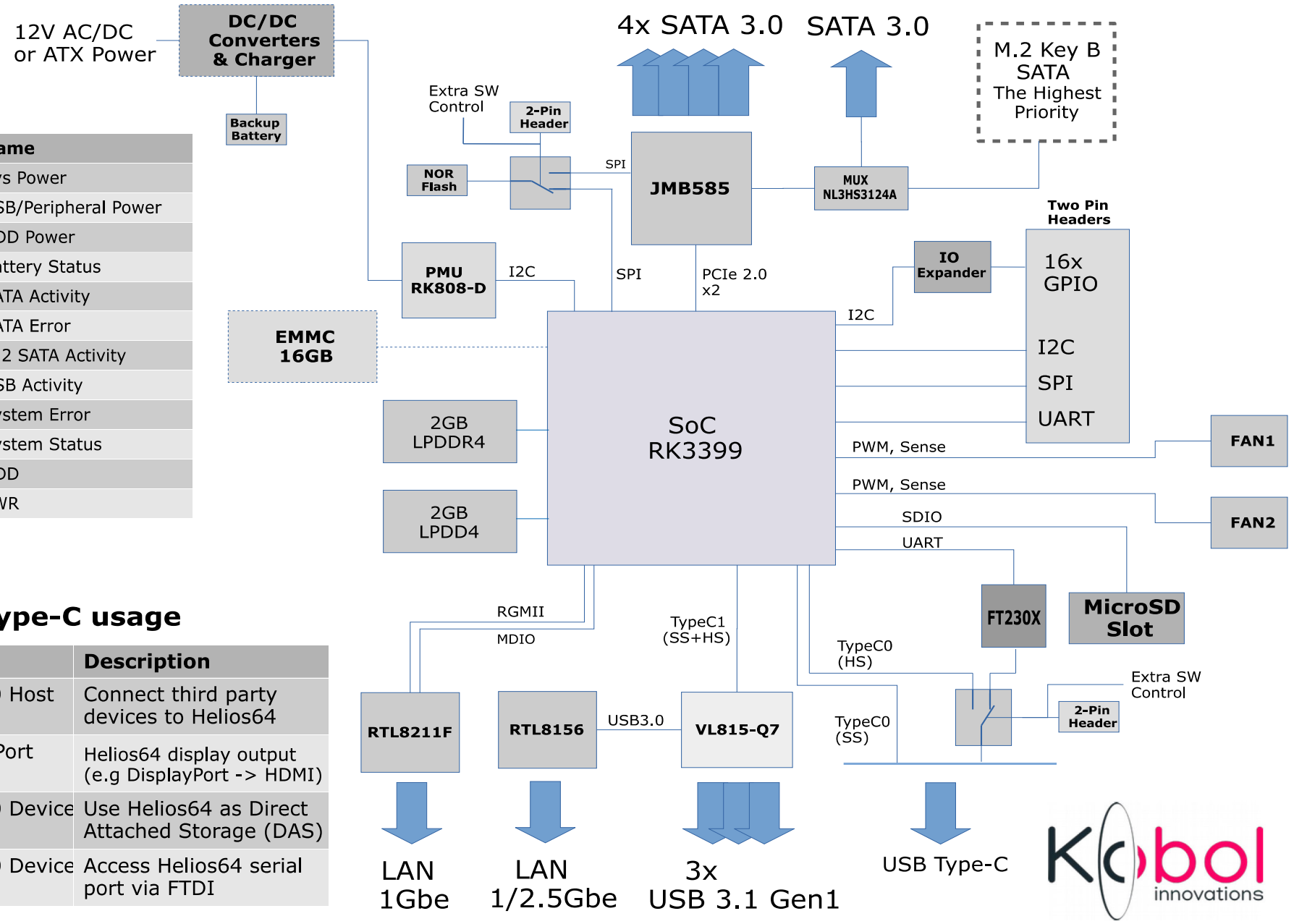

LED	Name
G	Sys Power
G	USB/Peripheral Power
G	HDD Power
Y	Battery Status
B x5	SATA Activity
R x5	SATA Error
G	M.2 SATA Activity
G x4	USB Activity
R	System Error
B	System Status
Ext1	HDD
Ext2	PWR

USB Type-C usage

Mode	Description
USB 3.0 Host	Connect third party devices to Helios64
DisplayPort	Helios64 display output (e.g DisplayPort -> HDMI)
USB 3.0 Device	Use Helios64 as Direct Attached Storage (DAS)
USB 2.0 Device	Access Helios64 serial port via FTDI

SIZE	DWG NO	REV
A4	Helios64 NAS	fbd_sys	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost Aditya Prayoga	1	37	SJK	05/07/2020

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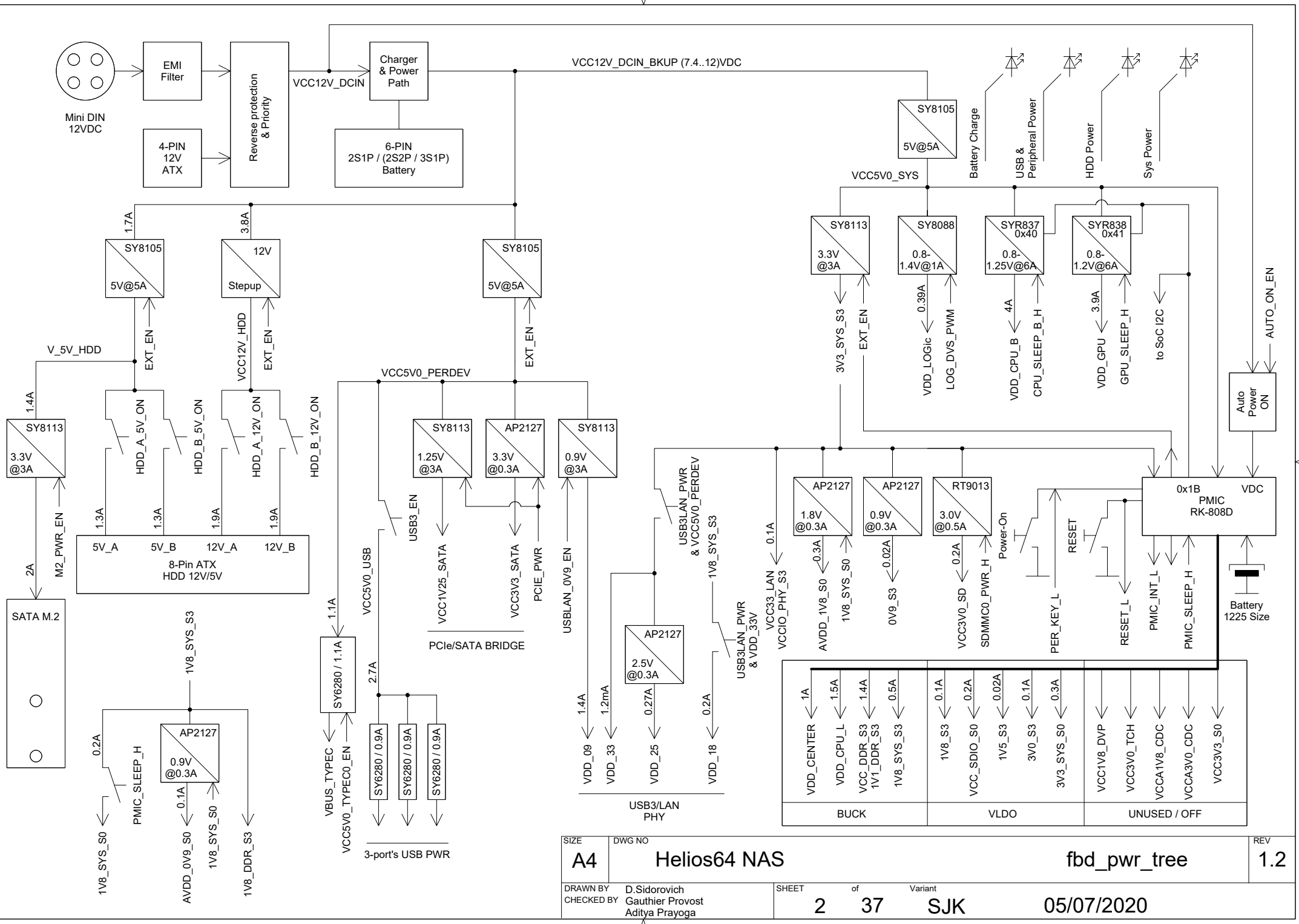

SIZE	DWG NO		REV
A4	Helios64 NAS	fbd_pwr_tree	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 2 of 37	Variant SJK	05/07/2020

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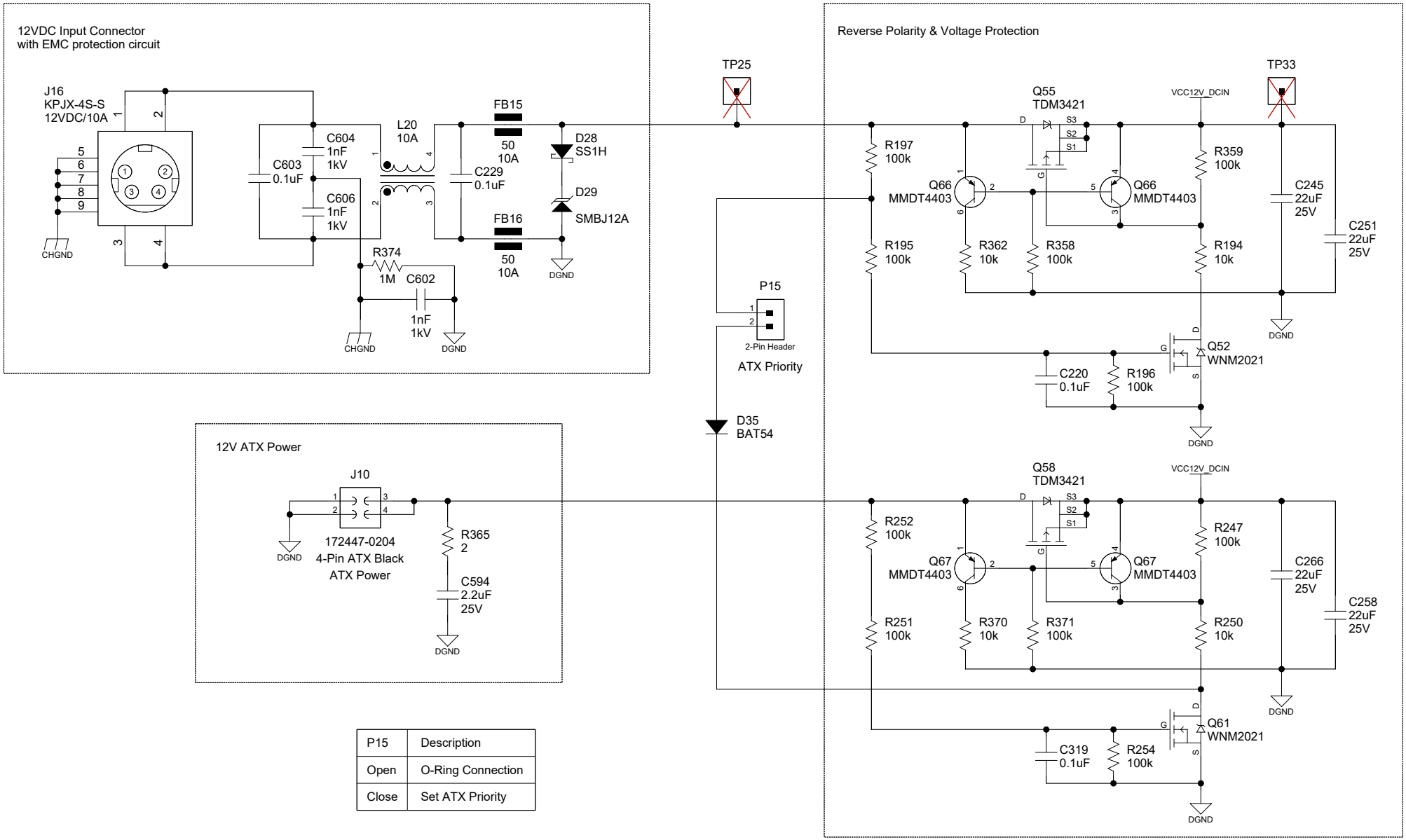
DC Power Input



P15	Description
Open	O-Ring Connection
Close	Set ATX Priority

SIZE	DWG NO		REV
A4	Helios64 NAS	dcin_atx_pwr	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 3 of 37	Variant SJK	05/15/2020

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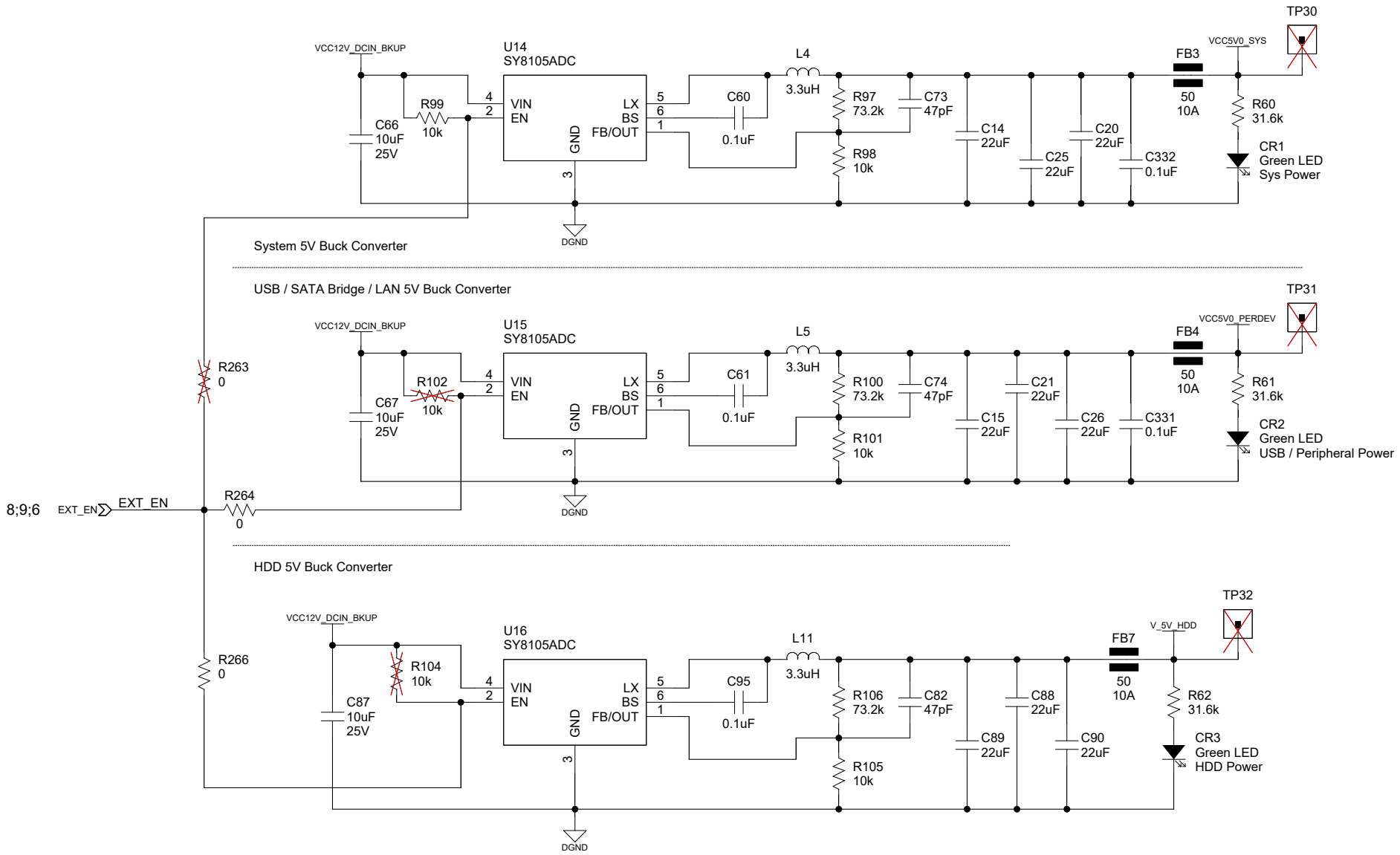
Main DCDC Converters



SIZE	DWG NO		REV
A4	Helios64 NAS	sys_usb_hdd_pwr	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost Aditya Prayoga	4	37	SJK	05/16/2020

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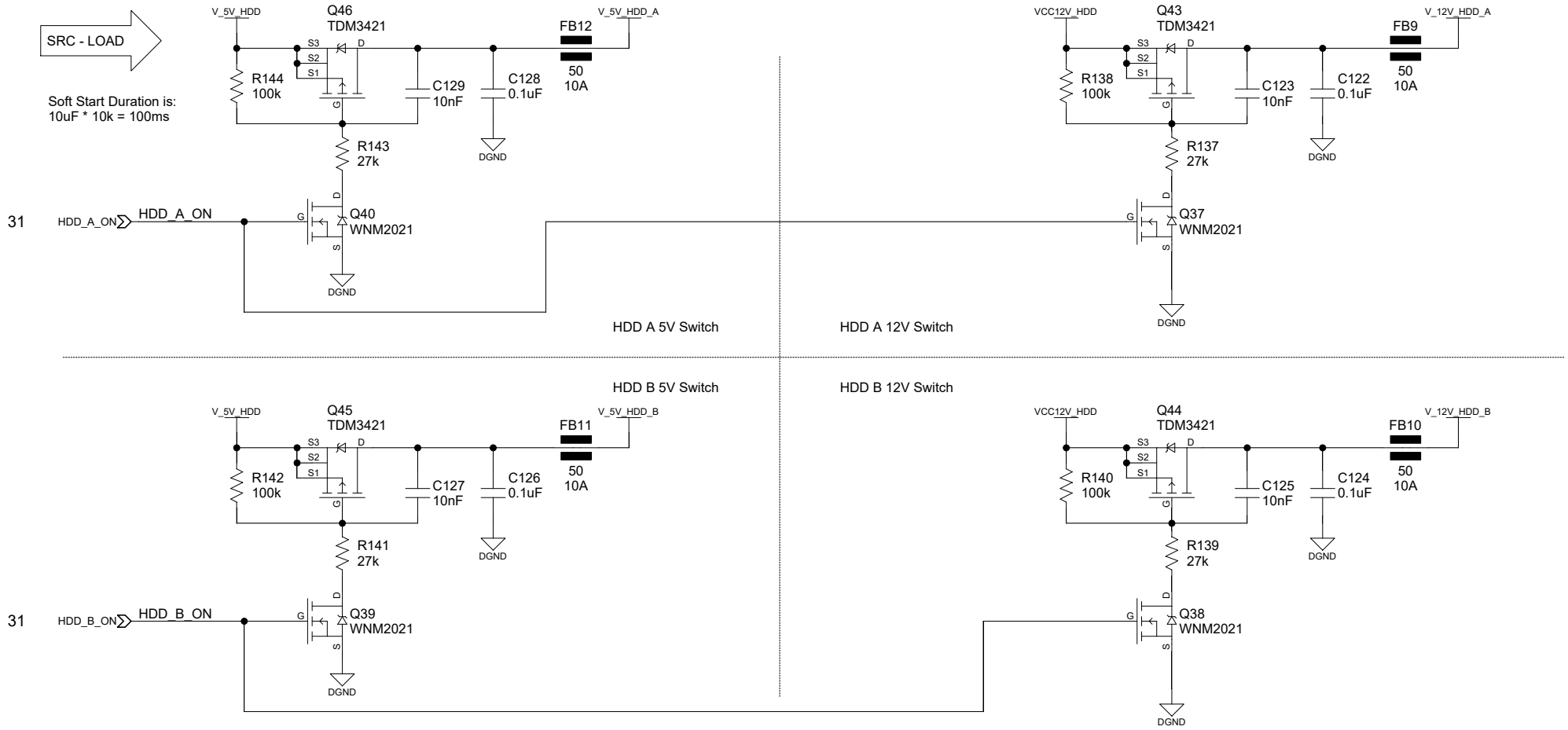
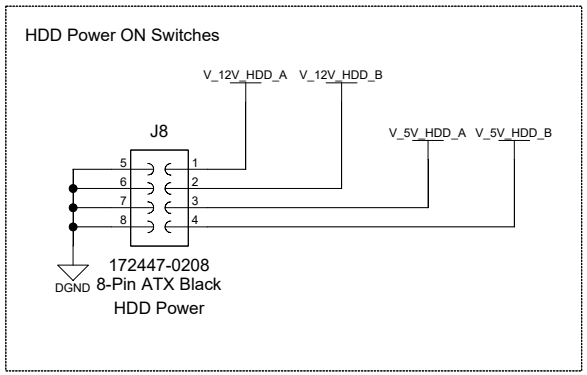
HDD Power Switches





SIZE	DWG NO	REV
A4	Helios64 NAS — hdd_pwr_sw	1.2

DRAWN BY / CHECKED BY	SHEET	of	Variant	
D.Sidorovich Gauthier Provost Aditya Prayoga	5	37	SJK	05/13/2020

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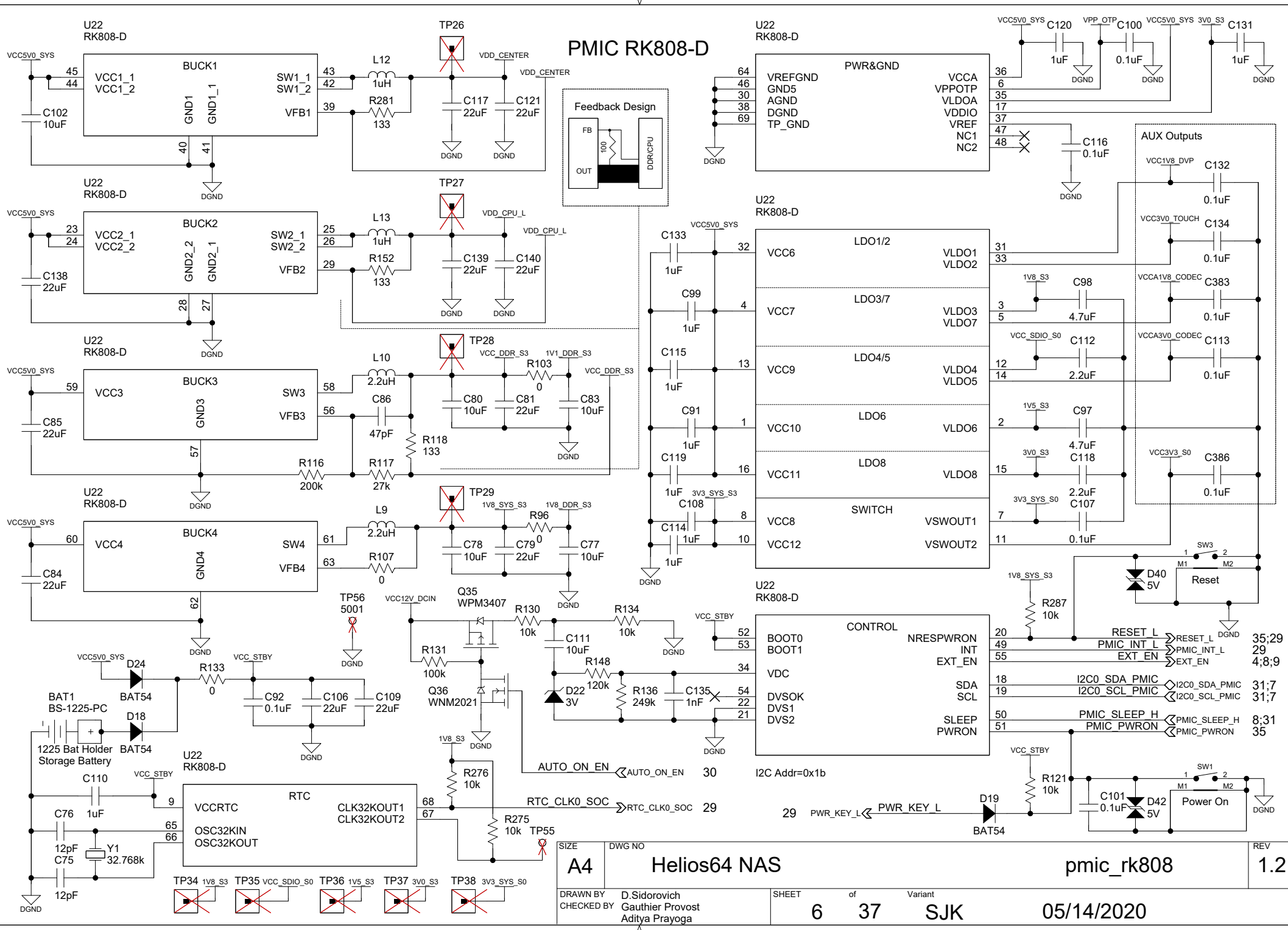

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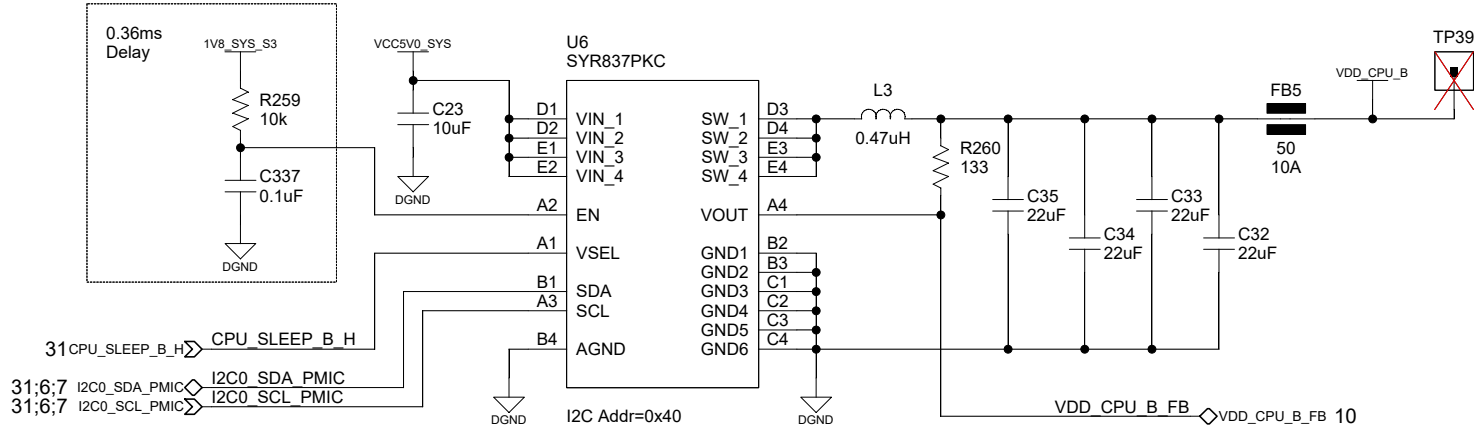
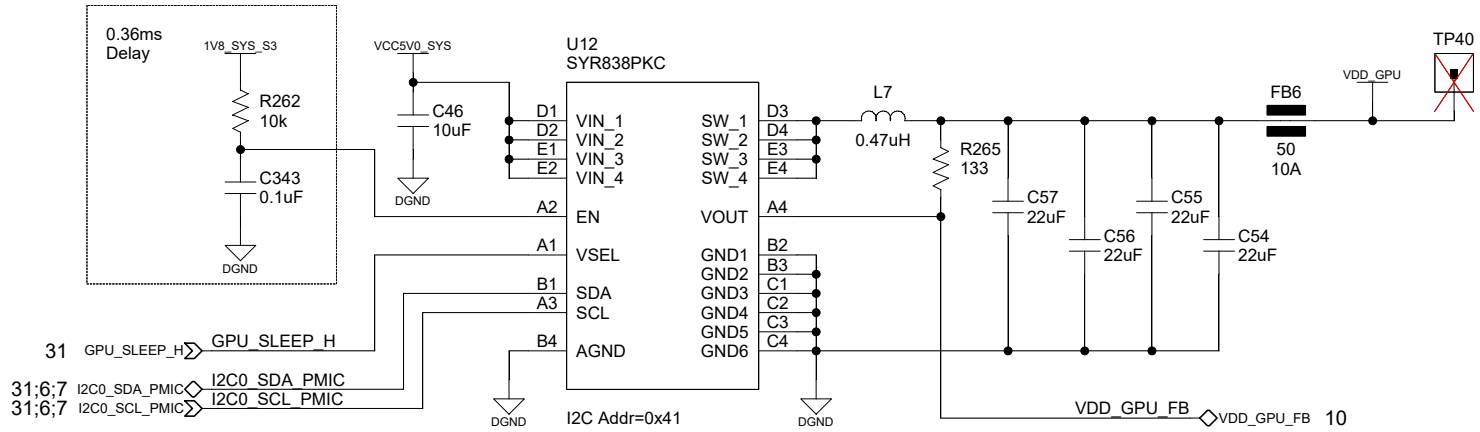
CPU & GPU Core Power



VDD_CPU_B Power

VDD_GPU Power



SIZE	DWG NO		REV
A4	Helios64 NAS	cpu_gpu_pwr	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 7 of 37	Variant SJK	05/15/2020

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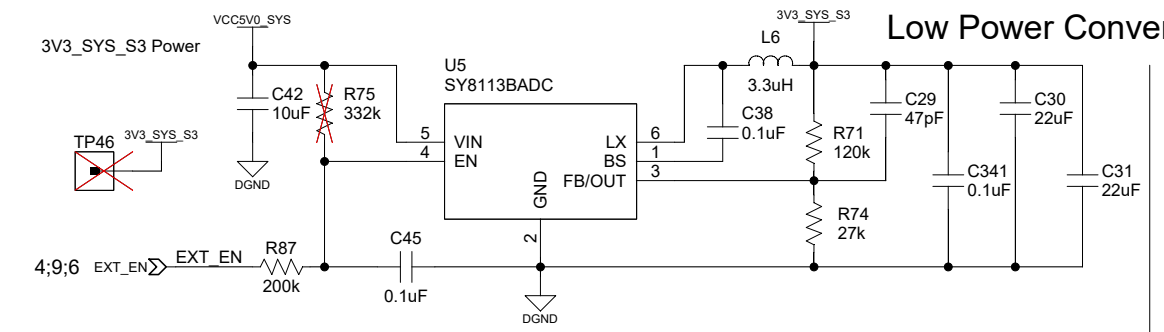
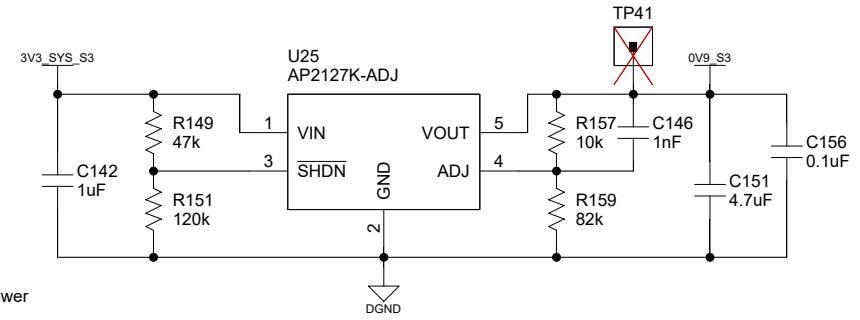
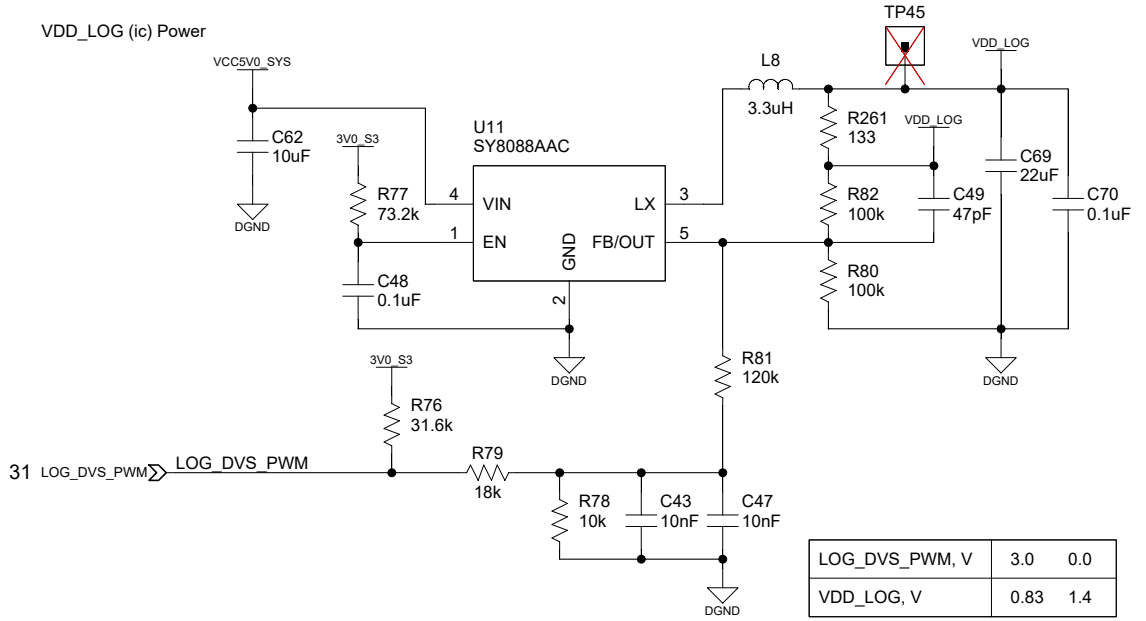
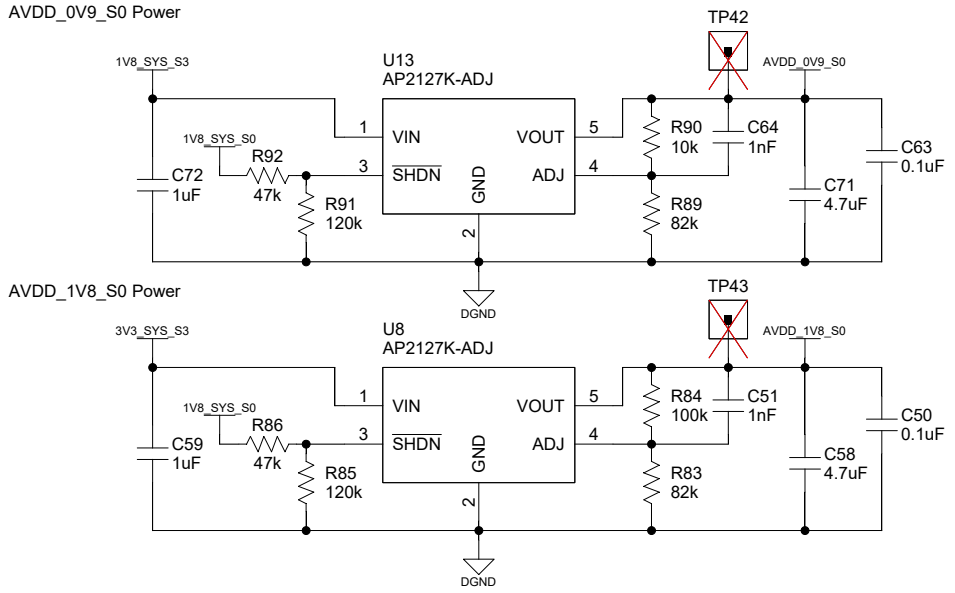
Low Power Converters

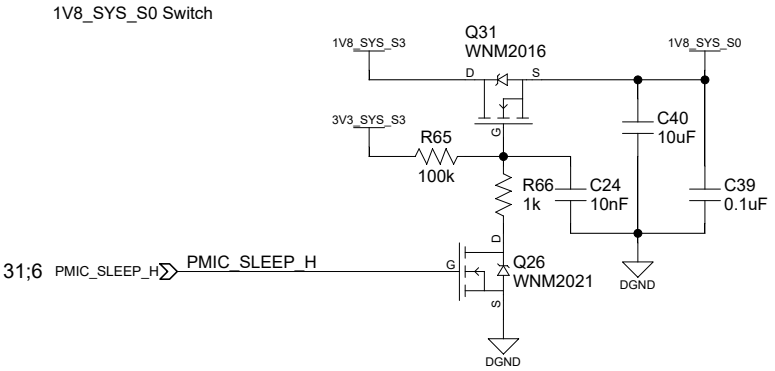


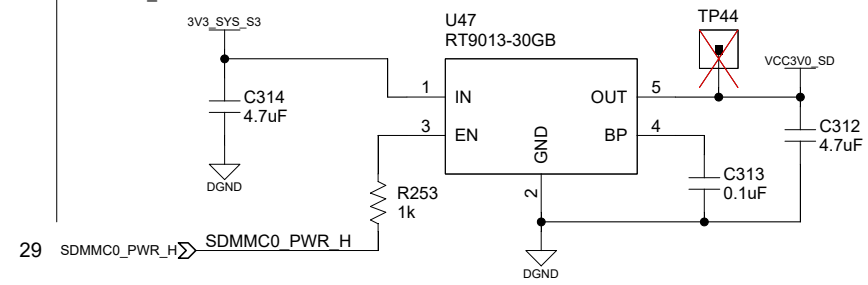




LOG_DVS_PWM, V	3.0	0.0
VDD_LOG, V	0.83	1.4







SIZE A4	DWG NO Helios64 NAS			REV 1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 8	of 37	Variant SJK	05/27/2020

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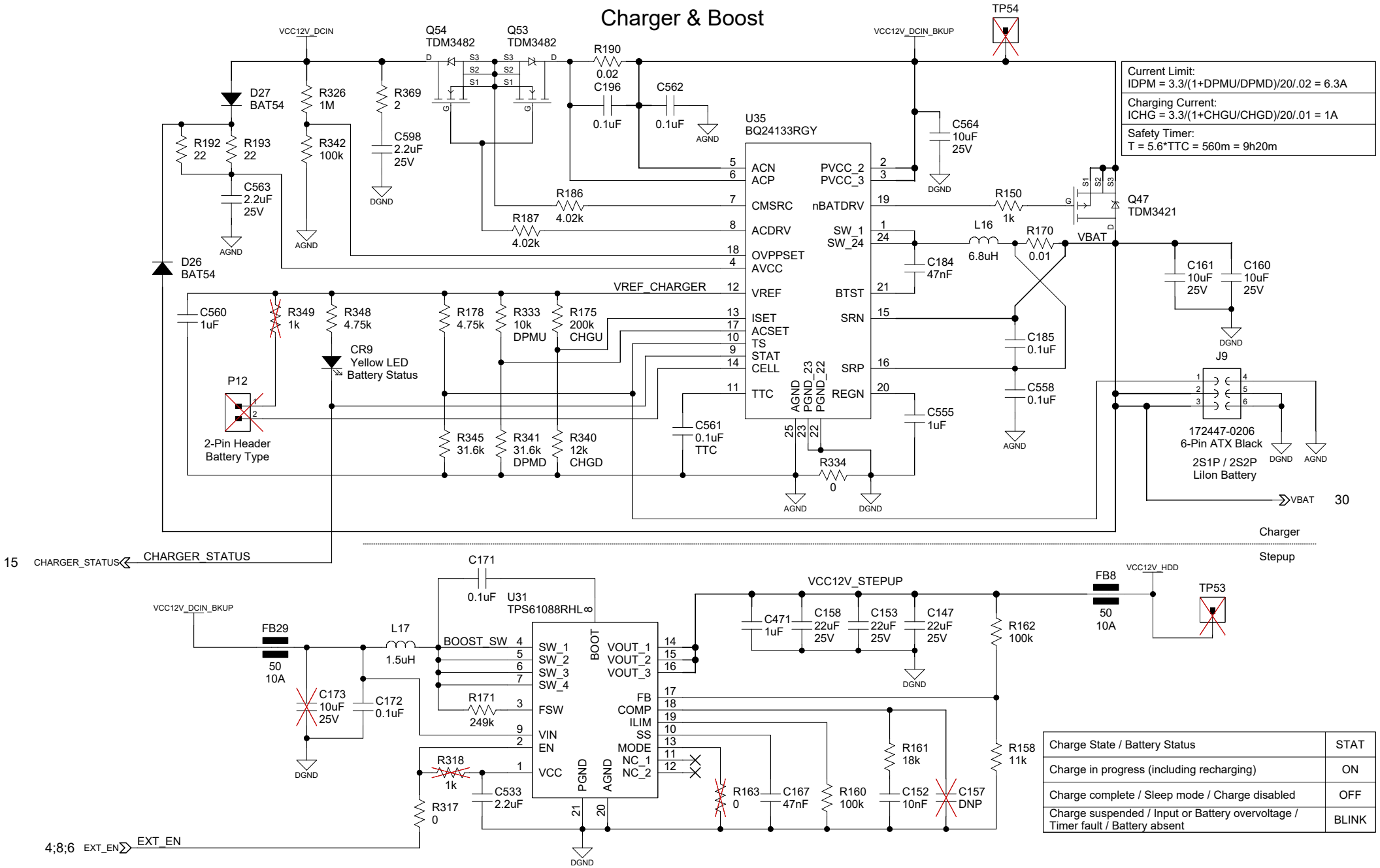
Charger & Boost



Charge State / Battery Status	STAT
Charge in progress (including recharging)	ON
Charge complete / Sleep mode / Charge disabled	OFF
Charge suspended / Input or Battery overvoltage / Timer fault / Battery absent	BLINK

SIZE	DWG NO		REV
A4	Helios64 NAS	charger_stepup	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 9 of 37	Variant SJK	05/15/2020

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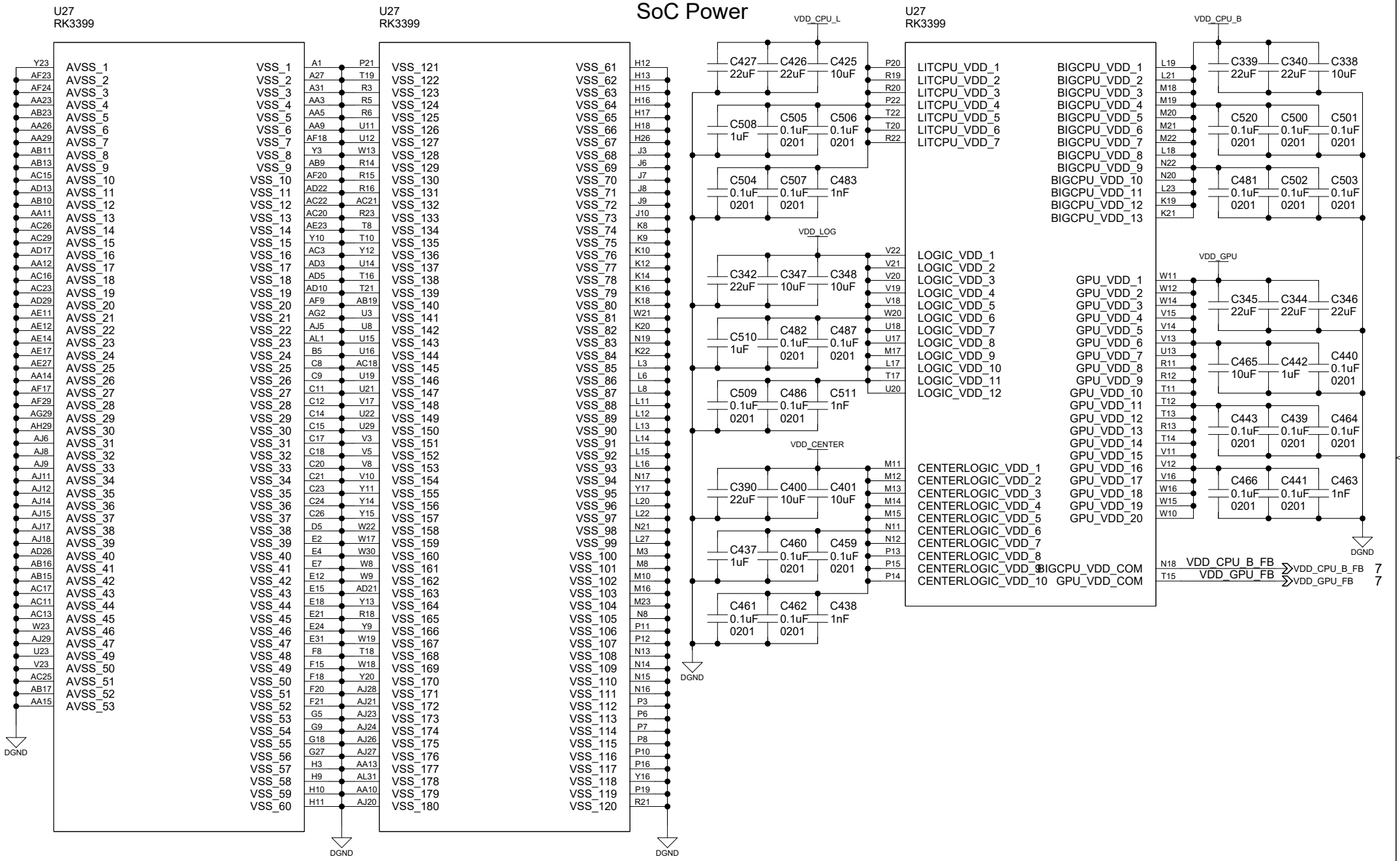
SoC Power



SIZE	DWG NO		REV
A4	Helios64 NAS	soc_pwr	1.2

DRAWN BY	D.Sidorovich
CHECKED BY	Gauthier Provost Aditya Prayoga

SHEET	of	Variant	
10	37	SJK	05/10/2020

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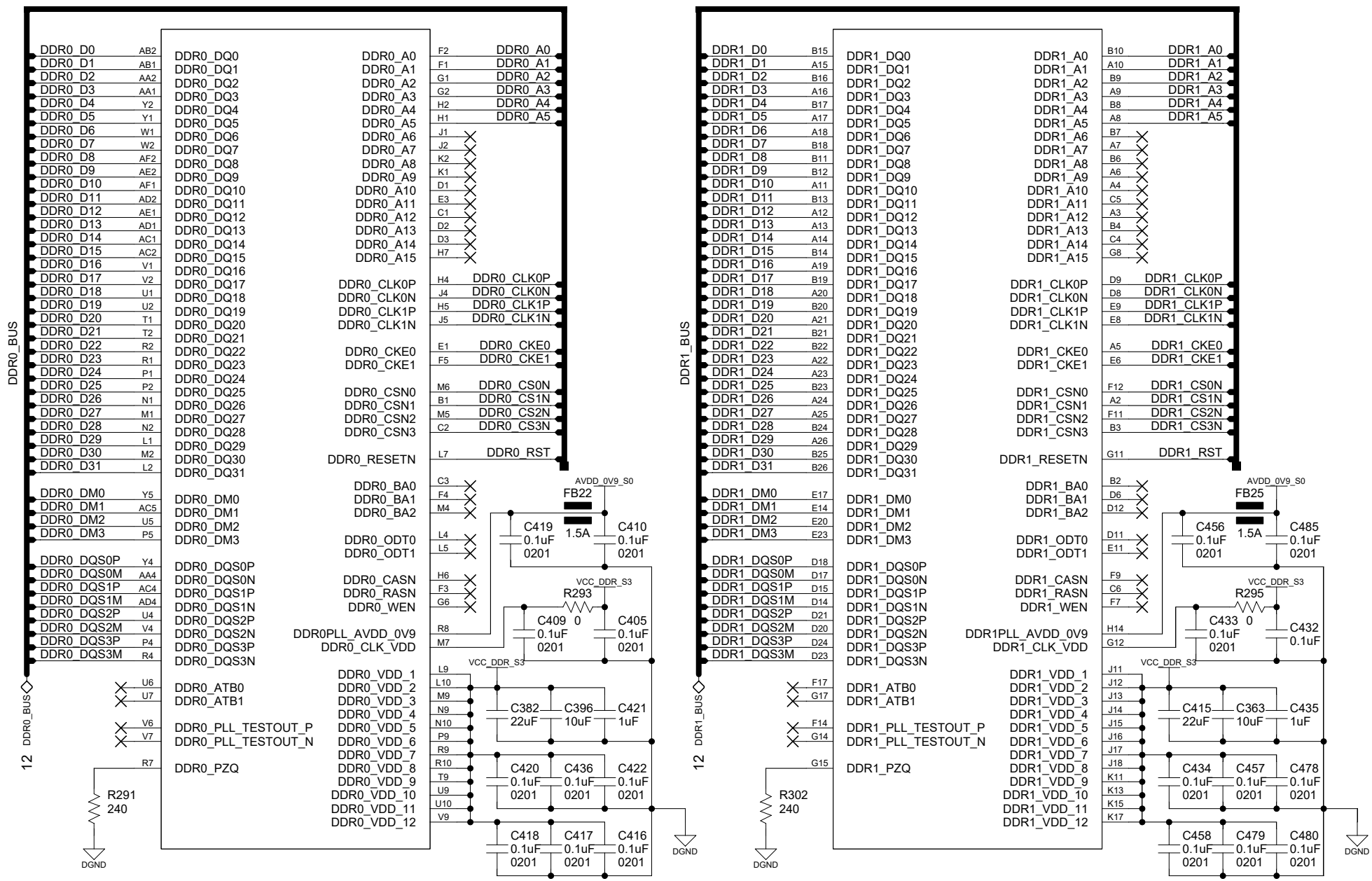
LPDDR4 / SoC



SIZE	DWG NO		REV
A4	Helios64 NAS	lpddr4_soc	1.2

DRAWN BY	D.Sidorovich	SHEET	of	Variant	
CHECKED BY	Gauthier Provost Aditya Prayoga	11	37	SJK	05/10/2020

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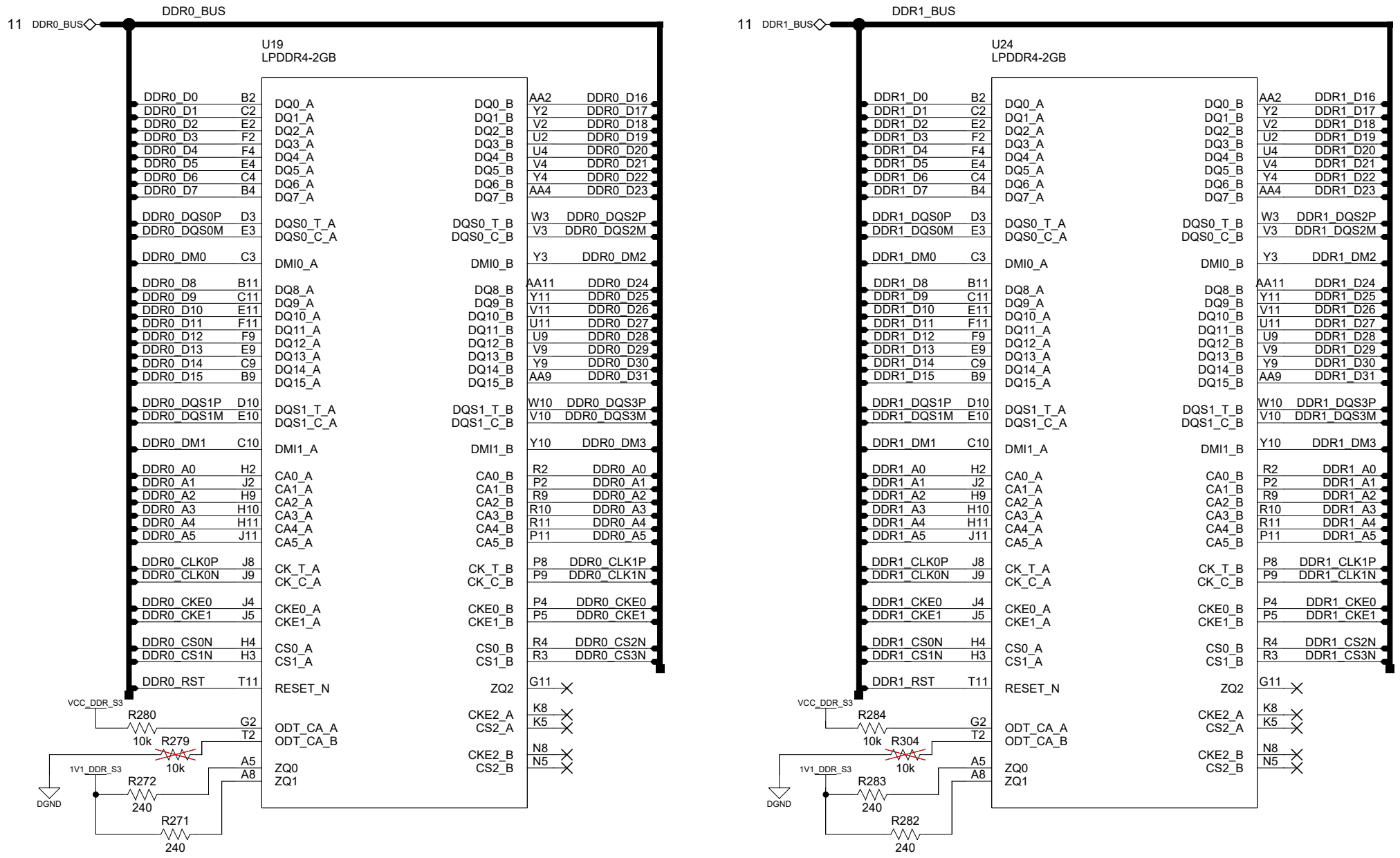
LPDDR4 2x 2GB



SDRAM - Mobile LPDDR4 Memory ICs
16Gb (512M x 32) 1600MHz - each chip

SIZE	DWG NO		REV
A4	Helios64 NAS	lpddr4_x2	1.2

DRAWN BY	D.Sidorovich	SHEET	of	Variant	
CHECKED BY	Gauthier Provost Aditya Prayoga	12	37	SJK	05/10/2020

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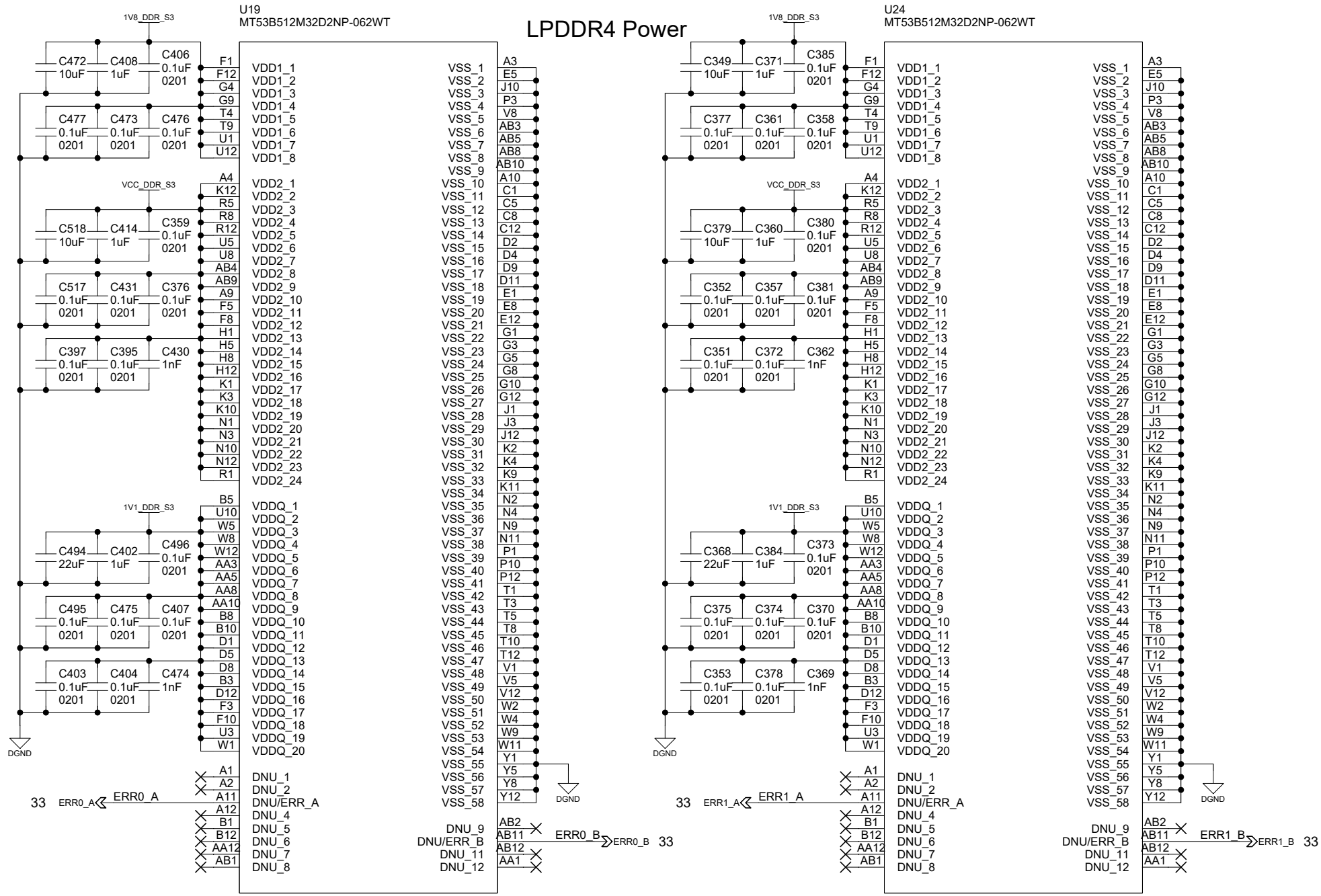
LPDDR4 Power



SIZE	DWG NO	REV
A4	Helios64 NAS — lpddr4_pwr	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost, Aditya Prayoga	13	37	SJK	05/10/2020

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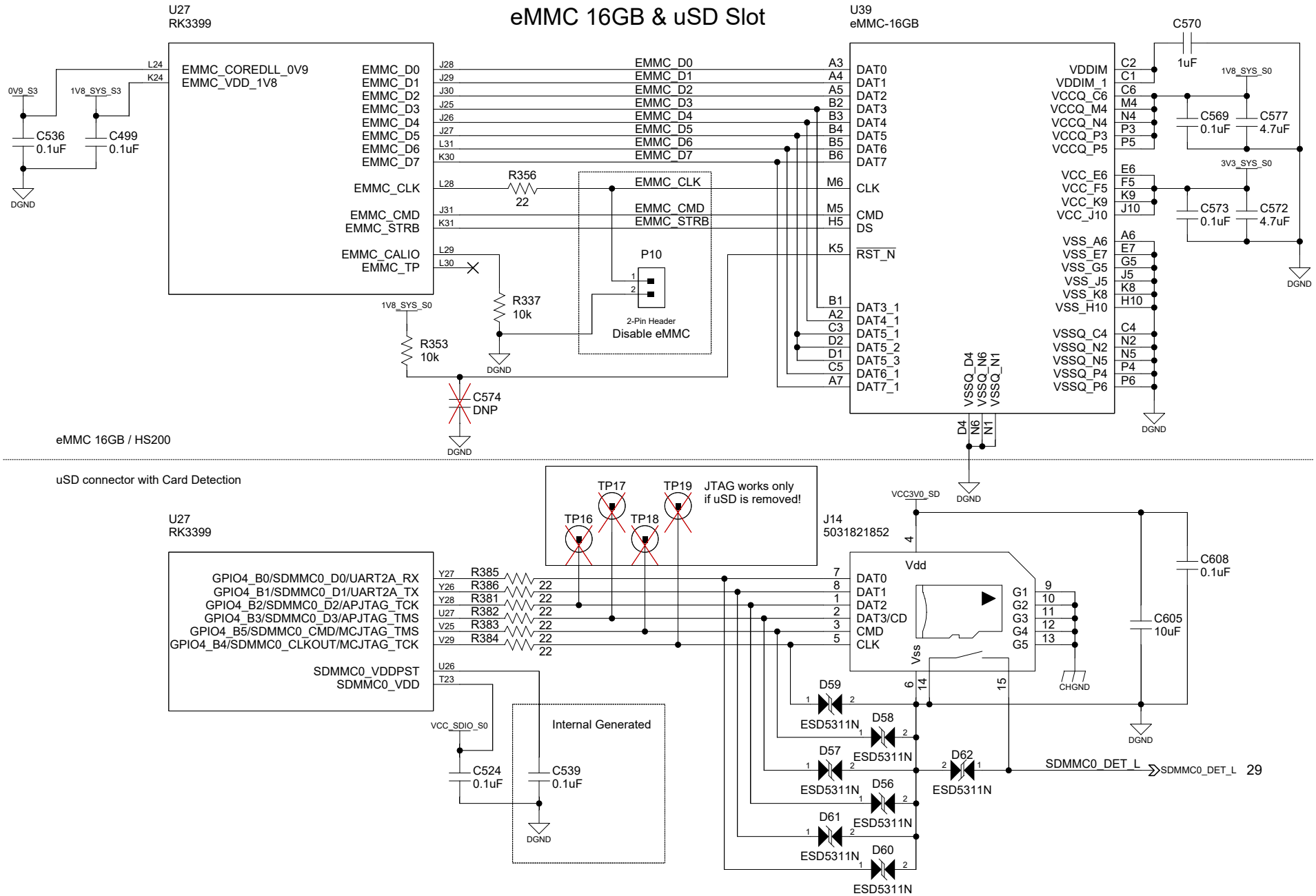
eMMC 16GB & uSD Slot



SIZE	DWG NO		REV
A4	Helios64 NAS	emmc_sd	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 14 of 37	Variant SJK	05/25/2020

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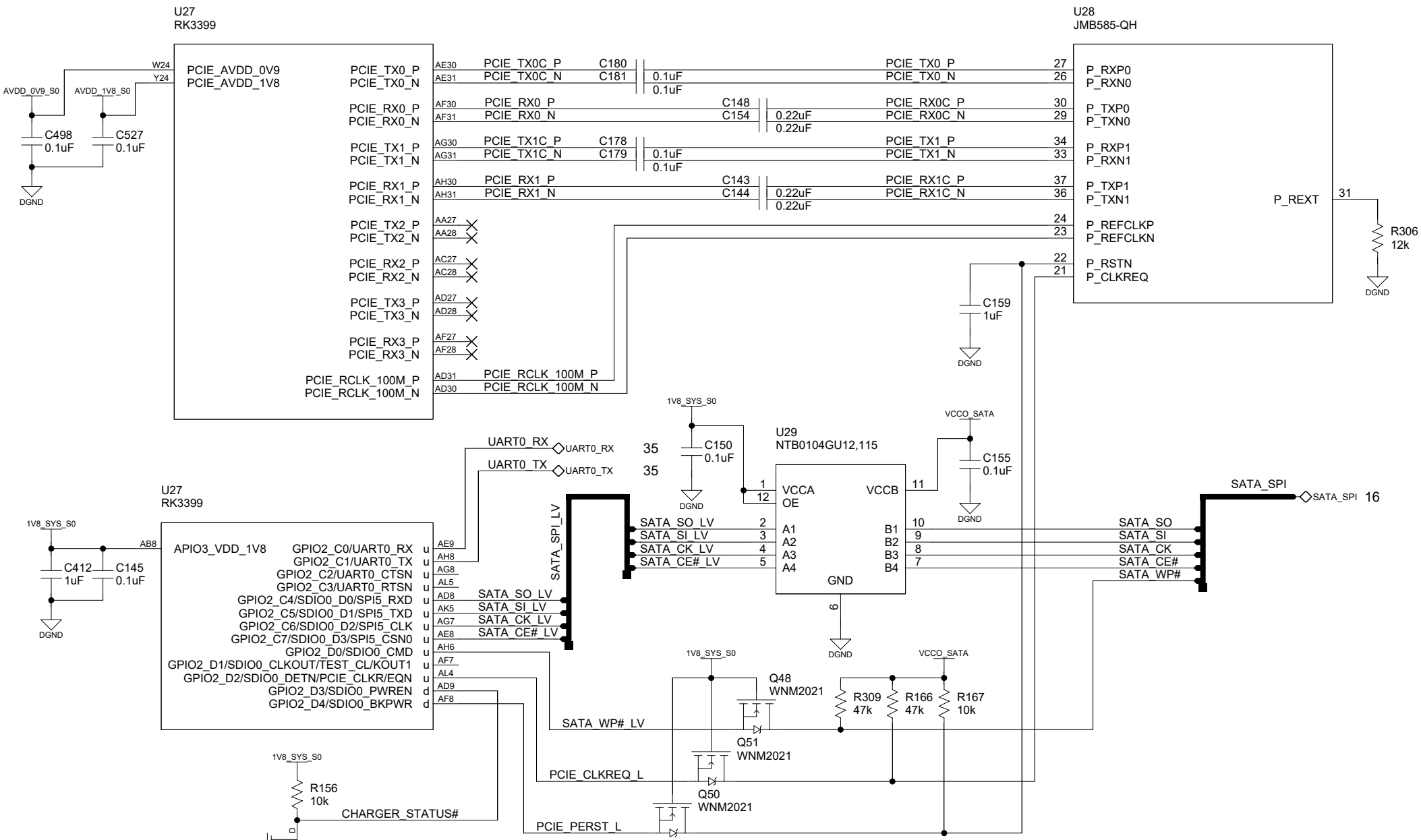
SATA to PCIe Bridge



CHARGER_STATUS#	Description
0	Complete
1	In progress
Blinking 0.5Hz	Fault/Batt absent

SIZE A4	DWG NO Helios64 NAS	sata_pcie	REV 1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 15 of 37	Variant SJK	05/10/2020

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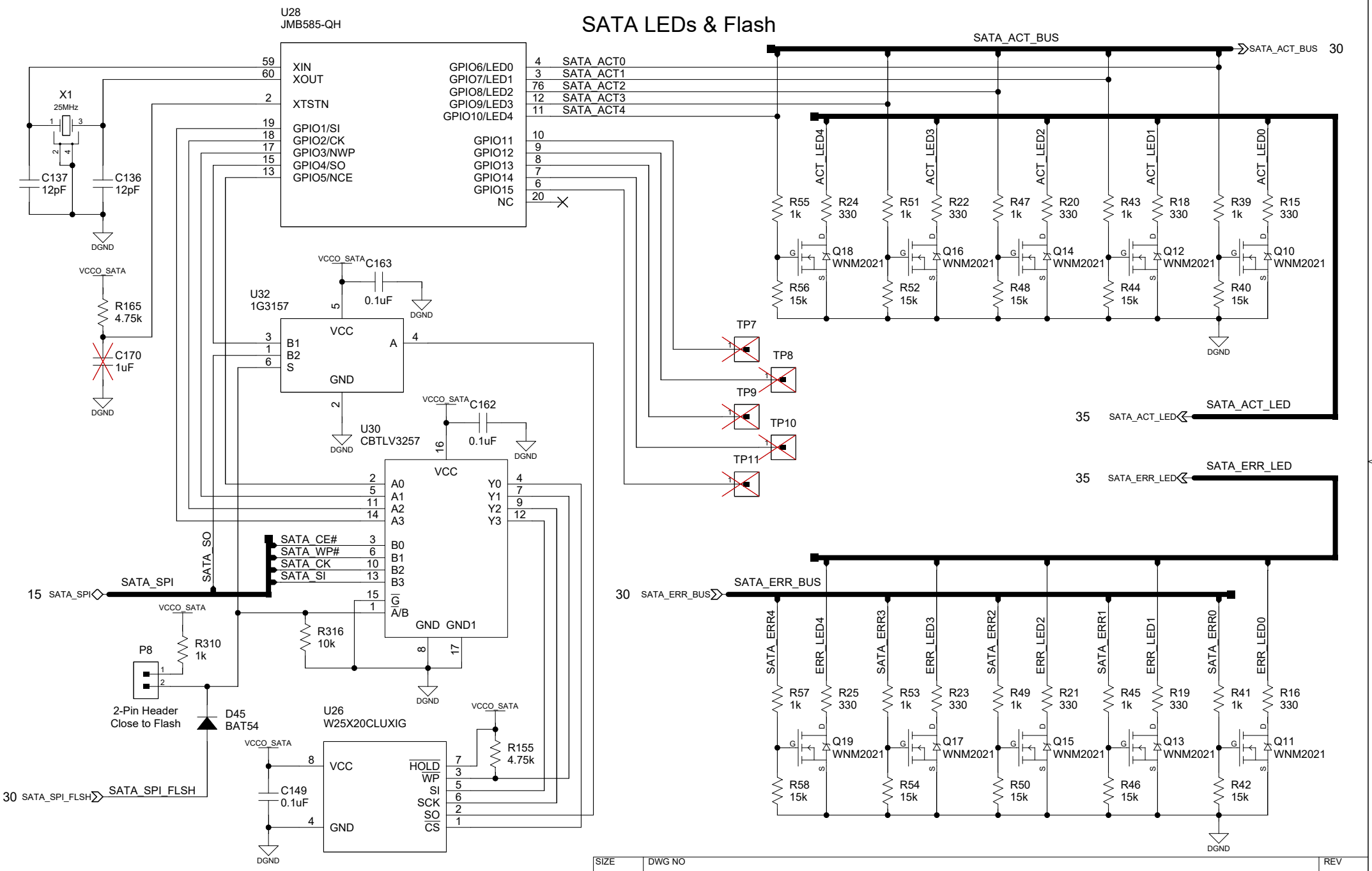
SATA LEDs & Flash



SIZE	DWG NO	REV
A4	Helios64 NAS — sata_led_spi	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost, Aditya Prayoga	16	37	SJK	05/15/2020

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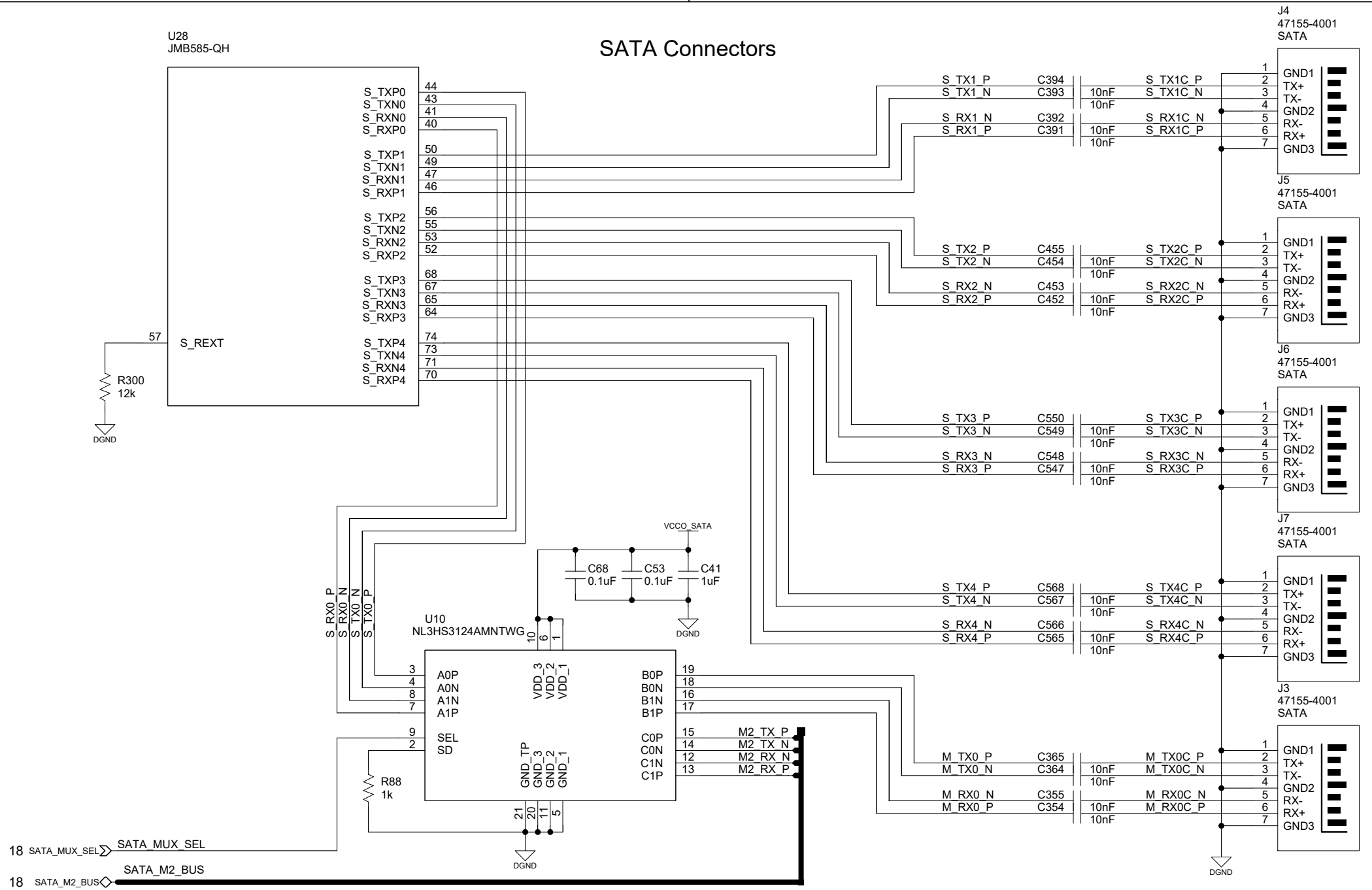
SATA Connectors



SIZE	DWG NO		REV
A4	Helios64 NAS	sata_hdd	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 17 of 37	Variant SJK	05/11/2020

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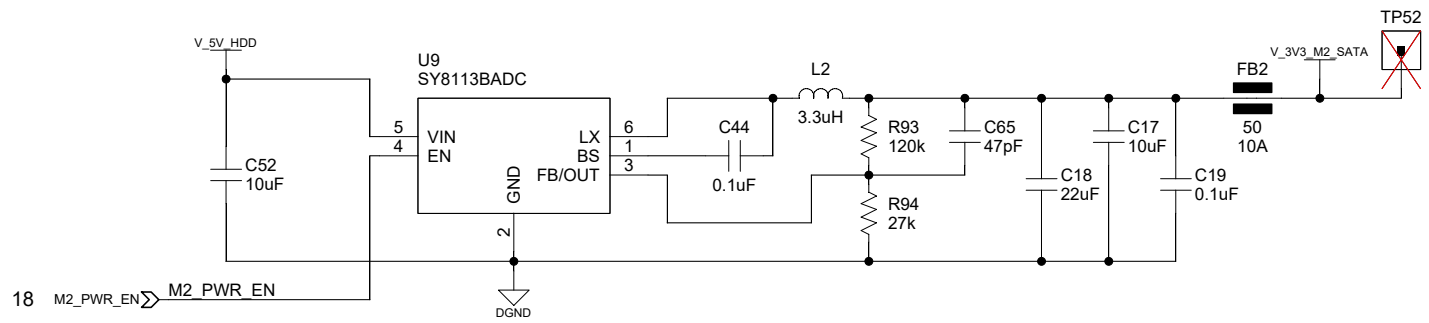
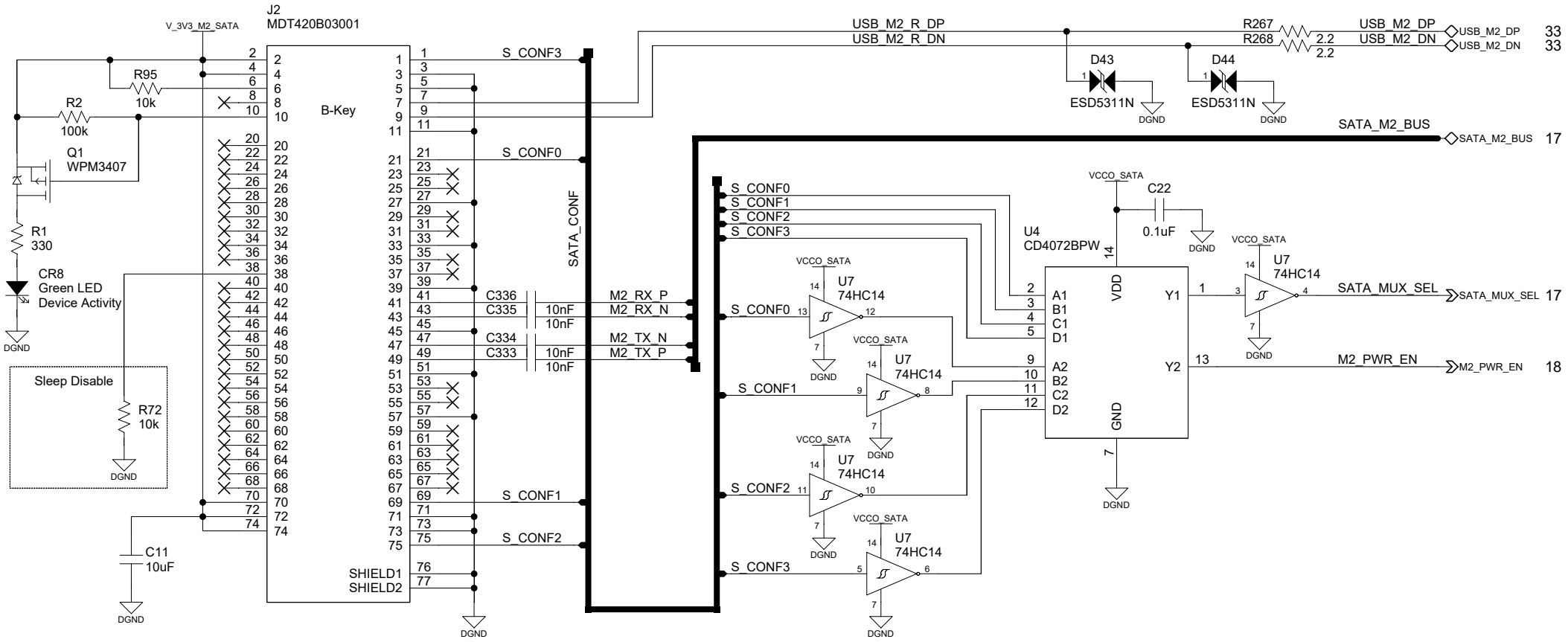
M.2 SATA



SATA M.2 3V3 Power

M.2 Connector



SIZE	DWG NO		REV
A4	Helios64 NAS	sata_m2	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 18 of 37	Variant SJK	05/10/2020

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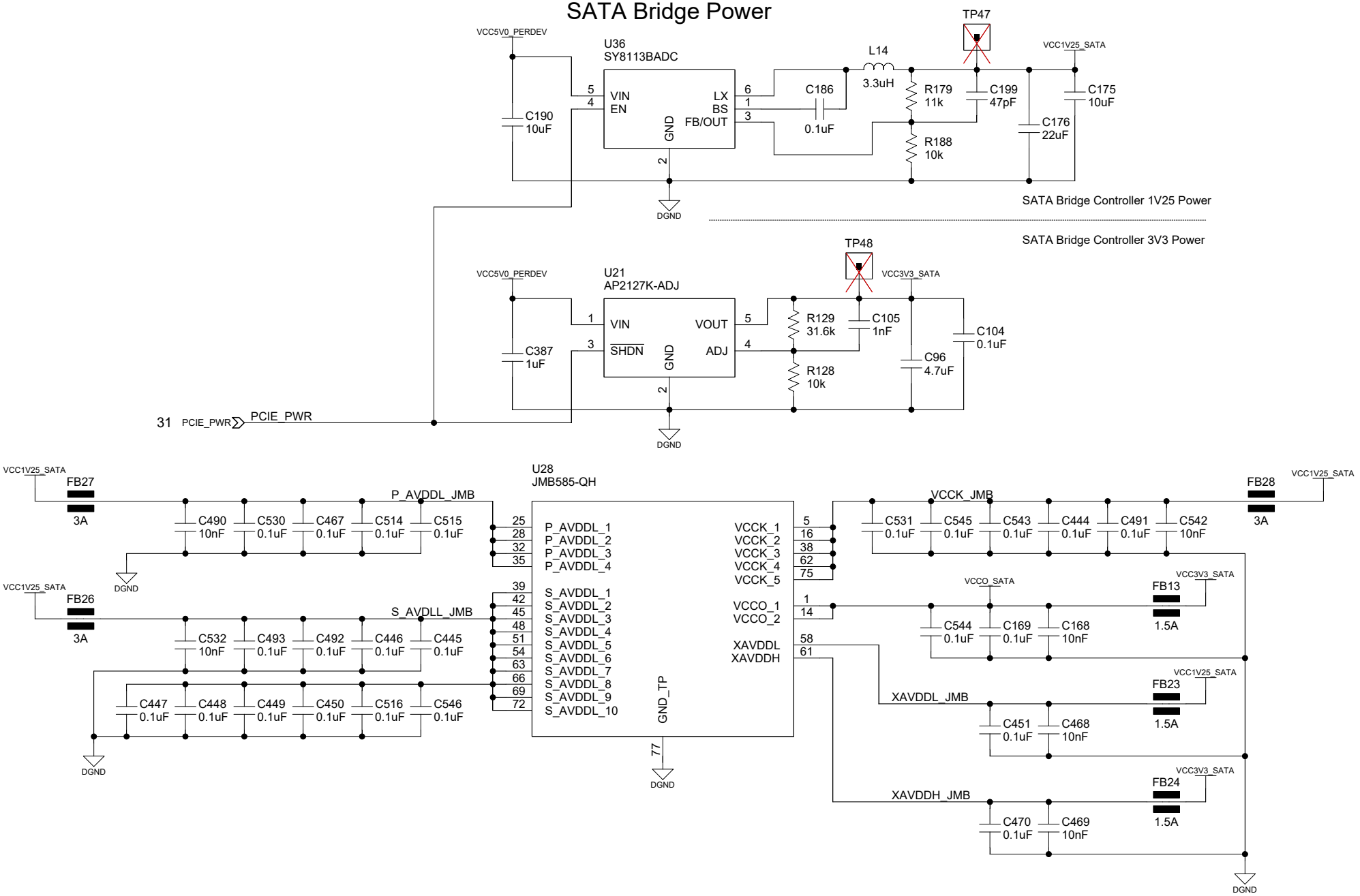
SATA Bridge Power



SIZE	DWG NO	REV
A4	Helios64 NAS — sata_bridge_pwr	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost, Aditya Prayoga	19	37	SJK	05/10/2020

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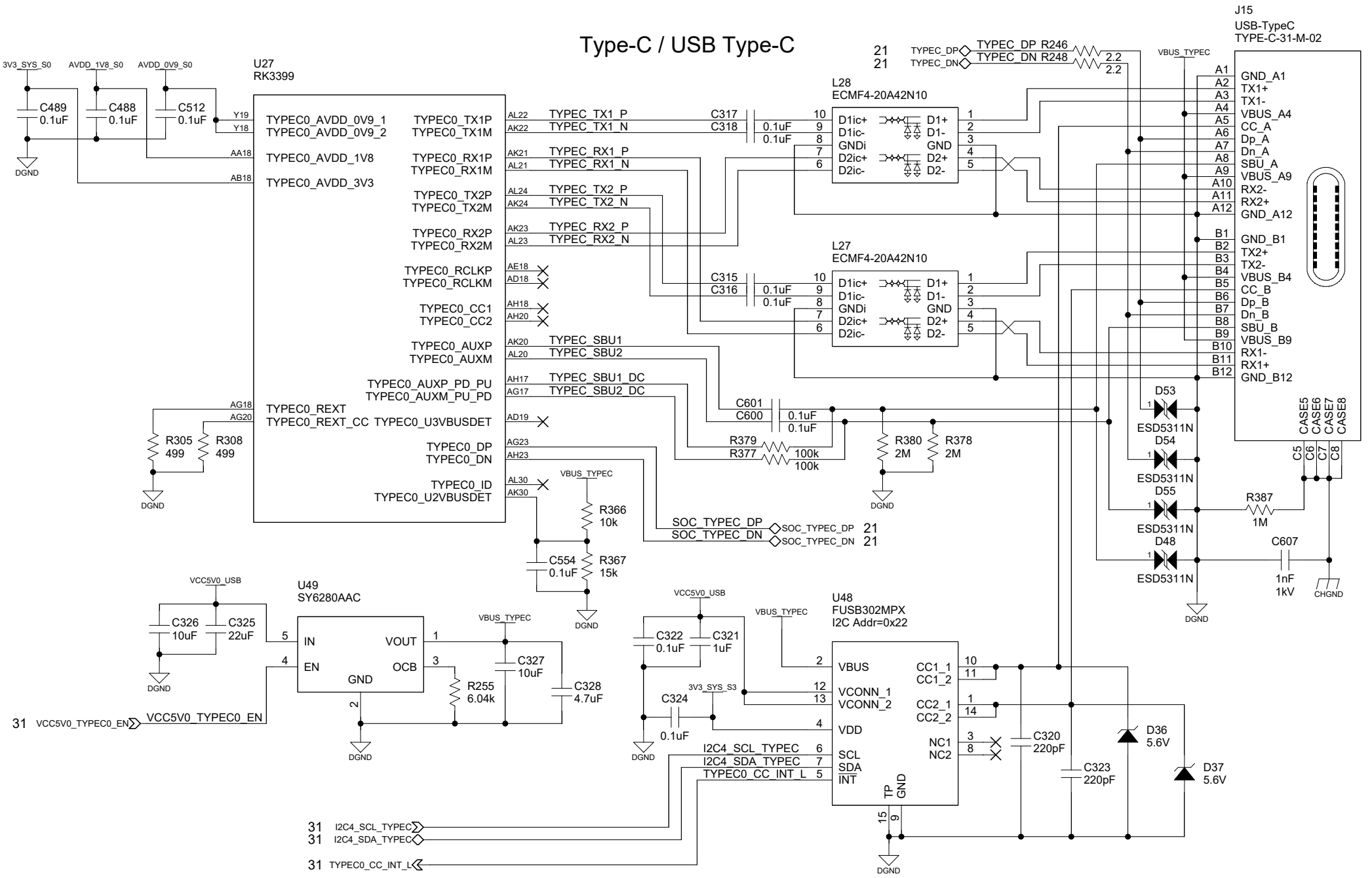
Type-C / USB Type-C



SIZE	DWG NO		REV
A4	Helios64 NAS	typec_port	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 20 of 37	Variant SJK	06/01/2020

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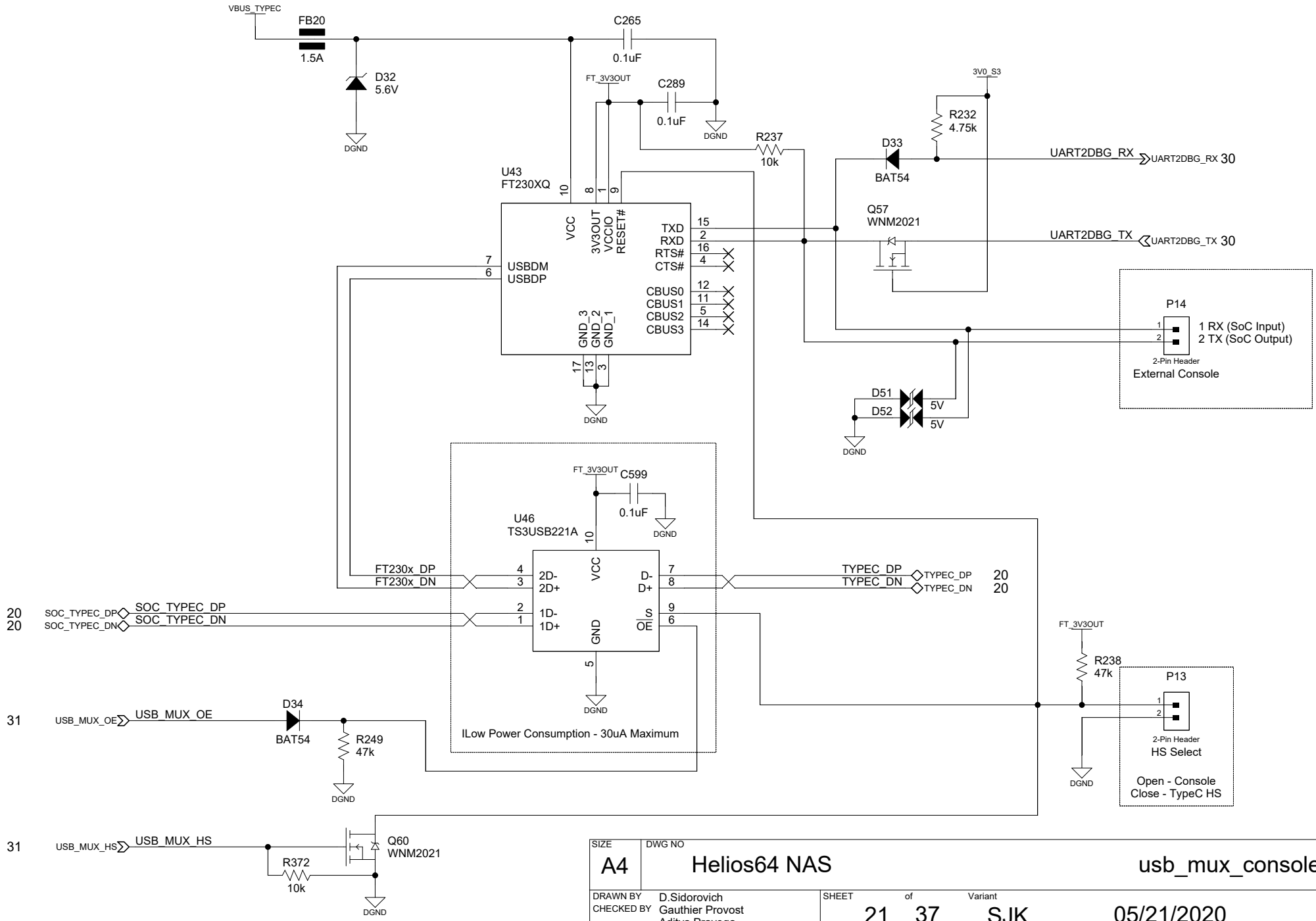
USB / UART Console & Type-C HS MUX 2:1



SIZE	DWG NO		REV
A4	Helios64 NAS	usb_mux_console	1.2

DRAWN BY	D.Sidorovich
CHECKED BY	Gauthier Provost Aditya Prayoga

SHEET	of	Variant	
21	37	SJK	05/21/2020

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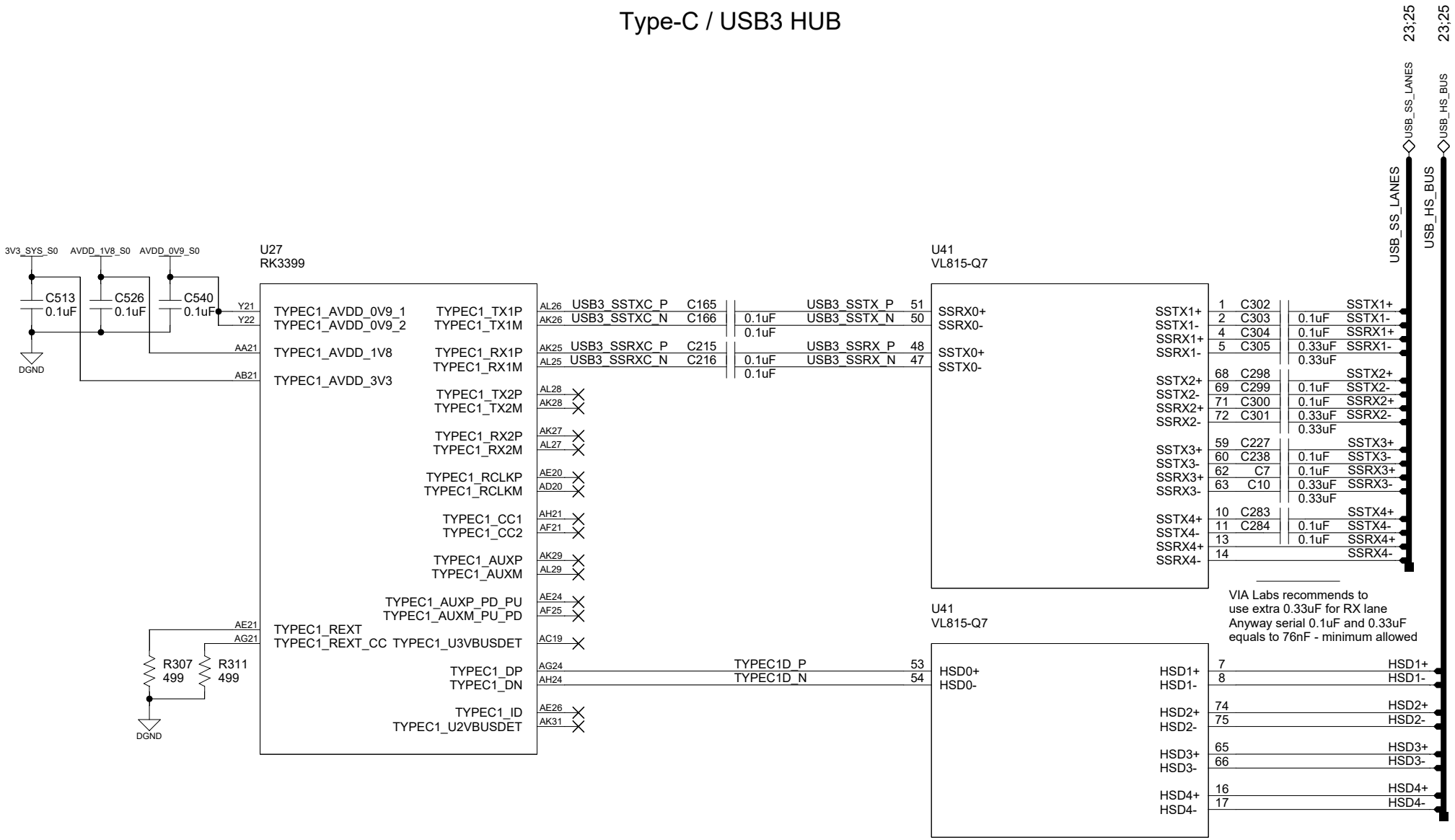
Type-C / USB3 HUB



SIZE	DWG NO		REV
A4	Helios64 NAS	usb3_hub_typec	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 22 of 37	Variant SJK	05/10/2020

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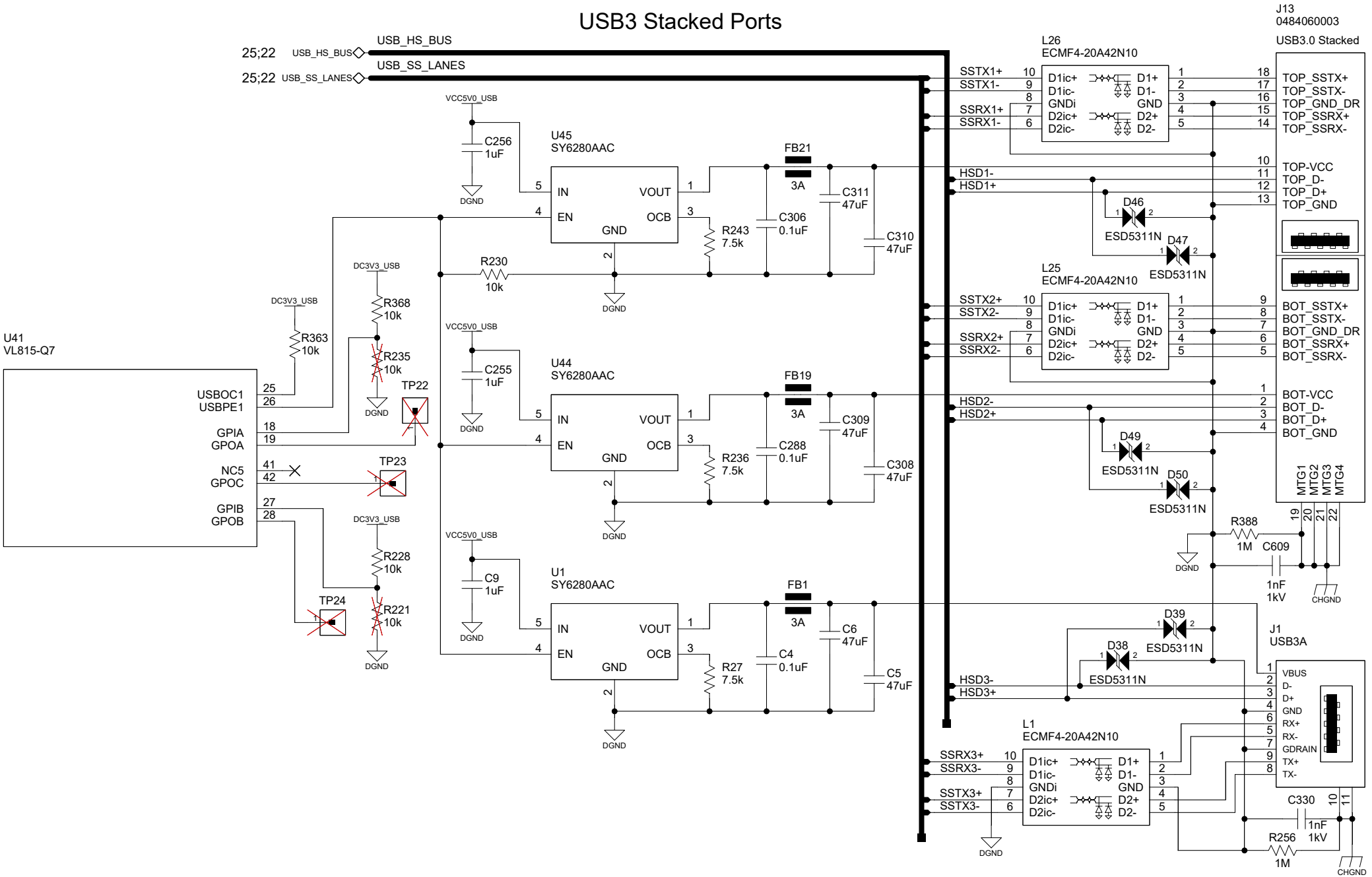
USB3 Stacked Ports



SIZE	DWG NO		REV
A4	Helios64 NAS	usb3_hub_ports	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 23 of 37	Variant SJK	06/01/2020

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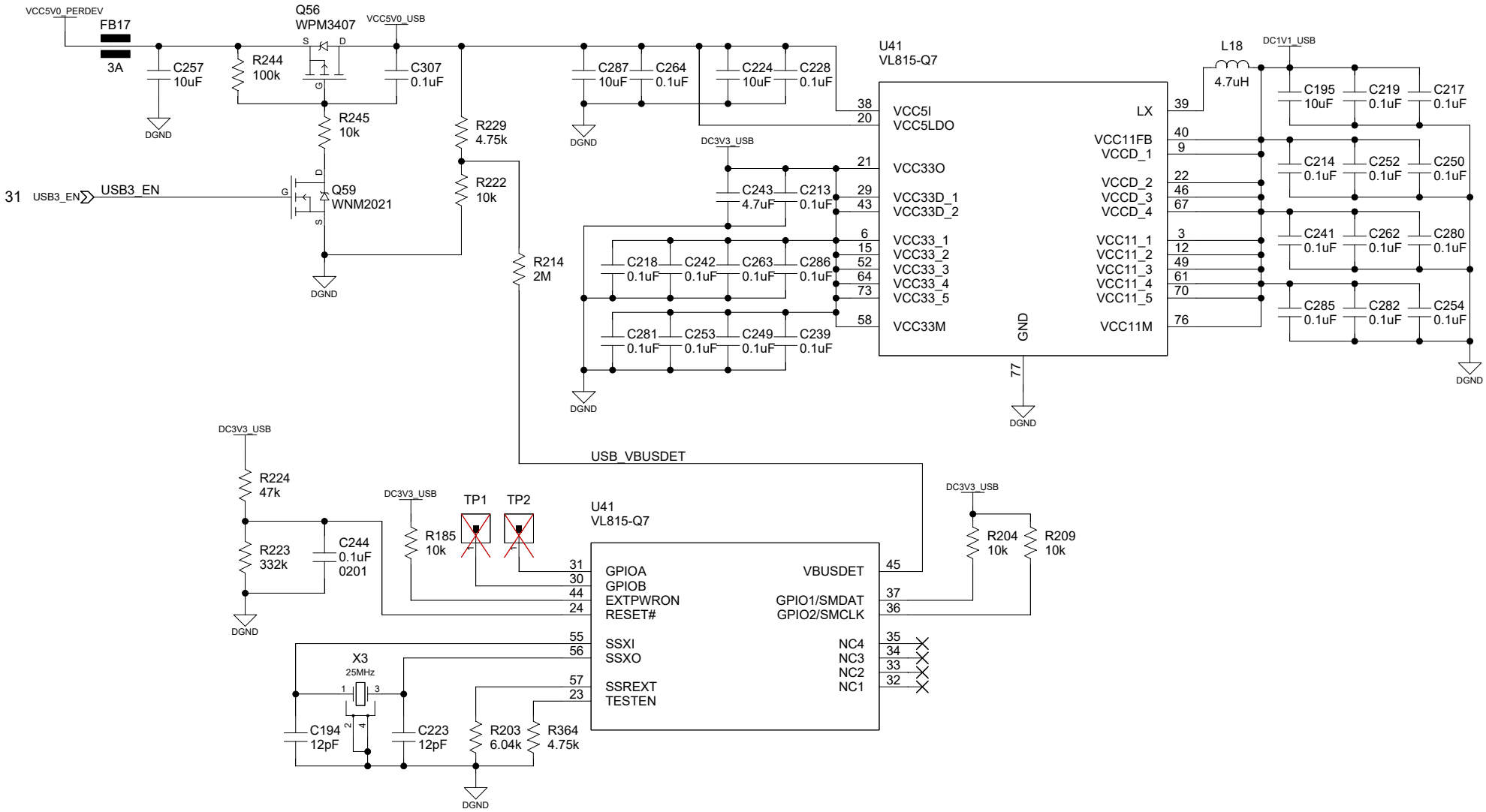
USB3 HUB Power



SIZE	DWG NO		REV
A4	Helios64 NAS	usb3_hub_pwr_led	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 24 of 37	Variant SJK	06/01/2020

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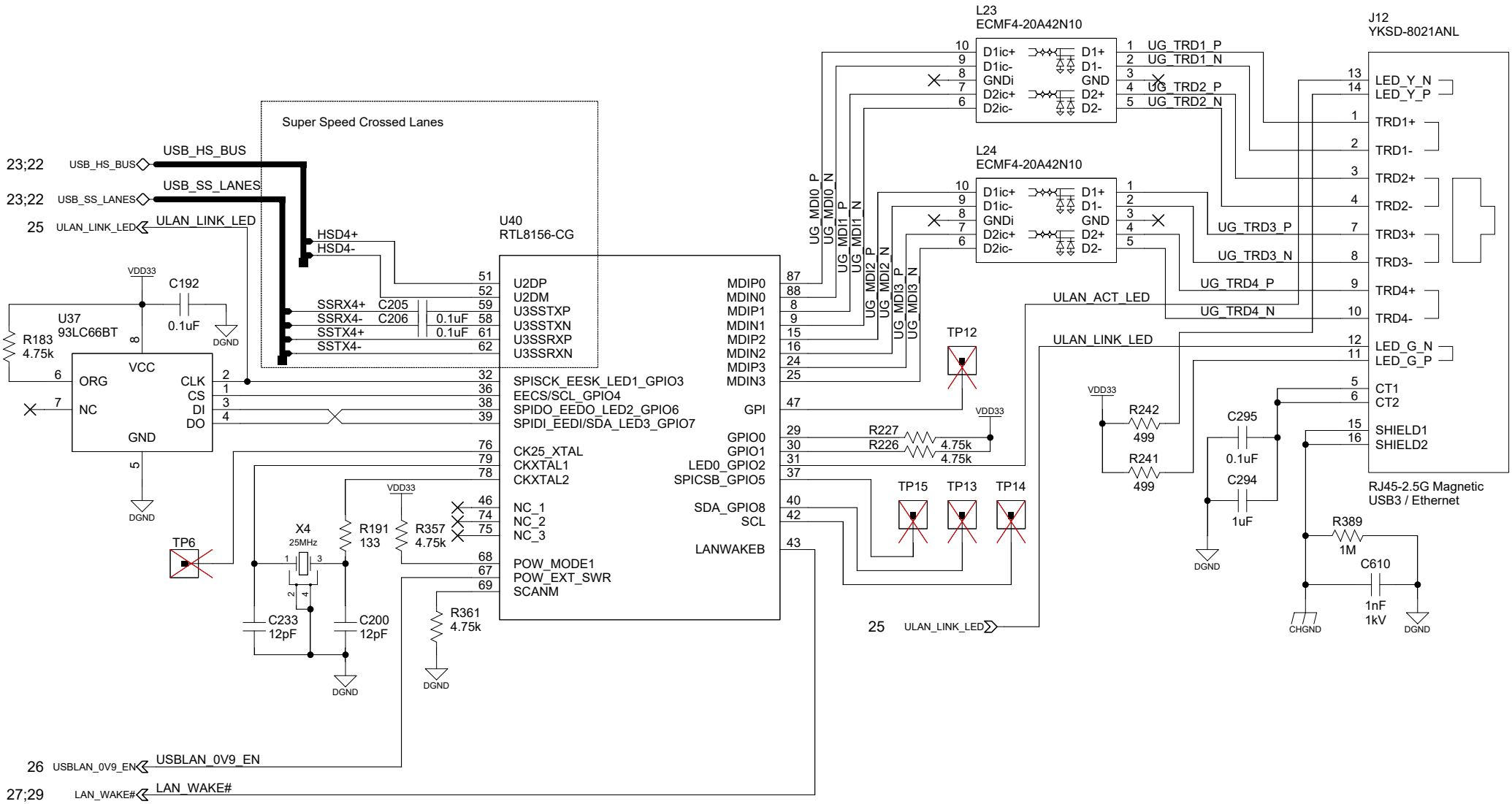
USB3 to 1.0/2.5 GbE LAN



SIZE	DWG NO		REV
A4	Helios64 NAS	usb3_lan	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 25 of 37	Variant SJK	06/01/2020

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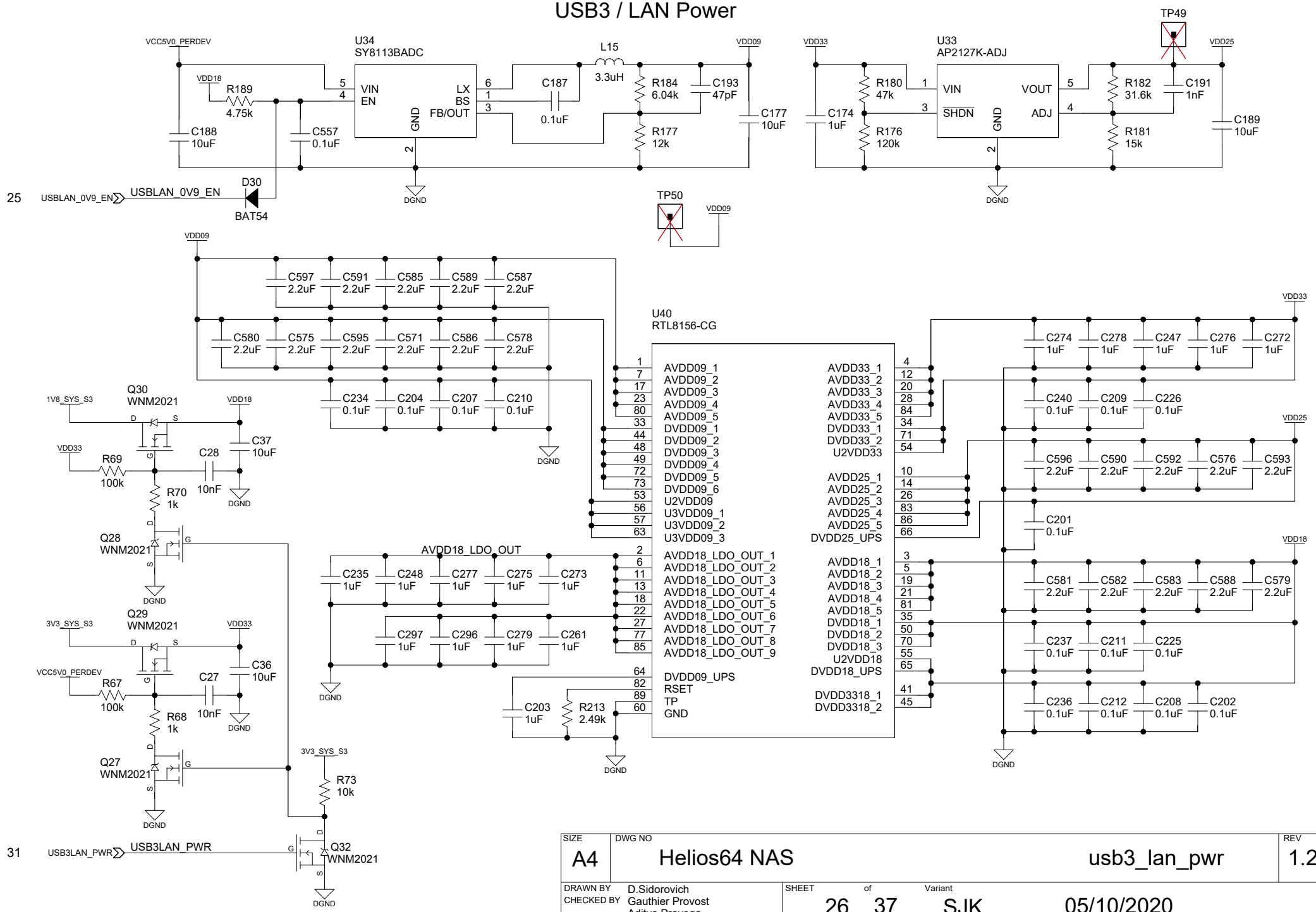
USB3 / LAN Power



SIZE	DWG NO		REV
A4	Helios64 NAS	usb3_lan_pwr	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 26 of 37	Variant SJK	05/10/2020

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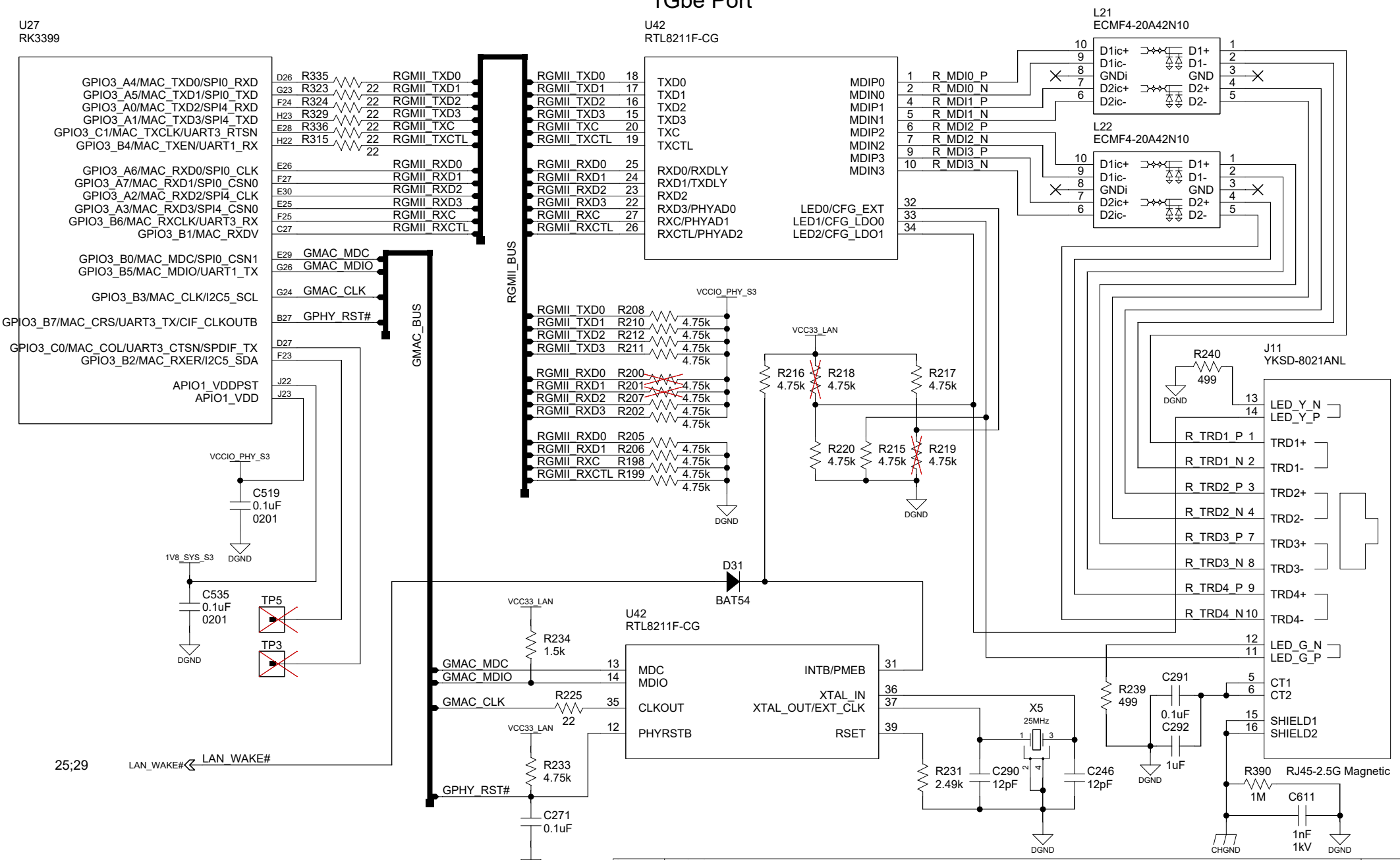
1Gbe Port



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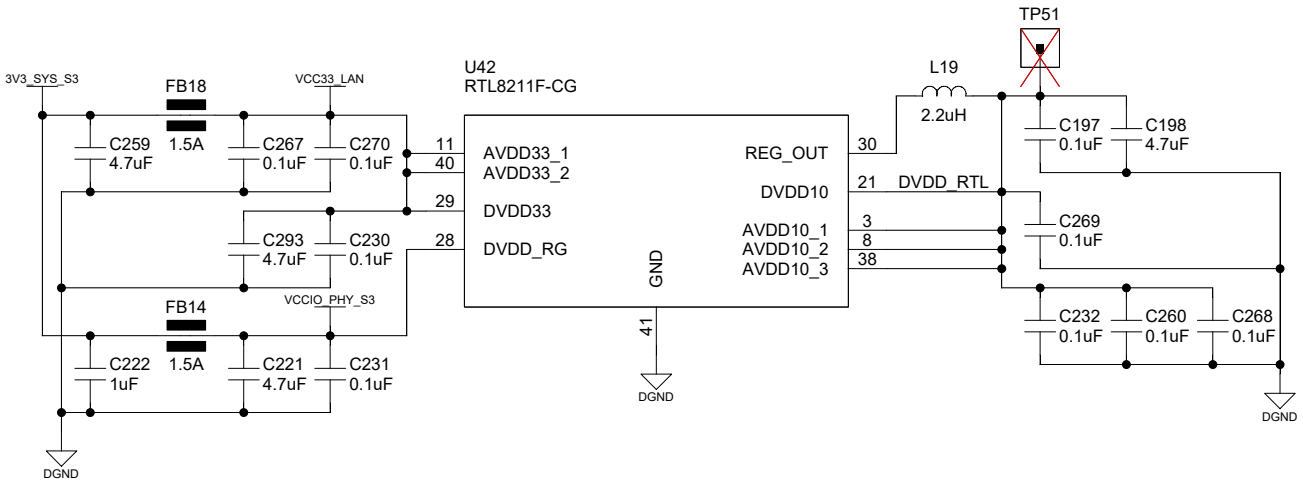
SIZE	DWG NO	REV
A4	Helios64 NAS — rgmii_lan_port	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost, Aditya Prayoga	27	37	SJK	06/01/2020

1Gbe Phy Power



SIZE	DWG NO	REV
A4	Helios64 NAS rgmii_lan_pwr	1.2

DRAWN BY / CHECKED BY	SHEET	of	Variant	
D.Sidorovich Gauthier Provost Aditya Prayoga	28	37	SJK	05/07/2020

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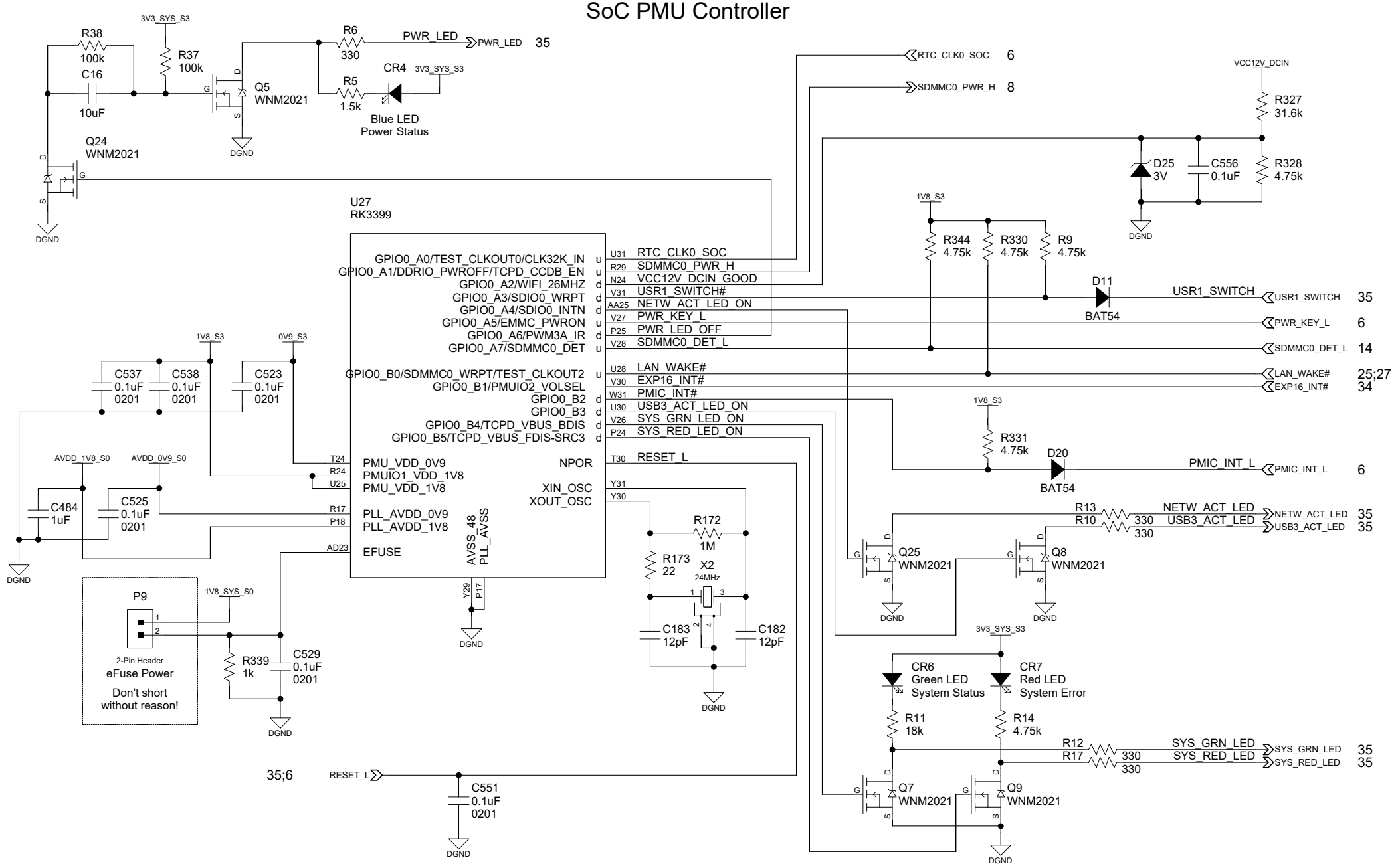
SoC PMU Controller



SIZE	DWG NO	REV
A4	Helios64 NAS soc_pmuc	1.2

DRAWN BY	CHECKED BY	SHEET	of	Variant	
D.Sidorovich	Gauthier Provost, Aditya Prayoga	29	37	SJK	05/16/2020

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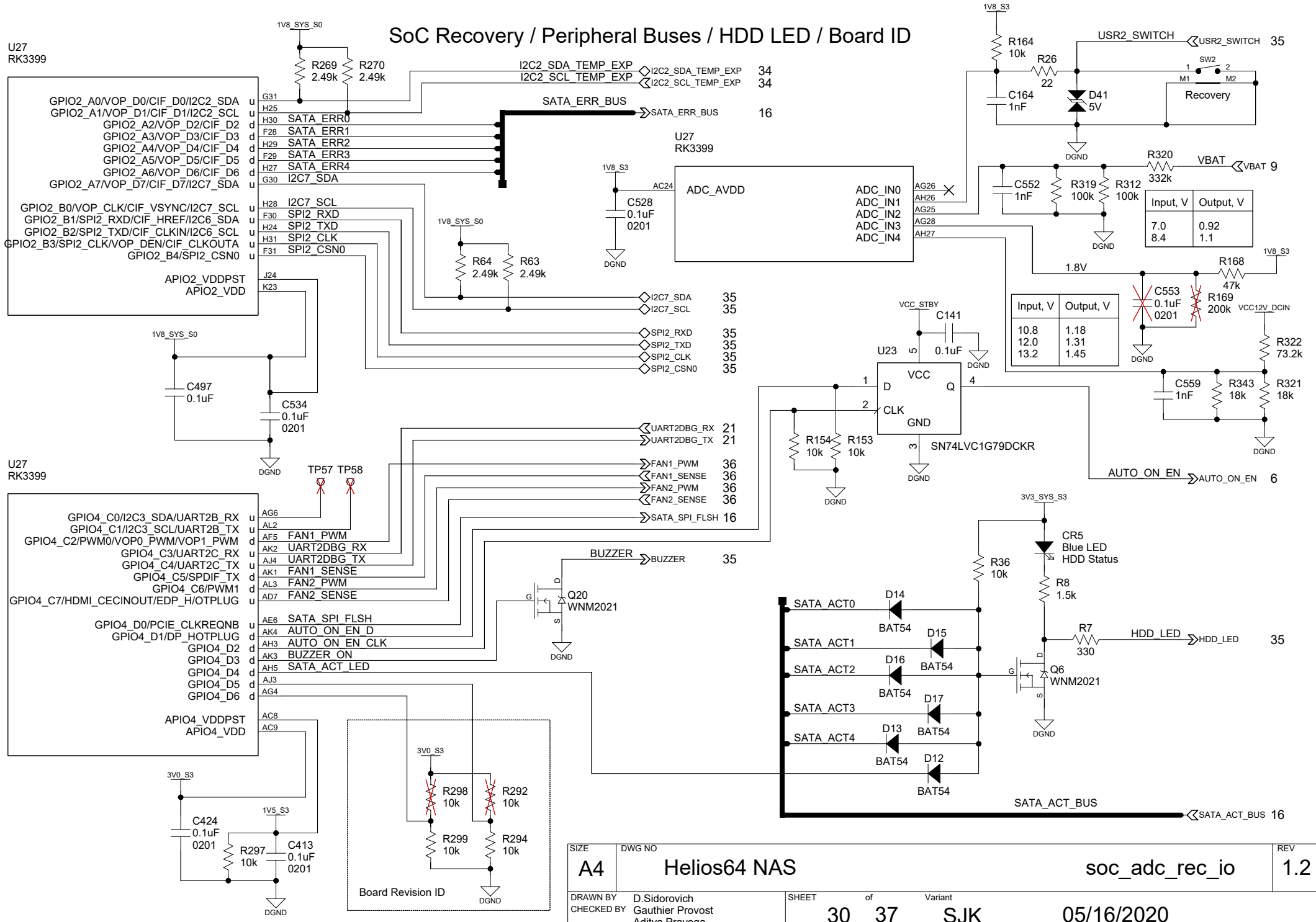
SoC Recovery / Peripheral Buses / HDD LED / Board ID



SIZE A4	DWG NO Helios64 NAS	soc_adc_rec_io	REV 1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 30 of 37	Variant SJK	05/16/2020

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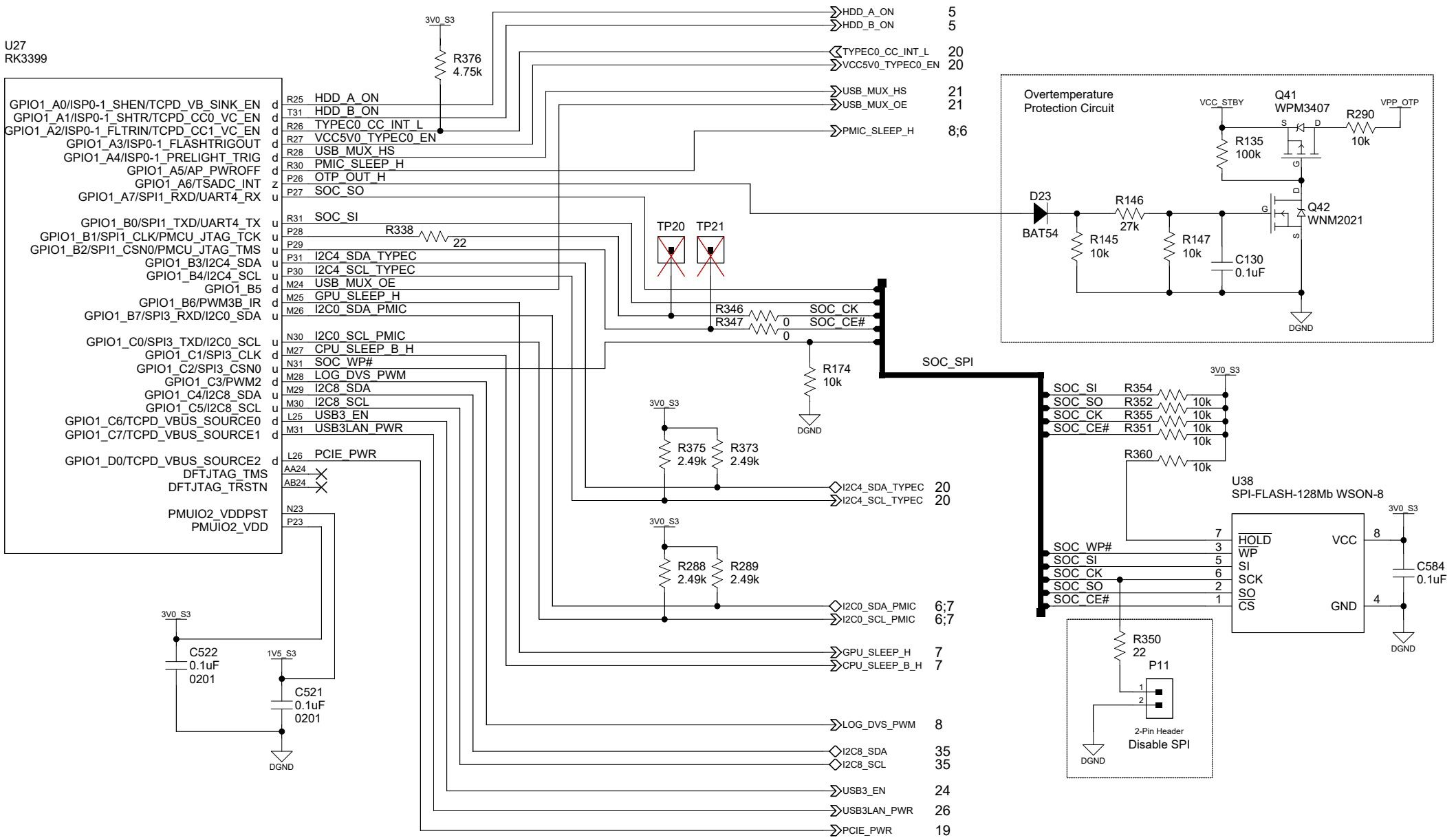
Power Control / Over Temperature Protection / SoC SPI



SIZE	DWG NO		REV
A4	Helios64 NAS	soc_pwrcntr_ovp	1.2

DRAWN BY	D.Sidorovich	SHEET	of	Variant	
CHECKED BY	Gauthier Provost Aditya Prayoga	31	37	SJK	05/16/2020

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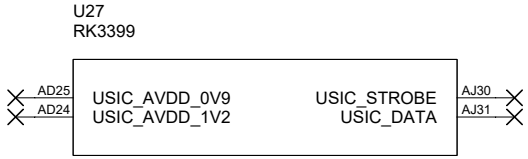
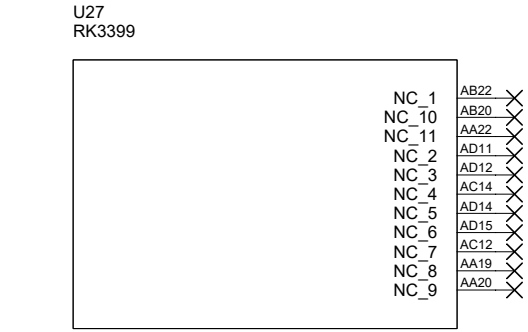
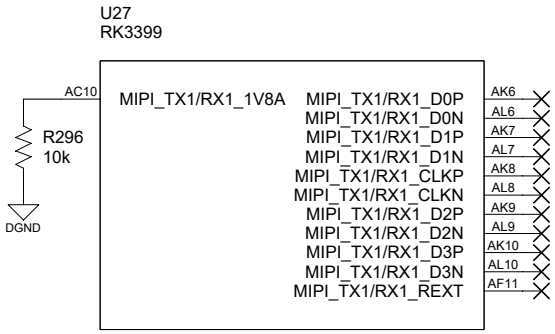
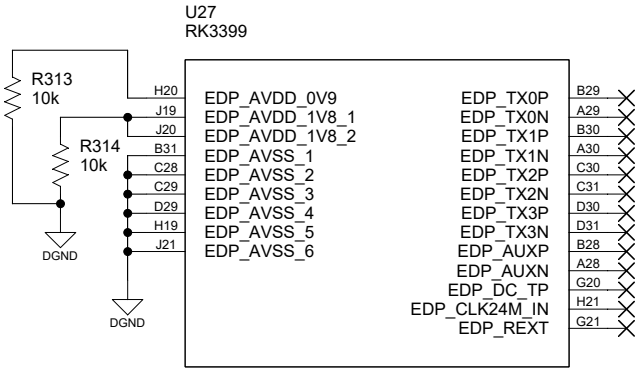
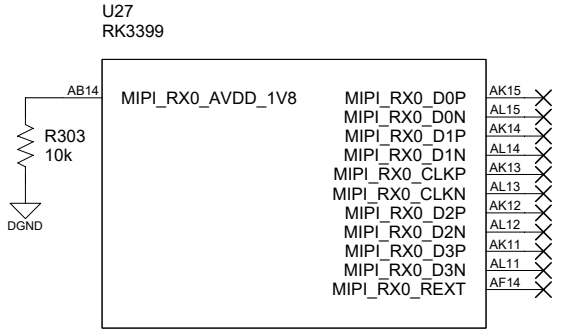
Unused SoC Peripheral

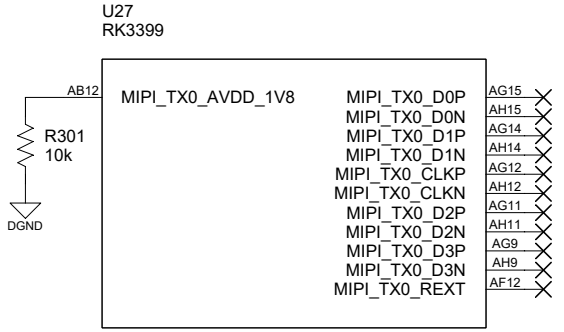












SIZE	DWG NO		REV
A4	Helios64 NAS	soc_unused	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 32 of 37	Variant SJK	05/07/2020

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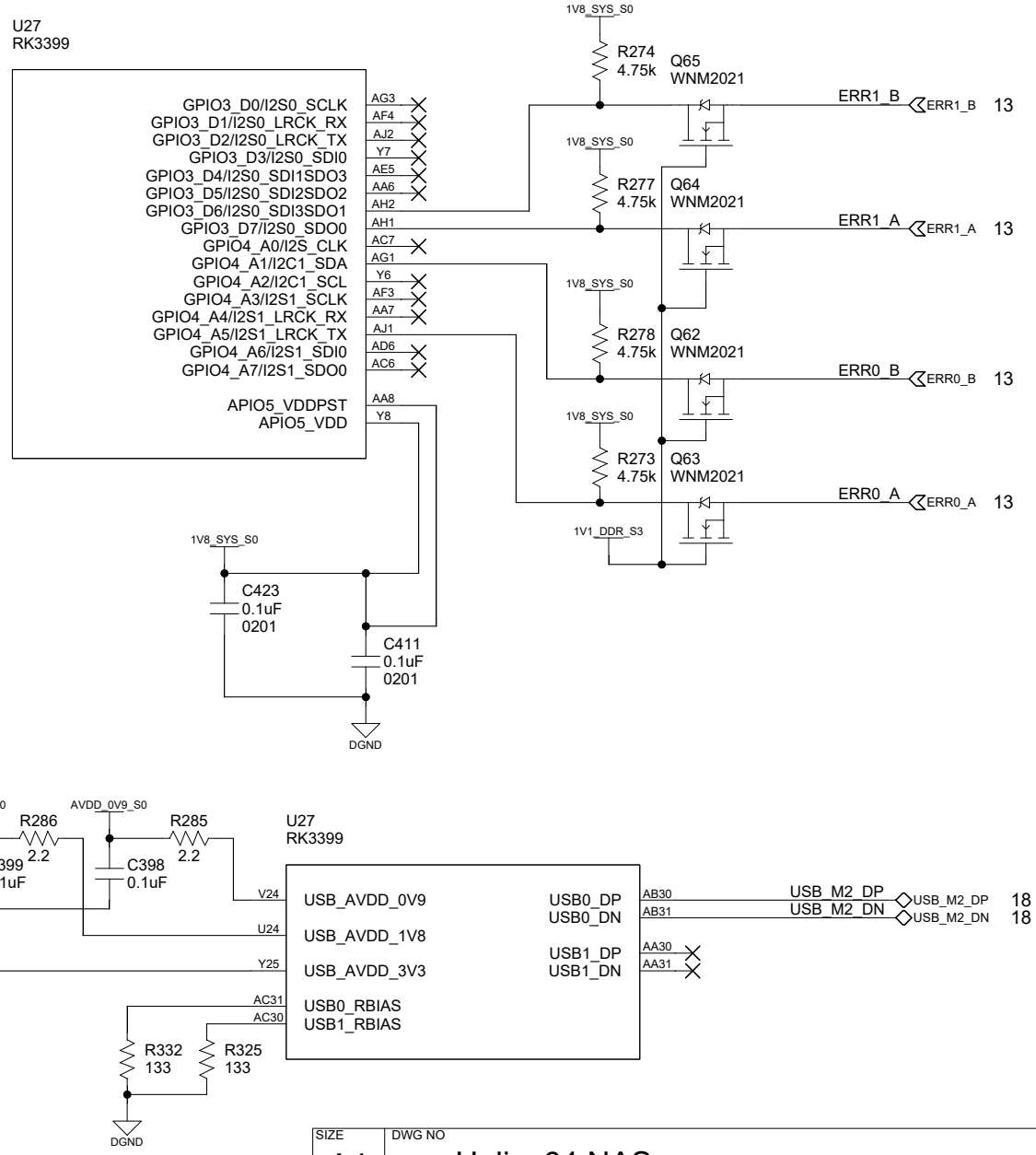
ECC LPDDR Support and USB2.0 M.2



SIZE	DWG NO		REV
A4	Helios64 NAS	ecc_usb2_m2	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 33 of 37	Variant SJK	05/10/2020

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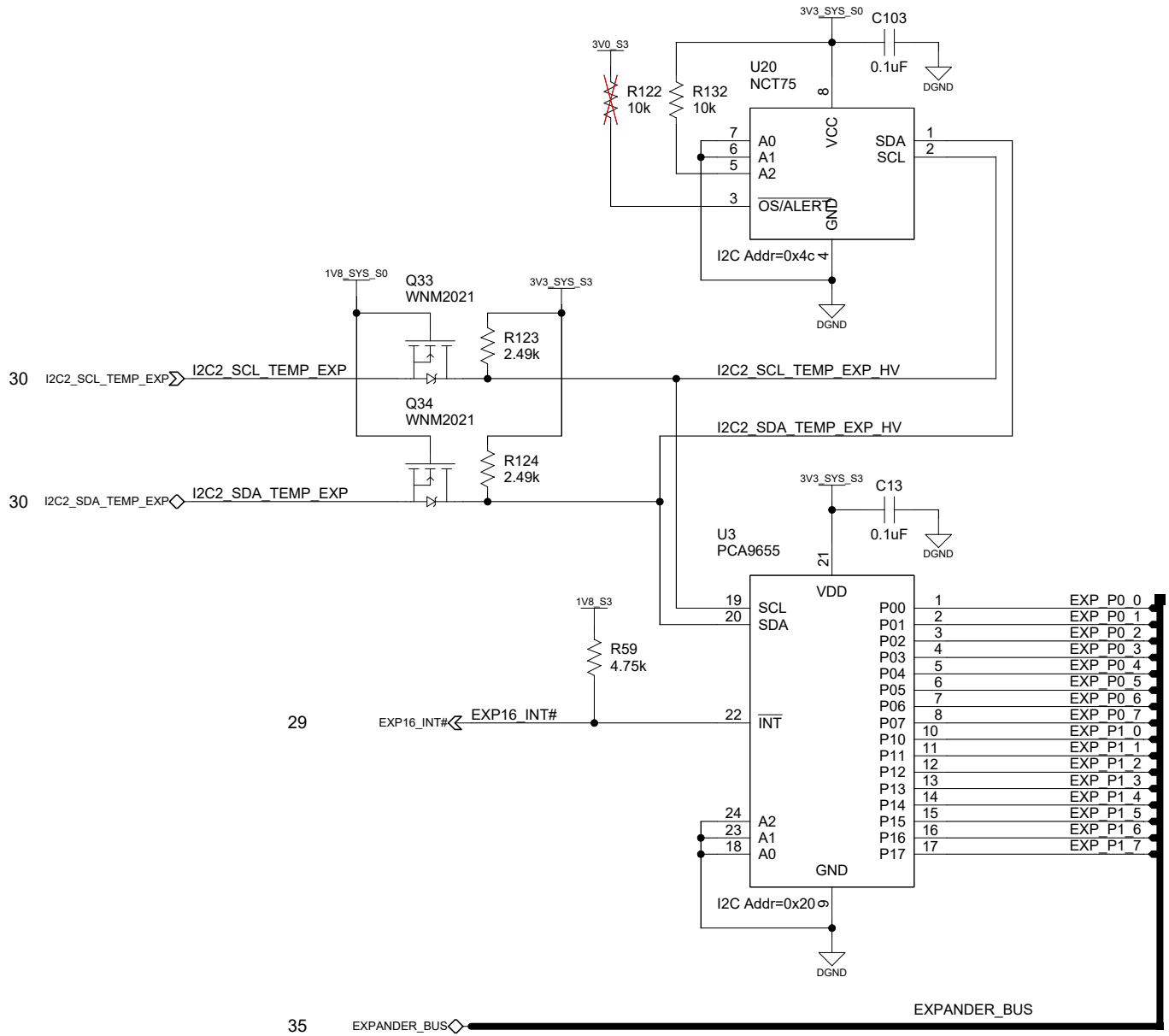
I2C Expander / Temperature Sensor



SIZE	DWG NO		REV
A4	Helios64 NAS	temp_expander	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 34 of 37	Variant SJK	05/10/2020

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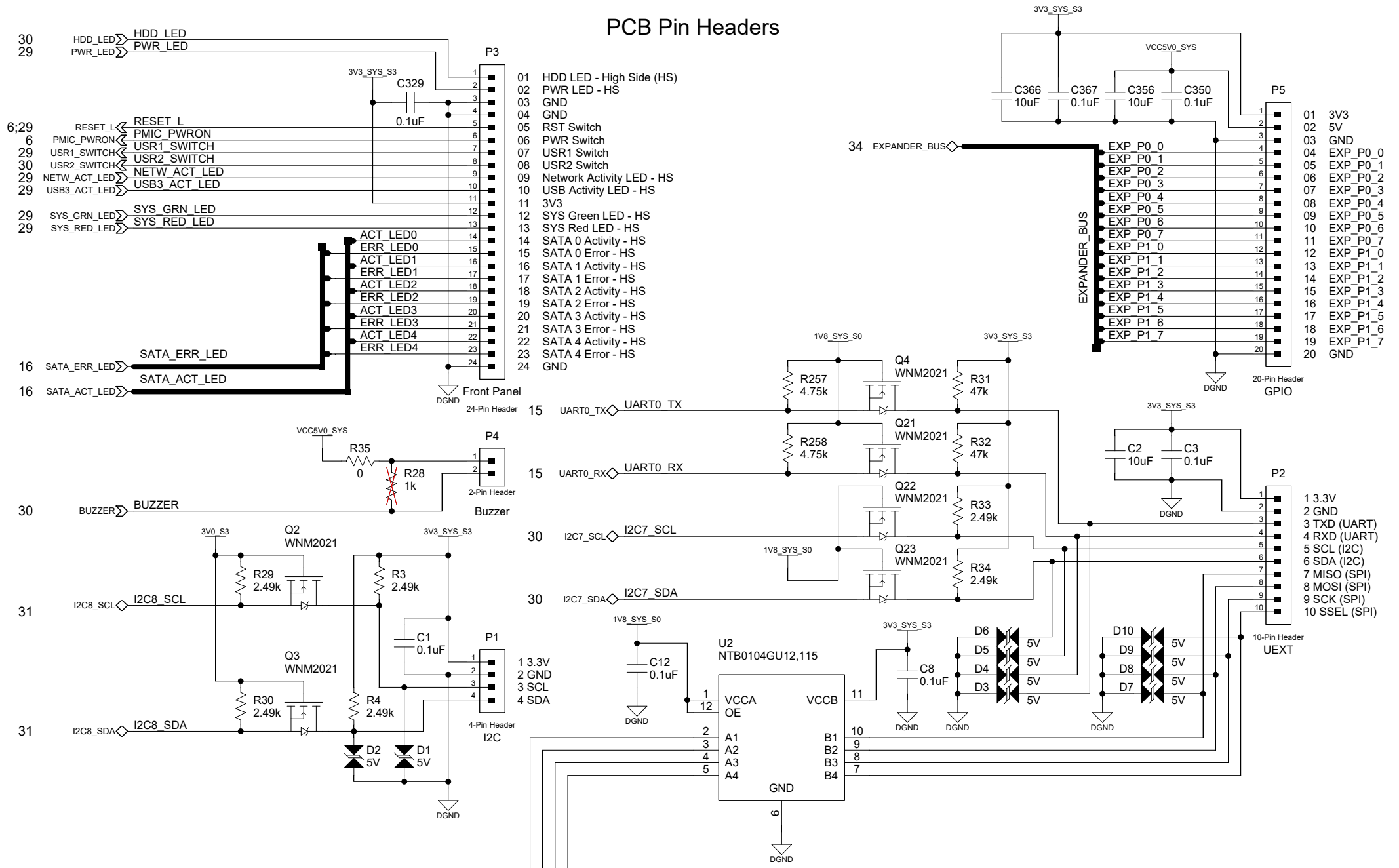
PCB Pin Headers



SIZE A4	DWG NO Helios64 NAS	pcb_headers	REV 1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 35 of 37	Variant SJK	05/14/2020

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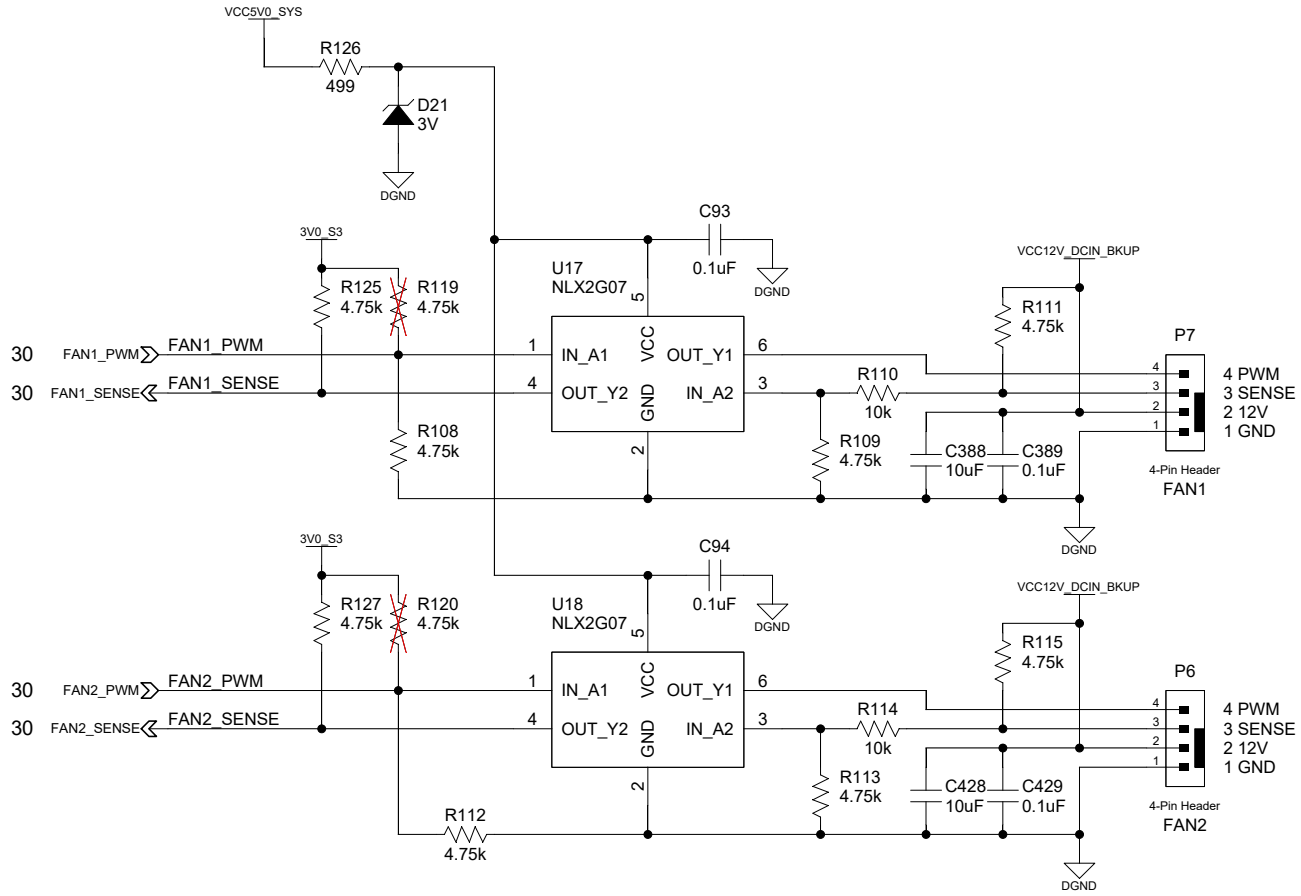
FAN Connectors



SIZE	DWG NO		REV
A4	Helios64 NAS	fans_headers	1.2
DRAWN BY D.Sidorovich CHECKED BY Gauthier Provost Aditya Prayoga	SHEET 36 of 37	Variant SJK	05/13/2020

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I2C Map

I2C	0	1	2	3	4	5	6	7	8
RK808-D	0x1b								
SYR837	0x40								
SYR838	0x41								
NCT75			0x4c						
PCA9655			0x20						
FUSB302					0x22				
P1 Header									Ext Devices
P2 Header				Reserved (UART default)			Reserved (SPI default)	Ext Devices	
Absent		Reserved							

SIZE	DWG NO		REV
A4	Helios64 NAS	i2c_map	1.2

DRAWN BY	D.Sidorovich	SHEET	of	Variant	
CHECKED BY	Gauthier Provost Aditya Prayoga	37	37	SJK	05/07/2020

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