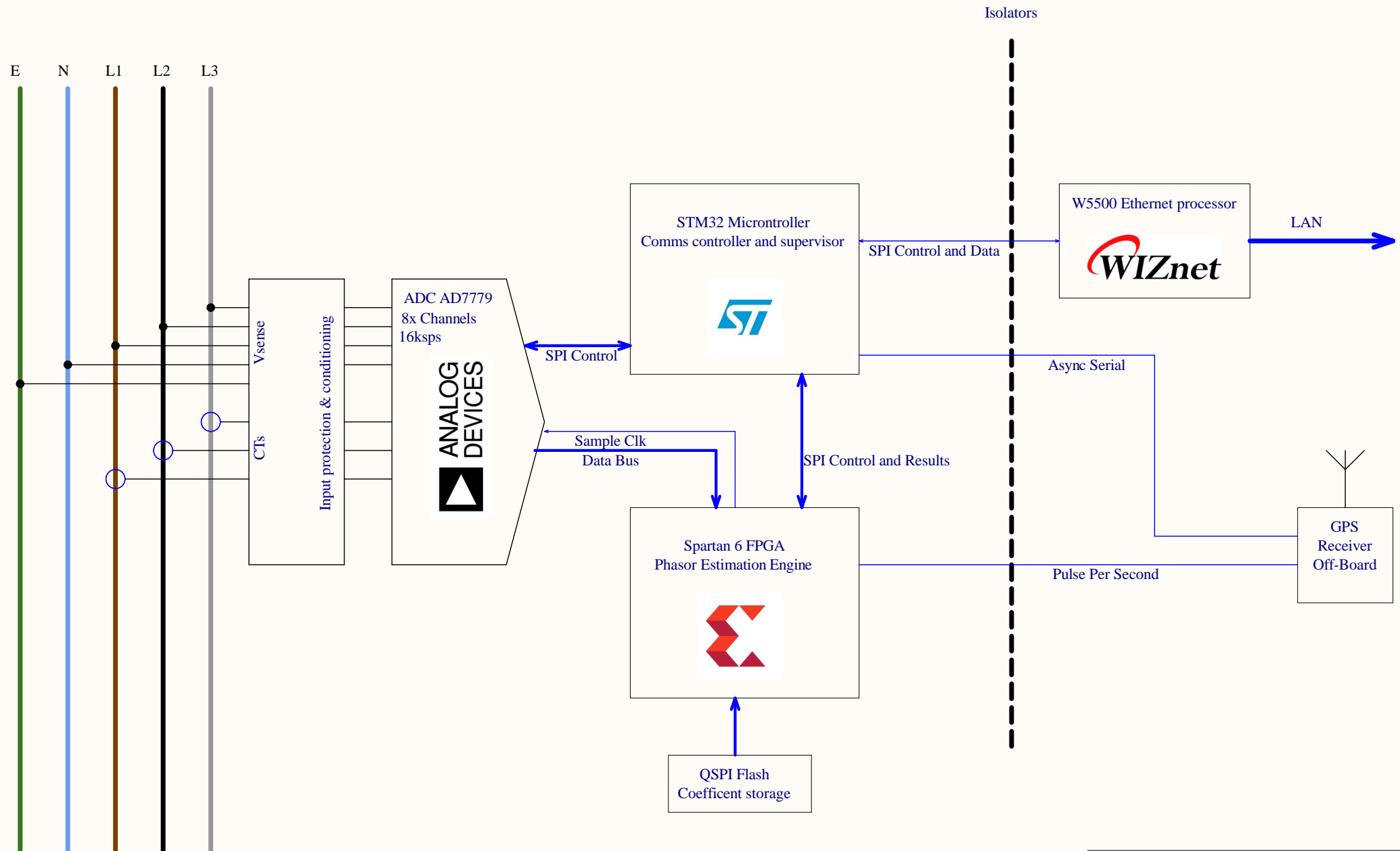


# FPGA based Phasor Measurement Unit 0.1



Title FPGA based Phasor Measurement Unit - System Diagram		
Size A3	Number	Revision
Date: 6/20/2020	Sheet of	Drawn By:
File: C:\Source\...\[01] - CoverSheet.SchDoc		

	1	2	3	4																													
A	<div>PCB Issues</div> <div>- OE enable on oscillator is active high, not low. Needs to be swaped from pull down to pull up.</div>				A																												
B					B																												
C					C																												
D	<table><tr><td colspan="4">Title</td></tr><tr><td colspan="4">FPGA based Phasor Measurement Unit - README</td></tr><tr><td>Size</td><td colspan="2">Number</td><td colspan="2">Revision</td></tr><tr><td>A4</td><td colspan="2"></td><td colspan="2"></td></tr><tr><td>Date:</td><td colspan="2">6/20/2020</td><td colspan="2">Sheet of</td></tr><tr><td>File:</td><td colspan="2">C:\Source\...\[02] - Notes.SchDoc</td><td colspan="2">Drawn By:</td></tr></table>				Title				FPGA based Phasor Measurement Unit - README				Size	Number		Revision		A4					Date:	6/20/2020		Sheet of		File:	C:\Source\...\[02] - Notes.SchDoc		Drawn By:		D
Title																																	
FPGA based Phasor Measurement Unit - README																																	
Size	Number		Revision																														
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Date:	6/20/2020		Sheet of																														
File:	C:\Source\...\[02] - Notes.SchDoc		Drawn By:																														
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A

B

C

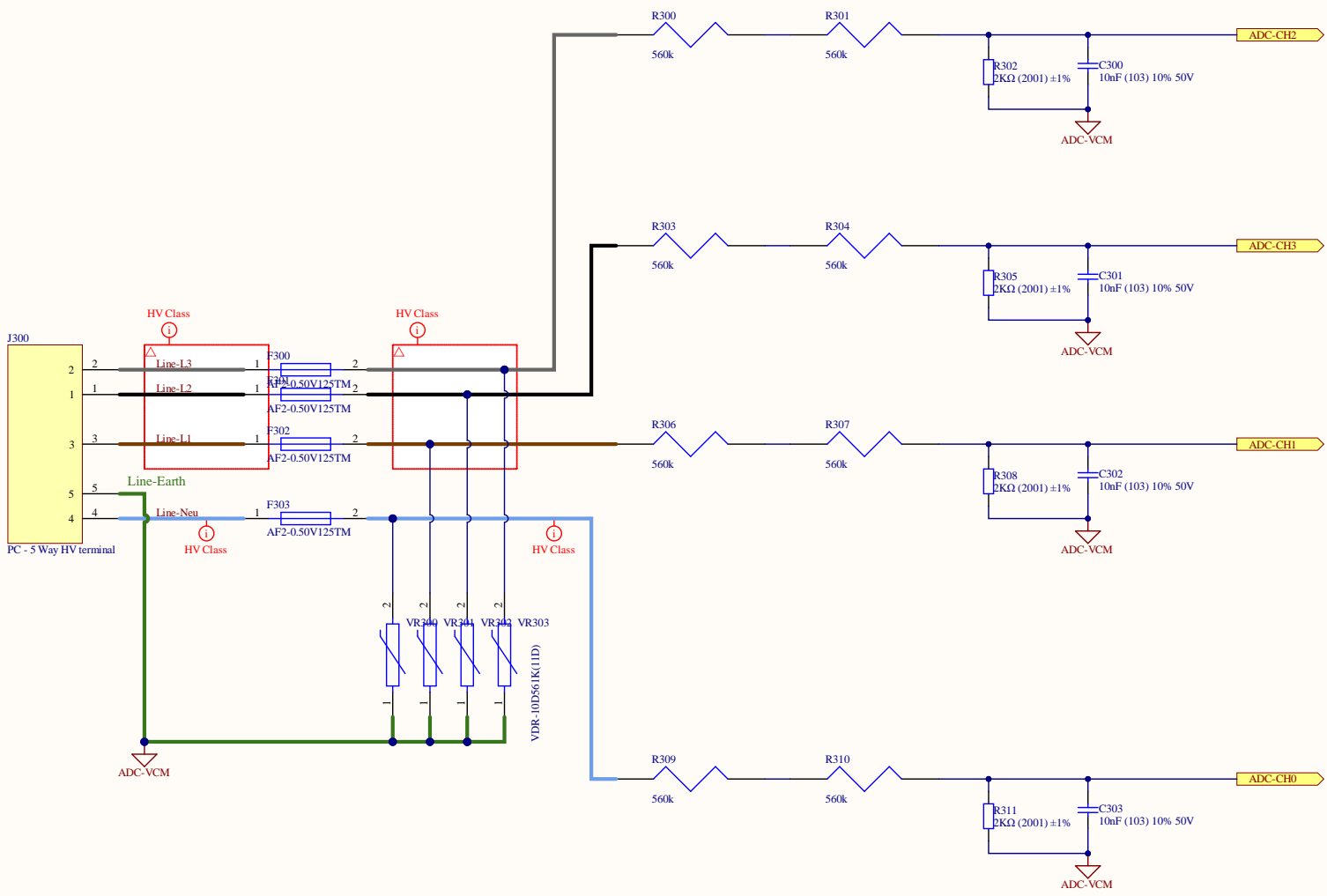
D

A

B

C

D



Vin nom. (p-p)= $250*\sqrt{2}=707V$   
Vadc-input (peak-peak nominal) =  $707*2/(560*2+2) = 1.26V$   
Vadc ref = 2.5V

Input f-3db =  $1/(2 * \pi * 2k * C)$   
Input f-3db =  $1/(2 * \pi * 2k * 10n) = 8kHz$

Title		
FPGA based Phasor Measurement Unit - HV Input		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\03] - HV Input.SchDoc	Drawn By:

A

B

C

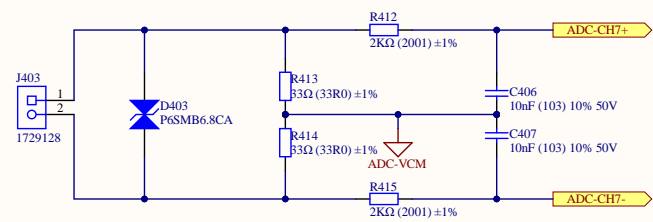
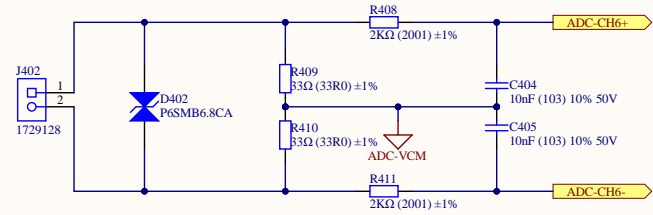
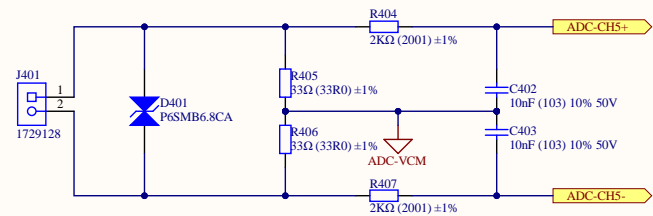
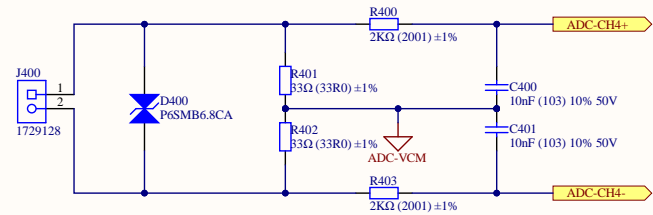
D

A

B

C

D



Title		
FPGA based Phasor Measurement Unit - CT Input		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\[04] - Current Transformers.SchDoc	Drawn By:

A

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C

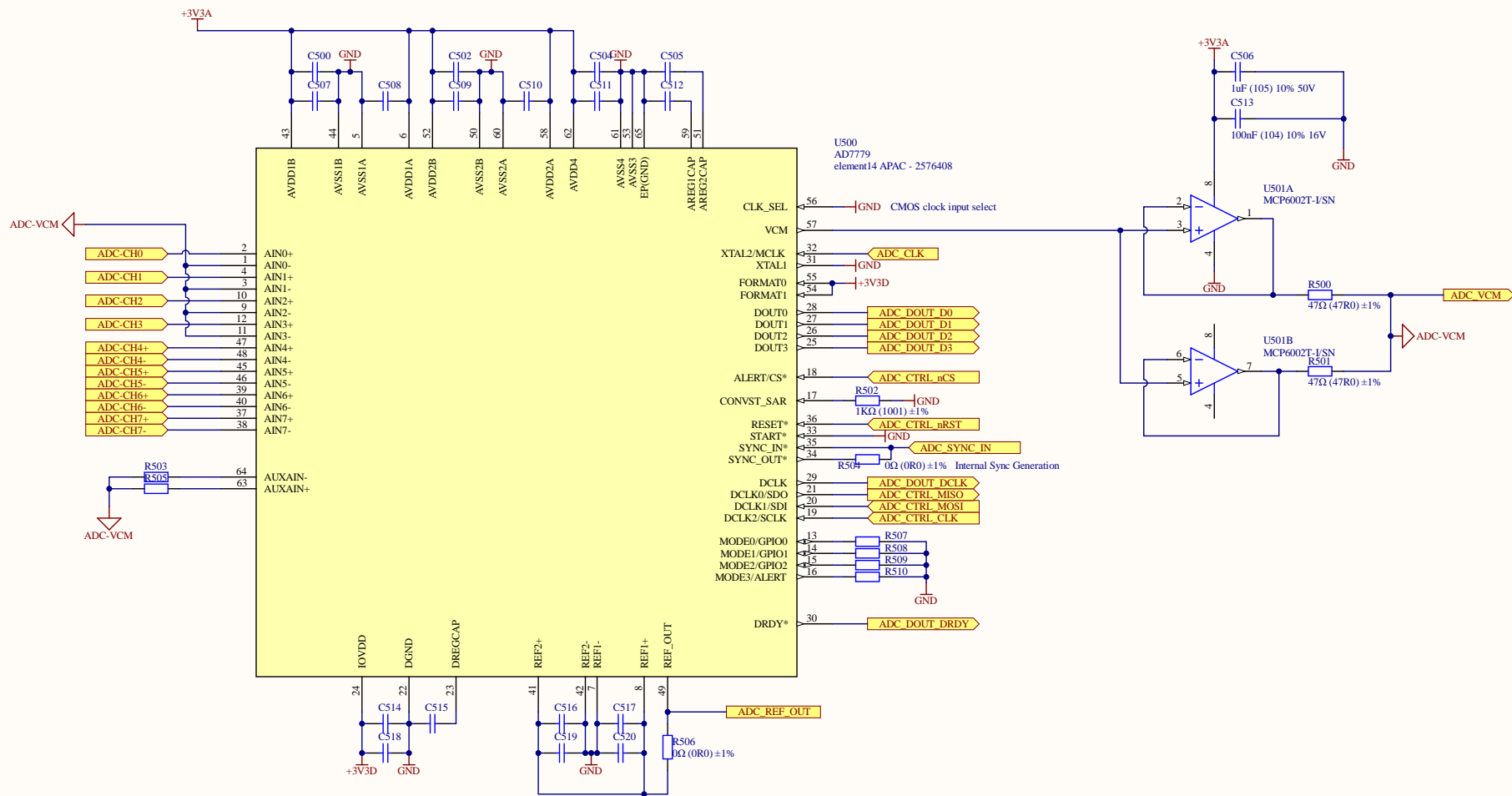
D

A

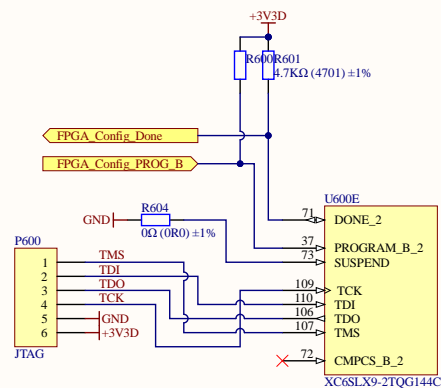
B

C

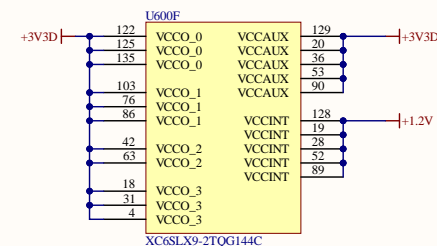
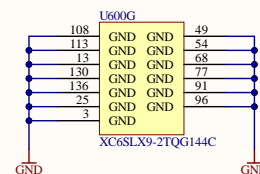
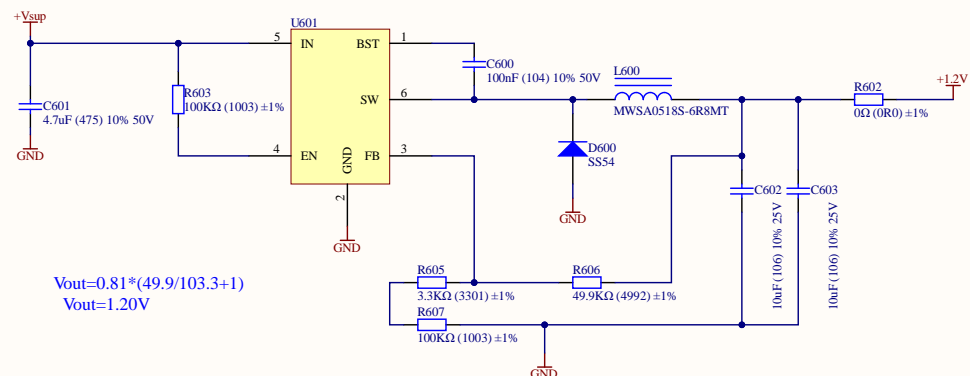
D



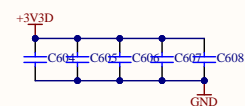
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FPGA based Phasor Measurement Unit - AD7779 ADC		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\[05] - ADC.SchDoc	Drawn By:



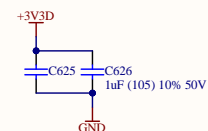
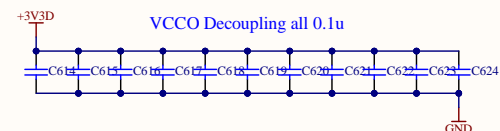
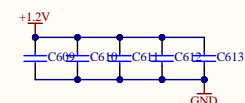
- Spartan 6 - Slave Serial configuration
- Configure by ARM processor - 0.5MB for the LX16
- M[1:0] - "11" for slave serial select
- Add pull-up to Done pin and connect to ARM, so it knows the FPGA believes configuration is complete



VCCAUX Decoupling all 0.1u



VCCINT Decoupling all 0.1u



Title <b>FPGA based Phasor Measurement Unit - FPGA Aux Systems</b>		
Size A3	Number	Revision
Date: 6/20/2020	File: C:\Source\1\061 - FPGA Aux.SchDoc	Sheet of Drawn By:

A

A

B

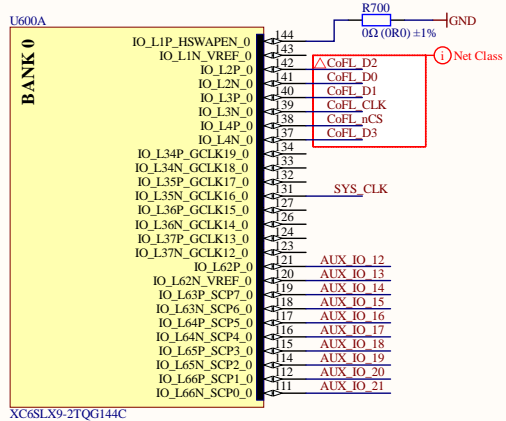
B

C

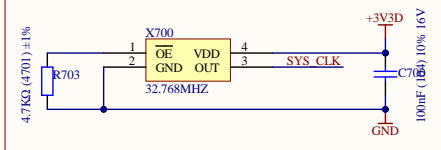
C

D

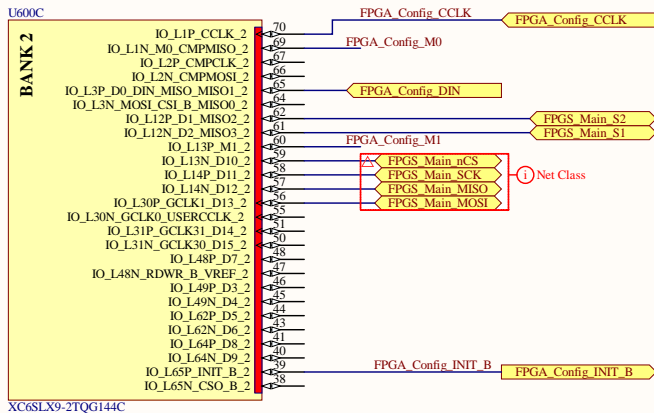
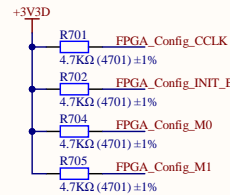
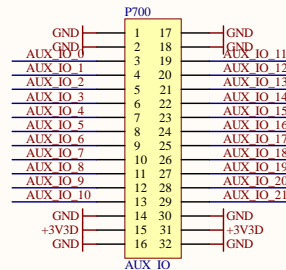
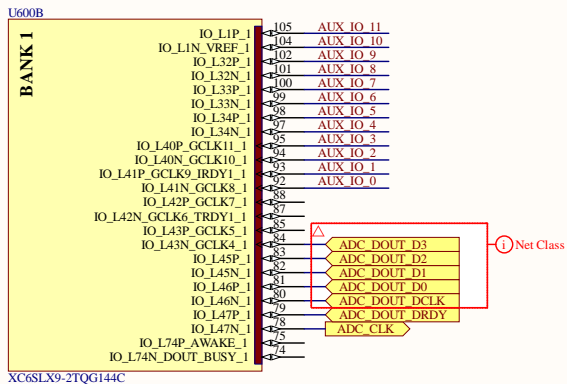
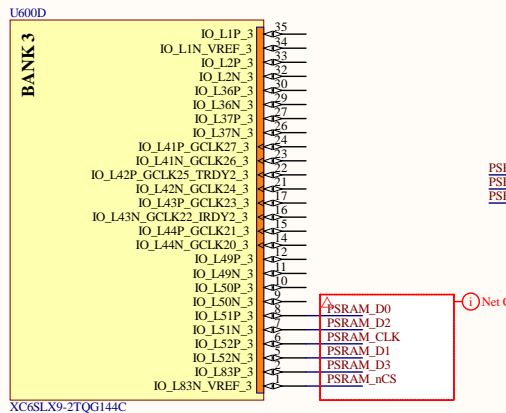
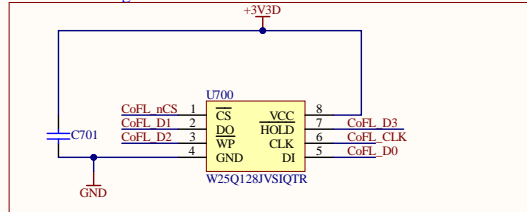
D



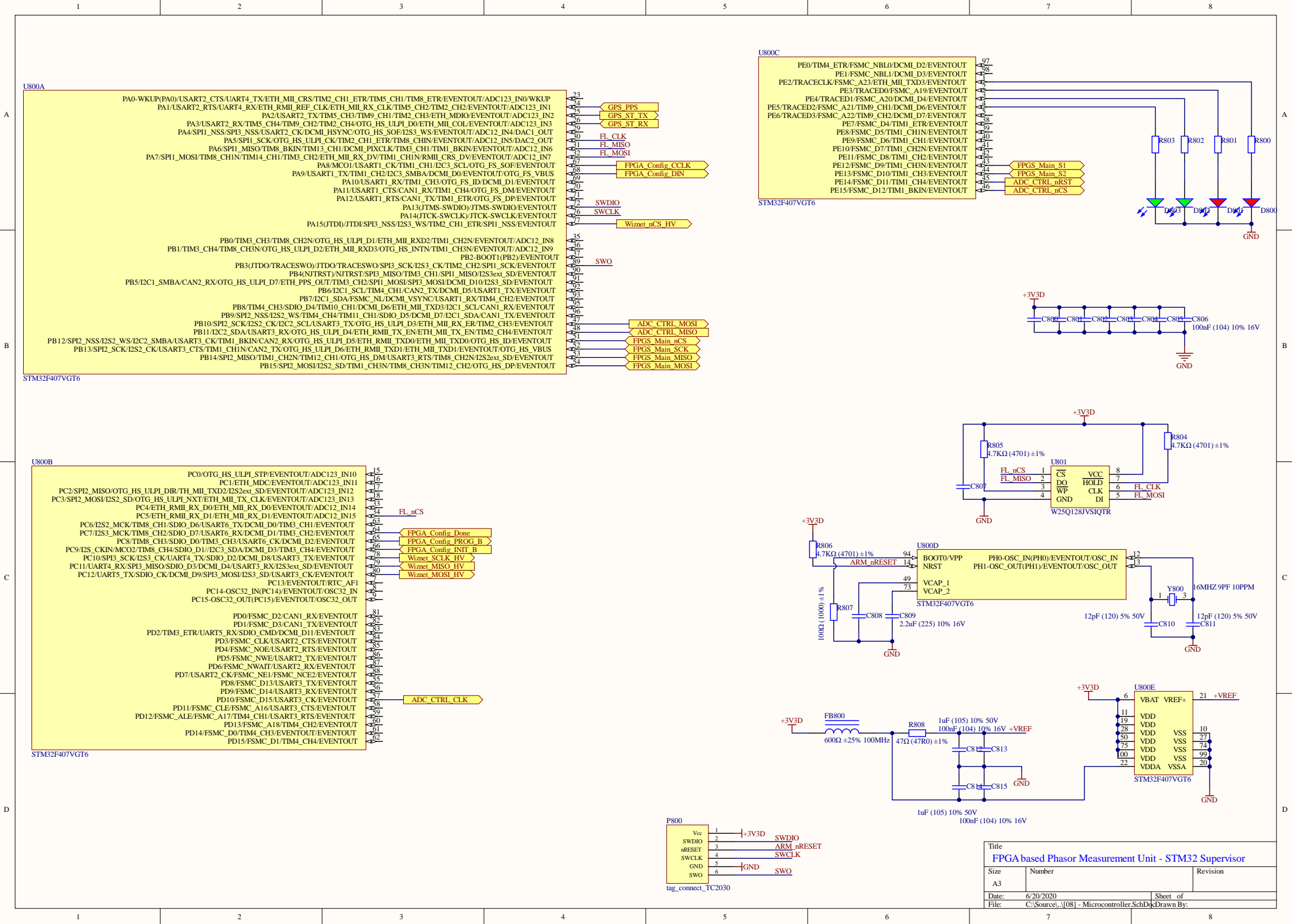
32.768MHz Oscillator



Coefficient storage flash

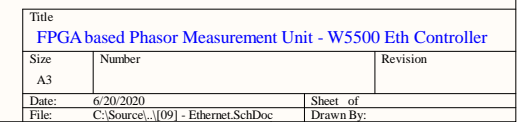
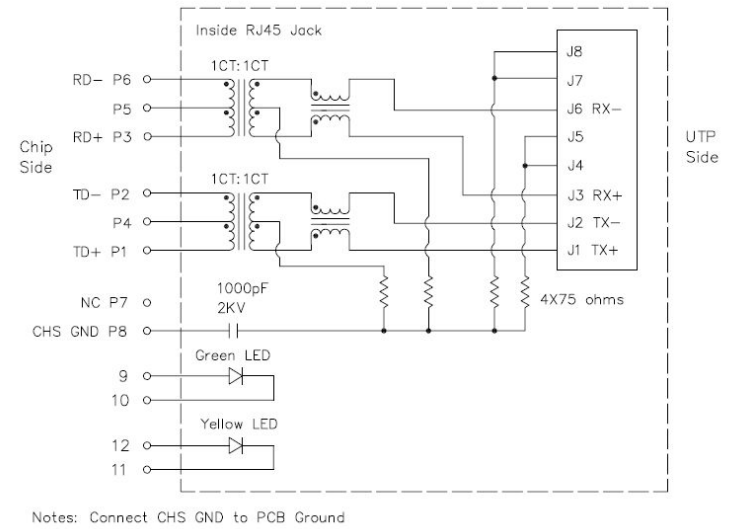


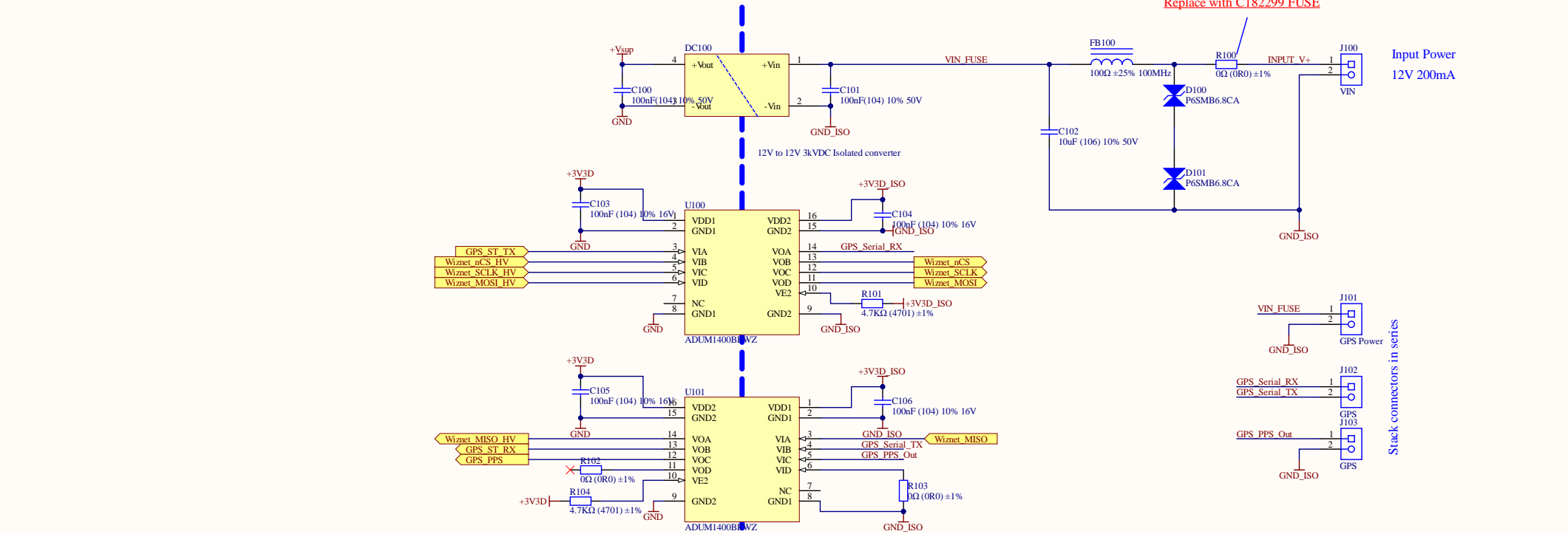
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FPGA based Phasor Measurement Unit - FPGA Main IO		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\071 - FPGA IO.SchDoc	Drawn By:



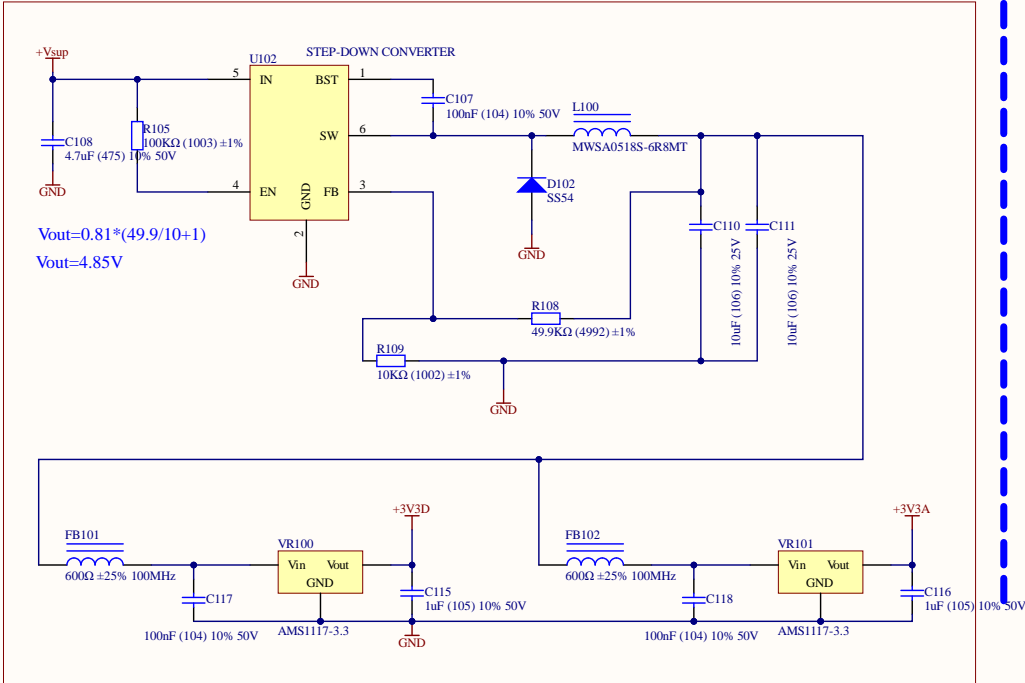
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FPGA based Phasor Measurement Unit - STM32 Supervisor		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\[08] - Microcontroller.SchDoc	Drawn By:



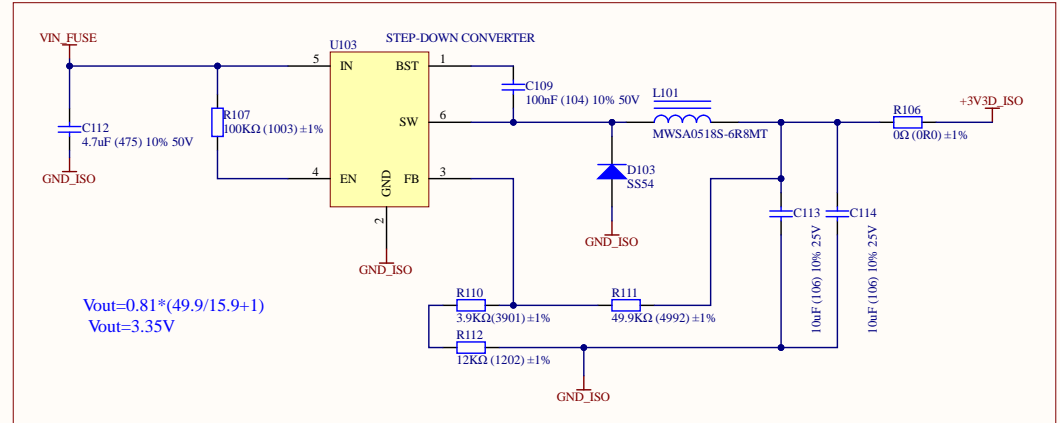




### Main digital and analog supply



### Isolated 3.3V Supply Generation



Title		
FPGA based Phasor Measurement Unit - Isolation and supply		
Size	Number	Revision
A3		
Date:	6/20/2020	Sheet of
File:	C:\Source\...\[10] - Isolation.SchDoc	Drawn By:

