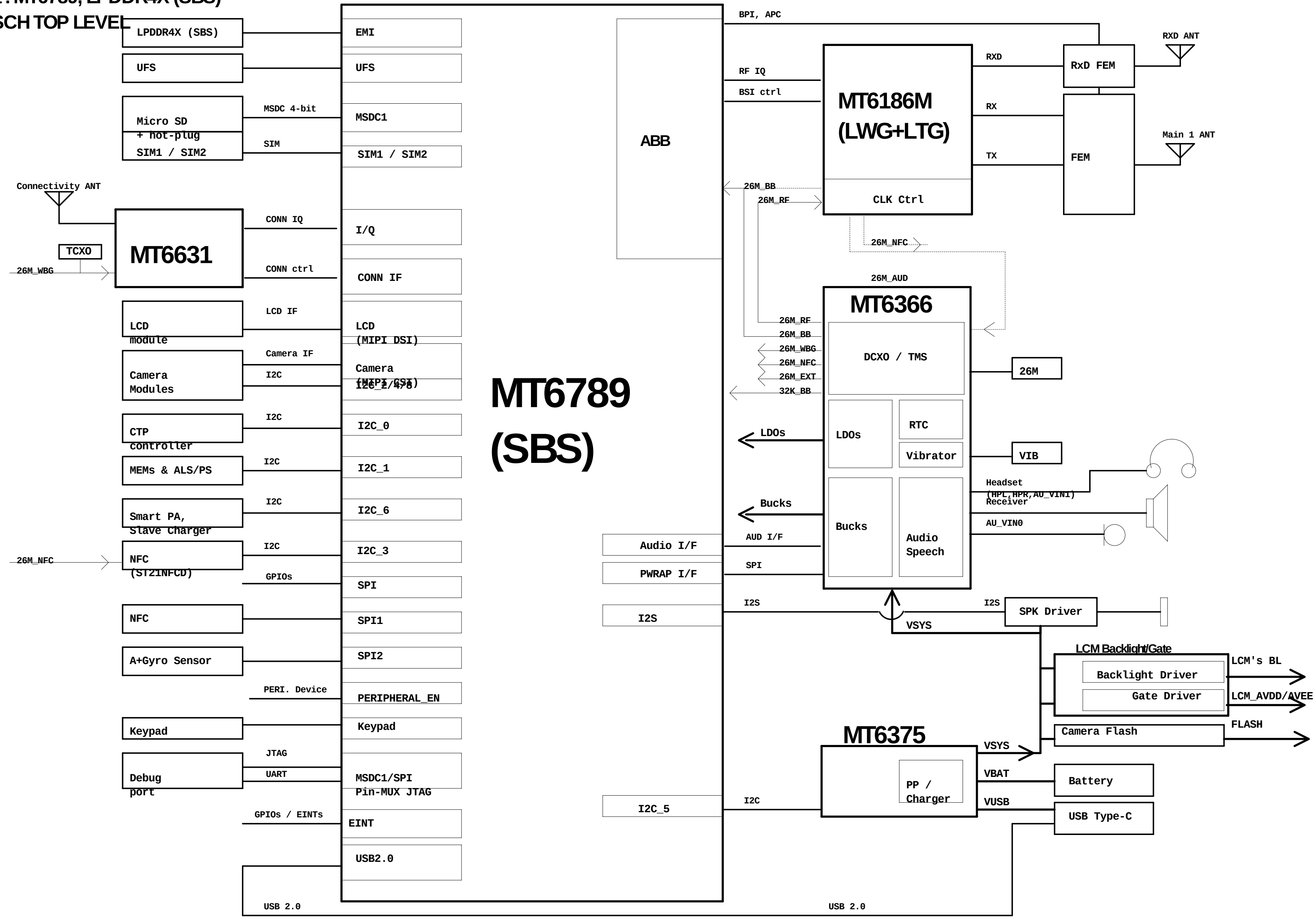


Project : MT6789, LPDDR4X (SBS)

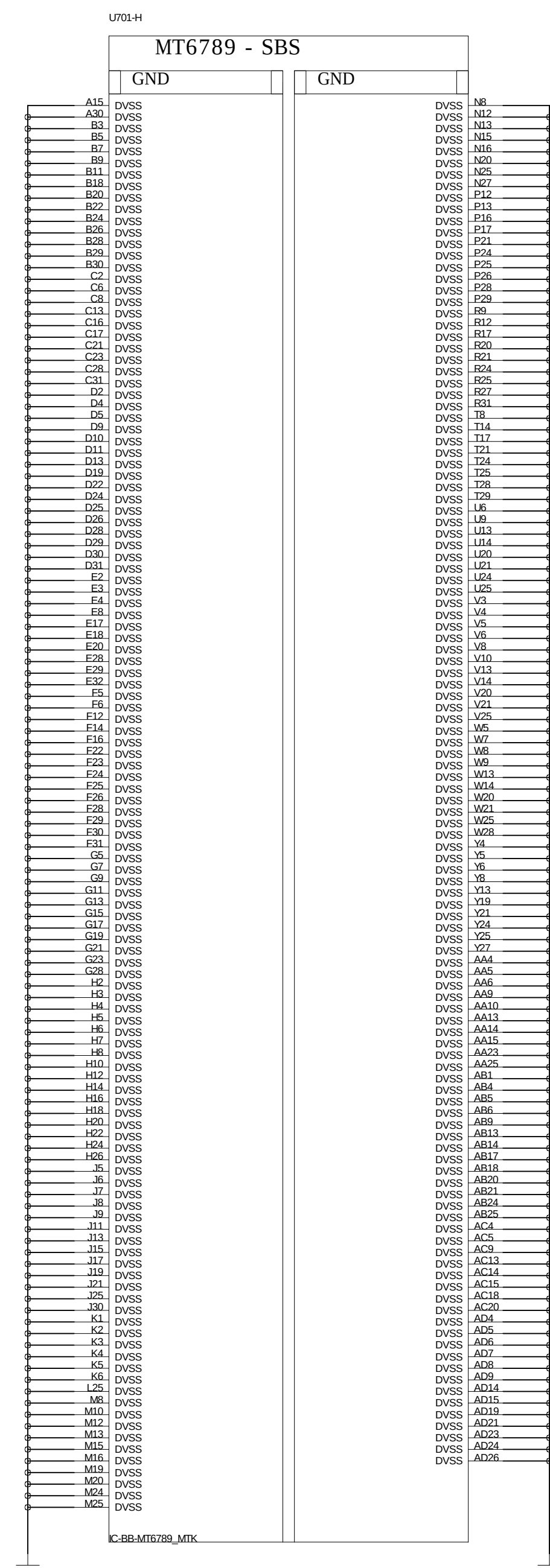
REF_SCH TOP LEVEL



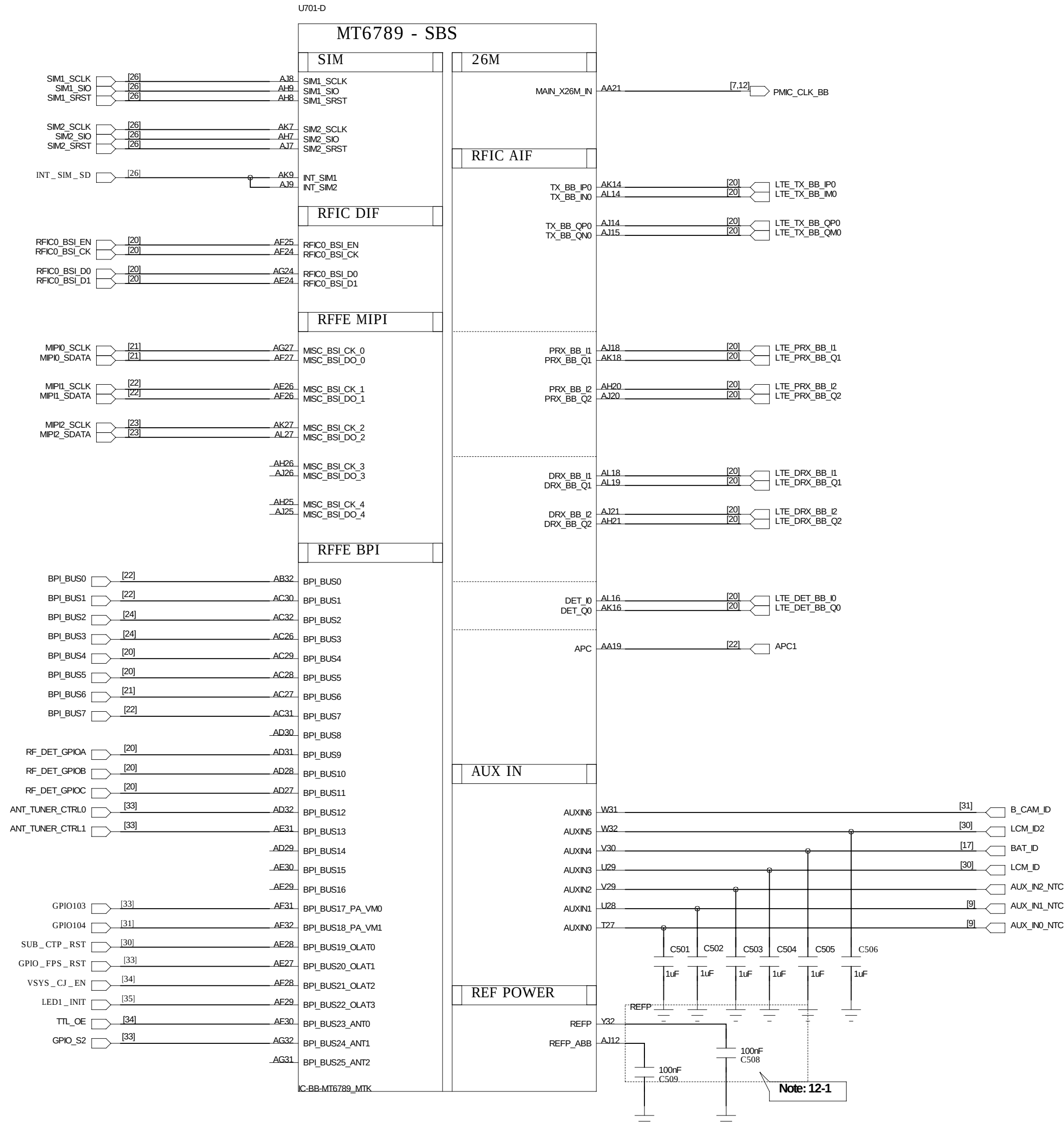
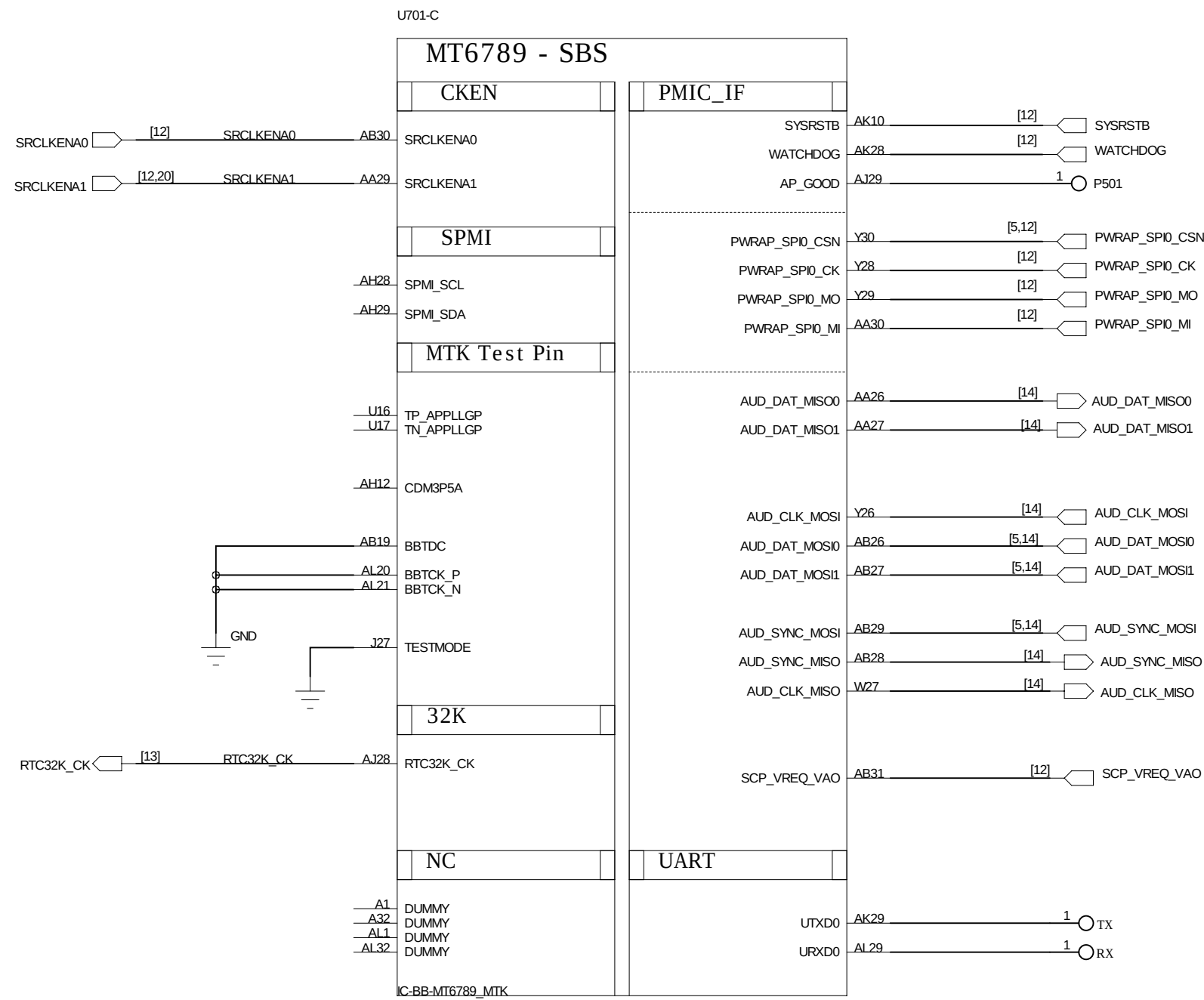
COMPANY: Wheatek 威泰克电子股份有限公司				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 01_BLOCK_DIAGRAM		VERSION: V1.1	SHEET: 1 OF 36
CHECKED		DATED					

Date	Version	Page	Change notice
2021/12/xx	V0.1	10_20_44	Modify PDN_cap NC part
2022/01/xx	V0.2	20_POWER_MT6366-Buck	Remove un-used R2002, R2003 R / 0 / ohm / NC
2022/01/xx	V0.2	44_Memory_UFS_LPDDR4X	Remove R4401 & R4402 R / 0 / ohm test RES
2022/01/xx	V0.2	13_BB_2_CONN_CSI	Fixed GPIO100 (HW_ID0), GPIO101 (HW_ID1) txt
2022/01/xx	V0.2	20_21_22	Fixed Title name and Note:21-1 IC naming
2022/01/xx	V0.2	81_SYCLK_Clock-26MHz-TSX	Remove R8107 R / 0 / ohm test RES and Finetune Page81 Schematic design notice
2022/01/xx	V0.2	21_POWER_MT6366-LDO	Remove C2137 C / 4.7 / uF / 6.3V
2022/01/xx	V0.2	13_BB_2_CONN_CSI	Add finger print configure
2022/01/xx	V0.2	78_PERI_SENSORS_FingerPrint	Add finger print configure
2022/01/xx	V0.2	32_RF_MT6186M_RF_TX	Modify C3299 from C / 10 / uF / 6.3V to C / 4.7 / uF / 6.3V
2022/01/xx	V0.2	68_PERI_CTP	Modify VTP_PMU net to VI028_PMU
2022/01/xx	V0.2	77_PERI_SENSORS_MEMs_ALS/PS	Modify VLD028_EXT net to VI028_PMU
2022/01/xx	V0.2	27_POWER_MT6375-Charger + PP	Change R2705 to R / 0.005/ ohm, HFCL0603MMW33R005F
2022/01/xx	V0.2	79_POWER_FLASH_DRIVER	Change U7901 to U / LM3643YFFR
2022/01/xx	V0.2	13_BB_2_CONN_CSI	Fixed typo_GPIO111 (GPIO_DRDI)
2022/02/xx	V0.2	10_BB_PDN1	Change C1033 to C / 2.2 / uF / 6.3V / NC
2022/02/xx	V0.2	11_BB_IOVDD	Change C1131 to C / 1 / uF / 6.3V / NC
2022/02/xx	V0.2	82_SYCLK_RTC32K	Change R8203 to R / 0 / ohm / NC
2022/02/xx	V0.2	27_POWER_MT6375-Charger + PP	Modify MT6375 gauge notic
2022/02/xx	V0.2	21_POWER_MT6366-LDO	Modify Note 21-1 content
2022/02/xx	V0.2	23_POWER_MainPMIC-Charger	Change R2304 to R / 4.7 / K
2022/02/xx	V0.2	29_POWER_EXT	
			Modify AFVDD/AVDD note
2022/02/xx	V0.2	69_PERI_CAMERA_Rear	Remove R6906, C6904 and modify C6900 capacitor to 0.1uF
2022/02/xx	V0.2	70_PERI_CAMERA_Front	Remove R7008, C7012 and modify C7001 capacitor to 0.1uF
2022/02/xx	V0.2	77_PERI_SENSORS_MEMs_ALS/PS	Modify Note 77-7 Interrupt pin of MEMS sensor must be assign to SCP_EINT
2022/02/xx	V0.2	79_POWER_FLASH_DRIVER	Remove flash address note
2022/02/xx	V0.2	21_POWER_MT6366-LDO	Remove R2100 chapter in Baseband Design Notice
2022/02/xx	V0.2	10_BB_PDN1	Change C1006, C1007 to NC
2022/02/xx	V0.2	20_POWER_MT6366-Buck	Change C2033, C2042 to NC

COMPANY: Wheatek 威泰克电子股份有限公司				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 02_CHANGE_NOTICE		VERSION: V1.1	SHEET: 2 OF 36
CHECKED		DATED					
4		3		2		1	



COMPANY: Wheatek ΕΠΕ ΕΠΙΧΕΙΡΗΣΗ ΕΠΕΞΕΛΕΚΤΙΚΩΝ				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 04_BB_POWER_IO	VERSION: V1.1	SHEET: 4 OF 36
CHECKED		DATED				



Schematic design notice of "12_BB_1" page:

Note 12-1: The de-coupling cap. for REFP have to be placed as close to BB as possible.

Note 12-2: "PWRAP_SPI0_CSN" and "AUD_DAT_MOSI0" pin features in trapping pin to enable JTAG.

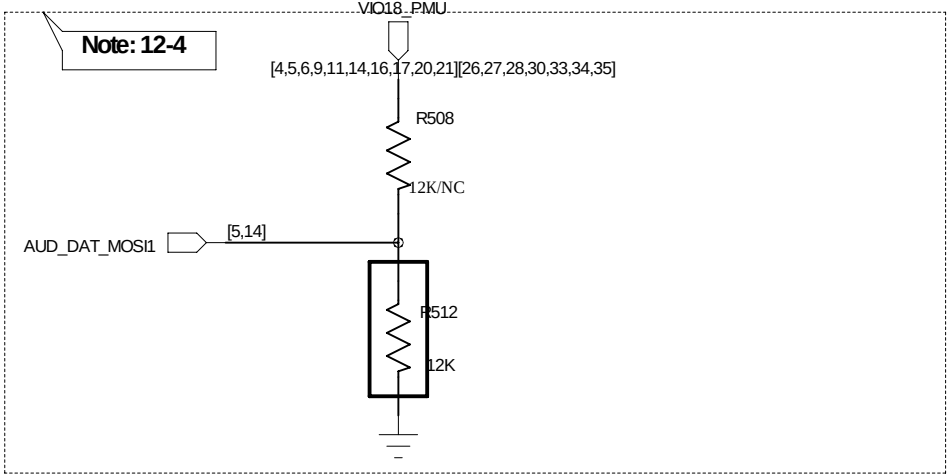
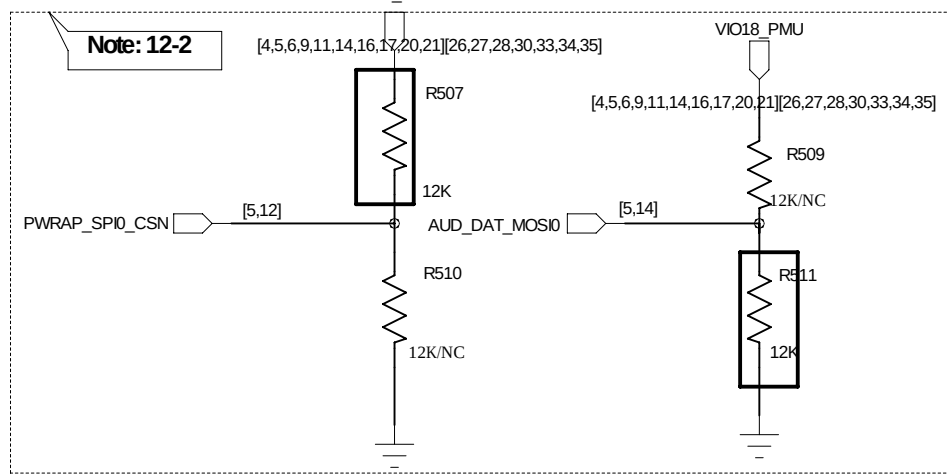
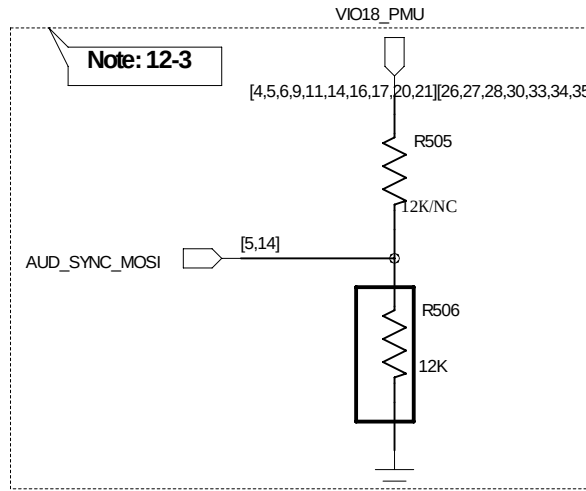
PWRAP_SPI0_CSN	AUD_DAT_MOSI0	AP JTAG Mode	IO JTAG Mode
H (Default)	L (Default)	N/A	N/A
H	H (by external PU)	SPI5_CSB, SPI5_CLK, SPI5_MO, SPI5_ML, EINT13	N/A
L (by external PD)	L	SPI1_CSB, SPI1_CLK, SPI1_MO, SPI1_ML, EINT13	N/A
L (by external PD)	H (by external PU)	SPI5_CSB, SPI5_CLK, SPI5_MO, SPI5_ML, EINT13	N/A

Note 12-3: "AUD_SYNC_MOSI" pin features in trapping pin to booting (UFS/eMMC).

AUD_SYNC_MOSI	Storage Booting Mode
L (Default)	Only UFS boot
H (by external PU)	Only eMMC boot

Note 12-4 "AUD_DAT_MOSI1" pin features in trapping pin for SW co-load.

AUD_DAT_MOSI1	Mode
L (Default)	LP4x-MCP
H (by external PU)	LP4x-Discrete



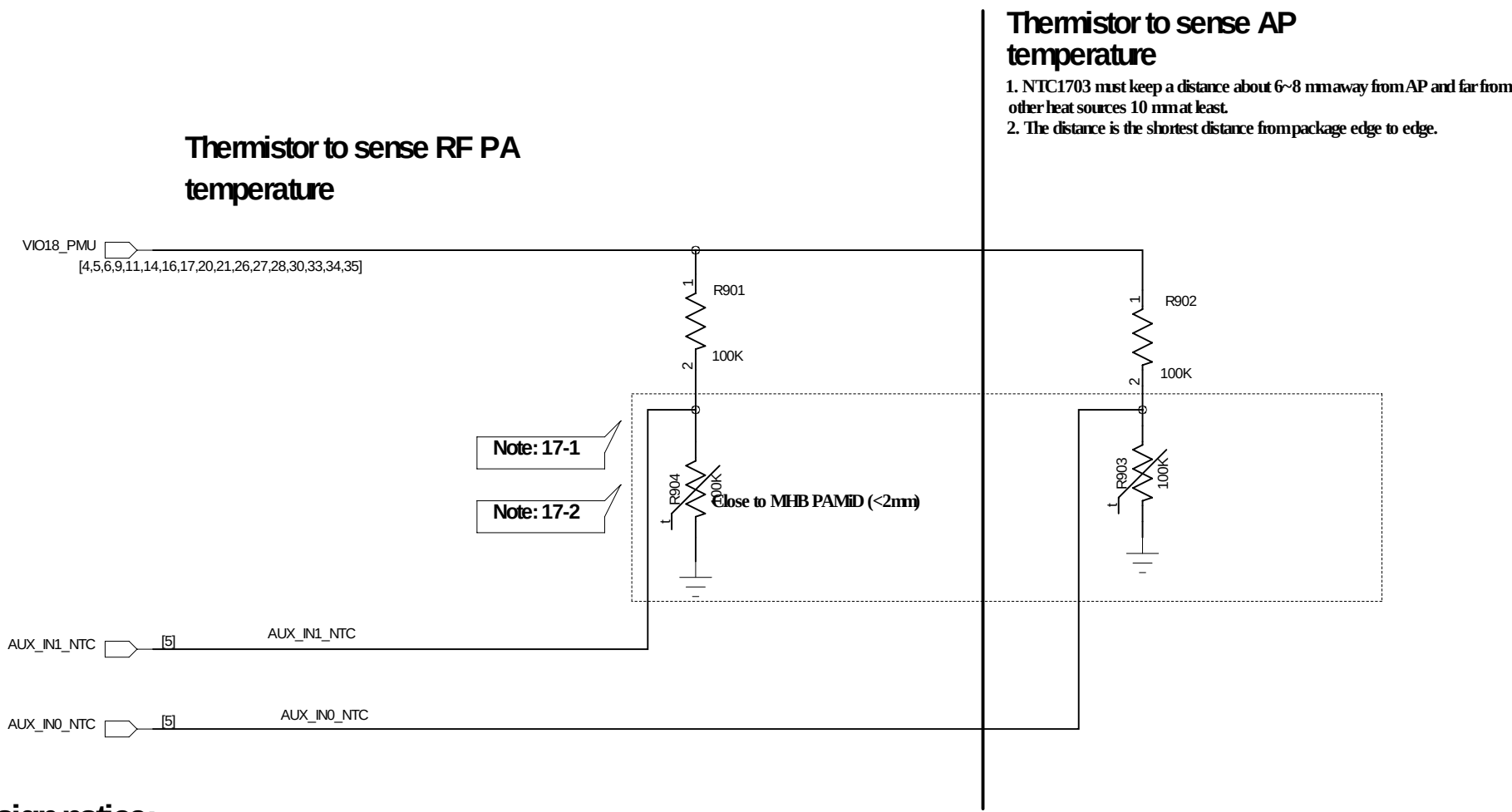
COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 05_BB_1		VERSION: V1.1	SHEET: 5 OF 36
CHECKED		DATED					



Schematic design notice of "16_BB_AUXADC" page.

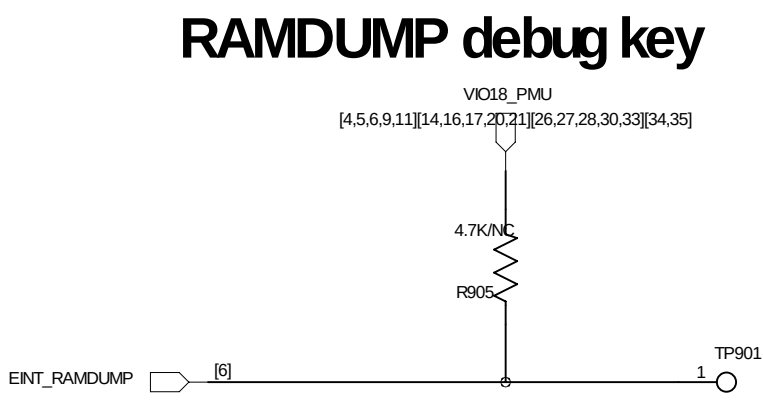
	AUX_IN2 (RF SKU/PCB ID)	
	(ADC range is 0.05~1.45V)	
SKU1 EU+CHN+JPN	0.05V	0V(R1604=NC, R1606=100K)
SKU2 NA	0.21V	0.21V(R1604=750K, R1606=100K)
Reserved	0.42V	0.41V(R1604=330K, R1606=100K)
Reserved	0.62V	0.62V(R1604=191K, R1606=100K)
Reserved	0.82V	0.82V(R1604=120K, R1606=100K)
Reserved	1.04V	0.99V(R1604=100K, R1606=137K)
Reserved	1.24V	1.24V(R1604=100K, R1606=220K)
Reserved	1.45V	1.45V(R1604=100K, R1606=422K)

COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 08_BB_AUXADC		VERSION: V1.1	SHEET: 8 OF 36
CHECKED		DATED					

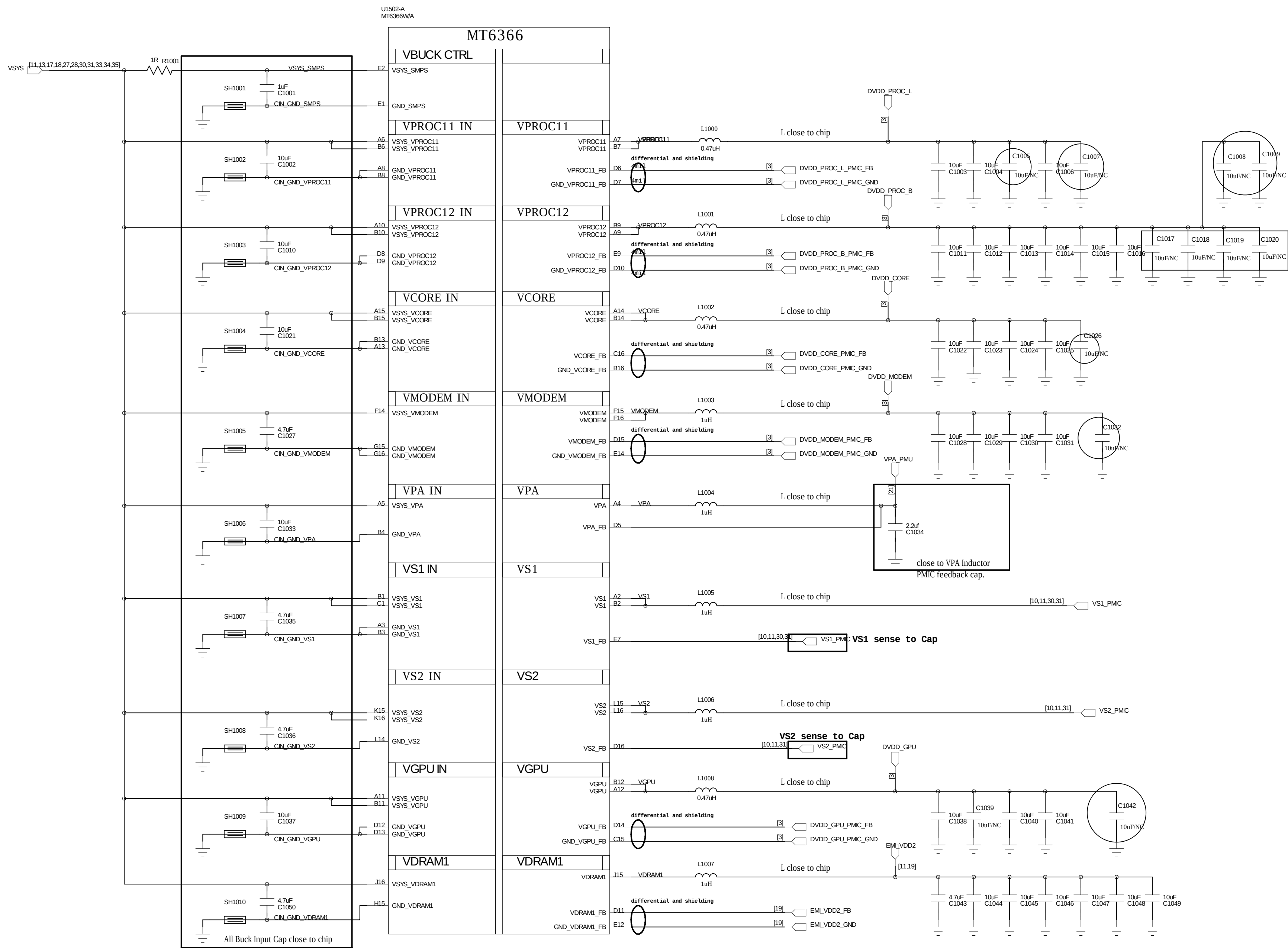


Schematic design notice:

Note 17-1: SW Default Configuration is as followings
AUX_IN0_NTC is for AP Temp.
AUX_IN1_NTC is for MHB PAMID Temp.
Note 17-2: If your design or placement is different with SW Default Config.
Please refer to "MTXXXX Thermal User Manuel.docx" and modify SW setting.



COMPANY: Wheatek 威创电子股份有限公司				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 09_BB_AUXADC_THERMAL		VERSION: V1.1	SHEET: 9 OF 36
CHECKED		DATED					

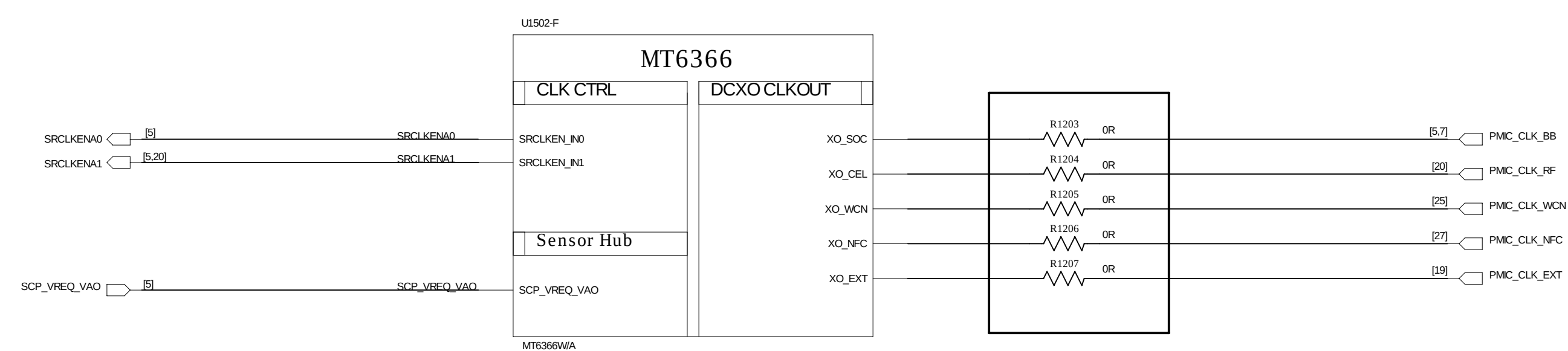
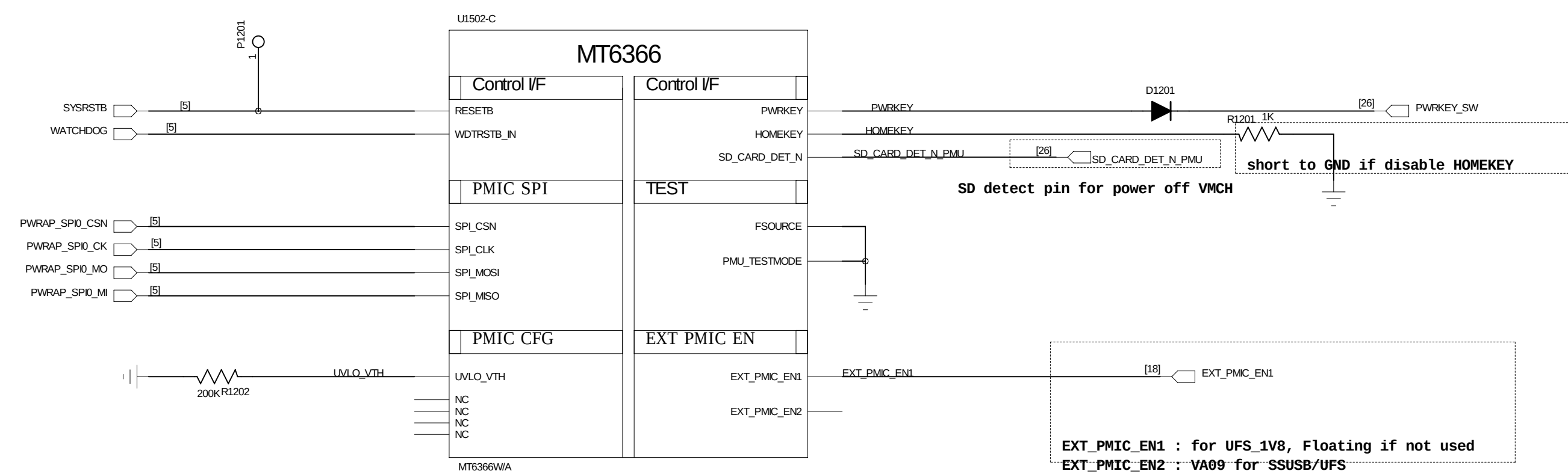


COMPANY: Wheatek Technology Co., Ltd.				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 10_POWER_MT6366-BUCK		VERSION: V1.1	SHEET: 10 OF 36
CHECKED		DATED					

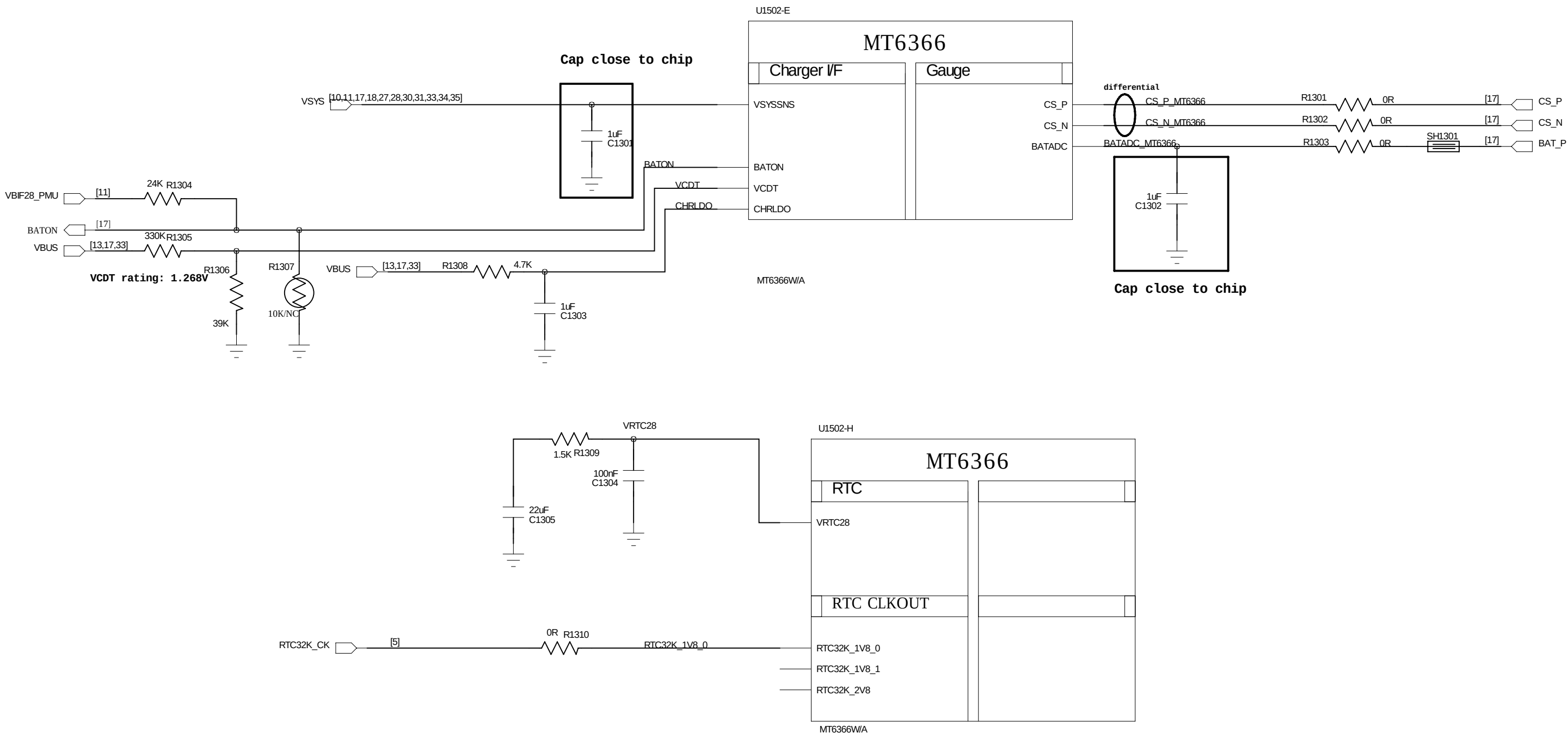


Note 21-1: Please set SH2101 close to C2132, making star connection between VIO18_PMU and VIO18_PMU_AVDD near to LDO cap. C2132
Please also refer to MT6366 design notice for further detail design information

COMPANY: Wheatek ԷՊԸԱճԵՂԻԱԿԷՊՈՒՐԻՃԵՆ				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 11_POWER_MT6366-LDO	VERSION: V1.1	SHEET: 11 OF 36
CHECKED		DATED				

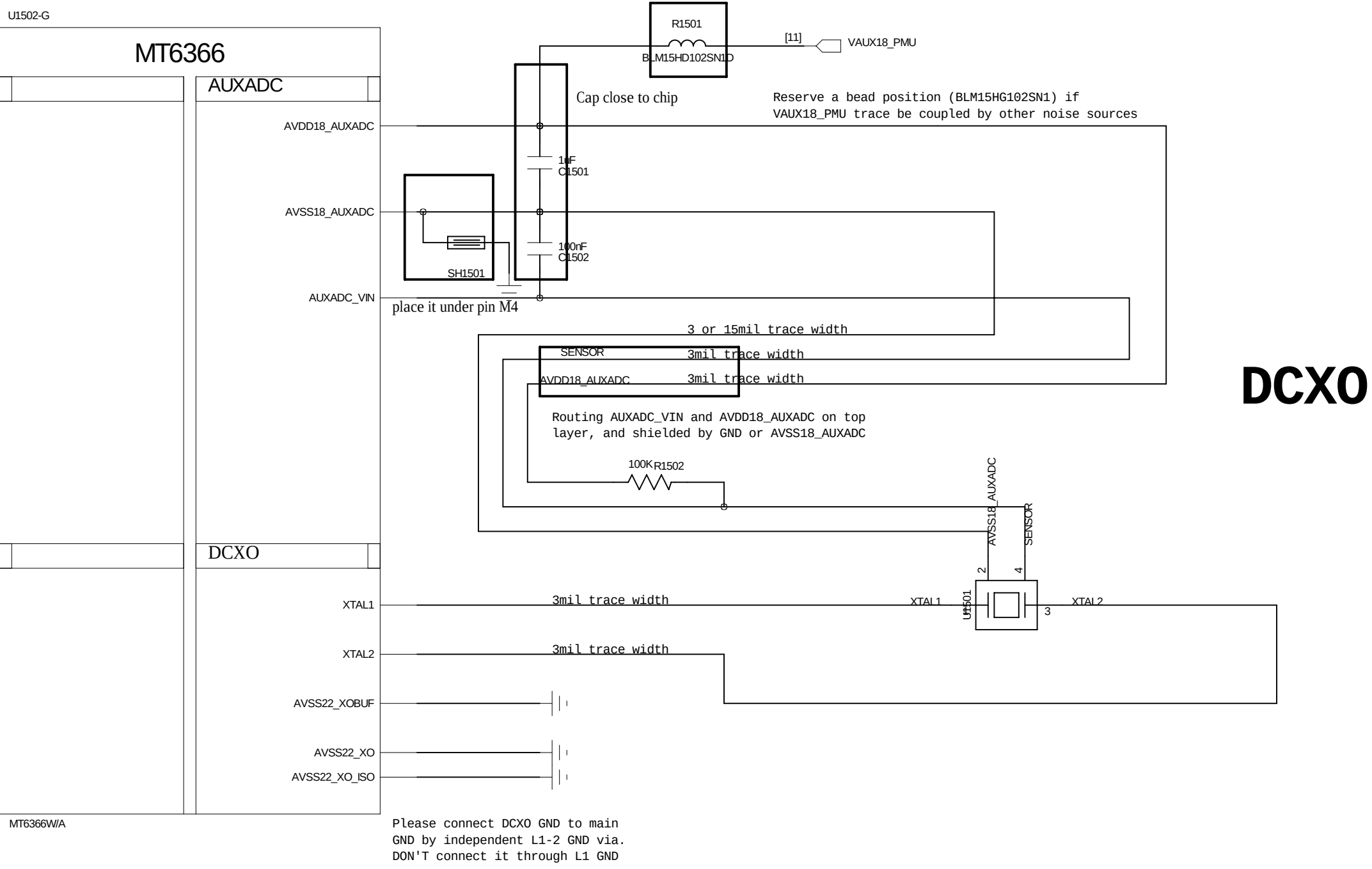


COMPANY: Wheatek Engineering Co., Ltd.				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 12_POWER_MT6366-GENERAL	VERSION: V1.1	SHEET: 12 OF 36
CHECKED		DATED				



Schematic design notice of "23_POWER_MainPMIC-Charger" page:

COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 13_POWER_MT6366-CHARGER		VERSION: V1.1	SHEET: 13 OF 36
CHECKED		DATED					



DCXO

Schematic design notice of "81_SYSCLK_Clock-26MHz-TSX" page:

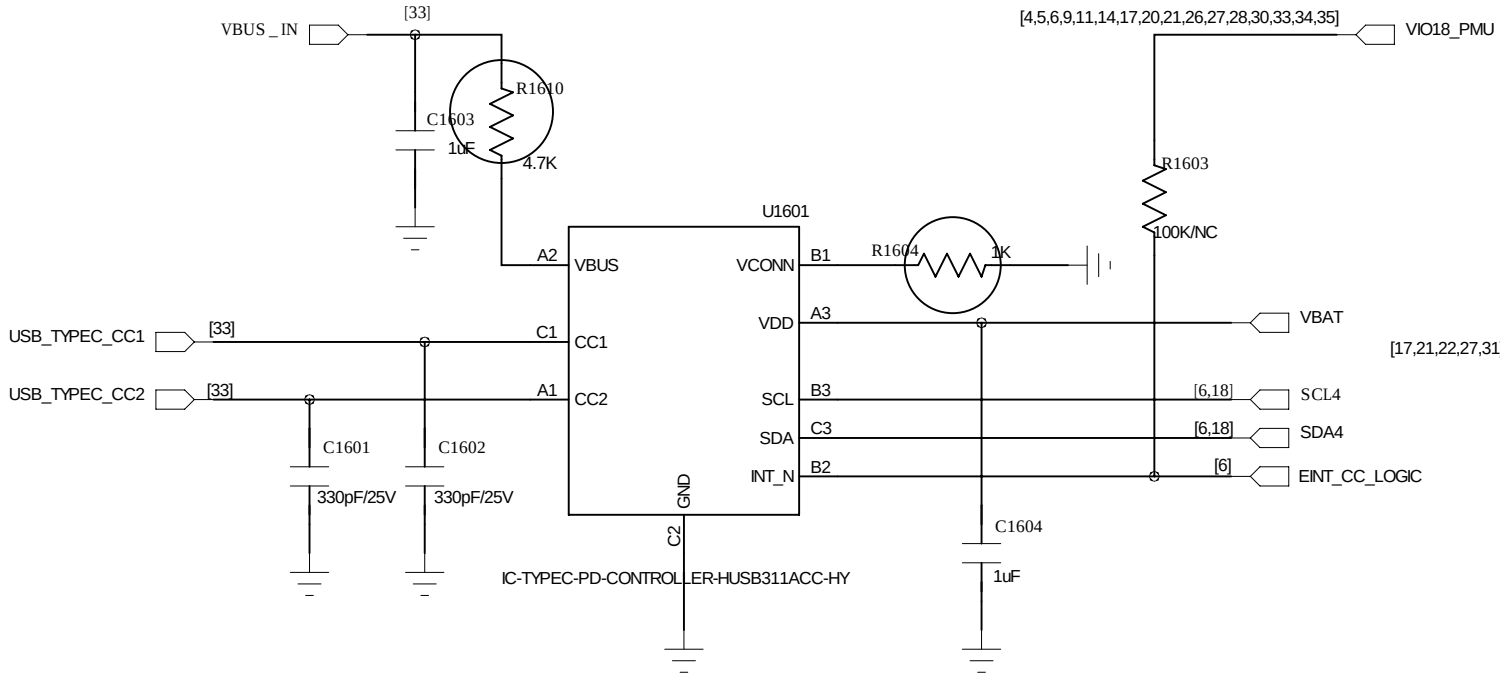
Route AVDD18_AUXADC/AUXADC_VIN as differential trace (3 mil each)with well GND shielding and route AVSS18_AUXADC with 15mil trace width under AVDD18_AUXADC/AUXADC_VIN trace to provide return current path

COMPANY: Wheatek 威泰克电子股份有限公司				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 15_POWER_MT6366_CLOCK		VERSION: V1.1
CHECKED		DATED				

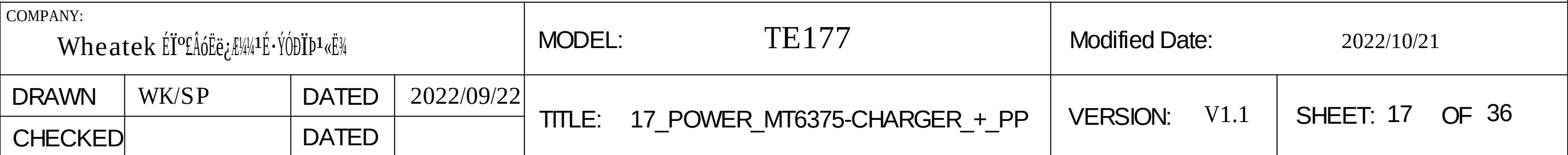
CC Logic

HUSB311 I2C:0x4Eor 0x3E

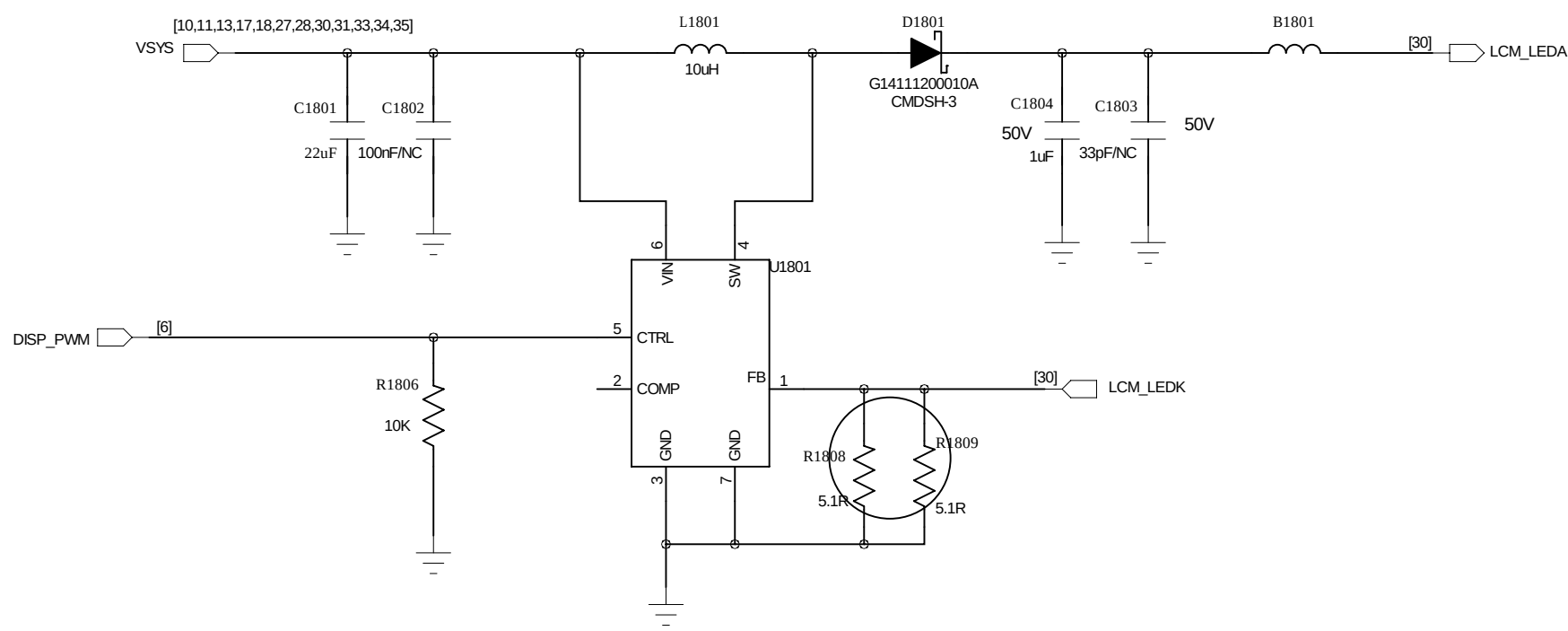
HUSB311 R1610 0R ; RT1715 4.7K



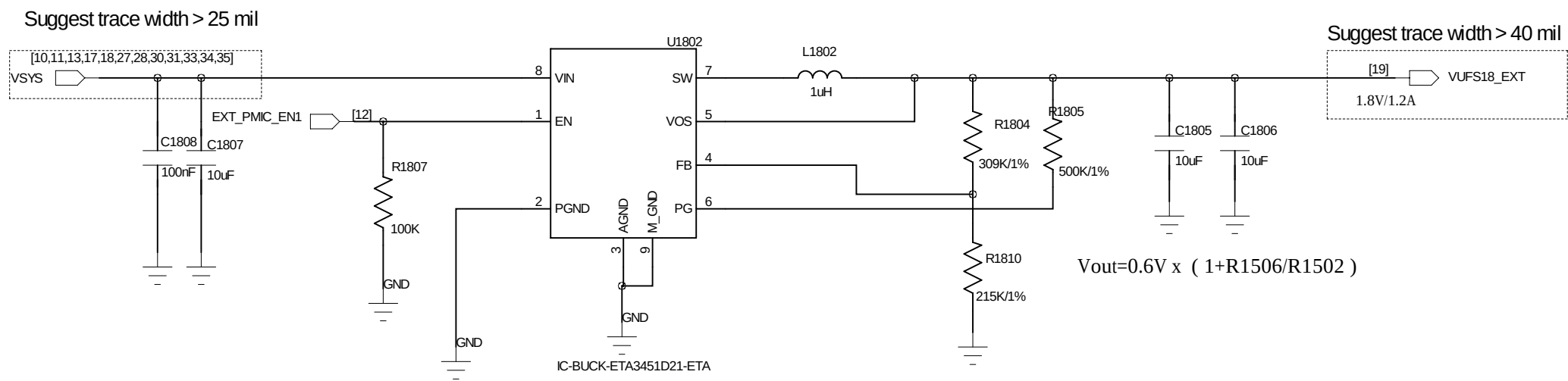
COMPANY: Wheatek ET2A0E2;D441E-Y0D1P1-CEX				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 16_POWER_MT6375-IF	VERSION: V1.1	SHEET: 16 OF 36
CHECKED		DATED				



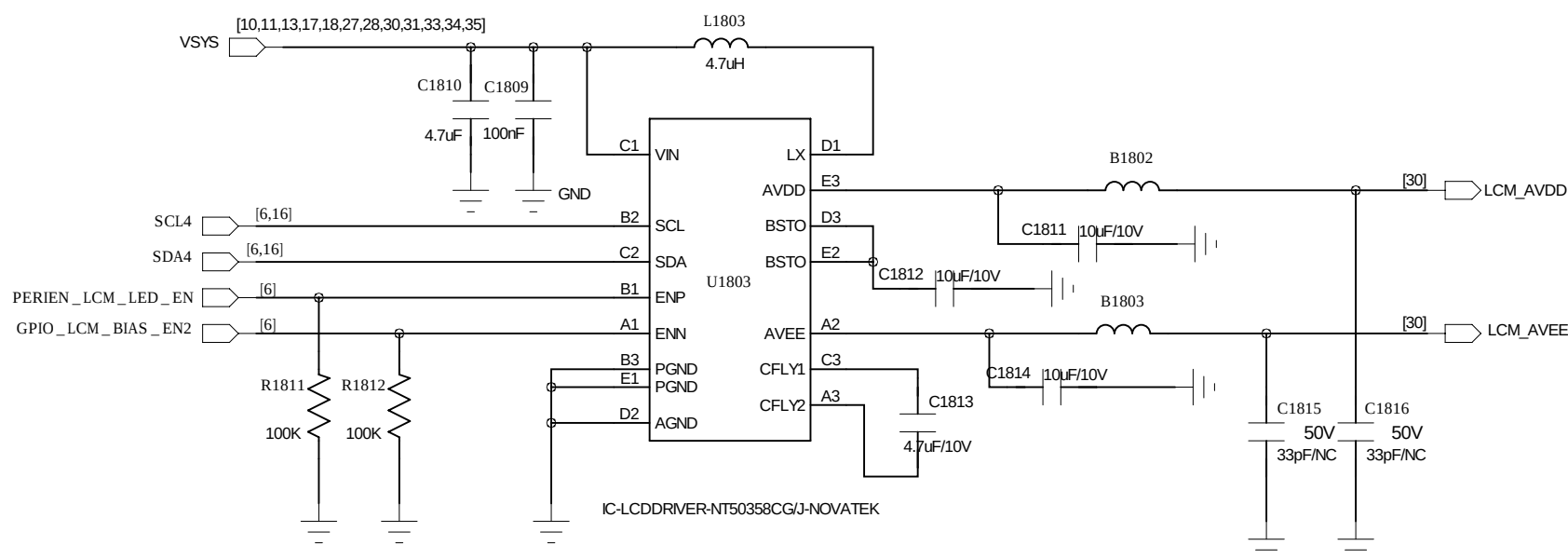
LCM Backlight LED Driver



EXT VUFS18 for UFS

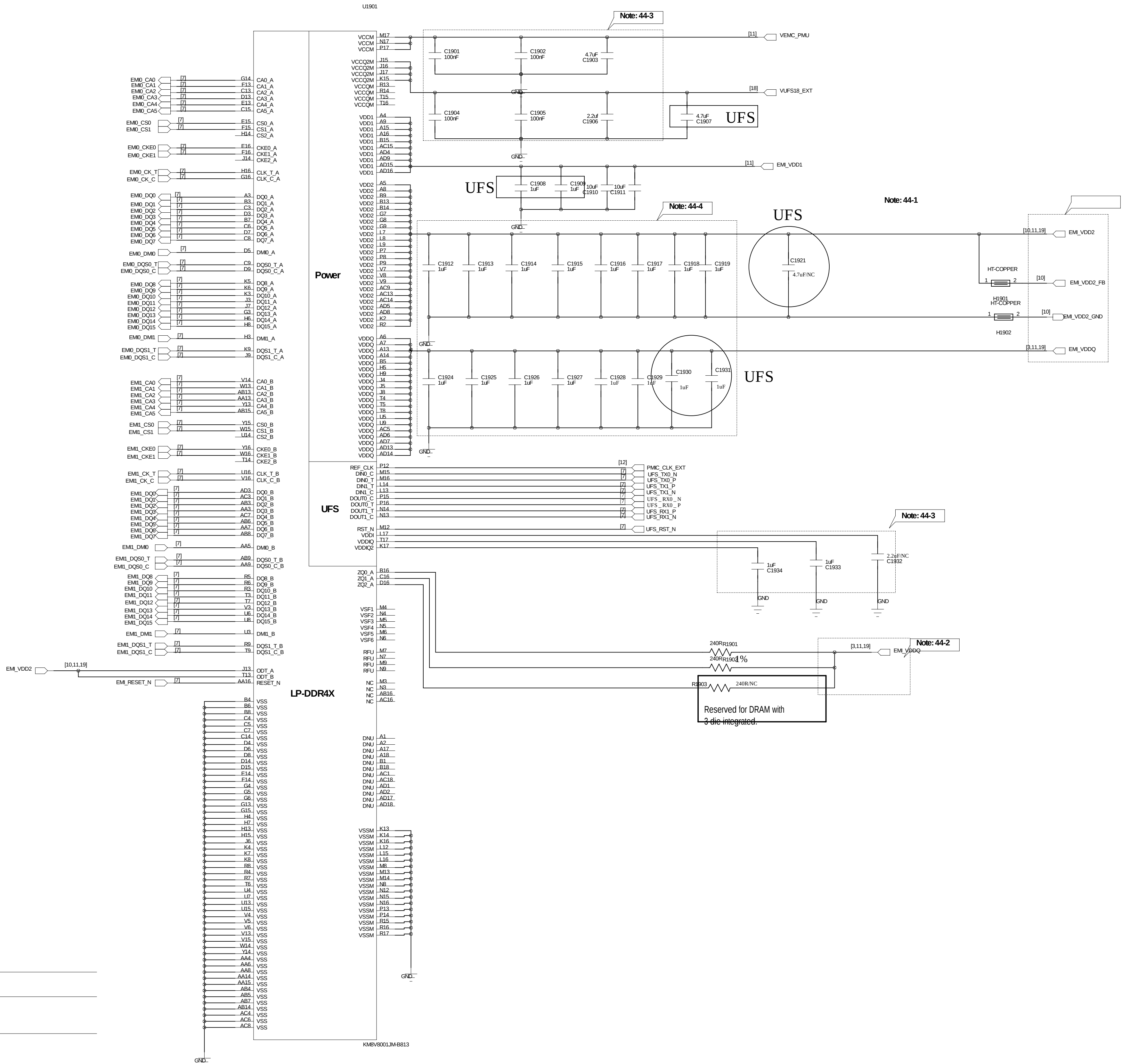


LCM Gate Drive



NT50358CGJ3I2C ADDRESS:0x3EH(Write:0x7C,Read:0x7D)

COMPANY: Wheatek ΕΤΕ				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 18_POWER_EXT		VERSION: V1.1	SHEET: 18 OF 36
CHECKED		DATED					



Schematic design notice of "44_Memory_UFS_LPDDR4X" page.

Note 44-1: Please refer to power supply related PMIC page select output voltage properly for LPDDR4X

Note 44-2: DRAM ZQx resistor = 240ohm (1%) that must be connected to VDDQ.

Note 44-3: Please refer to uMCP vendor's datasheet or MTK common design notice to get the recommendation bypass cap. value for VCC/VCCQ/VDD1 power domains of UFS.

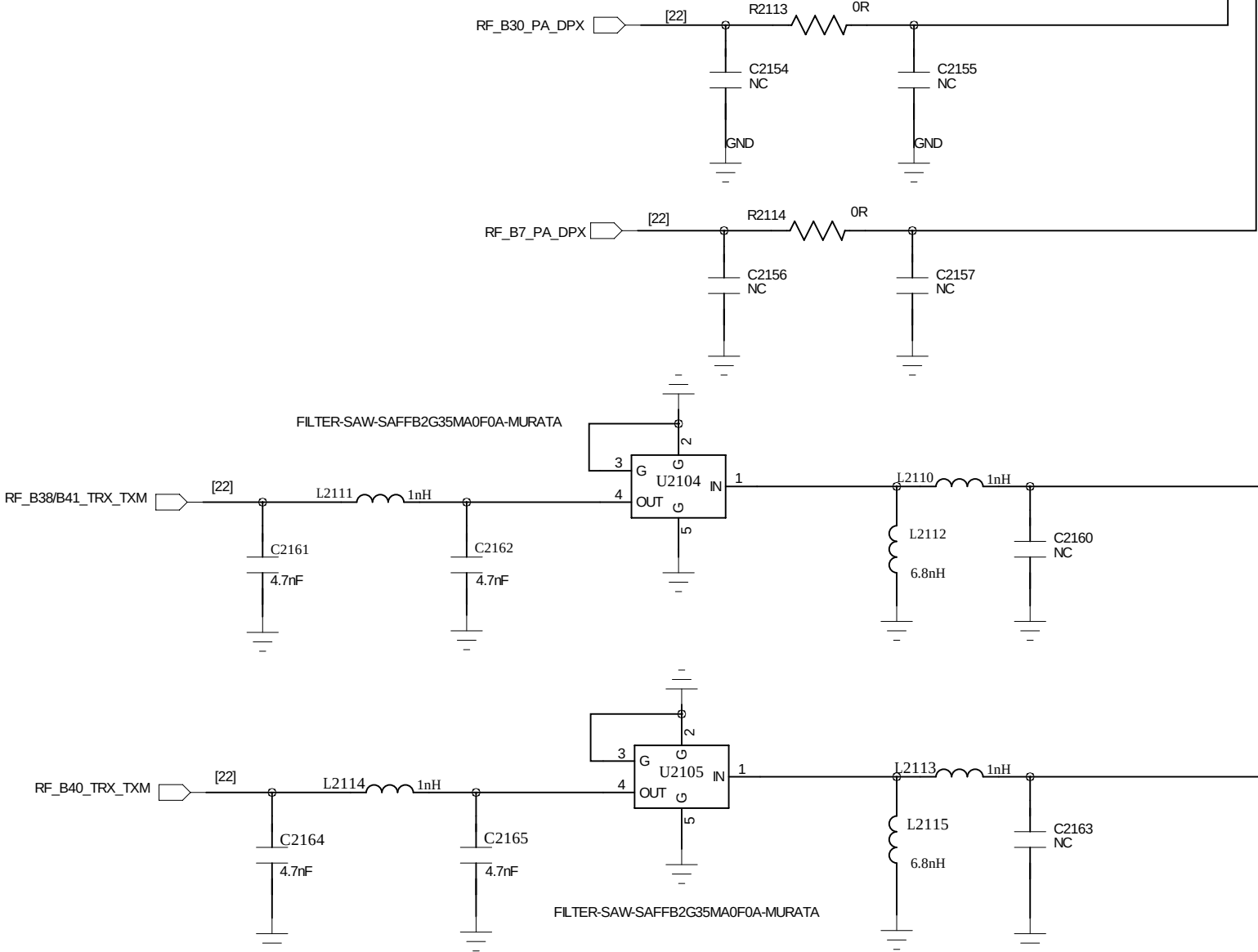
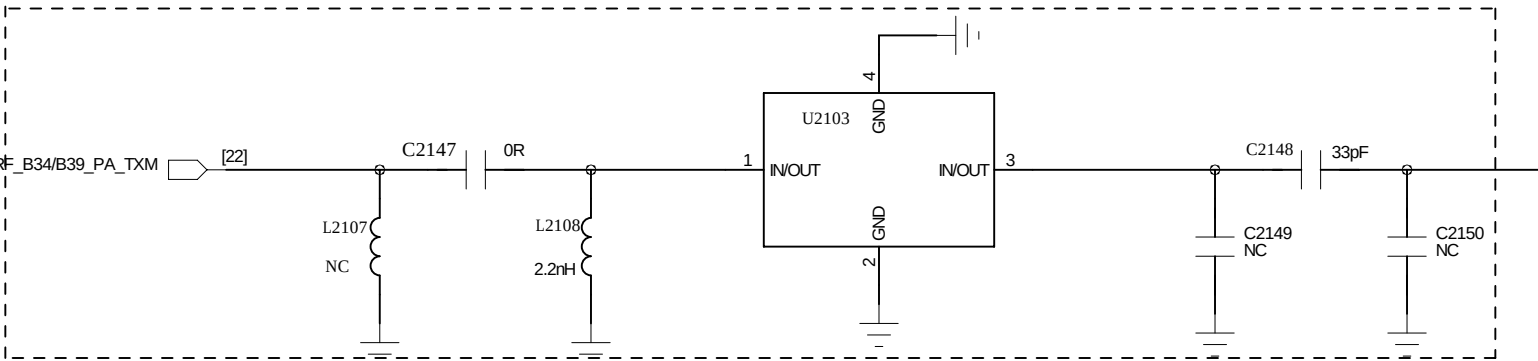
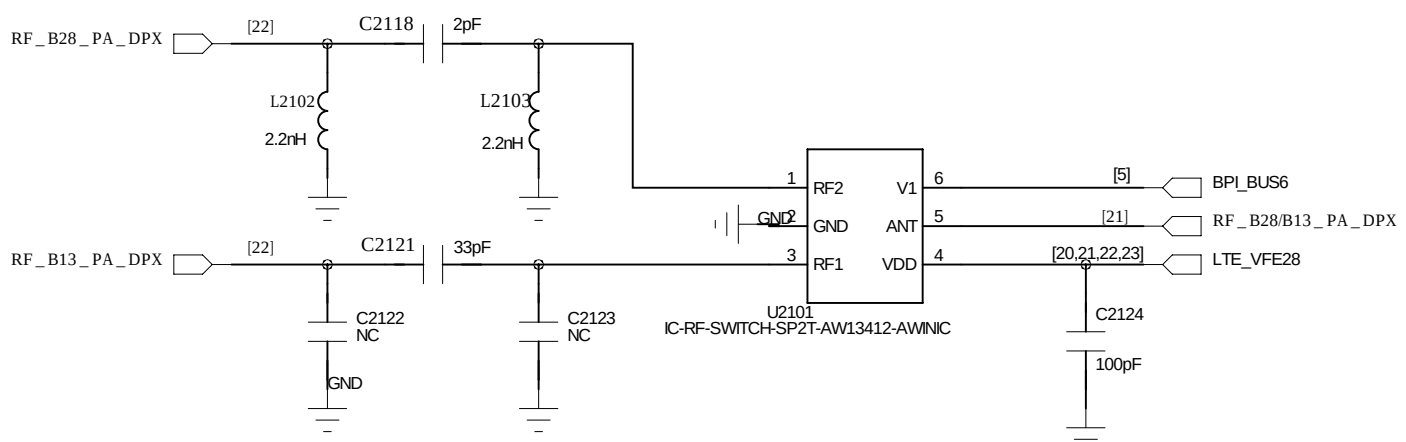
Note 44-4: VDD2 VDDQ decoupling cap: closed to DRAM ball.
For other cap for PMIC [≥10uF, at PMIC page]:
please also refer to MVID and layout guide for placement.

COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 19_MEMORY_UFS_LPDDR4X		VERSION: V1.1	SHEET: 19 OF 36
CHECKED		DATED					

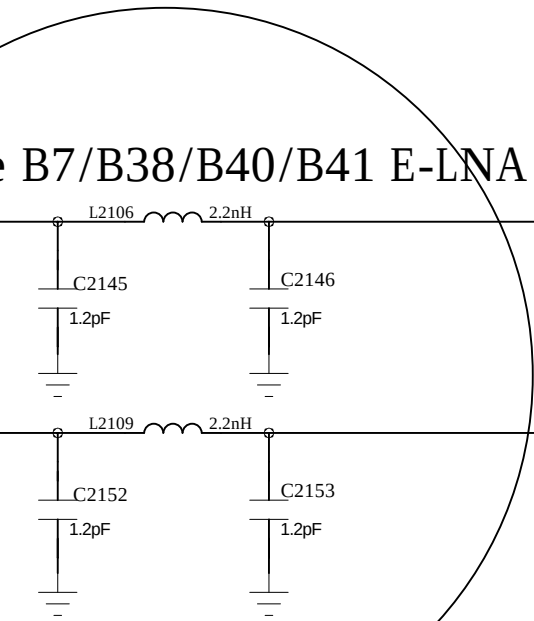
Power Net Connection

PA Power Trace Width
VPA_VCC1: 10mil
VPA_PMU:40mil
VBAT: 60mil

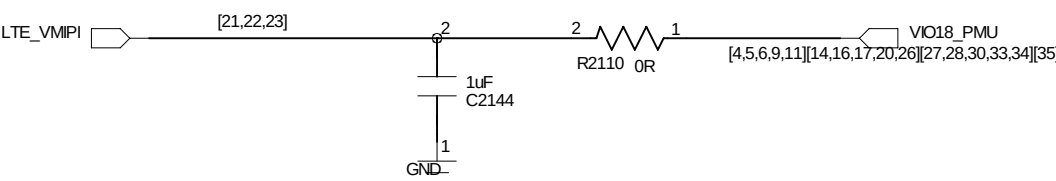
B13 and B28 Share Same TX Port



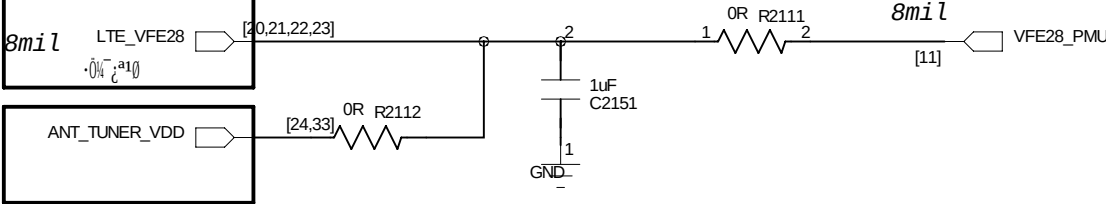
Close B7/B38/B40/B41 E-LNA



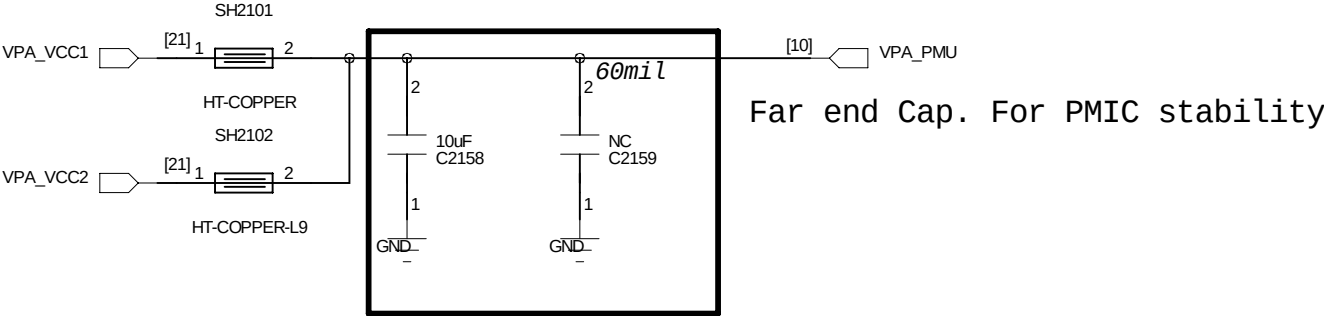
Power Net Connection



V28 to FEM

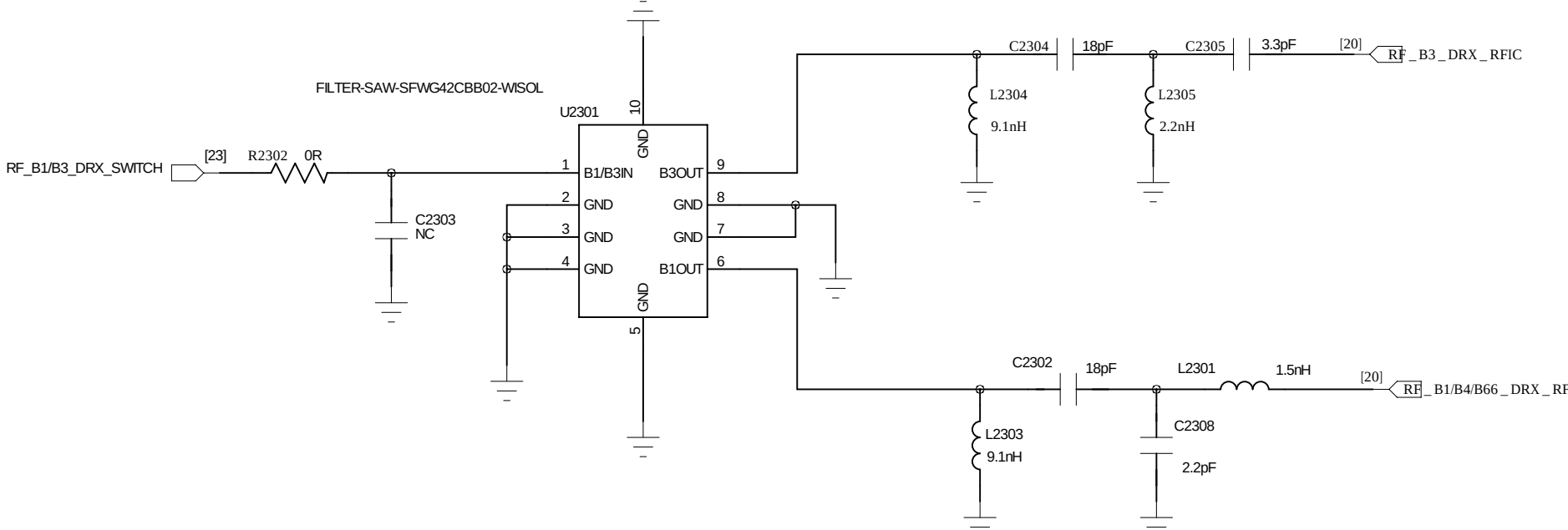


VPA_PMU to 3G/4G PA

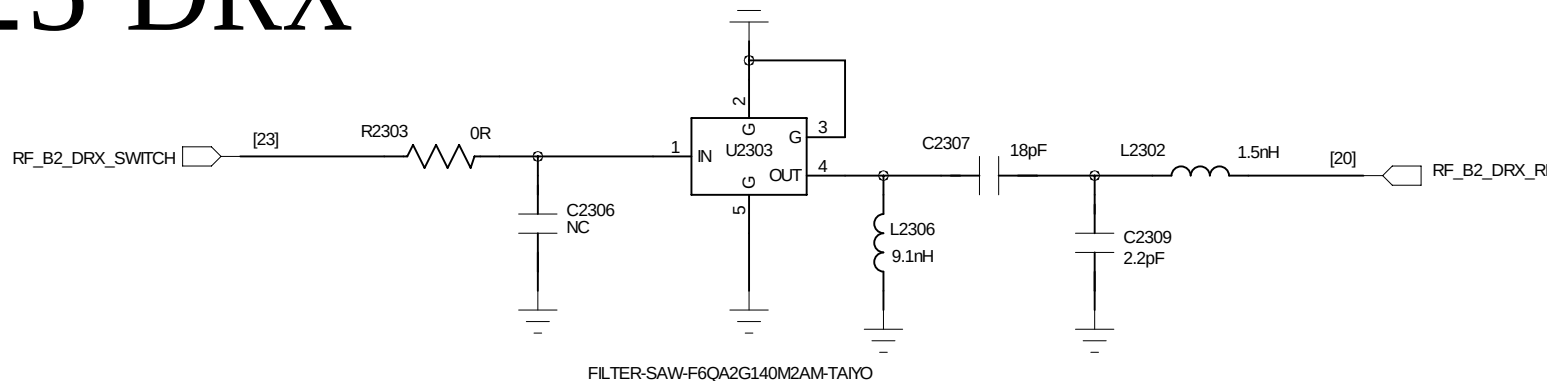


COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 21_RF_MT6186M_RF_TX		VERSION: V1.1	SHEET: 21 OF 36
CHECKED		DATED					

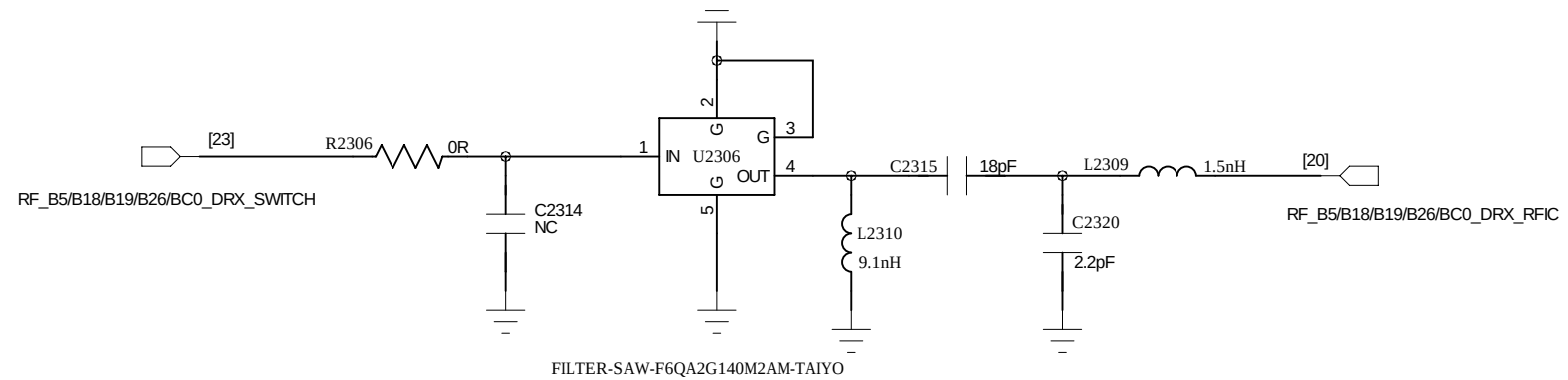
B1/B4/B66/B3 DRX (B1+B3 CA)



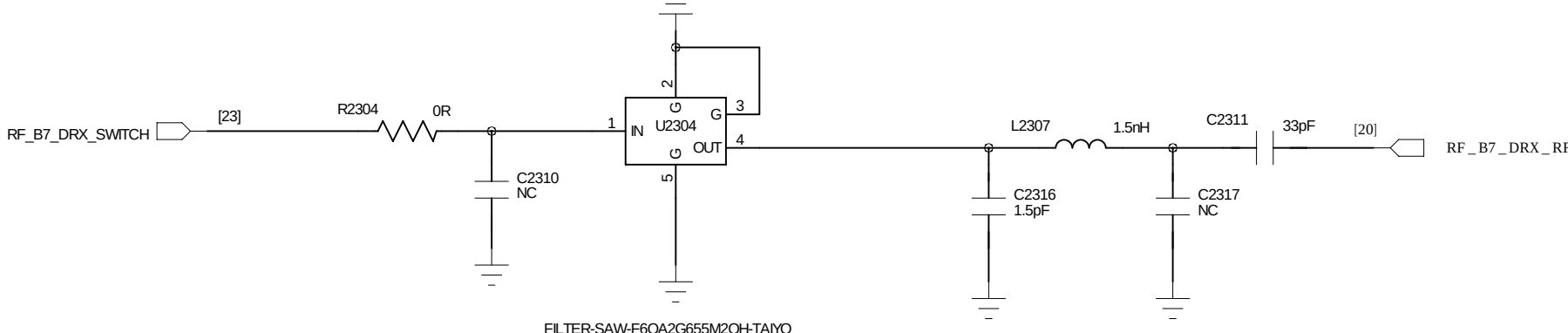
B2/B25 DRX



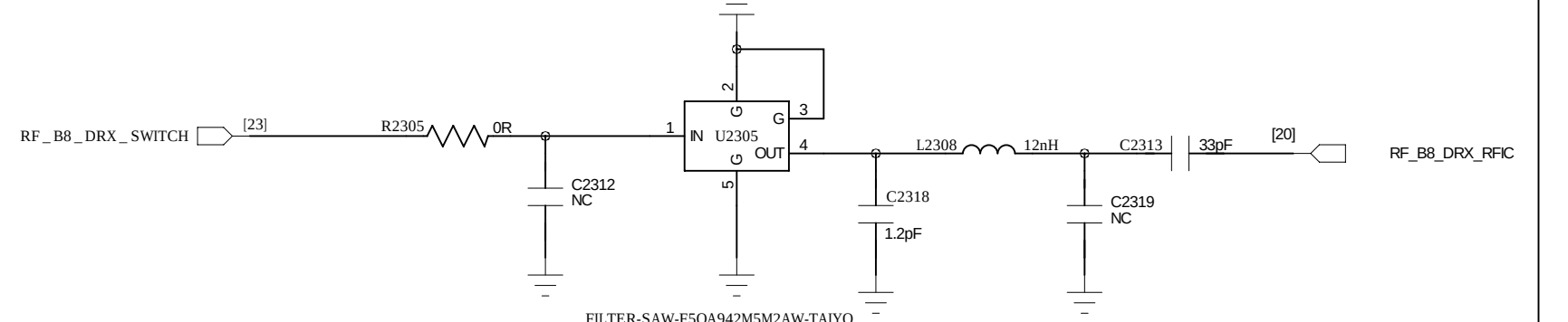
B5/B18/B19/B26/BC0 DRX



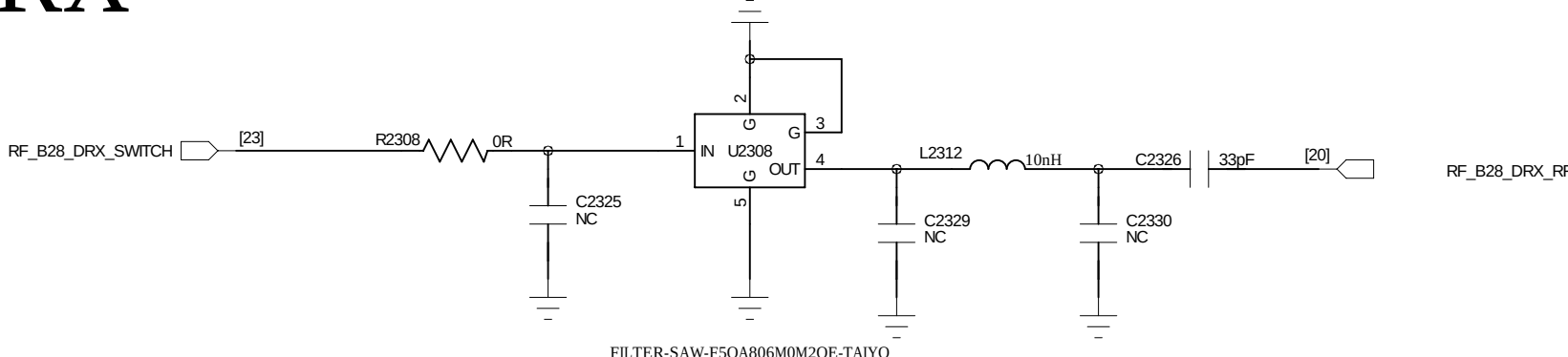
B7 DRX



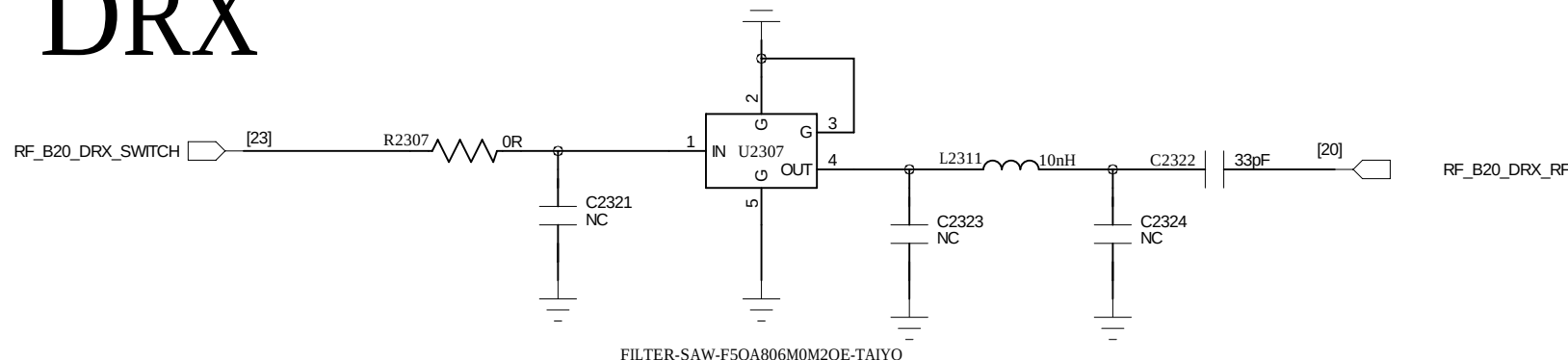
B8 DRX



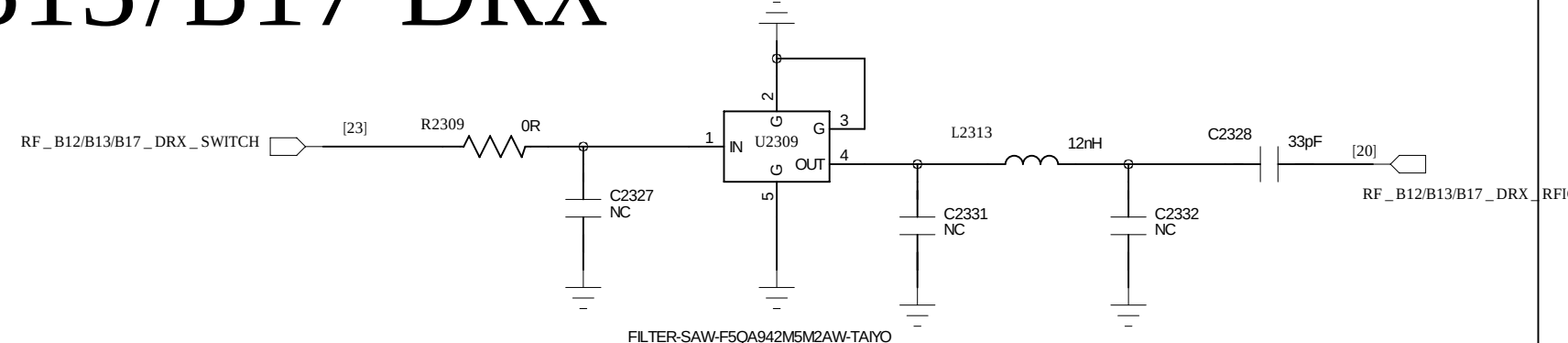
B28 DRX



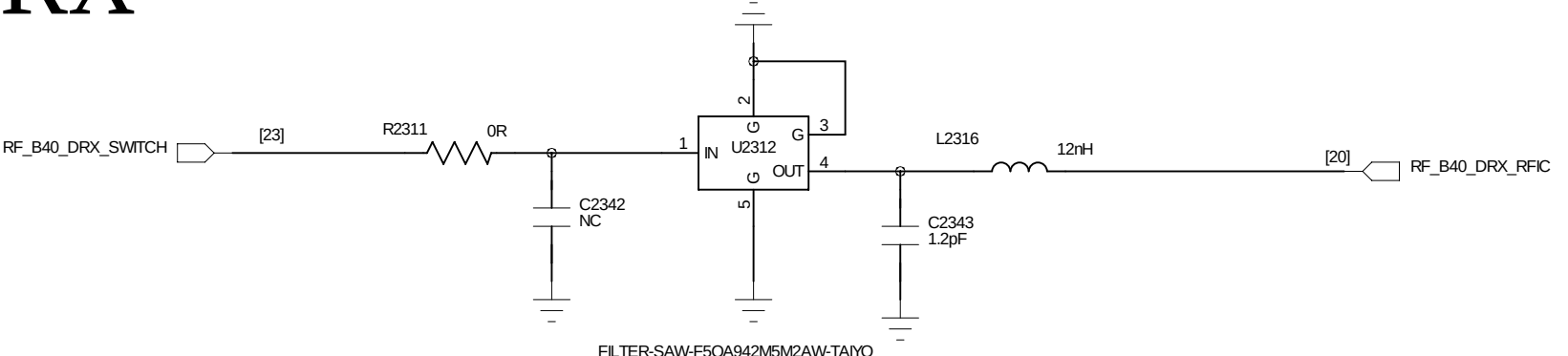
B20 DRX



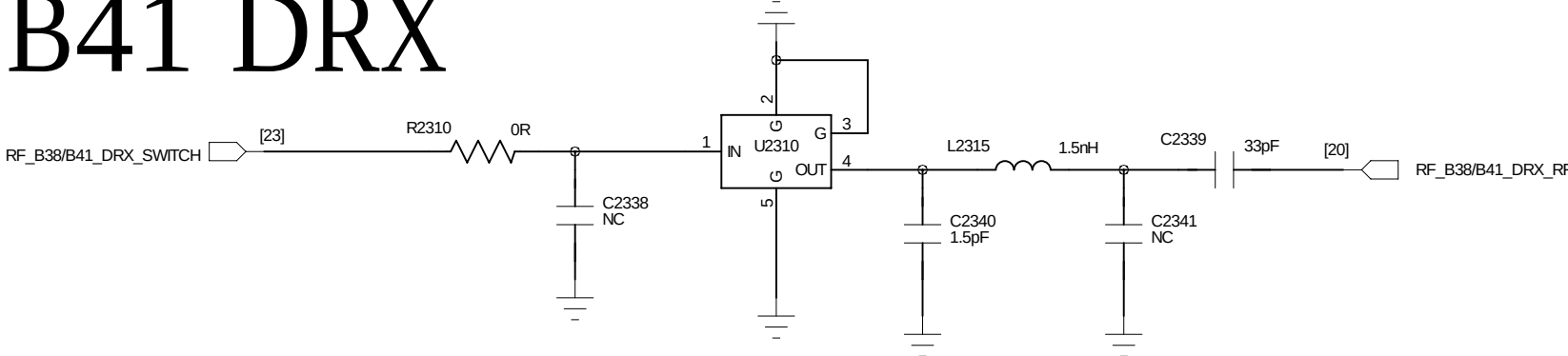
B12/B13/B17 DRX



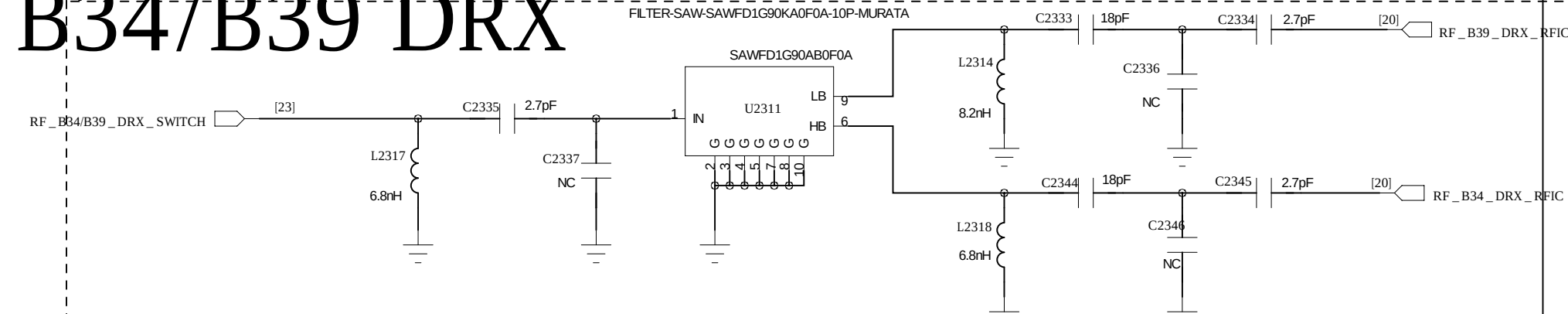
B40 DRX



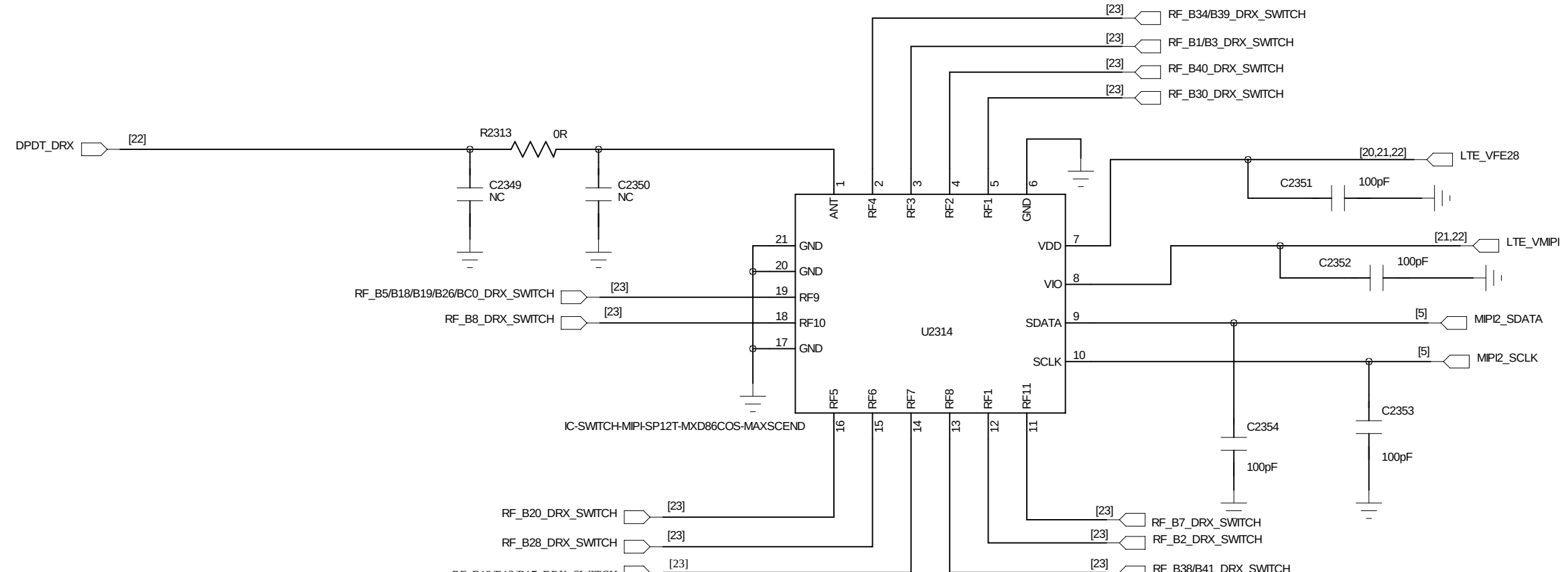
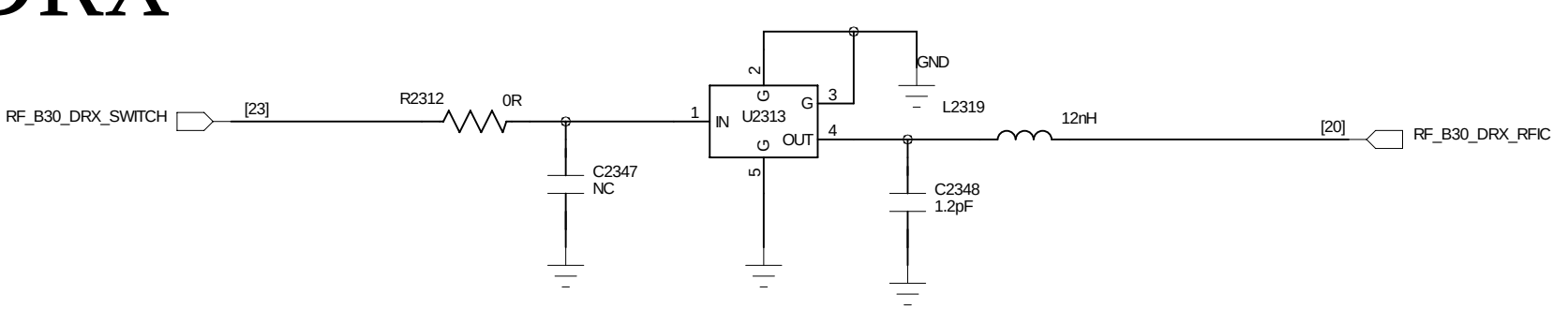
B38/B41 DRX



B34/B39 DRX

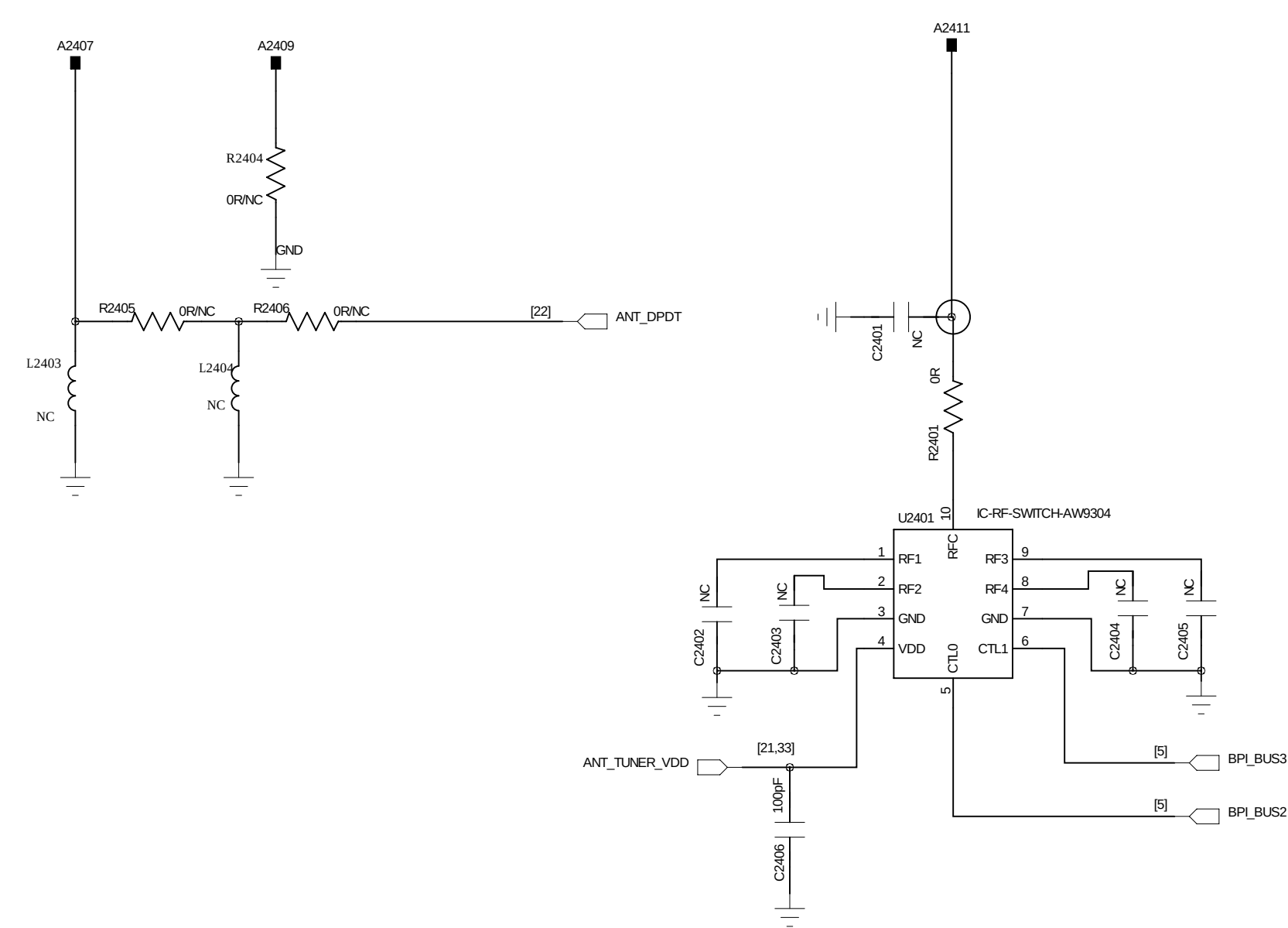


B30 DRX

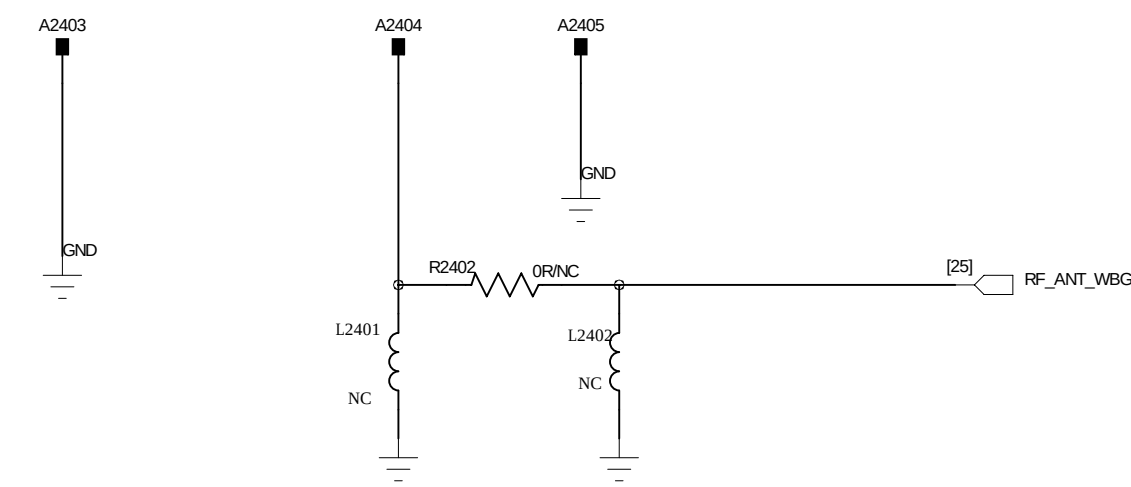


COMPANY: Wheatek 1106E; 1106E; 1106E; 1106E				MODEL: TE177	Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 23_RF_MT6186M_RF_DRX	VERSION: V1.1	SHEET: 23 OF 36
CHECKED		DATED				

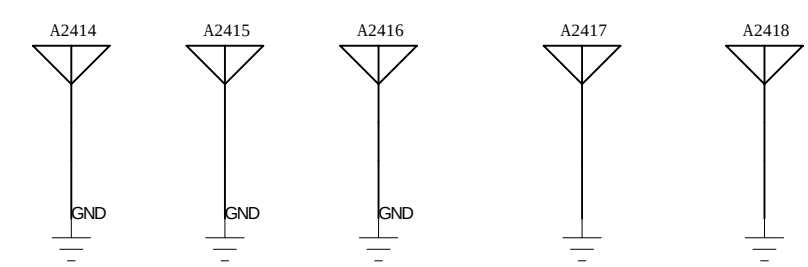
ANT1 (DRX_LB+MHB)



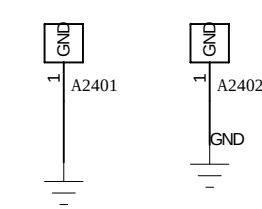
ANT2 (WBG_L1/2.4G/5G)



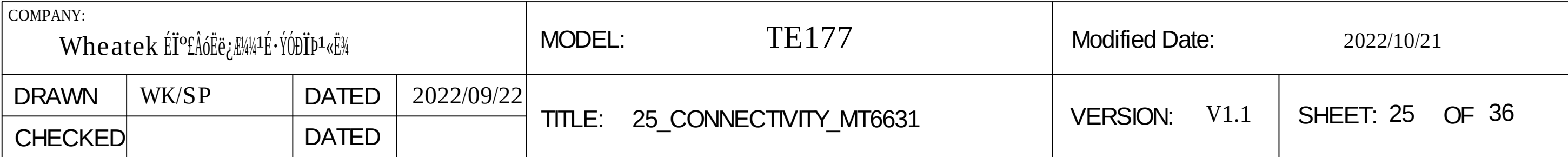
接地弹片



Cable Cleat

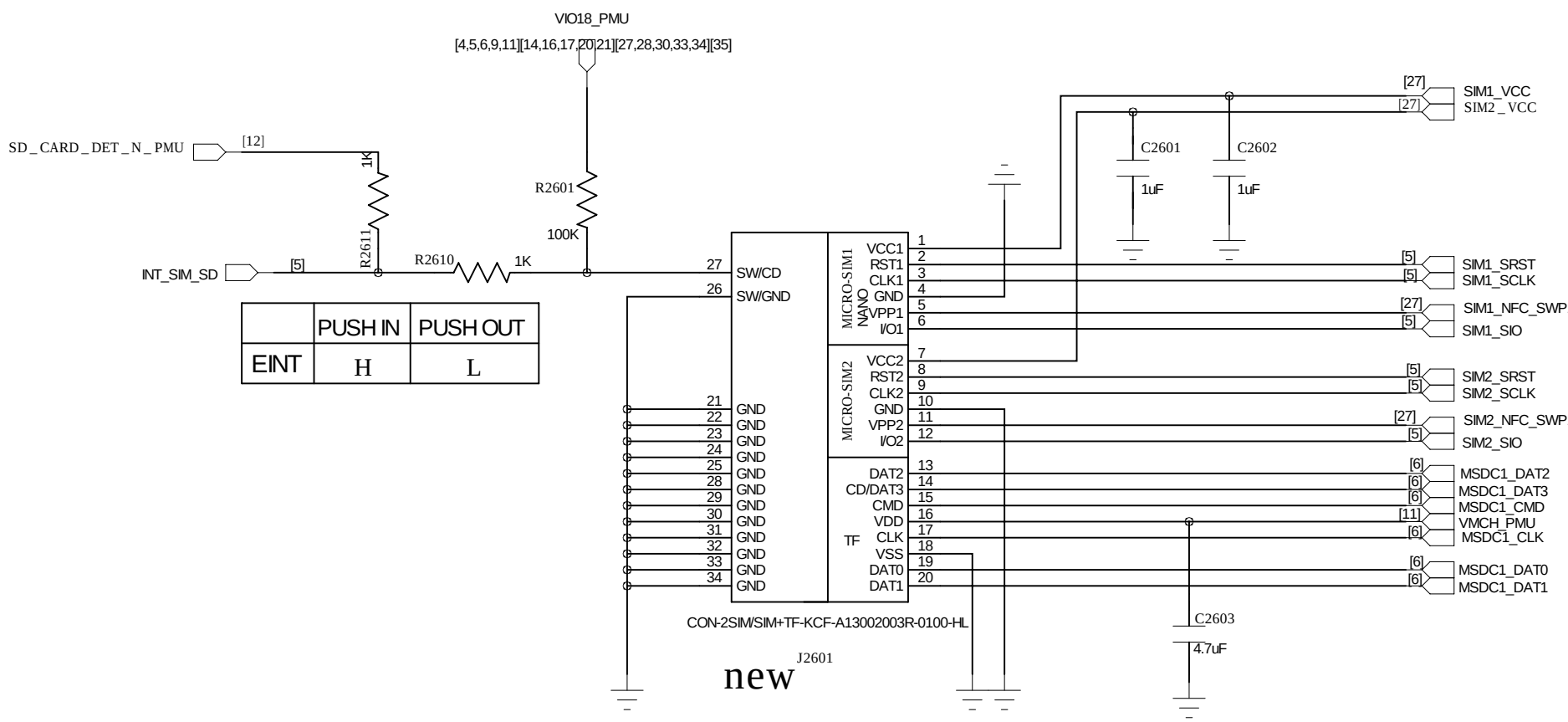


COMPANY: Wheatek 艾特克电子股份有限公司				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 24_RF_ANT		VERSION: V1.1	SHEET: 24 OF 36
CHECKED		DATED					



SIM+SD_Card

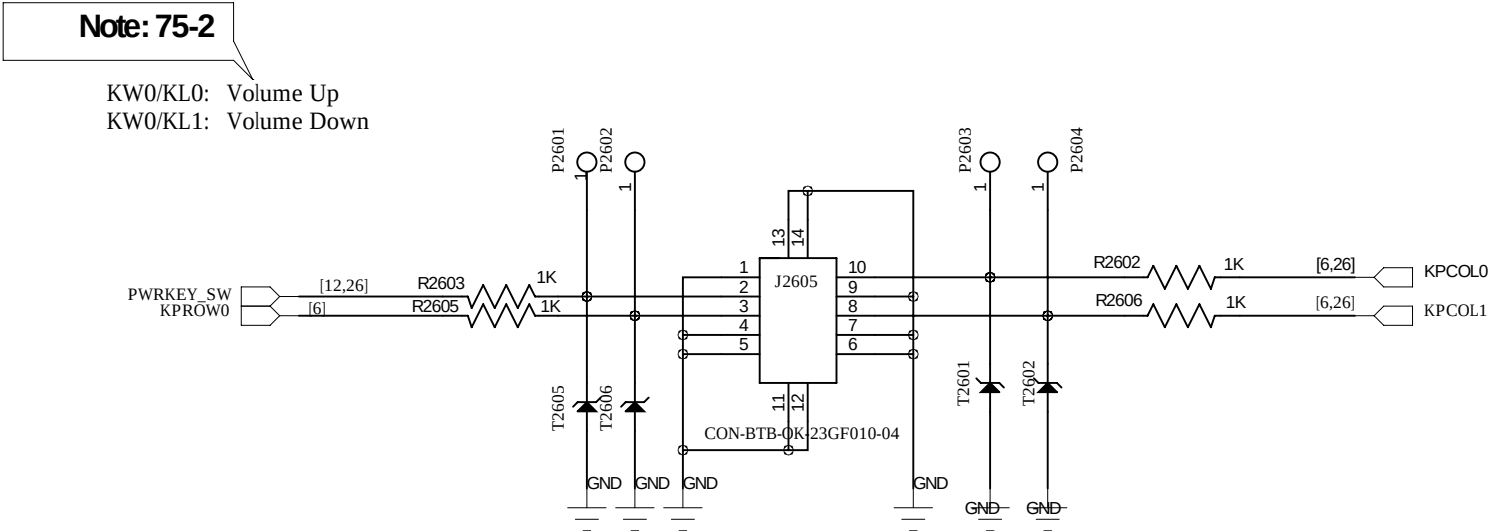
SIM_SD_Card



Power Key/ KeyPad

DO NOT put pull-up resistor on PWRKEY

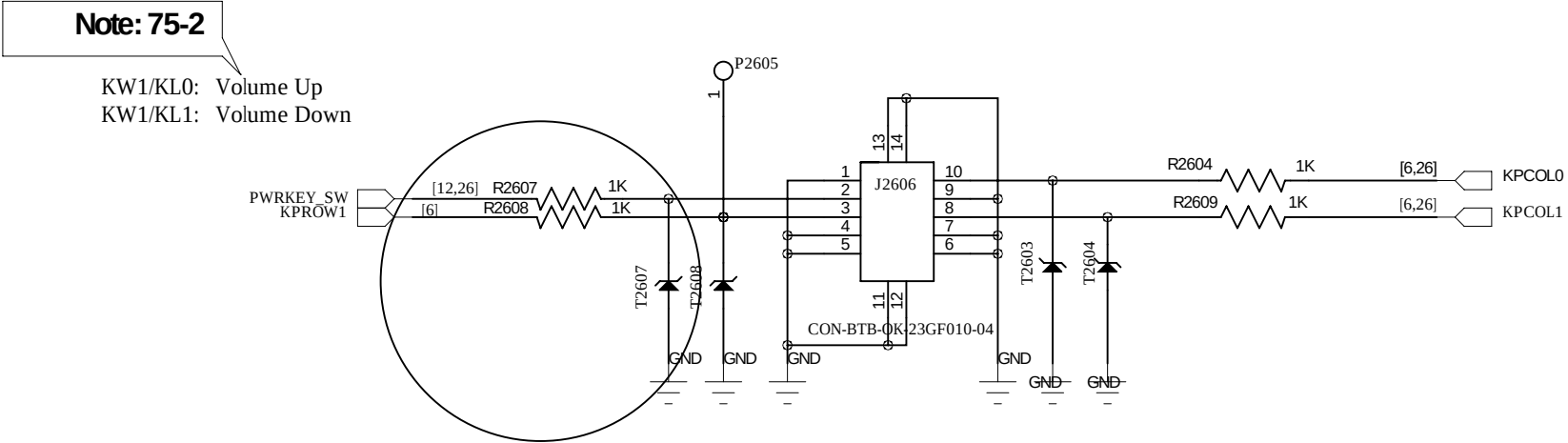
Power Key / Key1+2



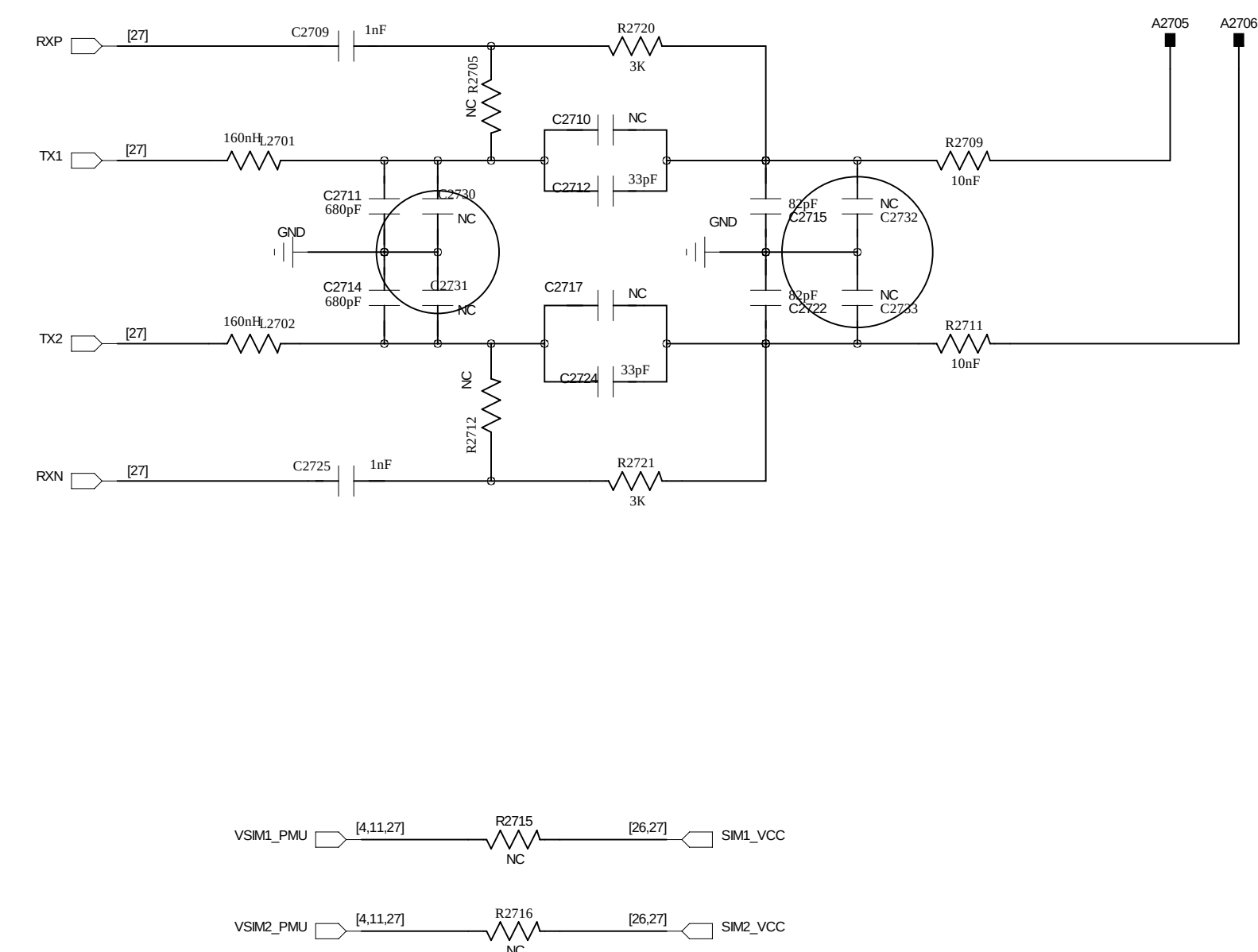
Power Key/ KeyPad

DO NOT put pull-up resistor on PWRKEY

Power Key / Key3+4



COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 26_PERI_SIM_SD_KEY		VERSION: V1.1	SHEET: 26 OF 36
CHECKED		DATED					



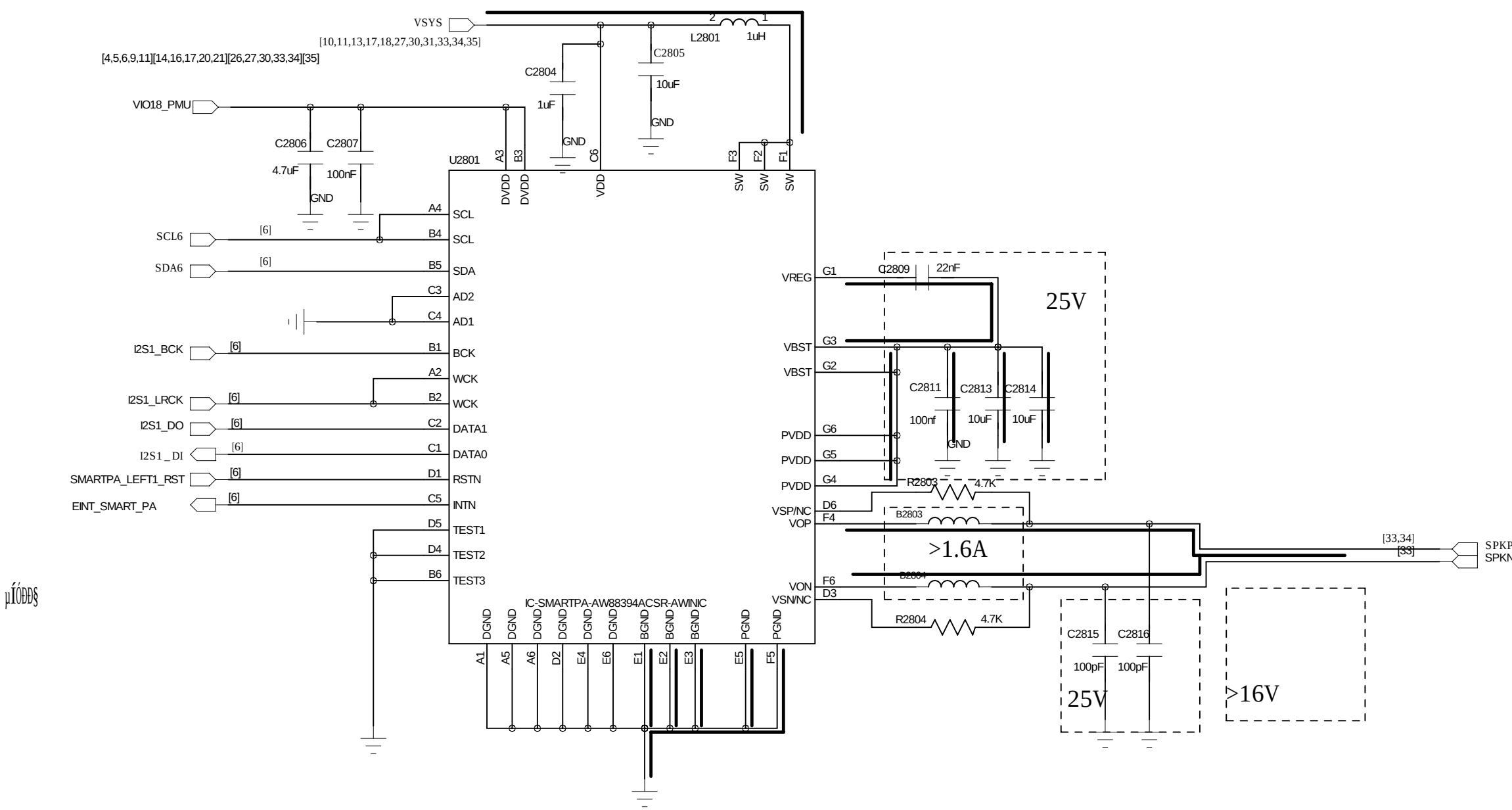
I2C

Table 11. **PC-bus interface addressing**

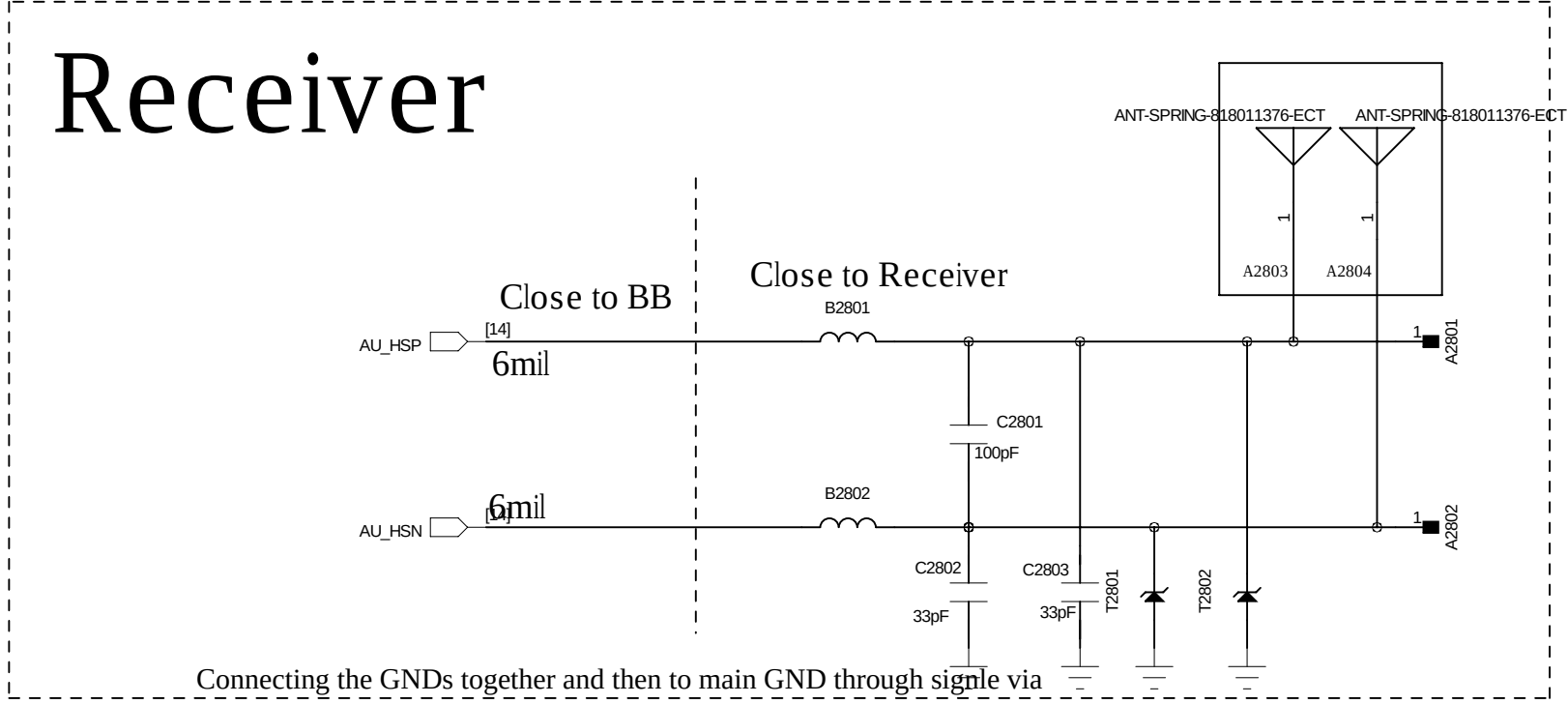
HIF2	HIF1	PC-bus address (R/W = 0, write)	PC-bus address (R/W = 1, read)
0	0	0x50	0x51
0	1	0x52	0x53
1	0	0x54	0x55
1	1	0x56	0x57

COMPANY: Wheatek Engineering, Inc.				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 27_CONNECTIVITY_NFC		VERSION: V1.1	SHEET: 27 OF 36
CHECKED		DATED					
4		3		2		1	

SMART PA

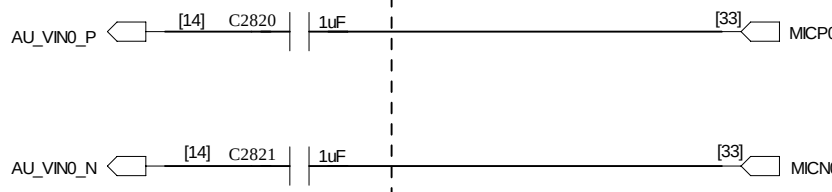


Receiver



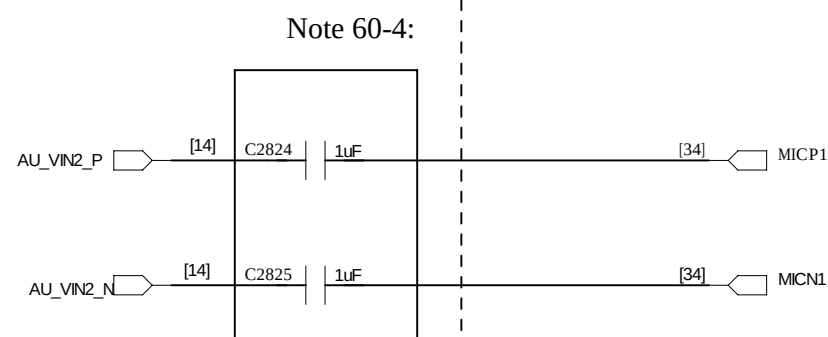
MAIN_MIC

Close to BB



SUB_MIC

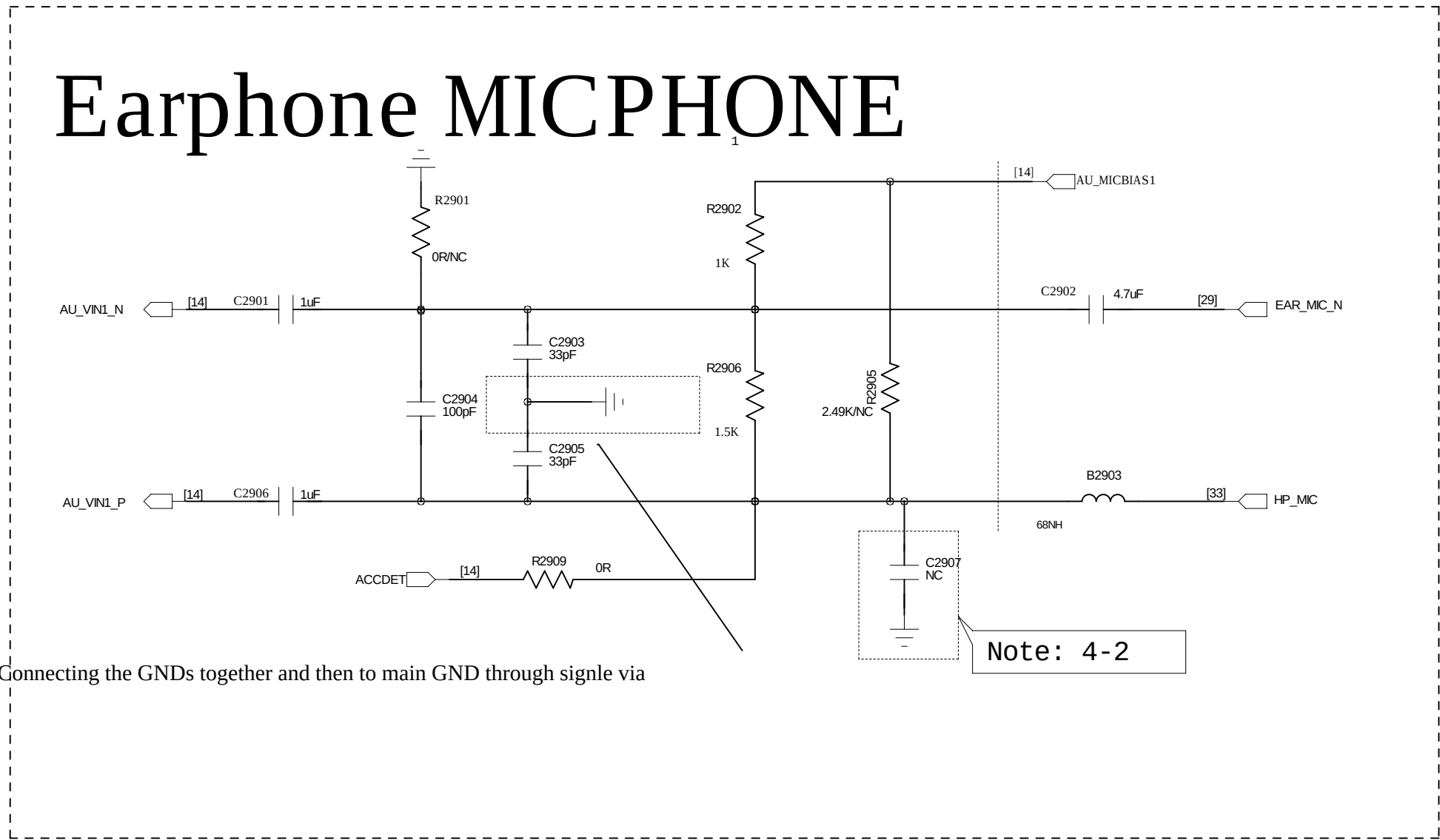
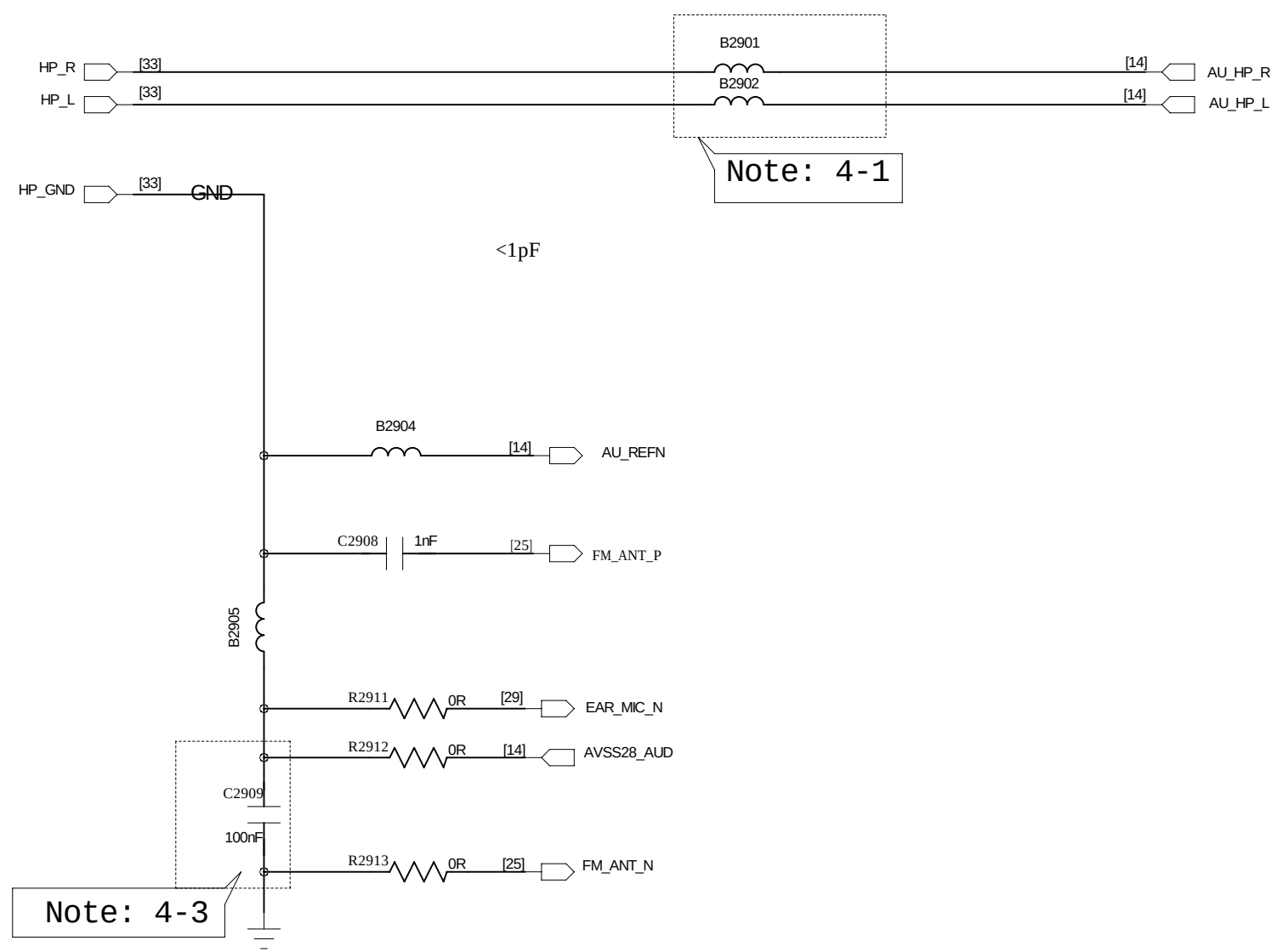
Close to BB



Note 60-4:

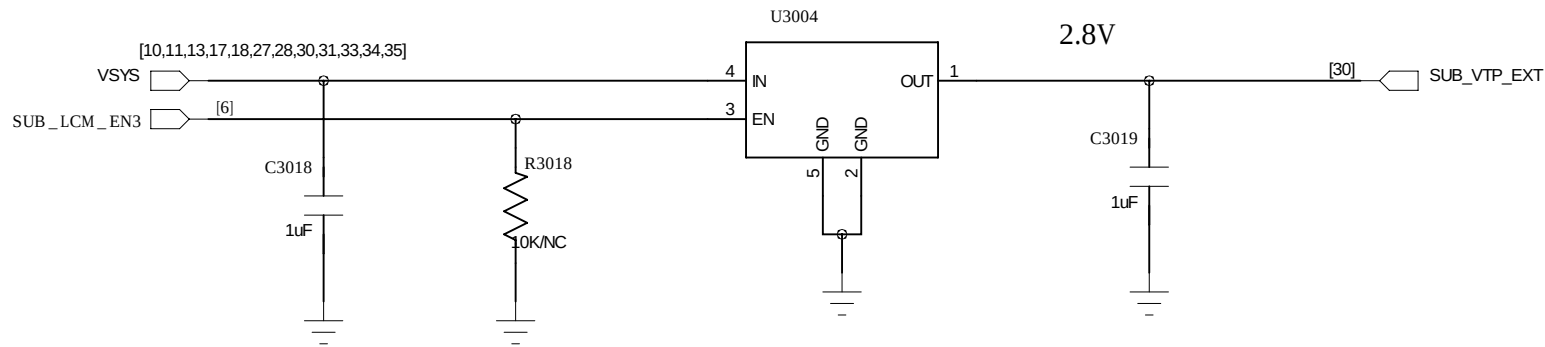
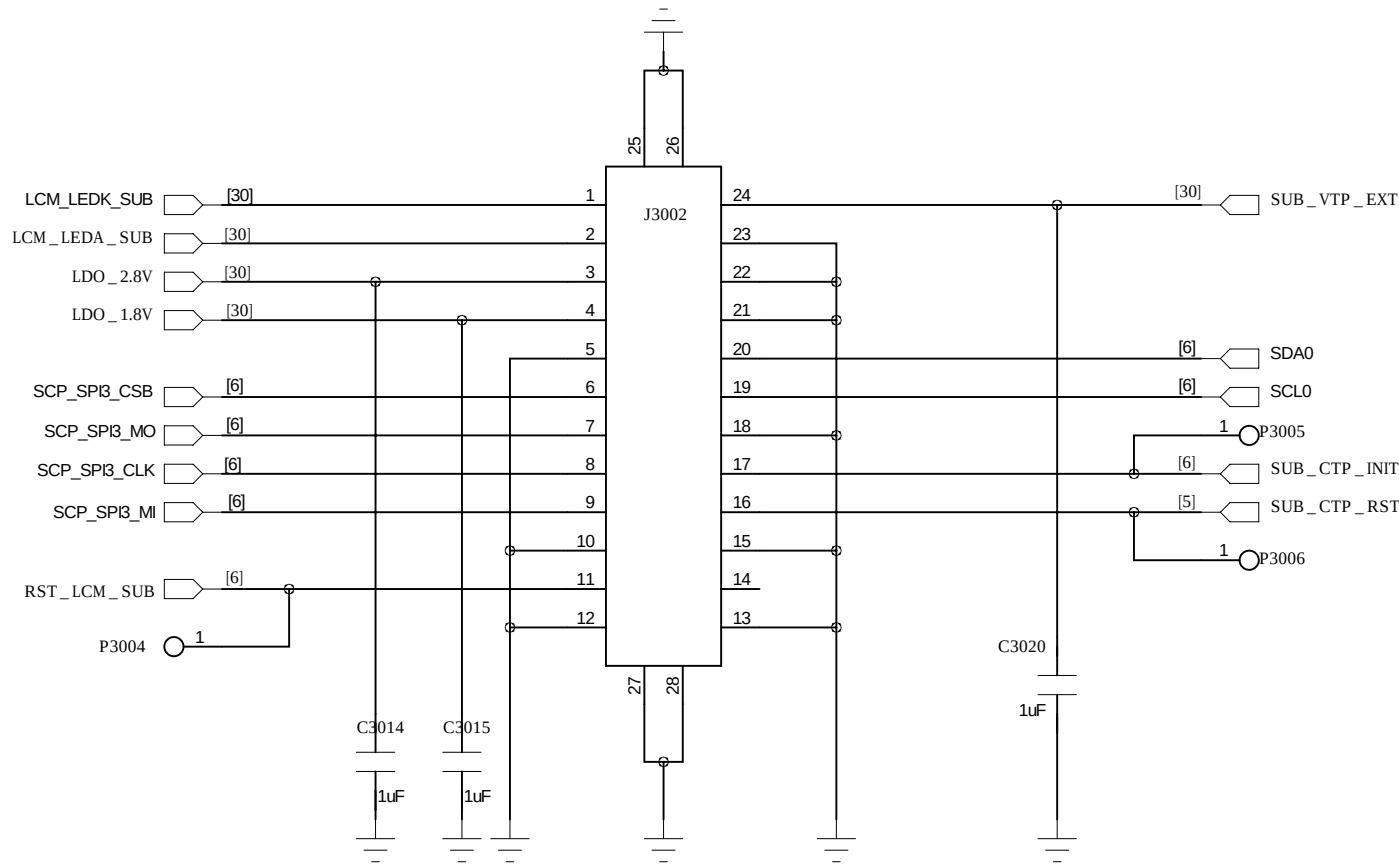
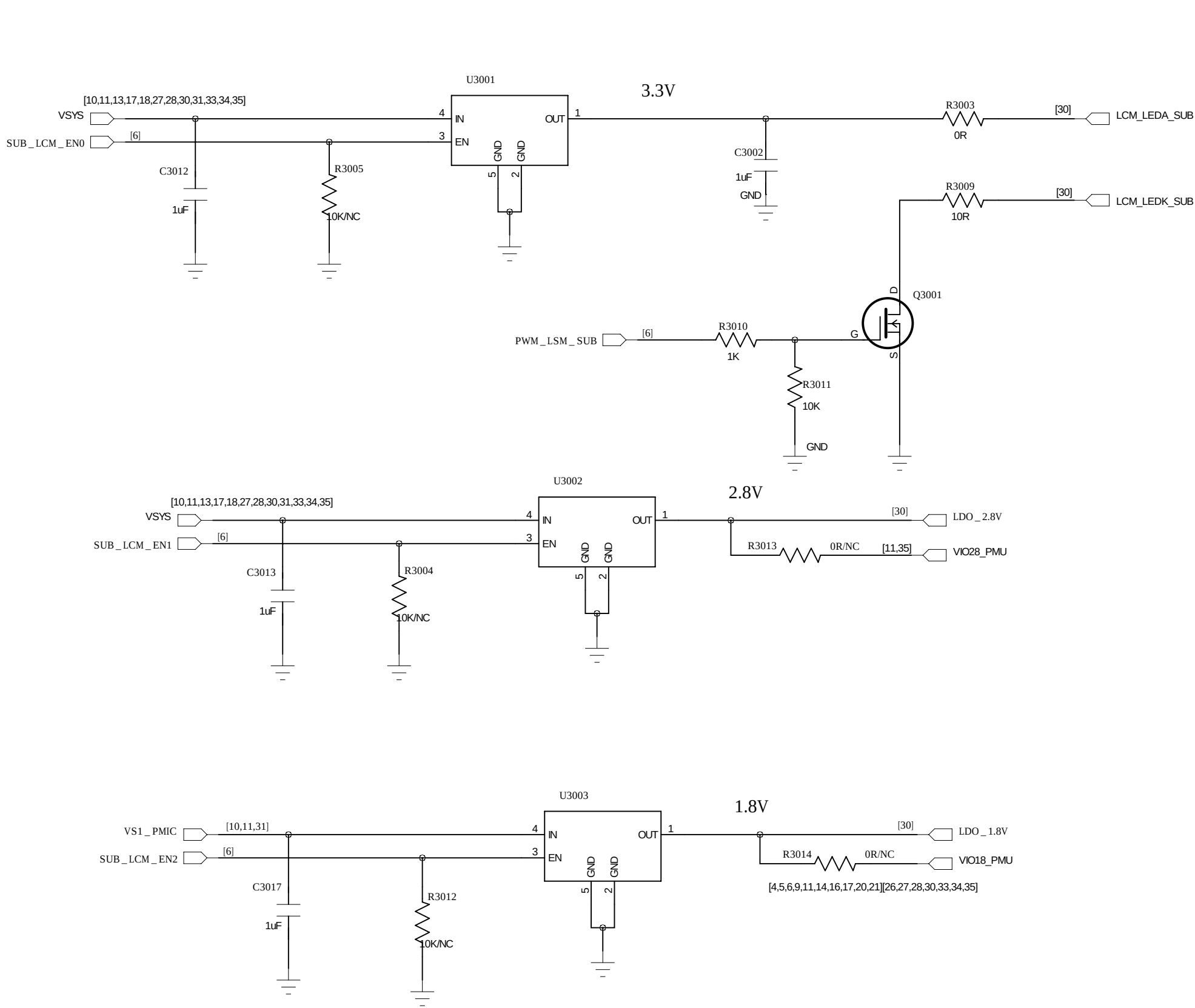
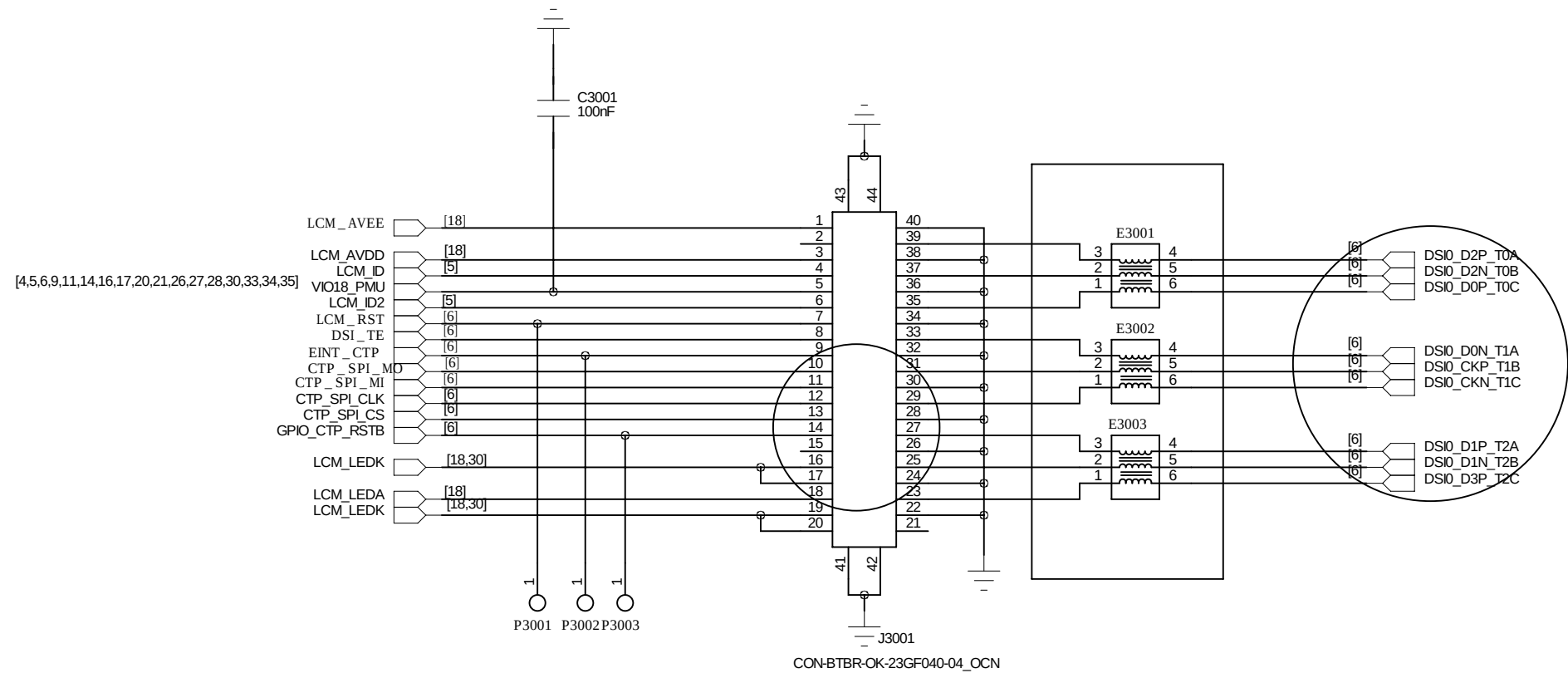
0.1/1 uF for ACC mode (1uF for WB_AMR Speech/0.1uF for NB_AMR Speech)
0 ohm for DCC mode

COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 28_PERI_AUDIOPA_MIC		VERSION: V1.1	SHEET: 28 OF 36
CHECKED		DATED					



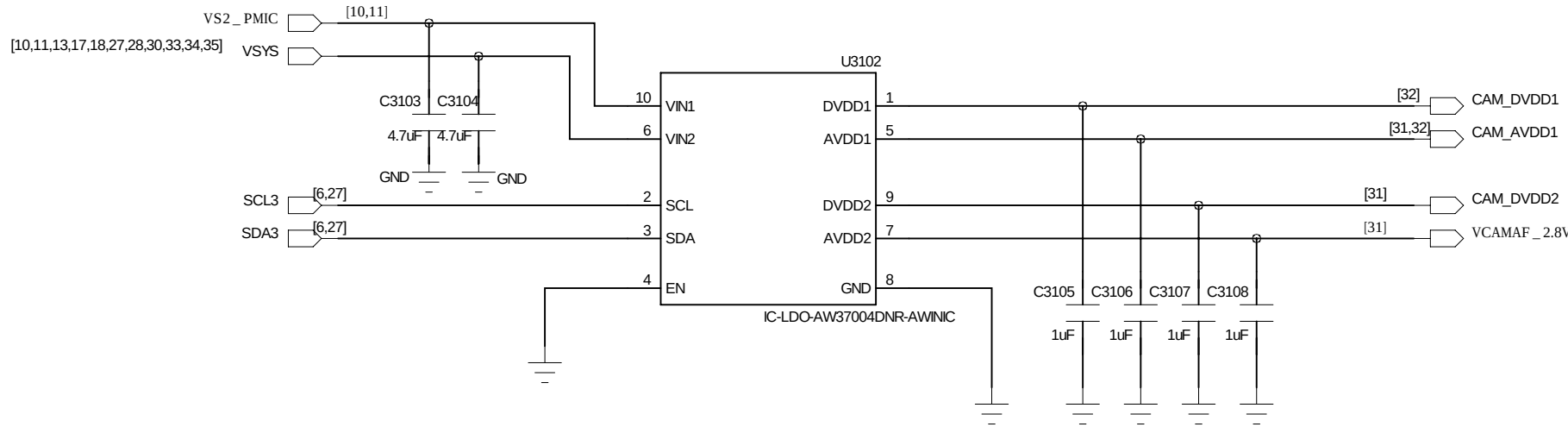
COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 29_PERI_AUDIO_JACK		VERSION: V1.1	SHEET: 29 OF 36
CHECKED		DATED					

Main LCM

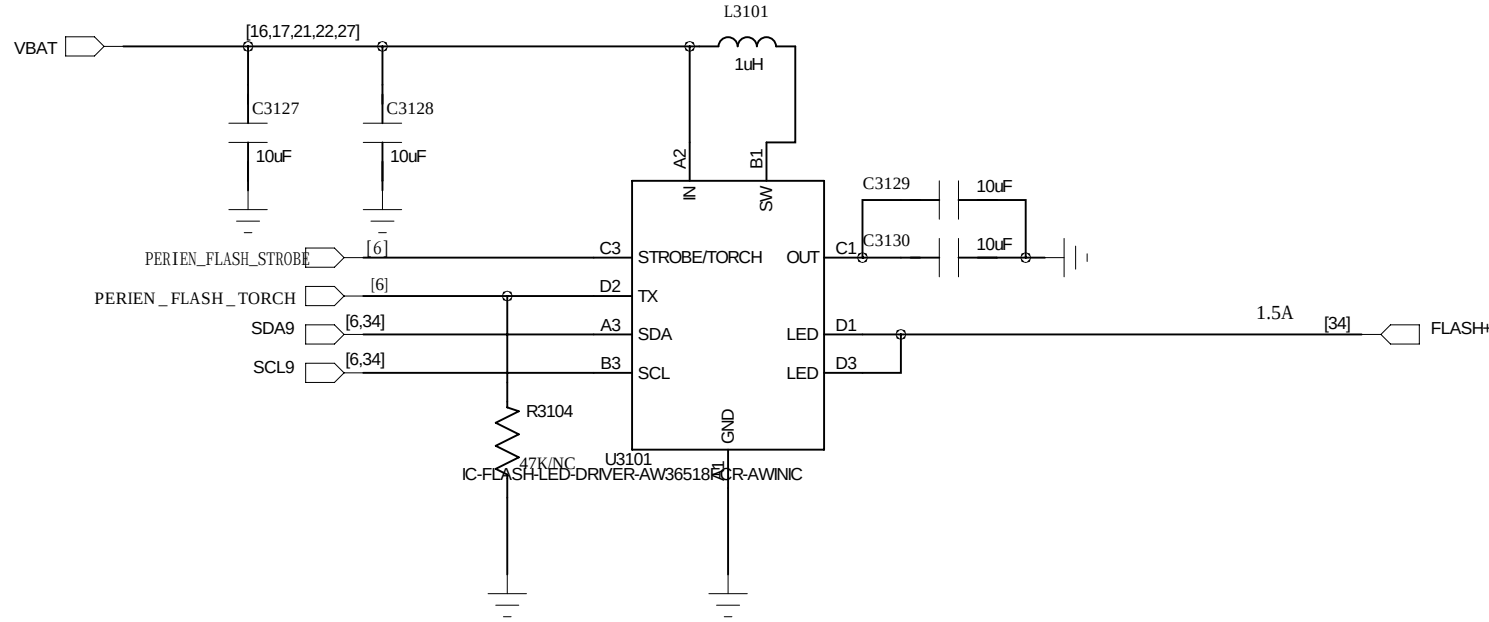
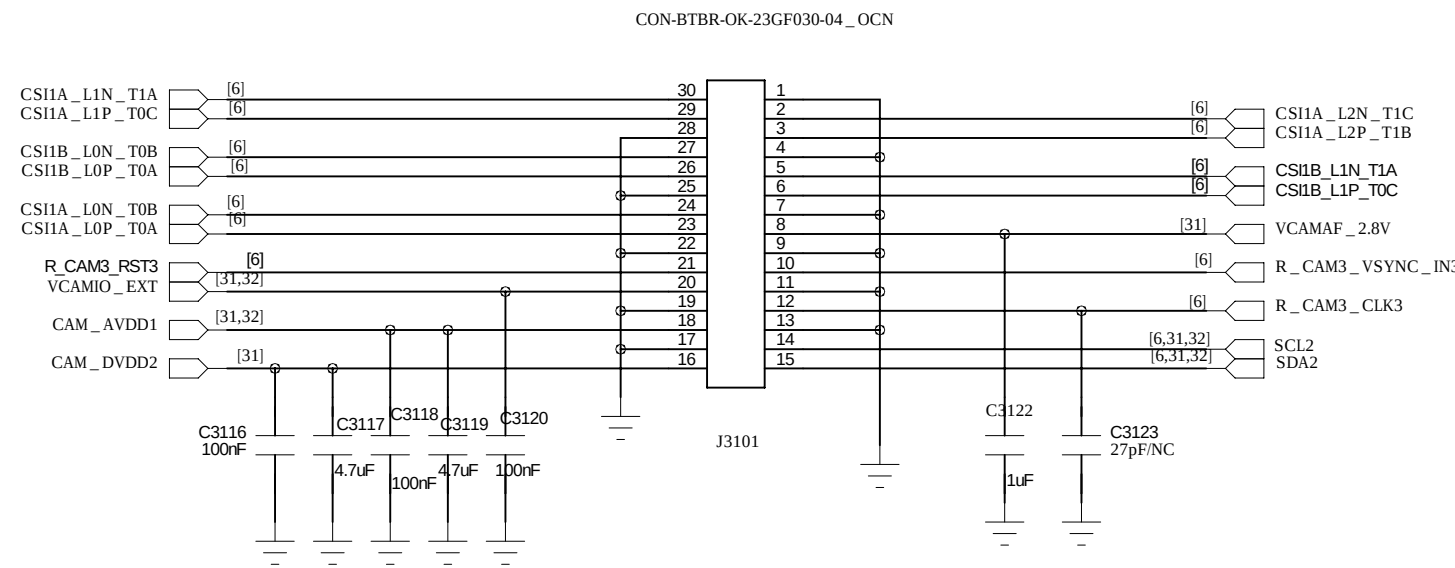
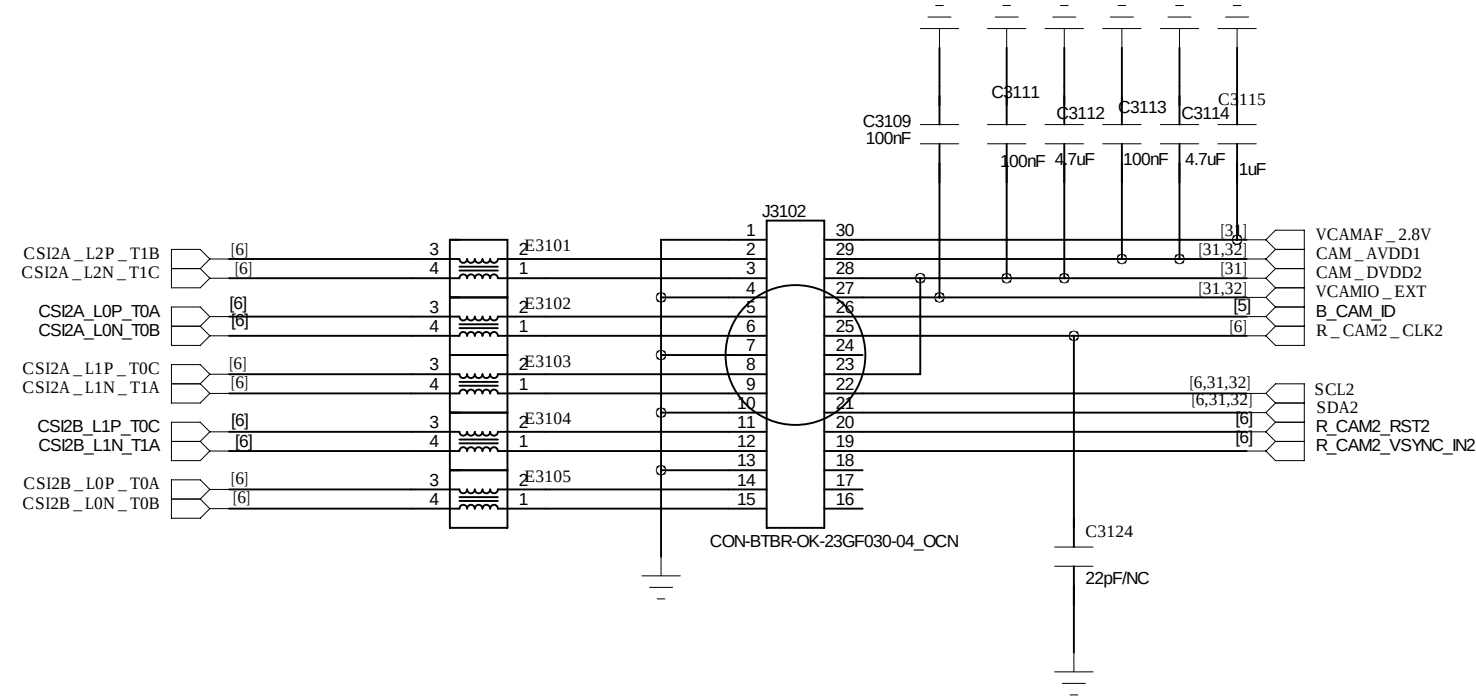
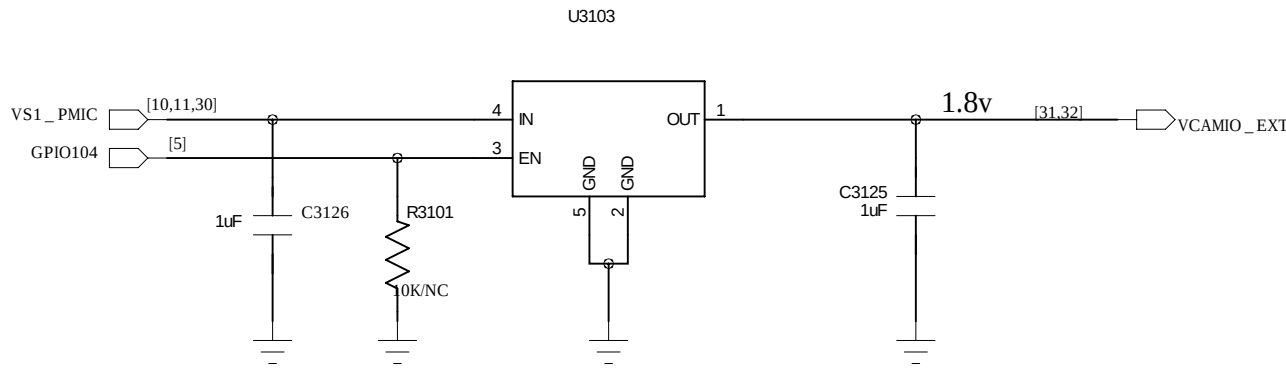


COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 30_PERI_LCD		VERSION: V1.1	SHEET: 30 OF 36
CHECKED		DATED					

Rear Camera - 50M



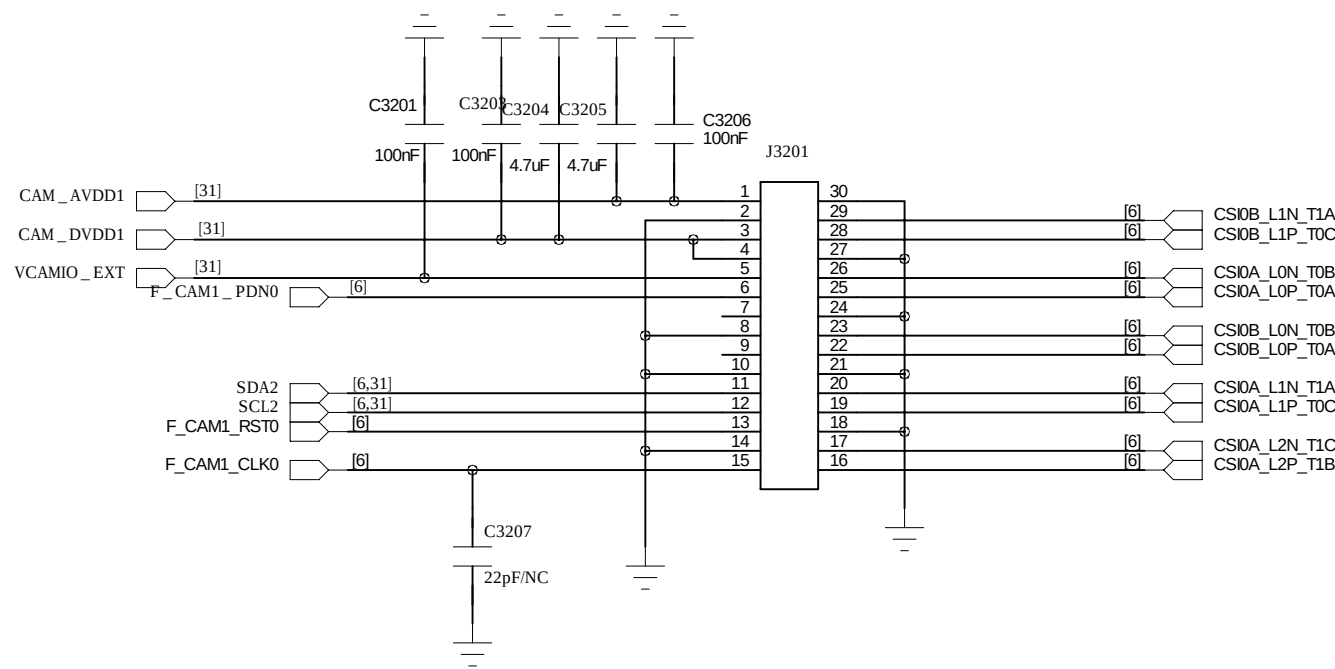
Rear Camera - 8M



I2C:0X63

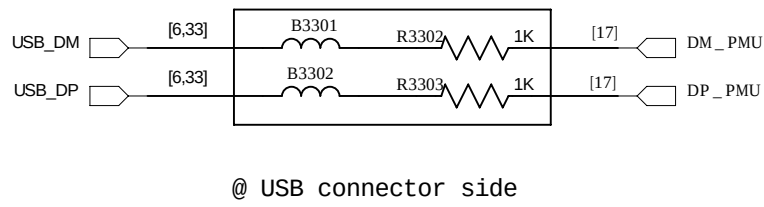
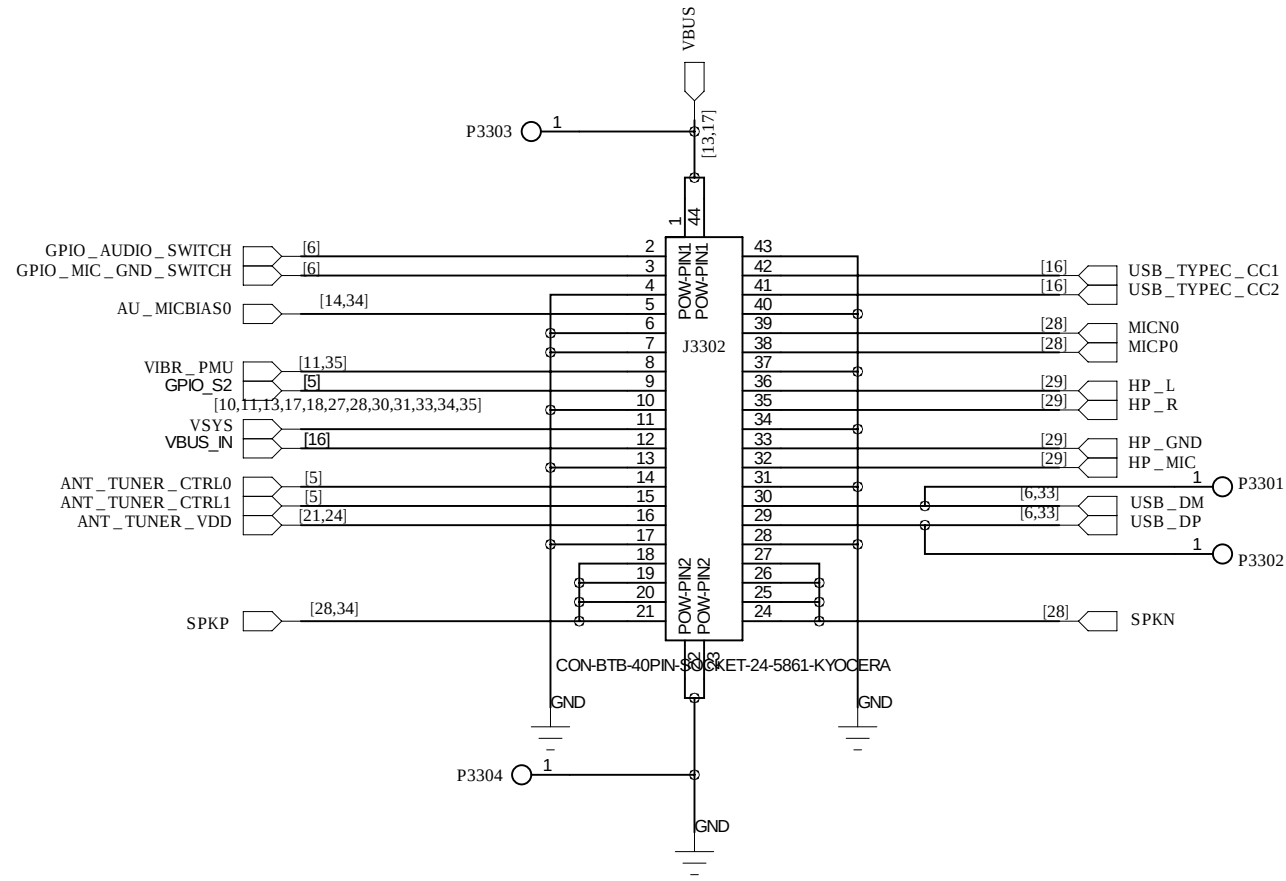
COMPANY: Wheatek				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 31_PERI_CAMERA_REAR		VERSION: V1.1	SHEET: 31 OF 36
CHECKED		DATED					

Front Camera - 32M

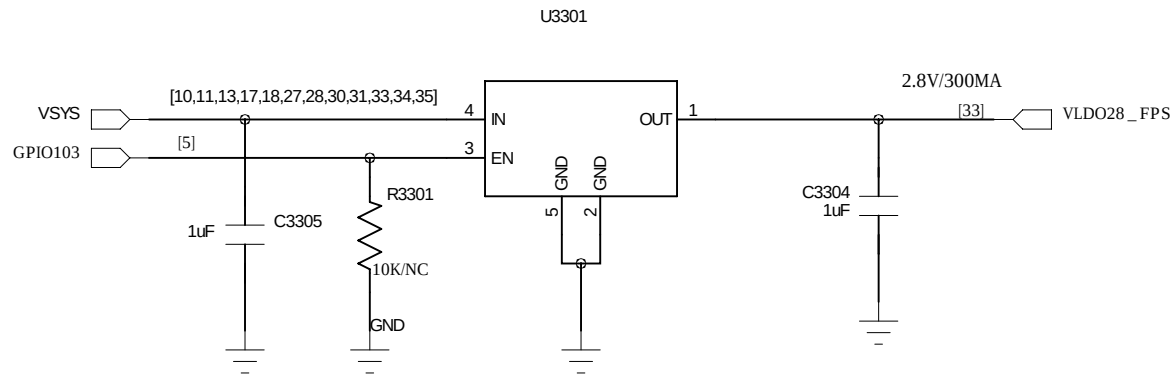
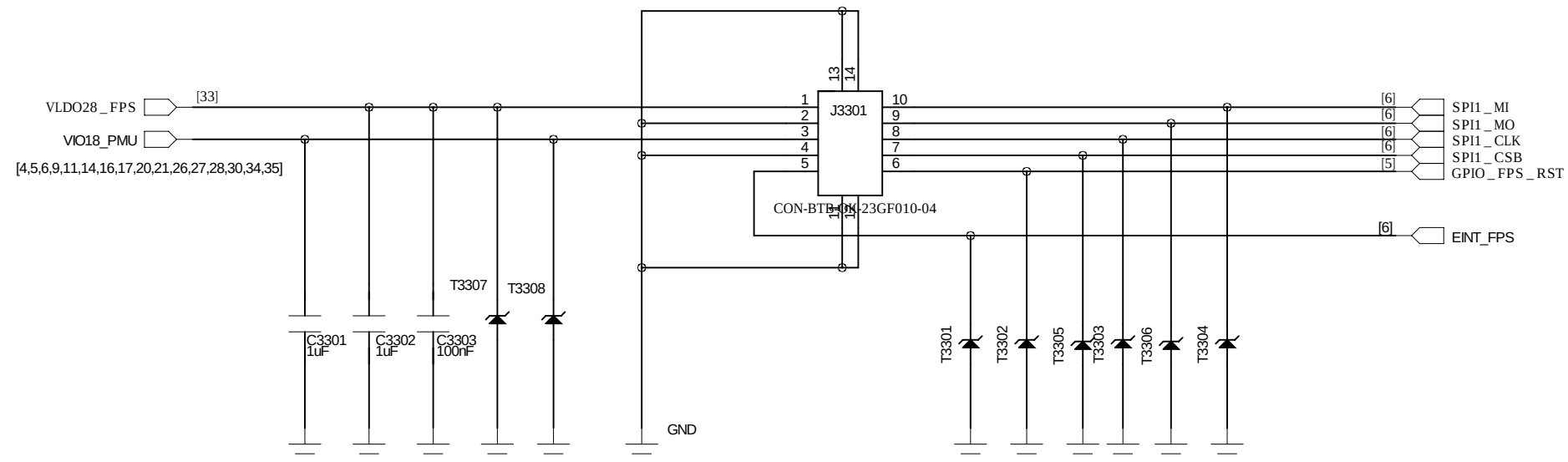


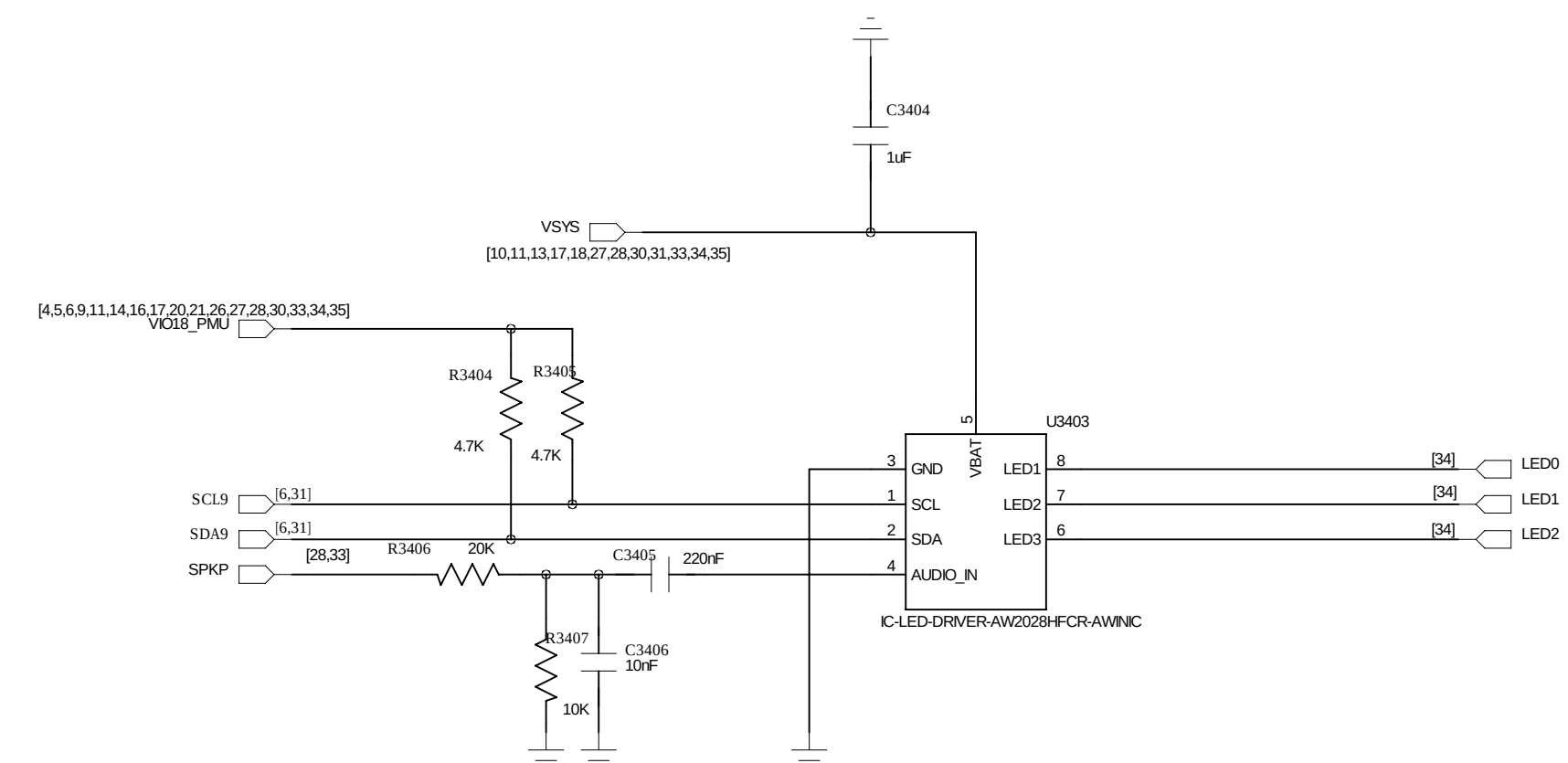
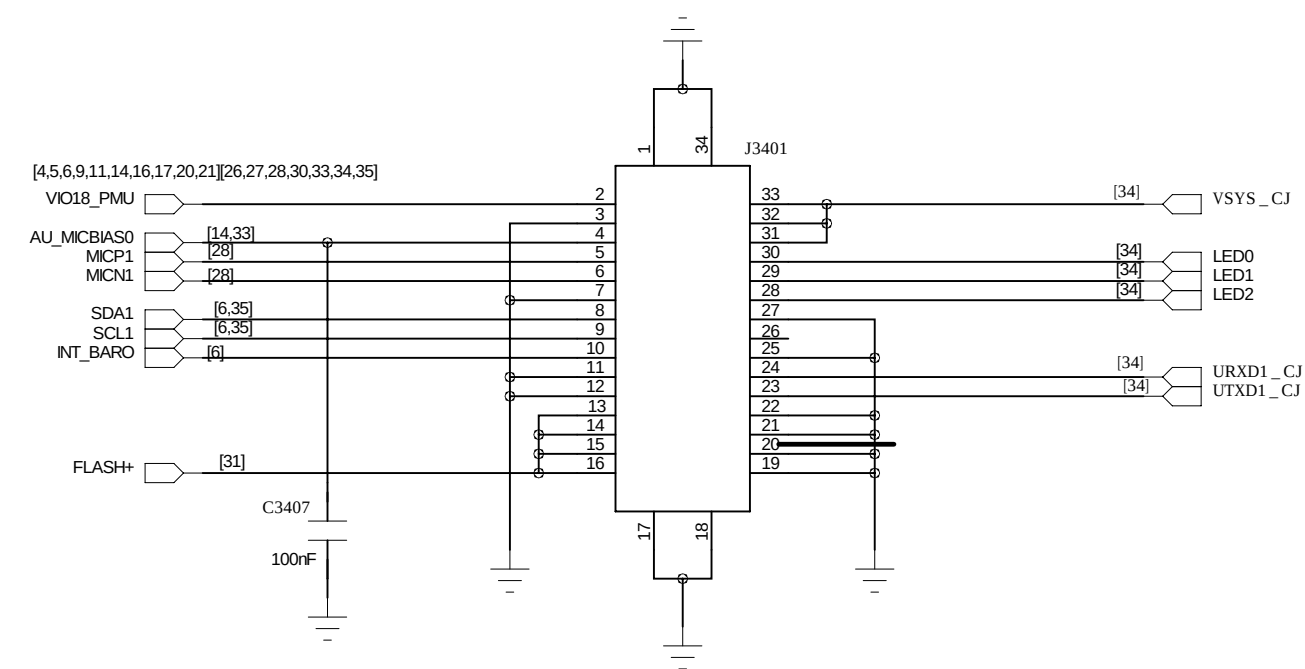
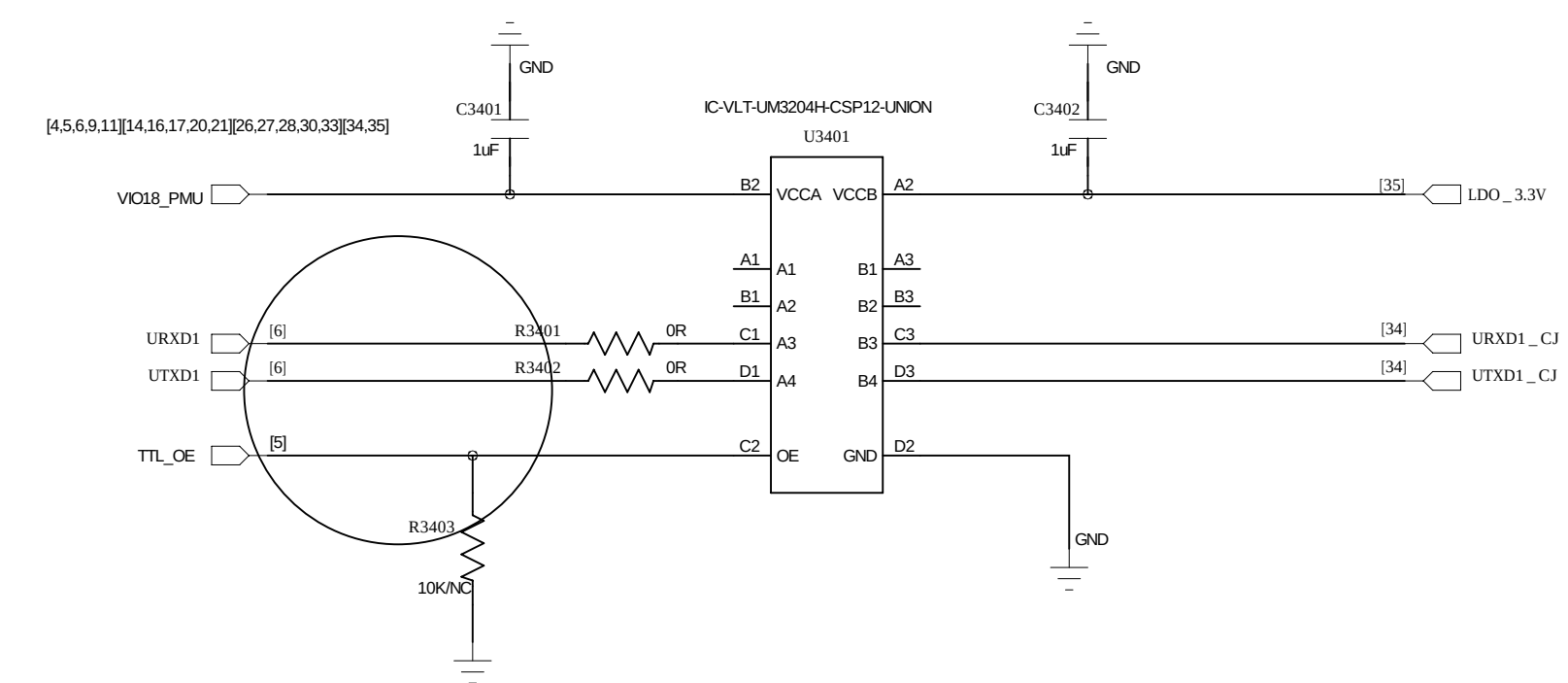
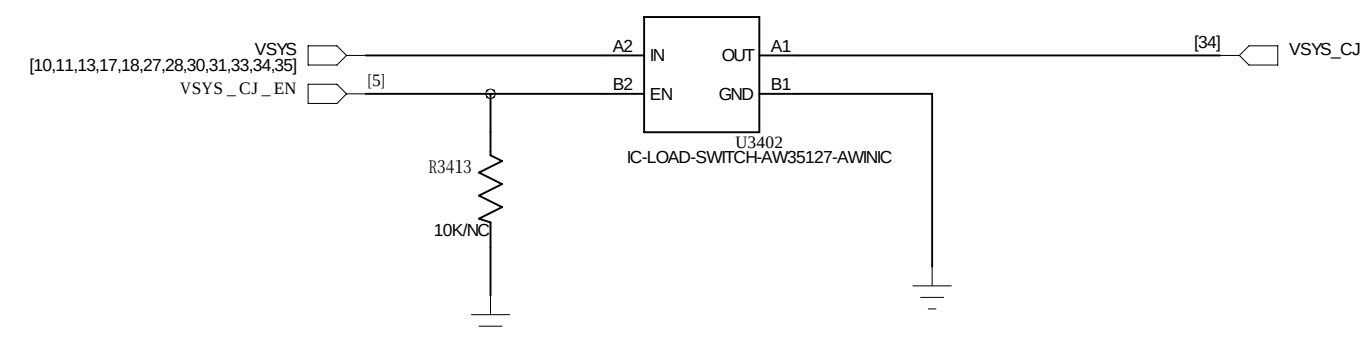
COMPANY: Wheatek ԷՊՇԱՆԵՐ ԷՎՈԼՅՈՒՄ				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 32_PERI_CAMERA_FRONT		VERSION: V1.1	SHEET: 32 OF 36
CHECKED		DATED					

SUB



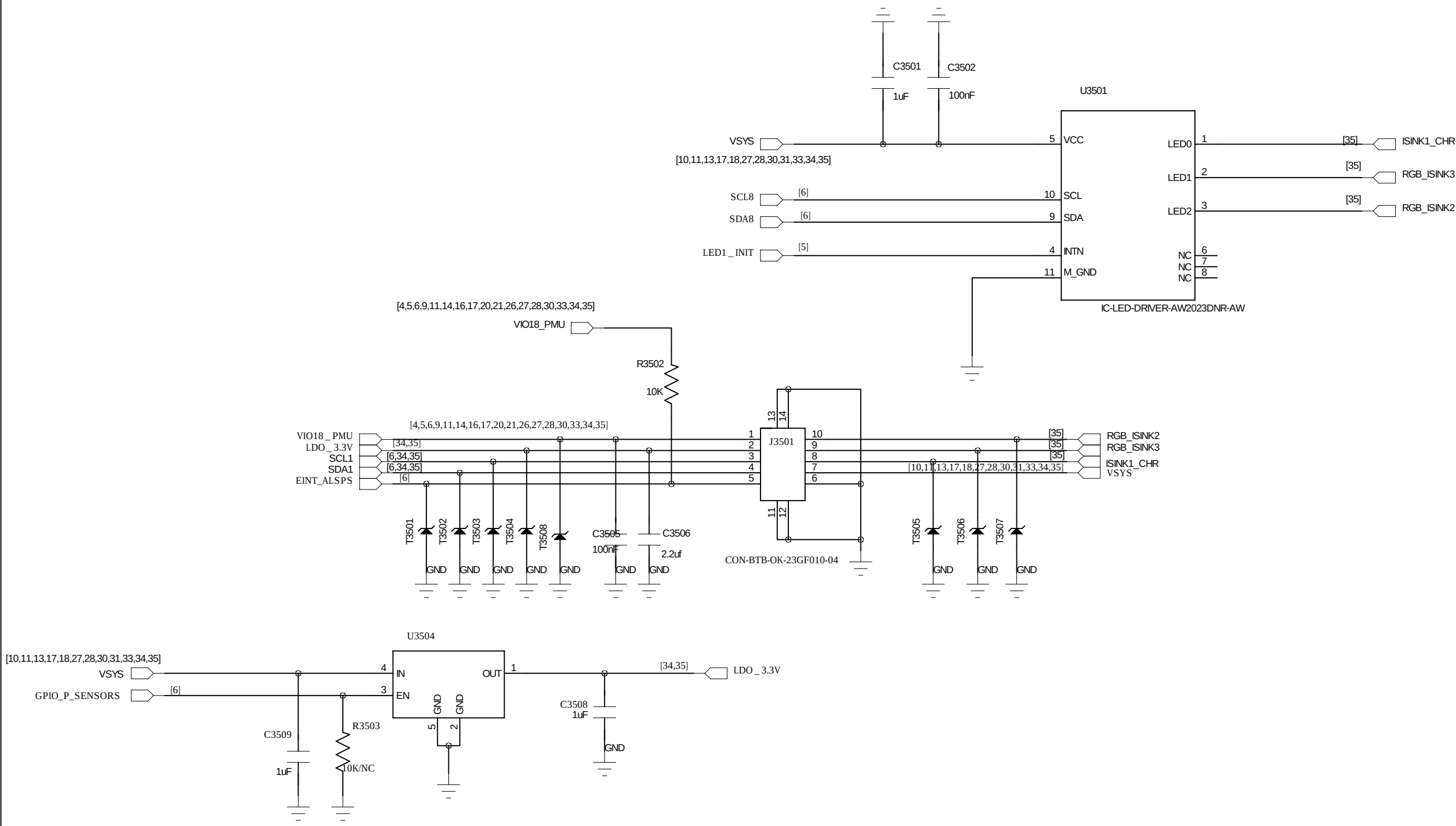
Fingerprint Connector



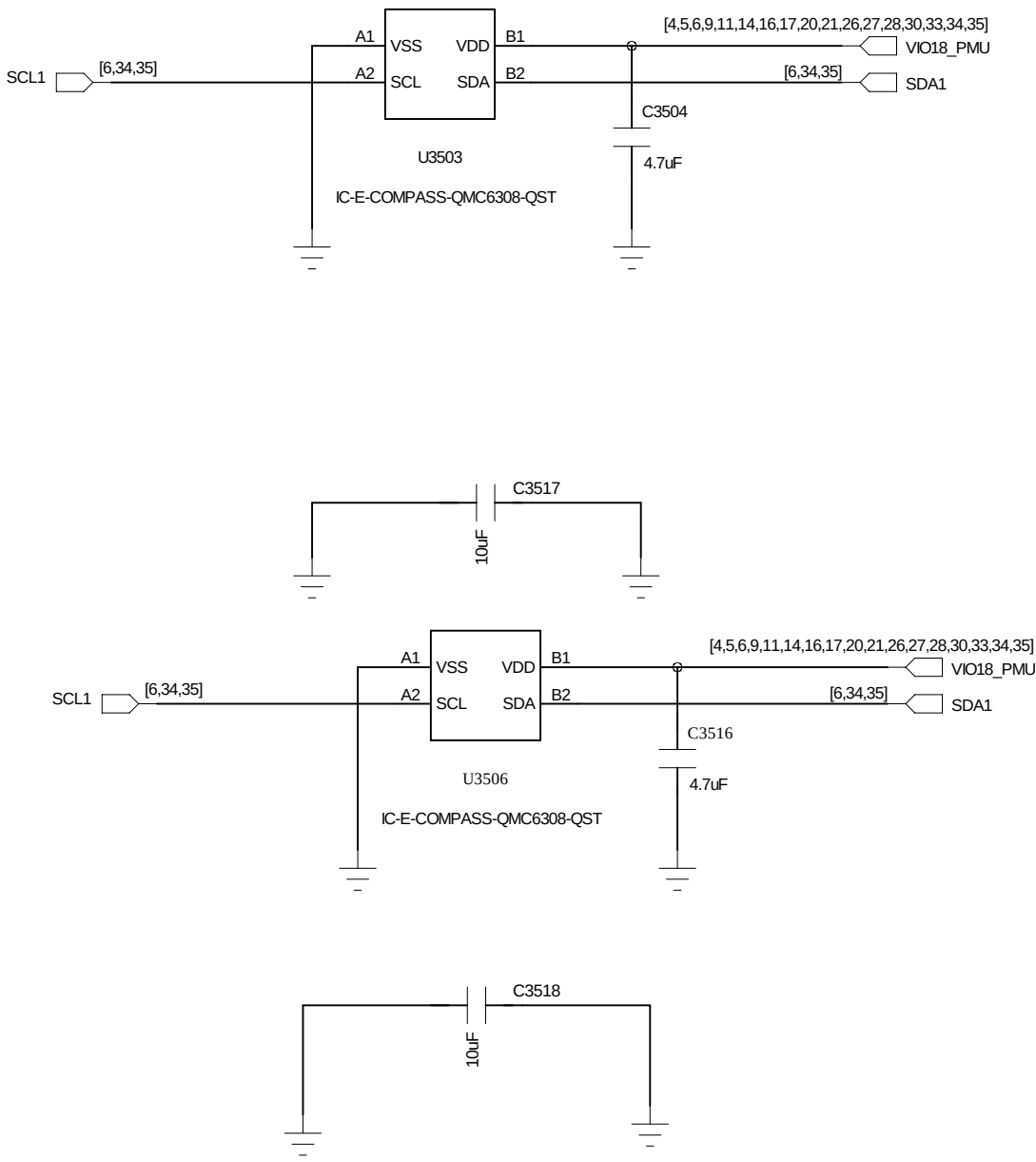


COMPANY: Wheatek Engineering, Inc. 1100 E. 700th Ave.				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 34_PERI_CJ		VERSION: V1.1	SHEET: 34 OF 36
CHECKED		DATED					

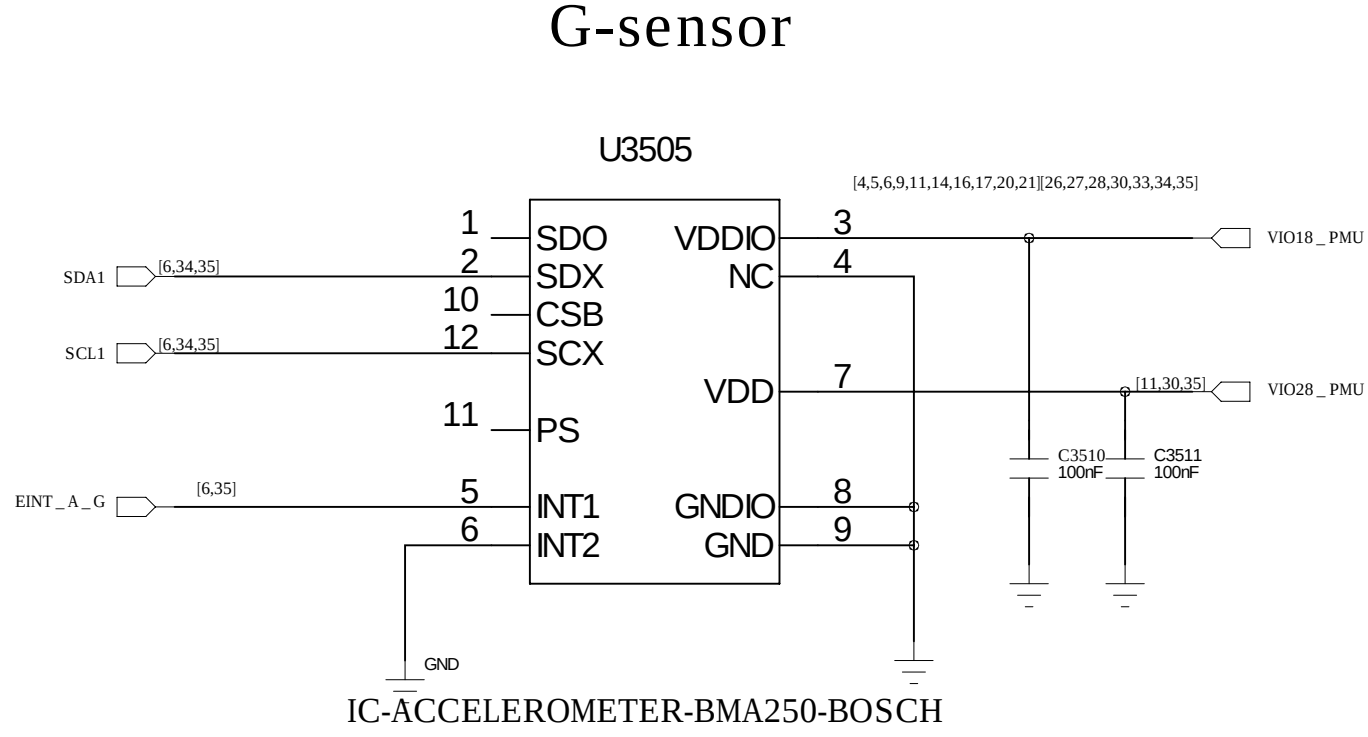
Ambient light Proximity sensor and Front Flash



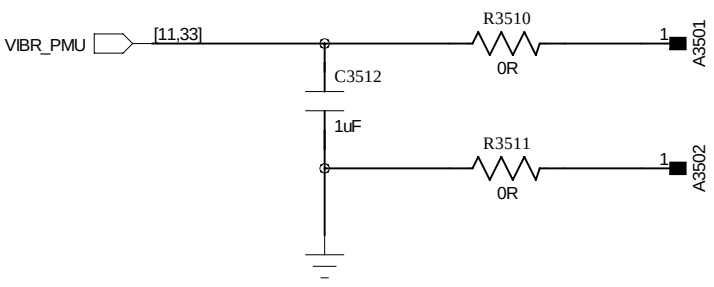
Compass



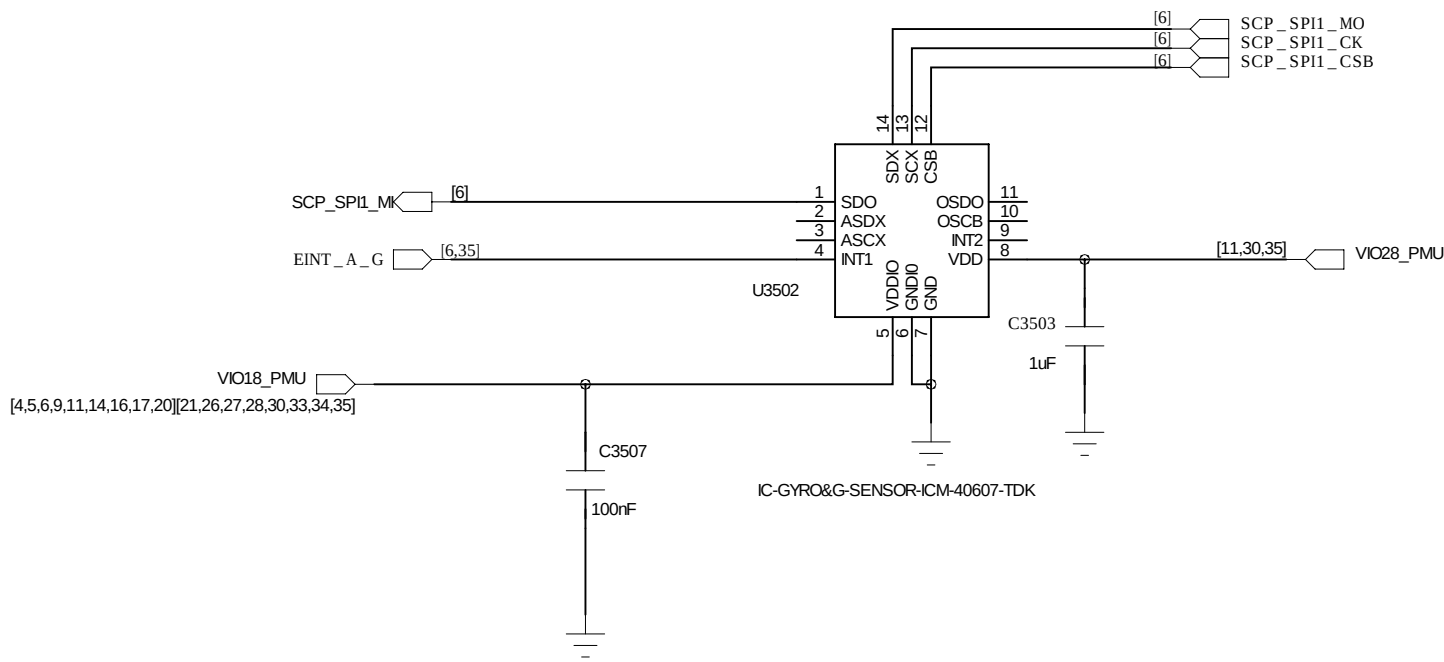
G-sensor



VIB



Gyroscope



COMPANY: Wheatek ΕΤΕ				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 35_PERI_SENSORS_MEMS_ALS/PS		VERSION: V1.1	SHEET: 35 OF 36
CHECKED		DATED					

COMPANY: Wheatek Engineering				MODEL: TE177		Modified Date: 2022/10/21	
DRAWN	WK/SP	DATED	2022/09/22	TITLE: 36_PERI_WPC		VERSION: V1.1	SHEET: 36 OF 36
CHECKED		DATED					