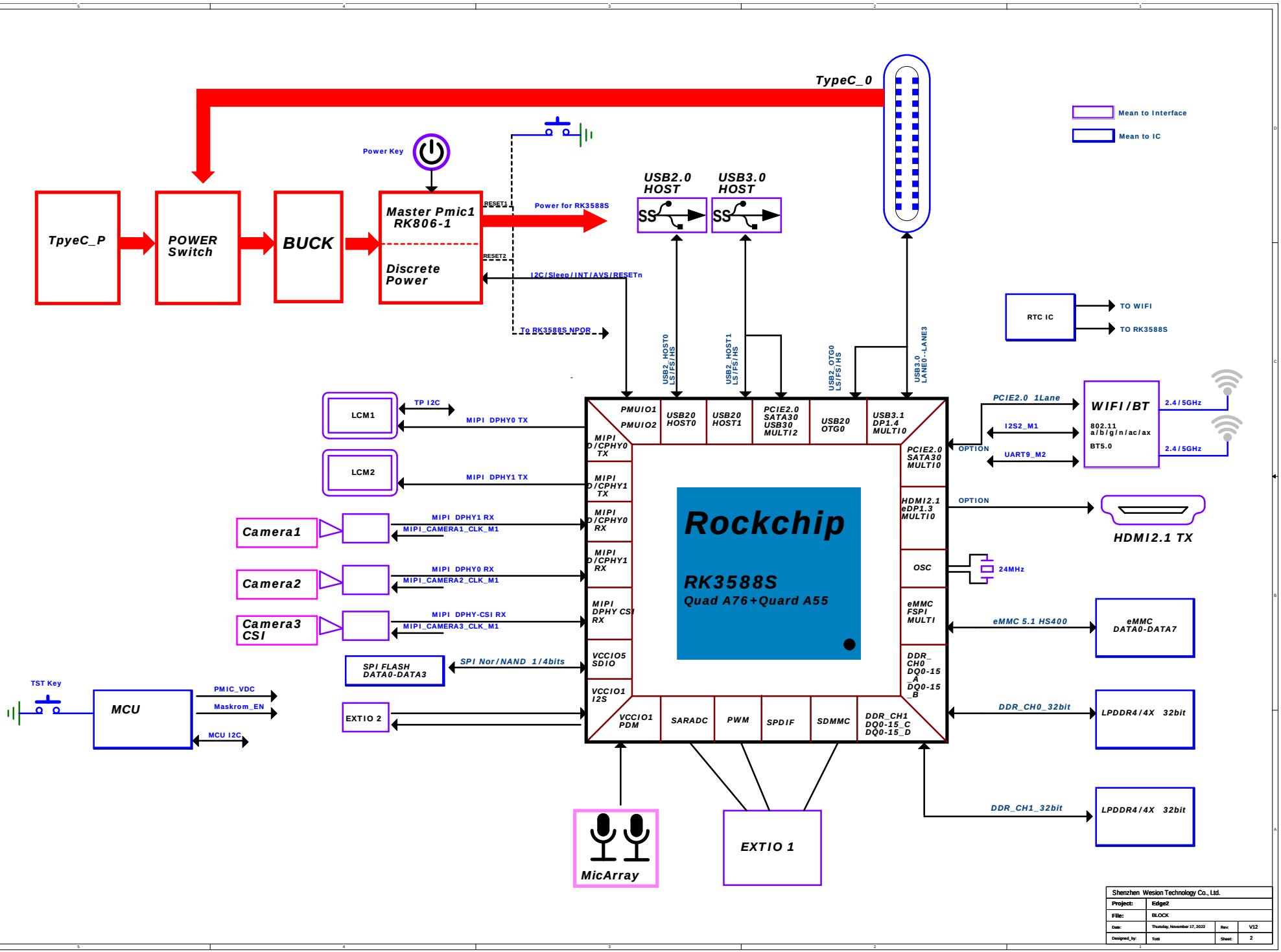
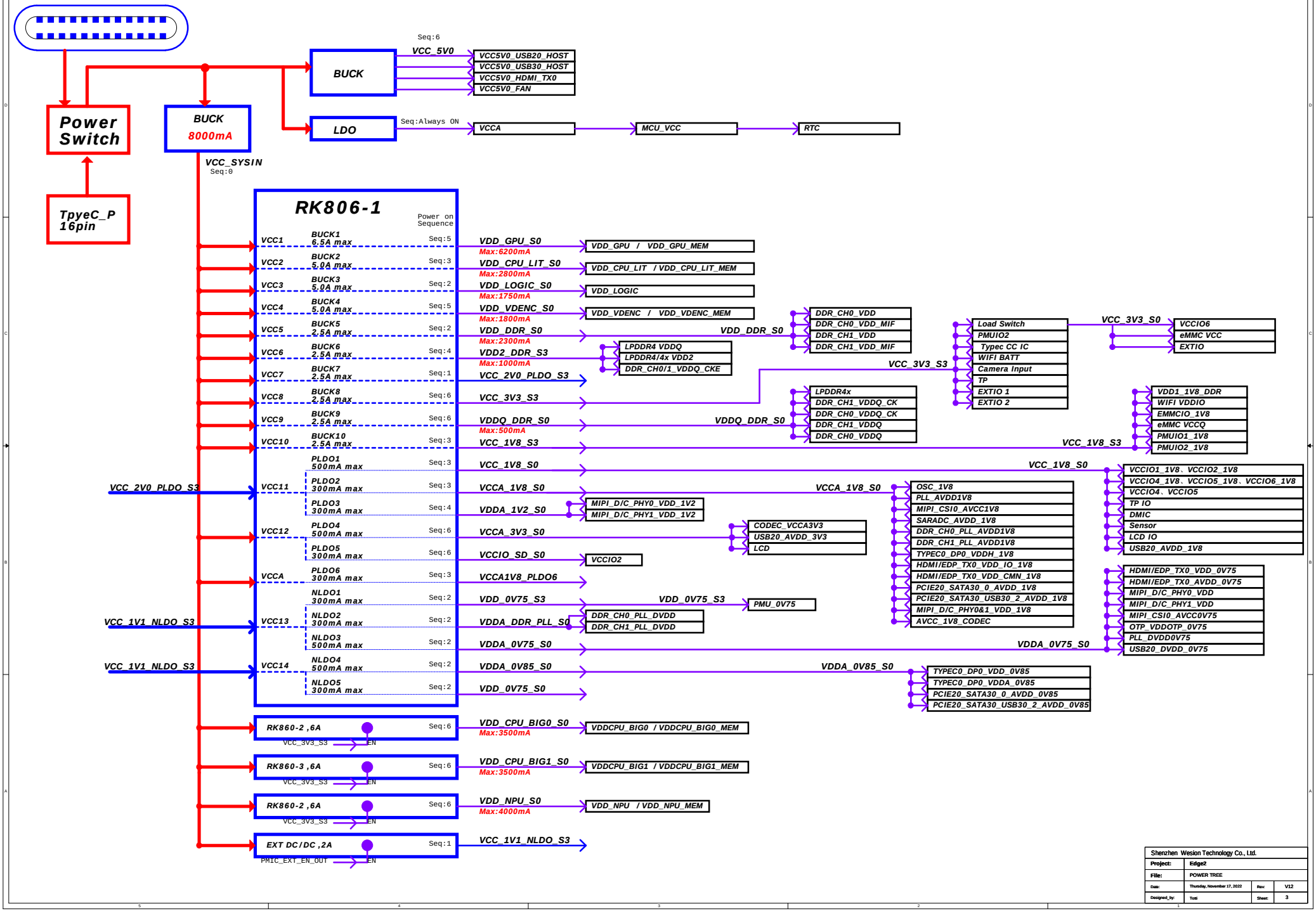
KHADAS

Something a little different.

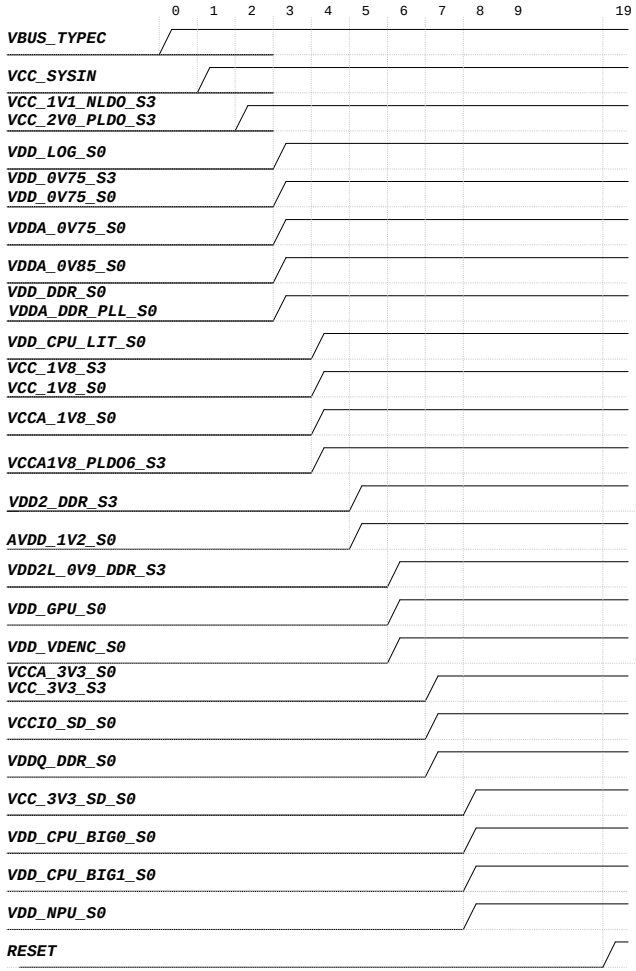
Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	Khadas		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	1


TypeC_0
Mean to Interface
Mean to IC
Power Key
TpyeC_P
POWER Switch
BUCK
Master Pmic1 RK806-1
Discrete Power
RESET1
RESET2
Power for RK3588S
I2C/Sleep/INT/AVS/RESETn
To RK3588S NPOR
USB2.0 HOST
USB3.0 HOST
USB2_HOST0 LS/FS/HS
USB2_HOST1 LS/FS/HS
USB2_OTG0 LS/FS/HS
USB3.0 LANE0--LANE3
RTC IC
TO WIFI
TO RK3588S
LCM1
LCM2
TP I2C
MIPI_DPHY0_TX
MIPI_DPHY1_TX
Camera1
Camera2
Camera3 CSI
MIPI_DPHY1_RX
MIPI_CAMERA1_CLK_M1
MIPI_DPHY0_RX
MIPI_CAMERA2_CLK_M1
MIPI_DPHY-CSI_RX
MIPI_CAMERA3_CLK_M1
SPI FLASH DATA0-DATA3
SPI Nor/NAND 1/4bits
EXTIO 2
TST Key
MCU
PMIC_VDC
Maskrom_EN
MCU I2C
PMUIO1
PMUIO2
USB20 HOST0
USB20 HOST1
PCIE2.0 SATA30 USB30 MULTI2
USB20 OTG0
USB3.1 DP1.4 MULTI0
MIPI_D/CPHY0_TX
MIPI_D/CPHY1_TX
MIPI_D/CPHY0_RX
MIPI_D/CPHY1_RX
MIPI_DPHY_CSI_RX
VCCIO5_SDIO
VCCIO1_I2S
VCCIO1_PDM
SARADC
PWM
SPDIF
SDMMC
DDR_CH1_DQ0-15_C_DQ0-15_D
PCIE2.0_SATA30_MULTI0
HDMI2.1_eDP1.3_MULTI0
OSC
eMMC_FSPI_MULTI
DDR_CH0_DQ0-15_A_DQ0-15_B
Rockchip
RK3588S
Quad A76+Quard A55
PCIE2.0 1Lane
I2S2_M1
UART9_M2
OPTION
WIFI/BT
802.11 a/b/g/n/ac/ax
BT5.0
2.4/5GHz
2.4/5GHz
OPTION
HDMI2.1 TX
24MHz
eMMC 5.1 HS400
eMMC DATA0-DATA7
DDR_CH0_32bit
LPDDR4/4X 32bit
DDR_CH1_32bit
LPDDR4/4X 32bit
MicArray
EXTIO 1
Shenzhen Wesion Technology Co., Ltd.
Project: Edge2
File: BLOCK
Date: Thursday, November 17, 2022
Rev: V12
Designed_by: Totti
Sheet: 2



Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	POWER TREE		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	3

Power Sequence



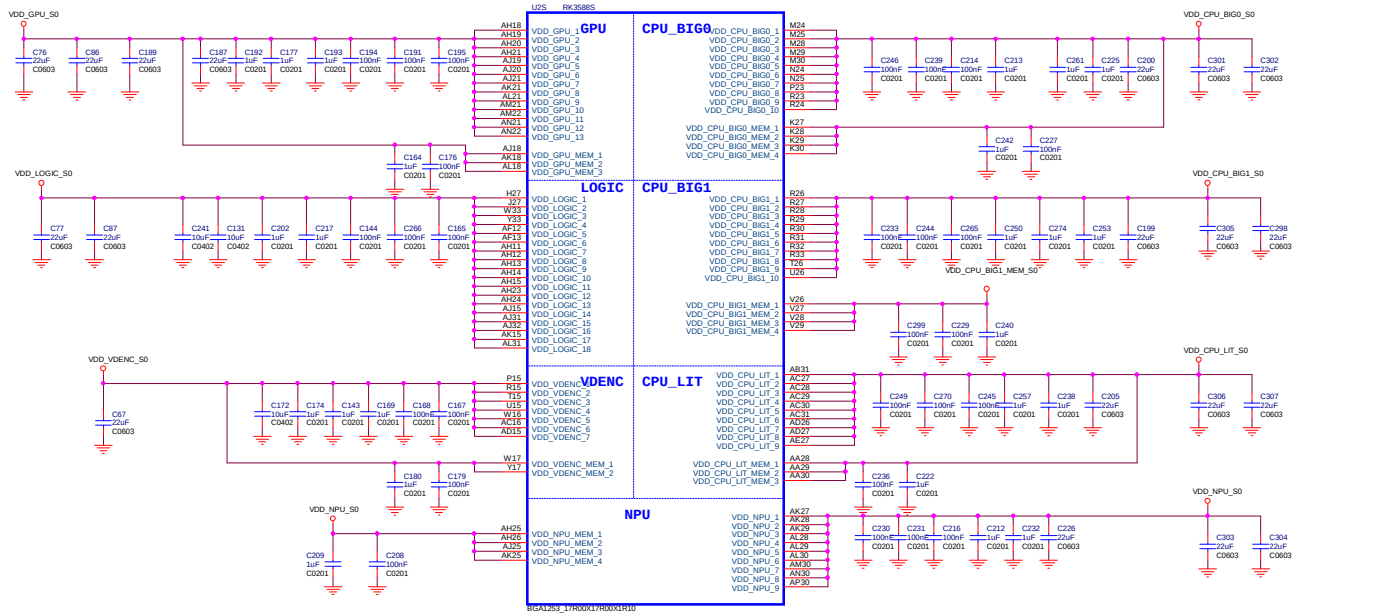
Power Supply	PMIC Channel	Supply Limit	Power Name	Time Slot	Default Voltage	Default ON/OFF	Sleep ON/OFF	Peak Current	Sleep Current
VCC_SYSIN	RK806-1_BUCK1	6.5A	VDD_GPU_S0	Slot:5	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK2	5A	VDD_CPU_LIT_S0	Slot:3	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK3	5A	VDD_LOG_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK4	3A	VDD_VDENC_S0	Slot:5	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK5	2.5A	VDD_DDR_S0	Slot:2	0.85V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK6	2.5A	VDD2_DDR_S3	Slot:4	ADJ FB=0.5V	ON	ON	TBD	TBD
VCC_SYSIN	RK806-1_BUCK7	2.5A	VCC_2V0_PLDO_S3	Slot:1	2.0V	ON	ON	TBD	TBD
VCC_SYSIN	RK806-1_BUCK8	2.5A	VCC_3V3_S3	Slot:6	3.3V	ON	ON	TBD	TBD
VCC_SYSIN	RK806-1_BUCK9	2.5A	VDDQ_DDR_S0	Slot:6	ADJ FB=0.5V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_BUCK10	2.5A	VCC_1V8_S3	Slot:3	1.8V	ON	ON	TBD	TBD
VCC_2V0_PLDO_S3	RK806-1_PLDO1	0.5A	VCC_1V8_S0	Slot:3	1.8V	ON	OFF	TBD	TBD
	RK806-1_PLDO2	0.3A	VCCA_1V8_S0	Slot:3	1.8V	ON	OFF	TBD	TBD
	RK806-1_PLDO3	0.3A	VDDA_1V2_S0	Slot:4	1.2V	ON	OFF	TBD	TBD
VCC_SYSIN	RK806-1_PLDO4	0.5A	VCCA_3V3_S0	Slot:6	3.3V	ON	OFF	TBD	TBD
	RK806-1_PLDO5	0.3A	VCCIO_SD_S0	Slot:6	3.3V	ON	OFF	TBD	TBD
	RK806-1_PLDO6	0.3A	VCCA1V8_PLDO6_S3	Slot:3	1.8V	ON	ON	TBD	TBD
VCC_1V1_NLDO_S3	RK806-1_NLDO1	0.3A	VDD_0V75_S3	Slot:2	0.75V	ON	ON	TBD	TBD
	RK806-1_NLDO2	0.3A	VDDA_DDR_PLL_S0	Slot:2	0.85V	ON	OFF	TBD	TBD
	RK806-1_NLDO3	0.5A	VDDA_0V75_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
VCC_1V1_NLDO_S3	RK806-1_NLDO4	0.5A	VDDA_0V85_S0	Slot:2	0.85V	ON	OFF	TBD	TBD
	RK806-1_NLDO5	0.3A	VDD_0V75_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	BUCK_RK860-2	6A	VDD_CPU_BIG0_S0	Slot:6A	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	BUCK_RK860-3	6A	VDD_CPU_BIG1_S0	Slot:6A	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	BUCK_RK860-2	6A	VDD_NPU_S0	Slot:6A	0.75V	ON	OFF	TBD	TBD
VCC_SYSIN	EXT BUCK	2A	VCC_1V1_NLDO_S3	Slot:1	1.1V	ON	ON	TBD	TBD

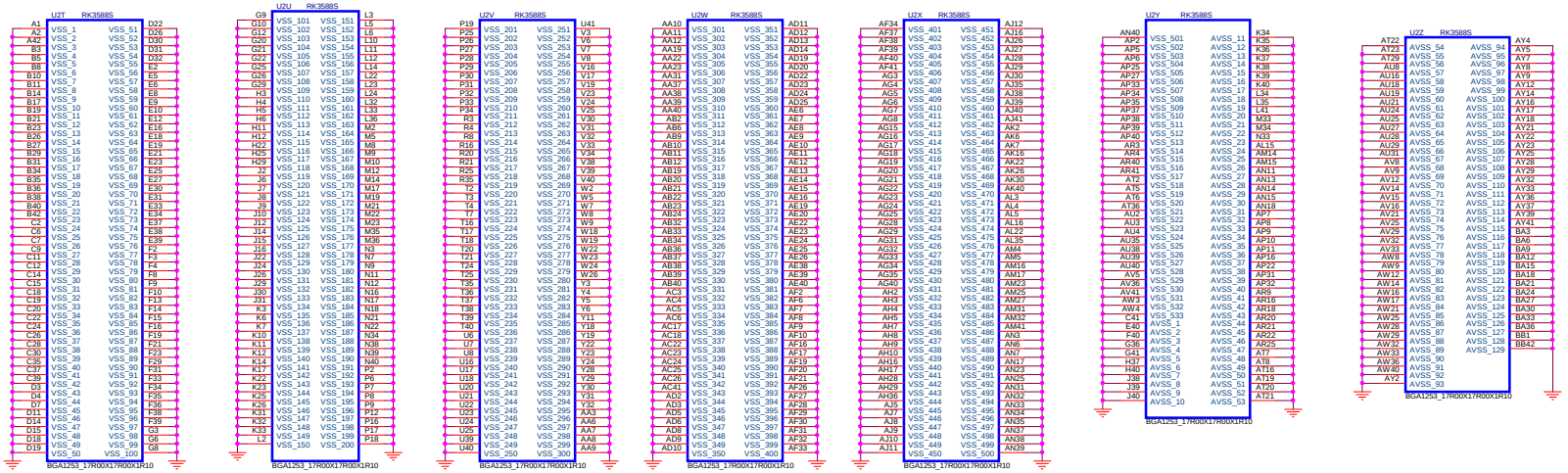
IO Power Domain Map

IO Domain	Pin Num	Support IO Voltage	Supply Power Pin Name	Power Source	Operating Voltage
PMUIO1	Pin N36 N37	1.8V Only	PMUIO1_1V8	VCC_1V8_S3	1.8V
PMUIO2	Pin V37 Y37 Pin V35 V36	1.8V or 3.3V	PMUIO2_1V8 PMUIO2	VCC_1V8_S3 VCC_1V8_S3	1.8V 1.8V
EMMCIO	Pin AC35 Pin AC36	1.8V Only	EMMCIO_1V8	VCC_1V8_S0	1.8V
VCCIO1	Pin H31	1.8V Only	VCCIO1_1V8	VCC_1V8_S0	1.8V
VCCIO2	Pin AK11 Pin AK10	1.8V or 3.3V	VCCIO2_1V8 VCCIO2	VCC_1V8_S0 VCC_IO_SD	1.8V 1.8V/3.3V
VCCIO4	Pin G27 G28 Pin G31	1.8V or 3.3V	VCCIO4_1V8 VCCIO4	VCC_1V8_S0 VCC_1V8_S0	1.8V 1.8V
VCCIO5	Pin AF35 AF36 Pin AC33 AC34	1.8V or 3.3V	VCCIO5_1V8 VCCIO5	VCC_1V8_S0 VCC_1V8_S0	1.8V 1.8V
VCCIO6	Pin AJ34 Pin AL33 AM33	1.8V or 3.3V	VCCIO6_1V8 VCCIO6	VCC_1V8_S0 VCC_3V3_S0	1.8V 3.3V

Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	System Power Sequence		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	4

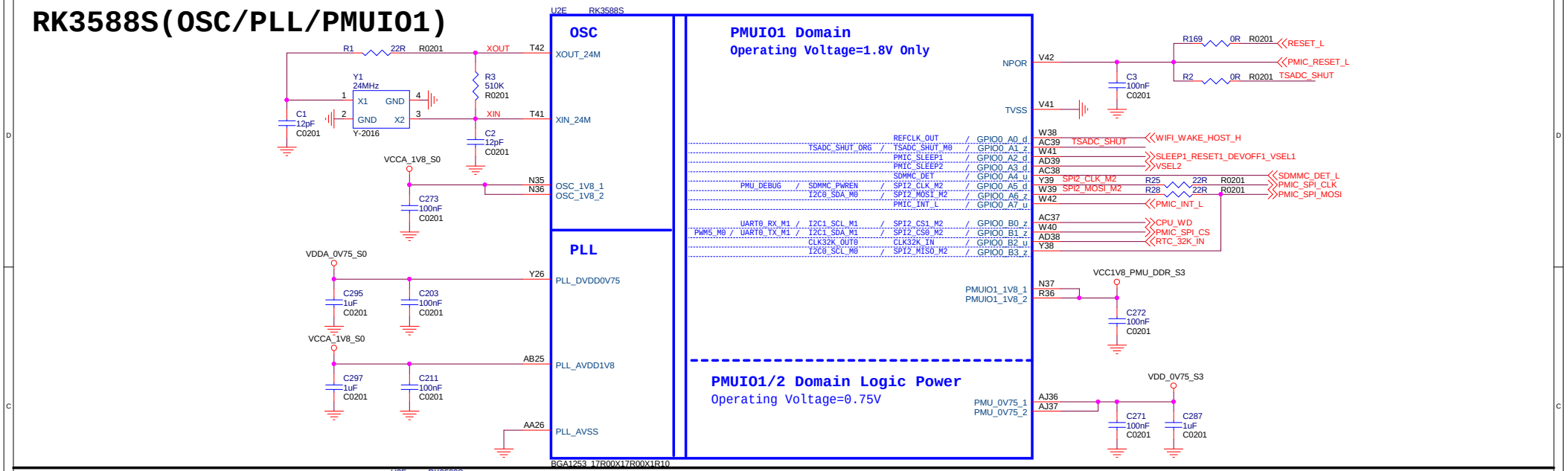
RK3588S(Power&Gnd)



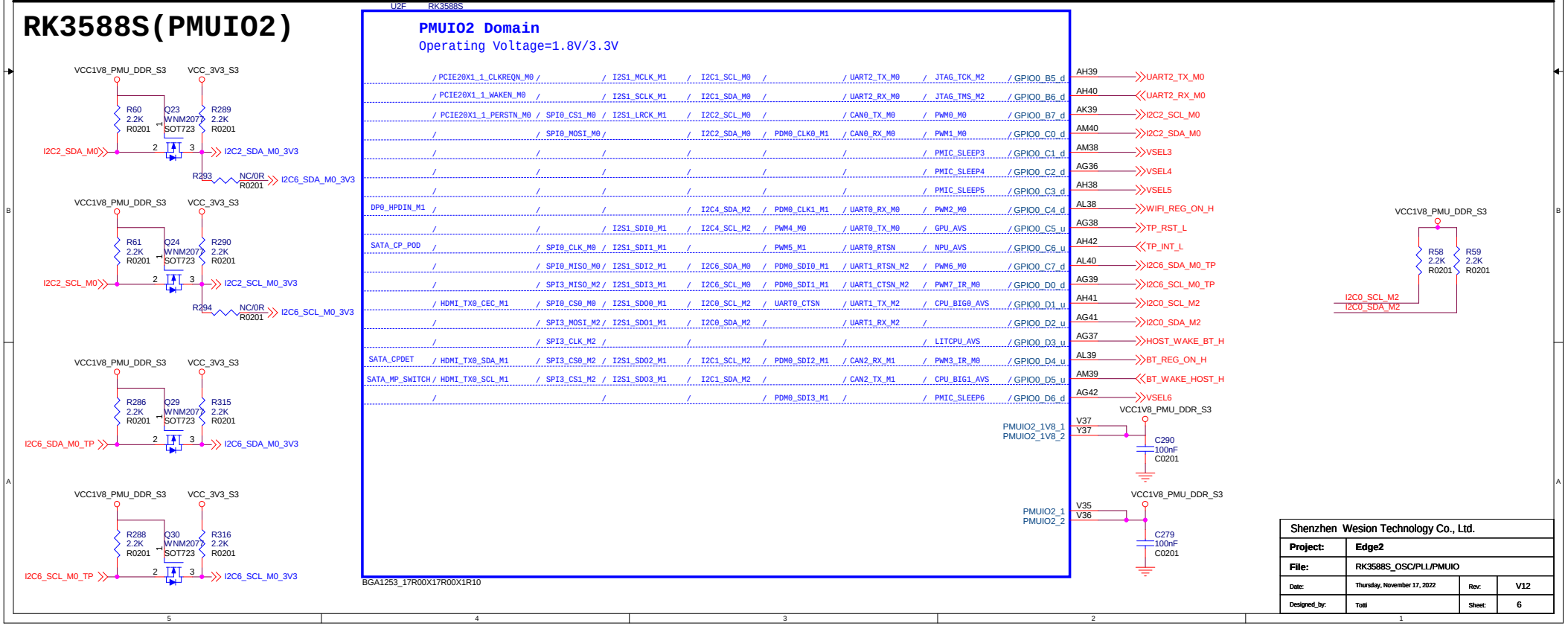


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_Power/GND		
Date:	Thusday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	5

RK3588S(OSC/PLL/PMUIO1)

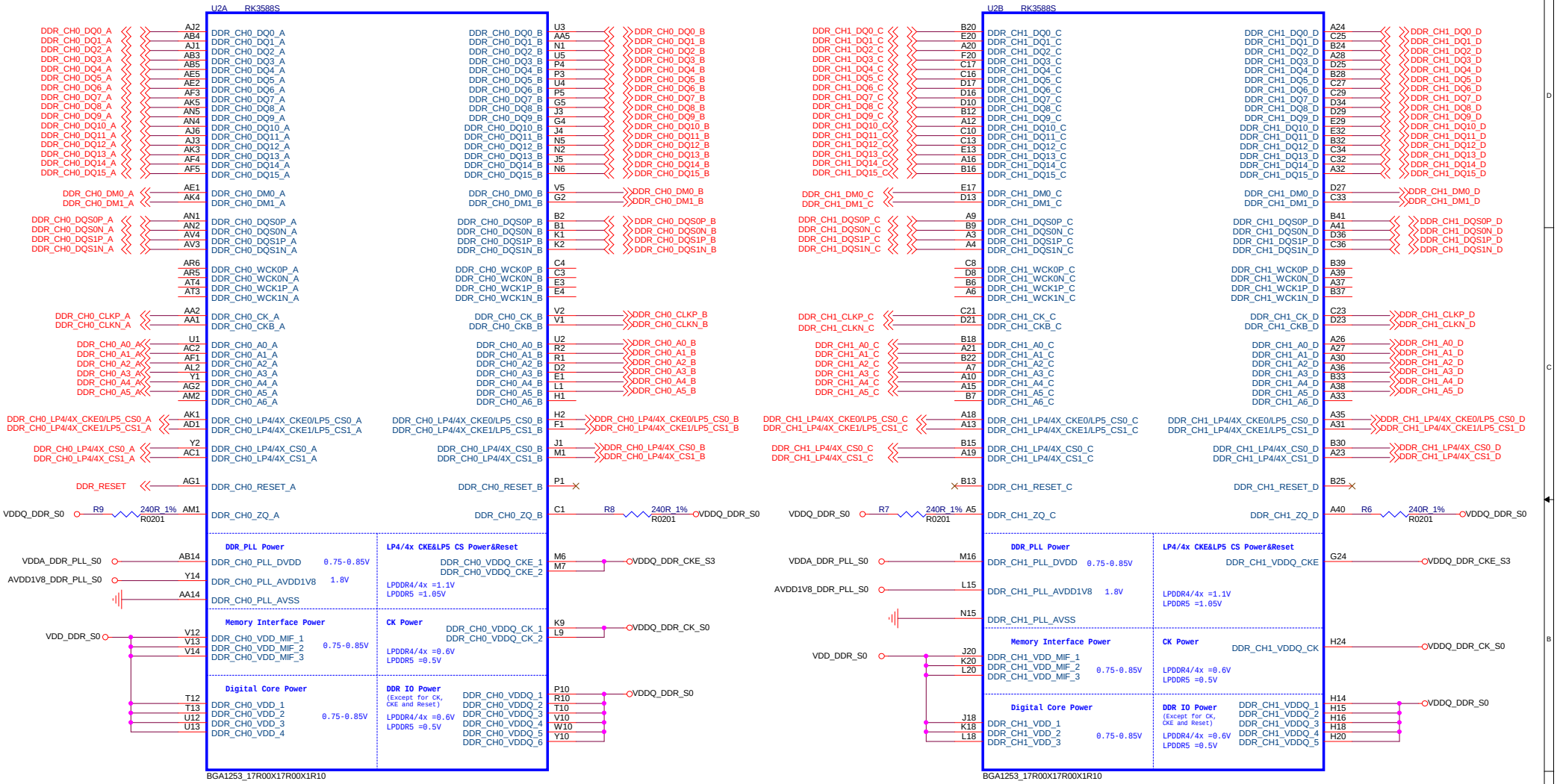


RK3588S(PMUIO2)

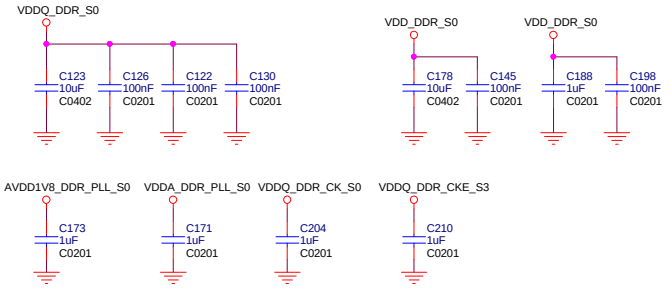


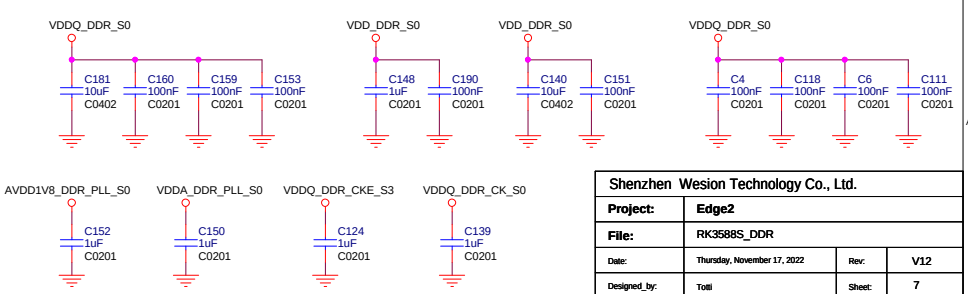
Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_OSC/PLL/PMUIO		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	6

RK3588S(DDR PHY)



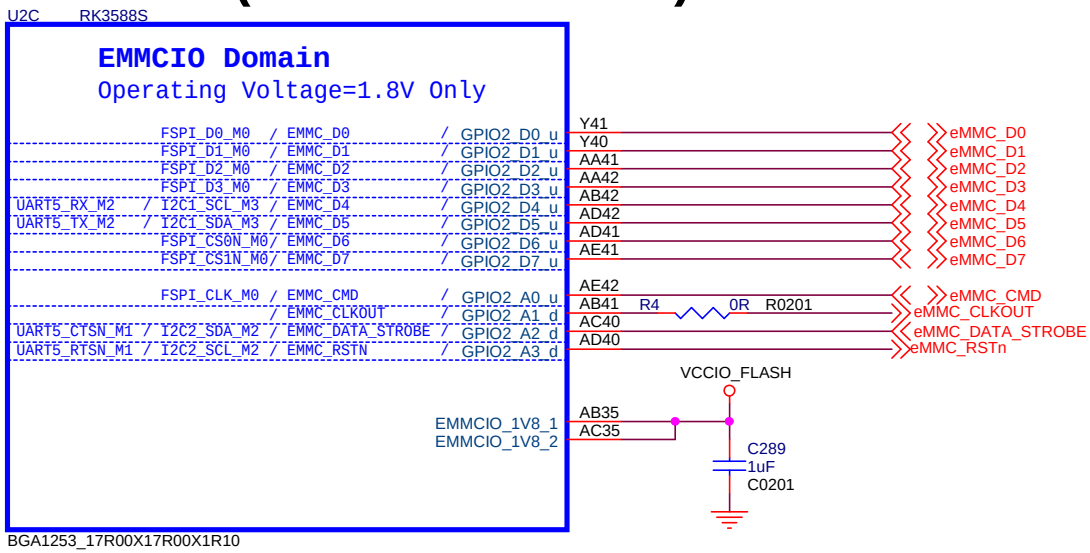
DDR FILTER



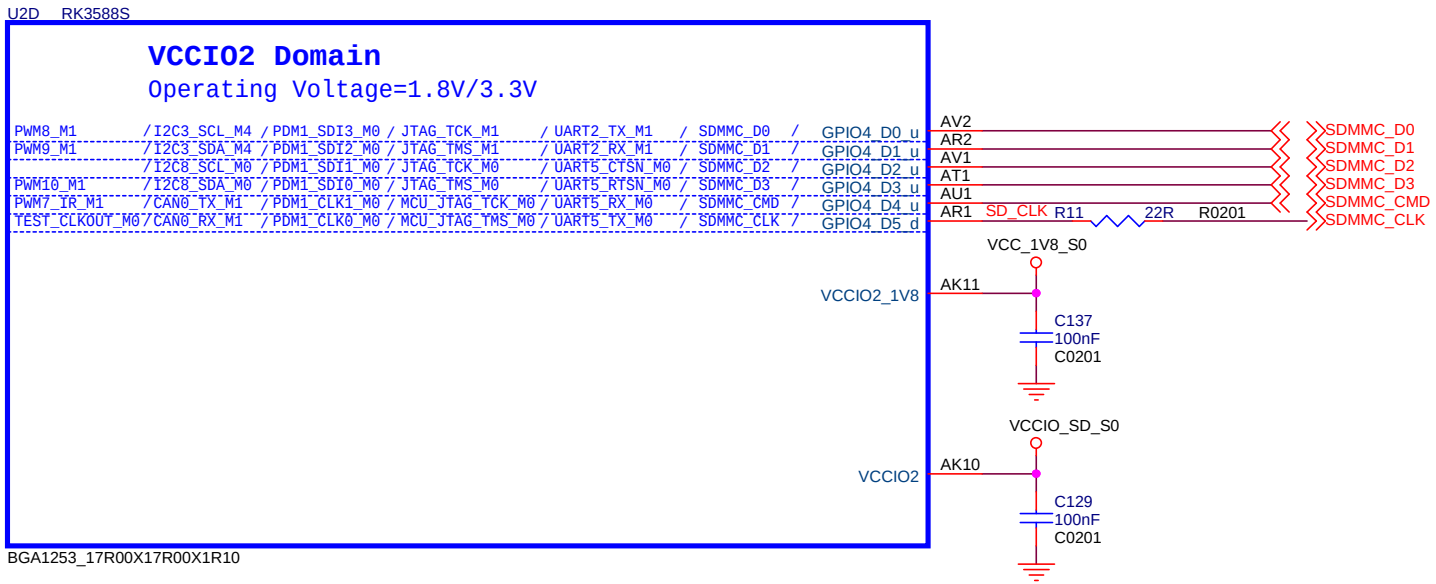


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_DDR		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	7

RK3588S(EMMCIO Domain)

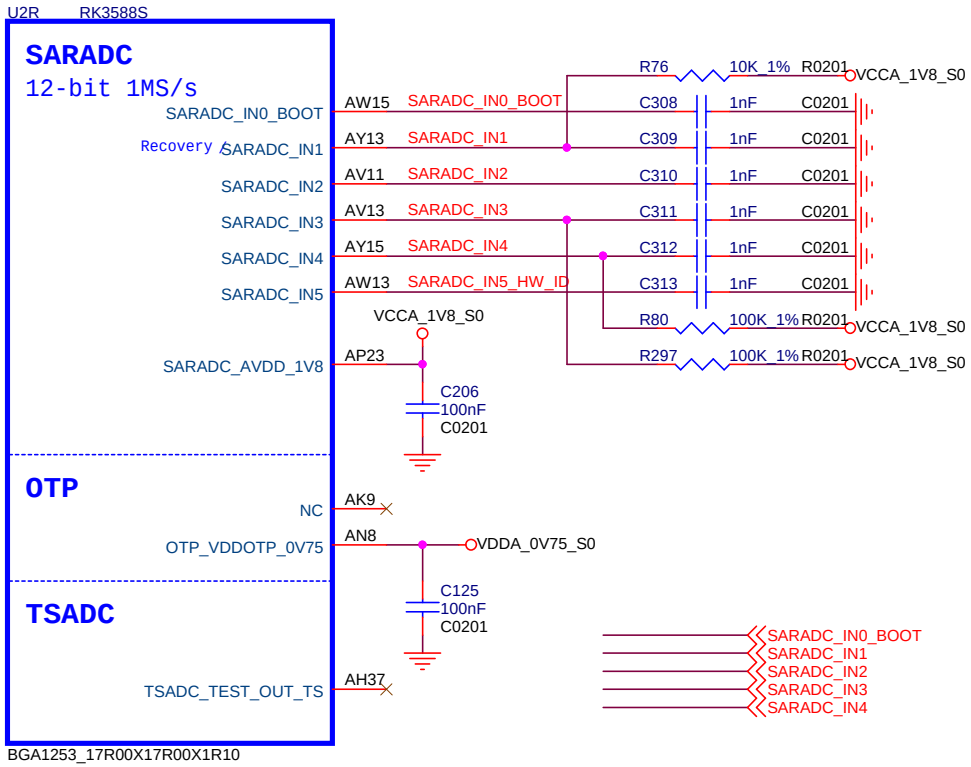


RK3588S(VCCIO2 Domain)

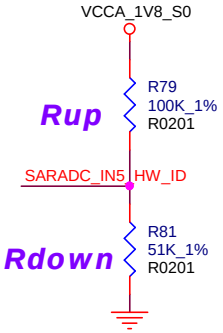


Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	RK3588S_Flash/SD		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	8

RK3588S(SARADC/OTP/TSADC)

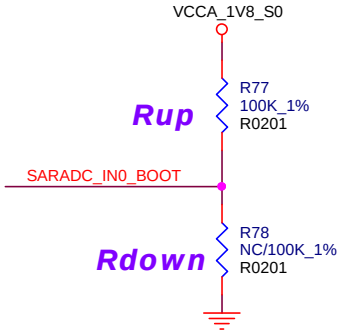


BOARD ID CONFIG



Item	Rup	Rdown	ADC	VERSION
LEVEL1	DNP	100K	0	V10
LEVEL2	100K	20K	682	V11
LEVEL3	100K	51K	1365	V12
LEVEL4	100K	100K	2047	V13
LEVEL5	100K	200K	2730	V14
LEVEL6	100K	499K	3412	V15
LEVEL7	100K	DNP	4095	V16

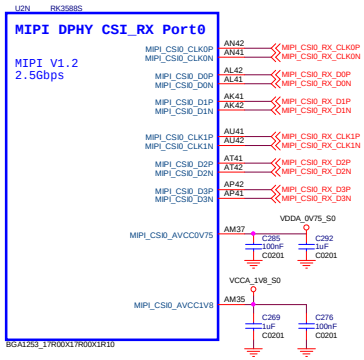
BOOT MODE CONFIG



Item	Rup	Rdown	ADC	BOOT MODE
LEVEL1	DNP	100K	0	USB (Maskrom mode)
LEVEL2	100K	20K	682	SD Card-USB
LEVEL3	100K	51K	1365	EMMC-USB
LEVEL4	100K	100K	2047	FSPI M0-USB
LEVEL5	100K	200K	2730	FSPI M1-USB
LEVEL6	100K	499K	3412	FSPI M2-USB
LEVEL7	100K	DNP	4095	FSPI_M2-FSPI_M0-EMMC -SD Card-USB

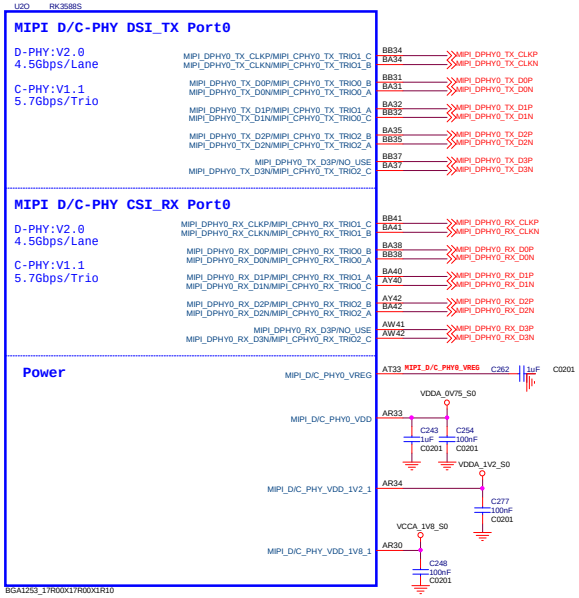
Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_SARADC		
Date:	Thursday, December 15, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	9

RK3588S(MIPI_DPHY CSI0 RX)

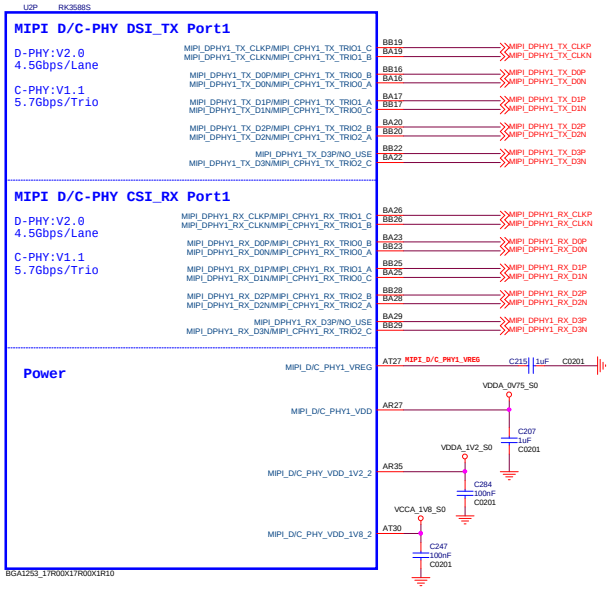


Option1	*Sensor1 x4Lane*	*MIPI_CSI_RX_D0-3* *MIPI_CSI_RX_CLK0*
Option2	*Sensor1 x2Lane* *+* *Sensor2 x2Lane*	*MIPI_CSI_RX_D0-1* *MIPI_CSI_RX_CLK0* ~~*MIPI_CSI_RX_D2-3*~~ *MIPI_CSI_RX_CLK1*

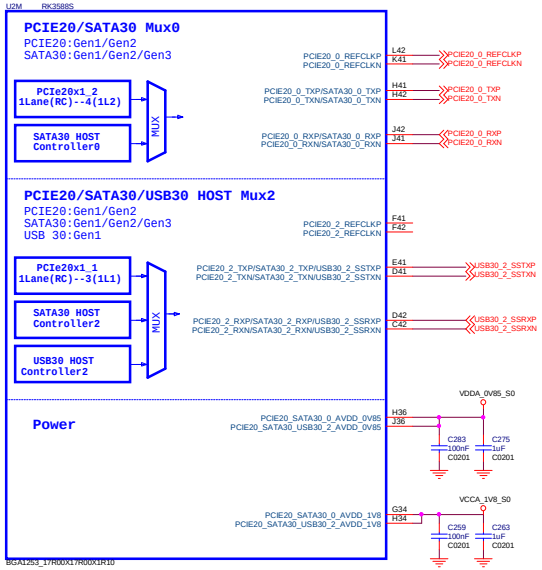
RK3588S(MIPI_D/C PHY0)



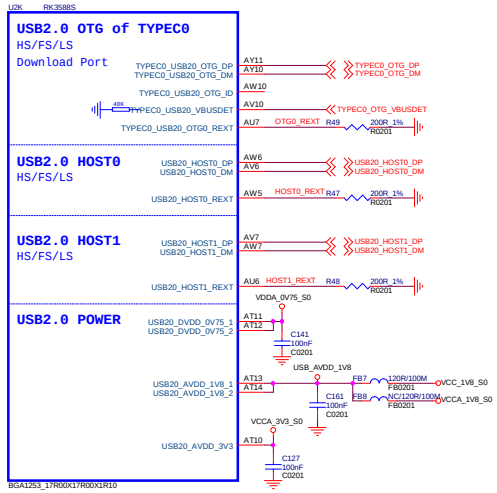
RK3588S(MIPI_D/C PHY1)



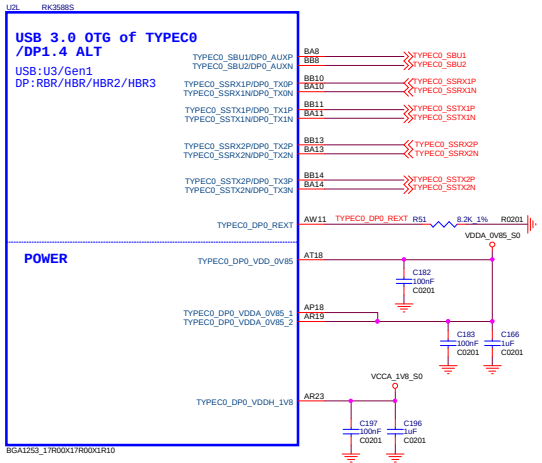
RK3588S(PCIE20/SATA30/USB30)



RK3588S(USB2.0)

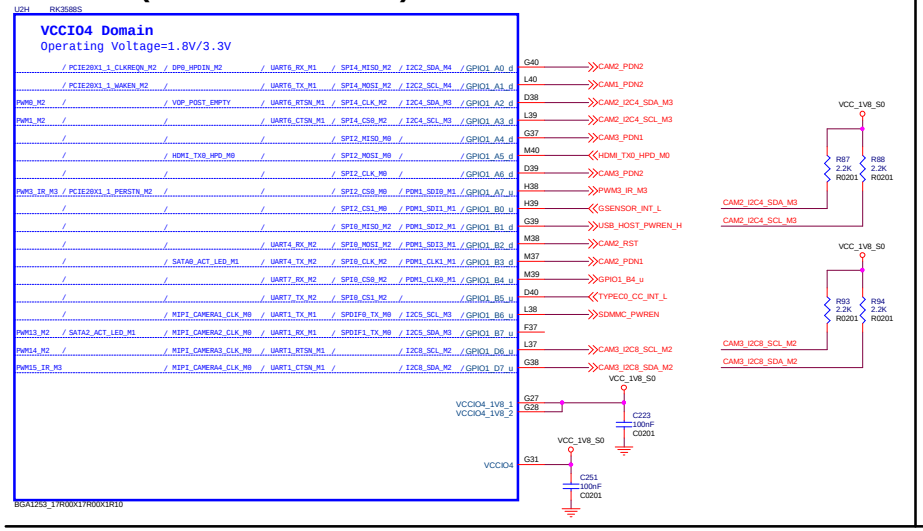


RK3588S(USB3.0/DP1.4)

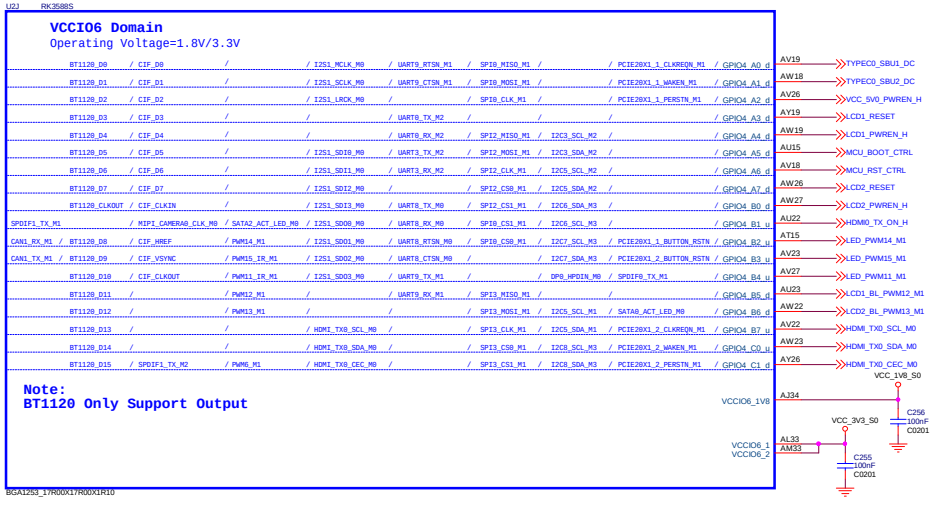


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_MIPI&USB/PCIE		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	10

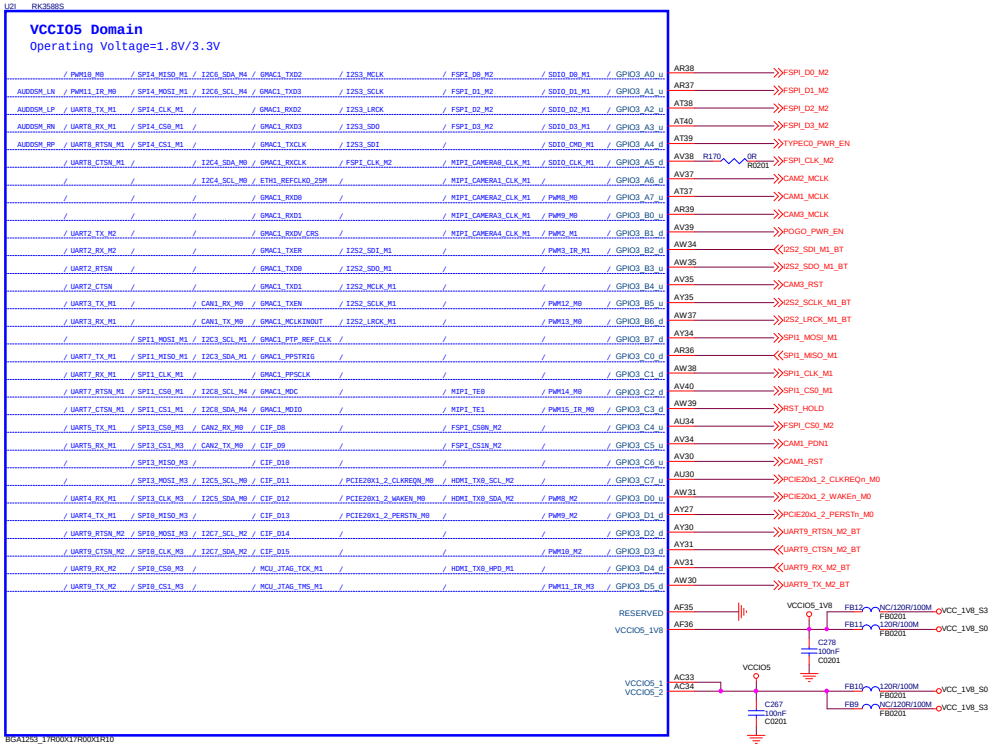
RK3588S(VCCIO4 Domain)



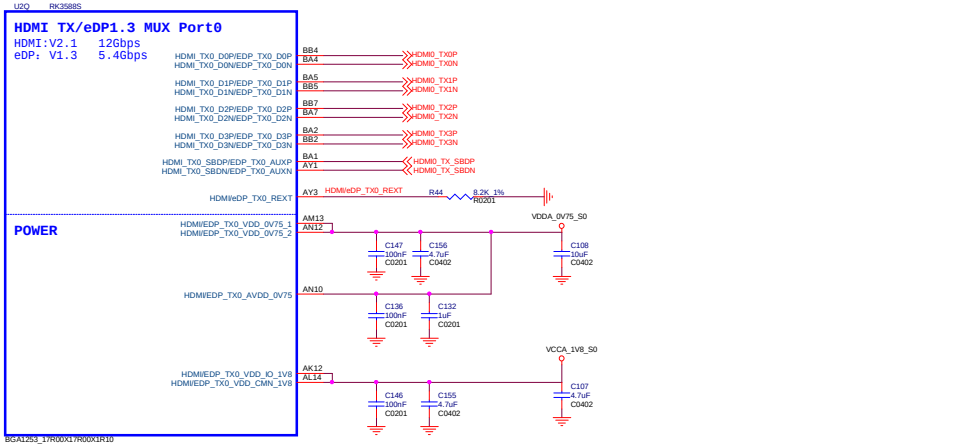
RK3588S(VCCIO6 Domain)



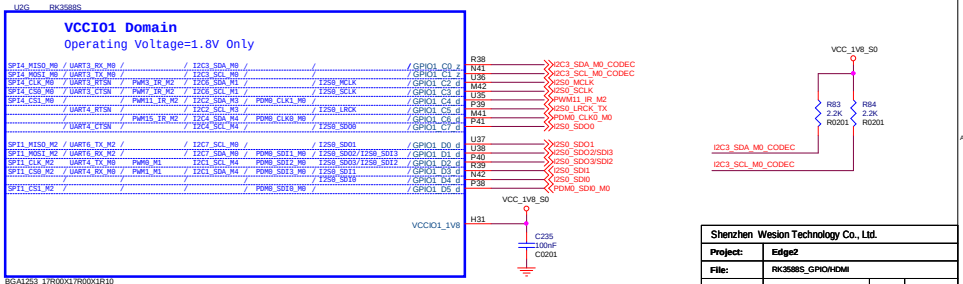
RK3588S(VCCIO5 Domain)



RK3588S(HDMI2.1 TX/eDP1.3 TX)

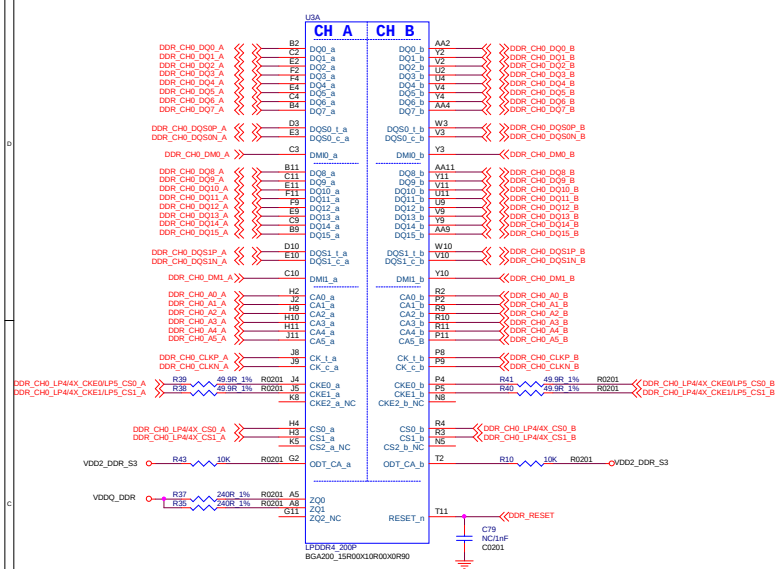


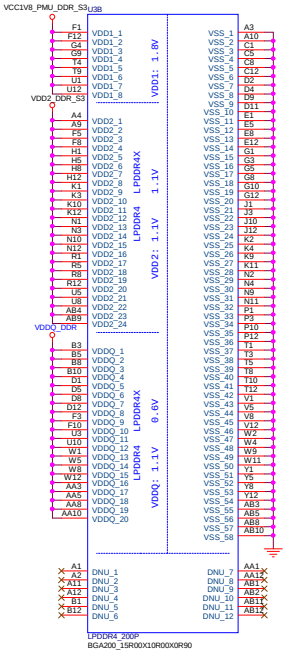
RK3588S(VCCIO1 Domain)

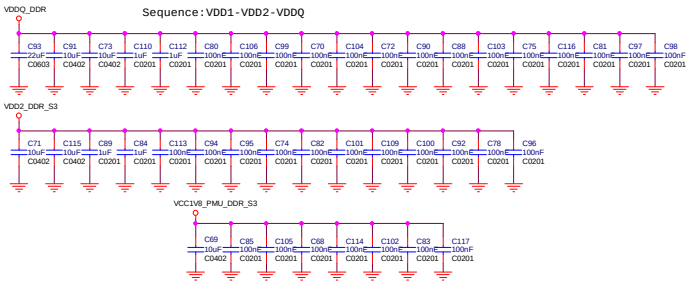


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	RK3588S_GPIO/HDMI		
Date:	Thusday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	11

DRAM-LPDDR4/4x_2X32bit

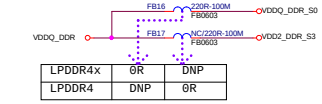






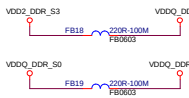
DRAM-LPDDR4/4x Power

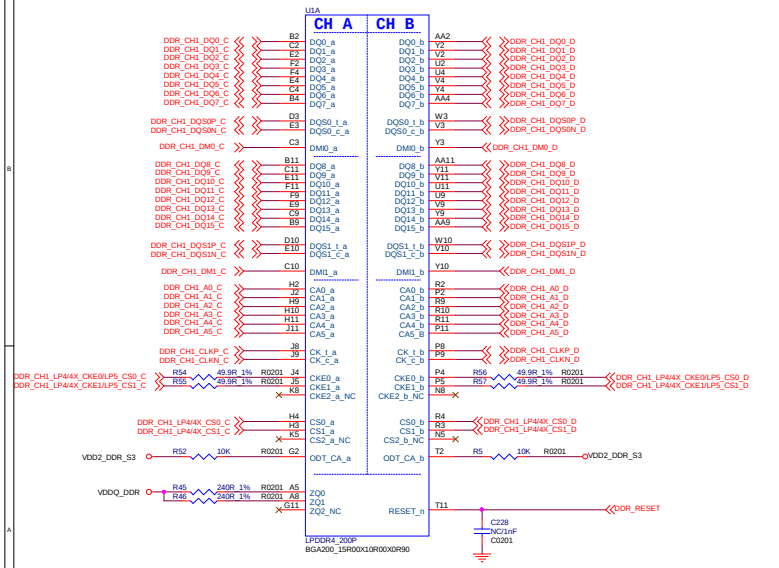
Sequence:VDD1-VDD2-VDDQ

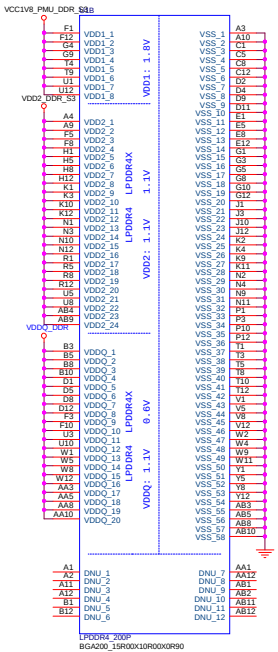


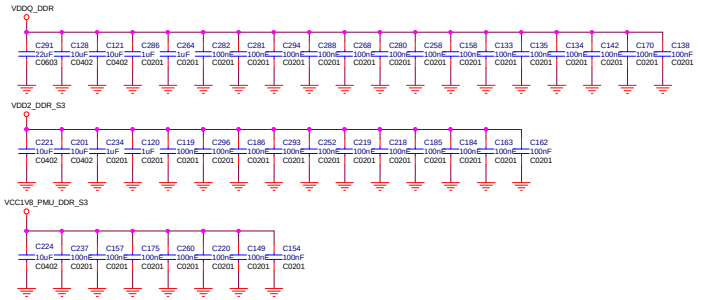
	LPDDR4x	0R	DNP
	LPDDR4	DNP	0R

	LPDDR4	LPDDR4X
VDD1:	1.70-1.95	1.70-1.95
VDD2:	1.06-1.17	1.06-1.17
VDDQ:	1.06-1.17	0.57-0.65



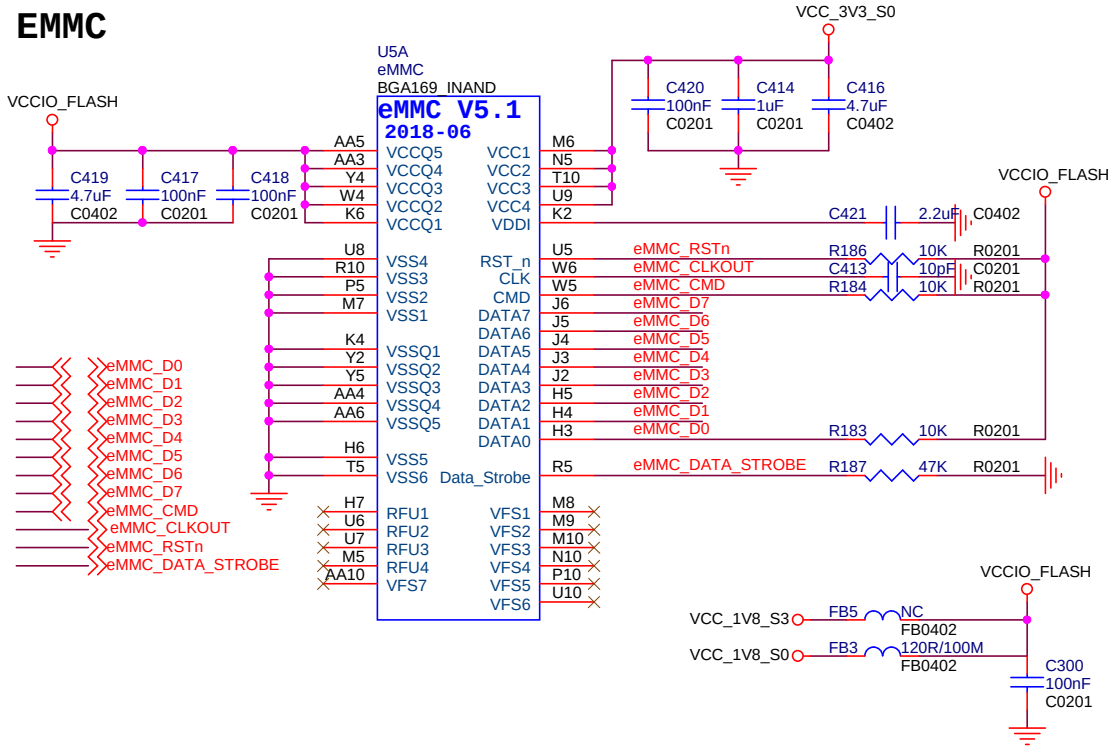


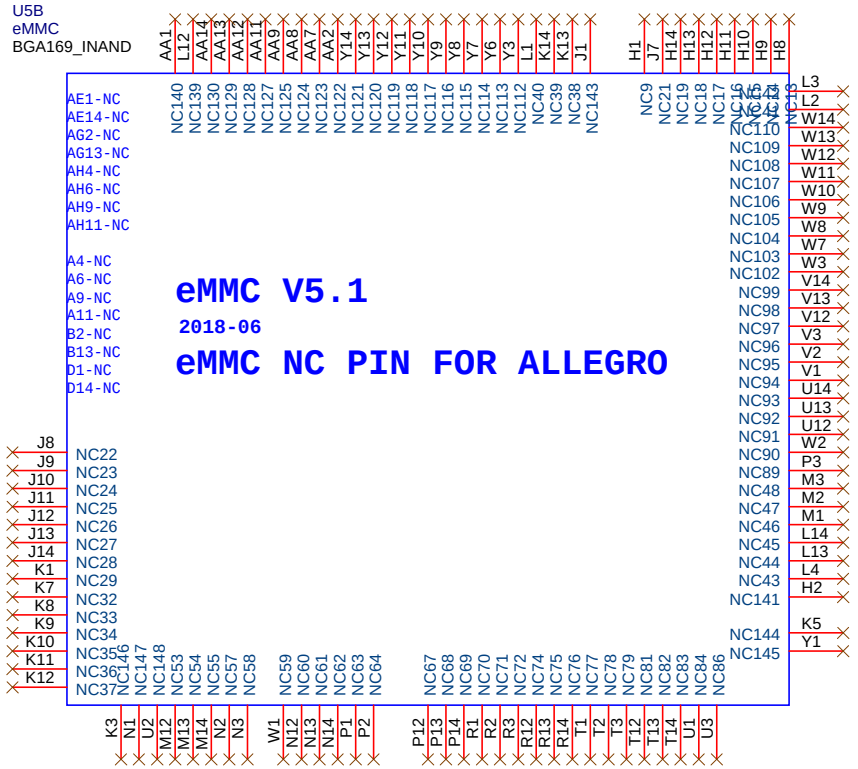




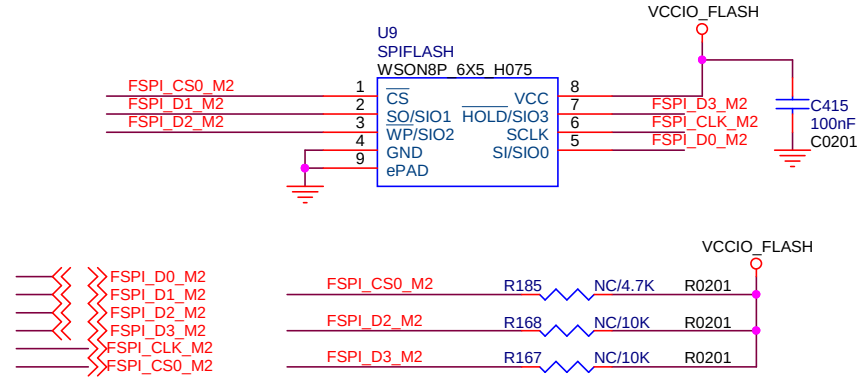
Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	DRAM_LPDDR4/4X		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	12

EMMC

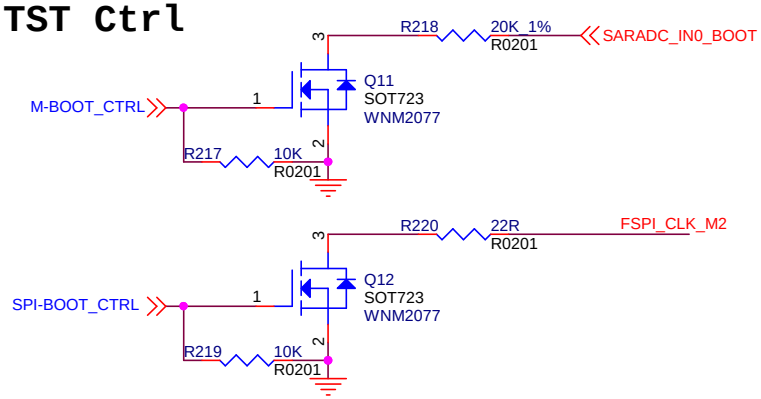




SPI FLASH



TST Ctrl

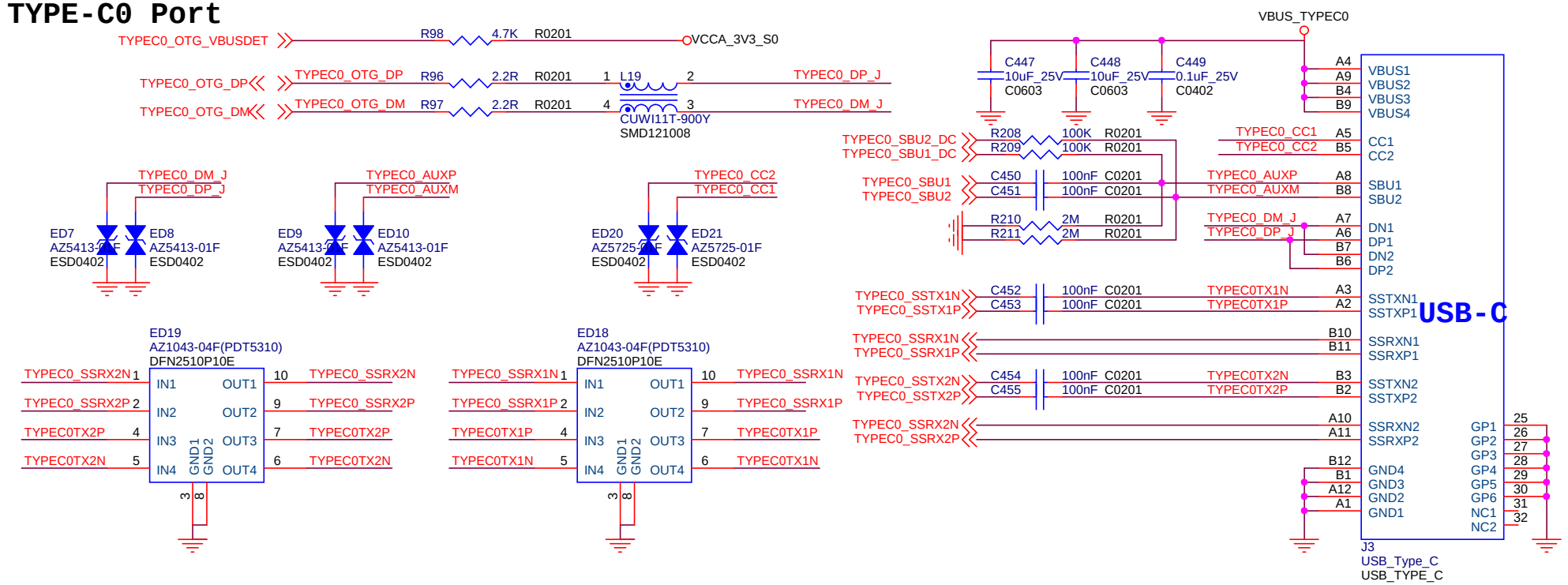


M-BOOT_CTRL	SPI-BOOT_CTRL	BOOT Priority
L	H	EMMC>USB
H	X	SD>USB
L	L	SPI>EMMC>USB

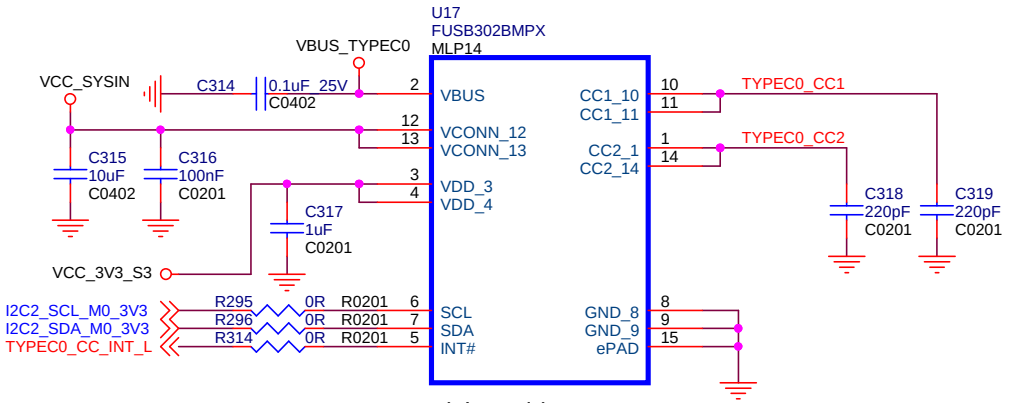
default

Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	**EMMC/SPI-FLASH**		
Date:	Thursday, December 15, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	13

TYPE-C0 Port



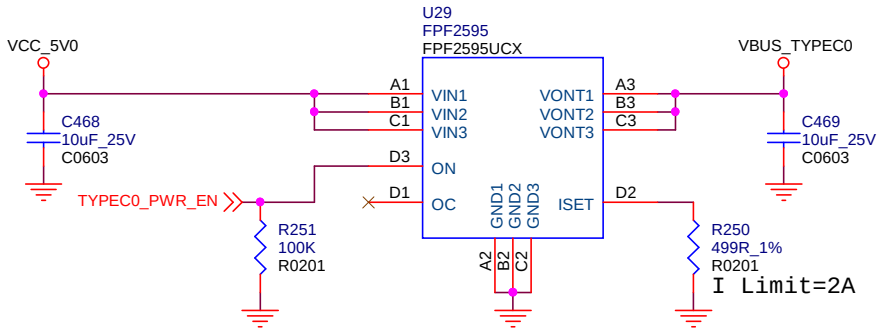
USB Type-C0 Controller(PD)



7bit address=0x22

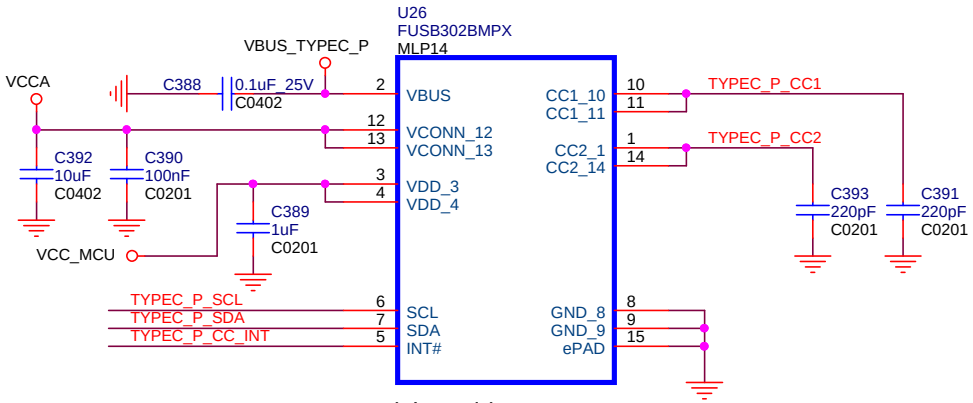
VBUS of FUSB302BMPX: 4 to 21 TYP = 5V
VDD of FUSB302BMPX: 3 to 5.5 TYP = 3.3V
VCONN of FUSB302BMPX: 3 to 5.5

USB Type-C0 POWER



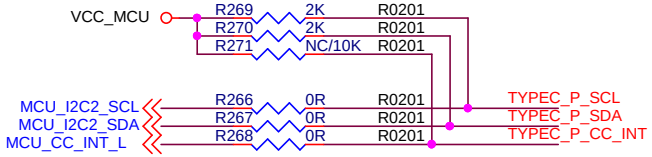
Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	Type-C0 Port		
Date:	Monday, November 21, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	14

USB Type-C_P Controller(PD)

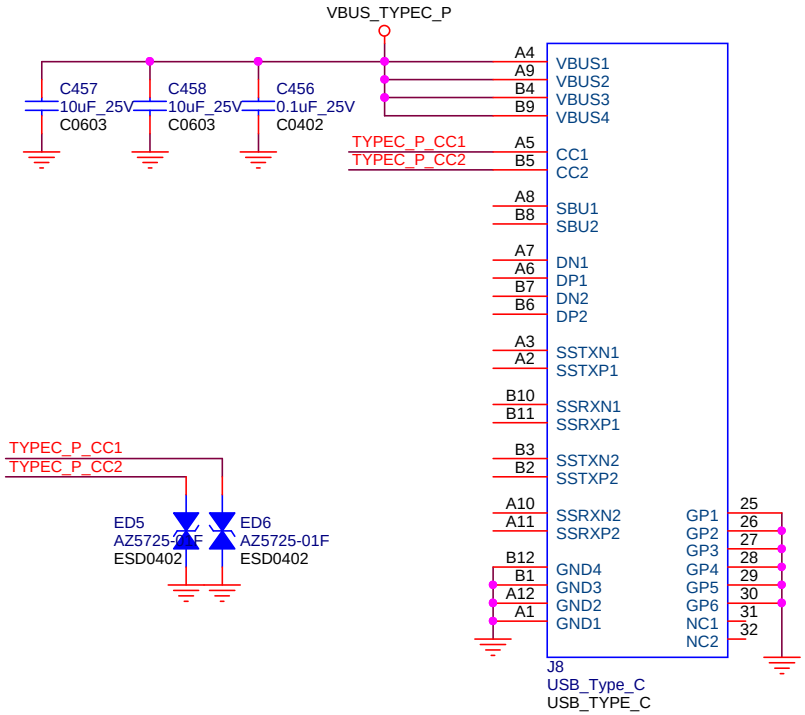


7bit address=0x22

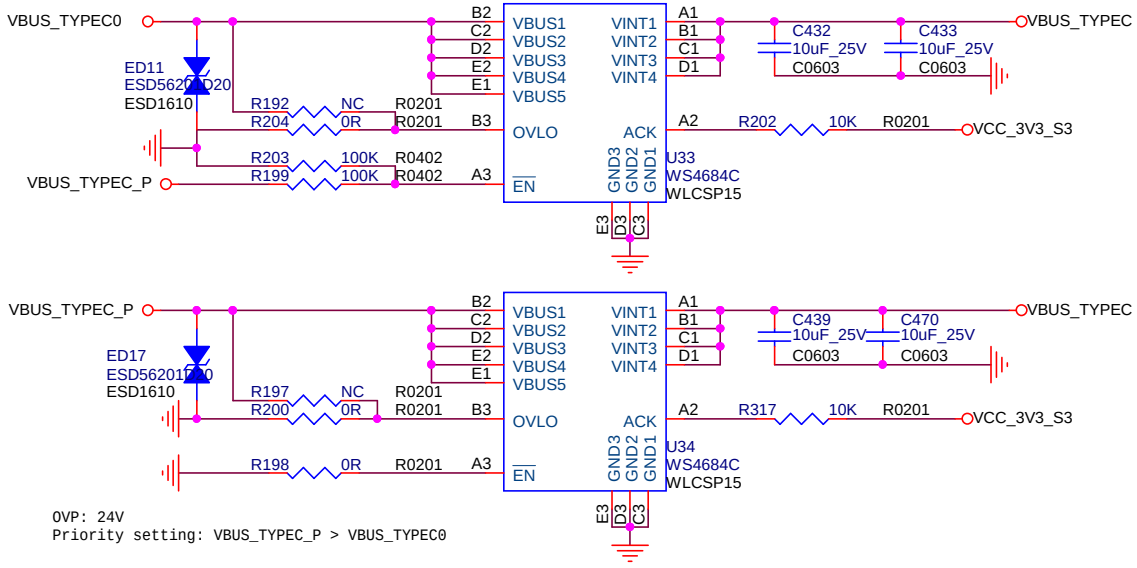
VBUS of FUSB302BMPX: 4 to 21 TYP = 5V
VDD of FUSB302BMPX: 3 to 5.5 TYP = 3.3V
VCONN of FUSB302BMPX: 3 to 5.5



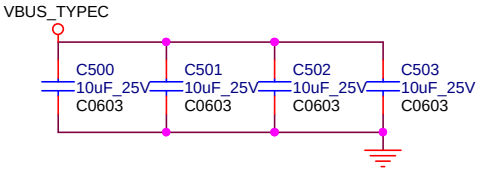
TYPE-C POWER-Only Port



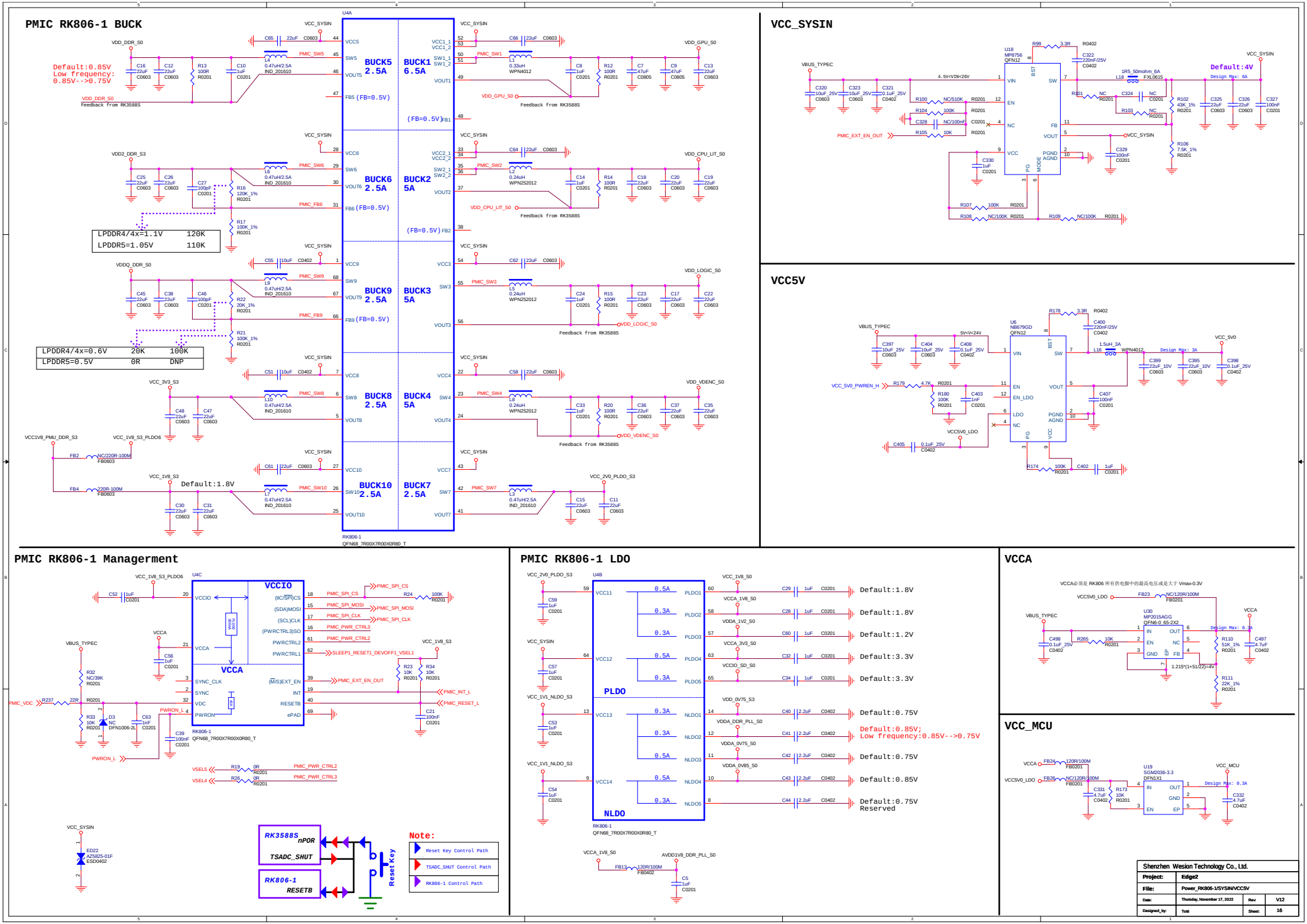
TPYE-C PWR PATH



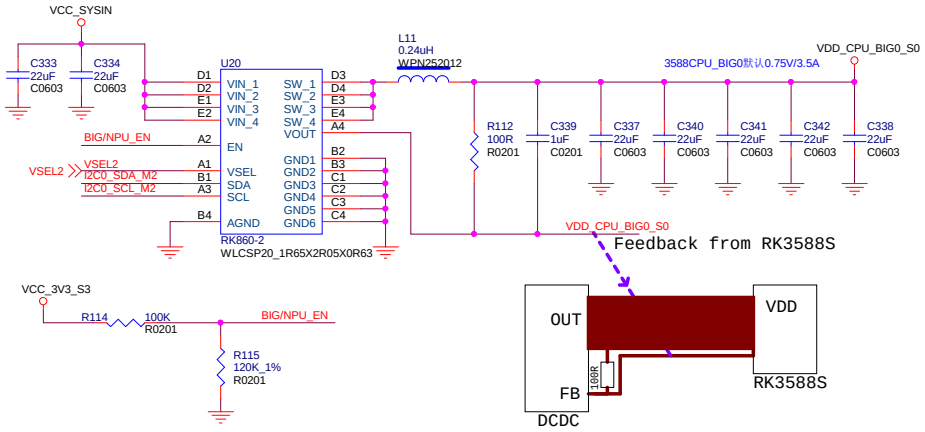
OVP: 24V
Priority setting: VBUS_TYPEC_P > VBUS_TYPEC0



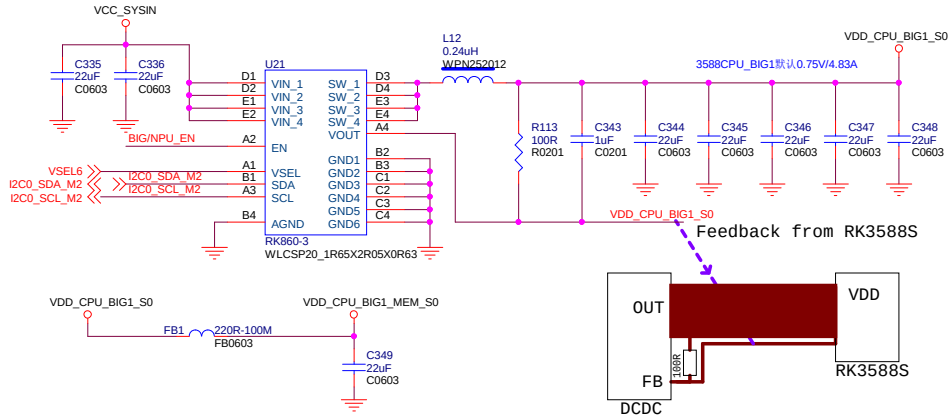
Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	Type-C PWR Port		
Date:	Thursday, December 15, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	15


PMIC RK806-1 BUCK
U4A
VCC_SYSIN
VDD_DDR_S0
Default:0.85V
Low frequency:
0.85V-->0.75V
Feedback from RK3588S
BUCK5 2.5A
BUCK1 6.5A
VDD_GPU_S0
BUCK6 2.5A
BUCK2 5A
VDD2_DDR_S3
VDD_CPU_LIT_S0
LPDDR4/4x=1.1V 120K
LPDDR5=1.05V 110K
VDDQ_DDR_S0
BUCK9 2.5A
BUCK3 5A
VDD_LOGIC_S0
LPDDR4/4x=0.6V 20K 100K
LPDDR5=0.5V 0R DNP
VCC_3V3_S3
BUCK8 2.5A
BUCK4 5A
VDD_VDENC_S0
VCC1V8_PMU_DDR_S3
VCC_1V8_S3_PLDO6
VCC_1V8_S3
Default:1.8V
BUCK10 2.5A
BUCK7 2.5A
VCC_2V0_PLDO_S3
RK806-1
QFN68_7R00X7R00X0R80_T
VCC_SYSIN
VCC5V0_LDO
VCC_5V0_PWREN_H
VCC5V0_LDO
VCC_1V8_S0
VCCA_1V8_S0
VDDA_1V2_S0
VCC_3V3_S0
VCCIO_SD_S0
VDD_0V75_S3
VDDA_DDR_PLL_S0
VDDA_0V75_S0
VDDA_0V85_S0
VCC_1V1_NLDO_S3
PLDO
NLDO
Default:1.8V
Default:1.8V
Default:1.2V
Default:3.3V
Default:3.3V
Default:0.75V
Default:0.85V;
Low frequency:0.85V-->0.75V
Default:0.75V
Default:0.85V
Default:0.75V
Reserved
VCCA
VCCA必须是 RK806 所有供电脚中的最高电压或是大于 Vmax-0.3V
VCC_MCU
PMIC RK806-1 Managerment
VCCIO
VCCA
PMIC_VDC
PWRON_L
VSEL5
VSEL4
RK3588S
nPOR
TSADC_SHUT
RK806-1
RESETB
Reset Key
Note:
Reset Key Control Path
TSADC_SHUT Control Path
RK806-1 Control Path
Shenzhen Wesion Technology Co., Ltd.
Project: Edge2
File: Power_RK806-1/SYSIN/VCC5V
Date: Thursday, November 17, 2022
Rev: V12
Designed_by: Totti
Sheet: 16

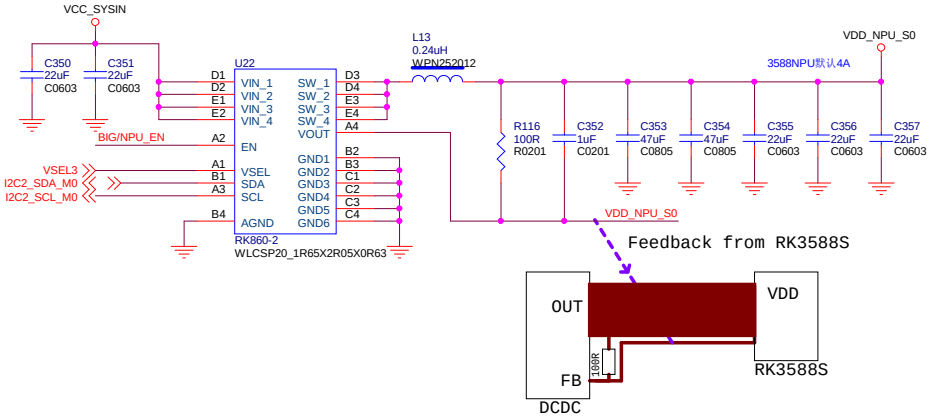
VDD_CPU_BIG0



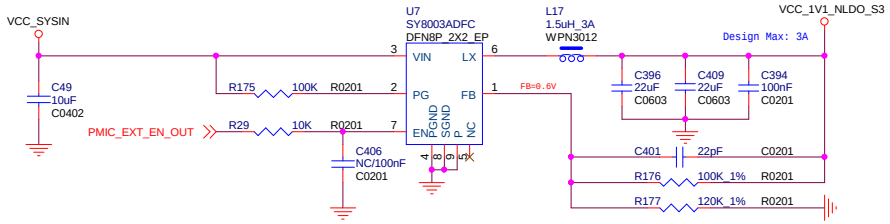
VDD_CPU_BIG1



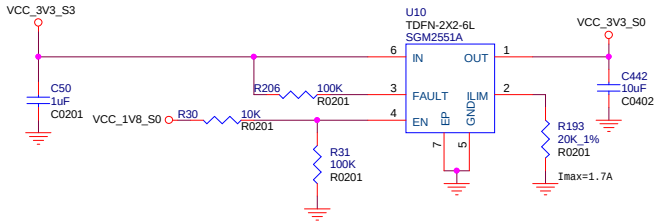
VDD_NPU



VCC_1V1_NLDO

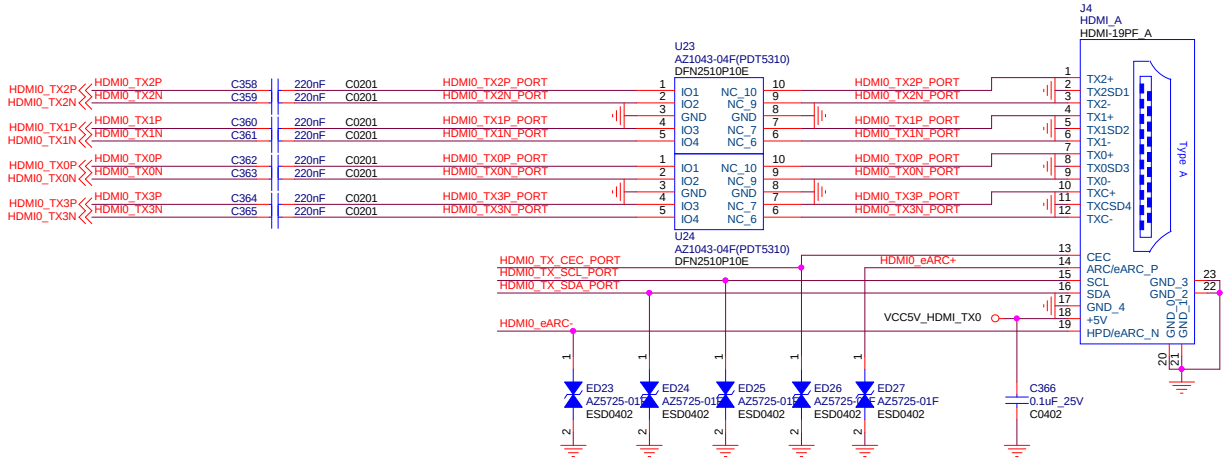


VCC_3V3_S0

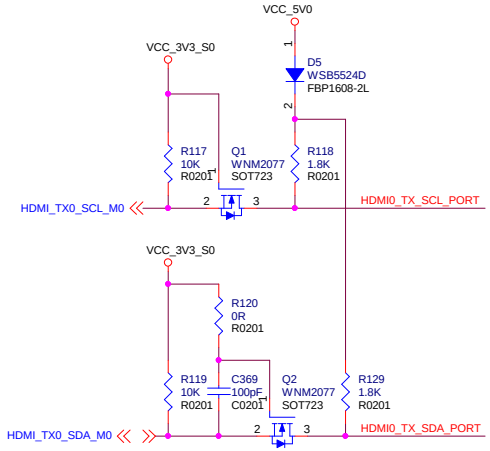


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	Power_Ext Discrete		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	17

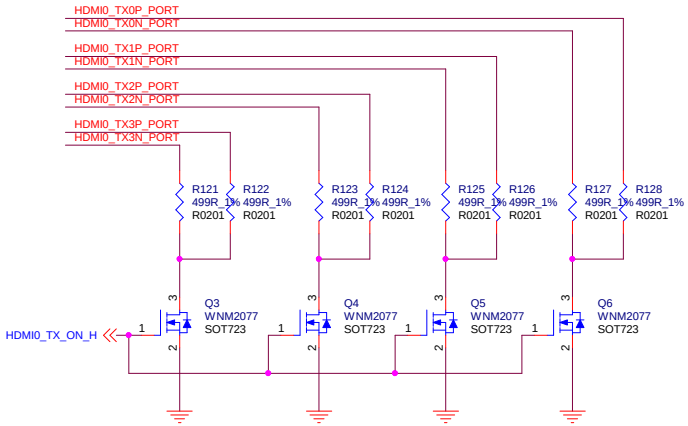
HDMI2.1 TX0



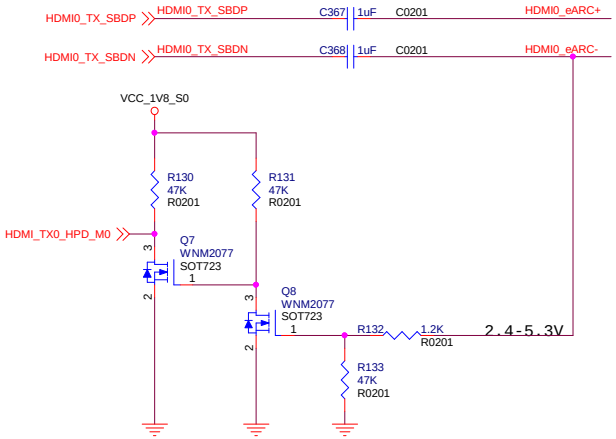
HDMI TX DDC



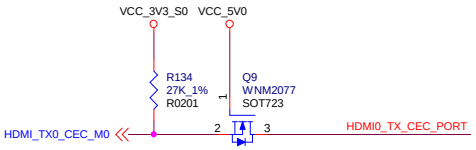
HDMI 2.0/2.1 SW



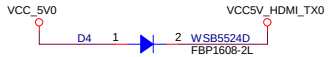
HDMI TX eARC



HDMI TX CEC

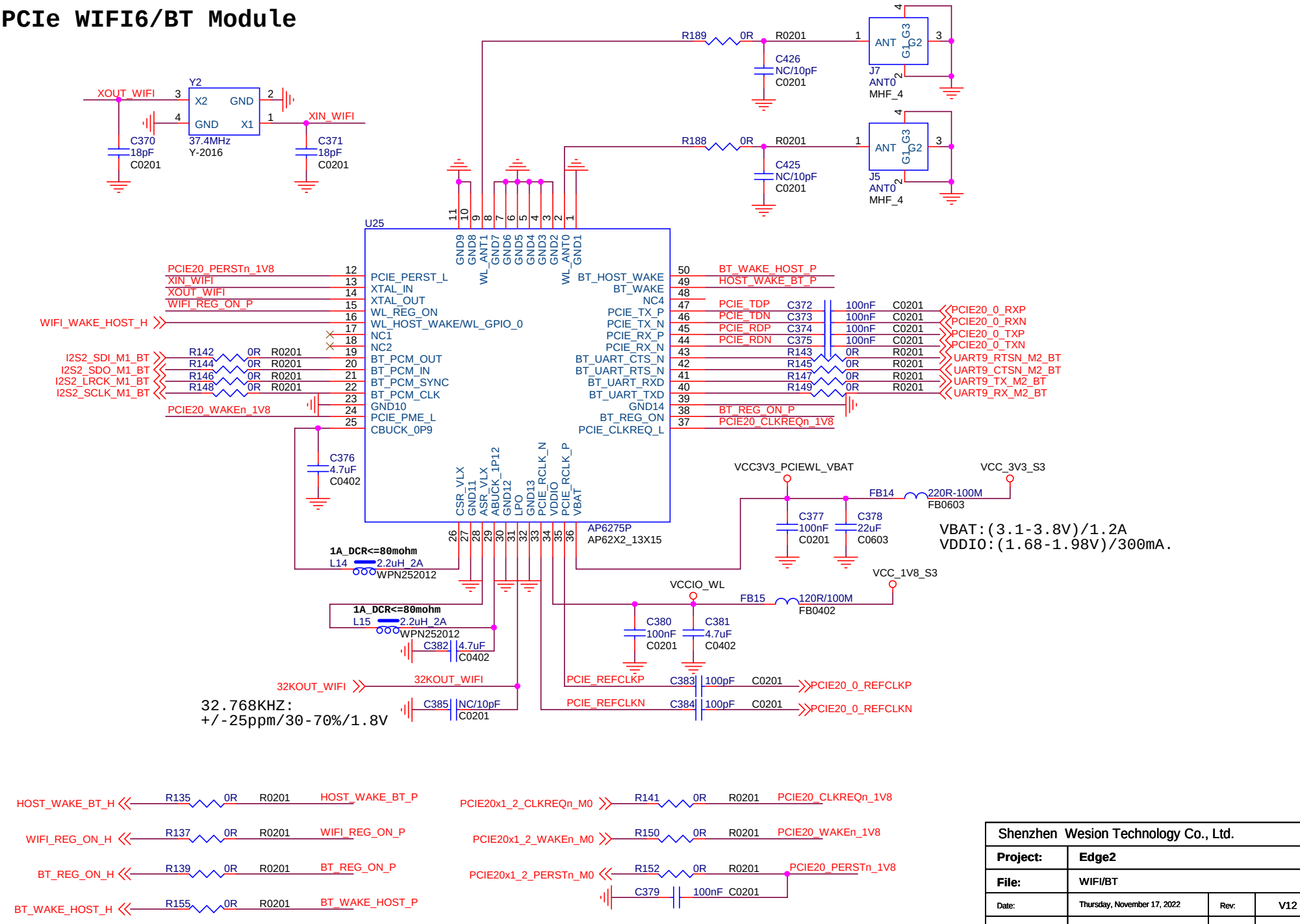


HDMI Power

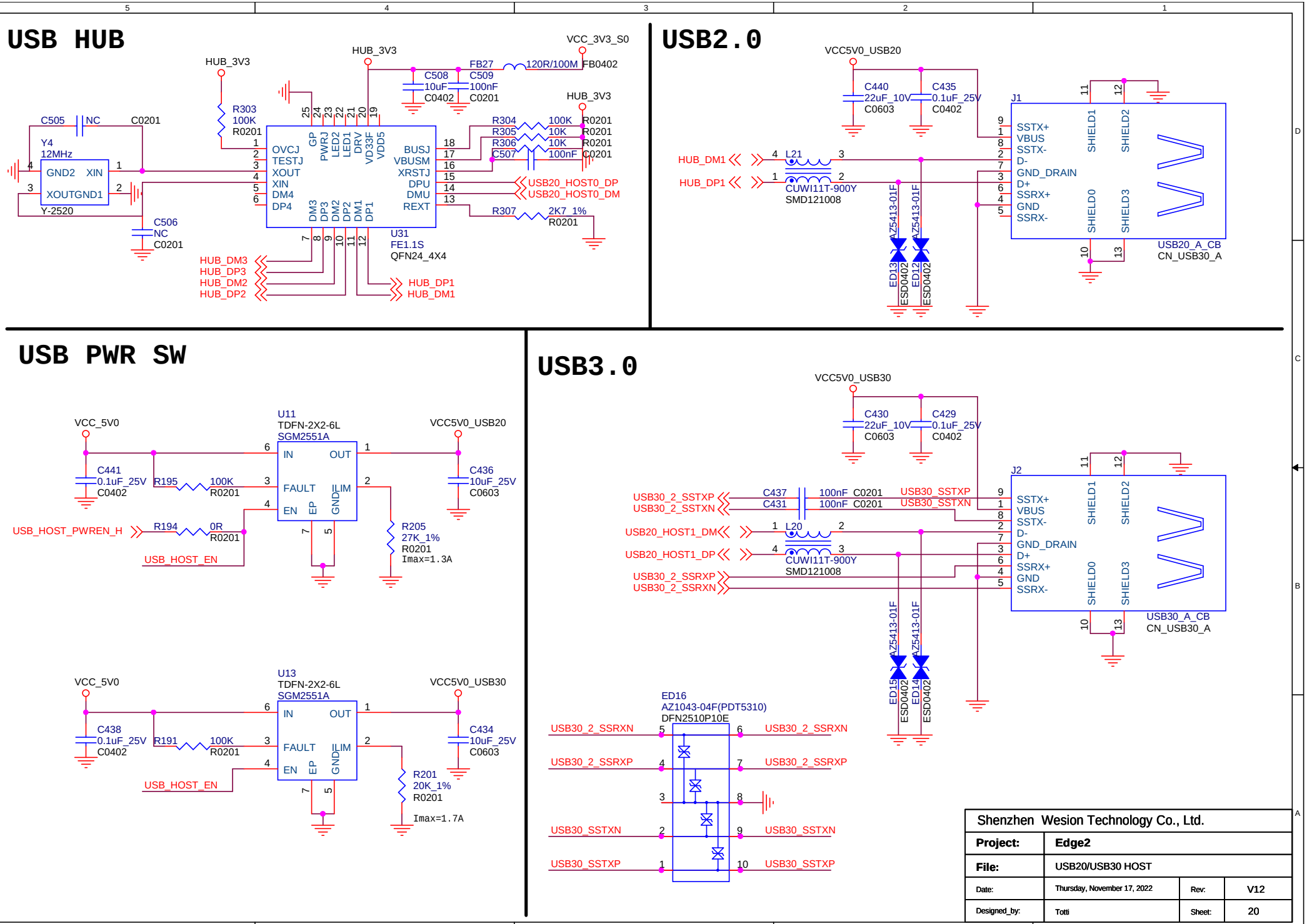


Shenzhen Wesion Technology Co., Ltd.			
Project:	Edge2		
File:	HDMI OUT		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	18

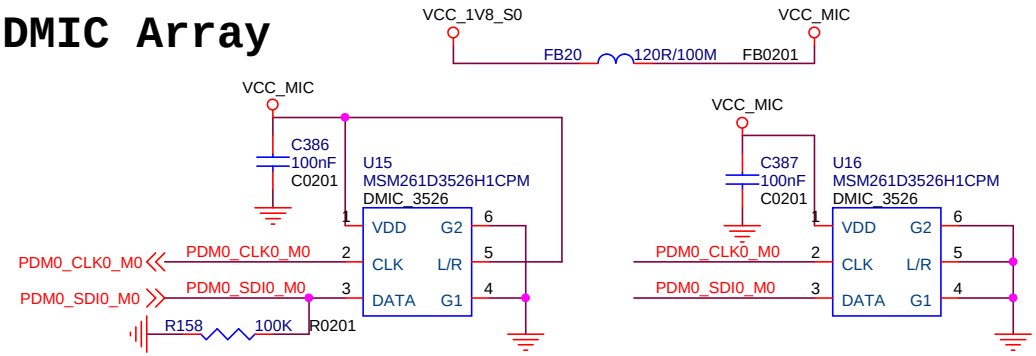
PCIe WIFI6/BT Module



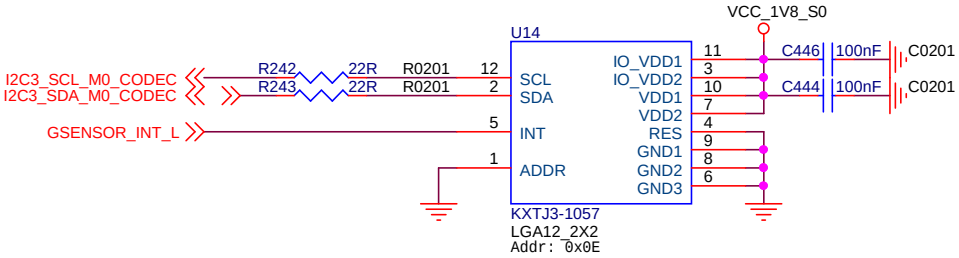
Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	**WIFI/BT**		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	19


USB HUB
HUB_3V3
VCC_3V3_S0
C505 NC C0201
Y4
12MHz
GND2 XIN
XOUTGND1
Y-2520
C506
NC
C0201
R303
100K
R0201
C508
10uF
C0402
C509
100nF
C0201
FB27
120R/100M
FB0402
R304 100K R0201
R305 10K R0201
R306 10K R0201
C507 100nF C0201
OVCJ
TESTJ
XOUT
XIN
DM4
DP4
GP
PWRJ
LED2
LED1
DRV
VD33F
VDD5
BUSJ
VBUSM
XRSTJ
DPU
DMU
REXT
DM3
DP3
DM2
DP2
DM1
DP1
U31
FE1.1S
QFN24_4X4
USB20_HOST0_DP
USB20_HOST0_DM
R307 2K7_1% R0201
HUB_DM3
HUB_DP3
HUB_DM2
HUB_DP2
HUB_DP1
HUB_DM1
USB2.0
VCC5V0_USB20
C440
22uF_10V
C0603
C435
0.1uF_25V
C0402
J1
SSTX+
VBUS
SSTX-
D-
GND_DRAIN
D+
SSRX+
GND
SSRX-
SHIELD1
SHIELD2
SHIELD0
SHIELD3
USB20_A_CB
CN_USB30_A
HUB_DM1
HUB_DP1
L21
CUWI11T-900Y
SMD121008
AZ5413-01F
ED13
ESD0402
ED12
ESD0402
USB PWR SW
VCC_5V0
U11
TDFN-2X2-6L
SGM2551A
IN
OUT
FAULT
ILIM
EN
EP
GND
VCC5V0_USB20
C441
0.1uF_25V
C0402
R195
100K
R0201
C436
10uF_25V
C0603
USB_HOST_PWREN_H
R194
0R
R0201
USB_HOST_EN
R205
27K_1%
R0201
Imax=1.3A
U13
TDFN-2X2-6L
SGM2551A
VCC_5V0
VCC5V0_USB30
C438
0.1uF_25V
C0402
R191
100K
R0201
C434
10uF_25V
C0603
USB_HOST_EN
R201
20K_1%
R0201
Imax=1.7A
USB3.0
VCC5V0_USB30
C430
22uF_10V
C0603
C429
0.1uF_25V
C0402
J2
USB30_2_SSTXP
USB30_2_SSTXN
C437
C431
100nF C0201
USB30_SSTXP
USB30_SSTXN
USB20_HOST1_DM
USB20_HOST1_DP
L20
CUWI11T-900Y
SMD121008
USB30_2_SSRXP
USB30_2_SSRXN
AZ5413-01F
ED15
ESD0402
ED14
ESD0402
USB30_A_CB
CN_USB30_A
ED16
AZ1043-04F(PDT5310)
DFN2510P10E
USB30_2_SSRXN
USB30_2_SSRXP
USB30_SSTXN
USB30_SSTXP
Shenzhen Wesion Technology Co., Ltd.
Project: Edge2
File: USB20/USB30 HOST
Date: Thursday, November 17, 2022
Rev: V12
Designed_by: Totti
Sheet: 20

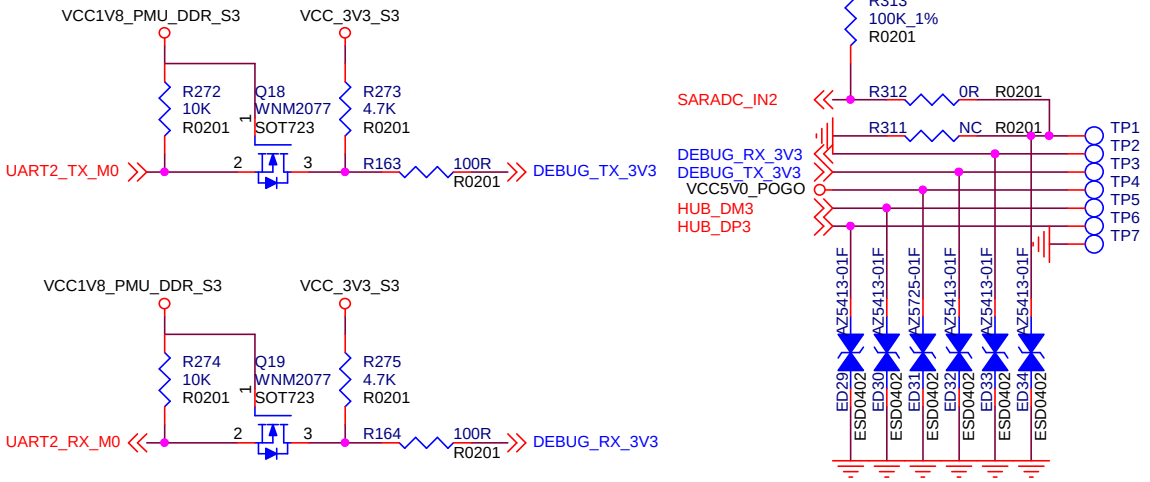
DMIC Array



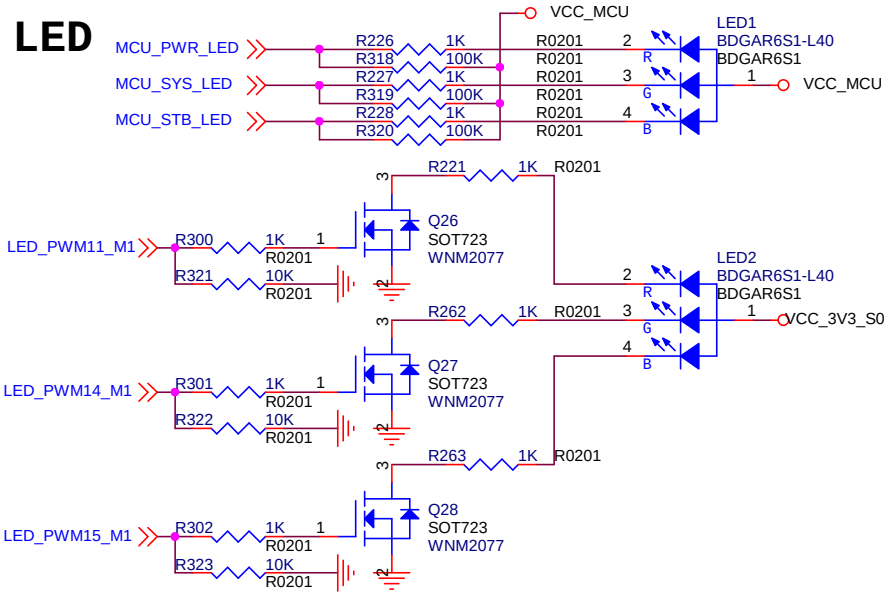
G-sensor



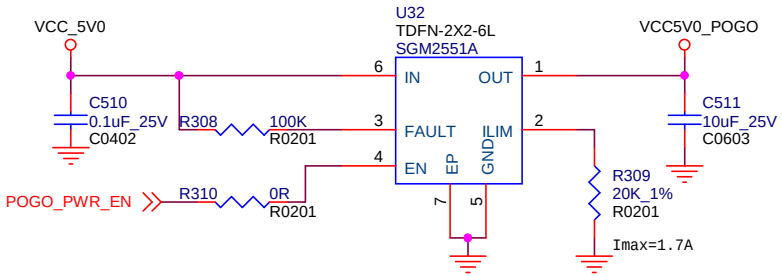
POGO PIN OUT



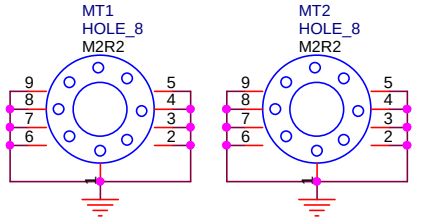
LED



POGO PIN PWR

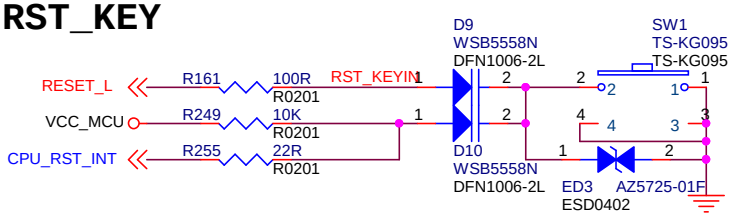


Mouting Holes

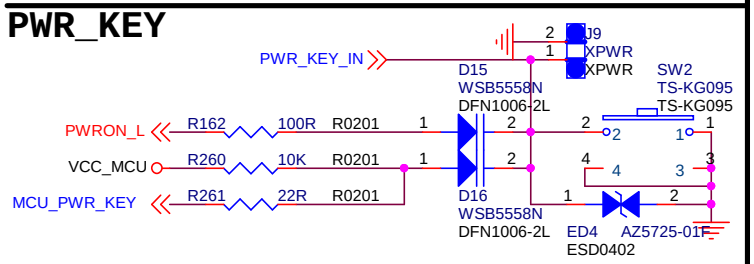


Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	DMIC/Sensor/DEBUG/LED		
Date:	Thursday, December 15, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	21

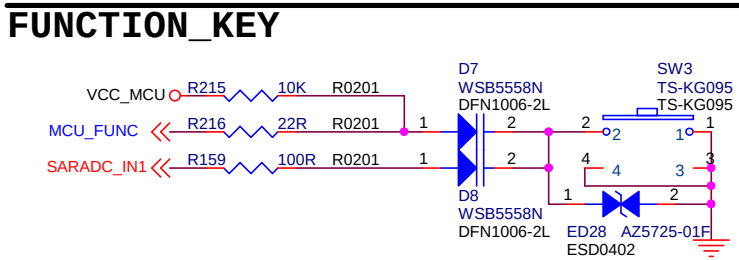
RST_KEY



PWR_KEY

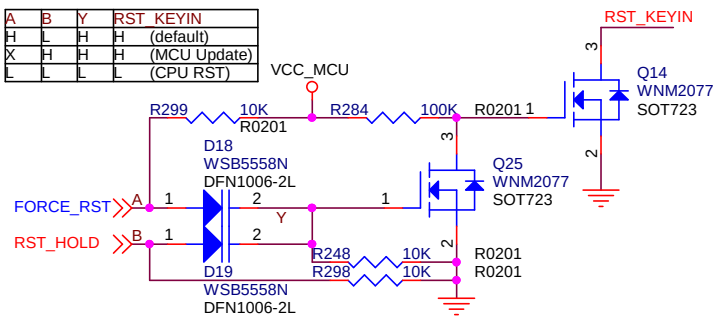


FUNCTION_KEY

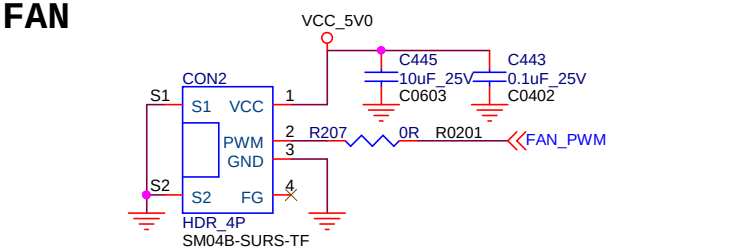


CPU RST CTRL

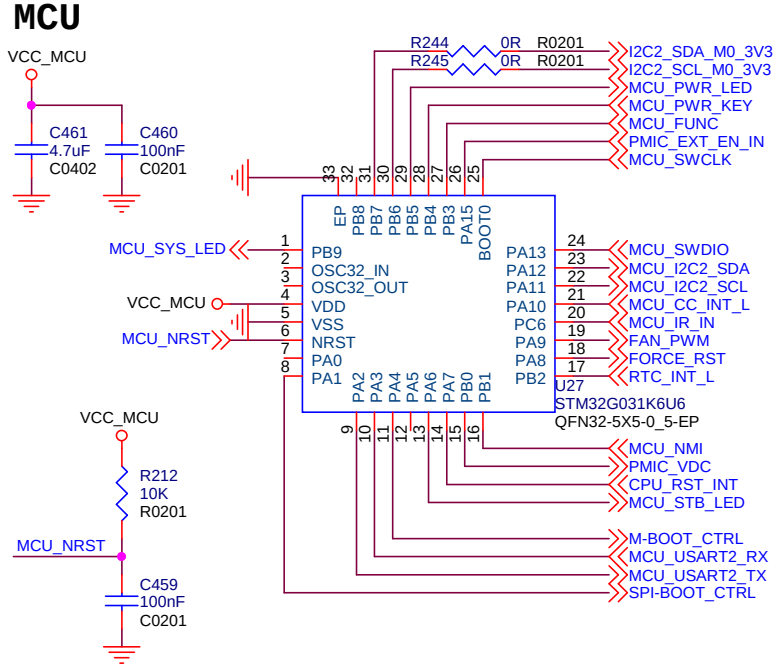
A	B	Y	RST_KEYIN
H	L	H	H (default)
X	H	H	H (MCU Update)
L	L	L	L (CPU RST)



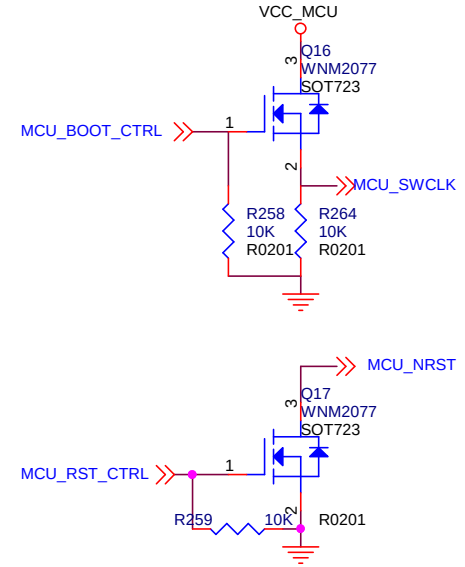
FAN



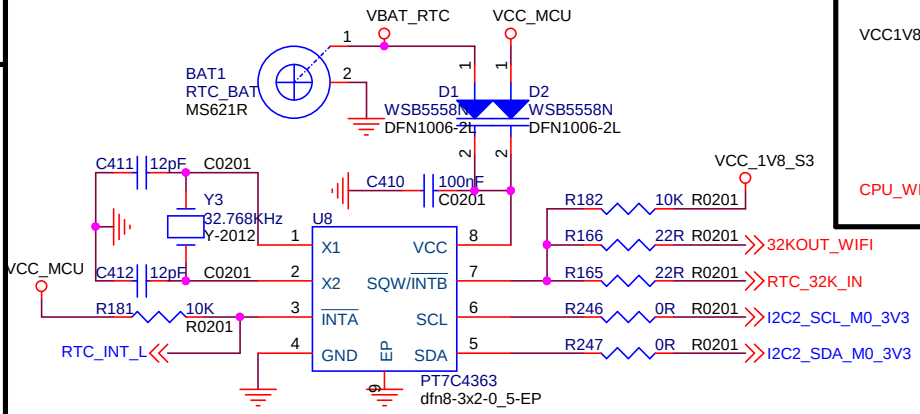
MCU



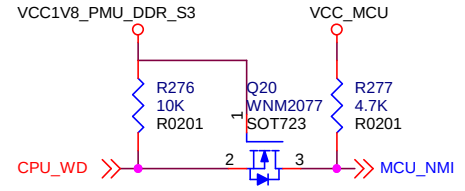
MCU BOOT CTRL



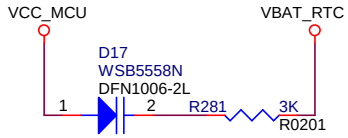
RTC



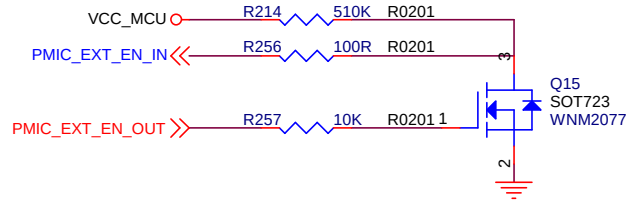
WATCH DOG



RTC CHARGE



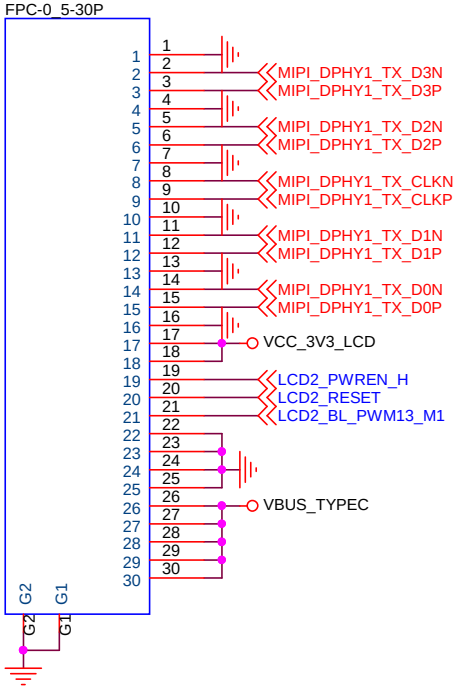
POWER OFF DET



Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	MCU/RTC/KEY/FAN		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	22

DSI 2

CON7
FH34SRJ-30S
FPC-0_5-30P



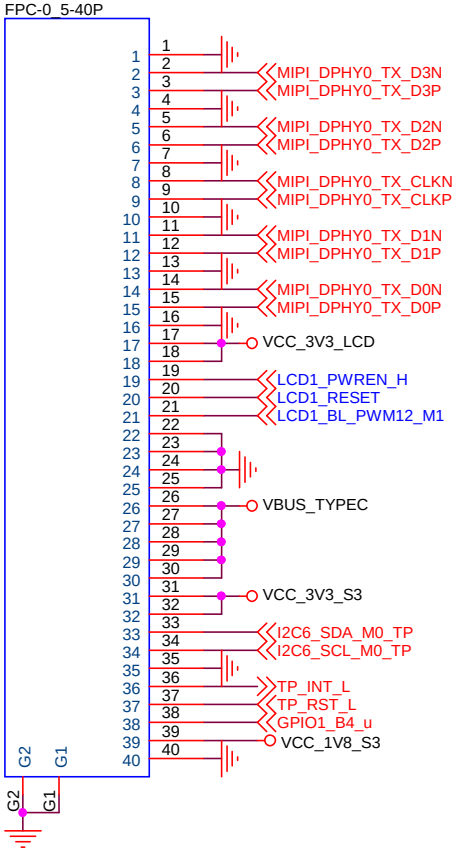
VCC_3V3_LCD
C472
10uF
C0402

VBUS_TYPEC
C473
10uF_25V
C0603
C475
10uF_25V
C0603

VCCA_3V3_S0
FB6
0R
R0603
VCC_3V3_LCD
VCC_3V3_S0
FB25
NC/220R-100M
FB0603

DSI 1

CON4
FH34SRJ-40S
FPC-0_5-40P



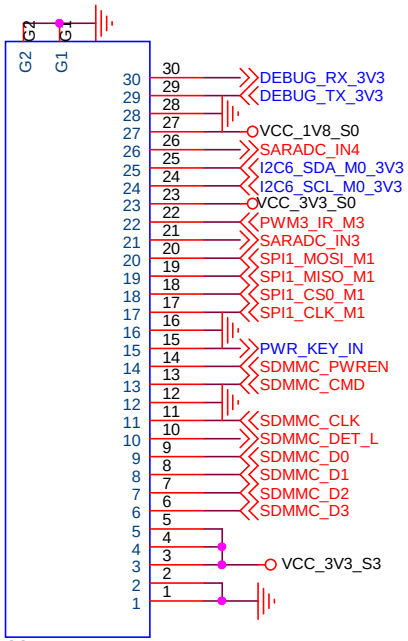
VCC_3V3_LCD
C476
10uF
C0402

VCC_3V3_S3
C479
10uF
C0402

VBUS_TYPEC
C477
10uF_25V
C0603
C478
10uF_25V
C0603

VCC_1V8_S3
C474
100nF
C0201

EXTIO 1



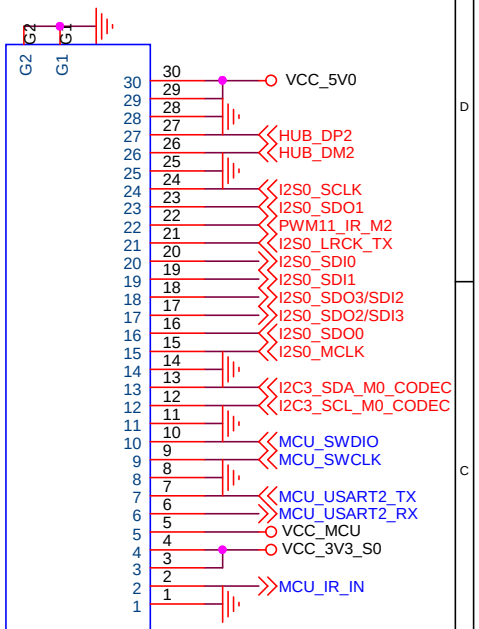
CON5
FH34SRJ-30S
FPC-0_5-30P

VCC_1V8_S0
C480
100nF
C0201

VCC_3V3_S0
C481
10uF
C0402

VCC_3V3_S3
C482
10uF
C0402

EXTIO 2



CON6
FH34SRJ-30S
FPC-0_5-30P

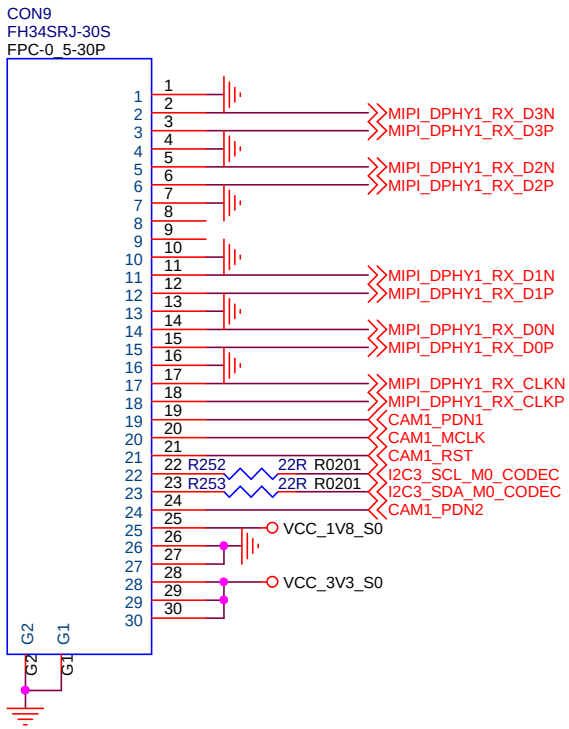
VCC_5V0
C483
10uF_25V
C0603

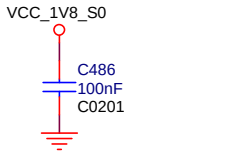
VCC_MCU
C484
10uF
C0402

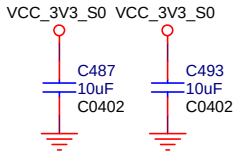
VCC_3V3_S0
C485
10uF
C0402

Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	EXT IO/MIPI LCD		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	23

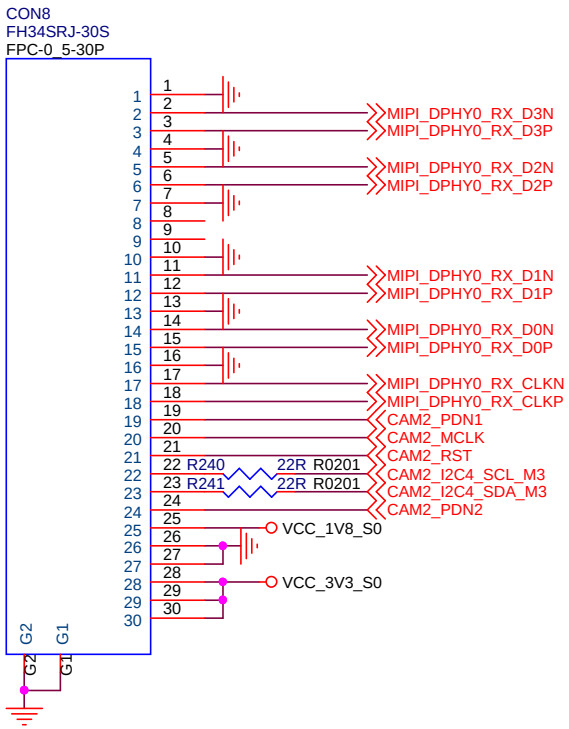
Camera1

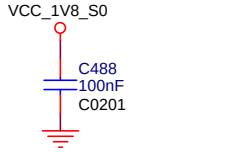


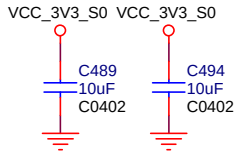




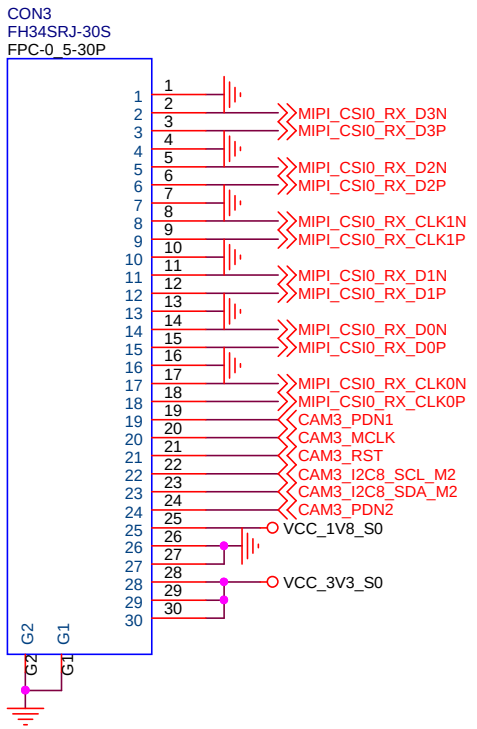
Camera2

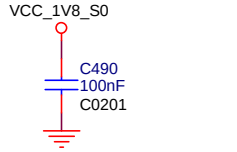


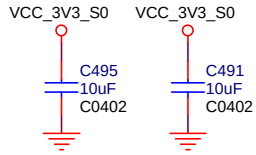




Camera3







Shenzhen Wesion Technology Co., Ltd.			
Project:	**Edge2**		
File:	CAMERA_Connector		
Date:	Thursday, November 17, 2022	Rev:	V12
Designed_by:	Totti	Sheet:	24