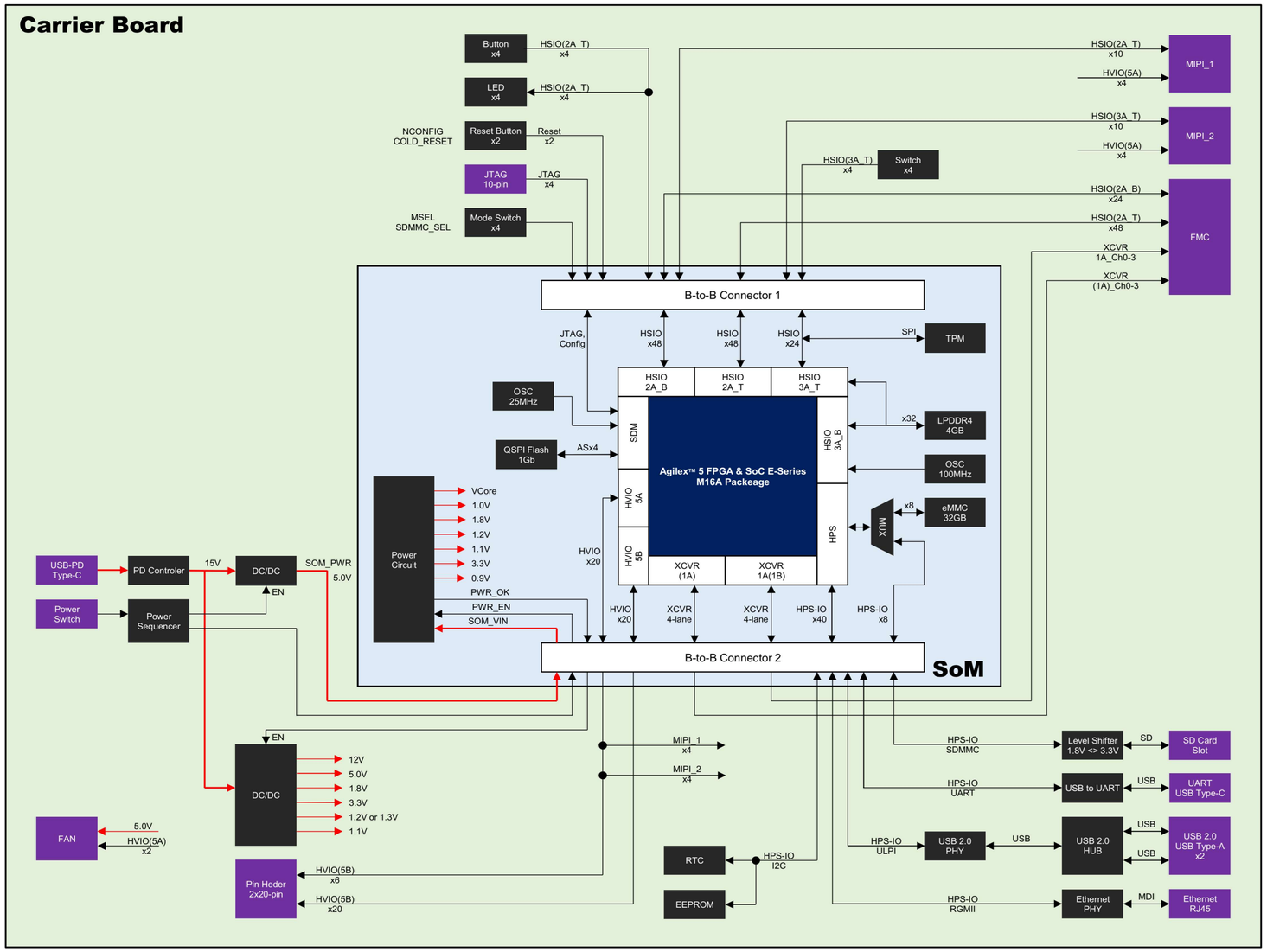
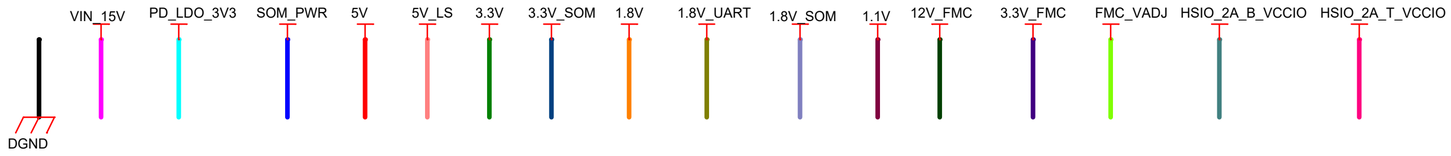
REV	PAGES	DESCRIPTION
1.0	all	Release

Sulfur-Mini Block Diagram

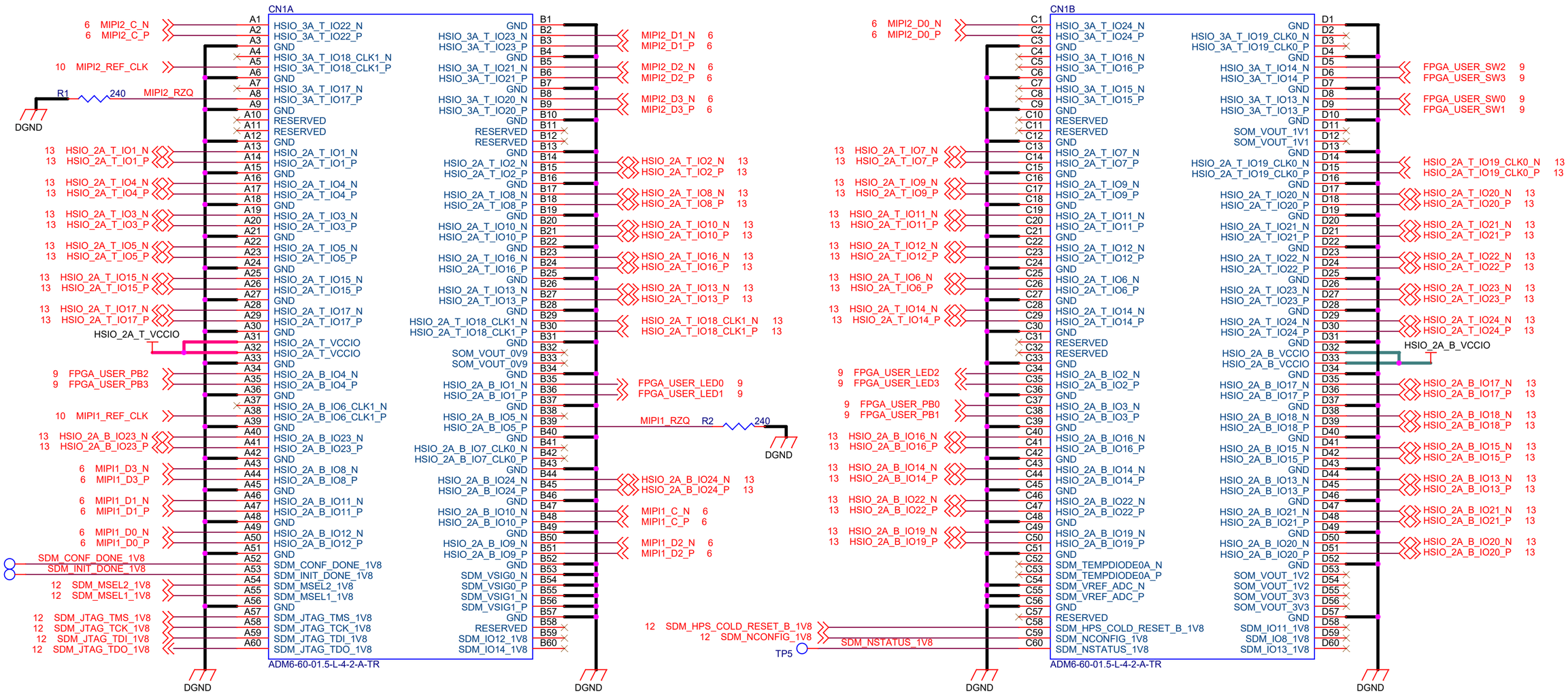


PAGE	DESCRIPTION
1	Cover
2	BtoB Connector 1
3	BtoB Connector 2
4	10/100/1000 Ethernet
5	USB2.0
6	MIPI
7	MicroSD
8	UART
9	Peripheral
10	Clock
11	PinHeader, RTC, EPPROM
12	RESET, JTAG, MSEL, SDMMC SEL
13	FMC Connector 1/2
14	FMC Connector 2/2
15	Power 15V, 5V
16	Power 5V SOM, 3.3V
17	Power 1.8V, 1.2V/1.3V, 1.1V



KONDO ELECTRONICS INDUSTRY CO., LTD.			
Title: Sulfur-Mini Carrier Board			
Size: A3	Document Number: KEIM-MCB-STD-CS1		Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 1 of 17		

BtoB Connector 1



KONDO ELECTRONICS INDUSTRY CO., LTD.	
Title	BtoB Connector 1
Size A3	Document Number KEIM-MCB-STD-CS1
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Date:	Thursday, March 12, 2026
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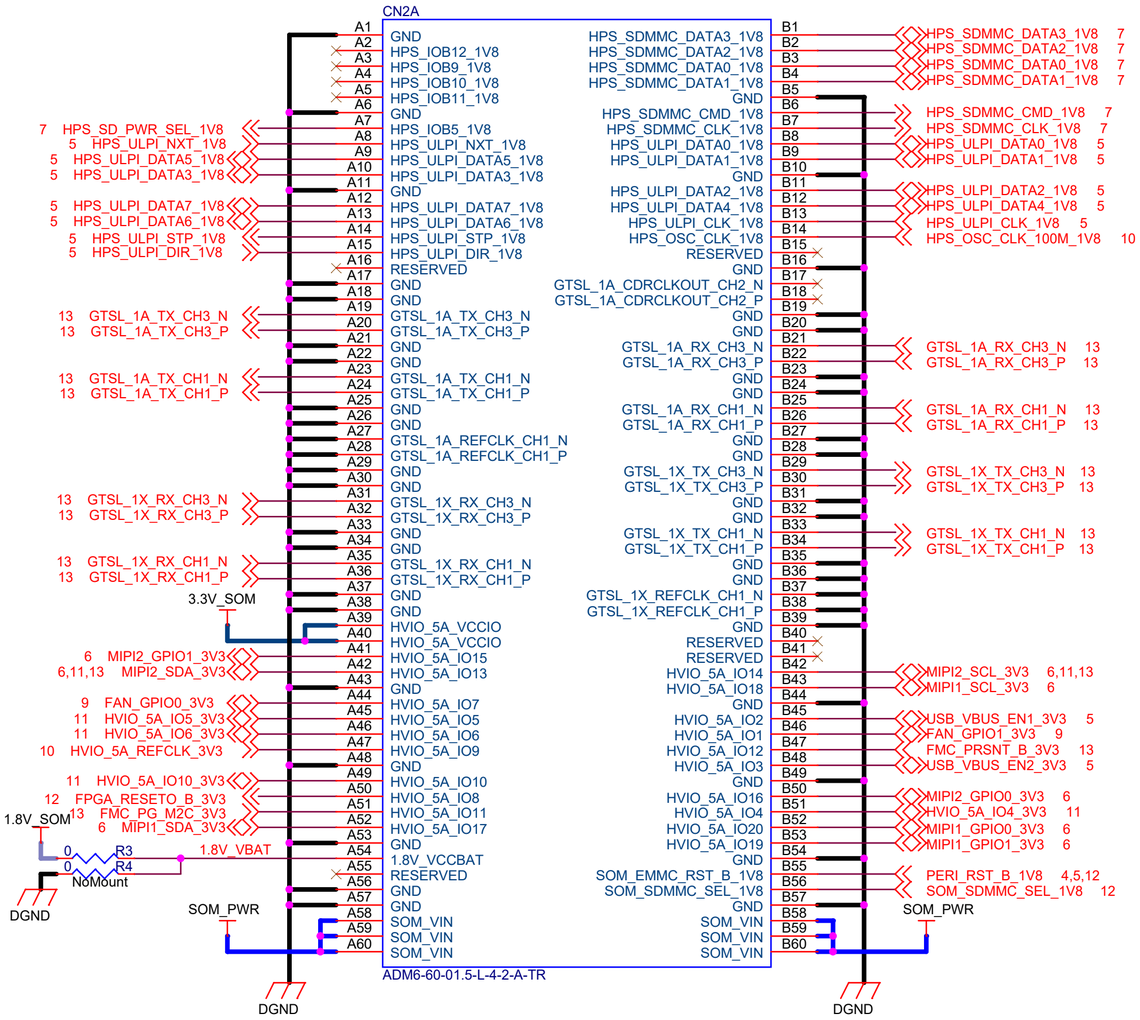
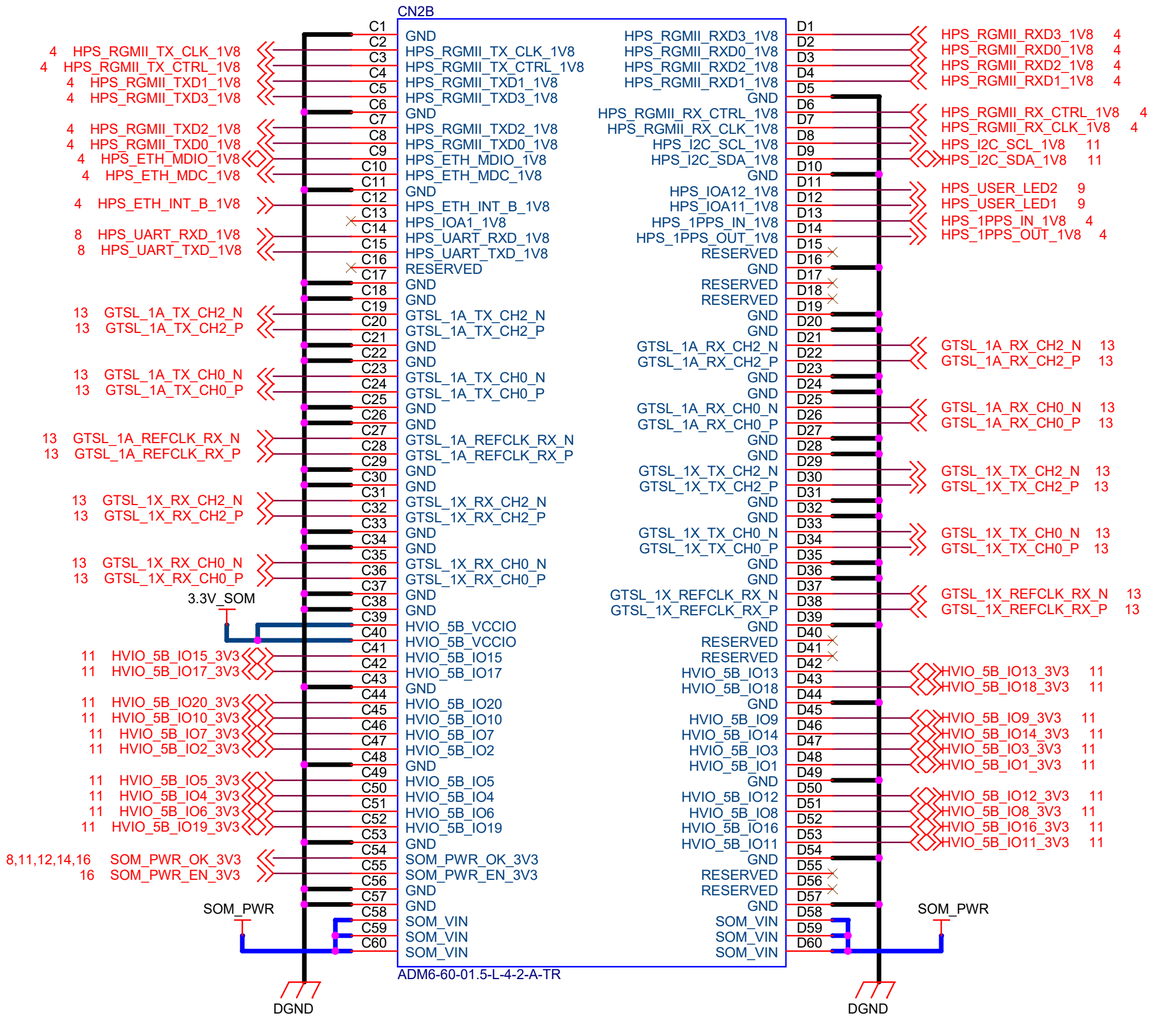
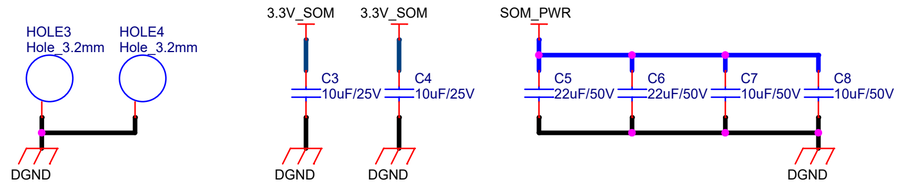
BtoB Connector 2

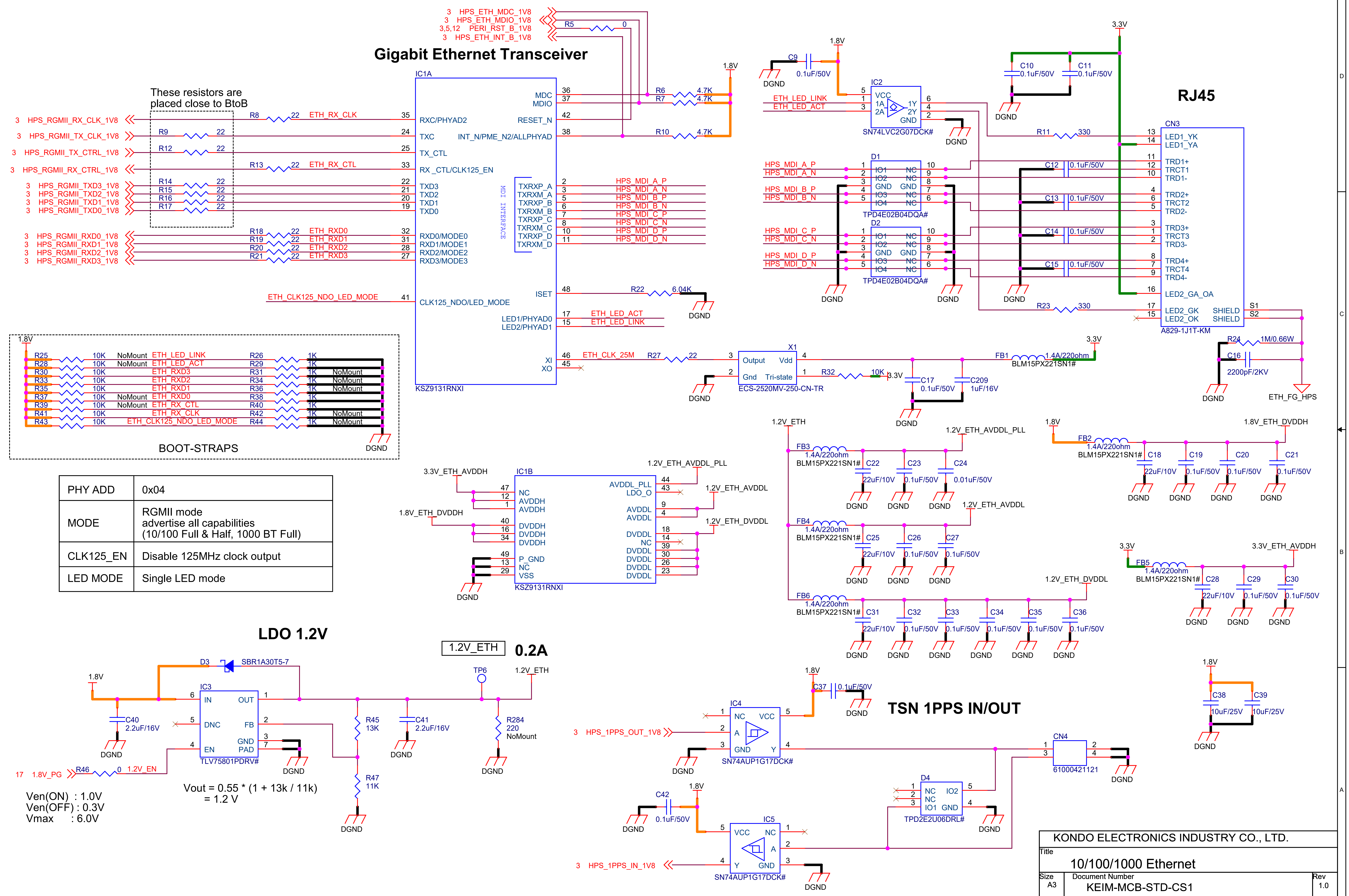






KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: BtoB Connector 2		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 3 of 17	

10/100/1000 Ethernet



PHY ADD	0x04
MODE	RGMII mode advertise all capabilities (10/100 Full & Half, 1000 BT Full)
CLK125_EN	Disable 125MHz clock output
LED MODE	Single LED mode

KONDO ELECTRONICS INDUSTRY CO., LTD.

Title: 10/100/1000 Ethernet

Size: A3 | Document Number: KEIM-MCB-STD-CS1 | Rev: 1.0

Date: Thursday, March 12, 2026 | Sheet 4 of 17

USB2.0

Load switch 5V USB

5V
C203 10uF/50V
C43 0.1uF/50V
DGND
3.3V
R49 100K
R50 100K
3 USB_VBUS_EN1_3V3
3 USB_VBUS_EN2_3V3
R257 2K
R258 2K
TP9 TP10
IC6
IN IN
OUT1 OUT2
FAULT1 FAULT2
EN1 EN2
ILIM
GND PAD
TPS2561DRC#
10uF/25V C220
10uF/25V C221
DGND
RILIM = 91kOhm
Iosmin = 517mA
Iosnom = 615mA
Iosmax = 712mA
TP7 TP8
R51 91K
DGND
USB_DN1_HUB_VBUS
USB_DN2_HUB_VBUS
0.1uF/50V C46
100uF/16V C47
100uF/16V C48
0.1uF/50V C49
100uF/16V C50
100uF/16V C51
DGND
USB_VBUS 3
D8
SBAT54CLT1G
NoMount
BLM15PX221SN1#
FB7 1.4A/220ohm
FB8 1.4A/220ohm
BLM15PX221SN1#
0.1uF/50V C45
D6 TPD1E10B06DPY#
0.1uF/50V C52
D7 TPD1E10B06DPY#
DGND

USB 2.0 Type-A x2

90 OHM Impedance

USB_DN1_HUB_D_N
USB_DN1_HUB_D_P
USB_DN2_HUB_D_N
USB_DN2_HUB_D_P
L1 DLW21SN900HQ2#
L2 DLW21SN900HQ2#
D5
IO1 IO2 GND IO3 IO4
NC NC GND NC NC
TPD4E02B04DQA#
DGND
CN5
VBUS D- D+ GND
VBUS D- D+ GND
SHELL
1A 2A 3A 4A 1B 2B 3B 4B
FG1 FG2 FG3 FG4
USB1035-GF-P-0-B-B
R48 1M/0.66W
C44 2200pF/2kV
USB2_FG
DGND

USB HUB

1.8V
C53 0.1uF/50V
DGND
IC7
VCC 1A 2A 1Y 2Y GND
SN74LVC2G07DCK#
3,4,12 PERI_RST_B_1V8
3.3V
R52 10K
USB_HUB_RST_B_3V3
3.3V
FB9 1.4A/220ohm
BLM15PX221SN1#
C54 4.7uF/10V
C55 1uF/50V
C56 0.1uF/50V
C57 0.1uF/50V
DGND
C58 1uF/50V
C59 0.1uF/50V
DGND
R260 0 NoMount
R53 0
R54 100K
R56 100K
DGND
R58 0
IC8
VDD33 VDD33 VDD33
SMBCLK/CFG_SEL0
SMBDATA/NON_REM1
SUSP_IND/LOCAL_PWR/(NON_REM0)
RESET_N
VBUS_DET
USBDM_UP
USBDP_UP
XTALOUT/(CLKIN_EN)
XTALIN/CLKIN
PRTPWR1/(BC_EN1)
OCS1_N
USBDP_DN1/PRT_DIS_P1
USBDM_DN1/PRT_DIS_M1
PRTPWR2
OCS2_N
USBDP_DN2/PRT_DIS_P2
USBDM_DN2/PRT_DIS_M2
PLLFILT
CRFILT
RBIAS
NC
Thermal Slug(VSS)
USB2422-I/MJ
USB_DN1_HUB_D_P
USB_DN1_HUB_D_N
USB_DN2_HUB_D_P
USB_DN2_HUB_D_N
C223 0.1uF/50V NoMount
C224 0.1uF/50V NoMount
DGND
C67 0.1uF/50V
C210 1uF/16V
DGND
R82 10K 1.8V
X2
Output Vdd
Gnd Tri-state
ECS-2520MV-240-DN-TR
USB_HUB_CLK_3V3 R79 22
FB10 1.4A/220ohm
BLM15PX221SN1# 1.8V
C65 1uF/50V
C66 0.1uF/50V
R67 12K
DGND

USB2.0 PHY

3.3V
C63 2.2uF/16V
C60 0.1uF/50V
C64 0.1uF/50V
1.8V
DGND
IC9
VBAT VDD33 VDDIO
VDD18 VDD18
CPEN
SPK_R SPK_L
DATA0 DATA1 DATA2 DATA3 DATA4 DATA5 DATA6 DATA7
VBUS DM DP ID
REFCLK
XO
CLKOUT NXT DIR STP
REFSEL0 REFSEL1 REFSEL2
RBIAS
RESETB
N/C
GND
USB3320C-EZK
3 HPS_ULPI_DATA0_1V8 R59 22
3 HPS_ULPI_DATA1_1V8 R60 22
3 HPS_ULPI_DATA2_1V8 R62 22
3 HPS_ULPI_DATA3_1V8 R63 22
3 HPS_ULPI_DATA4_1V8 R64 22
3 HPS_ULPI_DATA5_1V8 R66 22
3 HPS_ULPI_DATA6_1V8 R68 22
3 HPS_ULPI_DATA7_1V8 R69 22
3 HPS_ULPI_CLK_1V8 R70 22
3 HPS_ULPI_NXT_1V8 R72 22
3 HPS_ULPI_DIR_1V8 R74 22
3 HPS_ULPI_STP_1V8 R77 22
R78 8.06K
PERI_RST_B_1V8 R81 0
R254 0
C61 0.1uF/50V
C62 2.2uF/16V
R55 0
R61 10K
R65 0
USB_VBUS
USB_D_N
USB_D_P
R71 10K
R73 10K
R75 10K
1.8V
5V_LS
R259 0
C222 10uF/25V
DGND
REFSEL[2:0] = 111
Reference Frequency=24MHz
1.8V
FB11 1.4A/220ohm
BLM15PX221SN1#
C211 1uF/16V
C68 0.1uF/50V
X3
Vdd Output
Tri-state Gnd
ECS-2520MV-240-DN-TR
R83 22
USB_PHY_CLK
1.8V R84 10K

KONDO ELECTRONICS INDUSTRY CO., LTD.			
Title: USB2.0			
Size: A3	Document Number: KEIM-MCB-STD-CS1		Rev: 1.0
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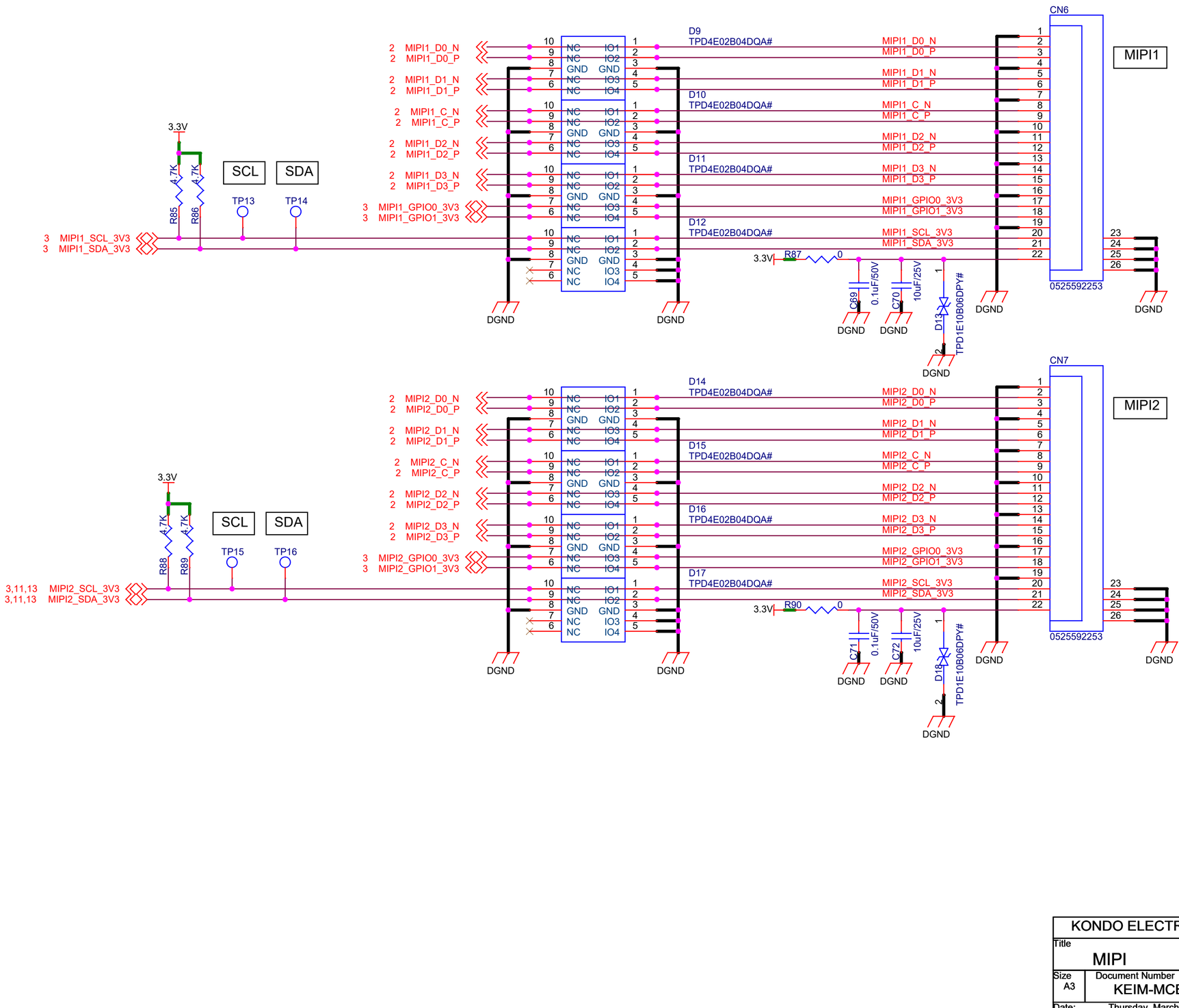
MIPI



KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: MIPI		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 6 of 17	

MicroSD

SD Power selection

EN
VIN : Typ3.3V Max6V
Vth : VEN Rising 1.2Vmin

SD_PWR_SEL
Low : 3.3V
High : 1.8V

EN, SEL : Internal 700k Ohm pull-down to GND.

Load switch 3.3V SD

0.4A

Ven(ON Max) : 1.9V
Ven(OFF Min) : 0.6V
Vmax : 6.5V

RILIM = 169kOhm
Iosmin=498mA
Iosnom=573mA
Iosmax=655mA

Level shifter

MicroSD

CMDA, DAT[3:0]A : Internal 70k Ohm pull-up resistor to VCCA
CMDB, DAT[3:0]B : Internal 70k Ohm pull-up resistor to VCCB
CLKA,CLK_FB, CMDA, DAT[3:0]A: Internal series resistance 22.5 Ohm
CLKB, CMDB, DAT[3:0]B: Internal series resistance 15 Ohm

KONDO ELECTRONICS INDUSTRY CO., LTD.			
Title: MicroSD			
Size: A3	Document Number: KEIM-MCB-STD-CS1		Rev: 1.0
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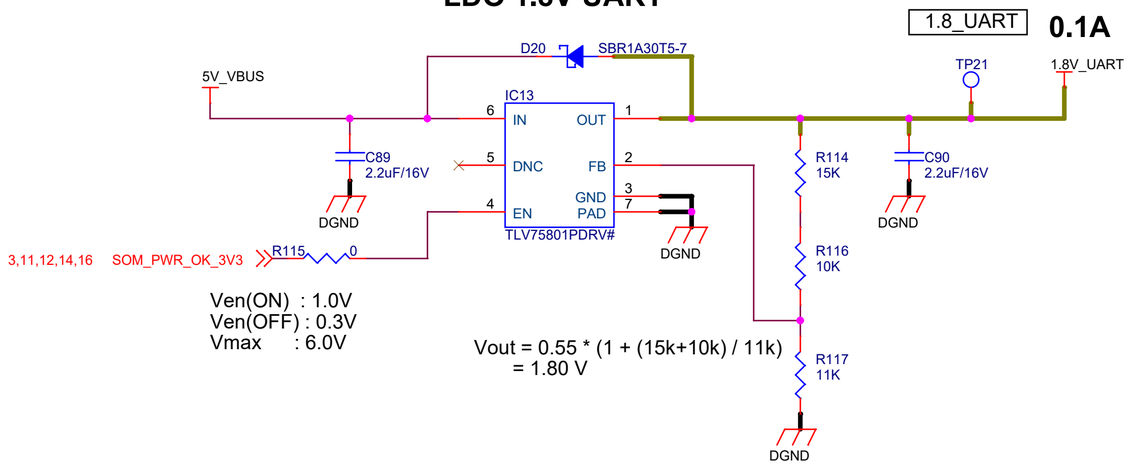
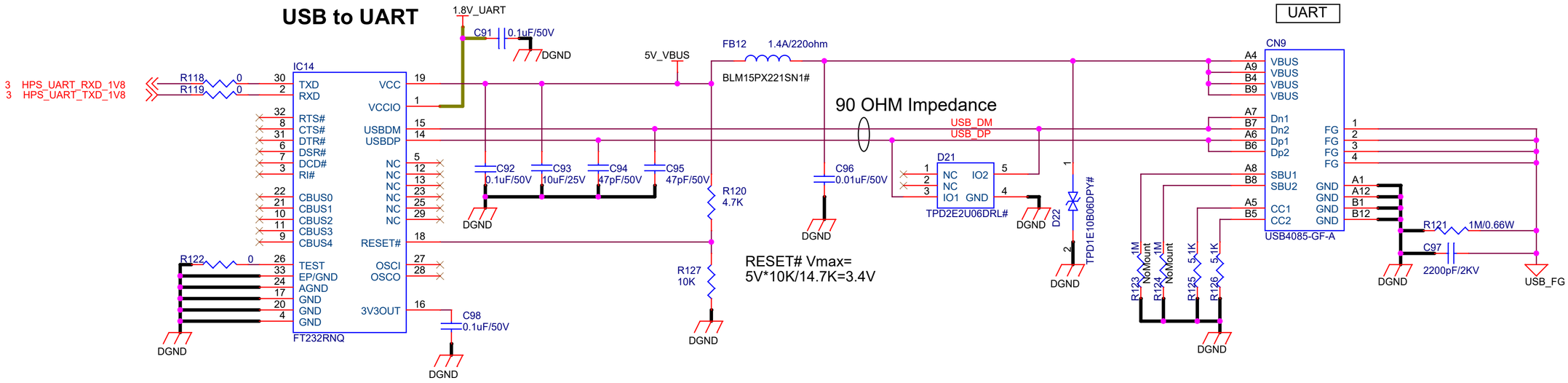
UART

LDO 1.8V UART

1.8_UART **0.1A**



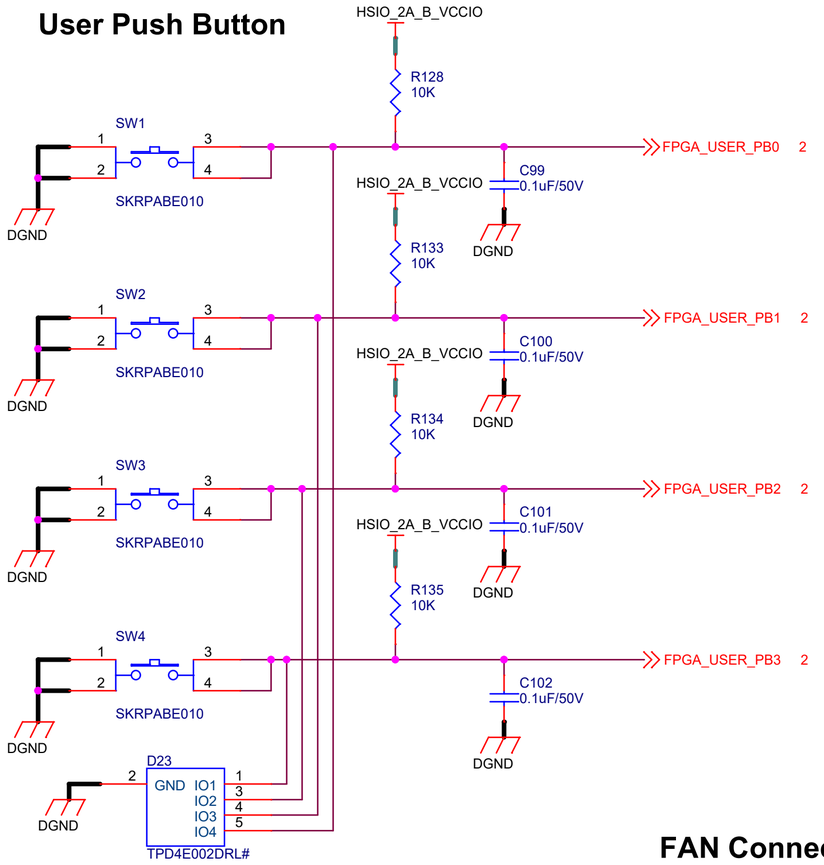
USB to UART



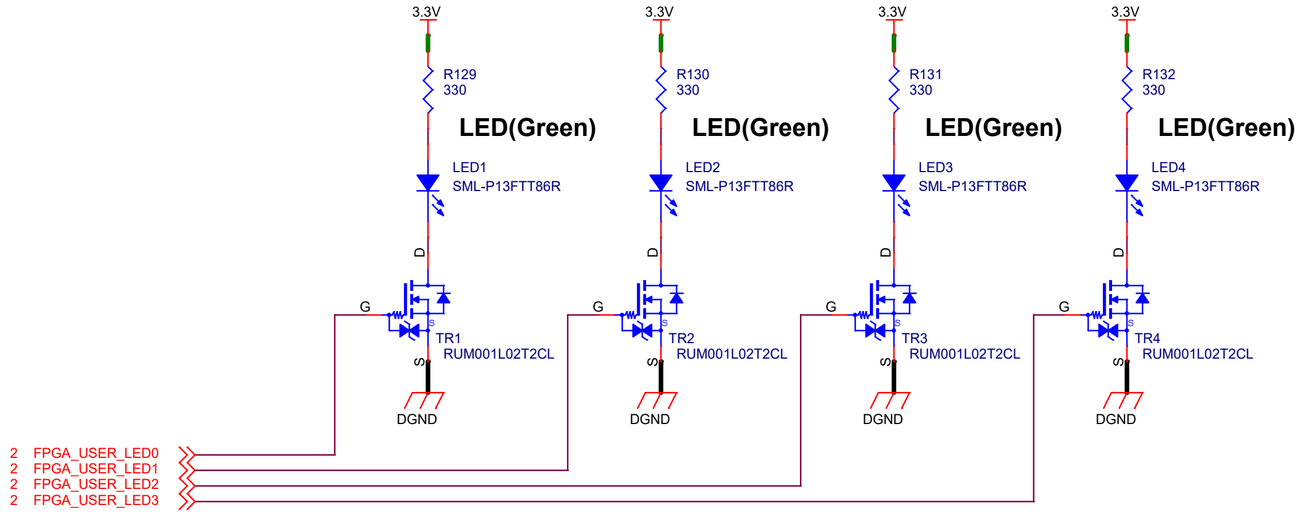
KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: UART		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 8 of 17	

Peripheral

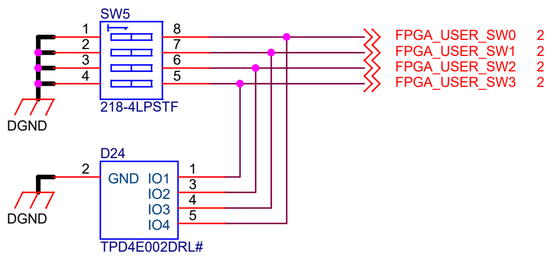
User Push Button



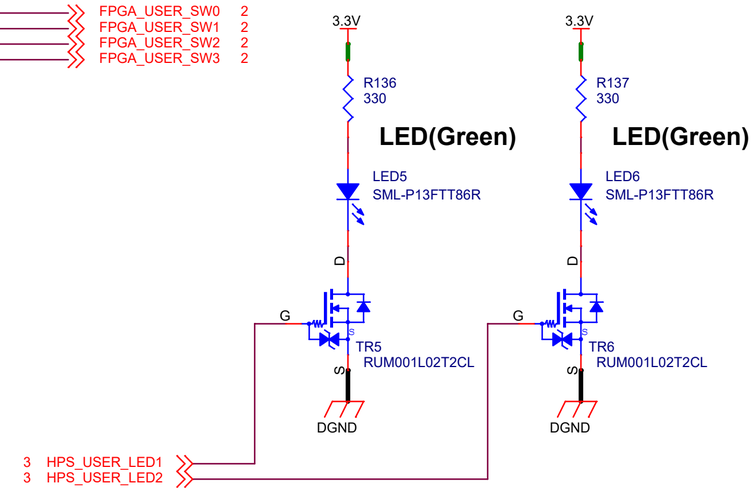
User LED FPGA



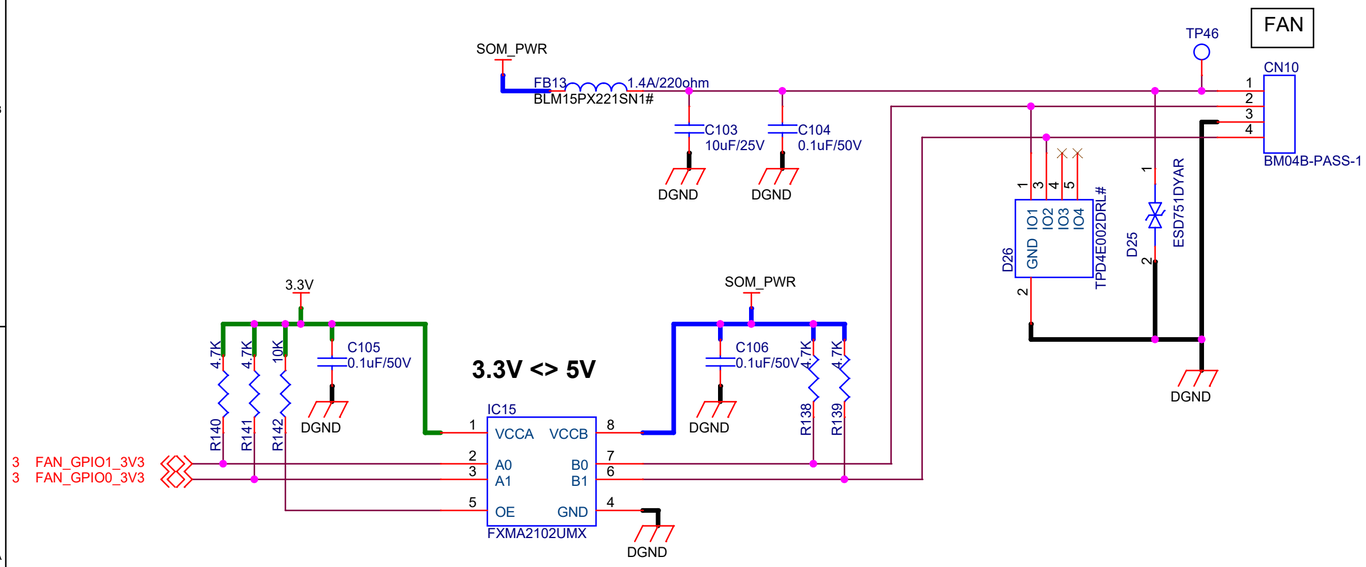
User Dip Switch



User LED HPS



FAN Connector



KONDO ELECTRONICS INDUSTRY CO., LTD.	
Title: Peripheral	
Size: A3	Document Number: KEIM-MCB-STD-CS1
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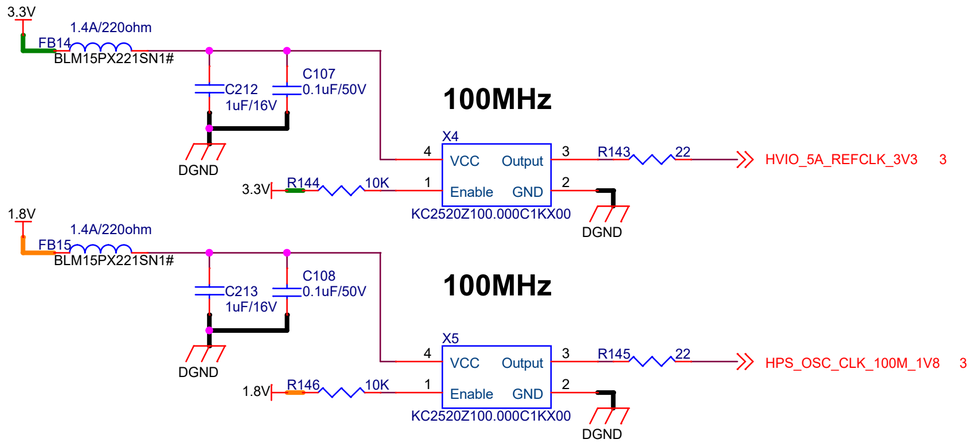
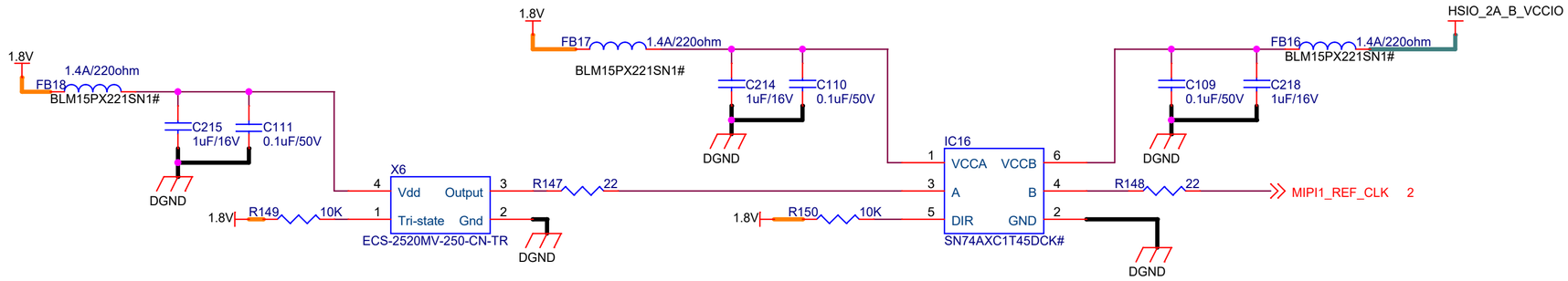
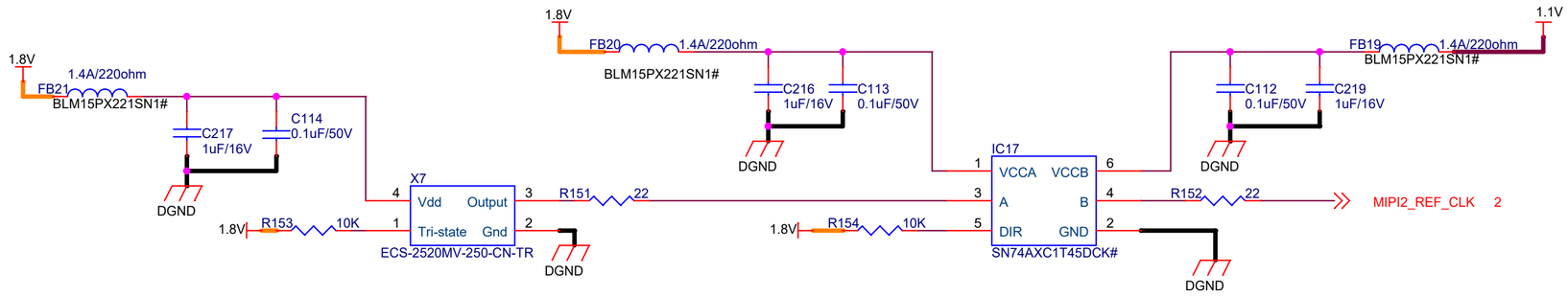
Clock

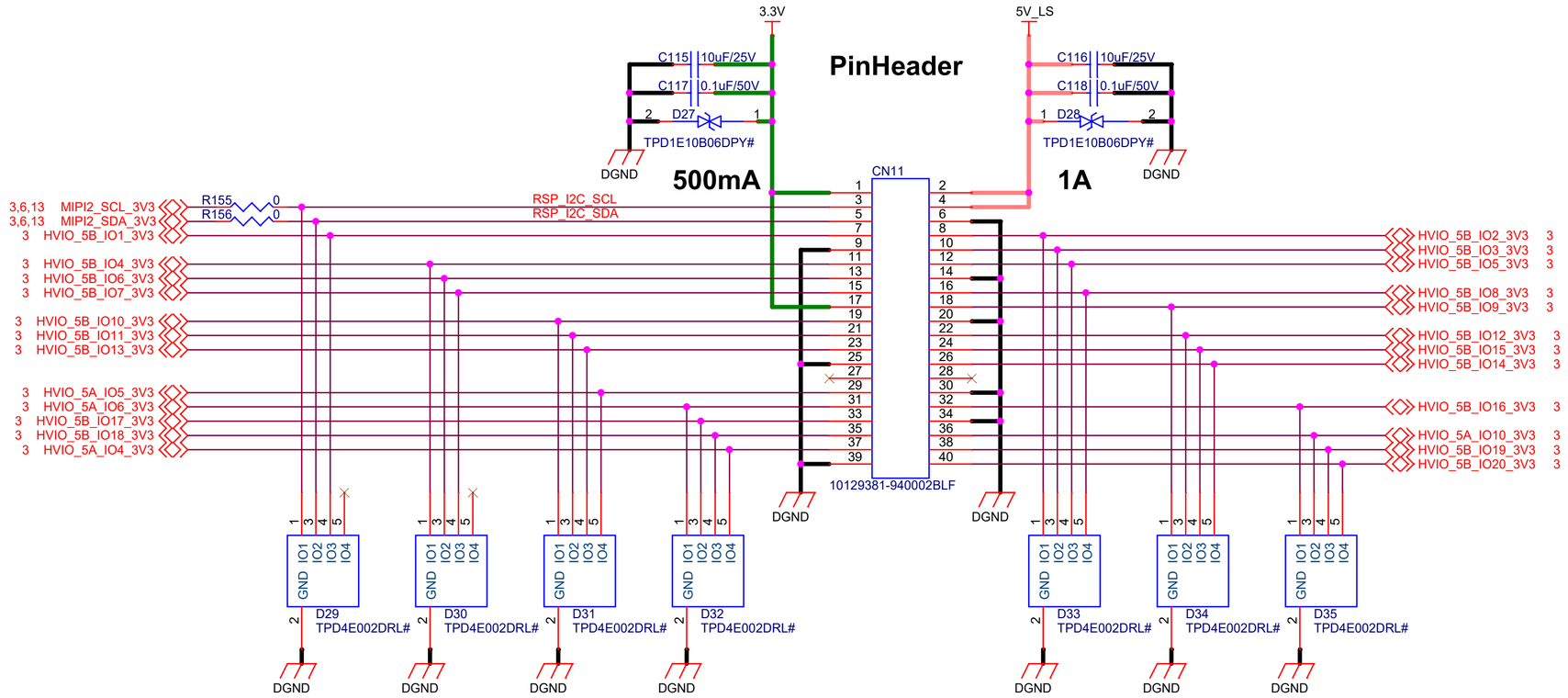


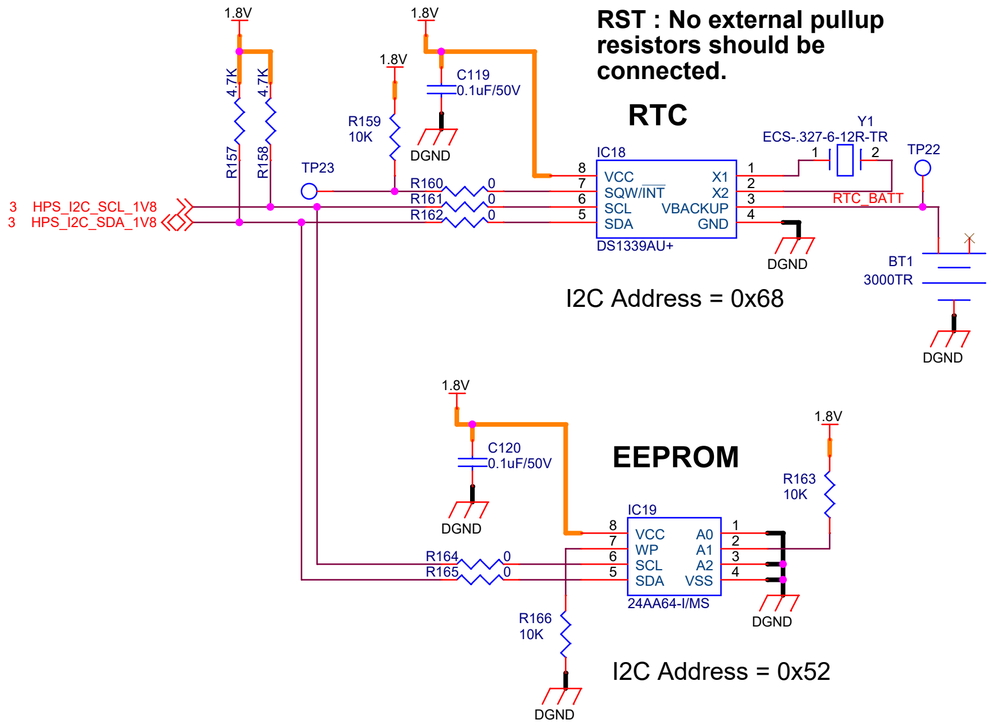


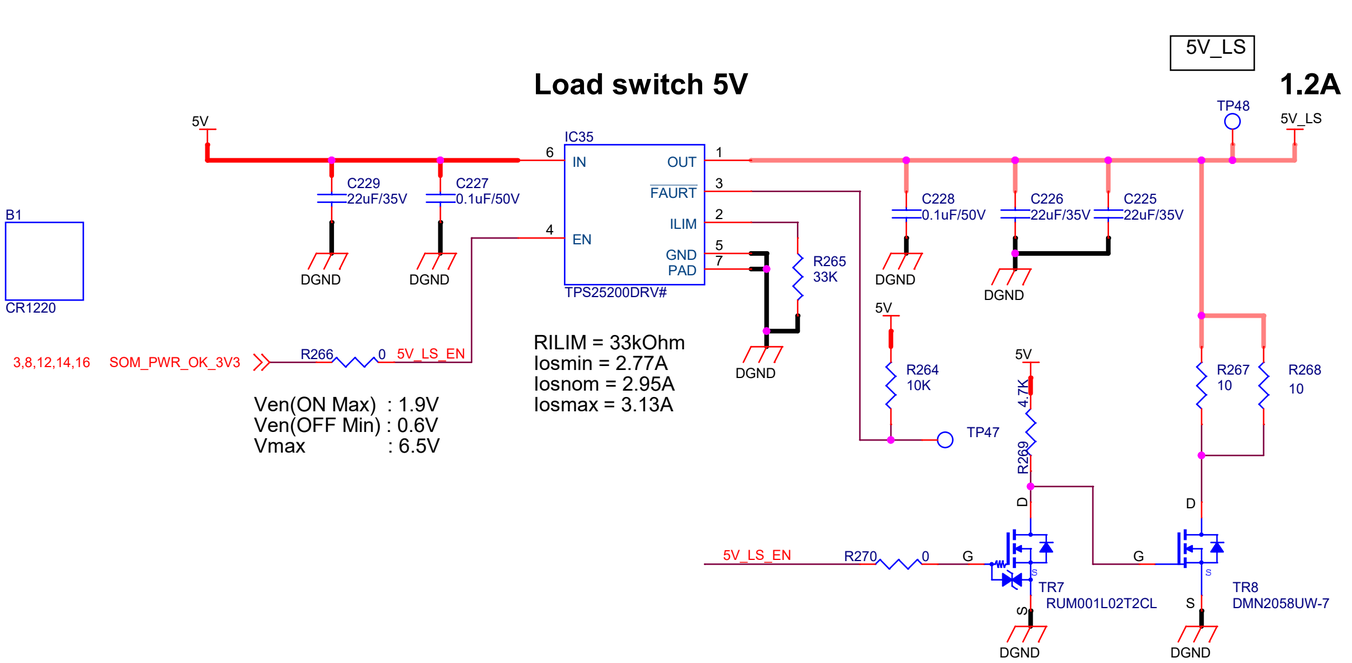


KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: Clock		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 10 of 17	

PinHeader, RTC, EPPROM



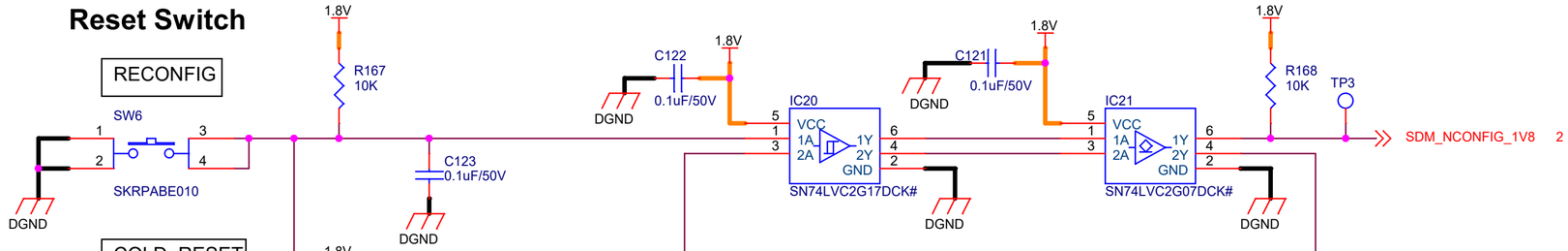




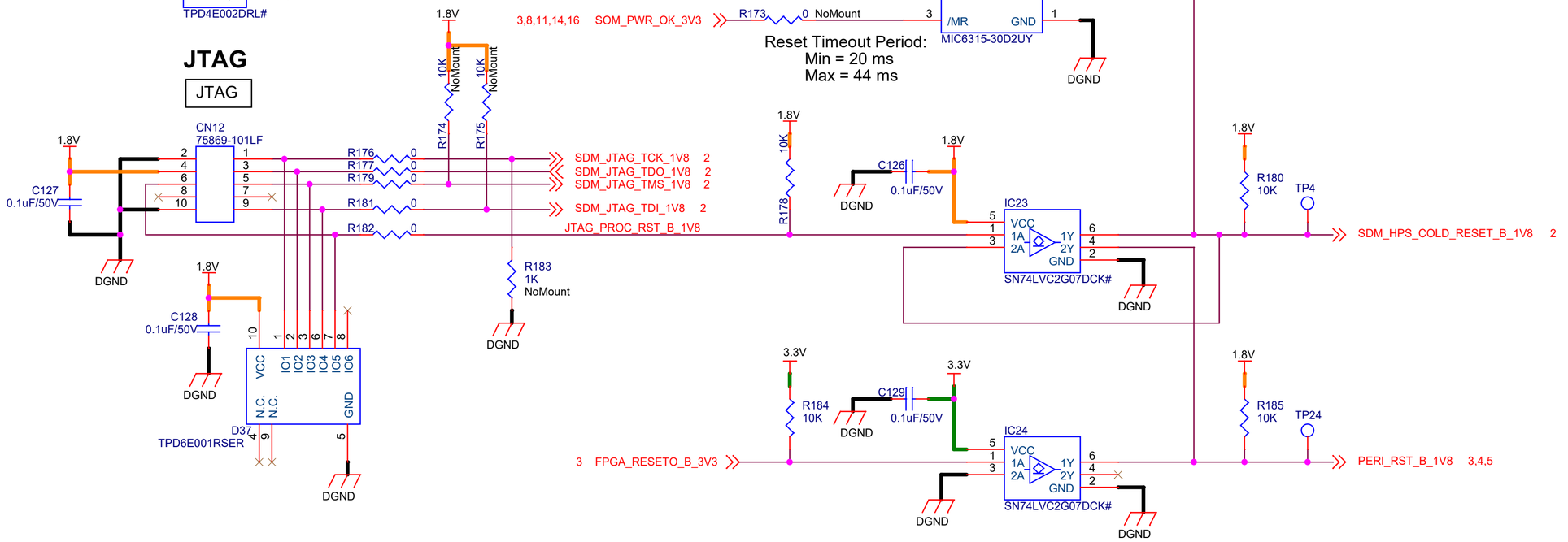
KONDO ELECTRONICS INDUSTRY CO., LTD.			
Title: Pin Header, RTC, EPPROM			
Size: A3	Document Number: KEIM-MCB-STD-CS1		Rev: 1.0
Date: Thursday, March 12, 2026		Sheet 11 of 17	

RESET, JTAG, MSEL, SDMMC SEL

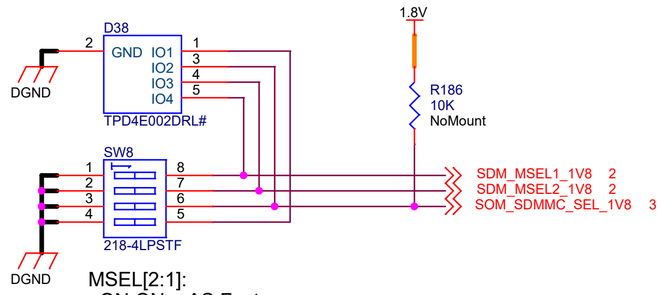
Reset Switch



JTAG



MSEL, SDMMC SEL

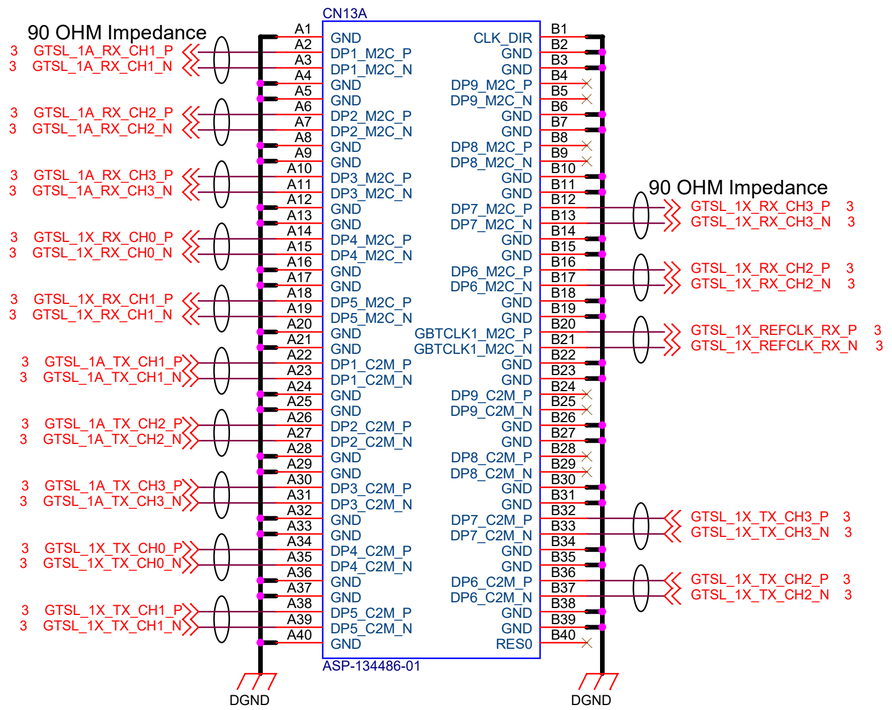


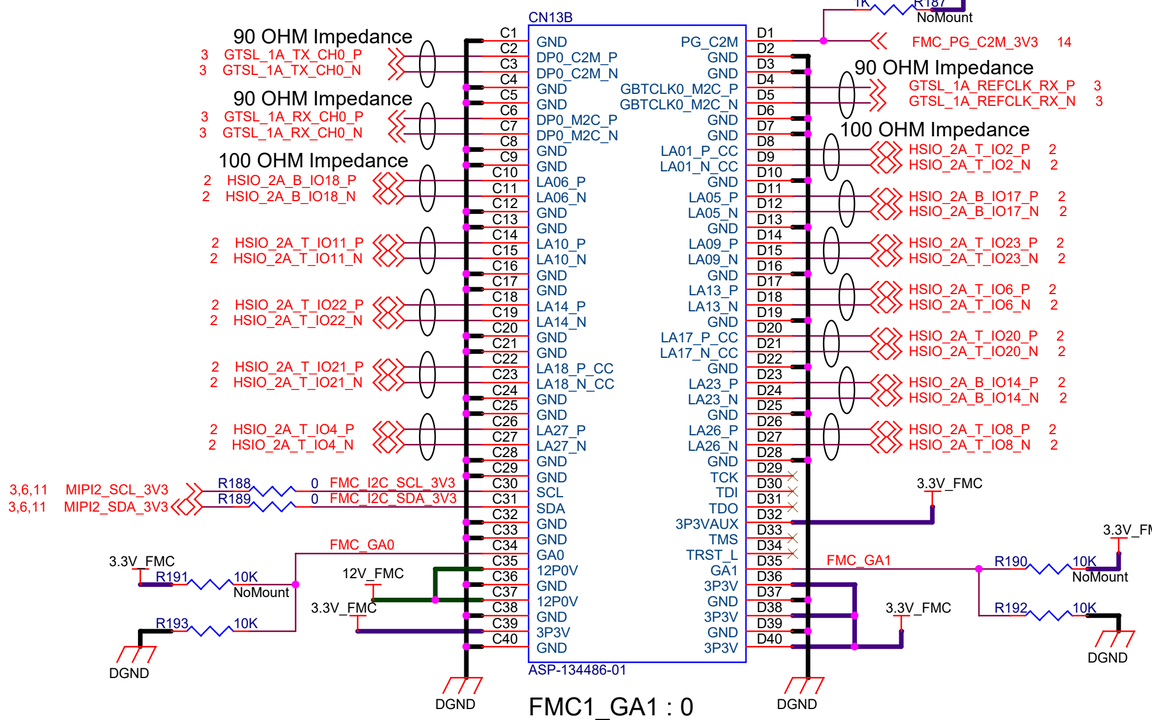
MSEL[2:1]:
ON:ON = AS Fast
ON:OFF = AS Nomal
OFF:OFF = JTAG Only

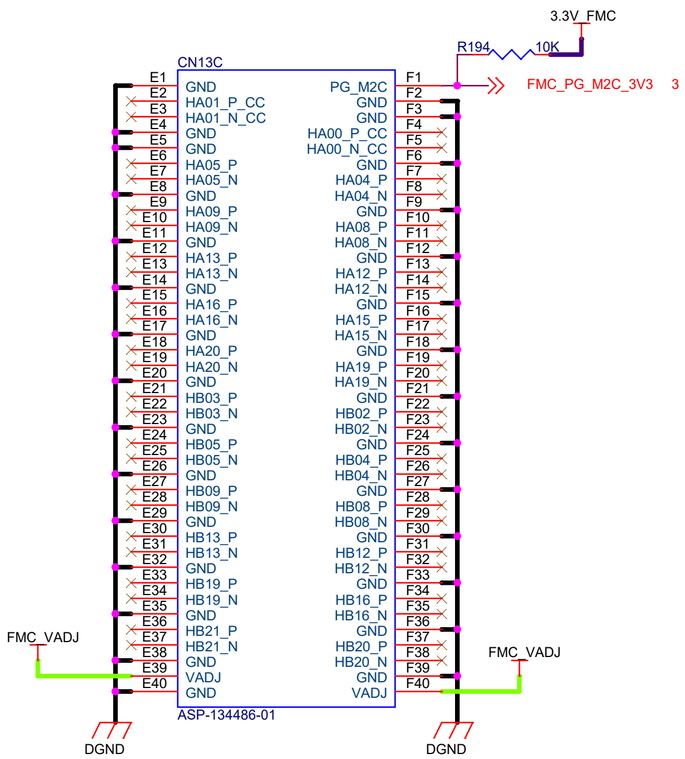
SDMMC_SEL:
ON = MicroSD / OFF = EMMC

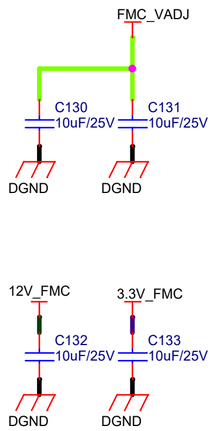
KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: RESET, JTAG, MSEL, SDMMC SEL		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 12 of 17	

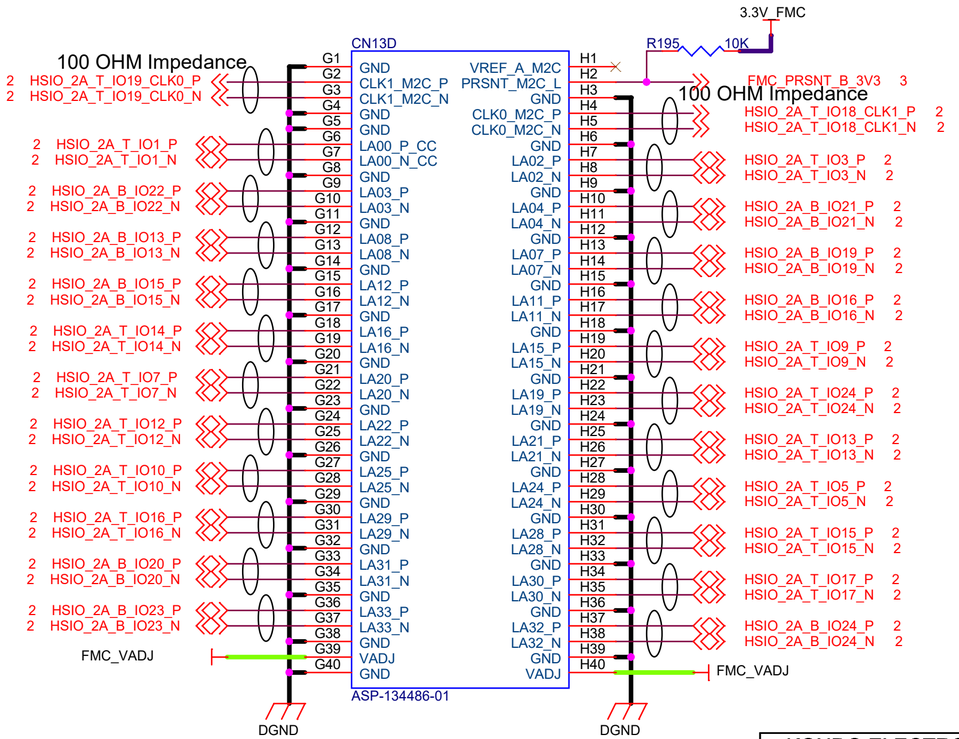
FMC Connector 1/2





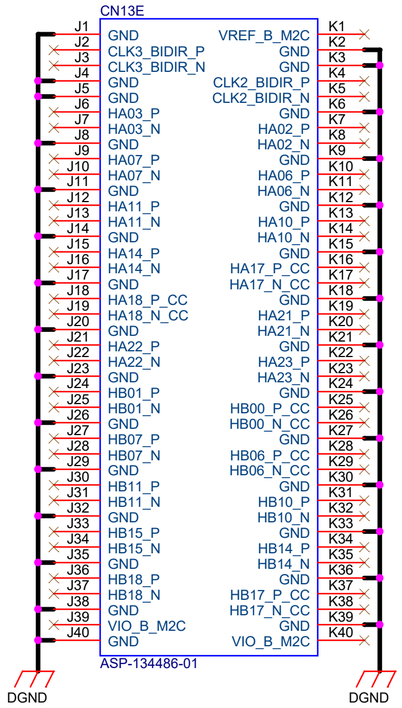




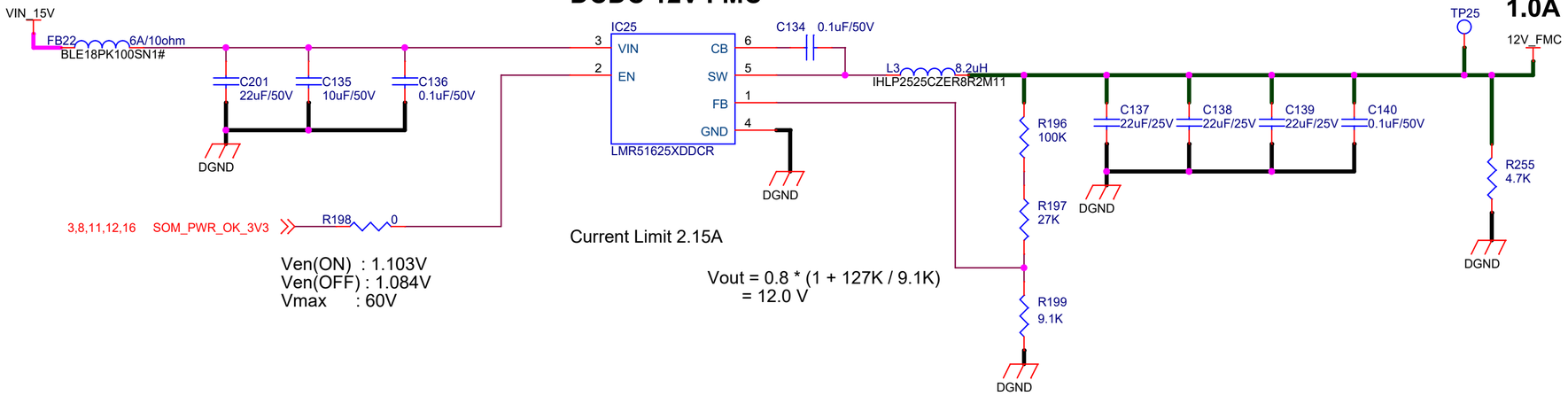


KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: FMC Connector 1/2		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 13 of 17	

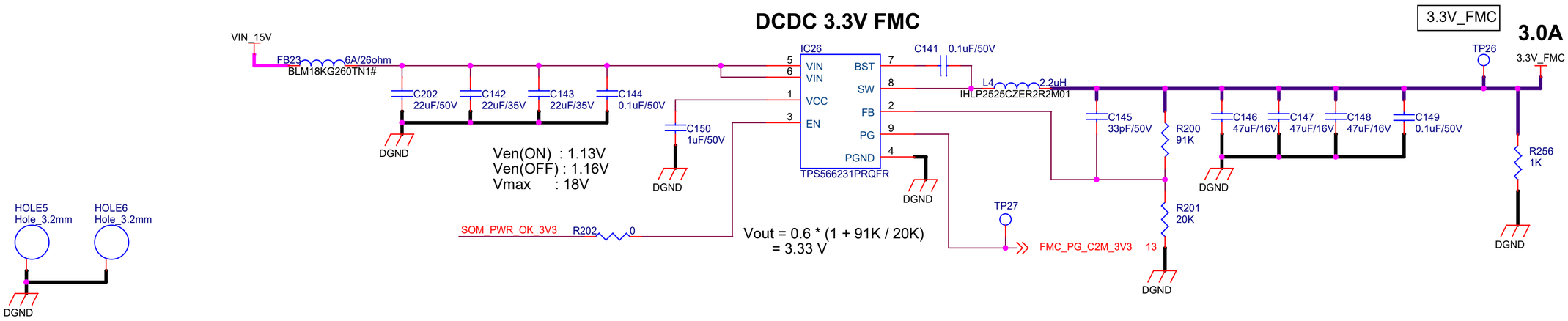
FMC Connector 2/2



DCDC 12V FMC

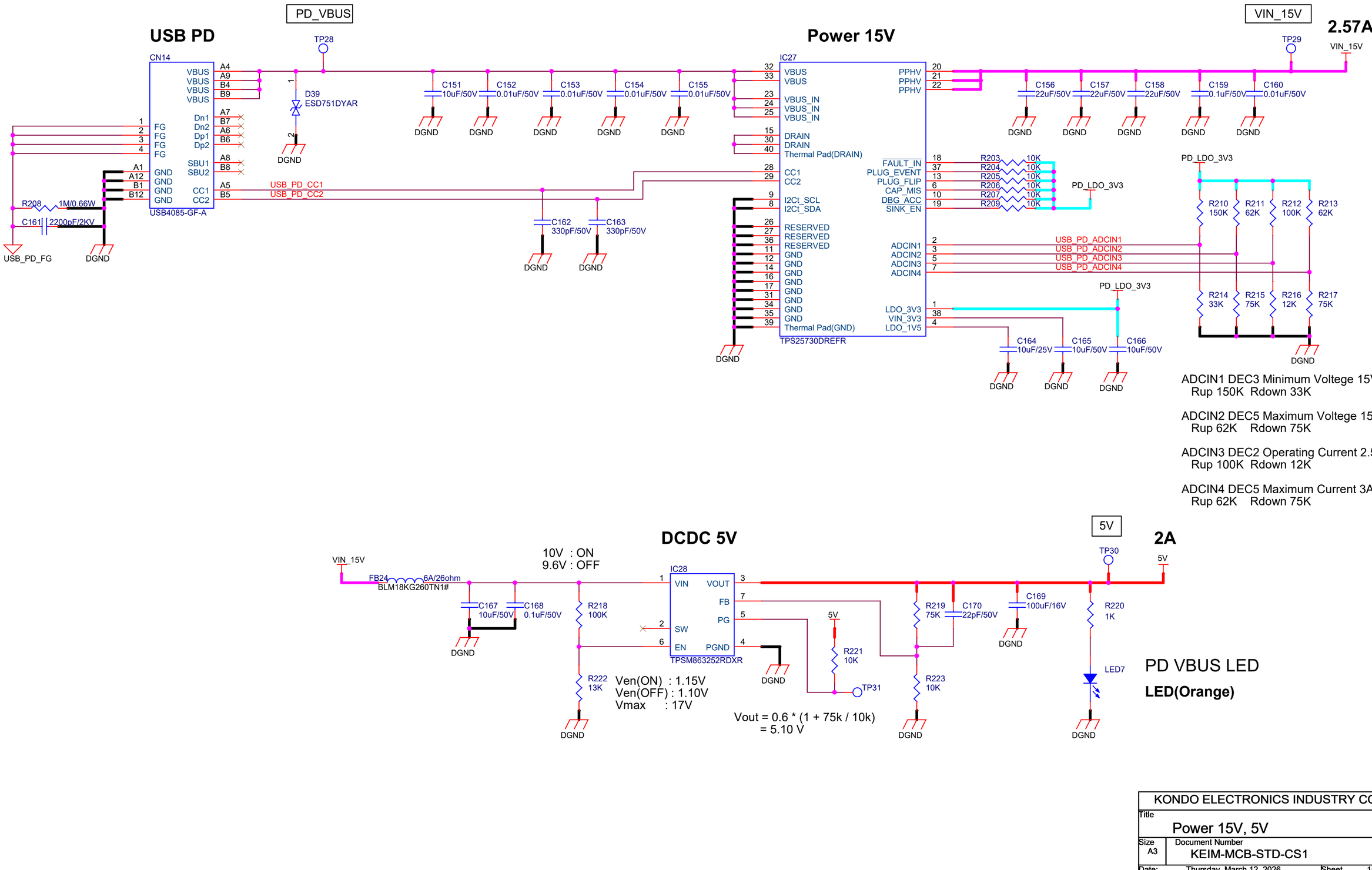


DCDC 3.3V FMC



KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: FMC Connector 2/2		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 14 of 17	

Power 15V, 5V

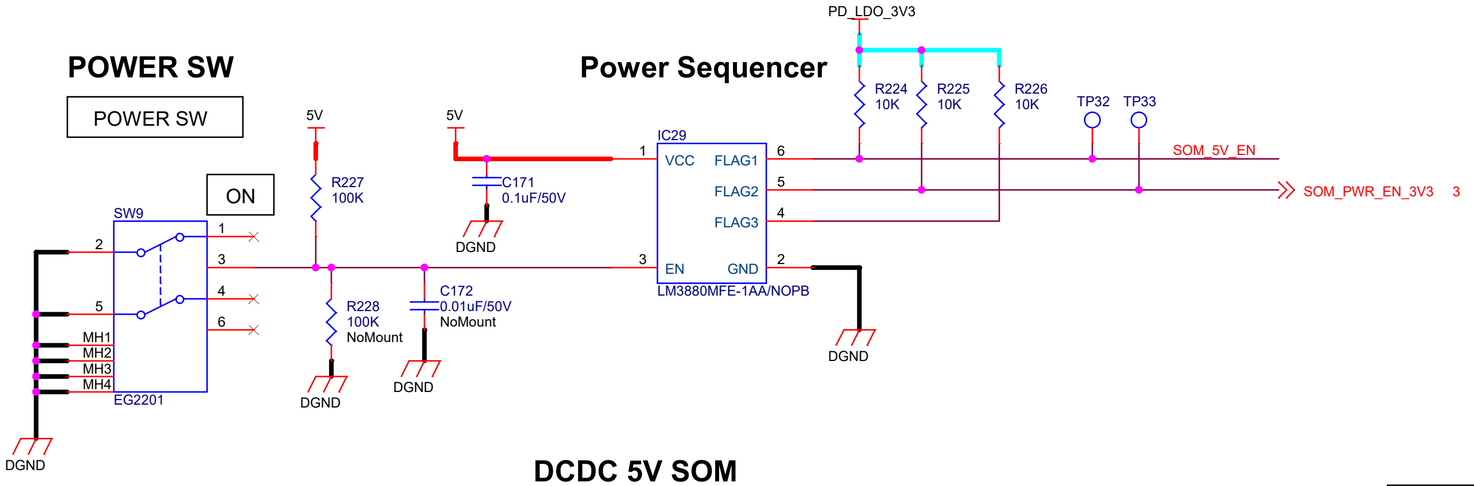


KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: Power 15V, 5V		
Size: A3	Document Number: KEIM-MCB-STD-CS1	Rev: 1.0
Date: Thursday, March 12, 2026	Sheet 15 of 17	

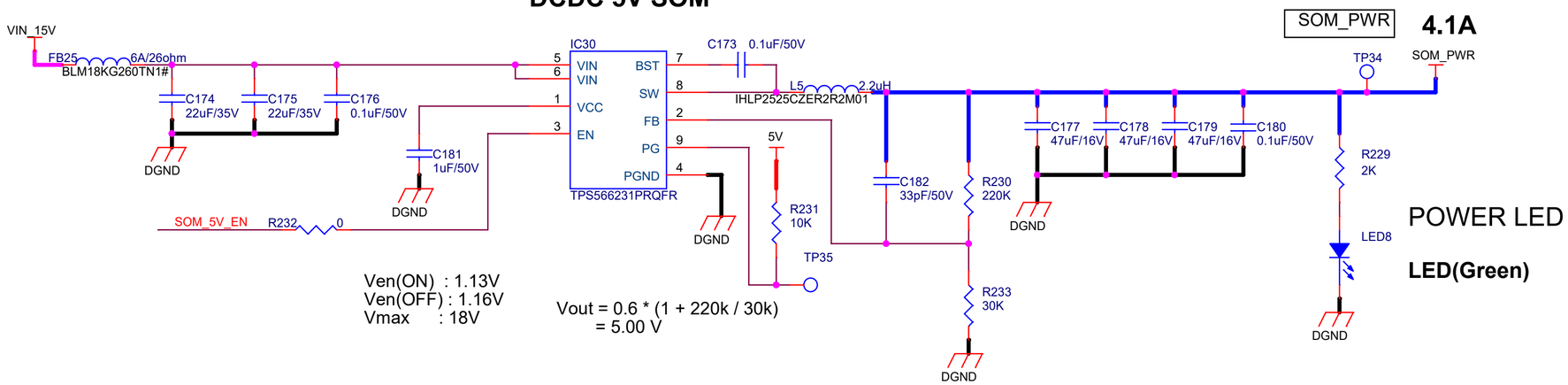
Power 5V SOM, 3.3V

POWER SW

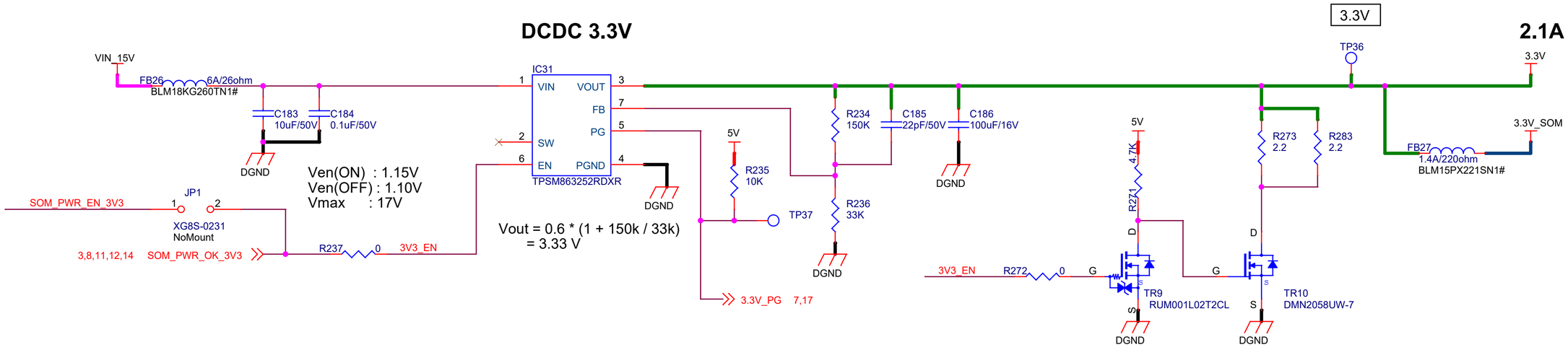
Power Sequencer



DCDC 5V SOM



DCDC 3.3V



KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: Power 5V SOM, 3.3V		
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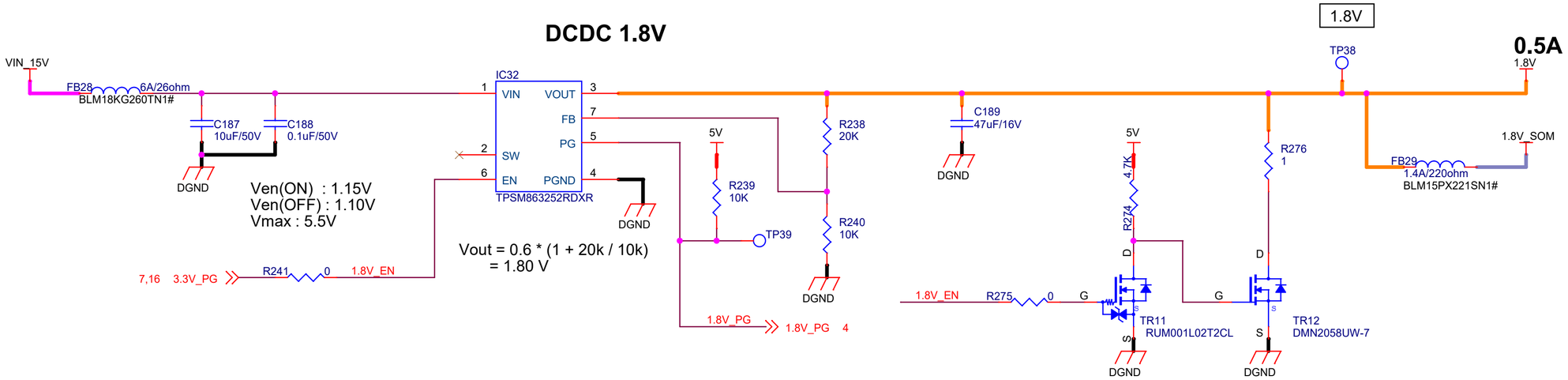
Power 1.8V, 1.2V/1.3V, 1.1V

DCDC 1.8V



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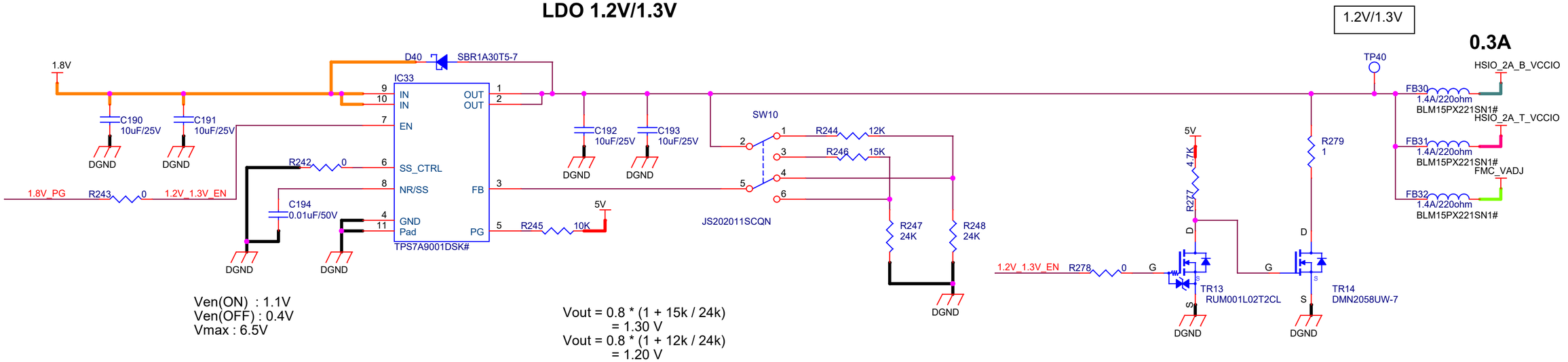

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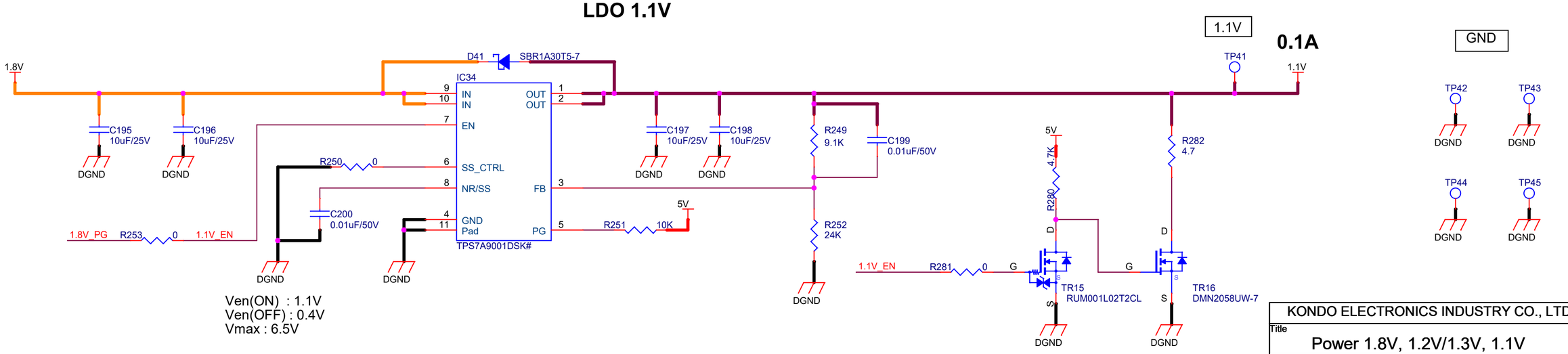

KONDO ELECTRONICS INDUSTRY CO., LTD.		
Title: Power 1.8V, 1.2V/1.3V, 1.1V		
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