

Compal Confidential

Argon2 MB Schematic Document

LA-L511P

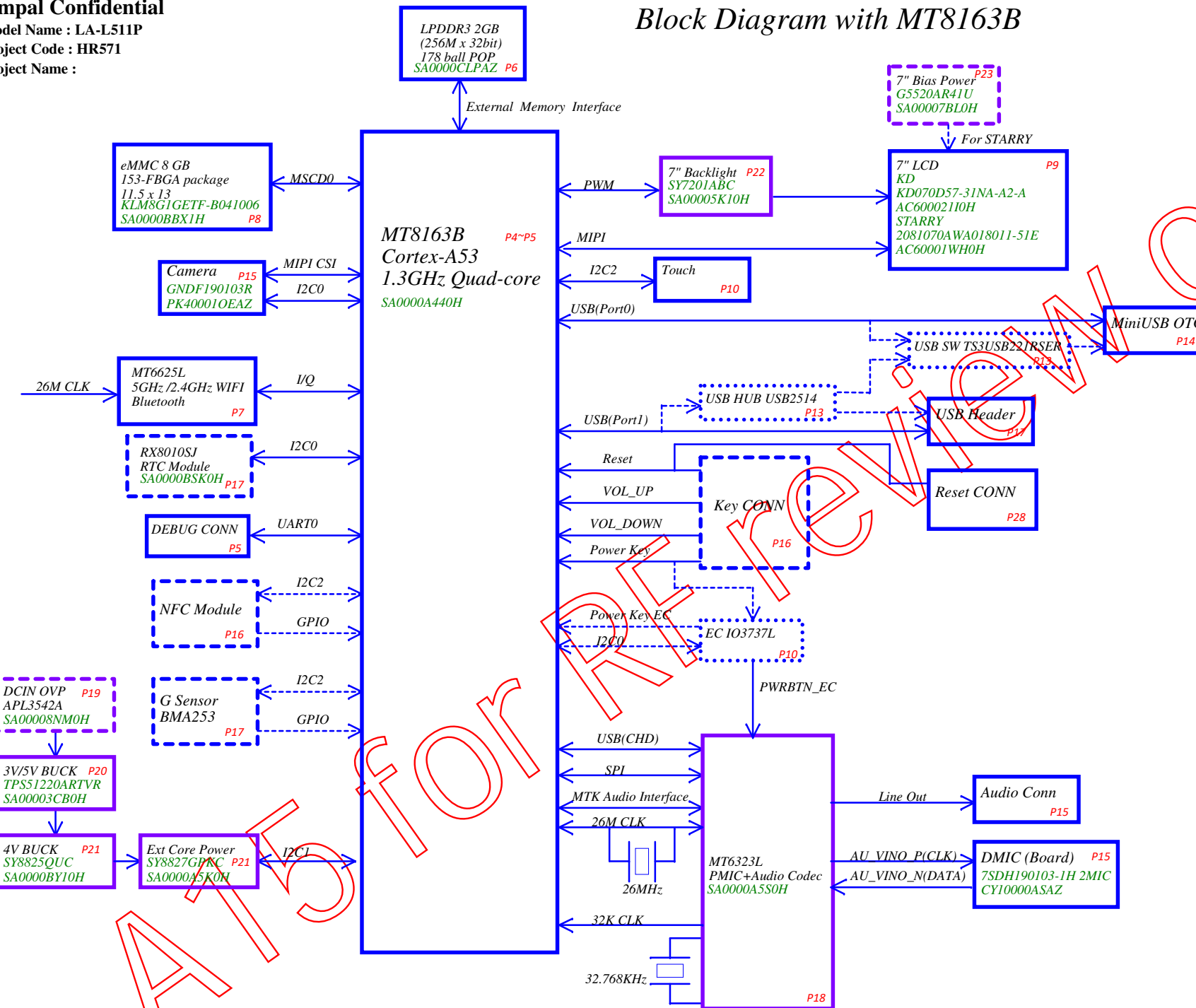
Rev: 0.2

2021.04.26

A15 for PREVIEW ONLY

Security Classification	Compal Secret Data			Title	
Issued Date	2016/06/28	Deciphered Date	2016/06/28	Cover Sheet	
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Block Diagram with MT8163B



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Size	Document Number	Rev		
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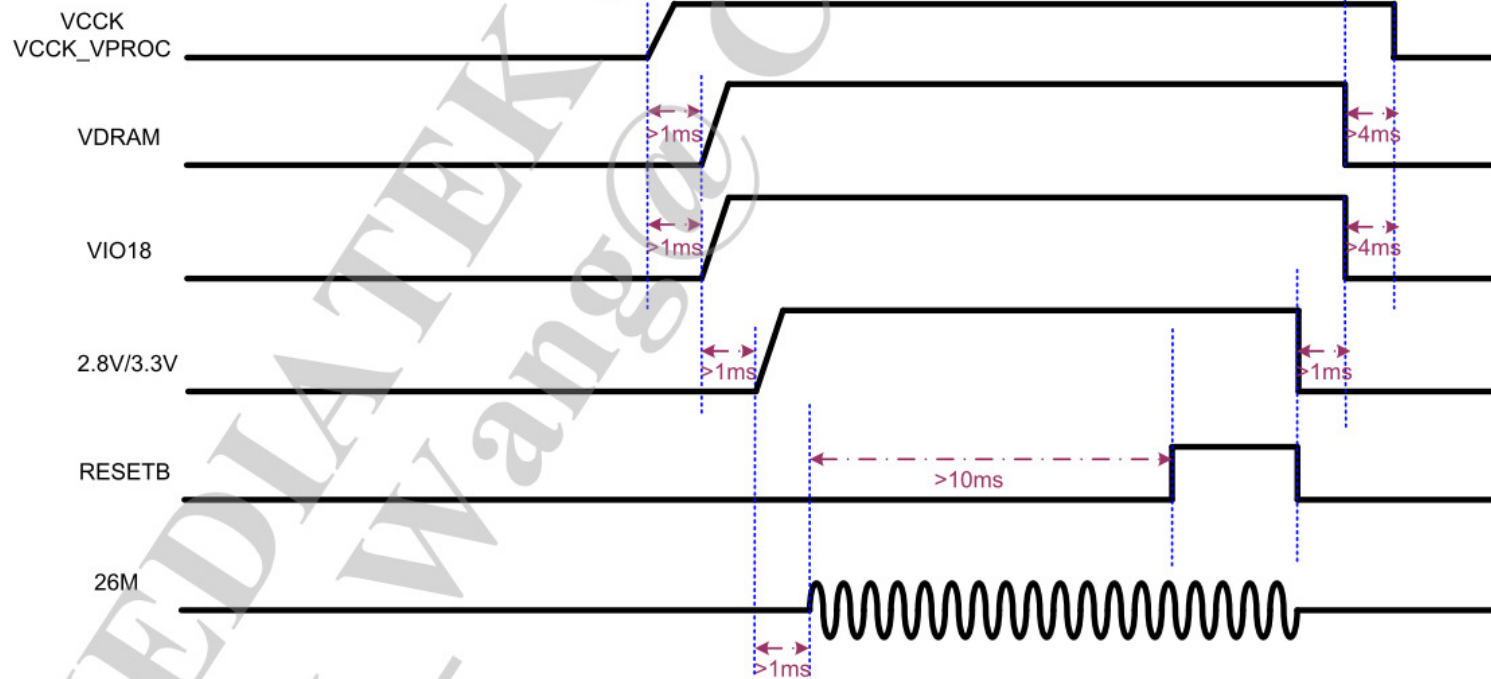


Figure 2-13: Power on/off sequence

Power Rail	Level	S0	S5
VPROC	1.15V	1.15V	0V
EXT VPROC Buck	1.15V	1.15V	0V
VSYS	2.2V	2.2V	0V
VA	2.8V	2.8V	0V
VTCXO	2.8V	2.8V	0V
VCN33	3.3V	3.3V	0V
(VM)VCCIO	1.24V	1.24V	0V
VIO18	1.8V	1.8V	0V
VRTC	2.8V	2.8V	0V
VCN18	1.8V	1.8V	0V
VEMC_3V3	3.3V	3.3V	0V
VMC	3.3V	3.3V	0V
VMCH	3.3V	3.3V	0V
VUSB	3.3V	3.3V	0V
VGP1	2.8V	2.8V	0V
VIBR	1.2V	1.2V	0V
VGP3	1.2V	1.2V	0V
VCAMA	2.8V	2.8V	0V
VCAMD	1.8V	1.8V	0V
VCAM_IO	1.8V	1.8V	0V
+3VA	3.3V	3.3V	3.3V
+3VL	3.3V	3.3V	3.3V
+4VA	4.0V	4.0V	0V
+5VALW	5.0V	5.0V	5.0V
+5VLDO	5.0V	5.0V	5.0V

I2C address table

	SCL0/SDA0	SCL1/SDA1	SCL2/SDA2
Camera (GC2375)	0x6E (Write) 0x6F (Read)		
EXT_VPROC BUCK (SY8827G)		0xC0	
Touch Controller (eKTH3386)			0x10
EC (IO3737LU B1)	0xE0		
RTC module (RX8010SJ)	0x32		
NFC module			0x??
G Sensor BMA253			0x18

Crystal

Y1

 EPSON@
 SJ100001K0H
 S CRYSTAL 32.768KHZ Q13FC1350000400

LPDDR3

U501

 LEAHKINN@
 SA0000CJ20H
 S IC D3 2G/1600 KFO5555ES8-ZIB1 FBGA178P

U501

 LEAHKINN@
 SA0000CLP0H
 S IC D3 2G/1600 LTFP0066E83-ZJY2 FBGA178

U501

 LEAHKINAZ@
 SA0000CLPAZ
 S IC D3 2G/1600 LTFP0066E83-ZJY2 FBGA178

PCB

DAX

 PCB DA@
 DA8001Q100H
 PCB 3PP LA-L511P REV0 7" LCD M/B

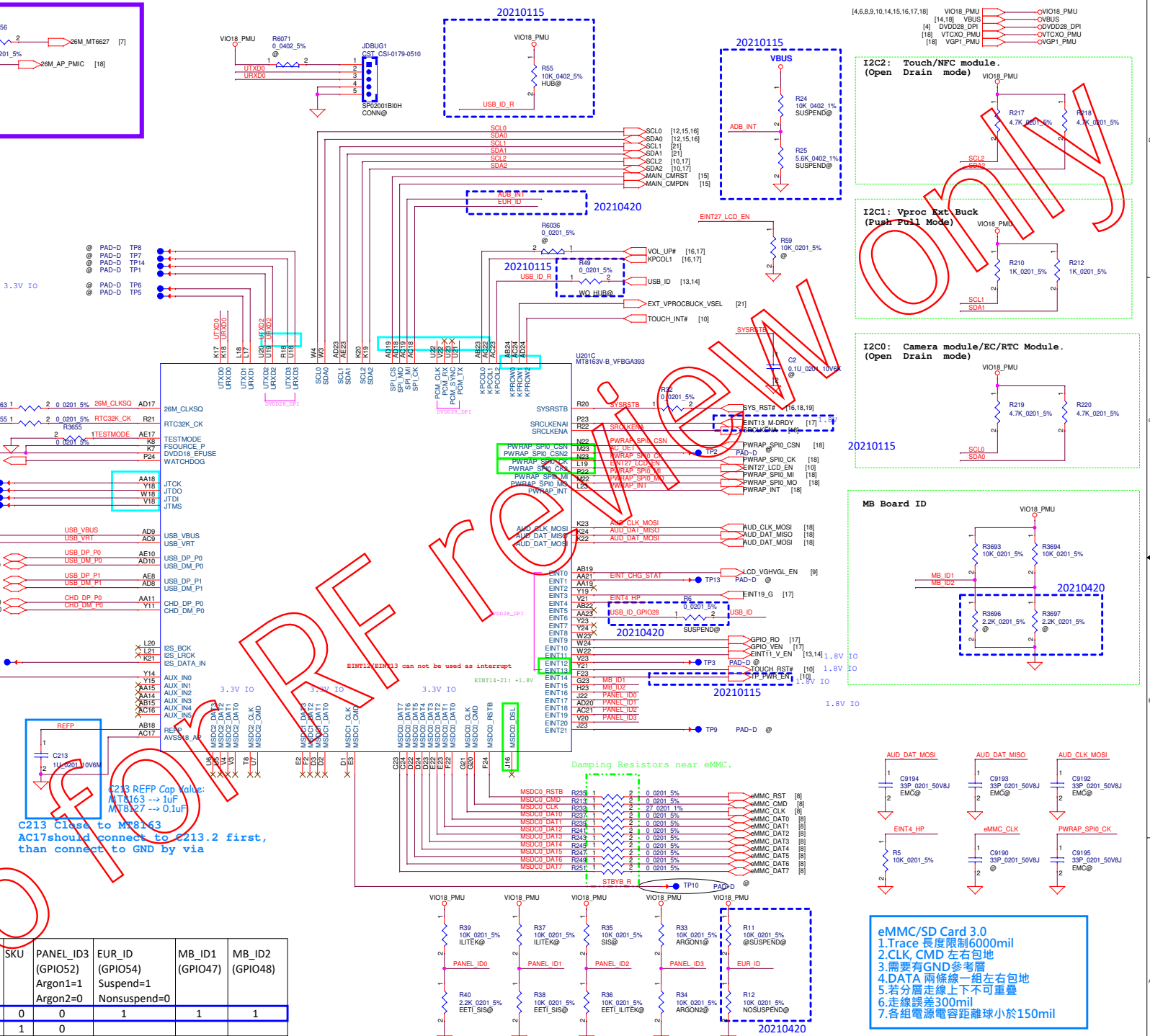
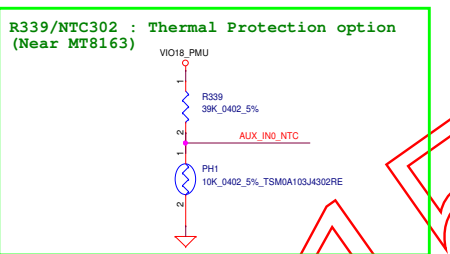
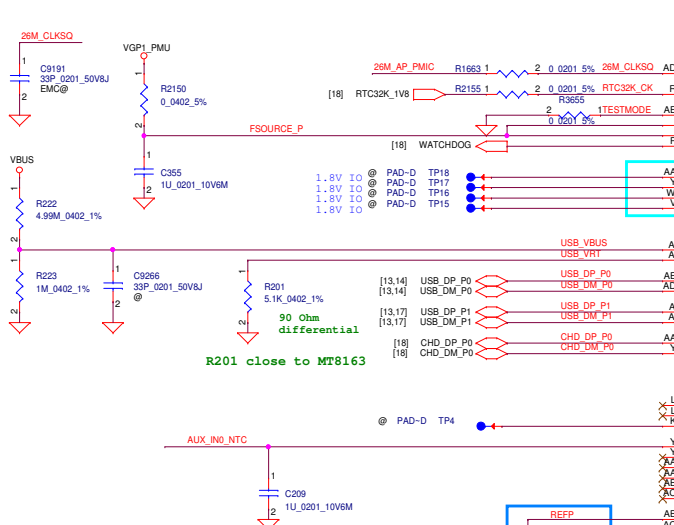
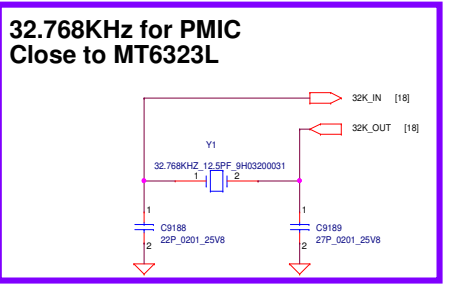
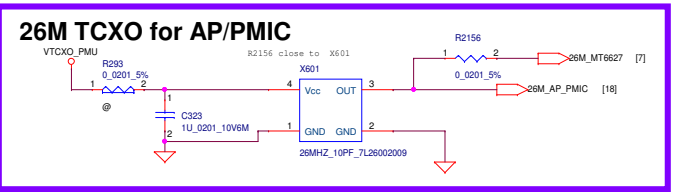
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- [18] VCKK_PMU
- [21] VPROC_PMU
- [18] VCCIO_PMU
- [5,6,8,9,10,14,15,16,17,18] VIO18_PMU
- [18] VUSB_PMU
- [9,18] VMC_PMU
- OVCKK_PMU
- OVPROC_PMU
- OVCCIO_PMU
- OVIO18_PMU
- OVUSB_PMU
- OVMC_PMU

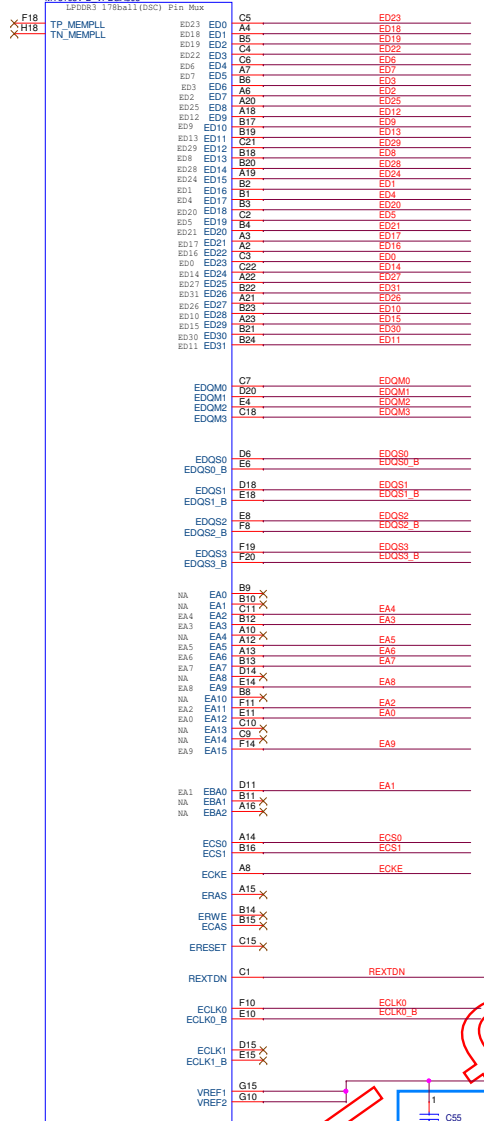
- VCKK [18]
- VCCIO [6]
- VCKK_VPROC [21]

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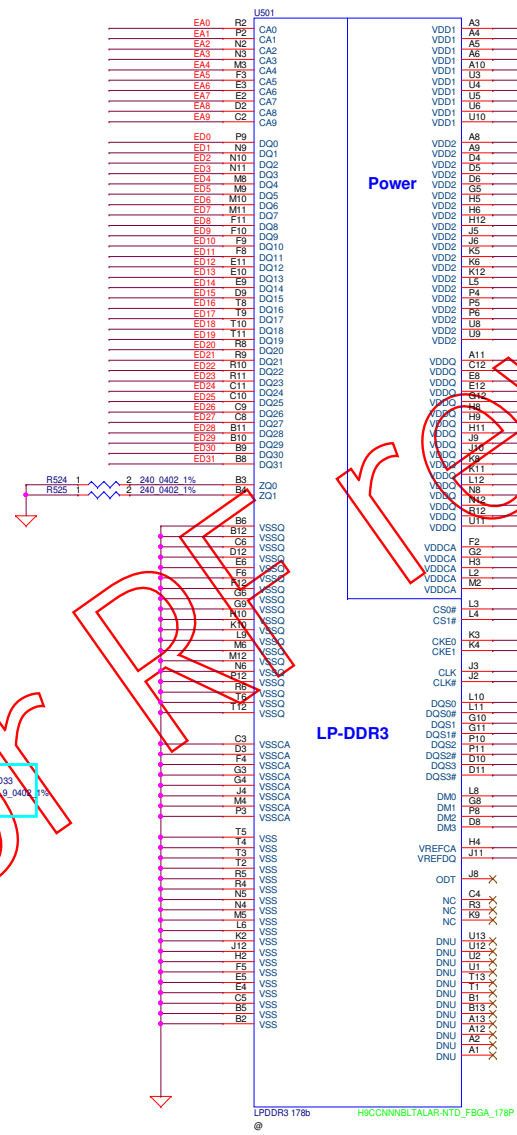


Panel	Touch	PANEL_ID0 (GPIO4S)	PANEL_ID1 (GPIO50)	PANEL_ID2 (GPIO51)	SKU	PANEL_ID3 (GPIO52)	EUR_ID (GPIO54)	MB_ID1 (GPIO47)	MB_ID2 (GPIO48)
7" KD	EETI(I2C)	0	0	0	0	0	1	1	1
10" KD(I9365BC)	SIS(USB)	1	0	0	1	0	1	0	0
21" LCD	SIS(USB)	0	1	0	2	0	0	0	0
7" KD	ILITEK(I2C)	0	1	0	3	0	1	1	1
7" KD	SIS(I2C)	0	0	1	4	0	1	1	1
10" KD	EETI(I2C)	1	0	1	5	0	0	0	0
10" KD	ILITEK(I2C)	0	1	1	6	0	0	0	0

U201D
MT8163V-B_VFBGA395

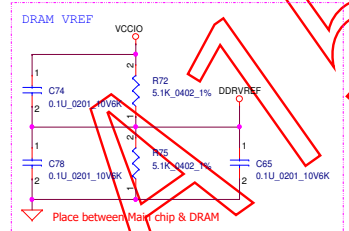
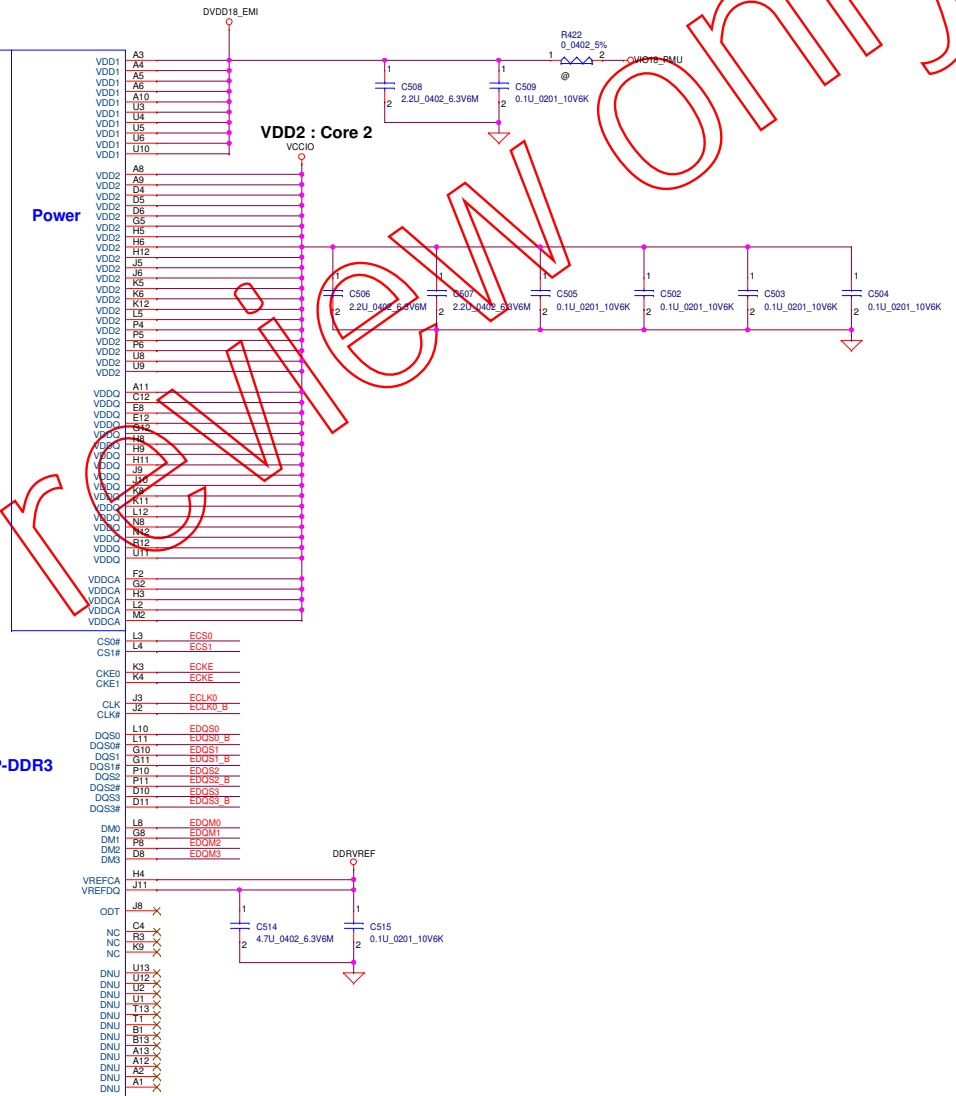


LPDDR3

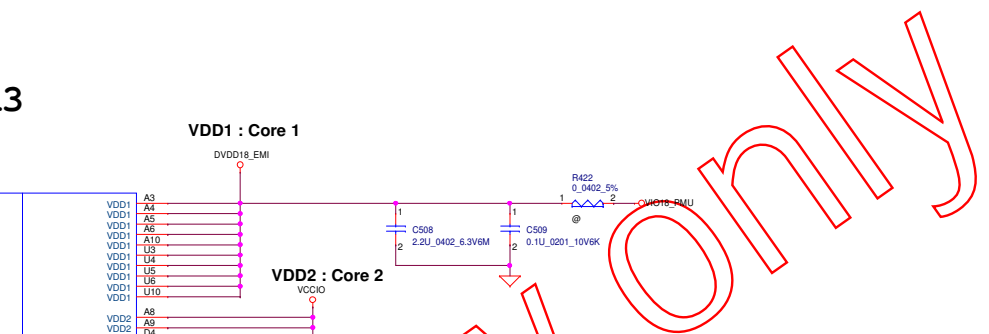


VDD1 : Core 1

VDD2 : Core 2

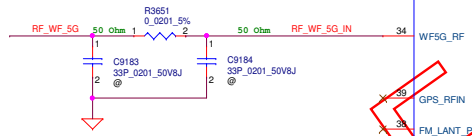
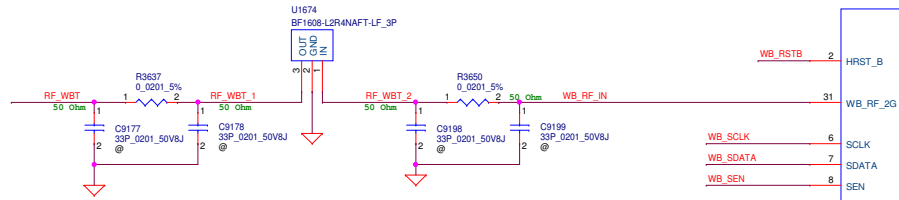
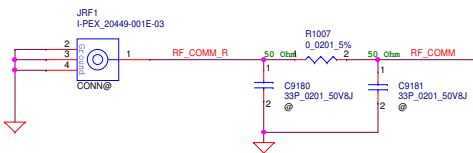
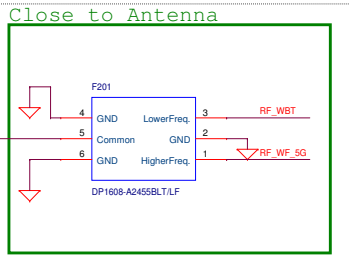


Near Ball G15 & G10

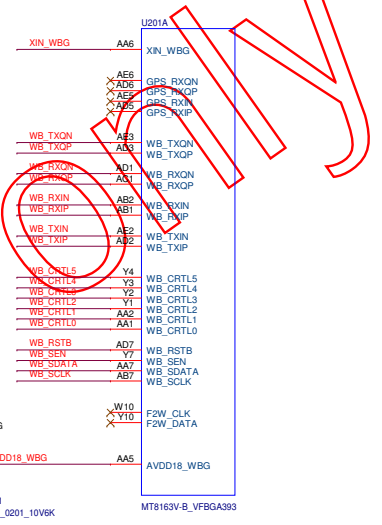
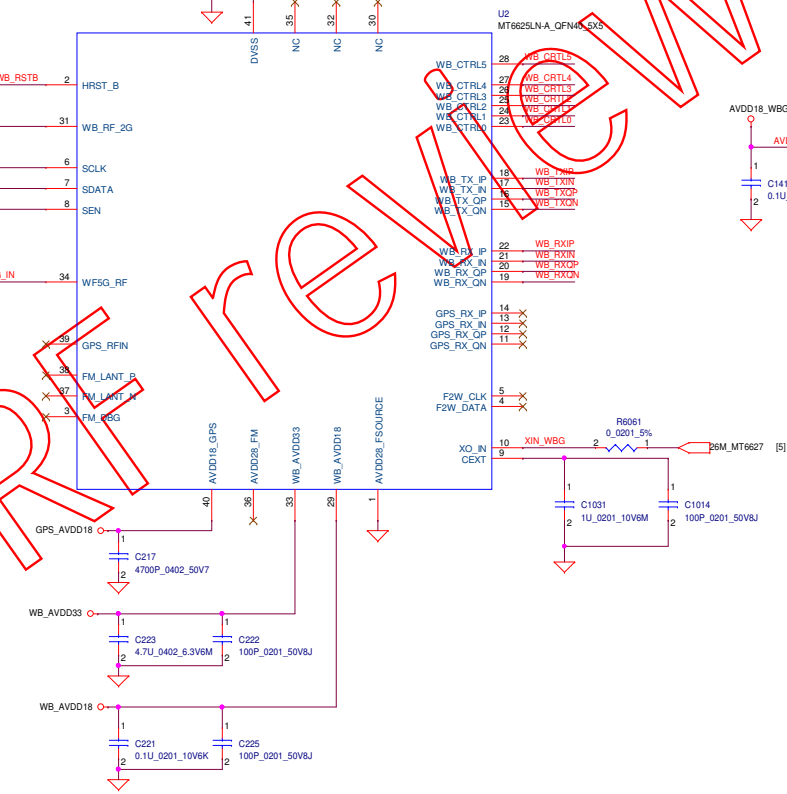
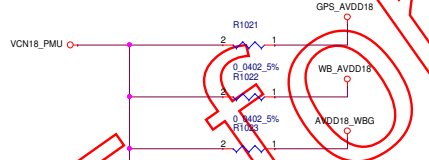
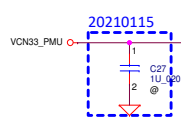


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[18] VCN18_PMU
 [18] VCN33_PMU



<Critical!!>
 5G PCB loss is higher.
 Trace must kept short and 50-ohm
 No layer transition



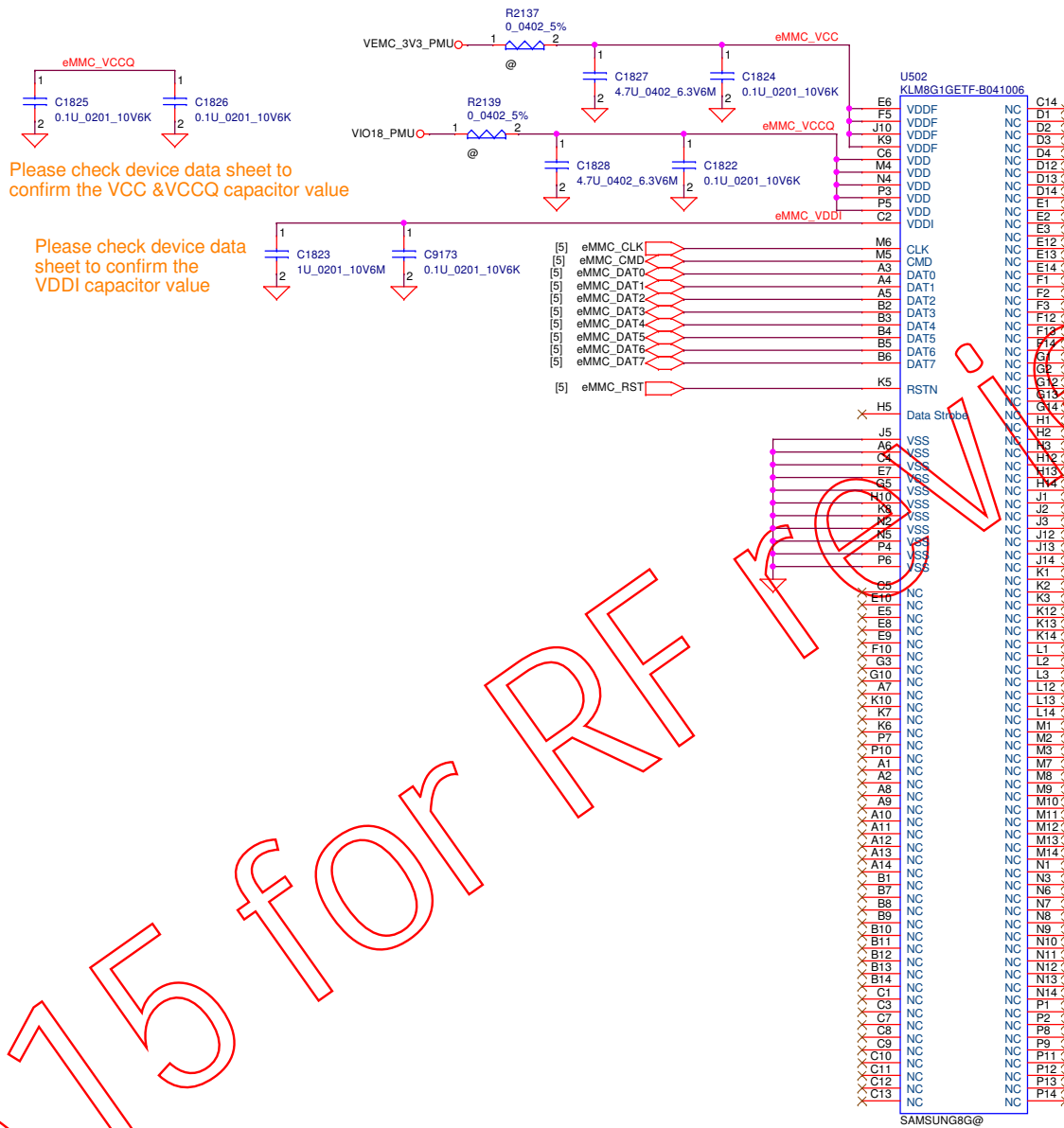
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eMMC

- VCC : Core Voltage 2.7v ~ 3.6v
- VCCQ : IO Voltage 1.7v~1.95v (low voltage range)

[18] VEMC_3V3_PMU
[4,5,6,9,10,14,15,16,17,18] VIO18_PMU



Please check device data sheet to confirm the VCC & VCCQ capacitor value

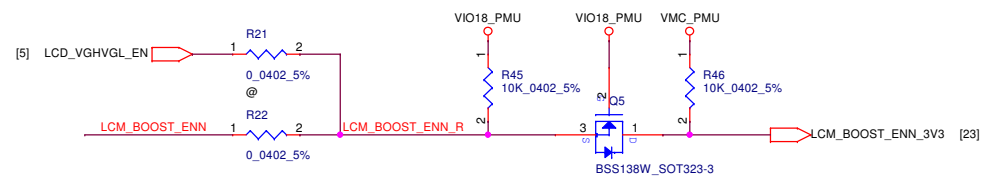
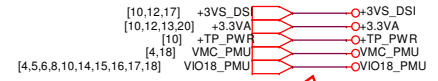
Please check device data sheet to confirm the VDDI capacitor value

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MT8163 MIPI DSI & LVDS PIN-MUX

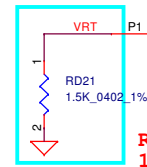
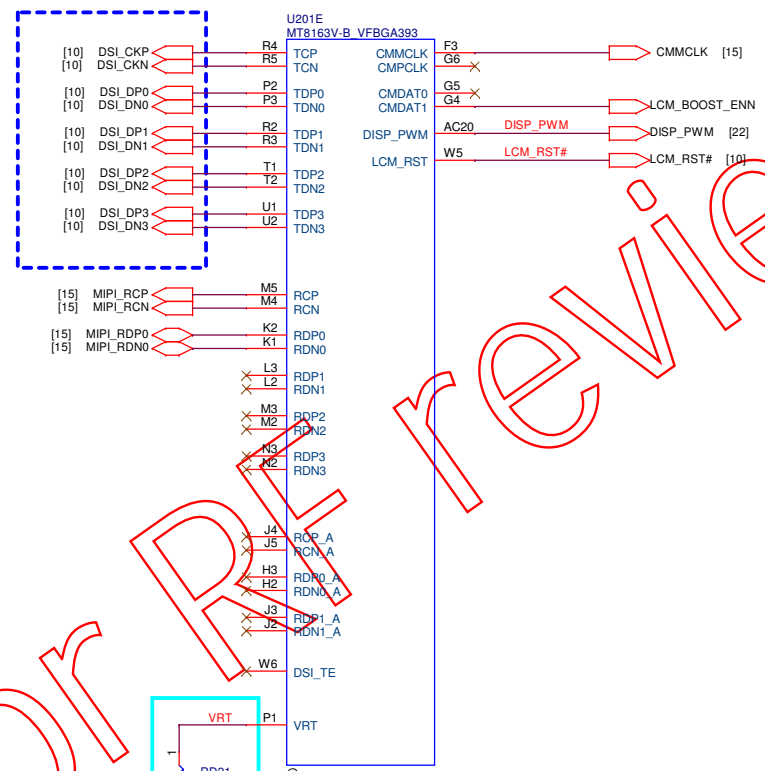


20210128

MIPI DSI IF	LVDS IF
TCP	RIN2+
TCN	RIN2-
TDP0	RIN0+
TDN0	RIN0-
TDP1	RIN1+
TDN1	RIN1-
TDP2	CLKIN+
TDN2	CLKIN-
TDP3	RIN3+
TDN3	RIN3-

MT8163 PARALLEL CAMERA I/F PIN-MUX

PAD_RCP	GPIO106	ERCP	
PAD_RDN2	GPIO107	ERDN2	ICMDAT8
PAD_RDP2	GPIO108	ERDP2	ICMDAT9
PAD_RDN3	GPIO109	ERDN3	ICMDAT4
PAD_RDP3	GPIO110	ERDP3	ICMDAT5
PAD_RDN_A	GPIO111	ERCN_A	ICMDAT6
PAD_RDP_A	GPIO112	ERCP_A	ICMDAT7
PAD_RDN1_A	GPIO113	ERDN1_A	ICMDAT2
PAD_RDP1_A	GPIO114	ERDP1_A	ICMDAT3
PAD_RDN0_A	GPIO115	ERDN0_A	ICMHSYNC
PAD_RDP0_A	GPIO116	ERDP0_A	ICMHSYNC
PAD_CMDAT0	GPIO117	ICMDAT0	ICMCS00
PAD_CMDAT1	GPIO118	ICMDAT1	ICMCS01
PAD_CMMCLK	GPIO119	ICMCLK	
PAD_CMPCLK	GPIO120	ICMPCLK	ICMCSK

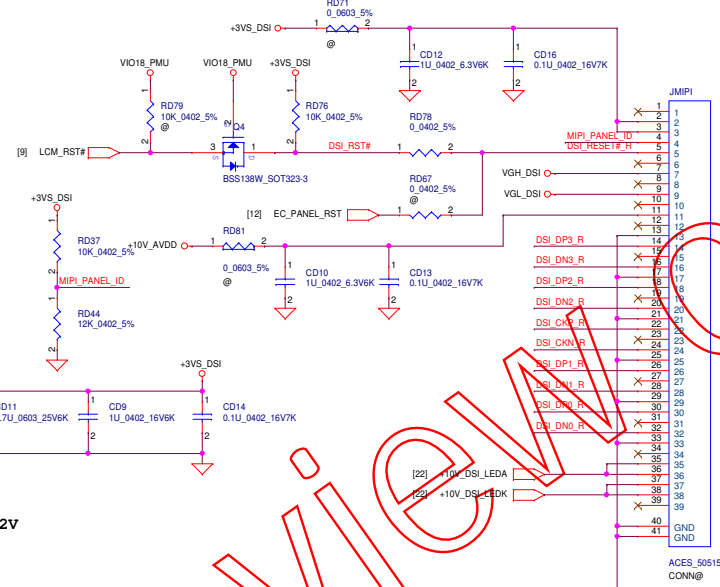
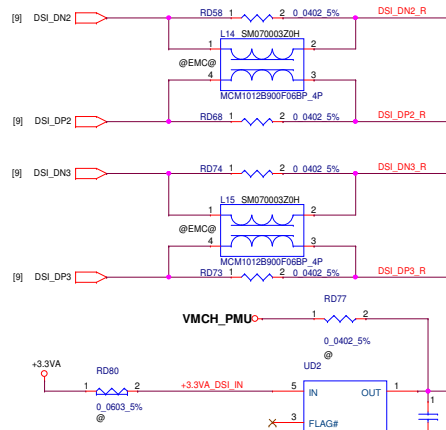
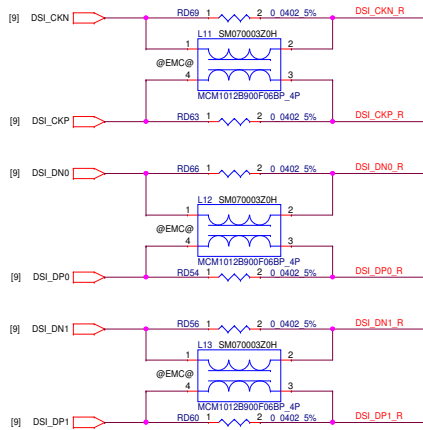


RD21 :
1.5K for MIPI display
24K for LVDS display

A15 for PL

review Only

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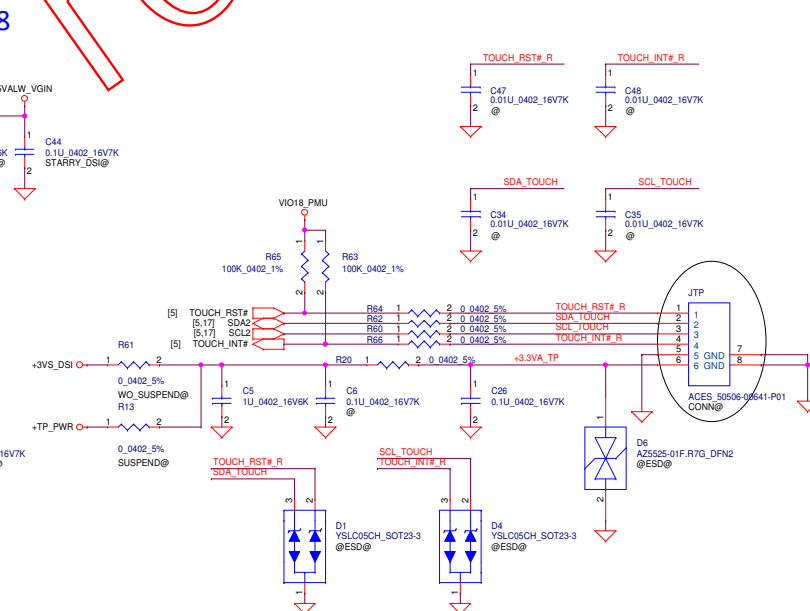
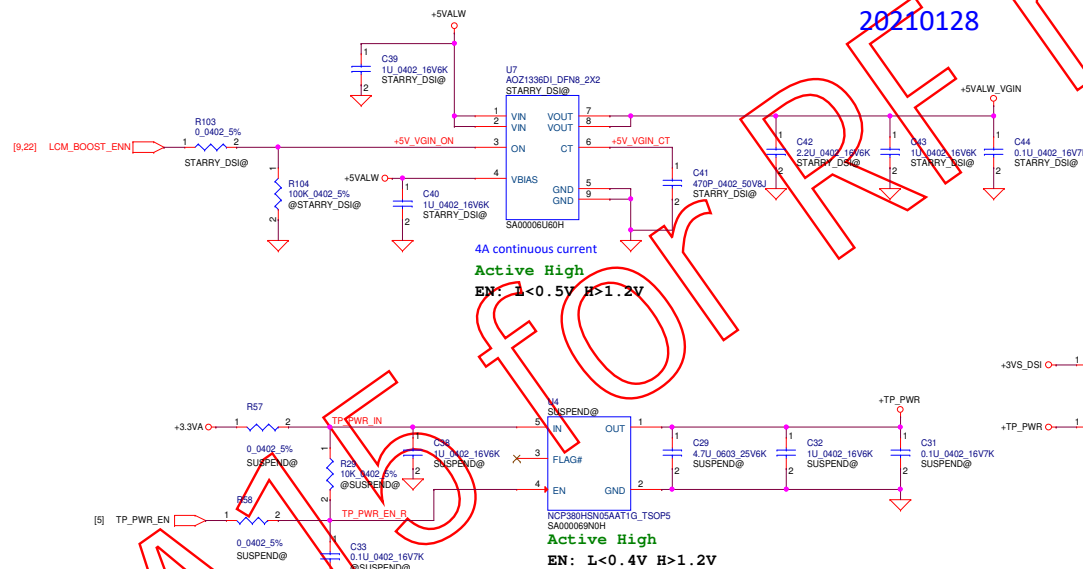


STARRY 2021070A018011-512

PIN	symbol
39	1 NC
38	2 LED-
37	3 LED+
36	4 LED+
35	5 LED+
34	6 NC
33	7 GND
32	8 DON
31	9 NC
30	10 DOP
29	11 GND
28	12 DIN
27	13 NC
26	14 D1P
25	15 GND
24	16 CLKM
23	17 NC
22	18 CLKP
21	19 GND
20	20 D2N
19	21 NC
18	22 D2P
17	23 GND
16	24 D3N
15	25 NC
14	26 D3P
13	27 GND
12	28 NC
11	29 AVDD (10V)
10	30 NC
9	31 VGL (-7V)
8	32 NC
7	33 VGH (21V)
6	34 NC
5	35 RESET
4	36 ID
3	37 VDD
2	38 VDD
1	39 NC

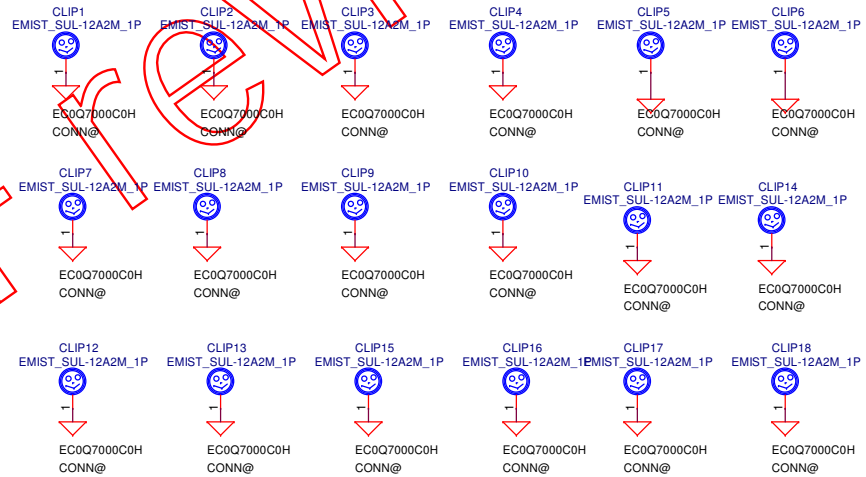
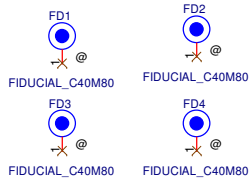
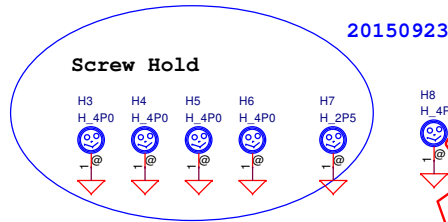
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20210128



U201F
MT8163V-B_VFBGA393

HDMITX_CH0_M AE13
HDMITX_CH0_P AD13
HDMITX_CH1_M AE14
HDMITX_CH1_P AD14
HDMITX_CH2_M AE15
HDMITX_CH2_P AD15
HDMITX_CLK_M AE12
HDMITX_CLK_P AD12
HDMITX_REXT AE16
CEC AE21
HDMISD AD22
HDMISCK AE22
HTPLG AD21
AVDD33_VDAC P21
VDAC_C R23

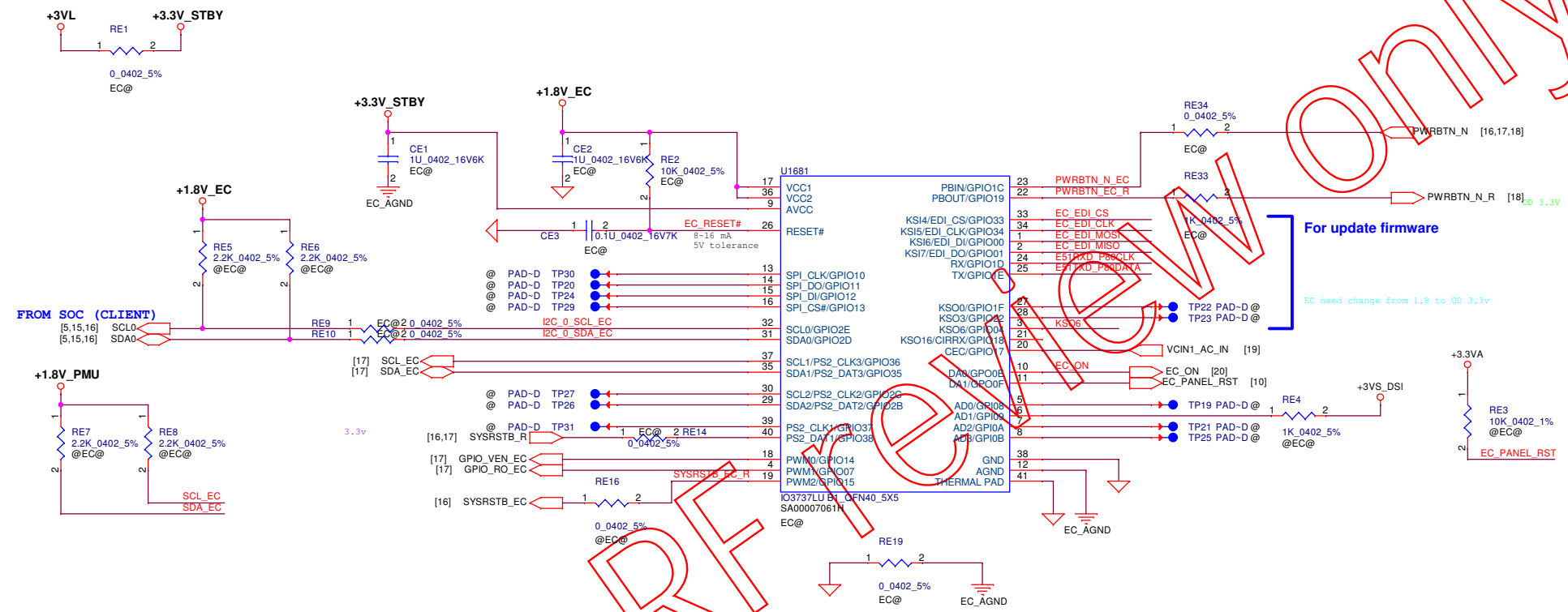


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EC IO3737L

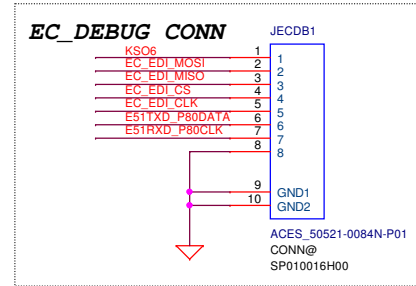
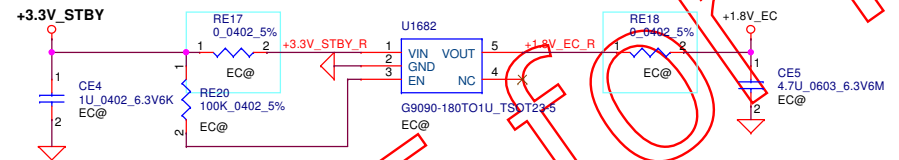
[16,20] +3VL
 [10,13,20] +3.3VA



Draft Only

For update firmware

EC need change from 1.8 to 0D 3.3v



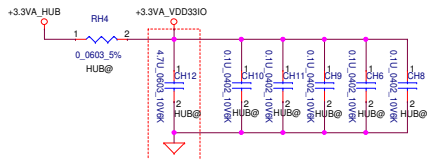
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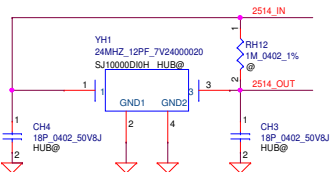
CFG_SEL[1]	CFG_SEL[0]	DESCRIPTION
0	0	Default configuration: <ul style="list-style-type: none"> ■ Strap options enabled ■ Self-powered operation enabled ■ Individual power switching ■ Individual over-current sensing

20210115

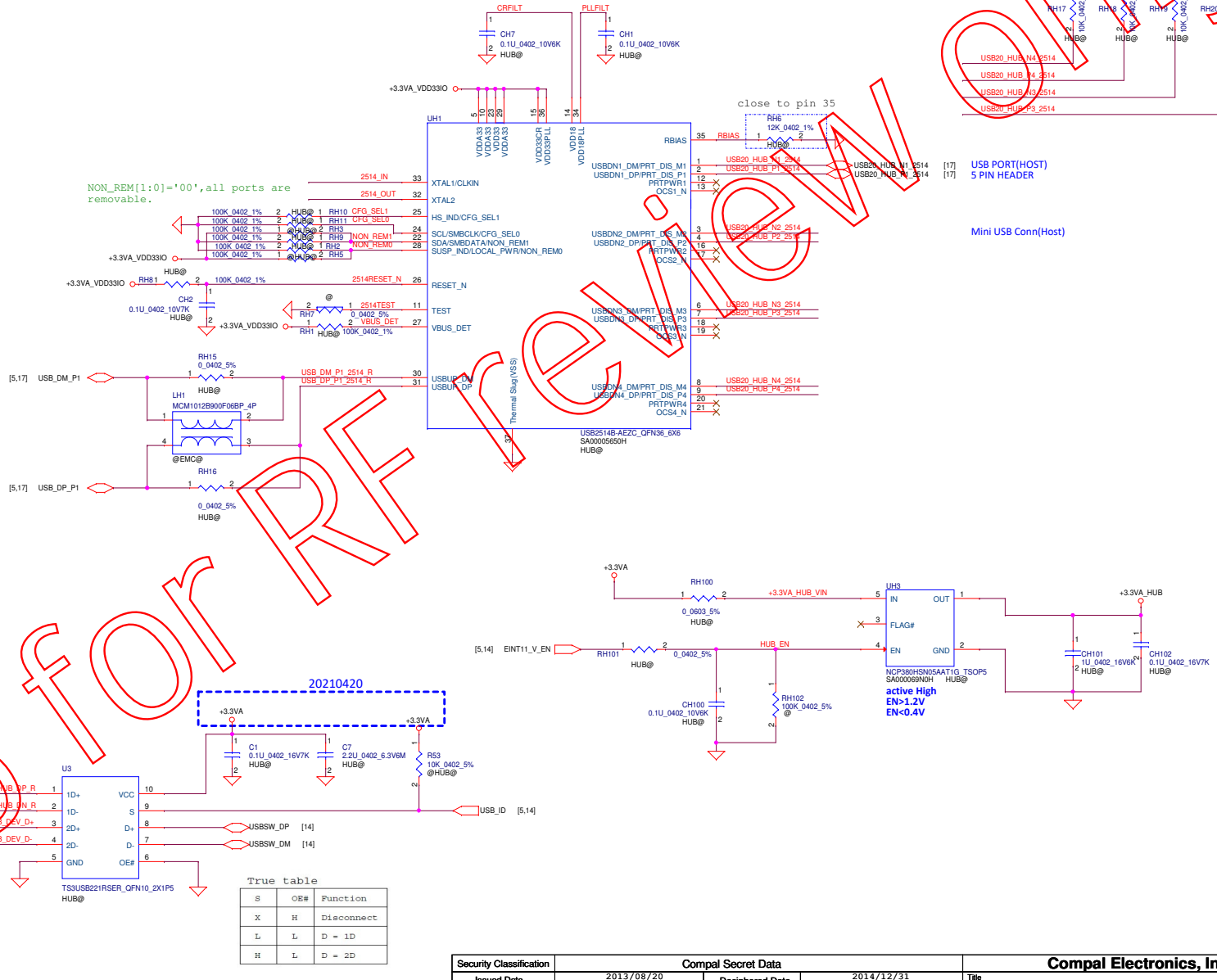
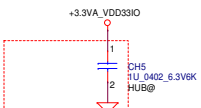
USB HUB



CH12 Close to UH1 pin 15



CH5 Close to UH1 pin 36

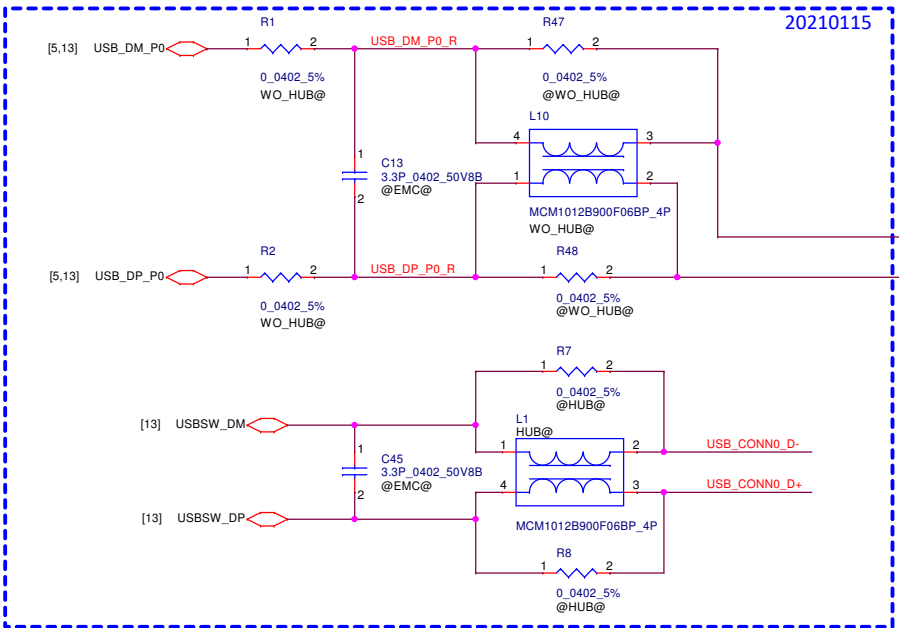


True table

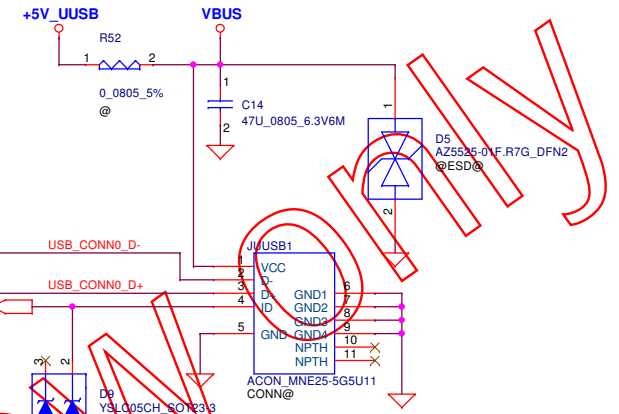
S	OE#	Function
X	H	Disconnect
L	L	D = 1D
H	L	D = 2D

Security Classification	Compal Secret Data		Title	
Issued Date	2013/08/20	Deciphered Date	2014/12/31	HUB-USB2514
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Size	Document Number	Rev		02
C	LA-L511P	Date		Monday, April 26, 2021
		Sheet		61 of 26

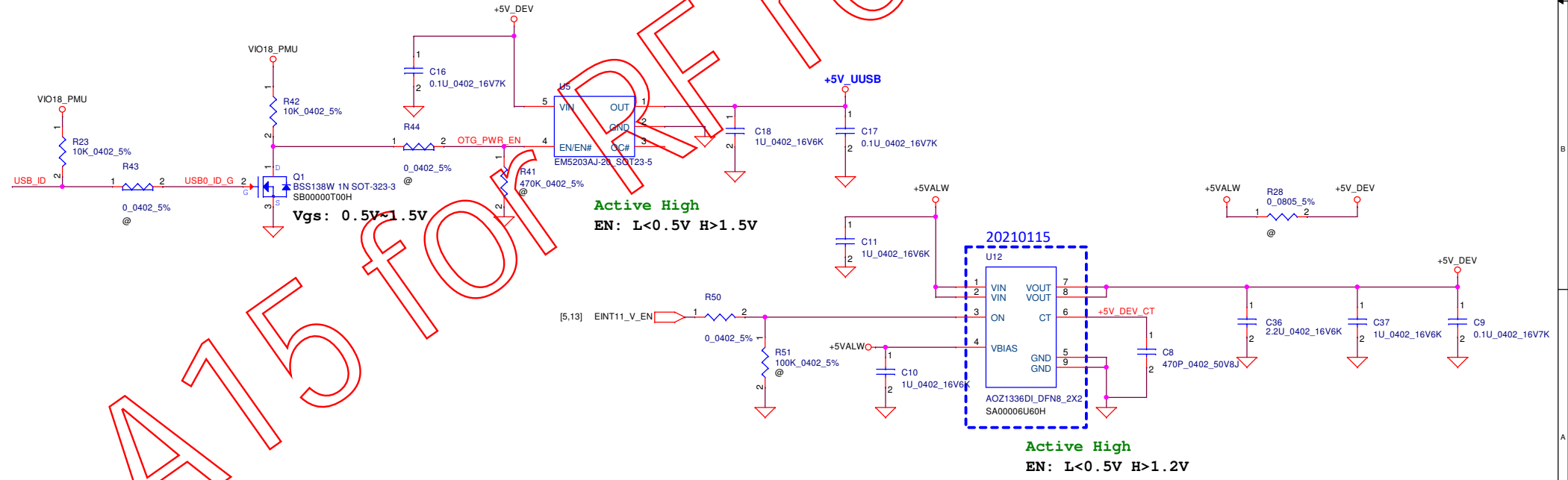
[10,17,20,21,22,23] +5VALW → +5VALW
 [10,12,13,20] +3.3VA → +3.3VA
 [4,5,6,8,9,10,15,16,17,18] VIO18_PMU → VIO18_PMU
 VBUS → VBUS [5,18]



USB OTG ID	
H	Client Mode
L	Host Mode



MiniUSB2.0 CONN.

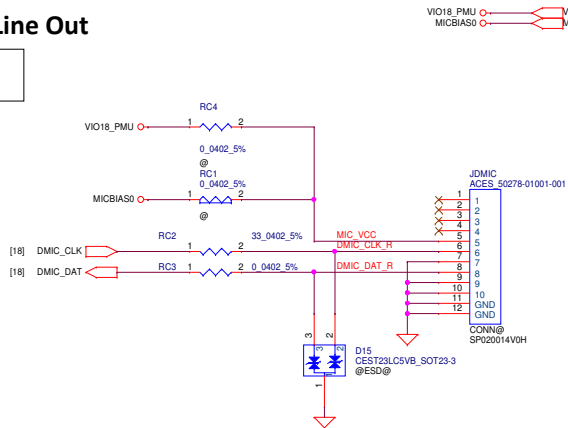


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A15 for review

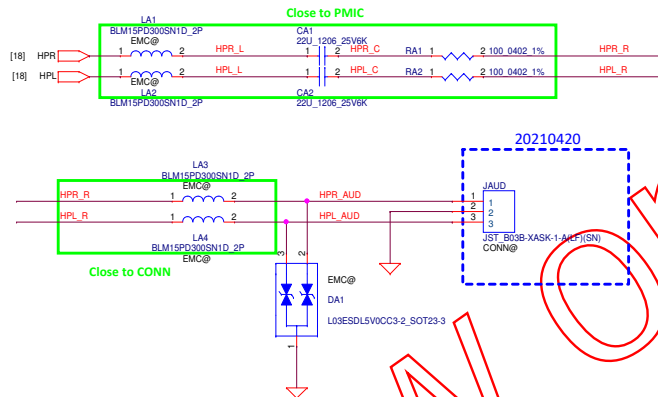
DMIC, Line Out

DMIC

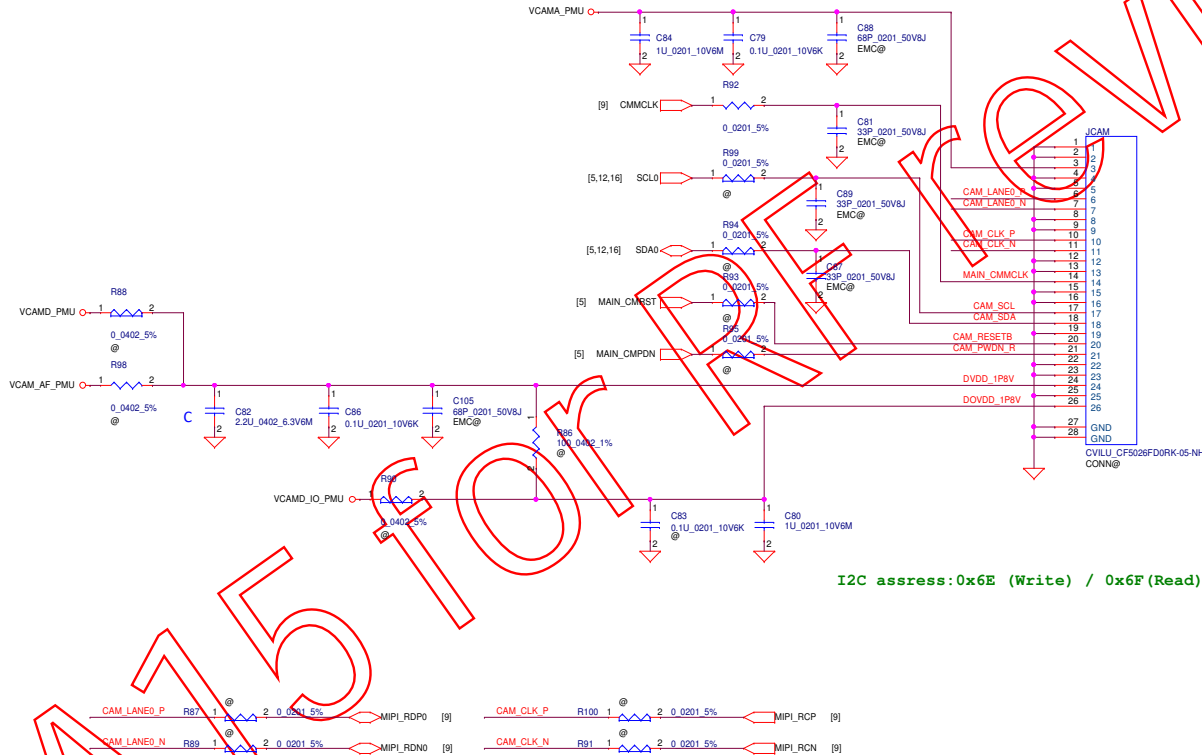
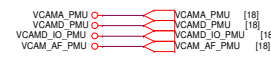


P/N/L	PIN define
1	NC
2	NC
3	NC
4	NC
5	MIC-VCC
6	MIC-MCLK
7	MIC-GND
8	MIC-SIG
9	DGND
10	NC

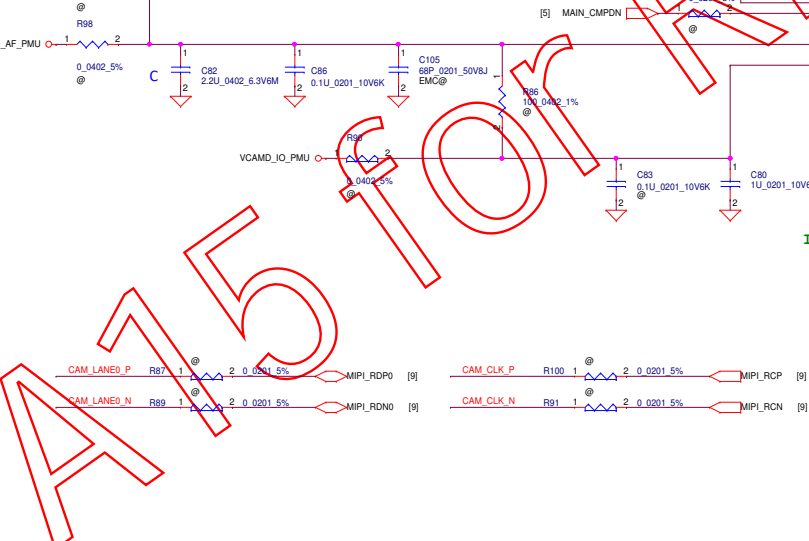
Line out CONNECTOR



P/N/L	PIN define
1	IDGND
2	GND
3	VCAMA 2P8V
4	GND
5	GND
6	CAM LANE0 P
7	CAM LANE0 N
8	GND
9	GND
10	CAM CLK P
11	CAM CLK N
12	GND
13	GND
14	CMMCLK
15	GND
16	GND
17	CAM SCL 1.8V
18	CAM SDA 1.8V
19	GND
20	CAM RESET 1.8V
21	CAM PWDN 1.8V
22	GND
23	GND
24	DVDD 1P8V
25	GND
26	DOVDD 1P8V

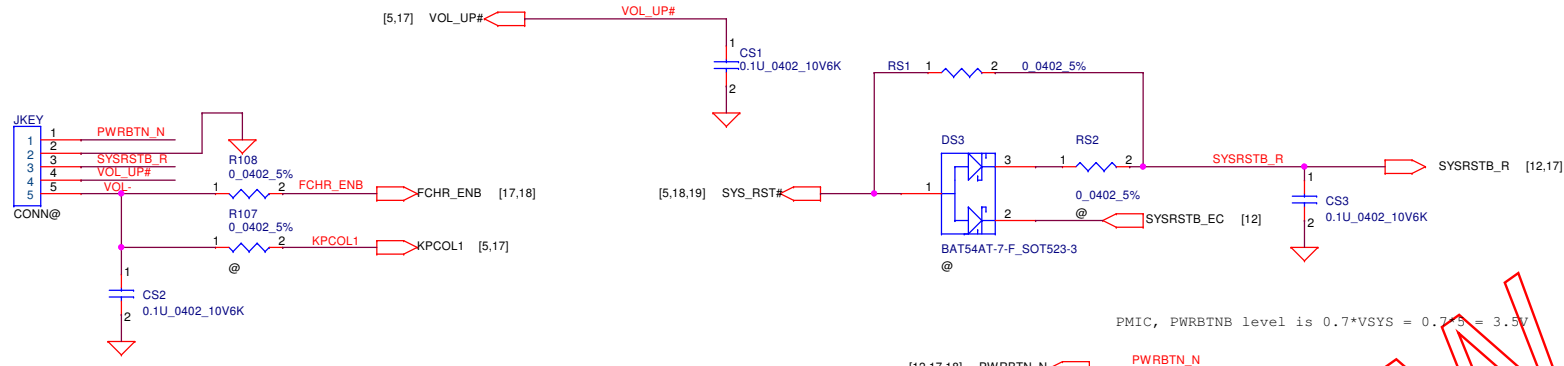


I2C address: 0x6E (Write) / 0x6F (Read)



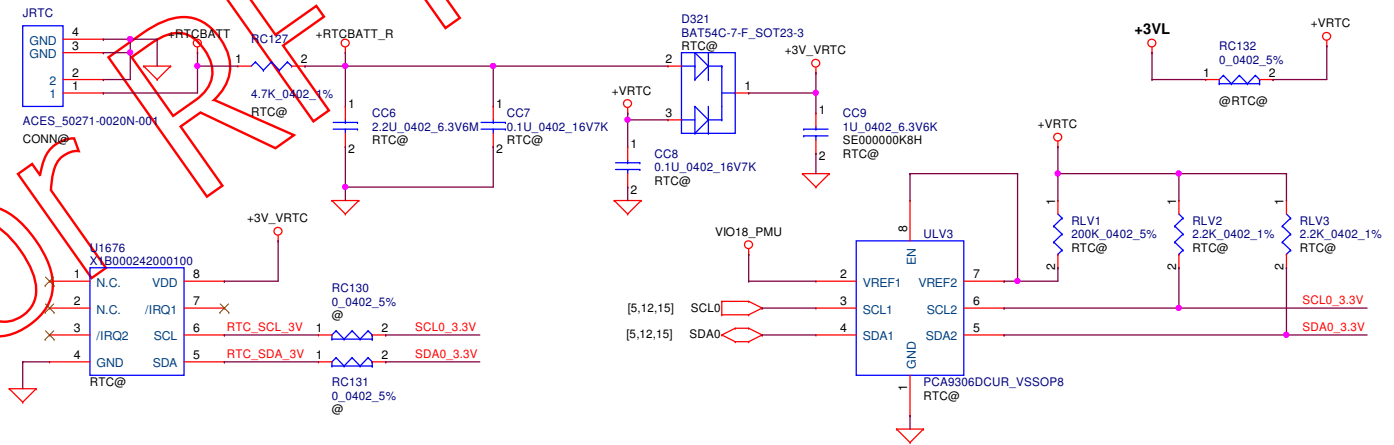
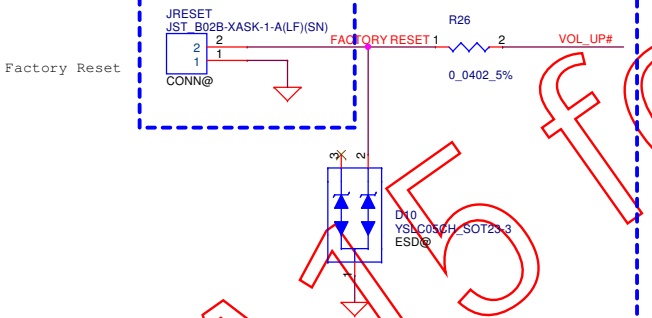
20210115

[10,12,17] +3VS_DSI → +3VS_DSI
 [12,20] +3VL → +3VL
 [4,5,6,8,9,10,14,15,17,18] VIO18_PMU → VIO18_PMU



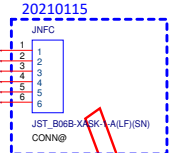
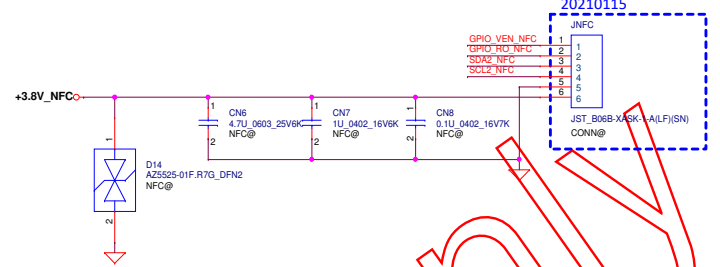
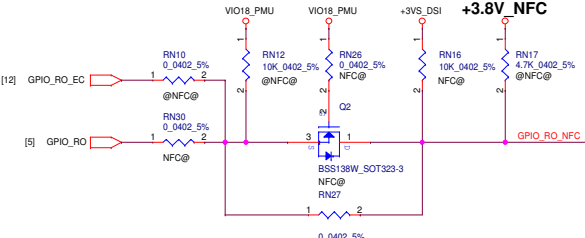
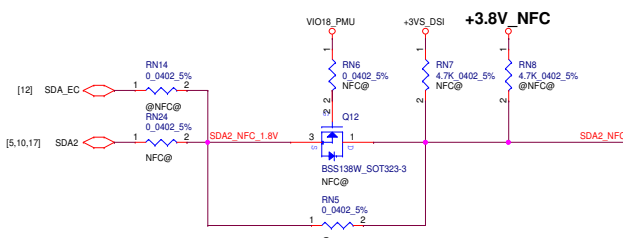
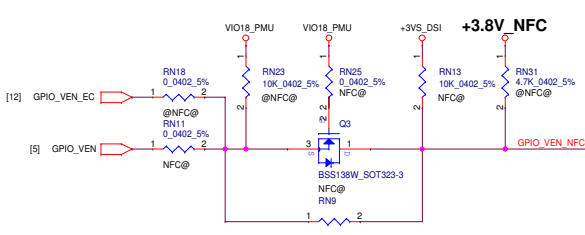
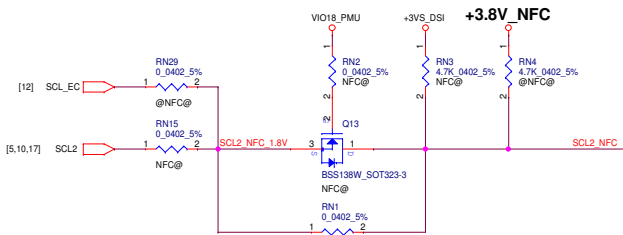
Reset CONNECTOR

20210420

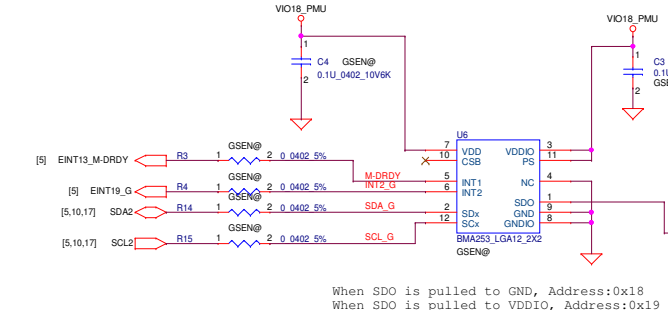


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Size	Custom	Document Number	LA-L511P	Rev	0.2
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20210115

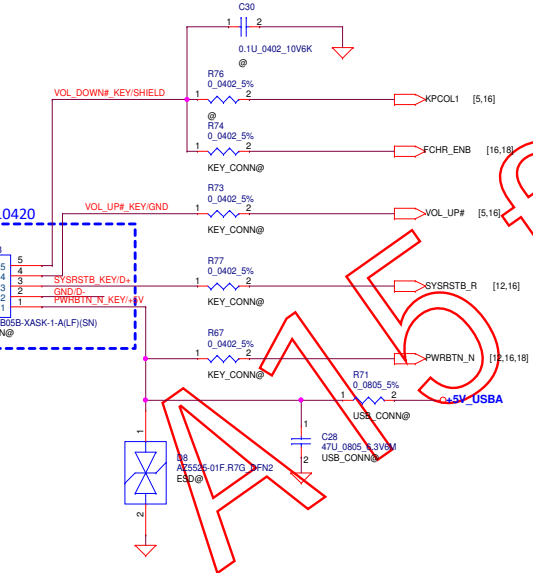


When SDO is pulled to GND, Address:0x18
When SDO is pulled to VDDIO, Address:0x19

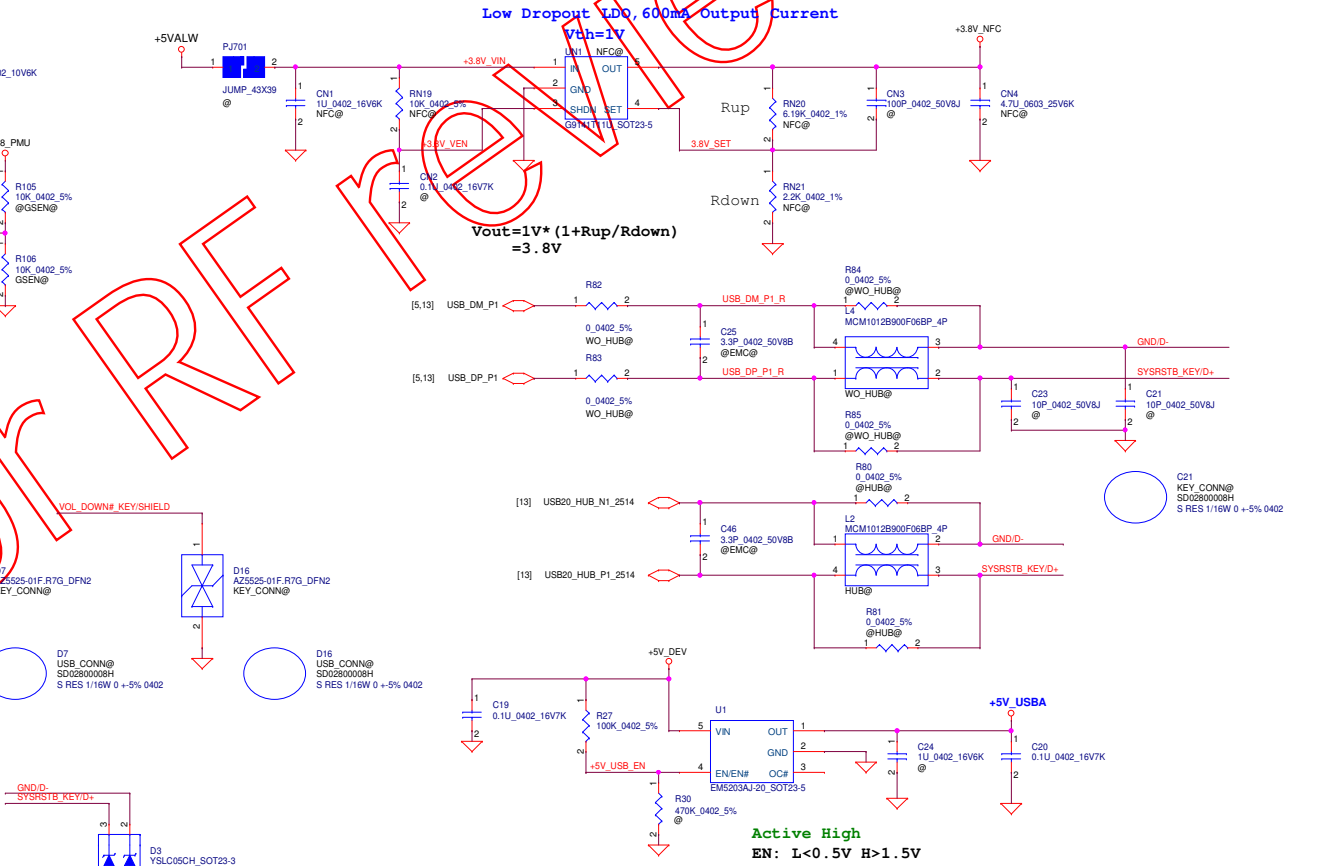
Low Dropout LDO, 600mA Output Current

Vth=1V

$$V_{out} = 1V * (1 + R_{up}/R_{down}) = 3.8V$$



20210420



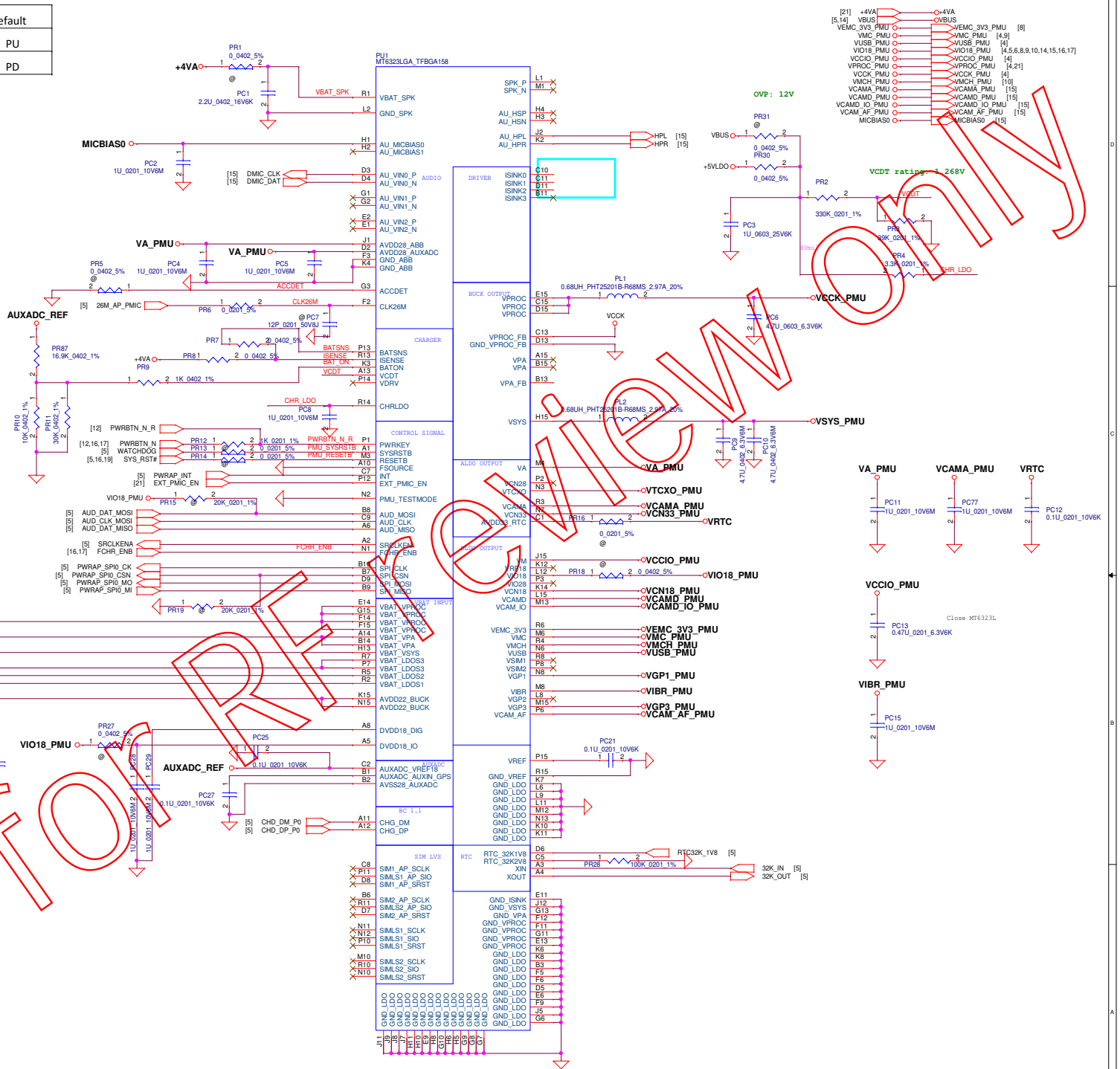
Active High
EN: L<0.5V H>1.5V

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	LPDDR2/1.2V	PCDDR3L/1.35V	PCDDR3/1.5V	LPDDR1/1.8V	Default
SPI_CSN	H	L(20K)	H	L(20K)	PU
AUD_MOSI	L	H(20K)	H(20K)	L	PD

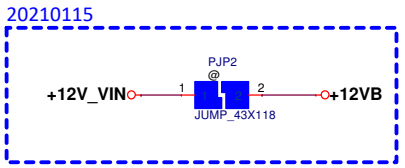
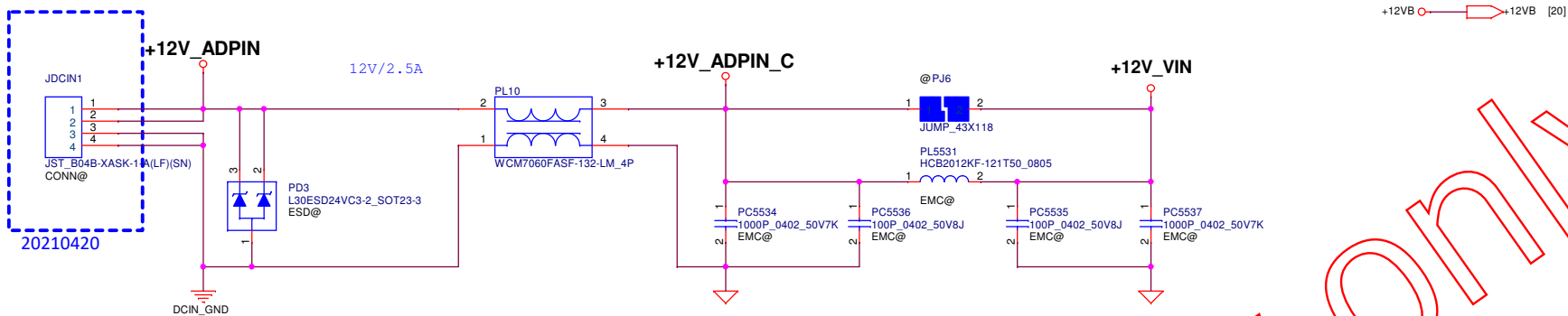
PMIC

	Symbol	Vout (V)	Iout (mA)
Buck	VPROC	1.15	2800
	VPA	0.5~3.4	600
	VSYS	2.2	1400
Analog LDO	VA	2.8	150
	VCN28	2.8	30
	VTCXO	2.8	40
	VCAMA	2.8	150
	VCN33	3.3/3.4/3.5/3.6	350
Digital LDO	VIO28	2.8	200
	VM	1.24/1.35/1.5/1.84	700
	VRF18	1.825	200
	VIO18	1.8	300
	VRTC	2.8	2
	VCN18	1.8	120
	VCAMD	1.2/1.3/1.5/1.8	150
	VCAM_IO	1.8	100
	VEMC_3V3	3.0/3.3	400
	VMC	1.8/3.3	100
	VMCH	3.0/3.3	400
	VUSB	3.3	20
VSIM1	1.8/3.0	50	
VSIM2	1.8/3.0	50	
VGP1	1.2/1.3/1.5/1.8/2.0/2.8/3.0/3.3	100	
VIBR	1.2/1.3/1.5/1.8/2.0/2.8/3.0/3.3	100	
VGP2	1.2/1.3/1.5/1.8/2.0/2.5/2.8/3.0	100	
VGP3	1.2/1.3/1.5/1.8	200	
VCAM_AF	1.2/1.3/1.5/1.8/2.0/2.8/3.0/3.3	100	



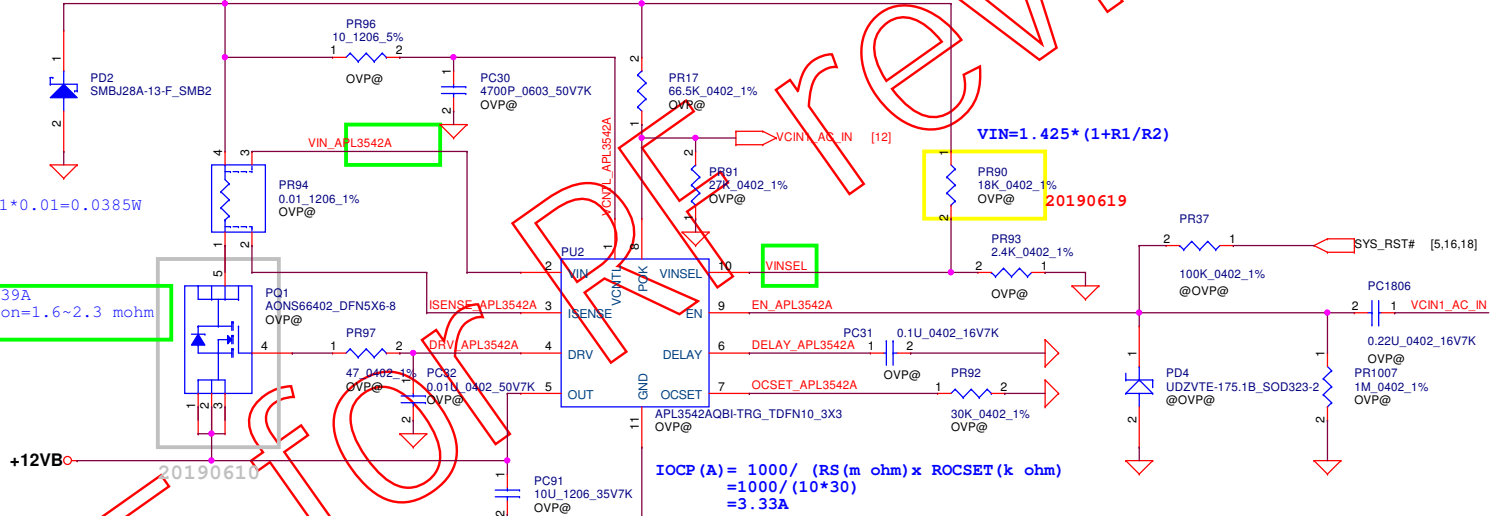
DRAFT

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Issued Date	Deciphered Date	Title	MT6323L PMIC
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		Sheet	18 of 26



W=1W
 $W=1.961 \times 1.961 \times 0.01 = 0.0385W$

$I_d = 39A$
 $R_{ds(on)} = 1.6 \sim 2.3 \text{ mohm}$

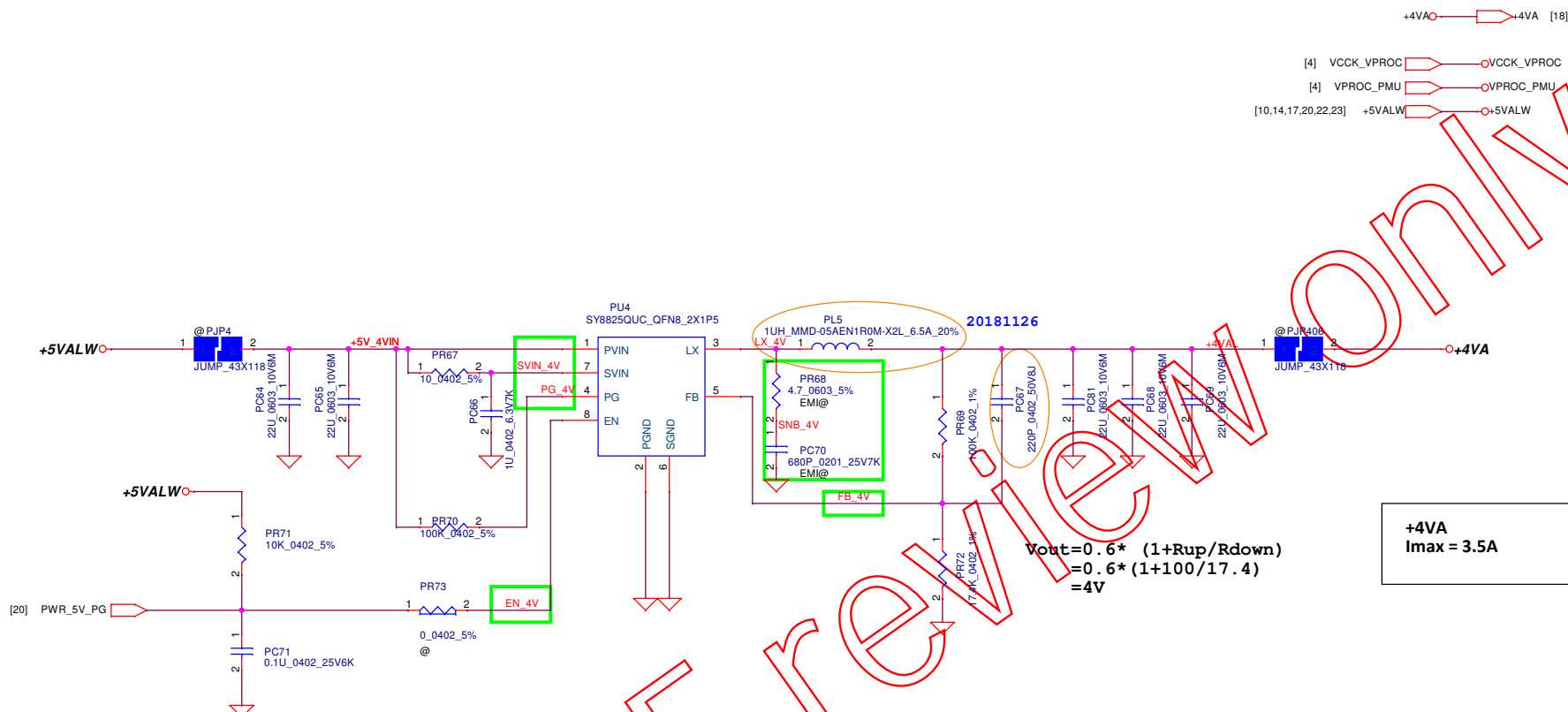


$$I_{OCP} (A) = \frac{1000}{(RS (m \text{ ohm}) \times ROCSET (k \text{ ohm}))} = \frac{1000}{(10 \times 30)} = 3.33A$$

$$V_{IN} = 1.425 \times (1 + R1/R2)$$

Function feild:
 EMC: 47.1
 ESD: 47.2
 Hot Swap : 35.7
 Rest of support elements : 35.8

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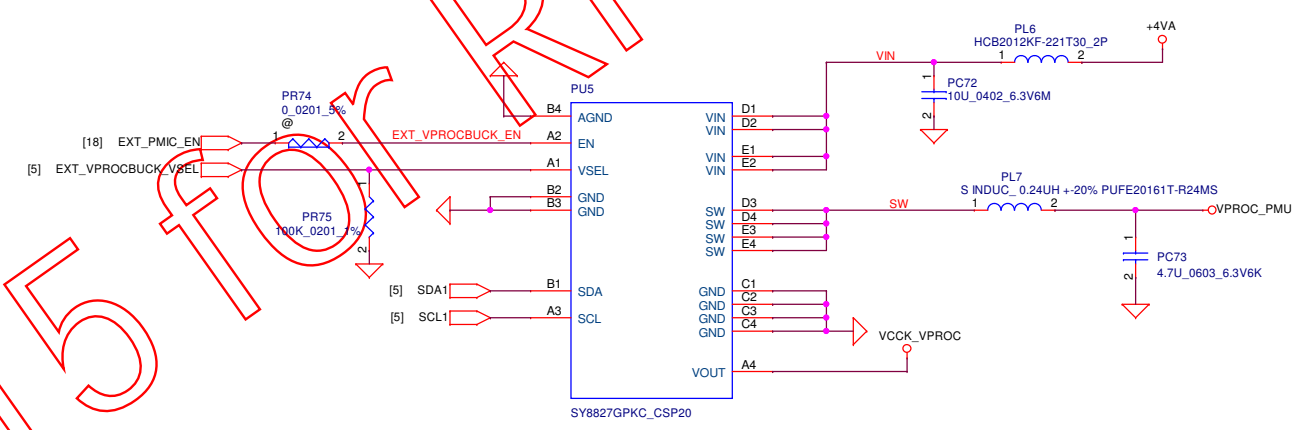
+4VA
I_{max} = 3.5A

$$V_{out} = 0.6 * (1 + R_{up}/R_{down})$$

$$= 0.6 * (1 + 100/17.4)$$

$$= 4V$$

EXT_VPROCBUCK_VSEL:
 Select a pin with default PD GPIO mode.



I2C Address
 SY8827G : 0xC0

VPROC_FB should be ground shielding.

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A15 for

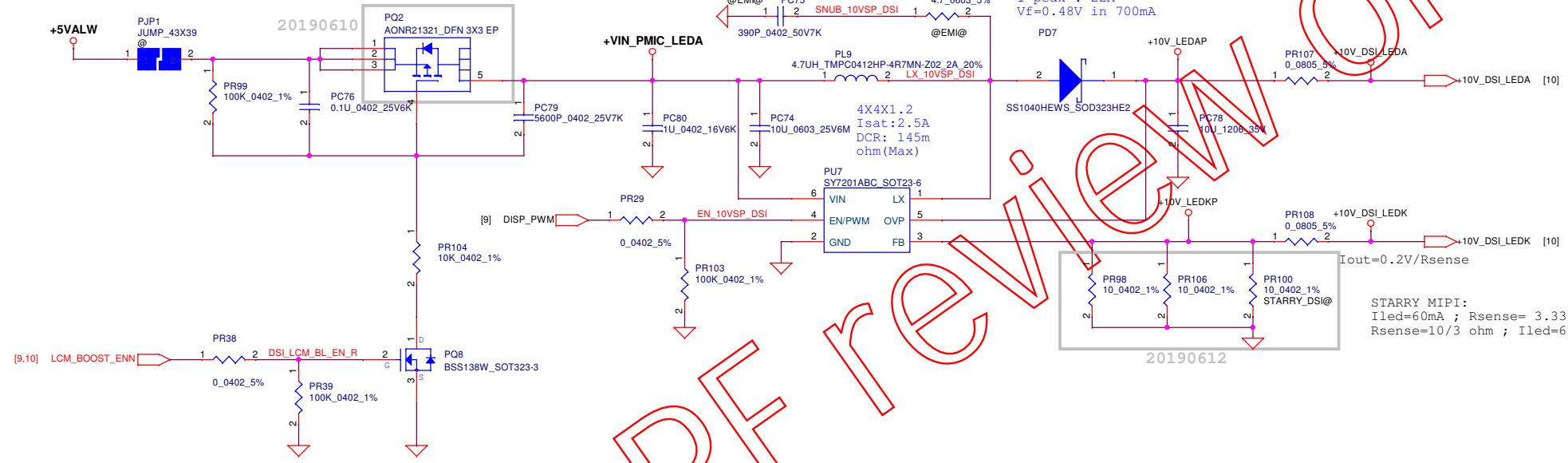
Review Only

Ta=70=>Id=-10A
Rdson=23-29.5 mohm

H=0.75
I continue : 1A
I peak : 22A
Vf=0.48V in 700mA

Imax = 265 mA

Panel : 3S6P



Iout=0.2V/Rsense
STARRY MIPI:
Iled=60mA ; Rsense= 3.33 ohm
Rsense=10/3 ohm ; Iled=60mA

Function feild:
EMC:47.1
BL:35.13
Rest of support elements:35.14

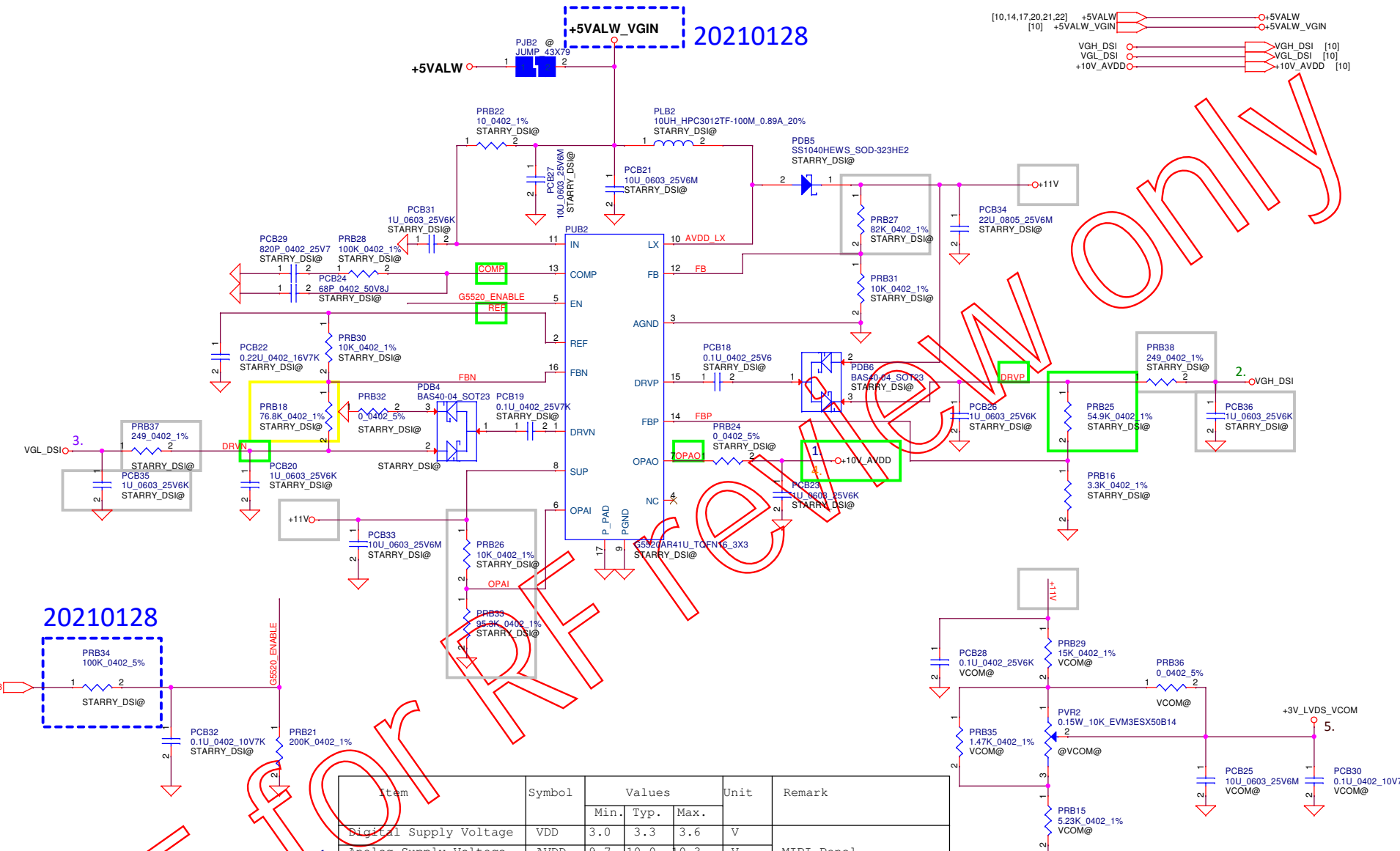
Enable and PWM dimming (EN/PWM Pin4)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
EN Rising Threshold	V _{ENH}	1.5	--	--	V	
EN Falling Threshold	V _{ENL}	--	--	0.4	V	
PWM dimming frequency	F _D	100	--	100K	Hz	

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ALWAYS

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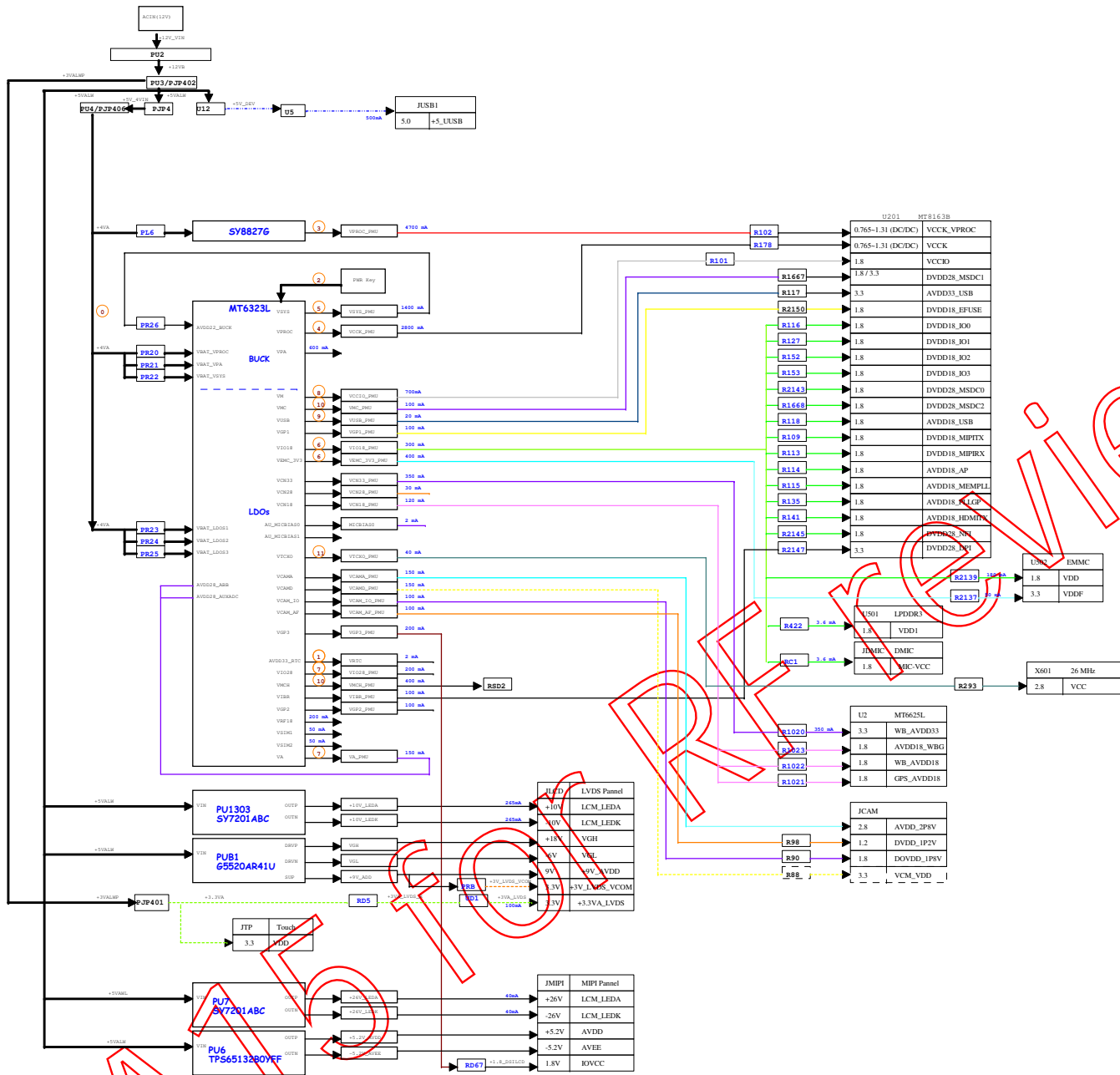
20210128

20210128

[9] LCM_BOOST_ENN_3V3

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Digital Supply Voltage	VDD	3.0	3.3	3.6	V	MIPI Panel STARRY 2081070AWA018011-51E
1. Analog Supply Voltage	AVDD	9.7	10.0	10.3	V	
2. Gate On Voltage	VGH	20	21	22	V	
3. Gate Off Voltage	VGL	-8	-7	-6	V	LVDS Panel TRULY TFT3P5645-E
Digital Supply Voltage	VDD	3.0	3.3	3.6	V	
4. Analog Supply Voltage	AVDD	-	9.6	-	V	
5. Common Voltage	VCOM	-	3.4	-	V	
6. Gate On Voltage	VGH	-	18	-	V	
7. Gate Off Voltage	VGL	-	-6	-	V	

Security Classification		Compal Secret Data		Title	
Issued Date	2015/08/26	Deciphered Date	2015/08/26	LED logic	
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Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
01		reserve OOA mode			add 0ohm pull high to 2V_REF, reserve 0ohm to pull low GND.	2016/08/02	DVT
02		change to 0.01 +-1% 1206 100PPM/C			PR21 change to SD00000K82H	2016/08/30	DVT
03		change to 0_0402_5%			PR36, PR53, PR1315, PR1316, PR1318, PR28, PR1308, PR1317	2016/08/30	DVT
04		increase 12V OCP setting			PR403 change to 1K_0402_1%	2016/08/30	DVT
05		modify Panel Imax setting to 277mA			PR71 change to 59K_0402_1%	2016/09/01	DVT
06		21" backlight OVP setting			PR72 change to 348K ohm PR63 change to 9.31K ohm	2016/09/02	DVT
07		ESD requirement			Add PD3	2016/10/17	PVT
08							
09							
10							
11							
12							
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16							
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21							

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Issued Date	2016/06/28	Deciphered Date	2016/06/28	Title	PIR (PWR)
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				Customer	LA-D691PR01
				Date	Monday, April 26, 2021
				Sheet	25 of 26

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
01							
02							
03							
04							
05							

A15 for RF review only