Schematic: reComputer Industrial J201

Revision History

VER	DATE	REVISION	DESCRIPTION
V1.0	04/23/2023	reComputer Industrial J201_V1.0_SCH_230423	Initial Version.
V1.1	06/15/2023	reComputer Industrial J201_V1.1_SCH_230615	Page 04:Added R448=0R in net DP0_HPD. Page 14:Added TVS D102,D103,D104 in PoE. Page 18:Added series diode D101 to R287.
V1.2	10/11/2023	reComputer Industrial J201_V1.2_SCH_231011	Page 07:Changed R107 from 499R to 0R; Changed X2 12MHz from CL=18pF to CL=10pF; Changed C73,C75 from 27pF to 12pF. Page 05:Moved R373,C248 from the Drain of Q17 to Source for "reverse polarity protection".

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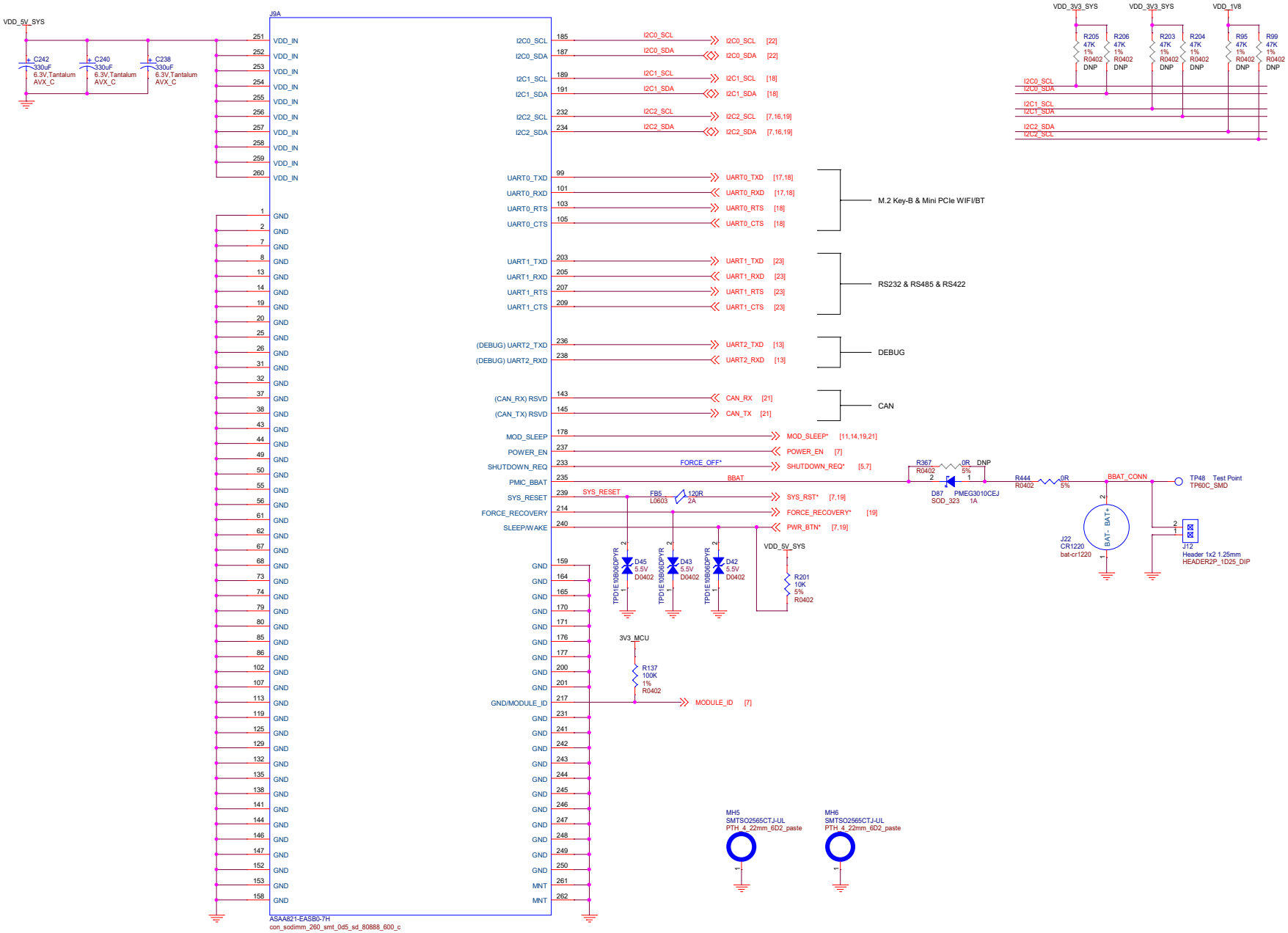
UART, I2C, CAN and GPIOs



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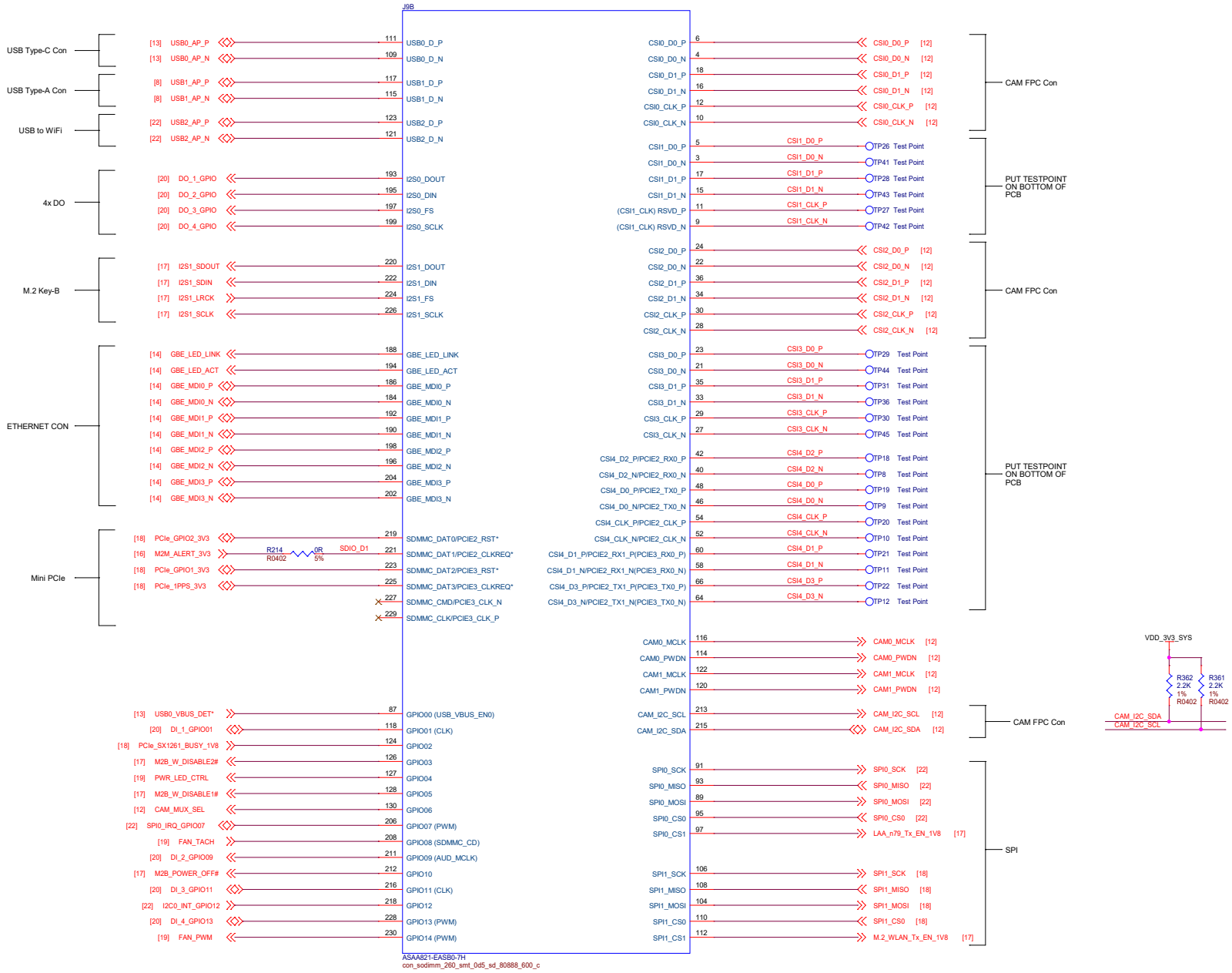
GPIOs, USB2.0, I2S, SPI, GBe and CSI



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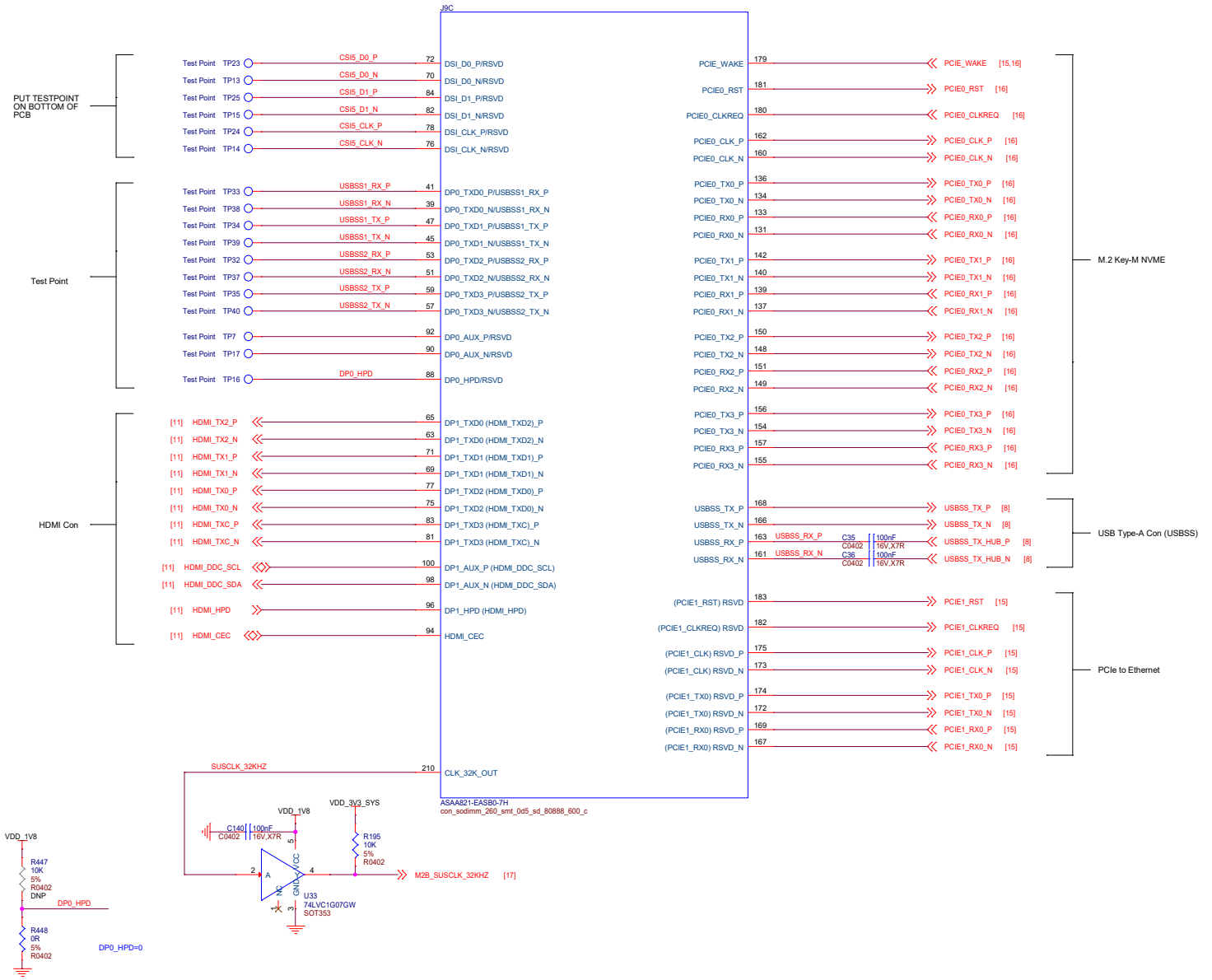
HDMI, DP, DSI, USBSS and PCIe



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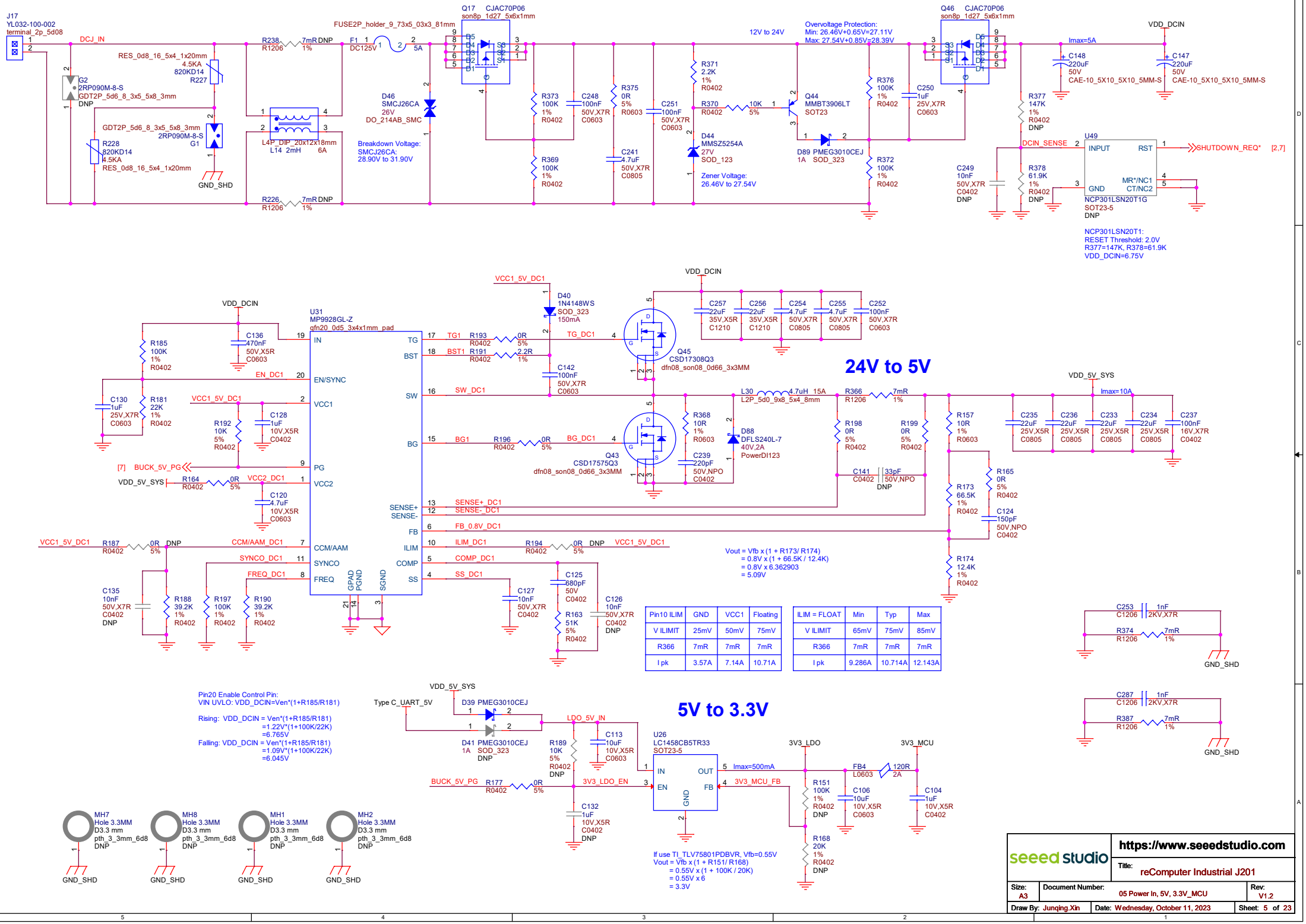
24V to 5V
5V to 3.3V
12V to 24V
Overvoltage Protection:
Min: 26.46V+0.65V=27.11V
Max: 27.54V+0.85V=28.39V
Breakdown Voltage:
SMCJ26CA:
28.90V to 31.90V
Zener Voltage:
26.46V to 27.54V
NCP301LSN20T1:
RESET Threshold: 2.0V
R377=147K, R378=61.9K
VDD_DCIN=6.75V
Vout = Vfb x (1 + R173/ R174)
= 0.8V x (1 + 66.5K / 12.4K)
= 0.8V x 6.362903
= 5.09V
Pin20 Enable Control Pin:
VIN UVLO: VDD_DCIN=Ven*(1+R185/R181)
Rising: VDD_DCIN = Ven*(1+R185/R181)
=1.22V*(1+100K/22K)
=6.765V
Falling: VDD_DCIN = Ven*(1+R185/R181)
=1.09V*(1+100K/22K)
=6.045V
If use TI_TLV75801PDBVR, Vfb=0.55V
Vout = Vfb x (1 + R151/ R168)
= 0.55V x (1 + 100K / 20K)
= 0.55V x 6
= 3.3V
Pin10 ILIM
GND
VCC1
Floating
V ILIMIT
25mV
50mV
75mV
R366
7mR
7mR
7mR
I pk
3.57A
7.14A
10.71A
ILIM = FLOAT
Min
Typ
Max
V ILIMIT
65mV
75mV
85mV
R366
7mR
7mR
7mR
I pk
9.286A
10.714A
12.143A
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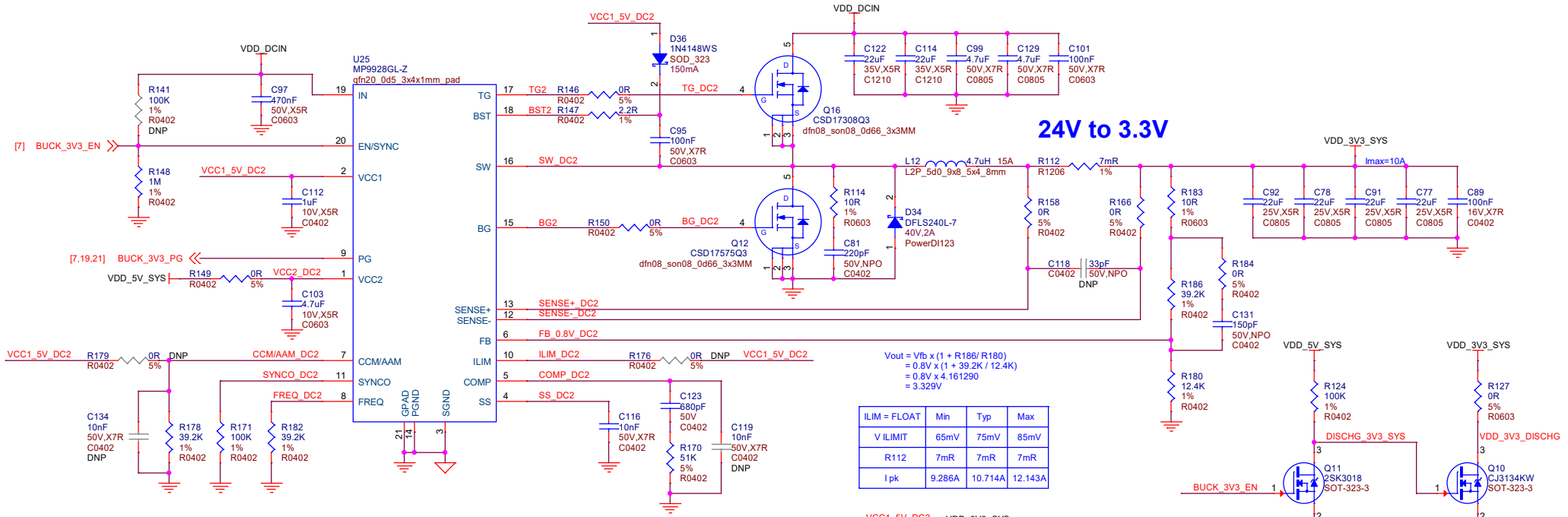
24V to 3.3V
VDD_DCIN
U25
MP9928GL-Z
qfn20_0d5_3x4x1mm_pad
IN
EN/SYNC
VCC1
PG
VCC2
CCM/AAM
SYNCO
FREQ
TG
BST
SW
BG
SENSE+
SENSE-
FB
ILIM
COMP
SS
GPAD
PGND
SGND
VCC1_5V_DC2
D36
1N4148WS
SOD_323
150mA
TG_DC2
BST2
C95
100nF
50V,X7R
C0603
Q16
CSD17308Q3
dfn08_son08_0d66_3x3MM
SW_DC2
L12
L2P_5d0_9x8_5x4_8mm
4.7uH_15A
R112
R1206
7mR
1%
R114
10R
1%
R0603
D34
DFLS240L-7
40V,2A
PowerDI123
BG2
BG_DC2
Q12
CSD17575Q3
dfn08_son08_0d66_3x3MM
C81
220pF
50V,NPO
C0402
SENSE+_DC2
SENSE-_DC2
FB_0.8V_DC2
ILIM_DC2
COMP_DC2
SS_DC2
C122
22uF
35V,X5R
C1210
C114
22uF
35V,X5R
C1210
C99
4.7uF
50V,X7R
C0805
C129
4.7uF
50V,X7R
C0805
C101
100nF
50V,X7R
C0603
R158
0R
5%
R0402
R166
0R
5%
R0402
C118
33pF
50V,NPO
C0402
DNP
R183
10R
1%
R0603
R186
39.2K
1%
R0402
R184
0R
5%
R0402
C131
150pF
50V,NPO
C0402
R180
12.4K
1%
R0402
VDD_3V3_SYS
Imax=10A
C92
22uF
25V,X5R
C0805
C78
22uF
25V,X5R
C0805
C91
22uF
25V,X5R
C0805
C77
22uF
25V,X5R
C0805
C89
100nF
16V,X7R
C0402
[7] BUCK_3V3_EN
R141
100K
1%
R0402
DNP
C97
470nF
50V,X5R
C0603
R148
1M
1%
R0402
VCC1_5V_DC2
C112
1uF
10V,X5R
C0402
[7,19,21] BUCK_3V3_PG
VDD_5V_SYS
R149
0R
5%
R0402
VCC2_DC2
C103
4.7uF
10V,X5R
C0603
R146
0R
5%
R0402
R147
2.2R
1%
R0402
R150
0R
5%
R0402
R179
0R
5%
R0402
DNP
R176
0R
5%
R0402
DNP
C134
10nF
50V,X7R
C0402
DNP
R178
39.2K
1%
R0402
R171
100K
1%
R0402
R182
39.2K
1%
R0402
C116
10nF
50V,X7R
C0402
C123
680pF
50V
C0402
R170
51K
5%
R0402
C119
10nF
50V,X7R
C0402
DNP
Vout = Vfb x (1 + R186/ R180)
= 0.8V x (1 + 39.2K / 12.4K)
= 0.8V x 4.161290
= 3.329V
ILIM = FLOAT
Min
Typ
Max
V ILIMIT
65mV
75mV
85mV
R112
7mR
7mR
7mR
I pk
9.286A
10.714A
12.143A
VDD_3V3_SYS RAIL DISCHARGE
VDD_5V_SYS
R124
100K
1%
R0402
DISCHG_3V3_SYS
Q11
2SK3018
SOT-323-3
BUCK_3V3_EN
VDD_3V3_SYS
R127
0R
5%
R0603
VDD_3V3_DISCHG
Q10
CJ3134KW
SOT-323-3
3.3V to 1.8V
VDD_3V3_SYS
C82
1uF
10V,X5R
C0402
U22
LC1458CB5TR18
SOT23-5
IN
OUT
EN
FB
GND
BUCK_3V3_PG
Imax=500mA
VDD_1V8_FB
VDD_1V8
R105
100K
1%
R0402
DNP
R106
44.2K
1%
R0402
DNP
C83
1uF
10V,X5R
C0402
TP47 Test Point
TP60C_SMD
If use TI_TLV75801PDBVR, Vfb=0.55V
Vout = Vfb x (1 + R105 / R106)
= 0.55V x (1 + 100K / 44.2K)
= 0.55V x 3.2624
= 1.79V
VCC1_5V_DC2
VDD_3V3_SYS
R104
51K
5%
R0402
R102
10K
5%
R0402
DNP
BUCK_3V3_PG
R101
100K
1%
R0402
USB3.0 HUB 5V to 1.2V
VDD_5V_SYS
BUCK_3V3_EN
R77
0R
5%
R0402
EN_1V2
EN
AVIN
PVIN
SW
MODE
GPAD
AGND
PGND
FB
SW_1V2
L11
L2016
1uH
2.05A
WPN201610H1R0MT
VDD_1V2_FB
C69
22uF
25V,X5R
C0805
R78
0R
5%
R0402
U14
ETA3410D2I-T
DFN8G_0D5_2X2MM_3410
Imax=688mA
Vout= 1.2V
VDD_1V2
R70
100K
1%
R0402
C62
22pF
50V,NPO
C0402
C64
22uF
25V,X5R
C0805
R74
100K
1%
R0402
TP46 Test Point
TP60C_SMD
Vout = Vfb x (1 + R70 / R74)
= 0.6V x (1 + 100K / 100K)
= 0.6V x 2
= 1.2V
Note: VDD12 should come up before VDD33(VDD33 should rise after or at the same rate as VDD12).
VDD_5V_SYS
R442
100K
1%
R0402
DNP
DISCHG_1V8_SYS
Q50
2SK3018
SOT-323-3
DNP
BUCK_3V3_PG
VDD_1V8
R443
5.1R
5%
R0402
DNP
VDD_1V8_DISCHG
Q51
CJ3134KW
SOT-323-3
DNP
VDD_1V8 RAIL DISCHARGE
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06 3.3V, 1.8V, 1.2V
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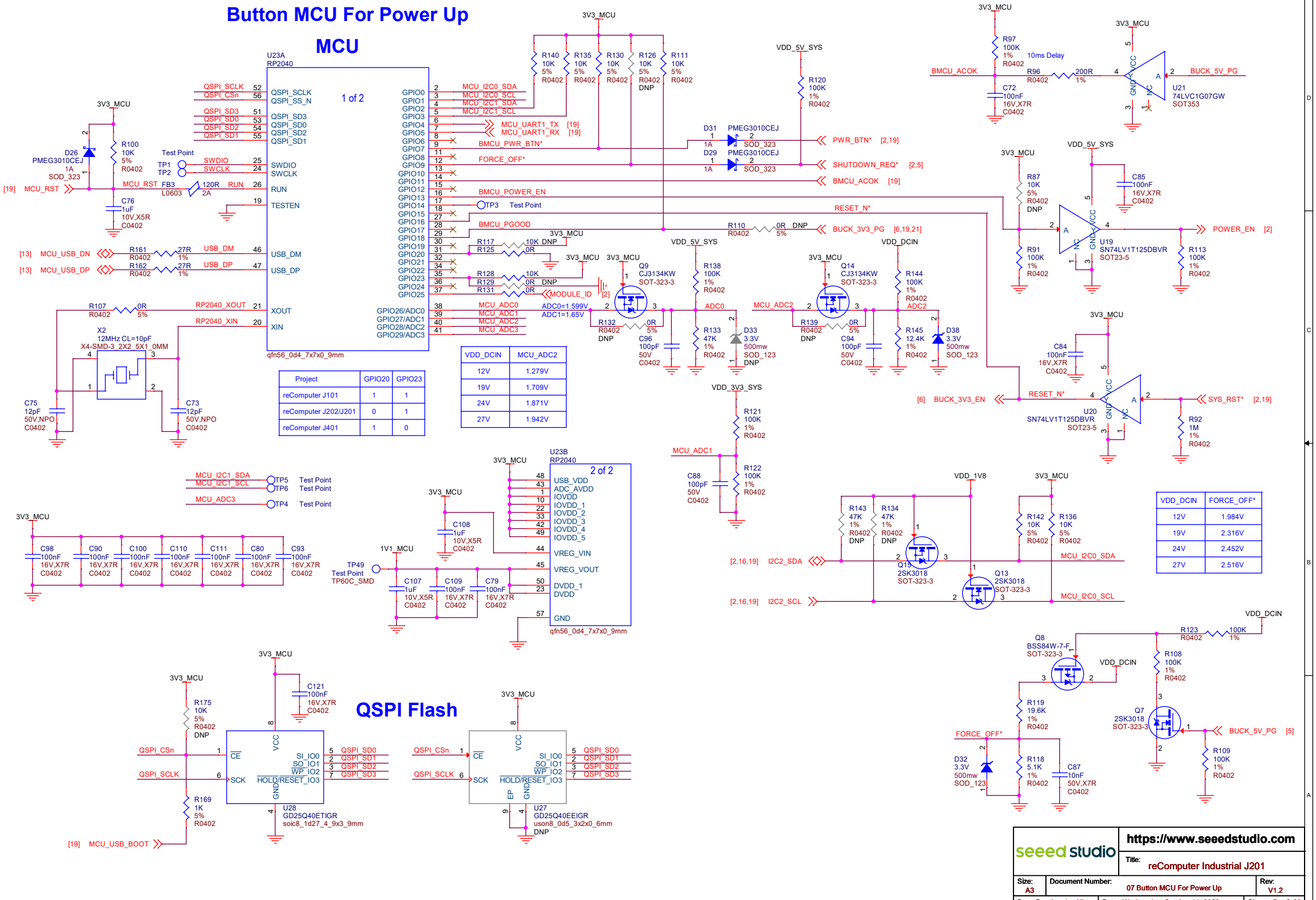
Button MCU For Power Up

MCU



Project	GPIO20	GPIO23
reComputer J101	1	1
reComputer J202/J201	0	1
reComputer J401	1	0

VDD_DCIN	MCU_ADC2
12V	1.279V
19V	1.709V
24V	1.871V
27V	1.942V

VDD_DCIN	FORCE_OFF*
12V	1.984V
19V	2.316V
24V	2.452V
27V	2.516V

QSPI Flash

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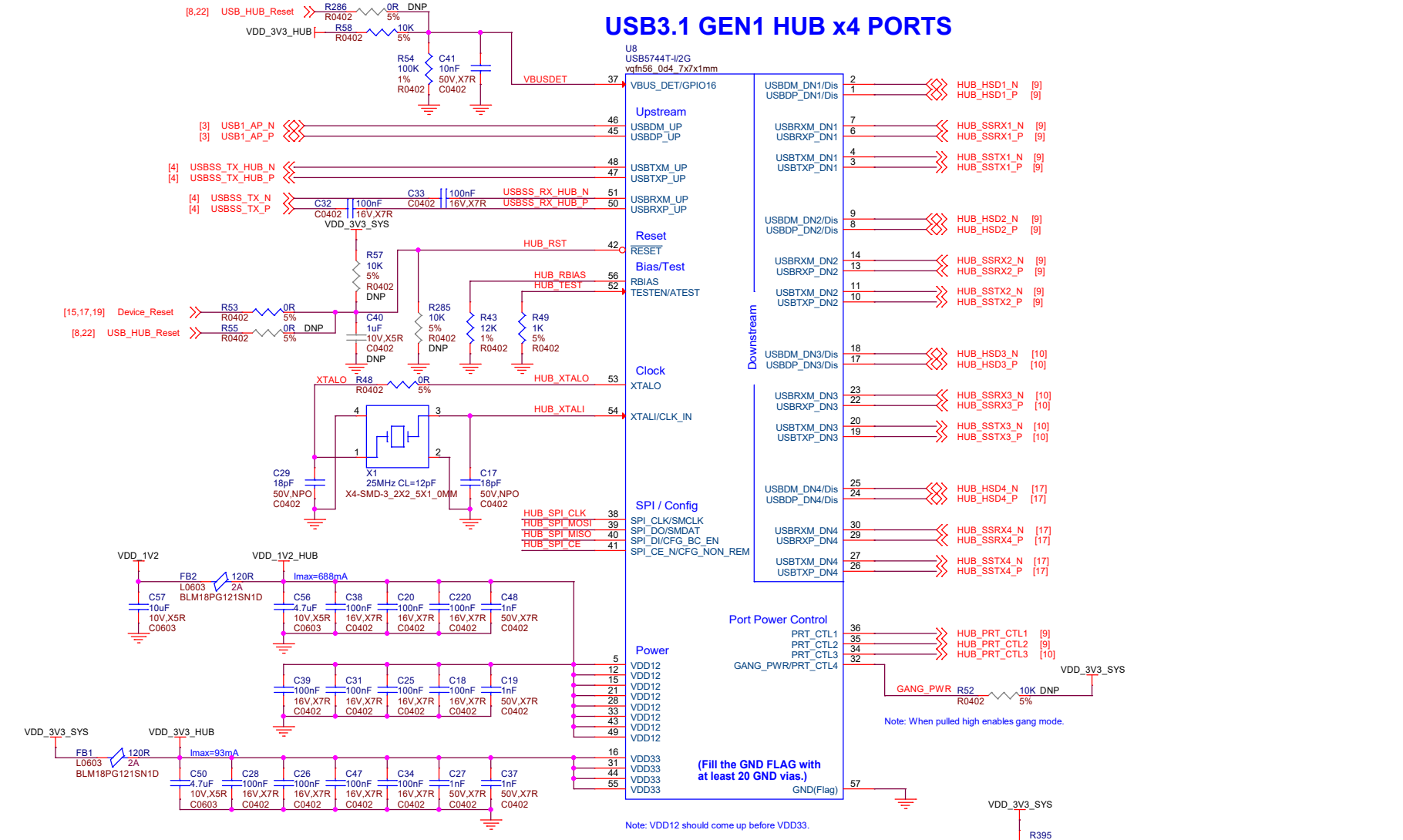
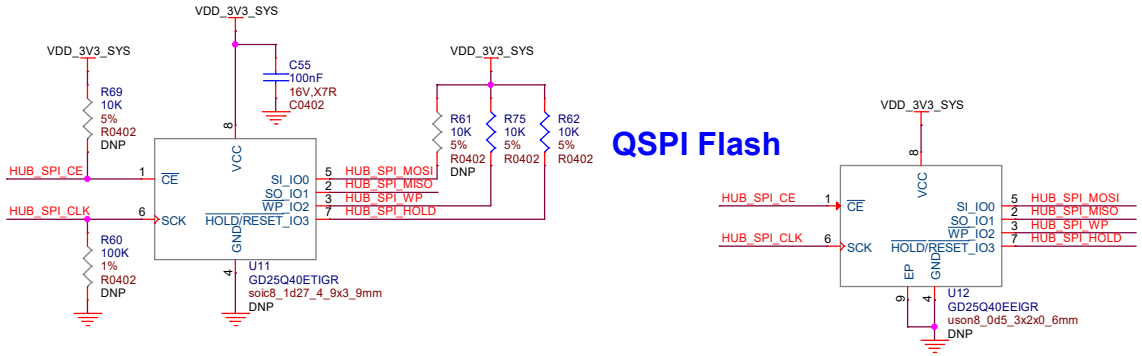
USB3.1 GEN1 HUB x4 PORTS



QSPI Flash



CFG_BC_EN: 200 kΩ Pull-Down, No battery charging.

CFG_NON_REM: 200 kΩ Pull-Down, All ports removable.

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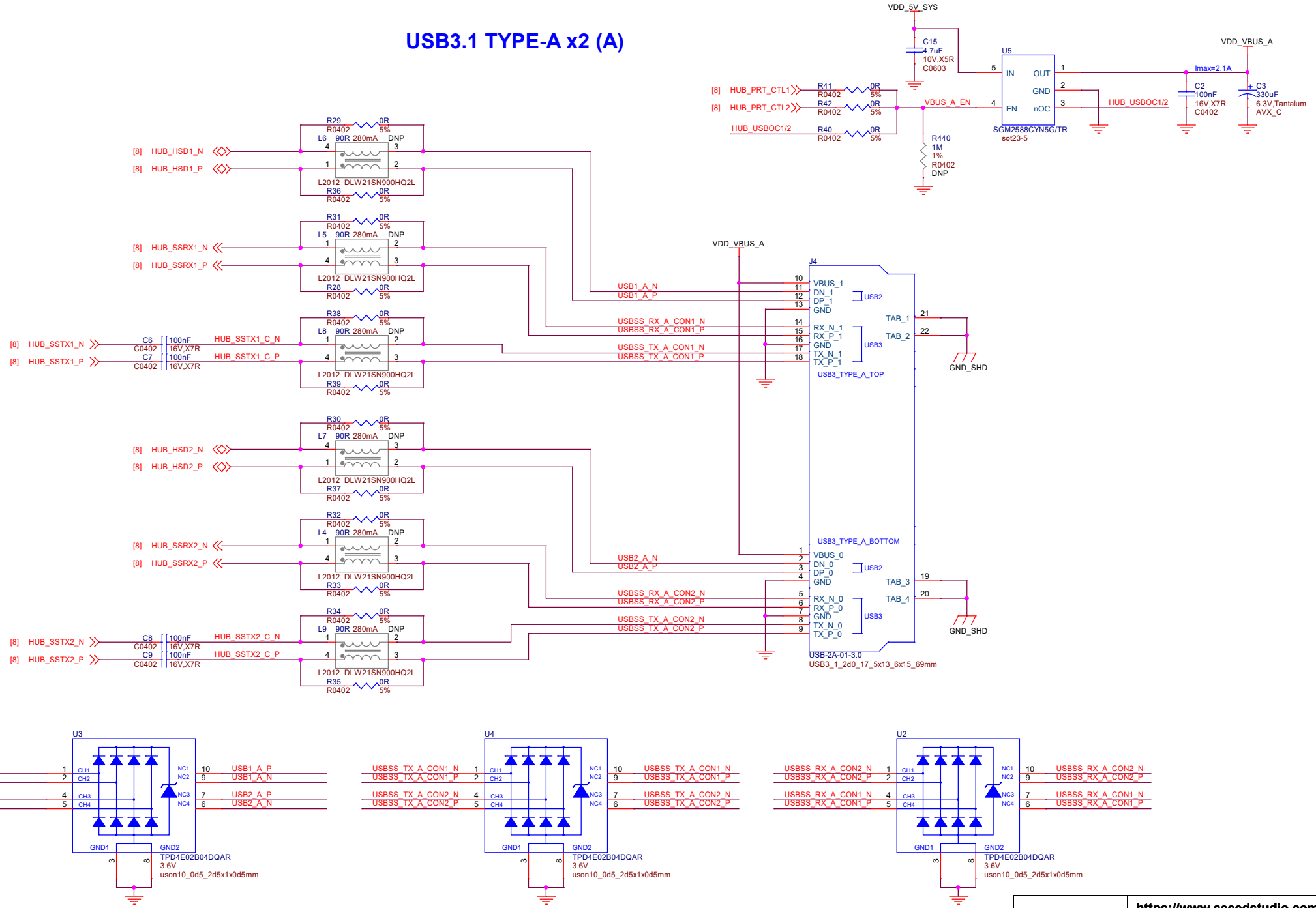
USB3.1 TYPE-A x2 (A)



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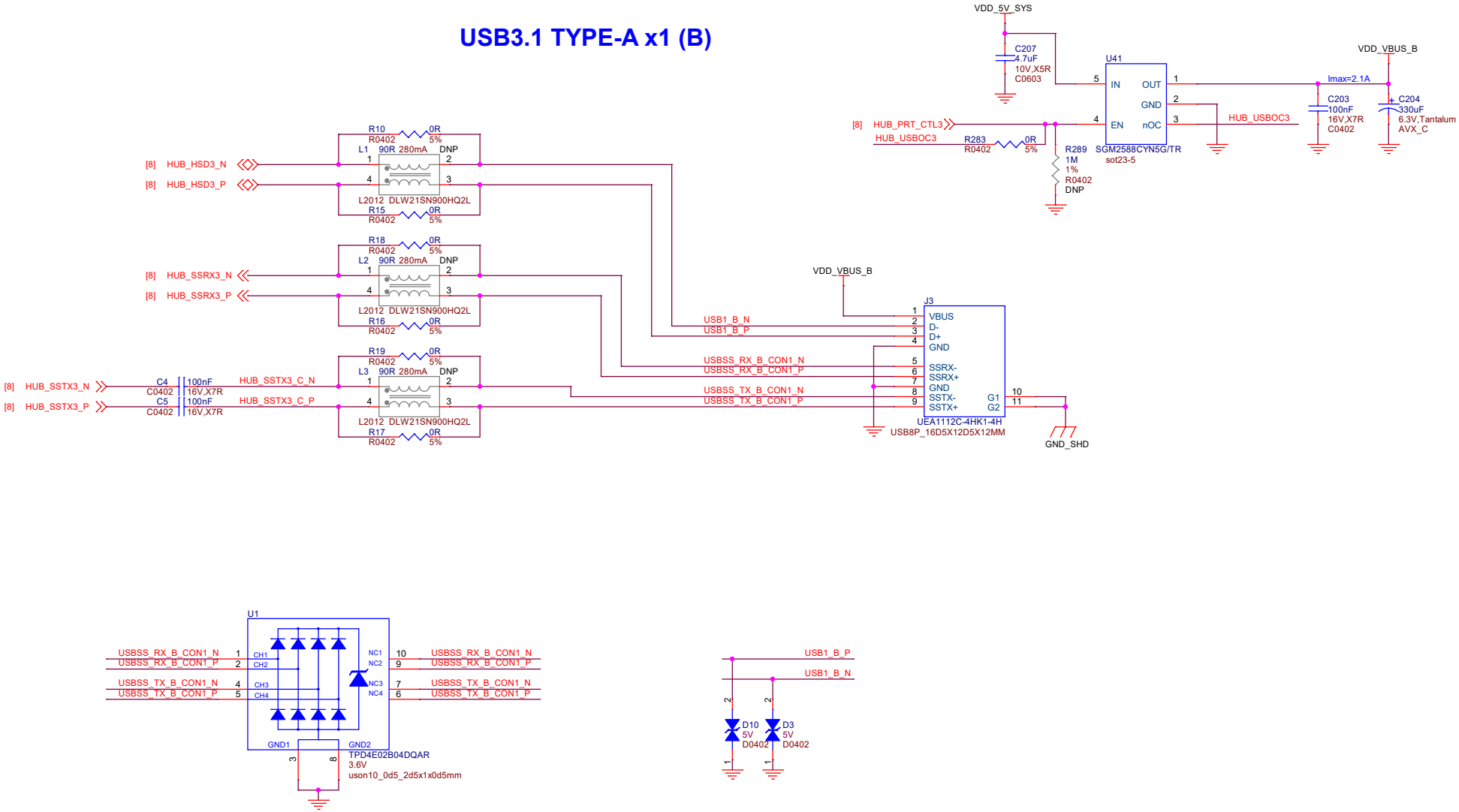
USB3.1 TYPE-A x1 (B)



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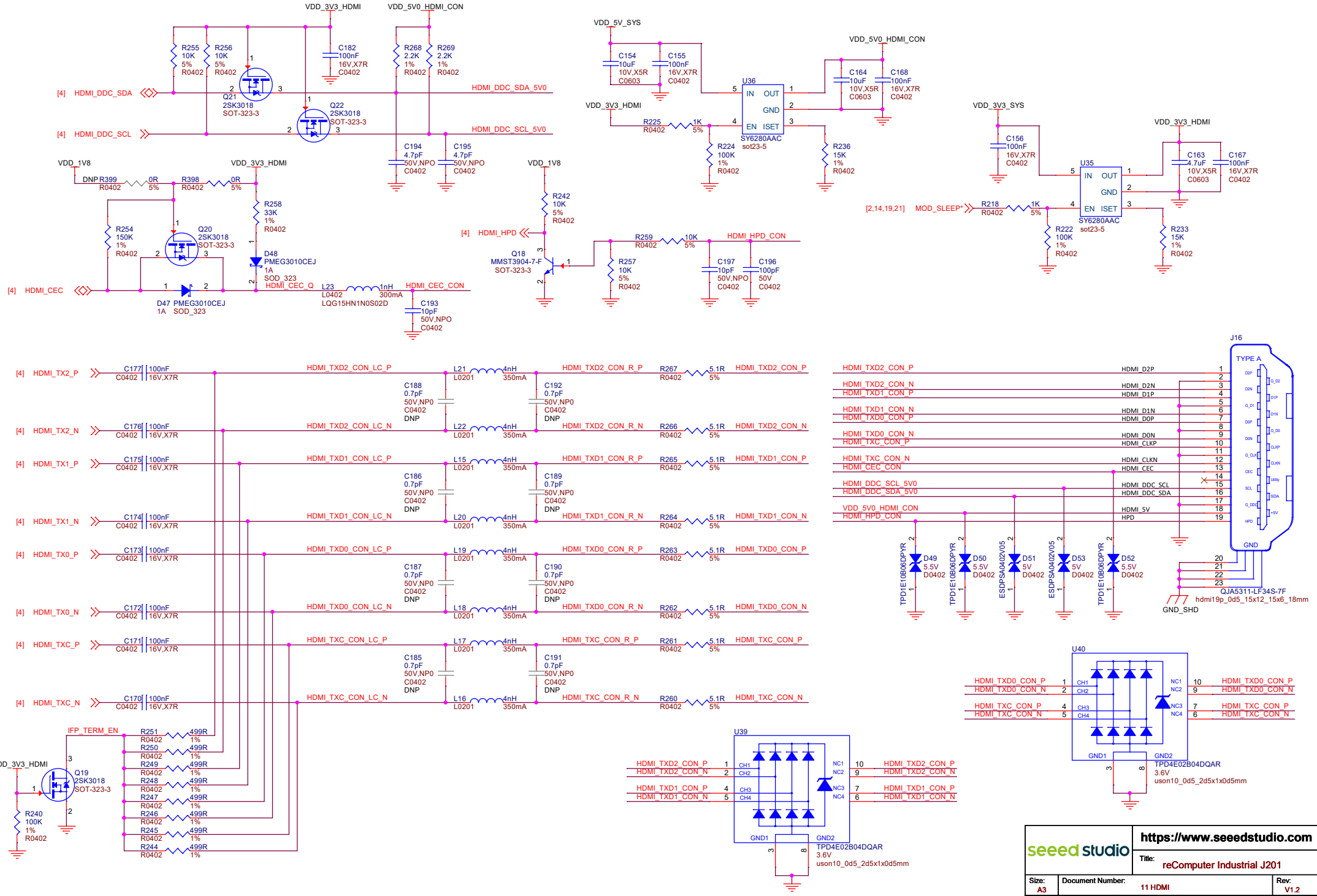
HDMI Connector



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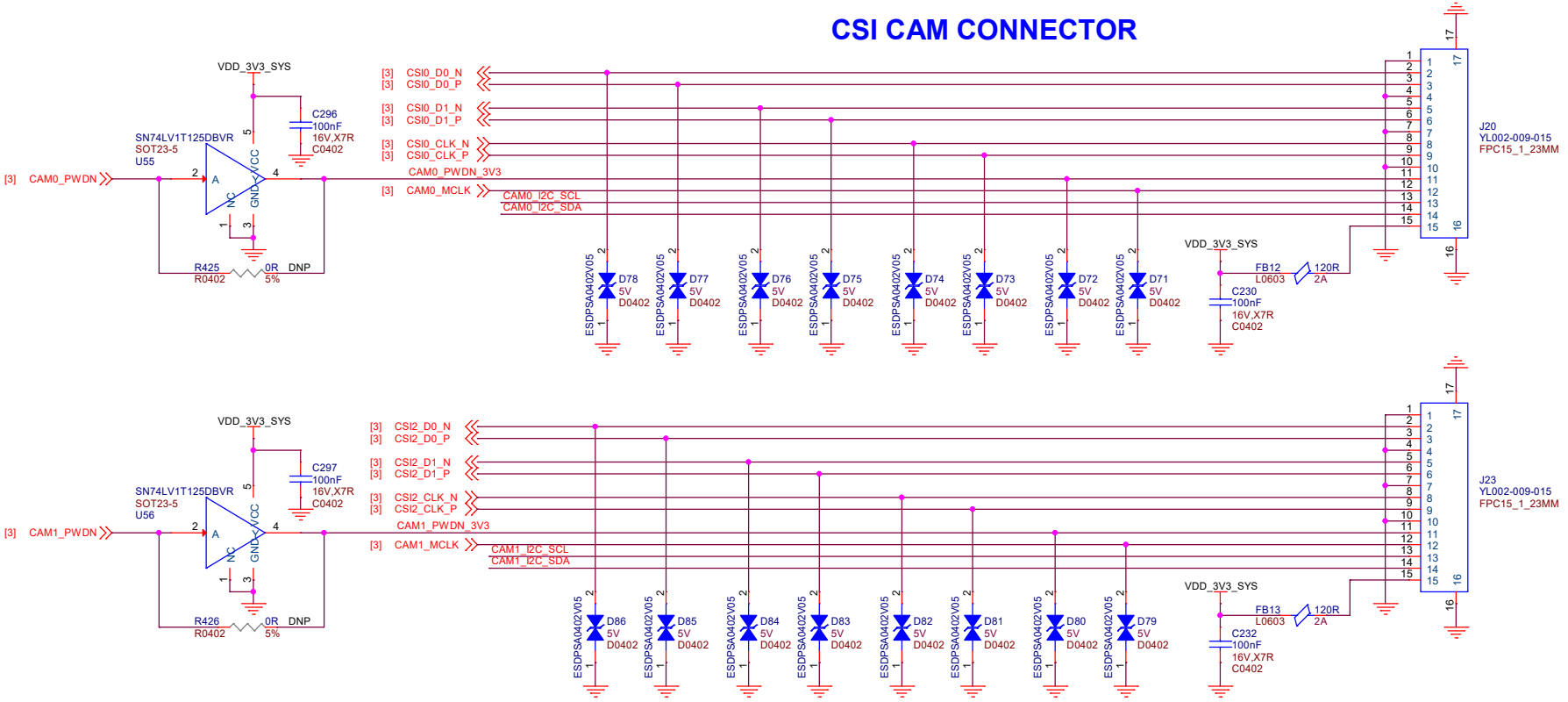
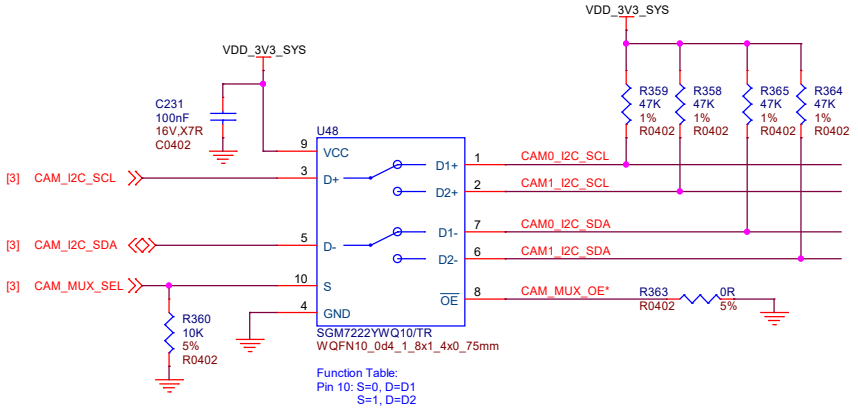
CSI CAM CONNECTOR





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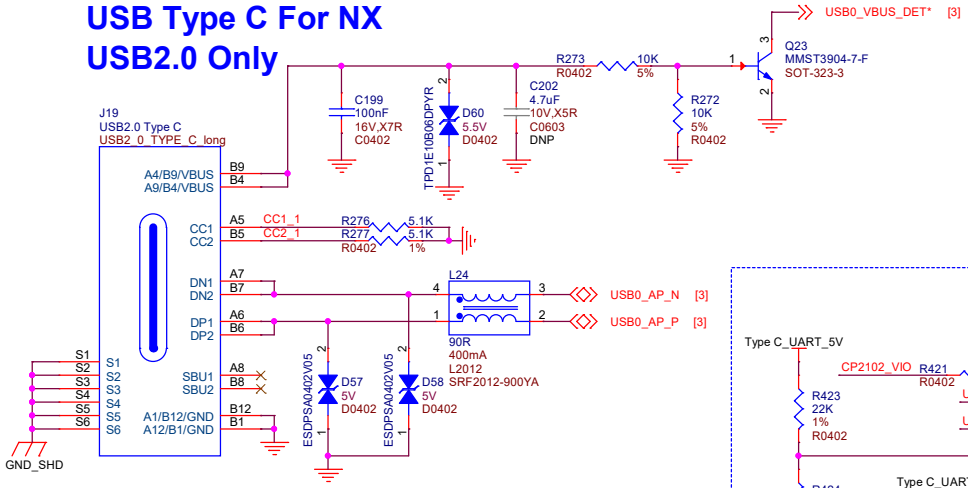
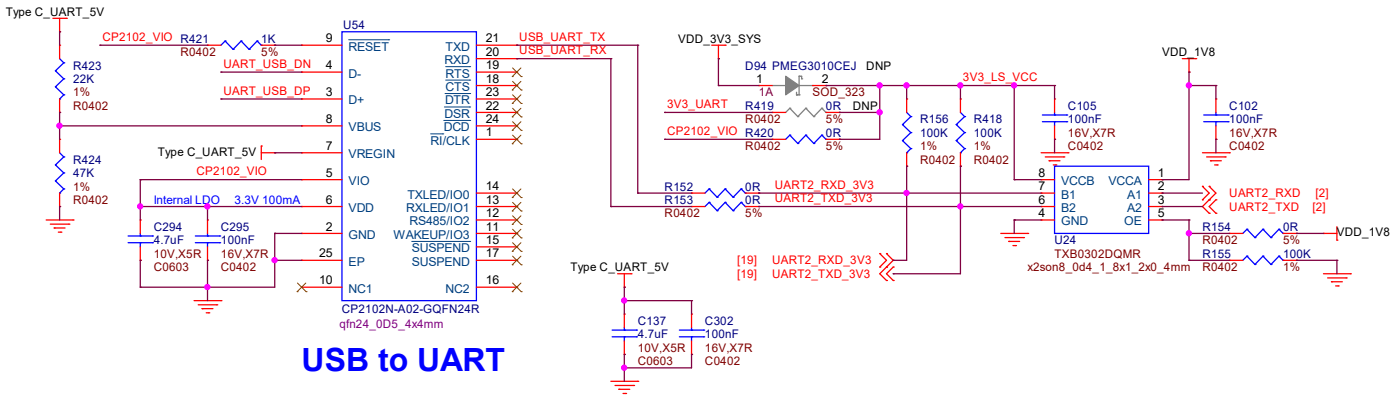
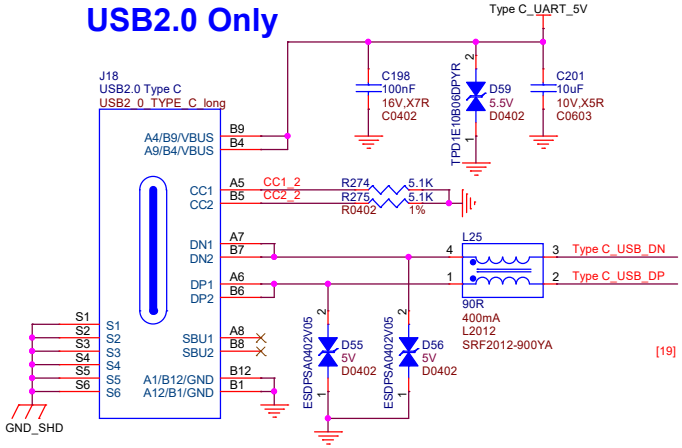
USB Type C For NX
USB2.0 Only

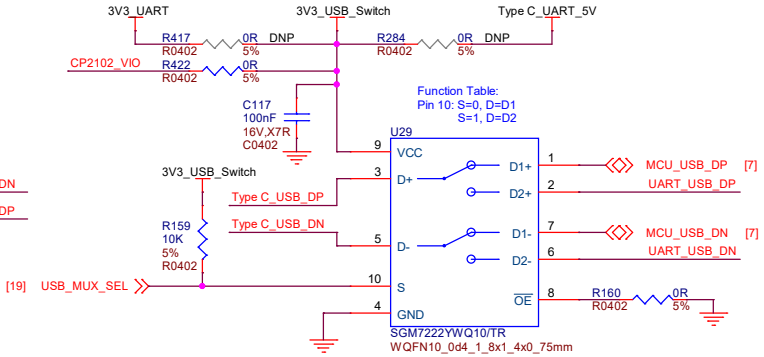


Option 1: CP2102N

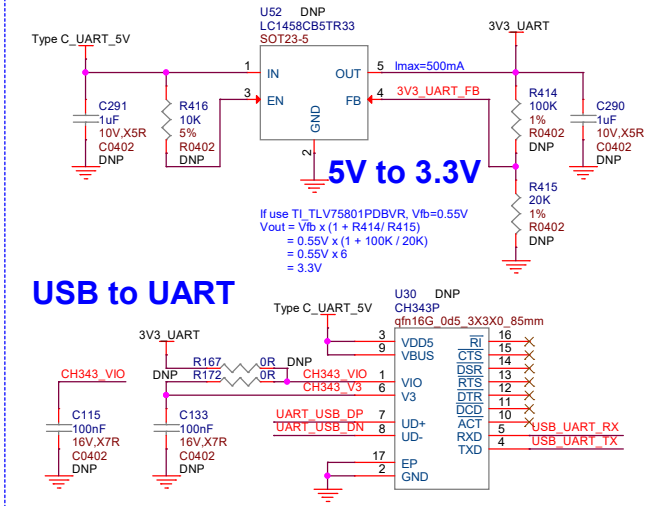


USB Type C For Debug UART & RP2040
USB2.0 Only





Option 2: CH343P DNP



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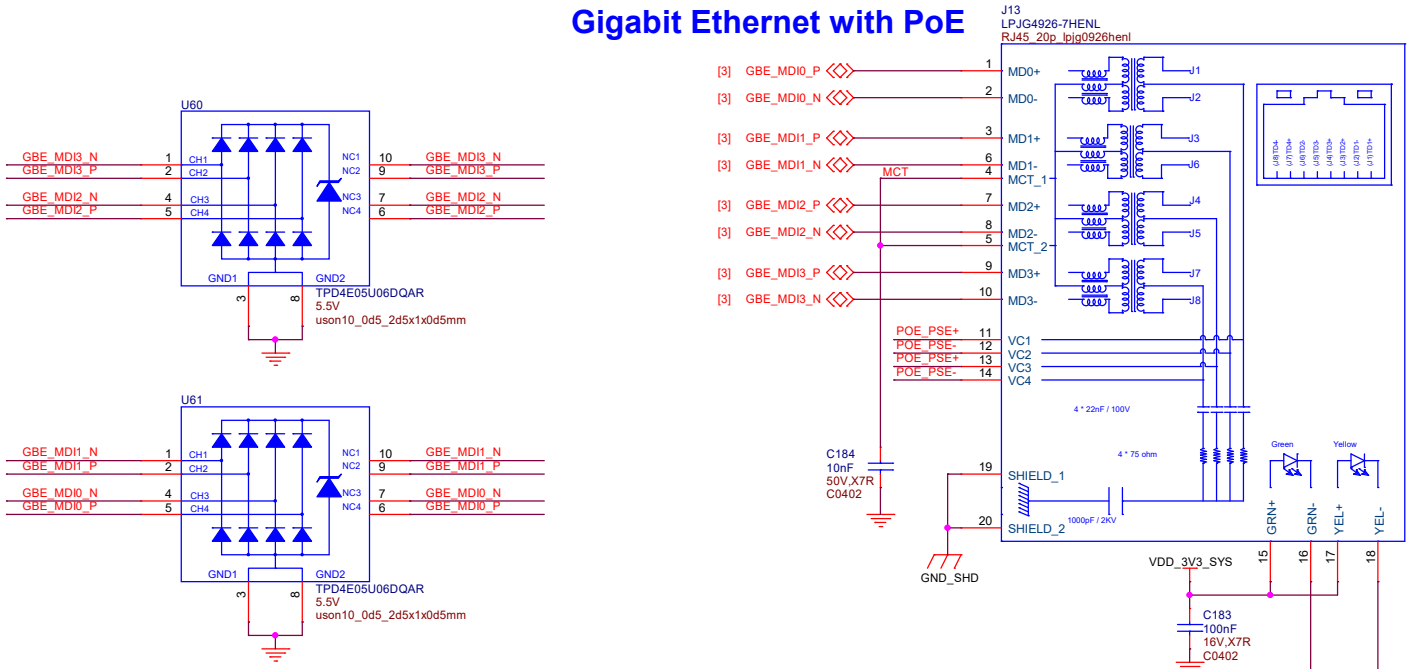
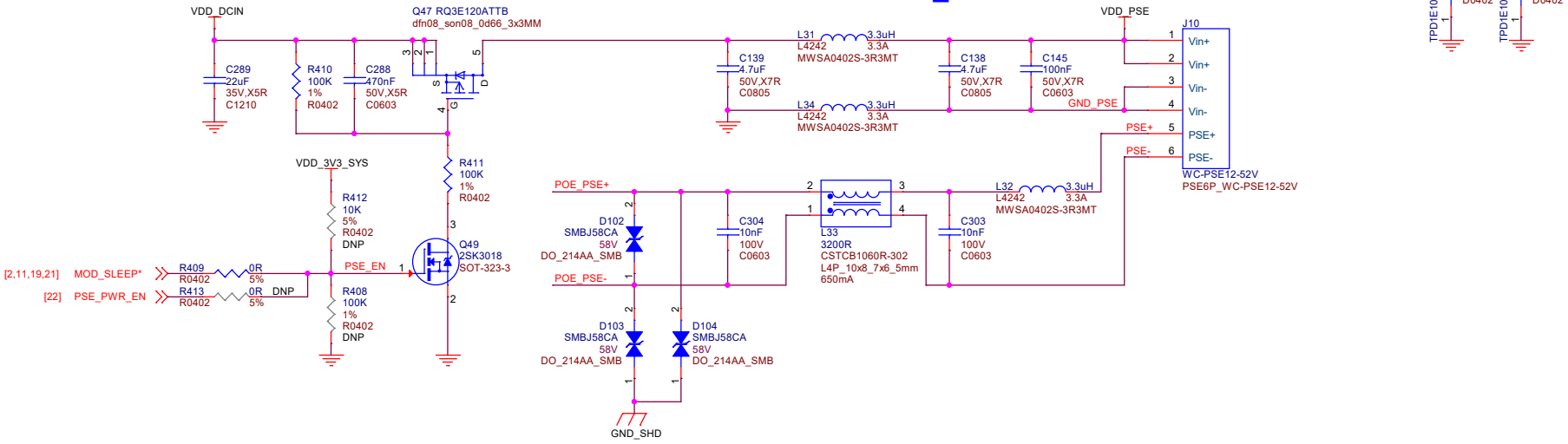
Gigabit Ethernet with PoE



PoE_PSE



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	Title: reComputer Industrial J201		
Size: A3	Document Number: 14 Gigabit Ethernet, POE		Rev: V1.2
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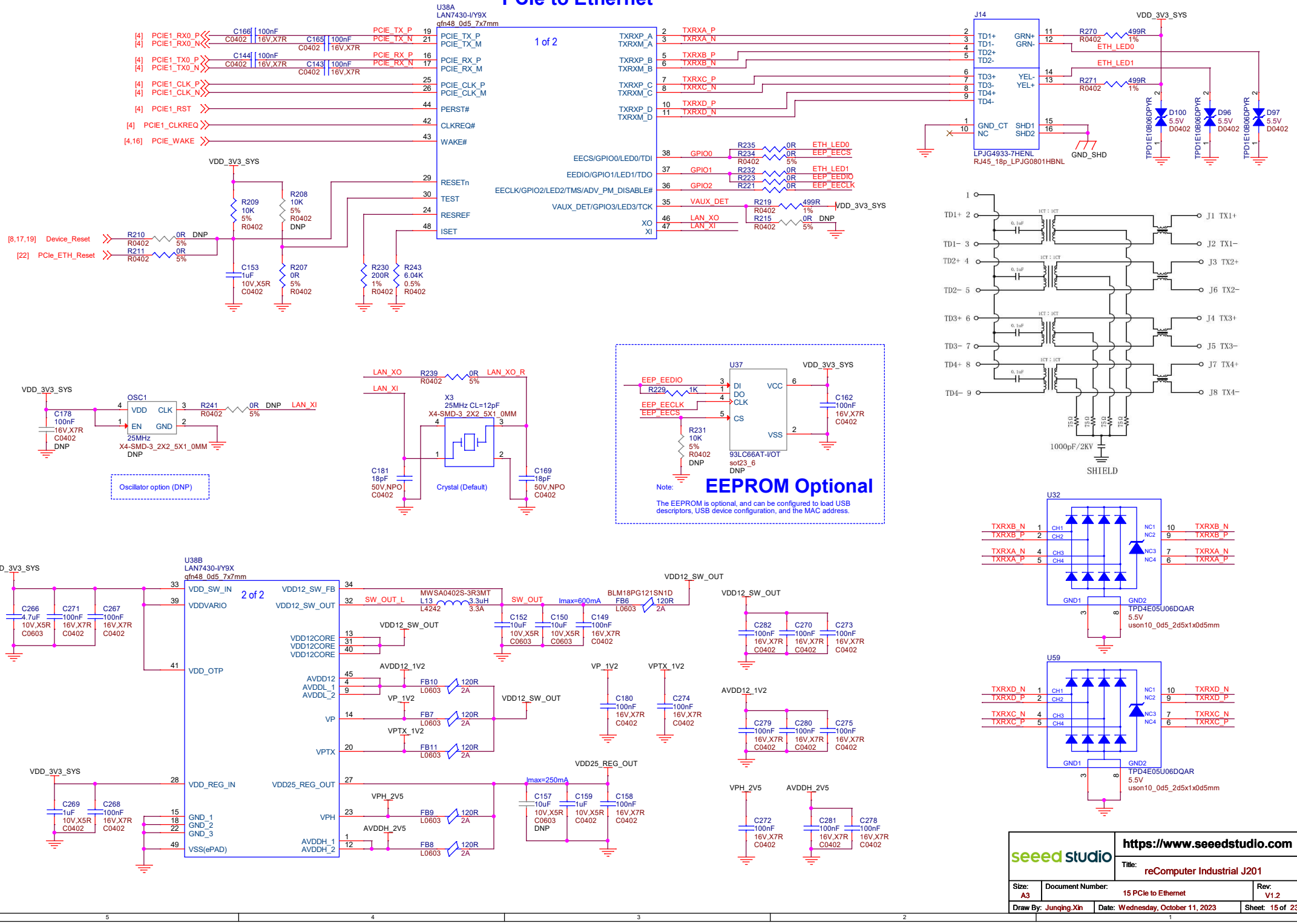
PCIe to Ethernet



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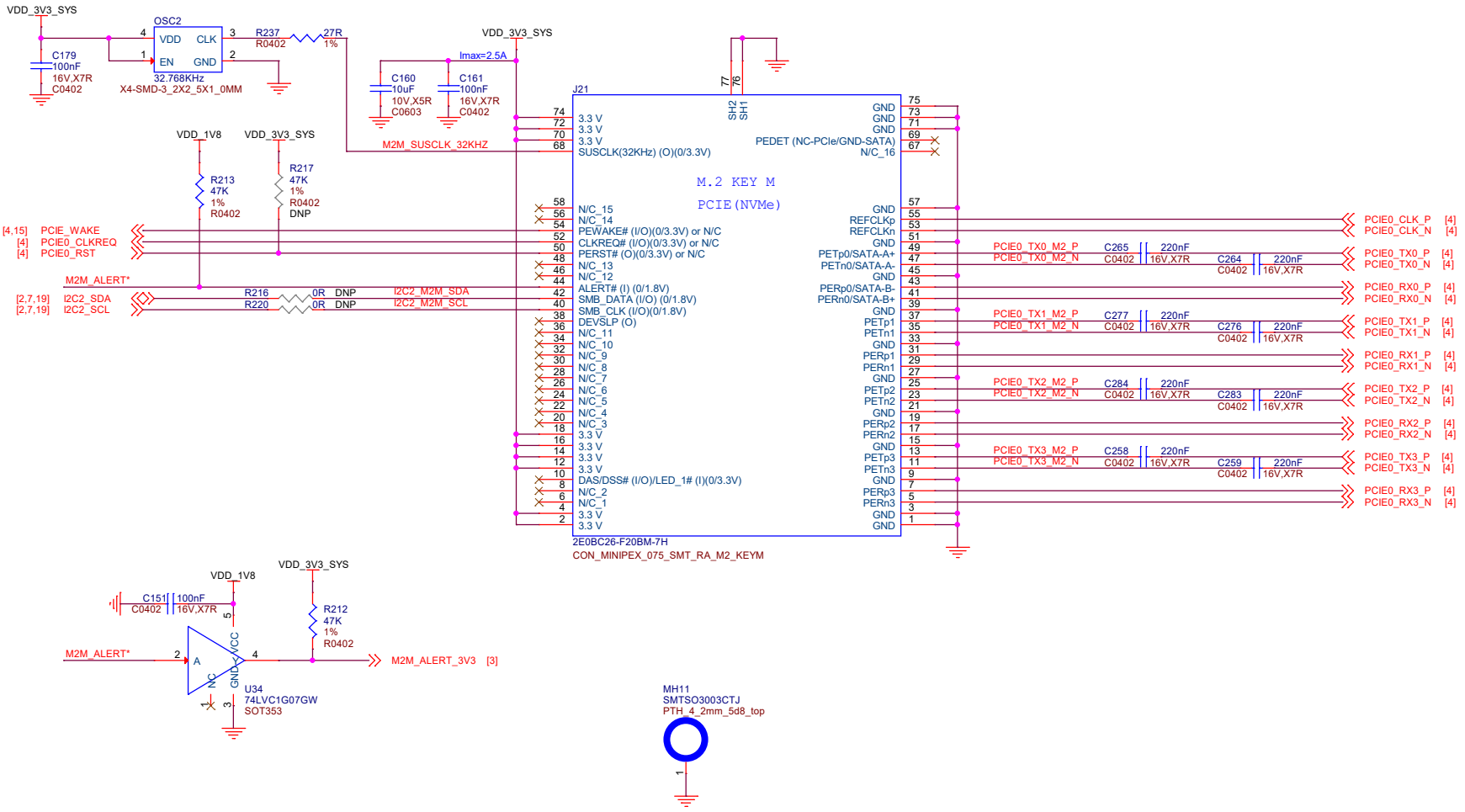
M.2 KEY-M (NVME)



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	Title: reComputer Industrial J201	
Size: A3	Document Number: 16 M.2 KEY-M (NVME)	Rev: V1.2
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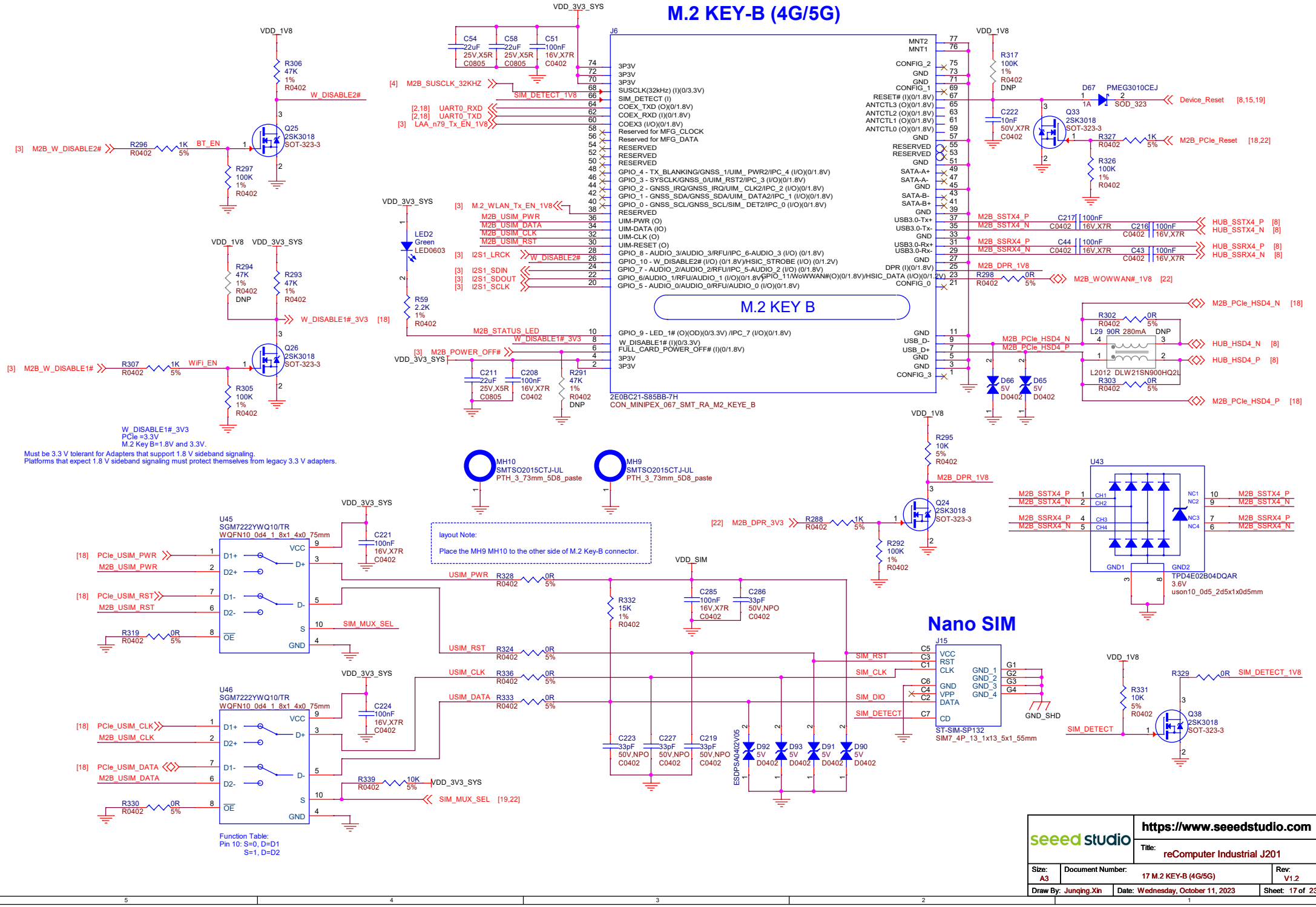
M.2 KEY-B (4G/5G)



seeed studio	https://www.seeedstudio.com		
	Title: reComputer Industrial J201		
Size: A3	Document Number: 17 M.2 KEY-B (4G/5G)		Rev: V1.2
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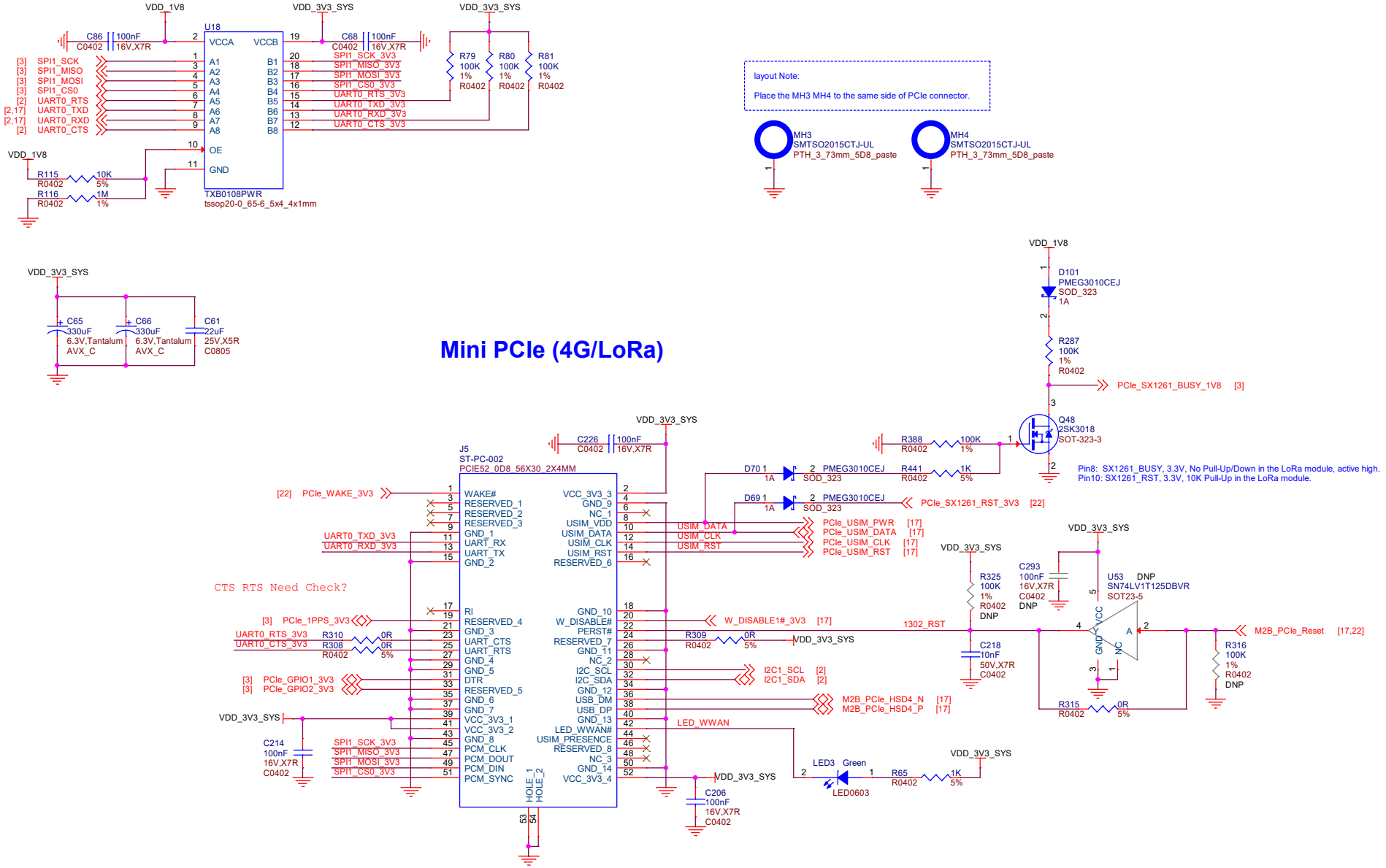

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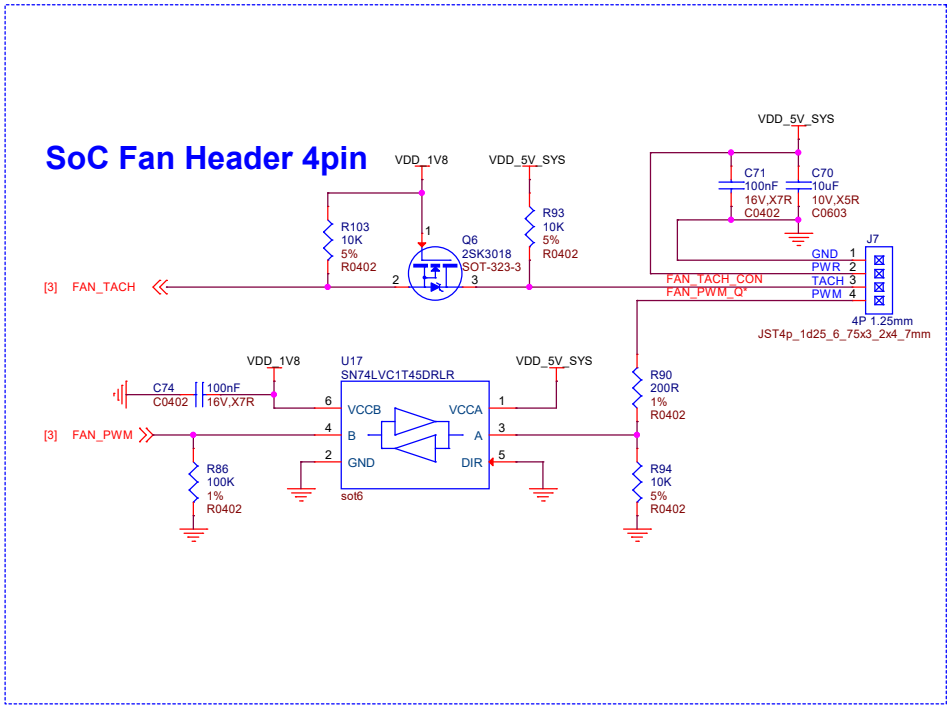

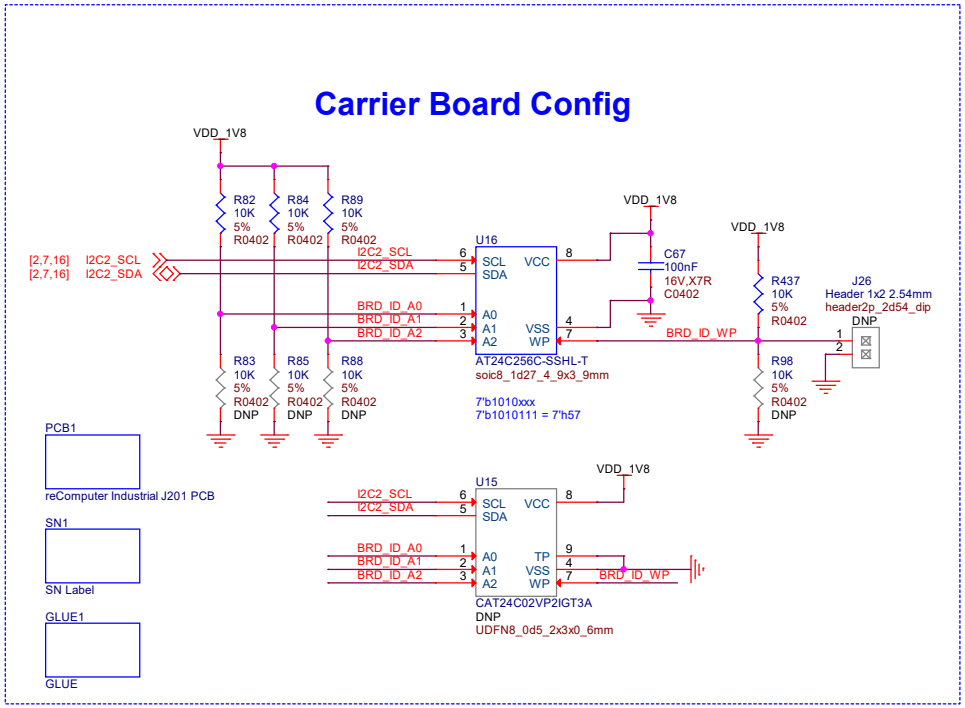

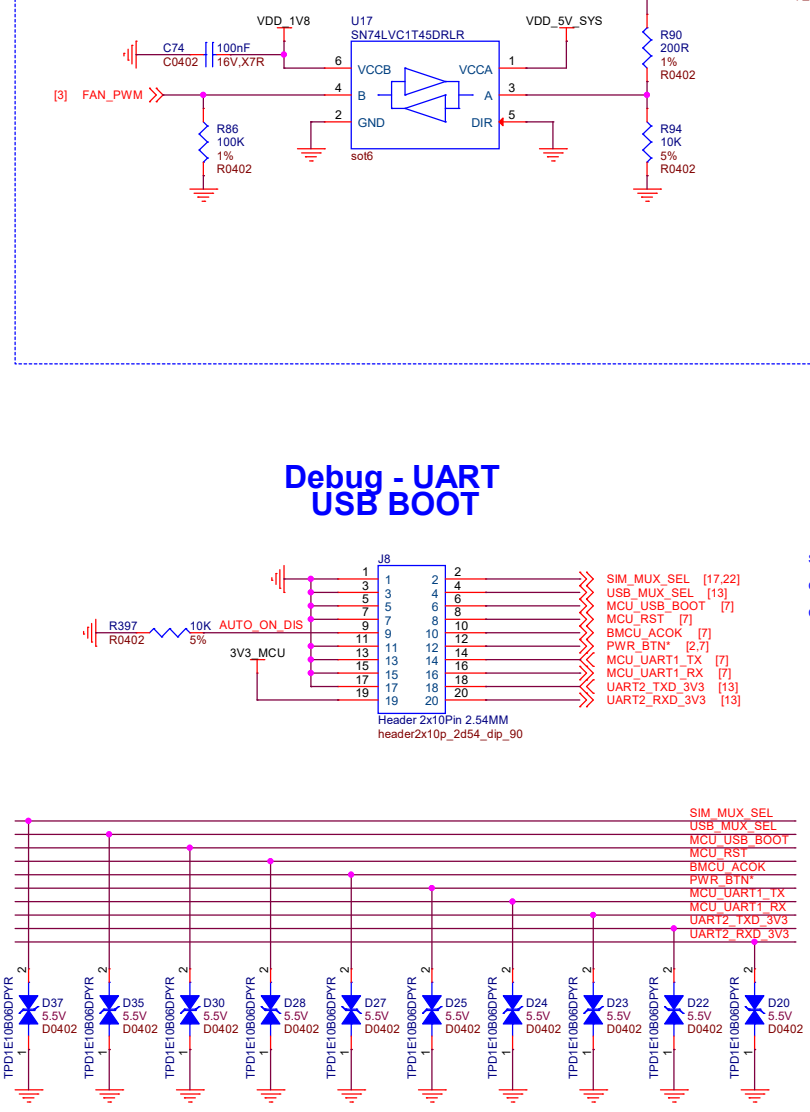

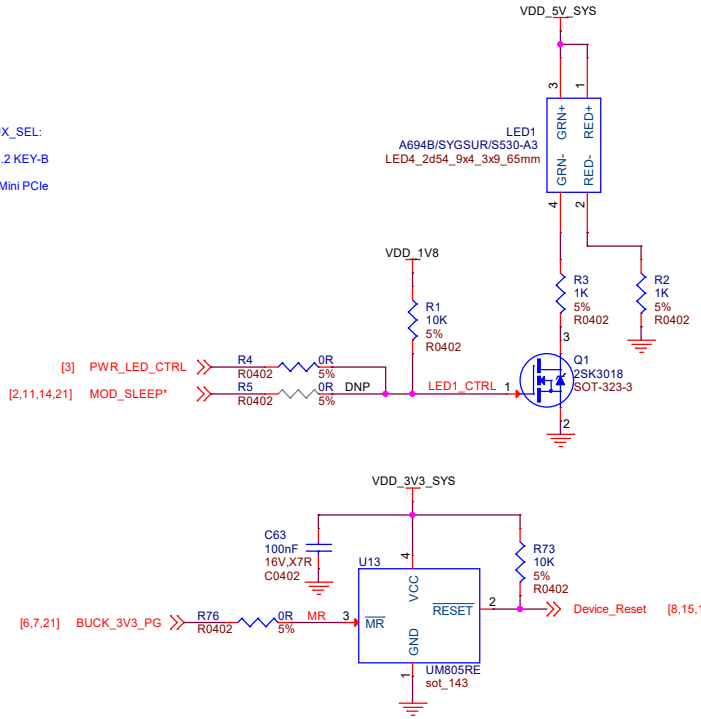

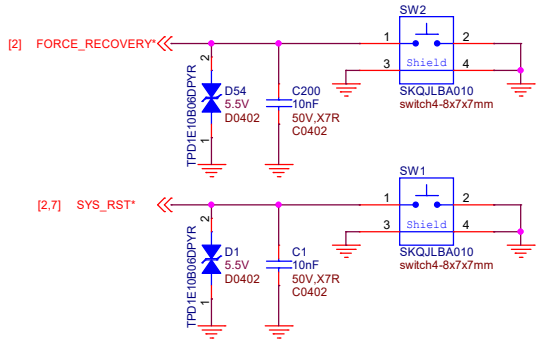

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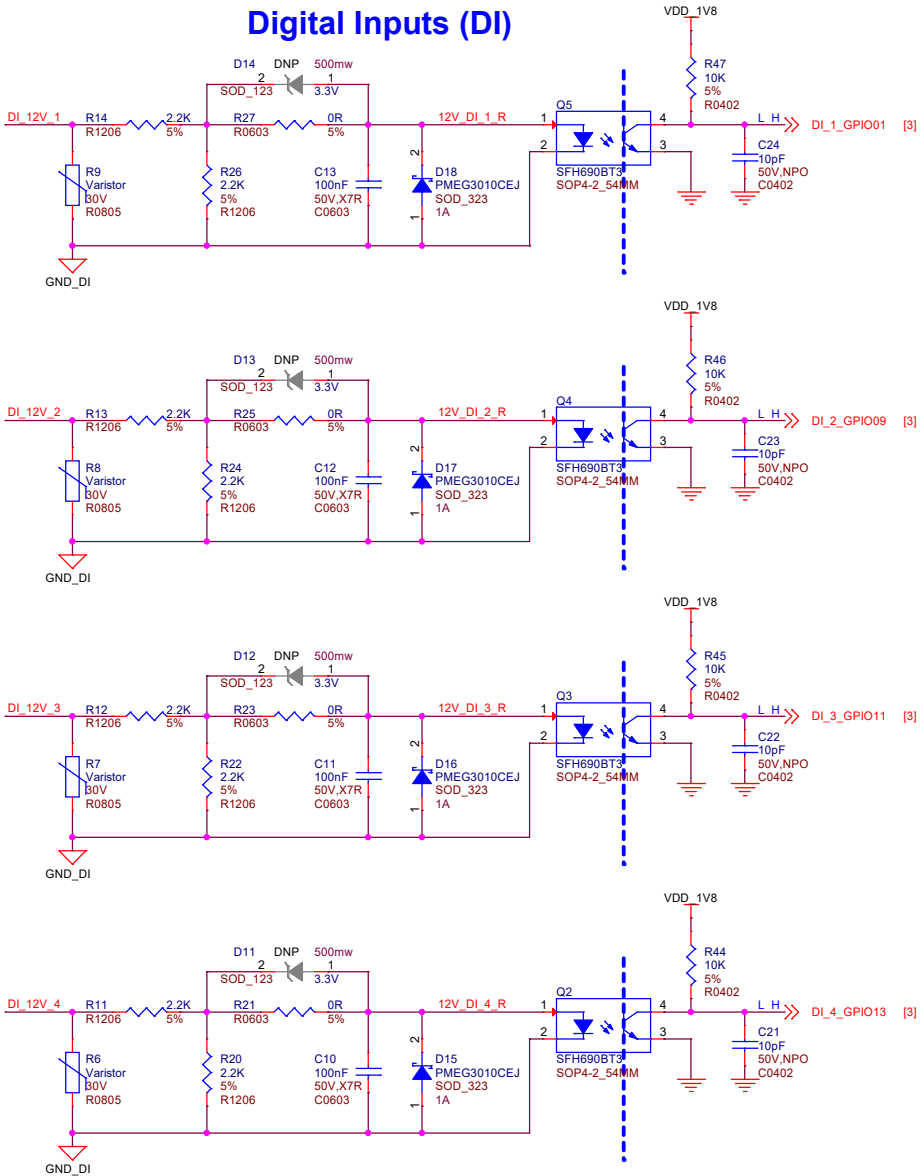
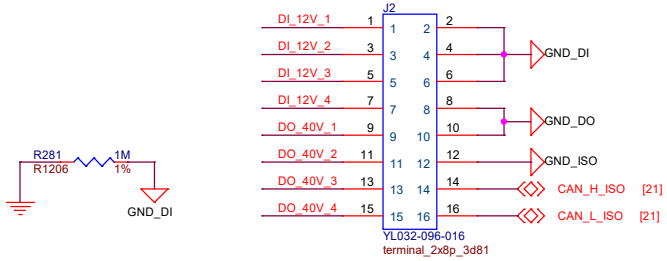
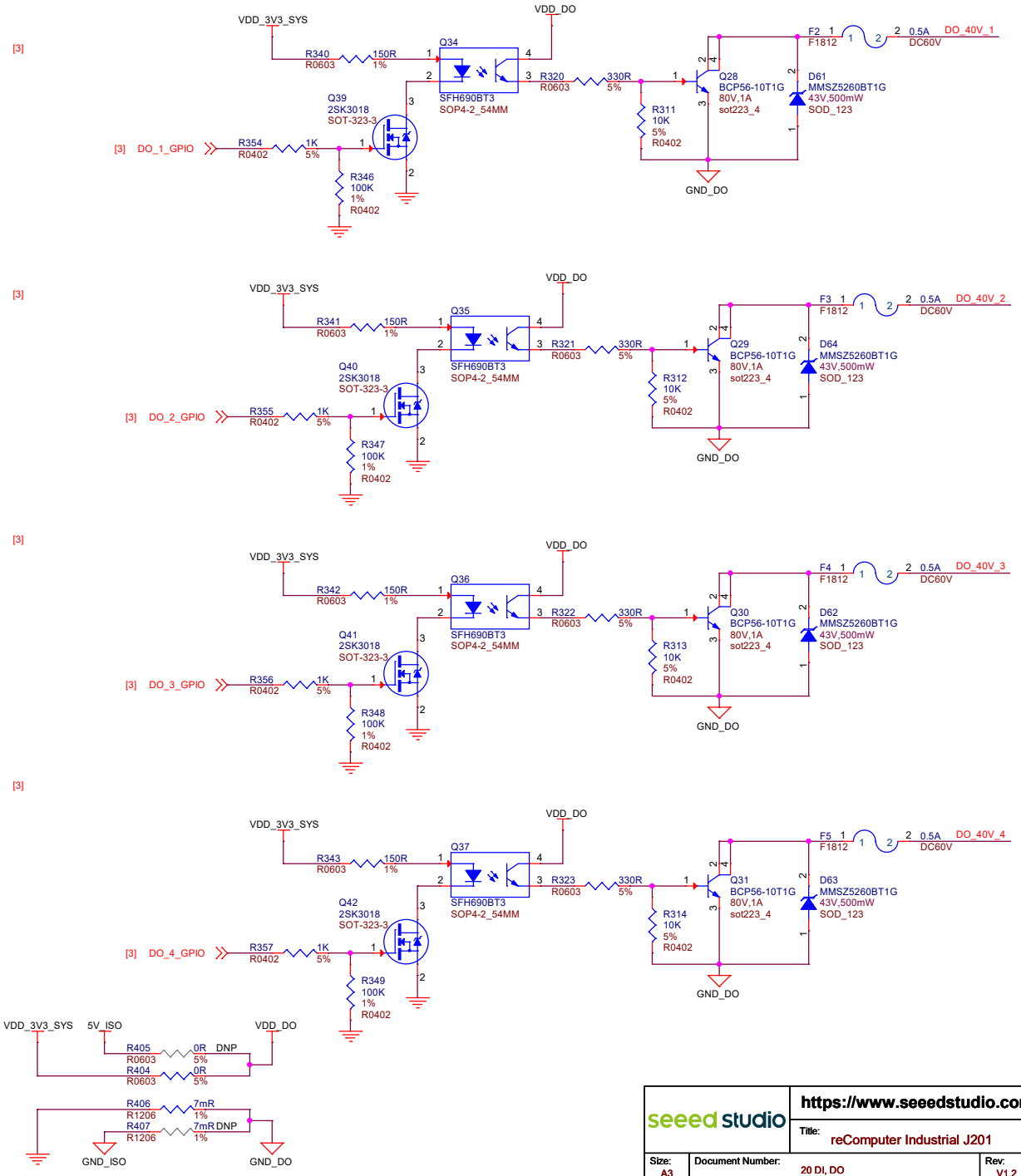
Digital Inputs (DI)



DI & DO & CAN



Digital Outputs (DO) rated 40V/0.4A



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	Title: reComputer Industrial J201		
Size: A3	Document Number: 20 DI, DO		Rev: V1.2
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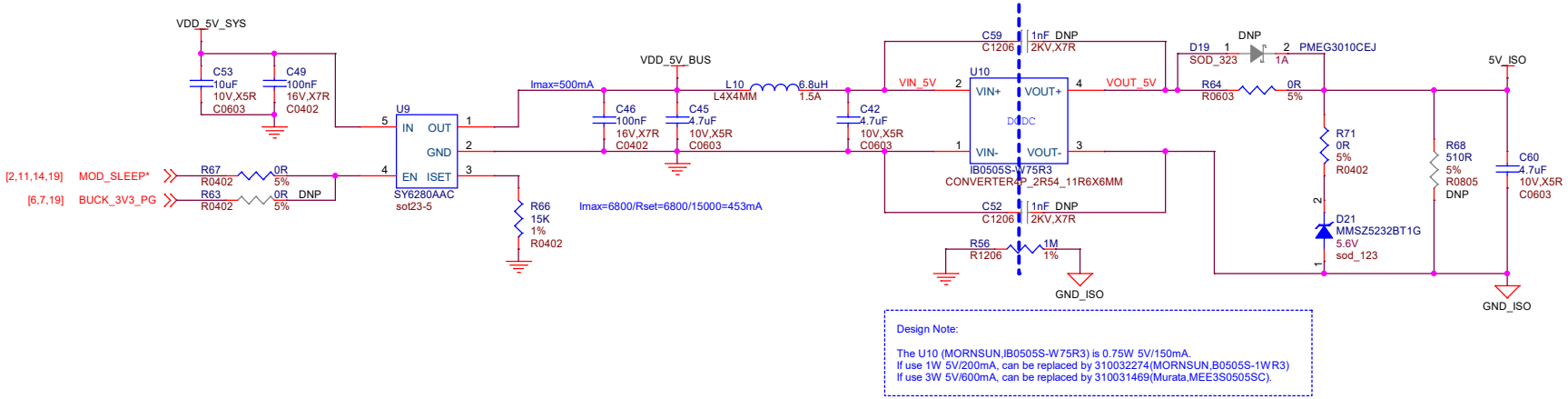
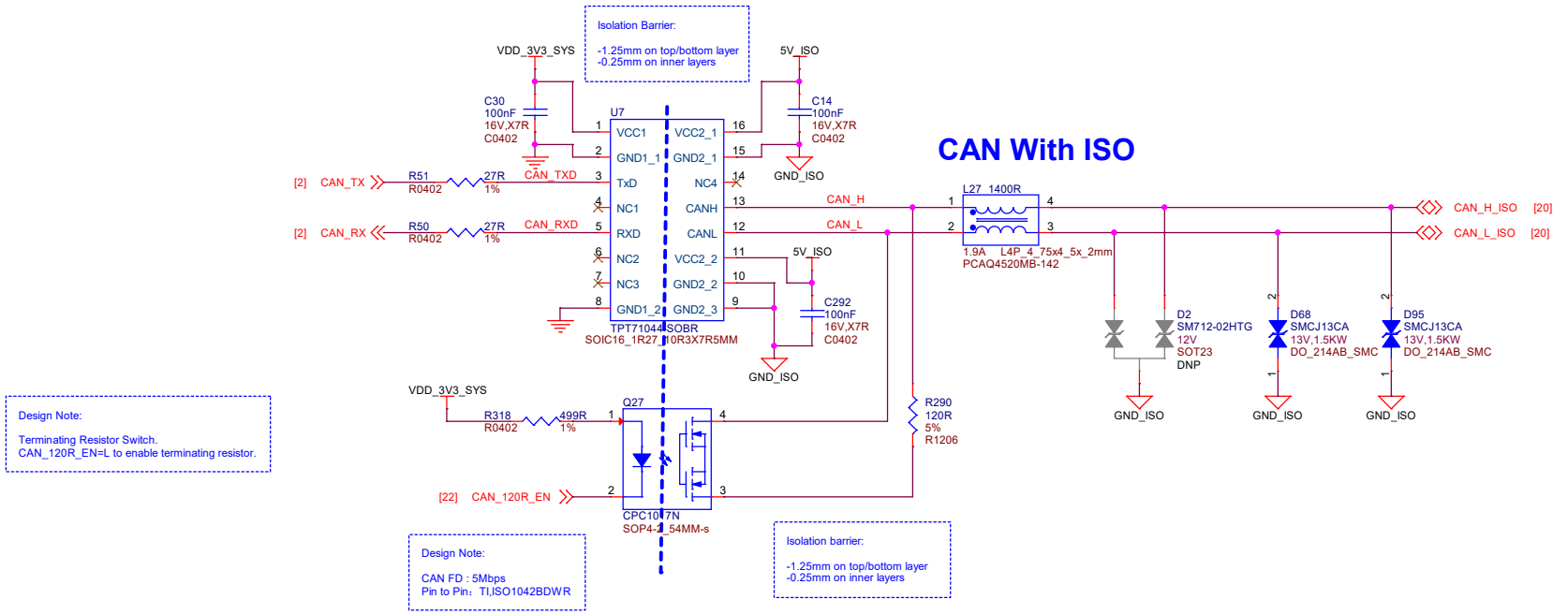
Isolated DCDC 5V to 5V



Design Note:

The U10 (MORNSUN,IB0505S-W75R3) is 0.75W 5V/150mA.
If use 1W 5V/200mA, can be replaced by 310032274(MORNSUN,B0505S-1WR3)
If use 3W 5V/600mA, can be replaced by 310031469(Murata,MEE3S0505SC).

CAN With ISO



Design Note:

Terminating Resistor Switch.
CAN_120R_EN=L to enable terminating resistor.

Design Note:

CAN FD : 5Mbps
Pin to Pin：TI,ISO1042BDWR

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	Title: reComputer Industrial J201	
Size: A3	Document Number: 21 CAN, Isolated 5V	Rev: V1.2
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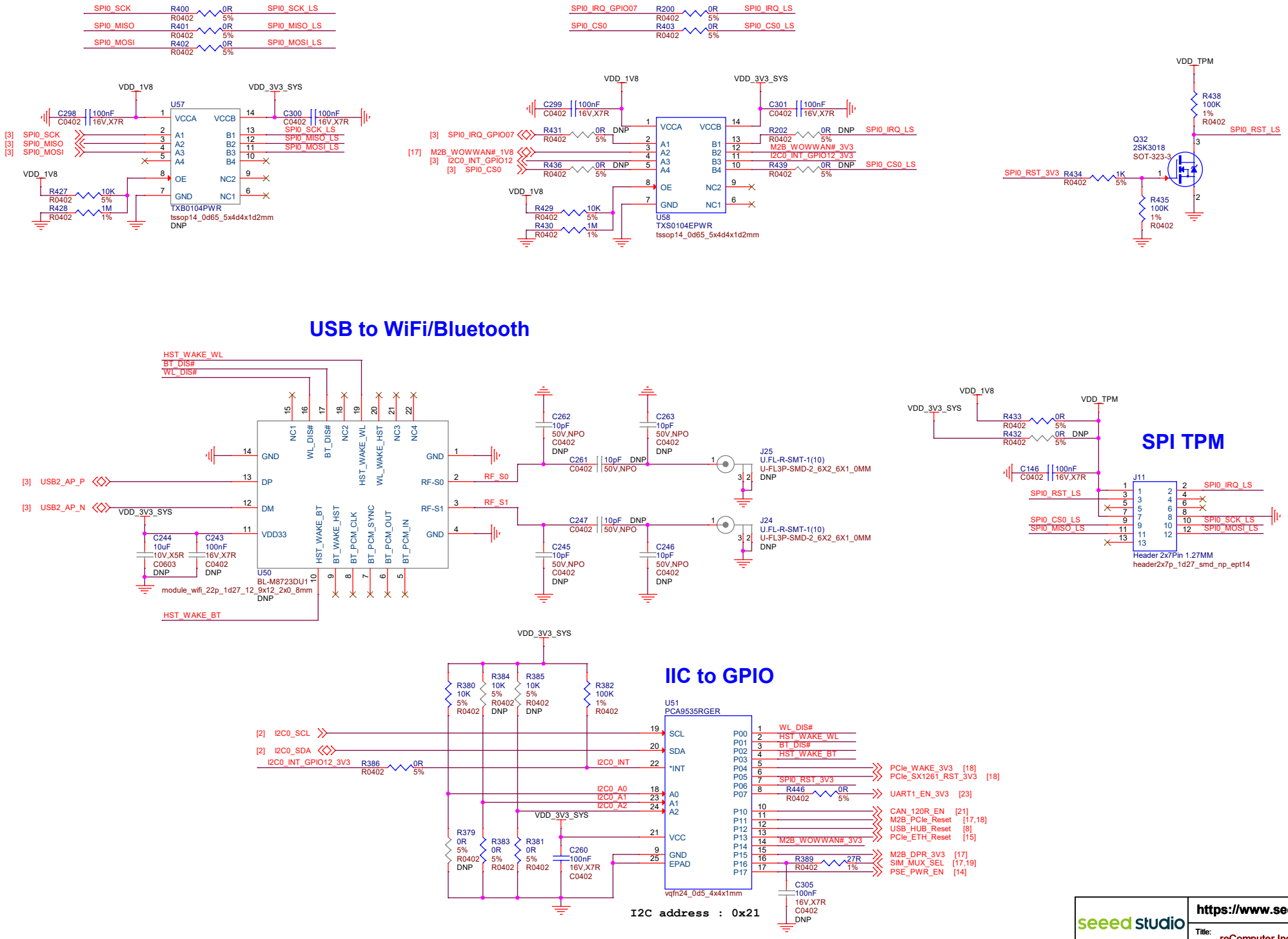
SPI0_SCK
SPI0_MISO
SPI0_MOSI
R400
R401
R402
0R
5%
R0402
SPI0_SCK_LS
SPI0_MISO_LS
SPI0_MOSI_LS
SPI0_IRQ_GPIO07
SPI0_CS0
R200
R403
SPI0_IRQ_LS
SPI0_CS0_LS
VDD_1V8
VDD_3V3_SYS
U57
TXB0104PWR
tssop14_0d65_5x4d4x1d2mm
DNP
C298
C300
C299
C301
100nF
C0402
16V,X7R
U58
TXS0104EPWR
R427
R428
R429
R430
10K
1M
1%
R431
R436
R202
R439
M2B_WOWWAN#_3V3
I2C0_INT_GPIO12_3V3
VDD_TPM
R438
100K
Q32
2SK3018
SOT-323-3
SPI0_RST_3V3
R434
1K
R435
USB to WiFi/Bluetooth
HST_WAKE_WL
BT_DIS#
WL_DIS#
USB2_AP_P
USB2_AP_N
U50
BL-M8723DU1
module_wifi_22p_1d27_12_9x12_2x0_8mm
HST_WAKE_BT
C244
C243
10uF
10V,X5R
C0603
C262
C263
C261
C247
C245
C246
10pF
50V,NPO
RF_S0
RF_S1
J25
J24
U.FL-R-SMT-1(10)
U.FL3P-SMD-2_6X2_6X1_0MM
SPI TPM
R433
R432
J11
Header 2x7Pin 1.27MM
header2x7p_1d27_smd_np_ept14
IIC to GPIO
U51
PCA9535RGER
vqfn24_0d5_4x4x1mm
I2C address : 0x21
R380
R384
R385
R382
R379
R383
R381
R386
R389
27R
C260
C305
100nF
16V,X7R
I2C0_SCL
I2C0_SDA
I2C0_INT
I2C0_A0
I2C0_A1
I2C0_A2
WL_DIS#
HST_WAKE_WL
BT_DIS#
HST_WAKE_BT
PCIe_WAKE_3V3 [18]
PCIe_SX1261_RST_3V3 [18]
UART1_EN_3V3 [23]
CAN_120R_EN [21]
M2B_PCIe_Reset [17,18]
USB_HUB_Reset [8]
PCIe_ETH_Reset [15]
M2B_DPR_3V3 [17]
SIM_MUX_SEL [17,19]
PSE_PWR_EN [14]
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Title: reComputer Industrial J201
Size: A3
Document Number: 22 TPM, USB to WiFi, IIC to IO
Rev: V1.2
Draw By: Junqing.Xin
Date: Wednesday, October 11, 2023
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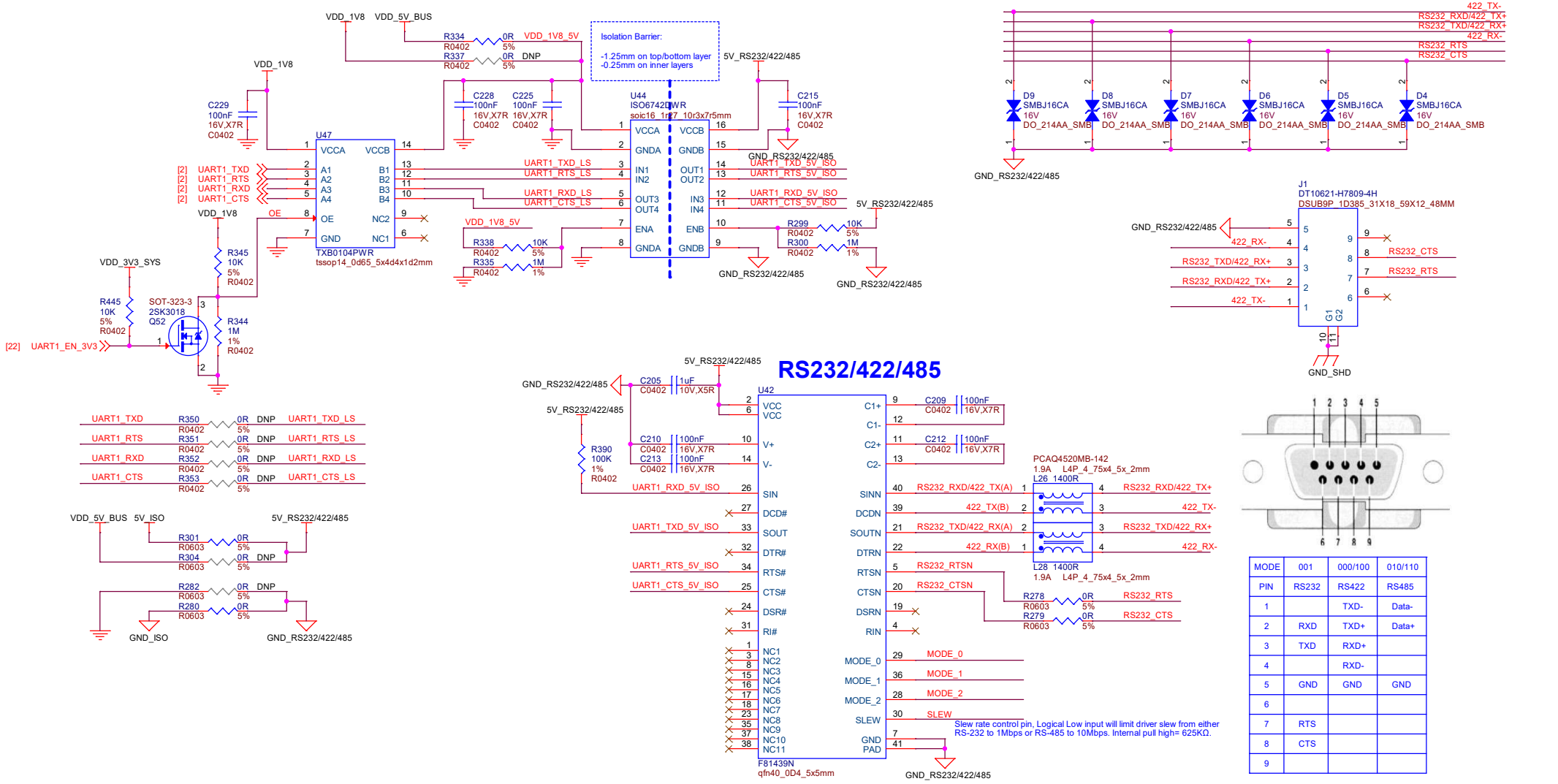

MODE	001	000/100	010/110
PIN	RS232	RS422	RS485
1		TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	
4		RXD-	
5	GND	GND	GND
6			
7	RTS		
8	CTS		
9			

TABLE 1: Mode Select Configuration for F81439

Pin 29 MODE_0	Pin 36 MODE_1	Pin28 MODE_2	Mode	Status
0	0	0	RS-422 Full Duplex	1T/1R RS-422
0	0	1	Pure RS-232	3T/5R RS-232.
0	1	0	RS-485 Half Duplex	1T/1R RS-485 ,TX ENABLE Low Active
0	1	1	RS-485 Half Duplex	1T/1R RS-485 ,TX ENABLE High Active
1	0	0	RS-422 Full Duplex	1T/1R RS-422 with termination resistor
1	0	1	Pure RS-232	1T/1R RS-232 co-exists with RS485 application without the need for the bus switch IC (for special usage).
1	1	0	RS-485 Half Duplex	1T/1R RS-485 with termination resistor TX ENABLE Low Active
1	1	1	Low Power Shutdown	All I/O pins are High Impedance

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Size: A3	Document Number: 23 RS232/422/485		Rev: V1.2
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