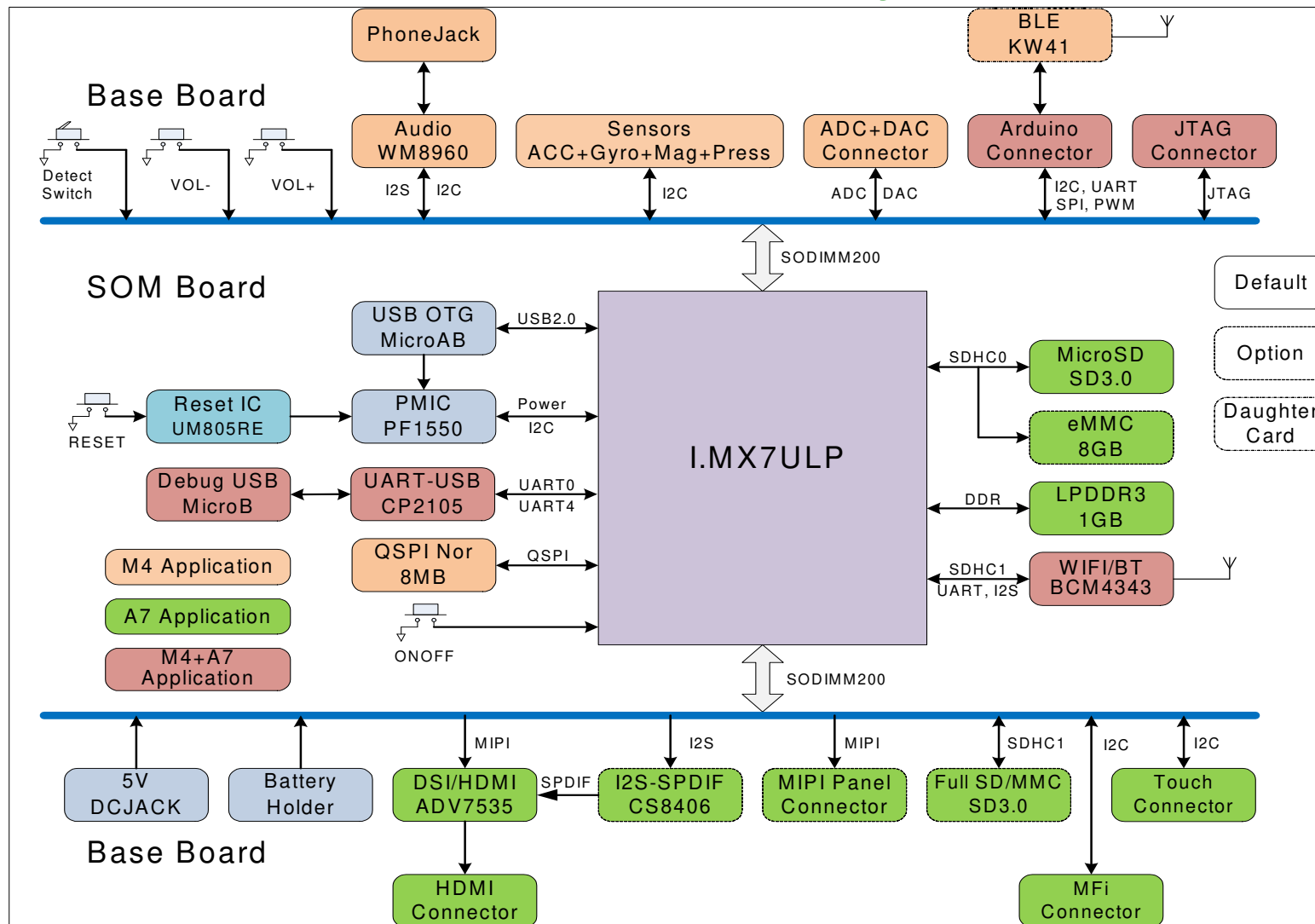


i.MX7ULP EVK Block Diagram



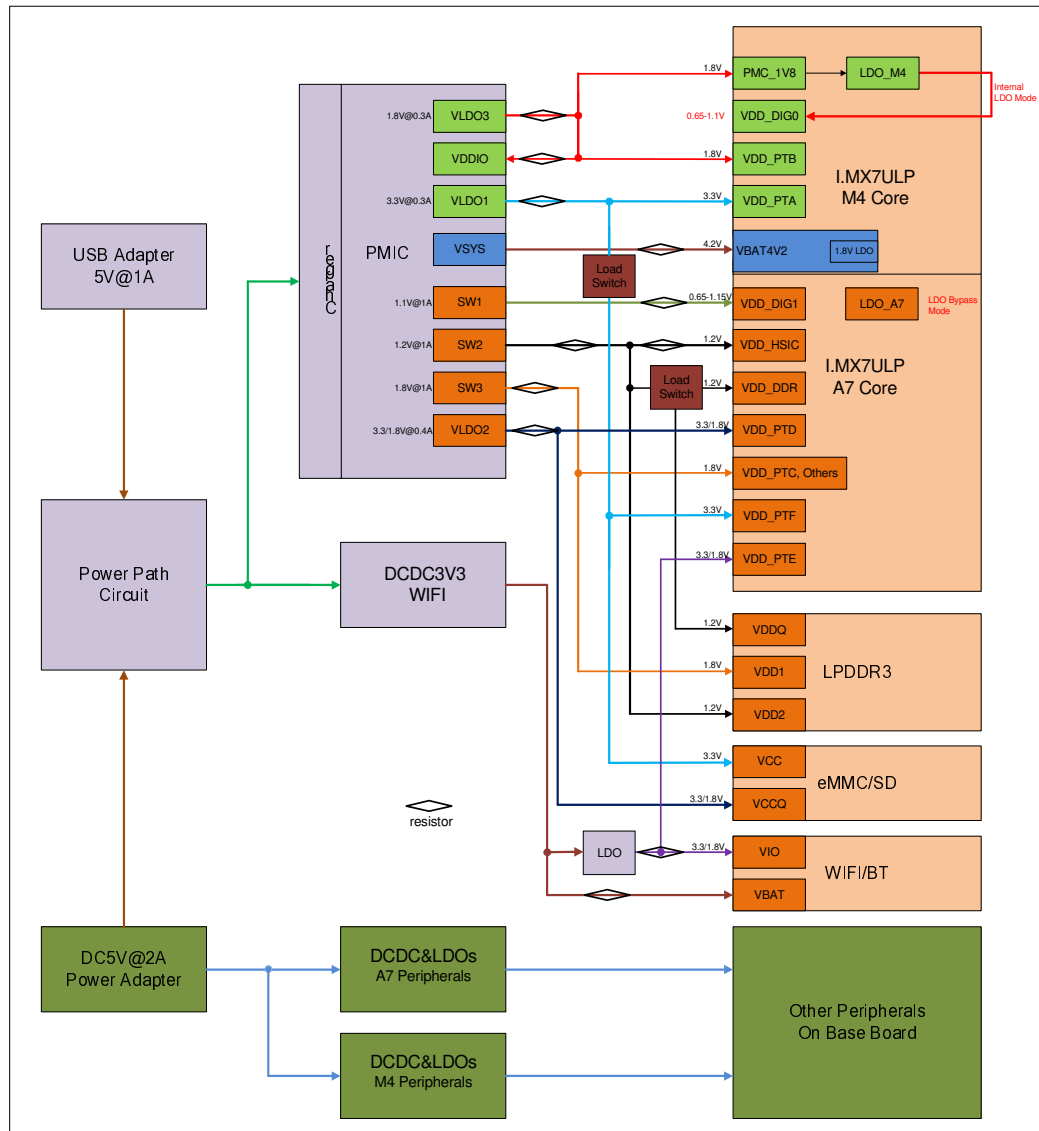
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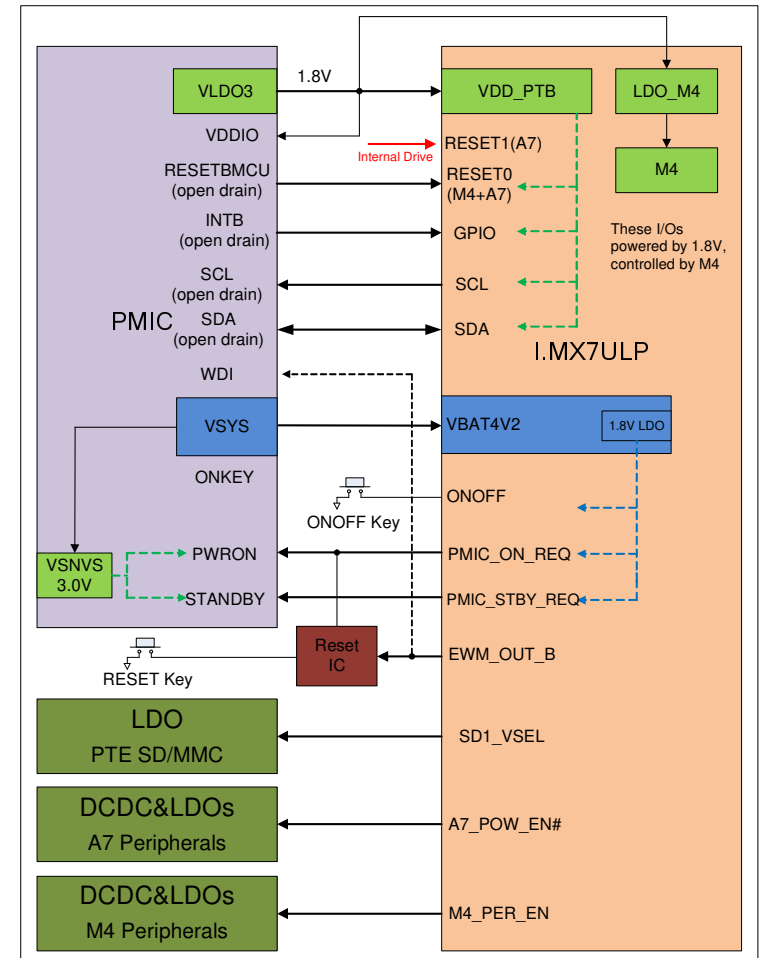
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Approved: <Approver>	Size A3	Document Number SCH-29164 PDF: SPF-29164			Rev B1
	Date: Friday, February 02, 2018		Sheet 2	of 16	

Power Distribution Diagram

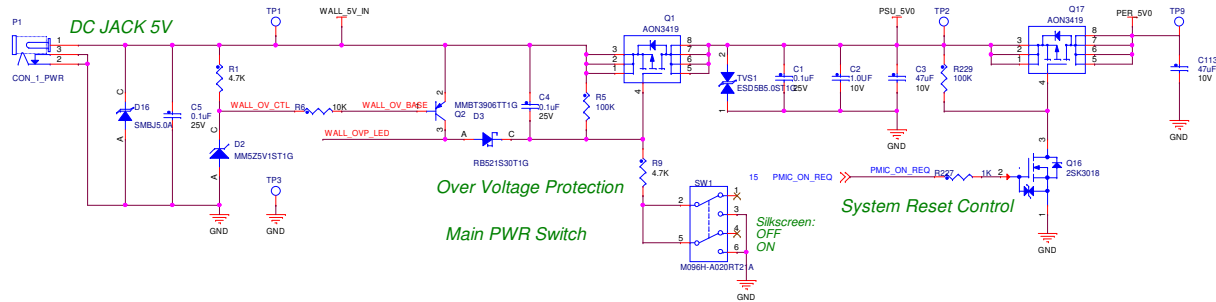


Power Control Diagram

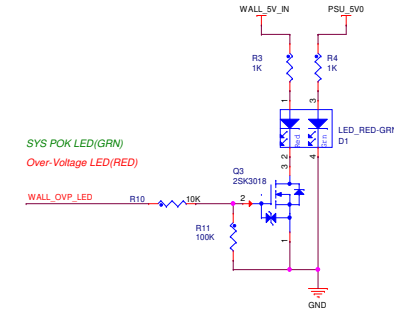


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Drawn by: <DrawnBy>	Page Title: Power Distribution Diagram		
Approved: <Approver>	Size A3	Document Number SCH-29164 PDF: SPF-29164	Rev B1
Date: Friday, February 02, 2018		Sheet 3 of 16	

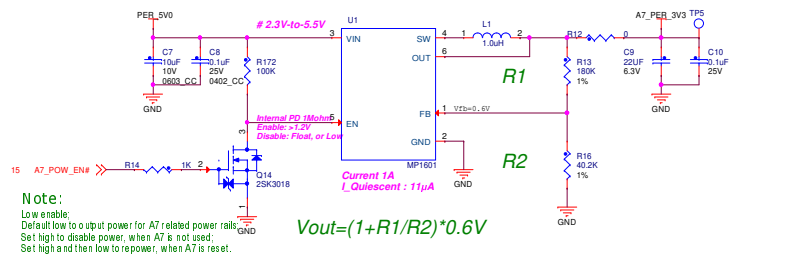
DC5V Input



Power LED Indicator



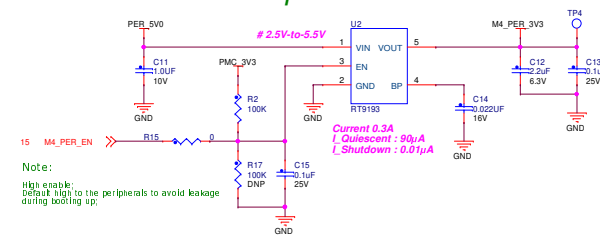
A7 Peripheral Power 3.3V



Note:
High enable;
Default high to output power for peripherals;
Set high to disable power, when A7 is not used;
Set high and then low to repower, when A7 is reset.

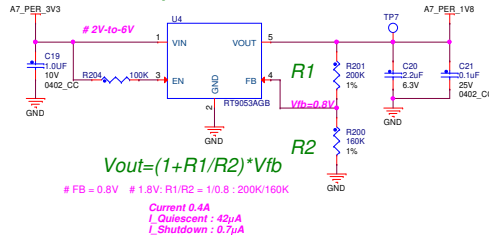
$$V_{out} = (1 + R1/R2) * 0.6V$$

M4 Peripheral Power 3.3V



Note:
High enable;
Default high to the peripherals to avoid leakage during booting up.

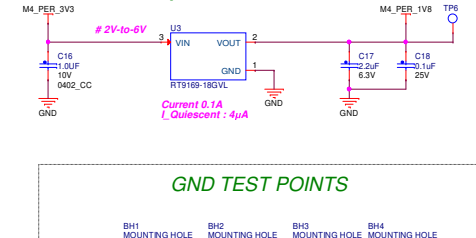
A7 Peripheral Power 1.8V



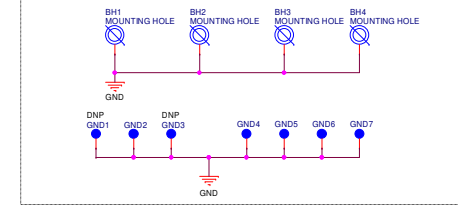
$$V_{out} = (1 + R1/R2) * V_{fb}$$

FB = 0.8V # 1.8V: R1/R2 = 1/0.8 : 200K/160K
Current 0.4A
I_{Quiescent} : 42μA
I_{Shutdown} : 0.7μA

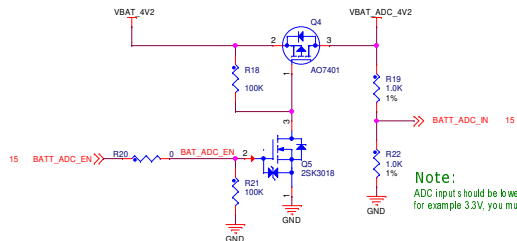
M4 Peripheral Power 1.8V



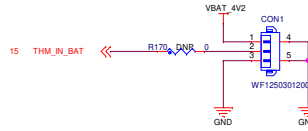
GND TEST POINTS




Battery Measurement



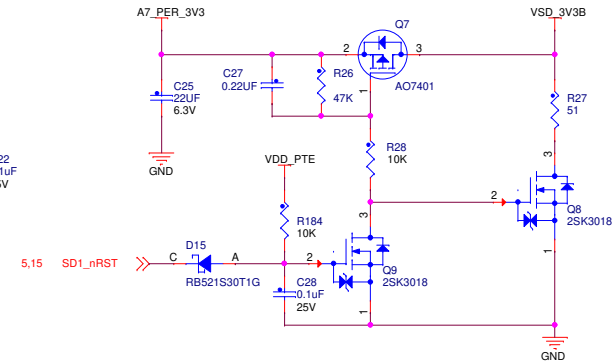
Li-on Battery Socket



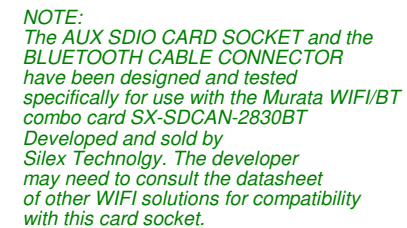
Note:
ADC inputs should be lower than VREFH:1.8V for full scale, but if you want to use an input higher than 1.8V, for example 3.3V, you must configure "CSCALE" register to reduce the selected ADC channel input voltage level by a factor of 30/64.

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Drawing Title: LMX7ULP-EVK_BB			
Drawn by: <Drawn by>		Page Title: Sensors	
Approved: <Approver>		Size C Document Number SCH-29164 PDF: SPF-29164	
Date: Friday, November 09, 2018		Sheet 4 of 16	

Power Switch for SD3.0

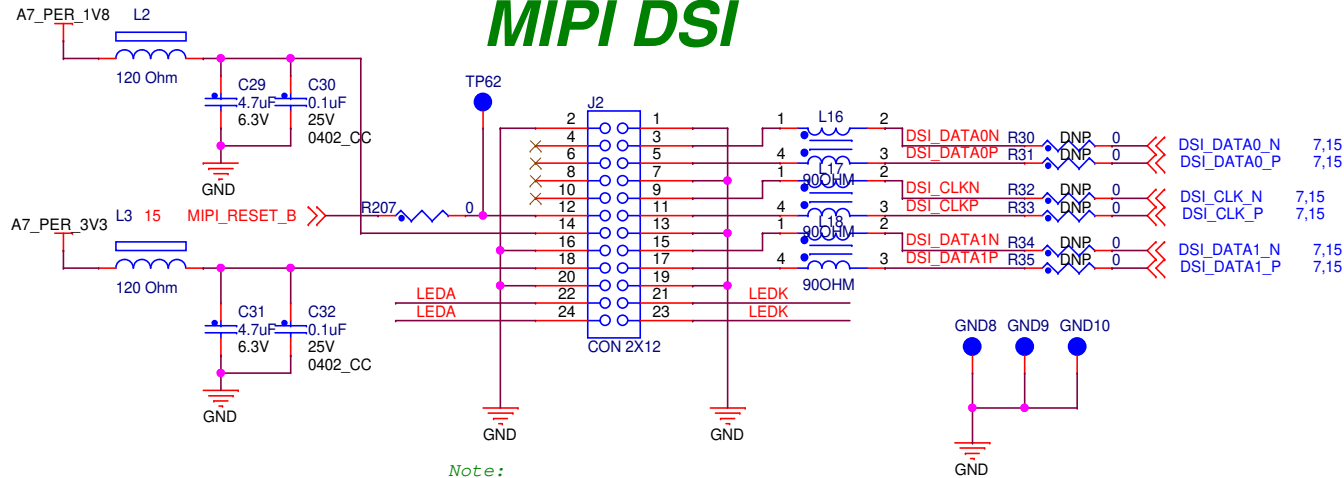


BLUETOOTH SOCKET



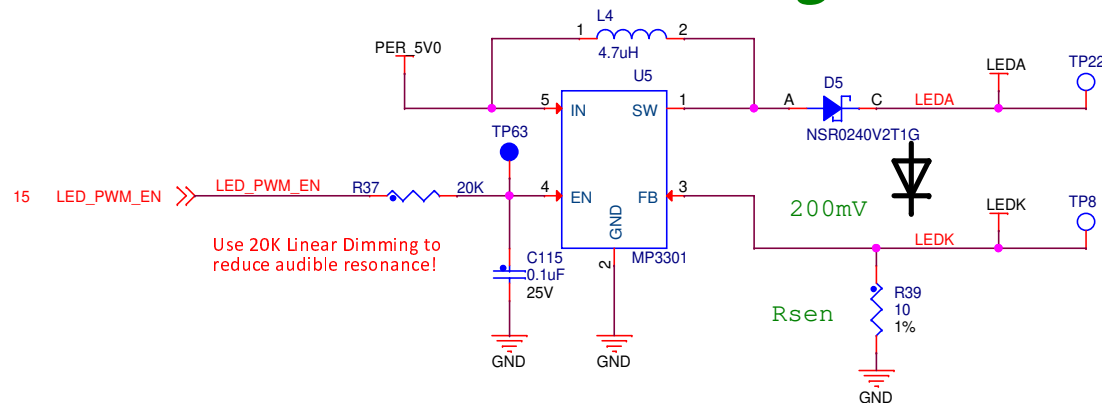
MIPI DSI

Touch



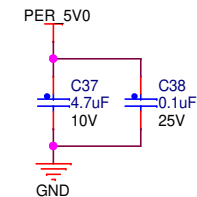
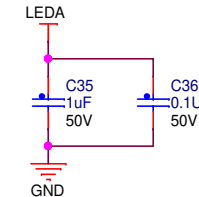
Note:
 1. HDMI is the default display, alternative with MIPI Panel;
 2. When MIPI Panel is used, R30-R35 should be populated;
 3. When MIPI Panel is used, R41,R51,R43-R46 should be removed;

LCD LED BackLight



Use 20K Linear Dimming to reduce audible resonance!

LED Current
 $I = 0.2 / R_{sen} = 20\text{mA}$



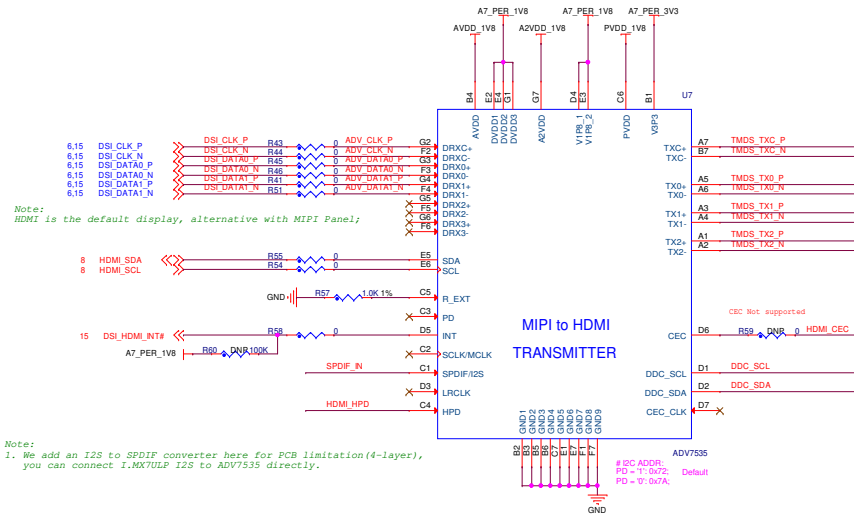
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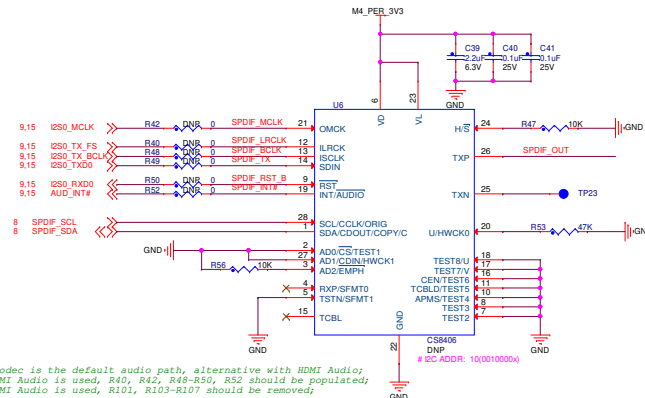
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Drawn by: <DrawnBy>	Page Title: MIPI Display & Touch				
Approved: <Approver>	Size A4	Document Number SCH-29164 PDF: SPF-29164			Rev B1
Date:	Friday, February 02, 2018		Sheet	6 of 16	

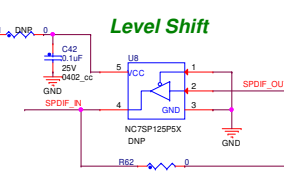
MIPI to HDMI Transmitter



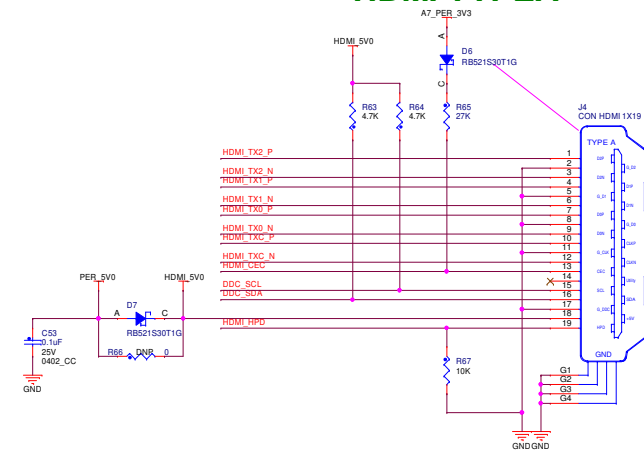
HDMI Audio I2S-SPDIF



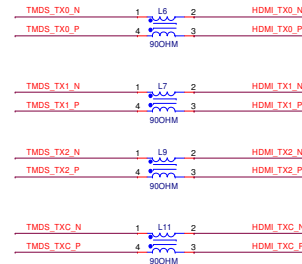
Level Shift



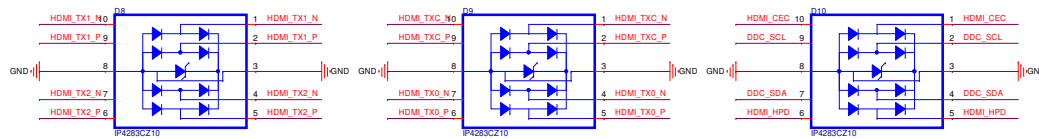
HDMI TYPEA




EMI

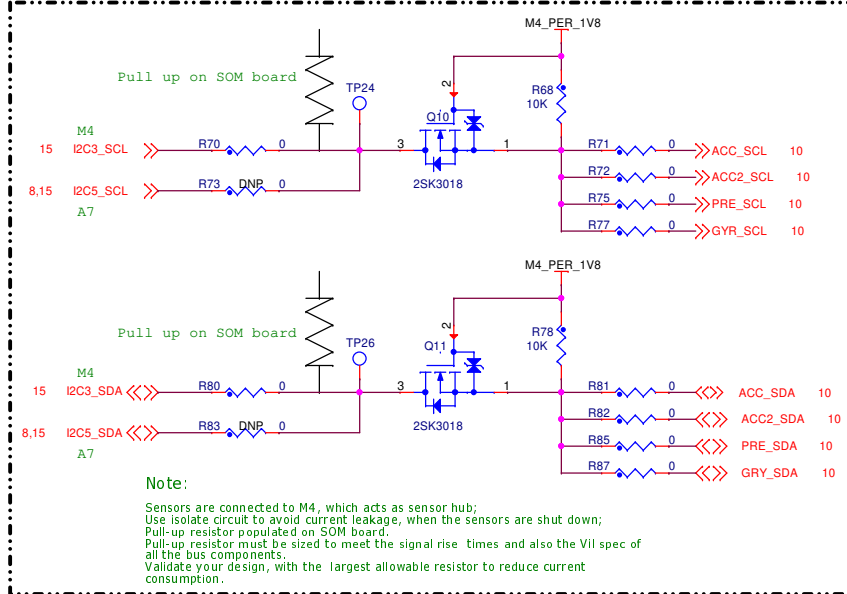


ESD

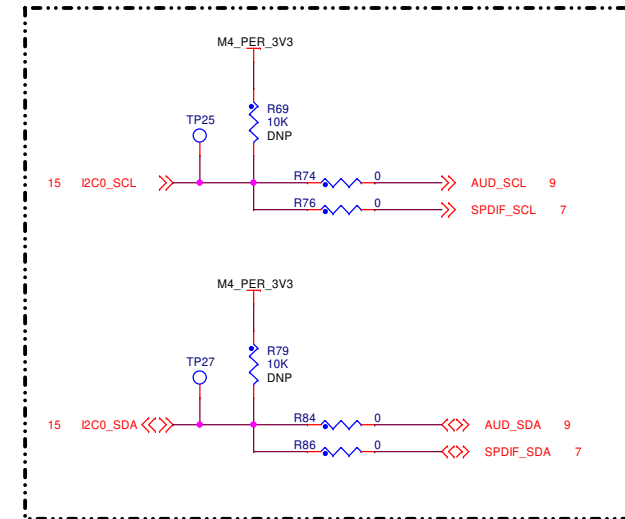


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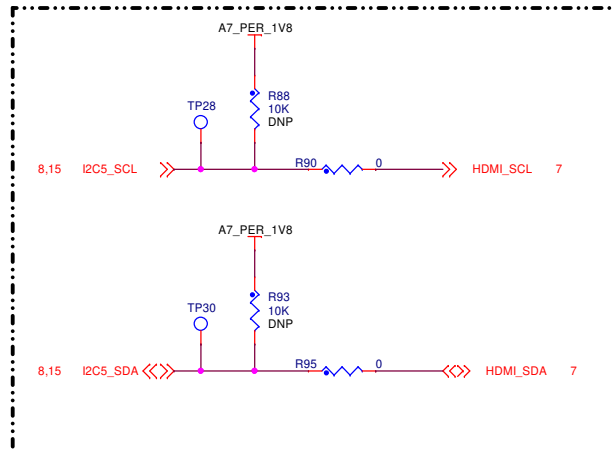
I2C3(M4, 1.8V)



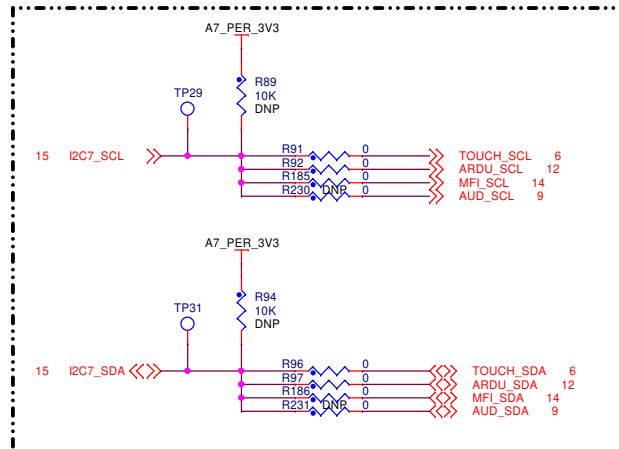
I2C0(M4, 3.3V)




I2C5(A7, 1.8V)

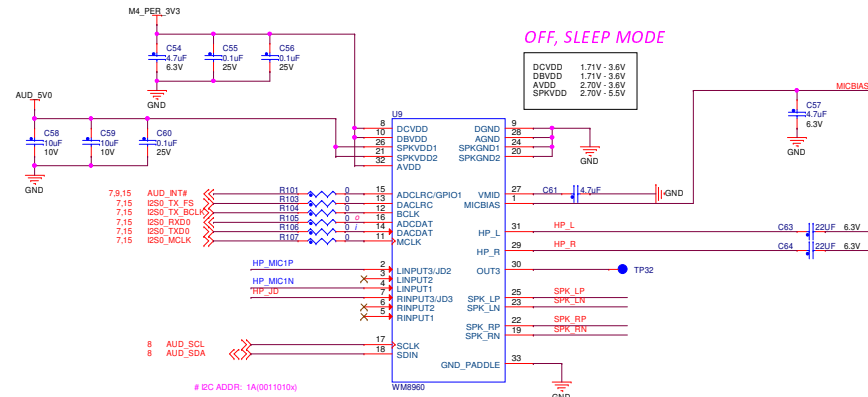


I2C7(A7, 3.3V)

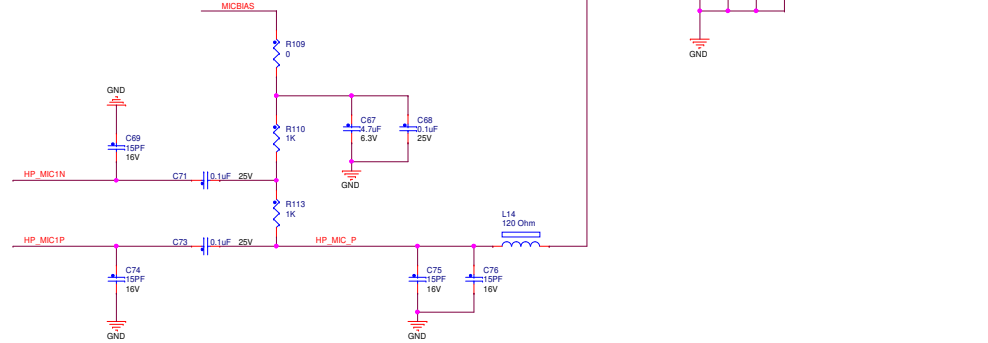


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Approved: <Approver>	Size B	Document Number SCH-29164 PDF: SPF-29164	
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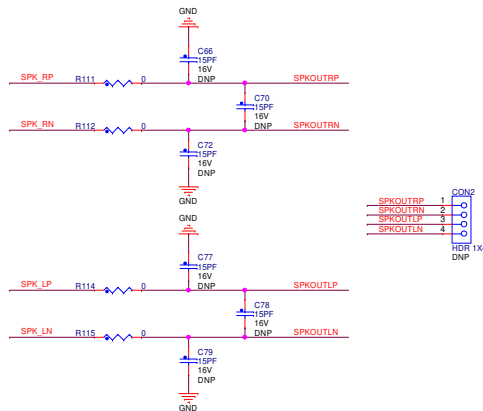
Audio Codec



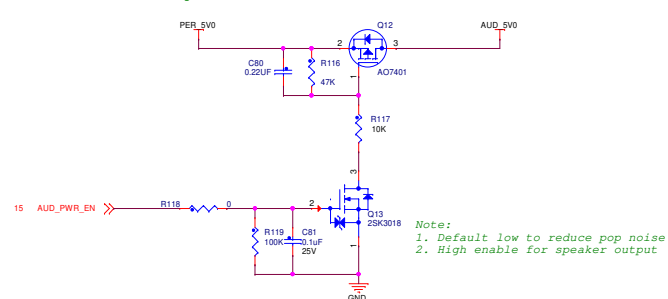
HP JACK




Speaker



Speaker Power Control



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Drawn by: <DrawnBy>	Page Title: Audio Codec		
Approved: <Approver>	Size C	Document Number SCH-29164 PDF: SCH-29164	Rev B1
Date:	Friday, February 02, 2018	Sheet	9 of 16

[illegible]

Gyroscope

The schematic diagram illustrates the electrical connections for the gyroscope module. The central component is the FXAS21002CQ IC (U11). Key connections include:

- Power Supply:** VDD (pin 15) and VREGD (pin 16) are connected to M4_PER_3V3. VDDIO (pin 18) is connected to M4_PER_1V8.
- Grounding:** GND pins (1, 5, 14, 19, 20) are connected to ground.
- I2C Interface:** SCL/SCLK (pin 11) and SDA/MOSI/SP_I_DIO (pin 12) are connected to the I2C bus. Pull-up resistors R120 (10K) and C91 (0.1uF) are shown on the SCL line.
- Reset:** RST# (pin 4) is connected to TP33.
- Other Pins:** INT1# (pin 3), INT2#/PWR_CTRL (pin 2), RSVD1 (pin 6), RSVD2 (pin 7), RSVD3 (pin 9), RSVD4 (pin 10), RSVD5 (pin 20), RSVD6 (pin 21), RSVD7 (pin 22), RSVD8 (pin 23), and RSVD9 (pin 24) are also shown.

I2C ADDR: 0x20; # Current consumption: IddAct: 2.7mA IddStby: 2.8uA

Pressure

Pressure

Schematic diagram showing the connection of the pressure sensor (U12, MPL3115A2) to the microcontroller (M4).

Microcontroller Pins:

- M4_PER_3V3
- M4_PER_1V8
- GND
- TP35

Sensor (U12) Pins:

- 1 VDD
- 2 CAP
- 3 GND
- 4 VDDIO
- 5 INT1
- 6 INT2
- 7 SCL
- 8 SDA

Connections:

- M4_PER_3V3 to VDD (Pin 1)
- M4_PER_1V8 to CAP (Pin 2)
- GND to GND (Pin 3)
- M4_PER_1V8 to VDDIO (Pin 4)
- PRE_SCL to SCL (Pin 7)
- PRE_SDA to SDA (Pin 8)
- PRE_INT1# to INT1 (Pin 5)
- PRE_INT2# to INT2 (Pin 6)

Component Values:

- C95: 1.0uF, 10V
- C96: 0.1uF, 25V, 0402_CC
- C97: 0.1uF, 25V, 0402_CC
- C98: 0.1uF, 25V, 0402_CC

Notes:

- # I2C ADDR: 0x60
- # Current consumption: 100uA @ 2mA, 100nA @ 2mA

The diagram shows the connection of the ACC2 module (U13) to the FXLS8952CWR1 sensor. The sensor is a blue square component with pins A1, A2, B1, B2, C1, C2, DNP, and GND. The connections are as follows:

- A1:** Connected to M4_PER_1V8.
- A2:** Connected to GND.
- B1:** Connected to ACC2_SCL (8 pins).
- B2:** Connected to ACC2_INT1# (8 pins).
- C1:** Connected to ACC2_SDA (8 pins).
- C2:** Connected to ACC2_INT2# (8 pins).
- DNP:** Connected to GND.
- GND:** Connected to GND.

Additional components and labels include:

- C93:** 1.0uF 10V capacitor.
- C94:** 0.1uF 25V capacitor.
- TP36:** Test point.
- FXLS8952CWR1:** The sensor component.
- ACC2:** The module being connected.
- FXLS8952CWR1:** The sensor component.

15 SEN_INT#

M4_PER_1V8

R122
10K
DNP

D11 1 PRE_INT1#

D12 1 ACC_INT1#


BAT54AWT1G

BAT54AWT1G

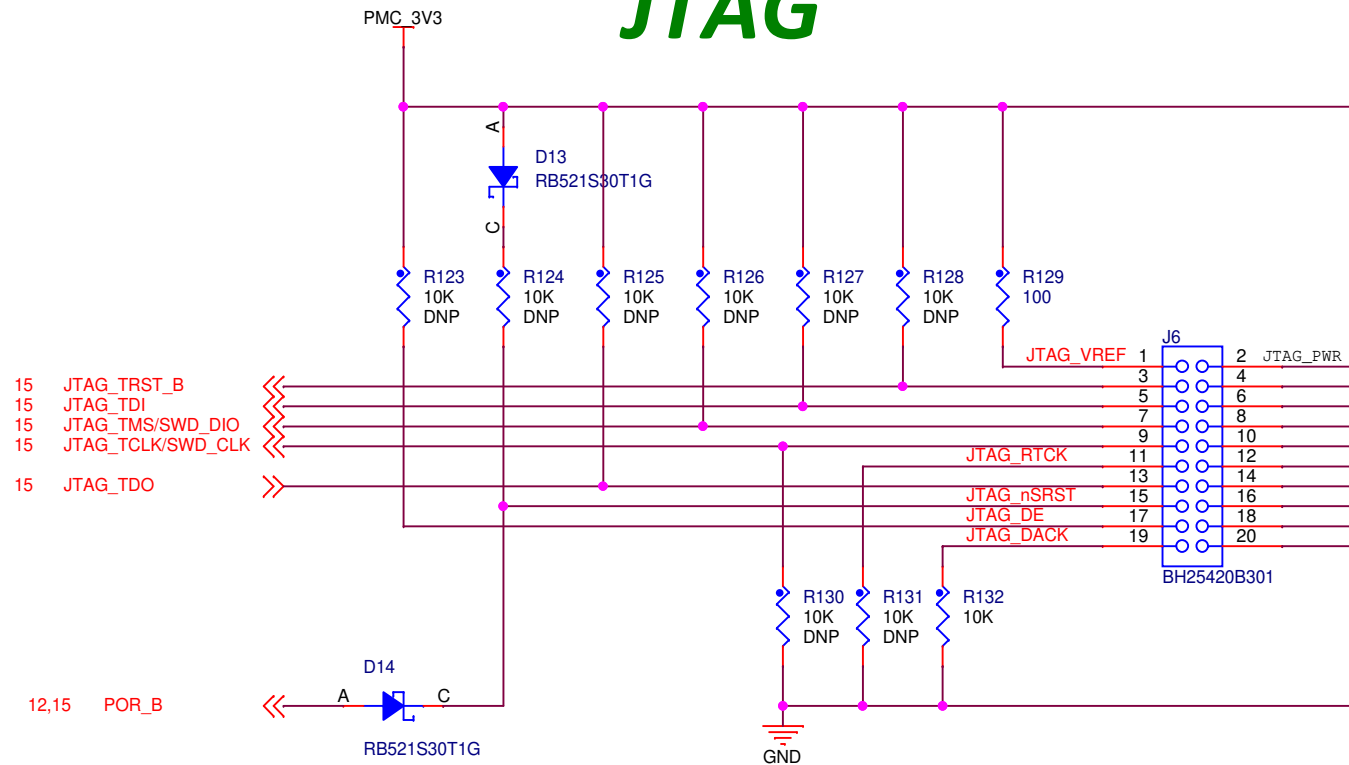
2 GYRO_INT1#

2 ACC2_INT1#

Internal pull up, active low;
When SEN_INT# is driven low, CPU start polling the devices to see which one is active;

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Approved: <Approver>	Size A3	Document Number SCH-29164 PDF: SPF-29164	Rev B1
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JTAG



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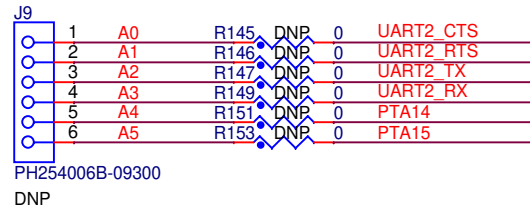
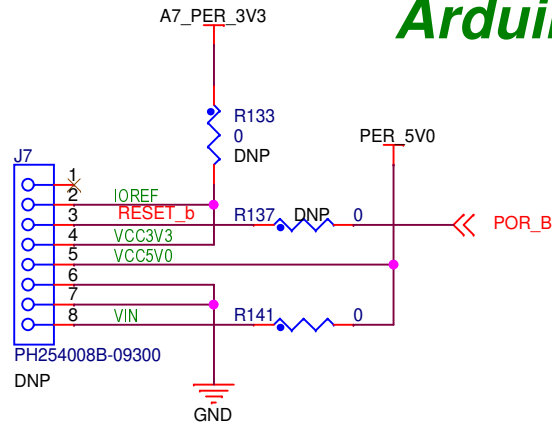
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Arduino-Headers



Pin Mux for Arduino Interface:

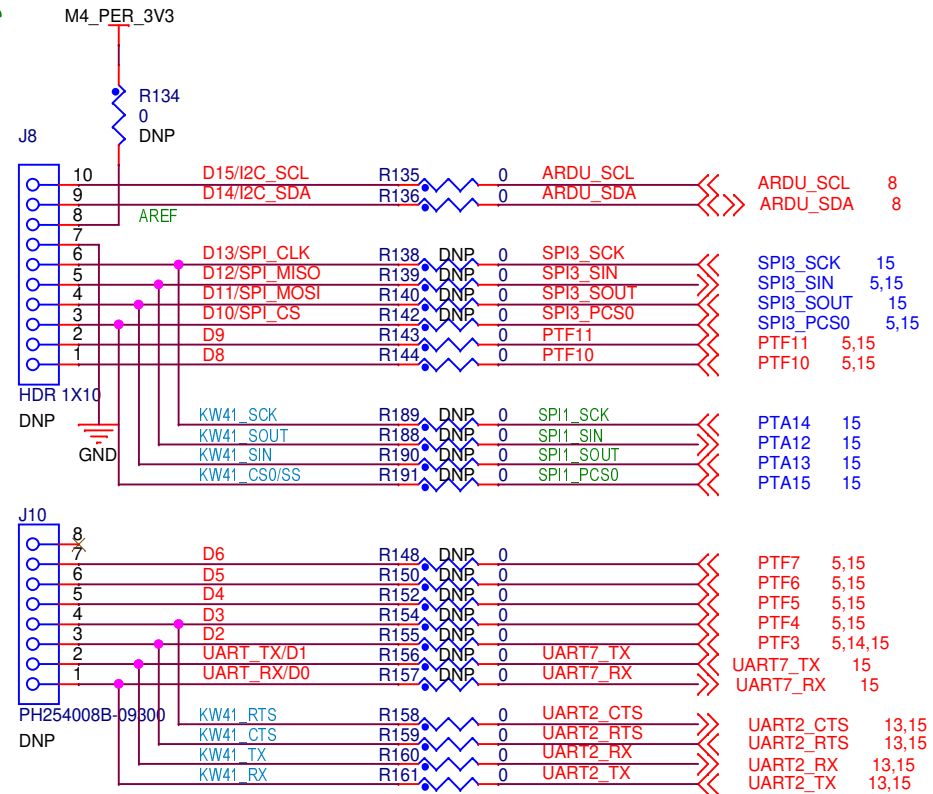
Arduino Pin	CPU M4 PAD	IOMUX1	IOMUX2	IOMUX3
A0	PTA8	ADC1_CH7A	UART2_CTS	I2C2_SCL
A1	PTA9	ADC1_CH7B	UART2_RTS	I2C2_SDA
A2	PTA10	ADC1_CH6A	UART2_TX	
A3	PTA11	ADC1_CH6B	UART2_RX	
A4	PTA14	ADC1_CH4A	UART3_TX	LLWU_P3
A5	PTA15	ADC1_CH4B	UART3_RX	

Arduino Pin	CPU A7 PAD	IOMUX1	IOMUX2	IOMUX3
D0/RX	PTF15	UART7_RX	TPM7_CH1	
D1/TX	PTF14	UART7_TX	TPM7_CH0	
D2	PTF3	TPM4_CH2		
D3	PTF4	TPM4_CH3		
D4	PTF5	TPM4_CH4		
D5	PTF6	TPM4_CH5		
D6	PTF7	TPM5_CH1		
D8	PTF10	TPM7_CH3		
D9	PTF11	TPM7_CH4		
D10	PTF19	SPI3_PCS0	TPM6_CH1	
D11	PTF17	SPI3_SOUT	TPM6_CLKIN	
D12	PTF16	SPI3_SIN	TPM7_CH2	
D13	PTF18	SPI3_SCK	TPM6_CH0	
D14	PTF13	I2C7_SDA	TPM7_CLKIN	UART7_RTS
D15	PTF12	I2C7_SCL	TPM7_CH5	UART7_CTS

Attention:
Be careful to use BOOT_CFG pins, make sure the external devices won't impact the pull up/down states when boot!

Default to support KW40/41 FRDM !

CPU M4 PAD	IOMUX1
PTA10	UART2_TX
PTA11	UART2_RX
PTA8	UART2_CTS
PTA9	UART2_RTS
PTA15	SPI1_PCS0/SS
PTA13	SPI1_SOUT
PTA12	SPI1_SIN
PTA14	SPI1_SCK



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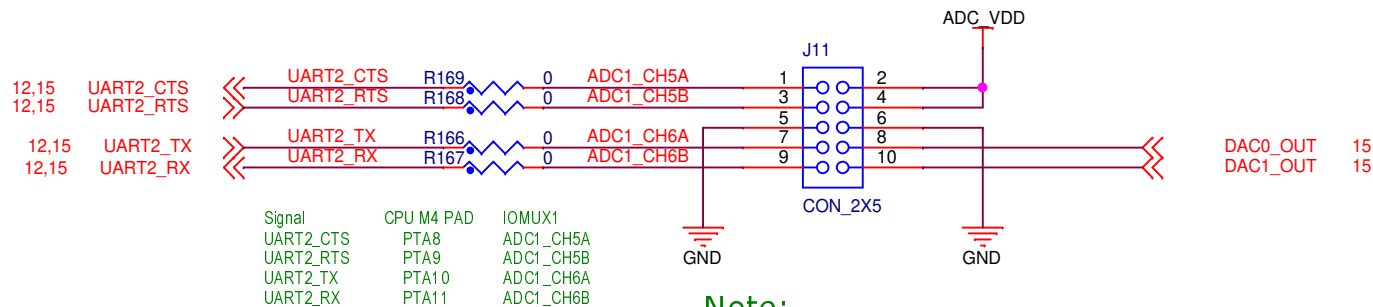
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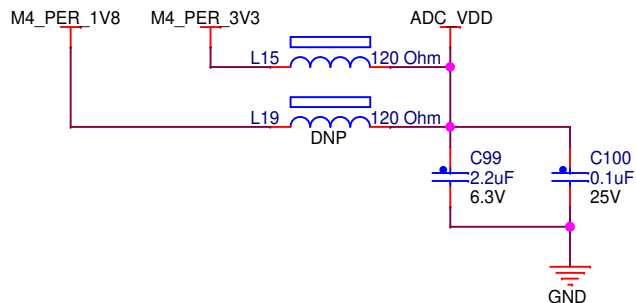
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Drawn by: <DrawnBy>	Page Title: Arduino Interface		
Approved: <Approver>	Size A	Document Number SCH-29164 PDF: SPF-29164	Rev B1
Date: Friday, February 02, 2018		Sheet 12 of 16	

12-bit ADC/DAC Connector



Note:

ADC input should be lower than VREFH=1.8V for full scale, but if you want to use an input higher than 1.8V, you must configure "CSCALE" register to reduce the selected ADC channel input voltage level by a factor of 30/64.



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ADC&DAC Interface

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<Approver>

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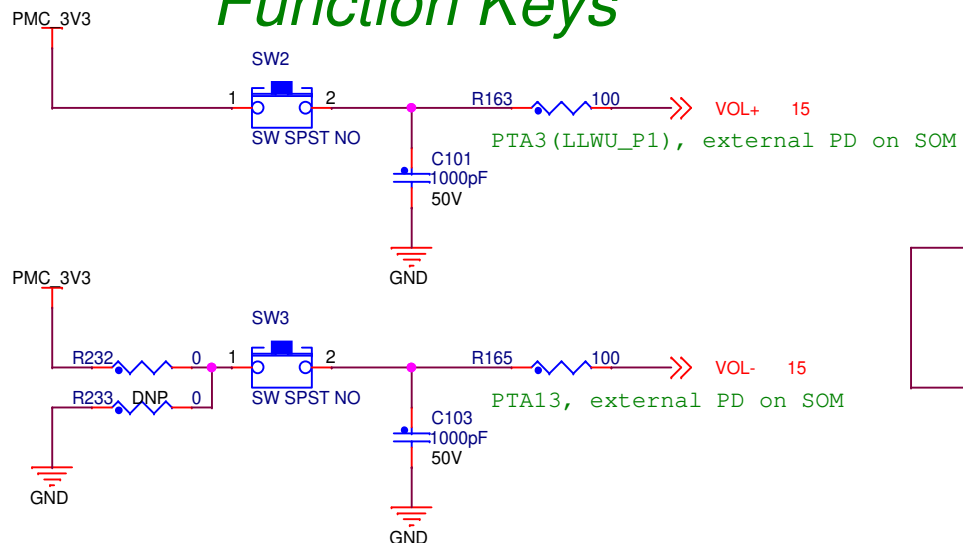
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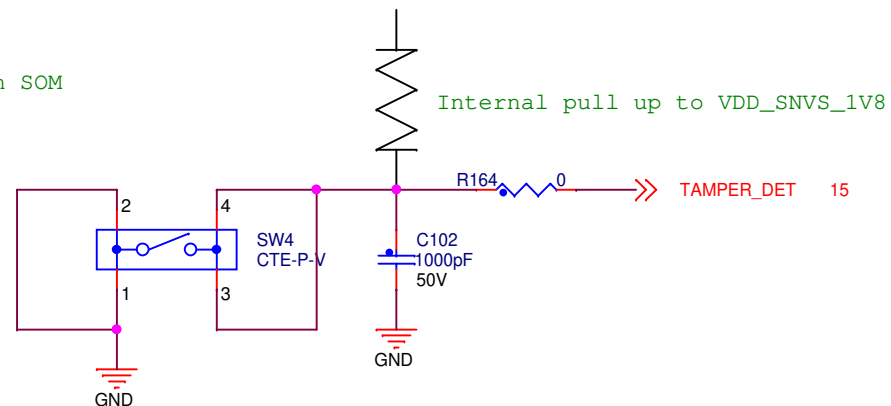
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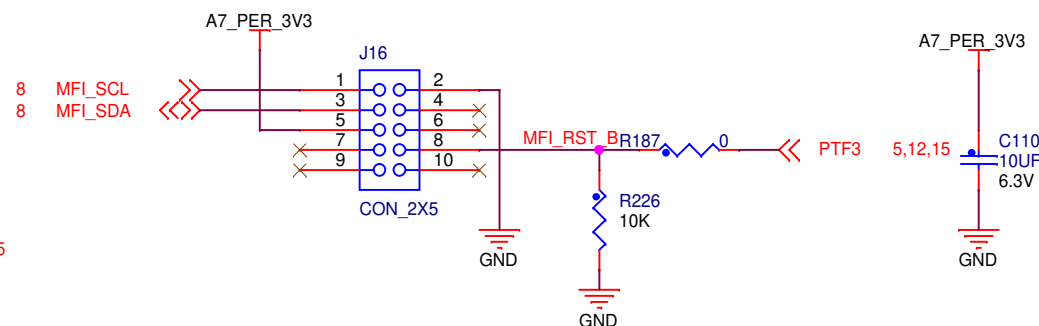
Function Keys



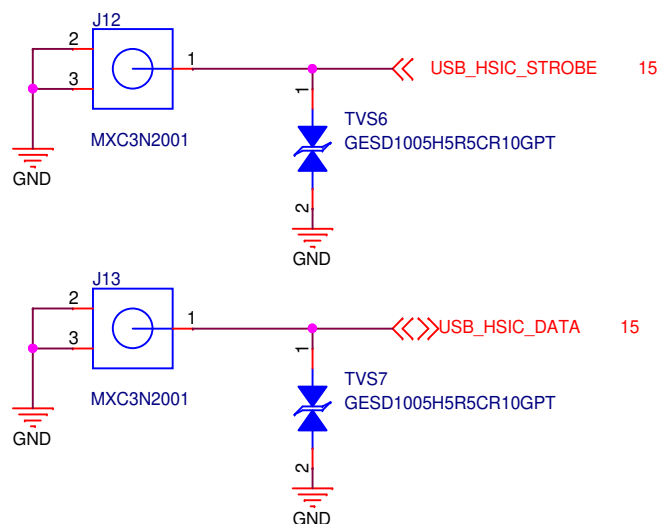
Detect Switch



MFI Interface



USB HSIC Interface



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Approved:
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Rev
B1

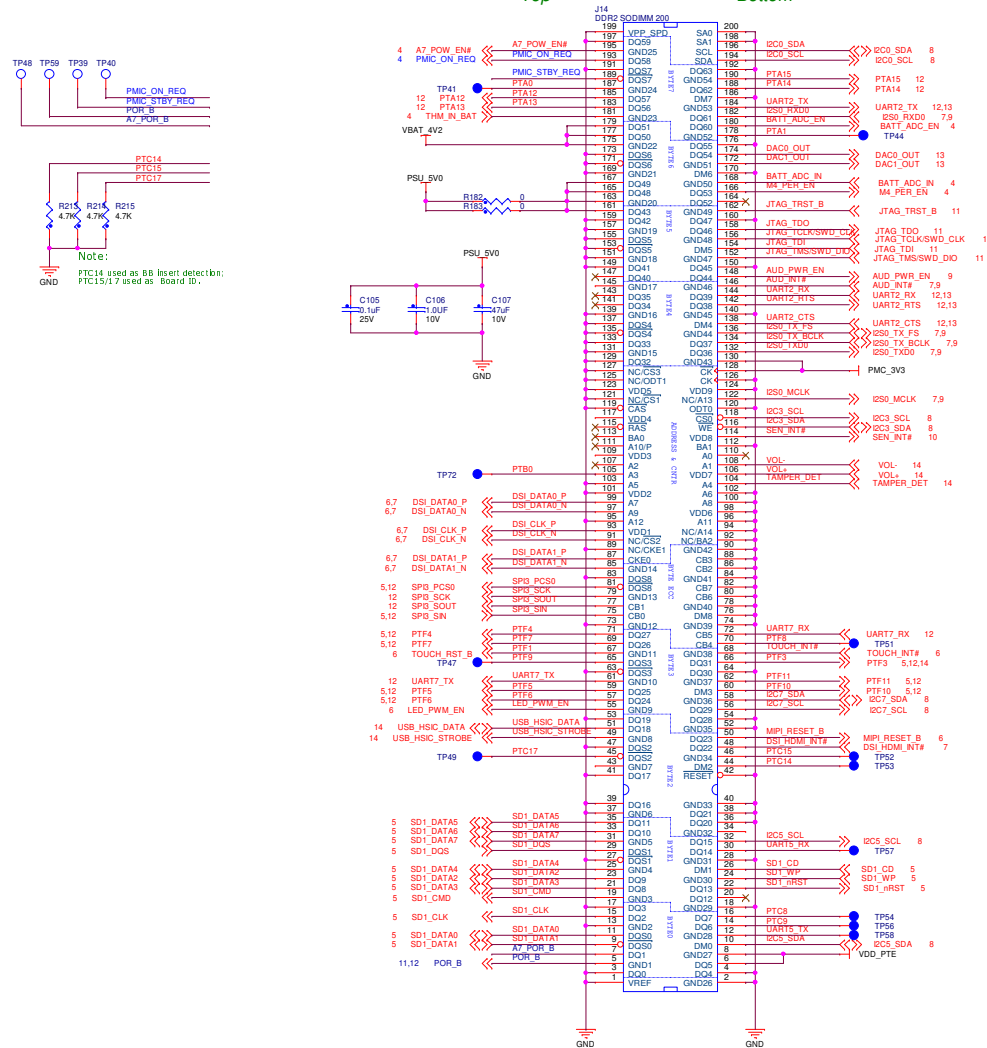
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