SHIELD_XENSIV_A - XENSIV™ Sensor Shield

CONTENTS

Drawing Numbers

PCBA	121-60700-01
PCB	600-60700-01
FAB DRW	610-60700-01
ASSY DRW	620-60700-01
SCH DRW	630-60700-01

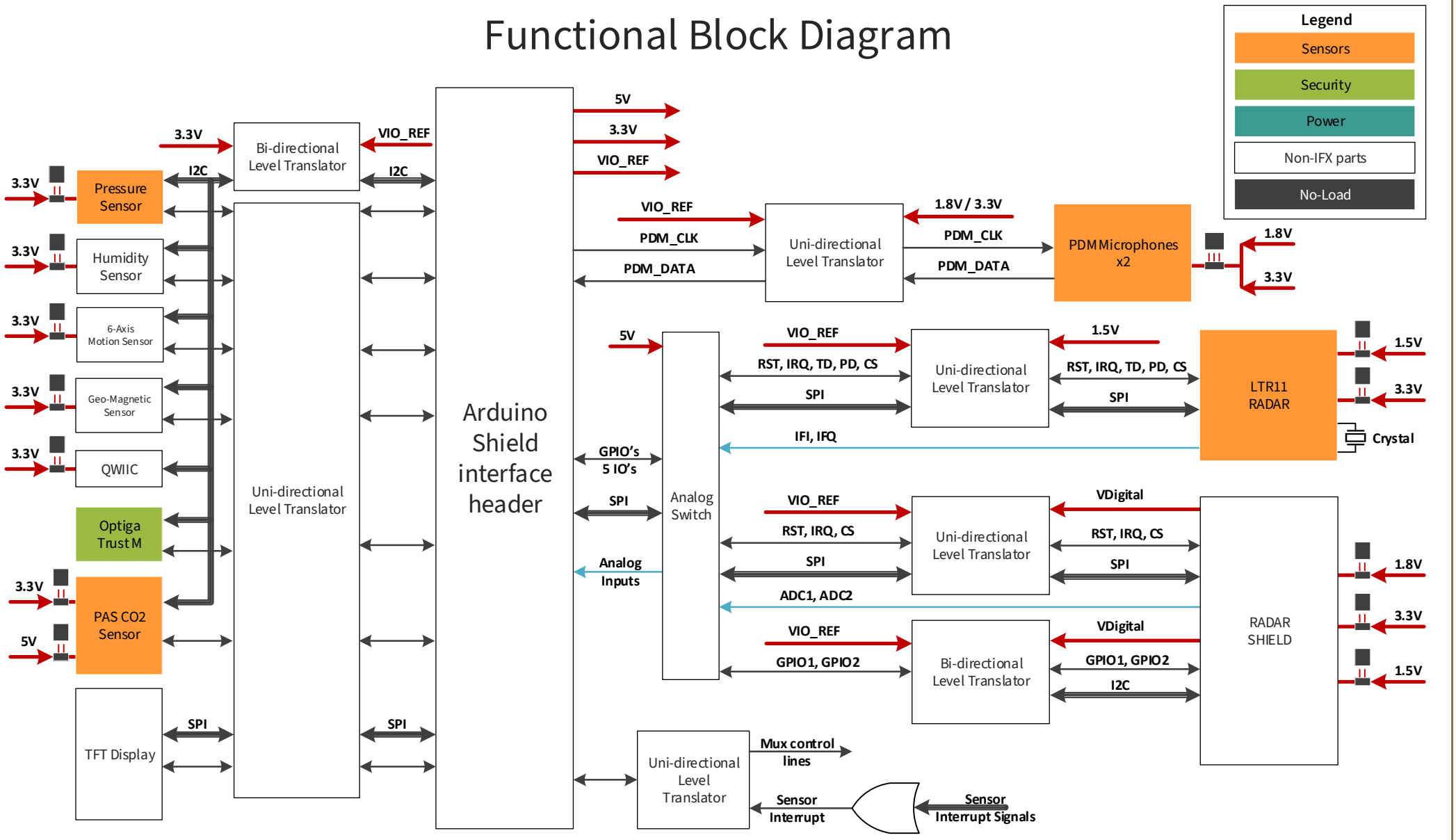
SCH Title : XENSIV™ Sensor Shield

Page Title: Title Page

Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03

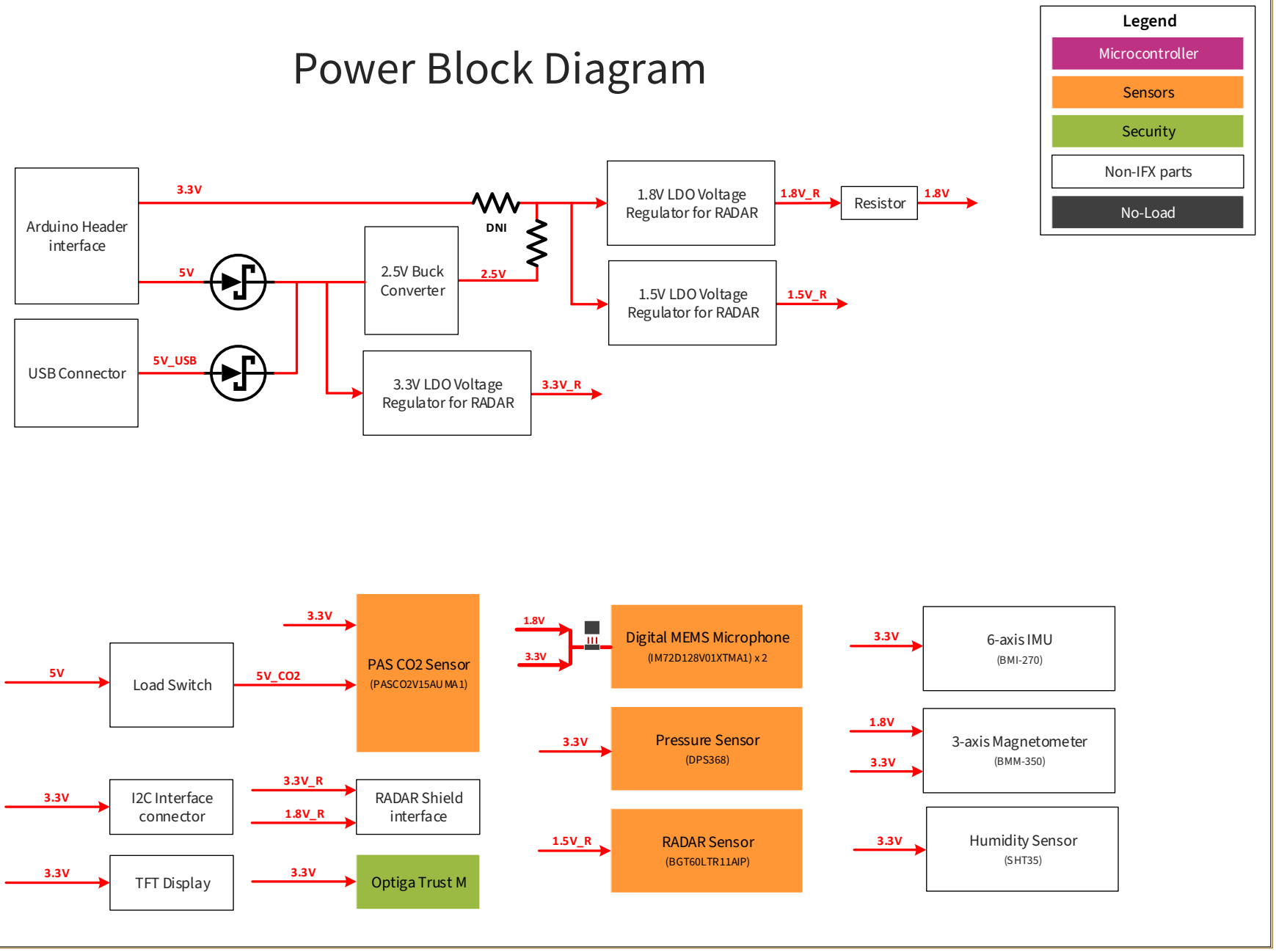
Date: Friday, November 08, 2024 Sheet 1 of 17

Functional Block Diagram



SCH Title : XENSIV™ Sensor Shield				
Page Title: Functional Block Diagram				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 2 of 17		

Power Block Diagram



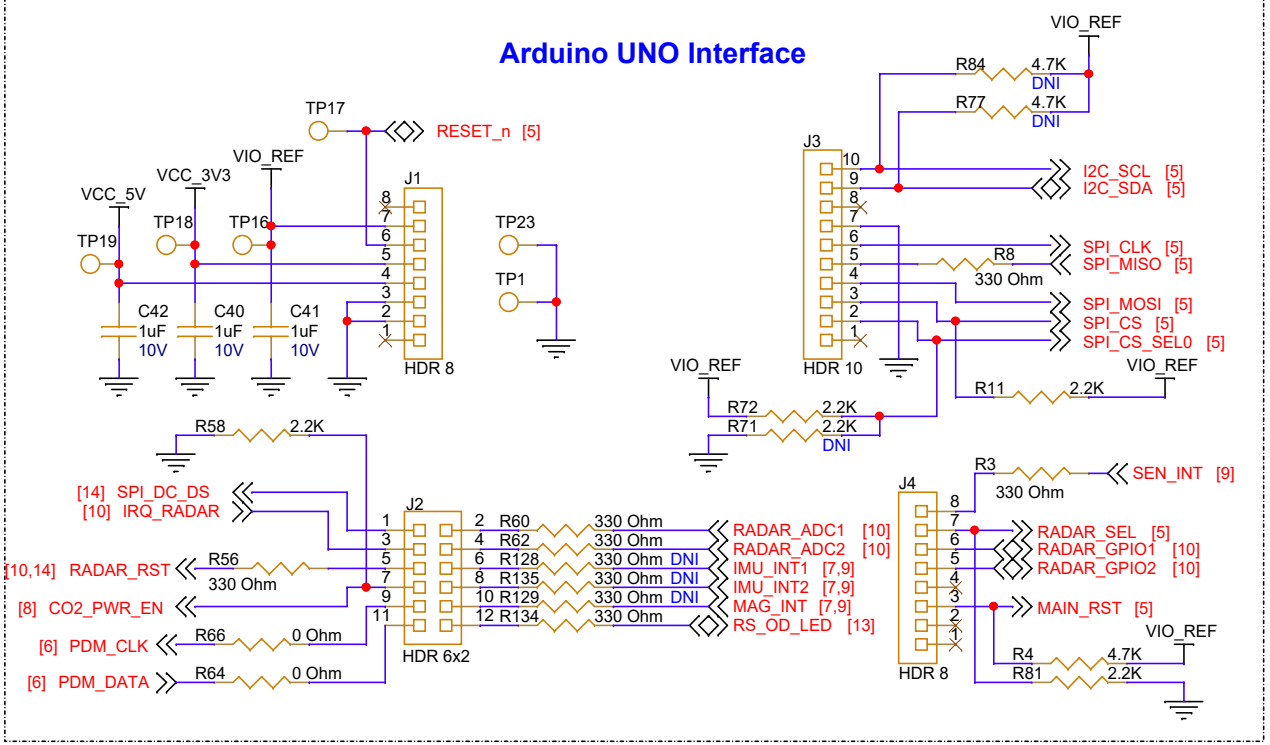
SCH Title : XENSIV™ Sensor Shield

Page Title: Power Block Diagram

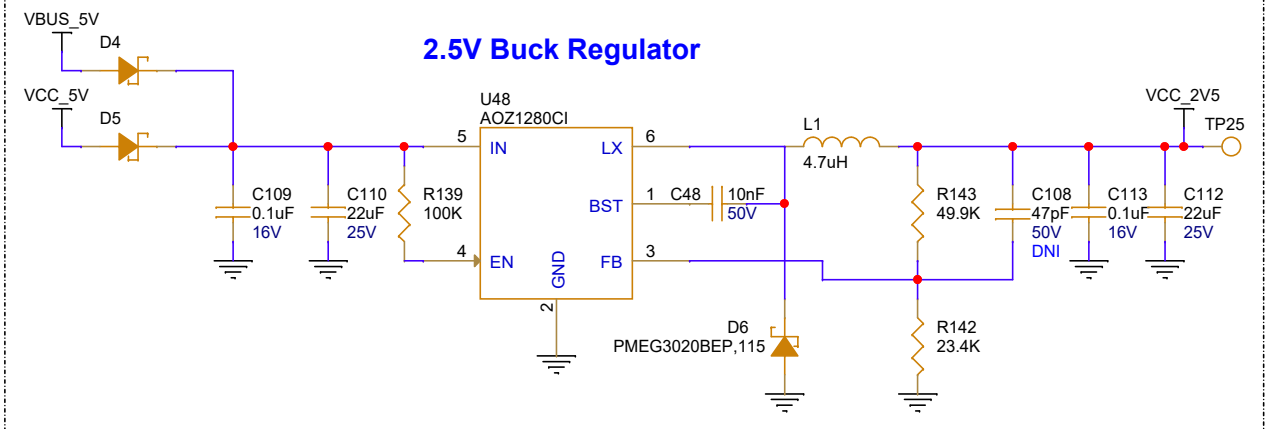
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03

Date: Wednesday, July 24, 2024 Sheet 3 of 17

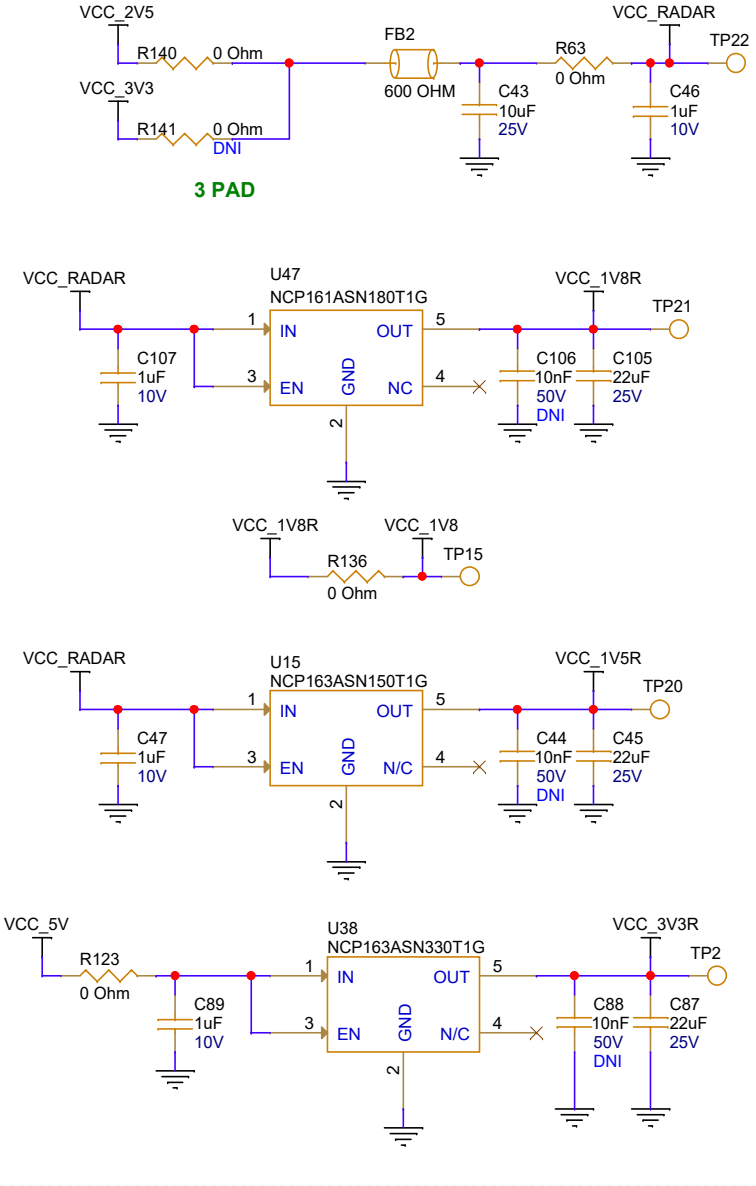
Arduino UNO Interface



2.5V Buck Regulator

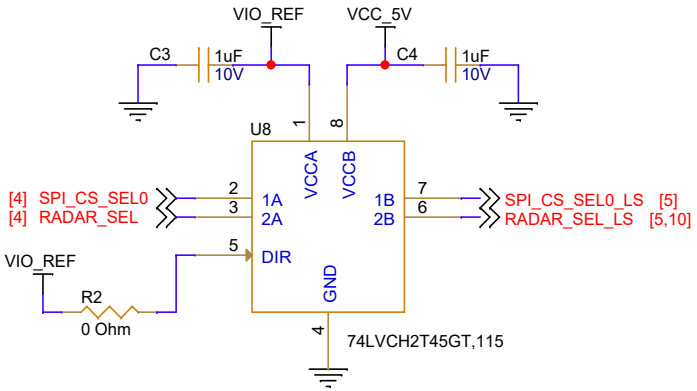


RADAR Power supplies

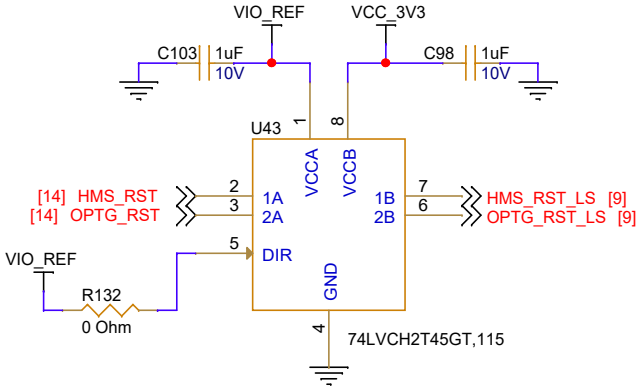


SCH Title : **XENSIV™ Sensor Shield**				
Page Title: **Arduino Interface and Power Supplies**				
Size	Document Number	Drawn By	Approved By	Rev
A4	**630-60700-01**	**MRRS**	**VAKI**	**03**
Date:	Wednesday, July 24, 2024	Sheet	**4** of **17**	

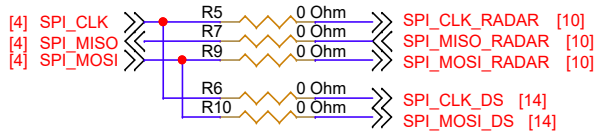
Analog Multiplexer Select Signal Level Translators



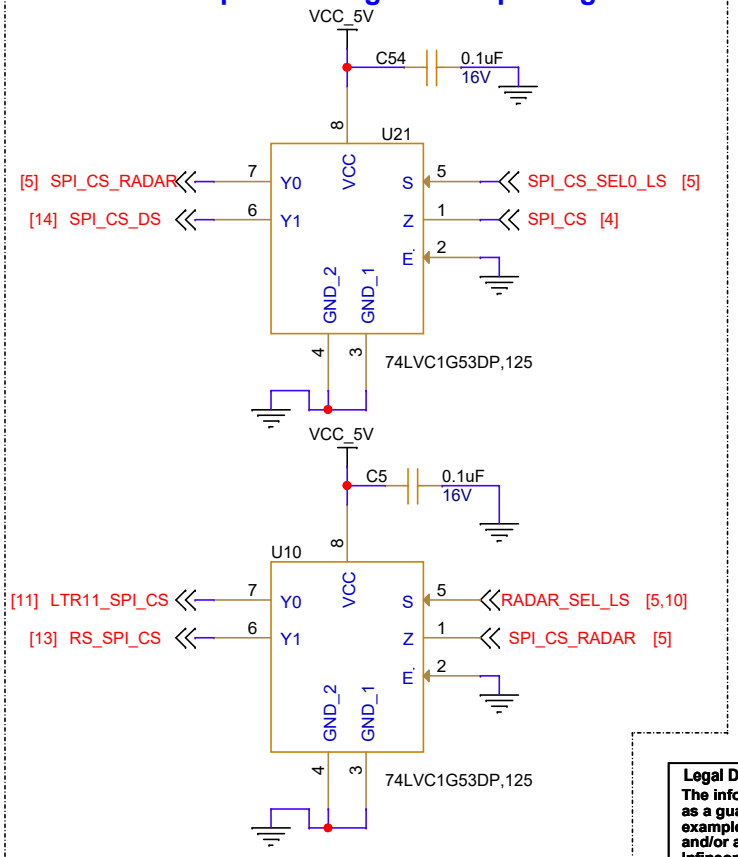
RESET signal Level Translator



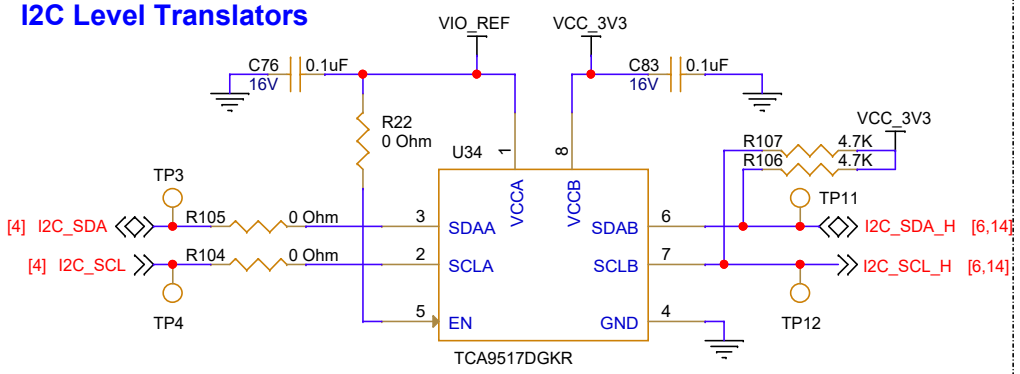
SPI Signals Multiplexing



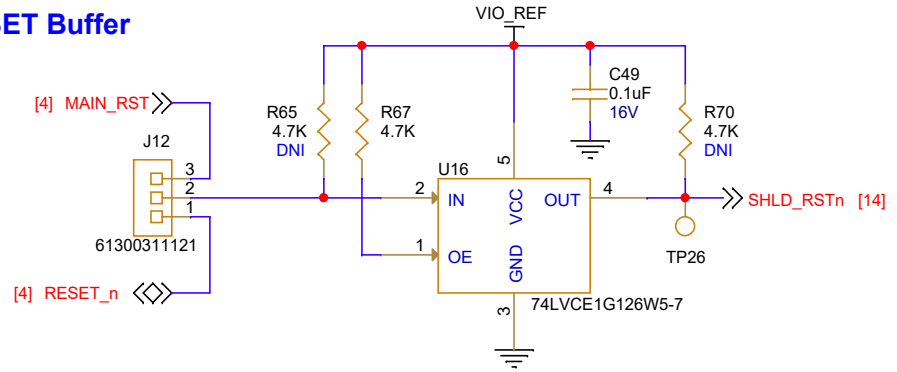
SPI Chip Select Signal Multiplexing



I2C Level Translators

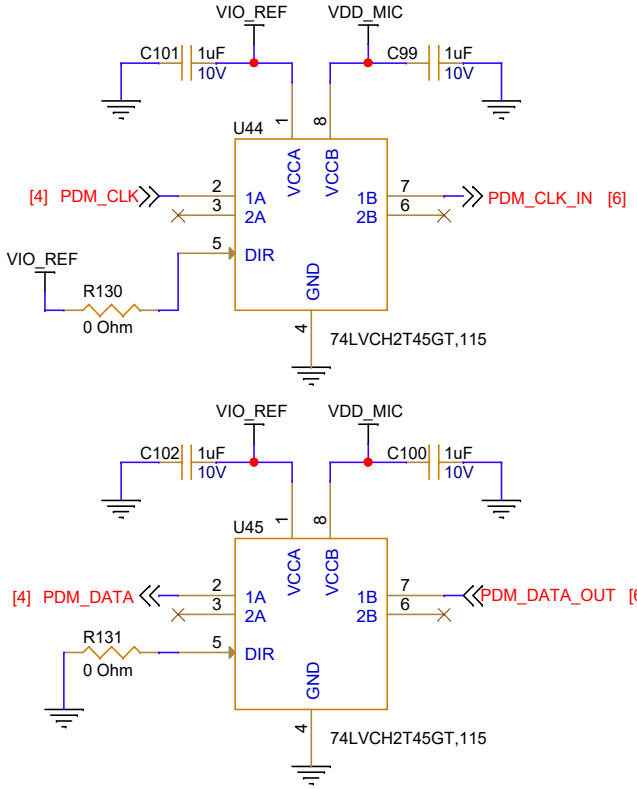


RESET Buffer

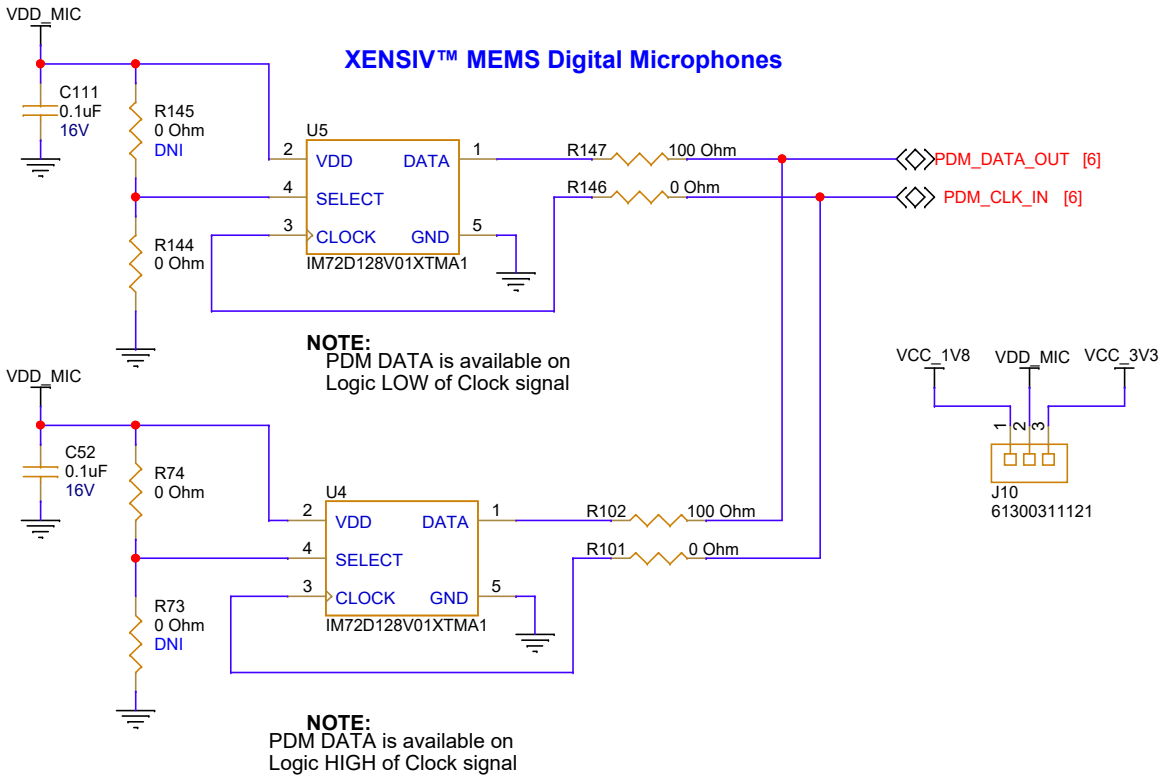


SCH Title :	**XENSIV™ Sensor Shield**			
Page Title:	**MUX Switch for reset & I2C level translator**			
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date:	Wednesday, July 24, 2024	Sheet	5 of 17	

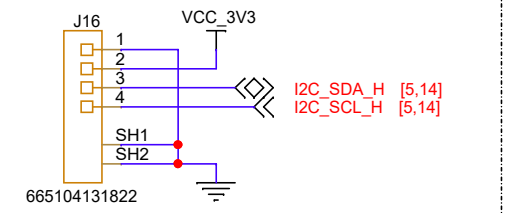
PDM Interface Level Translators



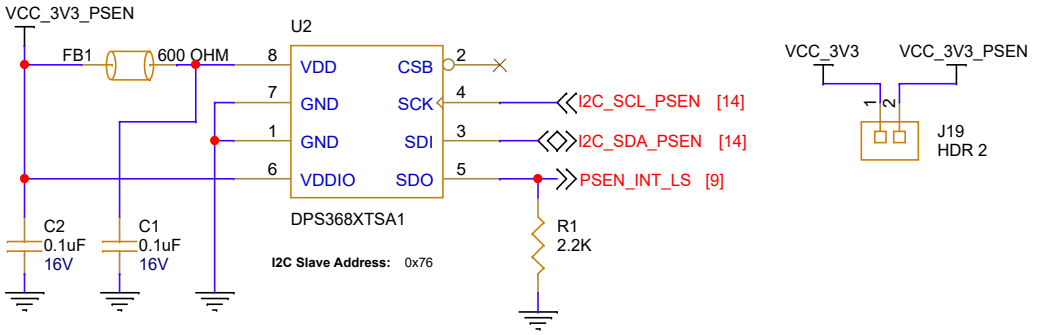
XENSIV™ MEMS Digital Microphones



I2C Interface

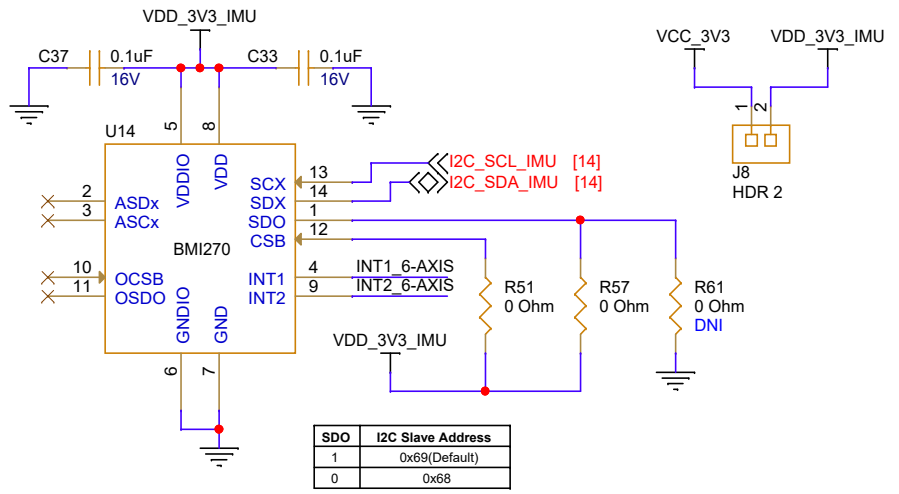


XENSIV™ Digital Barometric Pressure Sensor



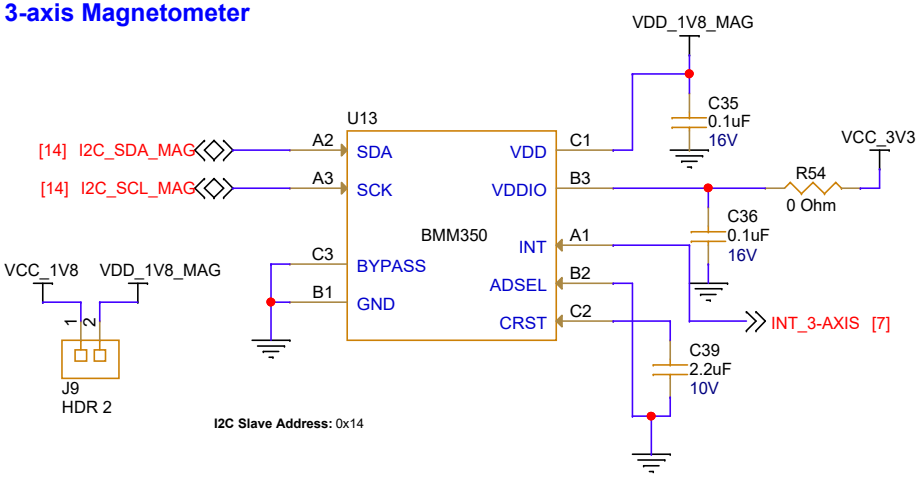
SCH Title : XENSIV™ Sensor Shield				
Page Title: Arudino Interface & PDM Mic				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 6 of 17		

6-axis IMU (Accelerometer + Gyroscope)

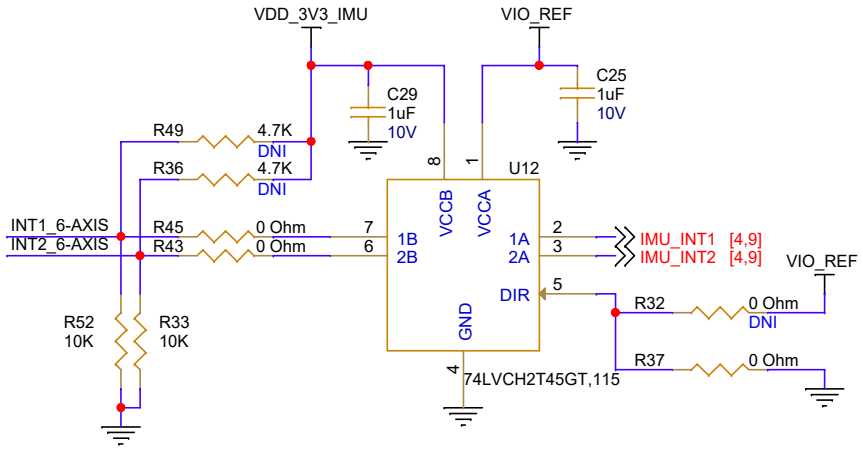


SDO	I2C Slave Address
1	0x69(Default)
0	0x68

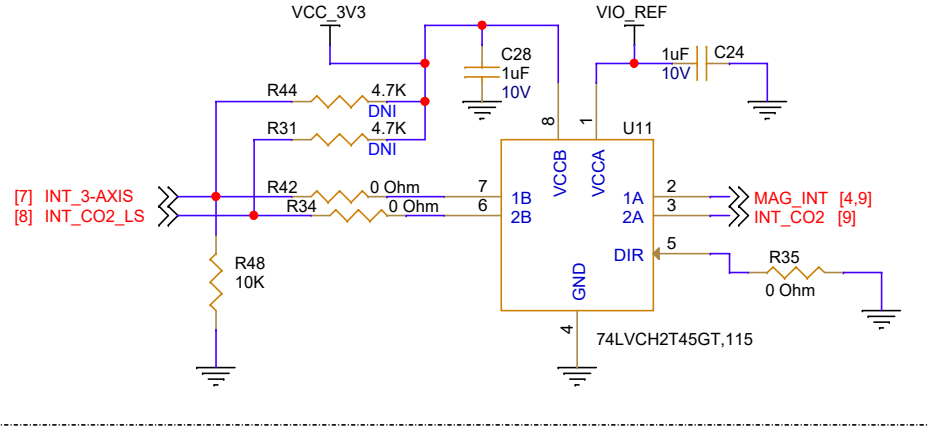
3-axis Magnetometer



6-axis IMU Interrupt Signal Level Translator

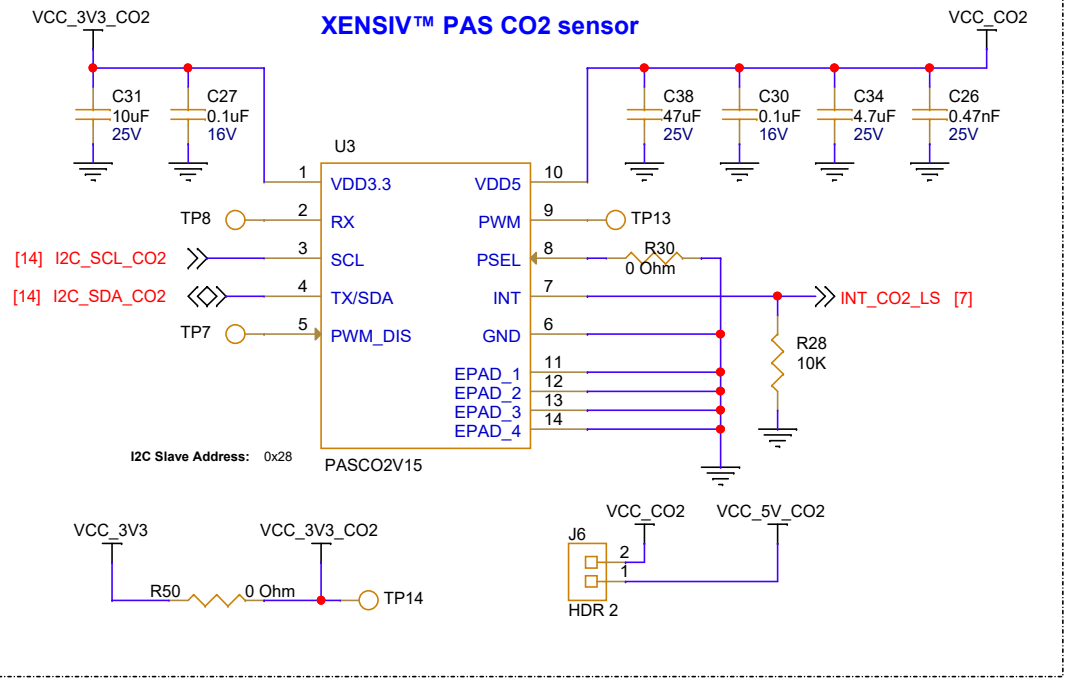


3-axis Magnetometer and PAS CO2 Sensor Interrupt Signal Level Translator

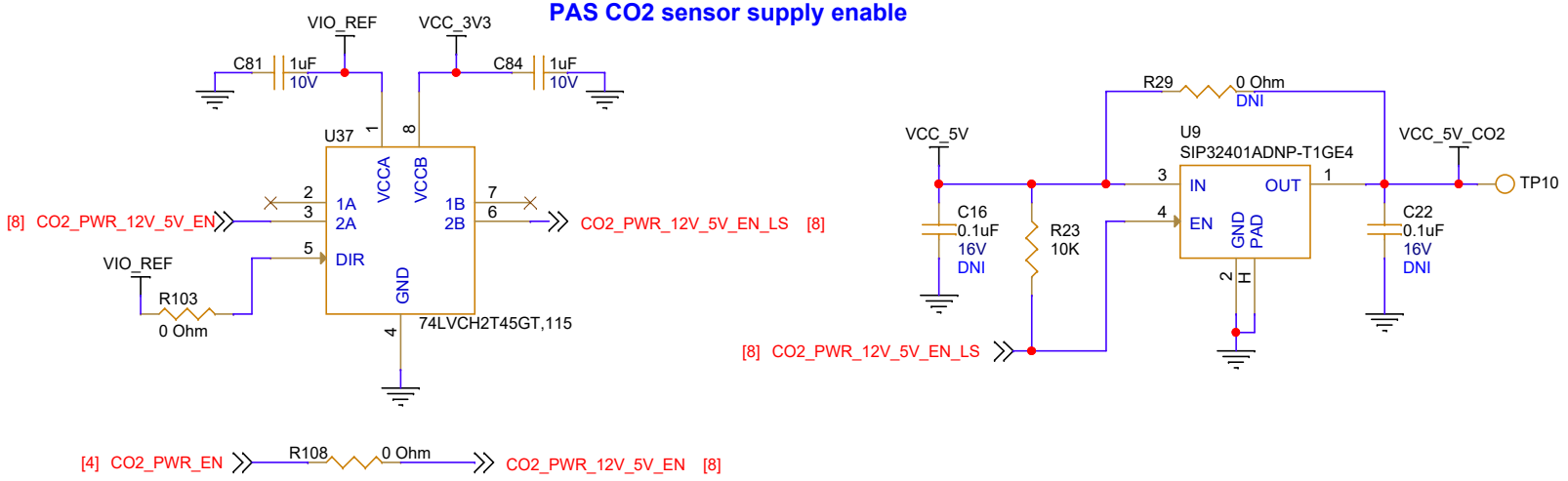


SCH Title : XENSIV™ Sensor Shield				
Page Title: IMU and Magnetometer Interface				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Friday, November 08, 2024		Sheet 7 of 17		

XENSIV™ PAS CO2 sensor



PAS CO2 sensor supply enable



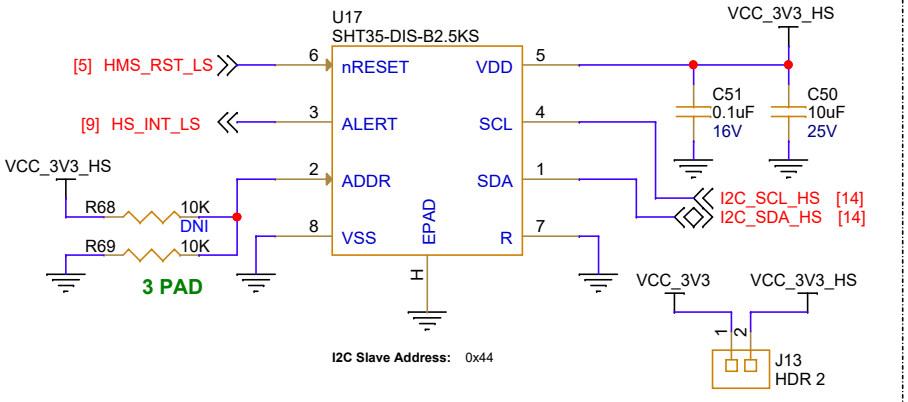
SCH Title : XENSIV™ Sensor Shield

Page Title: XENSIV™ PAS CO2 Sensor Interface

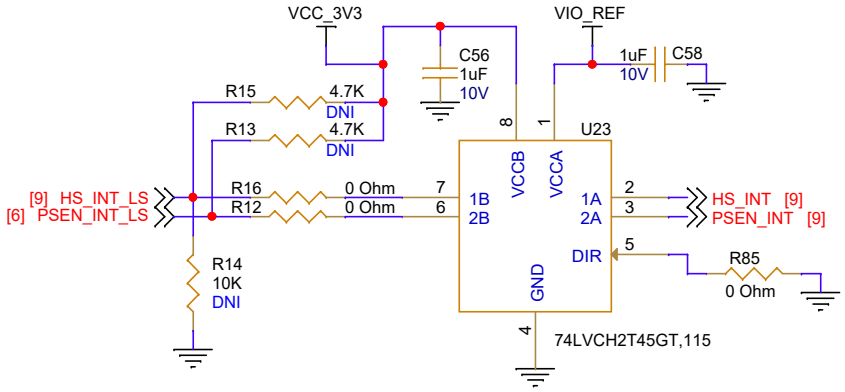
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03

Date: Wednesday, July 24, 2024 Sheet 8 of 17

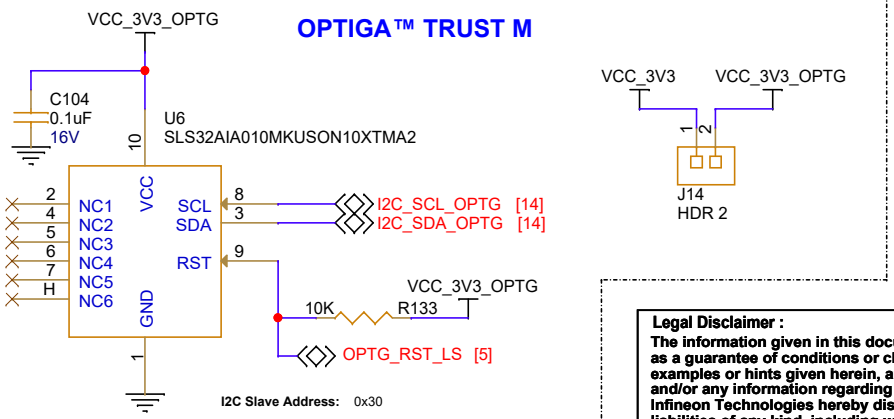
Digital Humidity Sensor



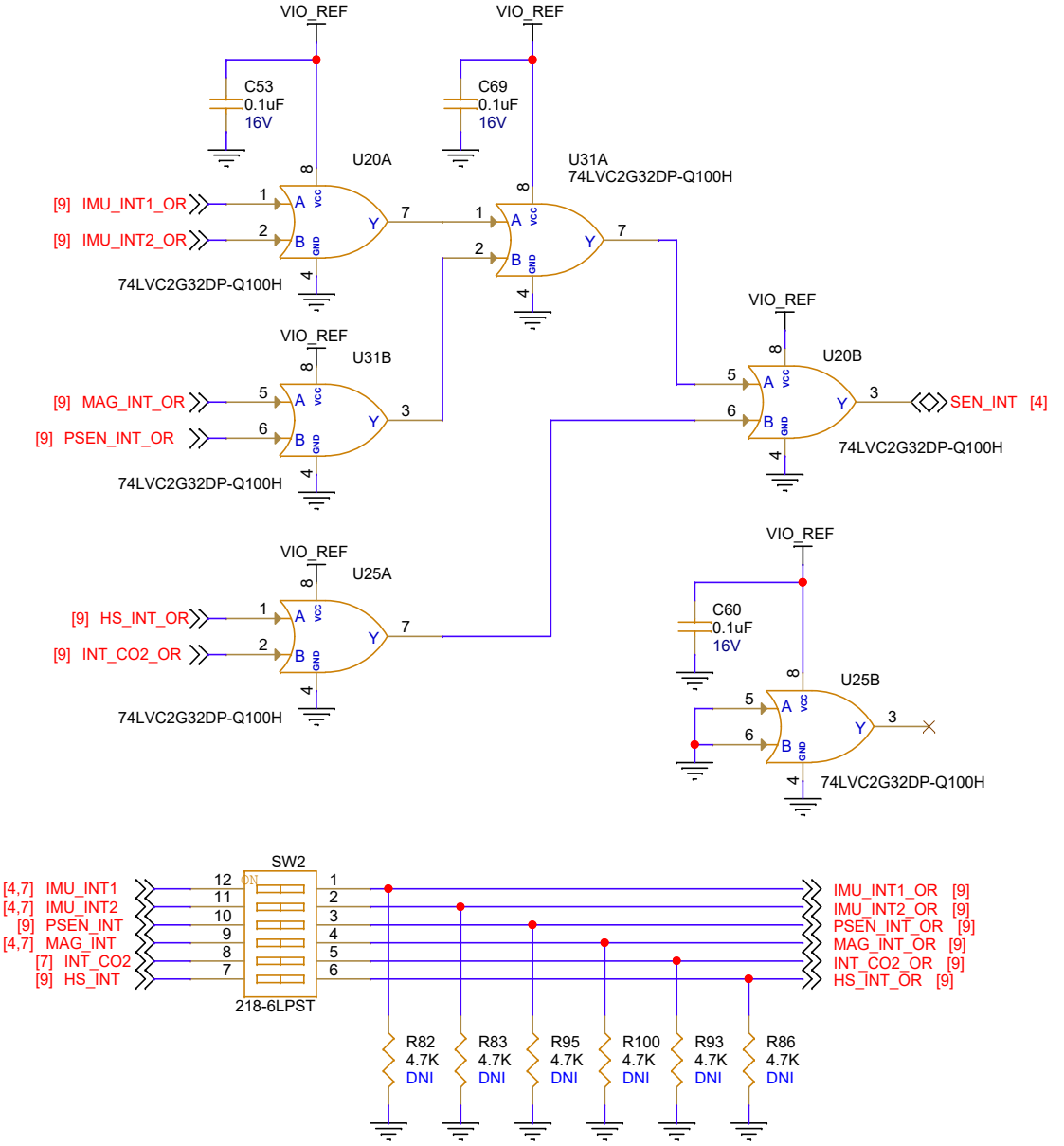
Humidity and Pressure Sensor Interrupt Signal Level Translator



OPTIGA™ TRUST M

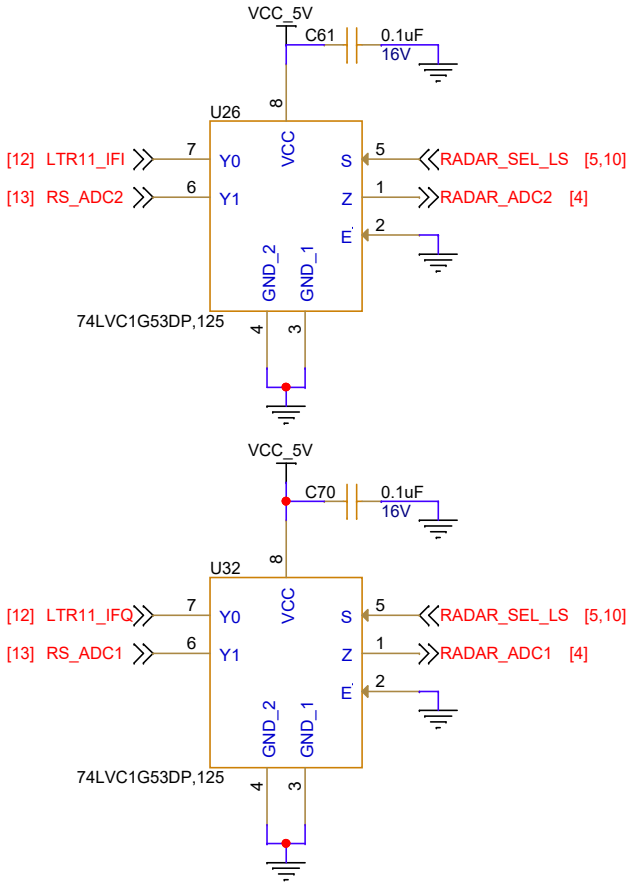


OR'ing of Interrupt Signals

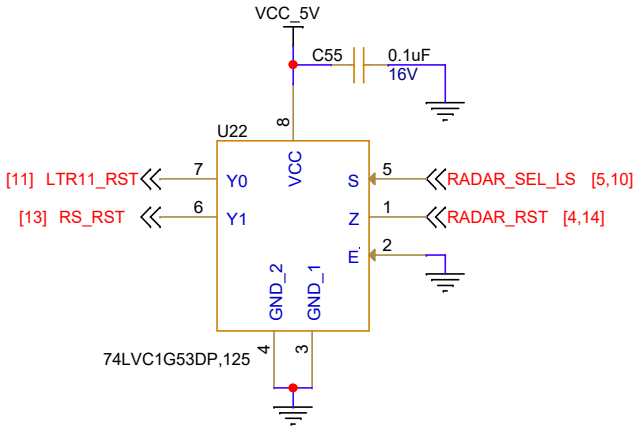


SCH Title :	**XENSIV™ Sensor Shield**			
Page Title:	**Digital Humidity Sensor and TRUST M interface**			
Size	Document Number	Drawn By	Approved By	Rev
A4	**630-60700-01**	**MRRS**	**VAKI**	**03**
Date:	Friday, November 08, 2024	Sheet	**9** of **17**	

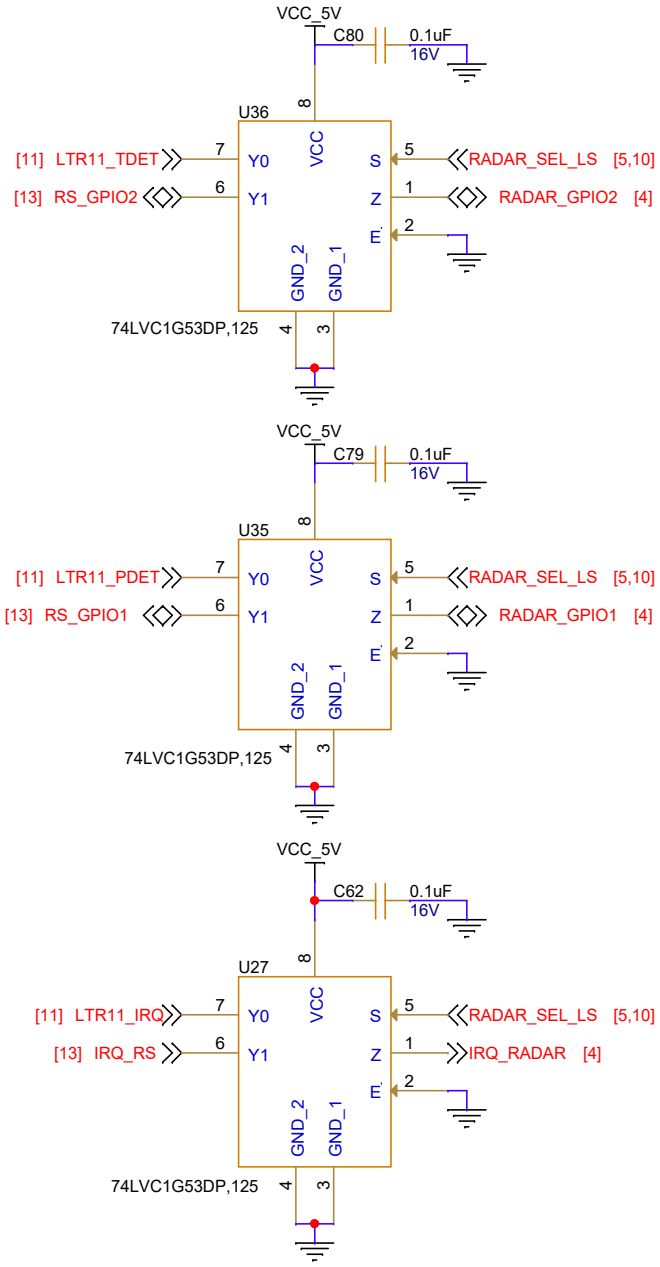
RADAR Anlog output Multplexing



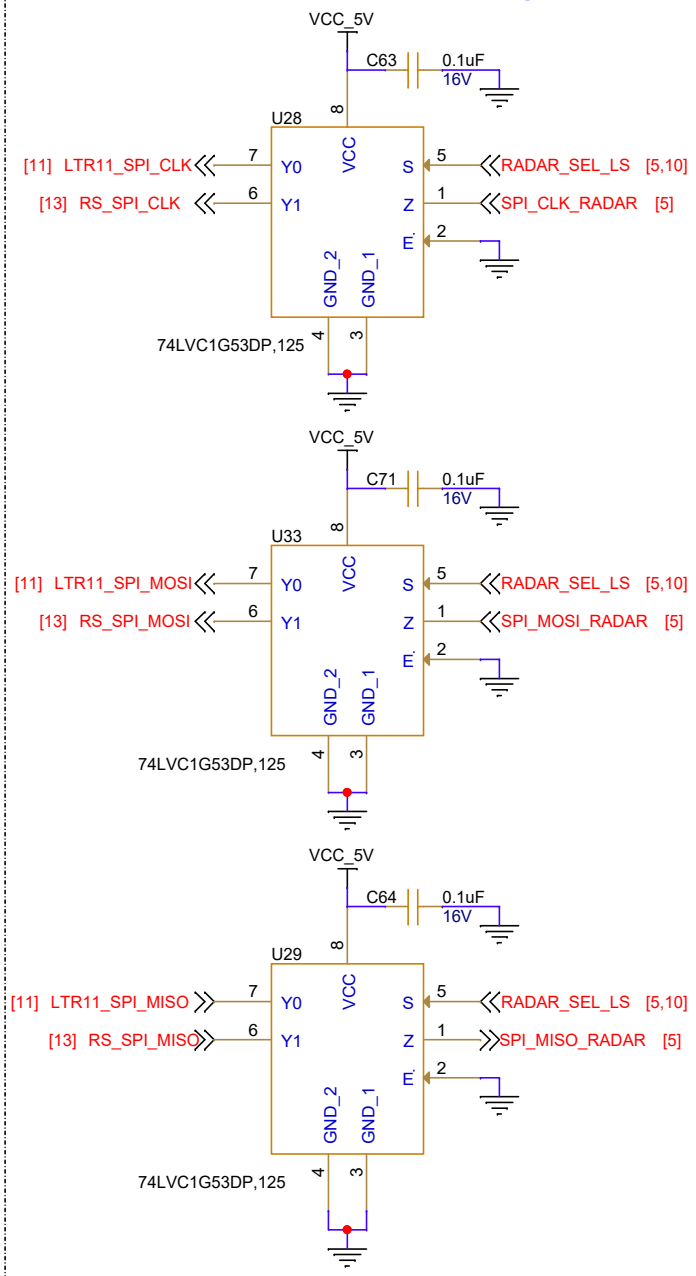
RADAR RESET Signal Multiplexing



RADAR GPIO Multplexing

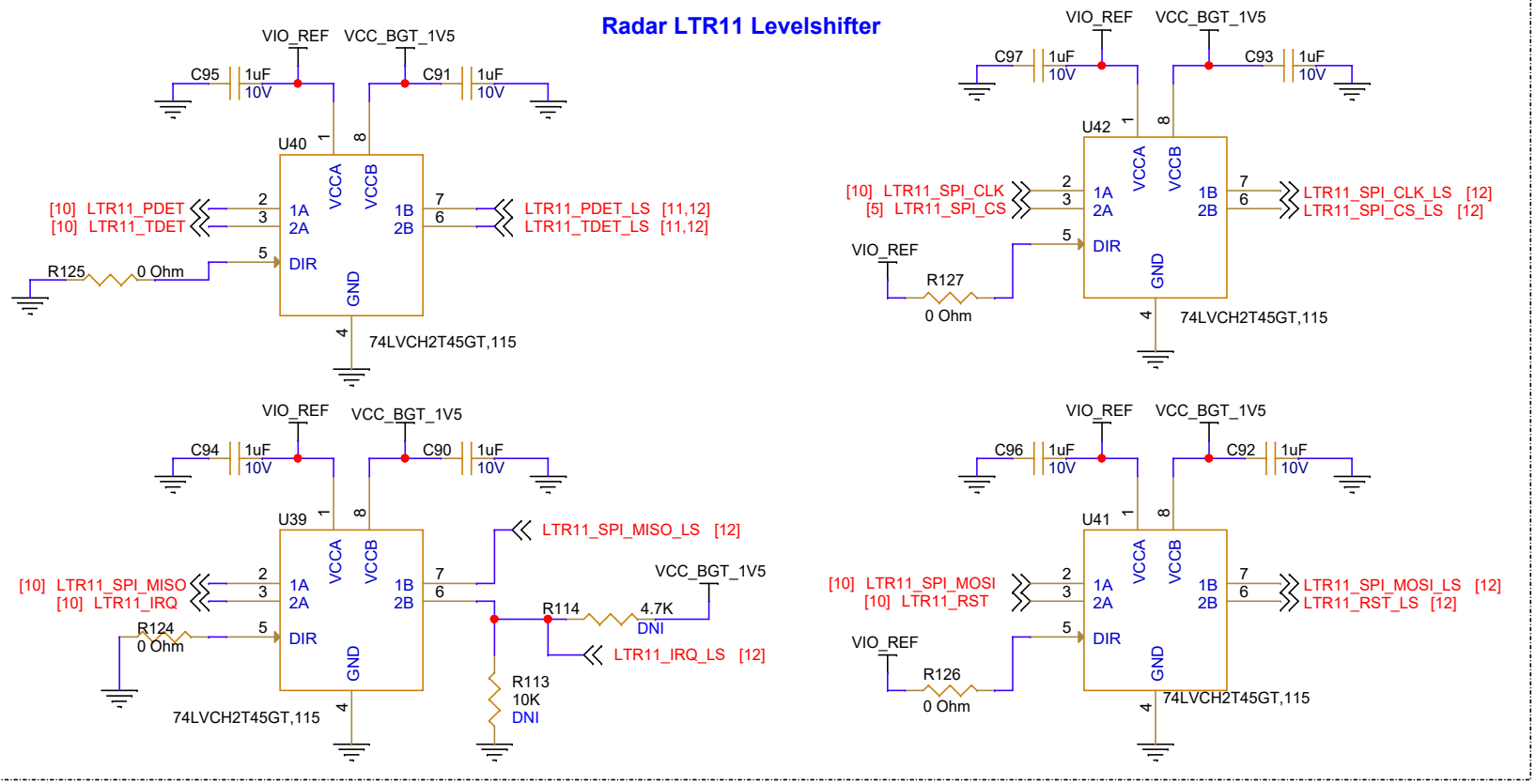


RADAR SPI Multplexing

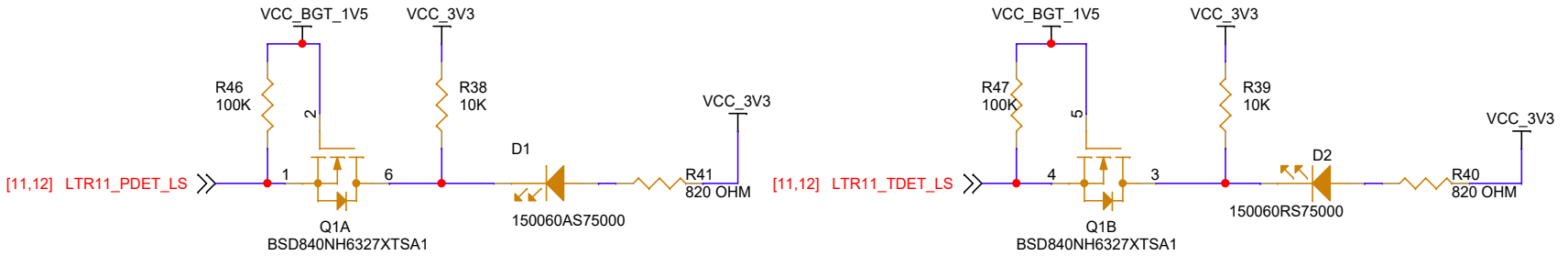


SCH Title : **XENSIV™ Sensor Shield**				
Page Title: **RADAR Interface Signals Multiplexing**				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 10 of 17		

Radar LTR11 Levelshifter

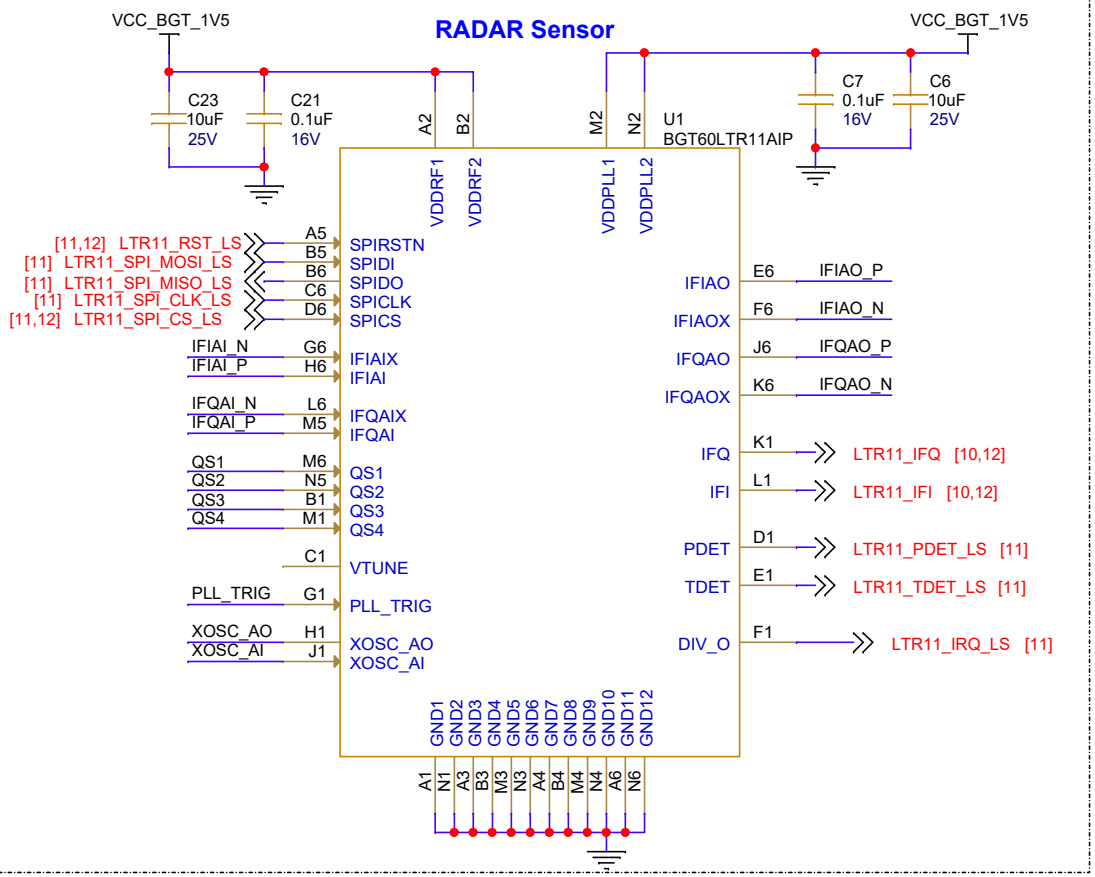


Radar LED circuit

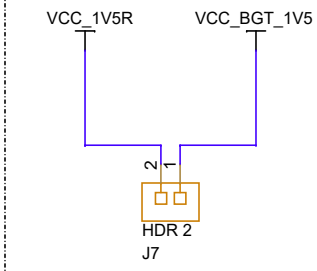


SCH Title : **XENSIV™ Sensor Shield**				
Page Title: **LTR11 level shifter and DAC for RADAR shield**				
Size	Document Number	Drawn By	Approved By	Rev
A4	**630-60700-01**	**MRRS**	**VAKI**	**03**
Date:	Wednesday, July 24, 2024	Sheet	**11** of **17**	

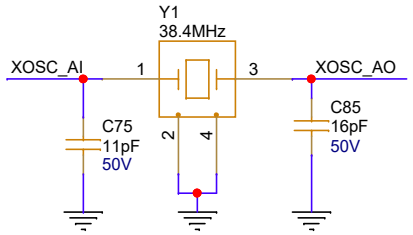
RADAR Sensor



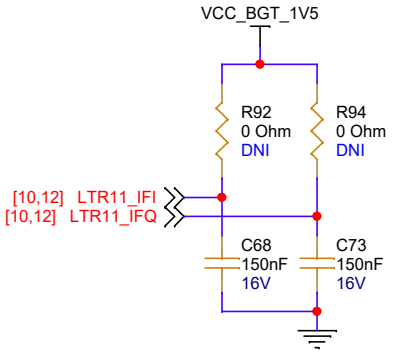
Power Supply Current measurement



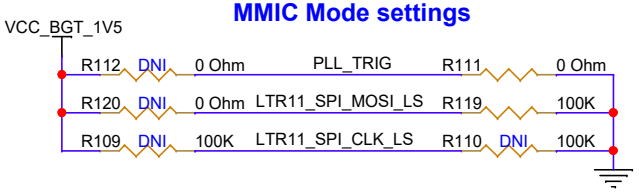
38.4MHz Oscillator



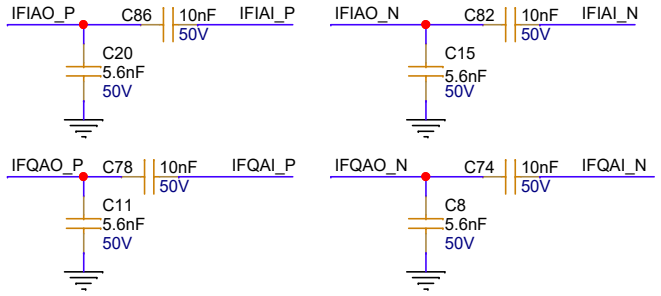
Low Pass Filter



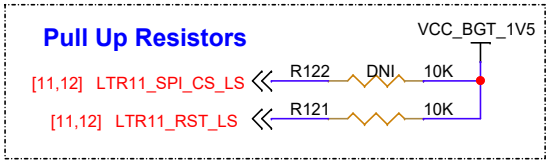
MMIC Mode settings



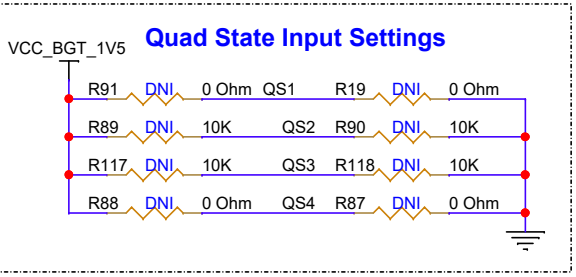
Sample and Hold Capacitors



Pull Up Resistors

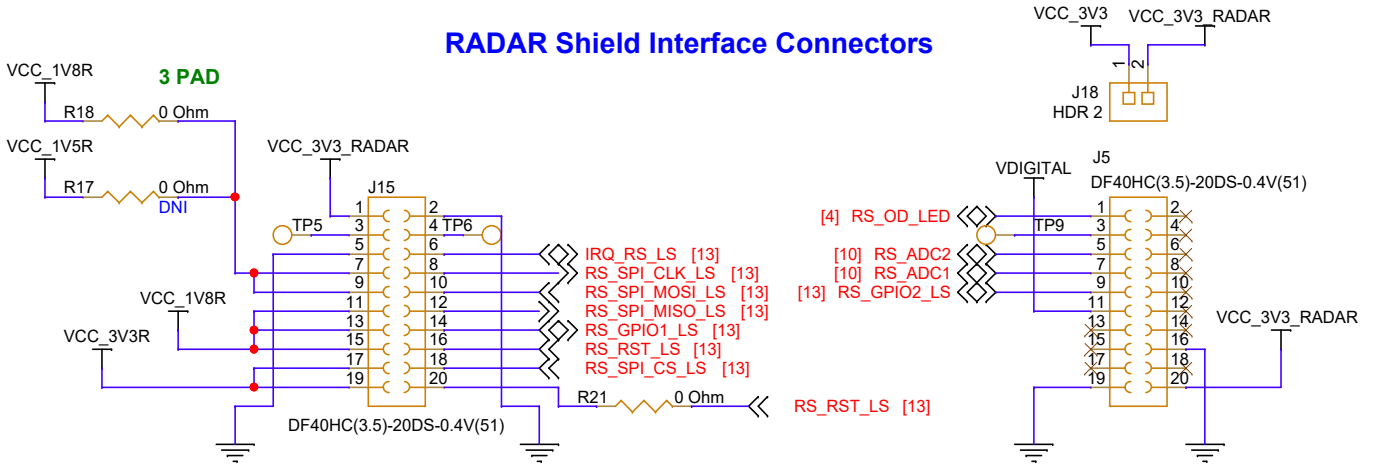


Quad State Input Settings

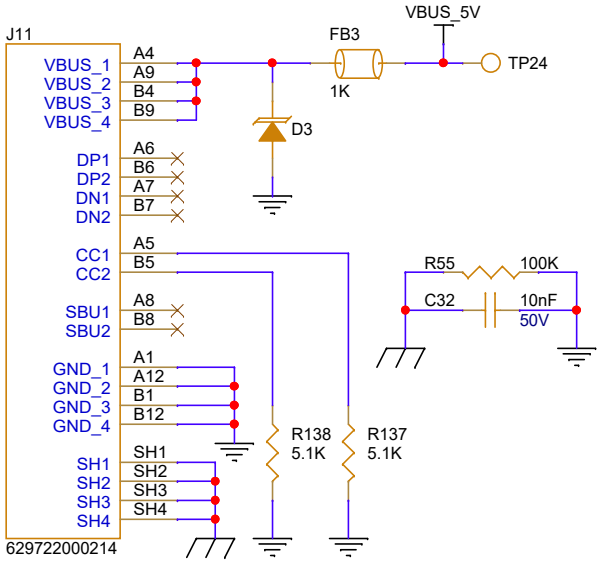


SCH Title : XENSIV™ Sensor Shield				
Page Title: RADAR LTR11 Sensor Interface				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 12 of 17		

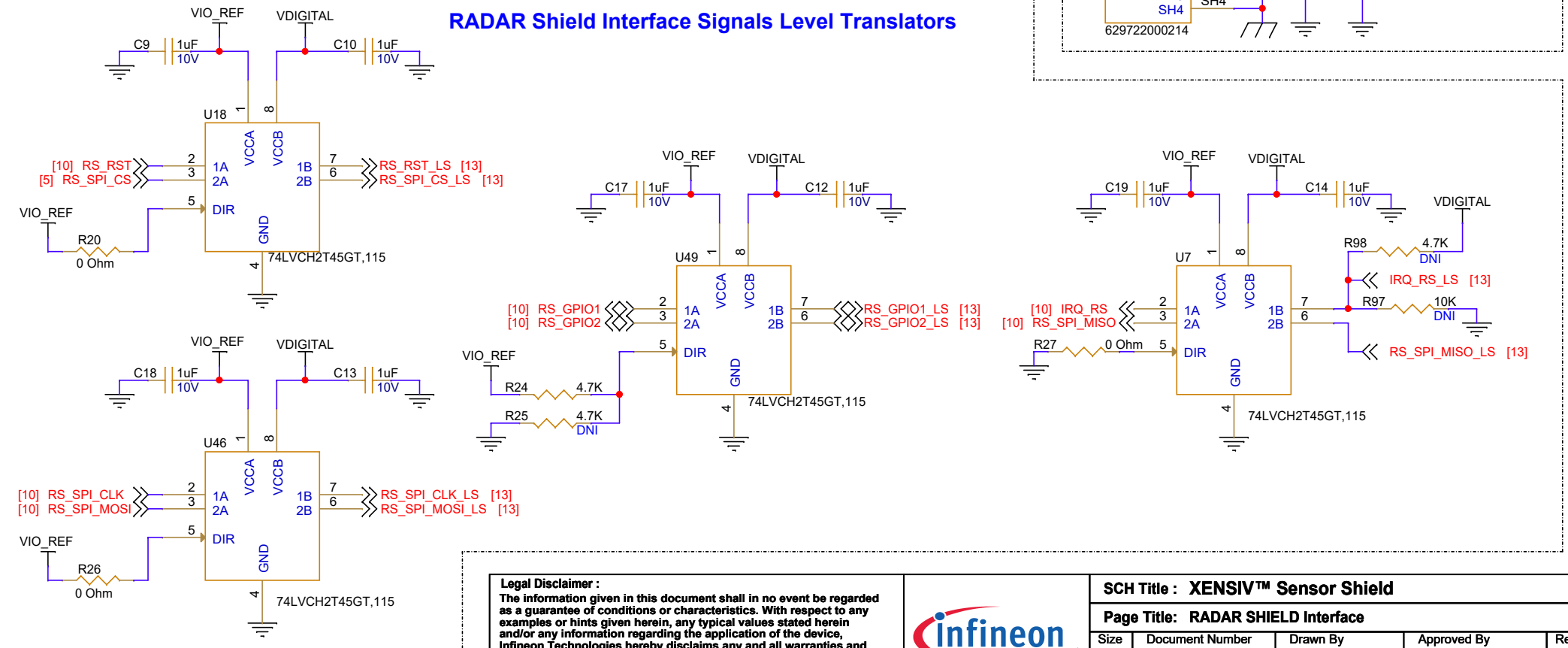
RADAR Shield Interface Connectors



USB Power Supply and Interface

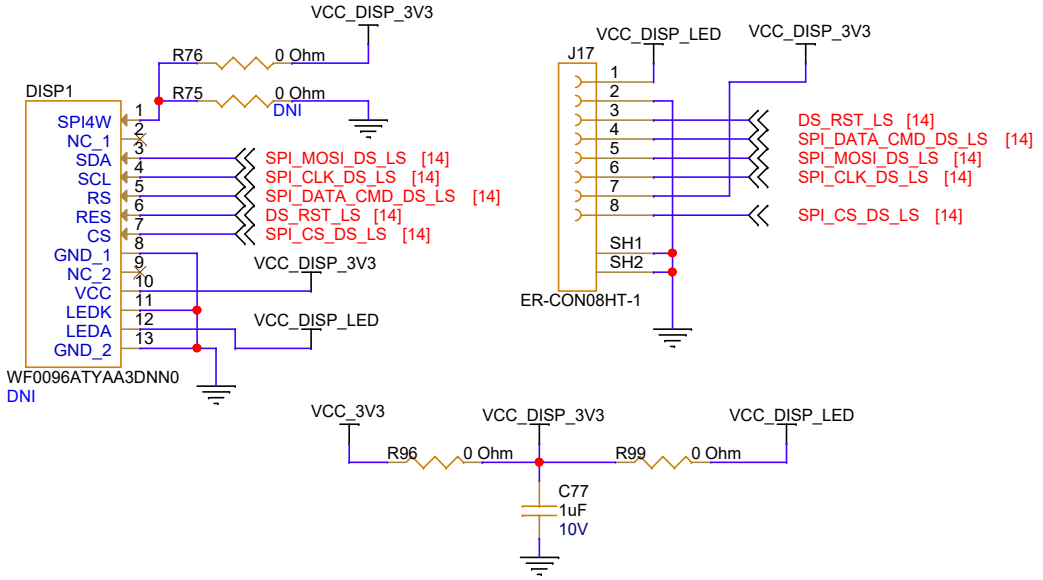


RADAR Shield Interface Signals Level Translators

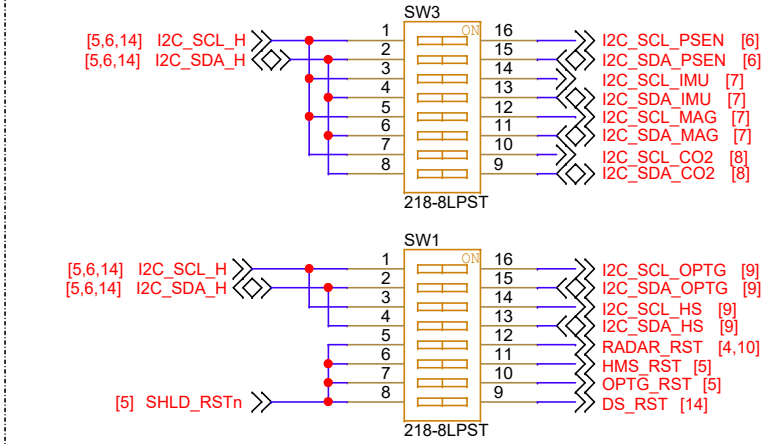


SCH Title : XENSIV™ Sensor Shield				
Page Title: RADAR SHIELD Interface				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 13 of 17		

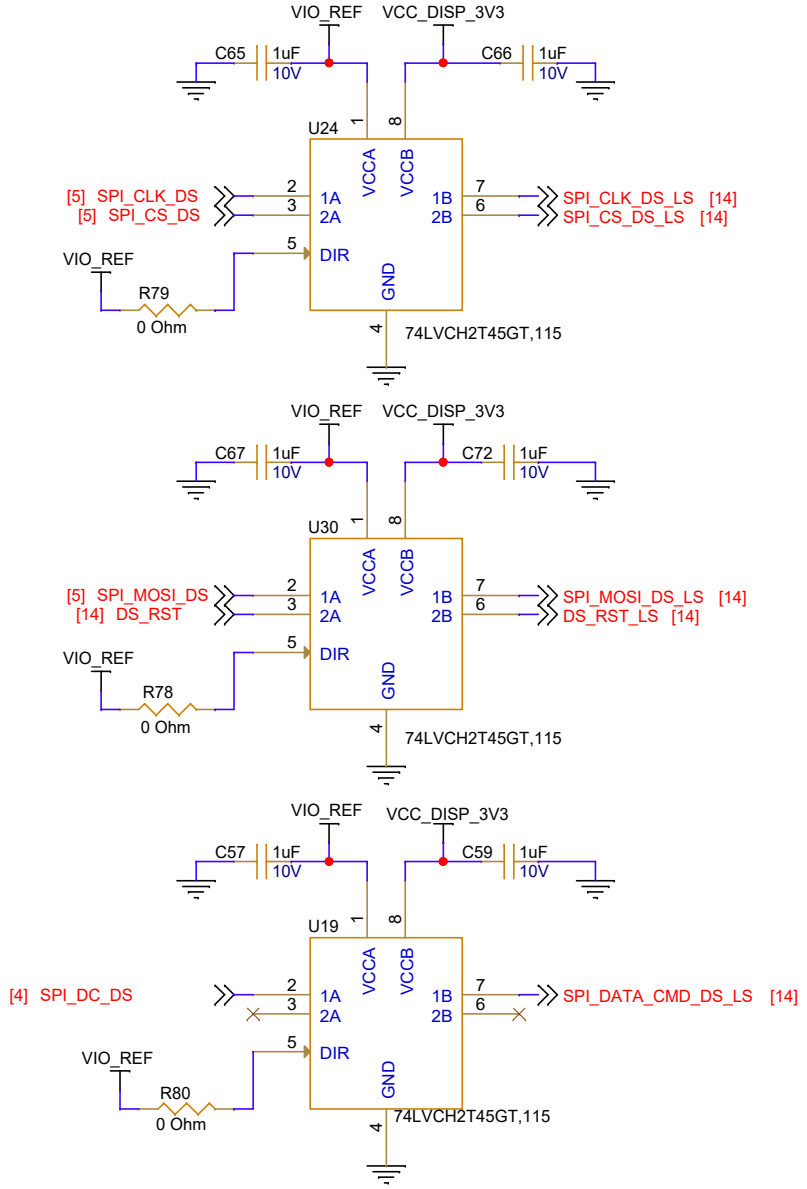
TFT Display Interface Provisions



I2C and RESET Multiplexing Switch



Display Interface Level Translators



SCH Title : **XENSIV™ Sensor Shield**				
Page Title: **TFT Display Interface and I2C/RST Selection Switch**				
Size	Document Number	Drawn By	Approved By	Rev
A4	**630-60700-01**	**MRRS**	**VAKI**	**03**
Date:	Wednesday, July 24, 2024	Sheet	**14** of **17**	

ACCESSORIES

ACC7

60900213421

ACC8

60900213421

ACC10

60900213421

ACC9

60900213421

ACC11

60900213421

ACC12

60900213421

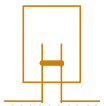
ACC13

60900213421

ACC14

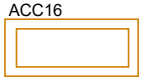
60900213421

ACC15



60900213421

ACC16



ER-TFT0.96-4

SCH Title : XENSIV™ Sensor Shield				
Page Title: DAC & TFT Interface				
Size	Document Number	Drawn By	Approved By	Rev
A4	630-60700-01	MRRS	VAKI	03
Date: Wednesday, July 24, 2024		Sheet 15 of 17		

REVISION HISTORY

REV	DESCRIPTION OF CHANGE	DATE
01	Initial release	02-02-2024
02	REV02 release	26-03-2024
2.21	add USB and oring circuit for RADAR auxilary supply	8-07-2024
03	REV03 release	24-07-2024