

# Genesys ZU

Variant: 5EV

5/5/2021

Rev D.1

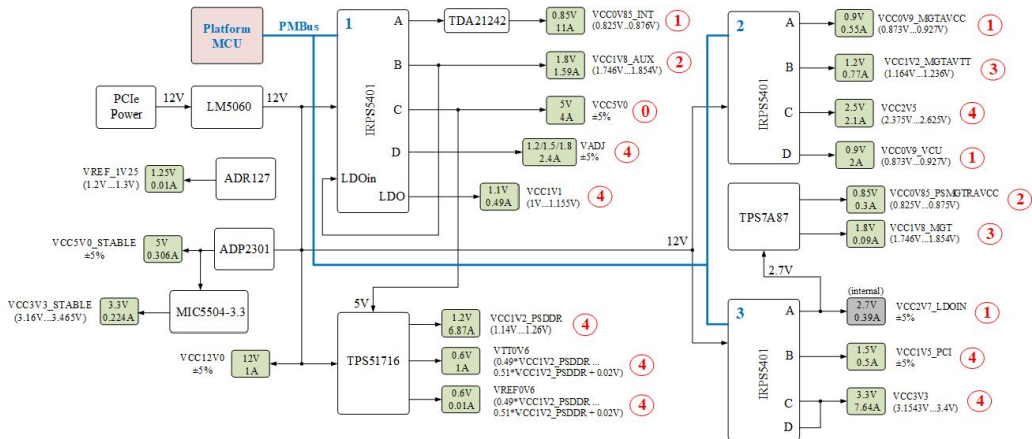
| Sheet | Circuit                     | Sheet | Circuit                     | Sheet | Circuit              |
|-------|-----------------------------|-------|-----------------------------|-------|----------------------|
| 1     | COVER PAGE                  | 14    | SD CARD                     | 29    | PS POWER; GND        |
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| 3     | I2C DIAGRAM                 | 16    | ETHERNET                    | 31    | DDR4 SODIMM          |
| 4     | PMOD                        | 17    | SFP+ INTERFACE              | 32    | DDR4 SODIMM SUPPLIES |
|       | MIO BUTTONS; MIO LED        | 18    | AUDIO INTERFACE             | 33    | I2C                  |
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|          |                |   |                |
|----------|----------------|---|----------------|
| Title    | Genesys ZU-5EV | Rev   | D.1            |
| Circuit  |                |   | Copyright 2021 |
| Doc#     | 500-383        | <br>A National Instruments Company |                |
| Engineer | EG             |   |                |
| Author   | IC             |   |                |
| Date     | 05/05/2021     |   |                |
| Sheet#   | 1 out of 40    |   |                |

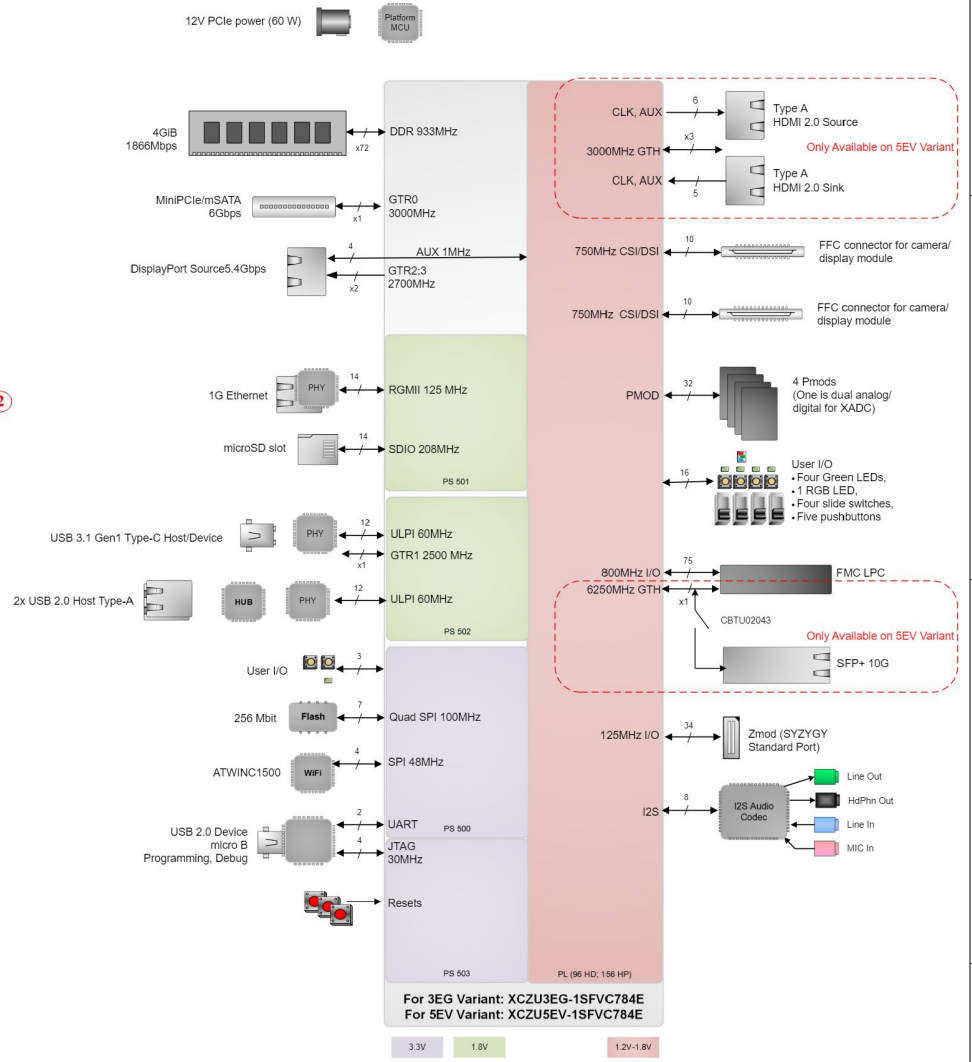
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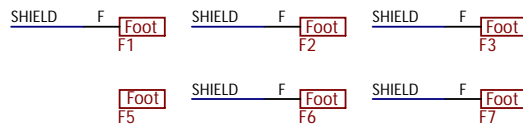
# Power Tree



# Block Diagram



Genesys ZU    Insert Contacts Down    UKCA  
 Chinese ROHS    ROHS    Digilent Inc.    CE    Xilinx

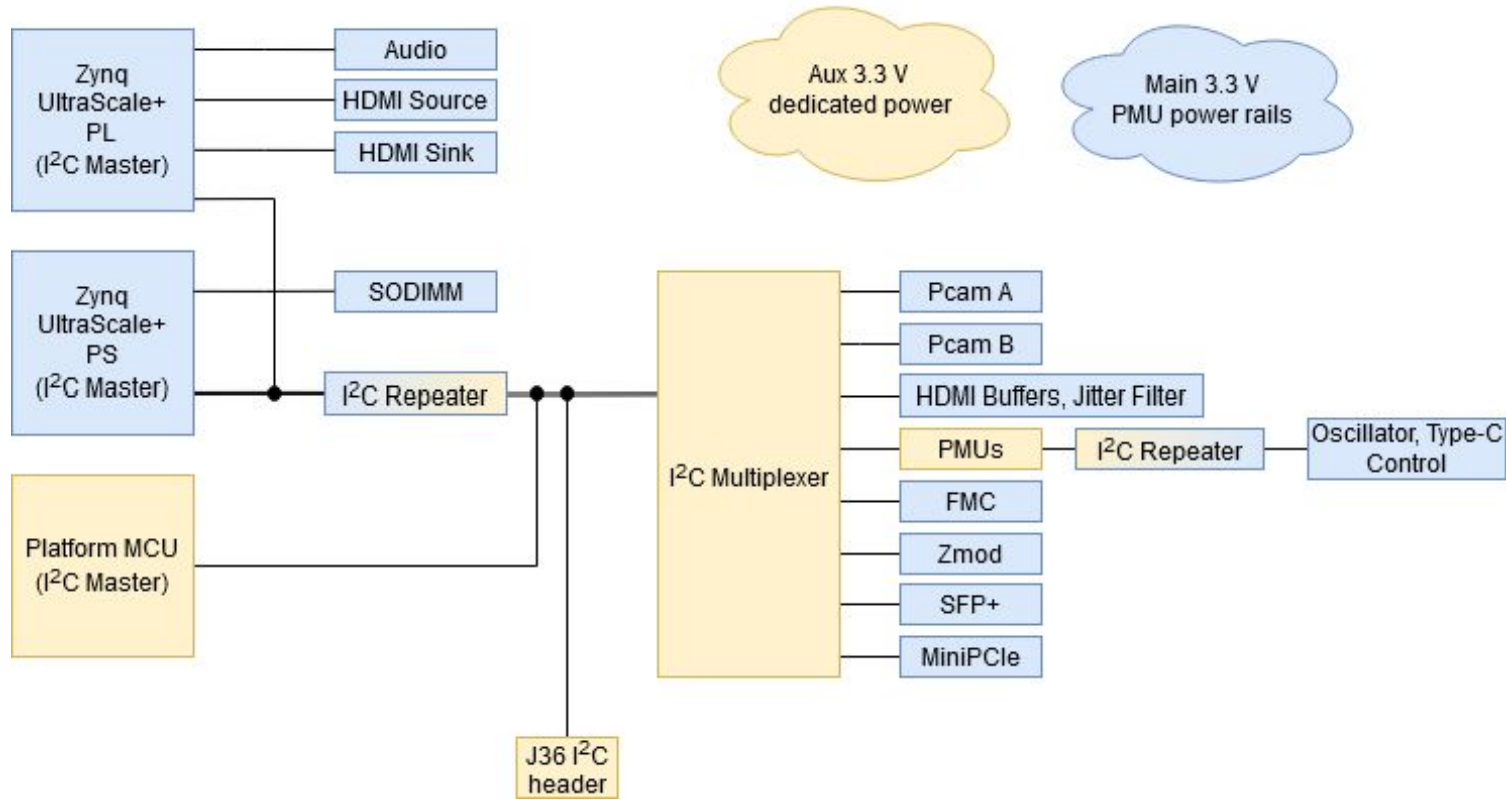


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| Title    | Genesys ZU-5EV | Rev    | D.1         |
| Circuit  | Block Diagram  | Author | IC          |
| Doc#     | 500-383        | Date   | 05/05/2021  |
| Engineer | EG             | Sheet# | 2 out of 40 |

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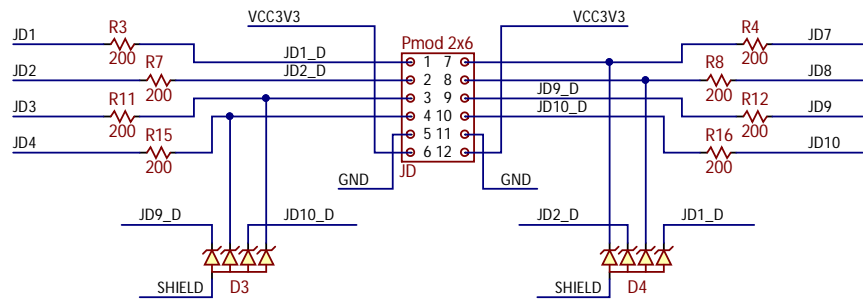
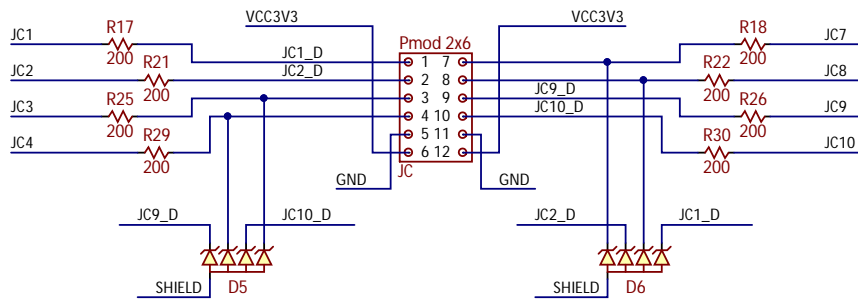
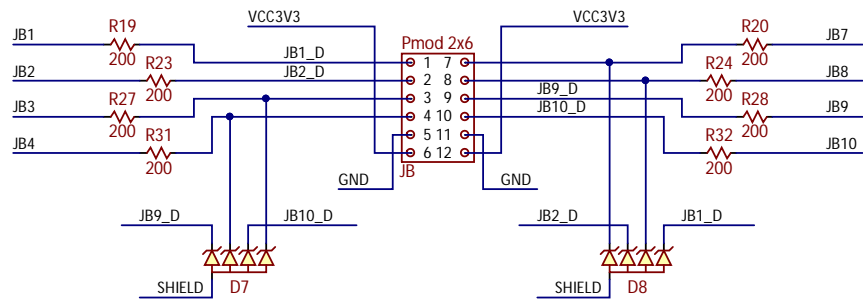
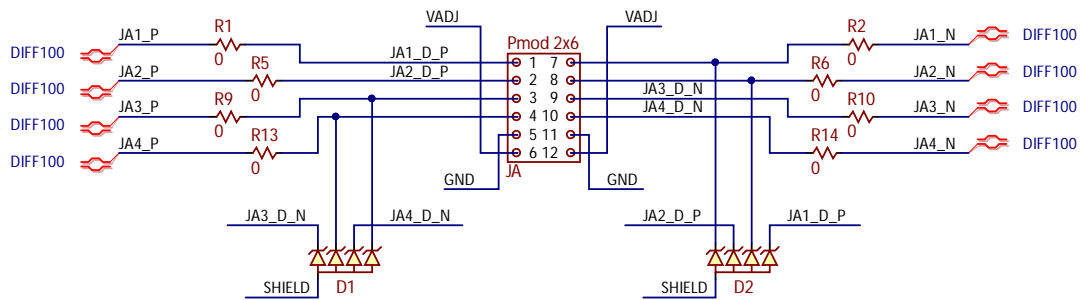
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## I2C Diagram

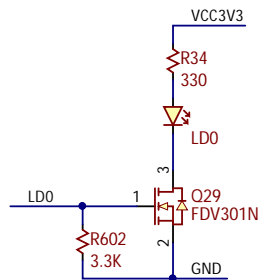


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| <p>Title<br/><b>Genesys ZU-5EV</b></p> <p>Circuit<br/>I2C Diagram</p> <p>Doc# 500-383</p> <p>Engineer EG</p> <p>Author IC</p> <p>Date 05/05/2021</p> <p>Sheet# 3 out of 40</p> | <p>Rev<br/><b>D.1</b><br/>Copyright 2021</p> <p style="text-align: center;"><b>DIGILENT</b><sup>®</sup><br/>A National Instruments Company</p> |
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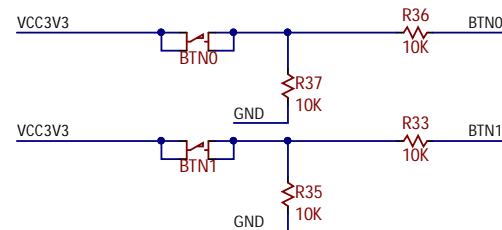
### XADC PMOD



### MIO LED

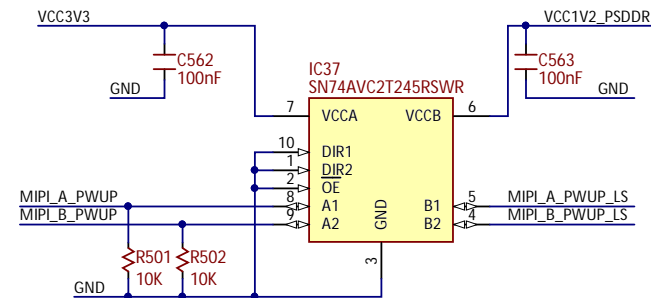
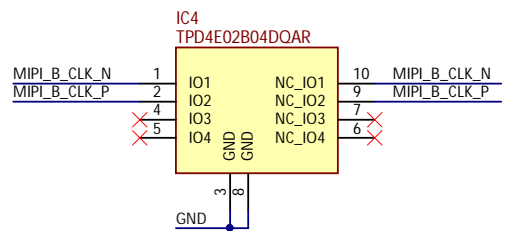
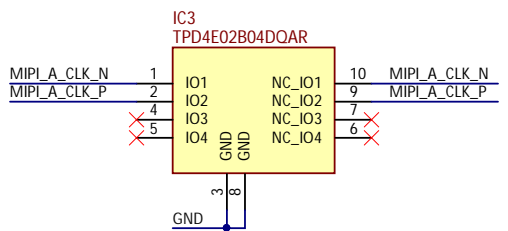
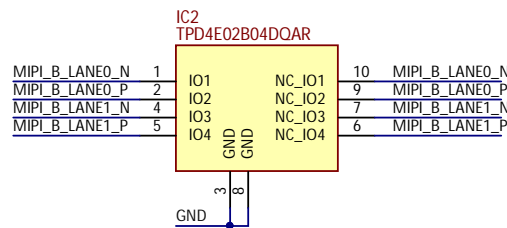
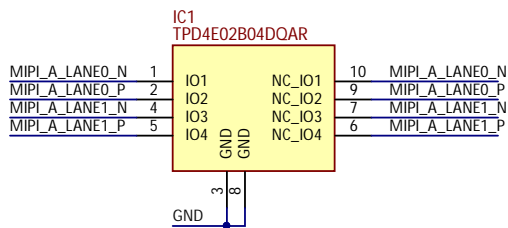
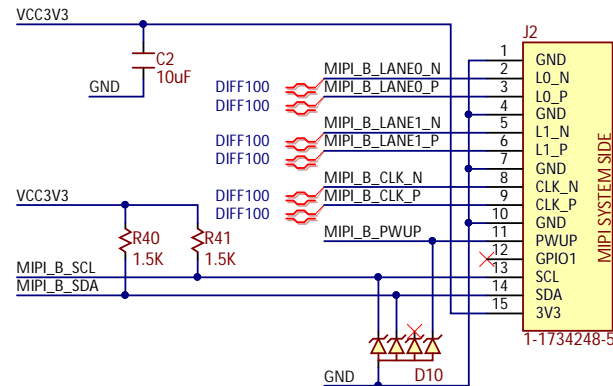
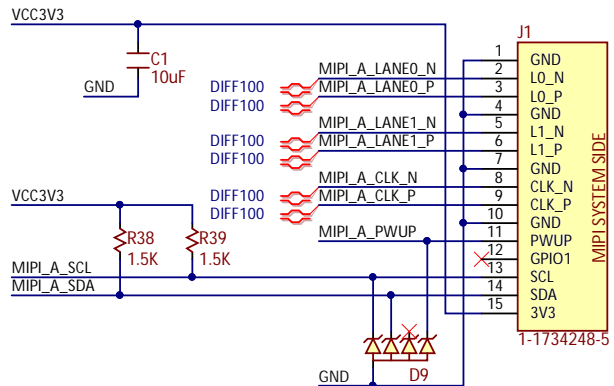


### MIO BUTTONS



|                   |             |                |
|-------------------|-------------|----------------|
| Title             |             | Rev            |
| Genesys ZU-5EV    |             | D.1            |
| Circuit           |             | Copyright 2021 |
| PMODs, MIO BUTTON |             |                |
| Doc#              | 500-383     |                |
| Engineer          | EG          |                |
| Author            | IC          |                |
| Date              | 05/05/2021  |                |
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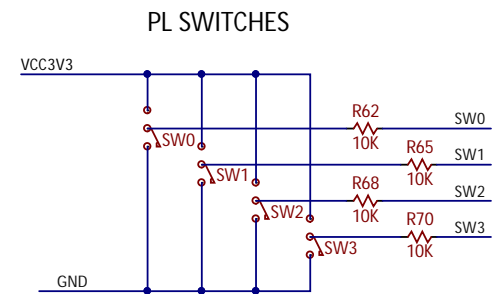
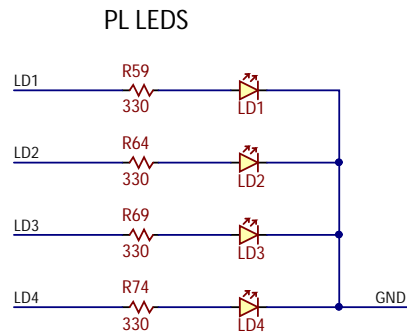
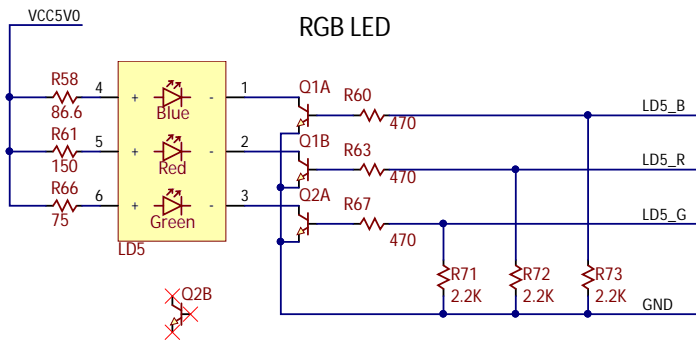
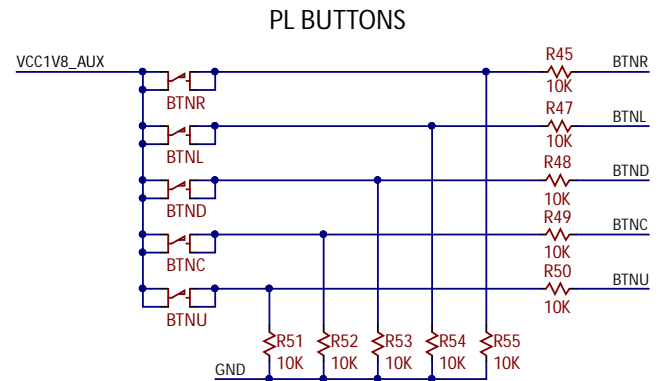
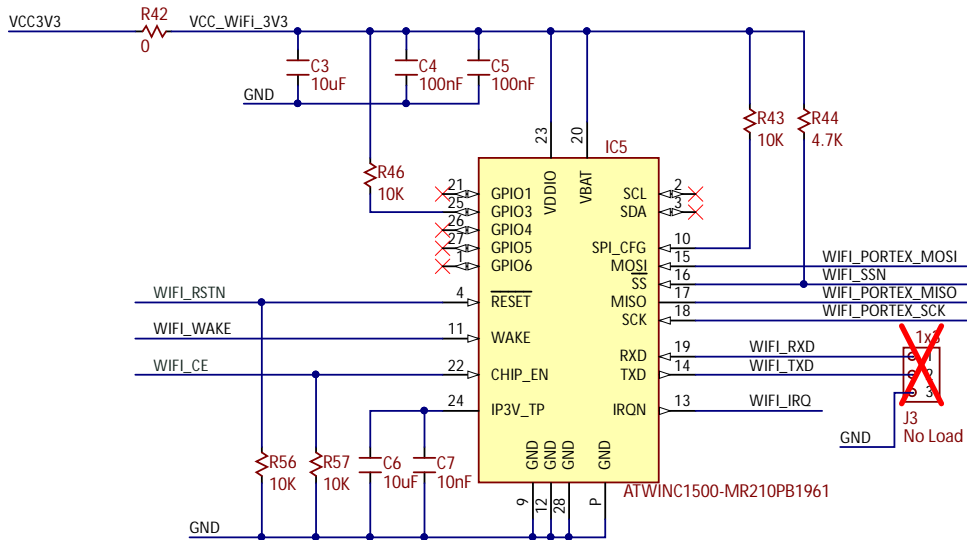




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| Genesys ZU-5EV |                 | D.1            |
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| Circuit        | MIPI Interfaces |                |
| Doc#           | 500-383         |                |
| Engineer       | EG              |                |
| Author         | IC              |                |
| Date           | 05/05/2021      |                |
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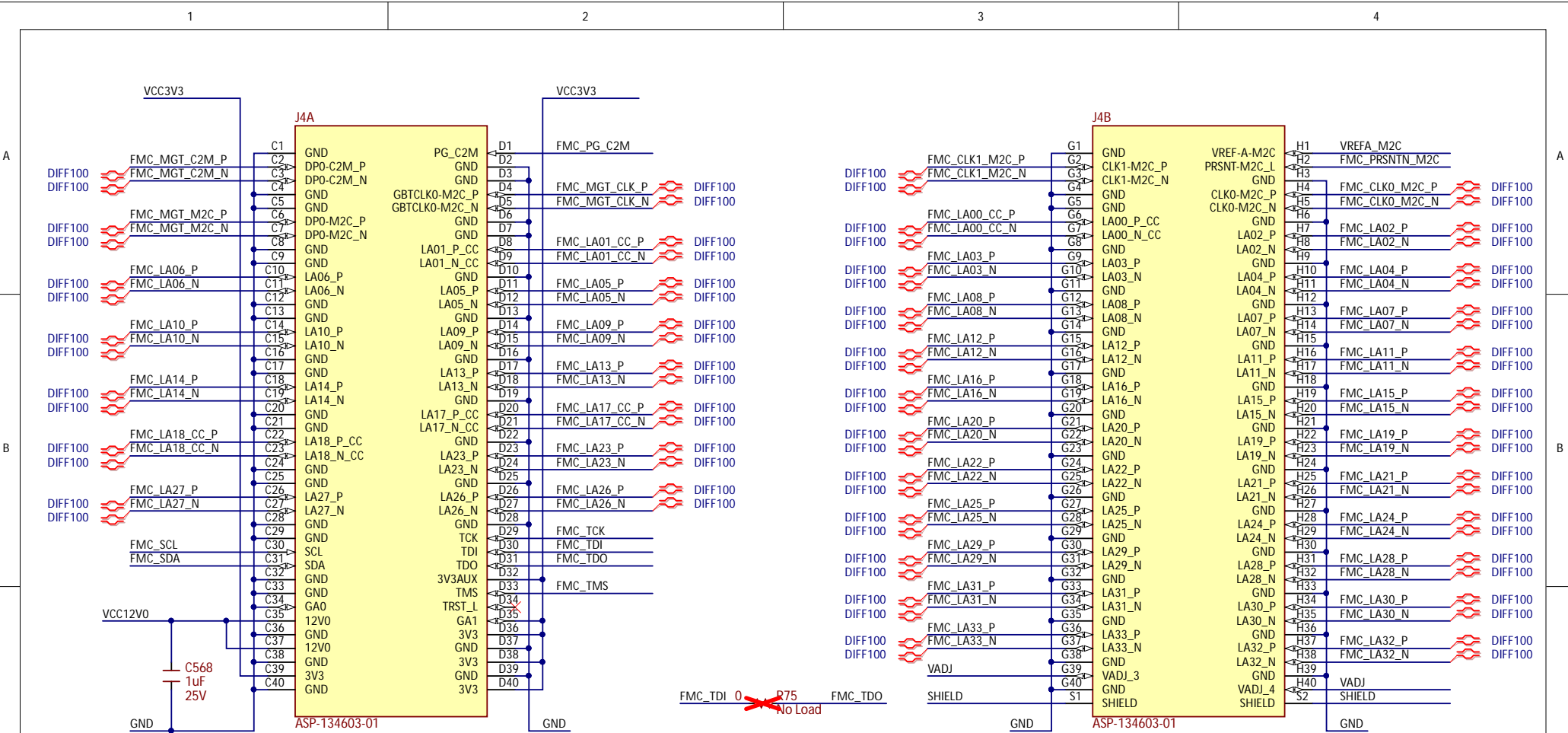


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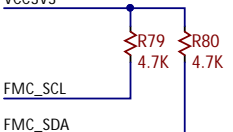
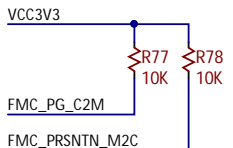
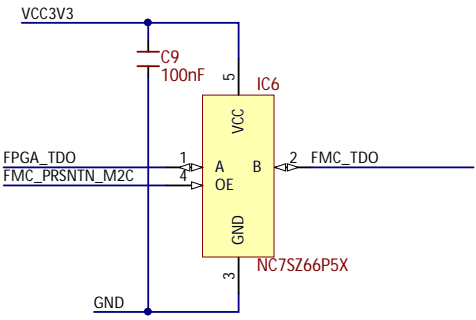
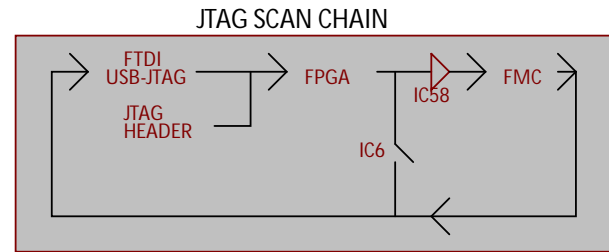


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|---------------------------|-------------|----------------|
| Title                     |             | Rev            |
| Genesys ZU-5EV            |             | D.1            |
| Circuit                   |             | Copyright 2021 |
| WI-FI, LEDs, BUTTONS etc. |             |                |
| Doc#                      | 500-383     |                |
| Engineer                  | EG          |                |
| Author                    | IC          |                |
| Date                      | 05/05/2021  |                |
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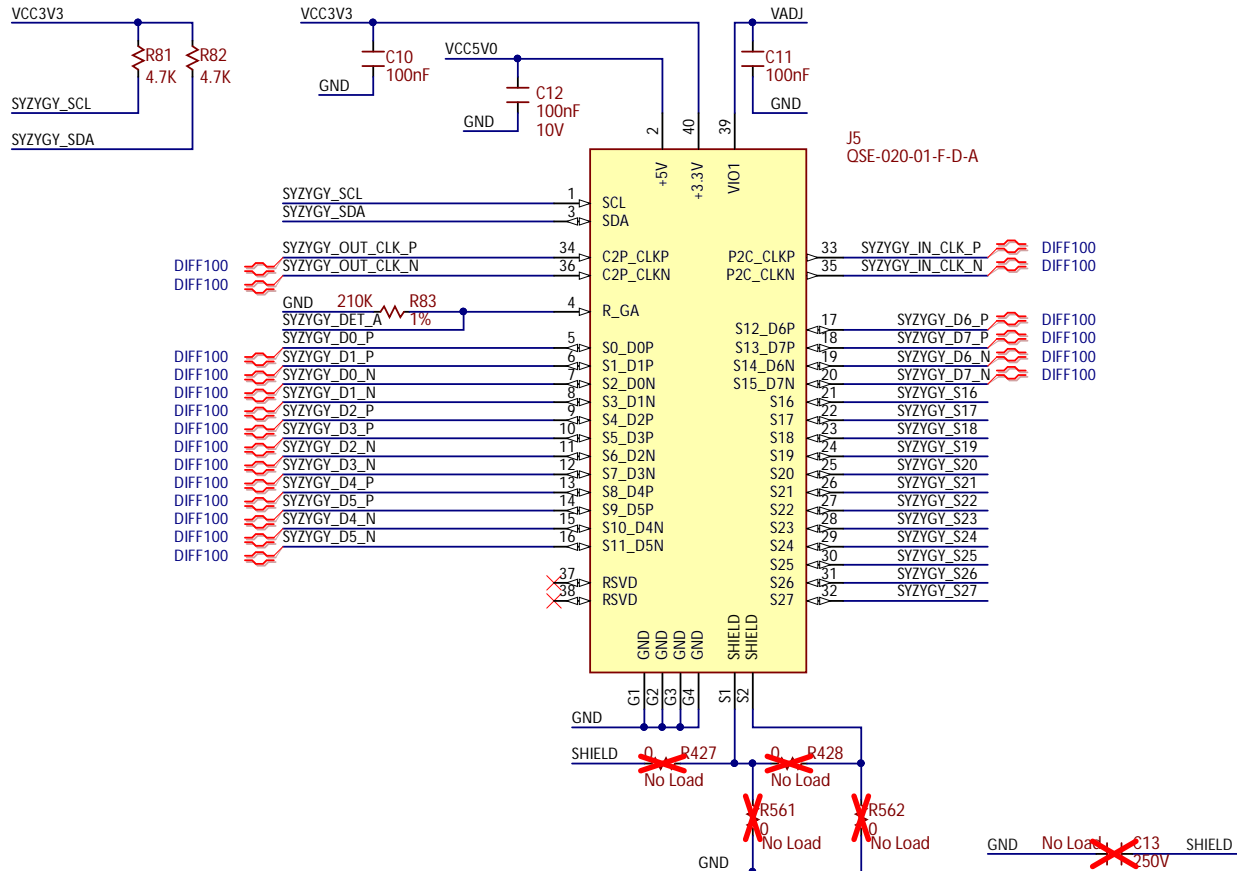
I2C 7-bit addresses ending with bits 01 (due to GAX pins).  
 E.g. FMC module EEPROM 7-bit address will be, in binary: 1010001.



|                |  |             |
|----------------|--|-------------|
| Title          |  | Rev         |
| Genesys ZU-5EV |  | D.1         |
| Circuit        |  | FMC LPC     |
| Doc#           |  | 500-383     |
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| Author         |  | IC          |
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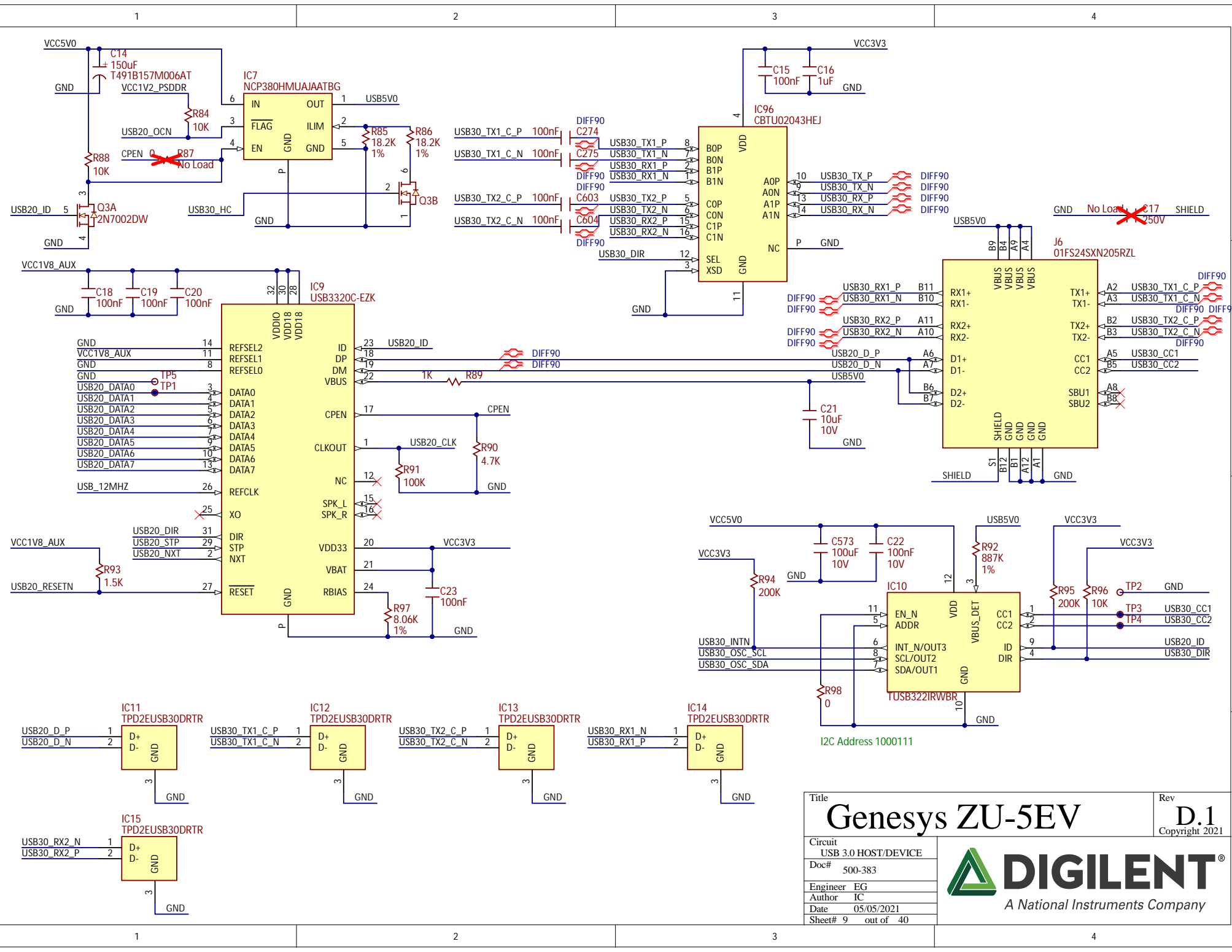


I2C Address 0110000 (due to R\_GA)

|                |             |                |  |
|----------------|-------------|----------------|--|
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| Genesys ZU-5EV |             | D.1            |  |
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| ZMOD           |             |                |  |
| Doc#           | 500-383     |                |  |
| Engineer       | EG          |                |  |
| Author         | IC          |                |  |
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|                     |             |                |
|---------------------|-------------|----------------|
| Title               |             | Rev            |
| Genesys ZU-5EV      |             | D.1            |
| Circuit             |             | Copyright 2021 |
| USB 3.0 HOST/DEVICE |             |                |
| Doc#                | 500-383     |                |
| Engineer            | EG          |                |
| Author              | IC          |                |
| Date                | 05/05/2021  |                |
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A

B

C

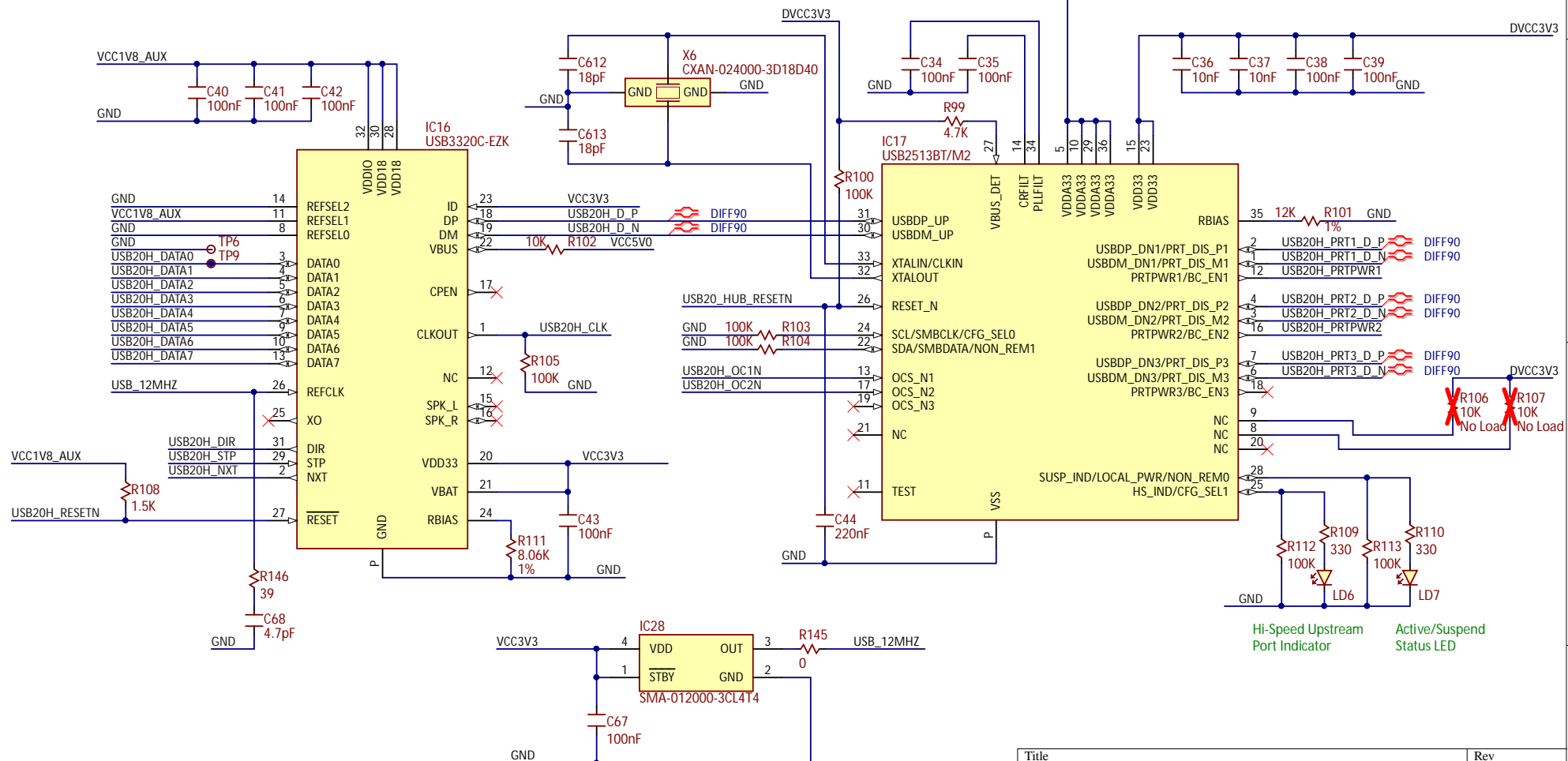
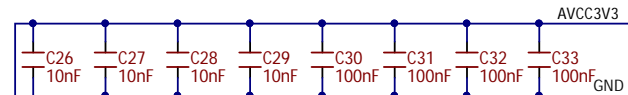
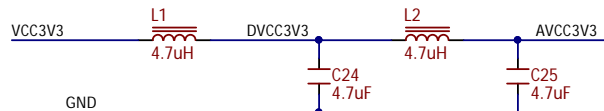
D

1

2

3

4



|                         |              |                |
|-------------------------|--------------|----------------|
| Title                   |              | Rev            |
| <h1>Genesys ZU-5EV</h1> |              | <b>D.1</b>     |
| Circuit                 |              | Copyright 2021 |
| USB 2.0 HOST PHY & HUB  |              |                |
| Doc#                    | 500-383      |                |
| Engineer                | EG           |                |
| Author                  | IC           |                |
| Date                    | 05/05/2021   |                |
| Sheet#                  | 10 out of 40 |                |



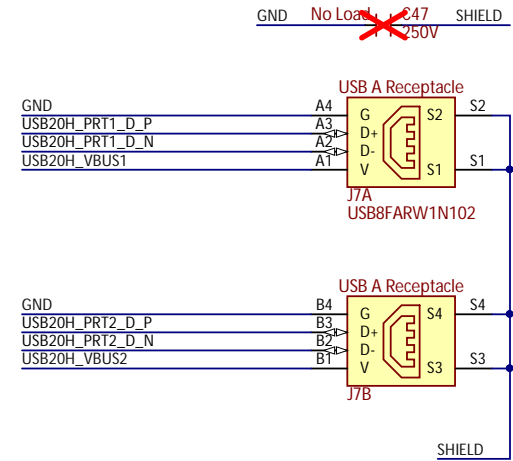
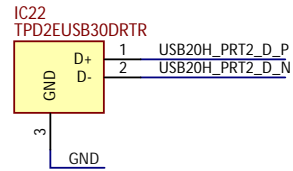
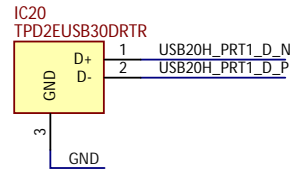
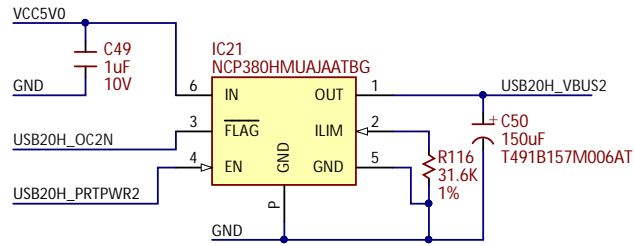
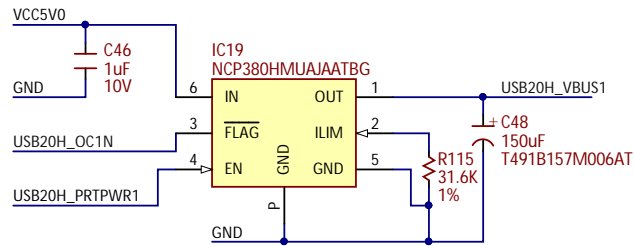
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1

2

3

4

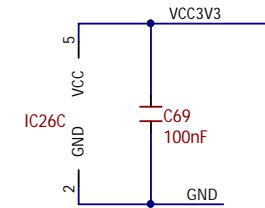
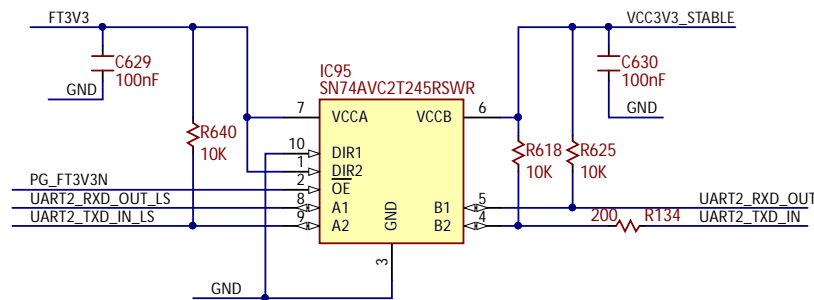
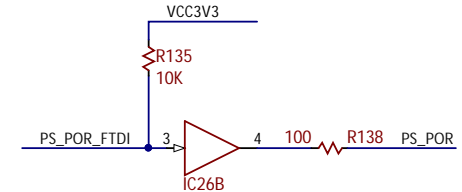
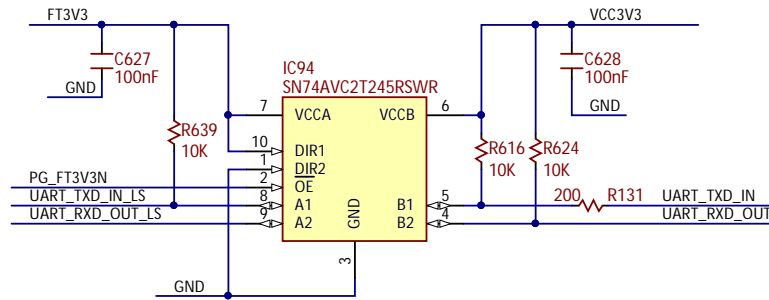
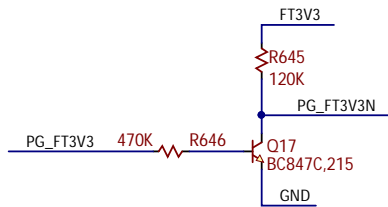
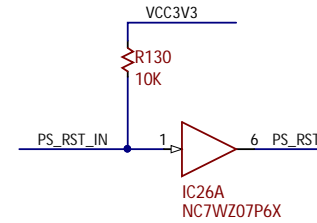
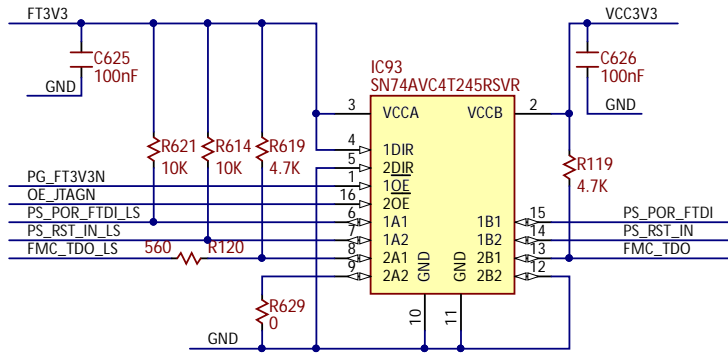
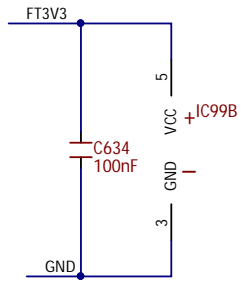
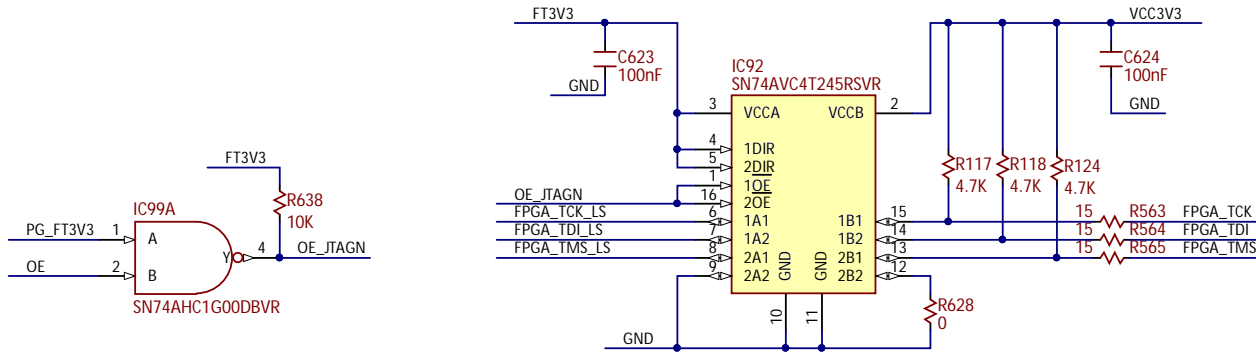


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| Title    |              | Genesys ZU-5EV   | Rev            | D.1 |
| Circuit  |              | USB 2.0 HUB CONN | Copyright 2021 |     |
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| Engineer | EG           |                  |                |     |
| Author   | IC           |                  |                |     |
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| Sheet#   | 11 out of 40 |                  |                |     |

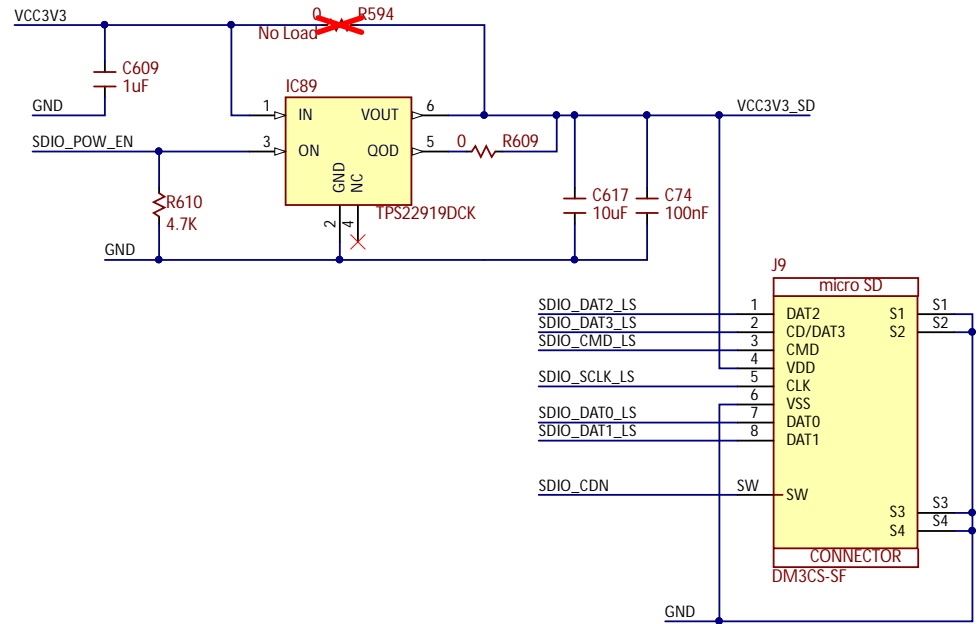
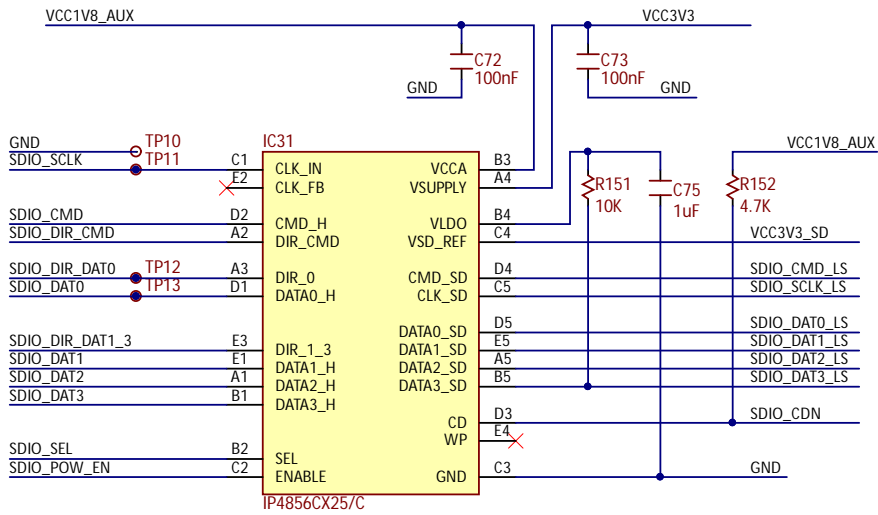


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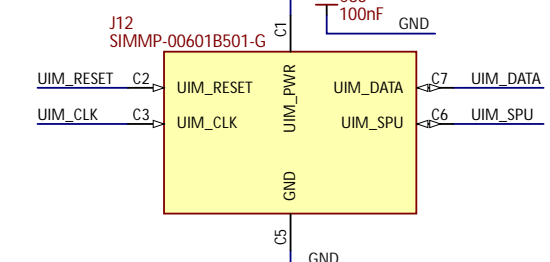
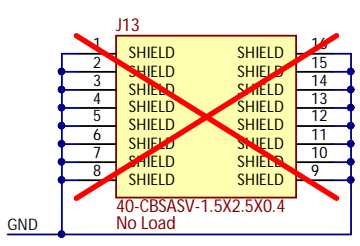
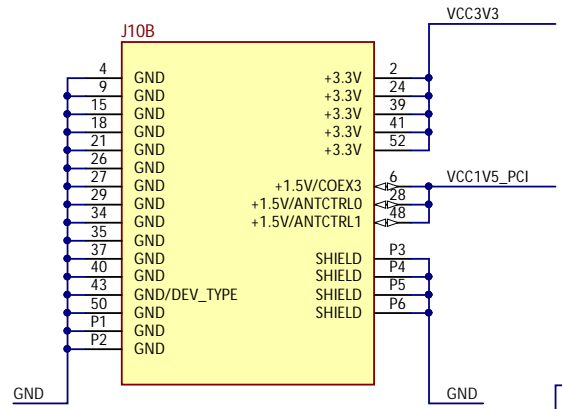
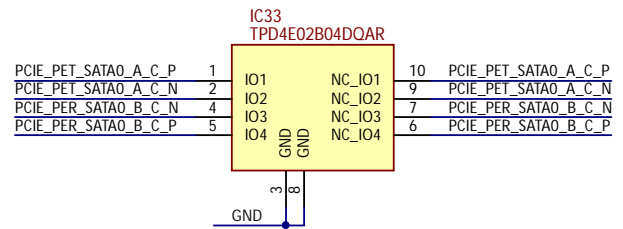
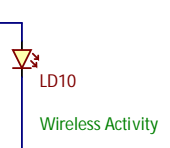
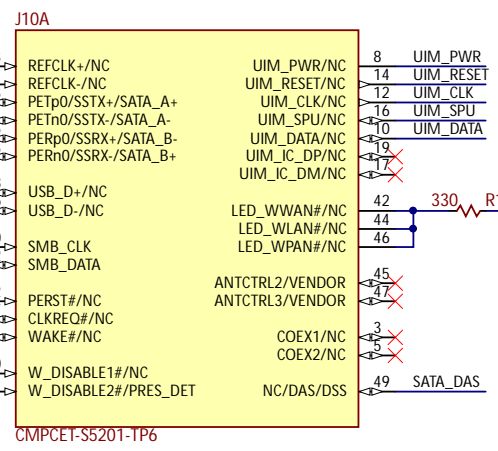
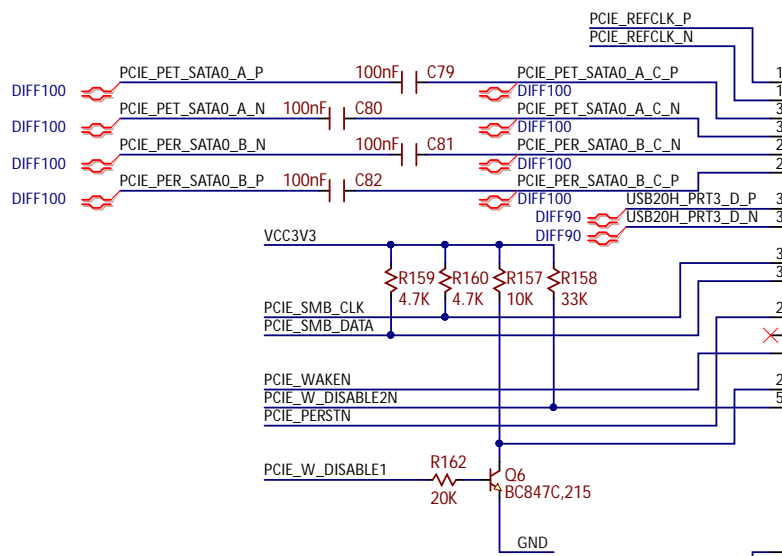
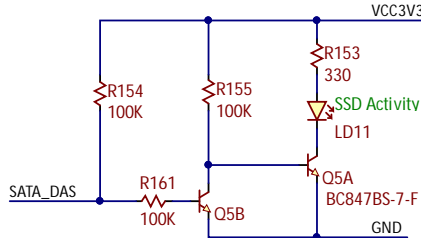
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| Title    | Genesys ZU-5EV | Rev  | D.1<br>Copyright 2021 |
| Circuit  | USB PROG/UART  |  <b>DIGILENT</b> <sup>®</sup><br>A National Instruments Company |                       |
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| Engineer | EG             |  |                       |
| Author   | IC             |  |                       |
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|   |  |                  |  |        |  |            |  |
|---|--|------------------|--|--------|--|------------|--|
| Title   |  | Genesys ZU-5EV   |  | Rev    |  | D.1        |  |
| Circuit   |  | USB PROG BUFFERS |  | Doc#   |  | 500-383    |  |
| Author  |  | EG               |  | Date   |  | 05/05/2021 |  |
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| Doc#           | 500-383      |   |
| Engineer       | EG           |   |
| Author         | IC           |   |
| Date           | 05/05/2021   |   |
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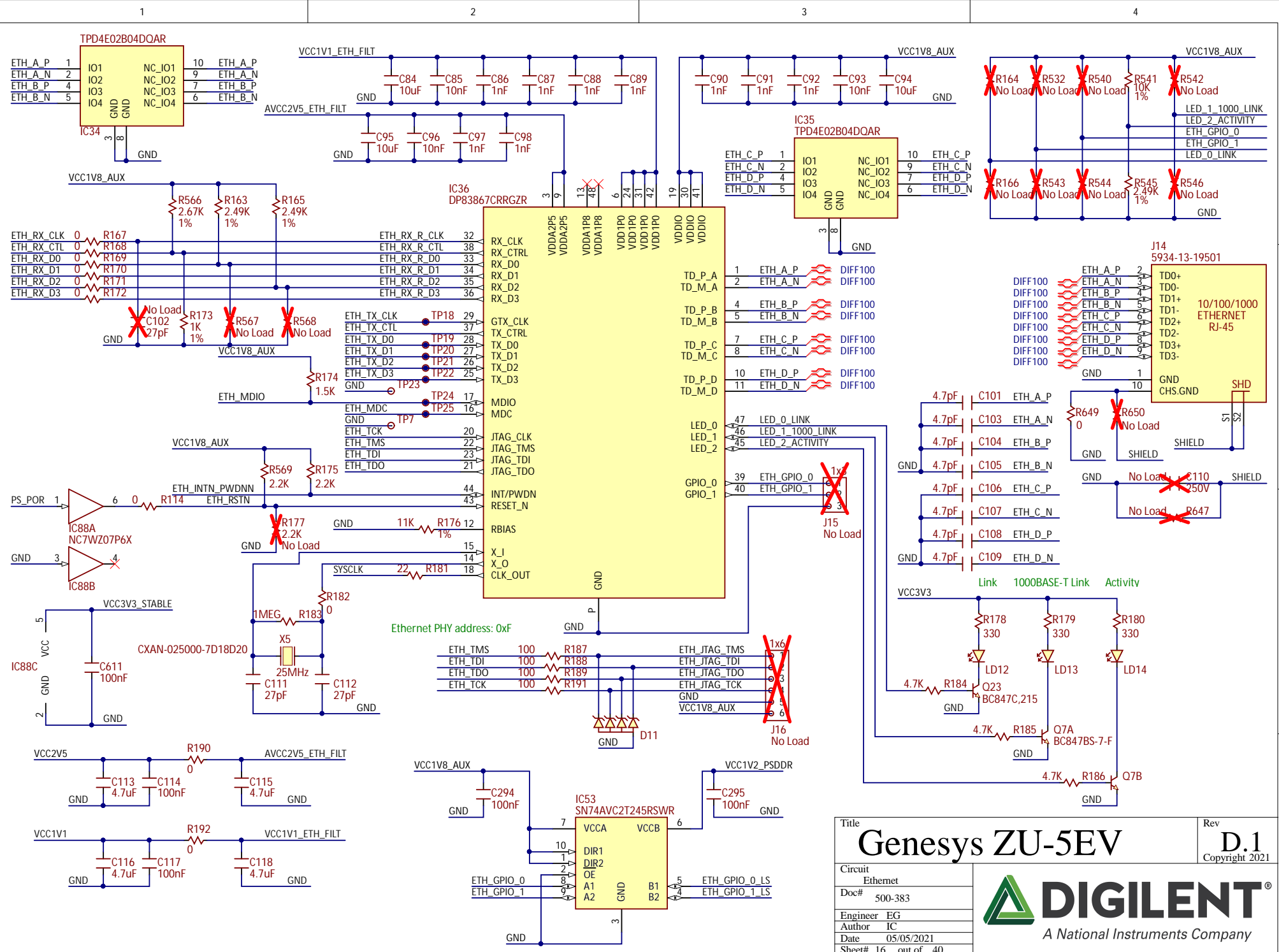


- F11 SMT Standoff S001-00001-B01
- F12 SMT Standoff S001-00001-B01
- F14 SMT Standoff S001-00001-B01
- F15 SMT Standoff S001-00001-B01

|                       |              |                |
|-----------------------|--------------|----------------|
| Title                 |              | Rev            |
| <b>Genesys ZU-5EV</b> |              | <b>D.1</b>     |
| Circuit               |              | Copyright 2021 |
| Mini PCIe / SATA      |              |                |
| Doc#                  | 500-383      |                |
| Engineer              | EG           |                |
| Author                | IC           |                |
| Date                  | 05/05/2021   |                |
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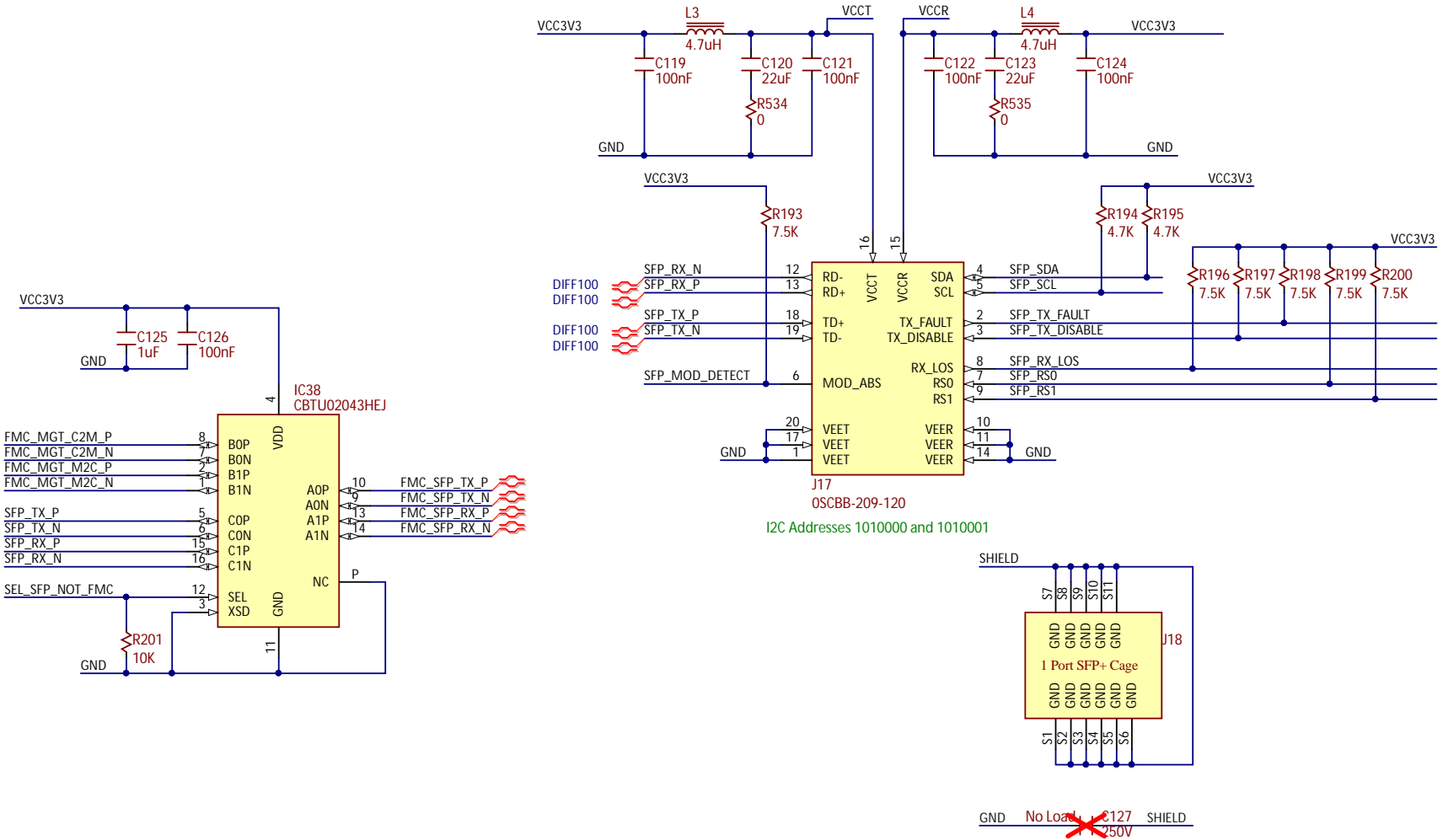
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|                |              |                |  |
|----------------|--------------|----------------|--|
| Title          |              | Rev            |  |
| Genesys ZU-5EV |              | D.1            |  |
| Circuit        |              | Copyright 2021 |  |
| Ethernet       |              |                |  |
| Doc#           | 500-383      |                |  |
| Engineer       | EG           |                |  |
| Author         | IC           |                |  |
| Date           | 05/05/2021   |                |  |
| Sheet#         | 16 out of 40 |                |  |







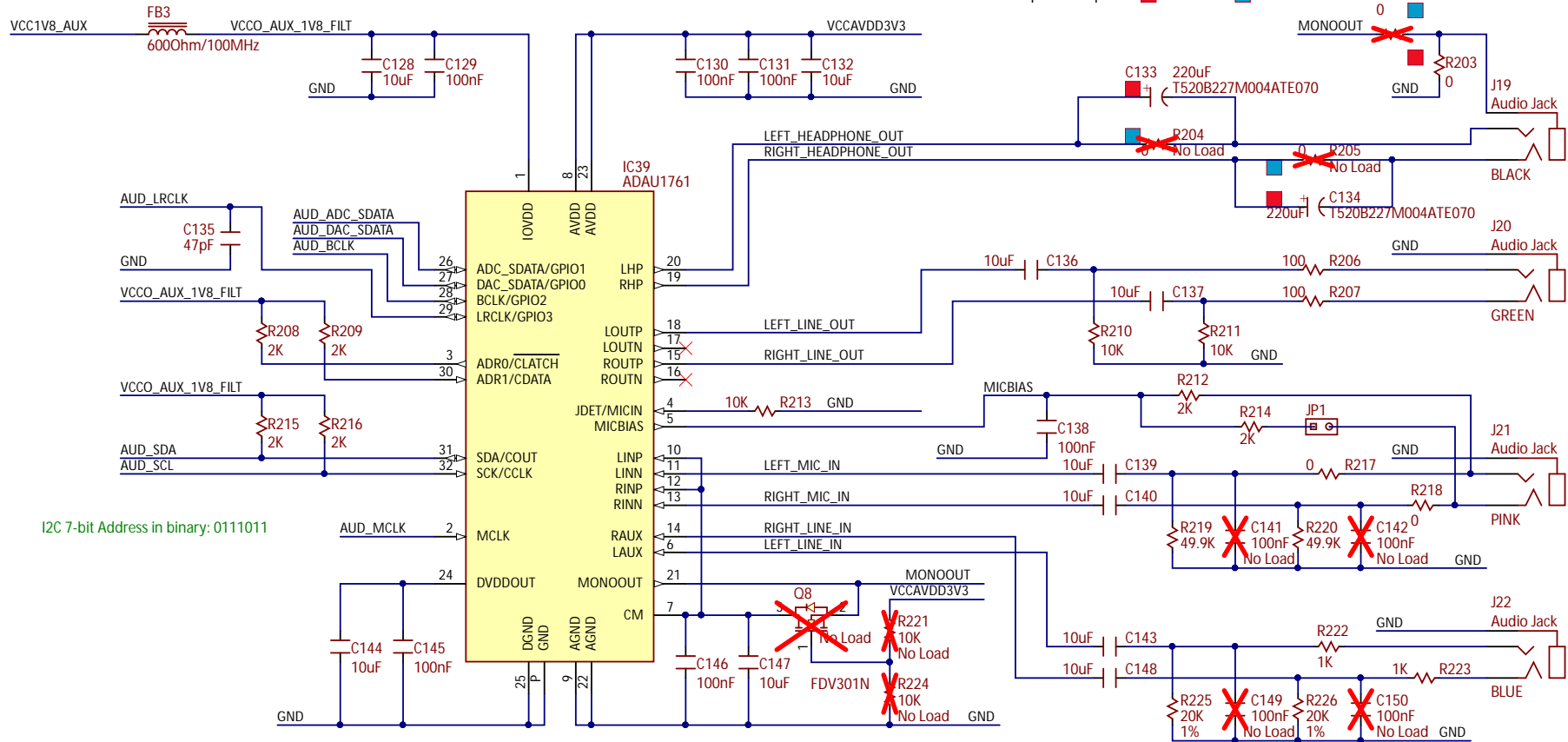
SFP+ cannot be used simultaneously with neither HDMI Source nor Sink due to the limited number of QPLL/CPLL primitives available in the GTH Quad.

|                       |              |                |
|-----------------------|--------------|----------------|
| Title                 |              | Rev            |
| <b>Genesys ZU-5EV</b> |              | <b>D.1</b>     |
|                       |              | Copyright 2021 |
| Circuit               | SFP+         |                |
| Doc#                  | 500-383      |                |
| Engineer              | EG           |                |
| Author                | IC           |                |
| Date                  | 05/05/2021   |                |
| Sheet#                | 17 out of 40 |                |

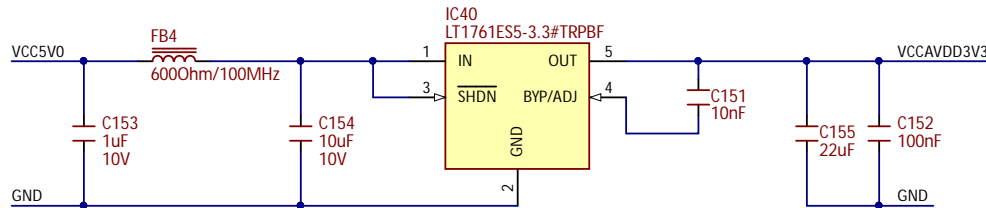


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NOTE: Load No Load  
 Capless Headphone ■ ■  
 AC-Coupled Headphone ■ ■

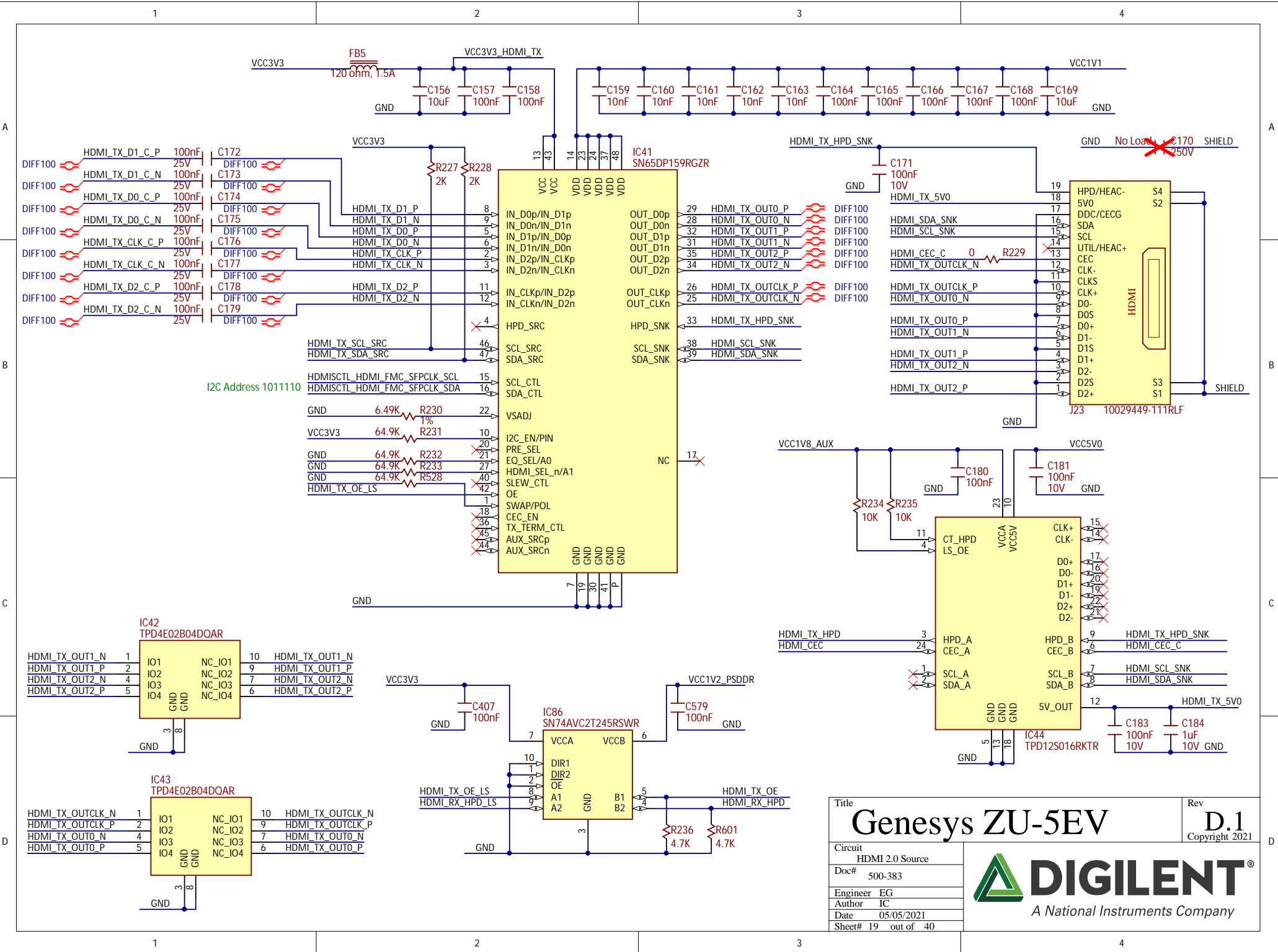


I2C 7-bit Address in binary: 0111011



|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
|                |              | Copyright 2021 |
| Circuit        | AUDIO        |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 18 out of 40 |                |

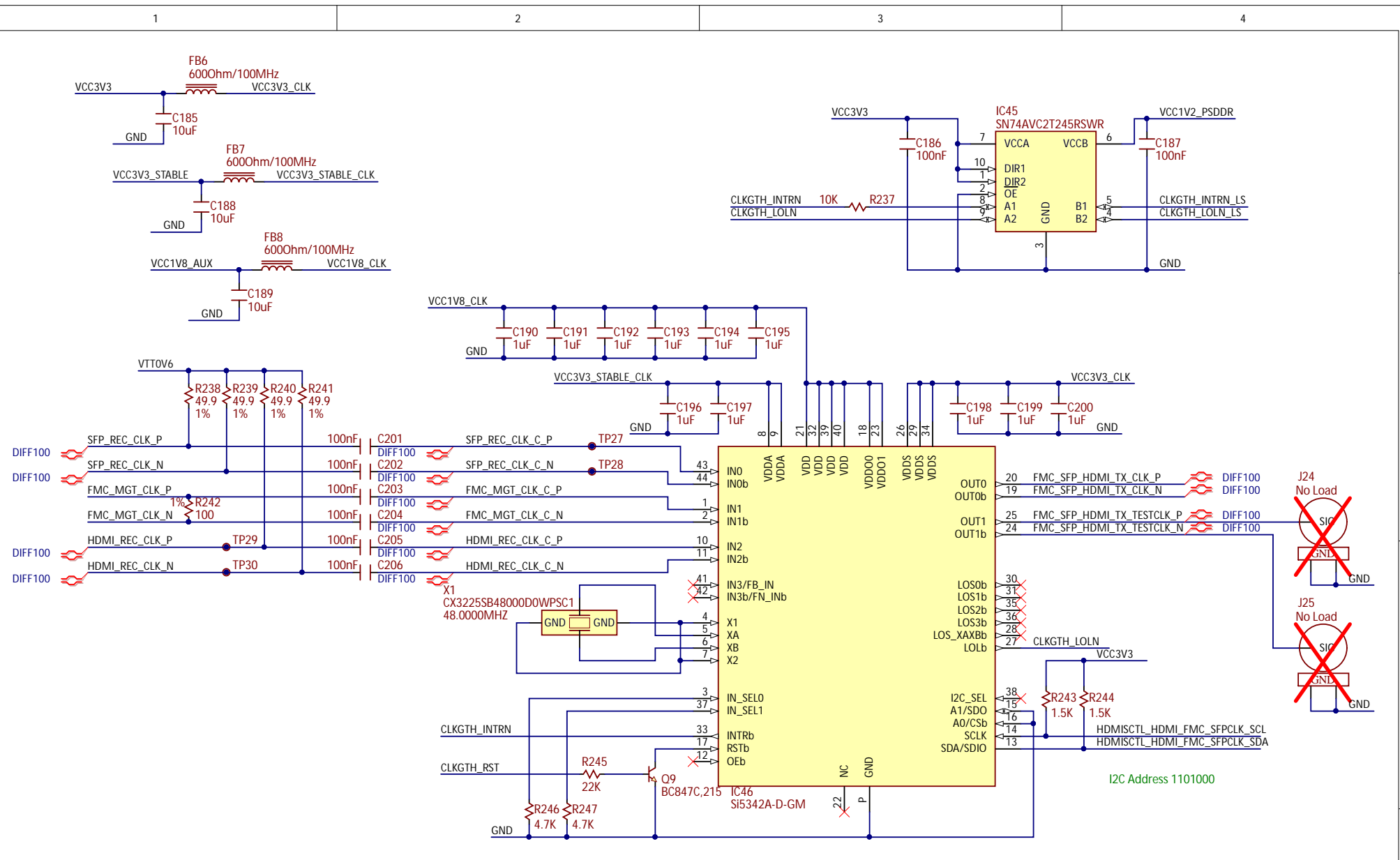




|                 |              |                |  |
|-----------------|--------------|----------------|--|
| Title           |              | Rev            |  |
| Genesys ZU-5EV  |              | D.1            |  |
| Circuit         |              | Copyright 2021 |  |
| HDMI 2.0 Source |              |                |  |
| Doc#            | 500-383      |                |  |
| Engineer        | EG           |                |  |
| Author          | IC           |                |  |
| Date            | 05/05/2021   |                |  |
| Sheet#          | 19 out of 40 |                |  |



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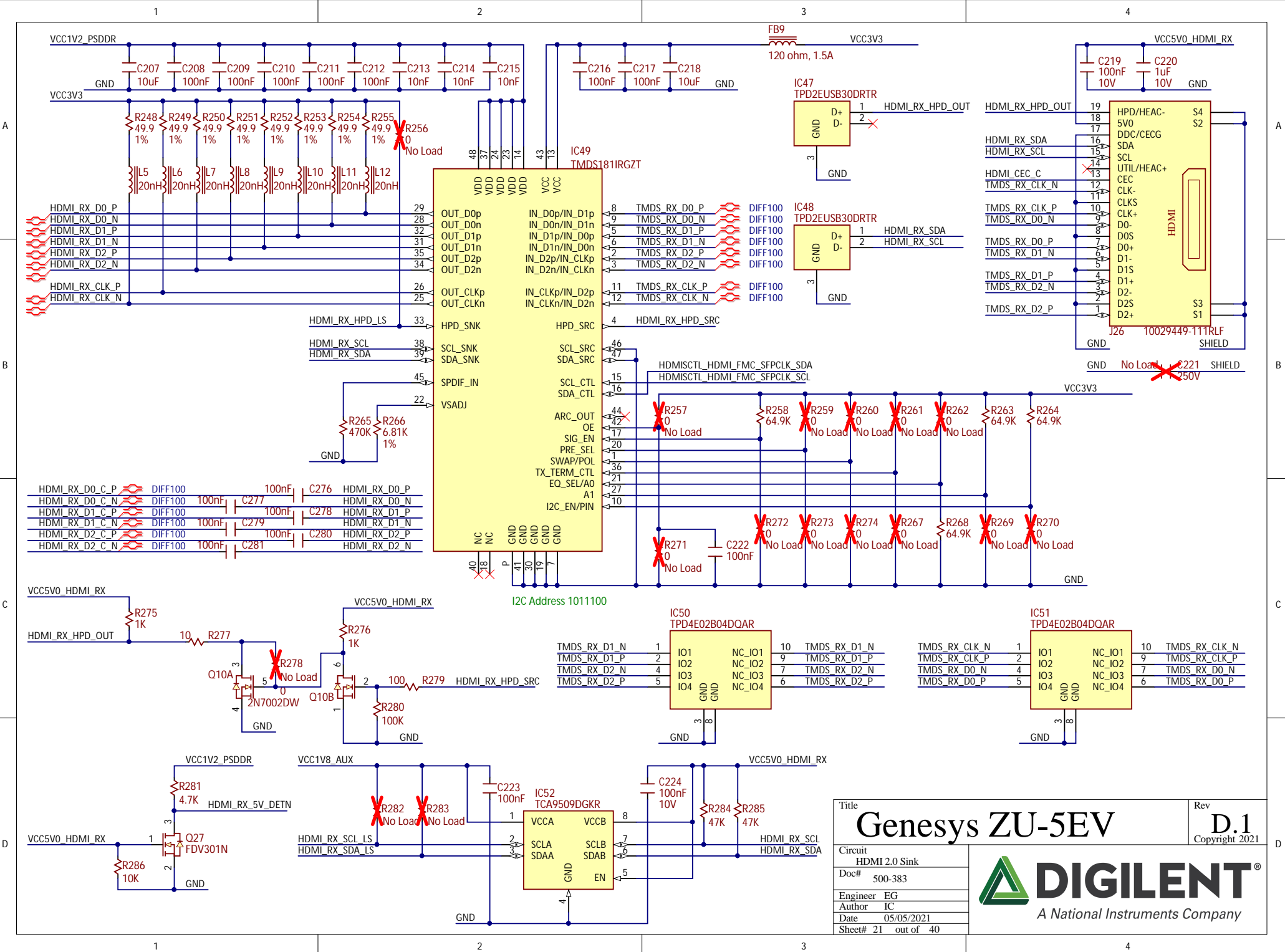


Upon board powerup, the first setting that must be done via I2C to the Si5342 is VDDIO level = 3.3V, by setting the IO\_VDD\_SEL bit to logic '1'.

|                       |              |                |
|-----------------------|--------------|----------------|
| Title                 |              | Rev            |
| <b>Genesys ZU-5EV</b> |              | <b>D.1</b>     |
| Circuit               |              | Copyright 2021 |
| FMC, SFP, HDMI Clock  |              |                |
| Doc#                  | 500-383      |                |
| Engineer              | EG           |                |
| Author                | IC           |                |
| Date                  | 05/05/2021   |                |
| Sheet#                | 20 out of 40 |                |



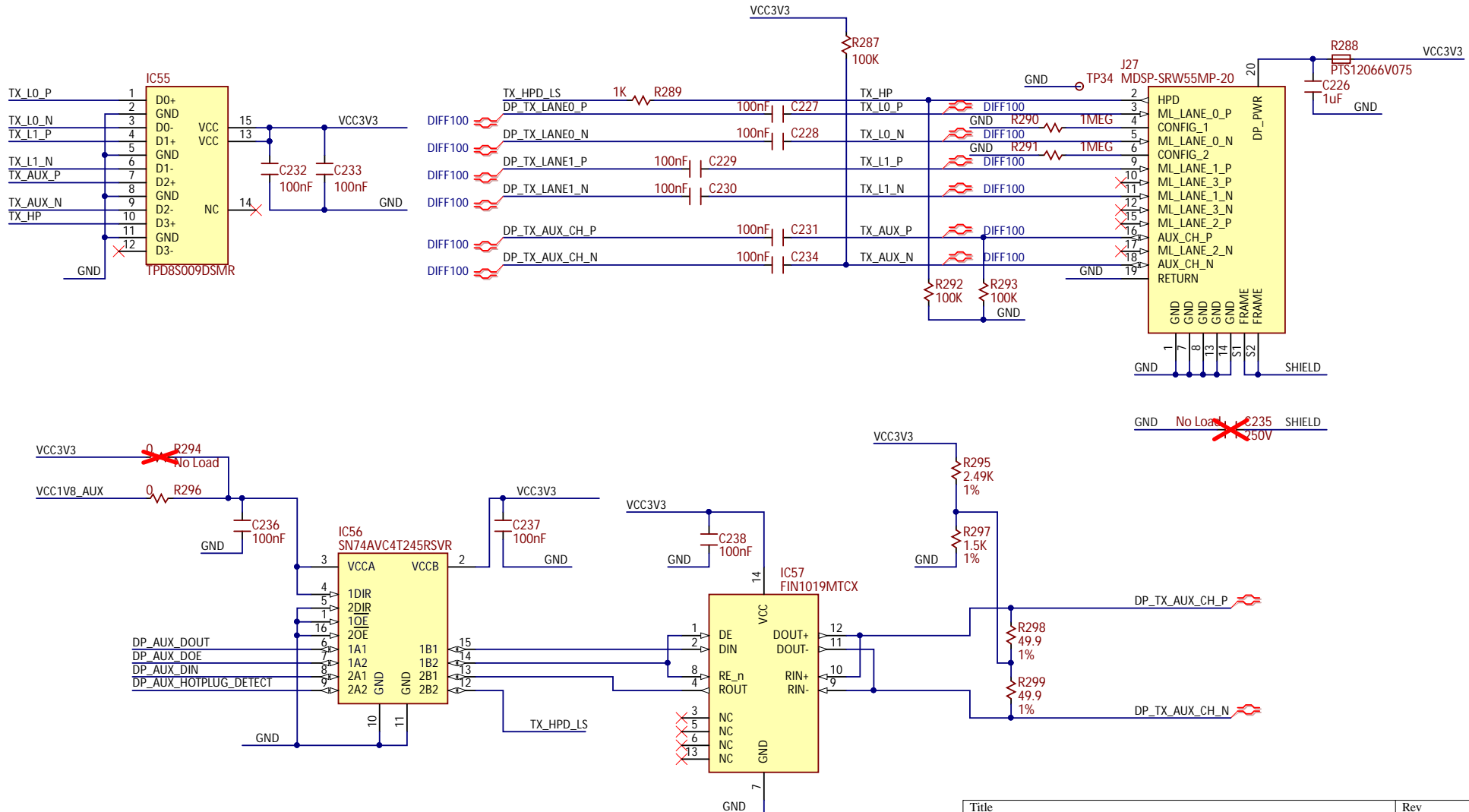
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|                       |              |                |
|-----------------------|--------------|----------------|
| Title                 |              | Rev            |
| <b>Genesys ZU-5EV</b> |              | <b>D.1</b>     |
| Circuit               |              | Copyright 2021 |
| HDMI 2.0 Sink         |              |                |
| Doc#                  | 500-383      |                |
| Engineer              | EG           |                |
| Author                | IC           |                |
| Date                  | 05/05/2021   |                |
| Sheet#                | 21 out of 40 |                |

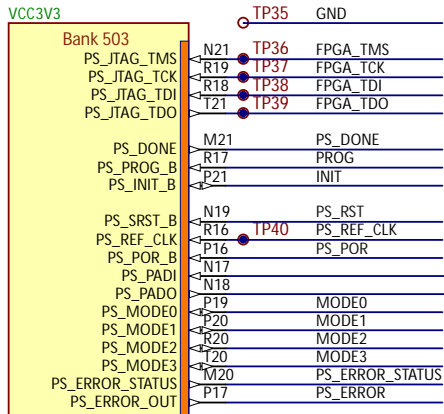


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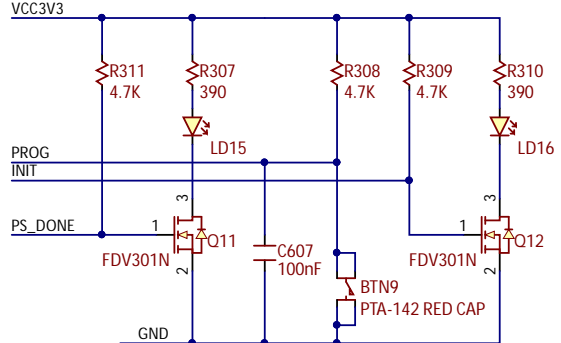
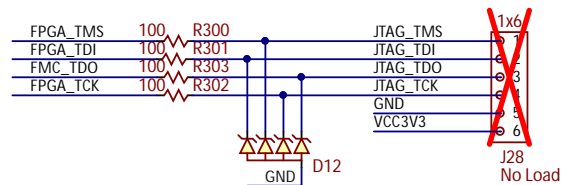
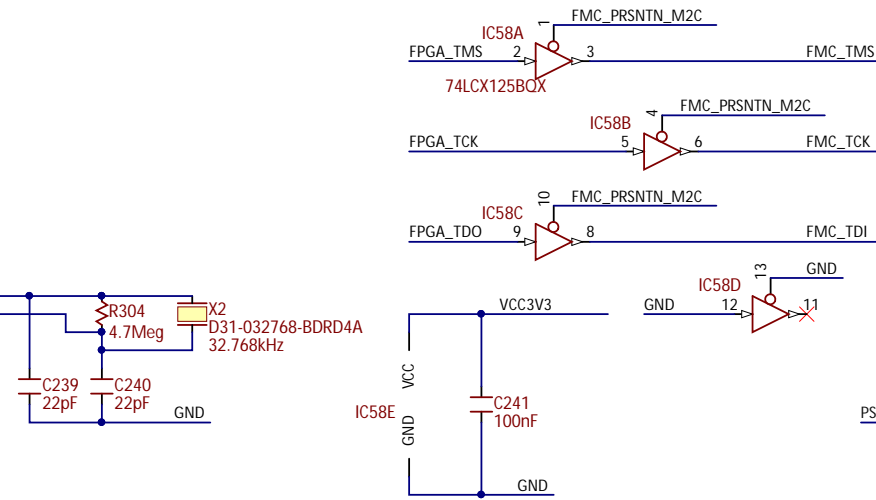


|                    |              |                |
|--------------------|--------------|----------------|
| Title              |              | Rev            |
| Genesys ZU-5EV     |              | D.1            |
| Circuit            |              | Copyright 2021 |
| DisplayPort Source |              |                |
| Doc#               | 500-383      |                |
| Engineer           | EG           |                |
| Author             | IC           |                |
| Date               | 05/05/2021   |                |
| Sheet#             | 22 out of 40 |                |

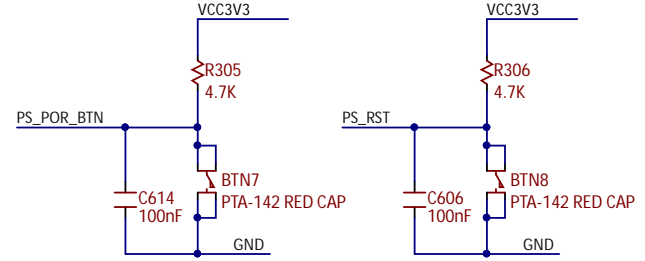
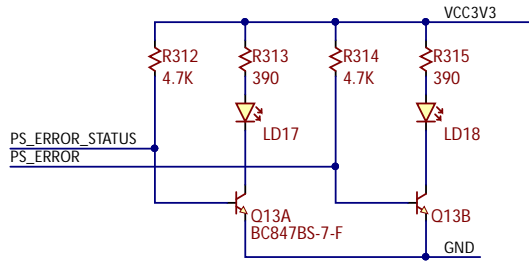




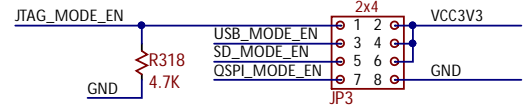
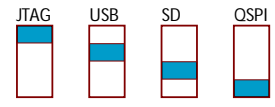
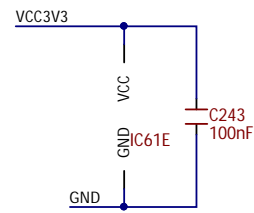
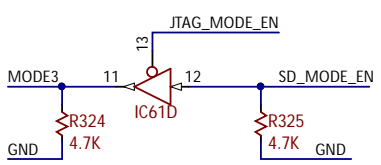
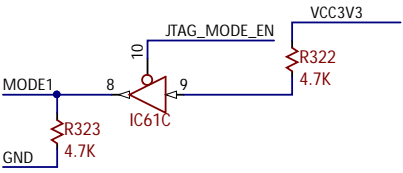
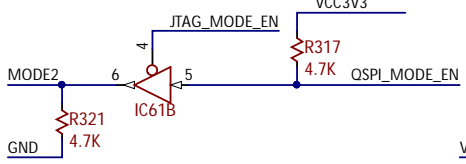
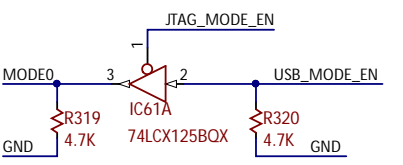
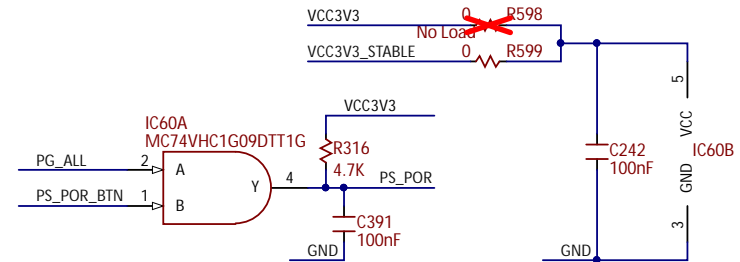
IC59L  
XCZU5EV-1SFVC784E



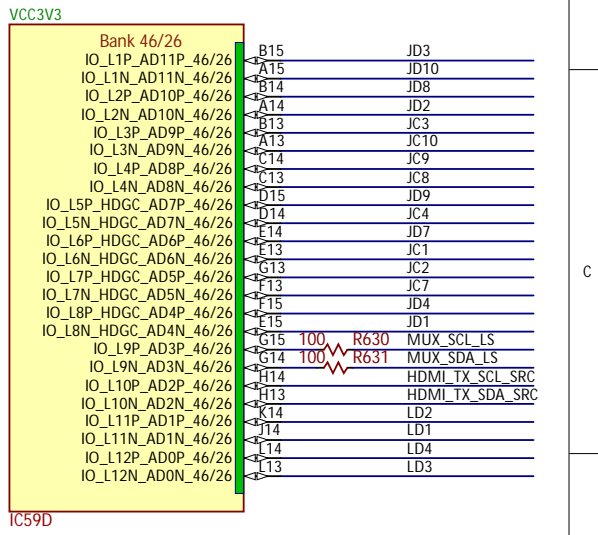
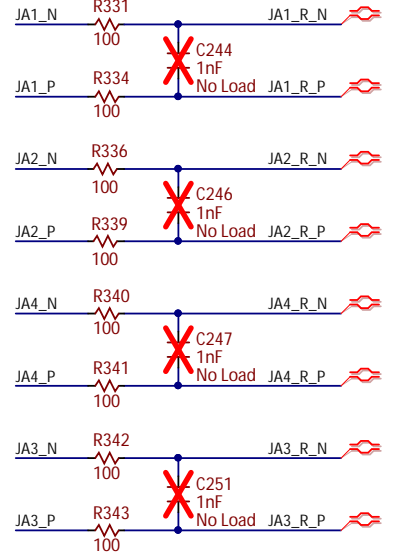
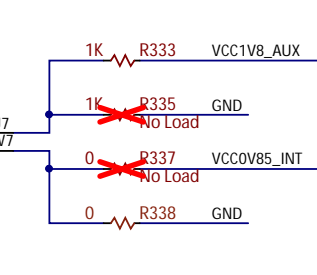
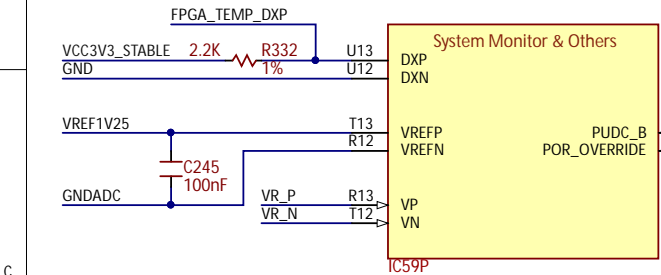
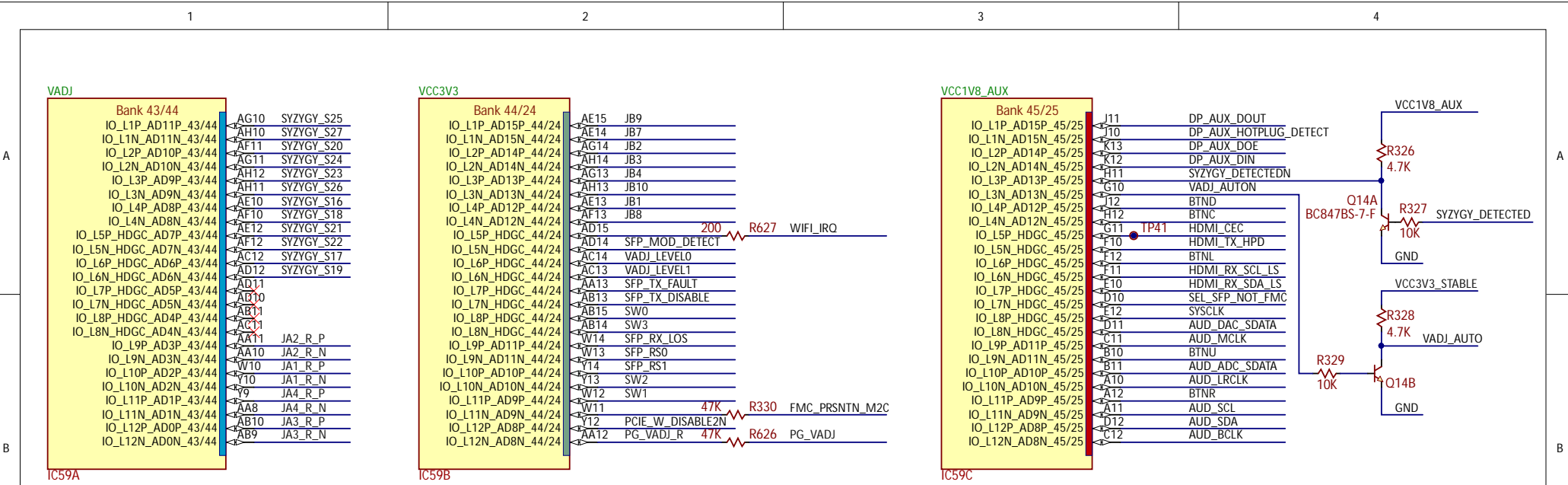
PL Configuration Reset



PS Power On Reset PS System Reset



|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
| Circuit        |              | Copyright 2021 |
| FPGA CONFIG    |              |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 23 out of 40 |                |

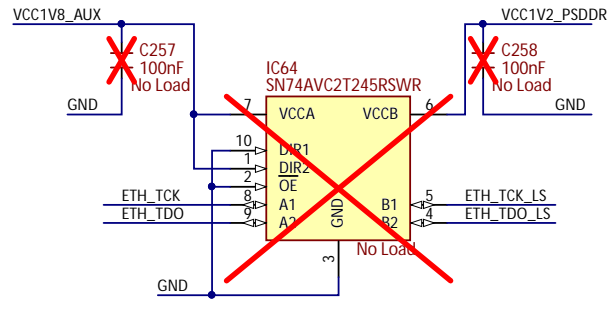
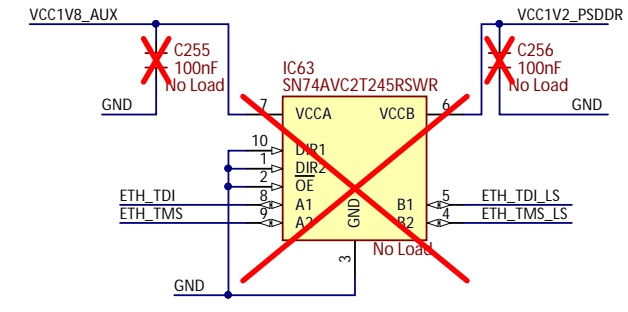
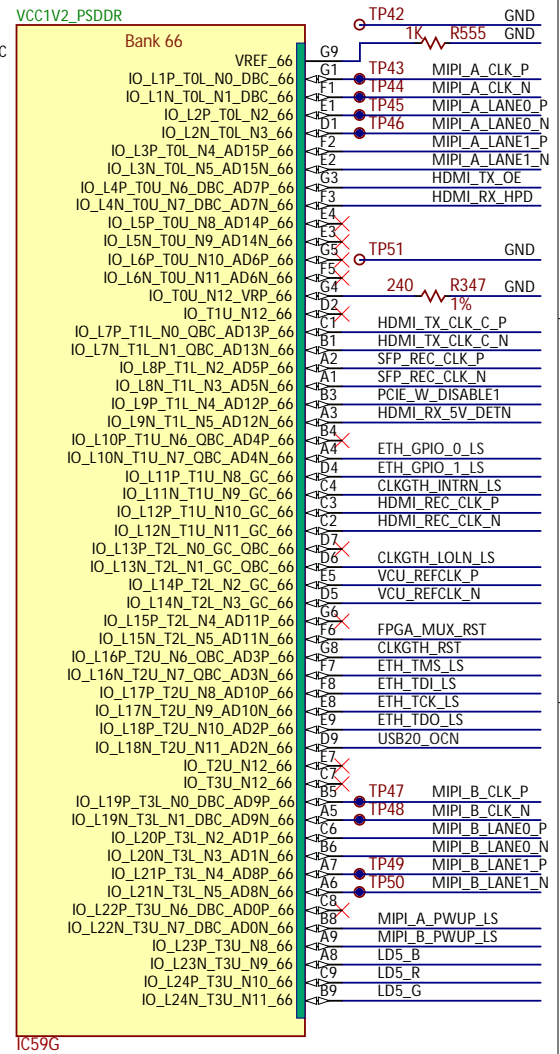
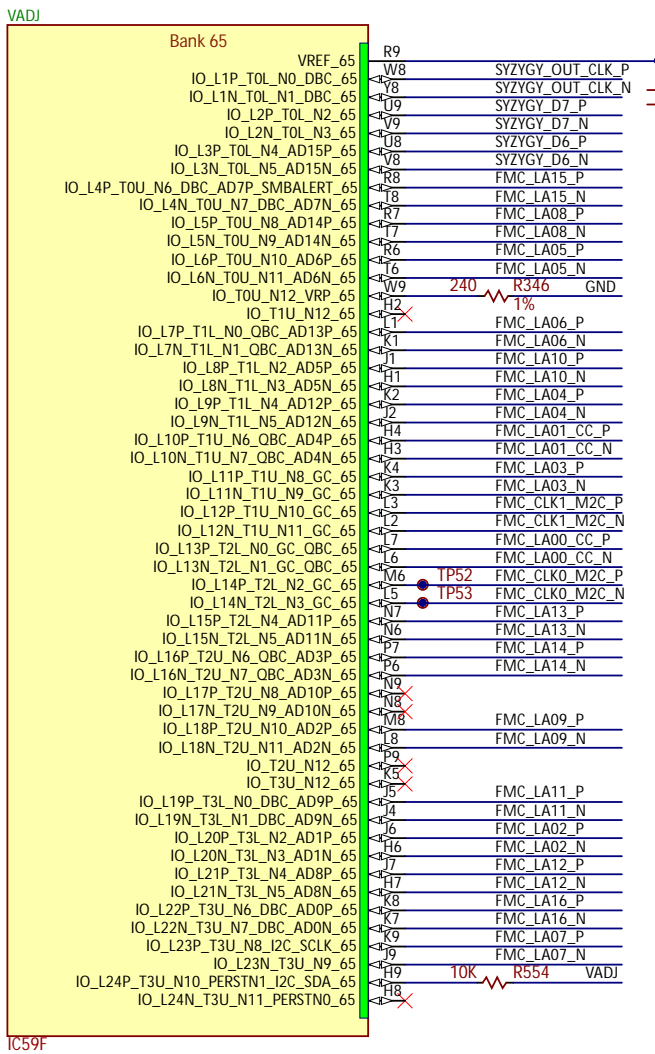
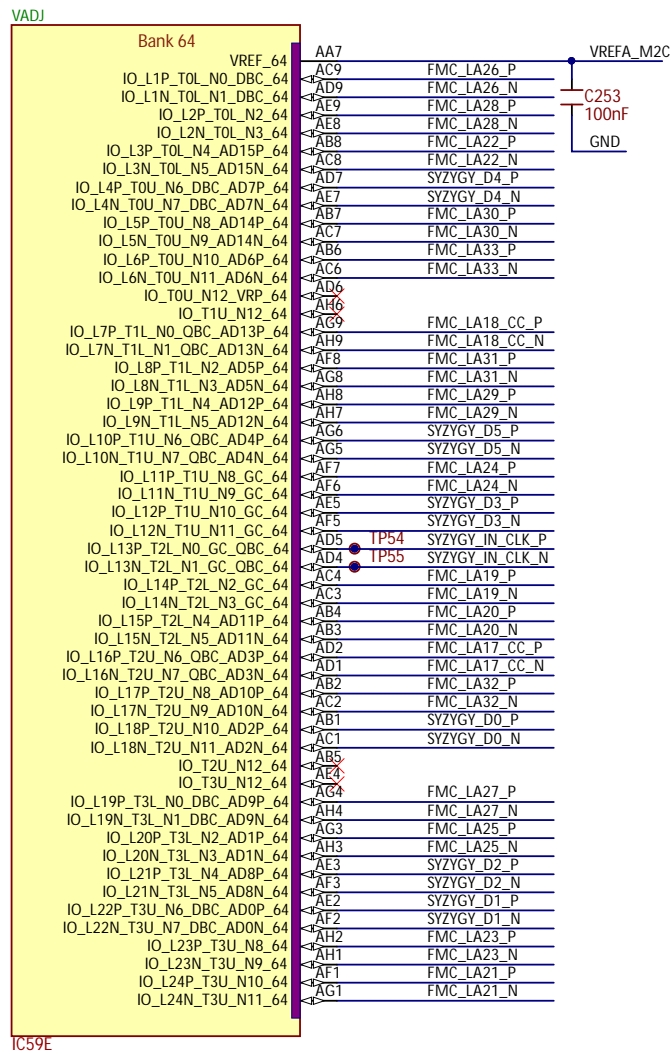


|                         |                     |                |
|-------------------------|---------------------|----------------|
| Title                   |                     | Rev            |
| <h1>Genesys ZU-5EV</h1> |                     | <h2>D.1</h2>   |
|                         |                     | Copyright 2021 |
| Circuit                 | HD FPGA BANKS; XADC |                |
| Doc#                    | 500-383             |                |
| Engineer                | EG                  |                |
| Author                  | IC                  |                |
| Date                    | 05/05/2021          |                |
| Sheet#                  | 24 out of 40        |                |



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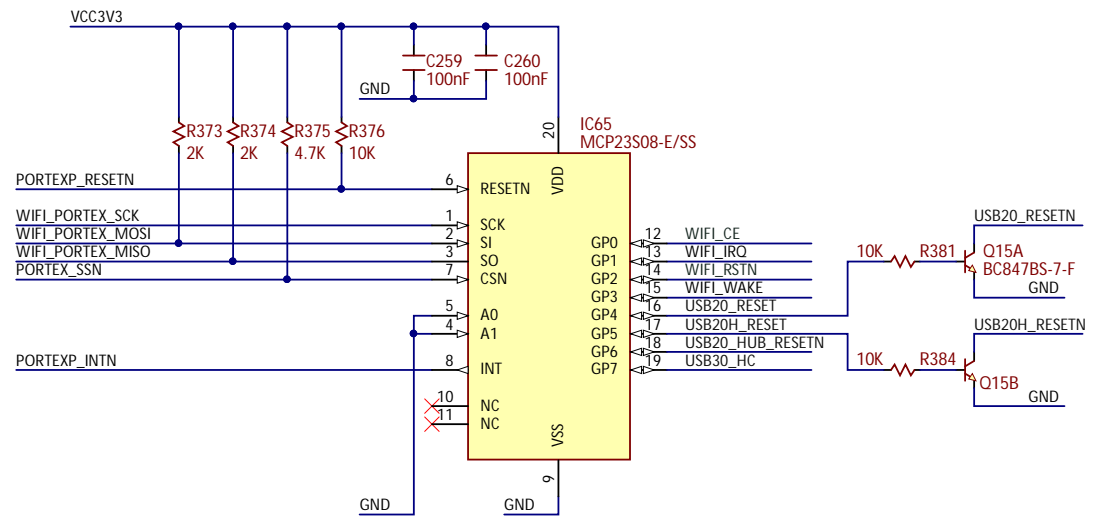
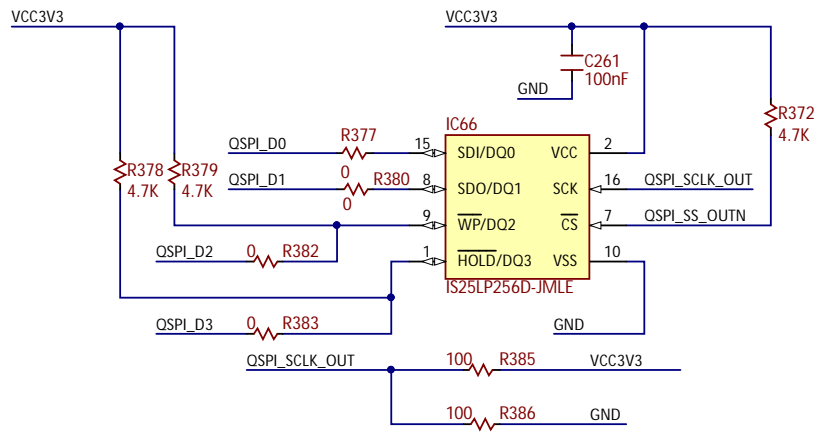
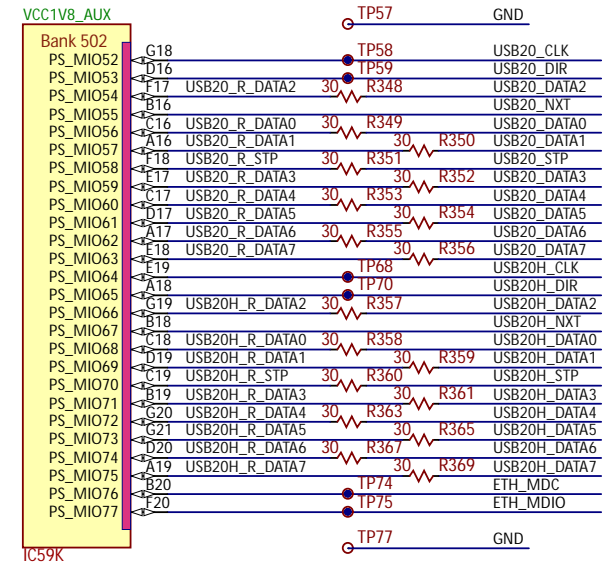
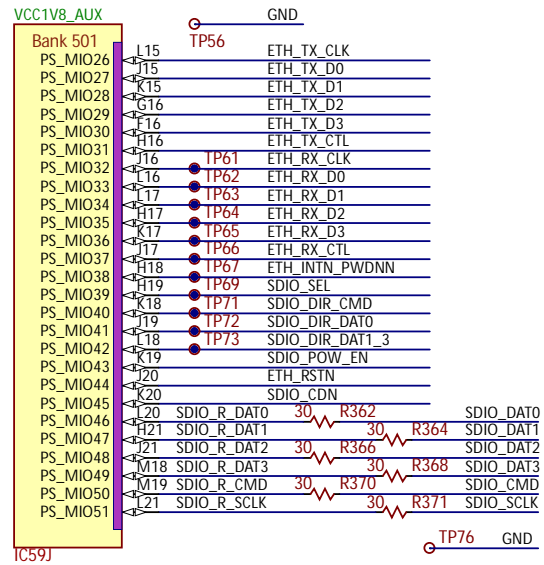
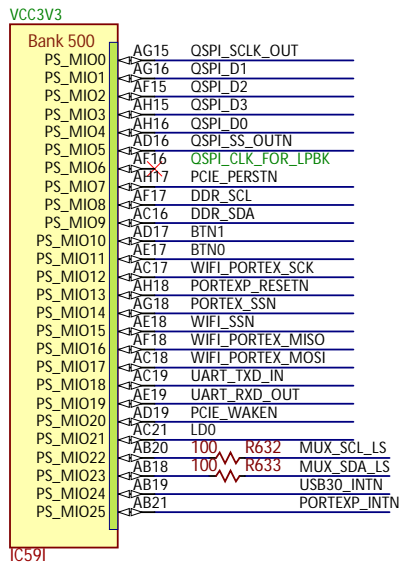




If a DCI standard is required on FMC\_LA15\_P and/or FMC\_LA07\_P, follow the requirements outlined in UG571, under section "Special DCI Requirements in Some Banks".

|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
| Circuit        |              | Copyright 2021 |
| HP FPGA BANKS  |              |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 25 out of 40 |                |

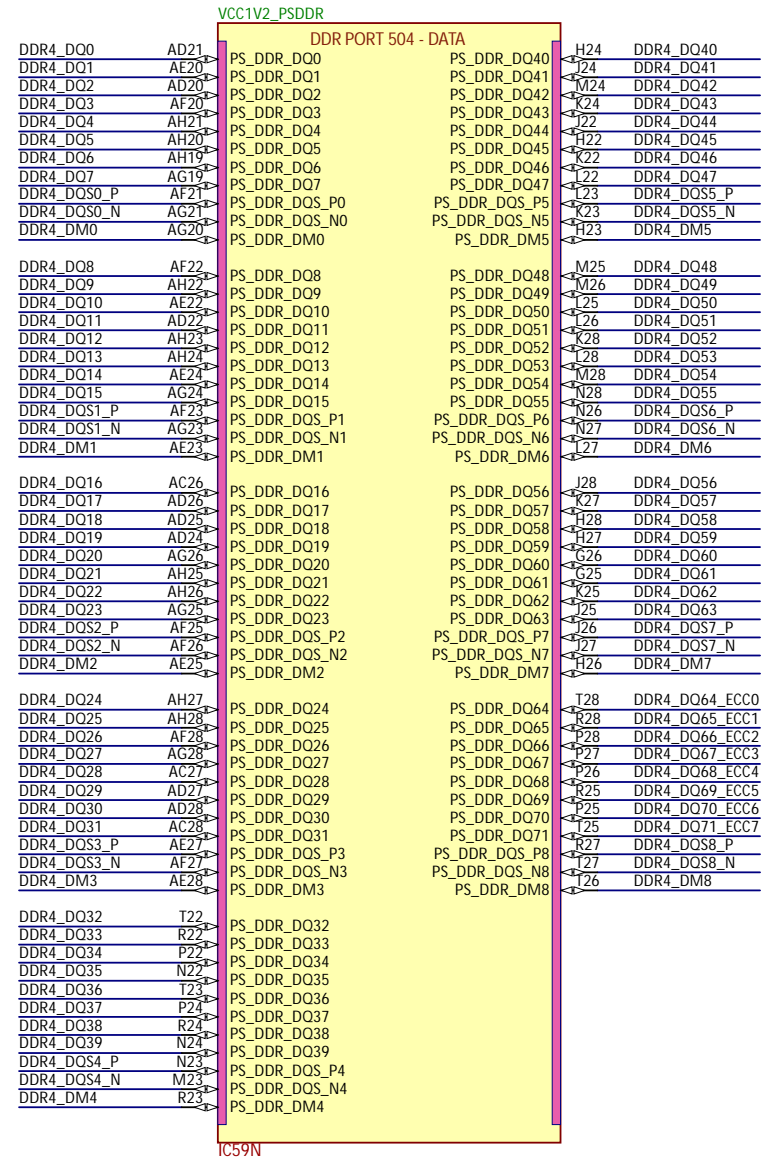
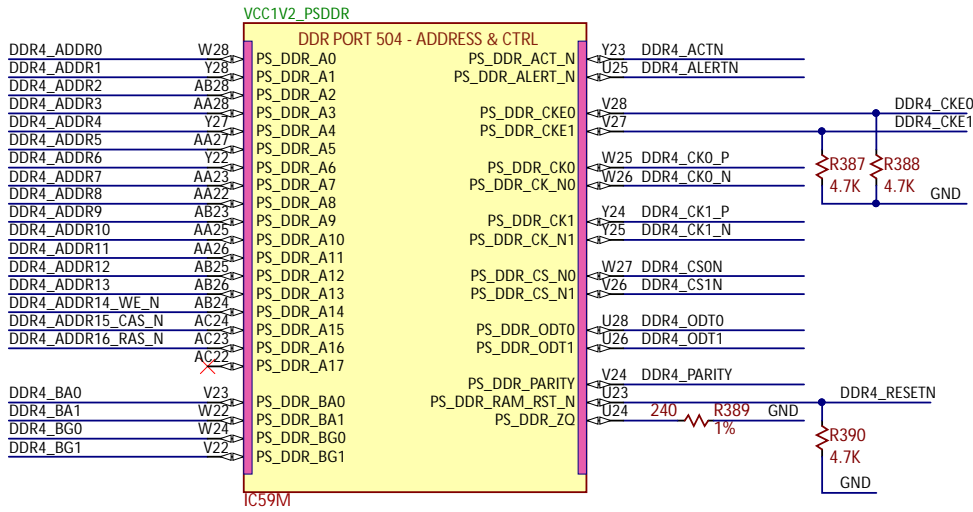
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|          |                      |     |                |
|----------|----------------------|-----|----------------|
| Title    | Genesys ZU-5EV       | Rev | D.1            |
|          |                      |     | Copyright 2021 |
| Circuit  | MIO BANKS; SPI FLASH |     |                |
| Doc#     | 500-383              |     |                |
| Engineer | EG                   |     |                |
| Author   | IC                   |     |                |
| Date     | 05/05/2021           |     |                |
| Sheet#   | 26 out of 40         |     |                |



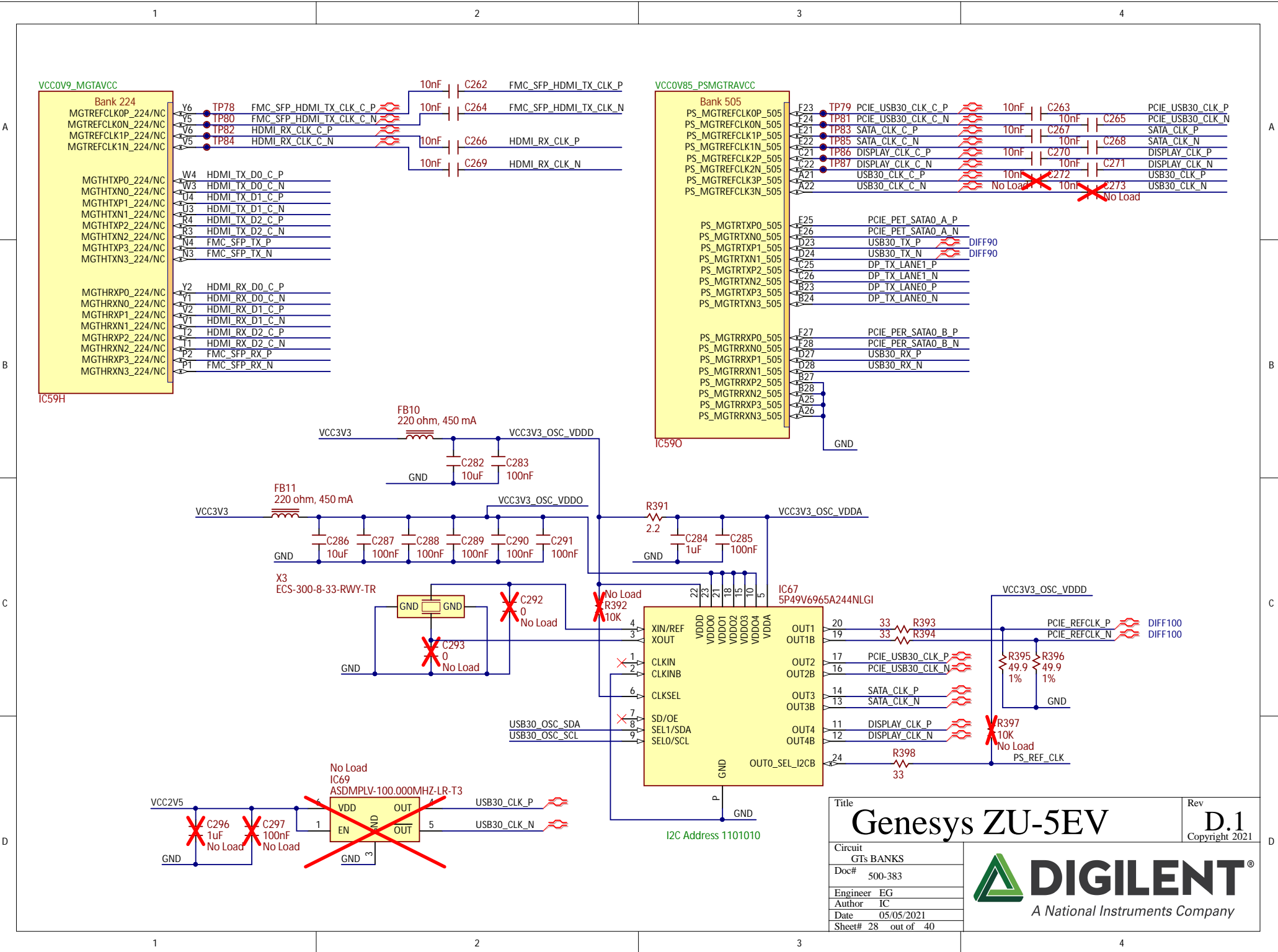
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|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
|                |              | Copyright 2021 |
| Circuit        | DDR BANK     |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 27 out of 40 |                |



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|                |  |                |  |
|----------------|--|----------------|--|
| Title          |  | Rev            |  |
| Genesys ZU-5EV |  | D.1            |  |
| Circuit        |  | Copyright 2021 |  |
| GTs BANKS      |  |                |  |
| Doc#           |  | 500-383        |  |
| Engineer       |  | EG             |  |
| Author         |  | IC             |  |
| Date           |  | 05/05/2021     |  |
| Sheet#         |  | 28 out of 40   |  |



A

B

C

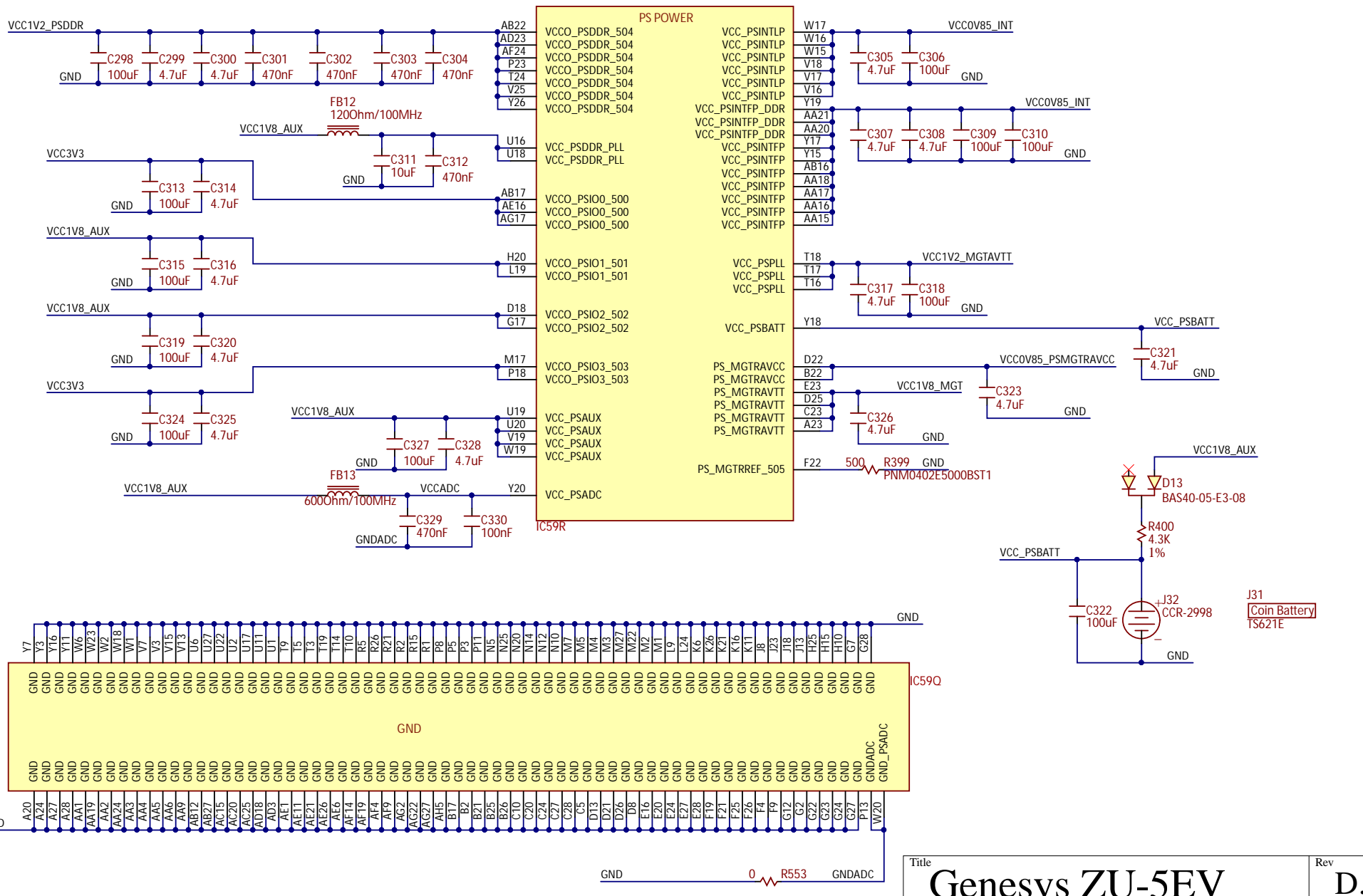
D

1

2

3

4



|         |  |                |  |        |  |            |  |
|---------|--|----------------|--|--------|--|------------|--|
| Title   |  | Genesys ZU-5EV |  | Rev    |  | D.1        |  |
| Circuit |  | PS POWER_GND   |  | Doc#   |  | 500-383    |  |
| Author  |  | EG             |  | Date   |  | 05/05/2021 |  |
| Sheet#  |  | 29             |  | out of |  | 40         |  |

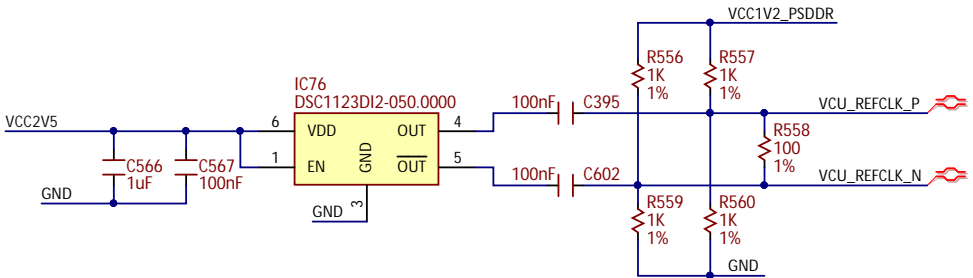
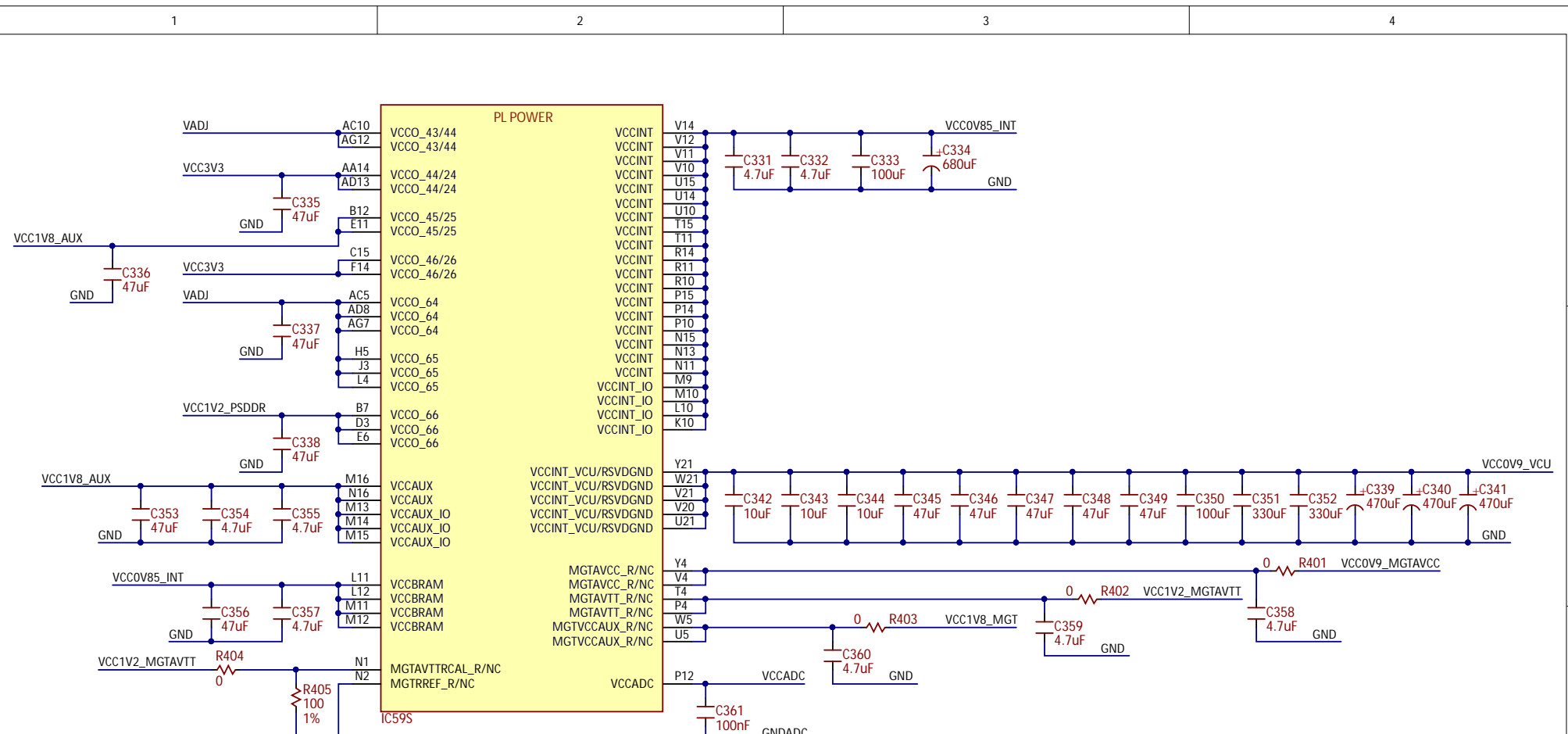
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1

2

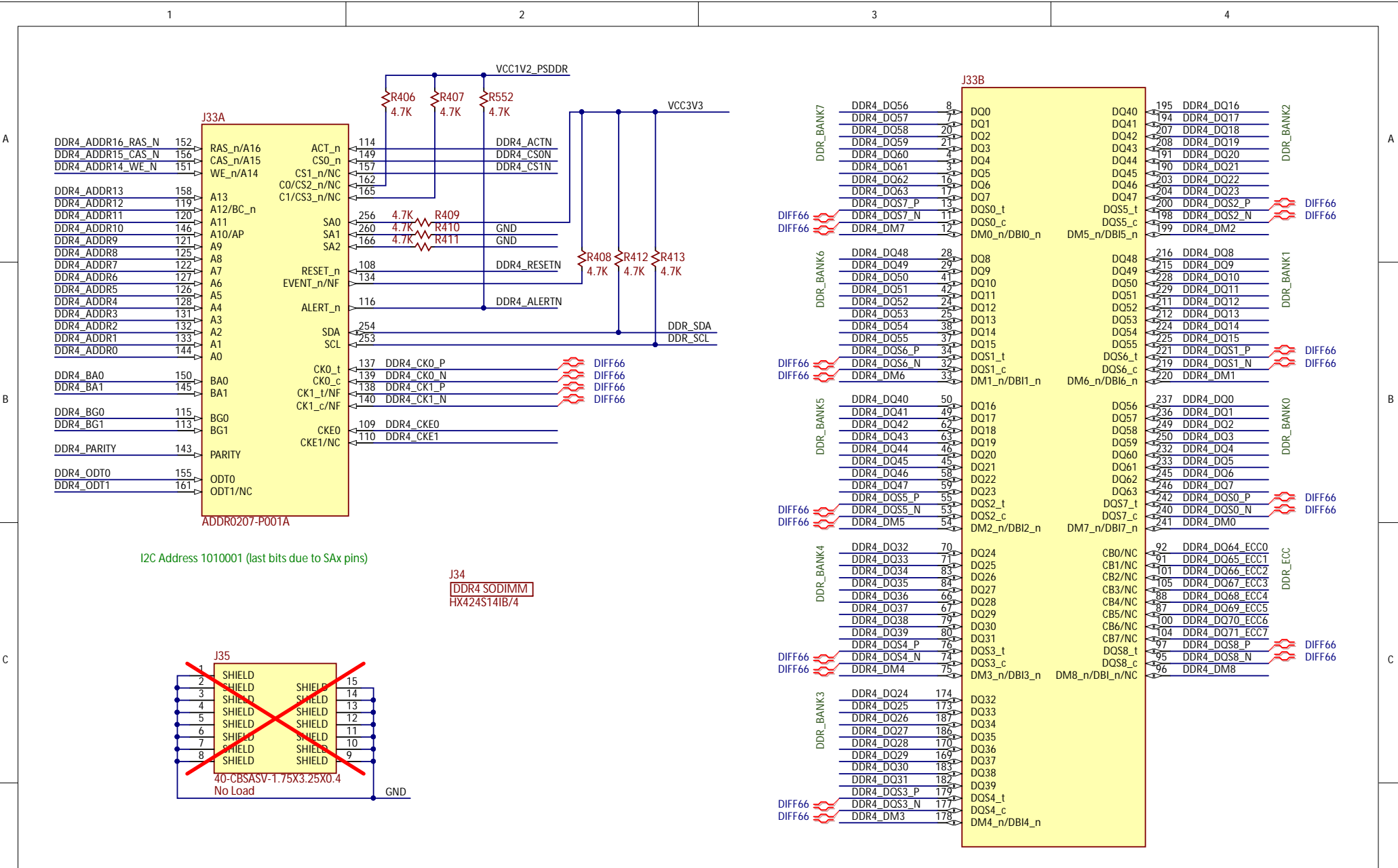
3

4



|                       |                   |                |
|-----------------------|-------------------|----------------|
| Title                 |                   | Rev            |
| <b>Genesys ZU-5EV</b> |                   | <b>D.1</b>     |
|                       |                   | Copyright 2021 |
| Circuit               | PL POWER: VCU OSC |                |
| Doc#                  | 500-383           |                |
| Engineer              | EG                |                |
| Author                | IC                |                |
| Date                  | 05/05/2021        |                |
| Sheet#                | 30 out of 40      |                |

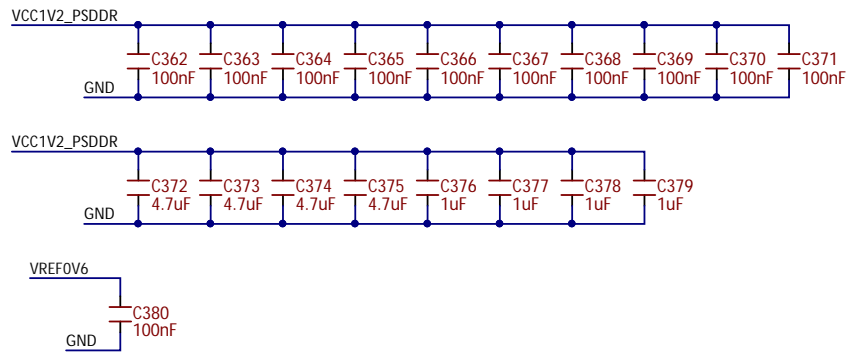
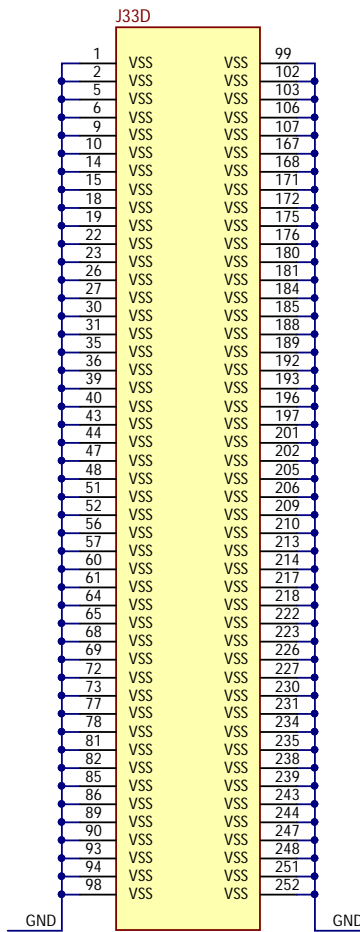
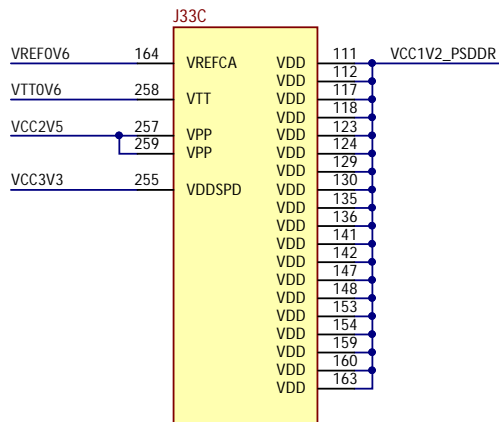




|          |                   |  |           |      |
|----------|-------------------|--|-----------|------|
| Title    | Genesys ZU-5EV    |  | Rev       | D.1  |
| Circuit  | DDR4 SODIMM INTFC |  | Copyright | 2021 |
| Doc#     | 500-383           |  |           |      |
| Engineer | EG                |  |           |      |
| Author   | IC                |  |           |      |
| Date     | 05/05/2021        |  |           |      |
| Sheet#   | 31 out of 40      |  |           |      |

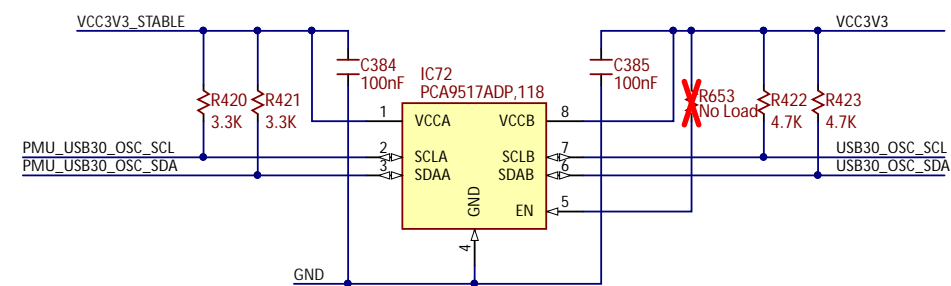
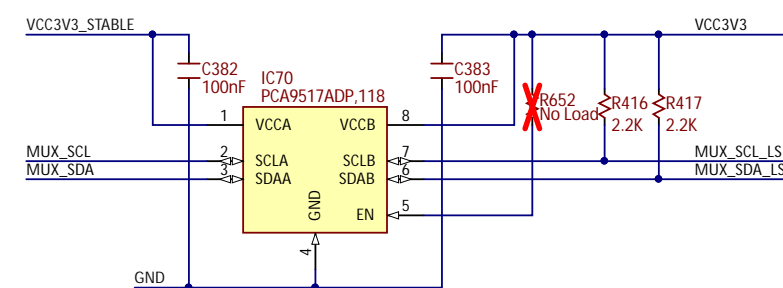
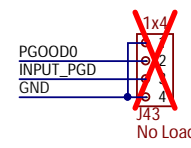
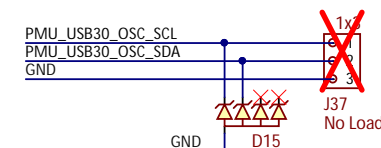
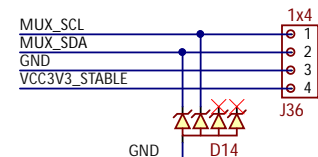
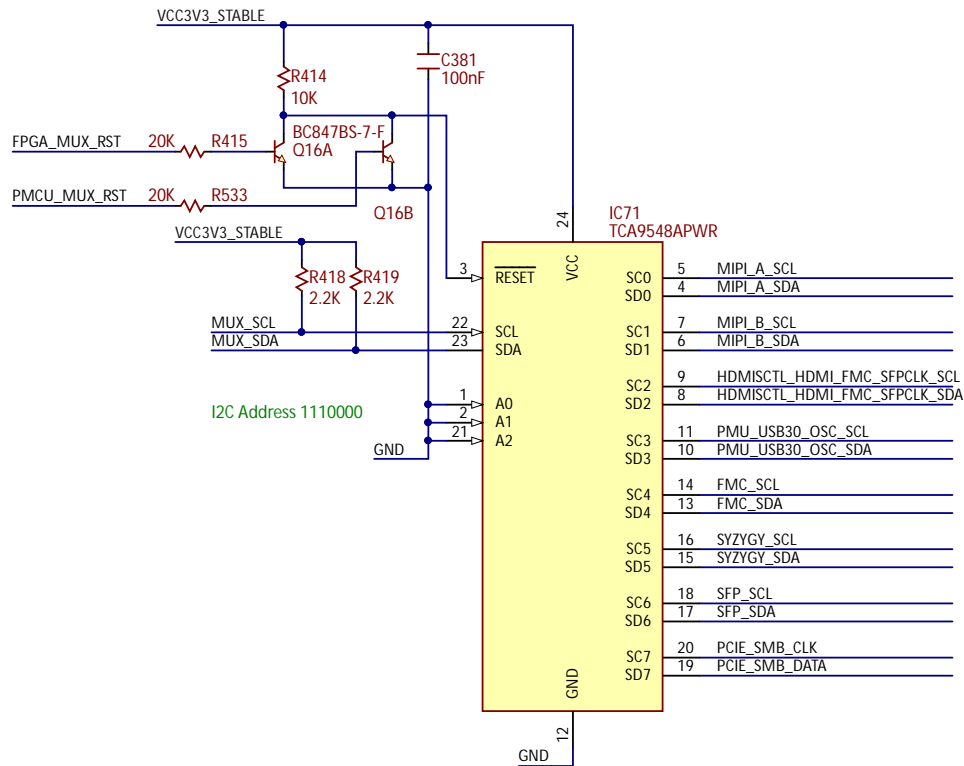


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|                      |  |                |
|----------------------|--|----------------|
| Title                |  | Rev            |
| Genesys ZU-5EV       |  | D.1            |
|                      |  | Copyright 2021 |
| Circuit              |  |                |
| DDR4 SODIMM SUPPLIES |  |                |
| Doc# 500-383         |  |                |
| Engineer EG          |  |                |
| Author IC            |  |                |
| Date 05/05/2021      |  |                |
| Sheet# 32 out of 40  |  |                |

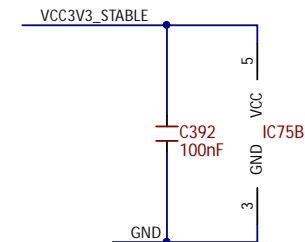
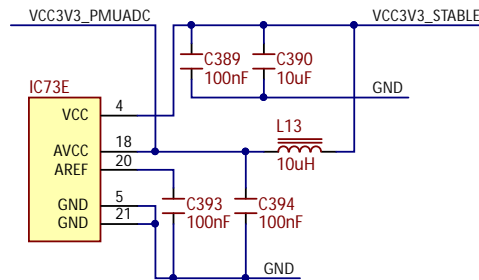
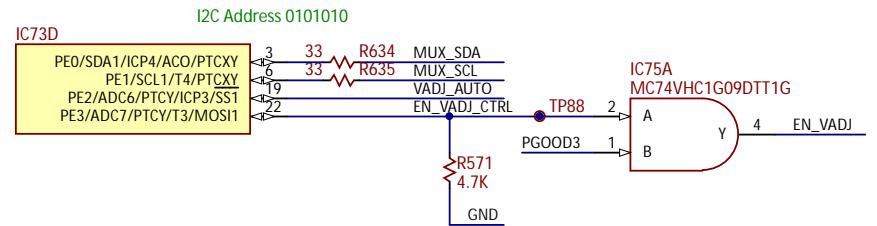
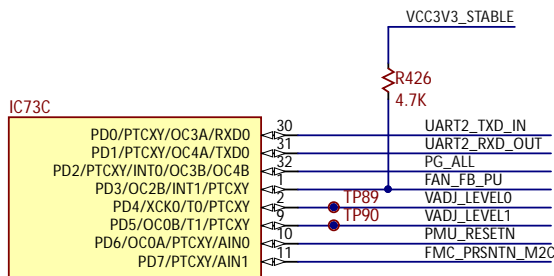
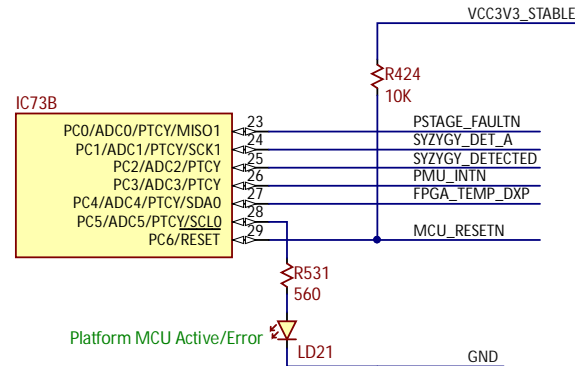
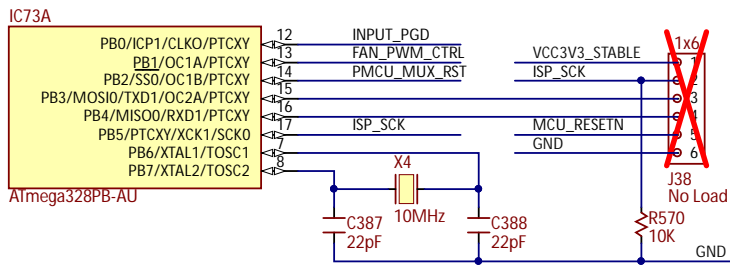




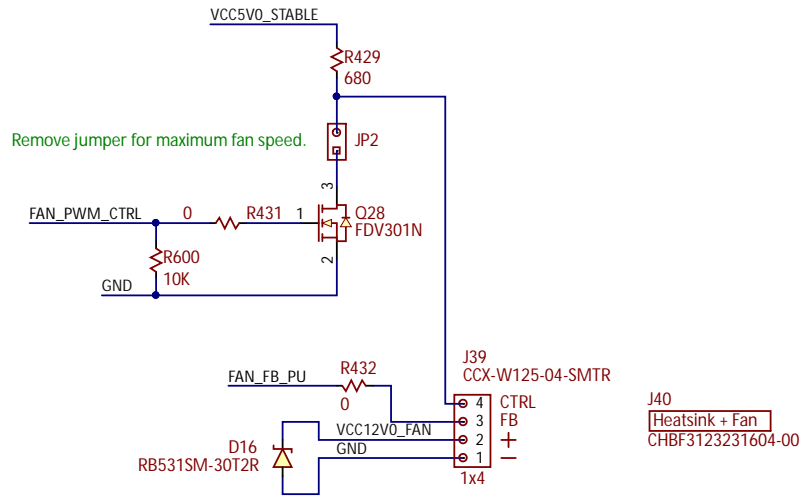
|                         |              |                |
|-------------------------|--------------|----------------|
| Title                   |              | Rev            |
| <h1>Genesys ZU-5EV</h1> |              | <h2>D.1</h2>   |
|                         |              | Copyright 2021 |
| Circuit                 |              |                |
| I2C Interfaces          |              |                |
| Doc#                    | 500-383      |                |
| Engineer                | EG           |                |
| Author                  | IC           |                |
| Date                    | 05/05/2021   |                |
| Sheet#                  | 33 out of 40 |                |



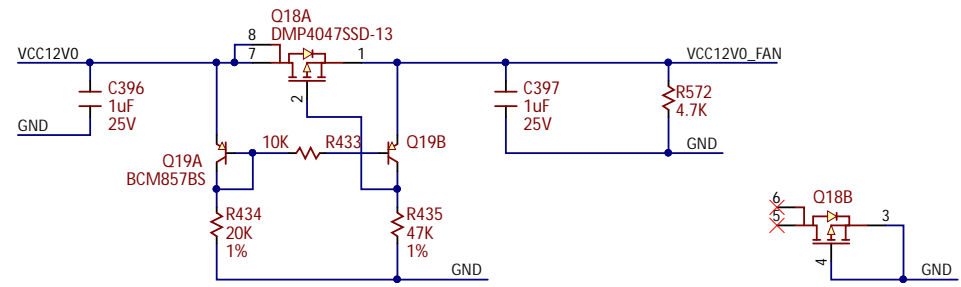
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|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
| Circuit        |              | Copyright 2021 |
| Platform MCU   |              |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 34 out of 40 |                |

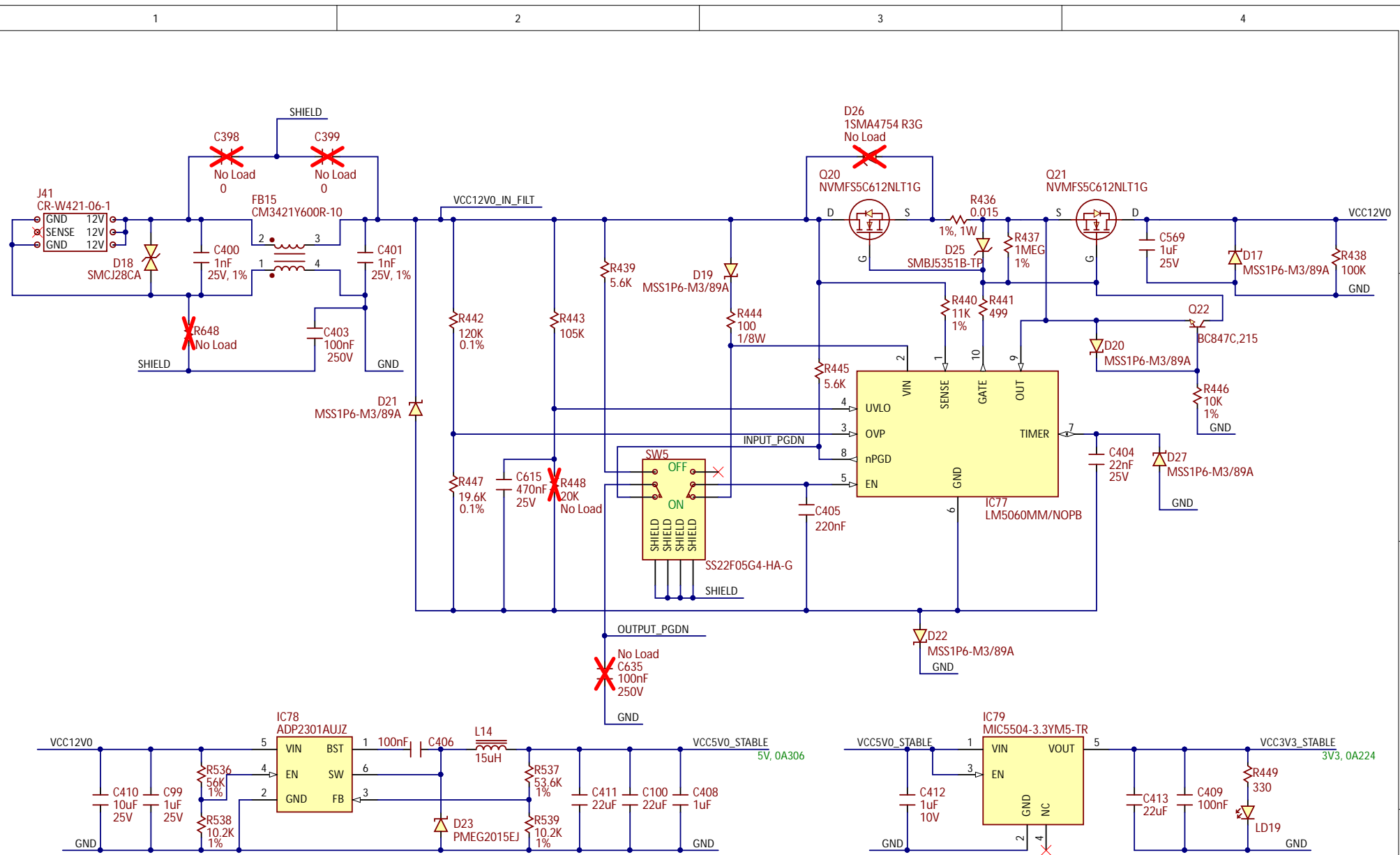


J40  
Heatsink + Fan  
CHBF3123231604-00



|          |  |                |  |           |  |      |  |
|----------|--|----------------|--|-----------|--|------|--|
| Title    |  | Genesys ZU-5EV |  | Rev       |  | D.1  |  |
|          |  |                |  | Copyright |  | 2021 |  |
| Circuit  |  | FAN Control    |  |           |  |      |  |
| Doc#     |  | 500-383        |  |           |  |      |  |
| Engineer |  | EG             |  |           |  |      |  |
| Author   |  | IC             |  |           |  |      |  |
| Date     |  | 05/05/2021     |  |           |  |      |  |
| Sheet#   |  | 35 out of 40   |  |           |  |      |  |

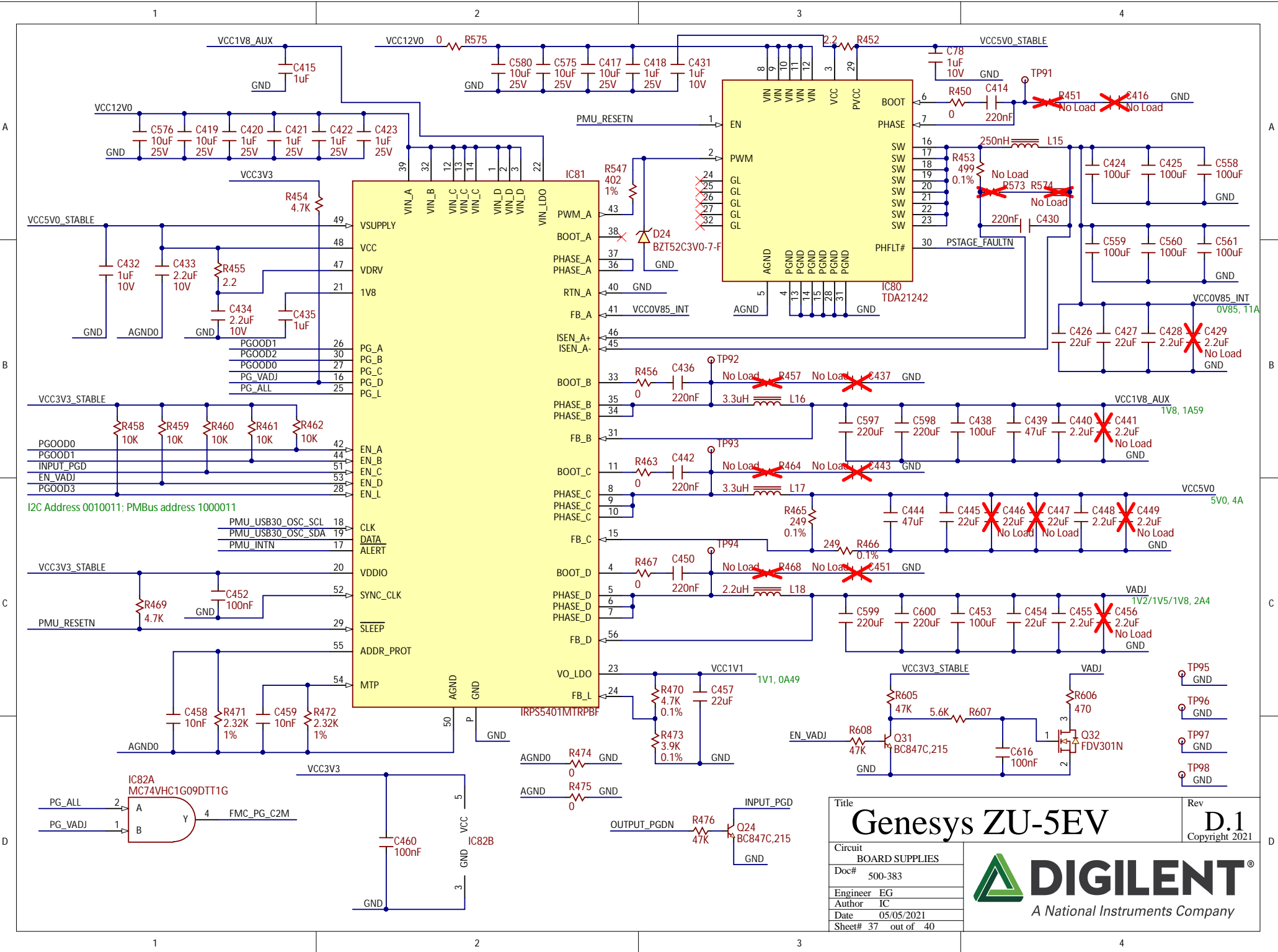




|                |              |                |
|----------------|--------------|----------------|
| Title          |              | Rev            |
| Genesys ZU-5EV |              | D.1            |
| Circuit        |              | Copyright 2021 |
| 12V PROTECTION |              |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 36 out of 40 |                |



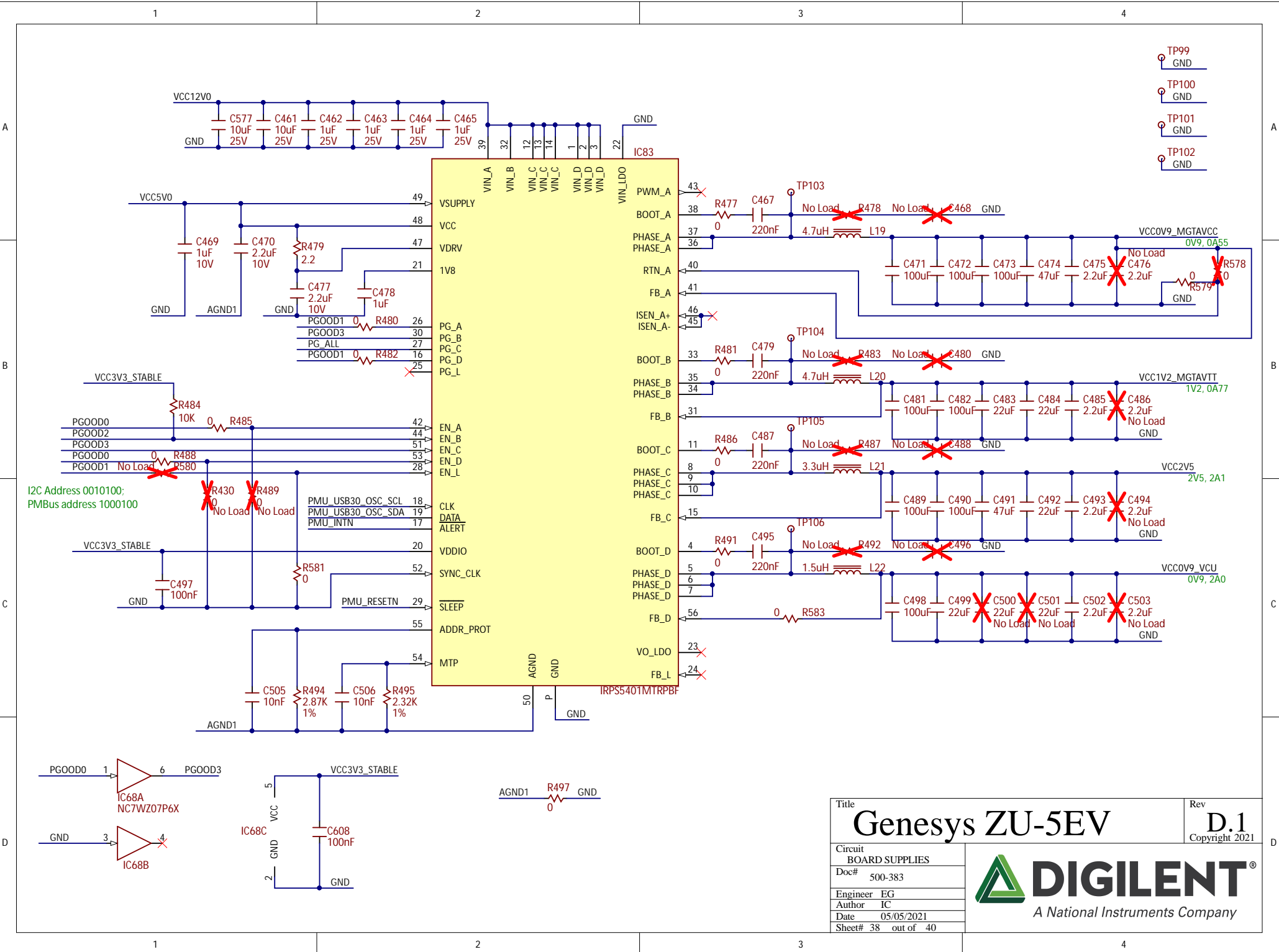
Config Power On



|           |  |                |  |        |  |              |  |
|-----------|--|----------------|--|--------|--|--------------|--|
| Title     |  | Genesys ZU-5EV |  | Rev    |  | D.1          |  |
| Circuit   |  | BOARD SUPPLIES |  | Doc#   |  | 500-383      |  |
| Author    |  | EG             |  | Date   |  | 05/05/2021   |  |
| Date      |  | 05/05/2021     |  | Sheet# |  | 37 out of 40 |  |
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| Circuit        |              | Copyright 2021 |
| BOARD SUPPLIES |              |                |
| Doc#           | 500-383      |                |
| Engineer       | EG           |                |
| Author         | IC           |                |
| Date           | 05/05/2021   |                |
| Sheet#         | 38 out of 40 |                |



A

B

C

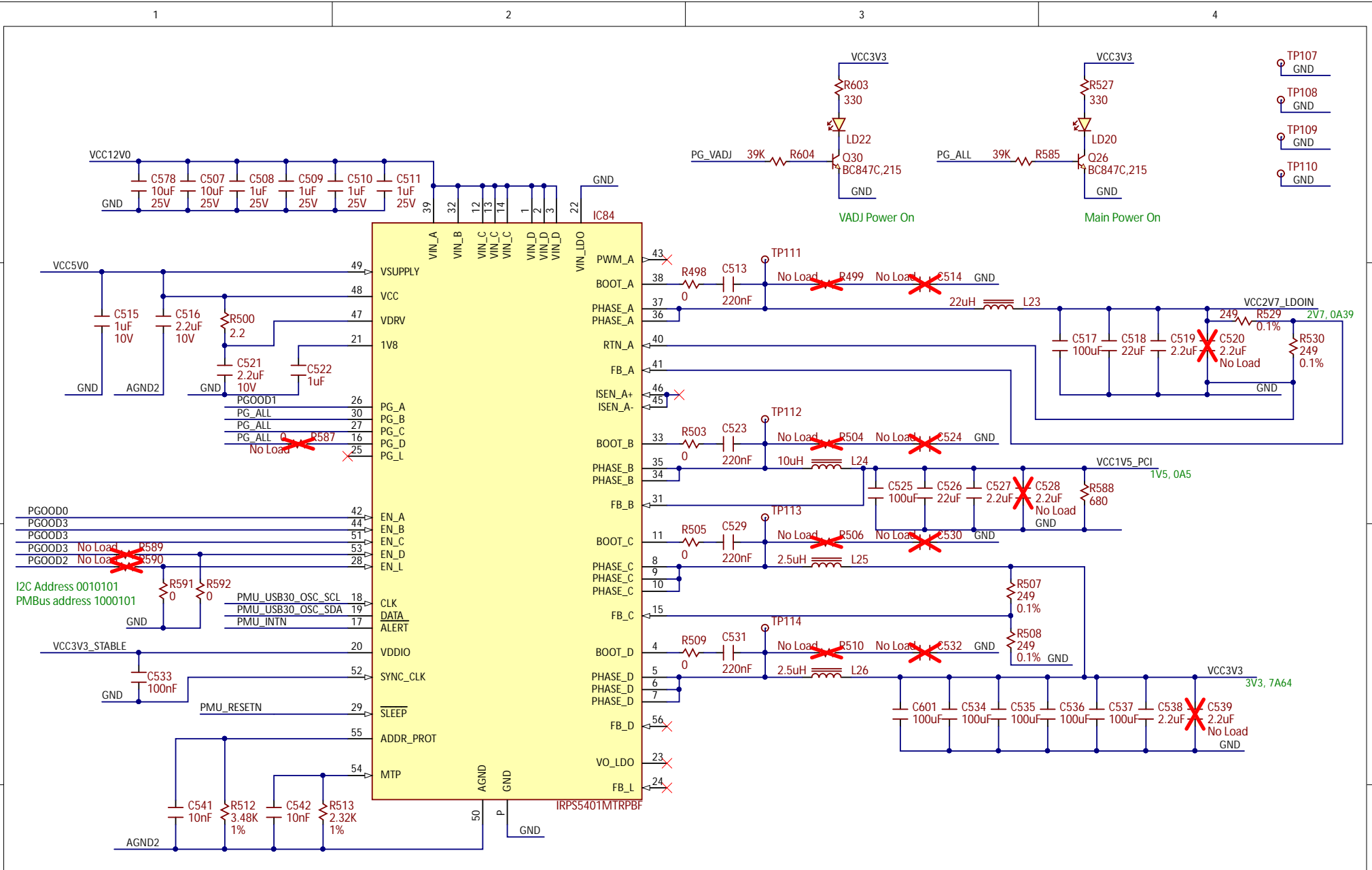
D

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2

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4



|                        |              |                |
|------------------------|--------------|----------------|
| Title                  |              | Rev            |
| Genesys ZU-5EV         |              | D.1            |
| Circuit BOARD SUPPLIES |              | Copyright 2021 |
| Doc#                   | 500-383      |                |
| Engineer               | EG           |                |
| Author                 | IC           |                |
| Date                   | 05/05/2021   |                |
| Sheet#                 | 39 out of 40 |                |



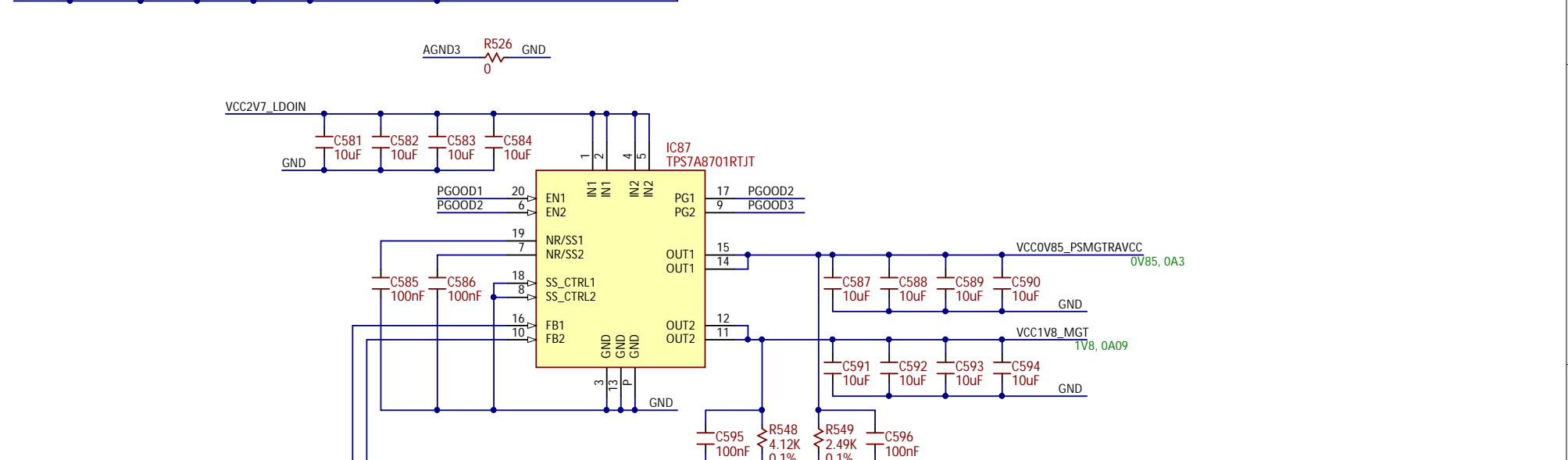
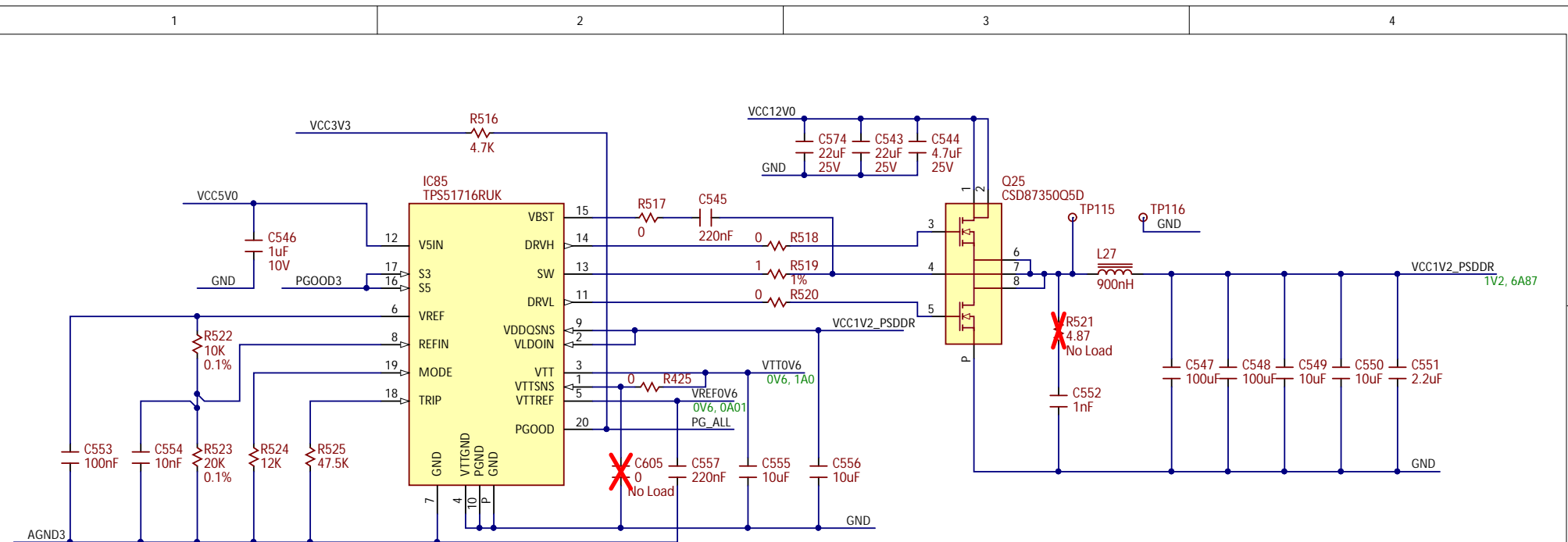
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|                        |              |                |
|------------------------|--------------|----------------|
| Title                  |              | Rev            |
| <b>Genesys ZU-5EV</b>  |              | <b>D.1</b>     |
| Circuit                |              | Copyright 2021 |
| DDR4 SUPPLY; GT SUPPLY |              |                |
| Doc#                   | 500-383      |                |
| Engineer               | EG           |                |
| Author                 | IC           |                |
| Date                   | 05/05/2021   |                |
| Sheet#                 | 40 out of 40 |                |

