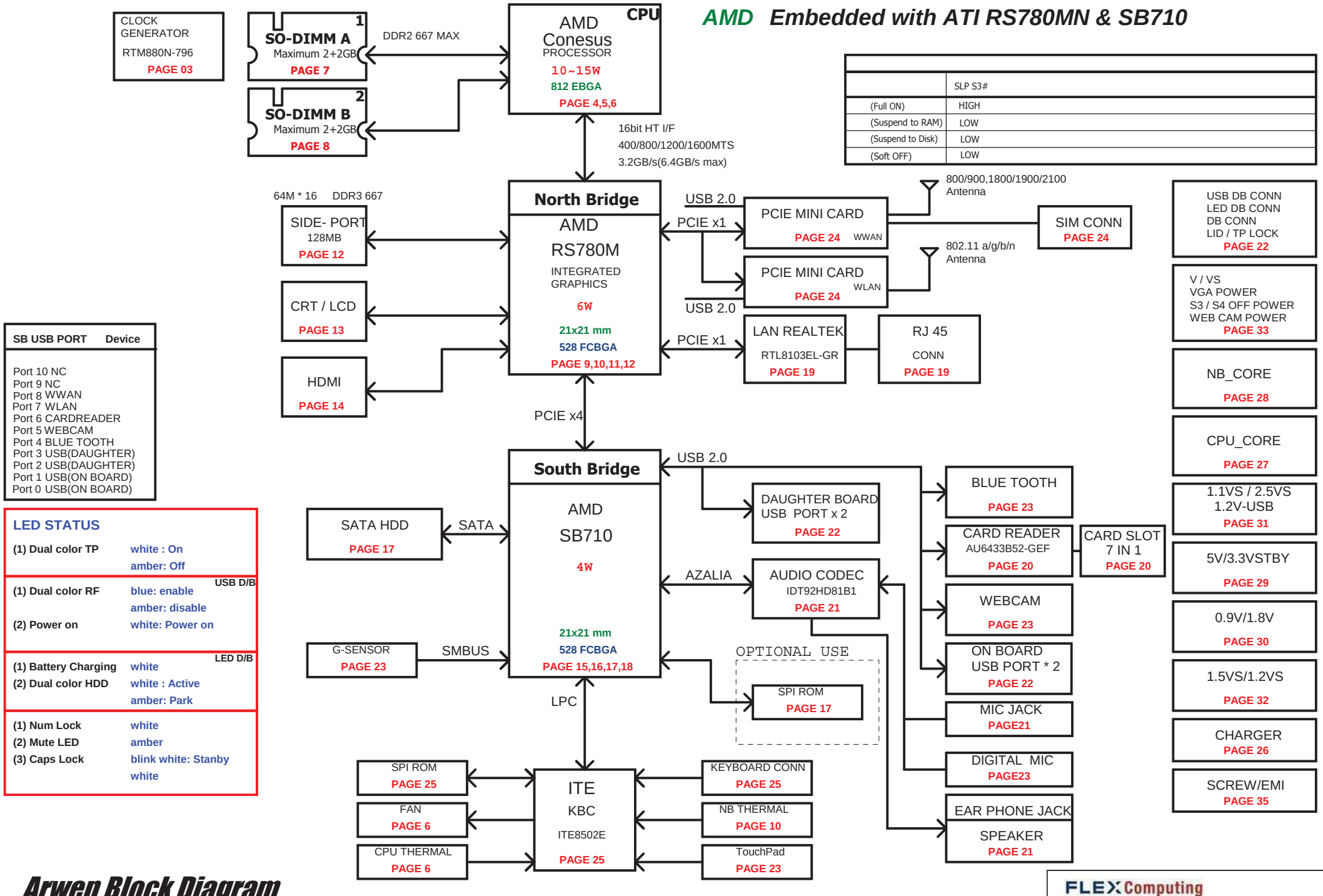
AMD Embedded with ATI RS780MN & SB710



SB USB PORT	Device
Port 10	NC
Port 9	NC
Port 8	WWAN
Port 7	WLAN
Port 6	CARDREADER
Port 5	WEBCAM
Port 4	BLUE TOOTH
Port 3	USB(DAUGHTER)
Port 2	USB(DAUGHTER)
Port 1	USB(ON BOARD)
Port 0	USB(ON BOARD)

LED STATUS

(1) Dual color TP	white : On amber: Off	
(1) Dual color RF	blue: enable amber: disable	USB D/B
(2) Power on	white: Power on	
(1) Battery Charging	white	LED D/B
(2) Dual color HDD	white : Active amber: Park	
(1) Num Lock	white	
(2) Mute LED	amber	
(3) Caps Lock	blink white: Stanby white	

Arwen Block Diagram

H310UA1

FLEXComputing

Project Name : ARWEN UA1	Title : BLOCK Diagram	
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14	CONN - HDMI
15-18	SOUTH BRIDGE RS780
19	LAN - RT8103EL
20	CARD READER - ALCOR AU6433B52-GEF
21	AUDIO - IDT 92HD81
22	USB CONN / SWITCH / LID
23	BT / WEBCAM / TOUCHPAD / G-SENSOR
24	WLAN / WWAN
25	KBC - ITE8502E
26	PWR - BATERY CHARGER
27	PWR - CPU CORE
28	PWR - NB CORE
29	PWR 5V / 3.3 VSTBY
30	PWR 1.8V / 0.9V
31	PWR - 1.1VS / 2.5VS / 1.2V-USB
32	PWR - 1.5VS / 1.2VS
33	PWR - V / VS / VGA POWER
34	POWER SEQUENCE
35	OTHER SCREW / EMI CAPS

Power States

POWER PLANE	VOLTAGE	PAGE	DESCRIPTION	CONTROL SIGNAL	ACTIVE IN
ACIN	~+19V	26	ADAPTER IN POWER		S0~S5
B+	+10~+19V	13,23,24,26,27,28,29,30,31,32,33	MAIN POWER		S0~S5
VBAT	+3.0V~+3.3V	15	RTC BATTERY		S0~S5
LDO5	+5V	22,29	LDO POWER	B+	S0~S5
LDO3	+3.3V	29	LDO POWER	B+	S0~S5
3.3VSTBY	+3.3V	15,16,17,22,25,26,29,31,33	STANDBY POWER	B+	S0~S5
3.3V-DUAL	+3.3V	15,16,17,18,25,31,33	EC CTRLD POWER	3.3VDUAL-ON#	BY EC CONTROL
1.2V-DUAL	+1.2V	18,31	3.3V-DUAL CTRLD POWER	3.3V-DUAL	BY EC CONTROL
5V	+5V	22,23,29,30,32,33,	SUS-C# CTRLD POWER	SUSC#	S0.S3
3.3V	+3.3V	13,33	SUS-C# CTRLD POWER	SUSC	S0.S3
1.8V	+1.8V	04,05,06,07,08,30,33	SUS-C# CTRLD POWER	SUSC#	S0,S3
0.9V	+0.9V	04,05,07,08,30	SUS-C# CTRLD POWER	SUSC#,SUSB#	S0,S3
5VS	+5V	06,13,14,17,18,21,22,23,25,27,28,31,32,33	SUS-B# CTRLD POWER	SUSB	S0
3.8VS	+3.8V	23,33	SUS-B# CTRLD POWER	SUSB#	S0
3.3VS	+3.3V	03,06,07,08,10,11,12,13,14,16,17,18,20,21,22 23,24,25,27,28,29,31,32,33	SUS-B# CTRLD POWER	SUSB	S0
2.5VS	+2.5V	06,31	SUS-B# CTRLD POWER	SUSB#	S0
1.8VS	+1.8V	06,10,11,12,15,16,33	SUS-B# CTRLD POWER	SUSB	S0
1.5VS	+1.5V	11,12,16,24,28,31,32	SUS-B# CTRLD POWER	SUSB#	S0
1.2VS	+1.2V	04,06,11,15,17,18,32	SUS-B# CTRLD POWER	SUSB#	S0
1.1VS	+1.1V	09,10,11,12,31	SUS-B# CTRLD POWER	SUSB#	S0
CPU_CORE		04,27	CPU CORE POWER	SUSB#	S0
NB_CORE	+1.0V~+1.1V	11,18,32	NORTH BRIDGE CORE POWER	1.1VS-PG	S0
BATA+	+10V~+17V	26	MAIN BATTERY		S0~S5

GND PLANE	PAGE	DESCRIPTION
GND	ALL	
AGND	19	
LAN-GND	21	

FLEX Computing

Project Name : ARWEN UA1	Title : Power Diagram
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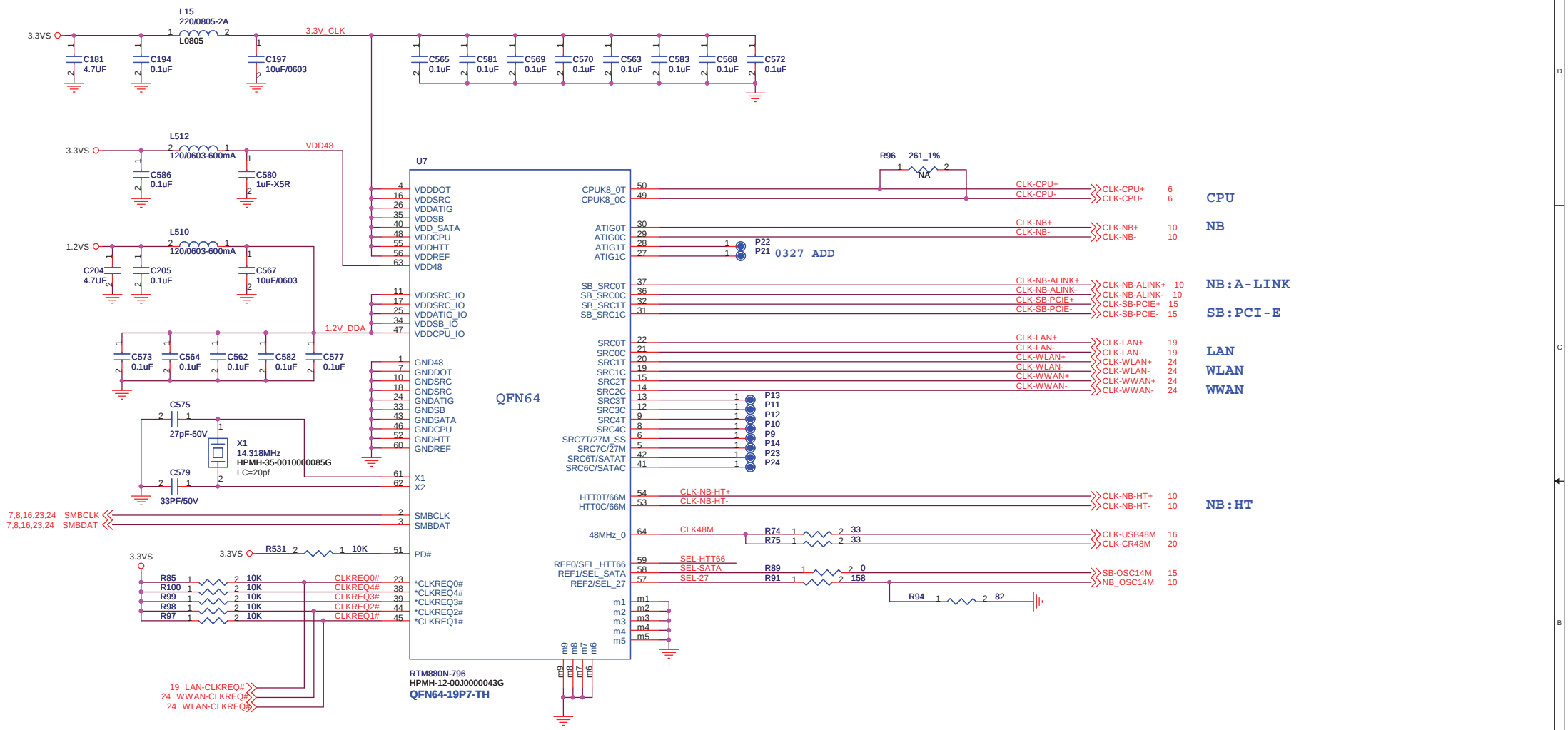
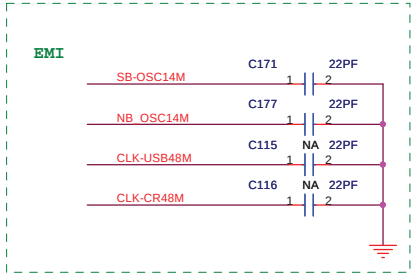
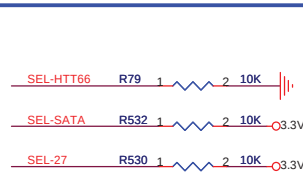
CLOCK GENERATOR







SEL_HTT66 :
-1 : Pin54/53: 66MHz 3.3V single ended HTT clock
-0 : Pin54/53: 100MHz differential HTT clock

SEL_SATA :
-1 : Pin42/41: 100MHz No_SSC-Differential SATA clock
-0 : Pin42/41: 100MHz SRC clock

SEL_27 :
-1 :Pin6/5: 27 MHz / 27_SSC MHz
-0 :Pin6/5: 100MHz SRC clock

FLEX Computing

Project Name : ARWEN UA1	Title : CLOCK GENERATOR
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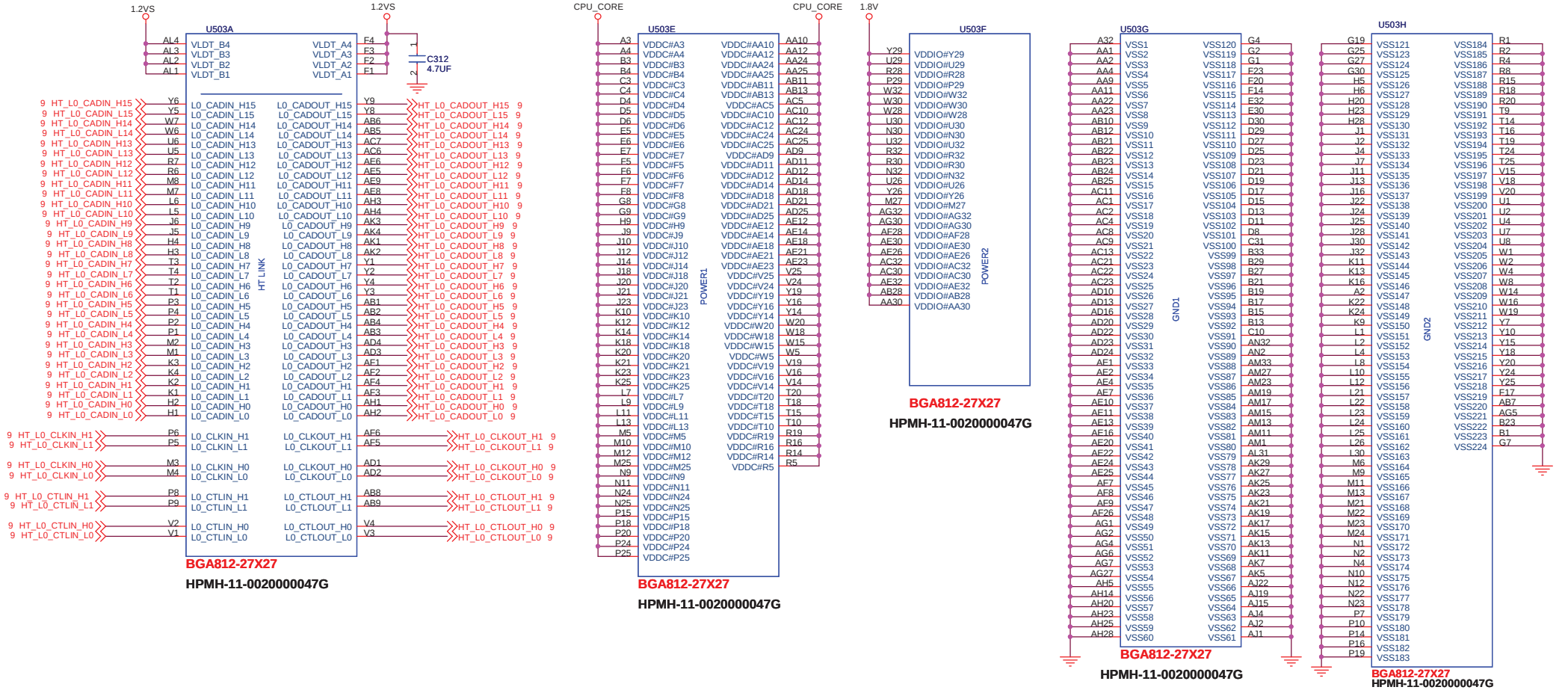
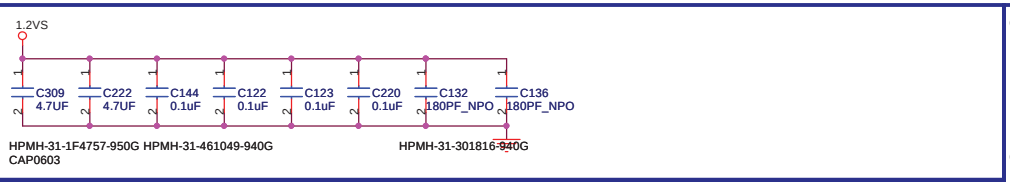
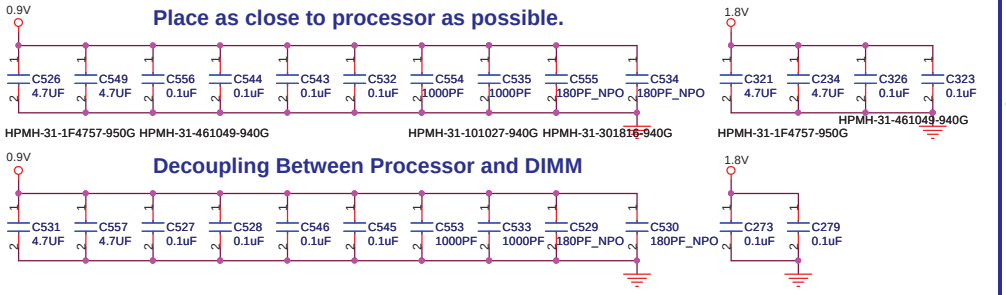
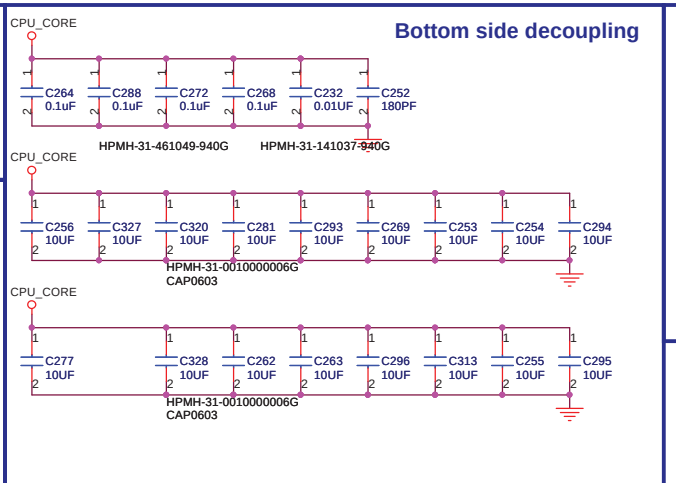
CPU HT/PWR/GND

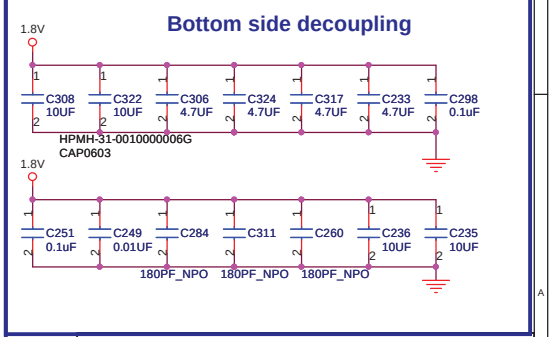
VLDT Trace at Itast 200 mils wide











FLEX Computing

Project Name : ARWEN UA1	Title : CPU HT/PWR/GND	
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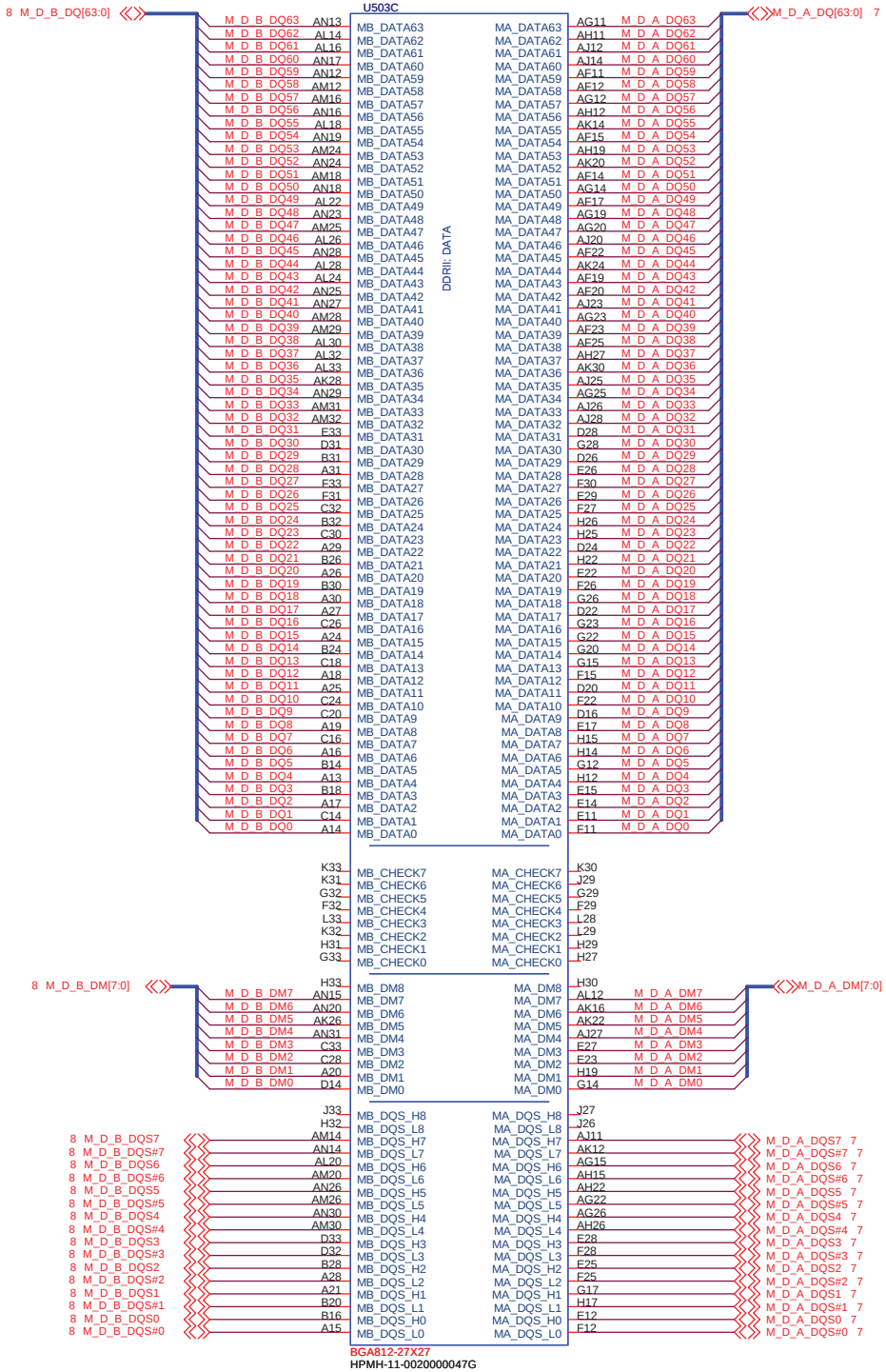
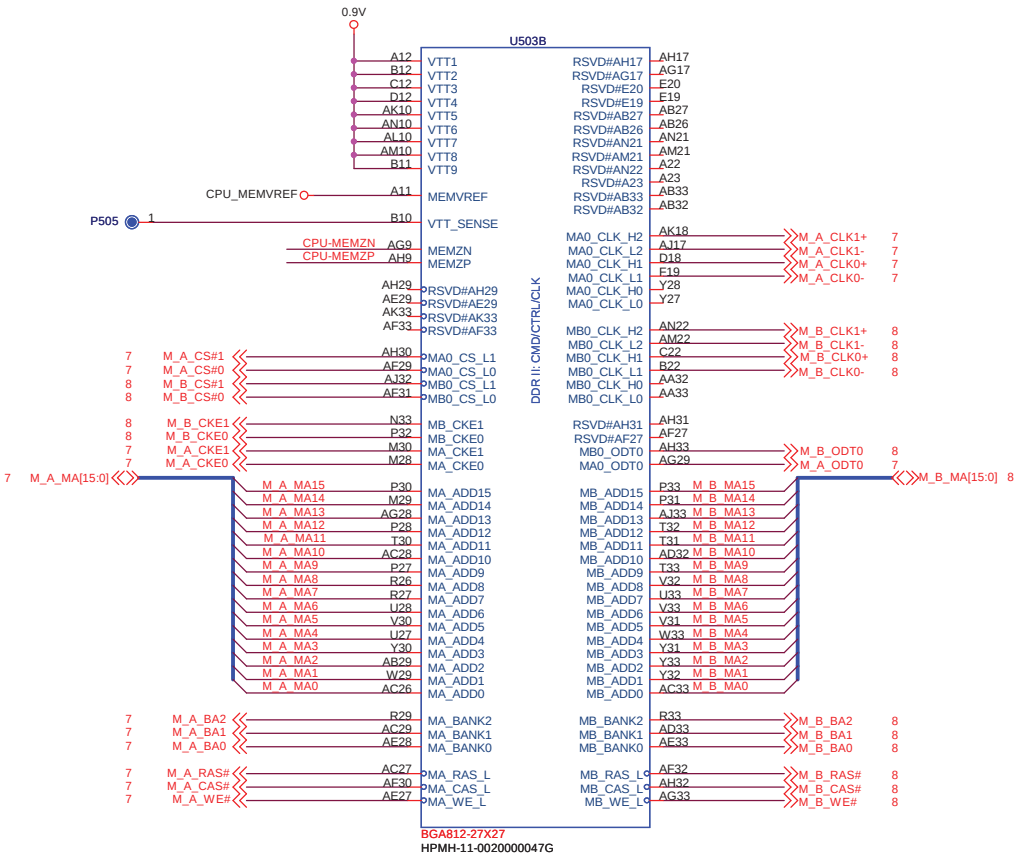
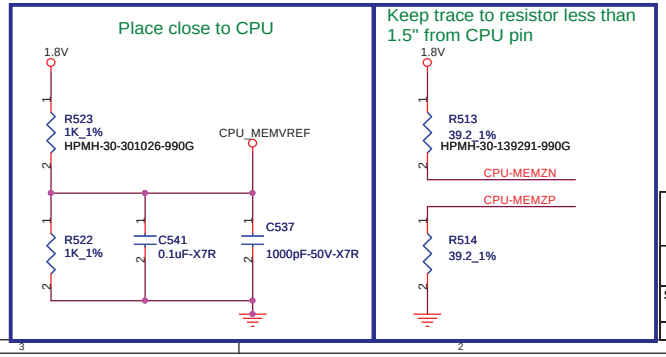
CPU MEMORY A/B



CPU Memory Interface





FLEX Computing

Project Name : ARWEN UA1	Title : CPU Memory Interface	
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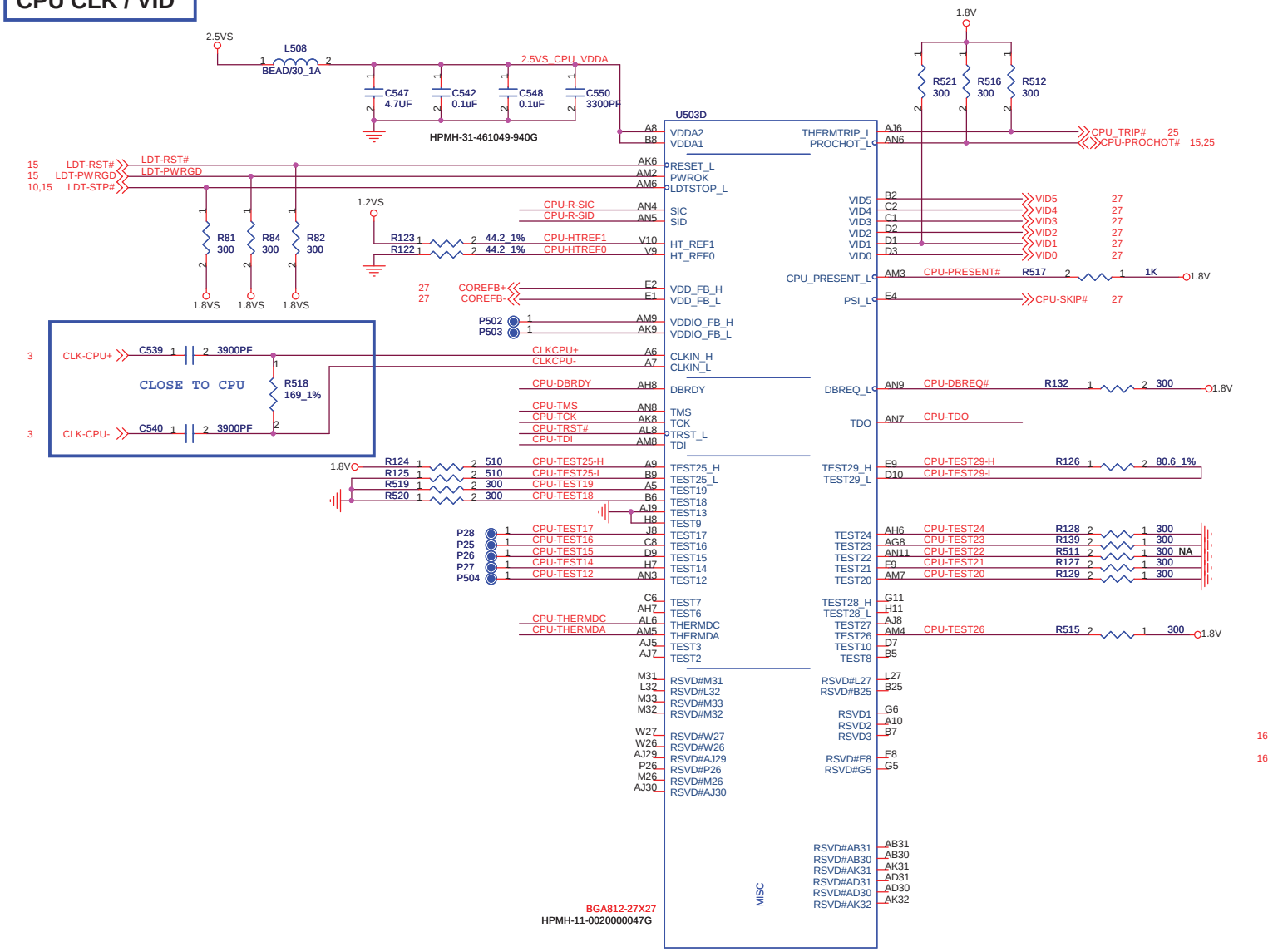
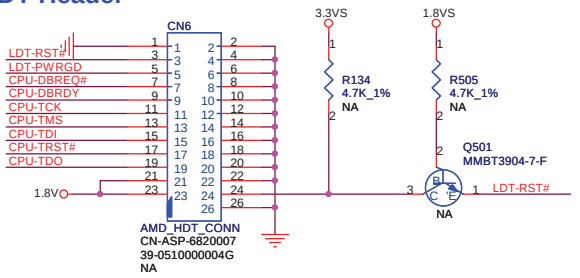
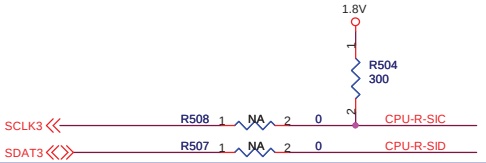
CPU CLK / VID



HDT Header



Reserve for internal thermal

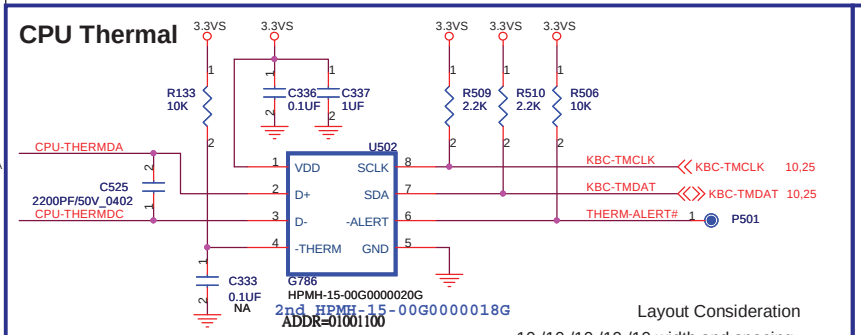


Delete LDT-STP# delay circuit for RS780 DA
ER_RS690B3

Layout (1) :Keep trace to resistor less than 600 mils from CPU pin and trace to AC caps less than 1250 mils

Layout (2) :Route VDDA trace approx. 50 mils wide (use 2x25 mil traces to exit ball field) and 500 mils long.

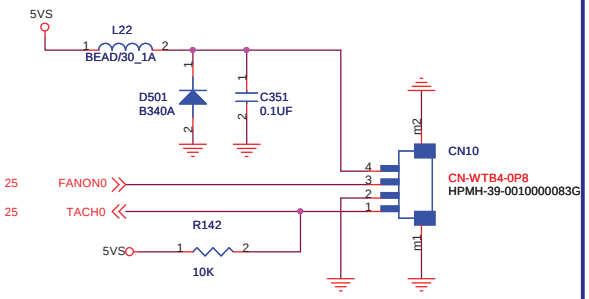
CPU Thermal



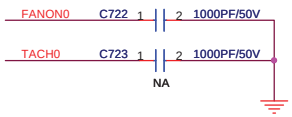
Layout Consideration

10 /10 /10 /10 /10 width and spacing

FAN



EMI



FLEX Computing

Project Name : ARWEN UA1	Title : CPU Control & Debug	
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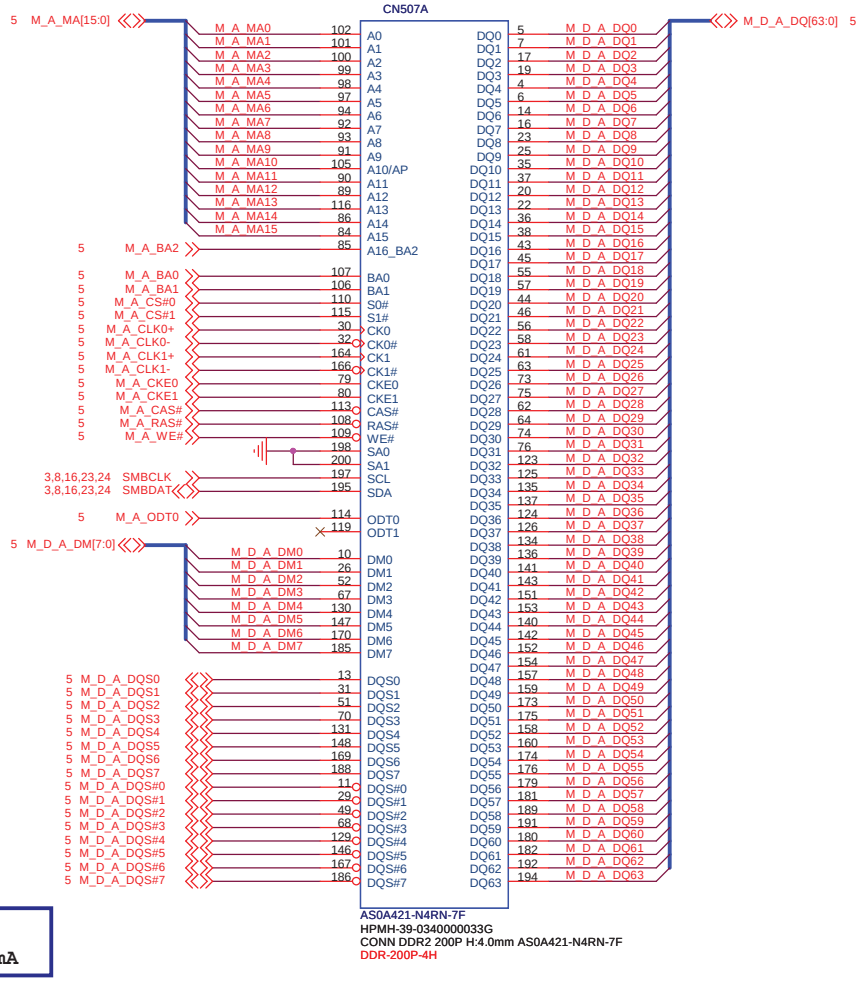
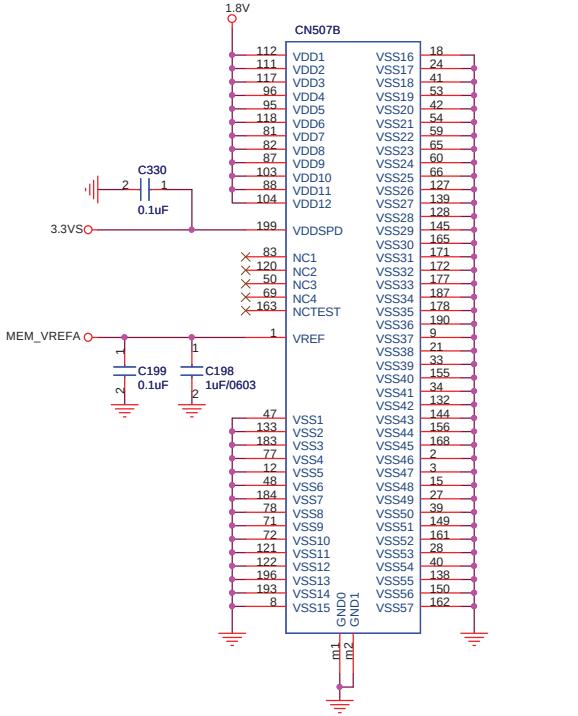
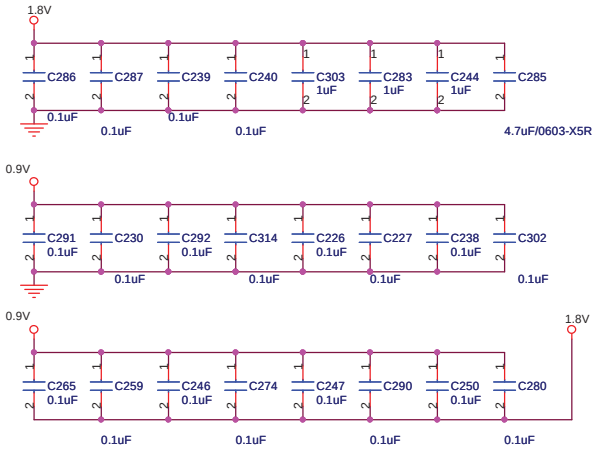
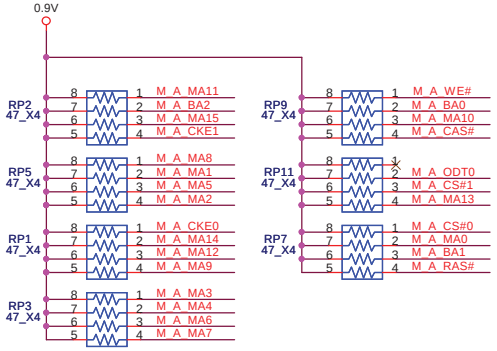
Memory Channel A

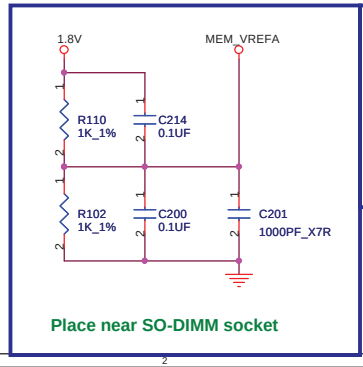


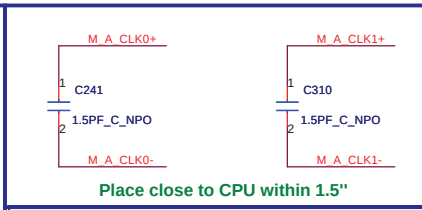


Layout :
Place these Caps near So-DimmA









FLEX Computing

Project Name : ARWEN UA1	Title : DDR2 SO-DIMM A / Termination	
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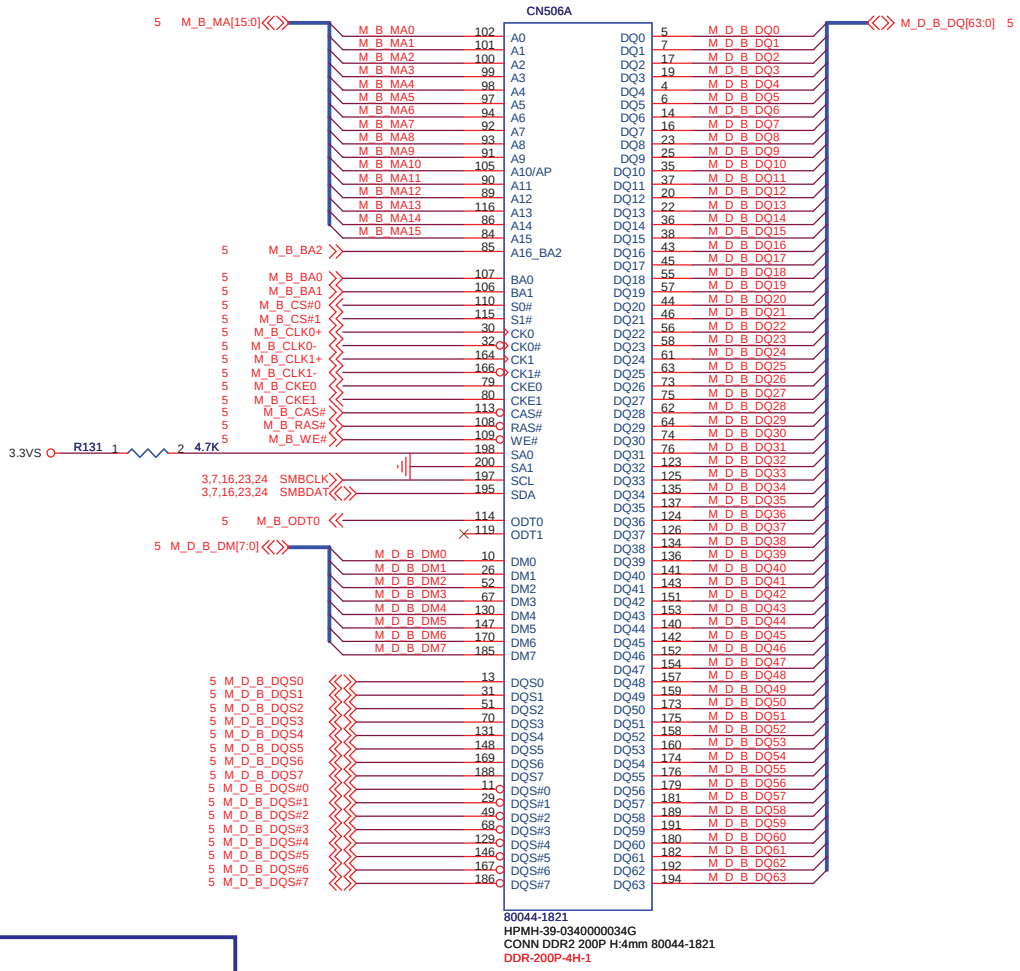
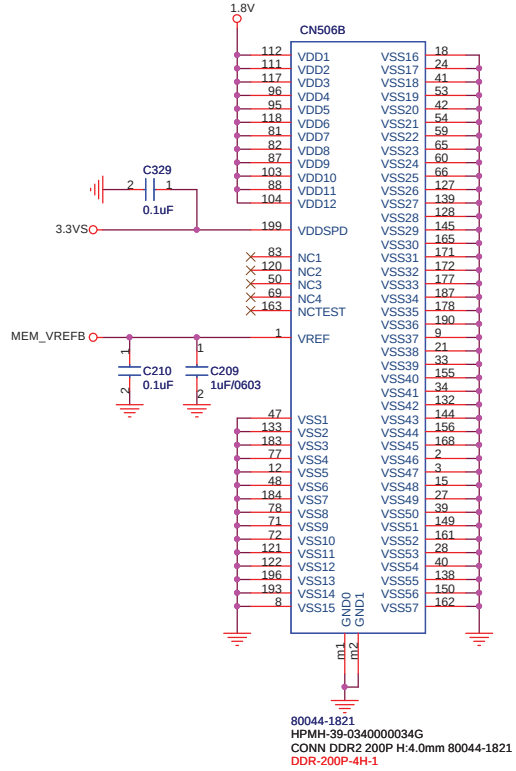
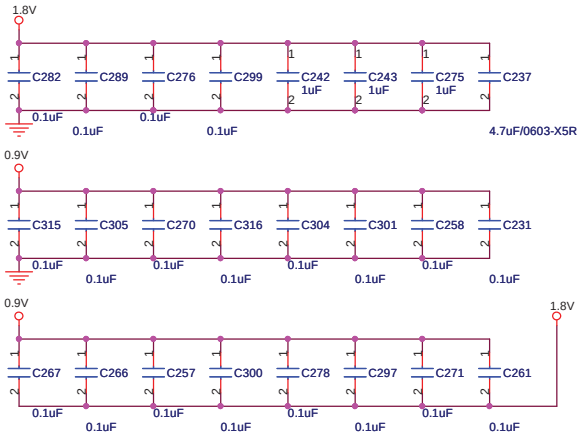
Memory Channel B

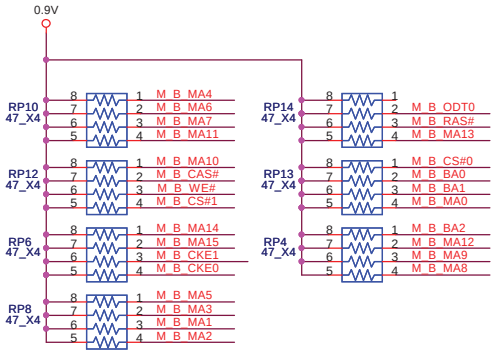
DDR2 Termination
DDR2 SO-DIMMB

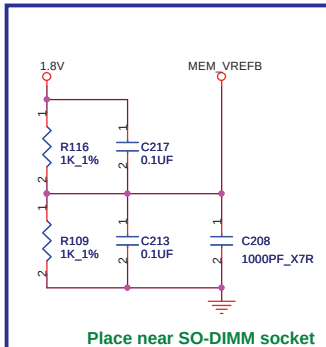




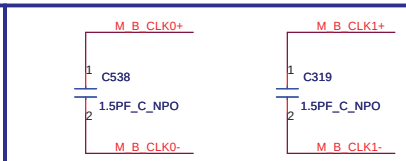
Layout :
Place these Caps near So-DimmA







Place near SO-DIMM socket



Place close to CPU within 1.5"

FLEX Computing

Project Name : ARWEN UA1	Title : DDR2 SO-DIMM B / Termination	
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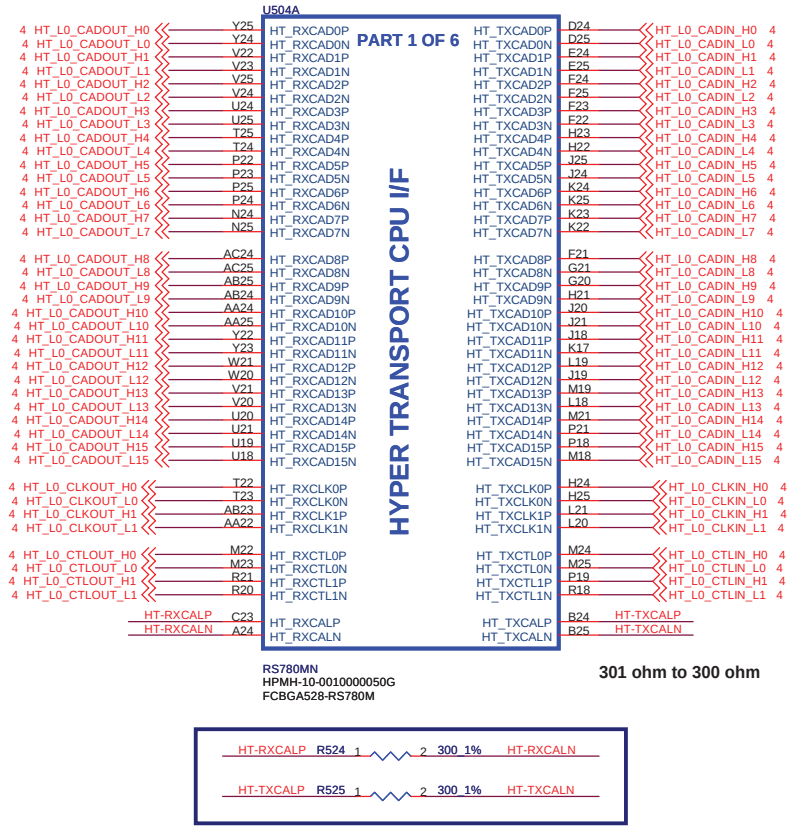
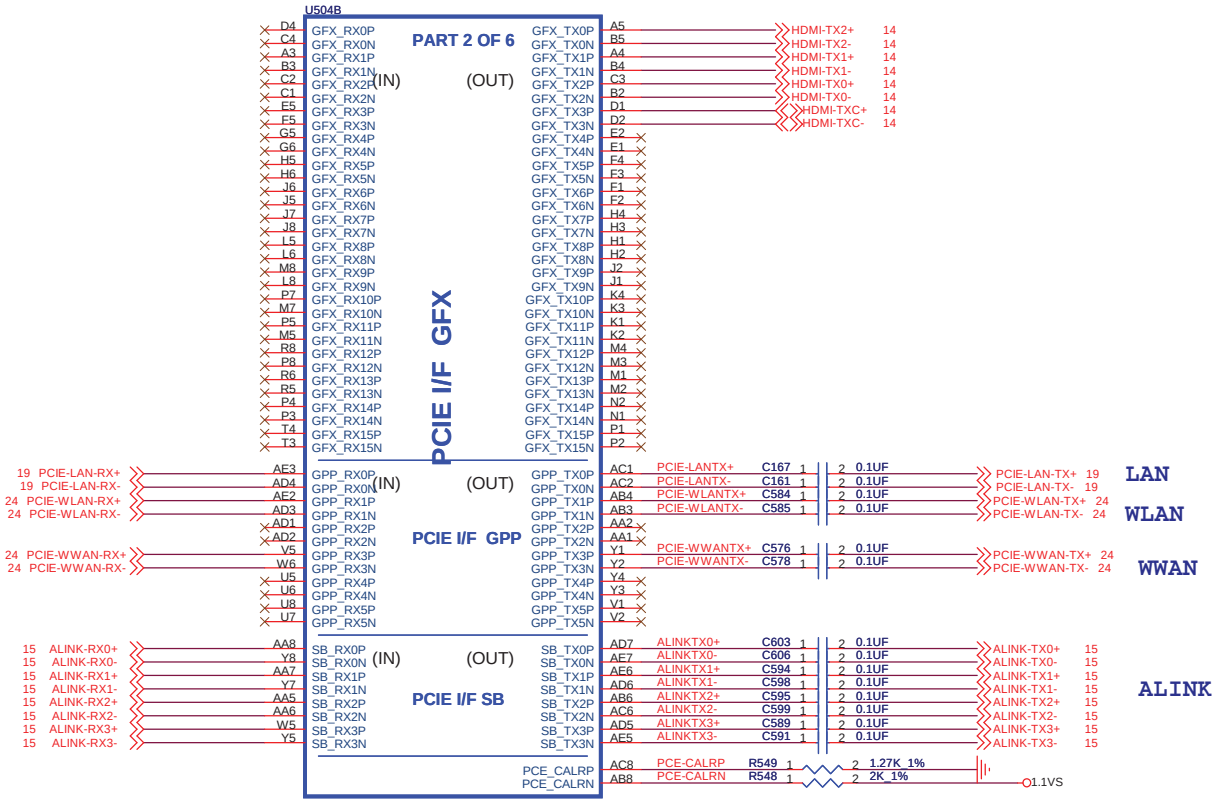
RS780M HT/PCIE/HDMI



RS780MN
HPMH-10-0010000050G
FCBGA528-RS780M

301 ohm to 300 ohm

UMA HDMI



RS780MN
HPMH-10-0010000050G
FCBGA528-RS780M

FLEXComputing

Project Name : ARWEN UA1	Title : RS780M HT/PCIE/HDMI Interface
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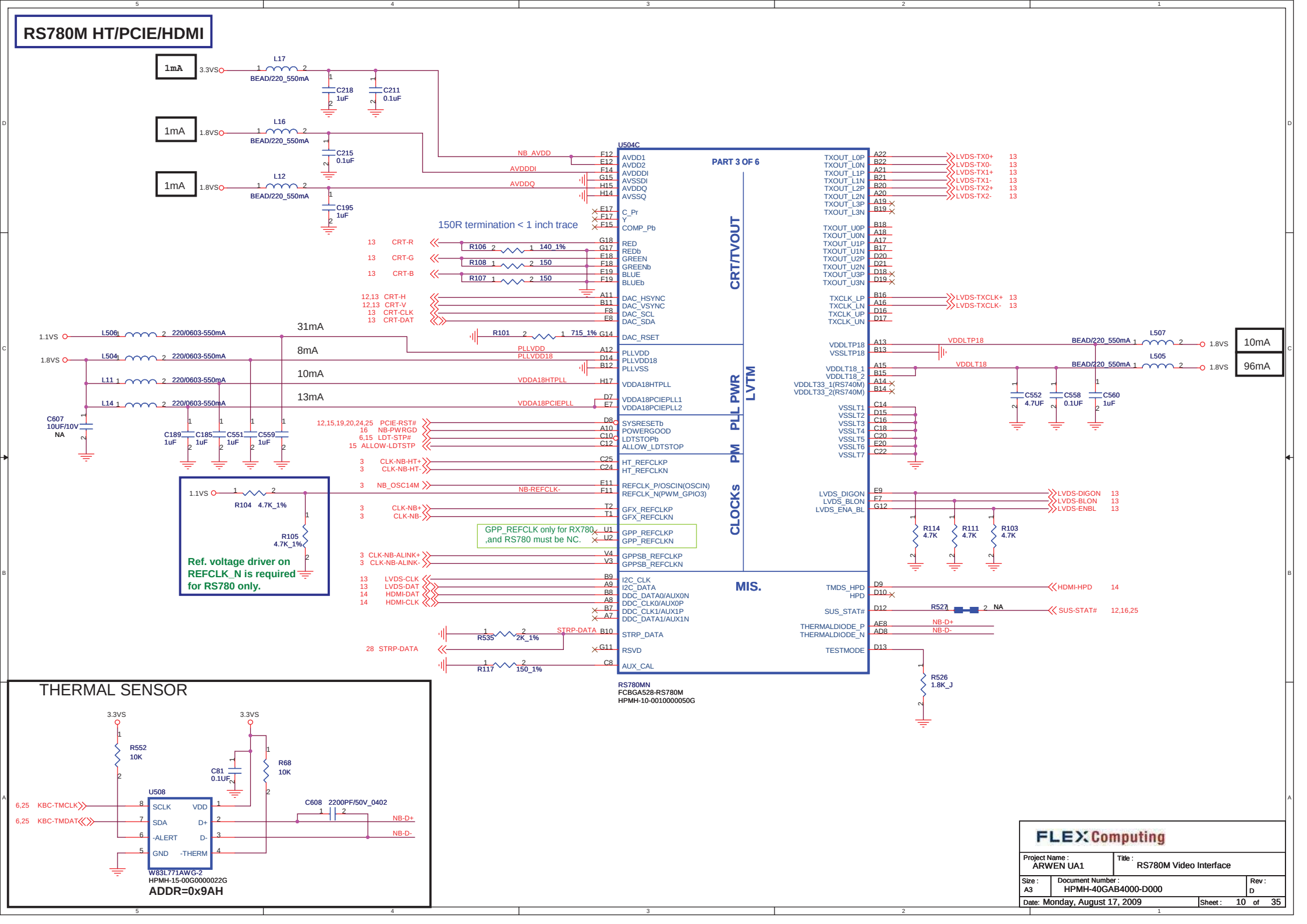
RS780M HT/PCIE/HDMI



THERMAL SENSOR

FLEX Computing

Project Name : ARWEN UA1	Title : RS780M Video Interface
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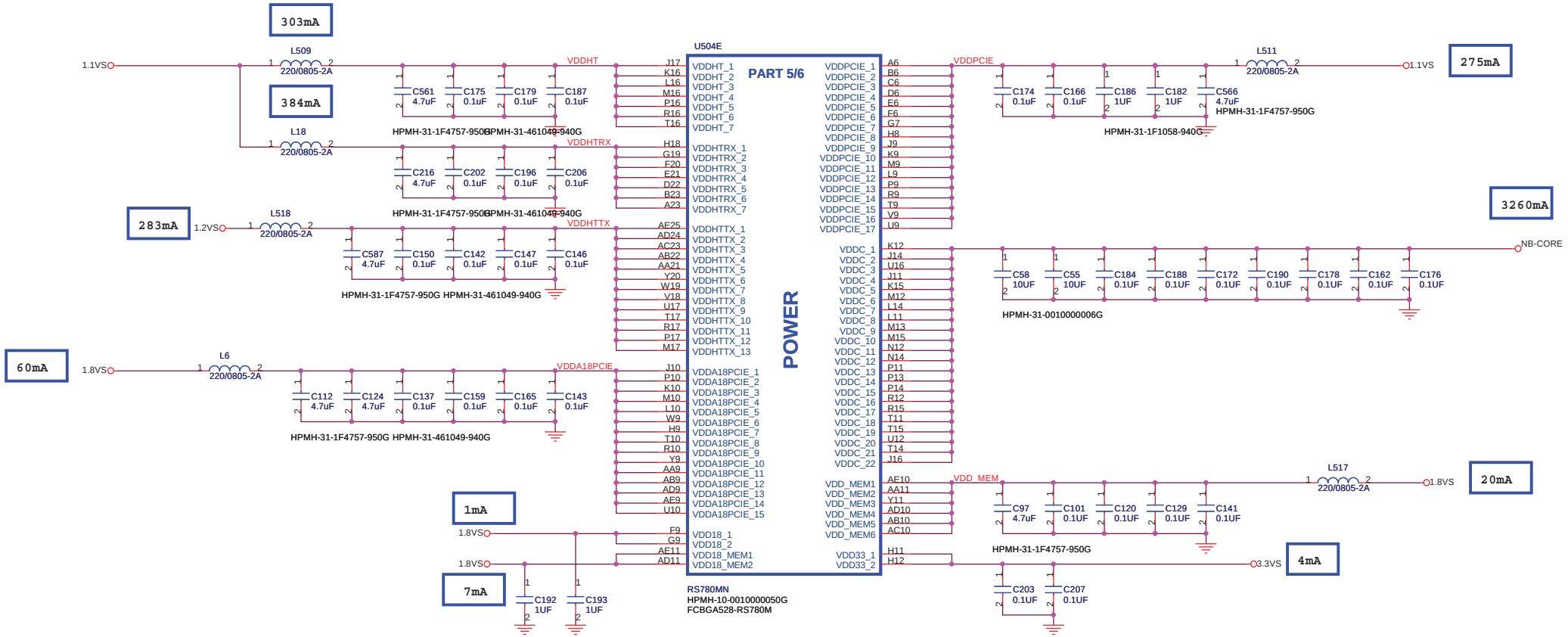
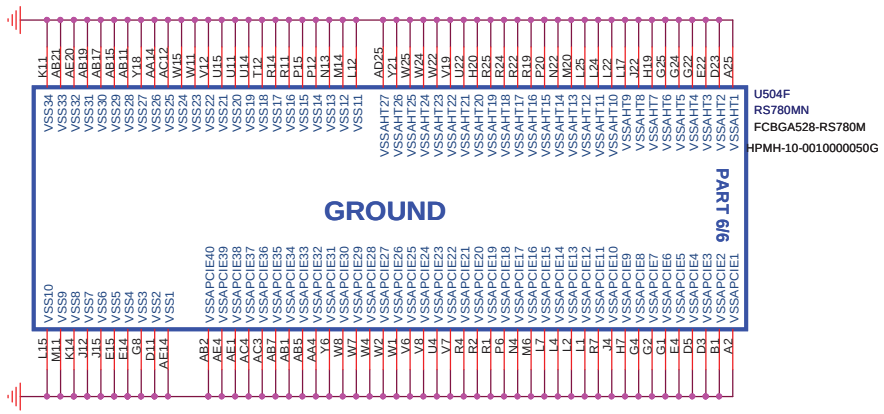
RS780M Power/Ground





FLEX Computing

Project Name : ARWEN UA1	Title : RS780M Power & Ground
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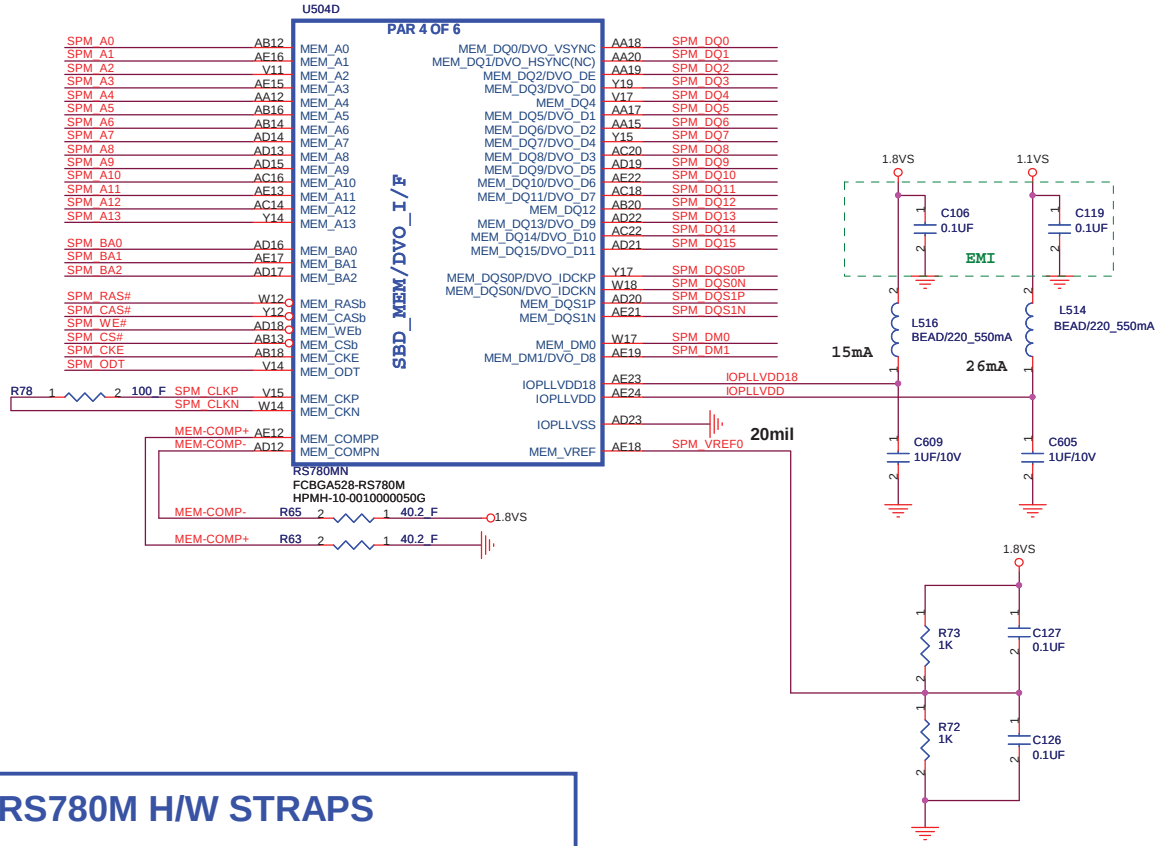
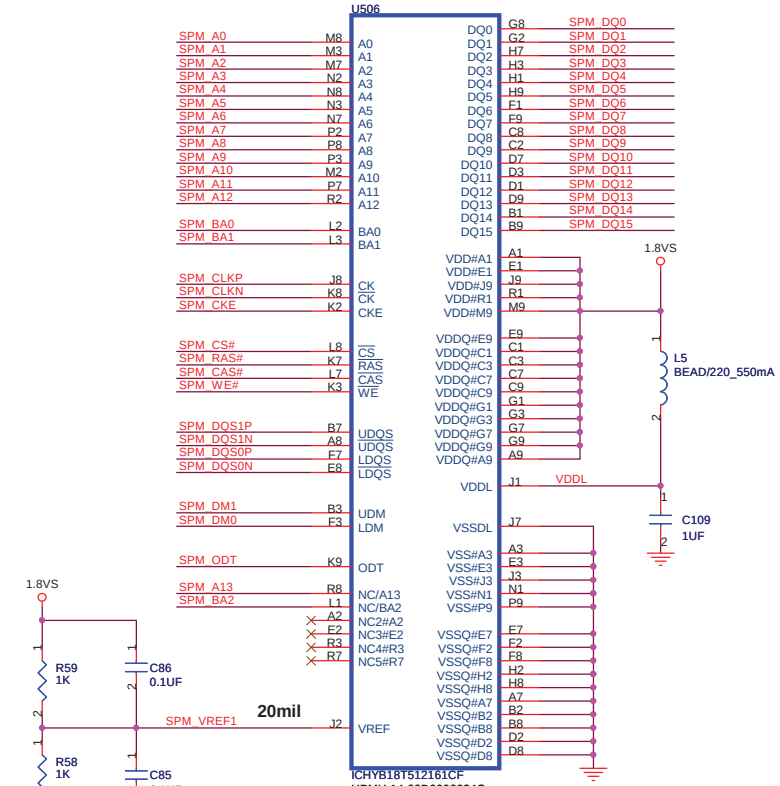
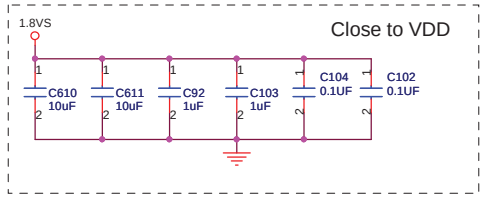
NB_SIDE PORT / STRAPS



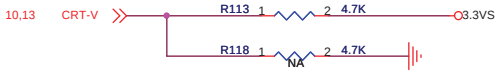




RS780M H/W STRAPS

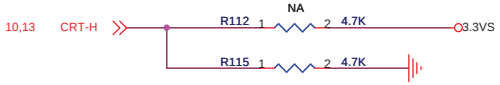
STRAP_DEBUG_BUS_GPIO_ENABLE

Enables the Test Debug Bus using GPIO.
DAC_VSYNC (RS780.Pin B11)
1 : Disable (RS780) (default)
0 : Ensable (RS780)



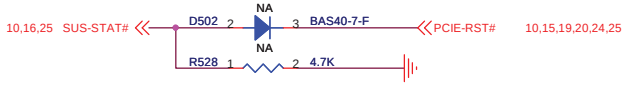
RS780: Enable Side Port Memory

Selects if Memory SIDE PORT is available or not
DAC_HSYNC (RS780.Pin A11)
1 : Disable (default)
0 : Enable
Register Readback of strap:
NB_CLKCFG:CLK_TOP_SPARE_D[1]



DFT_GPIO1: LOAD_EEPROM_STRAPS

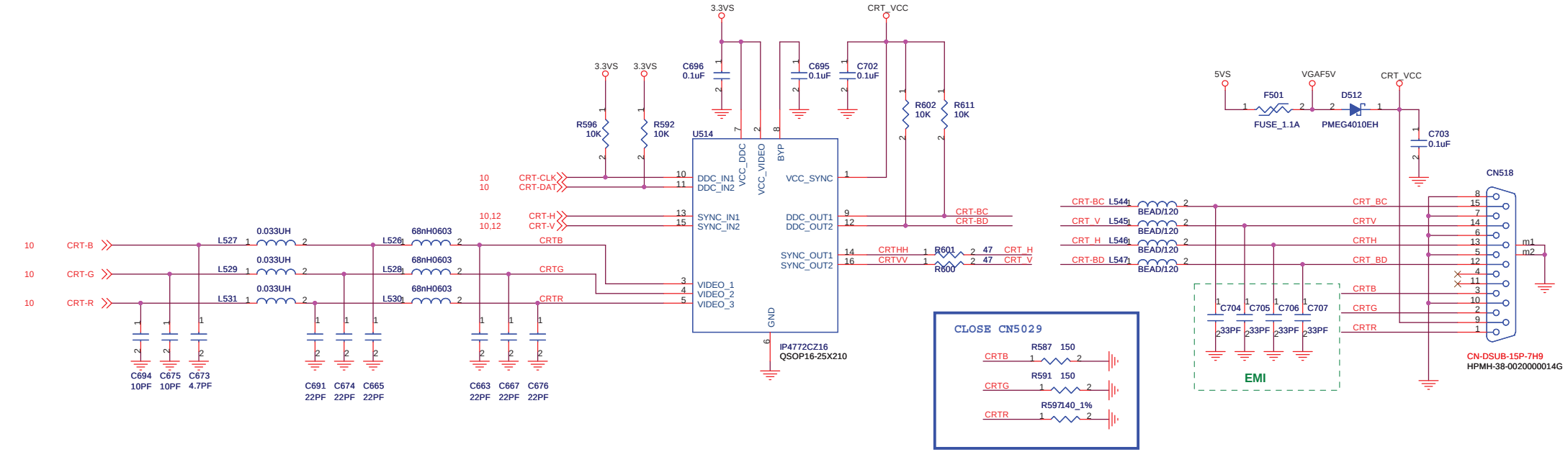
Selects Loading of STRAPS from EPROM
SUS_STAT# (RS780.Pin D12)
-1*: Bypass the loading of EEPROM straps and
use Hardware Default Values
-0 : I2C Master can load strap values from EEPROM if connected
, or use default values if not connected



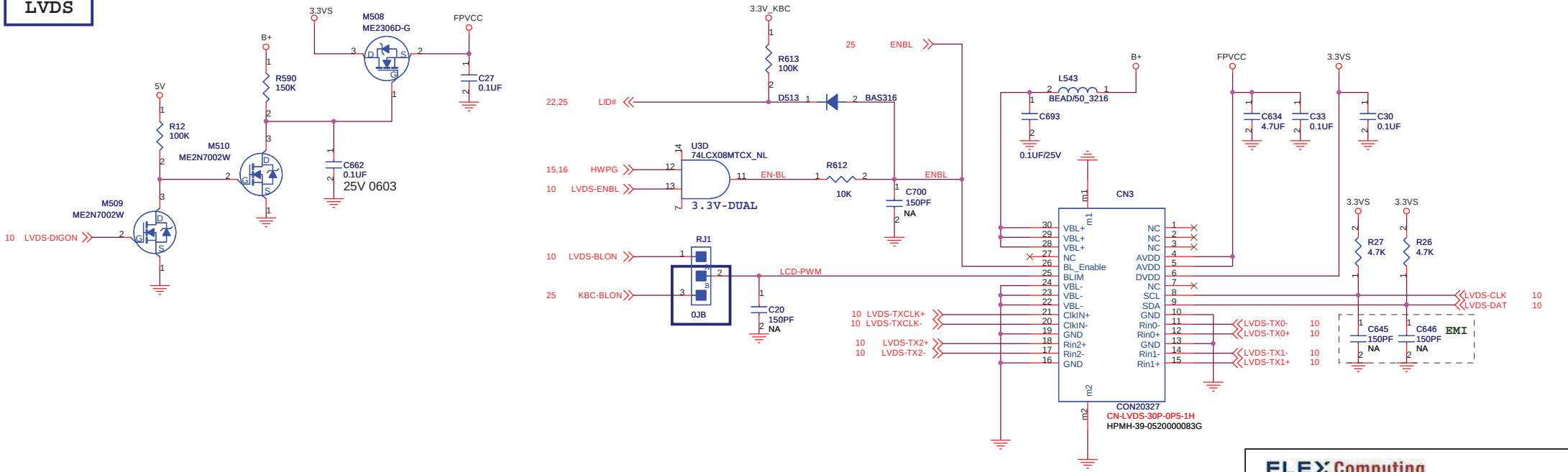
FLEX Computing

Project Name : ARWEN UA1	Title : RS780M SBD / STRAPS
Size : A3	Document Number : HPMH-40GAB4000-D000
Rev : D	
Date: Monday, August 17, 2009	Sheet : 12 of 35

CRT



LVDS



FLEXComputing		
Project Name : ARWEN UA1	Title : LVDS / CRT Connector	
Size : A3	Document Number : HPMH-40GAB4000-D000	Rev : D
Date: Monday, August 17, 2009	Sheet : 13 of 35	

HDMI

CLOSE CN5031

HPMH-32-4000000104G

HPMH-31-181047-940G

M92 SPEC SET 499 ohm

EMI

HDMICLK
HDMIDAT
C13 180PF NA
C15 180PF NA

HDMI

CN515

TMDS-D2+
TMDS-D2-Shield
TMDS-D2
TMDS-D1+
TMDS-D1-Shield
TMDS-D1
TMDS-D0+
TMDS-D0-Shield
TMDS-D0
TMDS-CLK+
TMDS-CLK-Shield
TMDS-CLK-
CEC
NC
DDC-CLK
DDC-DAT
GND
+5V
HP-DET

CN-HDMI-19DIP-5H55
HPMH-38-00F0000008G

HPMH-30-120031-990G

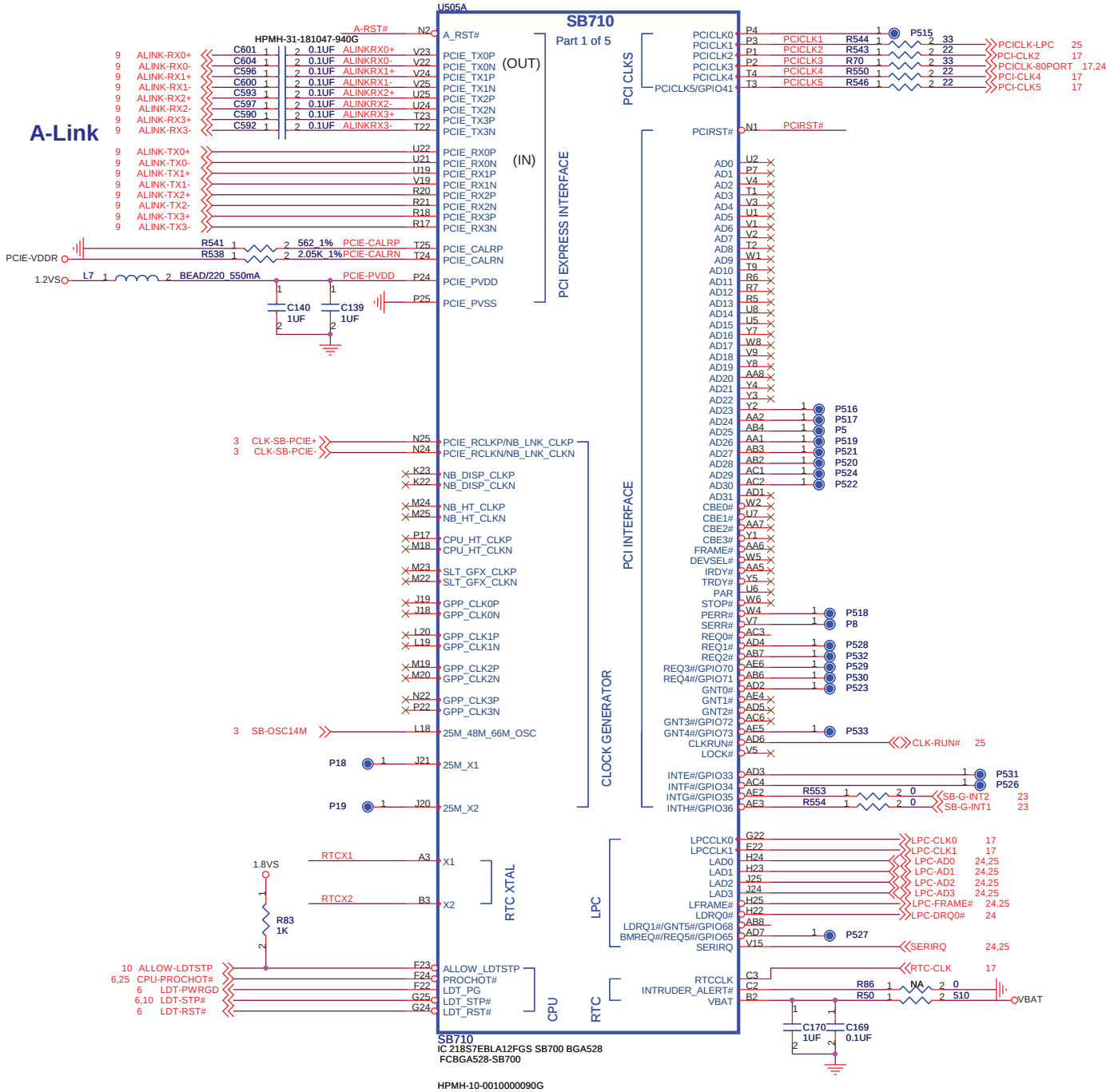
CLOSE CN5031
EMI

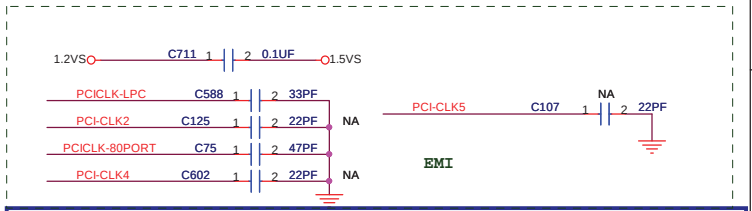
Project Name : ARWEN UA1	Title : HDMI Connector
Size : A3	Document Number : HPMH-40GAB4000-D000
Rev : D	
Date: Monday, August 17, 2009	Sheet : 14 of 35

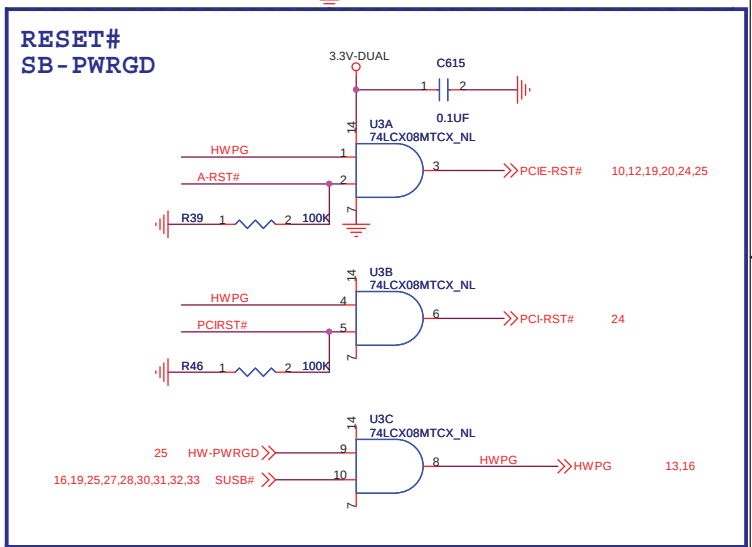
FLEX Computing

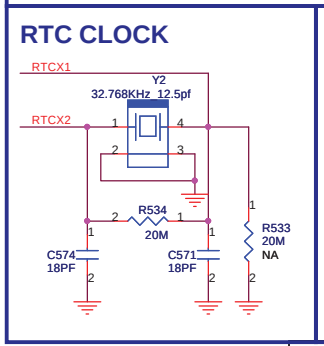
SB710 PCIE/PCI/CPU/LPC

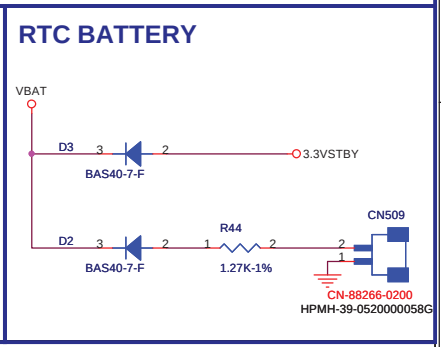
	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	RESERVED
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	







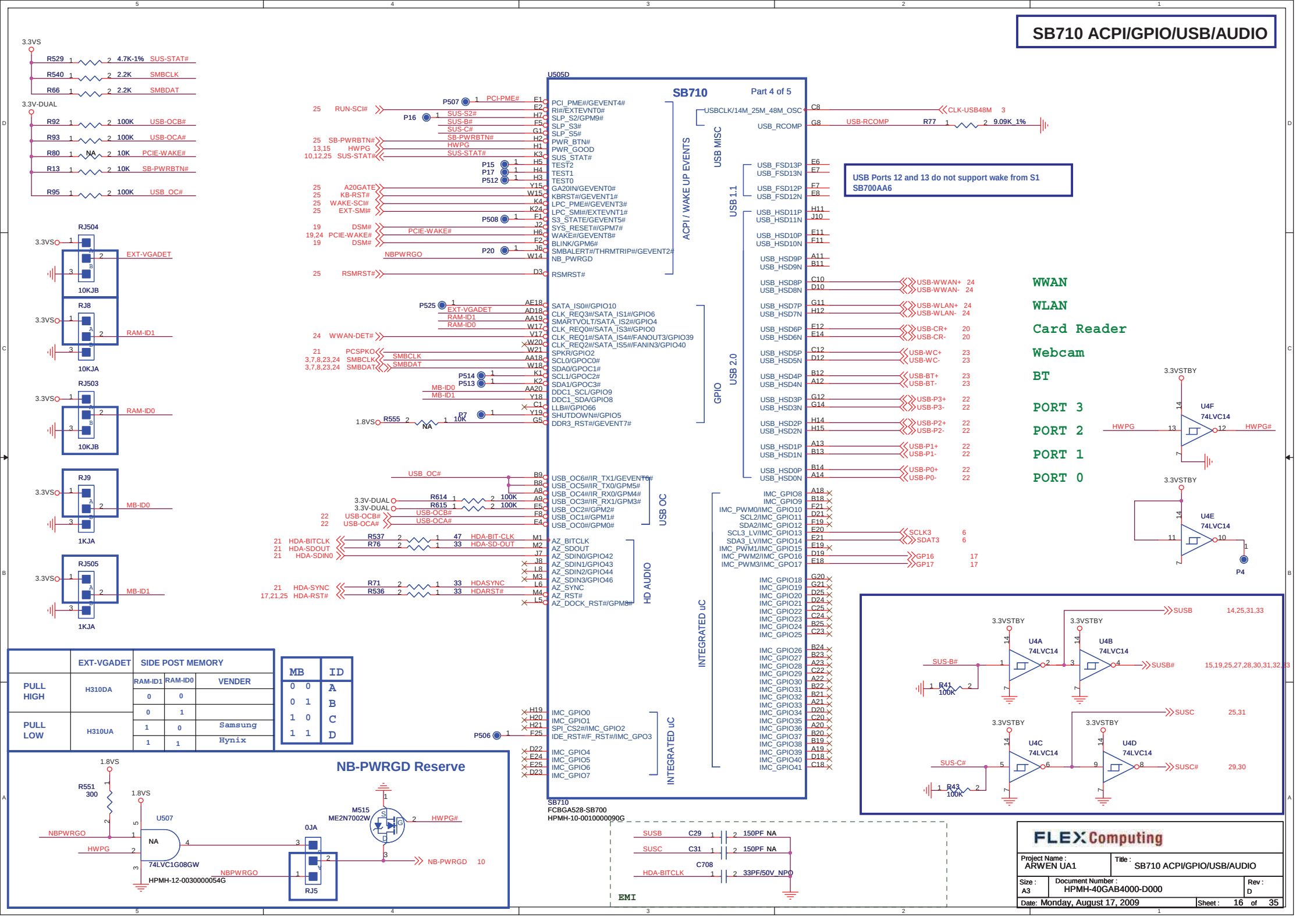




FLEX Computing

Project Name : ARWEN UA1	Title : SB700 PCIE/PCI/CPU/LPC
Size : A3	Document Number : HPMH-40GAB4000-D000
Rev : D	
Date: Monday, August 17, 2009	Sheet : 15 of 35

SB710 ACPI/GPIO/USB/AUDIO



	EXT-VGADET	SIDE POST MEMORY		
		RAM-ID1	RAM-ID0	VENDER
PULL HIGH	H310DA	0	0	
		0	1	
PULL LOW	H310UA	1	0	Samsung
		1	1	Hynix

MB	ID
0 0	A
0 1	B
1 0	C
1 1	D

Project Name :	ARWEN UA1
Title :	SB710 ACPI/GPIO/USB/AUDIO
Size :	A3
Document Number :	HPMH-40GAB4000-D000
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Date:	Monday, August 17, 2009
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FLEX Computing

SB710 SATA / IDE / HWM / SPI / STRAPS

SATA HDD

CN505

SIGNAL SEGMENT: GND_0 (S1), TX (S2), TX# (S3), GND_1 (S4), RX# (S5), RX (S6), GND_2 (S7)

POWER SEGMENT: 3.3V_0 (P1), 3.3V_1 (P2), 3.3V_Pre_Charge_2nd_mate (P3), GND_3 (P4), GND_4 (P5), GND_5 (P6), 5V_Pre_Charge_2nd_mate (P7), 5V_0 (P8), 5V_1 (P9), GND_6 (P10), Reserved (P11), GND_7 (P12), 12V_Pre_Charge_2nd_mate (P13), 12V_0 (P14), 12V_1 (P15), m2, m1

CN-SATA-22P-1P27-4H5
HPMH-39-0500000100G

SATA-TX0+ C518 0.01UF → SATATX0+ AD9
SATA-TX0- C519 0.01UF → SATATX0- AE9
SATA-RX0- C520 0.01UF → SATARX0- AB10
SATA-RX0+ C521 0.01UF → SATARX0+ AC10

5VS

C523 0.1UF, C524 0.1UF, C522 0.1UF, CPOS501 100UF/POS6.3V

EMI

PLACE SATA_CAL RES
VERY CLOSE TO BALL OF SB

R69 1K-1% → SATA-CAL → V12 SATA_CAL
SATA-X1 → Y12 SATA_X1
SATA-X2 → AA12 SATA_X2
3.3VS R51 10K → W11 SATA_ACT#/GPIO67
25 SATA-ACT#

1.2VS L4 220/0603-550mA → PLLVDD-SATA → AA11 PLLVDD_SATA
C99 1uF-X5R, C96 1uF-X5R
93 mA

XTLVDD-ATA
3.3VS L3 220/0603-550mA → W12 XTLVDD_SATA
C91 1uF-X5R
6 mA

SATA 25MHz

C84 10pF-50V — SATA-X1 — Y1 25MHz — R57 10M — C83 10pF-50V — SATA-X2
HPMH-35-0010000087G

SB710 H/W STRAPS

15 LPC-CLK0	R87 10K	15 PCI-CLK2	R542 10K
15 LPC-CLK1	R88 10K	15,24 PCICLK-80PORT	R539 10K
15 RTC-CLK	R90 10K → 3.3VSTBY	15 PCI-CLK4	R547 NA x10K
16,21,25 HDA-RST#	R23 10K	15 PCI-CLK5	R545 NA x10K

RJ10 (GP16, 3.3V-DUAL, NA, 16) 10KJA HPMH-30-301036-990G

RJ11 (GP17, 3.3V-DUAL, 1KJB) HPMH-30-310011-990G

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC_CLK

	PCI-CLK2	PCI-CLK3	PCI-CLK4	PCI-CLK5	LPC-CLK0	LPC-CLK1	RTC-CLK	AZ-RST#	GP17 GP16
PULL HIGH	WATCHDOG TIMER ON NB_PWRGD ENABLED	USE DEBUG STRAPS	RESERVED	RESERVED	ENABLE PCI MEM BOOT (A11) IMC ENABLED (A12)	CLKGEN ENABLED	INTERNAL RTC DEFAULT	IMC ENABLED (A11) ENABLE PCI MEM BOOT (A12)	H,H = Reserved H,L = SPI ROM (Default)
PULL LOW	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT			DISABLE PCI MEM BOOT (A11) IMC DISABLED (A12) DEFAULT	CLKGEN DISABLED DEFAULT	EXT. RTC (PD on X1, apply 32KHz to RTC_CLK)	IMC DISABLED (A11) DISABLE PCI MEM BOOT (A12) DEFAULT	L,H = LPC ROM L,L = FWH ROM

SB710

U505B — SB710 Part 2 of 5
SB710 FCBGA528-SB700
HPMH-10-0010000090G

SERIAL ATA: SATA_TX0P/N, SATA_RX0N/P, SATA_TX1P/N, SATA_RX1N/P, SATA_TX2P/N, SATA_RX2N/P, SATA_TX3P/N, SATA_RX3N/P, SATA_TX4P/N, SATA_RX4N/P, SATA_TX5P/N, SATA_RX5N/P

ATA 66/100/133: IDE_IORDY, IDE_IRQ, IDE_A0, IDE_A1, IDE_A2, IDE_DACK#, IDE_DRQ, IDE_IOR#, IDE_IOW#, IDE_CS1#, IDE_CS3#, IDE_D0/GPIO15 … IDE_D15/GPIO30

SB710 Internal Pull Up/Down

SPI ROM: SPI_DI/GPIO12 (G6), SPI_DO/GPIO11 (D2), SPI_CLK/GPIO47 (D1), SPI_HOLD#/GPIO31 (F4), SPI_CS#/GPIO32 (E3), LAN_RST#/GPIO13 (U15), ROM_RST#/GPIO14 (J1)

SATA PWR: PLLVDD_SATA, XTLVDD_SATA

HW MONITOR: FANOUT0/GPIO3, FANOUT1/GPIO48, FANOUT2/GPIO49, FANIN0/GPIO50, FANIN1/GPIO51, FANIN2/GPIO52, TEMP_COMM, TEMPIN0/GPIO61, TEMPIN1/GPIO62, TEMPIN2/GPIO63, TEMPIN3/TALERT#/GPIO64, VIN0/GPIO53 … VIN7/GPIO60

AVDD F6 → 3.3V-DUAL (C183 4.7UF NA, C191 0.1UF NA) — 5 mA
AVSS G7

Reserve 8M-bit SPI ROM

3.3V-DUAL: R56 10K NA; R54 10K NA; C77 0.1UF NA

U6 AT26DF081A-SU (CE#, SO, WP#, GND, VDD, HOLD#, SCK, SI)
HPMH-14-0080000004G
NA

SPI-CS#, SPI-DI, SPI-HOLD#, SPI-CLK, SPI-DO

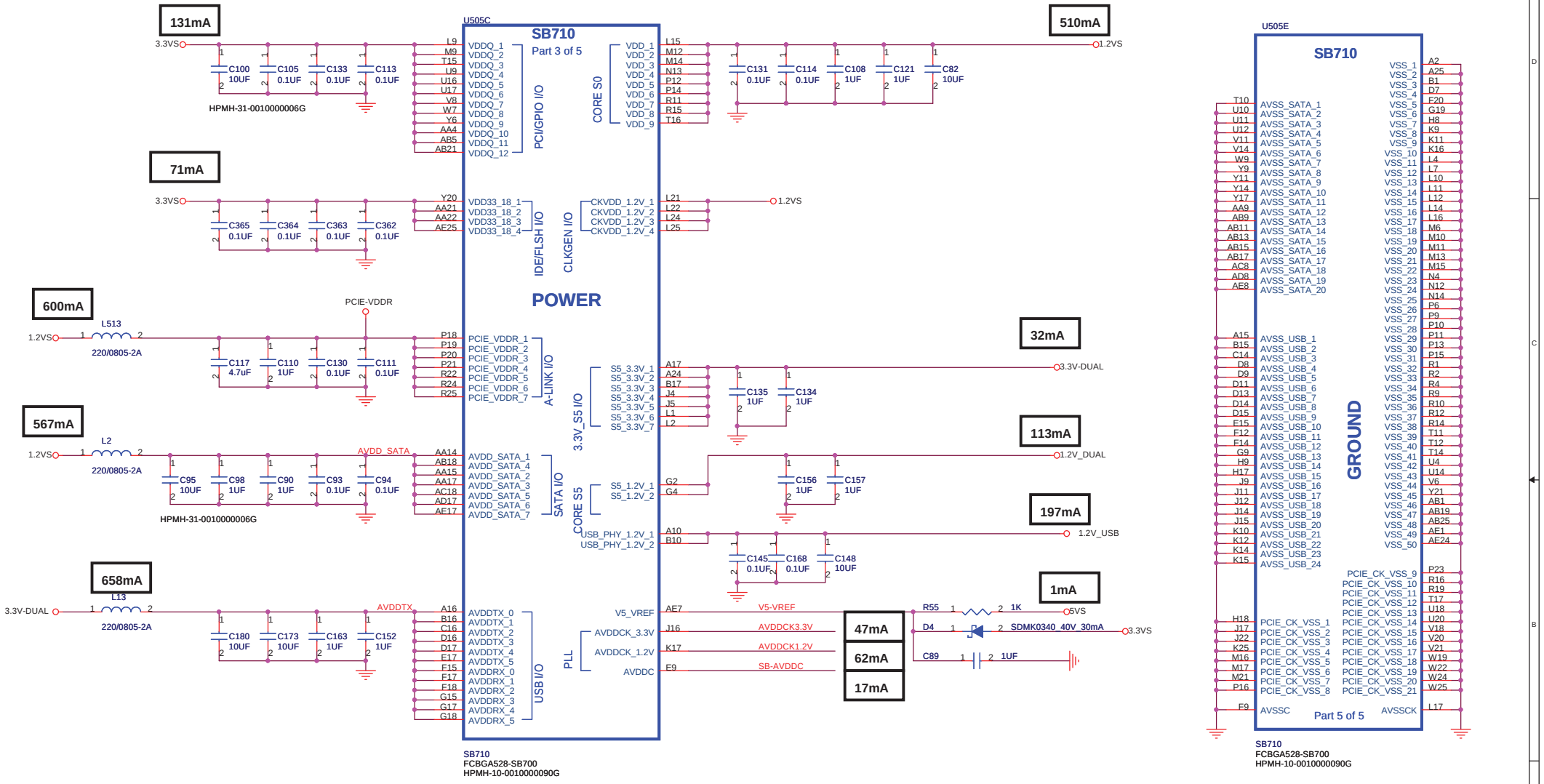
SB-SPI-DI → R64 33 → SPI-DI
SB-SPI-DO → R47 33 → SPI-DO
SB-SPI-CLK → R48 33 → SPI-CLK
SB-SPI-HOLD# → R49 33 → SPI-HOLD#
SB-SPI-CS# → R67 33 → SPI-CS#

P6, P510

FLEXComputing

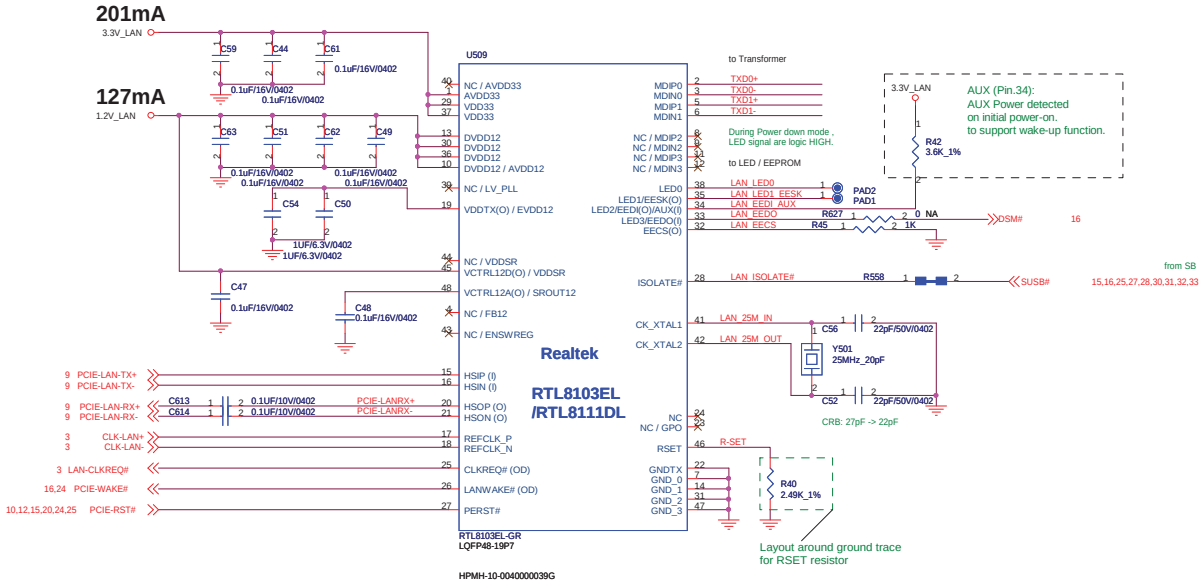
Project Name : ARWEN UA1	Title : SB710 SATA / IDE / SPI / HDD CONN
Size : A3	Document Number : HPMH-40GAB4000-D000 — Rev : D
Date: Monday, August 17, 2009	Sheet : 17 of 35

SB710 PWR / GND



FLEX Computing	
Project Name : ARWEN UA1	Title : SB710 PWR/GND
Size : Custom	Document Number : HPMH-40GAB4000-D000
Rev : D	
Date: Monday, August 17, 2009	Sheet : 18 of 35

10/100 LAN



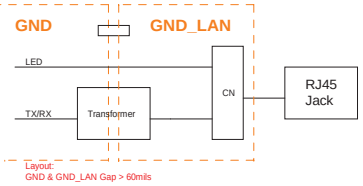
RTL8103E LED Configuation:

LED1-0	*00	01	10	11
LED0	Tx/Rx	**Tx/Rx**	Tx	Tx
LED1	LINK100	**LINK**	LINK	LINK100
LED2	LINK10	FULL	Rx	LINK10
LED3	NA	NA	NA	NA

LEDS1-0's initial value comes from the 93C46
If there is no 93C46, the default value is 00

H310 mini-spec_v1.4
LAN LED:
- Amber : Activity (RX/TX)
- Green : Connectivity (Link)

Layout notes:

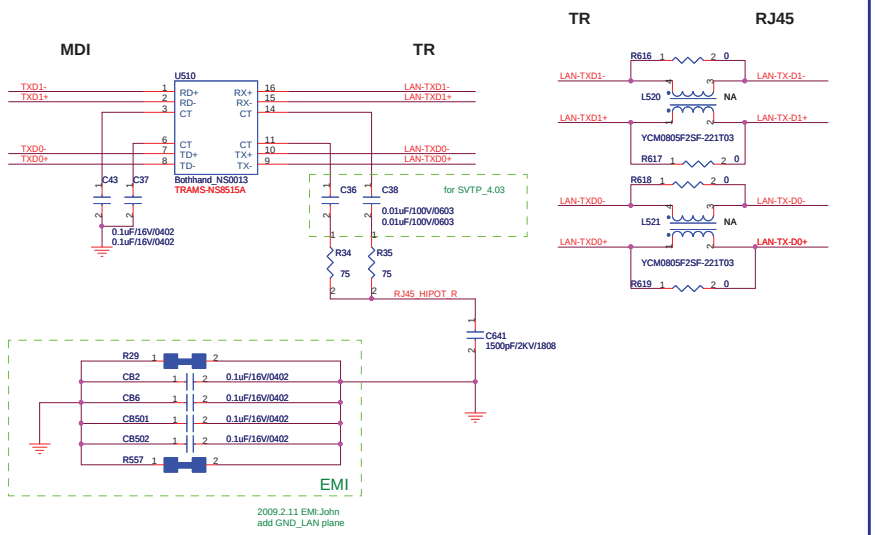


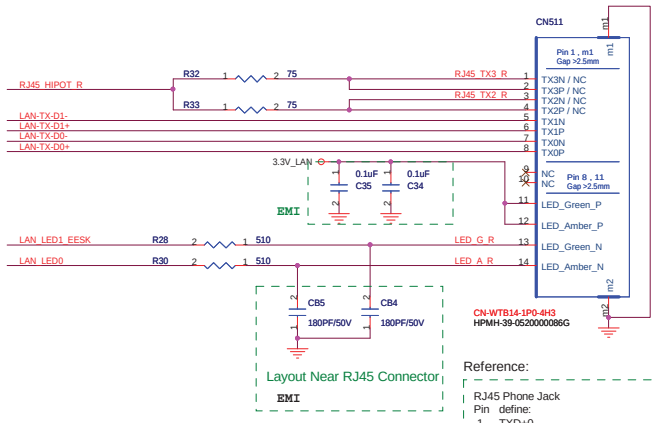
SVTP_v4.03
2.6 - Ethernet Checklist - Rev C.xls

- Ch.3.1.4.4
Some older cheap RJ-45s only populate pins 1,2,3,6. 10/100 requires the other 4 pins for grounding. Gigabit Ethernet requires all 8 pins for data signals.

- Ch.3.1.4.13
Resistance from RJ-45 shell to any other chassis ground point (ohms) less than 1 ohm

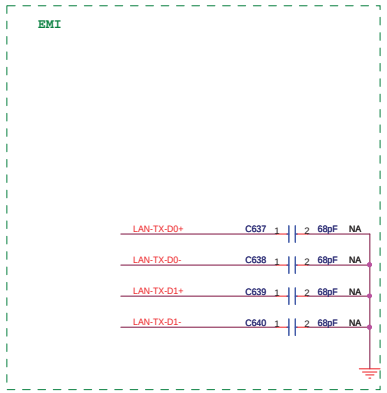
- Ch.3.1.4.14 & Ch.3.1.4.15
Protection against non-standard power-over-Ethernet (PoE) : Resistance between pins 1,3 (TXD0P,TXD1P) and pins 4,7 (TXD2P,TXD3P) of the RJ-45 greater than 58K ohms.





Reference:

RJ45 Phone Jack
Pin define:
1 TXD+0
2 TXD-0
3 TXD+1
4 TXD+2
5 TXD-2
6 TXD-1
7 TXD+3
8 TXD-3



FLEX Computing

Project Name : ARWEN UA1	Title : RTL8103EL (LQFP48)
Size : C	Document Number : HPMH-40GAB4000-D000 — Rev : D
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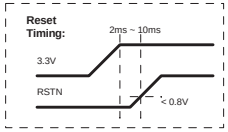
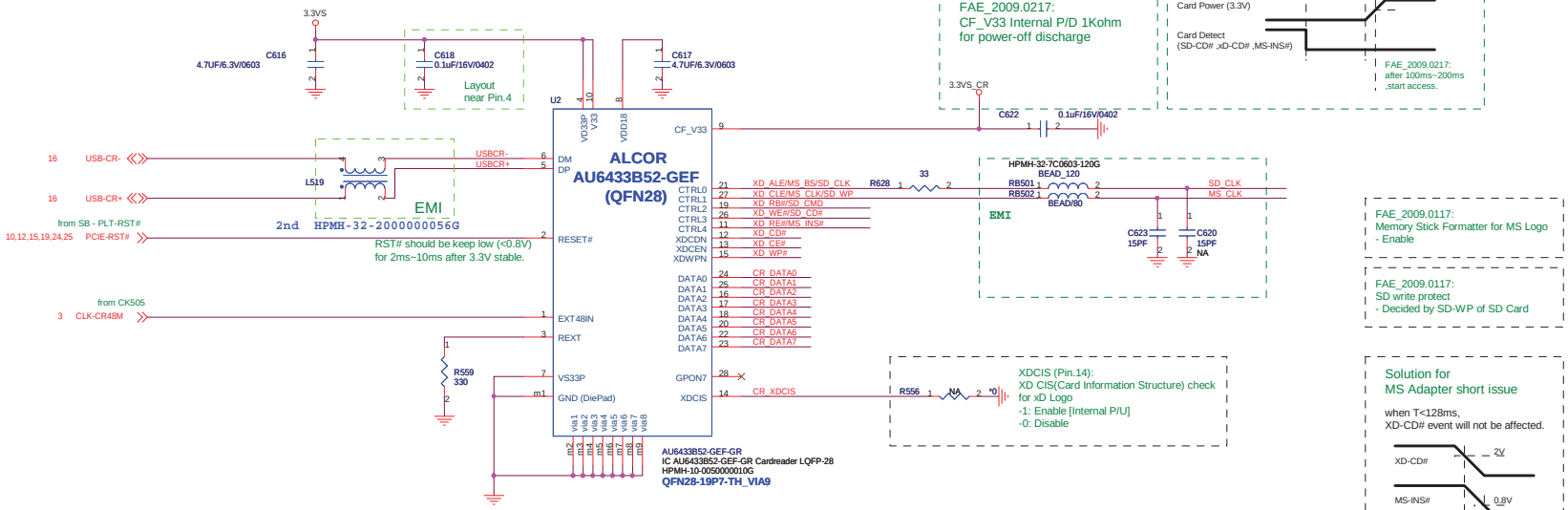
Card Reader

AIcor AU6433-GEF Card supported:

SD v2.0 (SDHC)
MMC v4.2
MS v1.43
MS-PRO v1.03
MS PRO-HG v1.01
xD v1.2





Card Power V33 = 3.3V ~ 2.8V
Card Power OCP = 420mA

FAE_2009.0217:
CF_V33 Internal P/D 1Kohm
for power-off discharge

Card detect Power-In Timing

FAE_2009.0117:
Memory Stick Formatter for MS Logo
- Enable

FAE_2009.0117:
SD write protect
- Decided by SD-WP of SD Card

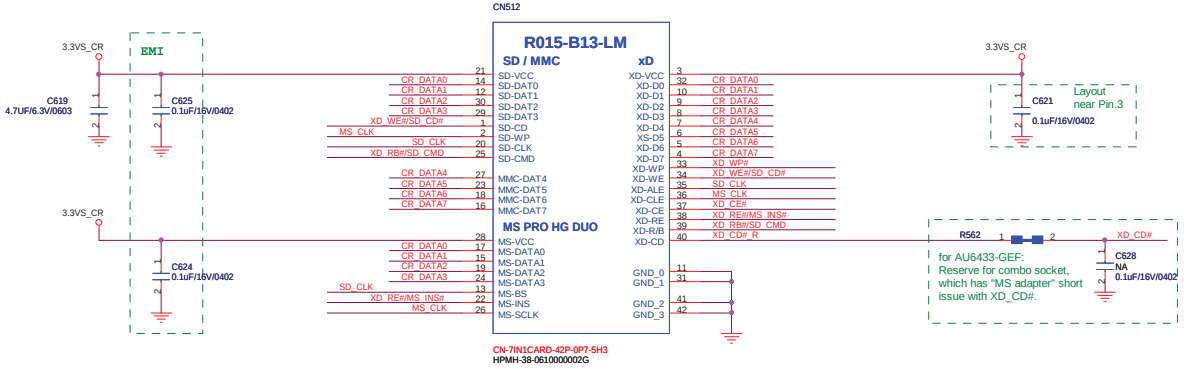
Solution for
MS Adapter short issue

when T<128ms,
XD-CD# event will not be affected.

Memory Card Socket

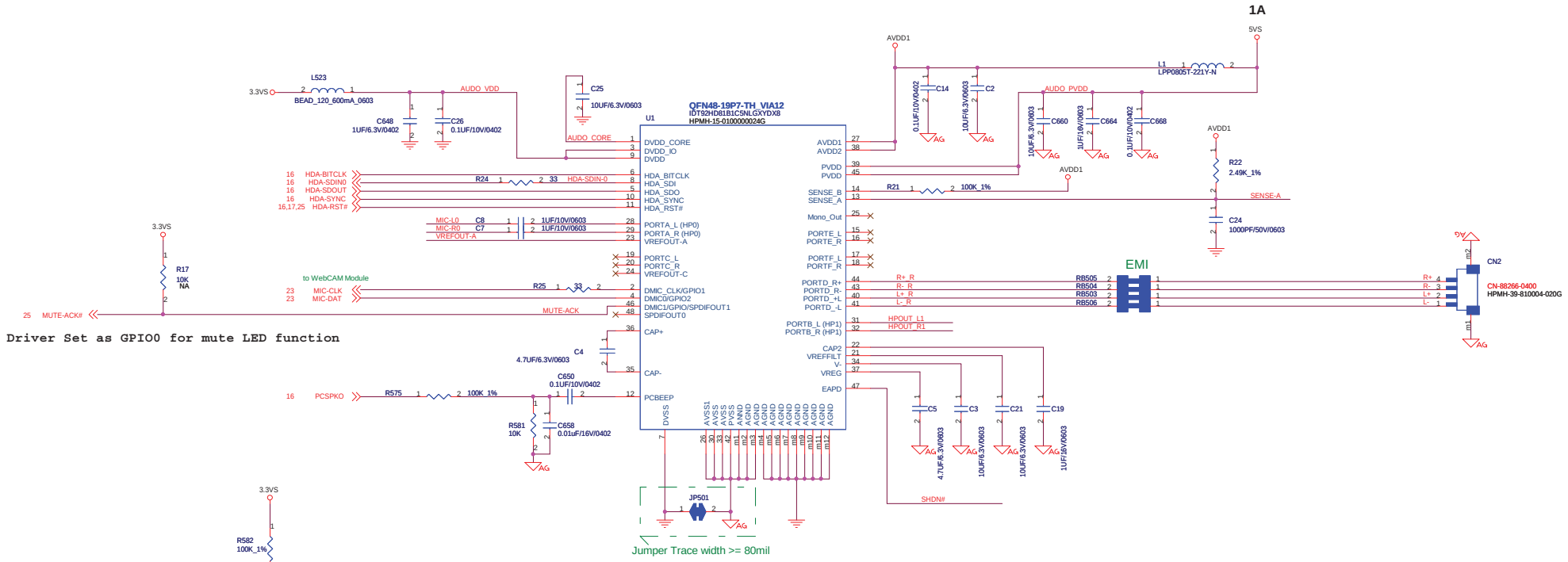
R015-B13-LM
HPMH-38-0610000002G

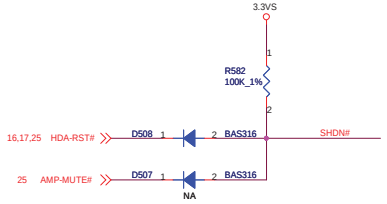
Card type Supported:
- SD
- SD IO
- MMC
- MMC4.0
- MS
- MS Pro
- xD

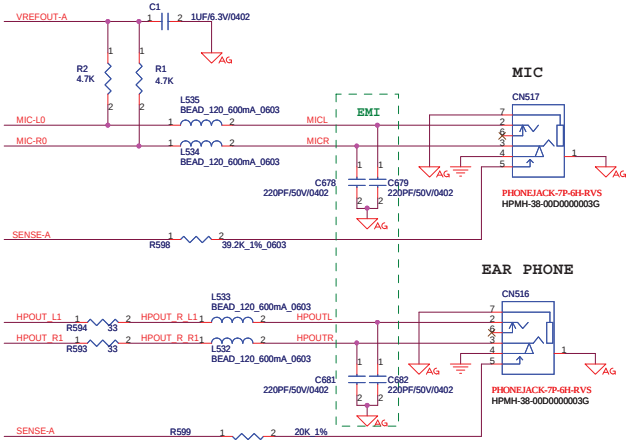


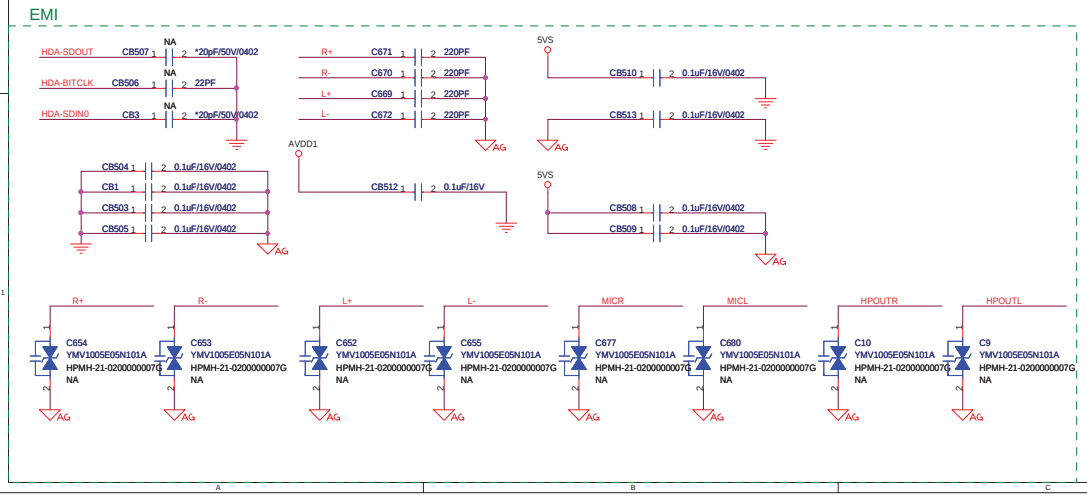
FLEX Computing			
Project Name : ARWEN UA1		Title : AU6433-GEF CardReader	
Size : C	Document Number : HPMH-40GAB4000-D000		Rev : D
Date: Monday, August 17, 2009		Sheet : 20 of 35	

Audio CODEC



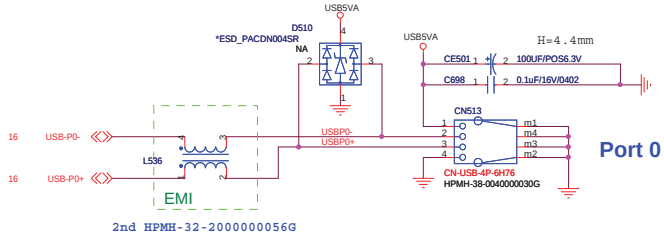


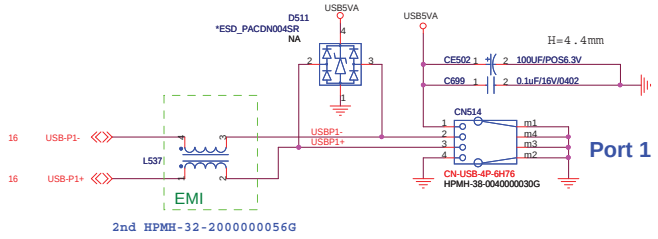


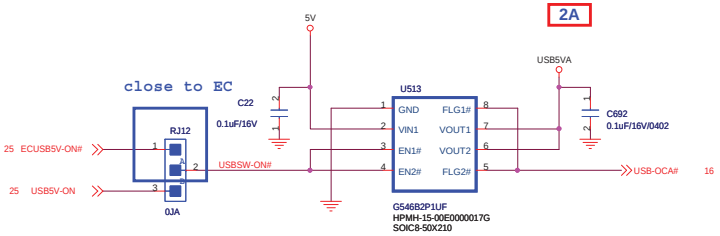


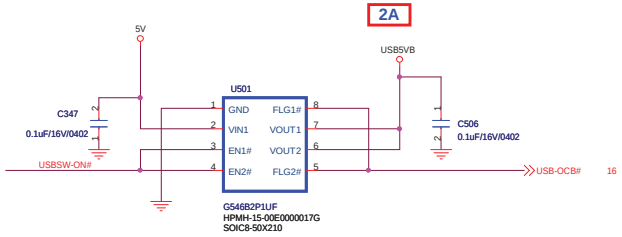
FLEX Computing			
Project Name : ARWEN UA1	Title : HDA CODEC(92HD81)		
Size : C	Document Number : HPMH-40GAB4000-D000	Rev : D	
Date: Monday, August 17, 2009	Sheet : 21 of 35		

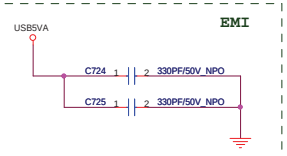
USB Port 0 / 1



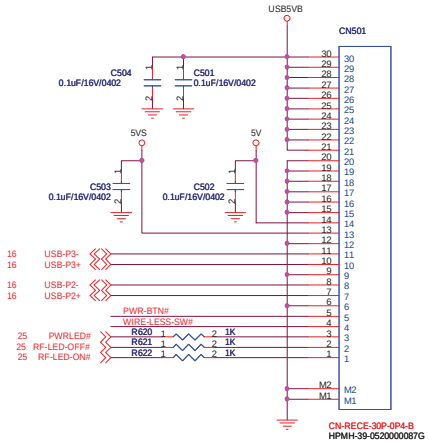






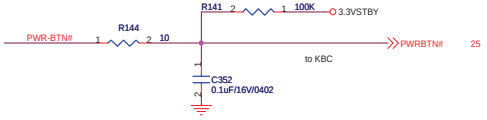


USB DB CONN

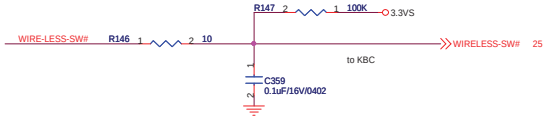


USB Power Connector needs >2A

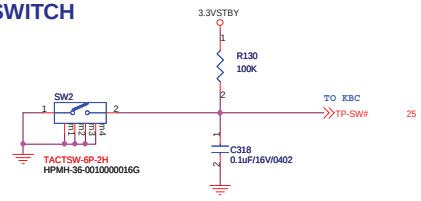
Power ON/OFF Button



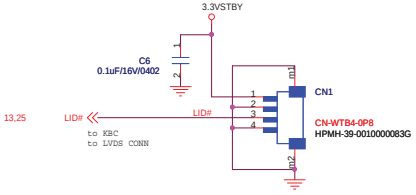
Wireless ON/OFF Button



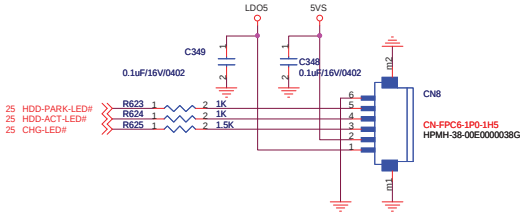
TP LOCK SWITCH

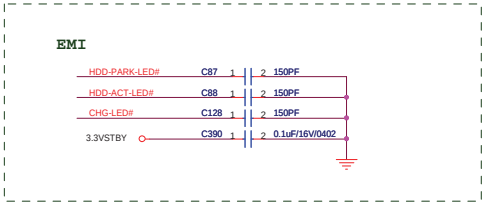


LID Switch



LED DB CONN

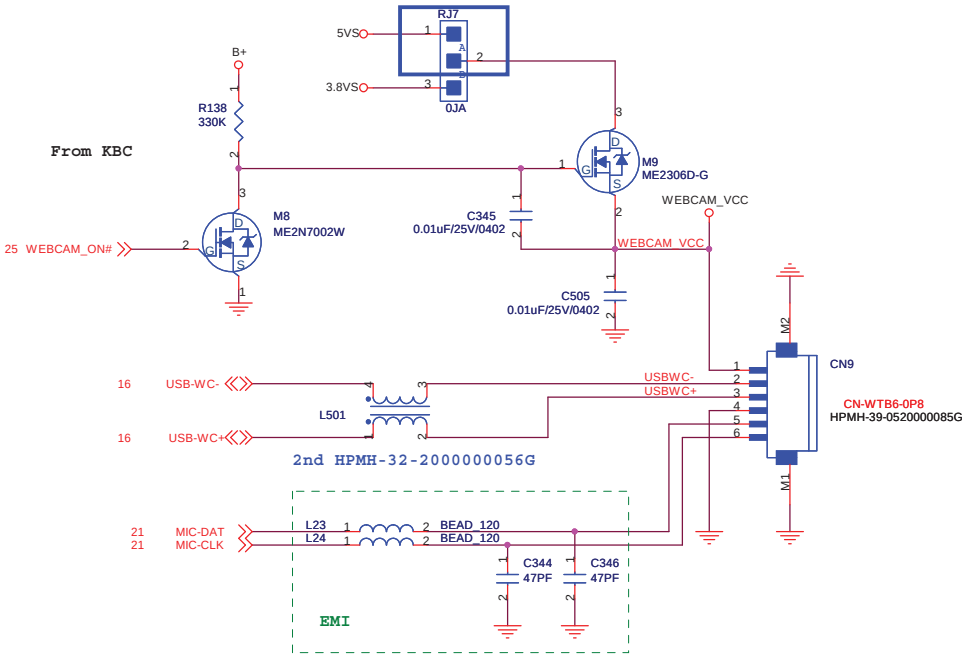




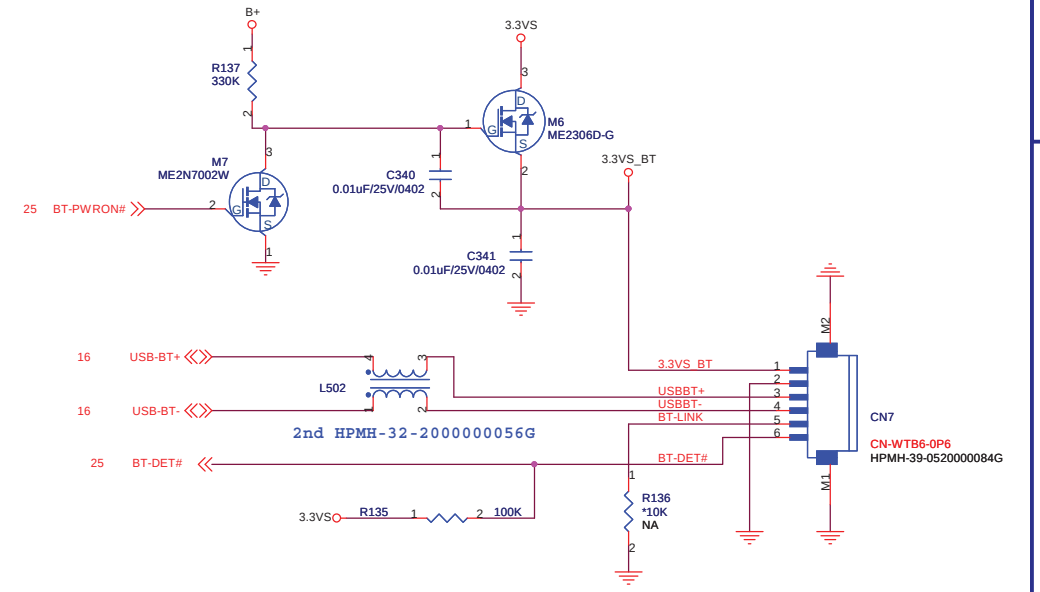
FLEX Computing

Project Name : ARWEN UA1	Title : USB / USB CON
Size : C	Document Number : HPMH-40GAB4000-D000 — Rev : D
Date: Monday, August 17, 2009	Sheet : 22 of 35

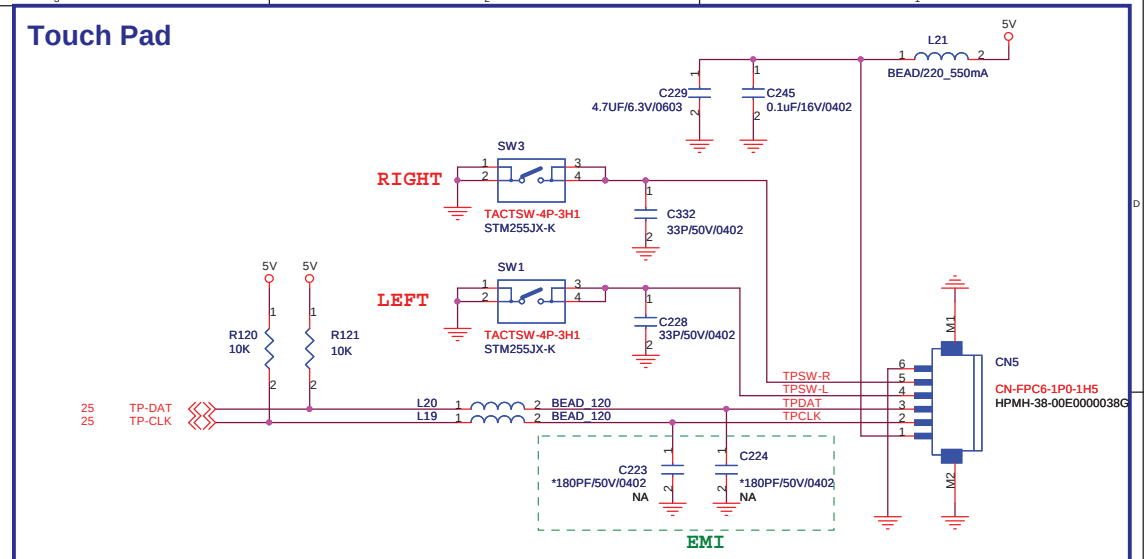
Web CAM



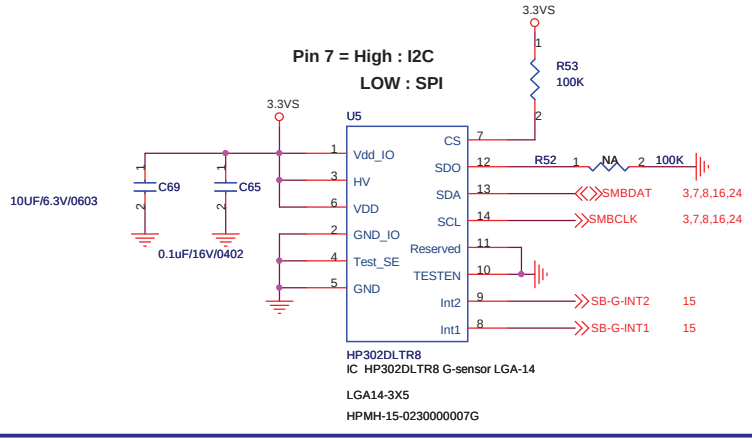
Blue Tooth

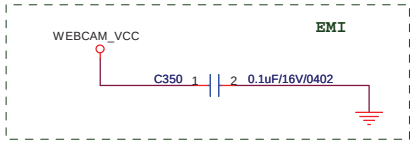


Touch Pad



G-Sensor





FLEX Computing

Project Name : ARWEN UA1	Title : BT/WEBCAM/TP/G-SENSOR
Size : Custom	Document Number : HPMH-40GAB4000-D000
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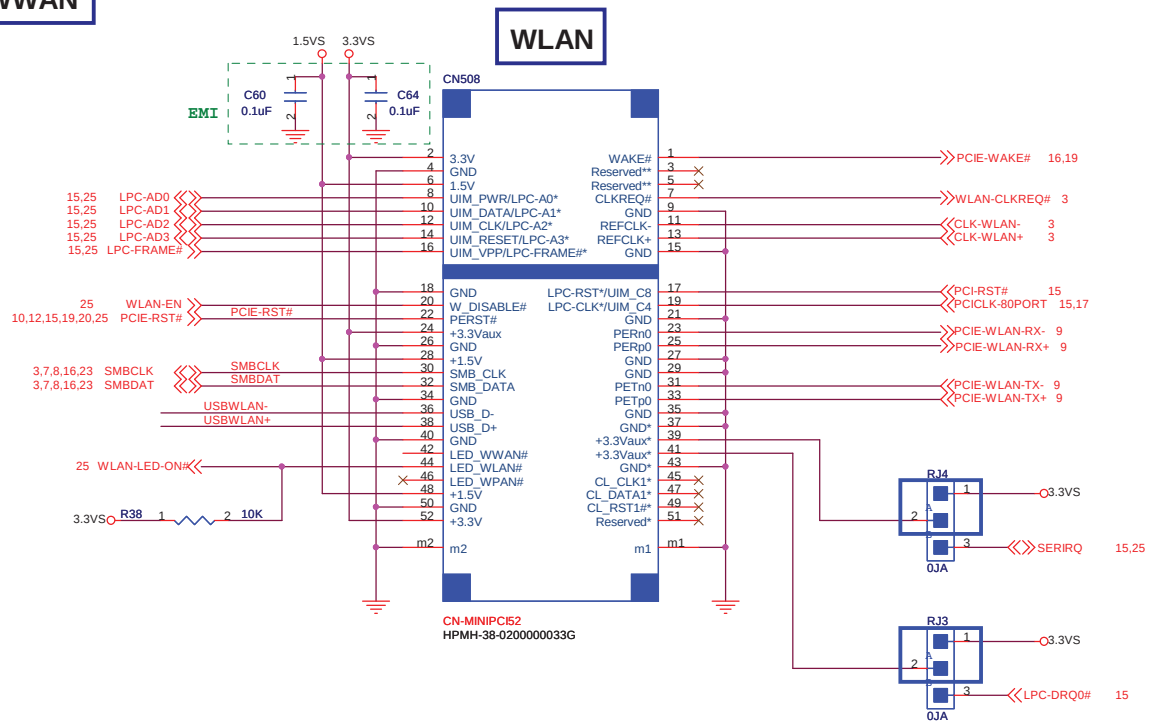
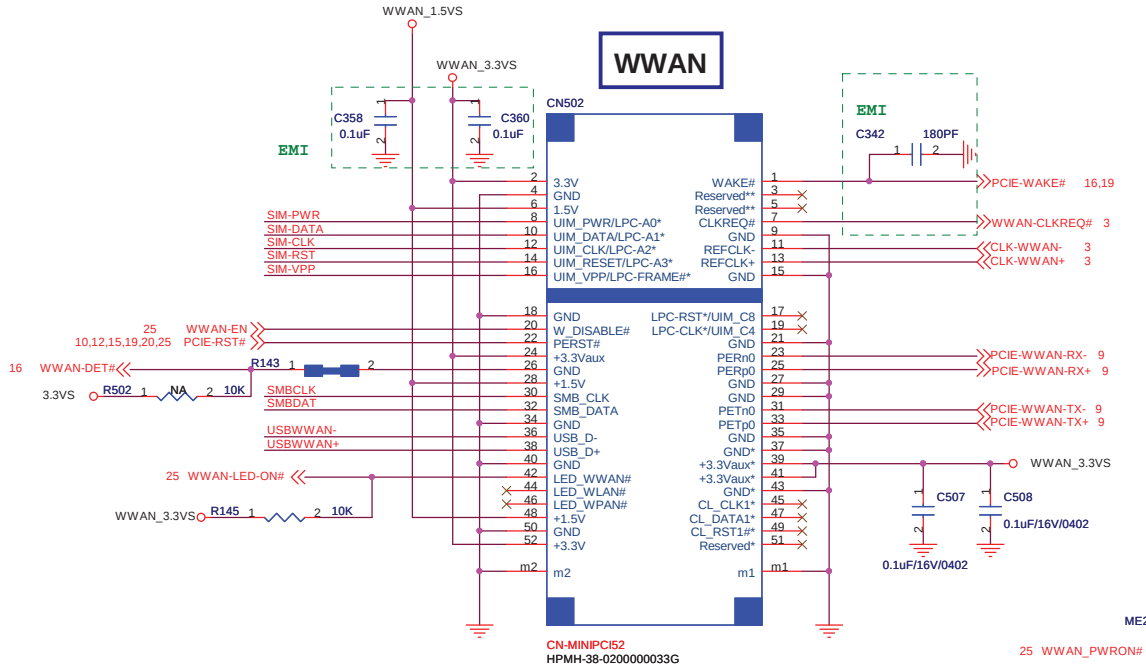
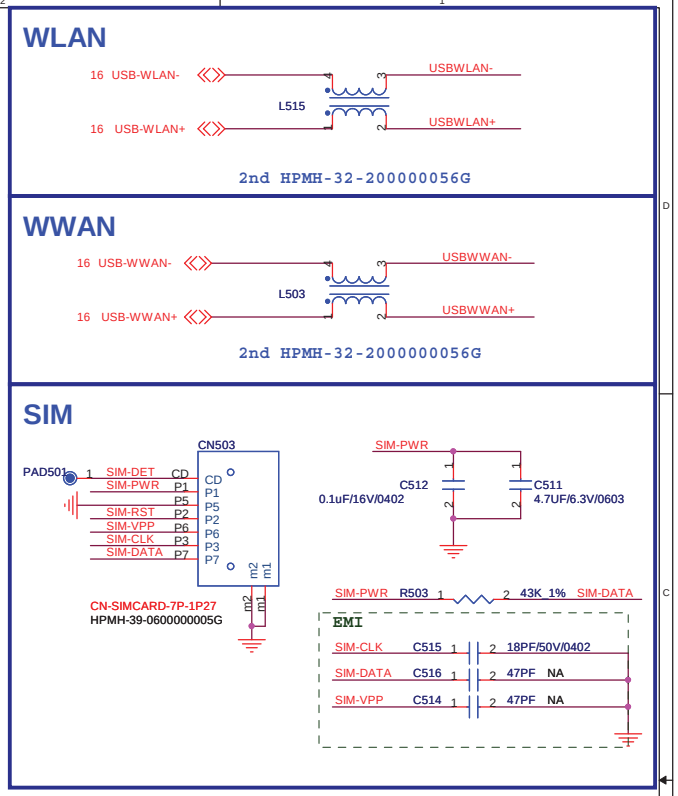
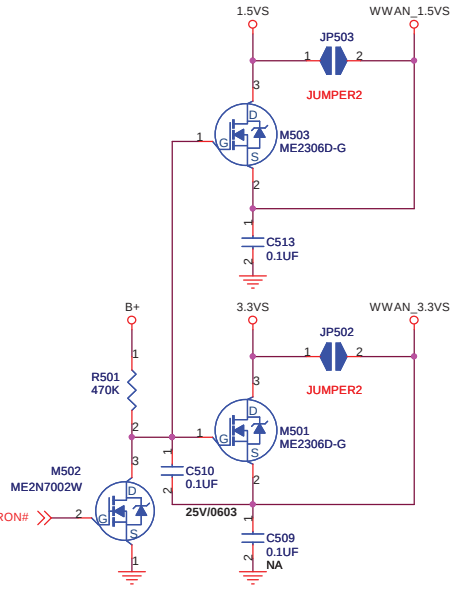
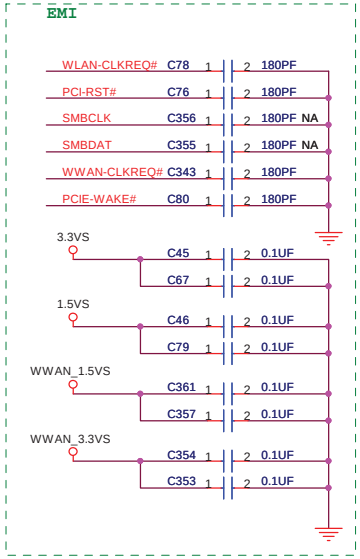
WLAN / WWAN











FLEX Computing

Project Name : ARWEN UA1	Title : MINI PCIE (WLAN / WWAN)
Size : A3	Document Number : HPMH-40GAB4000-D000
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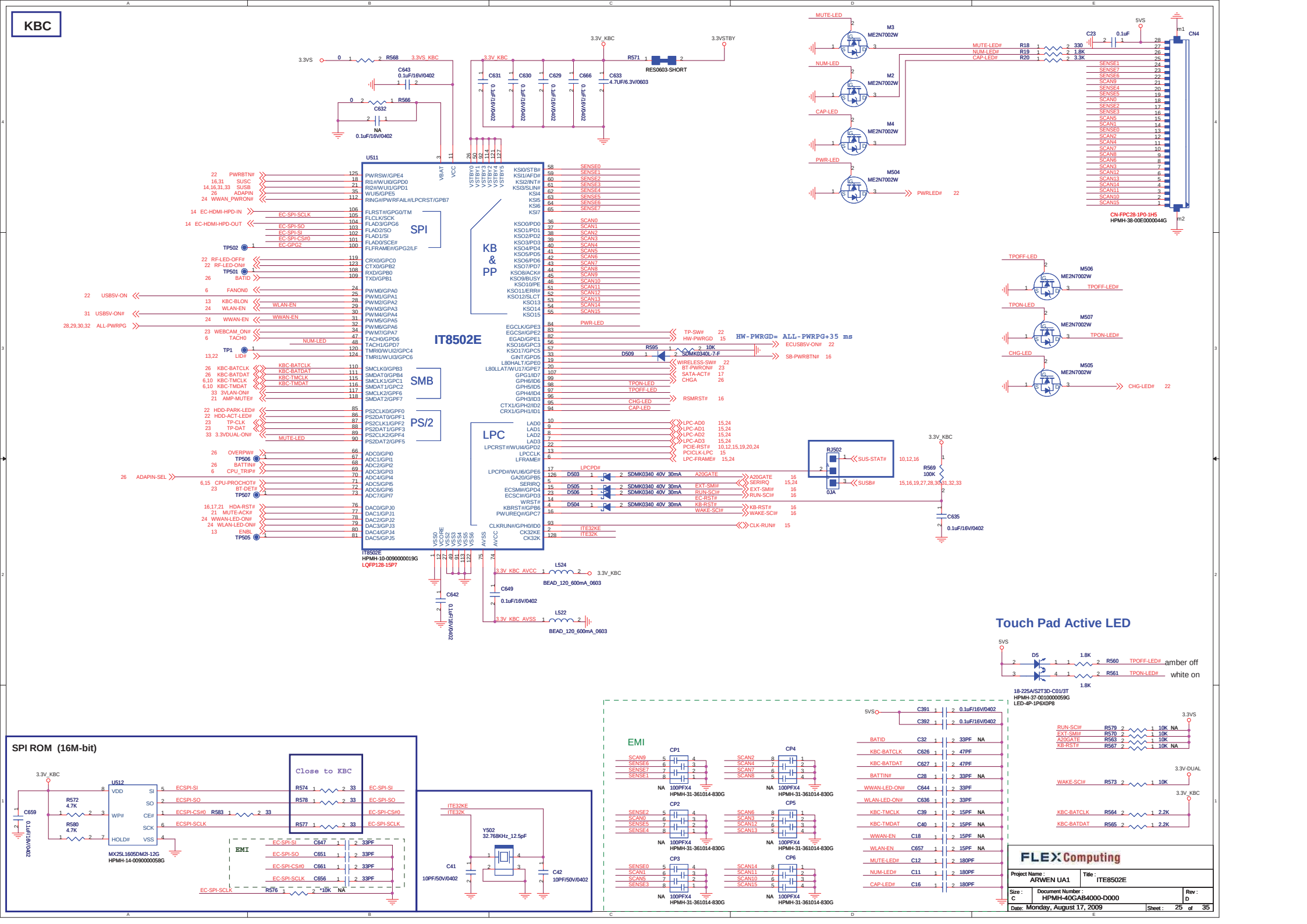
KBC


U511
IT8502E
HPMH-10-0090000019G
LQFP128-15P7
SPI
KB & PP
SMB
PS/2
LPC
PWRSW/GPE4
RI1#/WUI0/GPD0
RI2#/WUI1/GPD1
WUI5/GPE5
RING#/PWRFAIL#/LPCRST/GPB7
FLRST#/GPG0/TM
FLCLK/SCK
FLAD3/GPG6
FLAD2/SO
FLAD1/SI
FLAD0/SCE#
FLFRAME#/GPG2/LF
CRX0/GPC0
CTX0/GPB2
RXD/GPB0
TXD/GPB1
PWM0/GPA0
PWM1/GPA1
PWM2/GPA2
PWM3/GPA3
PWM4/GPA4
PWM5/GPA5
PWM6/GPA6
PWM7/GPA7
TACH0/GPD6
TACH1/GPD7
TMRI0/WUI2/GPC4
TMRI1/WUI3/GPC6
SMCLK0/GPB3
SMDAT0/GPB4
SMCLK1/GPC1
SMDAT1/GPC2
SMCLK2/GPF6
SMDAT2/GPF7
PS2CLK0/GPF0
PS2DAT0/GPF1
PS2CLK1/GPF2
PS2DAT1/GPF3
PS2CLK2/GPF4
PS2DAT2/GPF5
ADC0/GPI0
ADC1/GPI1
ADC2/GPI2
ADC3/GPI3
ADC4/GPI4
ADC5/GPI5
ADC6/GPI6
ADC7/GPI7
DAC0/GPJ0
DAC1/GPJ1
DAC2/GPJ2
DAC3/GPJ3
DAC4/GPJ4
DAC5/GPJ5
KSI0/STB#
KSI1/AFD#
KSI2/INT#
KSI3/SLIN#
KSI4
KSI5
KSI6
KSI7
KSO0/PD0
KSO1/PD1
KSO2/PD2
KSO3/PD3
KSO4/PD4
KSO5/PD5
KSO6/PD6
KSO7/PD7
KSO8/ACK#
KSO9/BUSY
KSO10/PE
KSO11/ERR#
KSO12/SLCT
KSO13
KSO14
KSO15
EGCLK/GPE3
EGCS#/GPE2
EGAD/GPE1
KSO16/GPC3
KSO17/GPC5
GINT/GPD5
L80HALT/GPE0
L80LLAT/WU17/GPE7
GPG1/ID7
GPH6/ID6
GPH5/ID5
GPH4/ID4
GPH3/ID3
CTX1/GPH2/ID2
CRX1/GPH1/ID1
LAD0
LAD1
LAD2
LAD3
LPCRST#/WUI4/GPD2
LPCCLK
LFRAME#
LPCPD#/WUI6/GPE6
GA20/GPB5
SERIRQ
ECSMI#/GPD4
ECSCI#/GPD3
WRST#
KBRST#/GPB6
PWUREQ#/GPC7
CLKRUN#/GPH0/ID0
CK32KE
CK32K
VBAT
VCC
VSTBY0
VSTBY1
VSTBY2
VSTBY3
VSTBY4
VSTBY5
VS50
VCORE
VSS2
VSS3
VSS4
VSS5
VSS6
AVSS
AVCC
PWR-LED
SENSE0
SENSE1
SENSE2
SENSE3
SENSE4
SENSE5
SENSE6
SENSE7
SCAN0
SCAN1
SCAN2
SCAN3
SCAN4
SCAN5
SCAN6
SCAN7
SCAN8
SCAN9
SCAN10
SCAN11
SCAN12
SCAN13
SCAN14
SCAN15
TPON-LED
TPOFF-LED
CHG-LED
CAP-LED
3.3V_KBC
3.3VSTBY
3.3VS
3.3V_KBC_AVCC
3.3V_KBC_AVSS
HW-PWRGD= ALL-PWRPG+35 ms
TP-SW#
HW-PWRGD
ECUSB5V-ON#
SB-PWRBTN#
WIRELESS-SW#
BT-PWRON#
SATA-ACT#
CHGA
RSMRST#
LPC-AD0
LPC-AD1
LPC-AD2
LPC-AD3
PCIE-RST#
PCICLK-LPC
LPC-FRAME#
A20GATE
EXT-SMI#
RUN-SCI#
EC-RST#
KB-RST#
WAKE-SCI#
CLK-RUN#
ITE32KE
ITE32K
SUS-STAT#
SUSB#
PWRLED#
MUTE-LED#
NUM-LED#
CAP-LED#
TPOFF-LED#
TPON-LED#
CHG-LED#
CN-FPC28-1P0-1H5
HPMH-38-00E0000044G
LED-4P-1P6X0P8
18-225A/S2T3D-C01/3T
HPMH-37-0010000059G
Touch Pad Active LED
amber off
white on
SPI ROM (16M-bit)
MX25L1605DM2I-12G
HPMH-14-0090000058G
Close to KBC
EMI
Y502
32.768KHz_12.5pF
FLEXComputing
Project Name : ARWEN UA1
Title : IT8502E
Size : C
Document Number : HPMH-40GAB4000-D000
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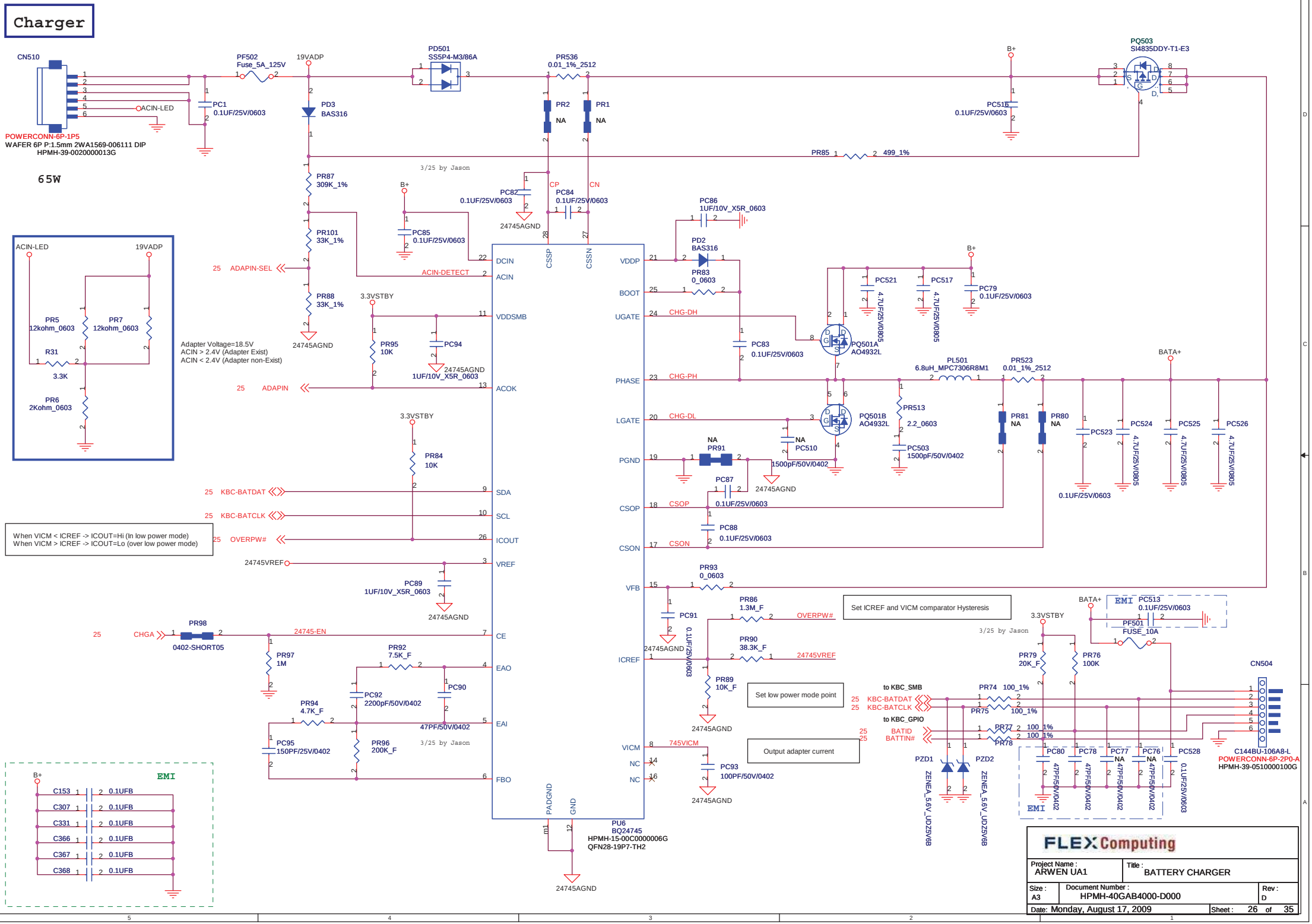
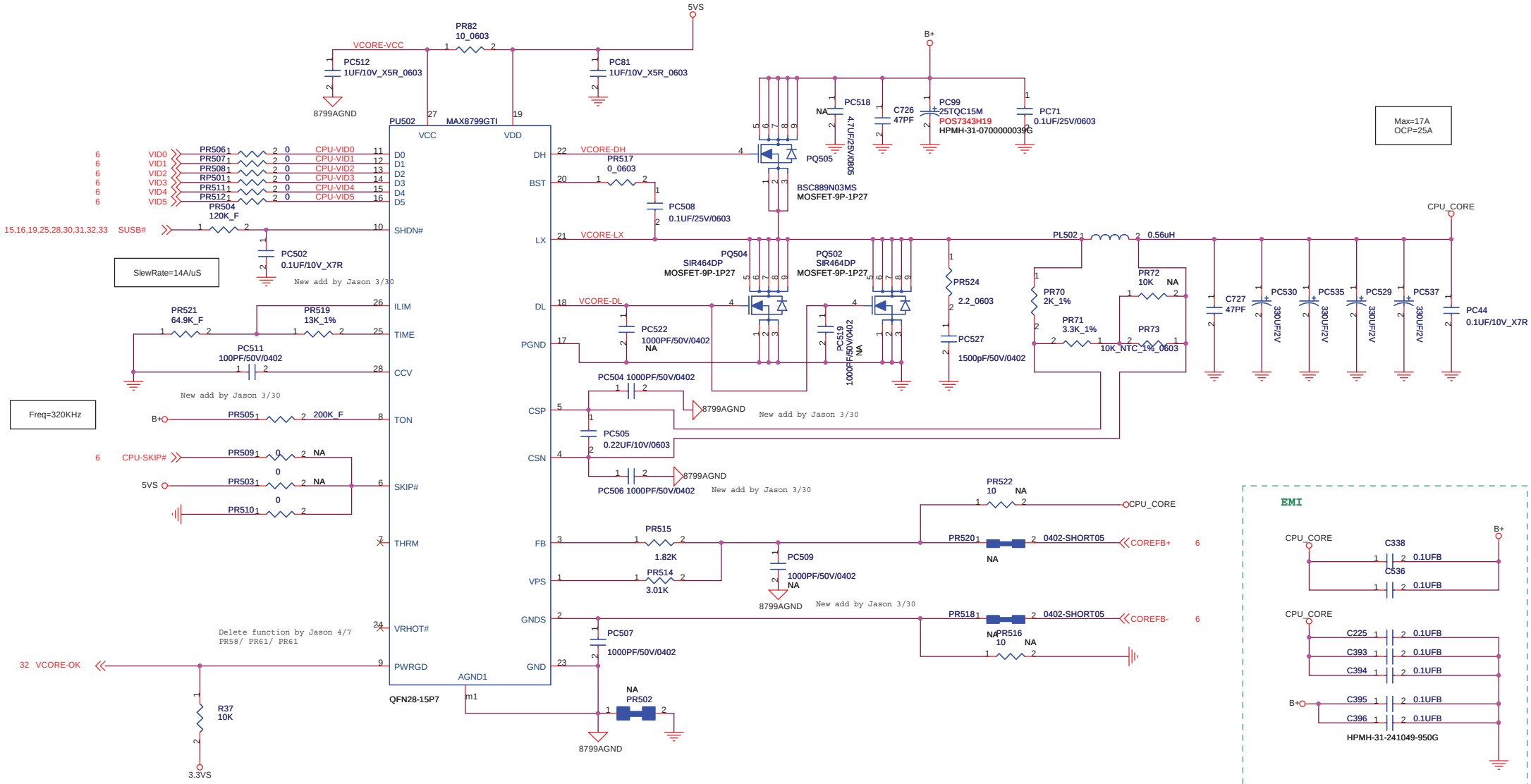
Charger



FLEX Computing			
Project Name : ARWEN UA1		Title : BATTERY CHARGER	
Size : A3	Document Number : HPMH-40GAB4000-D000		Rev : D
Date: Monday, August 17, 2009		Sheet : 26 of 35	

CPU_CORE



CPU Voltage	VID 0	VID 1	VID 2	VID 3	VID 4	VID 5
1.00V	0	1	1	0	1	0
1.05V	0	0	1	0	1	0
1.10V	0	1	0	0	1	0

FLEX Computing

Project Name : ARWEN UA1	Title : CPU_CORE
Size : A3	Document Number : HPMH-40GAB4000-D000
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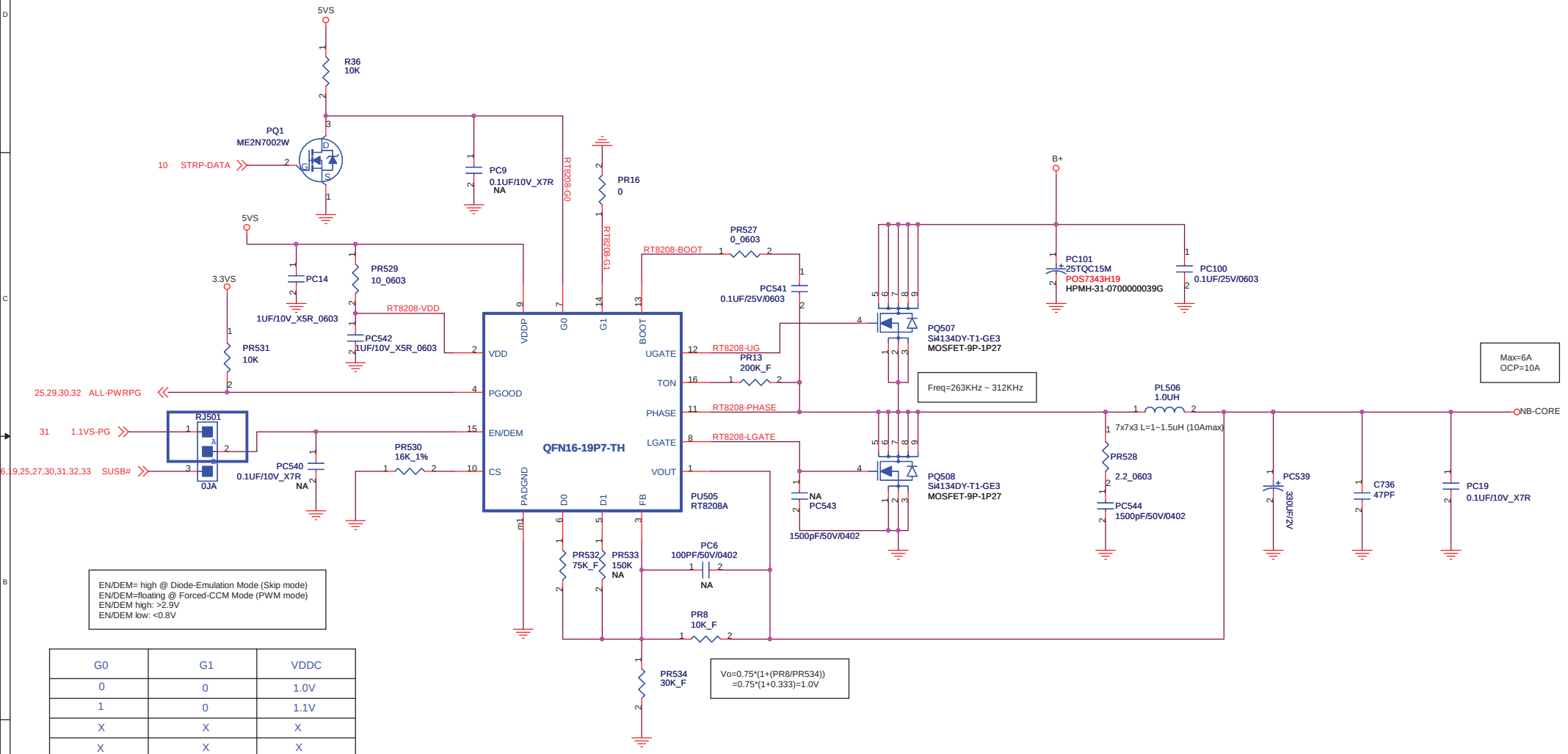
Date: Monday, August 17, 2009	Sheet : 27 of 35

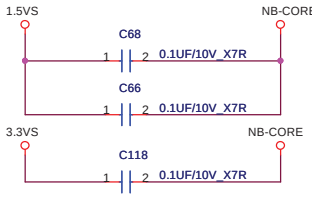
NB_CORE



EN/DEM= high @ Diode-Emulation Mode (Skip mode)
EN/DEM=floating @ Forced-CCM Mode (PWM mode)
EN/DEM high: >2.9V
EN/DEM low: <0.8V

G0	G1	VDDC
0	0	1.0V
1	0	1.1V
X	X	X
X	X	X

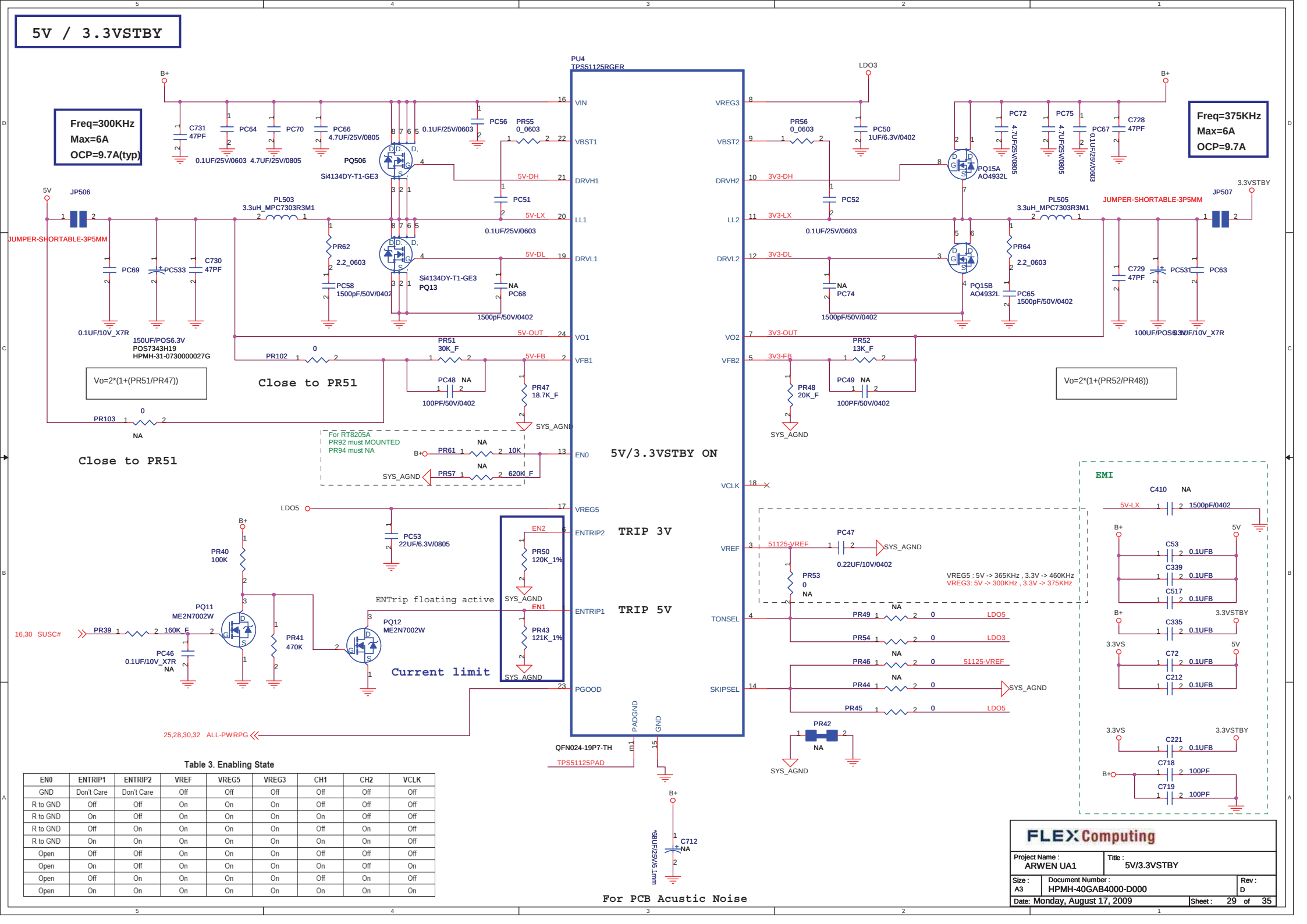
EMI



FLEX Computing

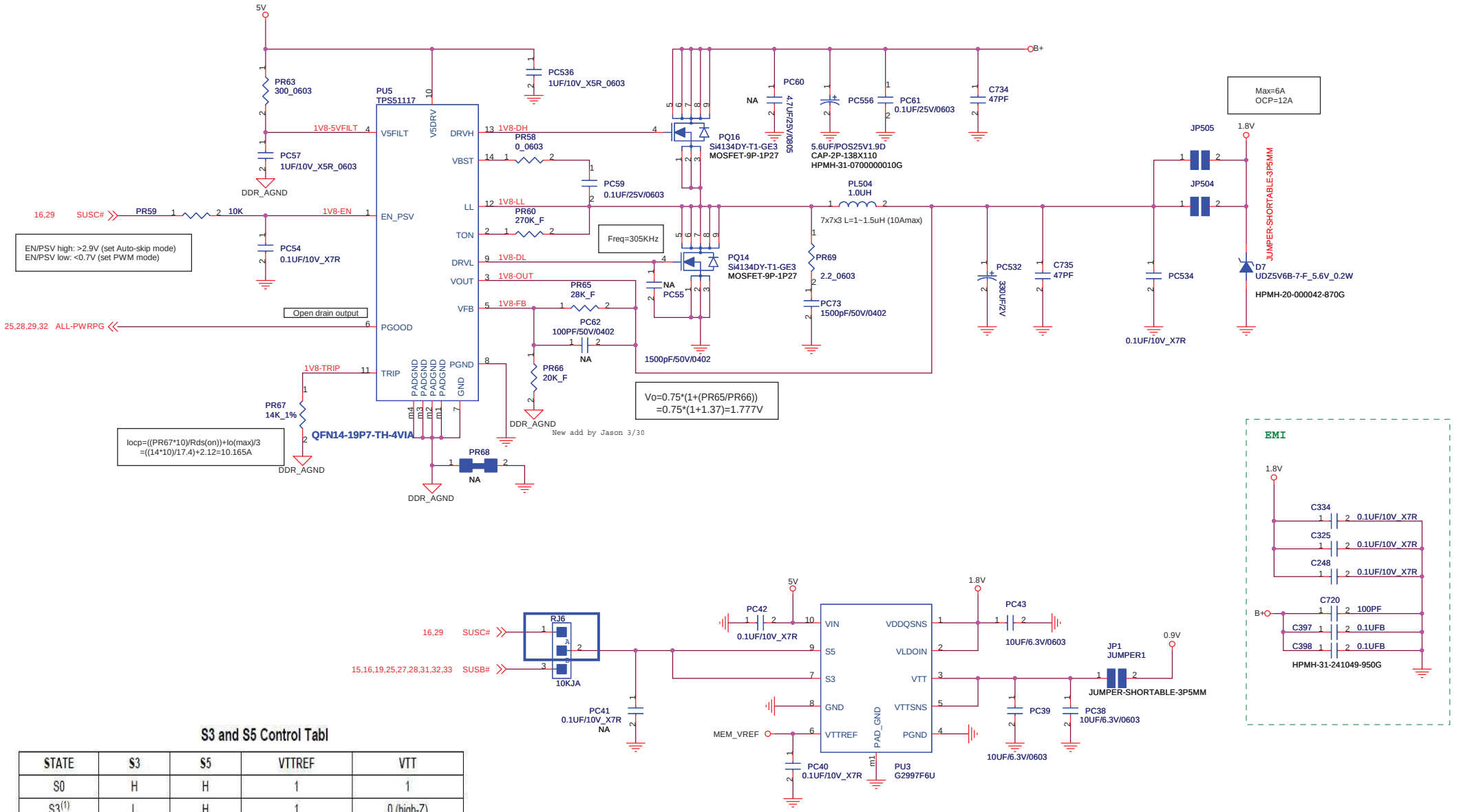
Project Name : ARWEN UA1	Title : NB_CORE	
Size : A3	Document Number : HPMH-40GAB4000-D000	Rev : D
Date: Monday, August 17, 2009	Sheet : 28 of 35	

5V / 3.3VSTBY



EN0	ENTRIP1	ENTRIP2	VREF	VREG5	VREG3	CH1	CH2	VCLK
GND	Don't Care	Don't Care	Off	Off	Off	Off	Off	Off
R to GND	Off	Off	On	On	On	Off	Off	Off
R to GND	On	Off	On	On	On	On	Off	Off
R to GND	Off	On	On	On	On	Off	On	Off
R to GND	On	On	On	On	On	On	On	Off
Open	Off	Off	On	On	On	Off	Off	Off
Open	On	Off	On	On	On	On	Off	On
Open	Off	On	On	On	On	Off	On	Off
Open	On	On	On	On	On	On	On	On

1.8V / 0.9V



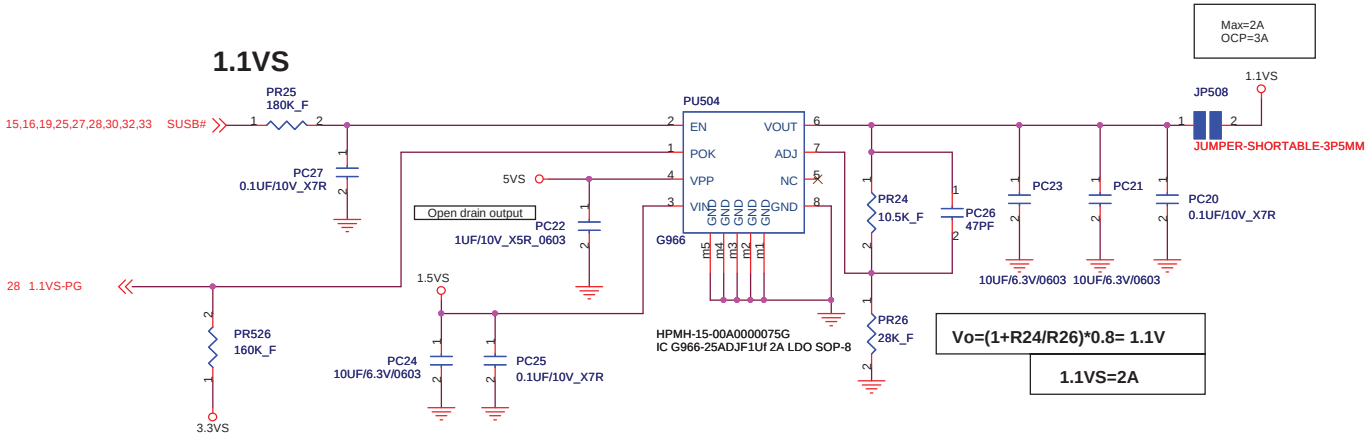
S3 and S5 Control Tabl

STATE	S3	S5	VTTREF	VTT
S0	H	H	1	1
S3(1)	L	H	1	0 (high-Z)
S4/S5(1)	L	L	0 (discharge)	0 (discharge)

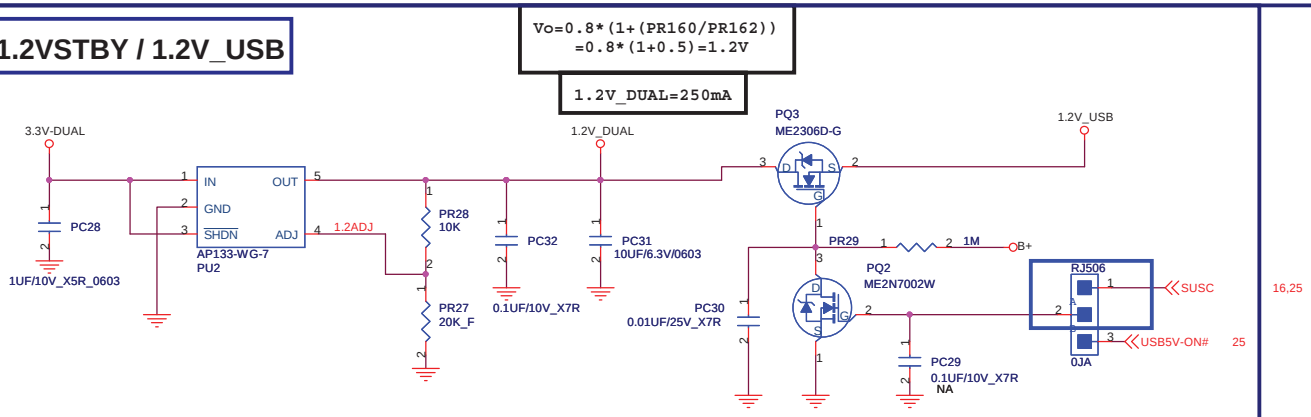
(1) In case S3 is forced to H and S5 to L, VTTREF is discharged and VTT is at High-Z state. This condition is NOT recommended.

FLEX Computing			
Project Name : ARWEN UA1	Title : 1.8V/0.9V		
Size : A3	Document Number : HPMH-40GAB4000-D000		Rev : D
Date: Monday, August 17, 2009		Sheet : 30 of 35	

1.1VS

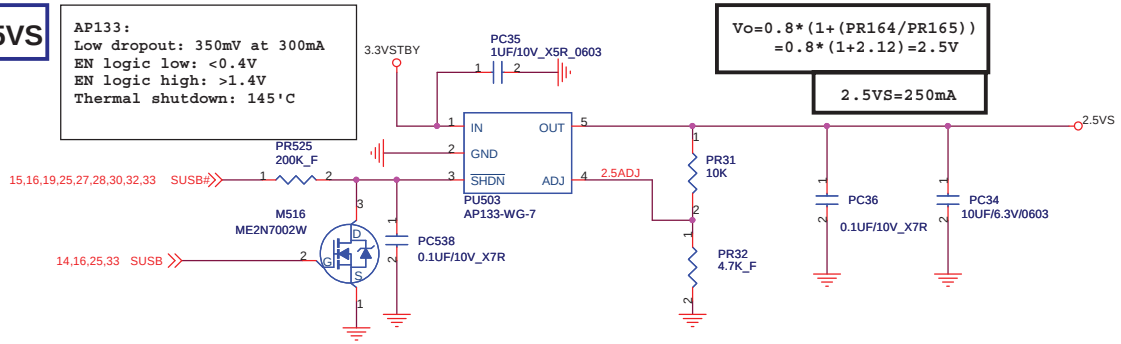


1.2VSTBY / 1.2V_USB



2.5VS

AP133:
Low dropout: 350mV at 300mA
EN logic low: <0.4V
EN logic high: >1.4V
Thermal shutdown: 145'C



FLEX Computing

Project Name : ARWEN UA1	Title : 1.1VS/2.5VS/1.2V_USB
Size : A3	Document Number : HPMH-40GAB4000-D000
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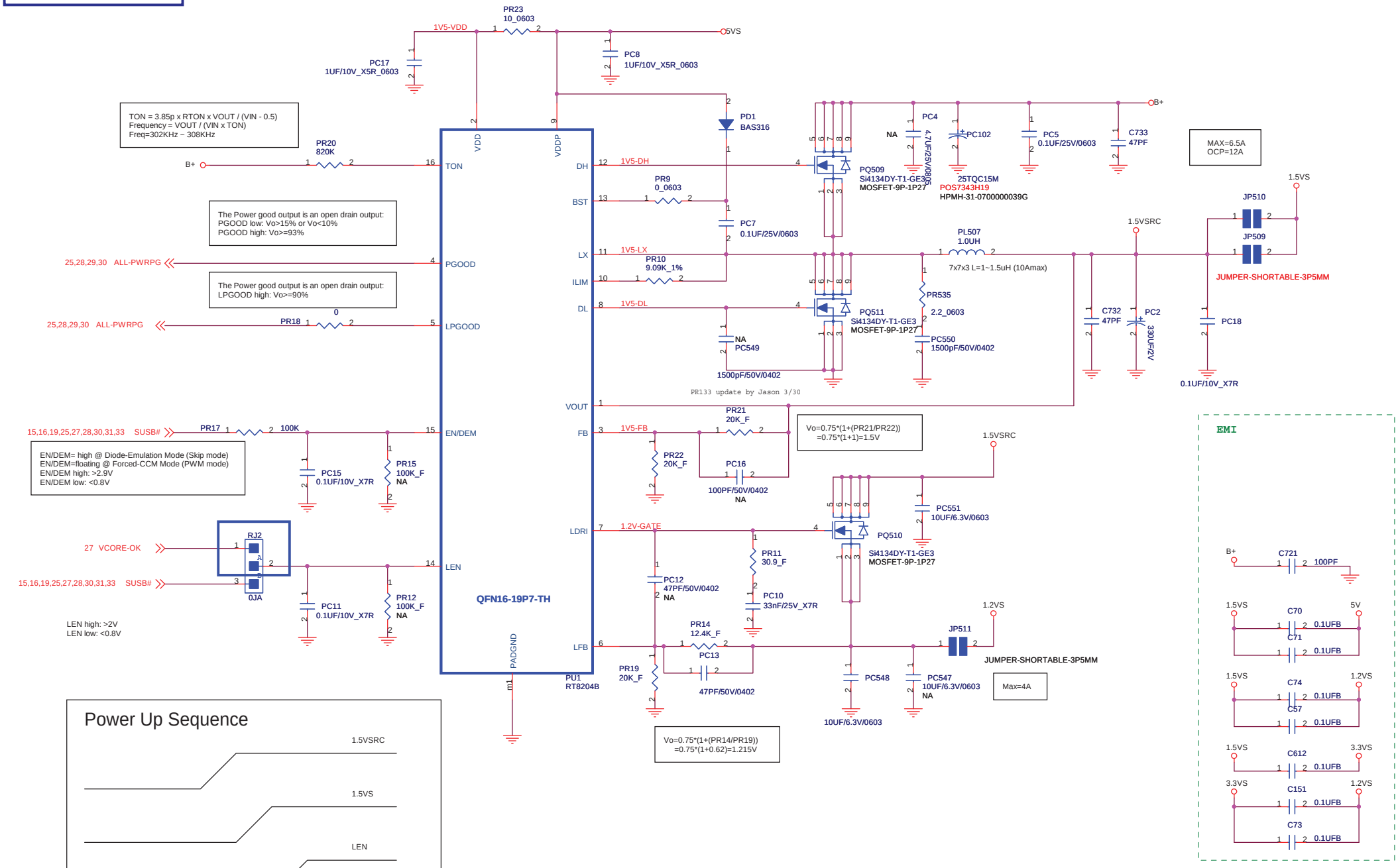
Date: Monday, August 17, 2009	Sheet : 31 of 35

1.5VS / 1.2VS



Power Up Sequence

FLEX Computing		
Project Name : ARWEN UA1	Title : 1.5VS/1.2VS	
Size : Custom	Document Number : HPMH-40GAB4000-D000	Rev : D
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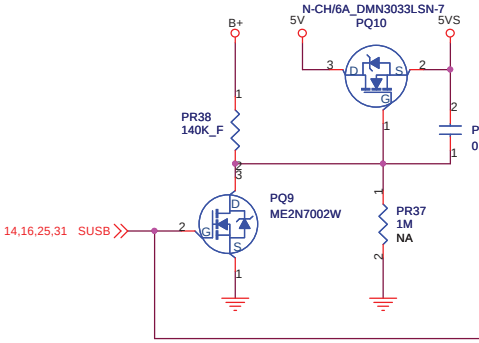
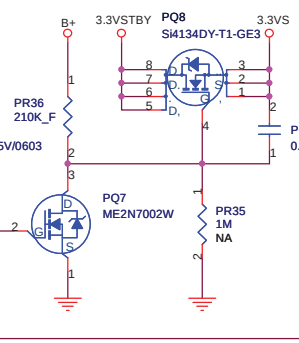
S4/S3 OFF

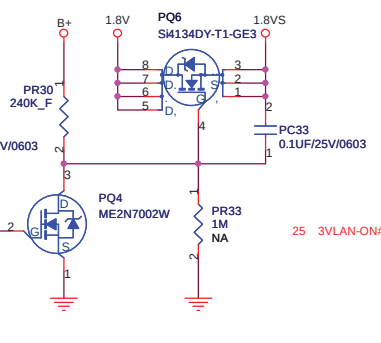
5VS



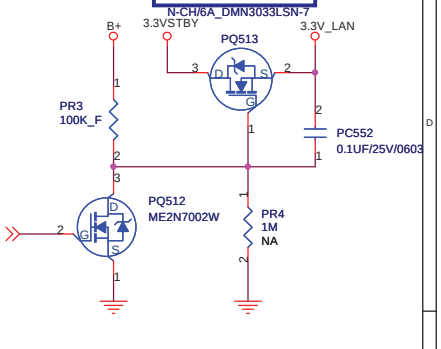
3.3VS



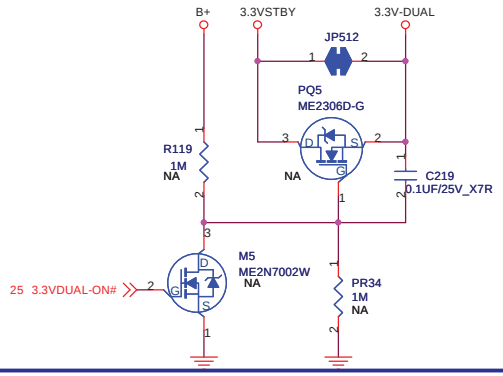
1.8VS



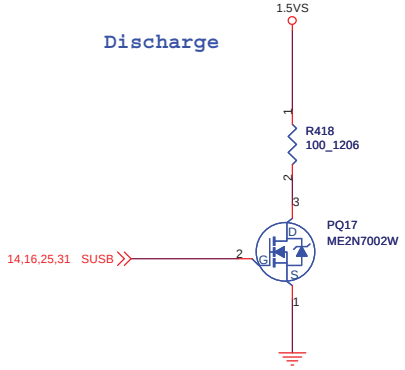
LAN_3.3V



3.3V_DUAL



Discharge

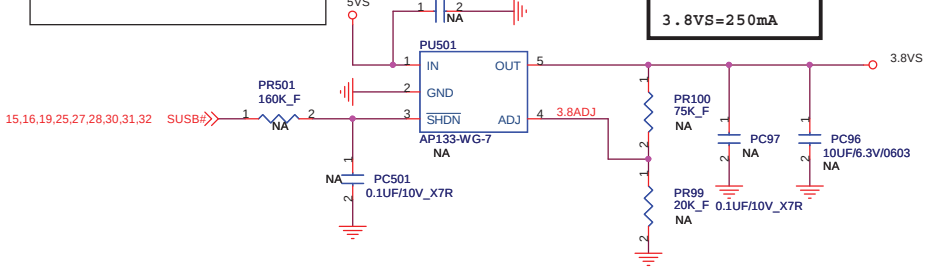


AP133:
Low dropout: 350mV at 300mA
EN logic low: <0.4V
EN logic high: >1.4V
Thermal shutdown: 145'C

3.8VS

Vo=0.8*(1+(PR100/PR99))
=0.8*(1+3.75)=3.8V

3.8VS=250mA



FLEX Computing

Project Name : ARWEN UA1	Title : V/VS/VGA POWER
Size : Custom	Document Number : HPMH-40GAB4000-D000
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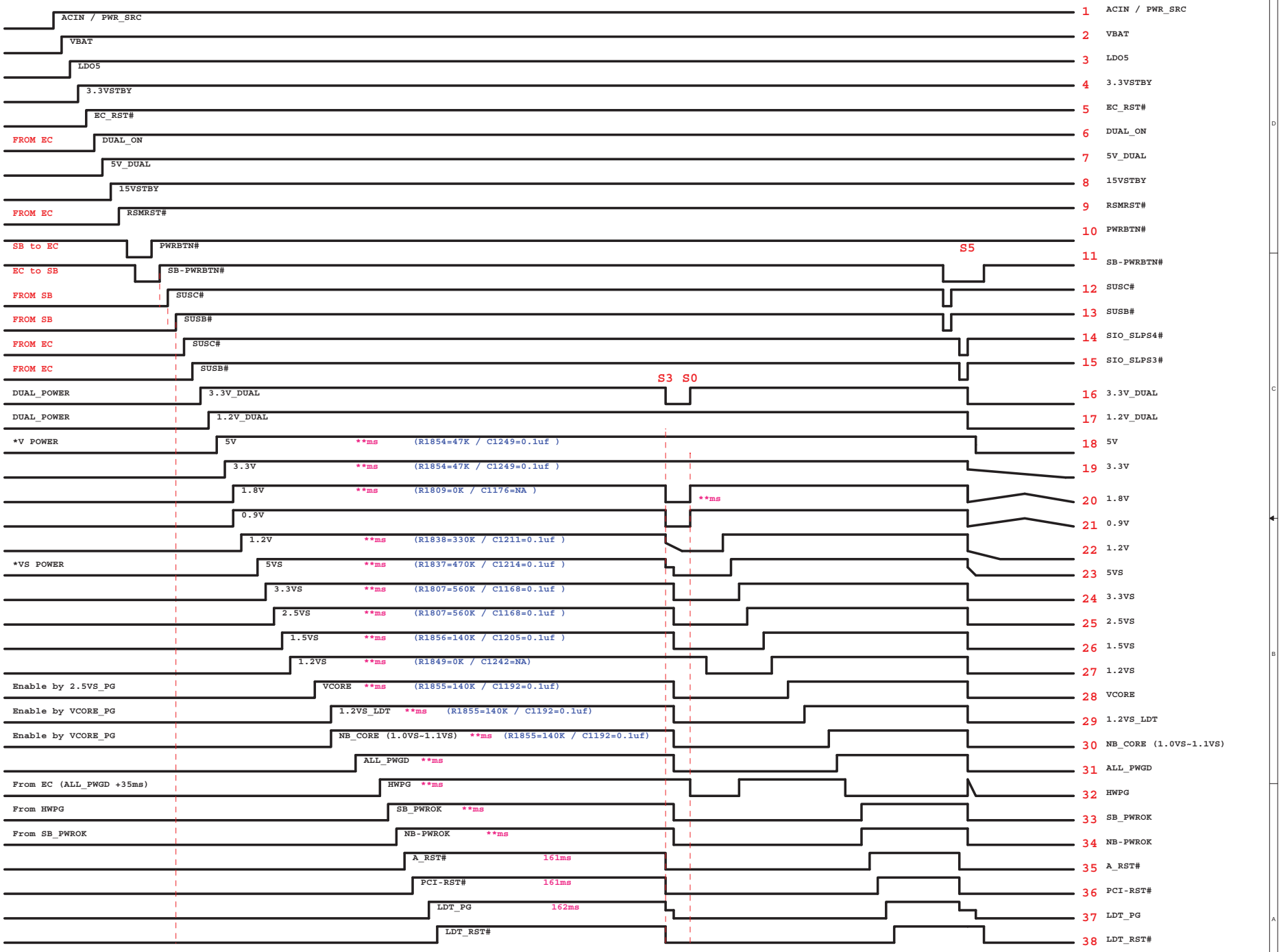
Date: Monday, August 17, 2009	Sheet : 33 of 35



FLEX Computing

Project Name : ARWEN UA1	Title : GPU OFF PWR	
Size : Custom	Document Number : HPMH-40GAB4000-D000	Rev : D
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Screw Hole

MB x 16

H26 *PTH6.4_3.3_6.4 THR252_130
H6 *PTH6.4_3.3_6.4 THR252_130
H5 *PTH8_3.3_8 THR315_130
H4 *PTH6.4_3.3_6.4 THR252_130
H7 *PTH6.4_3.3_6.4 THR252_130
H13 *PTH8_3.3_8 THR315_130
H18 *PTH8_3.3_8 THR315_130
H21 *PTH8_3.3_8 THR315_130
H9 *PTH8_3.3_8 THR315_130
H24 *PTH8_3.3_8 THR315_130
H22 *PTH6.4_3.3_6.4 THR252_130
H17 *PTH6.4_3.3_6.4 THR252_130
H25 *PTH6_3.3_6 THR236_130

CPU/VGA x 8

H19 *PTH6.4_4.4_6.4 THR252_173
H20 *PTH6.4_4.4_6.4 THR252_173
H15 *PTH6.4_4.4_6.4 THR252_173
H16 *PTH6.4_4.4_6.4 THR252_173
H10 *PTH6.4_4.4_6.4 THR252_173
H11 *PTH6.4_4.4_6.4 THR252_173

MINI CARD x 2

H8 NUT_MINIPCIE_H1.6 THR0B252_110
H12 NUT_MINIPCIE_H1.6 THR0B252_110

EMI x 2

H1 NUT_EMI_SUPPORTER THR177B0_044
H2 NUT_EMI_SUPPORTER THR0B177_044

FID

FID1 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID3 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID4 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID5 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID6 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID7 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID8 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.
FID2 *FIDUCIAL CAD-016 NC, NO CONNECT TO ANY.

H3 *NPTH0_1.7_0 NPTH068
H23 *NPTH0_1.7_0 NPTH068
H14 *NPTH5 NPTH197
H501 *PAD4.5MM PAD177

ME1 SU-15BS
ME2 SU-15BS
ME6 SU-15BS
ME3 SU-20AS
ME4 SU-20AS
ME5 SU-20AS

B+
C369 1 2 0.1UFB
C370 1 2 0.1UFB
C371 1 2 0.1UFB
C372 1 2 0.1UFB
C373 1 2 0.1UFB
C374 1 2 0.1UFB
C375 1 2 0.1UFB
C376 1 2 0.1UFB
C377 1 2 0.1UFB
C378 1 2 0.1UFB
C384 1 2 0.1UFB
C385 1 2 0.1UFB
C386 1 2 0.1UFB
C387 1 2 0.1UFB
C388 1 2 0.1UFB
C389 1 2 0.1UFB
C399 1 2 0.1UFB
C401 1 2 0.1UFB

5V
C379 1 2 0.1UFB
C380 1 2 0.1UFB

1.5VS
C381 1 2 0.1UFB
C403 1 2 0.1UFB
C404 1 2 0.1UFB
C405 1 2 0.1UFB

1.2VS
C382 1 2 0.1UFB
C383 1 2 0.1UFB
C406 1 2 0.1UFB
C407 1 2 0.1UFB
C408 1 2 0.1UFB

3.3VS
C409 1 2 0.1UFB

5VS
C400 1 2 0.1UFB

EMI1 SPRING_HEIGHT_40
HPMH-B2685111G00004
EMI-3LX2WX4H
2nd source HPMH-B2685111G00001

EMI5 SPRING_HEIGHT_12
HPMH-B2685111G00005
EMI-3L5X2WX1H2
2nd source HPMH-B2685111G00003

EMI2 SPRING_HEIGHT_25
HPMH-B2685111G00006
EMI-2L6X1W5X2H5
2nd source HPMH-B2685111G00002

EMI3 SPRING_HEIGHT_25
NA
HPMH-B2685111G00002
EMI-2L6X1W5X2H5

EMI4 SPRING_HEIGHT_25
HPMH-B2685111G00002
EMI-2L6X1W5X2H5

FLEX Computing

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