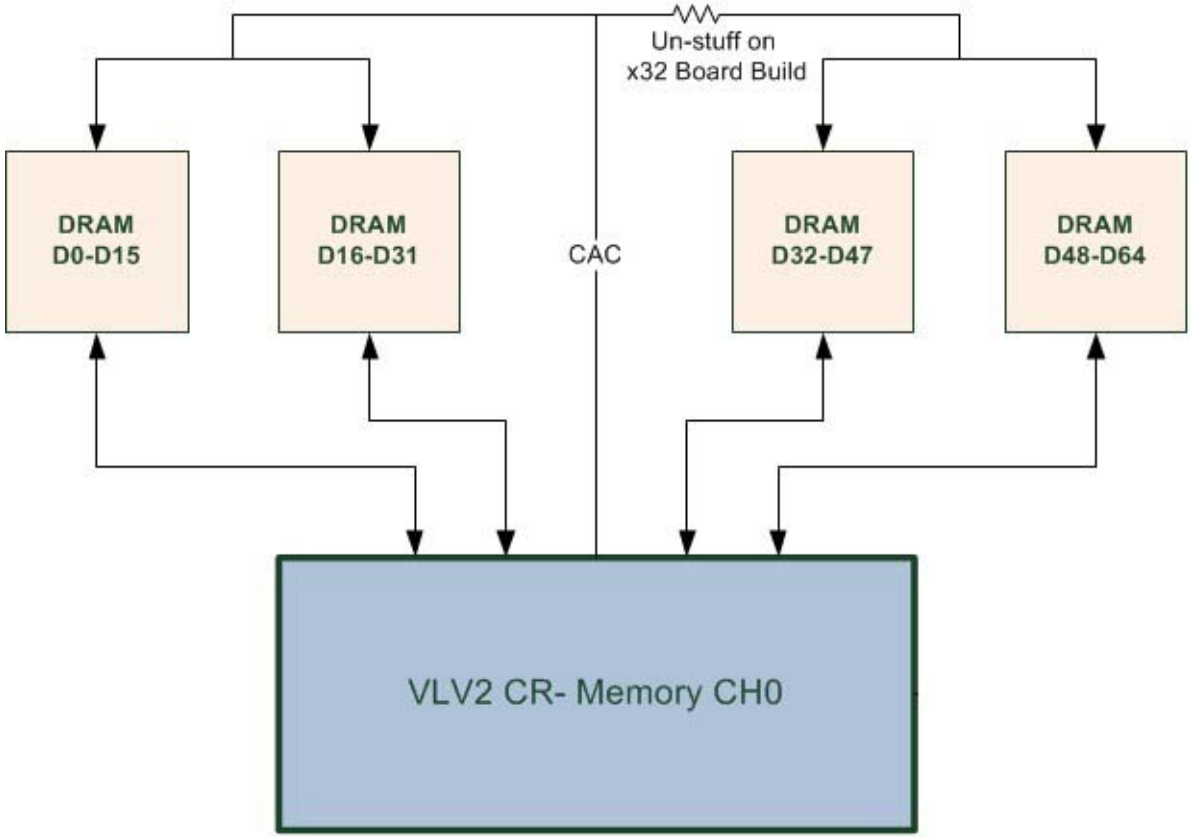
Title	SOC_ POWER 1	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 12 of 35	

SOC : POWER 2



Title	SOC_ POWER 2	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 13 of 35	

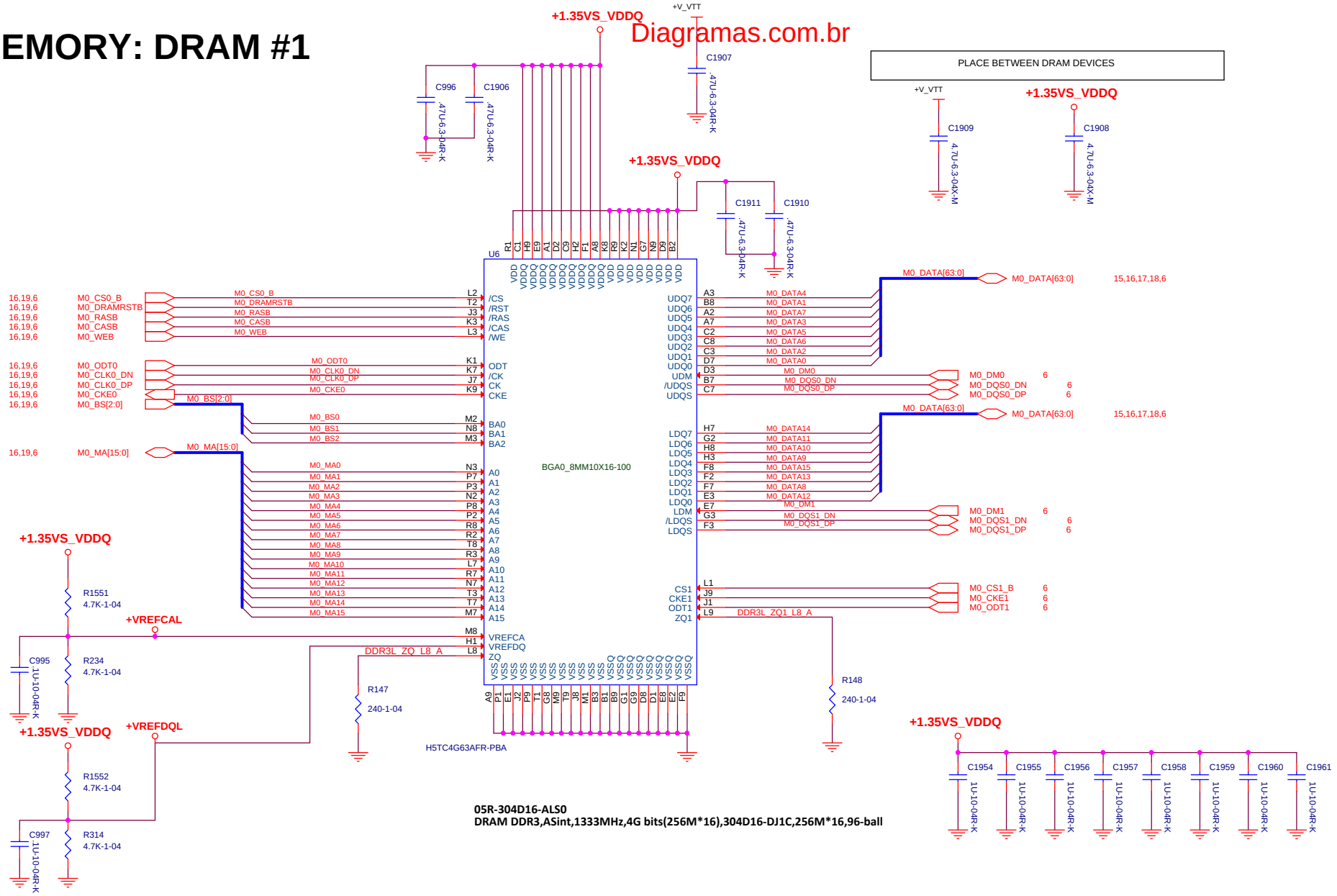
MEMORY: BLOCK DIAGRAM



Diagramas.com.br

Title	MEMORY_ BLOCK DIAGRAM	
Size A4	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 14 of 35	

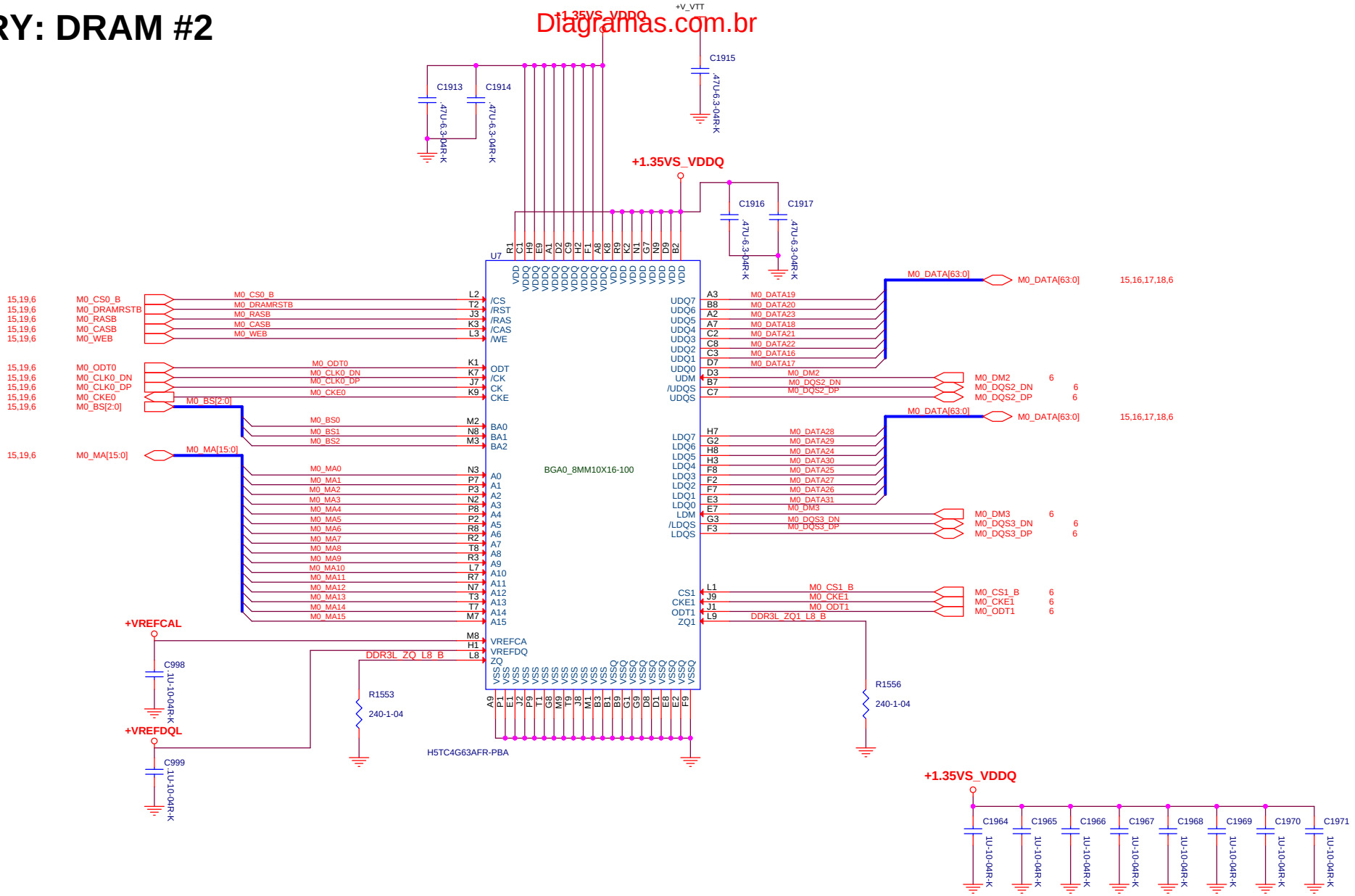
MEMORY: DRAM #1



Diagramas.com.br

Title	MEMORY_ DRAM #1	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 15 of 35	

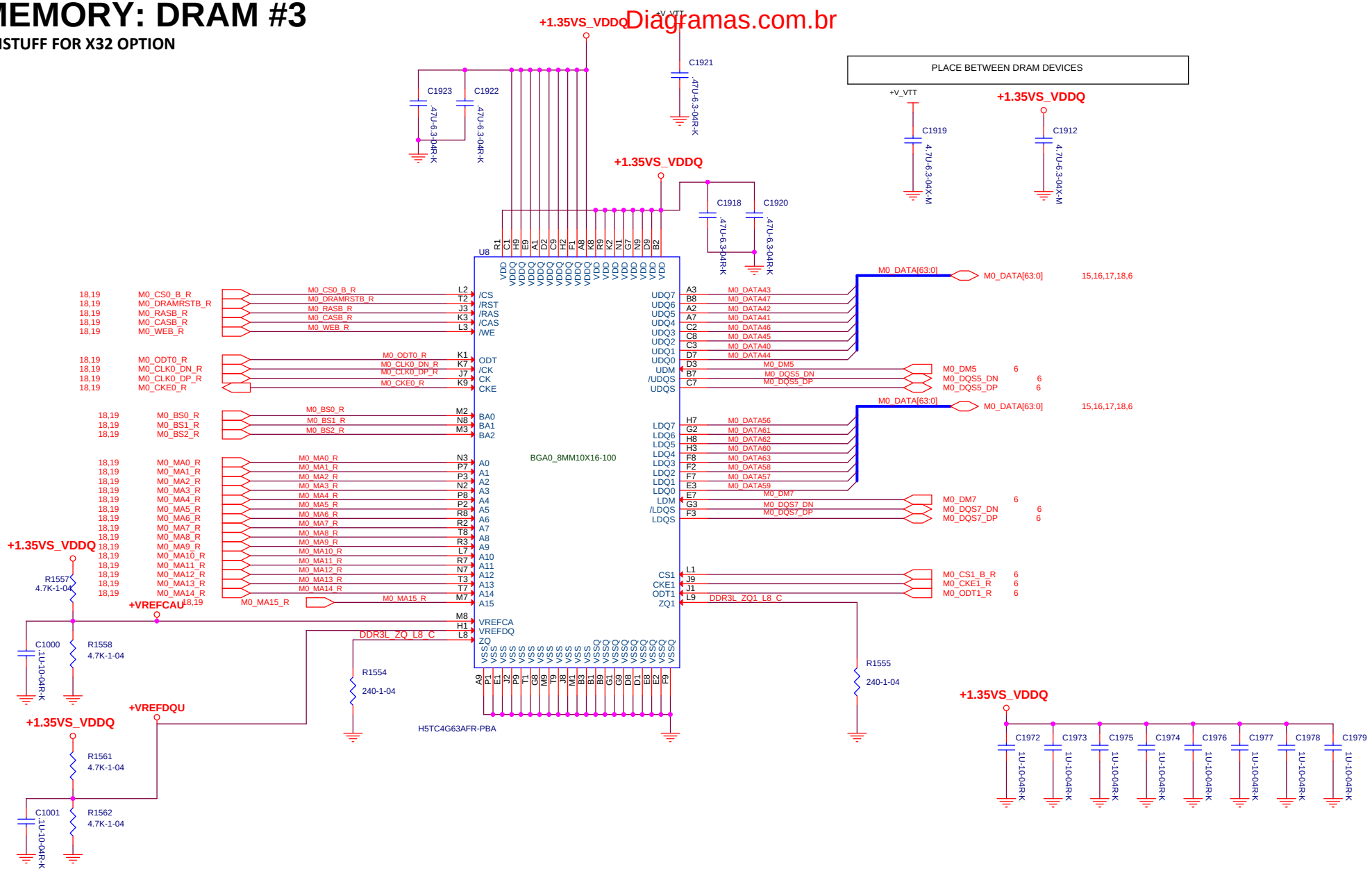
MEMORY: DRAM #2



Title	MEMORY_ DRAM #2	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 16 of 35	

MEMORY: DRAM #3

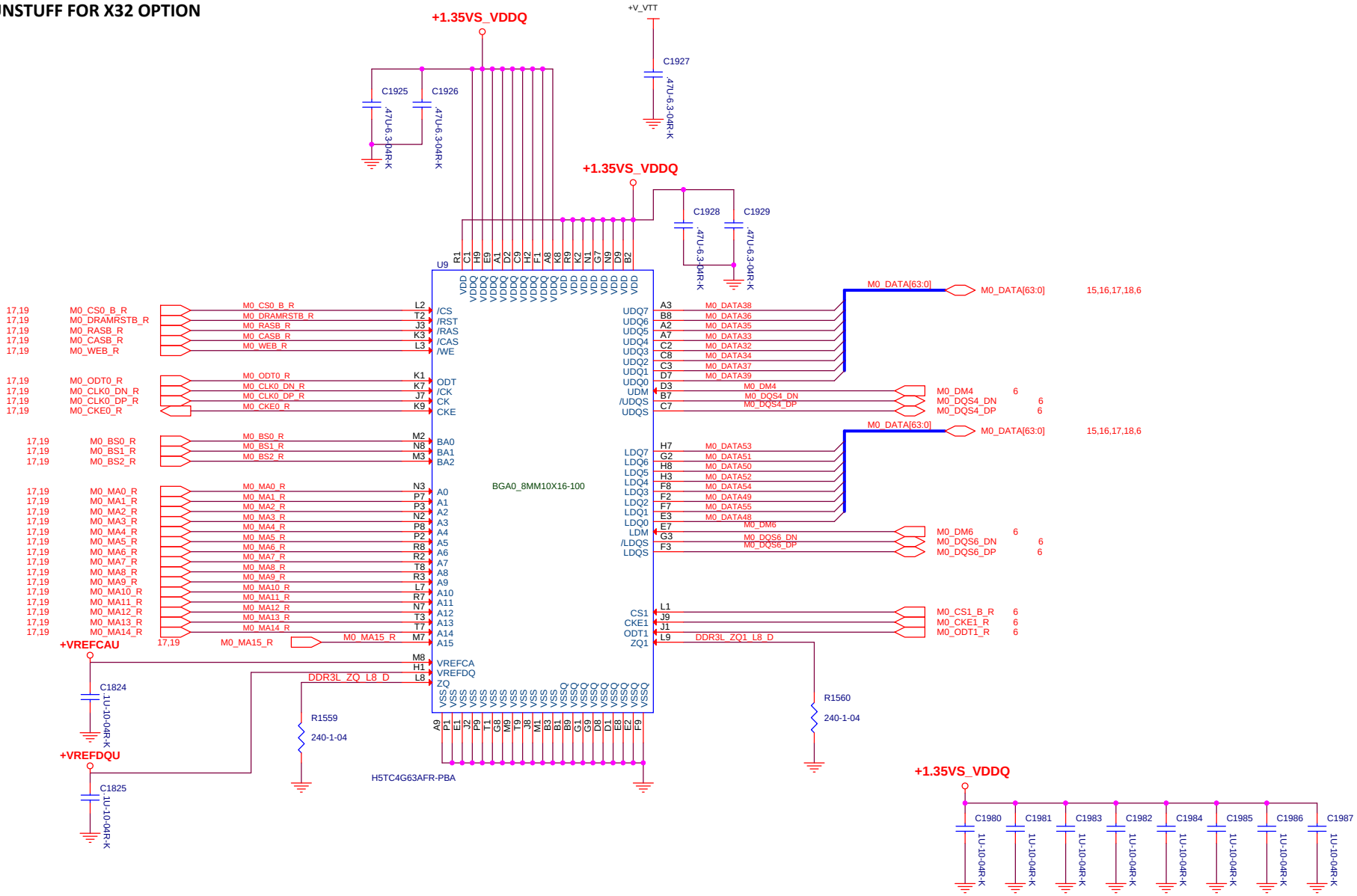
UNSTUFF FOR X32 OPTION



Title	MEMORY_ DRAM #3		
Size A3	Document Number S14CT01		Rev A
Date: Friday, February 19, 2016	Sheet 17 of 35		

MEMORY: DRAM #4

UNSTUFF FOR X32 OPTION

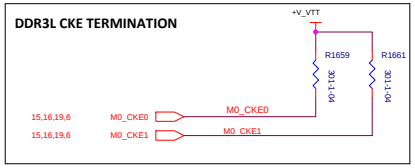


Title	MEMORY_ DRAM #4	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 18 of 35	

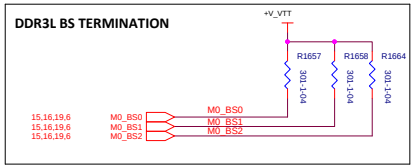
MEMORY: TERMINATION & X32/64 SCALABLE OPTIONS

UNSTUFF FOR X32 OPTION

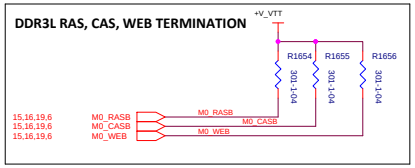
DDR3L CKE TERMINATION



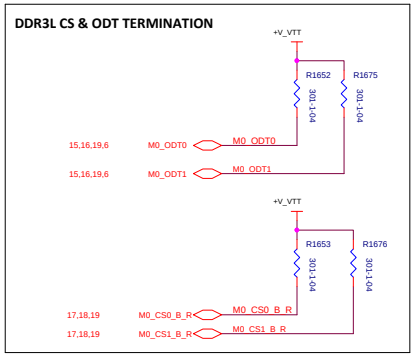
DDR3L BS TERMINATION



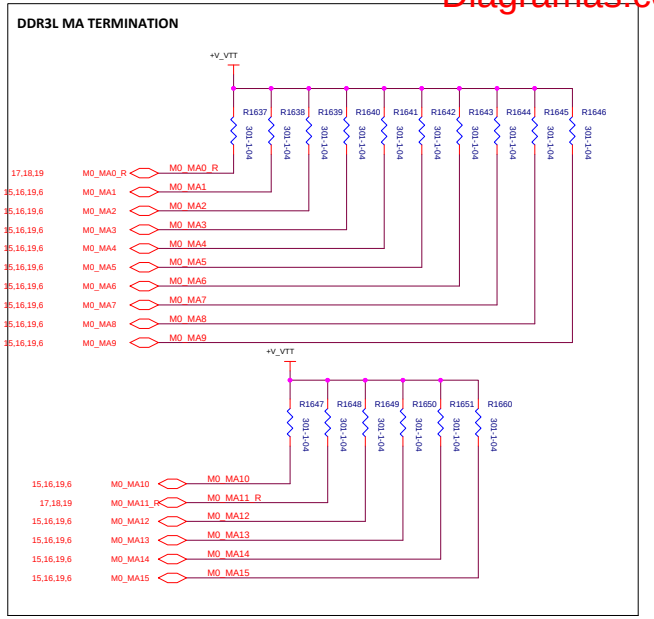
DDR3L RAS, CAS, WEB TERMINATION



DDR3L CS & ODT TERMINATION

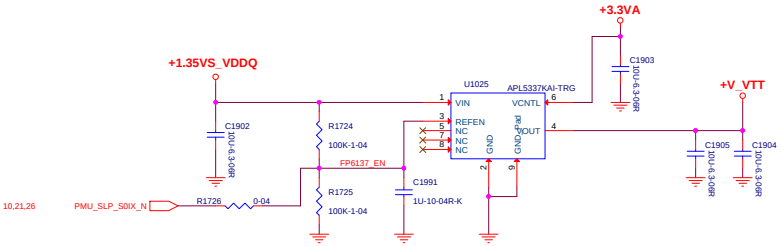


DDR3L MA TERMINATION

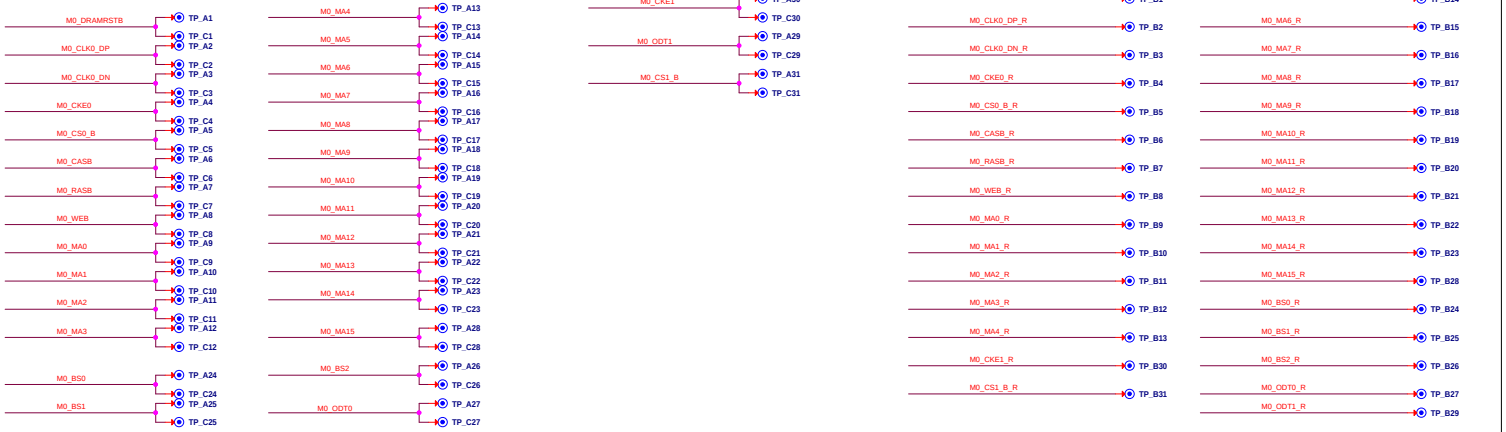


X32/64 RESISTOR OPTIONS

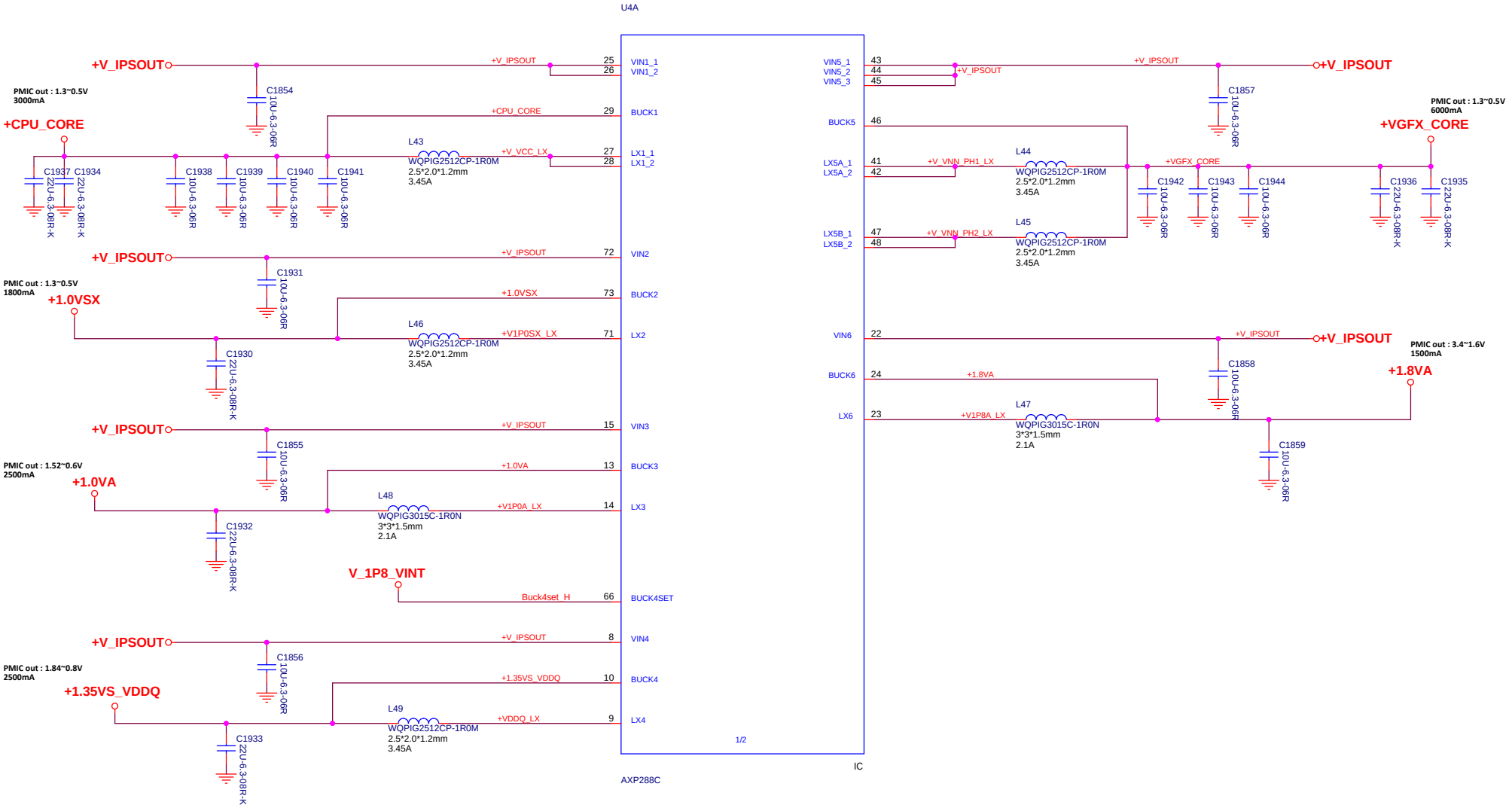
15,16,6	M0_DRAMRSTB	M0_DRAMRSTB	R1609	0-04	M0_DRAMRSTB_R	M0_DRAMRSTB_R 17,18
15,16,6	M0_CLK0_DP	M0_CLK0_DP	R1610	0-04	M0_CLK0_DP_R	M0_CLK0_DP_R 17,18
15,16,6	M0_CLK0_DN	M0_CLK0_DN	R1611	0-04	M0_CLK0_DN_R	M0_CLK0_DN_R 17,18
15,16,19,6	M0_CKE0	M0_CKE0	R1612	0-04	M0_CKE0_R	M0_CKE0_R 17,18
15,16,6	M0_CS0_B	M0_CS0_B	R1613	0-04	M0_CS0_B_R	M0_CS0_B_R 17,18,19
15,16,19,6	M0_CASB	M0_CASB	R1614	0-04	M0_CASB_R	M0_CASB_R 17,18
15,16,19,6	M0_RASB	M0_RASB	R1616	0-04	M0_RASB_R	M0_RASB_R 17,18
15,16,19,6	M0_WEB	M0_WEB	R1615	0-04	M0_WEB_R	M0_WEB_R 17,18
15,16,6	M0_MA0	M0_MA0	R1617	0-04	M0_MA0_R	M0_MA0_R 17,18,19
15,16,19,6	M0_MA1	M0_MA1	R1618	0-04	M0_MA1_R	M0_MA1_R 17,18
15,16,19,6	M0_MA2	M0_MA2	R1620	0-04	M0_MA2_R	M0_MA2_R 17,18
15,16,19,6	M0_MA3	M0_MA3	R1619	0-04	M0_MA3_R	M0_MA3_R 17,18
15,16,19,6	M0_MA4	M0_MA4	R1621	0-04	M0_MA4_R	M0_MA4_R 17,18
15,16,19,6	M0_MA5	M0_MA5	R1622	0-04	M0_MA5_R	M0_MA5_R 17,18
15,16,19,6	M0_MA6	M0_MA6	R1624	0-04	M0_MA6_R	M0_MA6_R 17,18
15,16,19,6	M0_MA7	M0_MA7	R1623	0-04	M0_MA7_R	M0_MA7_R 17,18
15,16,19,6	M0_MA8	M0_MA8	R1625	0-04	M0_MA8_R	M0_MA8_R 17,18
15,16,19,6	M0_MA9	M0_MA9	R1626	0-04	M0_MA9_R	M0_MA9_R 17,18
15,16,19,6	M0_MA10	M0_MA10	R1628	0-04	M0_MA10_R	M0_MA10_R 17,18
15,16,6	M0_MA11	M0_MA11	R1627	0-04	M0_MA11_R	M0_MA11_R 17,18,19
15,16,19,6	M0_MA12	M0_MA12	R1629	0-04	M0_MA12_R	M0_MA12_R 17,18
15,16,19,6	M0_MA13	M0_MA13	R1630	0-04	M0_MA13_R	M0_MA13_R 17,18
15,16,19,6	M0_MA14	M0_MA14	R1632	0-04	M0_MA14_R	M0_MA14_R 17,18
15,16,19,6	M0_MA15	M0_MA15	R1635	0-04	M0_MA15_R	M0_MA15_R 17,18
15,16,19,6	M0_BS0	M0_BS0	R1631	0-04	M0_BS0_R	M0_BS0_R 17,18
15,16,19,6	M0_BS1	M0_BS1	R1633	0-04	M0_BS1_R	M0_BS1_R 17,18
15,16,19,6	M0_BS2	M0_BS2	R1634	0-04	M0_BS2_R	M0_BS2_R 17,18
15,16,19,6	M0_ODT0	M0_ODT0	R1636	0-04	M0_ODT0_R	M0_ODT0_R 17,18
15,16,19,6	M0_CKE1	M0_CKE1	R1662	0-04	M0_CKE1_R	M0_CKE1_R 17,18
15,16,19,6	M0_ODT1	M0_ODT1	R1663	0-04	M0_ODT1_R	M0_ODT1_R 17,18
15,16,6	M0_CS1_B	M0_CS1_B	R1669	0-04	M0_CS1_B_R	M0_CS1_B_R 17,18,19



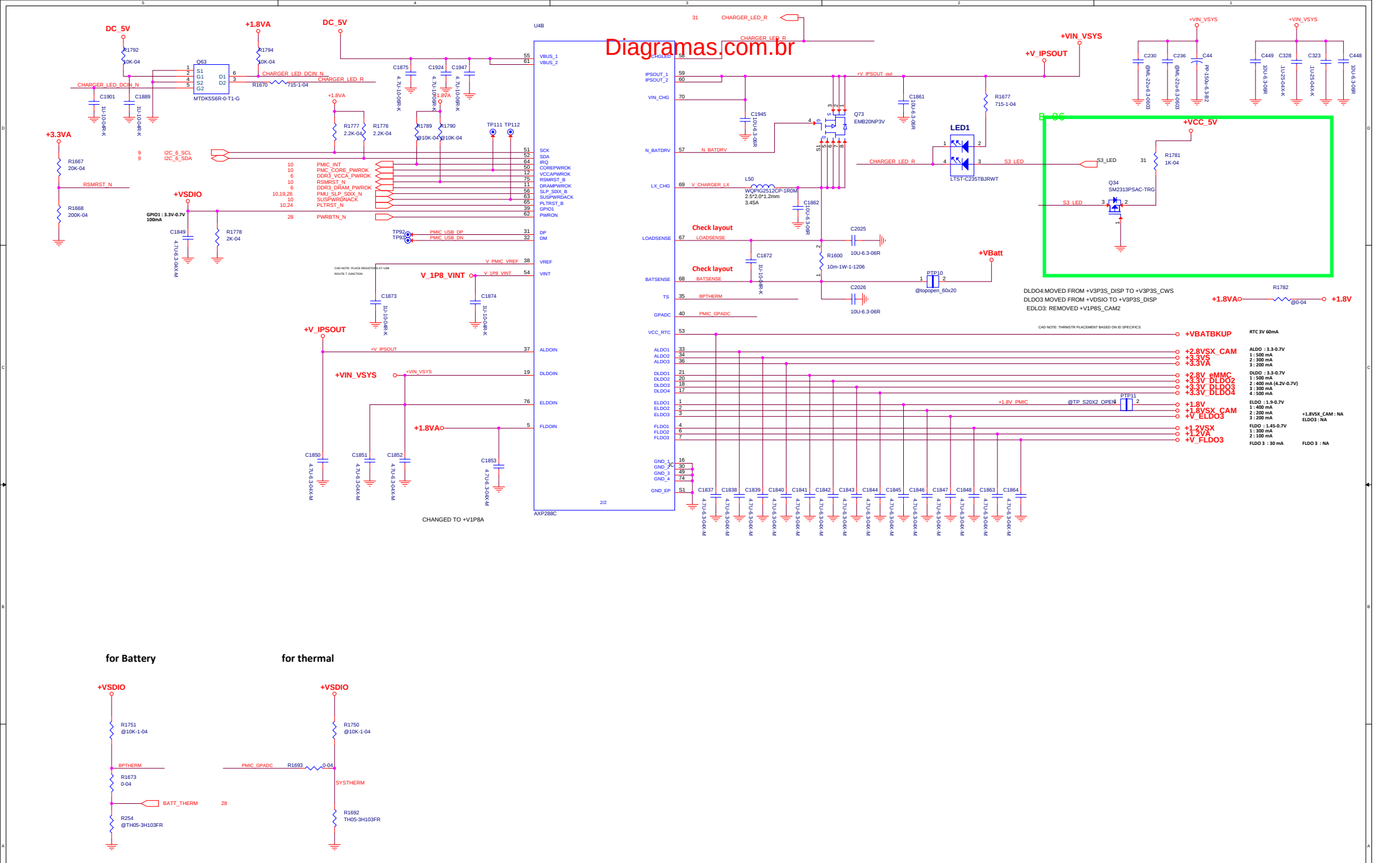
For layout



Title	MEMORY_ TERMINATION & X32_64	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 19 of 35	



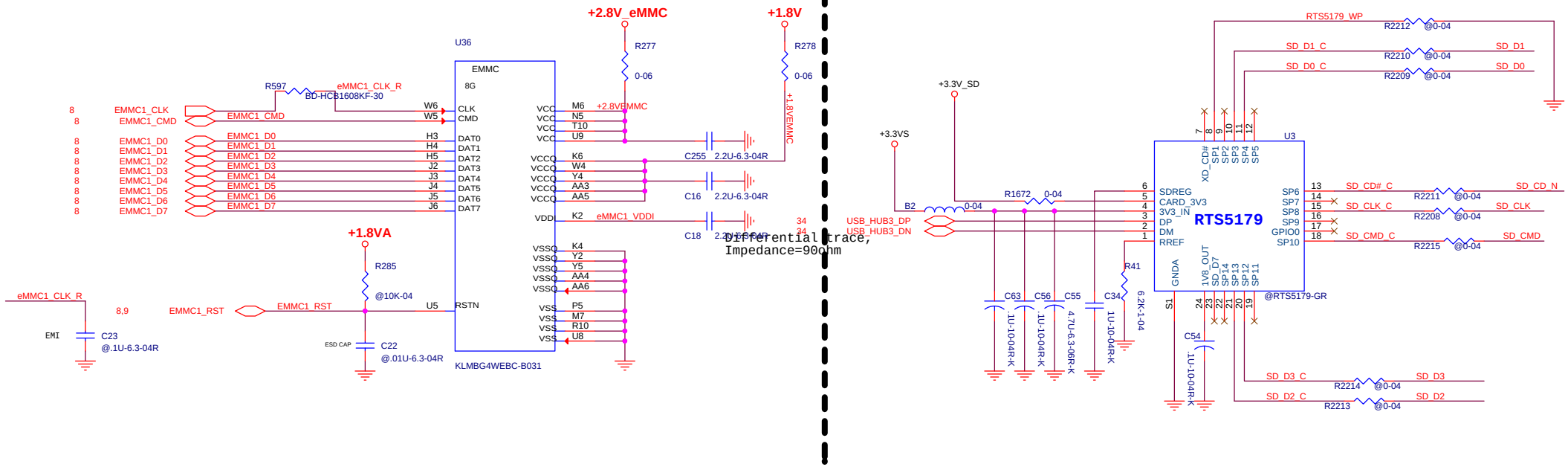
Title	PMIC-AXP288_buck_1/2	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 20 of 35	



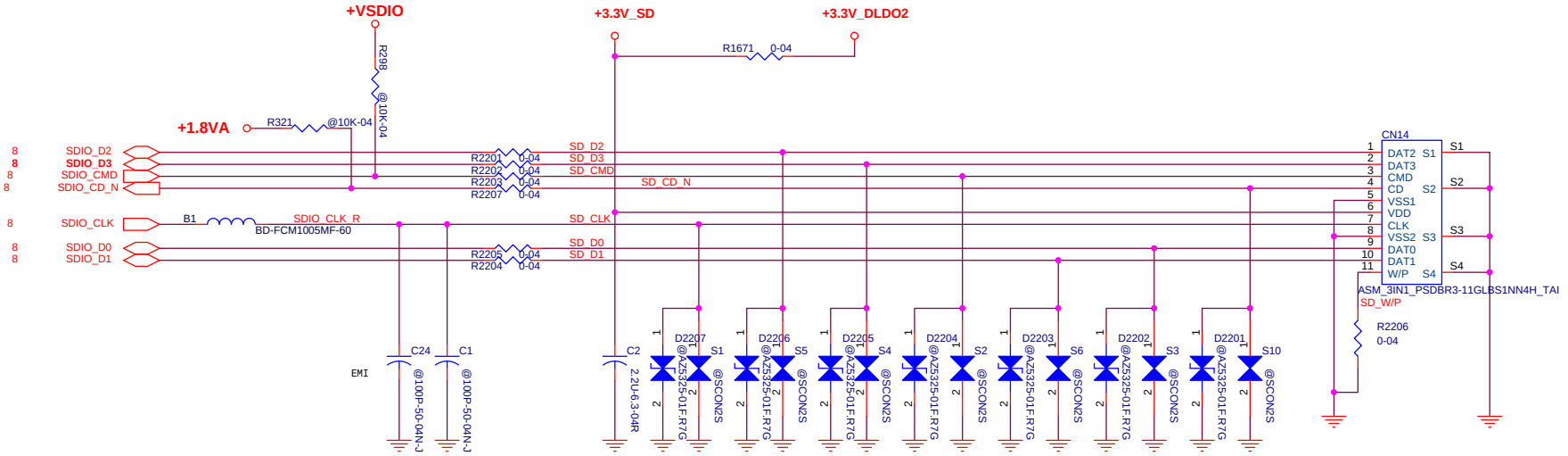
Diagramas.com.br

Title	PMIC-AXP288_CHGR_LDO_2/2	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 21 of 35	

EMMC

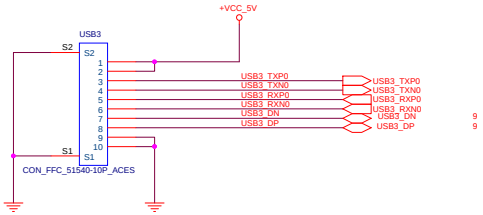


Micro-SD card



Title	eMMC/Micro SD	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 22 of 35	

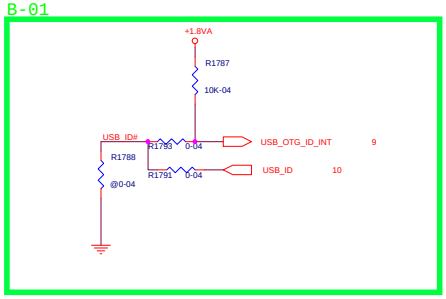
USB

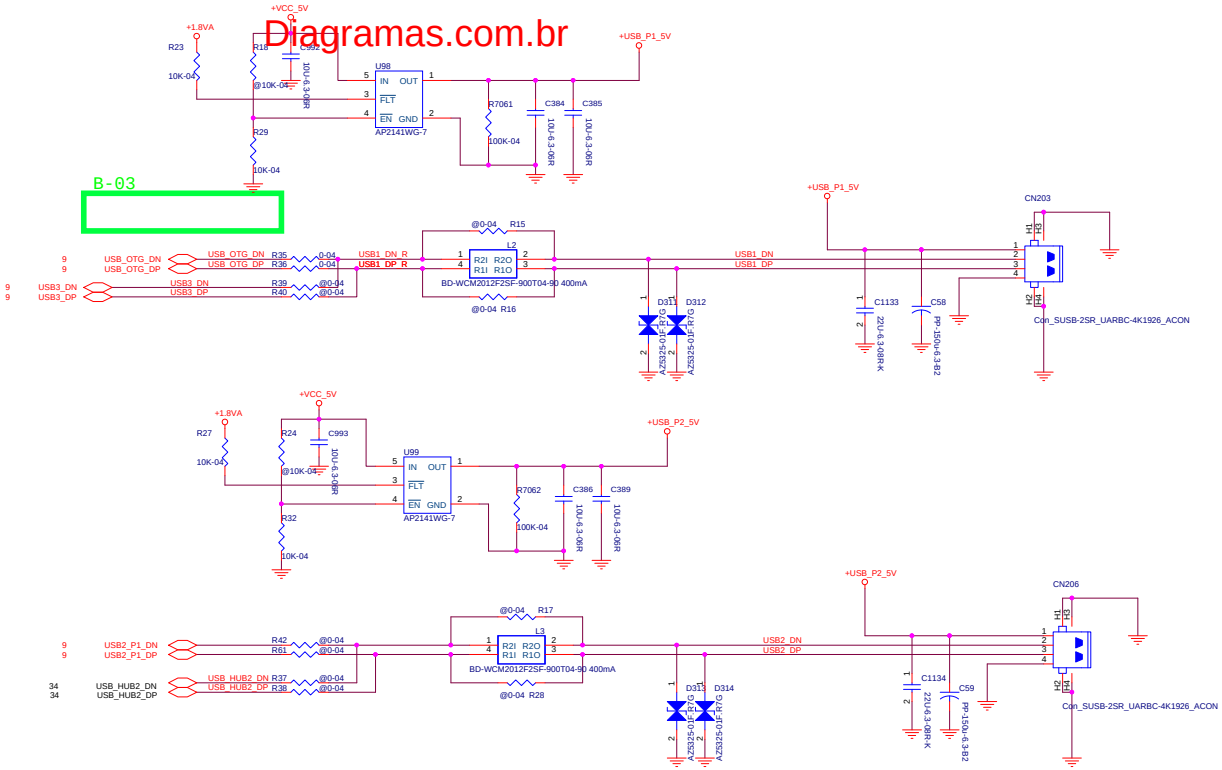


USB OTG detect

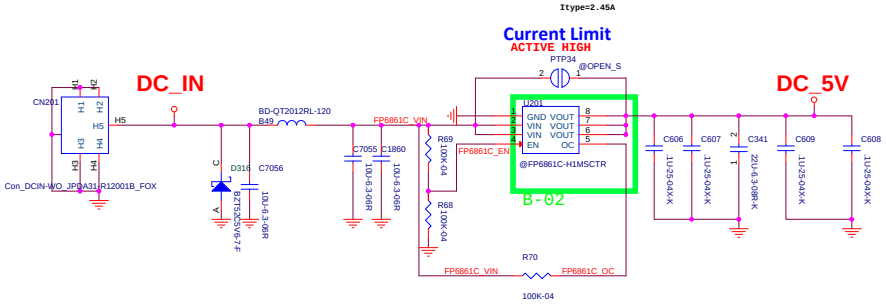
Function	USB_OTG_ID	USB_OTG_Detect#	USB_OTG_ID_INT	USB 5V
HOST	L	X	L	5V
OTG	X	L	H	0V
N/A	X	H	H	0V

B-01





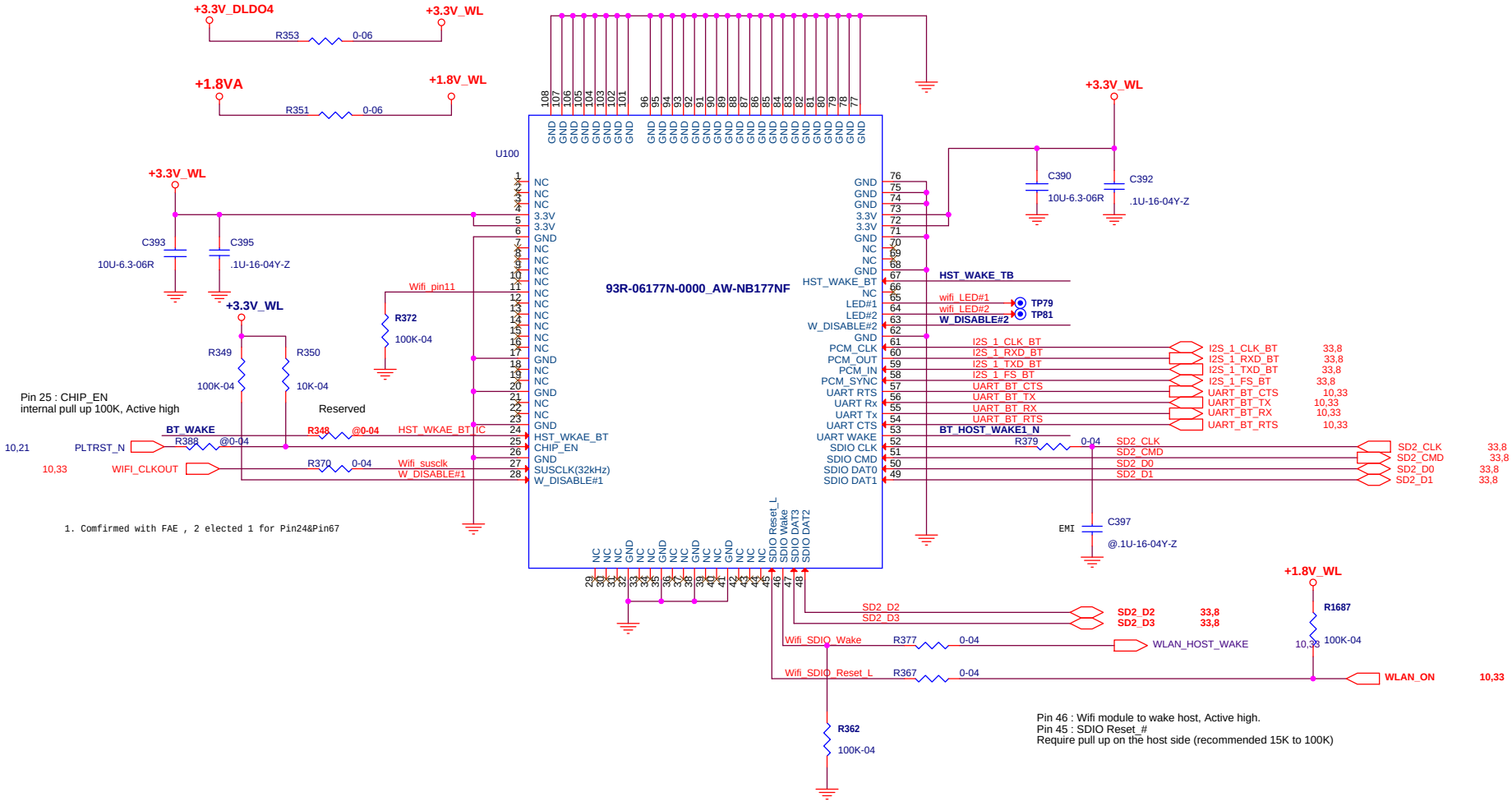
DC-in Power

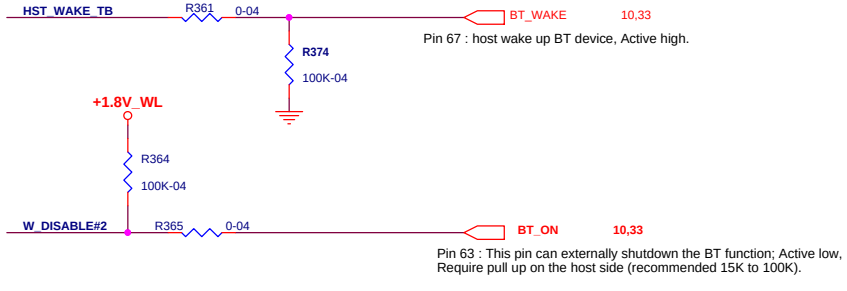


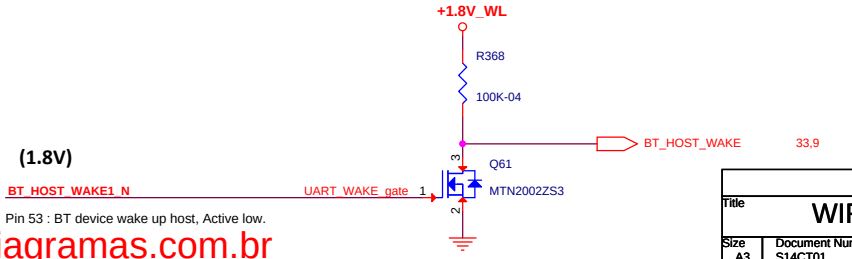
Title	USB / DC-IN		
Size A2	Document Number S14CT01		Rev A
Date: Friday, February 19, 2016	Sheet 23 of 35		

WIFI+BT(AW-NB177NF)

93R-06177N-0000

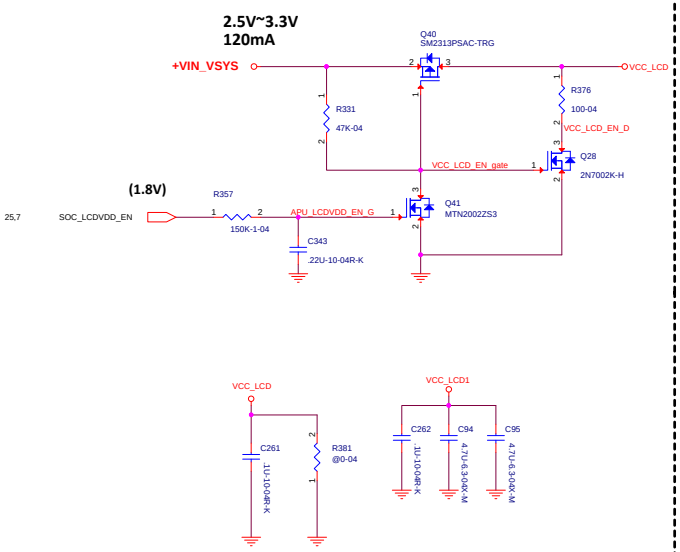






Title	WIFI+BT(AW-NB177NF)
Size	A3
Document Number	S14CT01
Rev	A
Date:	Friday, February 19, 2016
Sheet	24 of 35

VDD Power (source)

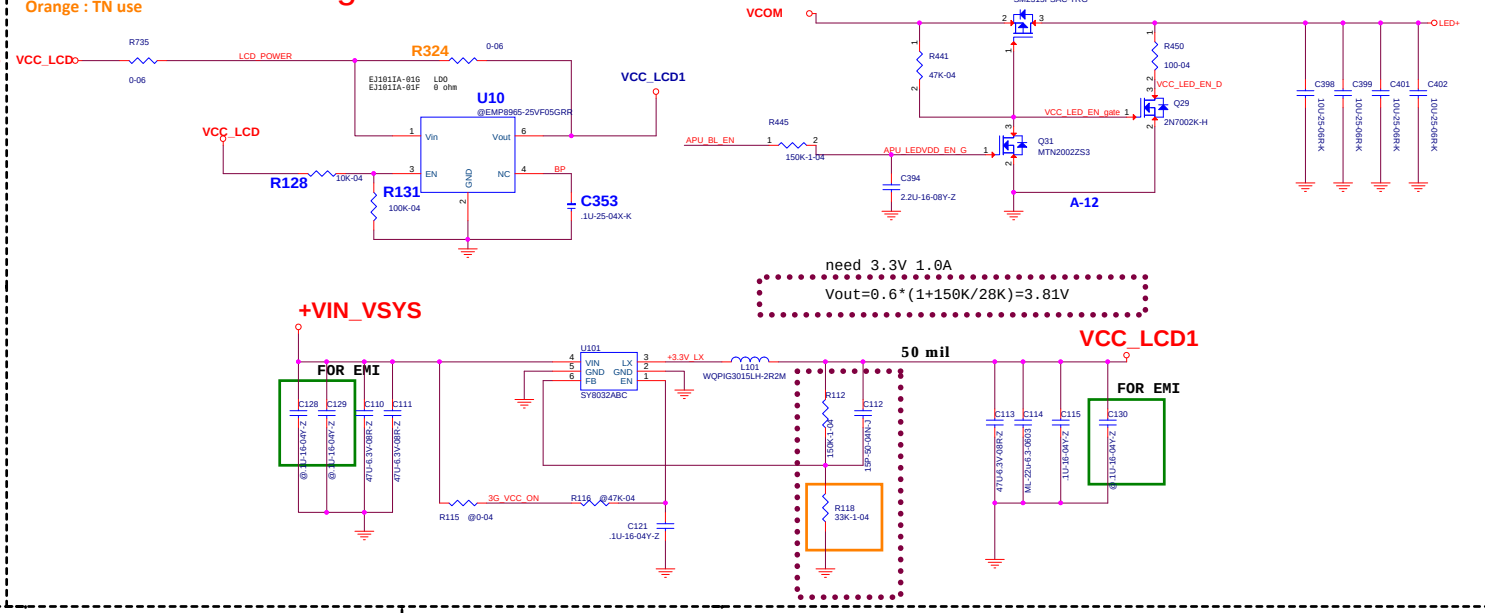


DVCC Power

Co-lay Power(2.5V&3.3V)Circuit

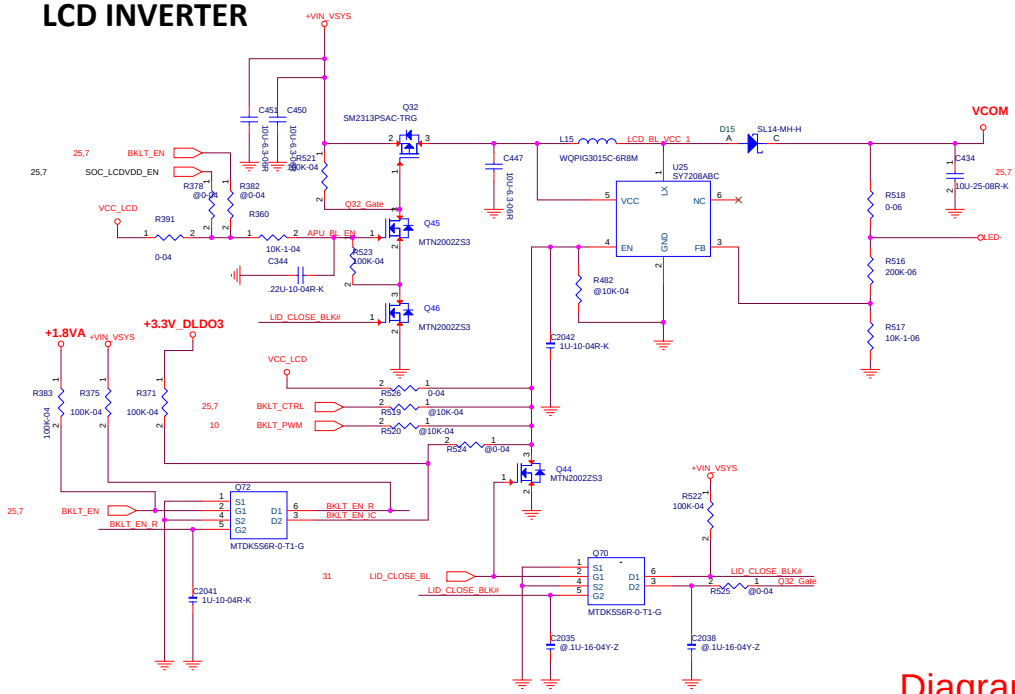
Blue : IPS use

Orange : TN use

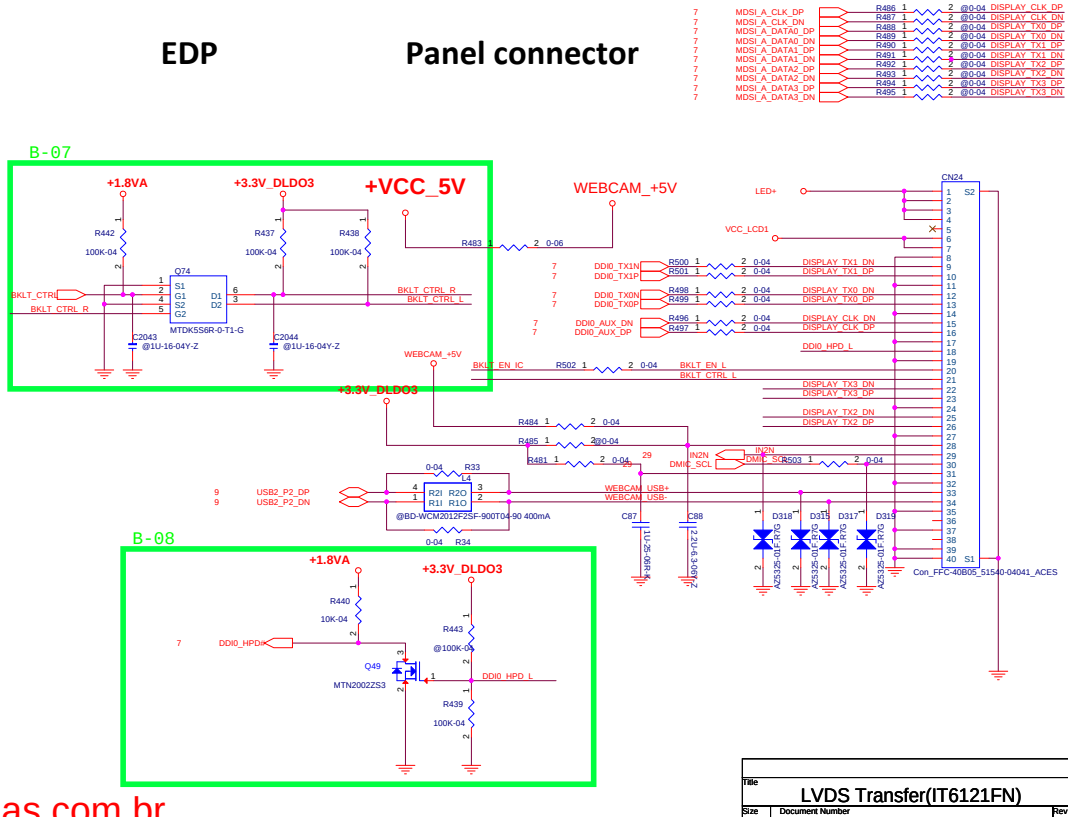


EDP

LCD INVERTER

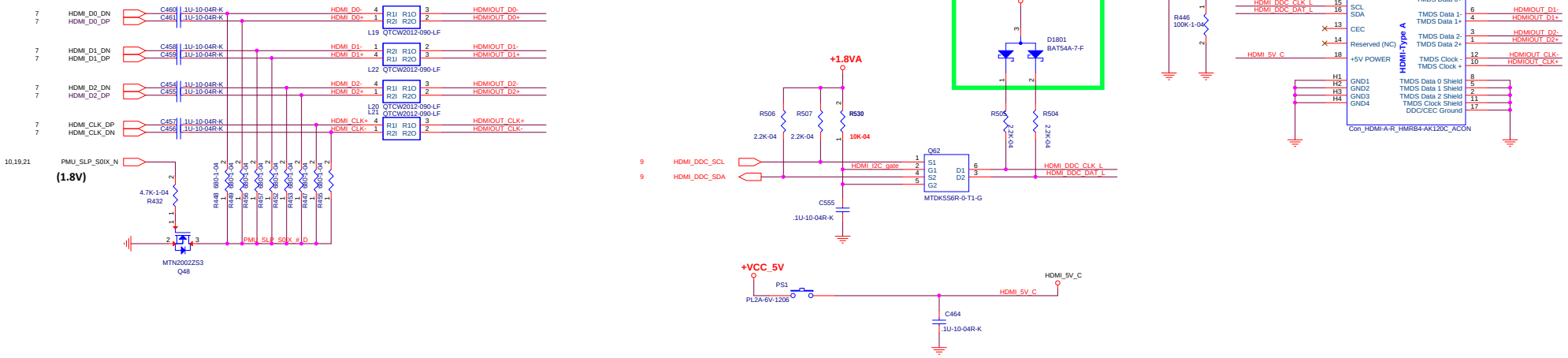


EDP Panel connector



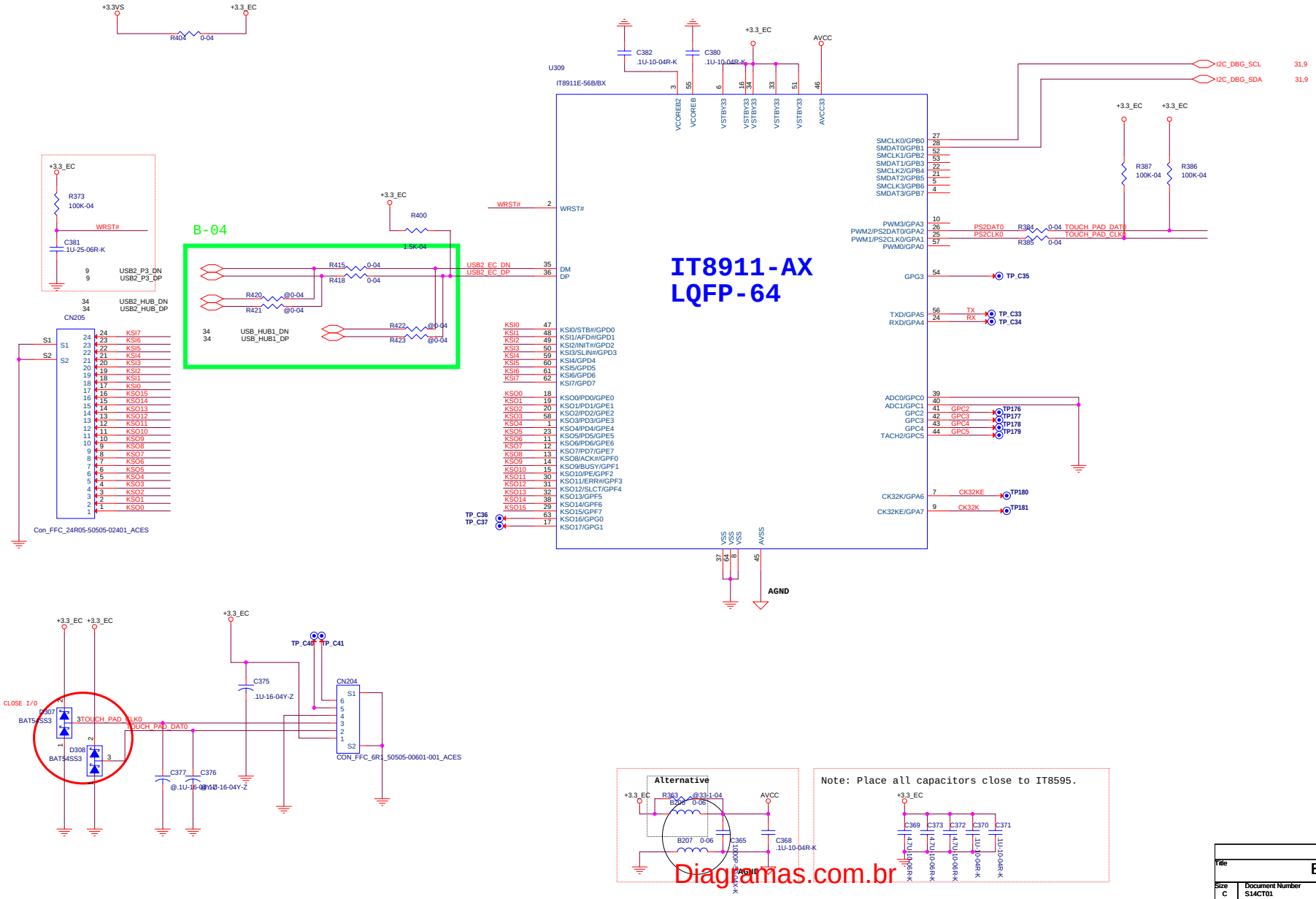
Title	LVDS Transfer(IT6121FN)		
Size A2	Document Number S14CT01		Rev A
Date: Friday, February 19, 2016	Sheet 25 of 35		

HDMI

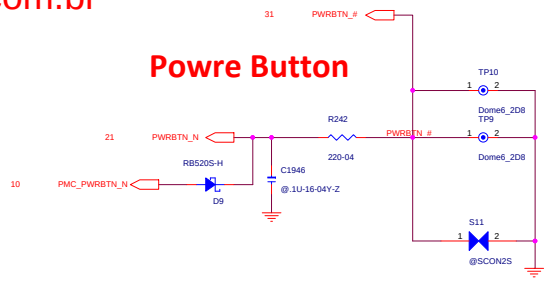


B-09

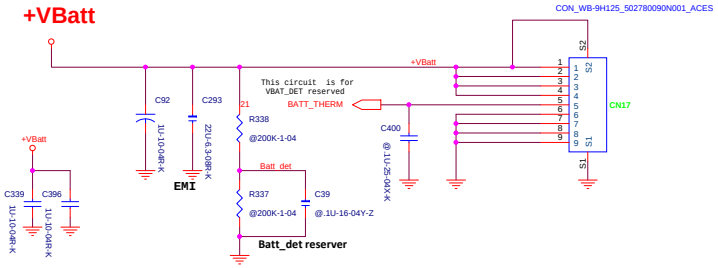
Title	LCD Inverter/HDMI	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 26 of 35	



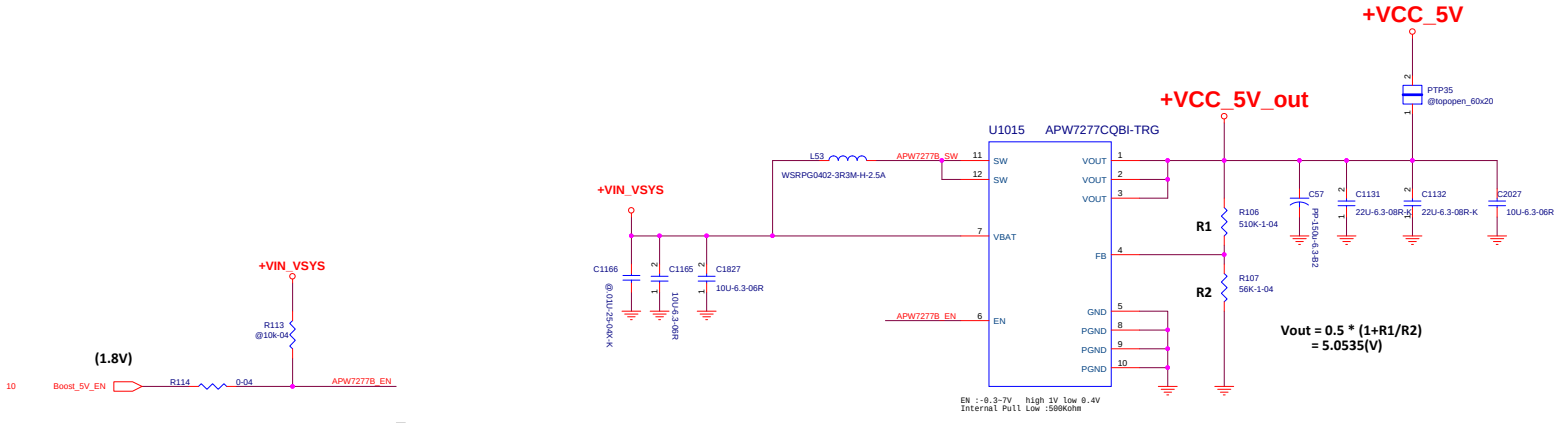
Powre Button



Battery connector

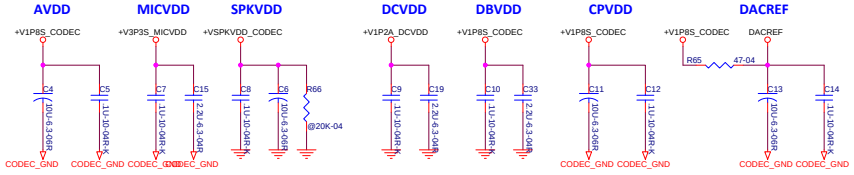


Boost 5V



Title	Battery/5V/Button	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 28 of 35	

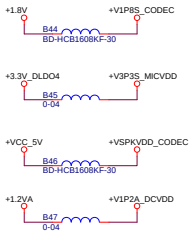
Codec Power Plan

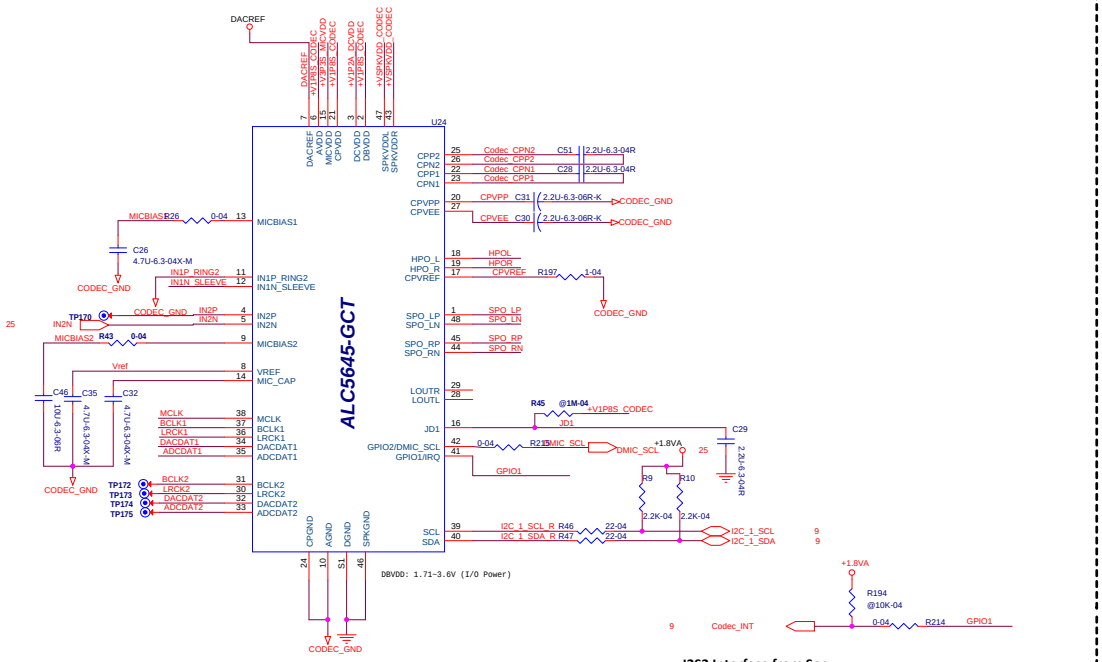


By-Pass Capcity Near The Power Pins

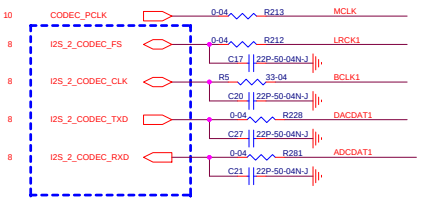
AVDD => 1.71V ~ 1.9V (1.8V is recommended)
MICVDD => 3.0V ~ 3.3V (3.3V is recommended)
SPKVDD to MICVDD
SPKVDD => 3.0V ~ 5.0V (Default 5V or 3.3V)
DCVDD => 1. 15V~ 1.3V (Default open is recommended.
CPVDD to DCVDD
DBVDD => 1.71V ~ 3.3V (1.8V is recommended)
CPVDD => 1.71V ~ 1.9V (1.8V is recommended)

Codec Gound

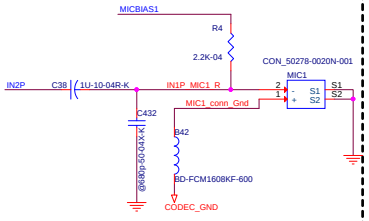




I2S2 Interface from Soc

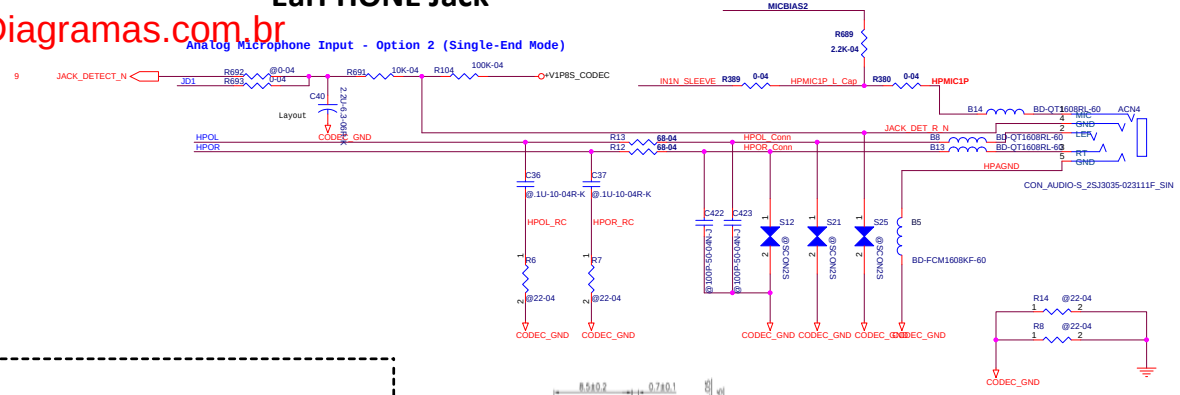


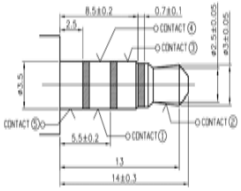
MIC

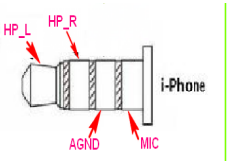


EarPHONE Jack

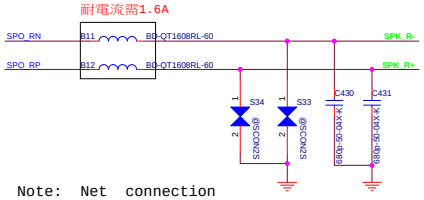
Analog Microphone Input - Option 2 (Single-End Mode)

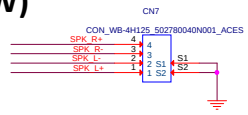




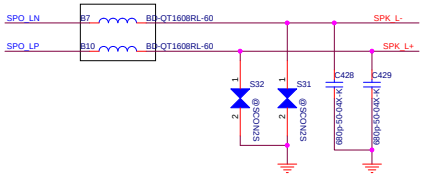


Speaker - Stereo Mode (4ohm 1.5W)



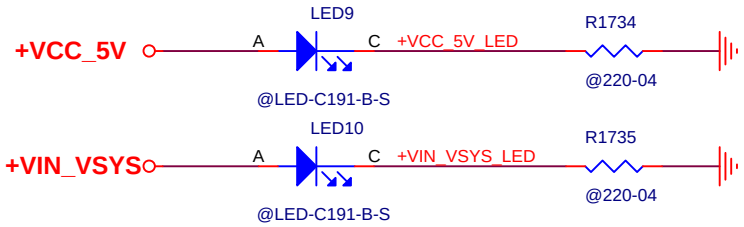


Note: Net connection

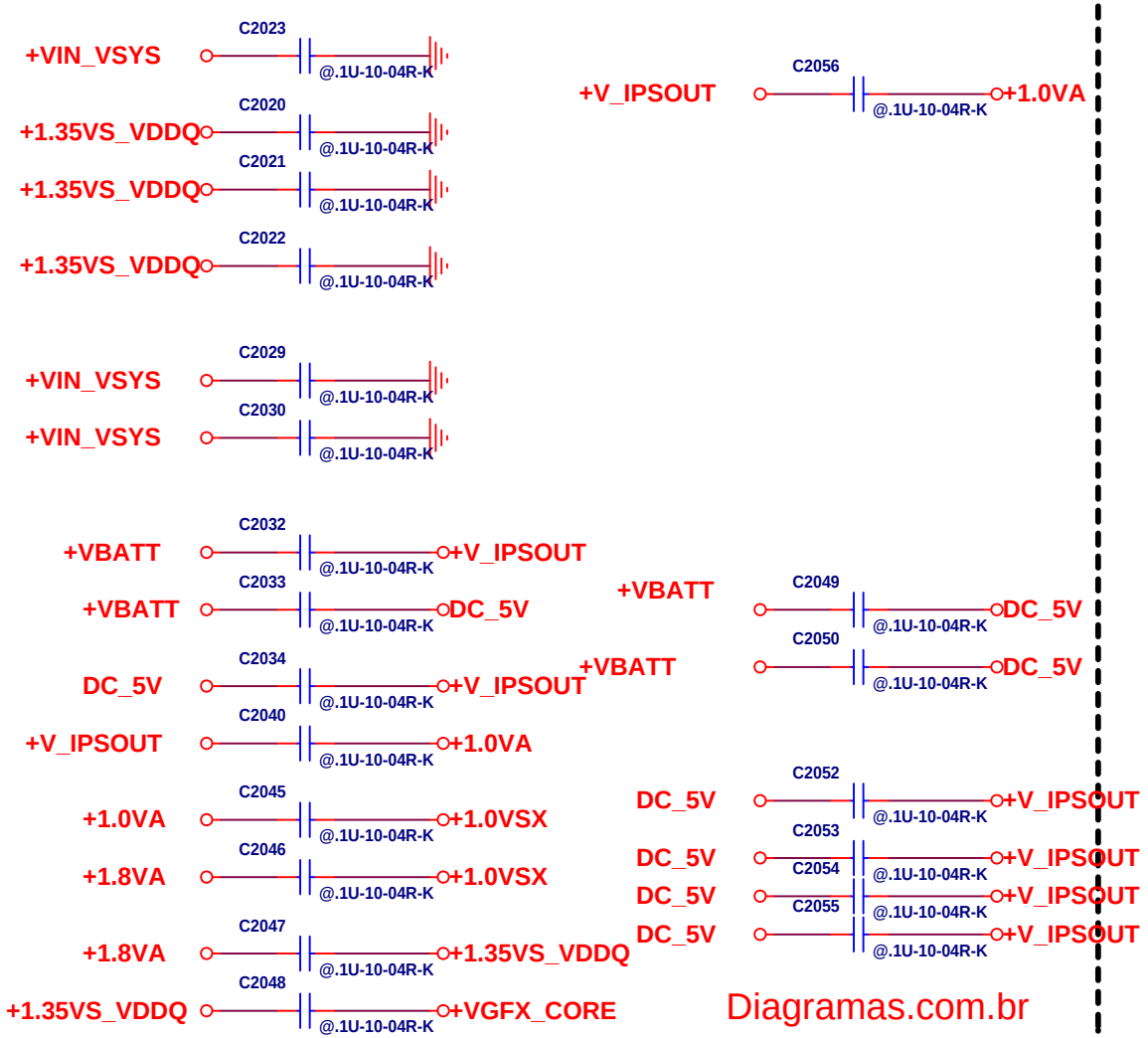


Title	I2S Audio(ALC-5645)	
Size A2	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 29 of 35	

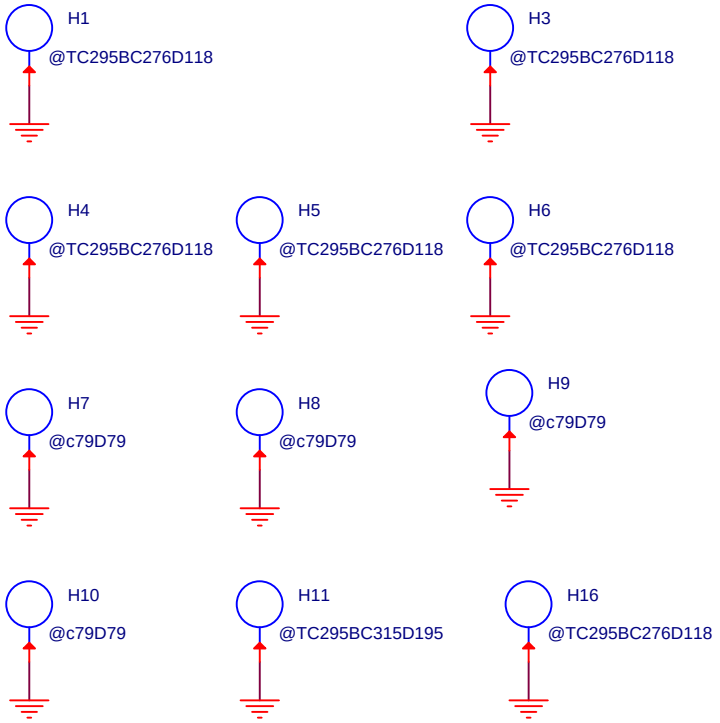
Debug LED



EMI

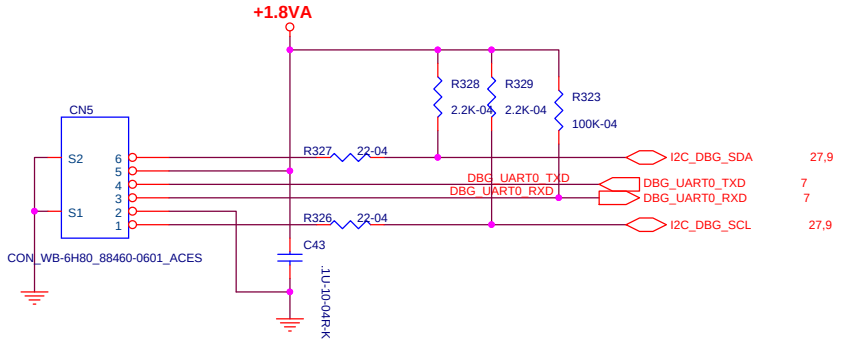


Hole

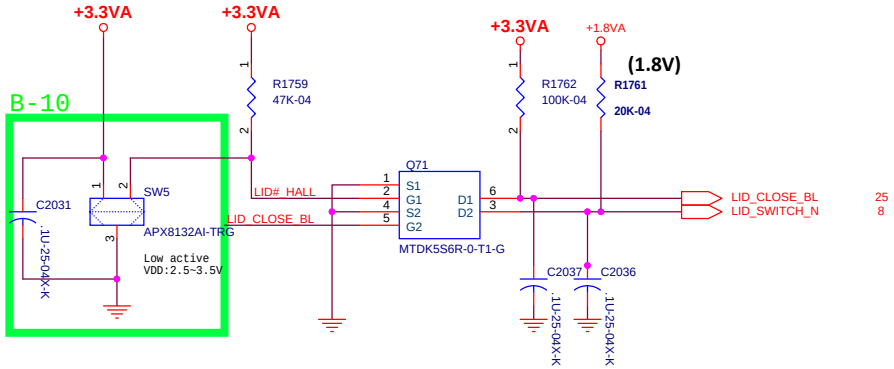


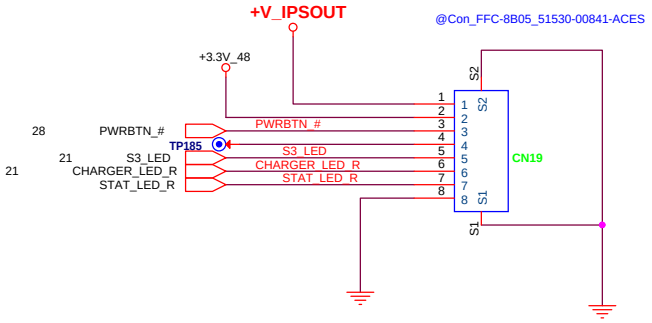
Title	Debug Led/EMI/SCREW	
Size A4	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 30 of 35	

Debug connector



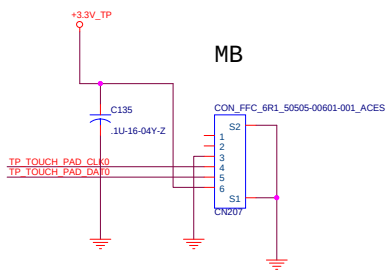
Lid Switch

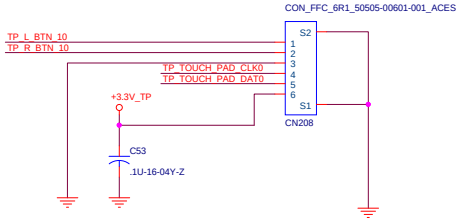


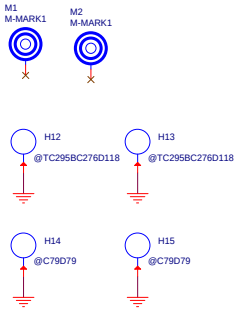


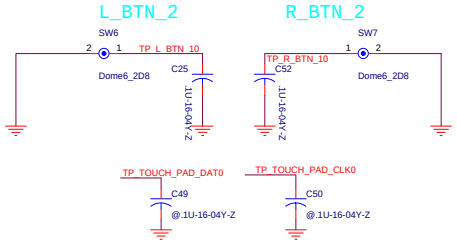
Title	DEBUG CONN/Lid	
Size A3	Document Number S14CT01	Rev A
Date: Friday, February 19, 2016	Sheet 31 of 35	

Touch Pad









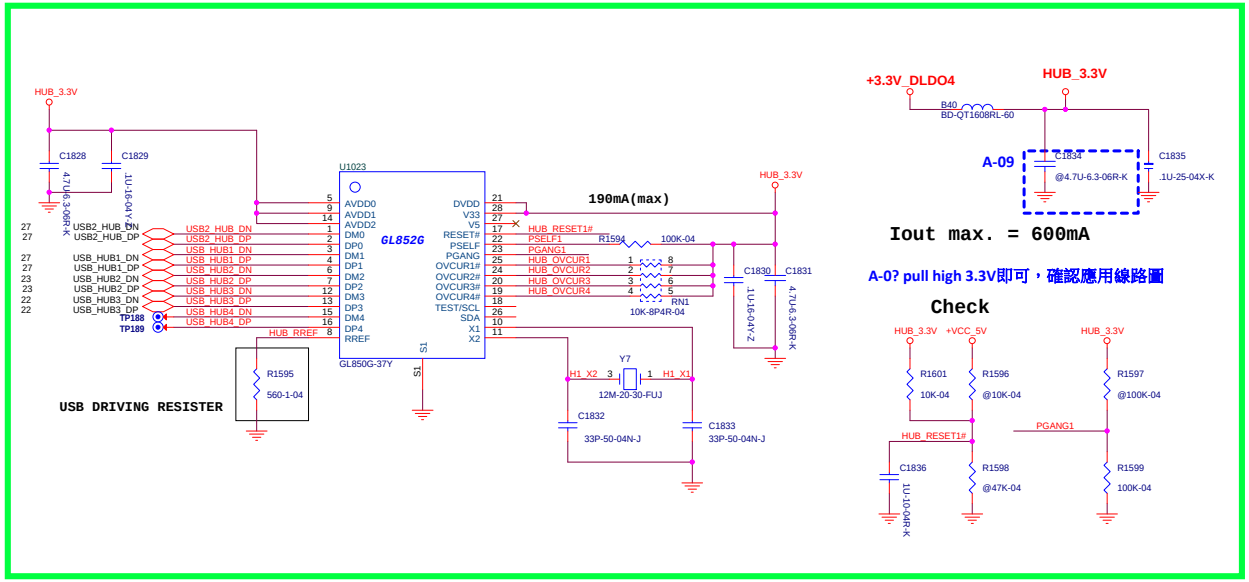
Title: TP		
Size: C	Document Number: S14CT01	Rev: A
Date: Friday, February 19, 2016	Sheet 32 of 35	

Diagramas.com.br

Title	WIFI+BT(AP6476)	
Size: C	Document Number: <Doc>	Rev: <RevCode>
Date: Friday, February 19, 2016	Sheet 33 of 35	

USB Hub (1 to 4 ch)

B-05



Title	USB HUB	
Size C	Document Number <Doc>	Rev <RevCode>
Date: Friday, February 19, 2016	Sheet 34 of 35	

History

B-01 PULL HGH THE USB ID PIN FOR AC MODE ISSUE

B-02 REMOVE THE DC-IN CURRENT LIMIIT

B-03 B-04 B-05 CO-LAY USB HUB for OTG PORT BUG

B-06 FOR S3 LED FUNCTION

B-07 B-08 FOR eDP FUNCTION ON BIOS MODE

B-09 FOR HDMI DESIGN RULE

B-10 CHANGE LID pindrfine

Diagramas.com.br

Title: History		
Size: A2	Document Number: S14CT01	Rev: A
Date: Friday, February 19, 2016	Sheet 35 of 35	