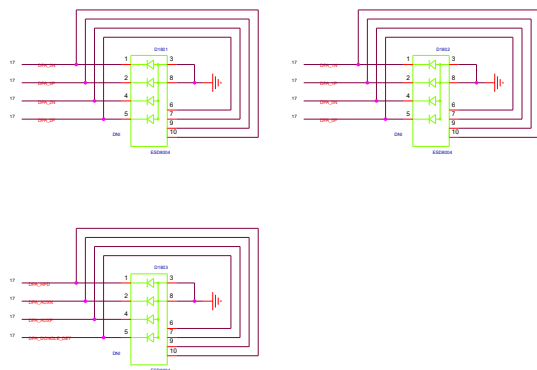
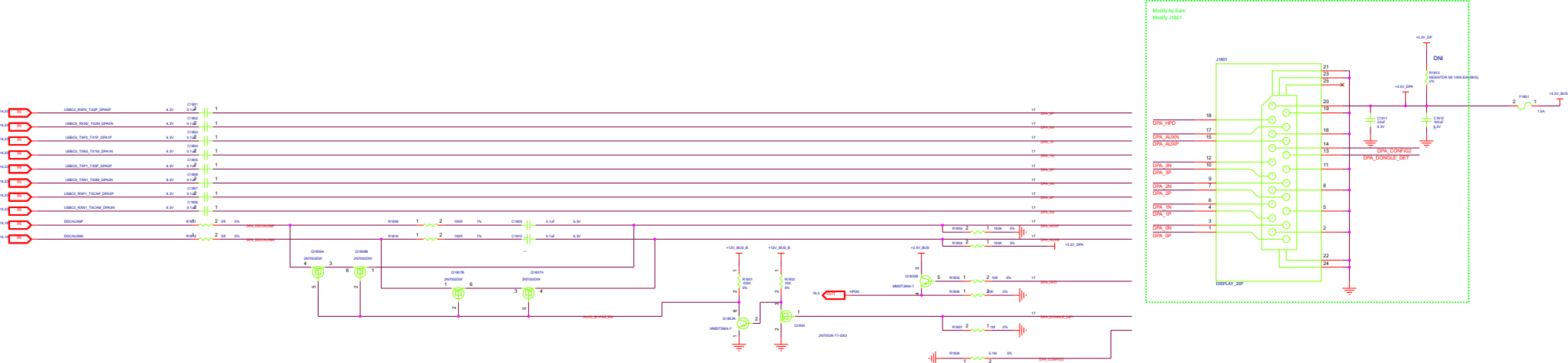
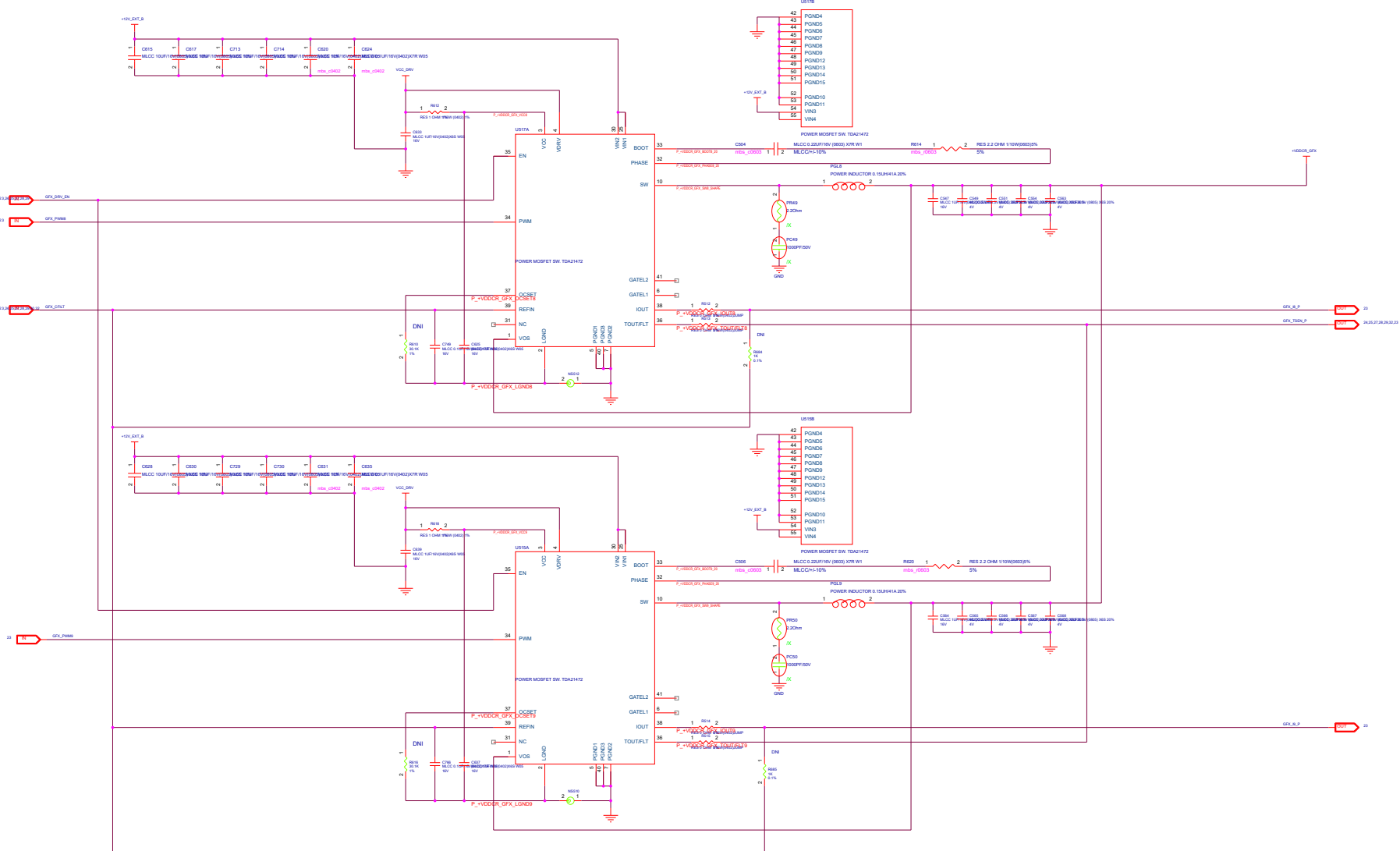


DeviceDB VIP + XinZhiZhi 1 Year: www.device-db.xyz/dev/subscriptions/

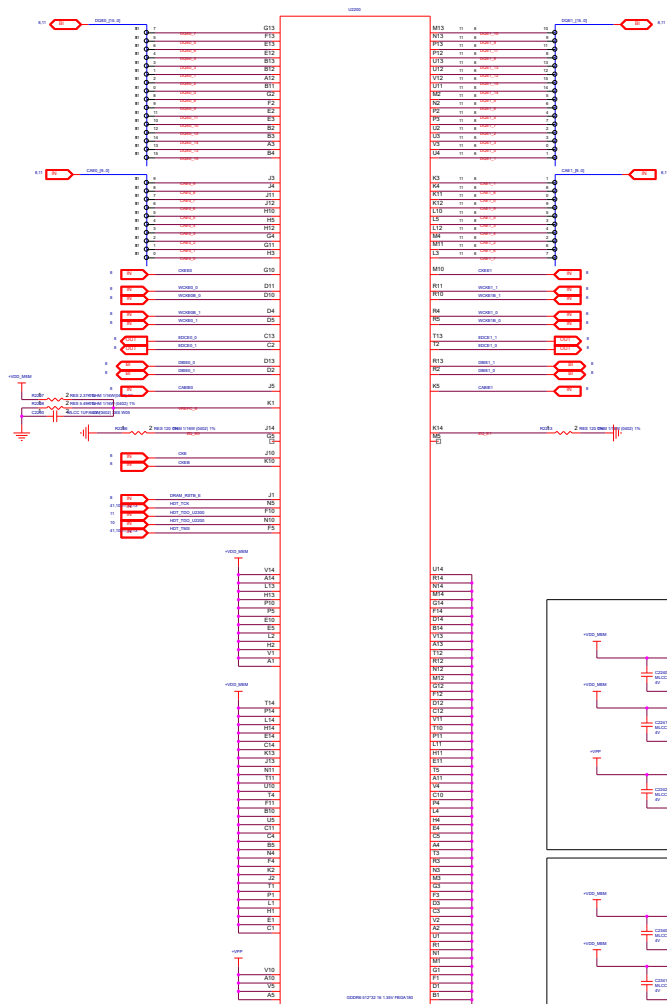


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



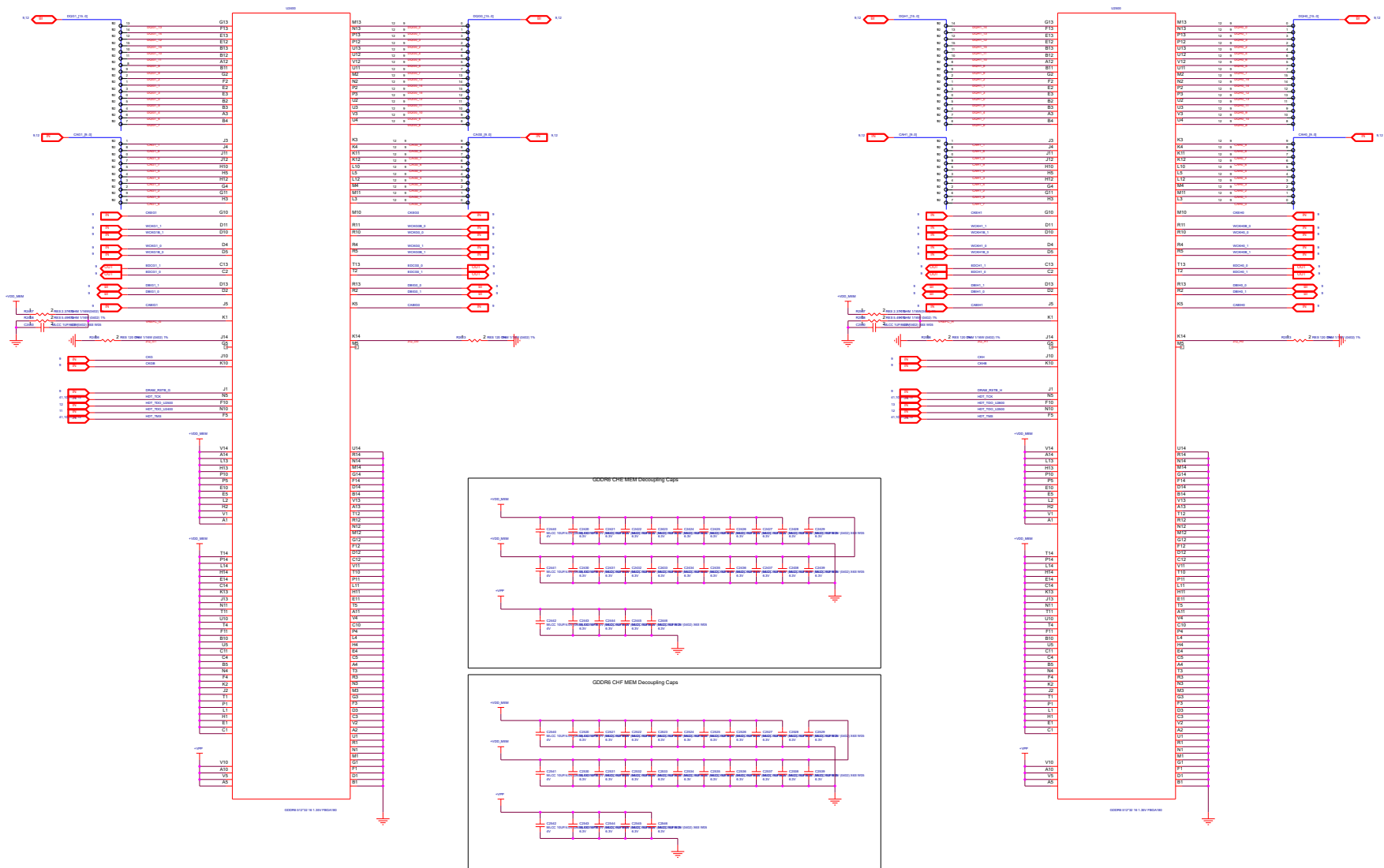
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

ASIC CH0 -> MEM CHA
ASIC CH1 -> MEM CHB

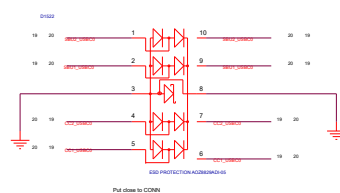
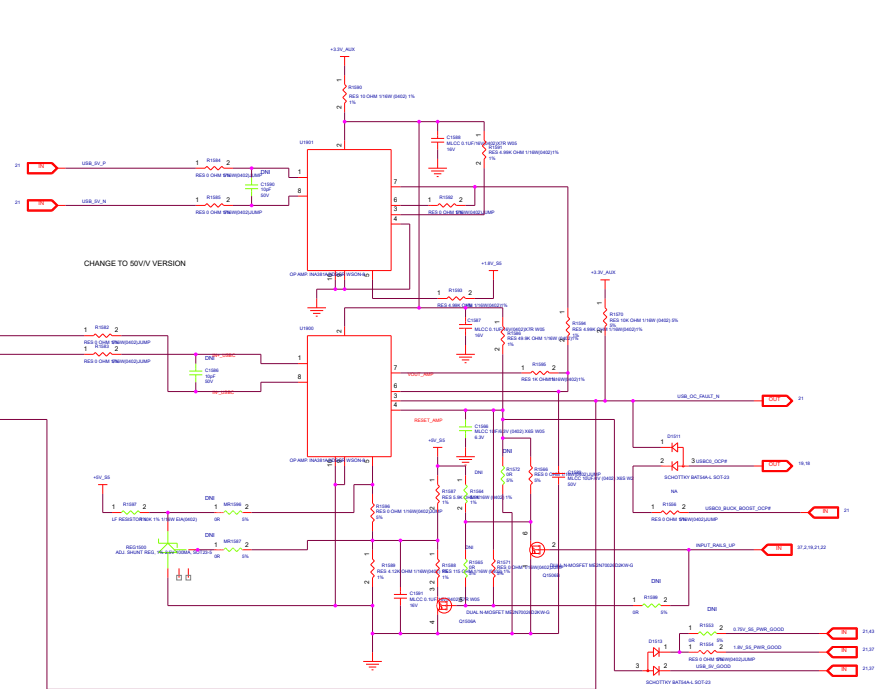


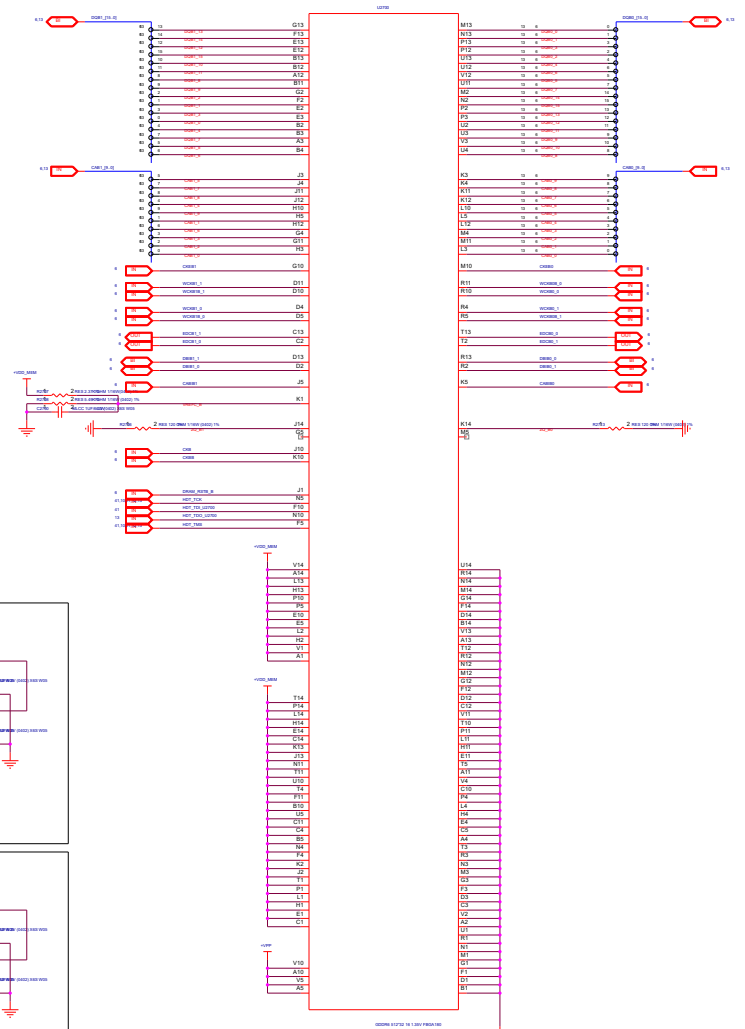
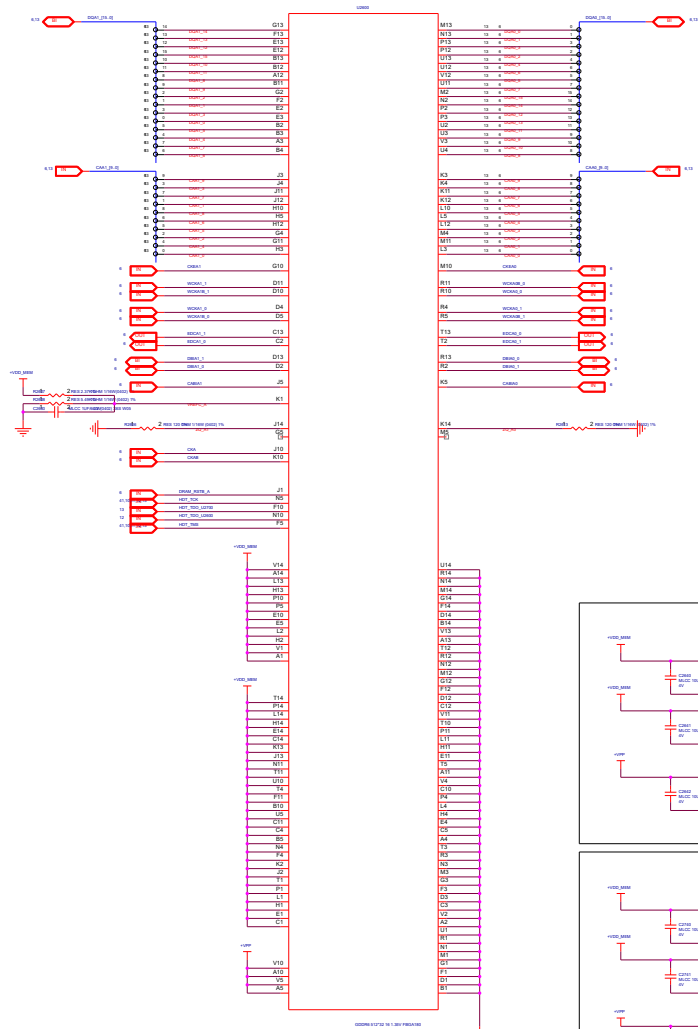
ASIC CH0 -> MEM CHB
ASIC CH1 -> MEM CHA

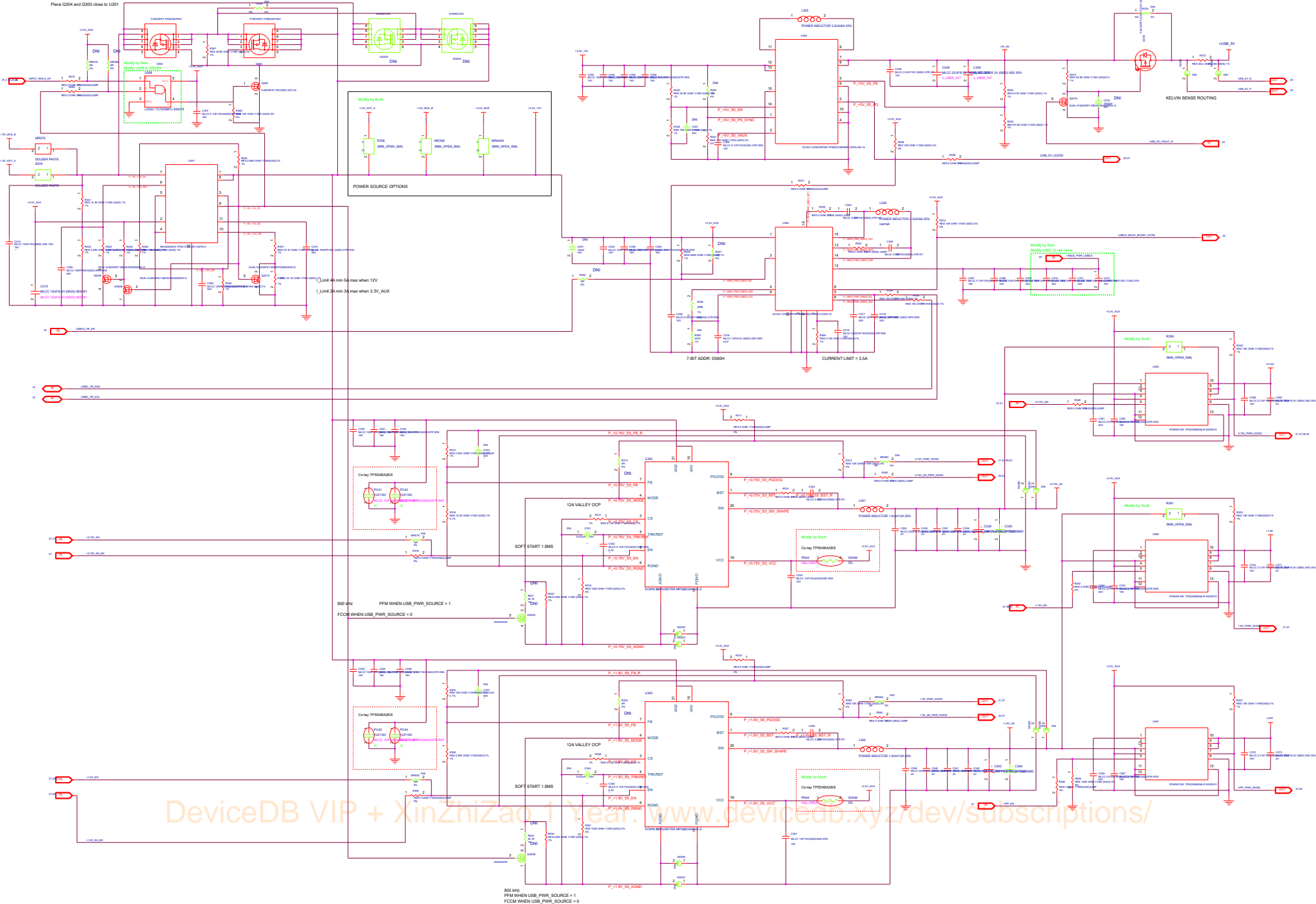
ASIC CH0 -> MEM CHB
ASIC CH1 -> MEM CHA



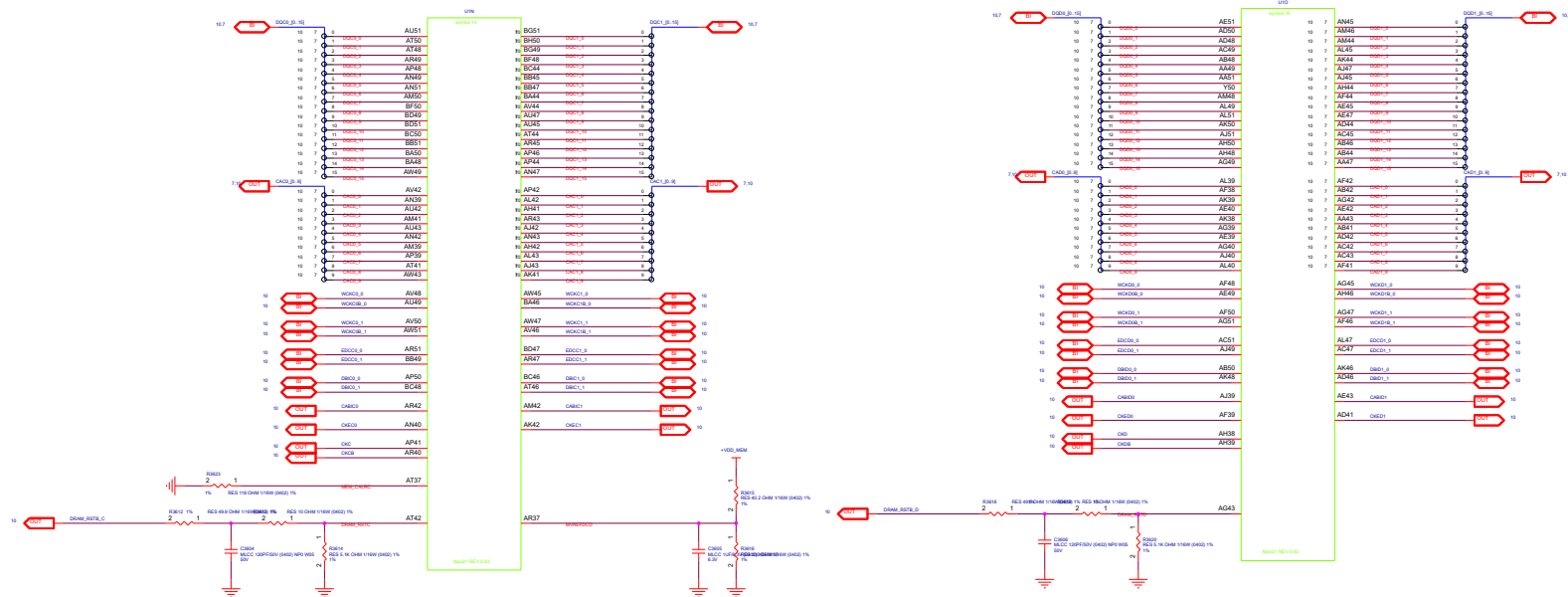
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



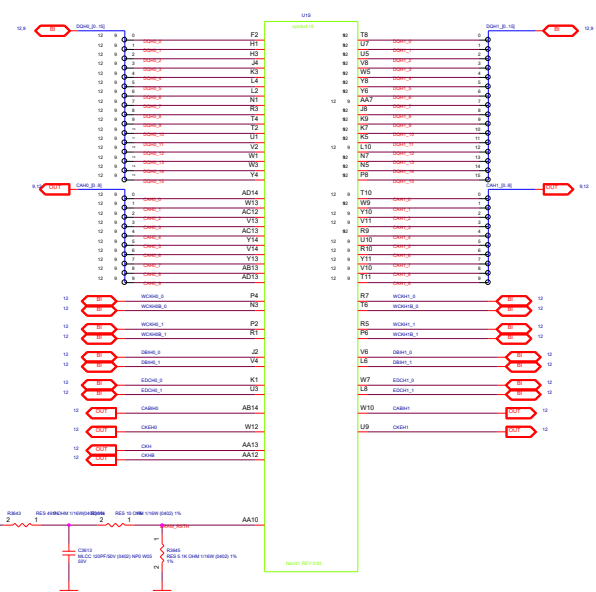
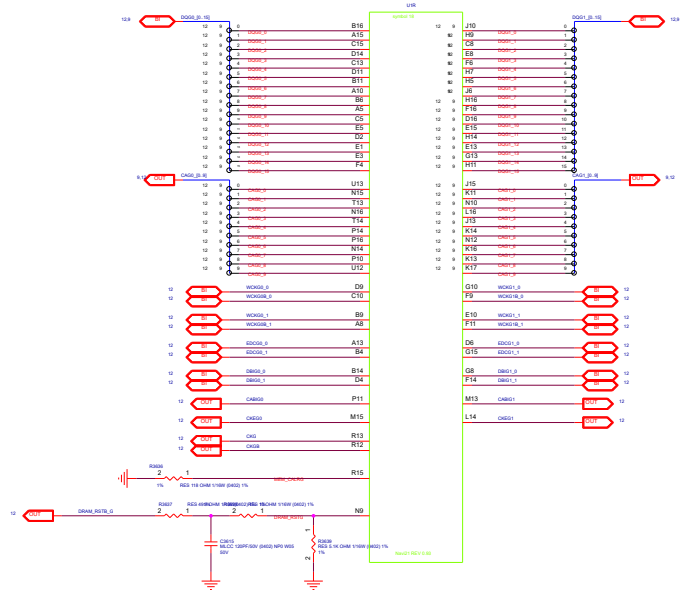




DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



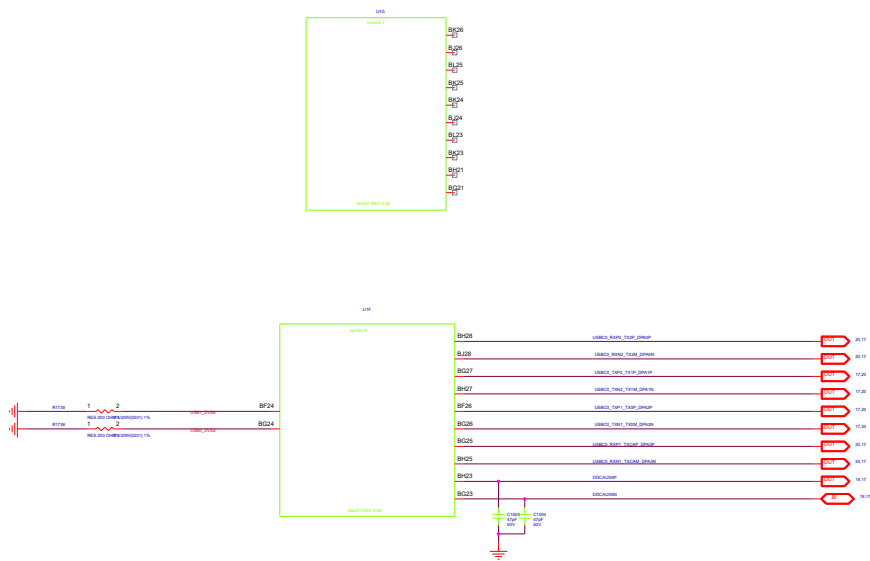
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

TABLE OF CONTENTS

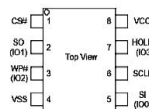
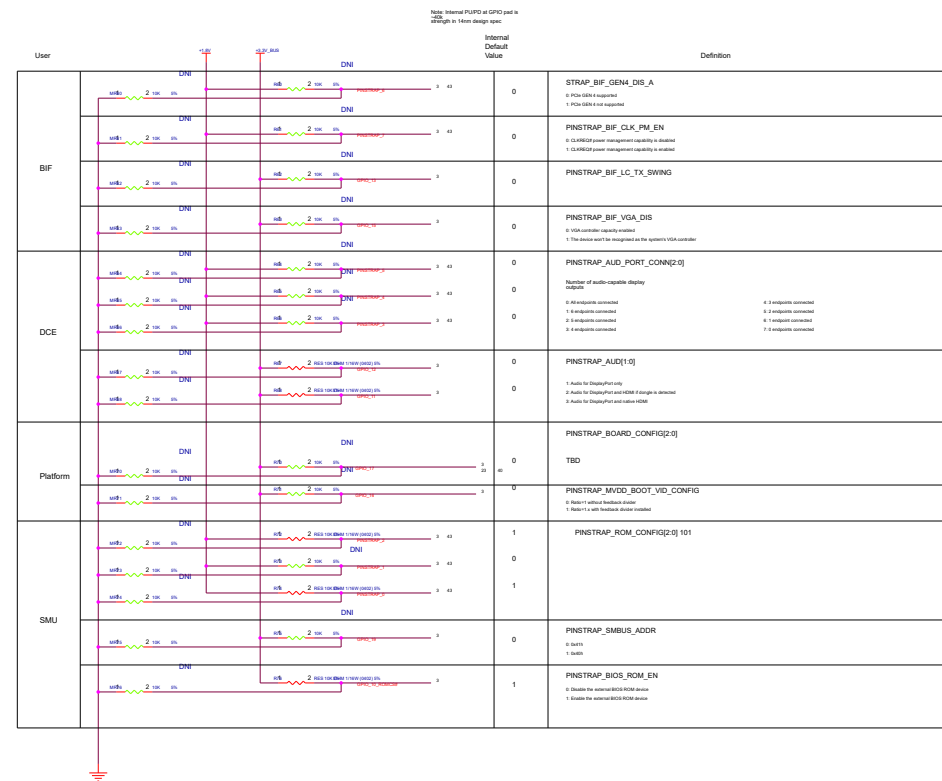
SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME
1	TOC	26	GFX PHASES 8&9
2	NAVI 21 - PCIe Interface	27	GFX PHASES 11
3	NAVI 21 - GPIOs	28	GFX PHASES 5&7
4	NAVI 21 XTAL	29	GFX PHASES 3&10
5	XGMI	30	SOC PHASE 1&2
6	NAVI 21 MEM CH AB	31	VDD_MEM & VDDCI CONTROLLER
7	NAVI 21 MEM CH CD	32	VDD_MEM PHASES 1&2
8	NAVI 21 MEM CH EF	33	VDDCI_MEM PHASE 1
9	NAVI 21 MEM CH GH	34	NAVI 21 DECAPS
10	GDDR6 MEM CH CD	35	NAVI 21 POWER
11	GDDR6 MEM CH EF	36	NAVI 21 POWER and GND
12	GDDR6 MEM CH GH	37	POWER_MANAGEMENT
13	GDDR6 MEM CH AB	38	ClampWA
14	NAVI21 TMDPA - USB-C	39	SVIZ & BxMACD
15	NAVI21 TMDPF - HDMI	40	THERMAL
16	NAVI21 TMDPC&E - DP	41	DPM_Status_LED & GDDR6_JTAG
17	NAVI21 TMDPA	42	PI Debug
18	NAVI21 USB	43	DEBUG
19	PD Controller	44	History
20	USB-C PORT 1		
21	USB_SV_1.8V_0.75V		
22	MODS CONTROL & POWER		
23	GFX & SOC CONTROLLER		
24	GFX PHASES 1&2		
25	GFX PHASES 4&6		

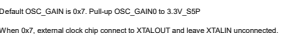
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/




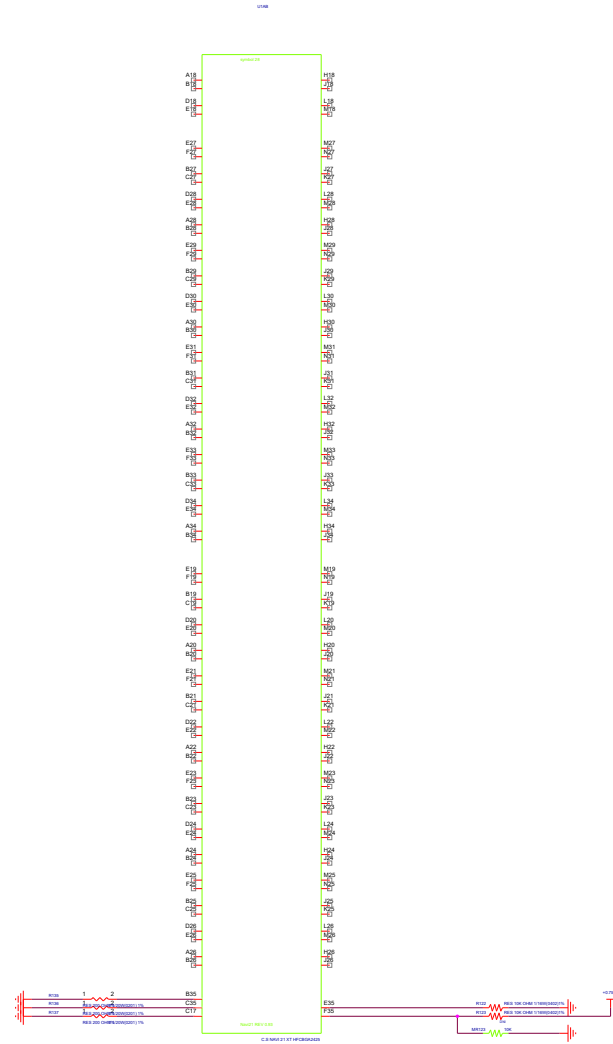


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

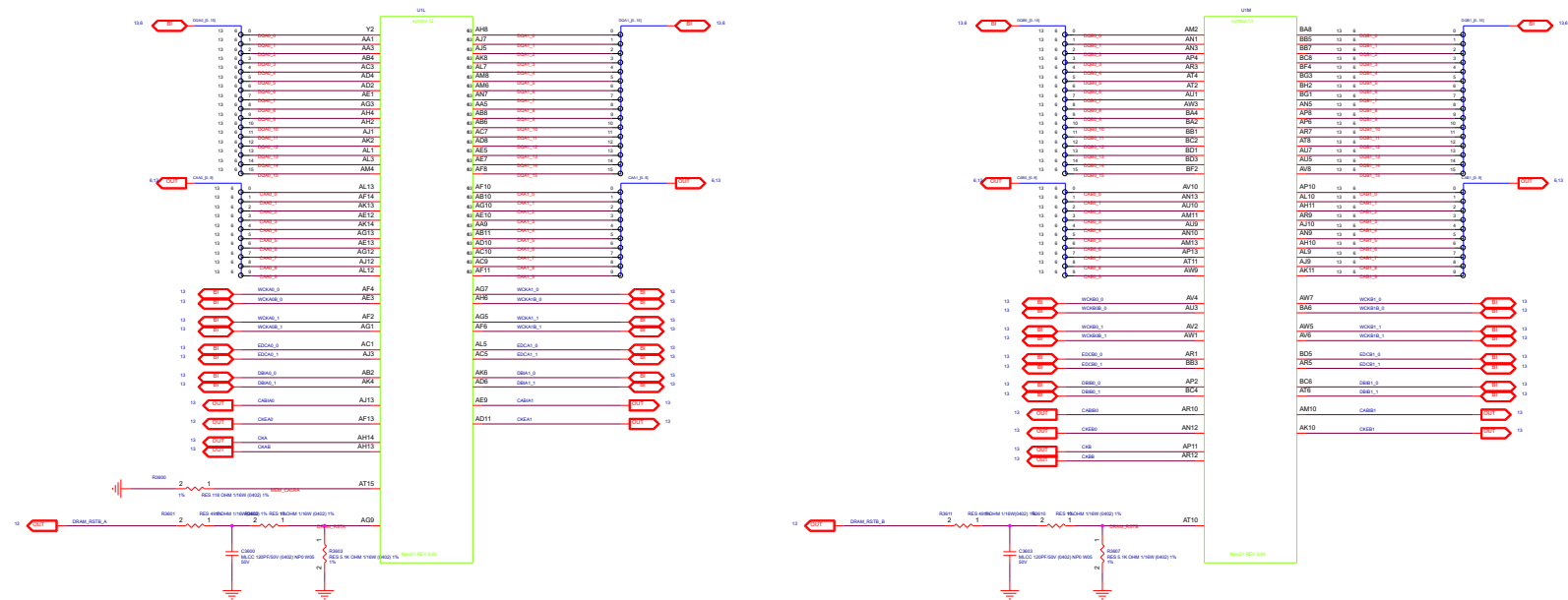




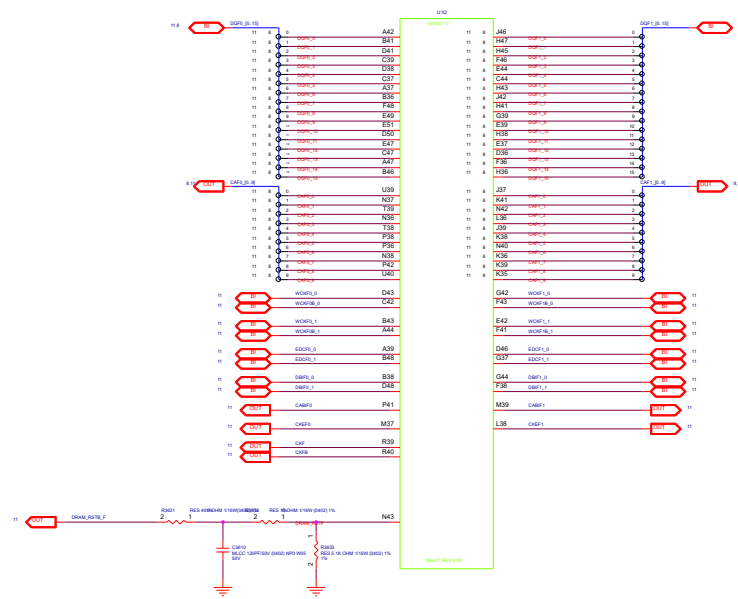
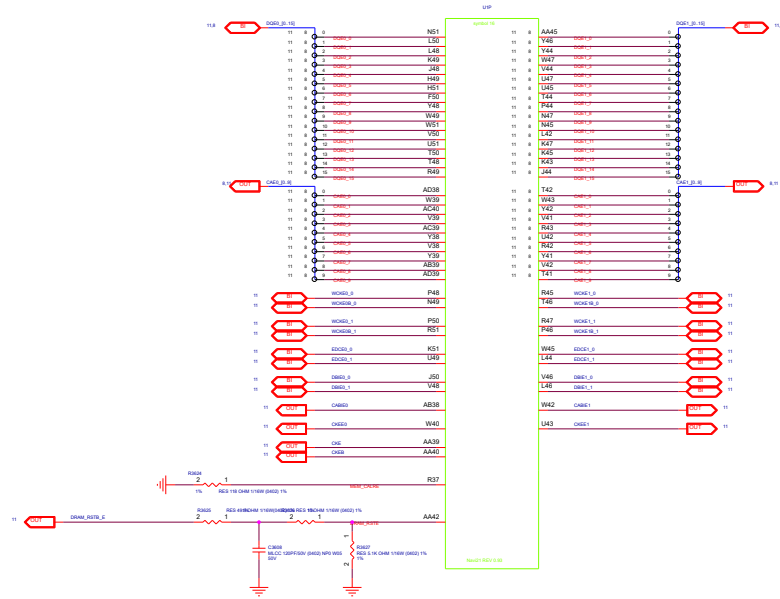
		Title : 04 NAVI 21 XTAL	
<OrigName>		Engineer: Sam Hom	
Size Custom	Project Name D412BS		Rev 1.00X
Date: Tuesday, November 10, 2020		Sheet 04 of 51	



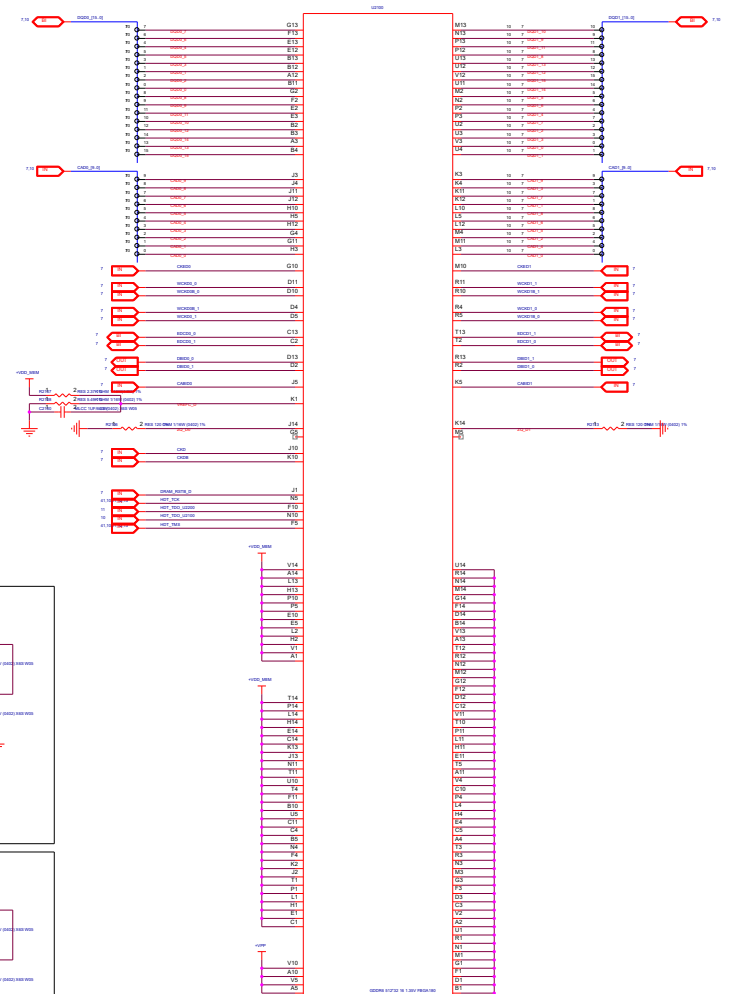
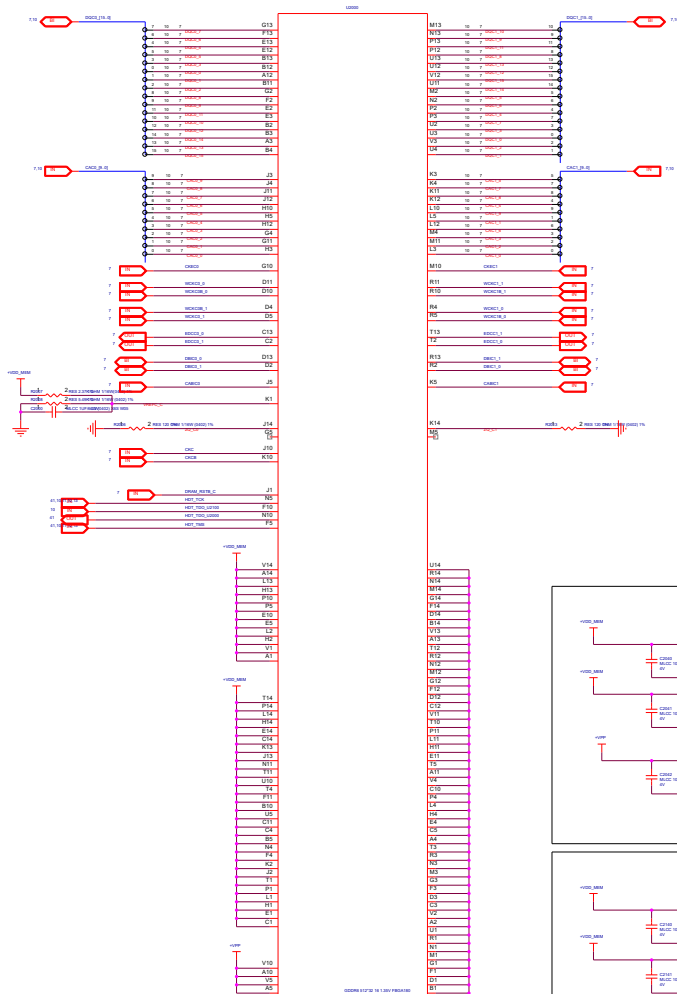
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



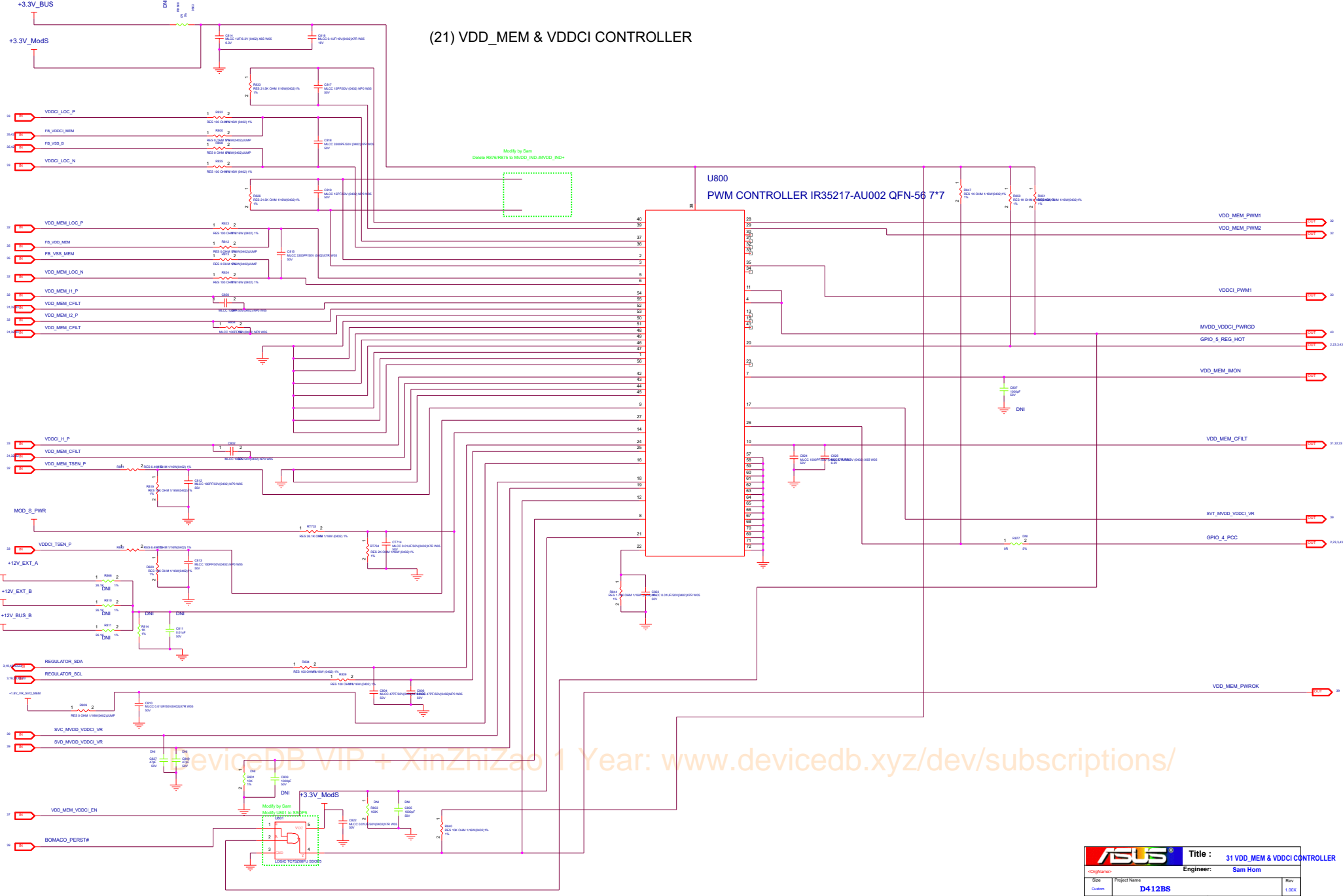
DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/



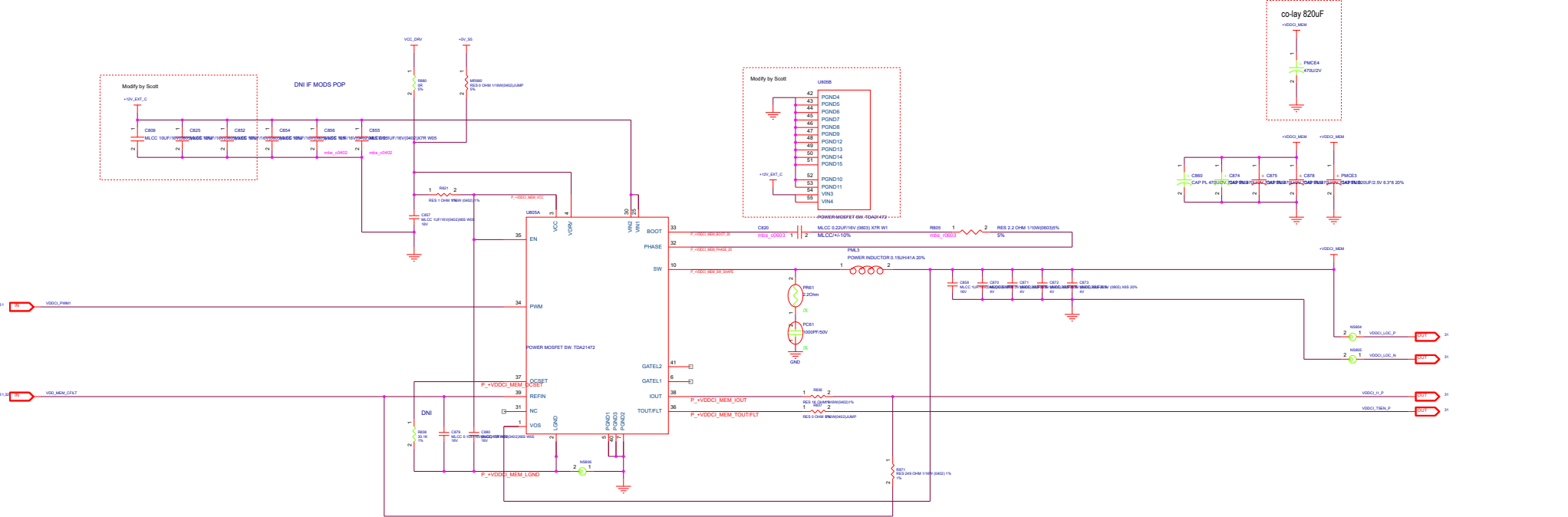
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/





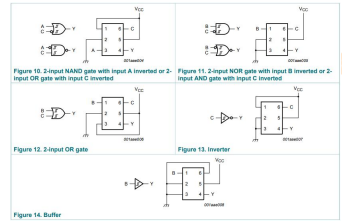


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

Modify by Scott
Delete OC1112QC113QC115QC116QC117QC118QC119

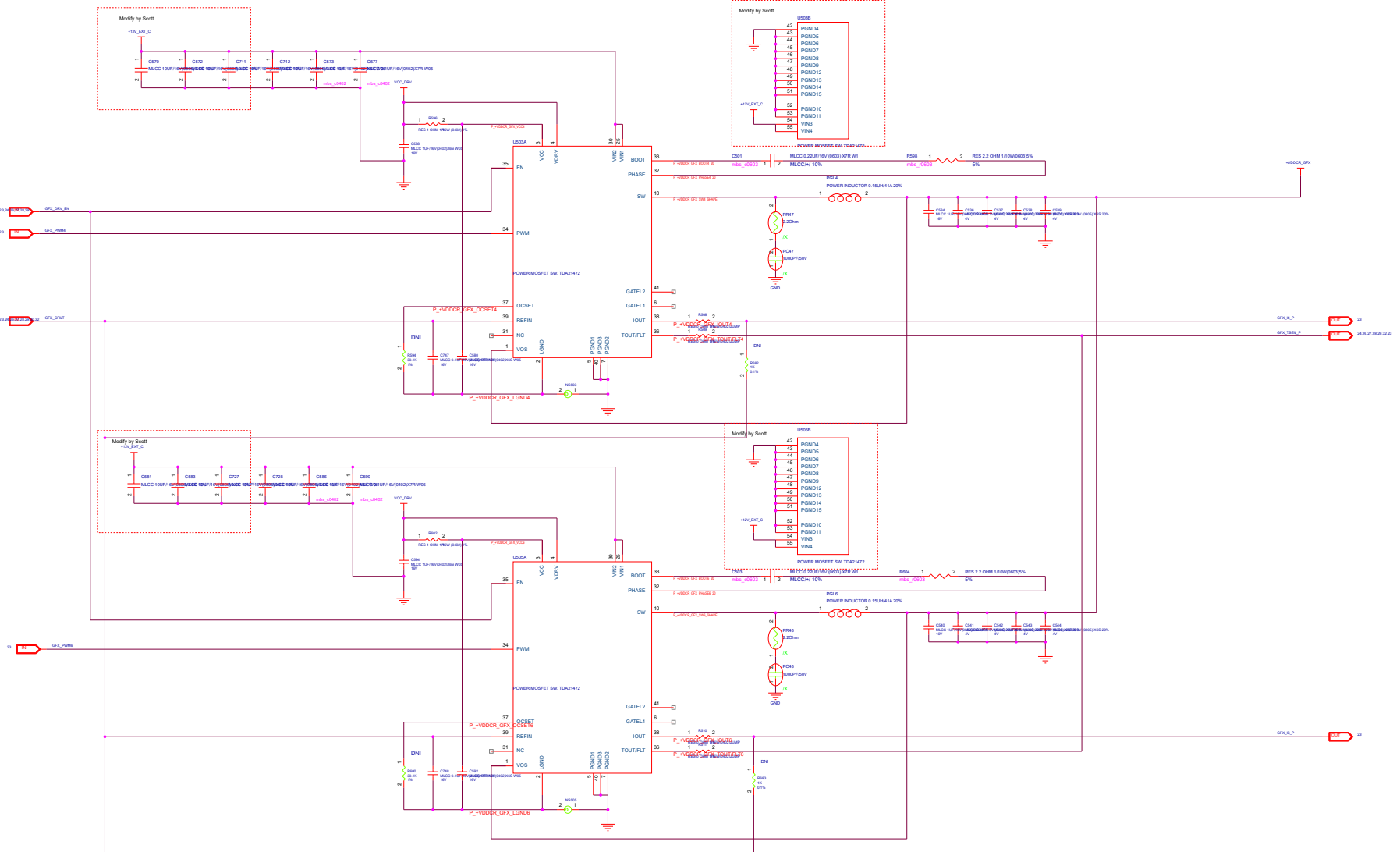
Modify by Scott:

Delete UC1115UC116UC117UC118UC119UC120UC121UC122UC123UC124
UC125UC126UC127UC128UC129UC130UC131UC132UC133UC134UC135UC136UC137UC138UC139UC140UC141UC142UC143UC144UC145UC146UC147UC148UC149UC150UC151UC152UC153UC154UC155UC156UC157UC158UC159UC160UC161UC162UC163UC164UC165UC166UC167UC168UC169UC170UC171UC172UC173UC174UC175UC176UC177UC178UC179UC180UC181UC182UC183UC184UC185UC186UC187UC188UC189UC190UC191UC192UC193UC194UC195UC196UC197UC198UC199UC200UC201UC202UC203UC204UC205UC206UC207UC208UC209UC210UC211UC212UC213UC214UC215UC216UC217UC218UC219UC220UC221UC222UC223UC224UC225UC226UC227UC228UC229UC230UC231UC232UC233UC234UC235UC236UC237UC238UC239UC240UC241UC242UC243UC244UC245UC246UC247UC248UC249UC250UC251UC252UC253UC254UC255UC256UC257UC258UC259UC260UC261UC262UC263UC264UC265UC266UC267UC268UC269UC270UC271UC272UC273UC274UC275UC276UC277UC278UC279UC280UC281UC282UC283UC284UC285UC286UC287UC288UC289UC290UC291UC292UC293UC294UC295UC296UC297UC298UC299UC300UC301UC302UC303UC304UC305UC306UC307UC308UC309UC310UC311UC312UC313UC314UC315UC316UC317UC318UC319UC320UC321UC322UC323UC324UC325UC326UC327UC328UC329UC330UC331UC332UC333UC334UC335UC336UC337UC338UC339UC340UC341UC342UC343UC344UC345UC346UC347UC348UC349UC350UC351UC352UC353UC354UC355UC356UC357UC358UC359UC360UC361UC362UC363UC364UC365UC366UC367UC368UC369UC370UC371UC372UC373UC374UC375UC376UC377UC378UC379UC380UC381UC382UC383UC384UC385UC386UC387UC388UC389UC390UC391UC392UC393UC394UC395UC396UC397UC398UC399UC400UC401UC402UC403UC404UC405UC406UC407UC408UC409UC410UC411UC412UC413UC414UC415UC416UC417UC418UC419UC420UC421UC422UC423UC424UC425UC426UC427UC428UC429UC430UC431UC432UC433UC434UC435UC436UC437UC438UC439UC440UC441UC442UC443UC444UC445UC446UC447UC448UC449UC450UC451UC452UC453UC454UC455UC456UC457UC458UC459UC460UC461UC462UC463UC464UC465UC466UC467UC468UC469UC470UC471UC472UC473UC474UC475UC476UC477UC478UC479UC480UC481UC482UC483UC484UC485UC486UC487UC488UC489UC490UC491UC492UC493UC494UC495UC496UC497UC498UC499UC500UC501UC502UC503UC504UC505UC506UC507UC508UC509UC510UC511UC512UC513UC514UC515UC516UC517UC518UC519UC520UC521UC522UC523UC524UC525UC526UC527UC528UC529UC530UC531UC532UC533UC534UC535UC536UC537UC538UC539UC540UC541UC542UC543UC544UC545UC546UC547UC548UC549UC550UC551UC552UC553UC554UC555UC556UC557UC558UC559UC560UC561UC562UC563UC564UC565UC566UC567UC568UC569UC570UC571UC572UC573UC574UC575UC576UC577UC578UC579UC580UC581UC582UC583UC584UC585UC586UC587UC588UC589UC590UC591UC592UC593UC594UC595UC596UC597UC598UC599UC600UC601UC602UC603UC604UC605UC606UC607UC608UC609UC610UC611UC612UC613UC614UC615UC616UC617UC618UC619UC620UC621UC622UC623UC624UC625UC626UC627UC628UC629UC630UC631UC632UC633UC634UC635UC636UC637UC638UC639UC640UC641UC642UC643UC644UC645UC646UC647UC648UC649UC650UC651UC652UC653UC654UC655UC656UC657UC658UC659UC660UC661UC662UC663UC664UC665UC666UC667UC668UC669UC670UC671UC672UC673UC674UC675UC676UC677UC678UC679UC680UC681UC682UC683UC684UC685UC686UC687UC688UC689UC690UC691UC692UC693UC694UC695UC696UC697UC698UC699UC700UC701UC702UC703UC704UC705UC706UC707UC708UC709UC710UC711UC712UC713UC714UC715UC716UC717UC718UC719UC720UC721UC722UC723UC724UC725UC726UC727UC728UC729UC730UC731UC732UC733UC734UC735UC736UC737UC738UC739UC740UC741UC742UC743UC744UC745UC746UC747UC748UC749UC750UC751UC752UC753UC754UC755UC756UC757UC758UC759UC760UC761UC762UC763UC764UC765UC766UC767UC768UC769UC770UC771UC772UC773UC774UC775UC776UC777UC778UC779UC780UC781UC782UC783UC784UC785UC786UC787UC788UC789UC790UC791UC792UC793UC794UC795UC796UC797UC798UC799UC800UC801UC802UC803UC804UC805UC806UC807UC808UC809UC810UC811UC812UC813UC814UC815UC816UC817UC818UC819UC820UC821UC822UC823UC824UC825UC826UC827UC828UC829UC830UC831UC832UC833UC834UC835UC836UC837UC838UC839UC840UC841UC842UC843UC844UC845UC846UC847UC848UC849UC850UC851UC852UC853UC854UC855UC856UC857UC858UC859UC860UC861UC862UC863UC864UC865UC866UC867UC868UC869UC870UC871UC872UC873UC874UC875UC876UC877UC878UC879UC880UC881UC882UC883UC884UC885UC886UC887UC888UC889UC890UC891UC892UC893UC894UC895UC896UC897UC898UC899UC900UC901UC902UC903UC904UC905UC906UC907UC908UC909UC910UC911UC912UC913UC914UC915UC916UC917UC918UC919UC920UC921UC922UC923UC924UC925UC926UC927UC928UC929UC930UC931UC932UC933UC934UC935UC936UC937UC938UC939UC940UC941UC942UC943UC944UC945UC946UC947UC948UC949UC950UC951UC952UC953UC954UC955UC956UC957UC958UC959UC960UC961UC962UC963UC964UC965UC966UC967UC968UC969UC970UC971UC972UC973UC974UC975UC976UC977UC978UC979UC980UC981UC982UC983UC984UC985UC986UC987UC988UC989UC990UC991UC992UC993UC994UC995UC996UC997UC998UC999

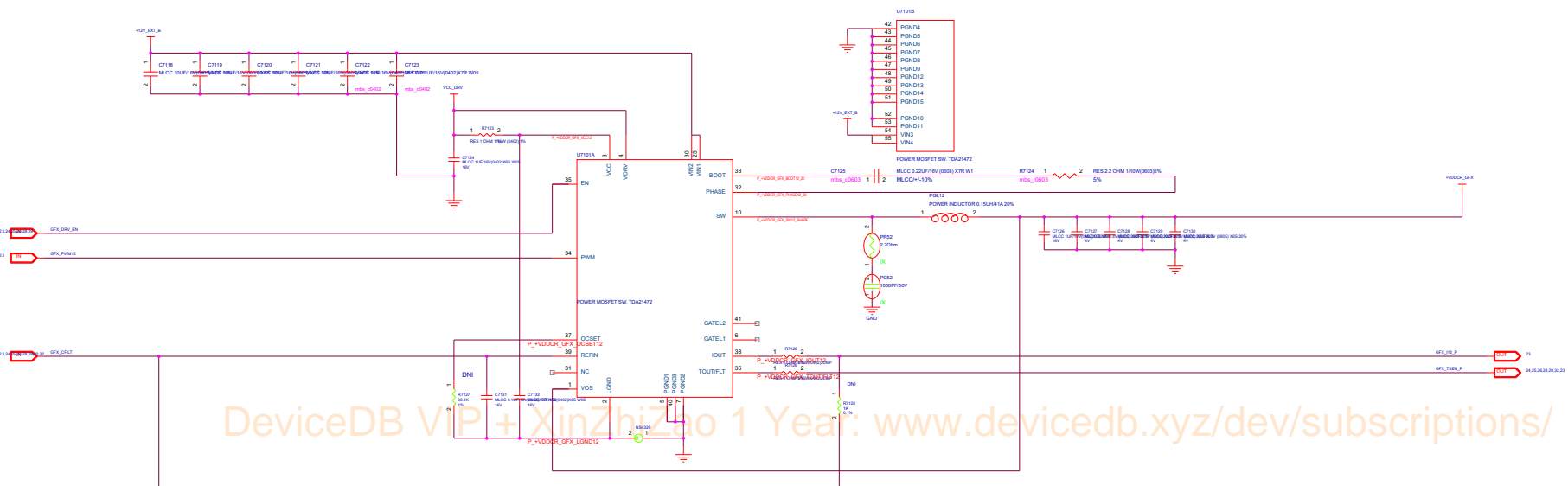
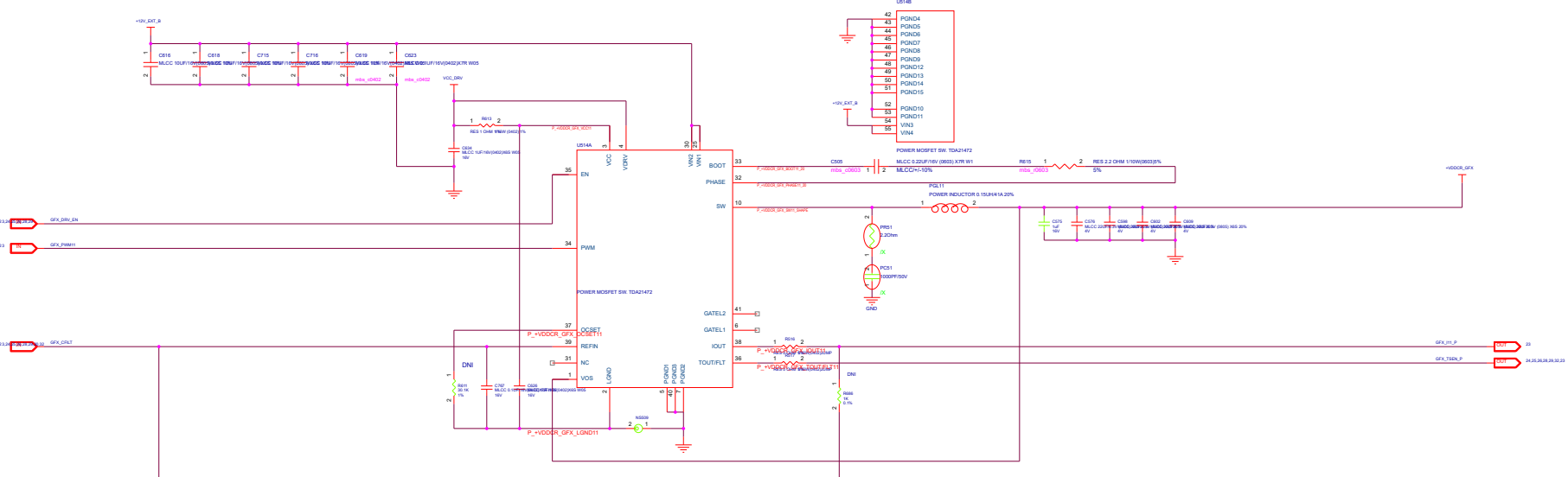


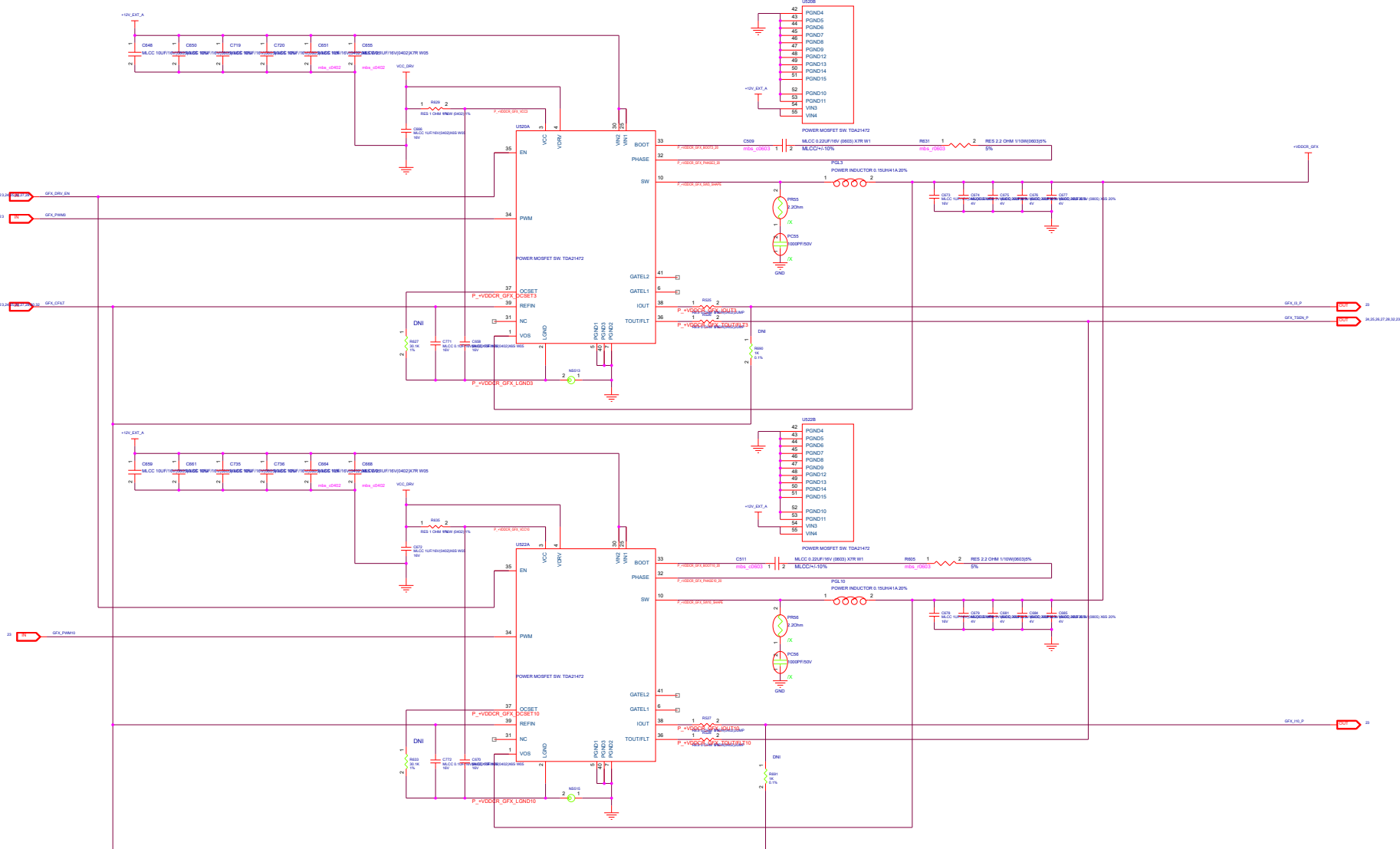
Modify by Scott
Delete OC1116QC117

DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

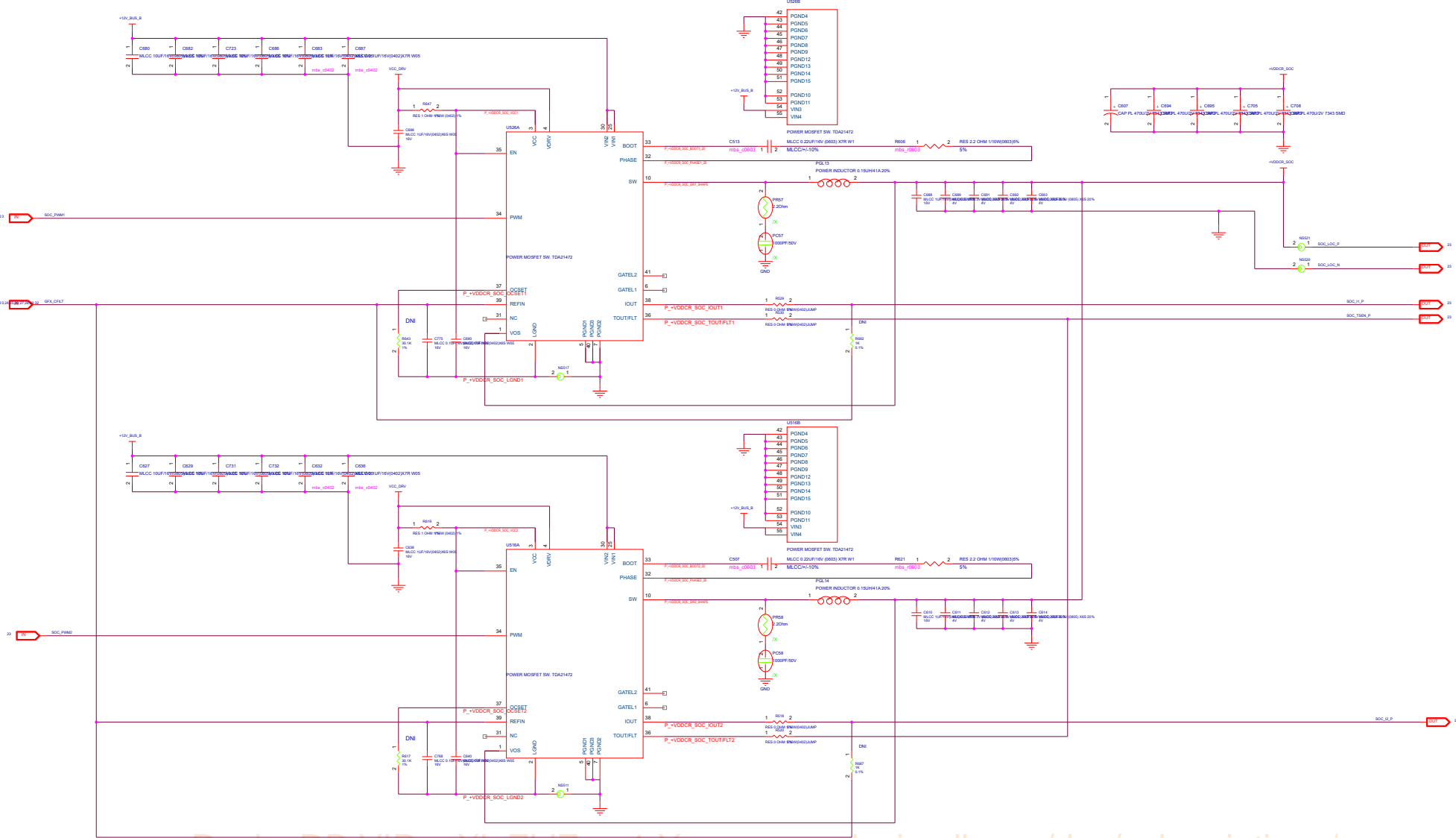


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

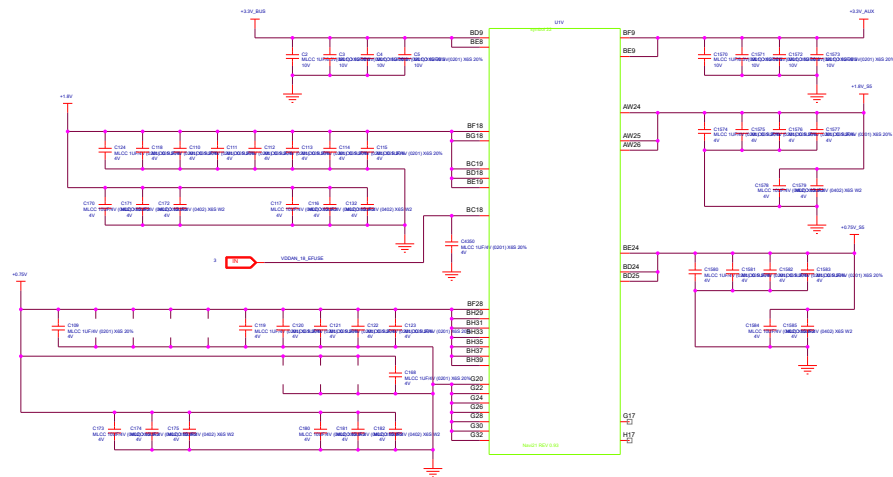
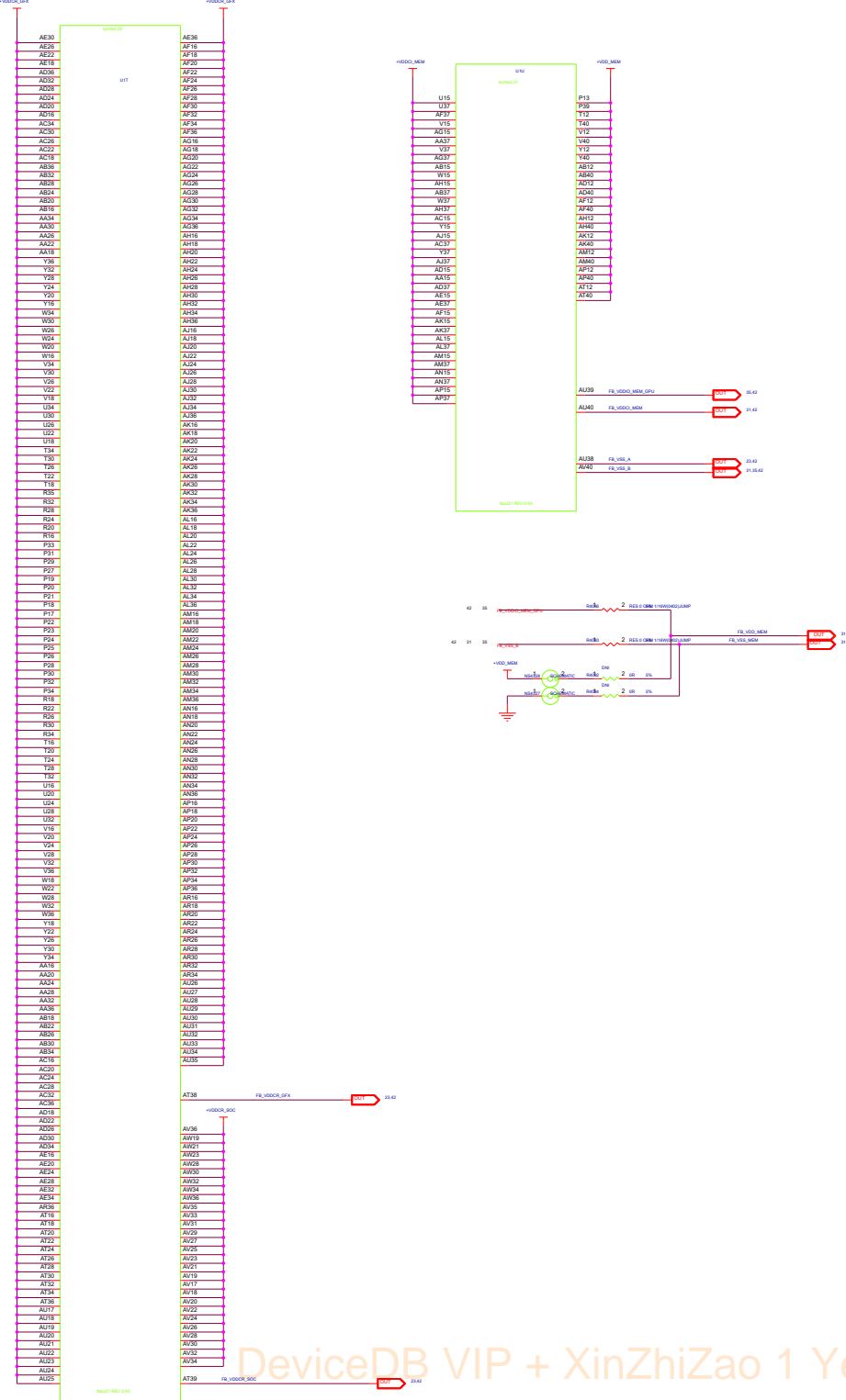




DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

FOR PI DAUGHTER CARD

Modify by Sam

Delete PI DAUGHTER CARD

DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/

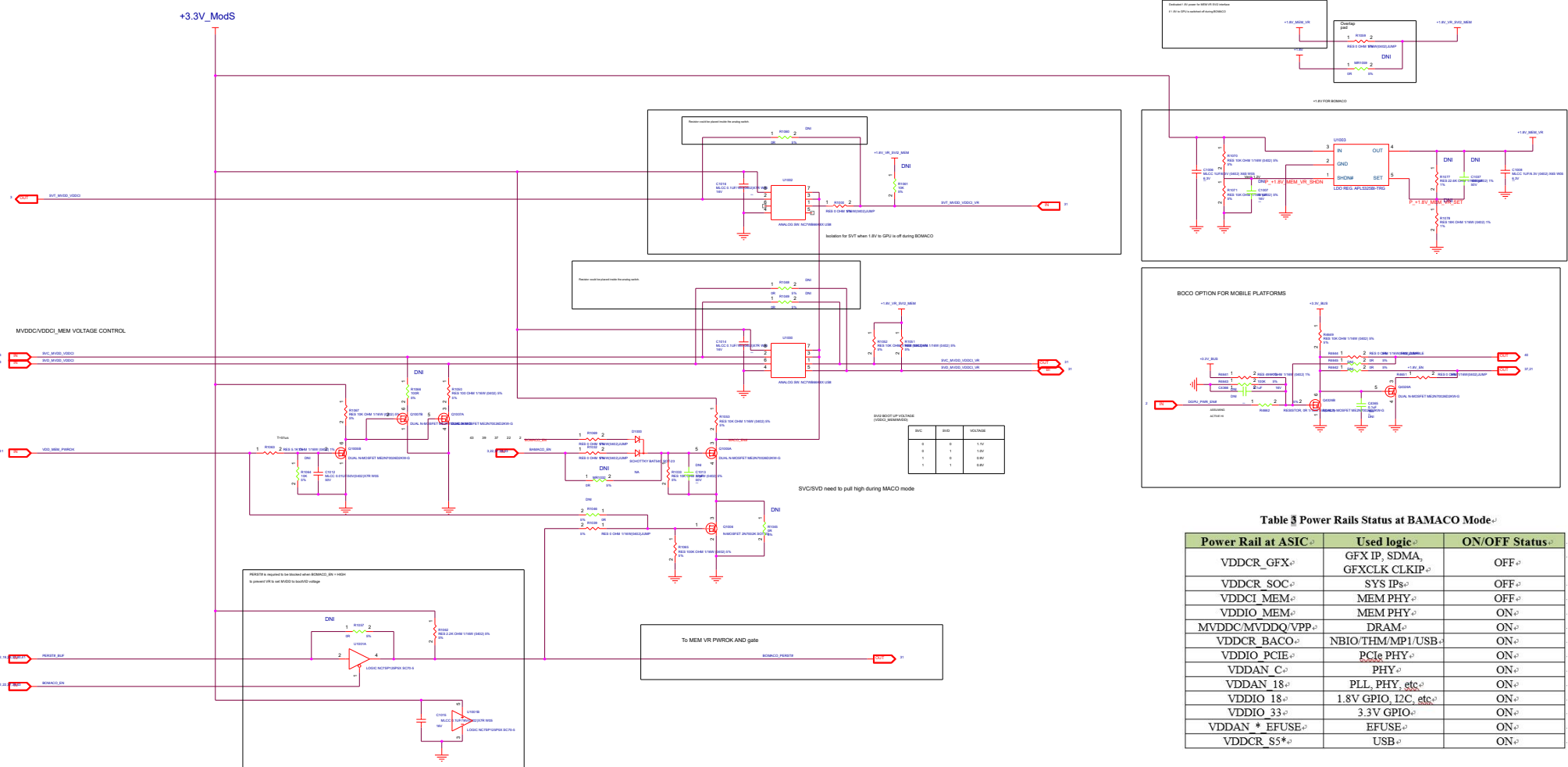


Table 4 Key Signals at Different PM Modes

Signals	Default	BOCO	BOMACO
PX_EN	LOW	N/A	N/A
MACO_EN	N/A	N/A	N/A
PERST	HIGH	1->0->1	1->0->1
PWR_EN	HIGH	LOW	LOW
BOMACO_EN	LOW	LOW	HIGH

Table 5 Platform to Support BOMACO

BOMACO_EN	SVC PU/PD	SVD PU/PD
HIGH	PU	PU
LOW	bootVID	bootVID

Table 3 Power Rails Status at BOMACO Mode

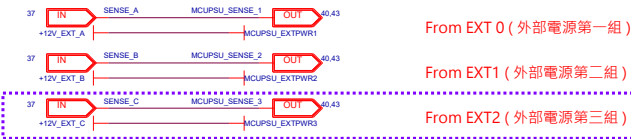
Power Rail at ASIC	Used logic	ON/OFF Status for BOMACO-A
VDDCR_GFX	GFX IP, SDMA, GFXCLK CLKIP	OFF
VDDCR_SOC	SYS IPs	OFF
VDDCI_MEM	MEM PHY	OFF
VDDIO_MEM	MEM PHY	ON
MVDDC/MVDDQ/VPP	DRAM	ON
VDDCR_BACO	NBIO/THM/MP1/USB	OFF
VDDIO_PCIE	PCIe PHY	OFF
VDDAN_C	PHY	OFF
VDDAN_18	PLL, PHY, etc	OFF
VDDIO_18	1.8V GPIO, I2C, etc	OFF
VDDIO_33	3.3V GPIO	OFF
VDDAN * EFUSE	EFUSE	OFF
VDDCR_S5	USB	ON

DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

Power



PSU DETECT INPUT



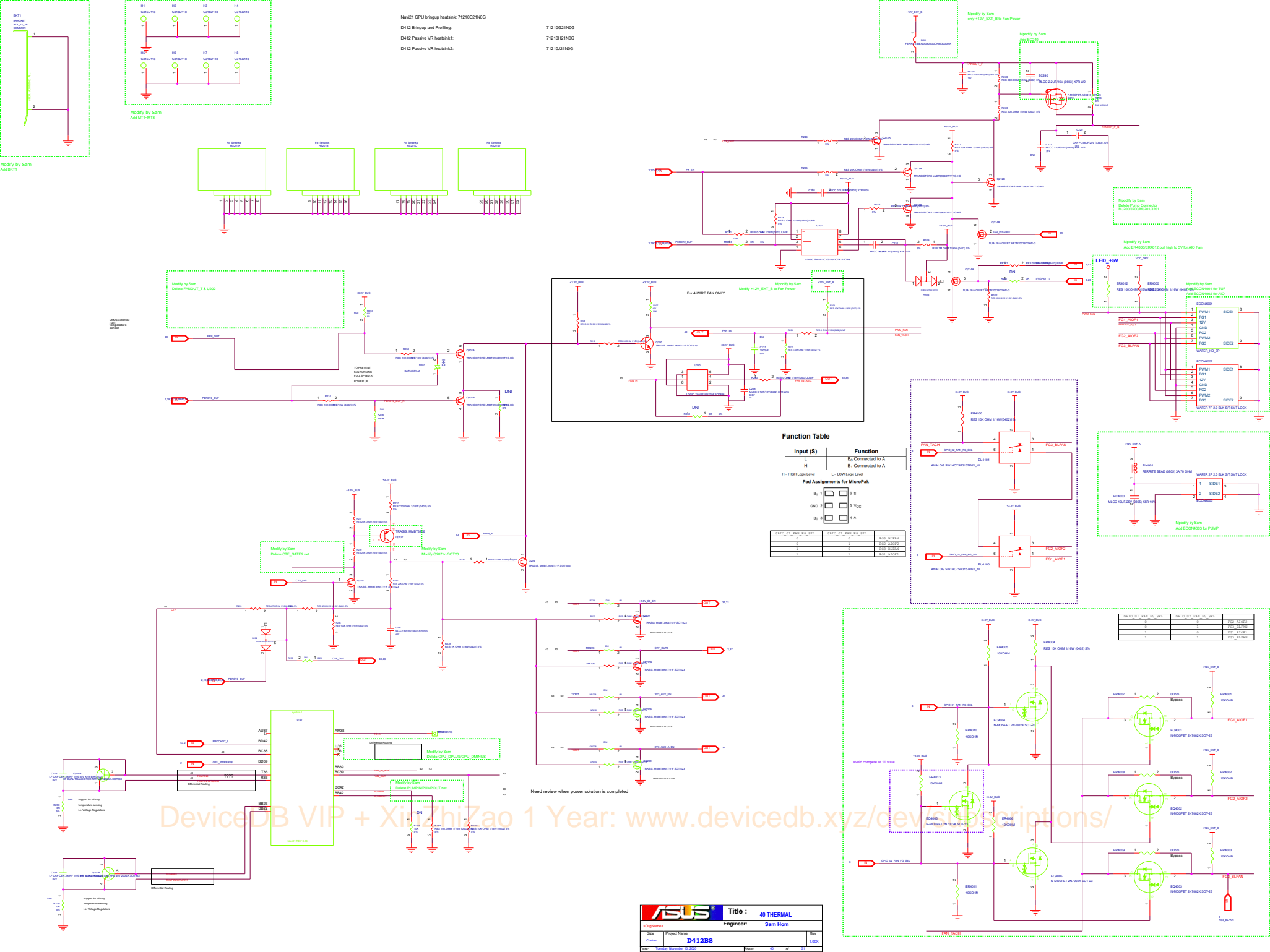
I2C



GPU_GPIO



DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/



NavG1 GPU bringup heatsink: 71210G21N0G

D412 Bringup and Profiling:

D412 Passive VR heatsink1:

D412 Passive VR heatsink2:

71210G21N0G

71210H21N0G

71210J21N0G

Function Table

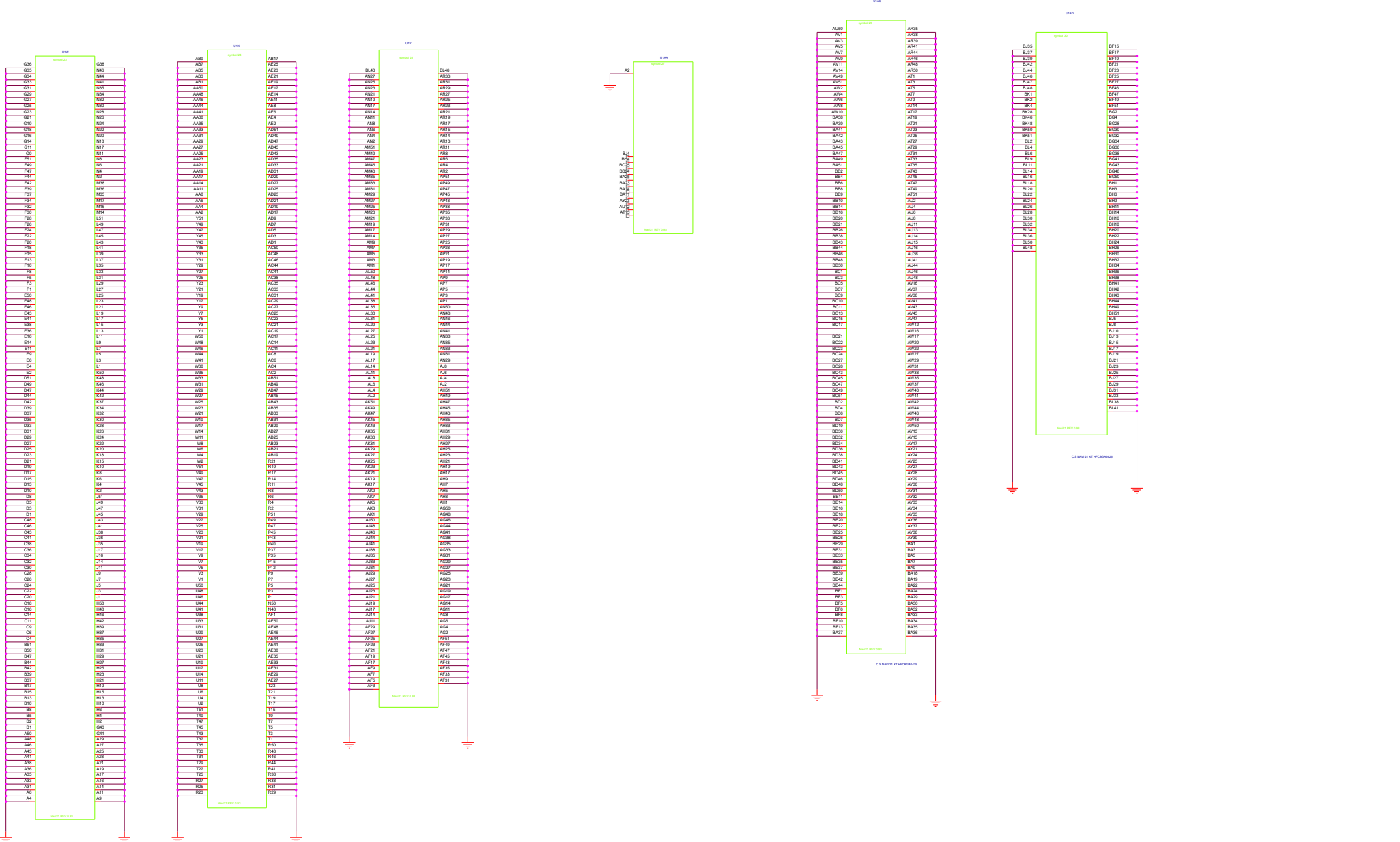
Input (S)	Function
L	B ₀ Connected to A
H	B ₁ Connected to A

H = HIGH Logic Level L = LOW Logic Level

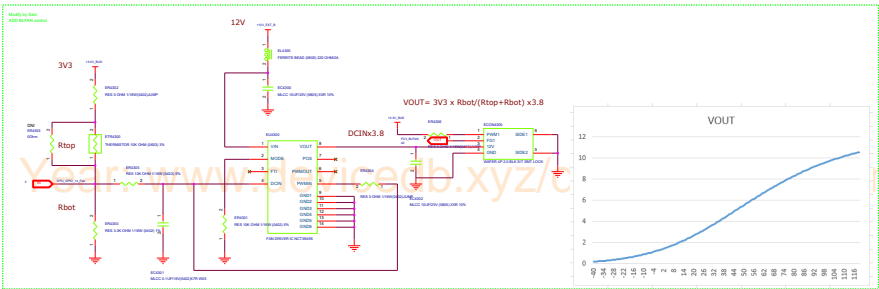
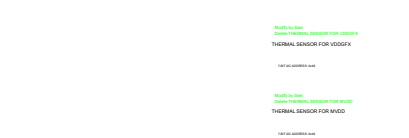
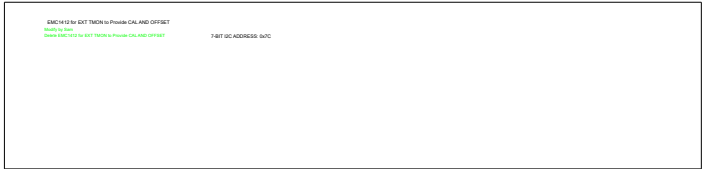
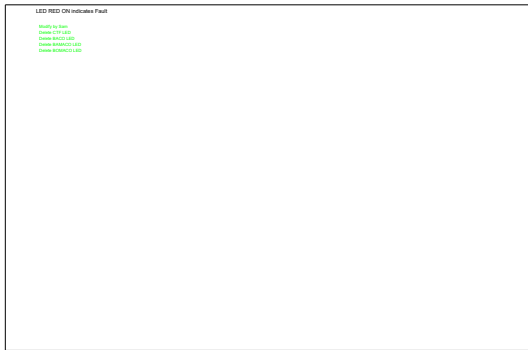
Pad Assignments for MicroPak			
B ₀ 1	B ₀ 0	B ₁ 1	B ₁ 0
GN0 2	GN0 1	GN1 2	GN1 1
B ₂ 3	B ₂ 4	B ₃ 3	B ₃ 4

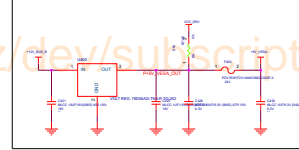
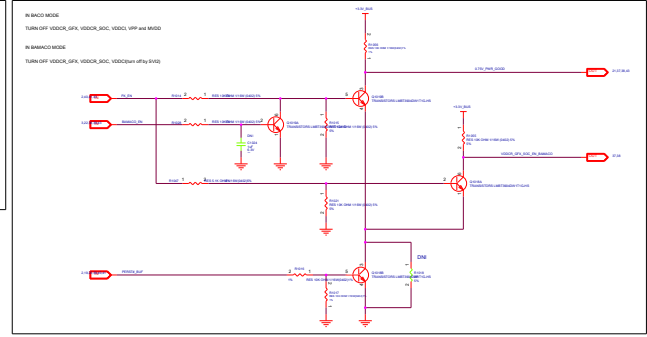
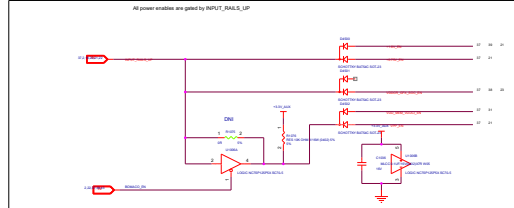
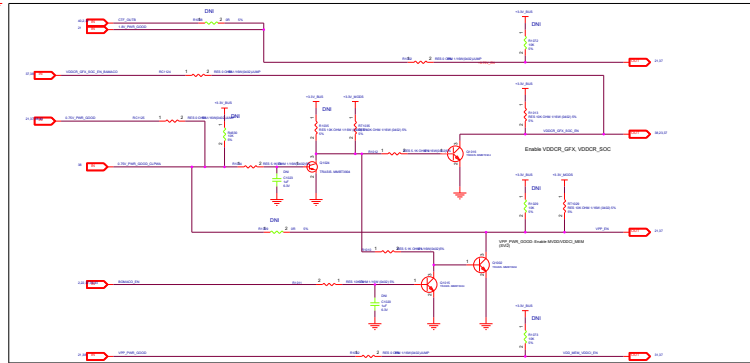
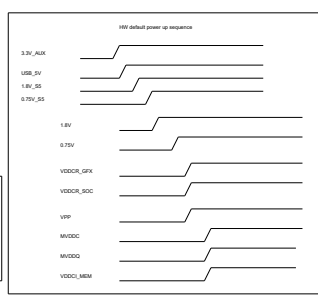
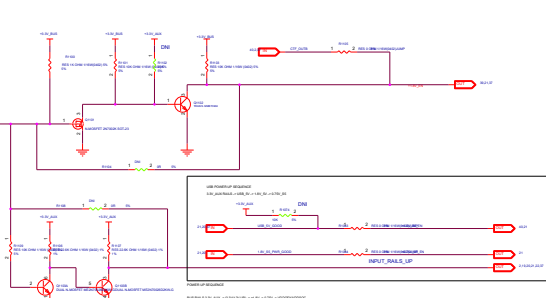
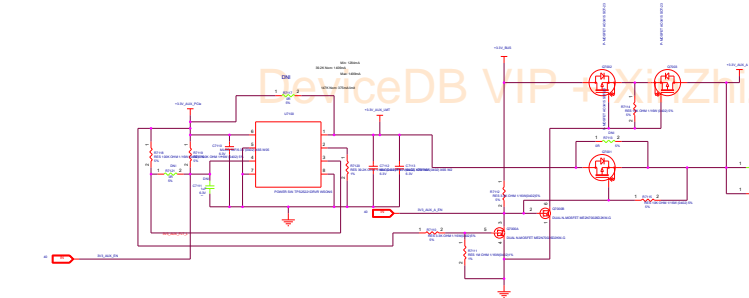
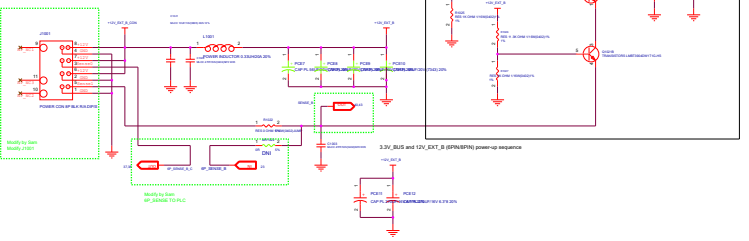
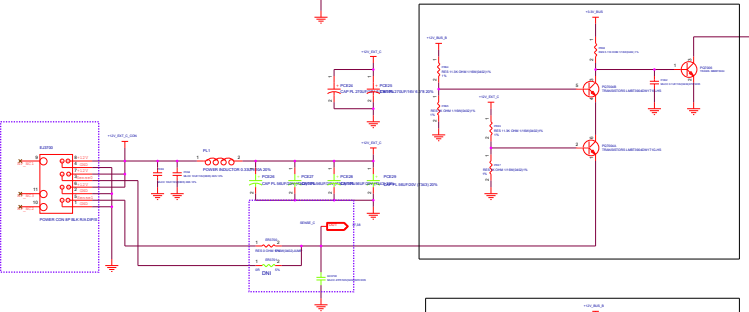
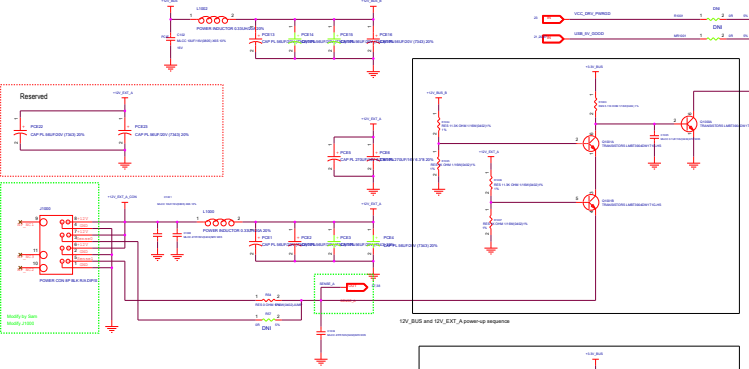
GPIO_01_VIN_VL_VEL	GPIO_02_VIN_VL_VEL	GPIO_03_VIN_VL_VEL
0	0	GPIO_04_VIN_VL_VEL
1	0	GPIO_05_VIN_VL_VEL
1	0	GPIO_06_VIN_VL_VEL
1	1	GPIO_07_VIN_VL_VEL

GPIO_01_VIN_VL_VEL	GPIO_02_VIN_VL_VEL	GPIO_03_VIN_VL_VEL
0	0	GPIO_04_VIN_VL_VEL
1	0	GPIO_05_VIN_VL_VEL
1	1	GPIO_06_VIN_VL_VEL



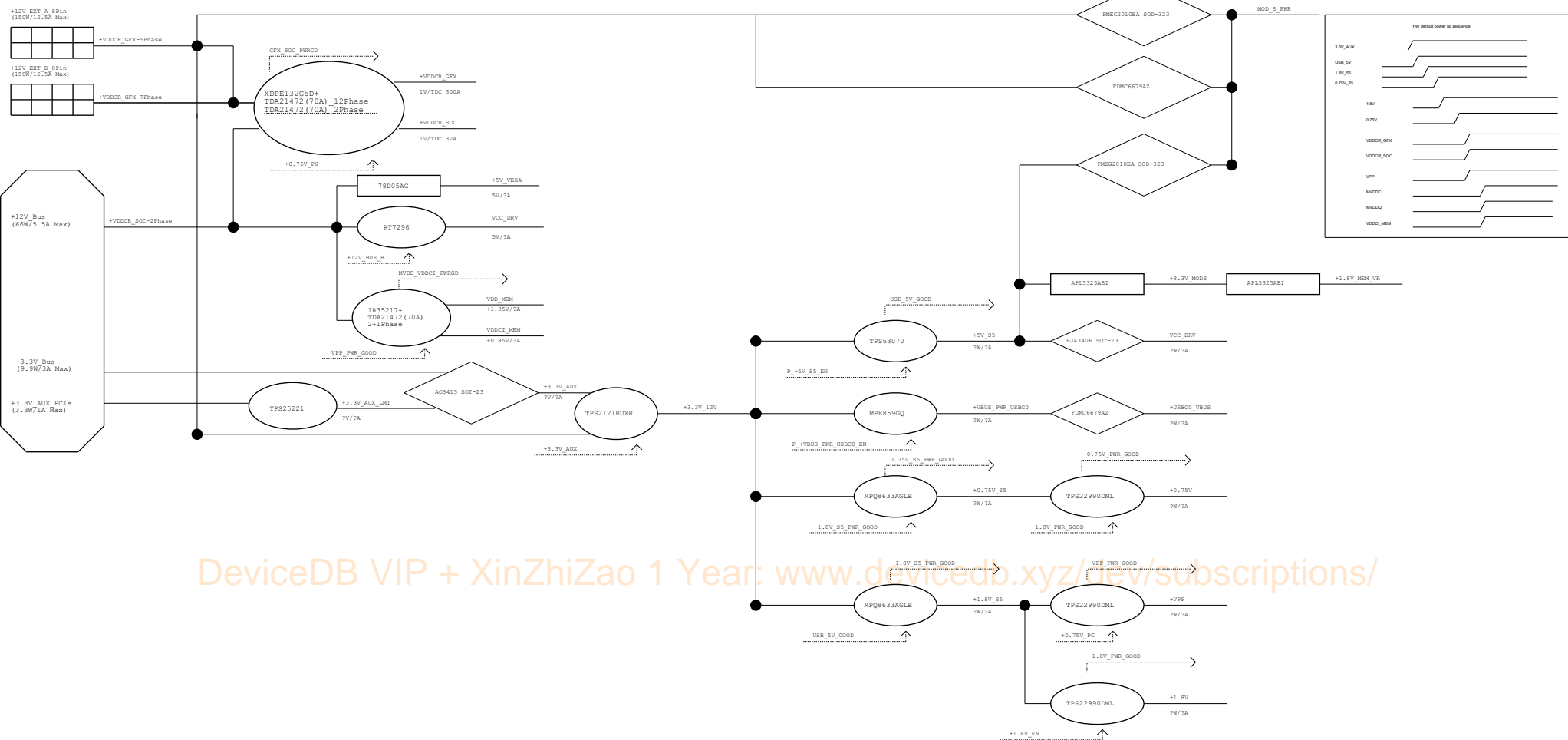
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/





DeviceDB VIP - XiZhuZao 1 Year: www.device-db.xyz/dev/subscriptions/

POWER FLOW

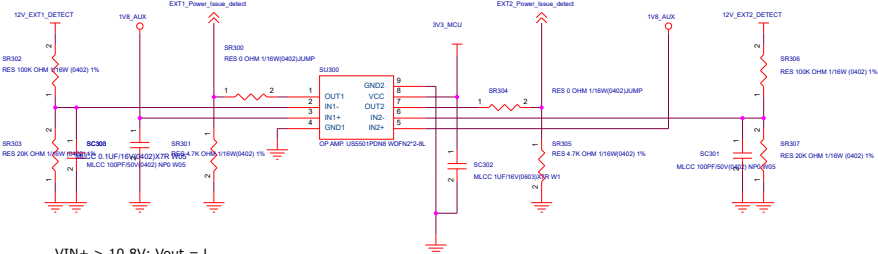


3. 隔離電感儘量靠近Connector, 接到PLC可拉一般正常線寬, 間隔20mils space.



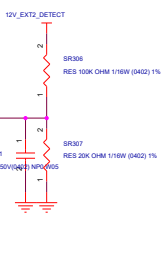


EXT1

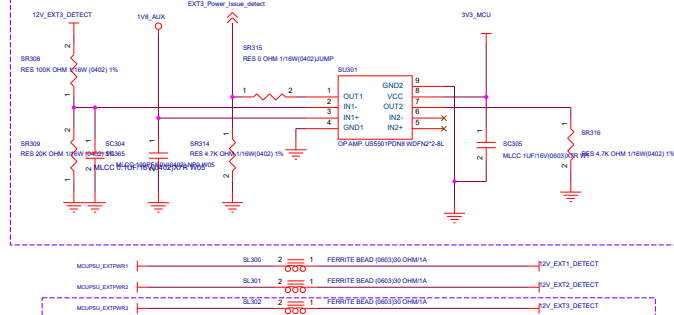

 $V_{IN} > 10.8V: V_{out} = L$
 $V_{IN} < 10.8V: V_{out} = H$
 $10.8V \times 20K\Omega / (100K\Omega + 20K\Omega) = 1.8V$

SR301/SR311, 若僅需做一組連接座偵測, 其他零件可以移除, 但SR301/SR310/SR328需上件4.7K

EXT2



EXT3



pcie 3v3 aux

EXT12V INPUT

EXT POWER connected DETECT PIN

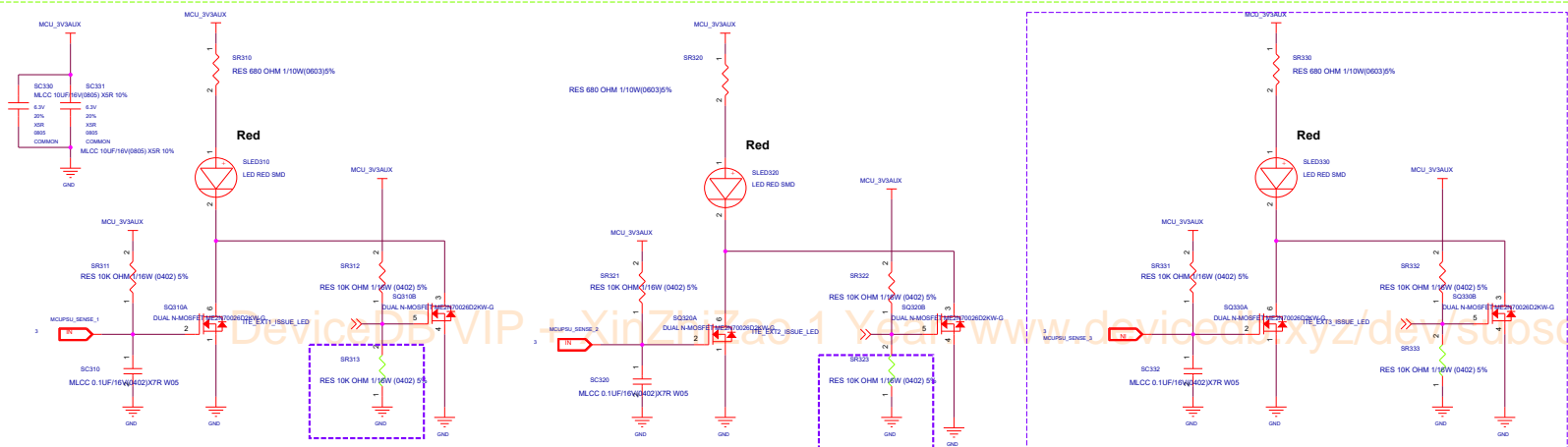
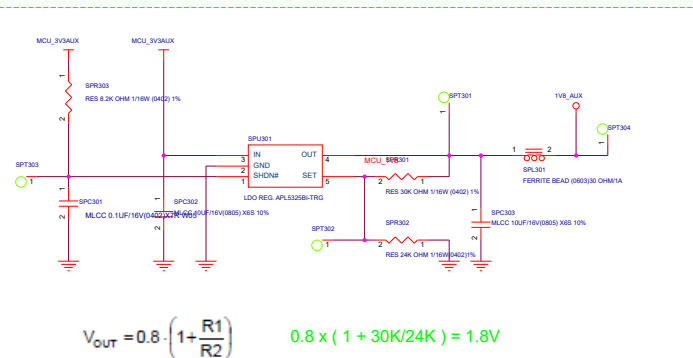
from ite8915

 ITE_EXT1_ISSUE_LED
 ITE_EXT2_ISSUE_LED
 ITE_EXT3_ISSUE_LED

OUPUT: AS ITE8915 INPUT

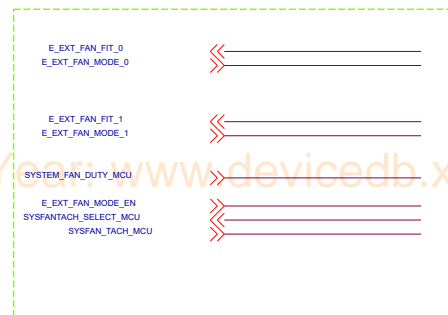
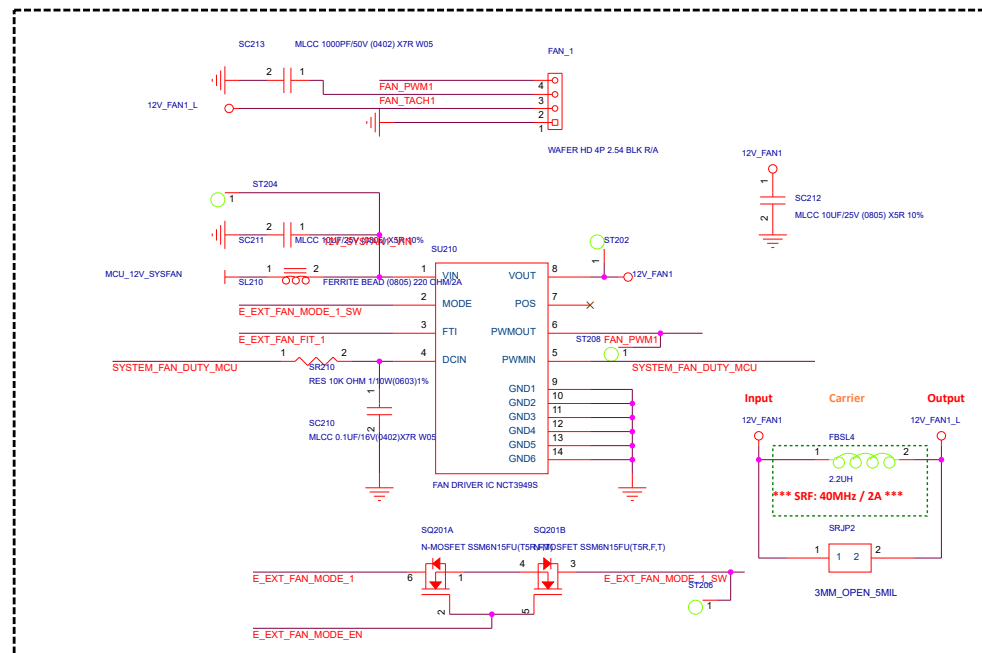
 EXT1_Power_Issue_detect
 EXT2_Power_Issue_detect
 EXT3_Power_Issue_detect

1v8_ref

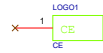


1. EXT power is not connected, the led is always on
2. EXT power is connected
- EXT 12V is over 10.8V, the led turns off
- EXT 12v is below 10.8V, the led blink

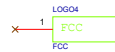
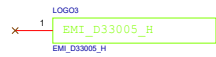
DeviceDB VIP + XinZhiZao 1 Year SYSTEM_FAN_DUTY_MCU www.device-db.xyz/dev/subscriptions/



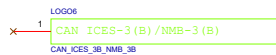
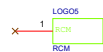
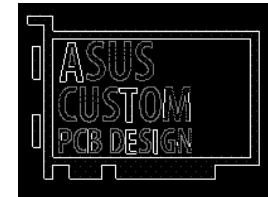
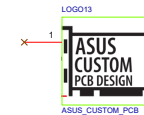
ASUS VGA PCB Logo



PCB MADE IN CHINA



ASUS Re-design logo
Do not place this on reference board



CAN ICES-3 (B) / NMB-3 (B)



		Title : XX ASUS PCB Logo	
<OrigName>		Engineer: Sam Hom	
Size	Project Name		Rev
A3	D412BS		1.00X
Date: Tuesday, November 10, 2020		Sheet	91 of 91