
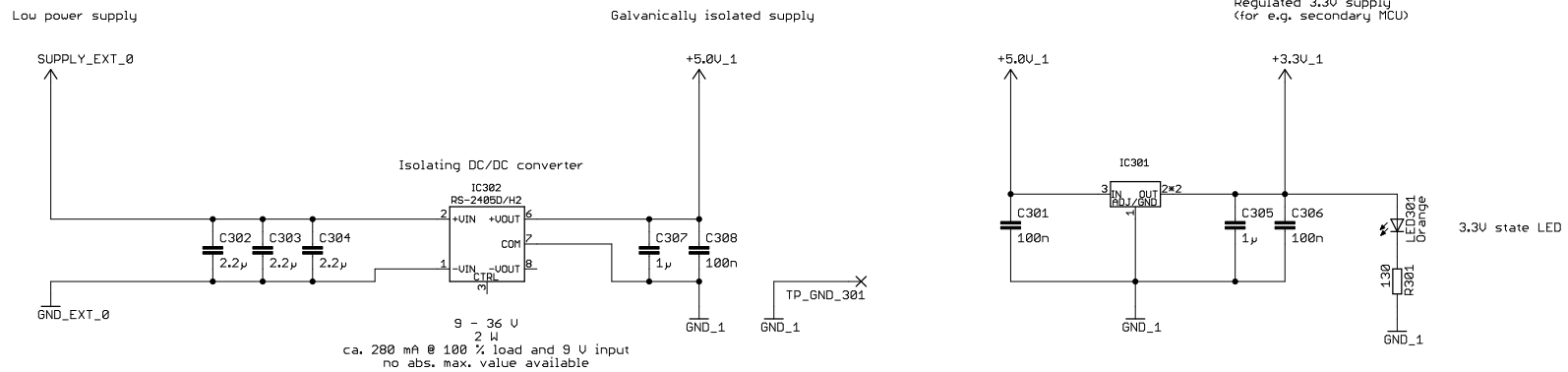

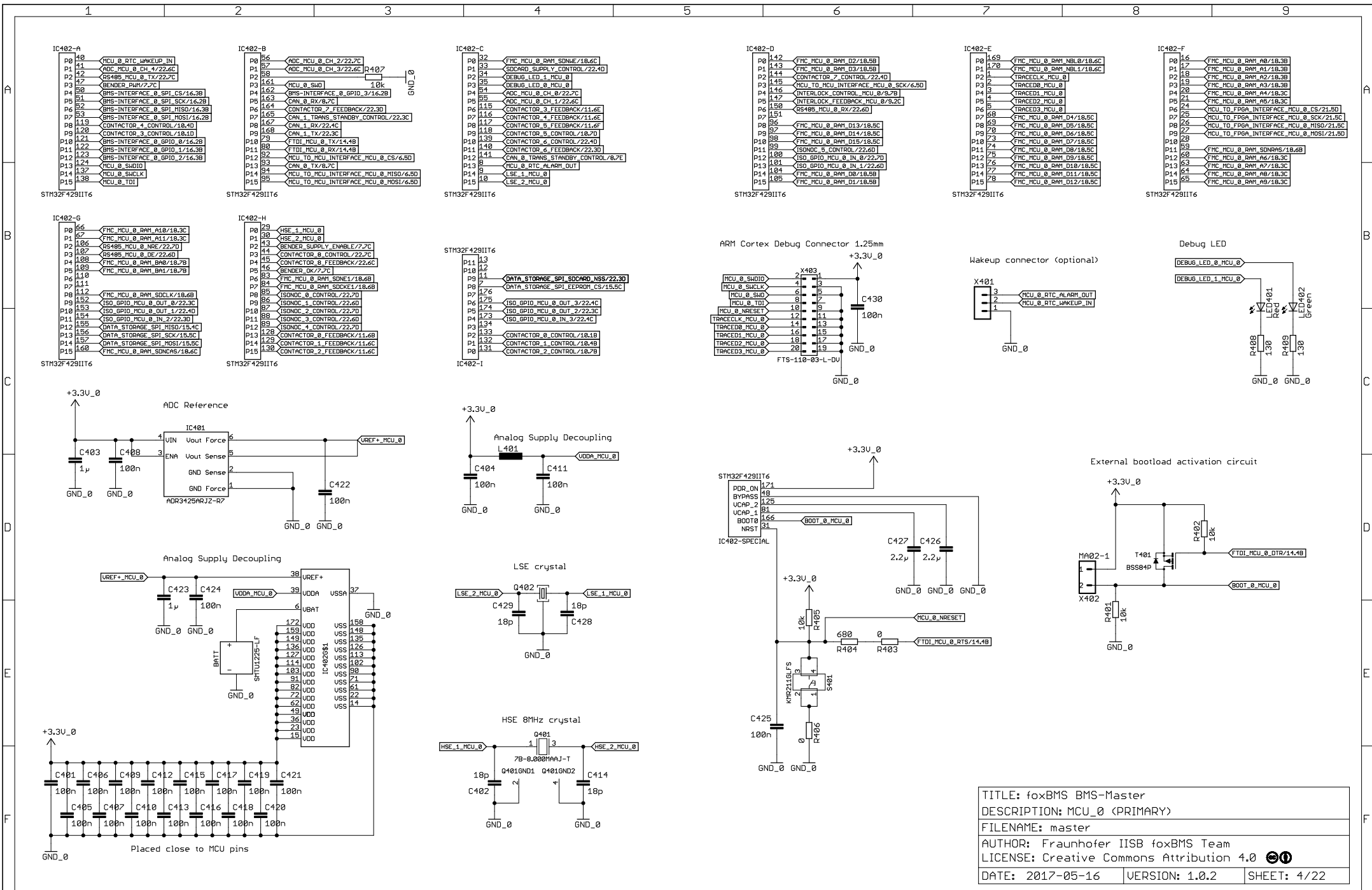
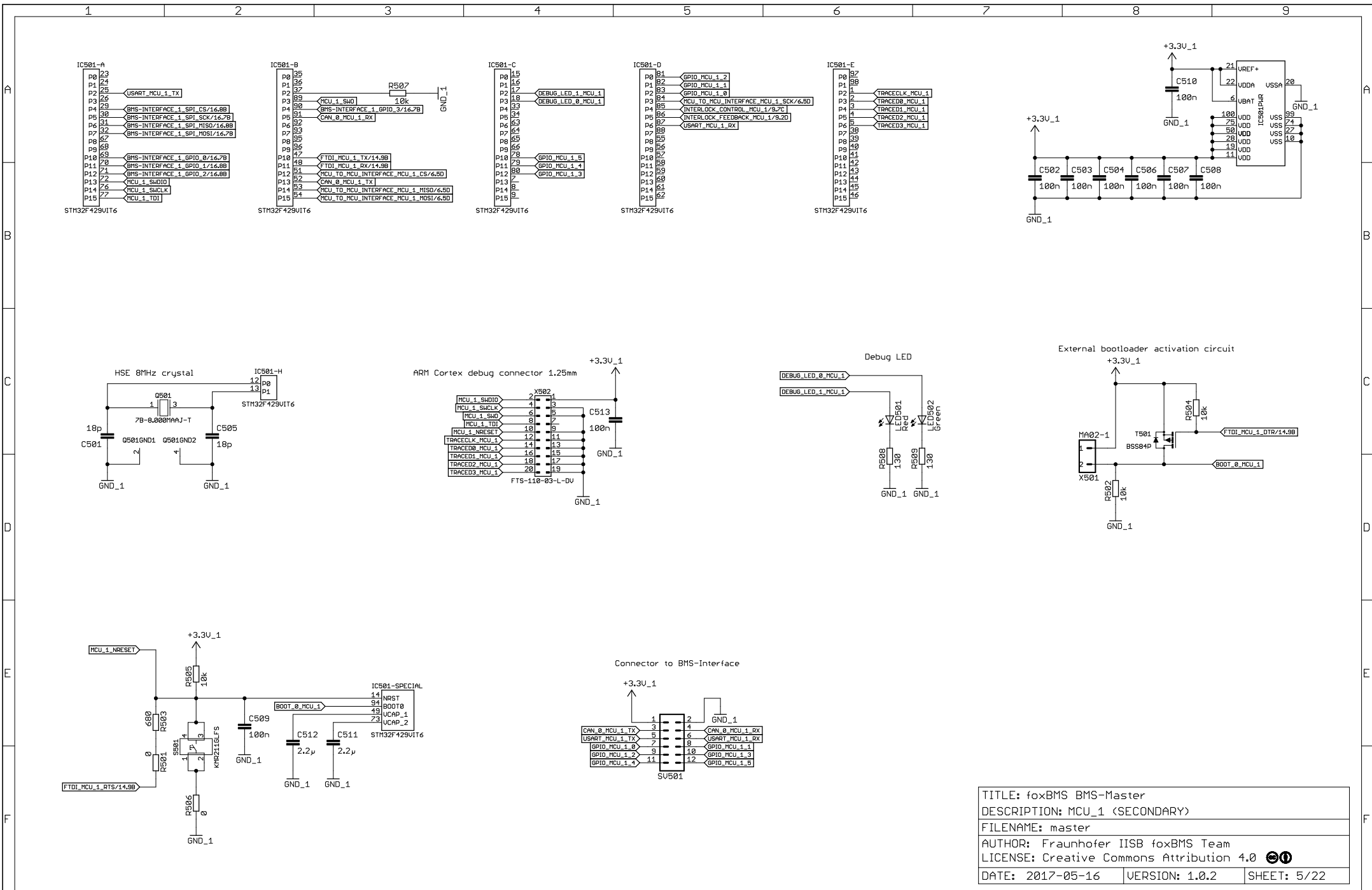


TITLE: foxBMS BMS-Master		
DESCRIPTION: SUPPLY_0		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 2/22



TITLE: foxBMS BMS-Master		
DESCRIPTION: SUPPLY_1		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 3/22





1 2 3 4 5 6 7 8 9

A

B

C

D

E

F

Isolated Bidirectional Interface
between MCU_0 (primary) and MCU_1 (secondary)
SPI up to 45MHz

MCU_0 (primary)
SPI Slave

MCU_1 (secondary)
SPI Master

+3.3V_0

+3.3V_1

100n
C601

100n
C602

GND_0

GND_1

IC601

IC601

VE2

VE4

U0A

U1A

U0B

U1B

U0C

U1C

U0D

U1D

ADUM3401ARW

MCU_TO_MCU_INTERFACE_MCU_0_MOSI/4,2B

MCU_TO_MCU_INTERFACE_MCU_1_MOSI/5,3B

MCU_TO_MCU_INTERFACE_MCU_0_SCK/4,6A


MCU_TO_MCU_INTERFACE_MCU_1_SCK/5,5A

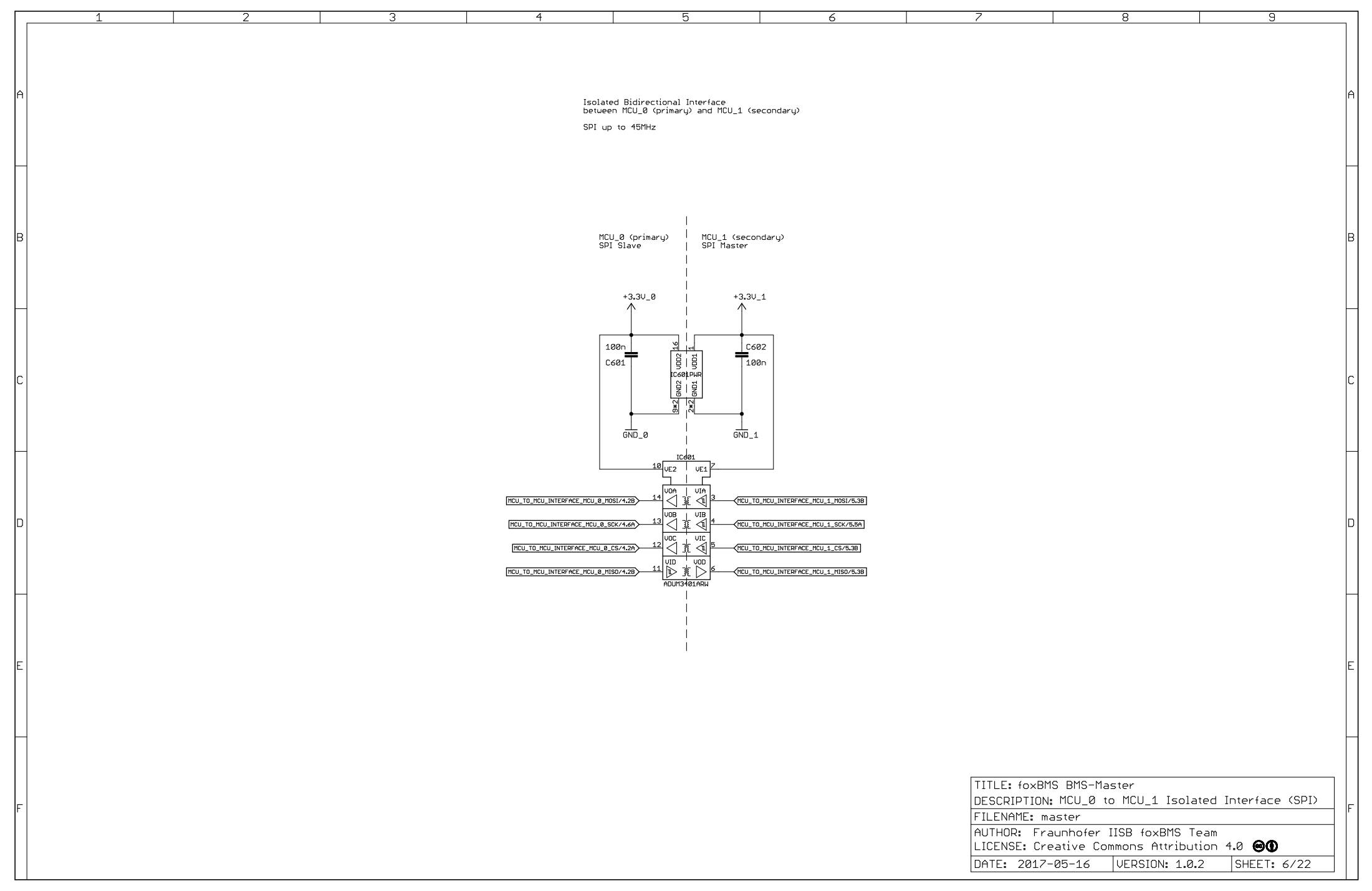
MCU_TO_MCU_INTERFACE_MCU_0_CS/4,2A

MCU_TO_MCU_INTERFACE_MCU_1_CS/5,3B

MCU_TO_MCU_INTERFACE_MCU_0_MISO/4,2B

MCU_TO_MCU_INTERFACE_MCU_1_MISO/5,3B

TITLE: foxBMS BMS-Master		
DESCRIPTION: MCU_0 to MCU_1 Isolated Interface (SPI)		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 6/22



1 2 3 4 5 6 7 8 9

A

B

C

D

E

F

Isolated Bidirectional Interface
between MCU_0 (primary) and MCU_1 (secondary)
SPI up to 45MHz

MCU_0 (primary)
SPI Slave

MCU_1 (secondary)
SPI Master

+3.3V_0

+3.3V_1

100n
C601

100n
C602

GND_0

GND_1

IC601

IC601

VE2

VE4

U0A

U1A

U0B

U1B

U0C

U1C

U0D

U1D

ADUM3401ARW

MCU_TO_MCU_INTERFACE_MCU_0_MOSI/4,2B

MCU_TO_MCU_INTERFACE_MCU_1_MOSI/5,3B

MCU_TO_MCU_INTERFACE_MCU_0_SCK/4,6A


MCU_TO_MCU_INTERFACE_MCU_1_SCK/5,5A

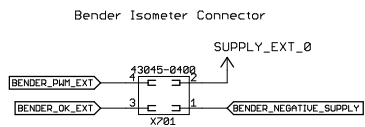
MCU_TO_MCU_INTERFACE_MCU_0_CS/4,2A

MCU_TO_MCU_INTERFACE_MCU_1_CS/5,3B

MCU_TO_MCU_INTERFACE_MCU_0_MISO/4,2B

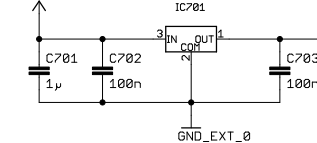
MCU_TO_MCU_INTERFACE_MCU_1_MISO/5,3B

TITLE: foxBMS BMS-Master		
DESCRIPTION: MCU_0 to MCU_1 Isolated Interface (SPI)		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 6/22



Onboard supply

SUPPLY_EXT_0



Status Signal
from Bender Isometer

BENDER_OK_EXT

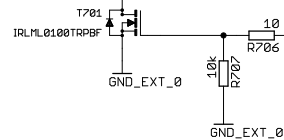
Diagnostic Signal
from Bender Isometer
(PWM coded)

BENDER_PWM_EXT

Solder jumper:
open for Bender IR155-3203 (LS)
closed for Bender IR155-3204/-3210 (HS)

BENDER_NEGATIVE_SUPPLY

Bender Supply LS Switch

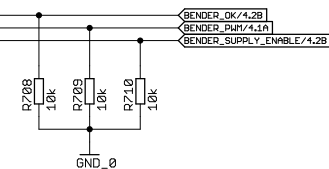


IC702NC1
IC702NC2

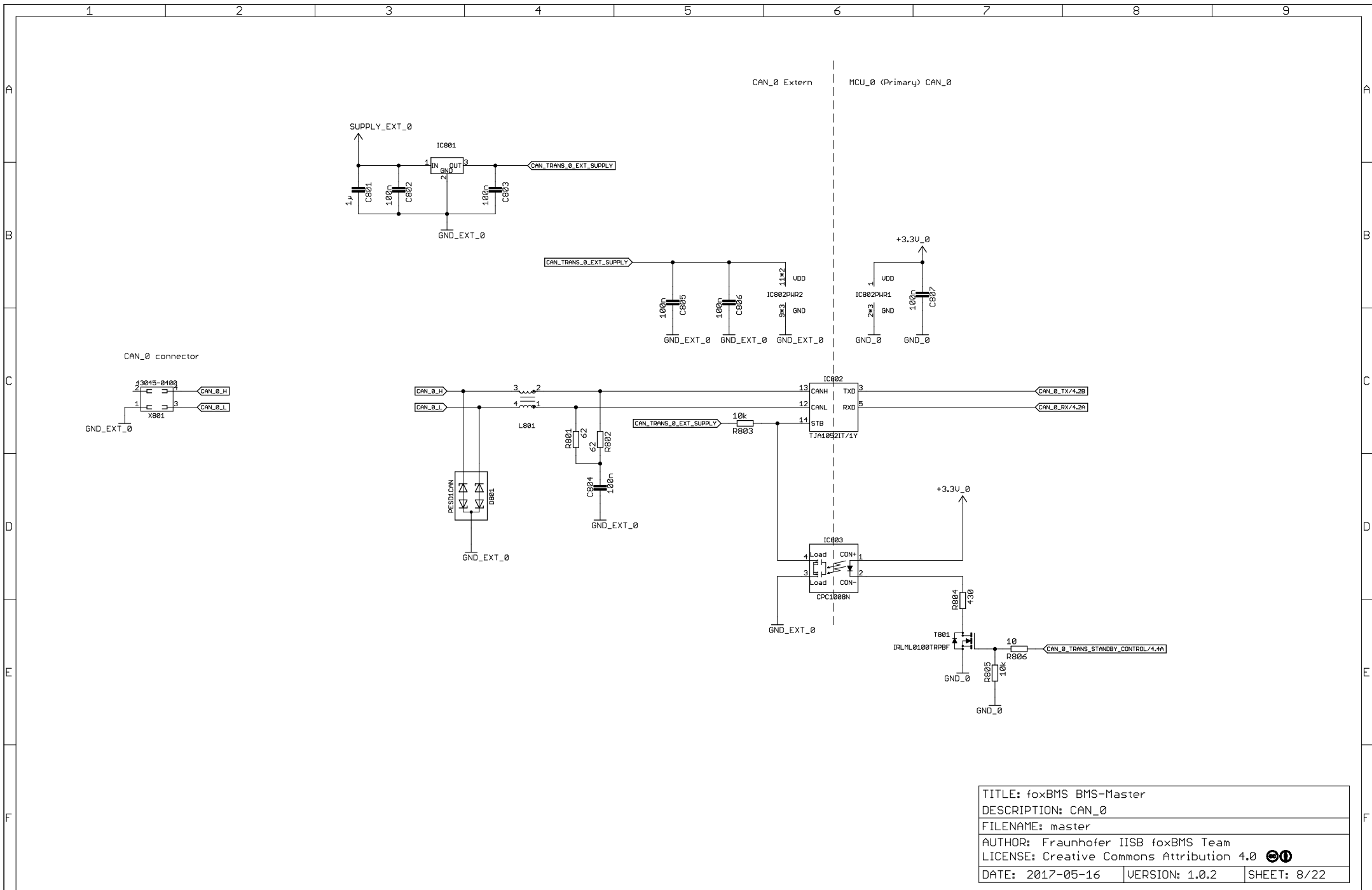
IC702
ADUM3301ARW


+3.3V_0

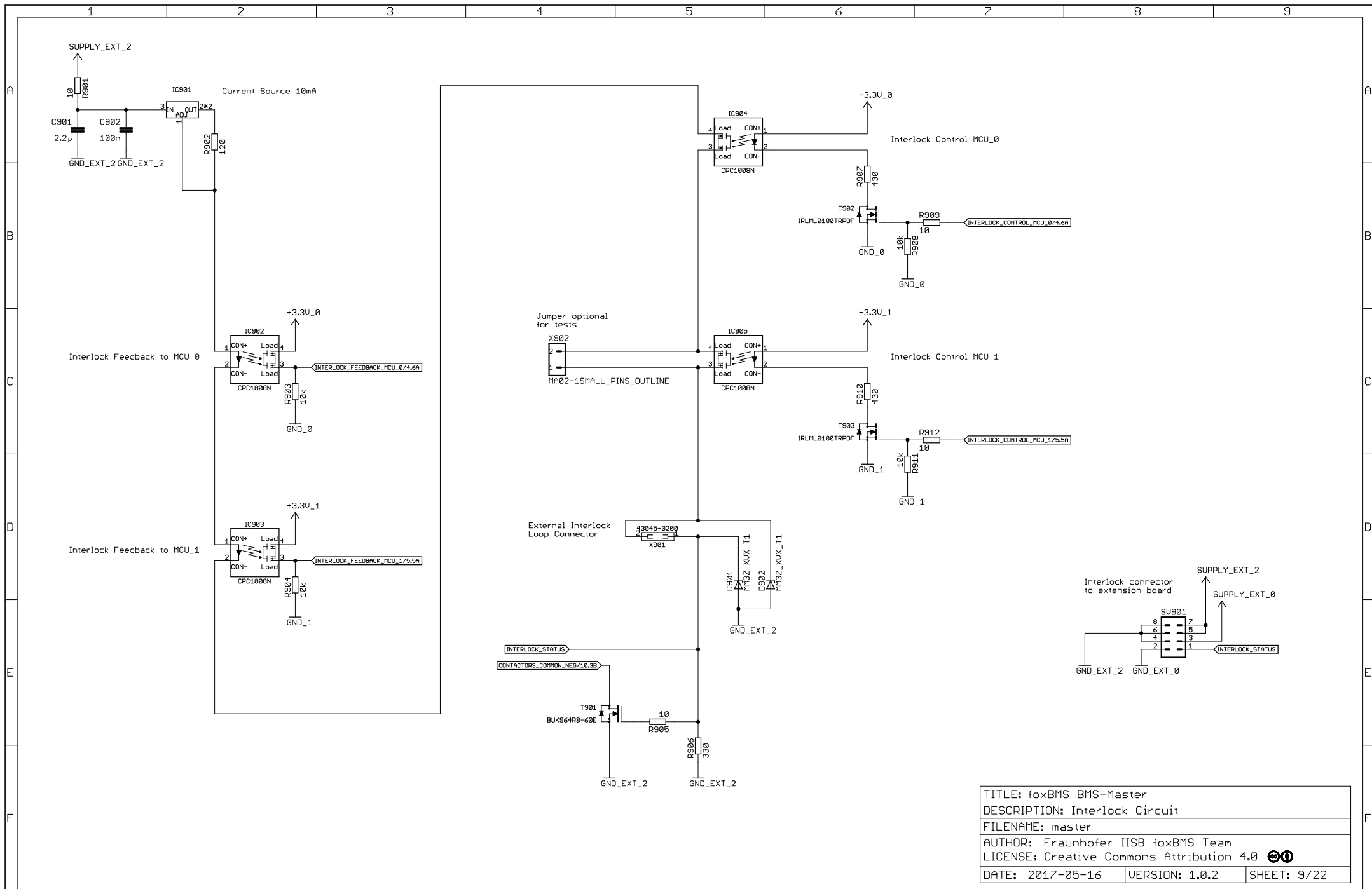
C707
100n

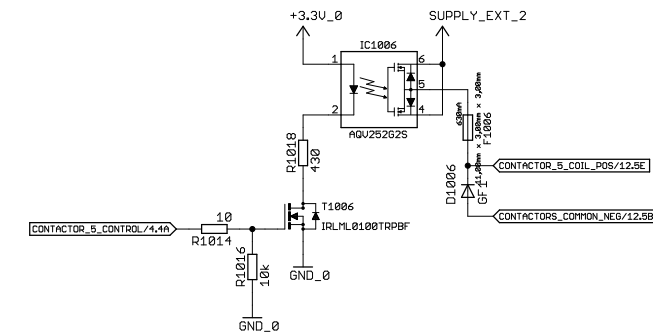
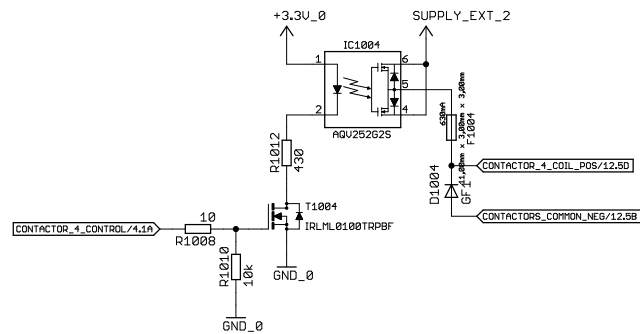
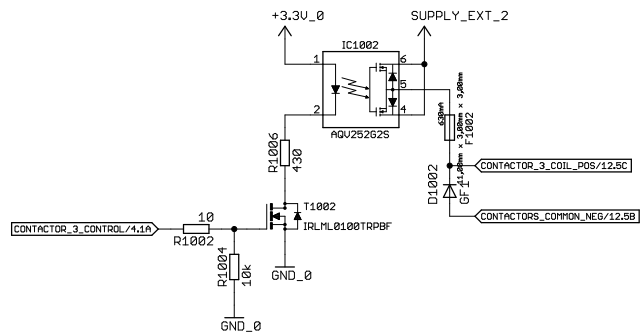
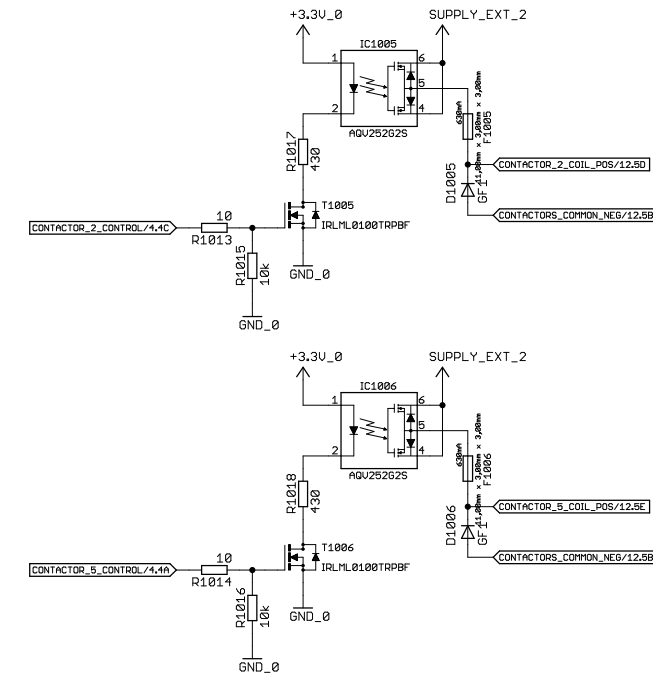
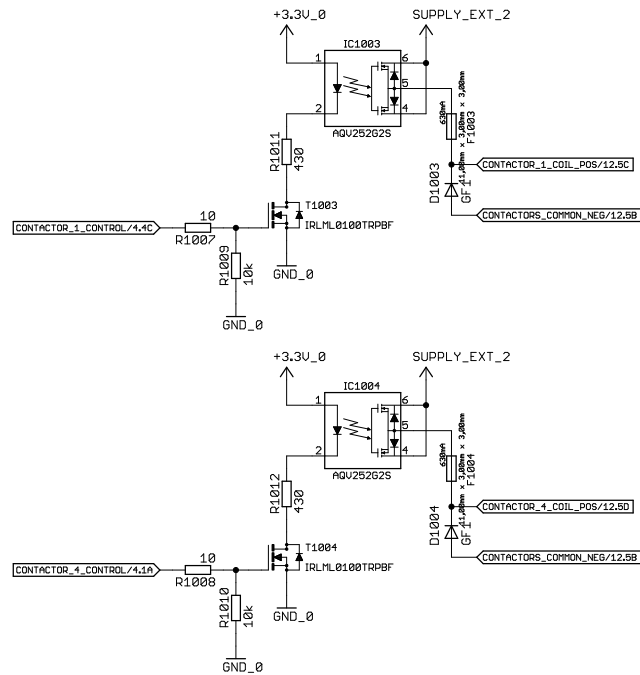
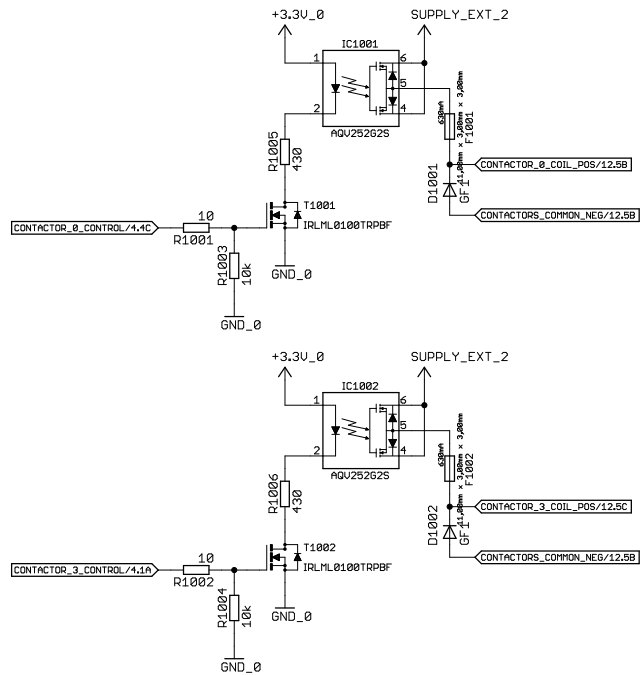



TITLE: foxBMS BMS-Master		
DESCRIPTION: BENDER Isometer Interface		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 7/22



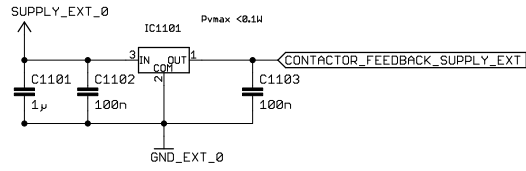
TITLE: foxBMS BMS-Master		
DESCRIPTION: CAN_0		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 8/22



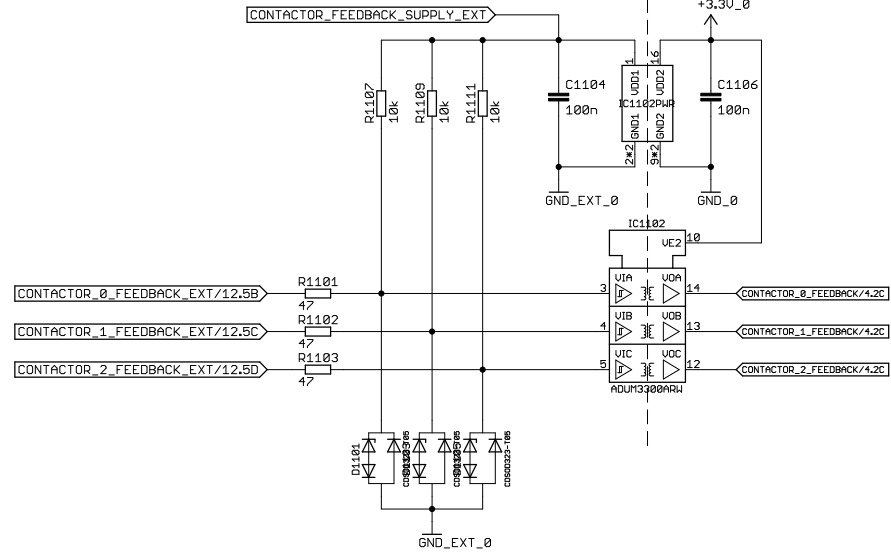


TITLE: foxBMS BMS-Master		
DESCRIPTION: Contactor Control		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 10/22

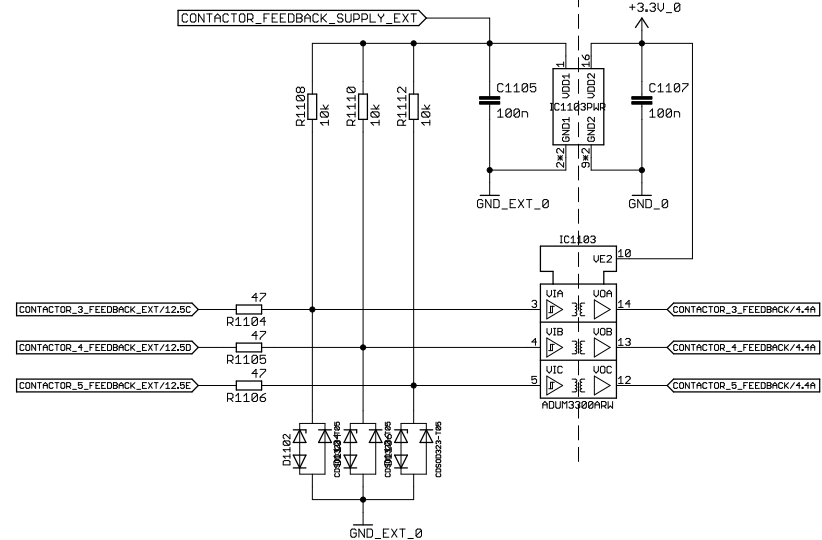
Contactor Feedback Supply from External Supply




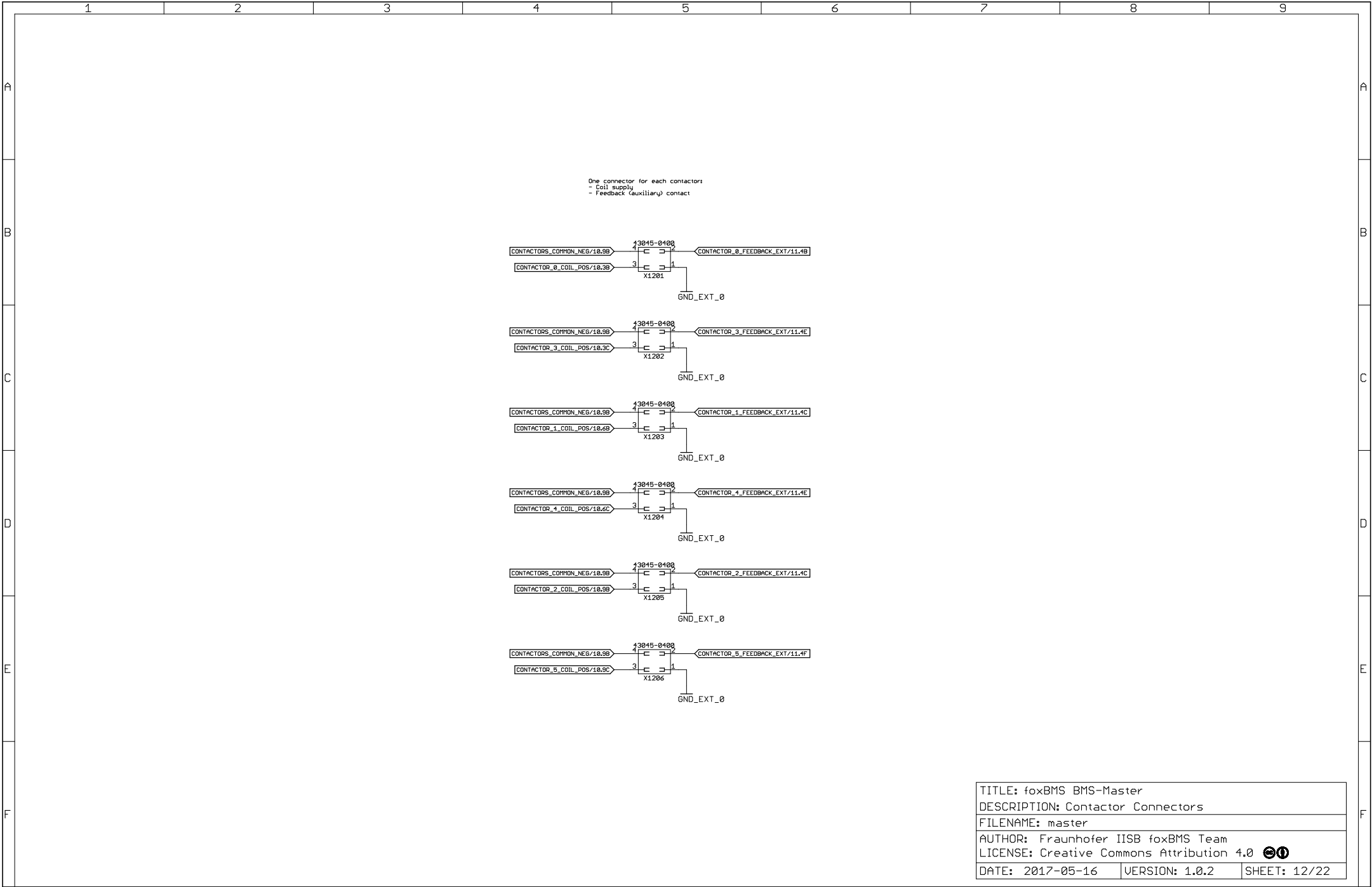
Contactor Feedback Isolation 0 to 2




Contactor Feedback Isolation 3 to 5




TITLE: foxBMS BMS-Master		
DESCRIPTION: Contactor Feedback		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 11/22

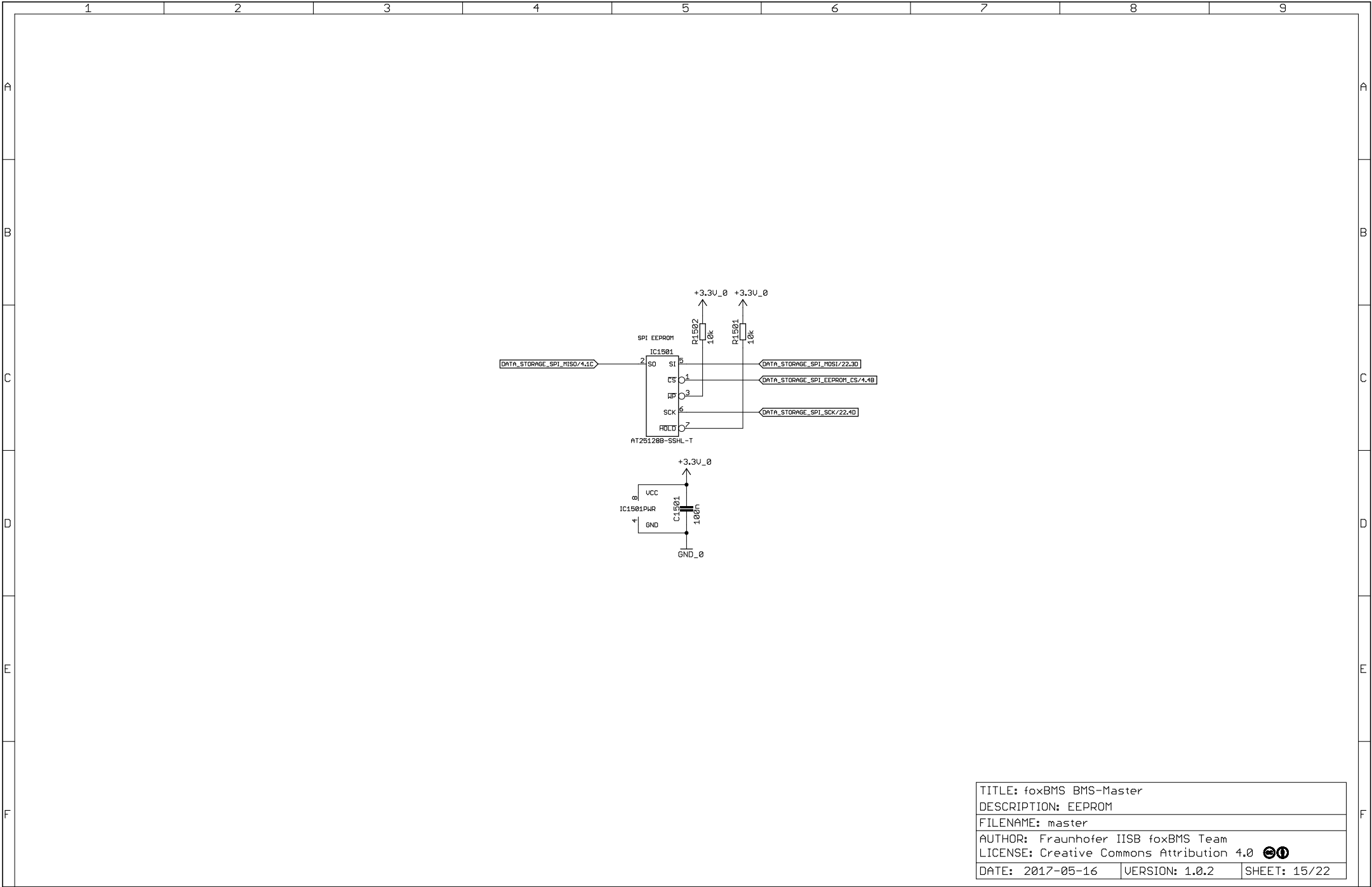


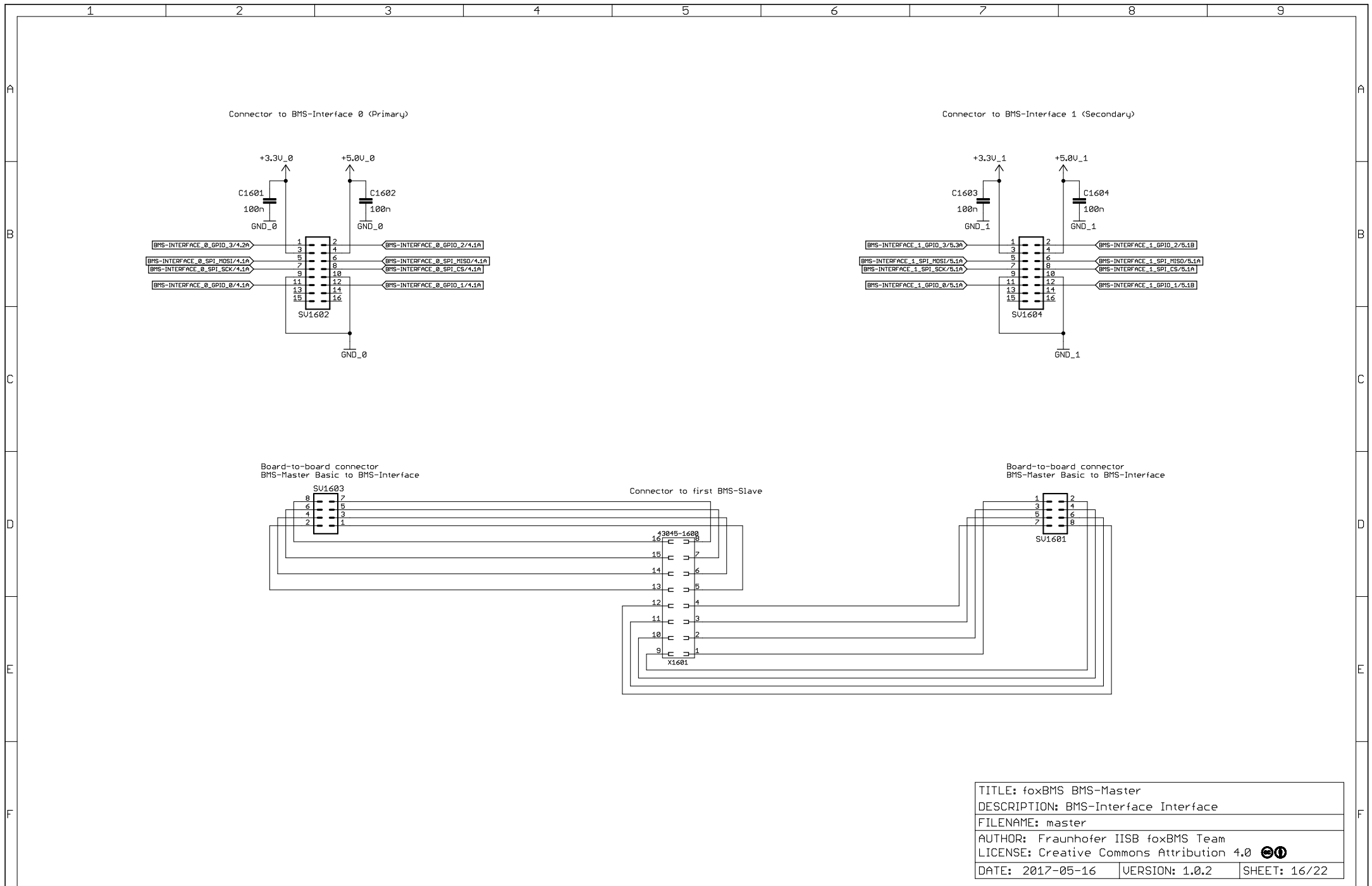
TITLE: foxBMS BMS-Master		
DESCRIPTION: Contactor Connectors		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 12/22


	1	2	3	4	5	6	7	8	9	
A										A
B										B
C										C
D										D
E										E
F										F

This page was intentionally left blank.

TITLE: foxBMS BMS-Master		
DESCRIPTION: Isolated RS485		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 13/22






TITLE: foxBMS BMS-Master		
DESCRIPTION: BMS-Interface Interface		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 16/22


	1	2	3	4	5	6	7	8	9	
A										A
B										B
C										C
D										D
E										E
F										F

This page was intentionally left blank.

TITLE: foxBMS BMS-Master		
DESCRIPTION: Analog Inputs		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 17/22


	1	2	3	4	5	6	7	8	9	
A										A
B										B
C										C
D										D
E										E
F										F

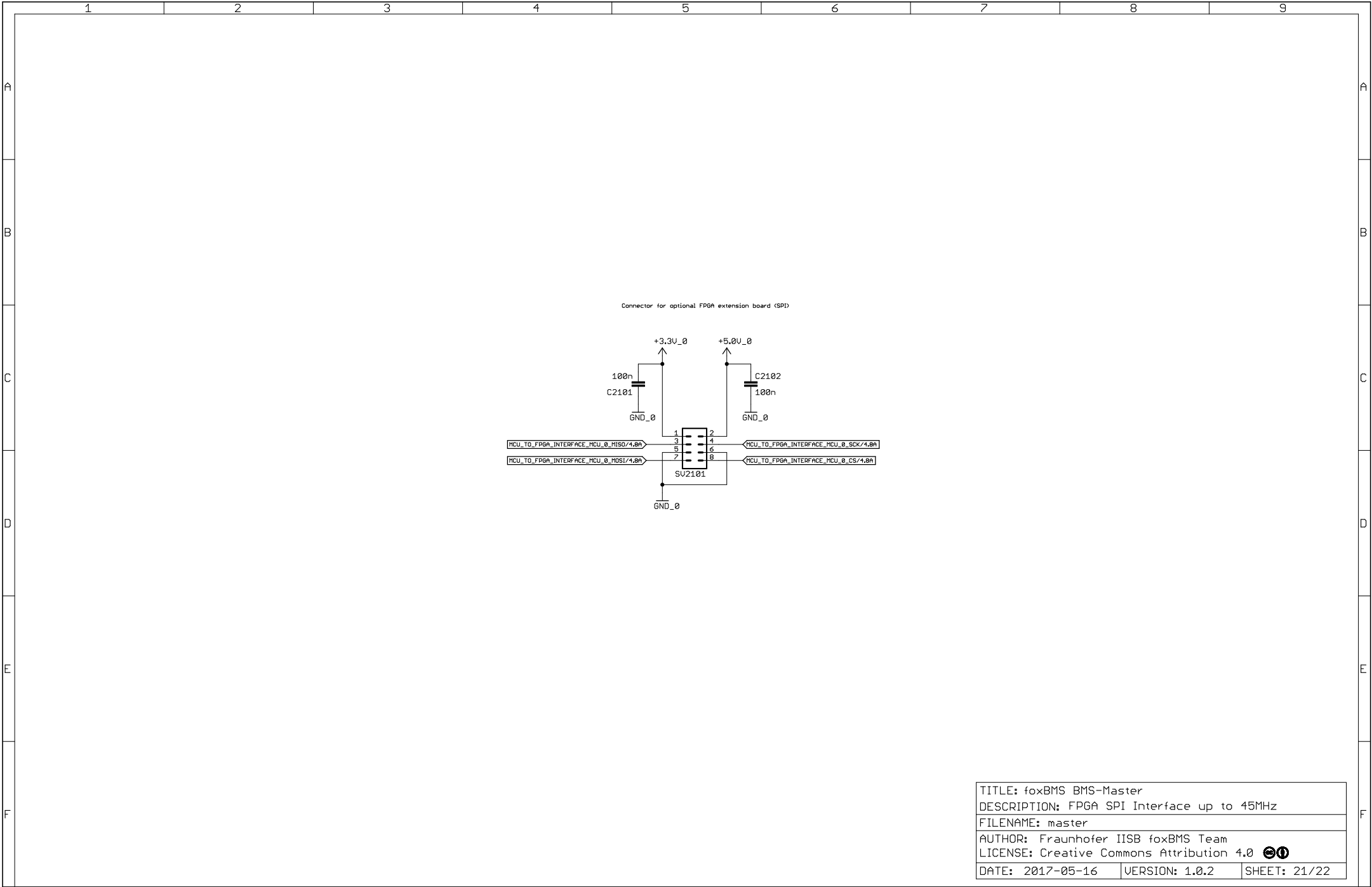
This page was intentionally left blank.

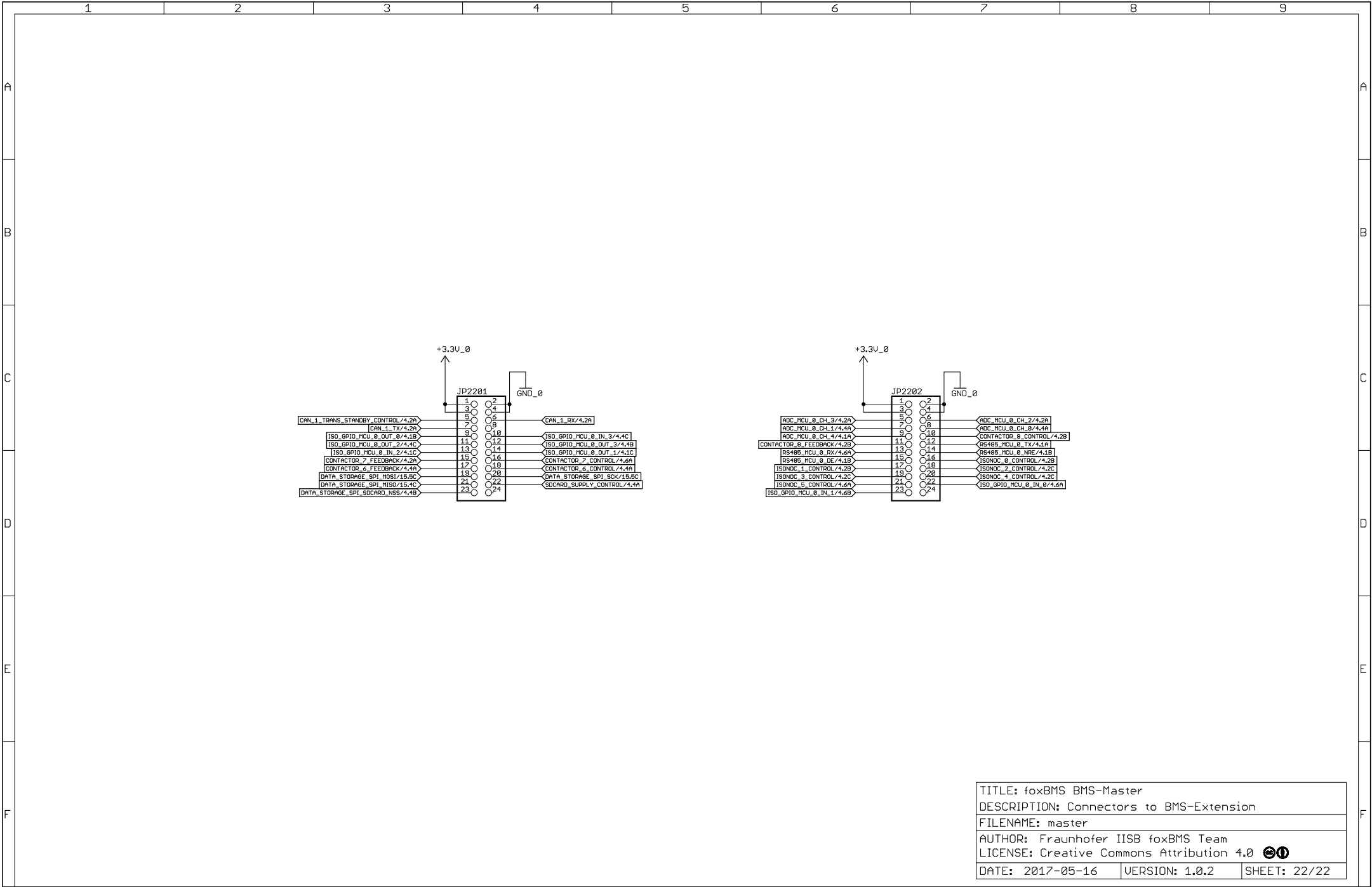
TITLE: foxBMS BMS-Master		
DESCRIPTION: Isolated GPIO 4x In / 4x Out		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 19/22


	1	2	3	4	5	6	7	8	9	
A										A
B										B
C										C
D										D
E										E
F										F

This page was intentionally left blank.

TITLE: foxBMS BMS-Master		
DESCRIPTION: Isolated Normally Open Contacts		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 20/22





TITLE: foxBMS BMS-Master		
DESCRIPTION: Connectors to BMS-Extension		
FILENAME: master		
AUTHOR: Fraunhofer IISB foxBMS Team		
LICENSE: Creative Commons Attribution 4.0 		
DATE: 2017-05-16	VERSION: 1.0.2	SHEET: 22/22