

Q410 CARRIER

MAJOR REVISION HISTORY :

PCB REV.	SCH. REV.	DESCRIPTION	DATE
1.0	1.0	Q410 CARRIER SCHEMATICS	22-June-2015
2.0	2.0	Q410 CARRIER SCHEMATICS	22-Sept-2015

PAGE DESCRIPTION

PAGE 01 : COVER PAGE
 PAGE 02 : BLOCK DIAGRAM
 PAGE 03 : POWER SUPPLY TREE
 PAGE 04 : MICRO SD AND JTAG
 PAGE 05 : USB HUB
 PAGE 06 : USB CONNECTORS
 PAGE 07 : USB TO ETHERNET
 PAGE 08 : LAN7500 POWER SUPPLY
 PAGE 09 : MIPI DSI DISPLAY
 PAGE 10 : MIPI CAMERA
 PAGE 11 : HEADSET,MIC & SPEAKER
 PAGE 12 : LED AND SWITCHES
 PAGE 13 : GPS-WGR7640
 PAGE 14 : GYROSCOPE & ACCELEROMETER
 PAGE 15 : INPUT SUPPLY AND LDO
 PAGE 16 : POWER SUPPLY
 PAGE 17 : BOOT CONFIGURATION AND DEBUG
 PAGE 18 : I/O EXPANDER
 PAGE 19 : EXPANSION CONNECTOR
 PAGE 20 : REVISION HISTORY

PCB MECHANICAL DETAILS :

1. PCB SIZE: 72 mm X 100 mm
2. PCB MATERIAL: FR4
3. NUMBER OF LAYERS: 8
4. IMPEDANCE CONTROL: YES

NOTES, UNLESS OTHERWISE SPECIFIED :


1. RESISTANCE VALUES ARE IN OHMS.
2. CAPACITANCE VALUES ARE IN MICROFARADS.
3. PARTS NOT INSTALLED ARE INDICATED WITH 'DNP'.
4. SIGNAL NET NAMES WITH "_N" SUFFIX, ARE ACTIVE LOW SIGNALS.

I2C ADDRESS TABLE :

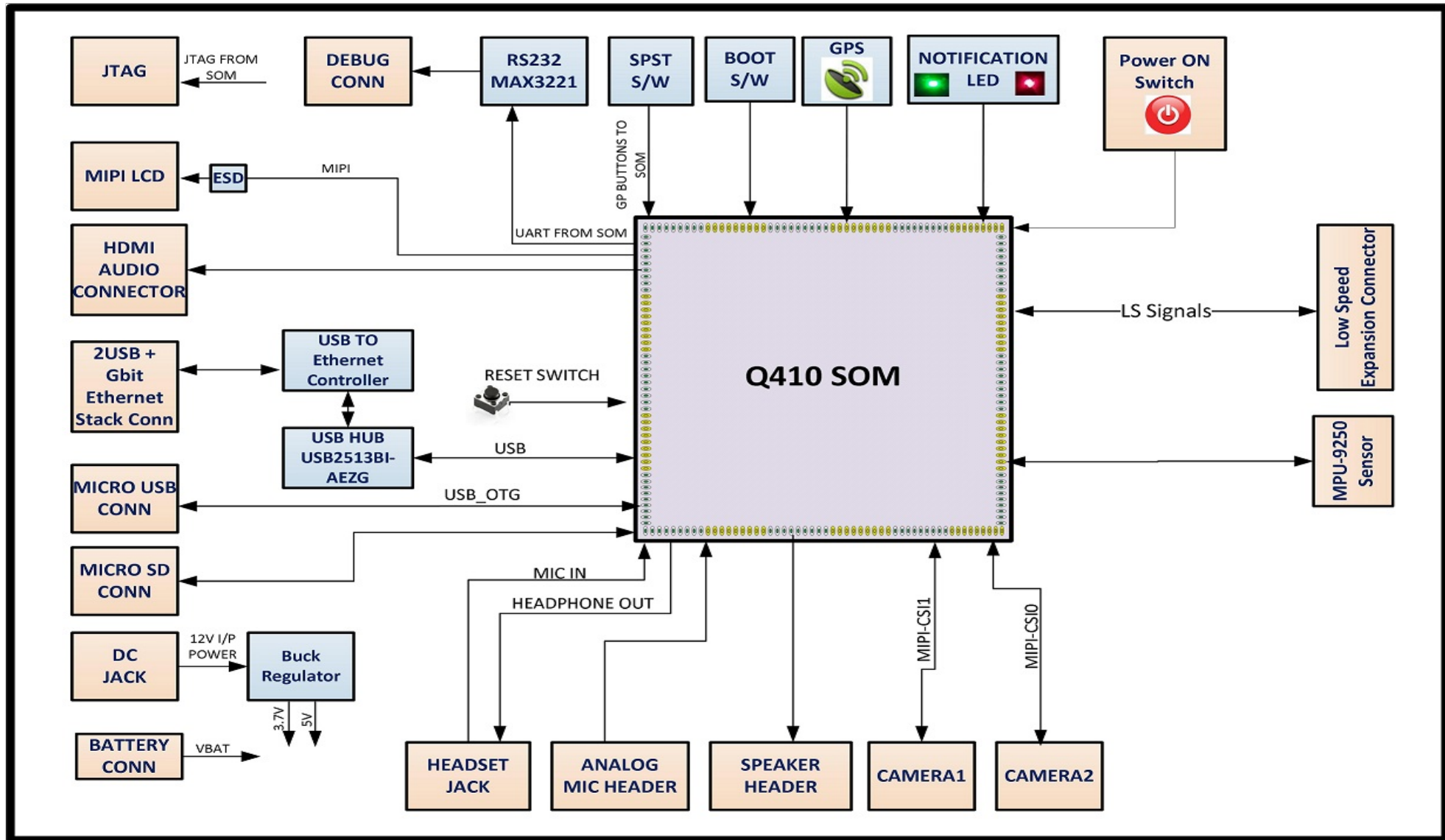
REFERENCE DESIGNATOR	DESCRIPTION	7 BIT ADDRESS
U8	USB2513BI-AEZG	0x50H(1010000b)
U33	MPU9250	0x68H(1101000b)
U46	PCA6416AHF,128	0x20H(0100000b)


PCB LAYER STACK-UP DETAILS :

Layer	Stack up	Description	Base Thickness	Processed Thickness	εr
1		Taiyo PSR 2000		4.000	
		Copper Foil 12 microns	0.400	1.800	
		Iteq IT180A Prepreg 106	3.100	1.848	3.570
		Iteq IT180A Prepreg 106	3.100	1.848	3.570
2			1.260	1.260	
		Iteq IT180A 4 mil core 1/1	4.000	4.000	4.040
			1.260	1.260	
3			4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
4			1.260	1.260	
		Iteq IT180A 4 mil core 1/1	4.000	4.000	4.040
			1.260	1.260	
5			4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
		Iteq IT180A Prepreg 1080	4.195	2.733	3.700
6			1.260	1.260	
		Iteq IT180A 4 mil core 1/1	4.000	4.000	4.040
			1.260	1.260	
7			3.100	1.848	3.570
		Iteq IT180A Prepreg 106	3.100	1.848	3.570
		Iteq IT180A Prepreg 106	3.100	1.848	3.570
8		Copper Foil 12 microns	0.400	1.800	
		Taiyo PSR 2000		4.000	

Project Q410 CARRIER		Designed einfochips	
Title COVER PAGE		 The Solutions People	
Size C	einfochips#: 16_00275_02		Rev 2.0
Date: Tuesday, September 22, 2015		Sheet	1 of 20

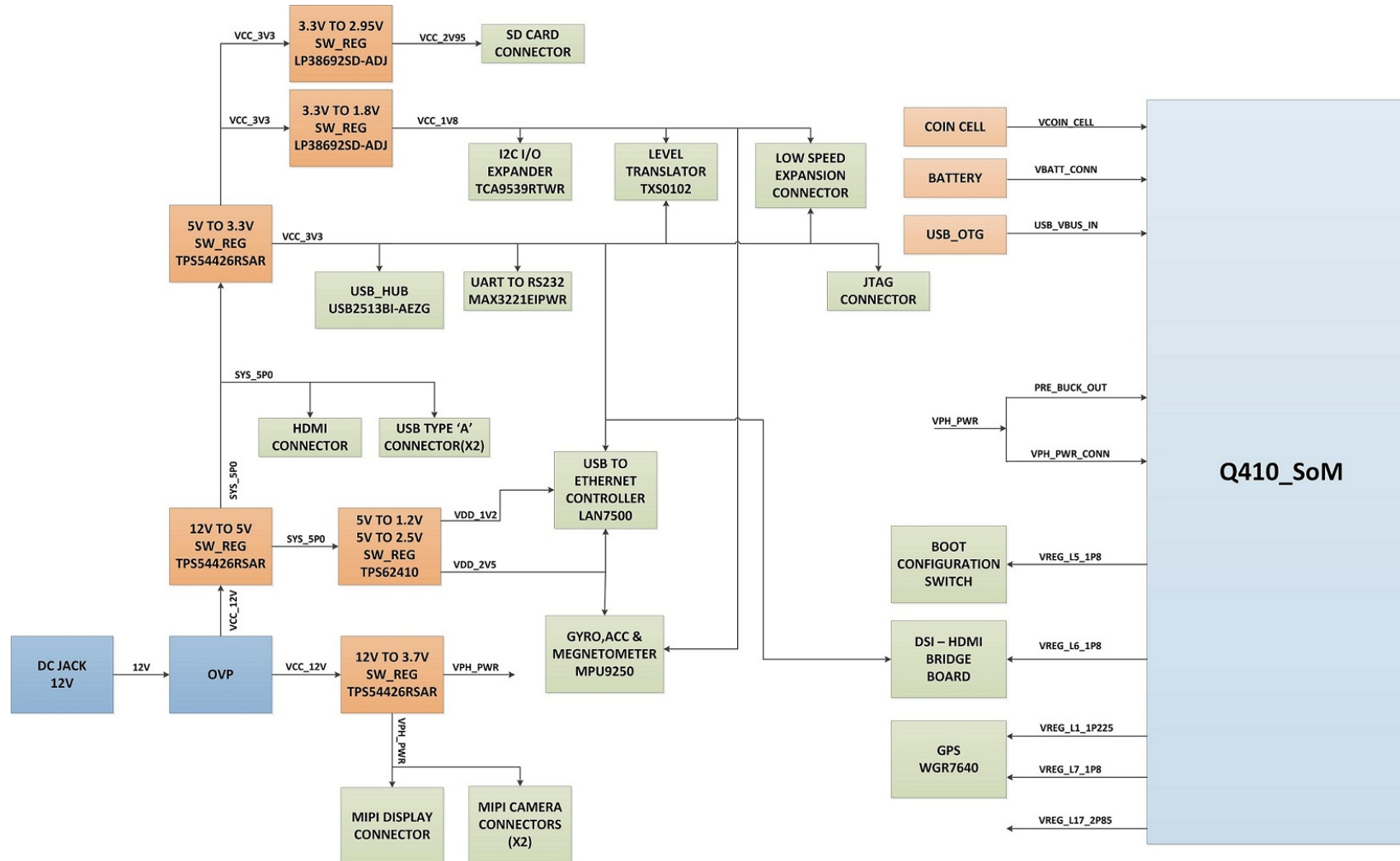
BLOCK DIAGRAM




Project Q410 CARRIER		Designed eInfochips	
Title BLOCK DIAGRAM		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
Date: Friday, September 18, 2015		Sheet	2 of 20

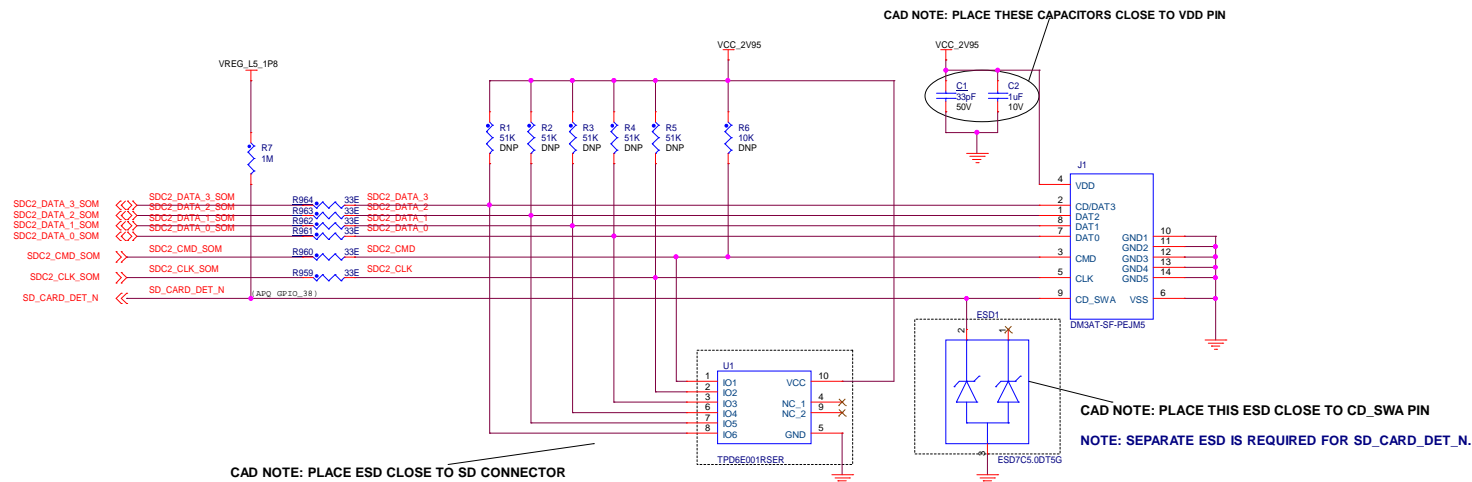
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POWER SUPPLY DISTRIBUTION



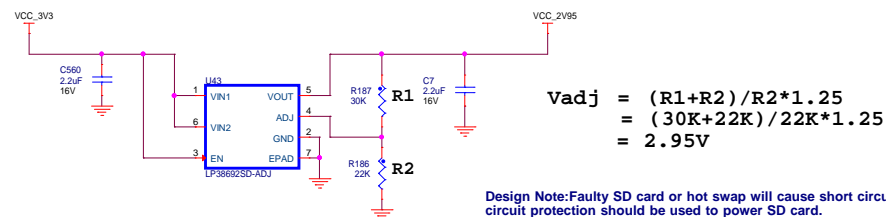
Project Q410 CARRIER		Designed eInfochips	
Title POWER SUPPLY DISTRIBUTION		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
Date: Friday, September 18, 2015		Sheet	3 of 20

MEMORY - Micro SD CONNECTOR



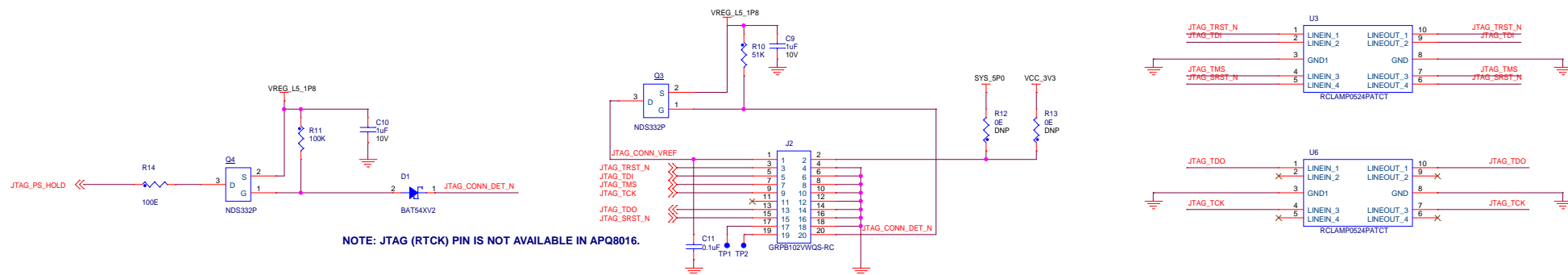
CARD_SELECT	CASE
CARD NOT INSTALLED	Connection between Pin9(CD) and Pin10(GND) will be open. It means SW is OFF
CARD INSTALLED	Connection between Pin9(CD) and Pin10(GND) will be closed. It means SW is ON


3V3 TO 2.95 @ 1A LDO



Design Note: Faulty SD card or hot swap will cause short circuit between VDD and ground, so an external LDO with short circuit protection should be used to power SD card.

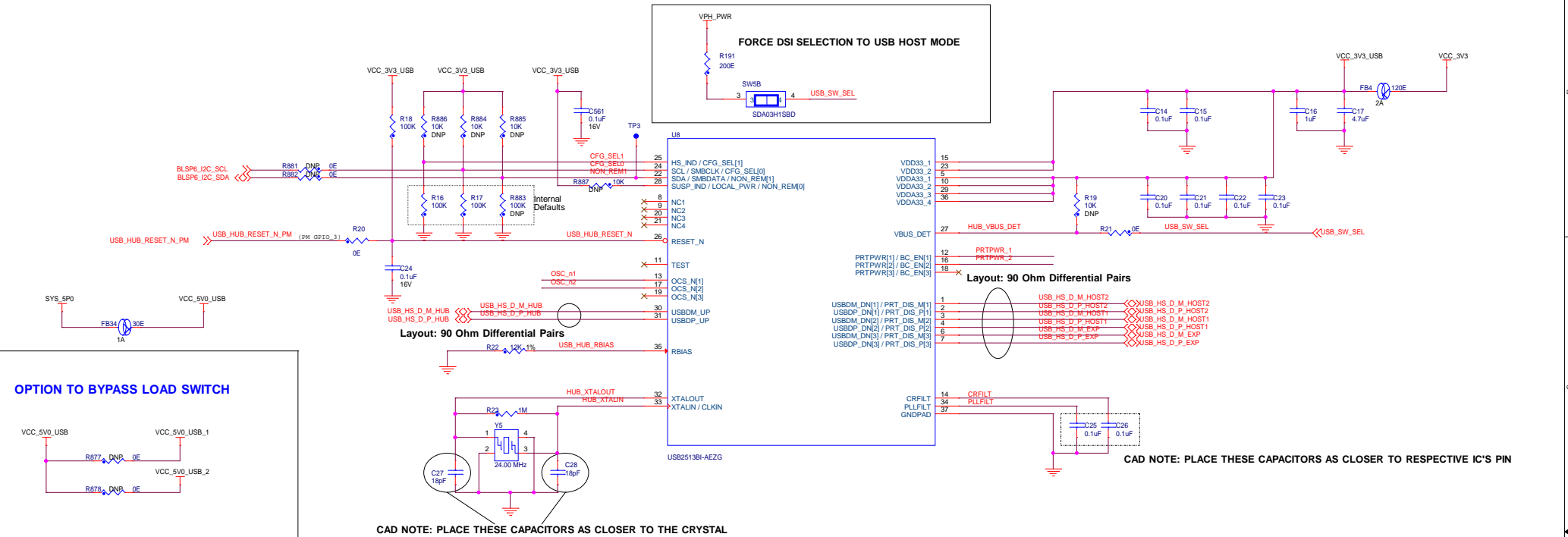
JTAG CONNECTOR



Project Q410 CARRIER		Designed eInfochips	
Title MICRO SD & JTAG		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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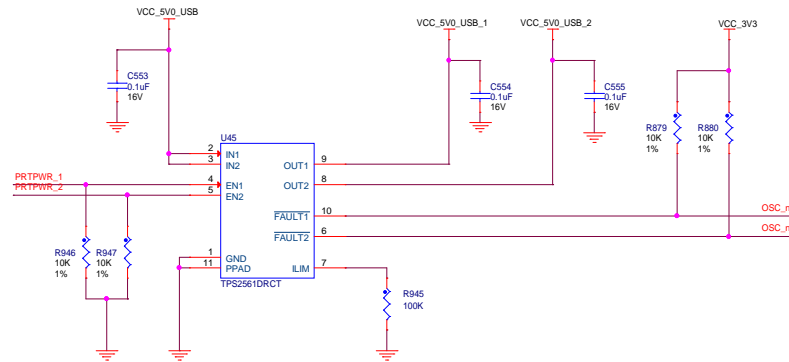
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USB HUB



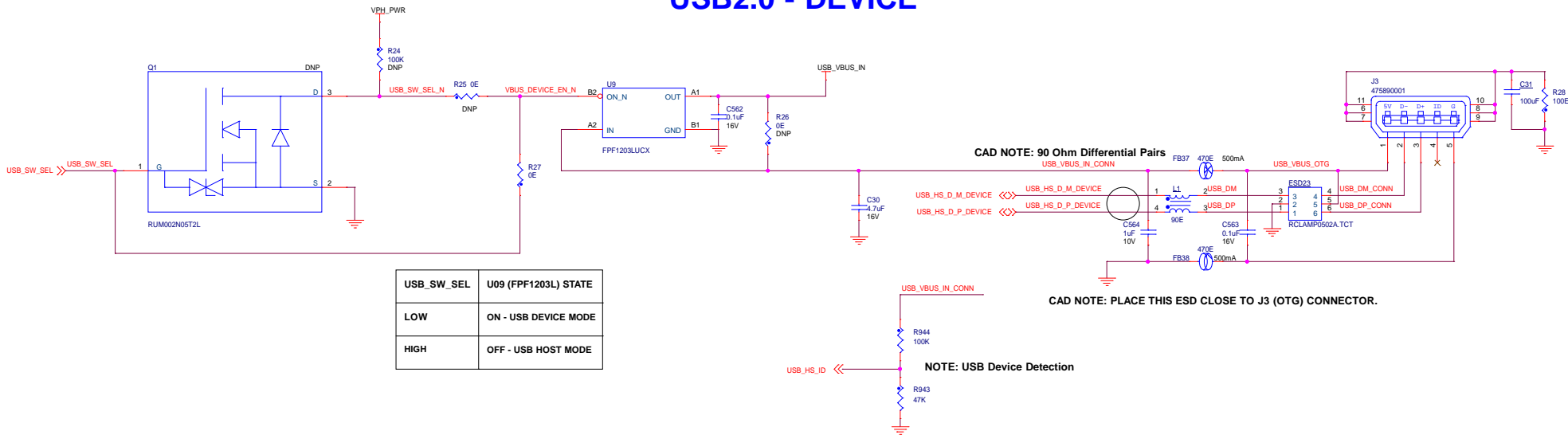
USB LOAD SWITCH

CFG_SEL[1]	CFG_SEL[0]	Discription
0	0	Internal Defaults (Self Powered)
0	1	SMBUS External Download
1	0	Internal Default (Bus Power)
1	1	2 Wire I2C EEPROM

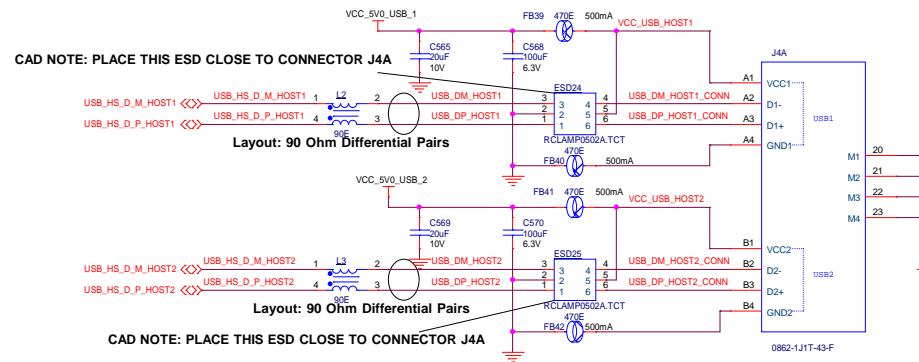


Project Q410 CARRIER		Designed eInfochips	
Title USB HUB		eInfochips The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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USB2.0 - DEVICE

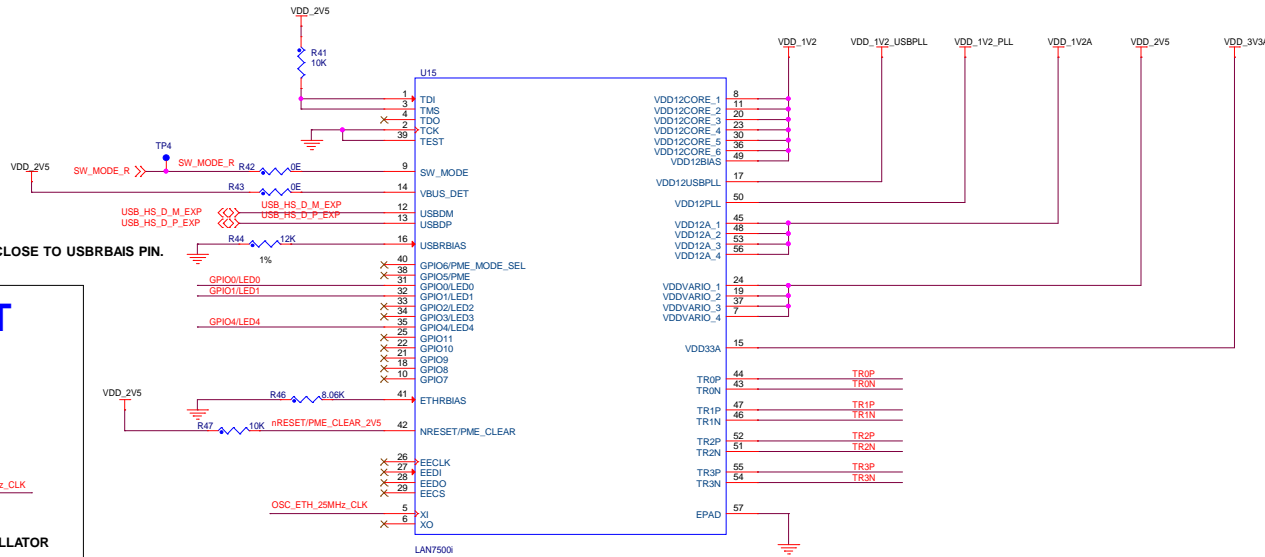


USB2.0 Type A - HOST1

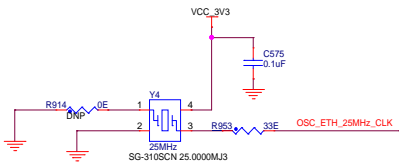


USB2.0 Type A - HOST2

USB TO ETHRENET

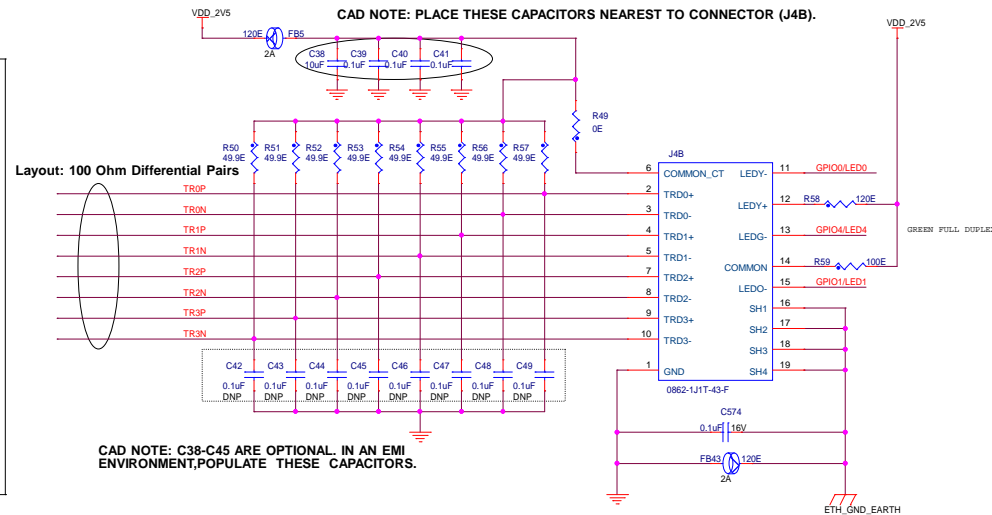
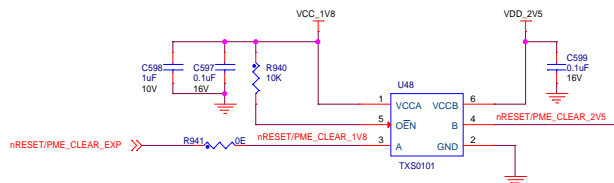



OSCILLATOR CIRCUIT



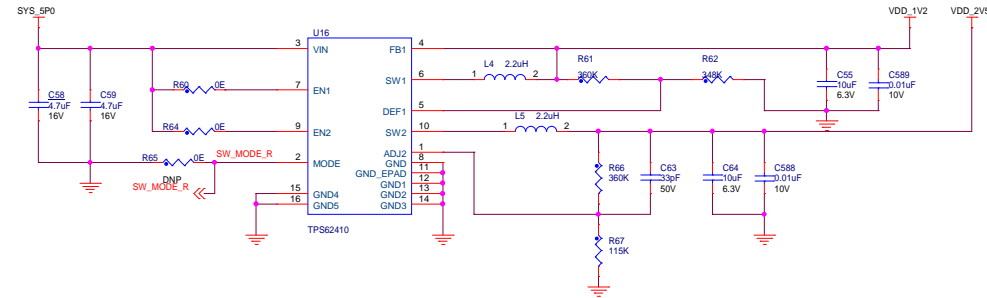
SPEED	LED0	LED1
NO LINK	OFF	OFF
10	ON	OFF
100	OFF	ON
1000	ON	ON

1.8V TO 2.5V TRANSLATOR

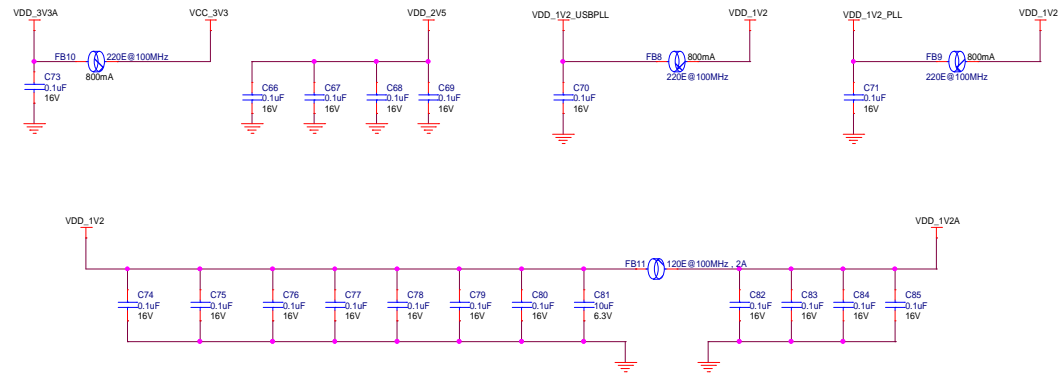



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LAN 7500 - POWER SUPPLY



LAN 7500 - POWER SUPPLY FILTER

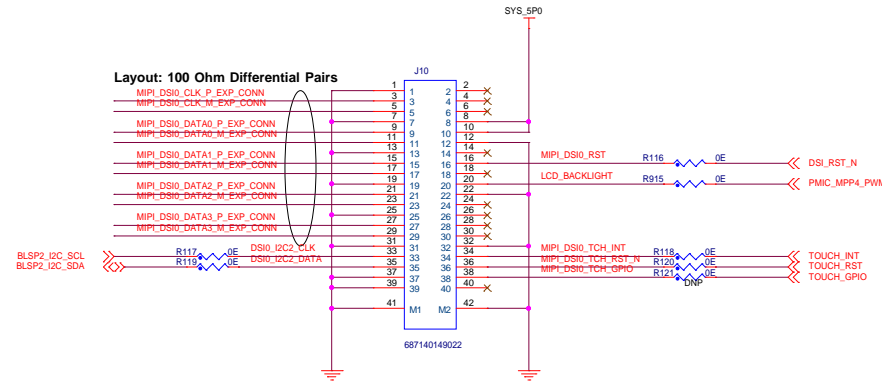


Project Q410 CARRIER		Designed eInfochips	
Title LAN 7500 POWER		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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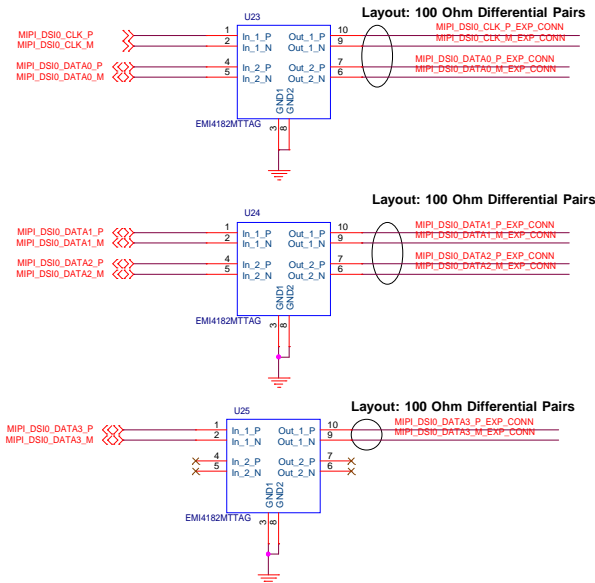
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MIPI DSI DISPLAY

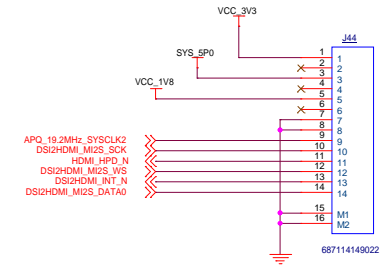
DISPLAY CONNECTOR




MIPI DSI0 - EMI FILTER



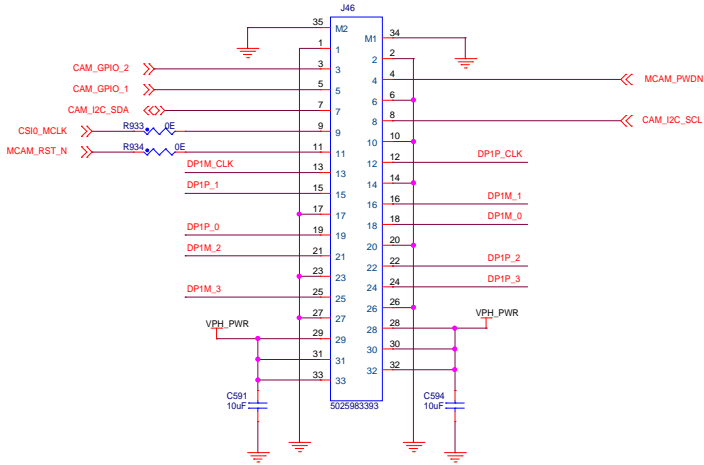
HDMI AUDIO CONNECTOR



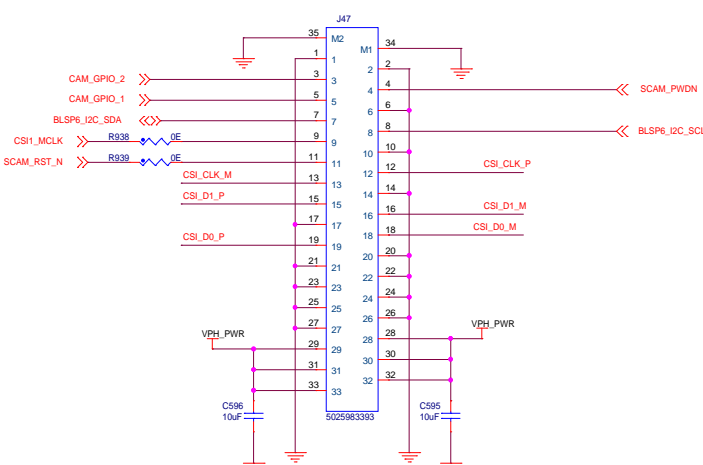
Project Q410 CARRIER		Designed eInfochips	
Title MIPI DSI DISPLAY		 The Solutions People	
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Date: Monday, September 21, 2015		Sheet	9 of 20

MIPI CAMERA

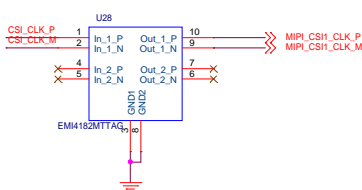
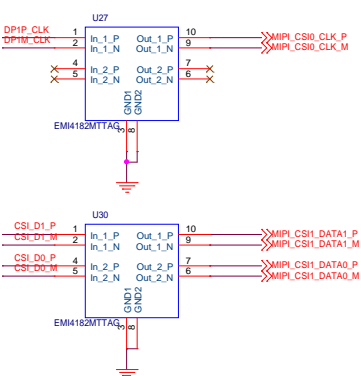
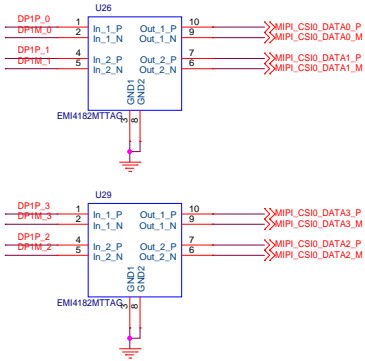
PRIMARY CAMERA



SECONDARY CAMERA

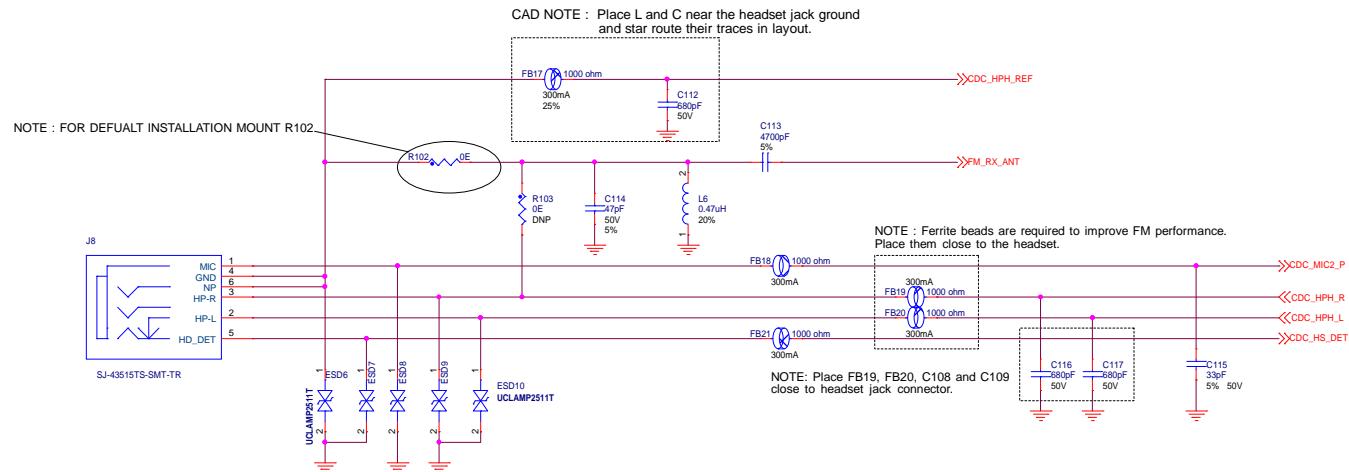


MIPI CAMERA FILTER

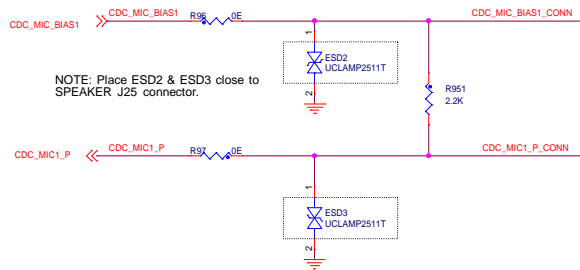


MIC, HEADSET & SPEAKER

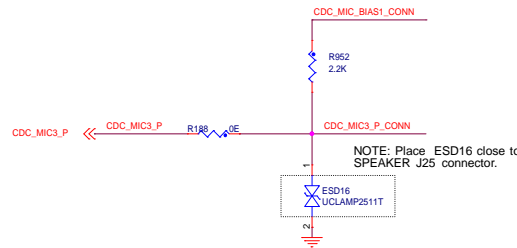
HEADSET AUDIO



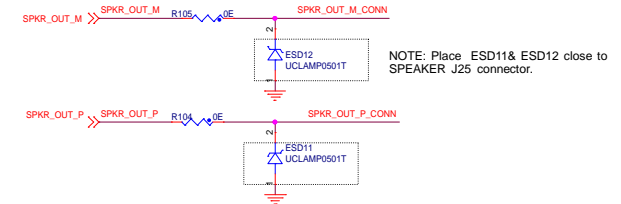
PRIMARY MIC



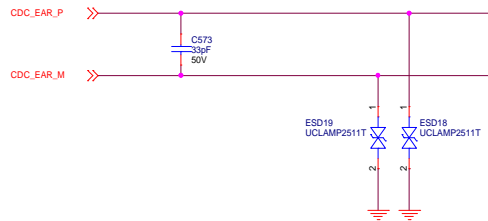
SECONDARY MIC



SPEAKER



EAR PIECE




ANALOG CONNECTOR

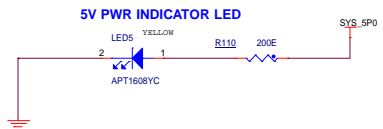
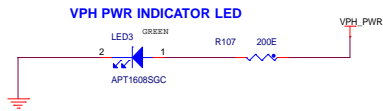


CAD NOTE:
Route two traces as differential Signals.

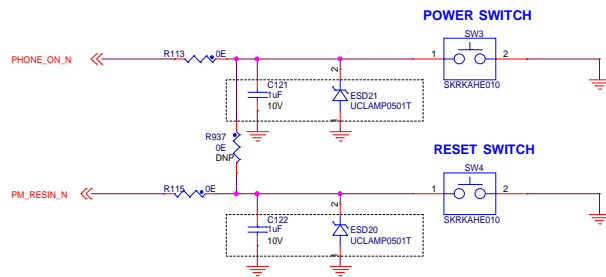
CAD NOTE:
Route two traces as differential Signals.


Project Q410 CARRIER		Designed eInfochips	
Title MIC, HEADSET & SPEAKER		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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LEDS

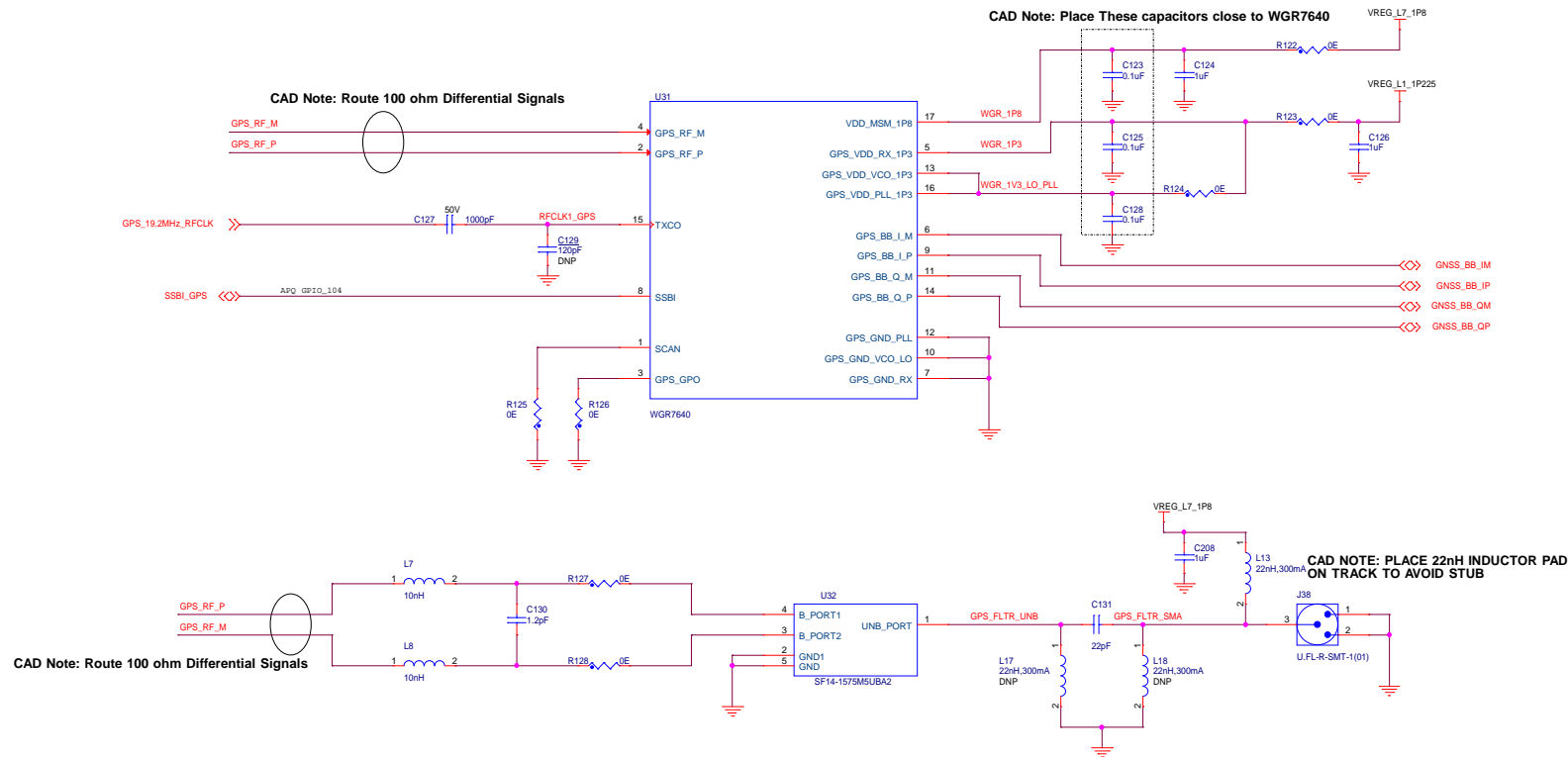


SWITCHES

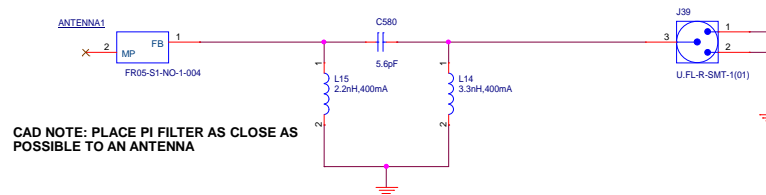


Project Q410 CARRIER		Designed eInfochips	
Title SWITCHES & LEDS		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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GPS-WGR7640



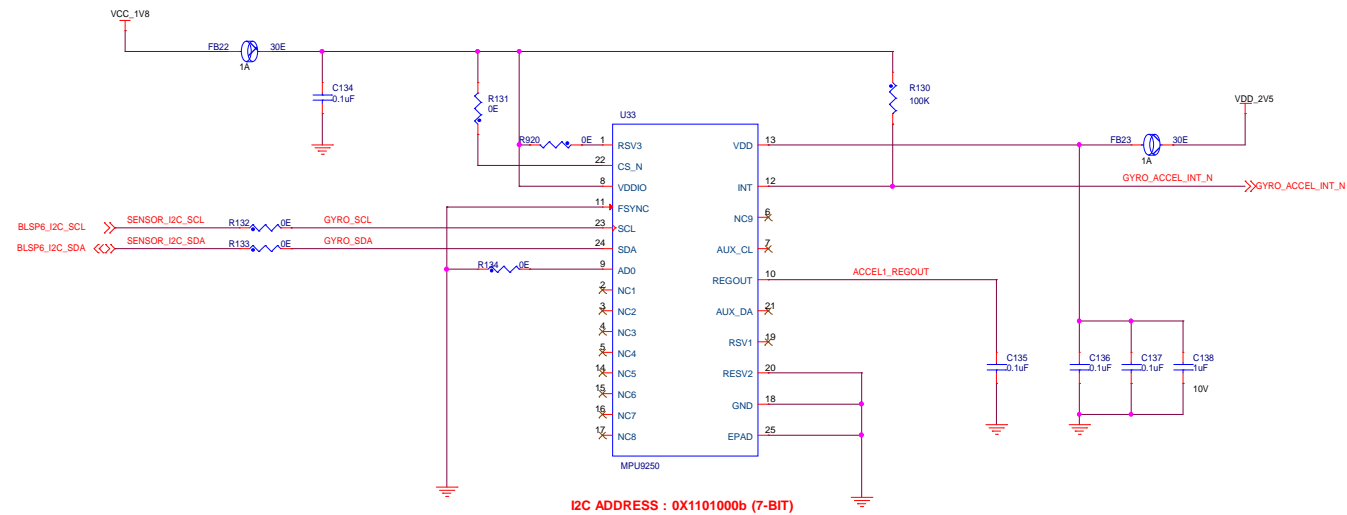
WIFI+BT CHIP ANTENNA



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Title WGR7640 - GPS & WIFI ANTENNA		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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GYROSCOPE & ACCELEROMETER

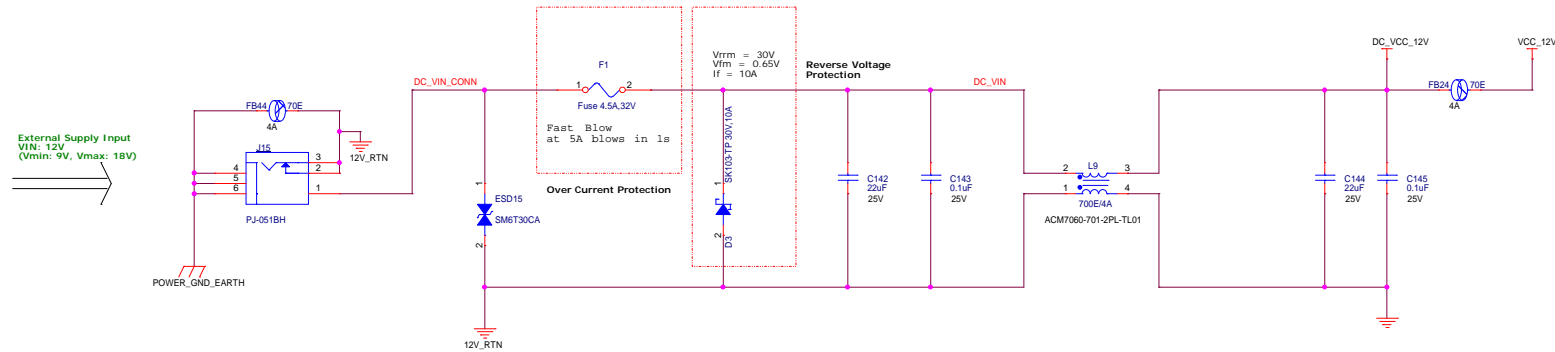


I2C ADDRESS : 0X1101000b (7-BIT)

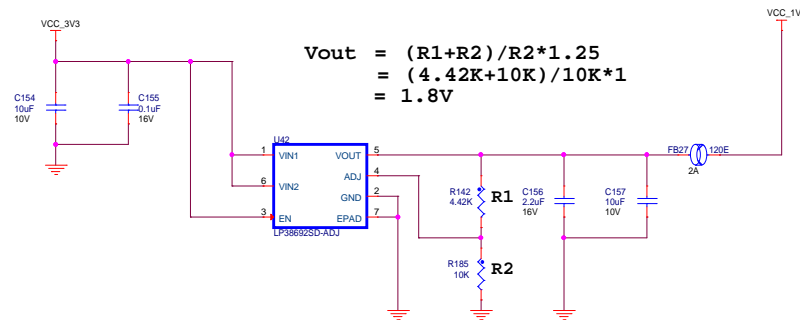
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Project Q410 CARRIER		Designed eInfochips	
Title GYRO & ACCELEROMETER		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
Date: Friday, September 18, 2015		Sheet 14 of 20	

INPUT SUPPLY FROM ADAPTOR



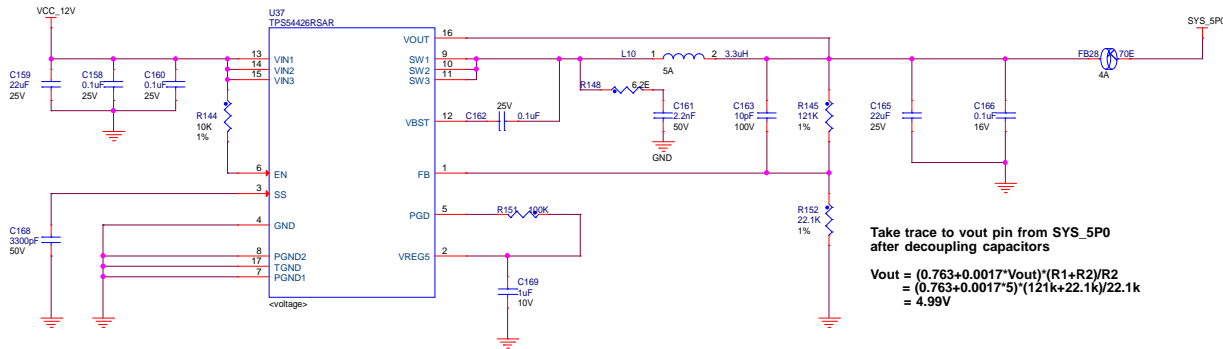
3.3V TO 1.8V @1A LDO



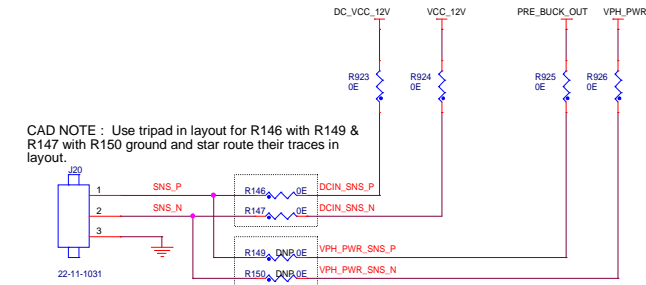
Project Q410 CARRIER		Designed eInfochips	
Title INPUT SUPPLY		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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SWITCHING REGULATOR

12V TO 5V @4A DC/DC CONVERTER



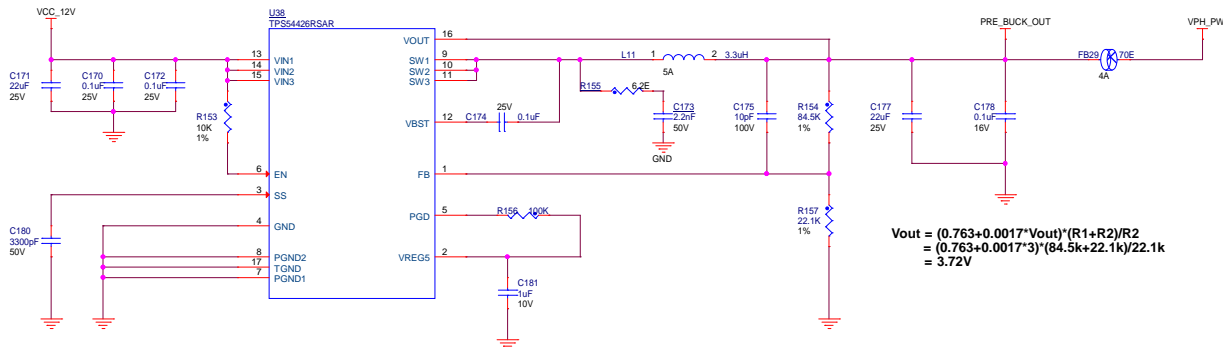
ARM ENERGY PROBE



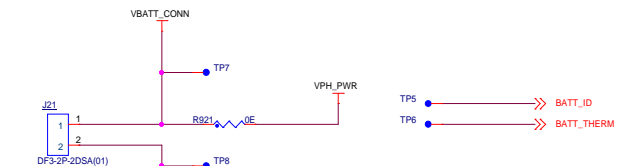
ARM ENERGY PROBE (PWR MEAS)

SUPPORTED	ASSY. OPTION
YES	POPULATE J20
NO	DNP J20

12V TO 3.7V @4A DC/DC CONVERTER



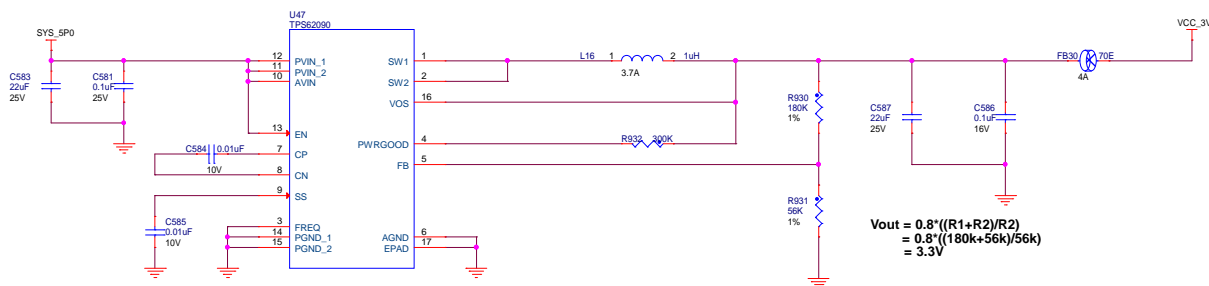
BATTERY CONNECTOR



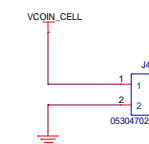
VPH_PWR SOURCE

SUPPLY SOURCE	ASSY. OPTION
3.7V BATTERY	POPULATE J21
VPH PWR	DNP J21

5V TO 3.3V @ 2A DC/DC CONVERTER



RTC COIN CELL



Project
Q410 CARRIER

Title
POWER SUPPLY

Designed eInfochips



The Solutions People

Size
C

eInfochips#: 16_00275_02

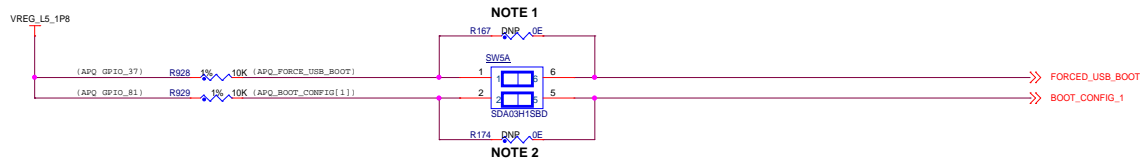
Rev
2.0

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BOOT CONFIGURATION & DEBUG

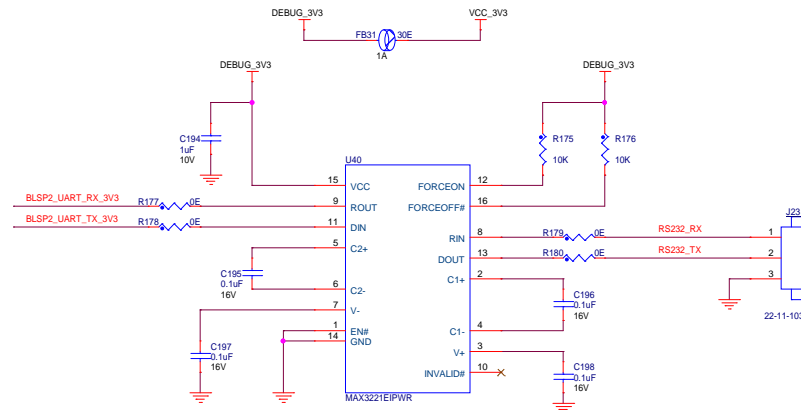


BOOT CONFIGURATIONS

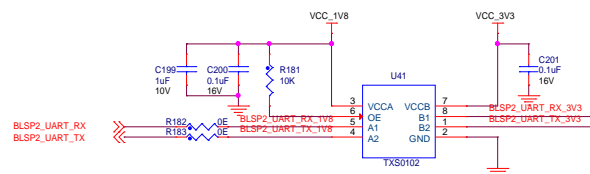
BOOT_CONFIG[3:1]	BOOT OPTIONS
0b000	SDC1 --> SDC2 --> USB2.0
0b001	SDC2 --> SDC1 --> USB2.0
0b010	SDC1 --> USB2.0
0b011	USB2.0


Default Boot Config (0b000) is eMMC on the SDC1

DEBUG - UART TO RS232 LEVEL



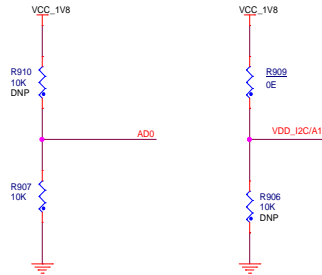
1.8V TO 3.3V TRANSLATOR



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Title BOOT CONFIGURATION & DEBUG		 The Solutions People	
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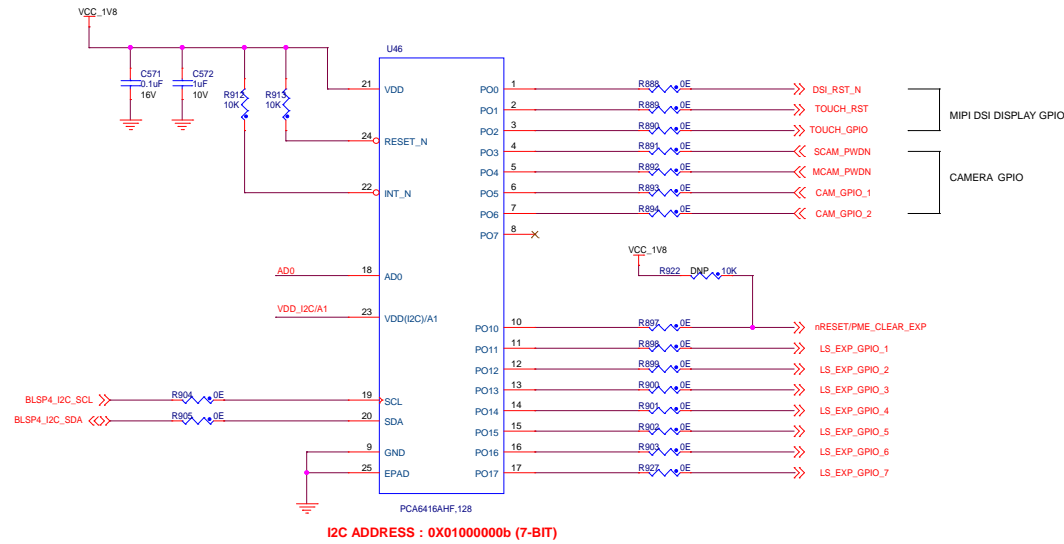
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I2C ADDRESS SELECTION

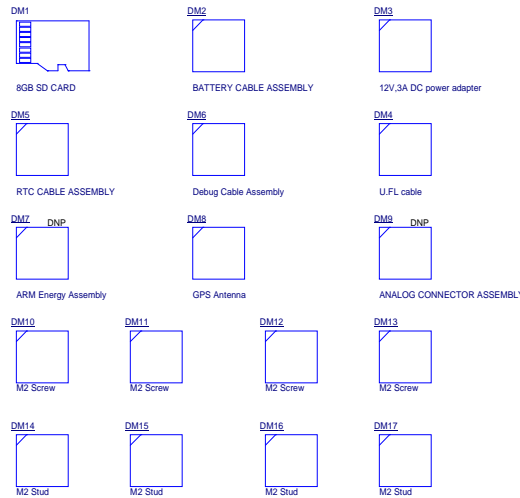


NOTE: If TCA9539RTWR IO-Expander is used, Replace R909 with 10k

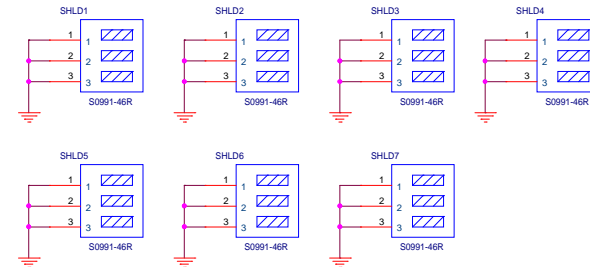
16 BIT IO EXPANDER



MISCELLANEOUS




SHIELD

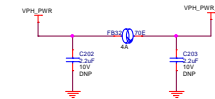
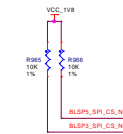



NOTE: Shield thickness should be 0.2-0.25mm

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Title I/O EXPANDER		 The Solutions People	
Size C	eInfochips#: 16_00275_02		Rev 2.0
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Q410 SOM




Project Q410 CARRIER		Designed eInfochips	
Title EXPANSION CONNECTOR		 The Solutions People	
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REVISION HISTORY

PCB REV	SCH REV	CHANGE DESCRIPTION	DATE	AUTHOR
1.0	DRAFT 0.1	Q410 Schematic Draft created	14-Apr-15	eInfochips
	DRAFT 0.2	1) Change the pin name at pin 15,23,29,26 of USB hub from VDD33 to VDDA33.Pin5 and Pin15 are swipec. 2) Use supply symbol instead of off page connector for TPD13S523RSVR. 3) Off page connector of IC U15(TPD13S523RSVR) pins 7,8 & 9,10 & 11,12 & 12,14 are swiped. 4) Use different pin name for repeat pin's name HDMI ADV7533BCBZ-RL.Pins are G1,E4,E2 of DVDD section,pins are D4,E3 of V1P2 section. 5) Refer Reference schematics of HDMI PAGE 27 NT726. Do changes in main schemtics as per reference schematics.MIPI_DSI_DATA pins are swiped.	28-Apr-15	eInfochips
	DRAFT 0.2	1) Add 51K pull resistor at DAT0, DAT1, DAT2, DAT3, SDCLK Lines. 2) Change the supply of U43 From 2V91 to 2V95. 3) Add Pull up 10K resistor at SCL lineand make it DNP. 4) Update U9 (FPF1203LUCX) pin B2 as input Low signal 5) Remove USB_GND_EARTH shiled signal and directly connect to digial ground.	8-Jun-15	eInfochips
	DRAFT 0.3	1) ADD LM3526-H IC to monitor USB current. 2) L1,L2 and L3 pins are changed. 3) ADD (RCLAMP0502A.TCT) ESD23,ESD 24 and ESD25 to avoid stub in layout. 4) ADD connector to support Audio signal for HDMI. 5) Make R922 DNP. 6) Add translator to support voltage level of the nRESET/PME_CLEAR_EXP which works on 2.5V.	22-Jun-15	eInfochips
	1.0	Released for Fabrication	22-Jun-15	eInfochips
2.0	DRAFT 1.1	Part# of L9 is changed to ACM7060-301-2PL-TL01 U45 is changed to TPS2561DRCT R943 & R944 is added and R887 & R883 mounting status is changed to DNP R914 & C129 mounting status is changed to DNP J47 Pinout is changed to make it similar with J46. J47 I2C lines are changed to BLSP6 U31 Pins 6 & 9 Nets are swiped and Pins 11 & 14 Nets are swiped Shield Pads are added & R954 added on APQ_19.2MHz_SYSCCLK2 J44 Pins 2,4 & 6 are changed to NC. J44.5 Pin net is changed to VCC_1V8 33E Series resistors are added on SD Card Data Lines, CLK and CMD Line 33E Series resistor (R953) added on Y4.3 Line and Add 0E Resistor on MI2S Lines 10k pull-up resistor added on both SPI Chip Select Net R148,R155 Value is changed to 6.2E & C161,C173 value is changed to 2.2nF J23 pin-1 & 3 nets are swiped U46 Part# is changed to PCA6416AHF,128 R951 & R952 added & FB44 mounting status is changed to mounted	10-Sep-15	eInfochips
	2.0	Released for Fabrication	22-Sep-15	eInfochips

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