Schematics Drafted in : Allegro Design entry CIS 17.2

| REV | Revision Notes | Designer | Approver | Date |
|---|---|---|---|---|
| A1 | Initial draft | VVDN | TI | 31-01-2020 |
| A1-01 | 1) Made R13=200E, R14=300E to avoid loading of DCDC6 feedback.<br>2) Made R221NM, R248M to make uSDHC1 as default boot source.<br>3) Made R77 NM. So that SD connector can control SD_CD# state.<br>4) Made R23NMSince the PGOOD_BU voltage is of 1V8 and PU is 3V<br>5) Made R250NM, R219M to select 4 bit bus width boot<br>6) Made R231NM, R238M to disable powercycle during boot<br>7) Made R571NM to disable extender mode in ethernet PHY<br>8) Made R773NM, R779NM to avoid the distortion of RMII Referance clock.<br>9) Made R771 NM to make PMIC_PWR_EN High always | VVDN | TI | 17-03-2020 |
| A1-02 | 1) R771Mounted | VVDN | TI | 17-03-2020 |
| A1-03 | 1) Mounted R190, R191, R261 with 0E; Made R192, R193, R262 NM For LCD Rework | VVDN | TI | 20-03-2020 |
| A1-04 | 1) Mounted R773, R779 with 510E for avoiding the dip in referance clock voltage.<br>2)Mounted R872, R873 with 49.9E and R208, R204 with 47K for clearing push button deglitch | VVDN | TI | 26-03-2020 |
| A2 | A2 Release | VVDN | TI | 26-03-2020 |

# TIXU_MX6Y

| Content | |
|---|---|
| **Page No** | **Sheet Name** |
| 01 | COVER PAGE |
| 02 | BLOCK DIAGRAM |
| 03 | DC JACK_MAIN POWER IN |
| 04 | PMIC TPS6521815 |
| 05 | LOAD SWITCH & COINCELL |
| 06 | IMX POWER |
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| 08 | IMX-LCD, ENET, eMMC, SDIO |
| 09 | IMX - CSI, USB, ADC, GPIO |
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| 14 | USB HUB |
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| 17 | USB-UART_USB2ANY_JTAG |
| 18 | CURRENT SENSE |
| 19 | LCD |
| 20 | BOOT SWITCH, LED AND GPIO |
| 21 | MISCELLANEOUS |

**TIDA-050043**

TIXU MX6Y

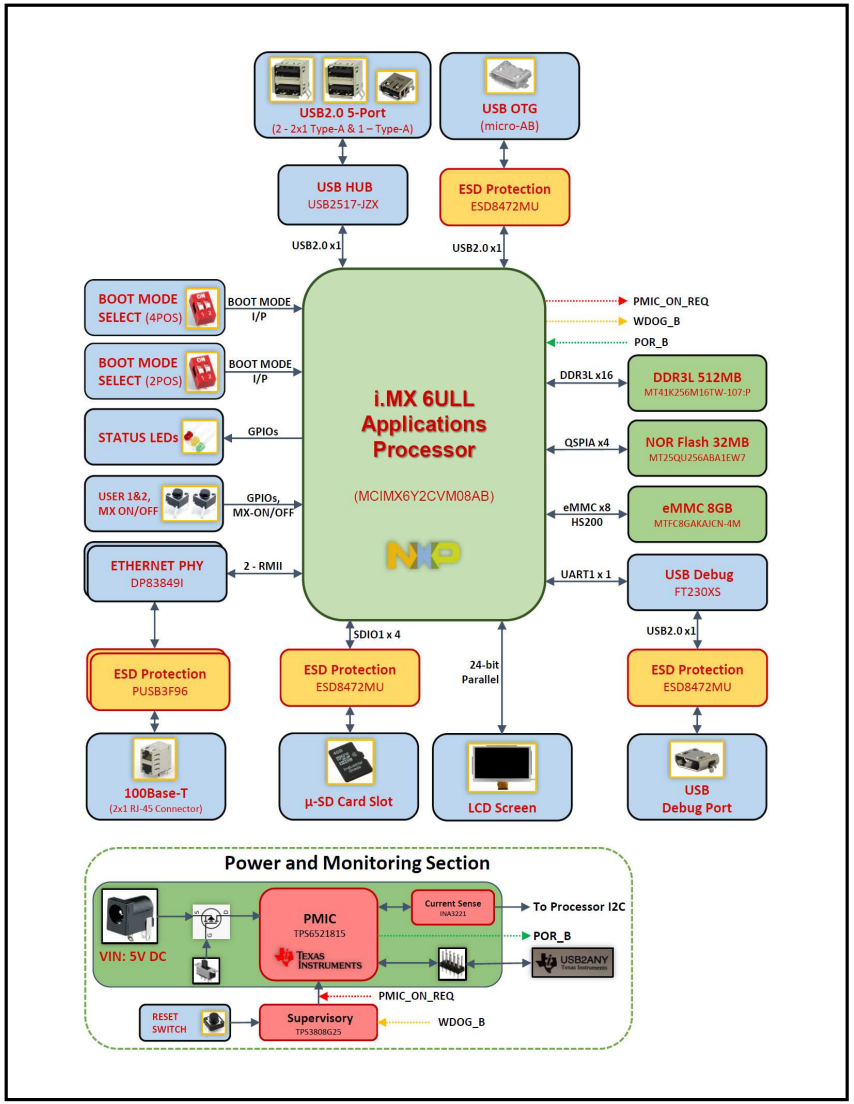
VVDN TECHNOLOGIES

A3 | **Title :** COVER_PAGE

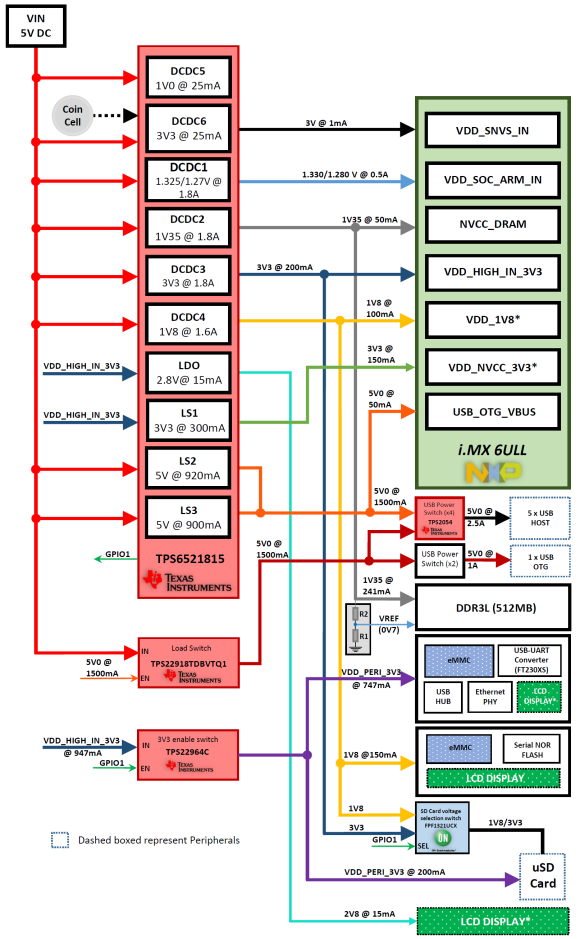
**Fab No :** 501-1-01151 | Rev: A2

**Asy No :** 701-1-01380 | Sheet 1 of 21

## BLOCK DIAGRAM




## POWER ARCHITECTURE

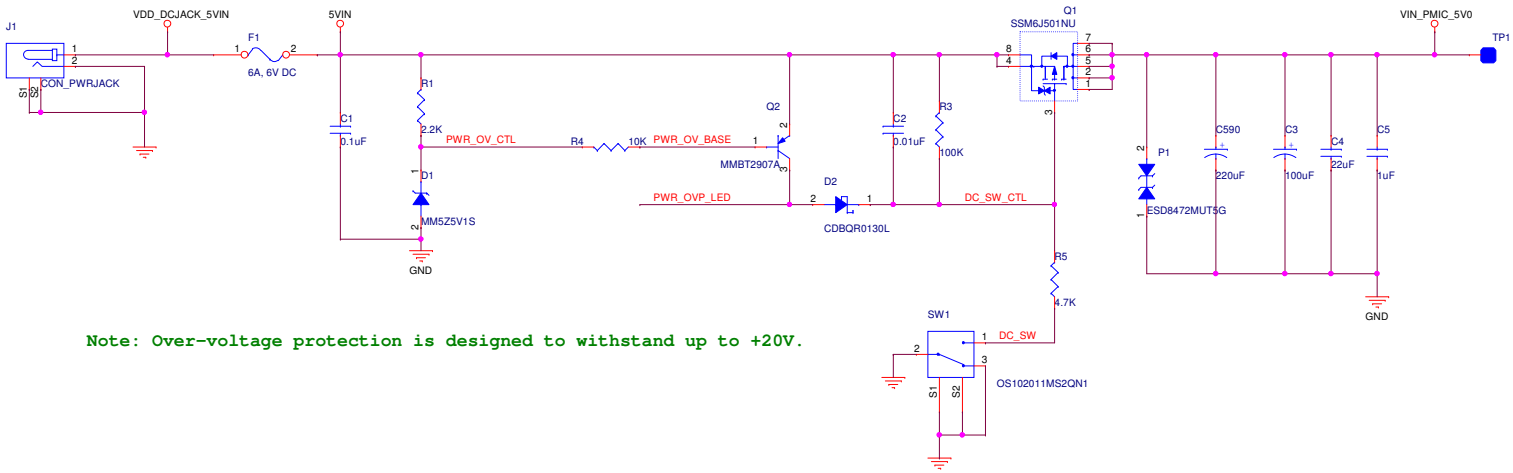



VDD_1V8* - Powers the rails NVCC_NAND, NVCC_LCD, NVCC_SD1 (UHS mode)
VDD_NVCC_3V3* - Powers the rails VDDA_ADC_3P3, NVCC_CSI, NVCC_ENET, NVCC_GPIO, NVCC_UART, NVCC_SD1 (High speed mode)
LCD DISPLAY* - 2V8 only required for the current design. For future upgrading to touch display, 3V3 option is provided.

TIXU MX6Y

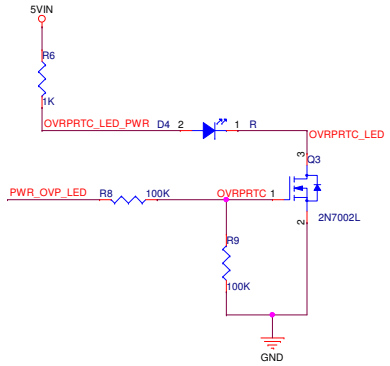
| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : BLOCK_DIAGRAM |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 2 of 21 |

# DC JACK (Main Power IN)

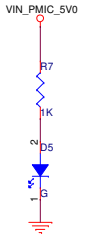



Note: Over-voltage protection is designed to withstand up to +20V.

## OVER VOLTAGE INDICATOR




## PMIC Input Power LED (GREEN) Indication




TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : DC JACK_MAIN POWER IN |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 3 of 21 |

# PMIC TPS6521815

TP40 PMIC_PGOOD
TP37 VDD_1V0
TP38 VDD_LDO_2V8
TP46 VDD_HIGH_IN_3V3_SNS
TP35 POR_B
TP36 VDD_SNVS_IN
TP44 VDD_SOC_ARM_IN_SNS
TP47 VDD_1V8_SNS
TP34 PMIC_PWR_EN
TP39 VDD_NVCC_3V3
TP45 NVCC_DRAM_1V35_SNS

**Input Capacitor for power rails – Place near U1 pins 5, 31, 32, 6, 27**

VIN_PMIC_5V0 VDD_HIGH_IN_3V3 VDD_IN_BU
C16 4.7uF C17 4.7uF C27 4.7uF C28 4.7uF C600 4.7uF

**Input Capacitor for power rails – Place near U1 pins 1, 43, 37,12**

VIN_PMIC_5V0 C6 4.7uF
C12 4.7uF C13 4.7uF C14 4.7uF C15 4.7uF

**Output Capacitor for all the power rails – Place near the output Inductor/ Pins**

VDD_SOC_ARM_IN_SNS: C7 10uF C8 0.1uF
NVCC_DRAM_1V35_SNS: C18 10uF C9 0.1uF
VDD_HIGH_IN_3V3_SNS: C10 10uF C11 0.1uF
VDD_1V0: C30 22uF C31 22uF
VDD_1V8_SNS: C19 47uF C20 0.1uF
VDD_LDO1: C21 10uF C22 0.1uF
VDD_PMIC_LS_5V0_SNS: C24 22uF C23 22uF
VDD_NVCC_3V3: C26 10uF C29 0.1uF

VIN_PMIC_5V0 R22 100K PMIC_PFI R24 29.4K
VDD_SNVS_IN R18 NM NM PMIC_PWR_EN R19 300K
VIN_PMIC_5V0 R10 NM NM PMIC_AC_DET R15 100K
PFI set for a threshold of 3.5V

U1 TPS6521815RSL

| | | | |
|---|---|---|---|
| IN_DCDC1 | 1 | L1 | 48 |
| IN_DCDC2 | 43 | L2 | 42 |
| IN_DCDC3 | 37 | L3 | 38 |
| IN_DCDC4 | 12 | L4A | 13 |
| | | L4B | 14 |
| | | DCDC4 | 15 |
| | | L5 | 20 |
| | | FB5 | 21 |
| | | L6 | 23 |
| | | FB6 | 22 |
| IN_BIAS | 36 | FB1 | 47 |
| | | FB2 | 41 |
| | | FB3 | 39 |
| CC | 25 | IN_CC# | 18 |
| IN_BU | 27 | LDO1 | 4 |
| SYS_BU | 24 | LS1 | 30 |
| IN_LDO1 | 5 | LS2 | 33 |
| IN_LS1 | 31 | LS3 | 7 |
| IN_LS2 | 32 | PGOOD | 8 |
| IN_LS3 | 6 | PGOOD_BU | 19 |
| PWR_EN | 46 | INT# | 45 |
| AC_DET | 9 | WAKEUP# | 40 |
| DC34_SEL | 17 | PFO# | 10 |
| PB# | 44 | INT_LDO | 35 |
| PFI | 16 | GPO2 | 34 |
| SCL | 3 | N/C_1 | 28 |
| SDA | 2 | N/C_2 | 29 |
| GPIO1 | 11 | GND_EP | 49 |
| GPIO3 | 26 | | |

DCDC1_L1 L1 1.5uH VDD_SOC_ARM_IN
DCDC2_L2 L2 1.5uH NVCC_DRAM_1V35
DCDC3_L3 L3 1.5uH VDD_HIGH_IN_3V3
DCDC4_L4A L4 1.5uH
DCDC4_L4B VDD_1V8_SNS
VDD_1V0
DCDC5_L5 L5 10uH VDD_DCDC6
DCDC6_L6 L6 10uH R802 0E VDD_SNVS_IN
FB_DCDC6 R13 200E R14 300E
The voltage range of SNVS_IN can be 2.4V to 3.6V

VDD_COINCELL_IN R11 10E PMIC_CC C32 4.7uF
VIN_PMIC_5V0 VDD_IN_BU R12 0E
SYS_BU C33 1uF
VDD_HIGH_IN_3V3
VIN_PMIC_5V0
PMIC_PFO# R859 0E
10 PMIC_PWR_EN
PMIC_AC_DET
R21 0E DC34_SEL
PMIC_PB_B
PMIC_PFI
10,17 PMIC_I2C1_SCL
10,17 PMIC_I2C1_SDA
5 PMIC_GPIO1 STBY_REQ
VDD_SNVS_IN R763 200K STBY_REQ
Q41 MMBT3904
10 PMIC_STBY_REQ
PGOOD R769 0E
PGOOD_BU R768 0E PMIC_PGOOD
PMIC_INT# 9
PMIC_WAKE# 10
PMIC_PFO# 10
INT_LDO C34 0.1uF
VDD_LDO1 VDD_LDO_2V8
R780 10mE
VDD_NVCC_3V3
VDD_PMIC_LS_5V0_SNS

GPIO1/3, PGOOD, INT#, WAKEUP#, PFO# Configured as Open Drain

VIN_PMIC_5V0 R781 1K COLL_CC#
PMIC_IN_CC# R766 1K BASE_CC#1 Q17 MMBT3904 R782 1K
VIN_PMIC_5V0 DA8 LTST-C195TBKFKT-2A

**POR Logic**

VDD_SNVS_IN
VDD_NVCC_3V3
R16 1M PMIC_PGOOD
U2 SN74LV1T126DCK
R803 0E POR_B 10,17
R17 1M

**PULL UP RES**

VDD_SNVS_IN
PMIC_PGOOD R23 NM NM
PMIC_WAKE# R26 100K
VDD_NVCC_3V3
PMIC_INT# R25 2.2K
VDD_HIGH_IN_3V3
PMIC_GPIO1 R28 10K

**PMIC PB**

VIN_PMIC_5V0 R20 100K
SW2 B3U-3100PM-B
PMIC_PB_B R842 NM PMIC_PB 10
R843 NM NM
If R843 Mounted Voltage to processor will be 3.43V

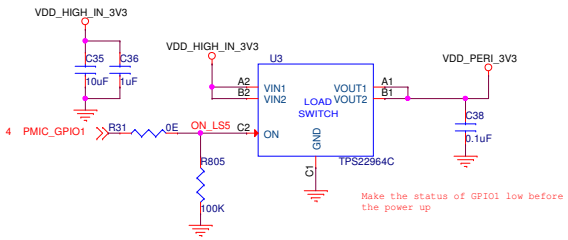
TIXU MX6Y

VVDN TECHNOLOGIES

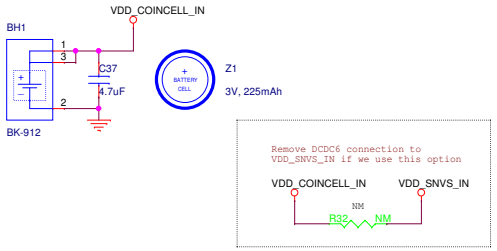
| | | |
|---|---|---|
| A3 | Title : PMIC TPS6521815 | |
| Fab No : 501-1-01151 | | Rev: A2 |
| Asy No : 701-1-01380 | | Sheet 4 of 21 |

# LOAD SWITCH & COINCELL

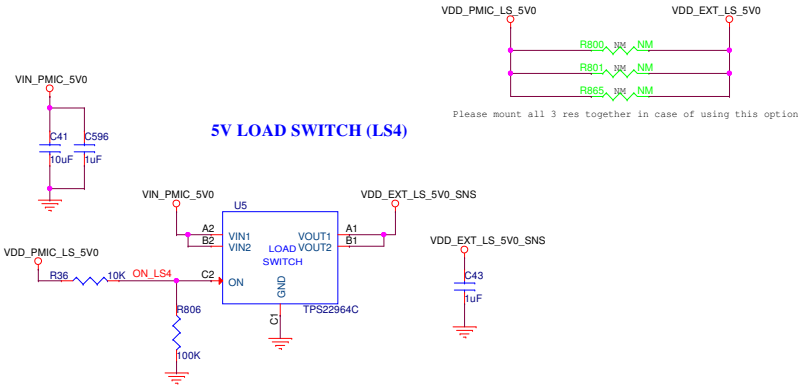
## VDD_PERI_3V3 SWITCH (LS5)



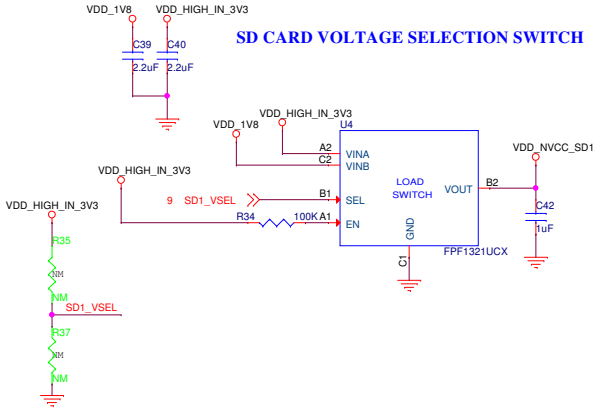

## COIN CELL




## 5V LOAD SWITCH (LS4)




## SD CARD VOLTAGE SELECTION SWITCH

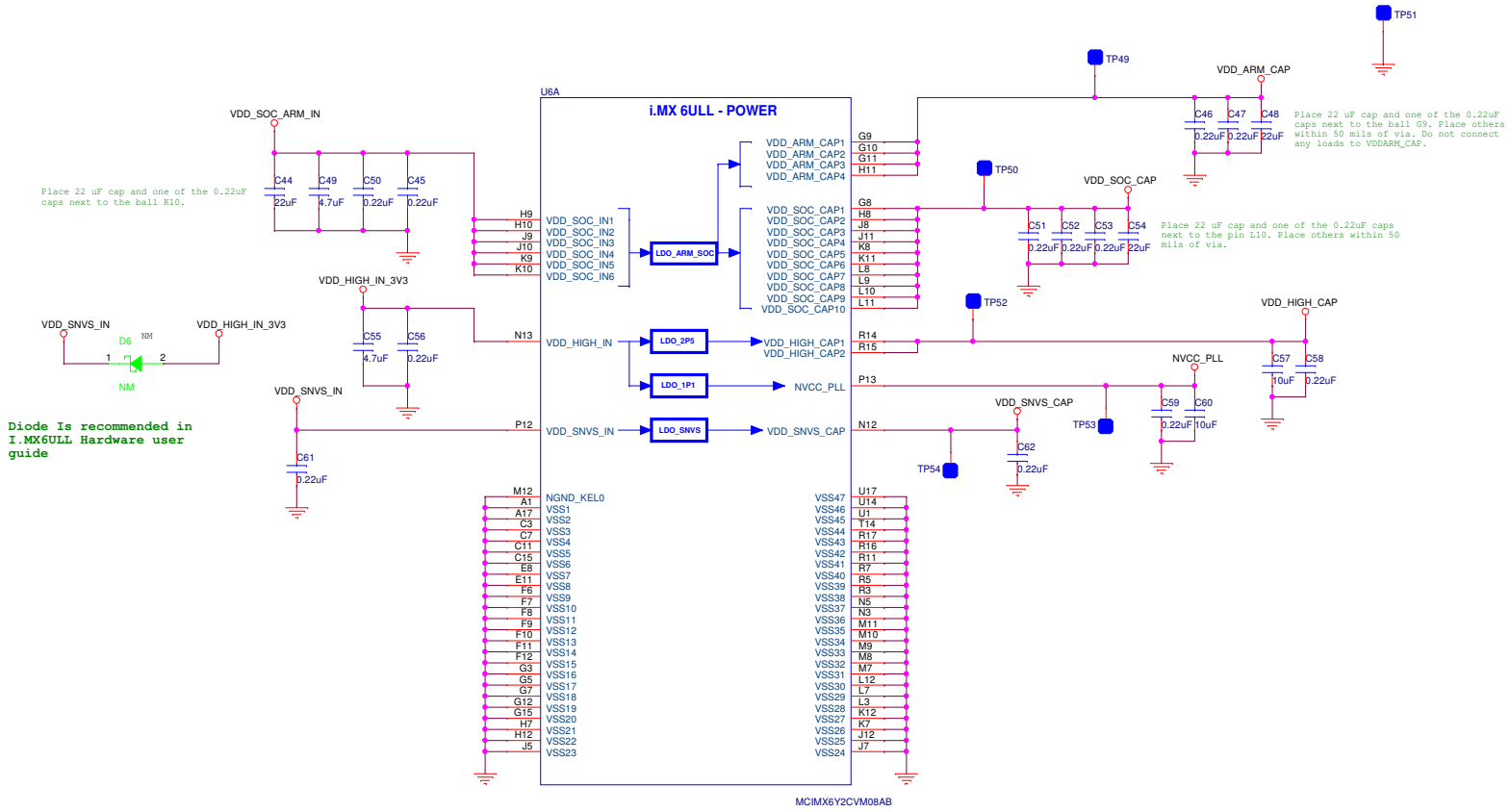



TIXU MX6Y

VVDN TECHNOLOGIES

| | | |
|---|---|---|
| A3 | Title : LOAD SWITCH & COINCELL | |
| Fab No : 501-1-01151 | | Rev: A2 |
| Asy No : 701-1-01380 | | Sheet 5 of 21 |

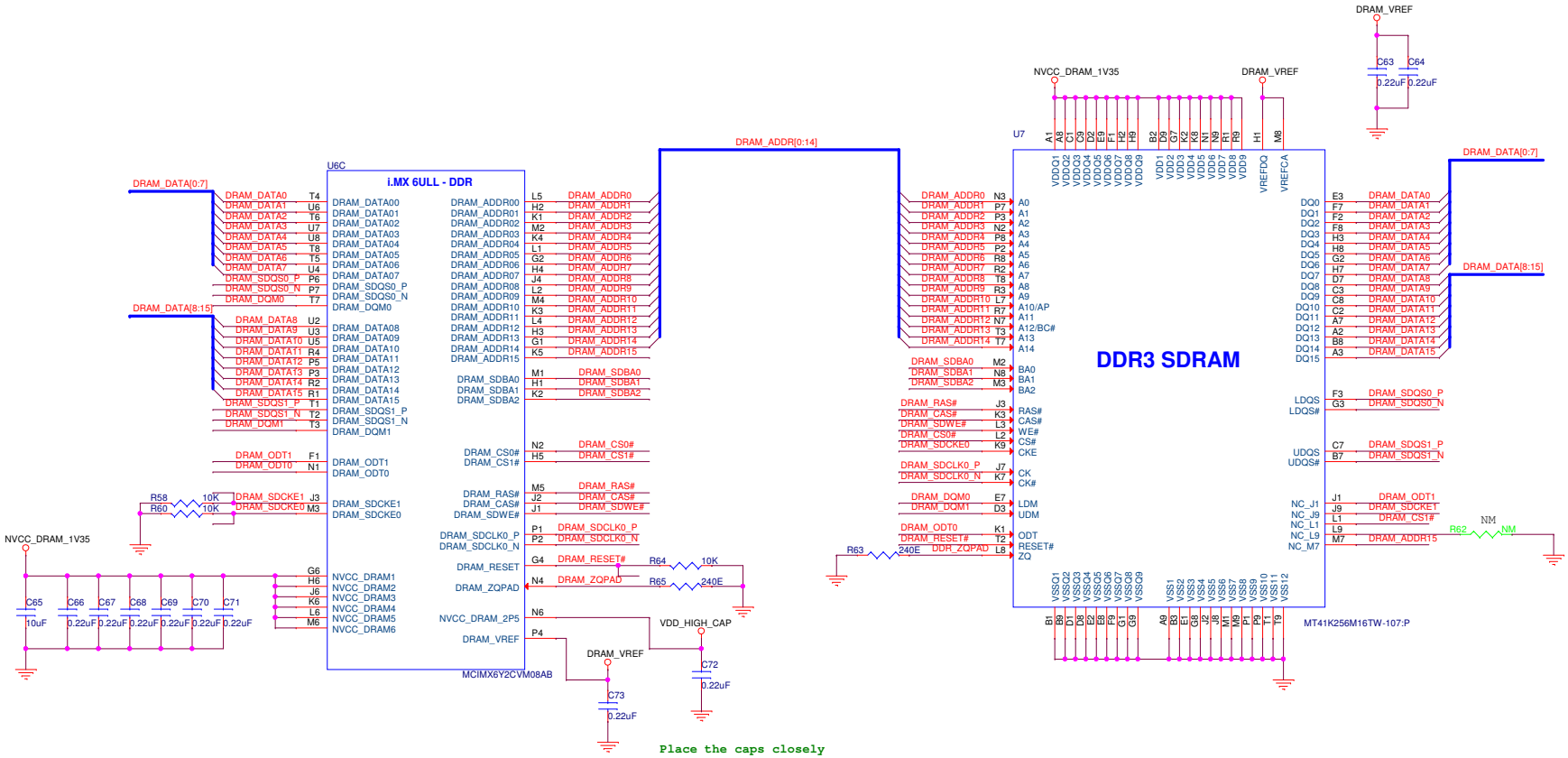
# i.MX6ULL POWER

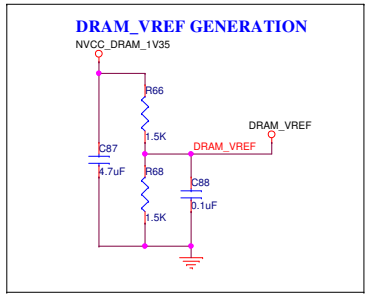


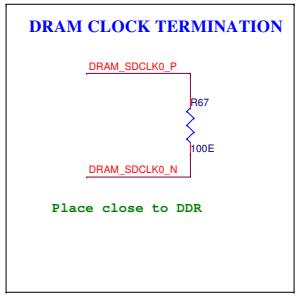

TIXU MX6Y

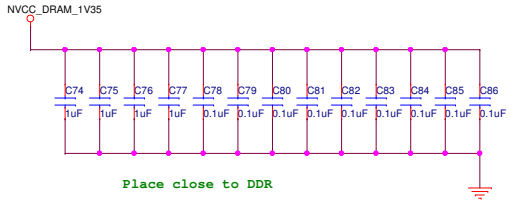
| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : IMX POWER |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 6 of 21 |

# i.MX6ULL - DDR3L



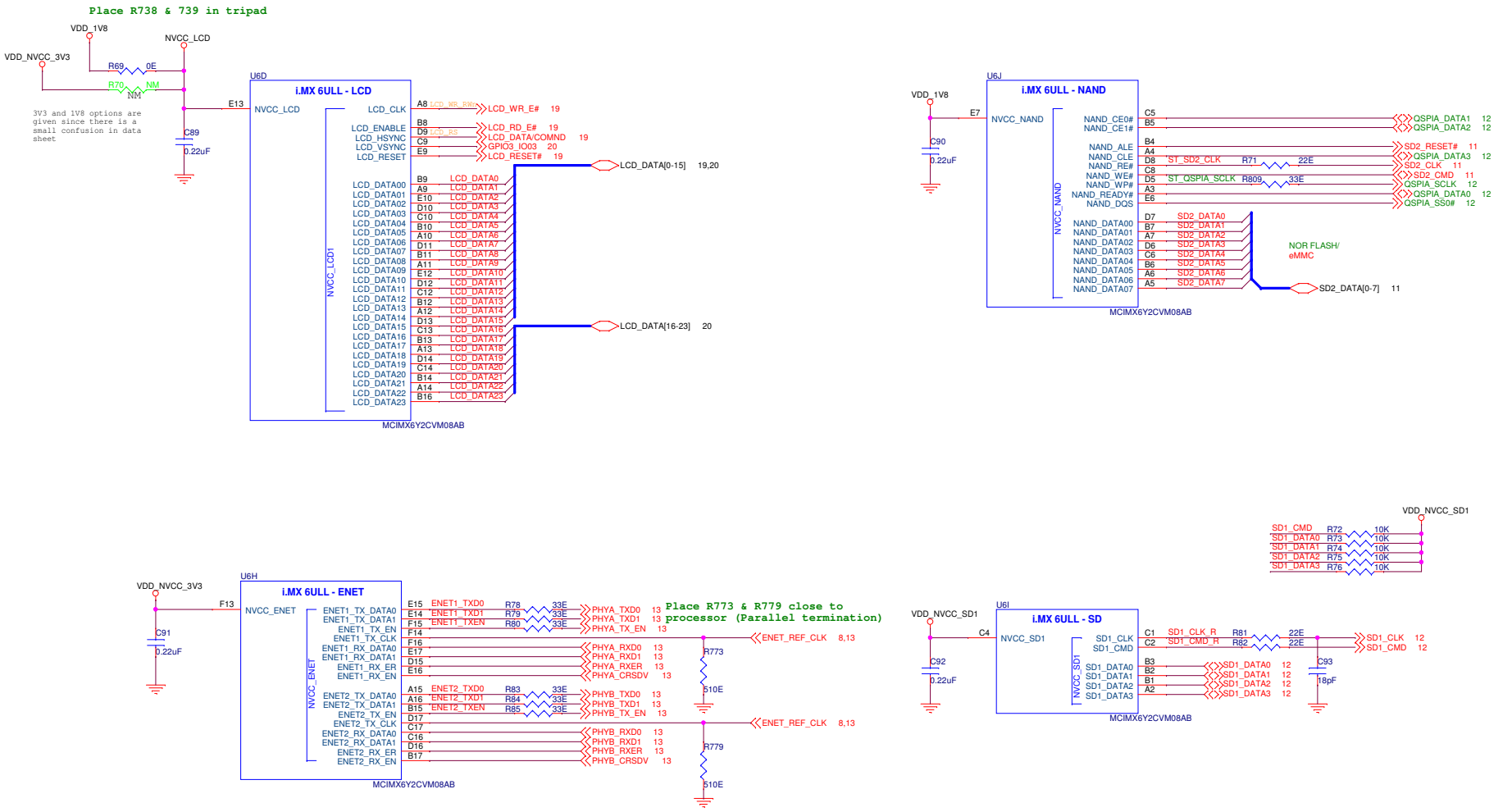




TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : IMX-DDR3L |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 7 of 21 |

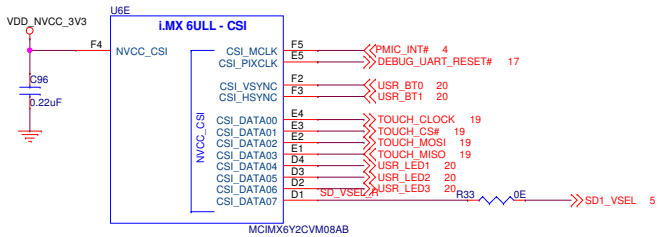
# IMX-LCD, ENET, eMMC, SDIO

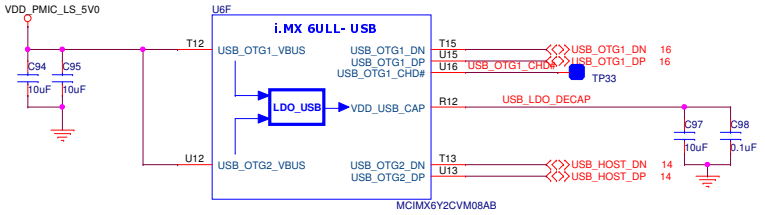


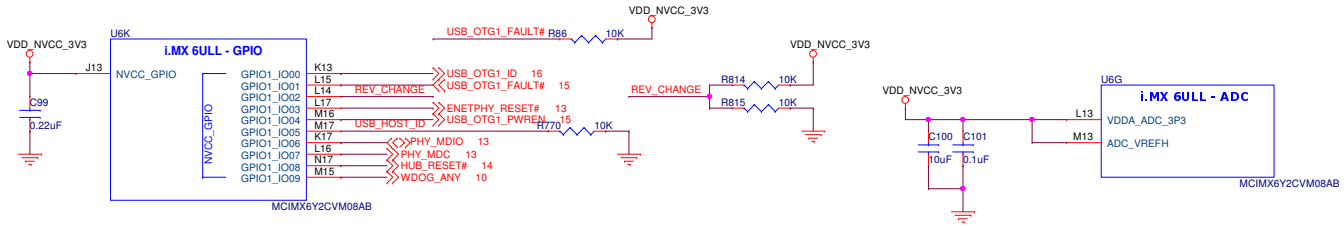

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : IMX-LCD, ENET, eMMC, SDIO |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 8 of 21 |

# IMX - CSI, USB, ADC, GPIO



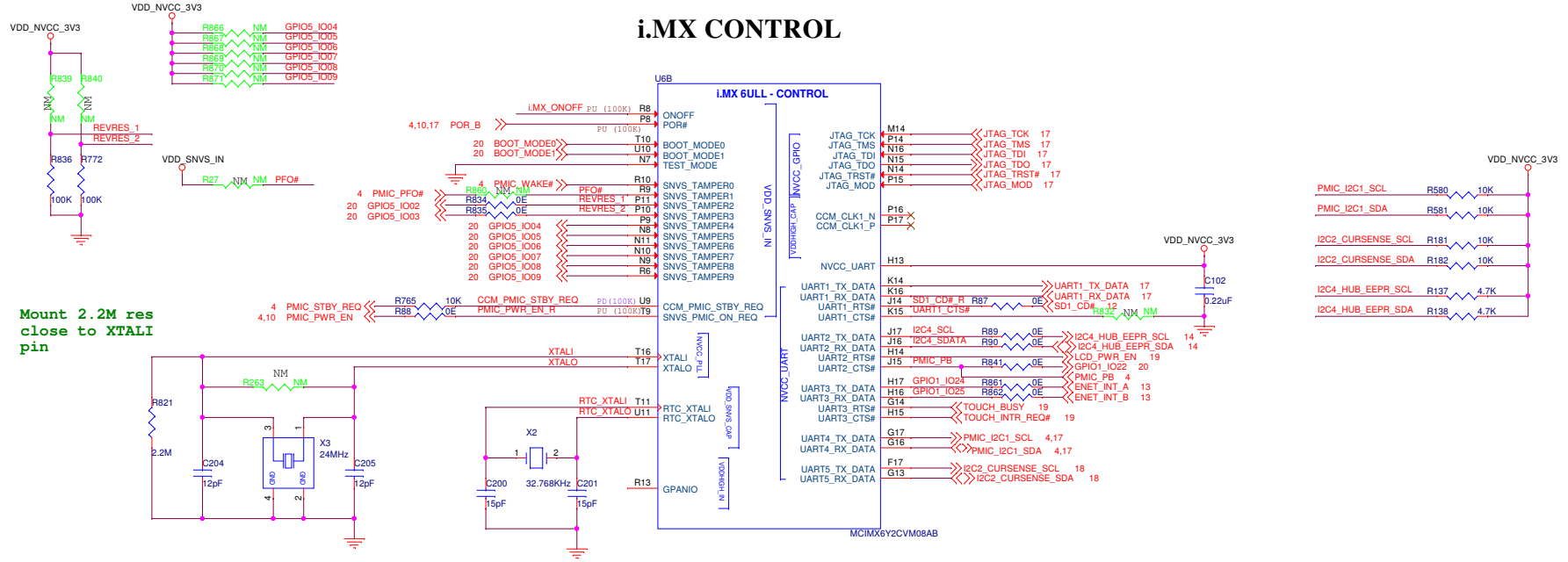



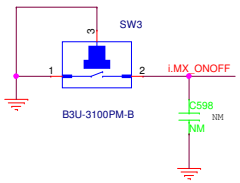

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : IMX - CSI, USB, ADC, GPIO |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 9 of 21 |

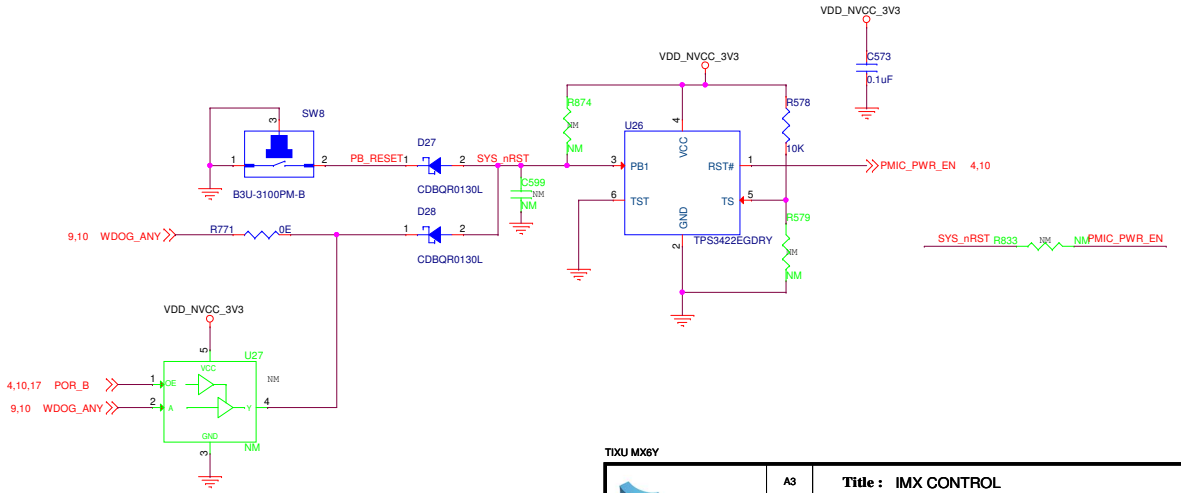
# i.MX CONTROL




## ONOFF BUTTON



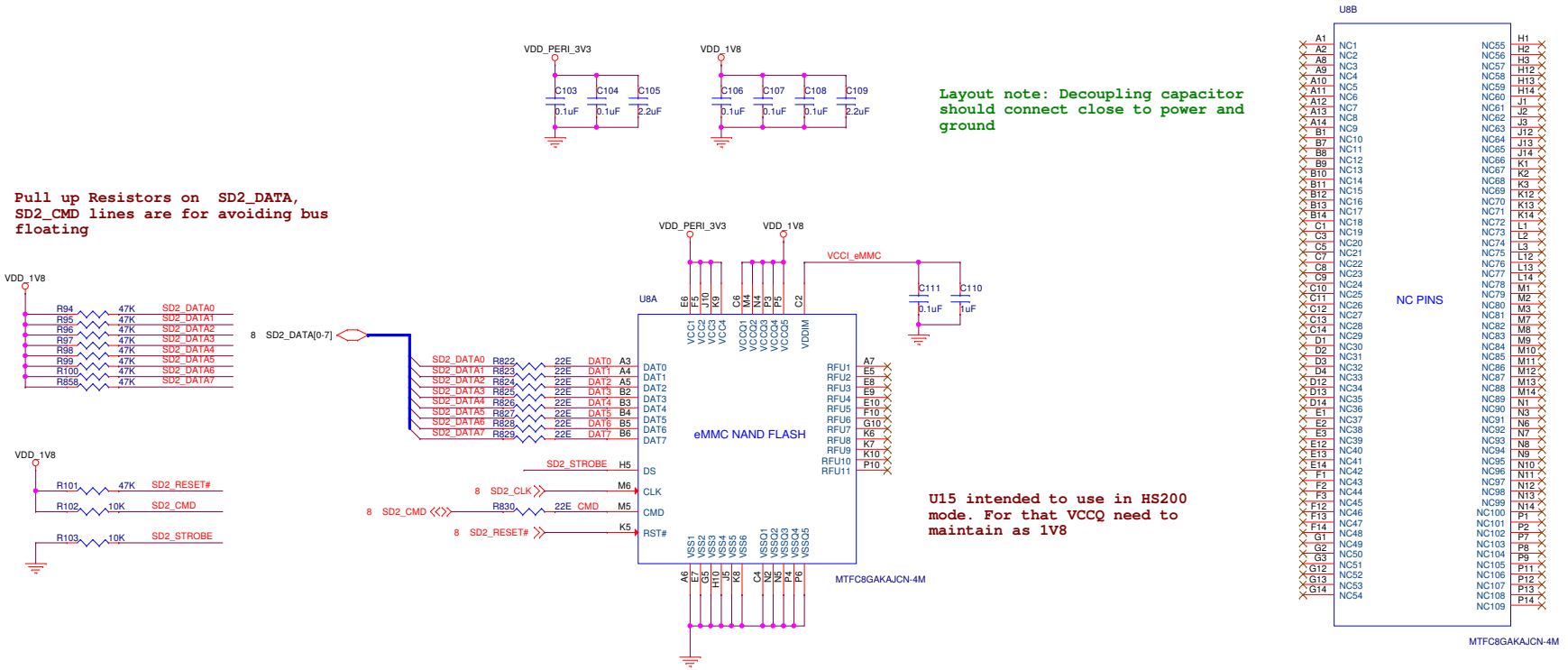

## RESET LOGIC




TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : IMX CONTROL |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 10 of 21 |

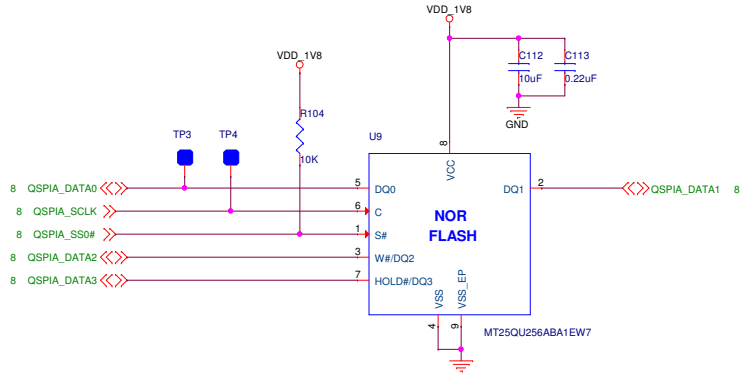
# eMMC



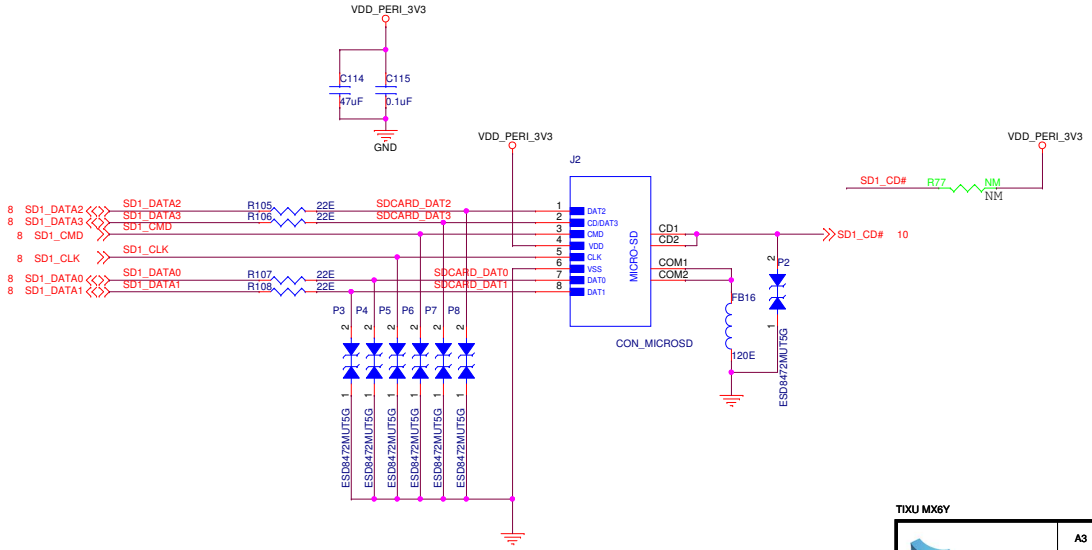

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : eMMC |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 11 of 21 |

# NOR FLASH



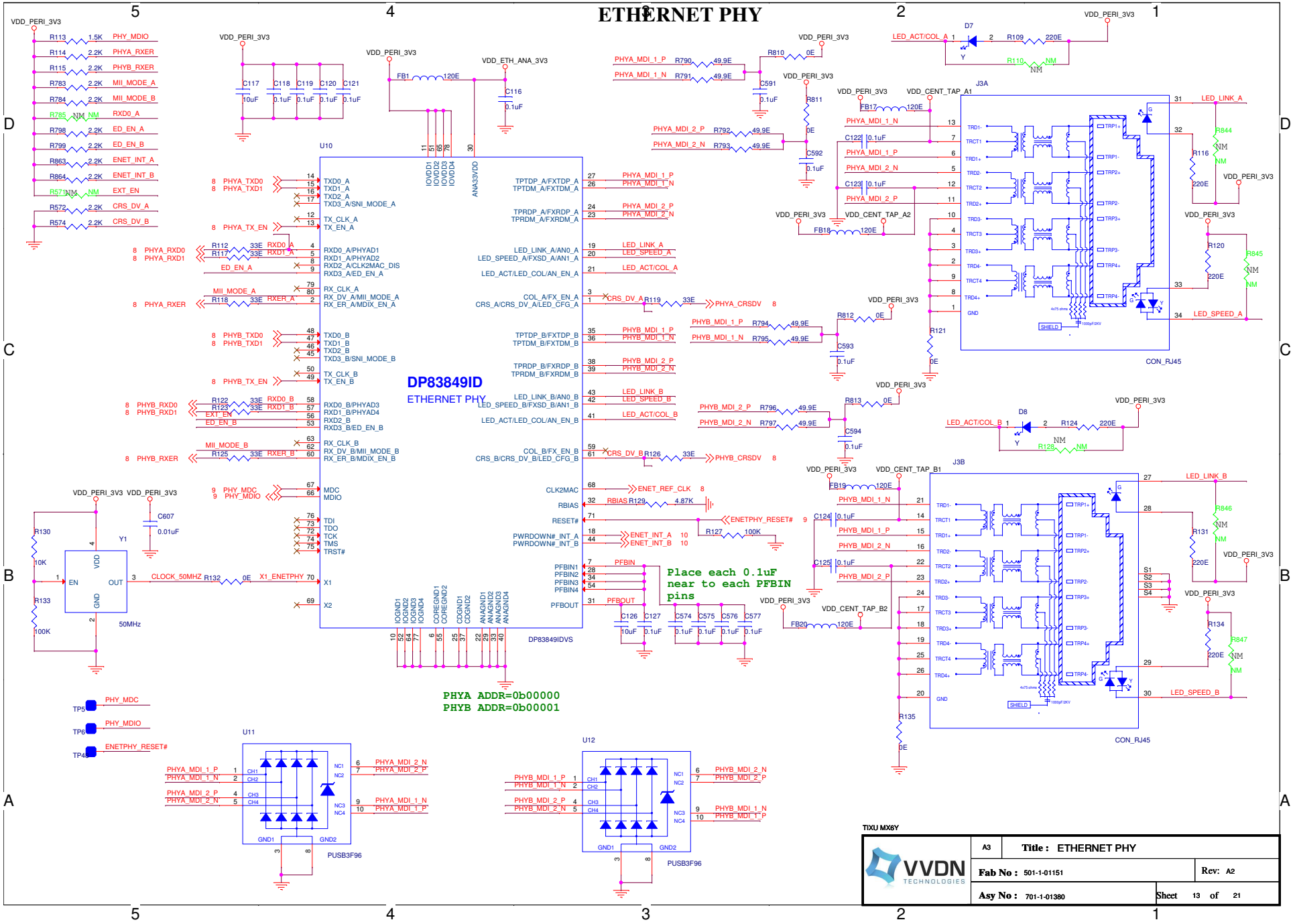

# uSD CARD




TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : NOR FLASH_SD CARD |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 12 of 21 |

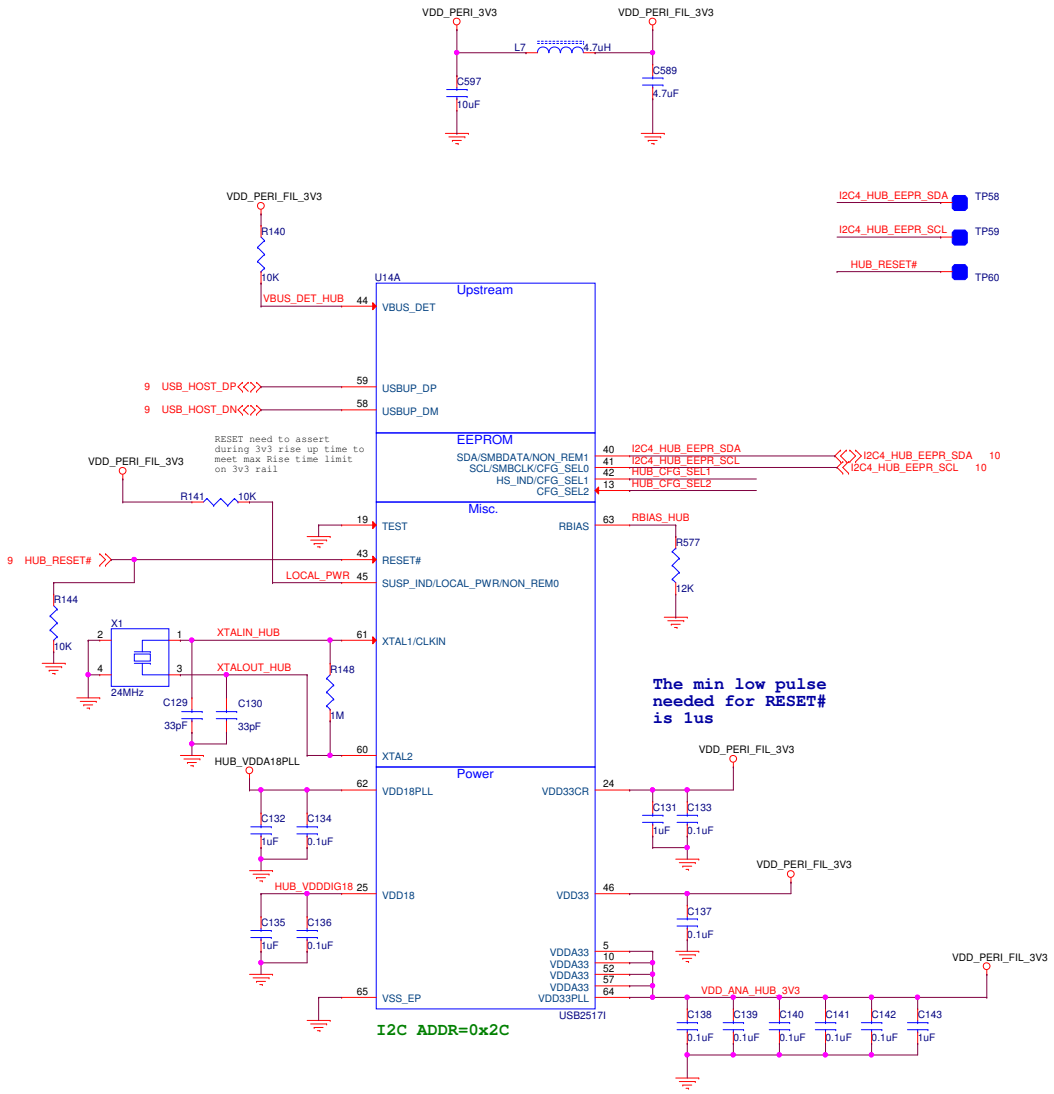
# ETHERNET PHY

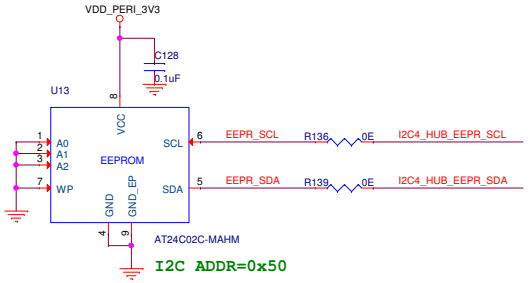


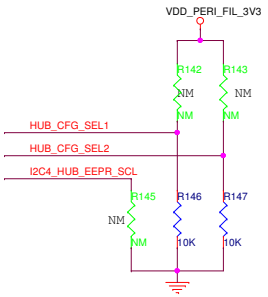

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : ETHERNET PHY |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 13 of 21 |

# USB HUB



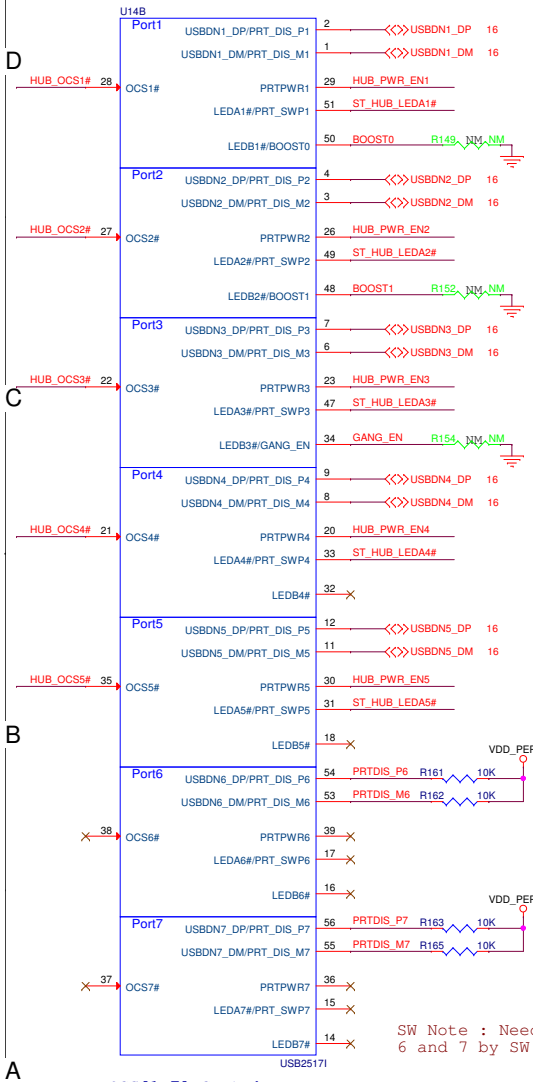

| I2C4_HUB_EEPR_SCL | HUB_CFG_SEL1 | HUB_CFG_SEL2 | Configuration |
|---|---|---|---|
| 1 | 0 | 0 | SMBus slave |
| 1 | 1 | 0 | EEPROM |
| All other configuration | | | Internal |

TIXU MX6Y

VVDN TECHNOLOGIES

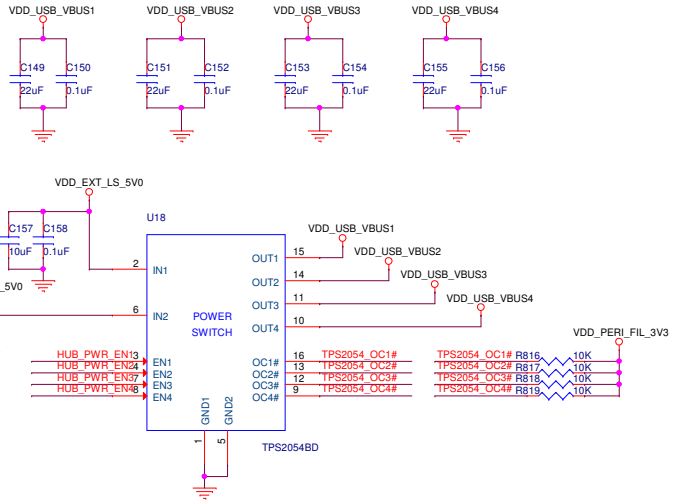
| | | |
|---|---|---|
| A3 | Title : USB HUB | |
| Fab No : 501-1-01151 | | Rev: A2 |
| Asy No : 701-1-01380 | | Sheet 14 of 21 |

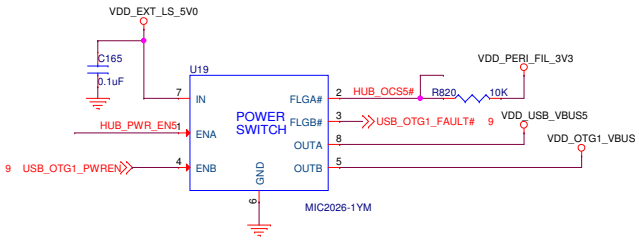
# USB_CONNECTORS/OTG

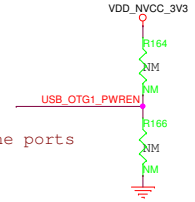


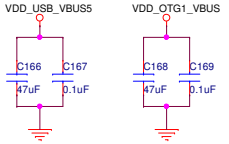

OCS[1:7] Contain internal pull up to 3V3 supply

SW Note : Need to disable the ports 6 and 7 by SW configuration

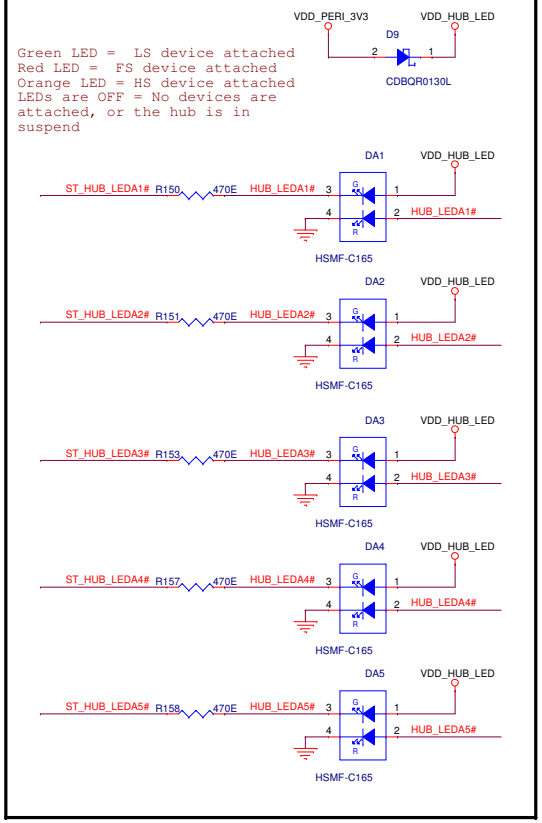


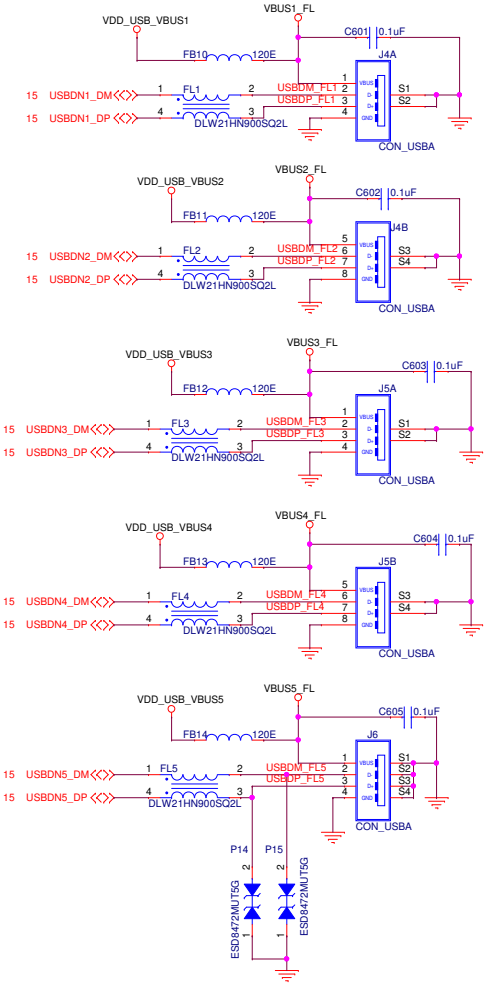

## USB LED

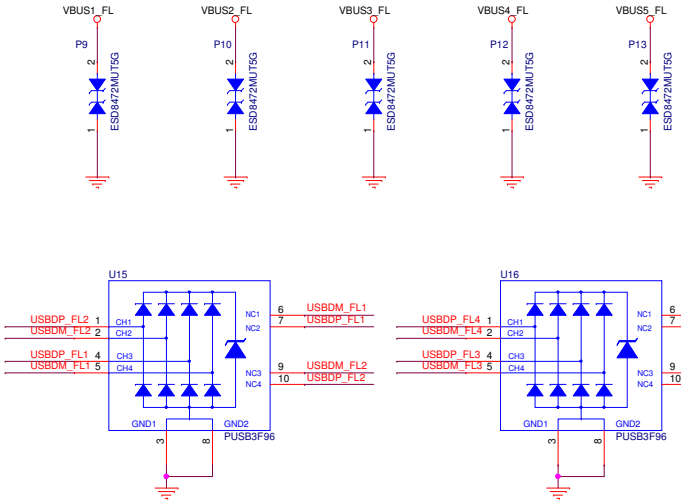



TIXU MX6Y

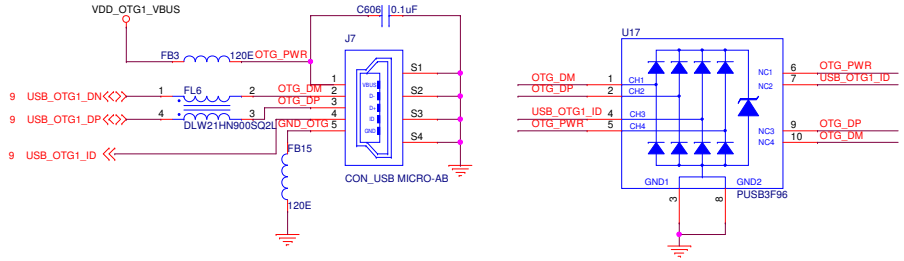
| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : USB_OTG_HOST |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 15 of 21 |

## USB HOST



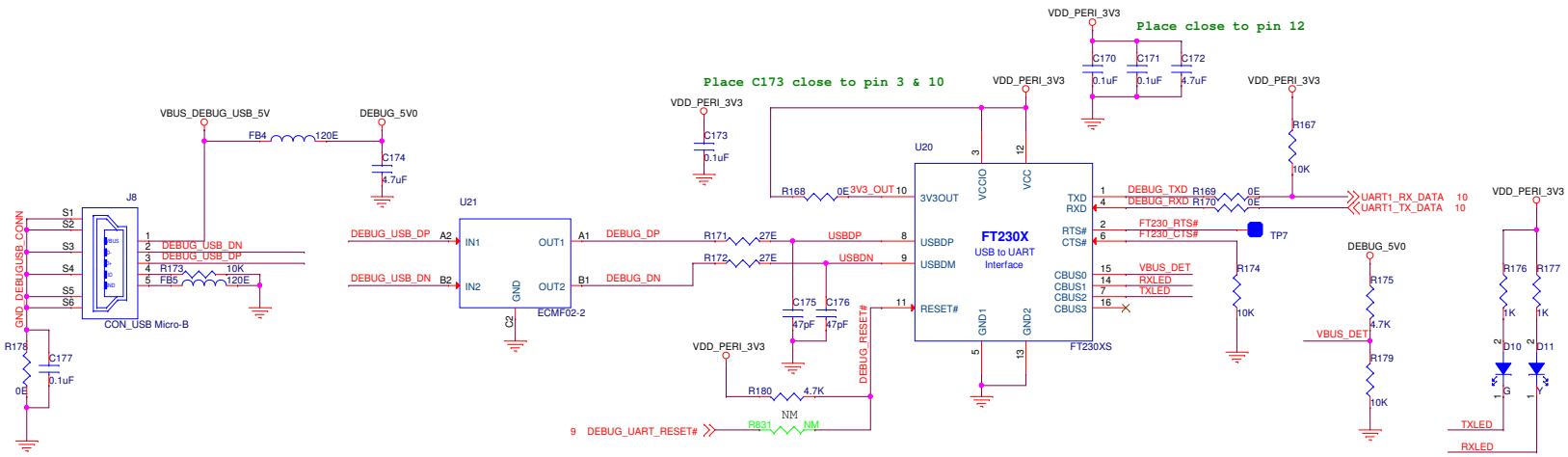

## USB OTG



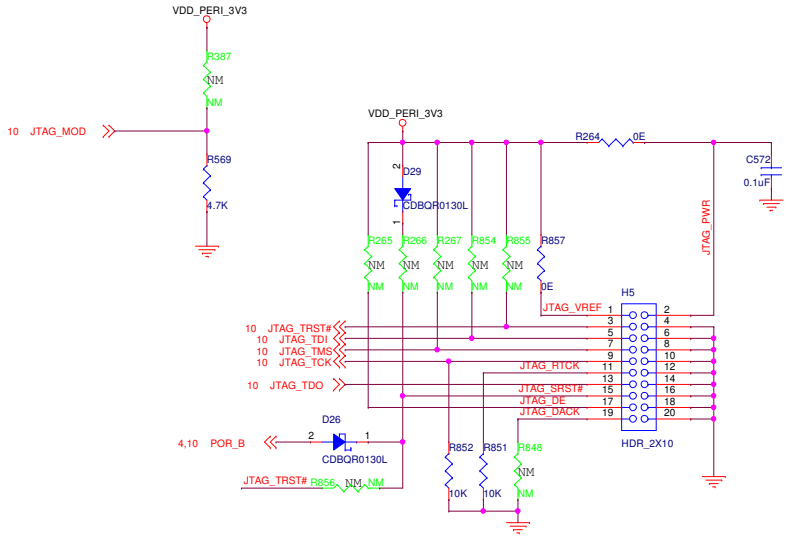

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : USB CONNECTORS |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 16 of 21 |

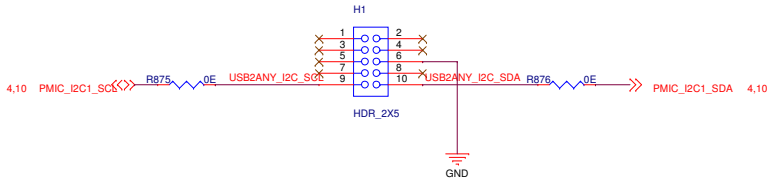
# USB-UART




# JTAG



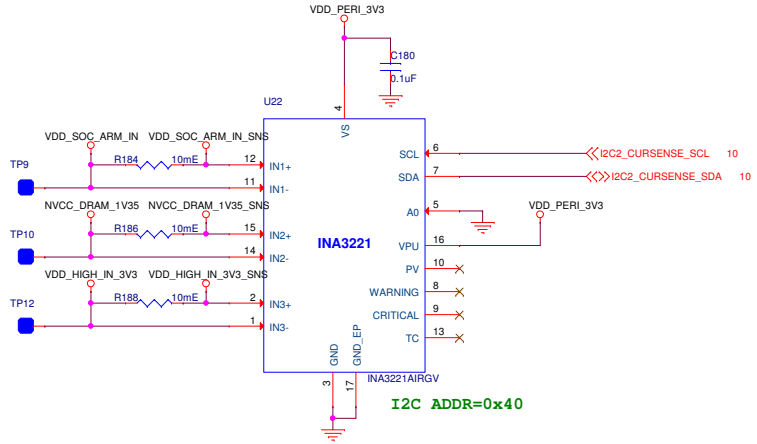

# USB2ANY

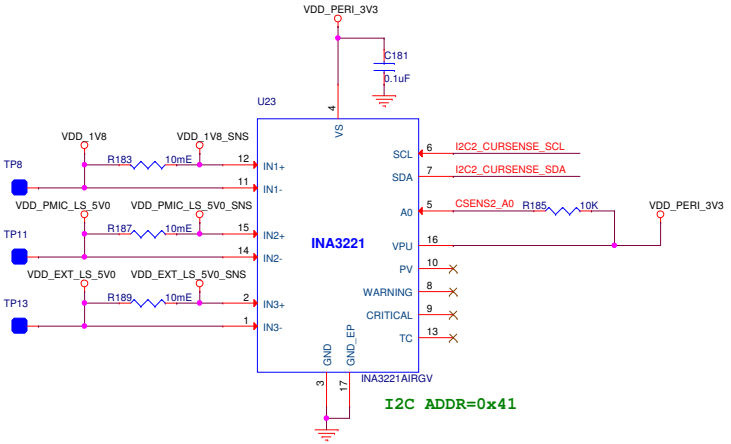



TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : USB-UART_USB2ANY_JTAG |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 17 of 21 |

# CURRENT SENSE



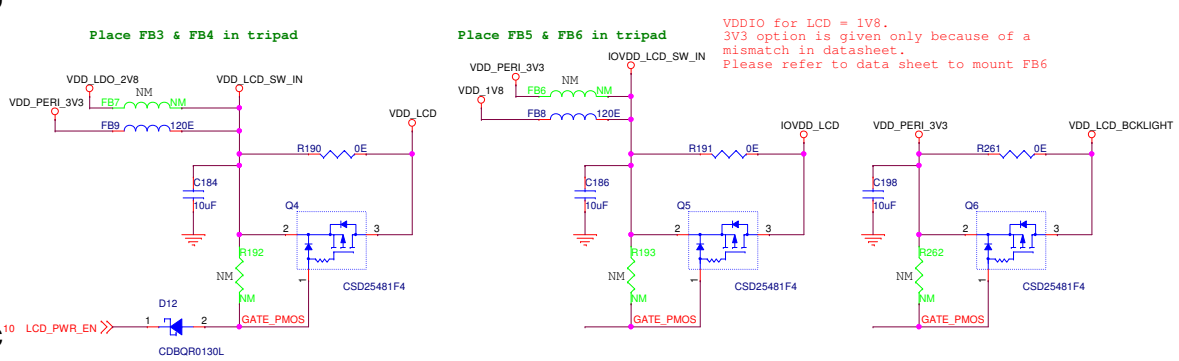



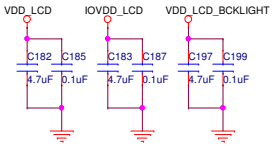

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : CURRENT SENSE |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 18 of 21 |

# LCD

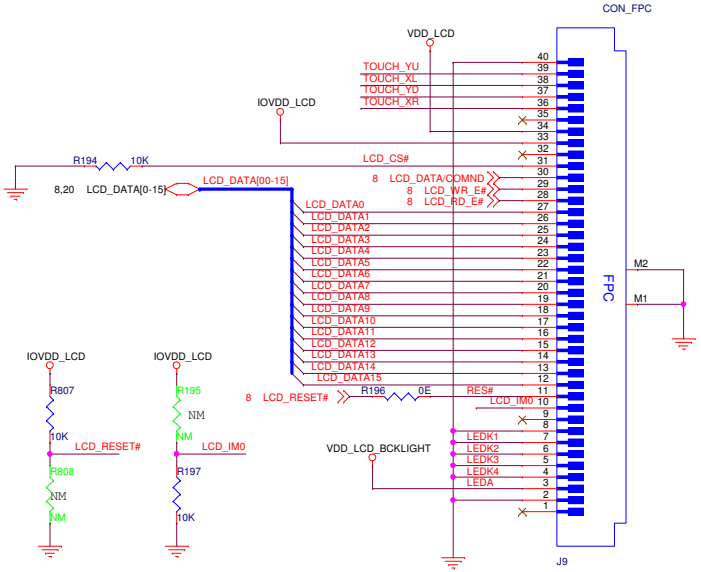
## LCD IO & CORE POWER SWITCHES



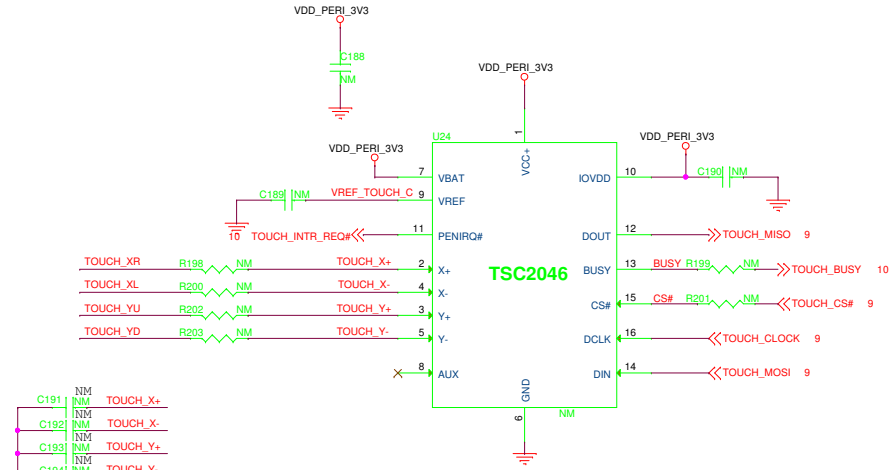

VDD_LCD = 2V8 for the part NHD-2.8-240320AF-CSXP-FT
VDD_LCD = 3V3 for the part NHD-2.4-240320CF-CSXV#-F

Current Design is for the part NHD-2.4-240320CF-CSXV#-F (No touch)




## NM

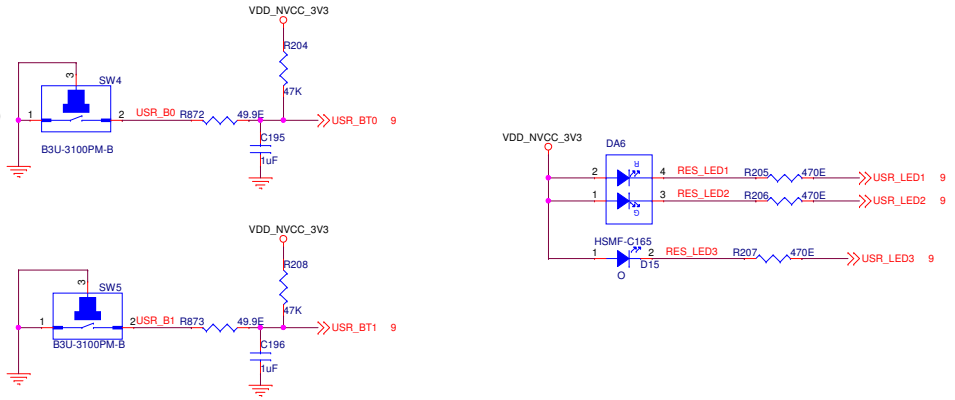
## TOUCH CONTROLLER



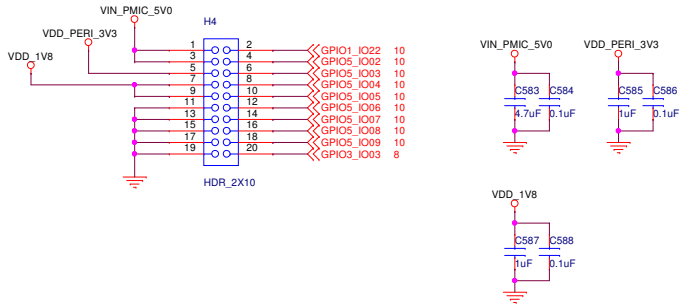

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : LCD |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 19 of 21 |

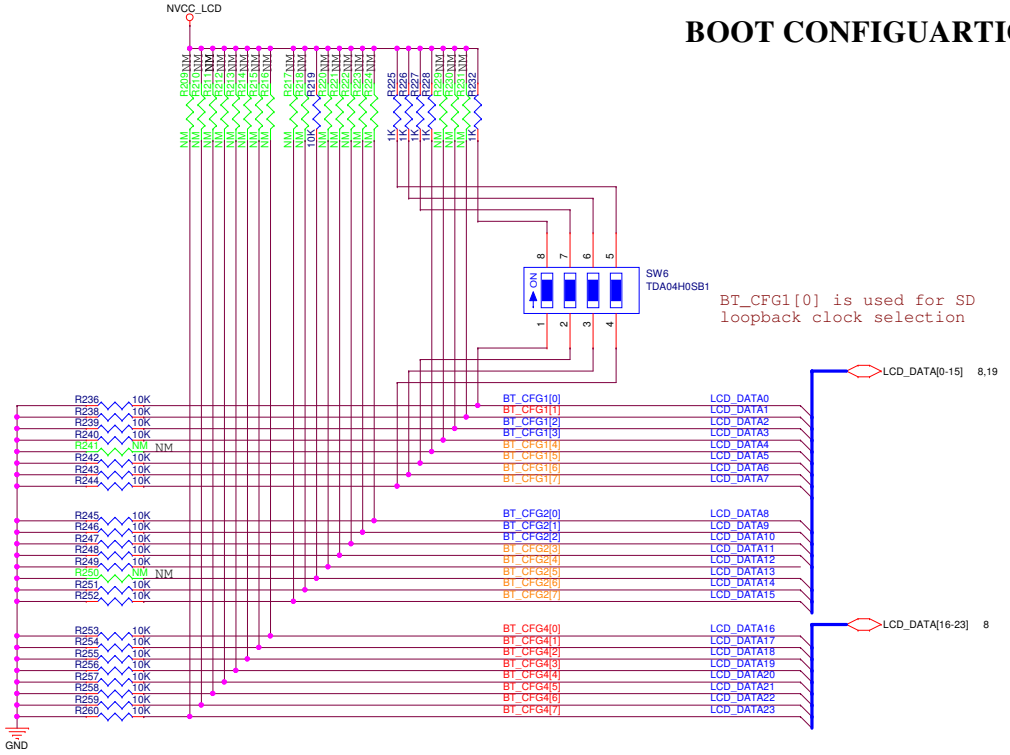
# FUNCTIONAL SWITCHES AND LED

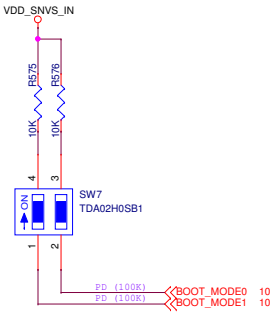



# GPIO HEADER




# BOOT CONFIGUARTION




| BOOT_MODE[1:0] | BOOT TYPE |
|---|---|
| 00 | Boot From Fuses |
| 01 | Serial Downloader |
| 10 | Internal Boot |
| 11 | Reserved |

| BOOT_CFG1[7:5] | BOOT DEVICE |
|---|---|
| 000 | QSPI |
| 010 | SD/eSD/SDXC |
| 011 | MMC/eMMC |

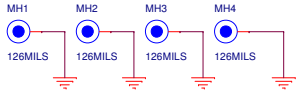
NOTE: To select boot device as eMMC along with the DIP switch change mount R221 with 10K and no mount R248

TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : BOOT SWITCH, LED AND GPIO |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 20 of 21 |

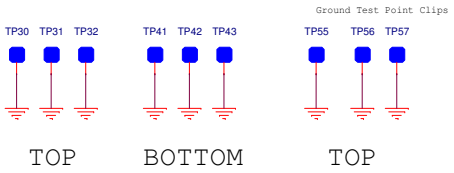
# MISCELLANEOUS

## MOUNTING HOLES



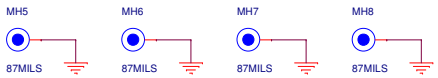

## GLOBAL FIDUCIALS


## GND TEST POINT




## LOCAL FIDUCIALS


## LCD MOUNTING HOLES




TIXU MX6Y

| | | |
|---|---|---|
| VVDN TECHNOLOGIES | A3 | Title : MISCELLANEOUS |
| | Fab No : 501-1-01151 | Rev: A2 |
| | Asy No : 701-1-01380 | Sheet 21 of 21 |

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