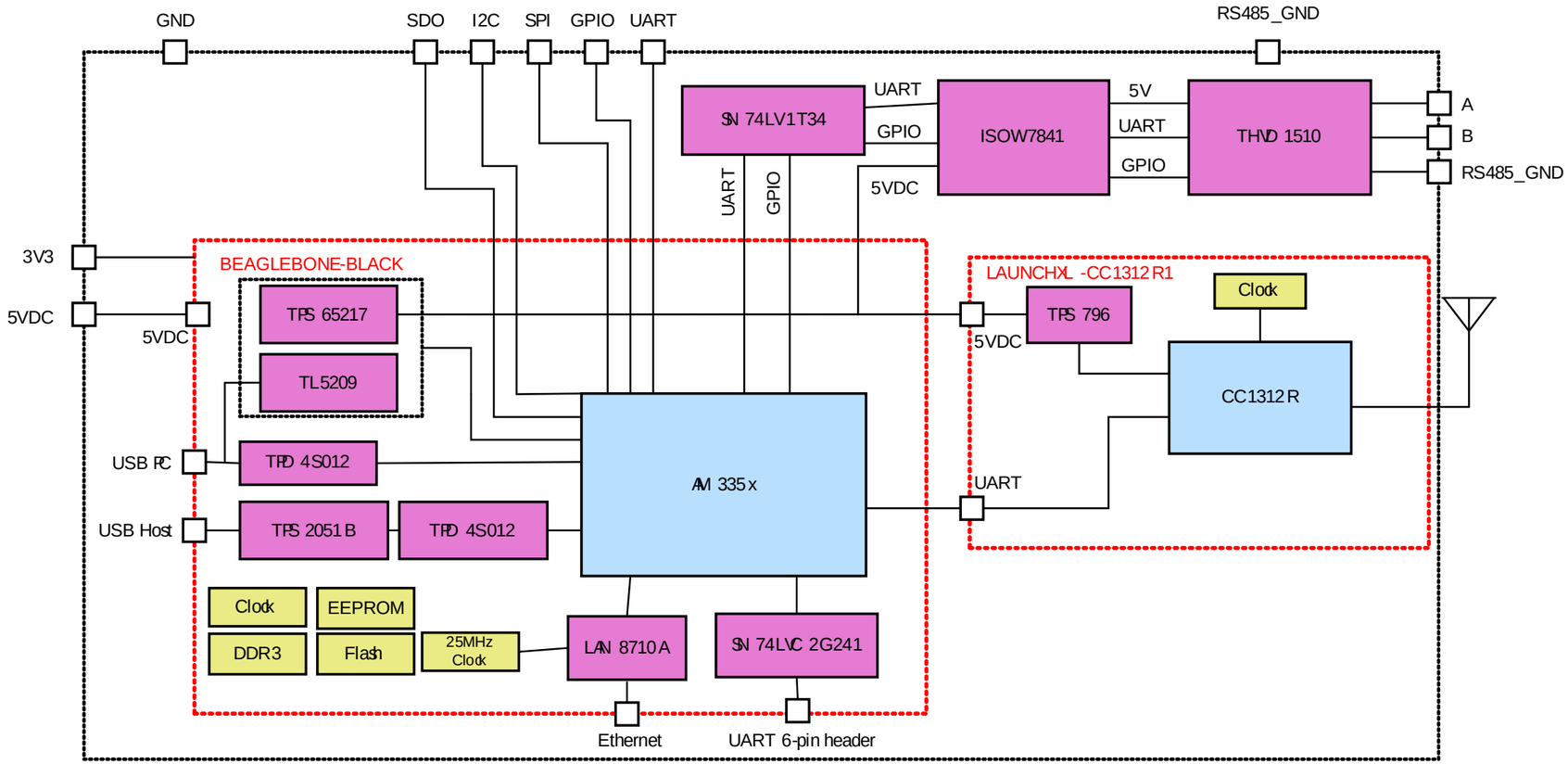
Revision History

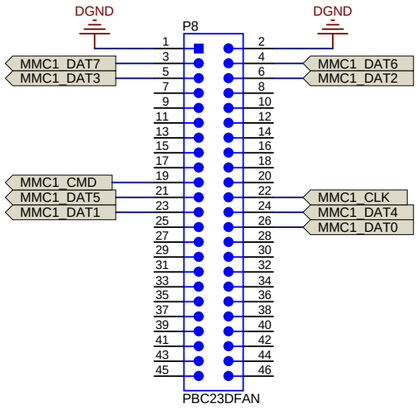
Rev	ECN #	Approved Date	Approved by	Notes
N/A	N/A	N/A	N/A	N/A

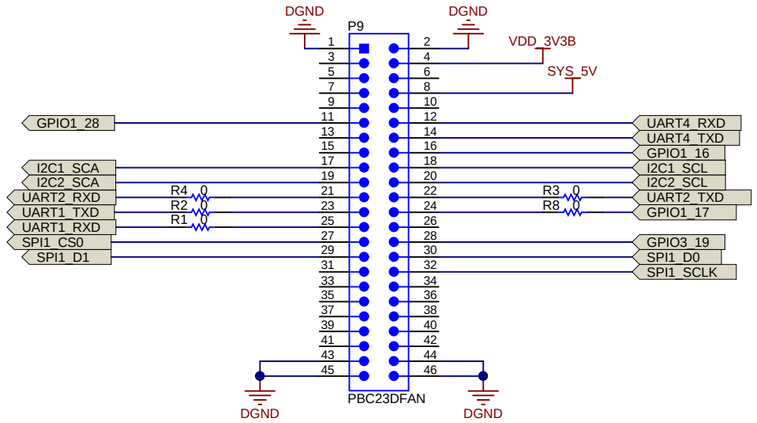


Orderable: N/A	Designed for: Public Release	Mod. Date: 11/12/2018
TID #: TIDA-010032	Project Title: Universal Data Concentrator Reference Design	
Number: TIDA-010032 Rev: A	Sheet Title:	
SVN Rev: Version control disabled	Assembly Variant: 001	Sheet: 1 of 4
Drawn By:	File: TIDA-010032_CoverSheet.SchDoc	Size: B
Engineer: Wonsoo Kim	Contact: http://www.ti.com/support	

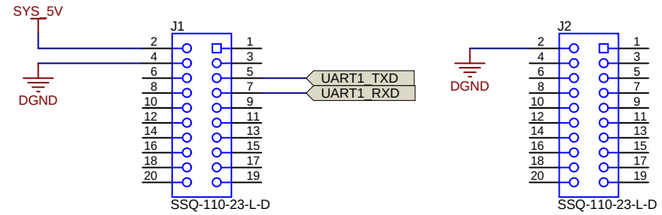
Texas Instruments
http://www.ti.com

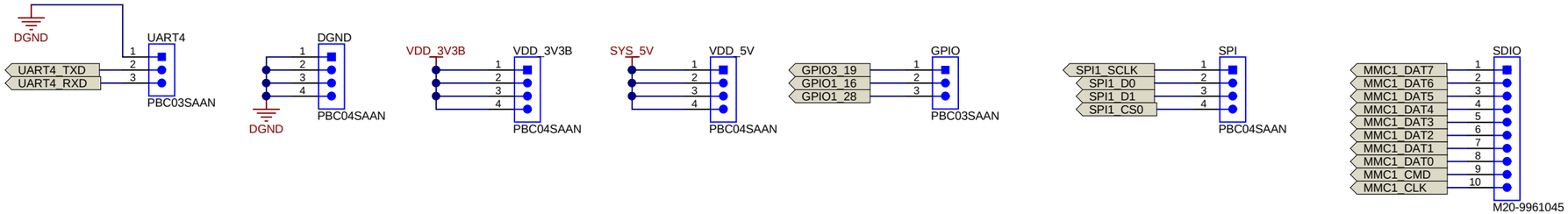
BeagleBone Black Plug-in

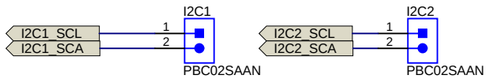




LAUNCHXL-CC1312R1 Plug-in



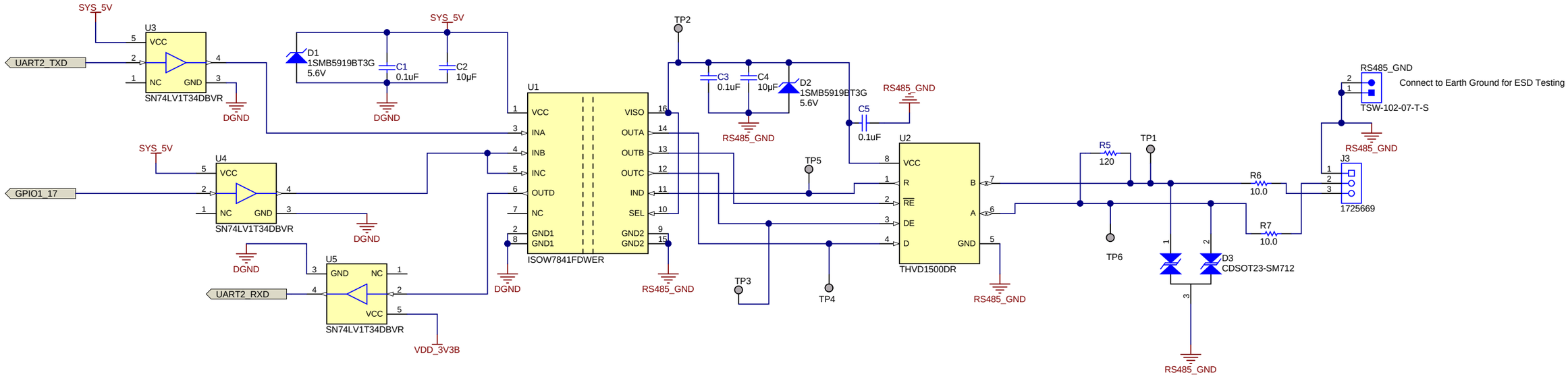




Orderable: N/A	Designed for: Public Release	Mod. Date: 11/13/2018
TID #: TIDA-010032	Project Title: Universal Data Concentrator Reference Design	
Number: TIDA-010032 Rev: A	Sheet Title:	
SVN Rev: Version control disabled	Assembly Variant: 001	Sheet: 2 of 4
Drawn By:	File: TIDA-010032_1.SchDoc	Size: B
Engineer: Wonsoo Kim	Contact: http://www.ti.com/support	

http://www.ti.com

RS-485 Transceiver



Orderable: N/A	Designed for: Public Release	Mod. Date: 10/31/2018
TID #: TIDA-010032	Project Title: Universal Data Concentrator Reference Design	
Number: TIDA-010032 Rev: A	Sheet Title:	
SVN Rev: Version control disabled	Assembly Variant: 001	Sheet: 3 of 4
Drawn By:	File: TIDA-010032_2.SchDoc	Size: B
Engineer: Wonsoo Kim	Contact: http://www.ti.com/support	

TEXAS INSTRUMENTS
http://www.ti.com

H1 1
NY PMS 440 0025 PH

H2 1
NY PMS 440 0025 PH

H3 1
NY PMS 440 0025 PH

H4 1
NY PMS 440 0025 PH

H5
1902C

H6
1902C

H7
1902C

H8
1902C

DNP
FID1

DNP
FID2

DNP
FID3

PCB Number: TIDA-010032
PCB Rev: A

PCB LOGO
Texas Instruments

PCB LOGO
Pb-Free Symbol

PCB LOGO
FCC disclaimer

Variant/Label Table	
Variant	Label Text
001	ChangeMe!
002	ChangeMe!

LBL1
PCB Label
Size: 0.65" x 0.20 "

ZZ1
Label Assembly Note
This Assembly Note is for PCB labels only

ZZ2
Assembly Note
These assemblies are ESD sensitive, ESD precautions shall be observed.

ZZ3
Assembly Note
These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

ZZ4
Assembly Note
These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

Orderable: N/A	Designed for: Public Release	Mod. Date: 11/12/2018
TID #: TIDA-010032	Project Title: Universal Data Concentrator Reference Design	
Number: TIDA-010032 Rev: A	Sheet Title:	
SVN Rev: Version control disabled	Assembly Variant: 001	Sheet: 4 of 4
Drawn By:	File: TIDA-010032_EVM_Hardware.SchDoc	Size: B
Engineer: Wonsoo Kim	Contact: http://www.ti.com/support	

Texas Instruments
http://www.ti.com

REV	Description	DATE	BY
A4A	Initial production Release.	11/19/2012	GC
A5	On the initial production release the processors were to be found incorrect as supplied by TI. Parts while marked AM3359 were actually AM3352. This revision uses the correct parts.	1/2/2013	GC
A5A	1. Deleted R29-R44 from the LCD lines. 2. Added 47pf capacitors C156-C173 to LCD data lines to ground. 3. Changed schematic revision to A5A. 4. Changed a few footprints after PCB update for above changes. 5. Added access point for the battery function of the TPS65217C. 6. Added Ferrite beads in series with LED power and 5V power rail of the USB host connector. Required to pass FCC/CE testing due to noise emissions on that pin. 7. Added power button to enable sleep, wakeup, power down and power up features on the system. 8. Added Modification to add 100K ohm resistor to ground to prvent crosstalk when serial cable is not plugged in.	2/8/2013	GC
A5B	1. Added 100K pulldown on J1 pin 4 to prevent crosstalk when serial cable is not connected into PCB layout. 2. Changed the LED resistors to 4.75K to lower the brightness.	5/21/2013	GC
A5C	1. Changed R46, R47,R48 to 0 ohms. 2. Changed R45 to 22 Ohms. Change was made due to production failures on some boards due to differences in impedances.	6/12/2013	GC
A6	1. Moved the enable for the VDD_3V3B regulator to VDD_3V3A rail. Change was made to reduce the delay between the ramp up of the 3.3V rails. 2. Added a AND gate to the SYS_RESETn circuitry. There is a small chance that on power up the nRESETOUT signal on the processor may go high, causing the SYS_RESETn signal to go HI before it should. This change reenforces the reset with the PORZn reset signal. 3. Added optional zero ohm resistor to tie GND_OSC0 to system ground.	7/25/2013	GC
A6A	1. Added optional zero ohm resistor to tie GND_OSC1 to system ground. 2. Changed C106 to a 1uF capacitor. 3. Changed C24 to a 2.2uF capacitor. 4. Made R8 installed and R9 not installed.	12/13/2013	GC
B	1.Changed the processor to the AM3358BZCZ100.	1/20/2014	GC
C	1.Increased the eMMC from 2GB to 4GB.	3/21/2014	GC

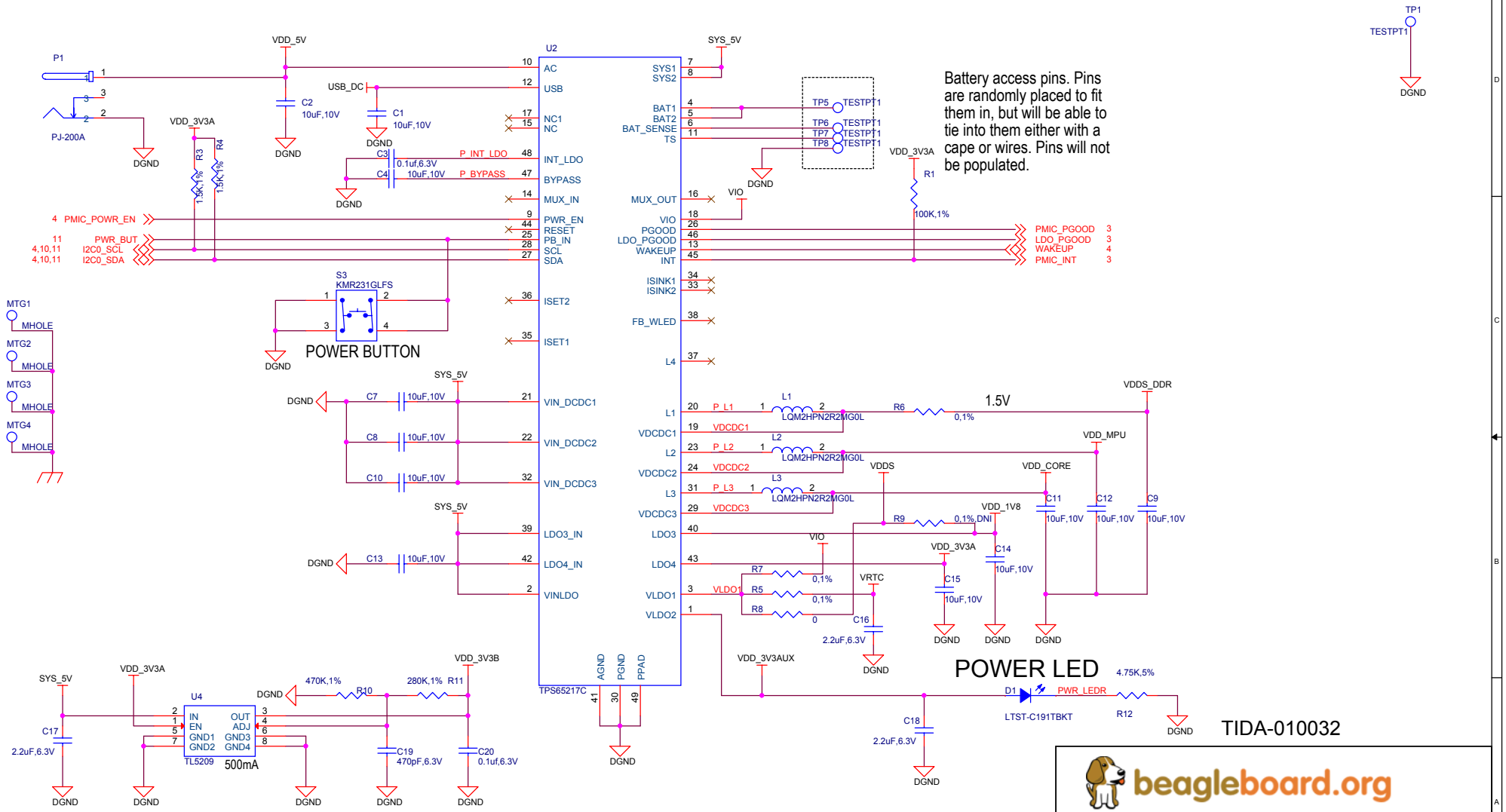
PAGE NO.	SCHEMATIC PAGE
1	COVER PAGE
2	POWER MANAGEMENT
3	PROCESSOR 1 OF 3, JTAG HEADER
4	PROCESSOR 2 OF 3, UAB PORTS
5	PROCESSOR 3 OF 3
6	LED, CONFIGURATION AND BUTTON
7	DDR3 MEMORY
8	eMMC FLASH
9	10/100 ETHERNET
10	HDMI FRAMER
11	EXP CONN, uSD

NOTE: PCB Revision for this board is Rev B6

TIDA-010032

beagleboard.org

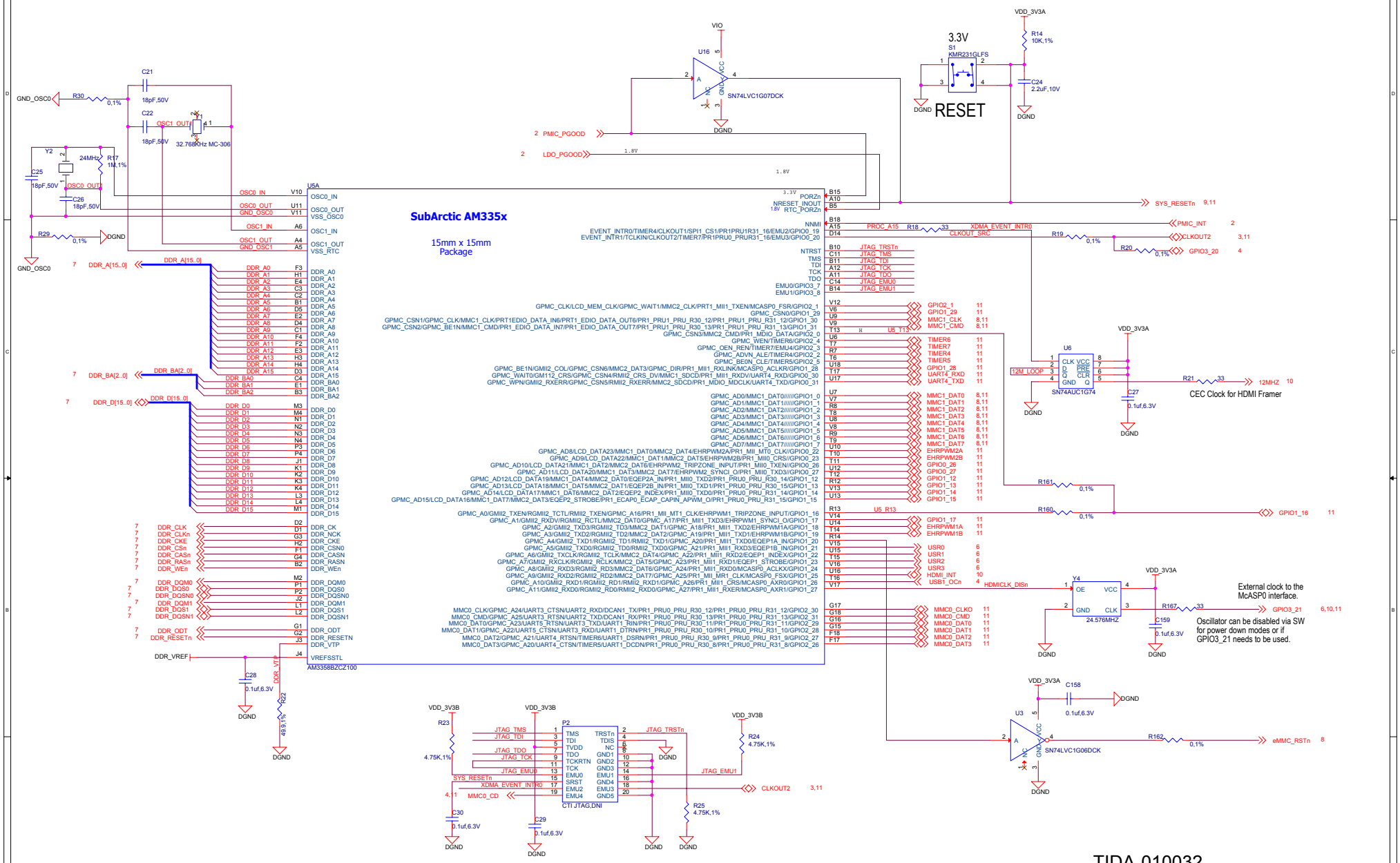
Title: BeagleBone Black Cover Page		
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 1 of 11	



TIDA-010032

beagleboard.org

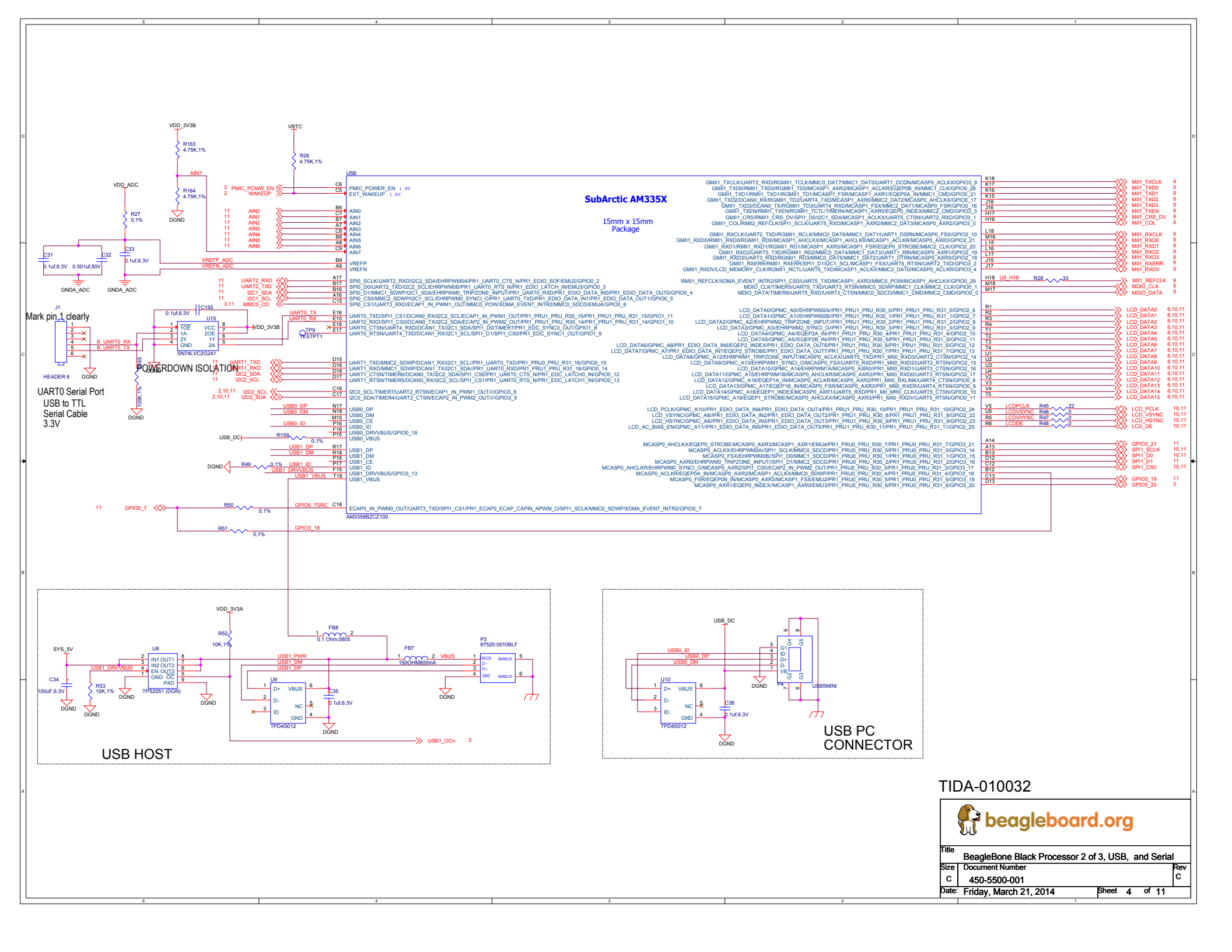
Title	BeagleBone Black Power Management	
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 2 of 11	



TIDA-010032

beagleboard.org

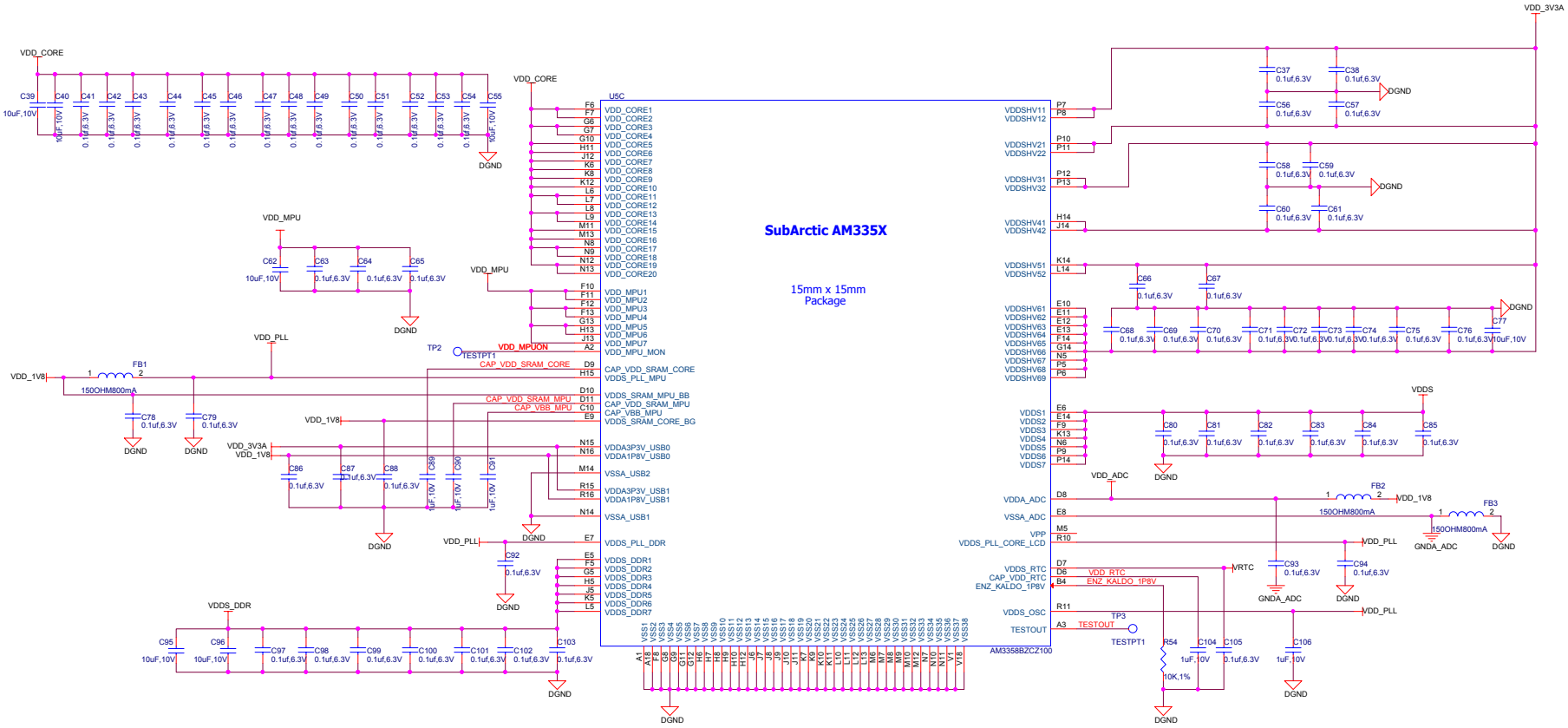
Title	BeagleBone Black Processor 1 of 3 and JTAG	
Size C	Document Number 450-5500-001	Rev C
Date: Friday, March 21, 2014	Sheet 3 of 11	



TIDA-010032

beagleboard.org

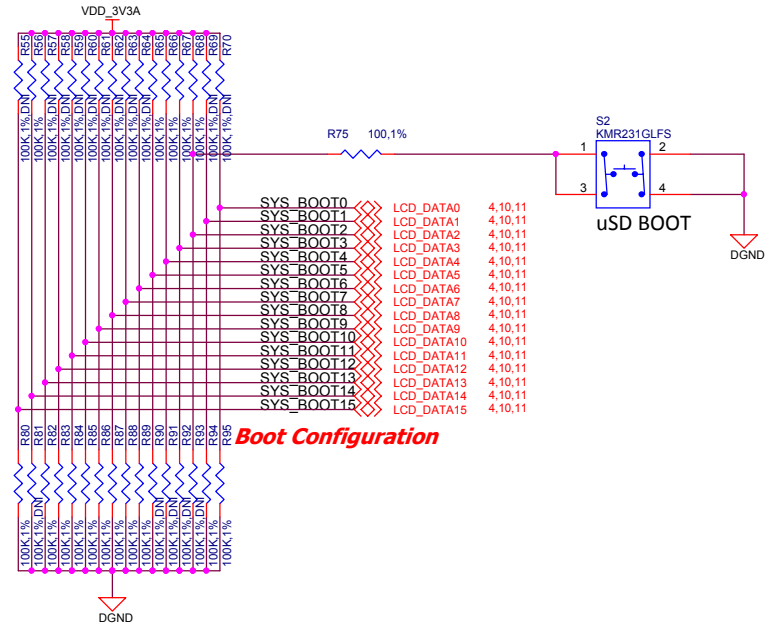
Title	BeagleBone Black Processor 2 of 3, USB, and Serial		
Size	Document Number		Rev
C	450-5500-001		C
Date:	Friday, March 21, 2014	Sheet 4 of 11	

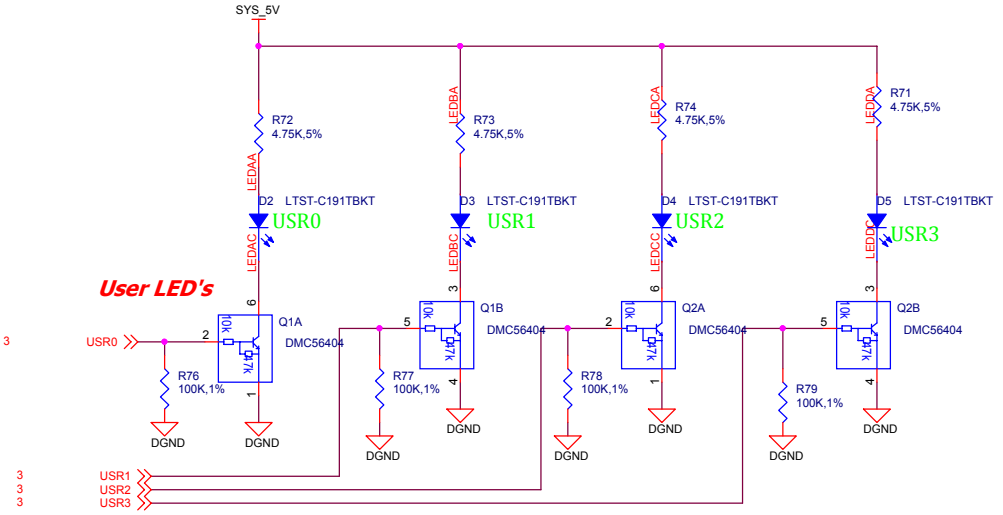


TIDA-010032

beagleboard.org

Title	BeagleBone Black Processr 3 of 3	
Size: C	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 5 of 11	



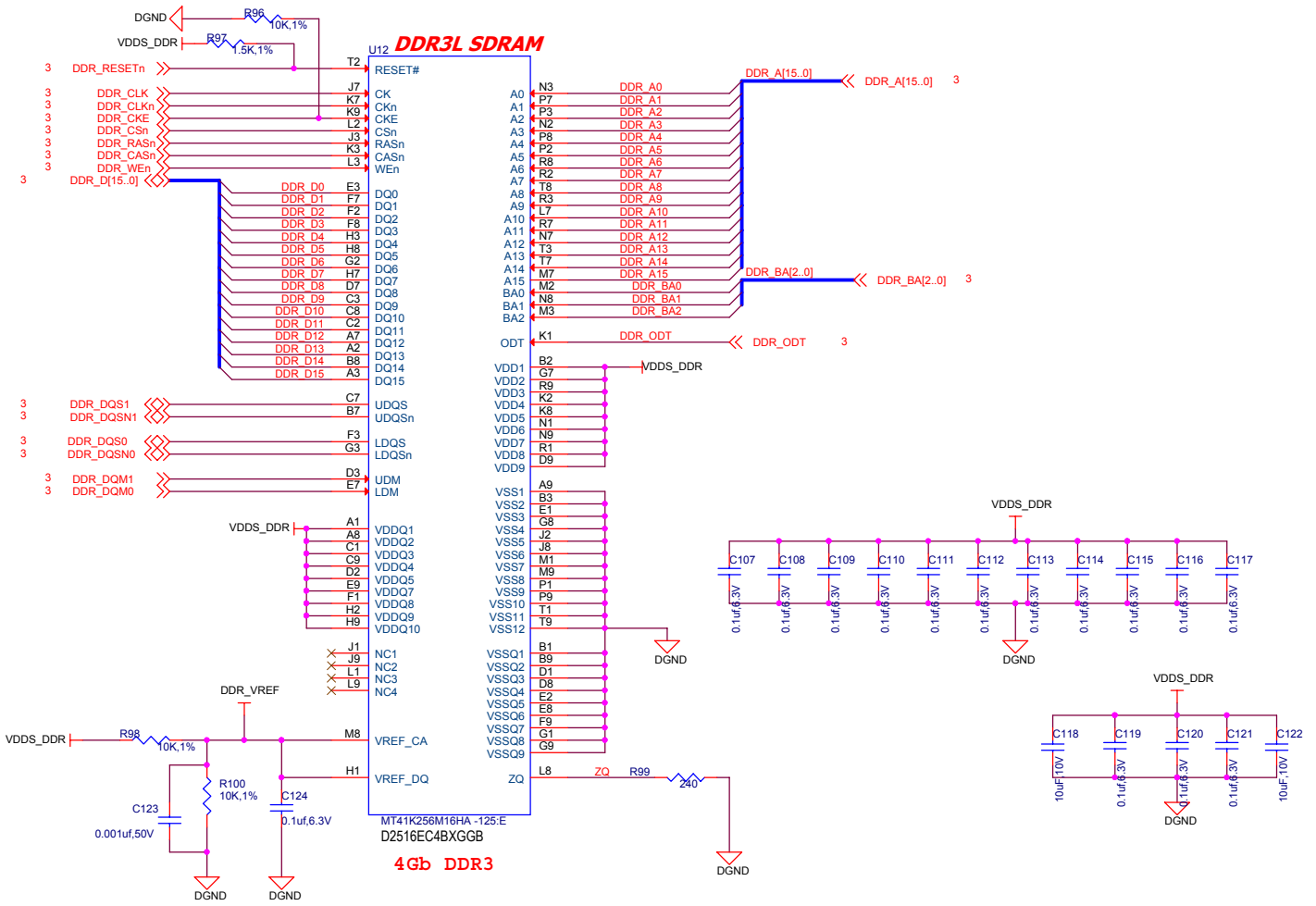


SYSBOOT[15:14]	SYSBOOT[13:12]	SYSBOOT[11:10]	SYSBOOT[9]	SYSBOOT[8]	SYSBOOT[7:6]	SYSBOOT[5]	SYSBOOT[4:0]	Boot Sequence			
00b = 19.2MHz 01b = 24MHz 10b = 25MHz 11b = 26MHz	00b (all other values reserved)	Don't care for ROM code	Don't care for ROM code	Don't care for ROM code	Don't care for ROM code	0 = CLKOUT1 disabled 1 = CLKOUT1 enabled	11100b	MMC1	MMC0	UART0	USB0[5]
00b = 19.2MHz 01b = 24MHz 10b = 25MHz 11b = 26MHz	00b (all other values reserved)	Don't care for ROM code	Don't care for ROM code	Don't care for ROM code	Don't care for ROM code	0 = CLKOUT1 disabled 1 = CLKOUT1 enabled	11000b	SPI0	MMC0	USB0[5]	UART0

TIDA-010032

beagleboard.org

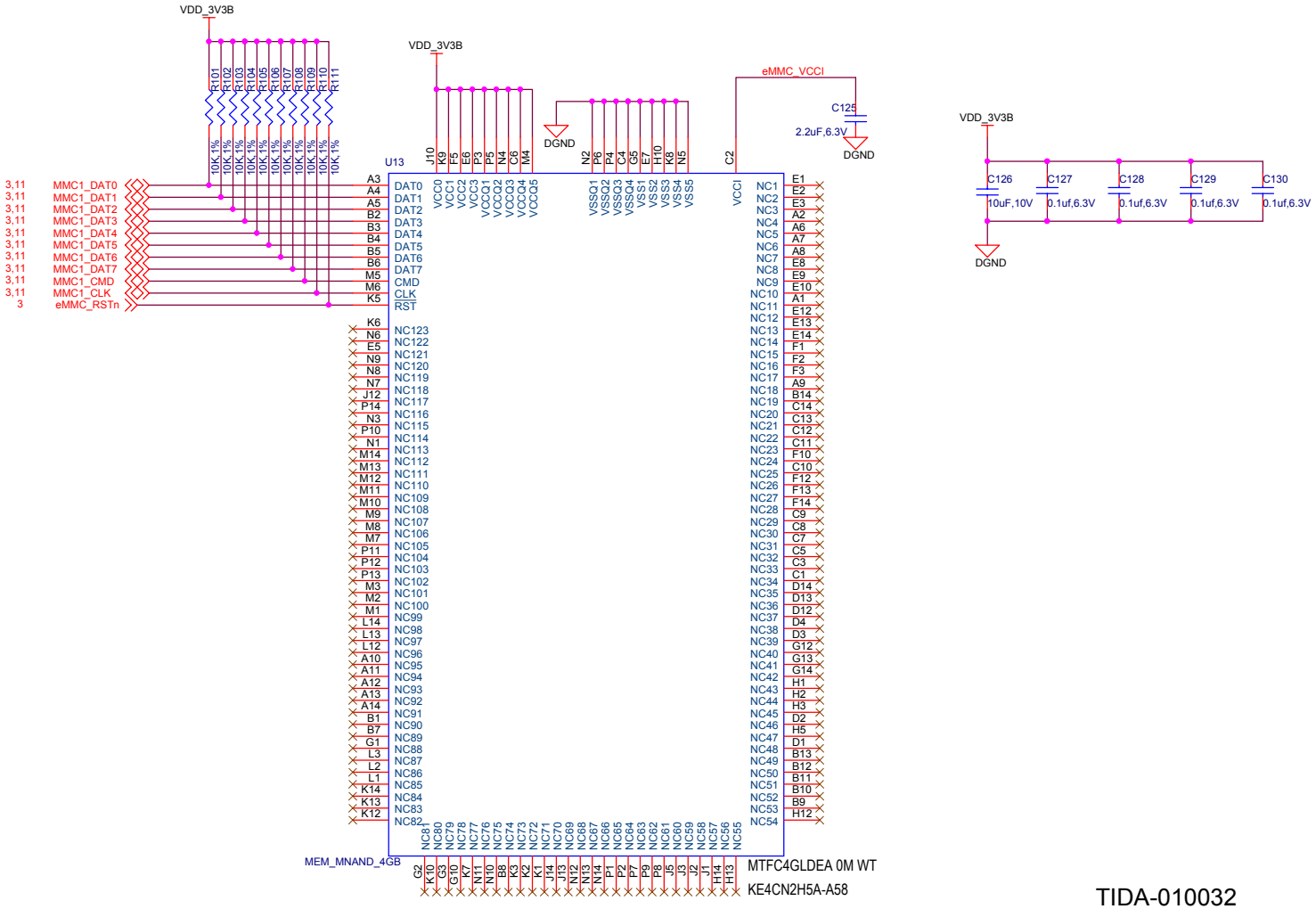
Title	BeagleBone Black LED, Configuration, and Reset	
Size B	Document Number 450-5500-001	Rev C
Date: Friday, March 21, 2014	Sheet 6 of 11	



TIDA-010032

beagleboard.org

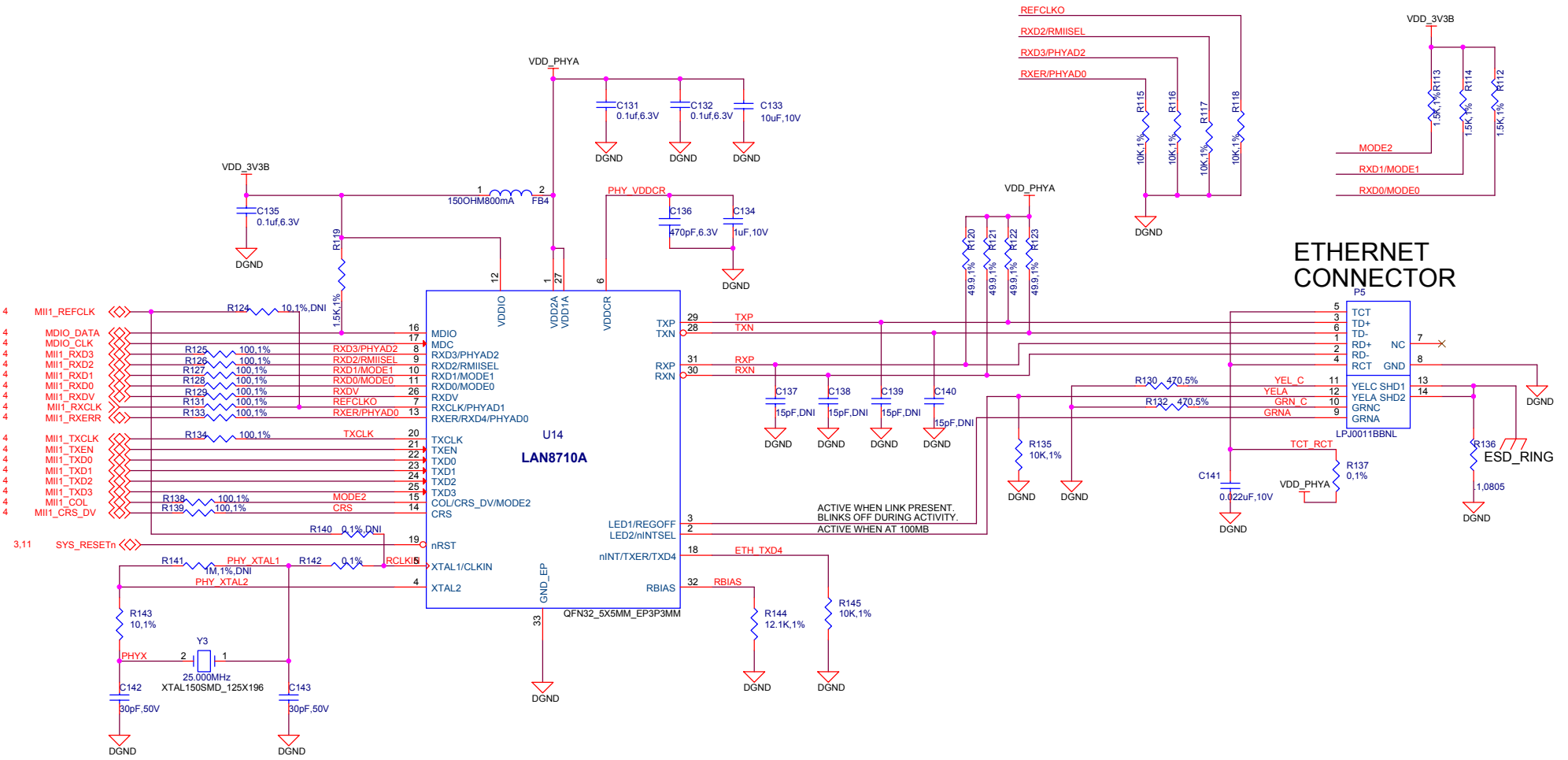
Title	BeagleBone Black DDR3 Memory	
Size: B	Document Number: 450-5500-001	Rev: C
Date: Wednesday, April 09, 2014	Sheet 7 of 11	



TIDA-010032

beagleboard.org

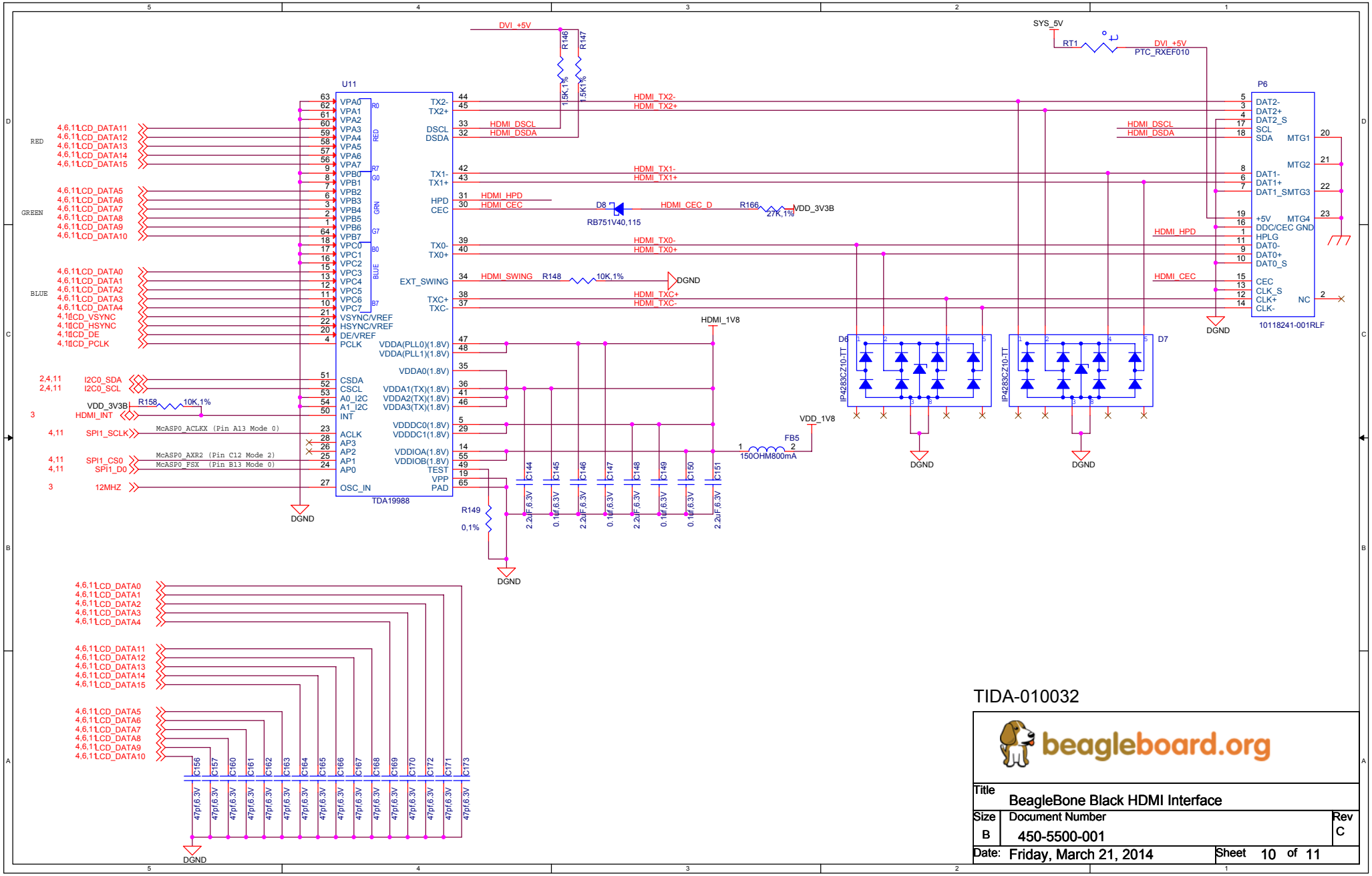
Title	Beagle BoneBlack 4G eMMC	
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 8 of 11	



TIDA-010032

beagleboard.org

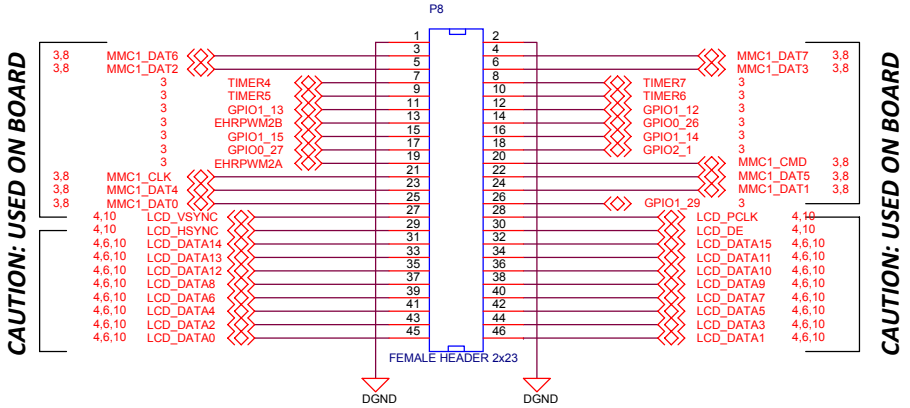
Title	BeagleBone Black Ethernet	
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 9 of 11	



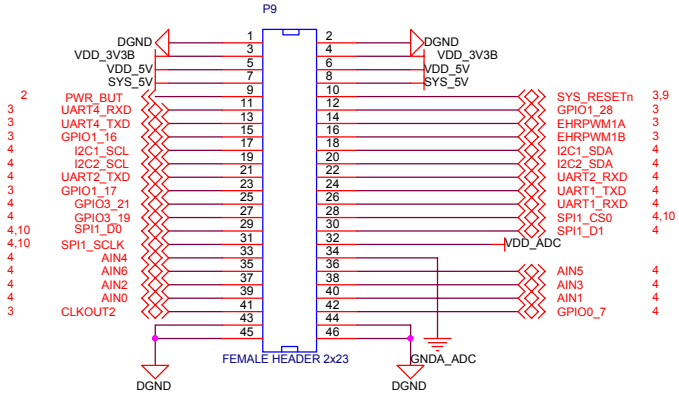
TIDA-010032

beagleboard.org

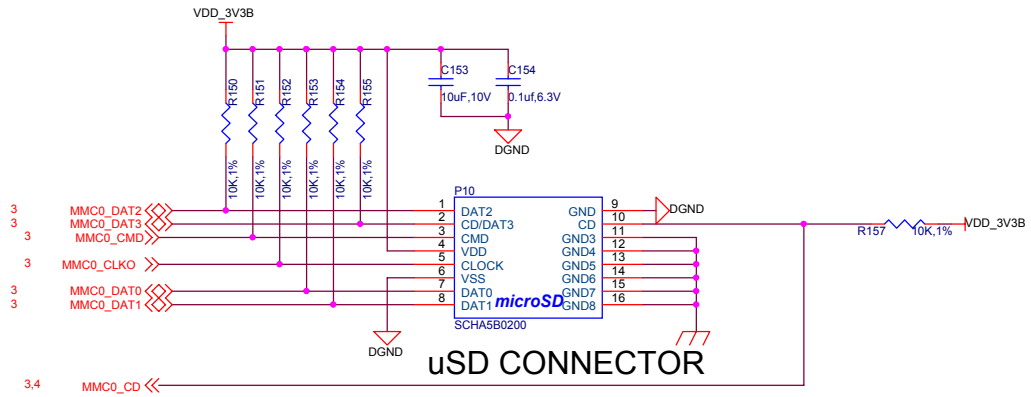
Title	BeagleBone Black HDMI Interface	
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 10 of 11	



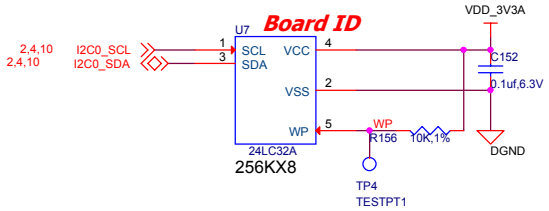
EXPANSION HEADER



EXPANSION HEADER



uSD CONNECTOR



TIDA-010032

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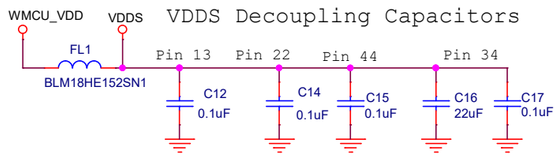
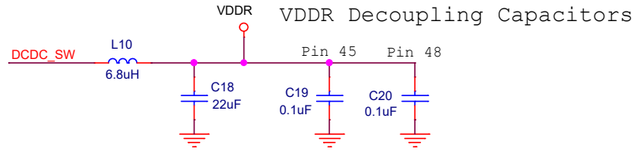
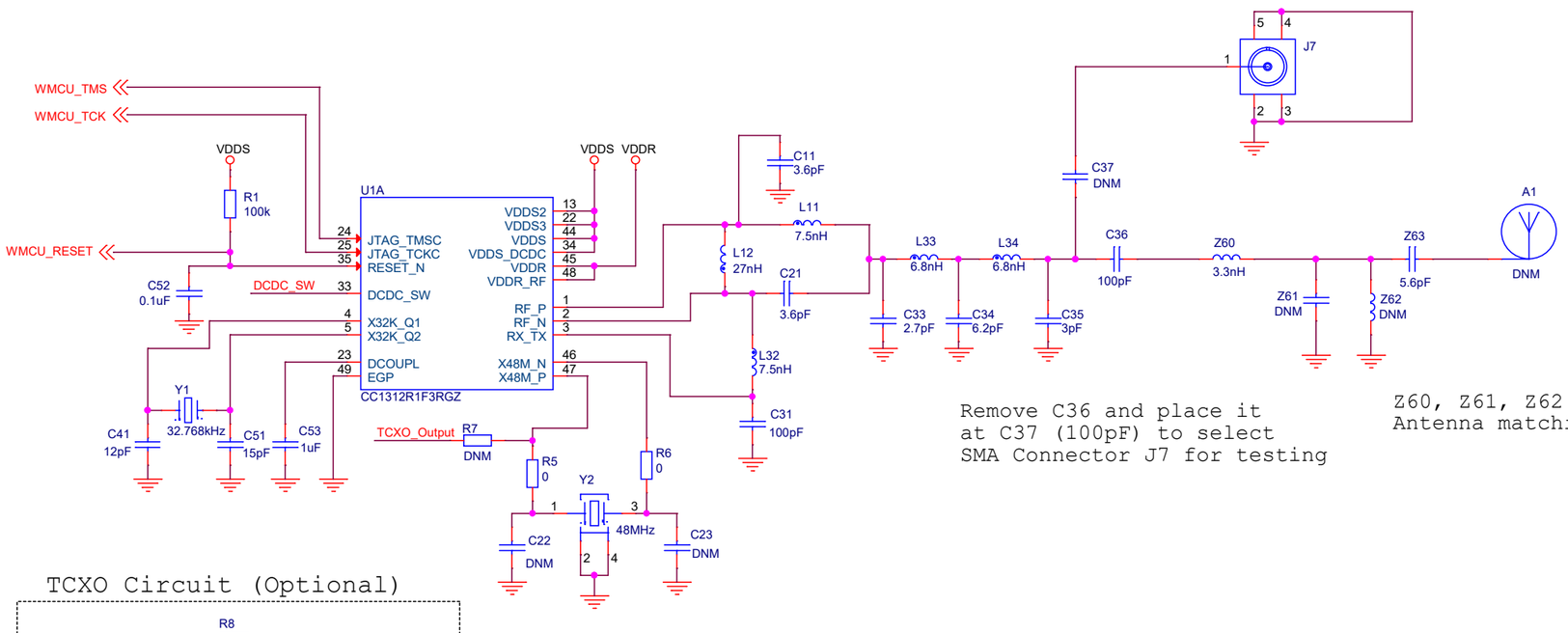
Title: BeagleBone Black Expansion Headers, uSD.and EEPROM		
Size: B	Document Number: 450-5500-001	Rev: C
Date: Friday, March 21, 2014	Sheet 11 of 11	

Wireless MCU RF





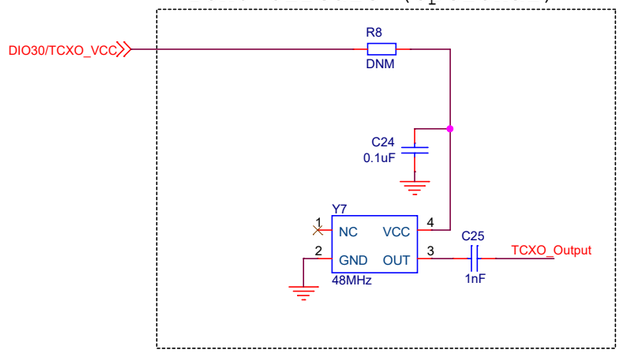
Place L10 and
C18 close to pin 33.
Low inductance ground for C18



Remove C36 and place it
at C37 (100pF) to select
SMA Connector J7 for testing

Z60, Z61, Z62 and Z63 for
Antenna matching

TCXO Circuit (Optional)



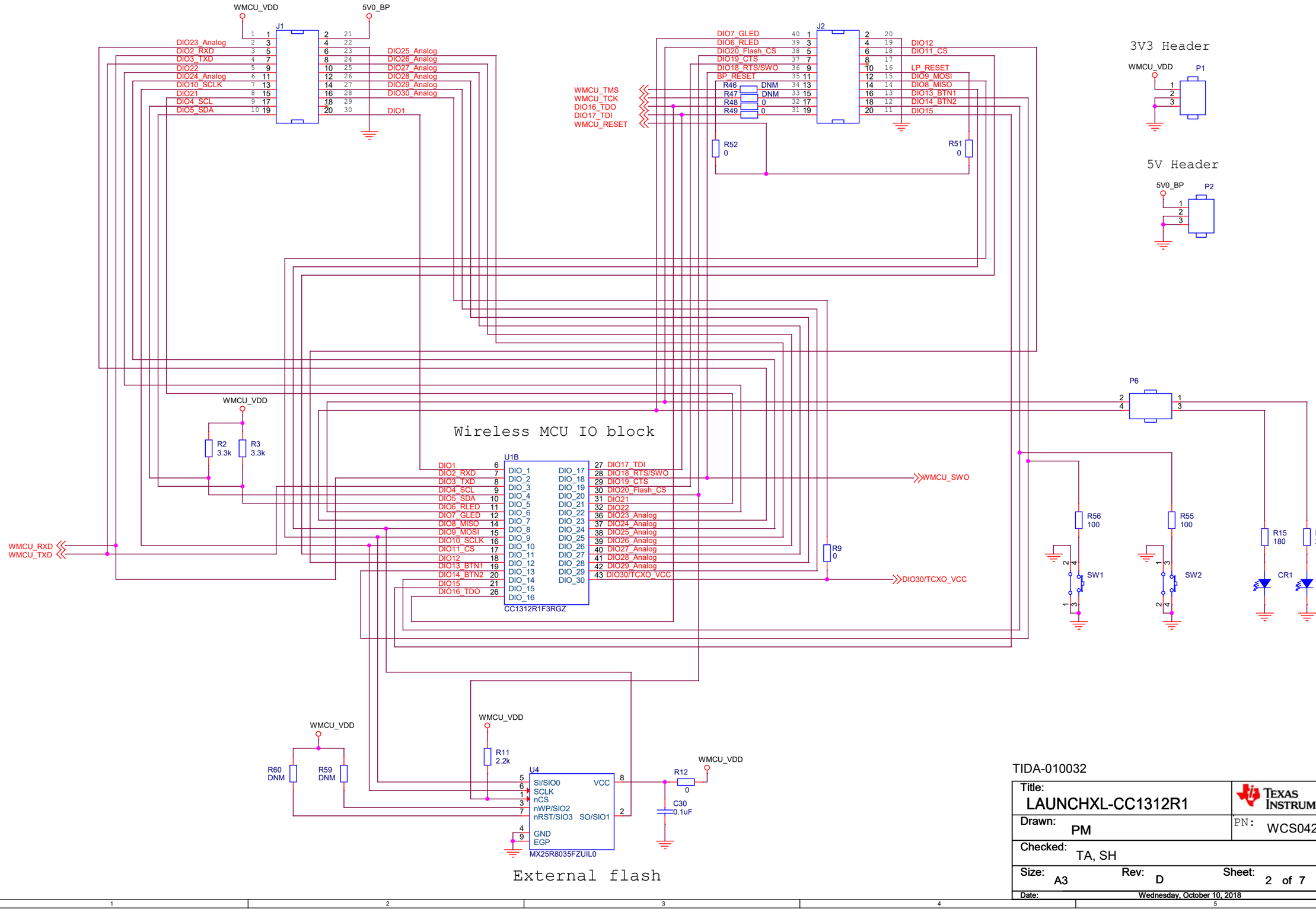
To use TCXO:
Remove R5,R6 & R9(placed on Page-2)
Place 0 Ohms at R7 & R8

Wireless MCU IO block
placed on page 2.

TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SH	
Size: A3 Rev: D Sheet: 1 of 7	
Date: Wednesday, October 10, 2018	

BoosterPack Headers and Peripherals

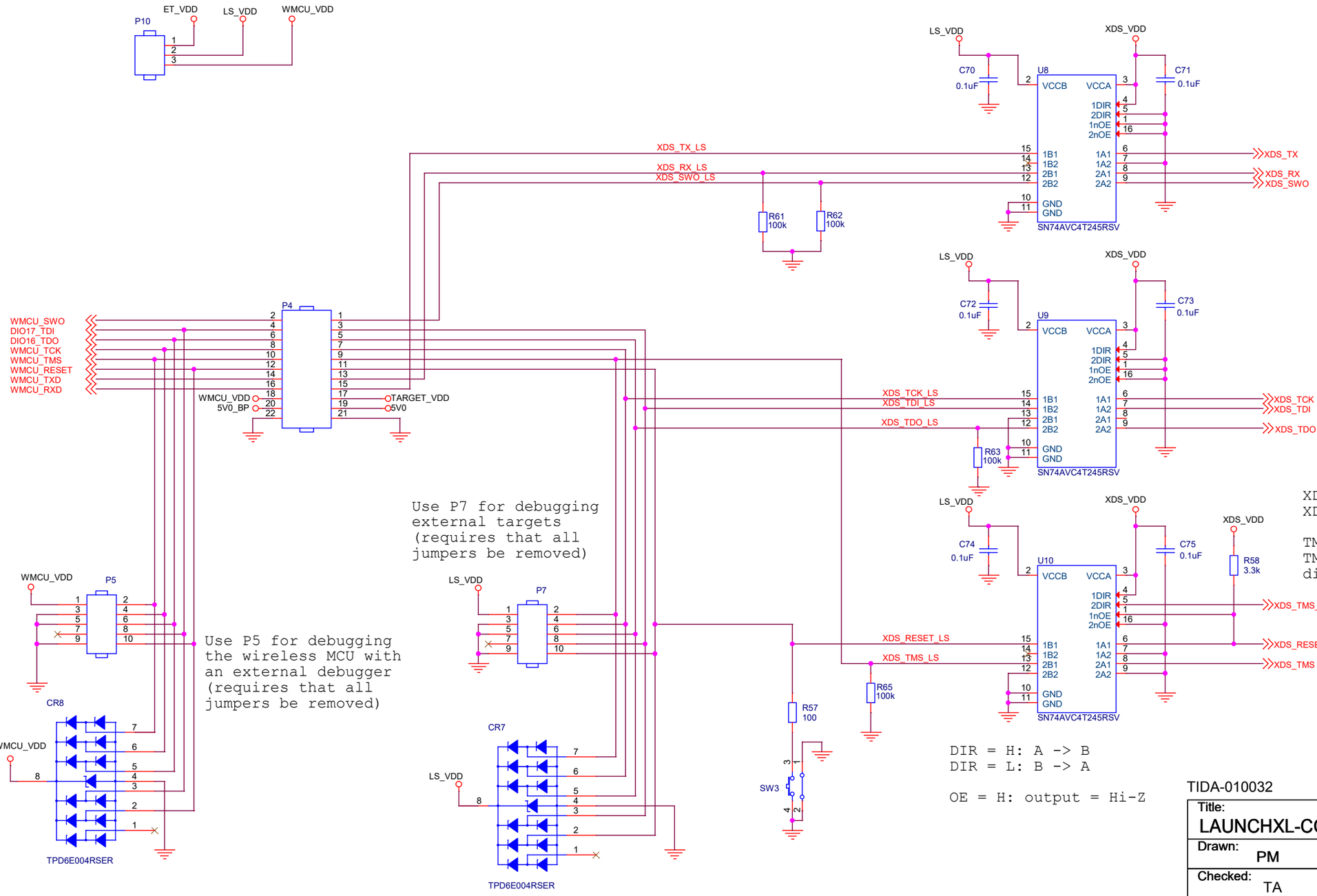


TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SH	
Size: A3 Rev: D	Sheet: 2 of 7
Date: Wednesday, October 10, 2018	

XDS110 Debugger Interface

P10 selects the voltage source for the level shifters
When powering the wireless MCU from the XDS supply, connect jumper between pins 1 and 2.
When powering the wireless MCU from an external supply, connect jumper between pins 2 and 3.



Use P5 for debugging the wireless MCU with an external debugger (requires that all jumpers be removed)

Use P7 for debugging external targets (requires that all jumpers be removed)

XDS-RST = 0 -> output = 0
XDS-RST = 1 -> output = Hi-Z

TMS signal is bidirectional. TMS_DIR used to control direction of level shifter

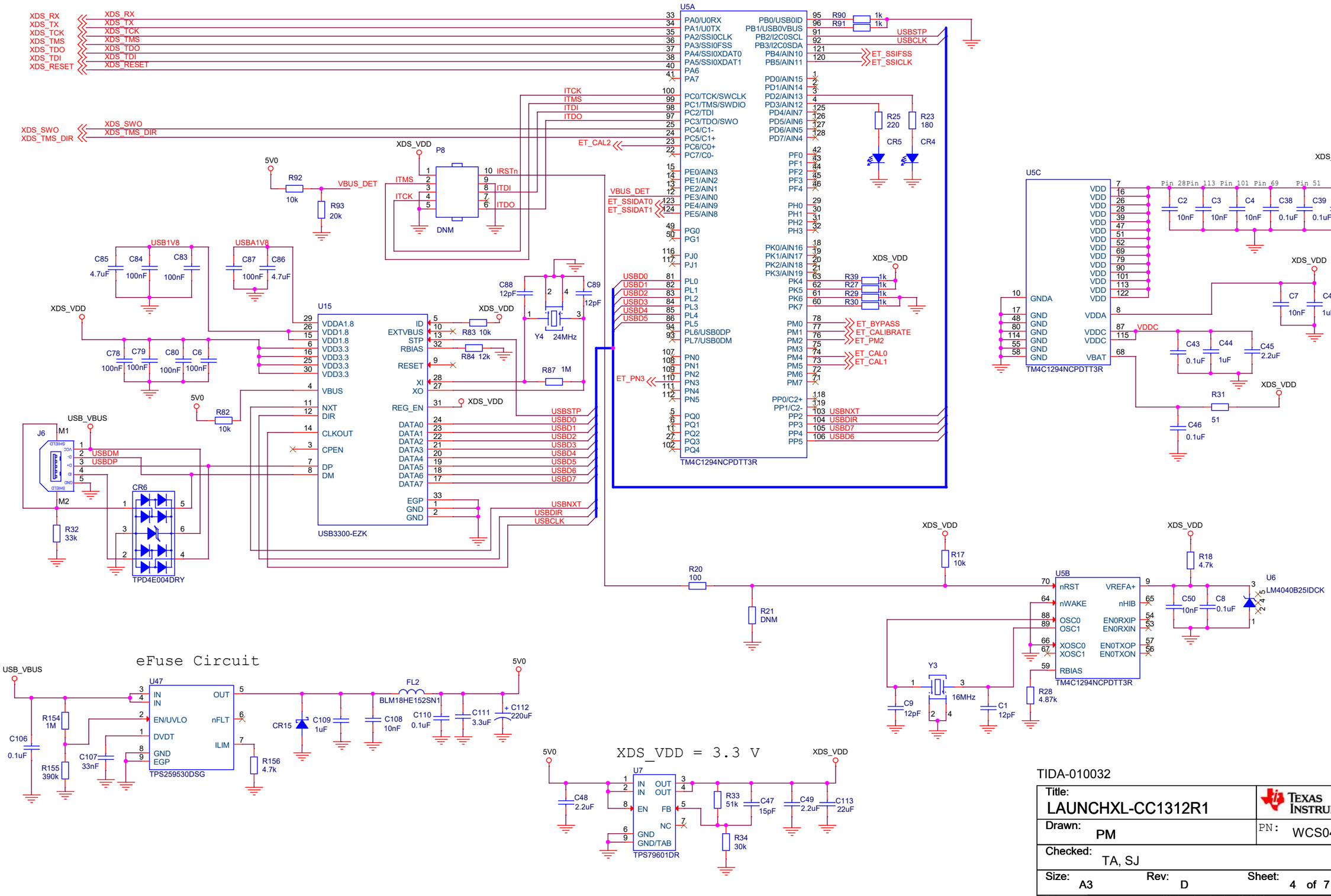
DIR = H: A -> B
DIR = L: B -> A

OE = H: output = Hi-Z

TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA	
Size: A3 Rev: D Sheet: 3 of 7	
Date: Wednesday, October 10, 2018	

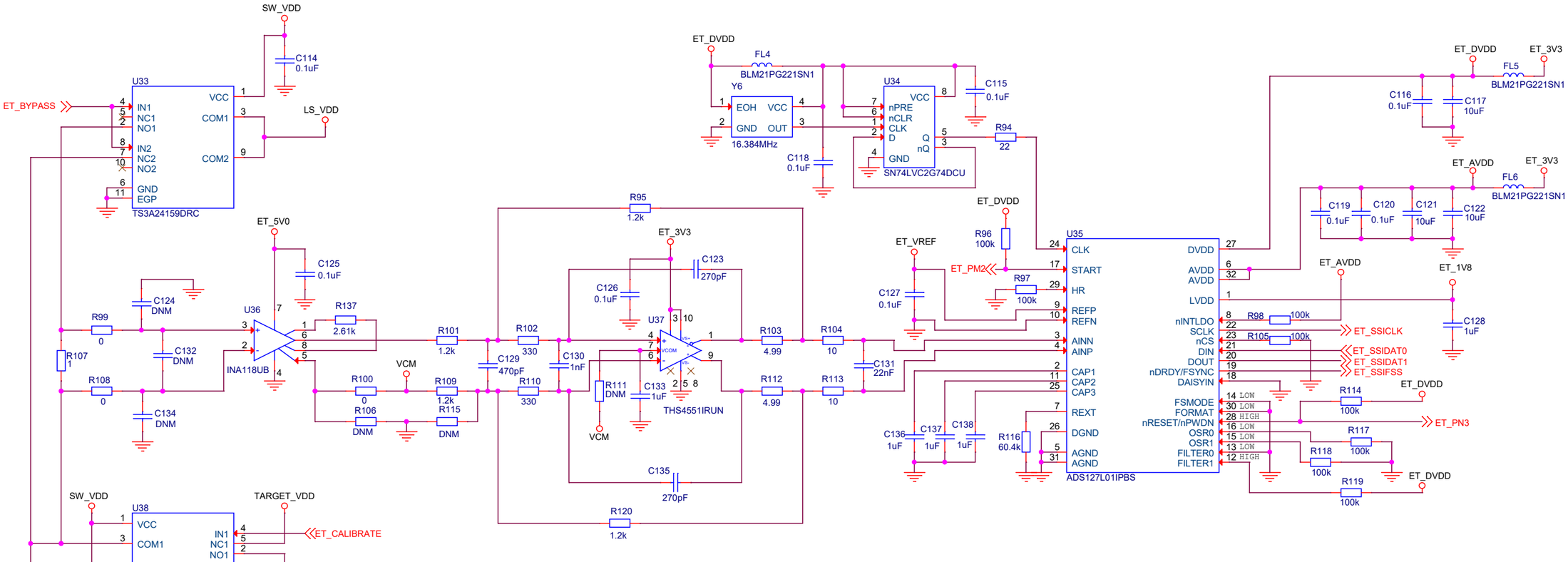
XDS110 Debugger

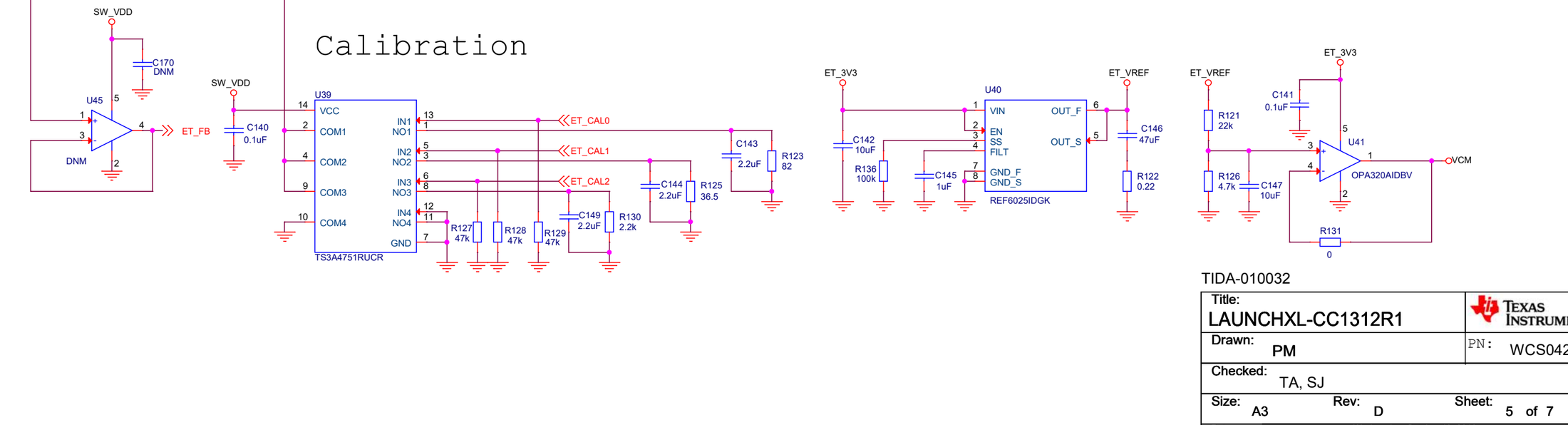


TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SJ	
Size: A3 Rev: D	Sheet: 4 of 7
Date: Wednesday, October 10, 2018	

EnergyTrace

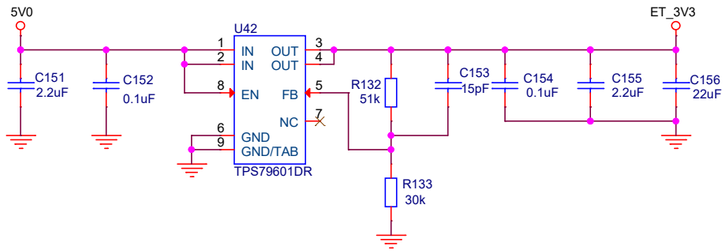


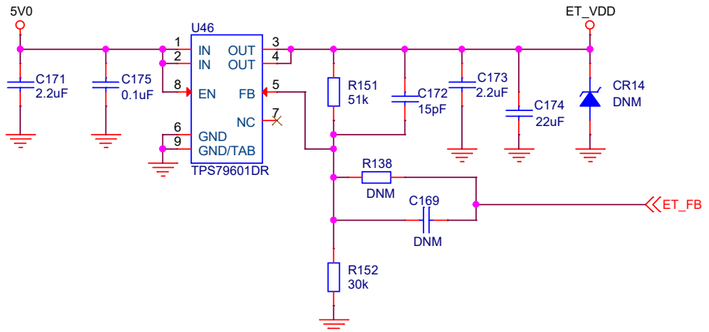


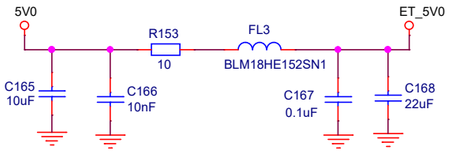
TIDA-010032

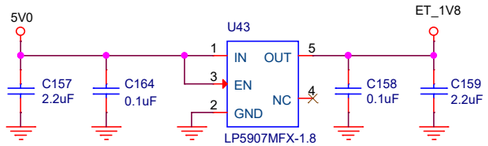
Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SJ	
Size: A3 Rev: D Sheet: 5 of 7	
Date: Wednesday, October 10, 2018	

EnergyTrace Power Supply

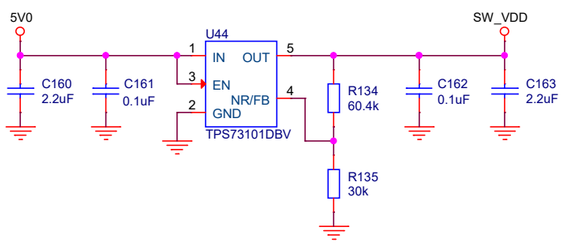








U39 VCC set at 3.6V, higher than switch supplies to prevent current through protection diodes



TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SJ	
Size: A3 Rev: D	Sheet: 6 of 7
Date: Wednesday, October 10, 2018	

Mechanical

Rev	Description	Date
E1	Initial Version	2017/08/09
A	Production Release Version	2017/10/20
B	Added Dustbin Symbol to Rev-A	2018/01/04
C	Updated ET, eFuse & TCXO Ckt	2018/07/09
D	Updated with CE Symbol	2018/10/10

Jumpers to be mounted on P4

M3 M4 M5 M6 M7 M8 M9 M10 M11 M12 M13

Jumper to be mounted on P10

M14

Jumpers to be mounted on P6

M1 M2

MH1 MH2 MH3 MH4 MH5

M15 M16 M17 M18

DCB-10 DCB-10 DCB-10 DCB-10

Place standoffs on bottom side on MH1 thru MH4

PCB1

As Per Fab Drawing-WCS042

FIDU1 FIDU2 FIDU3

FIDU4 FIDU5 FIDU6

LBL1

CE_label

LBL2

LBL4

FCC dsc

LBL6

TIDA-010032

Title: LAUNCHXL-CC1312R1	Texas Instruments
Drawn: PM	PN: WCS042
Checked: TA, SJ	
Size: A3 Rev: D Sheet: 7 of 7	
Date: Wednesday, October 10, 2018	

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