Project Name : A14HM02 REV.B

Platform : Calpella ARRANDALE(PROCESSOR)+HM55(PCH)

PAGE CONTENT

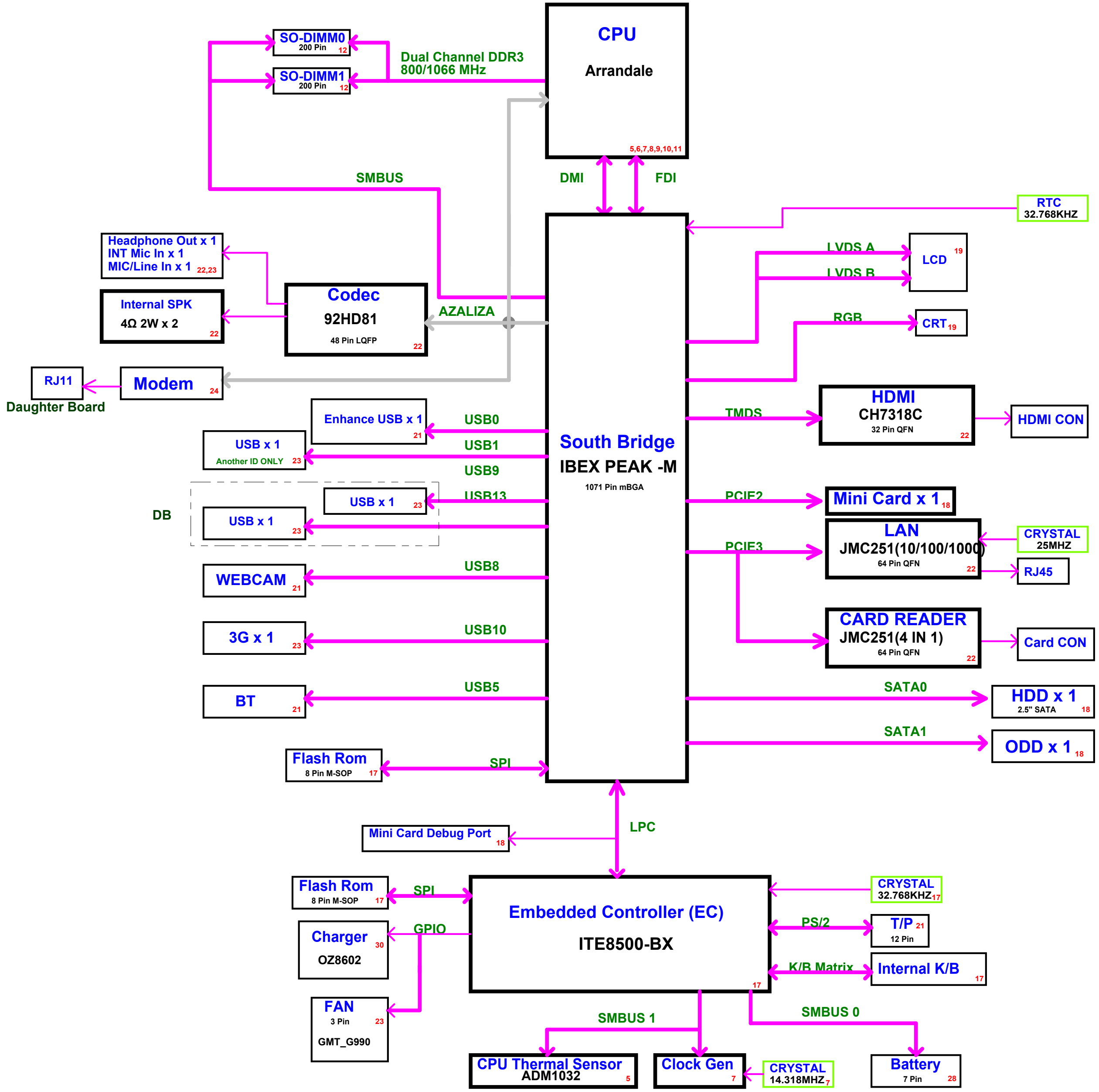
M/B Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

Daughter Board Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

SYSTEM BLOCK DIAGRAM



Shuttle Inc.	
Title	A14HM02
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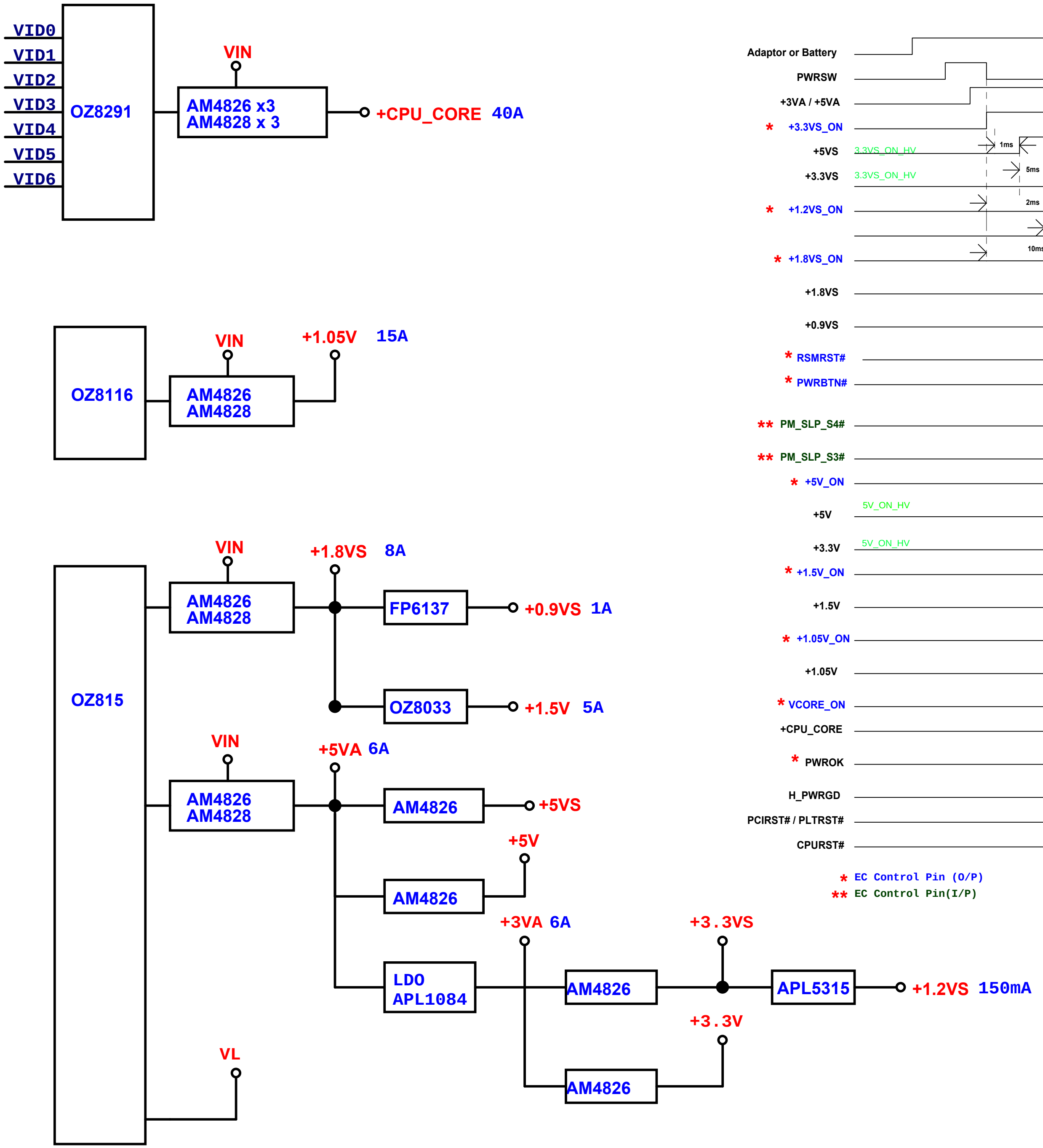
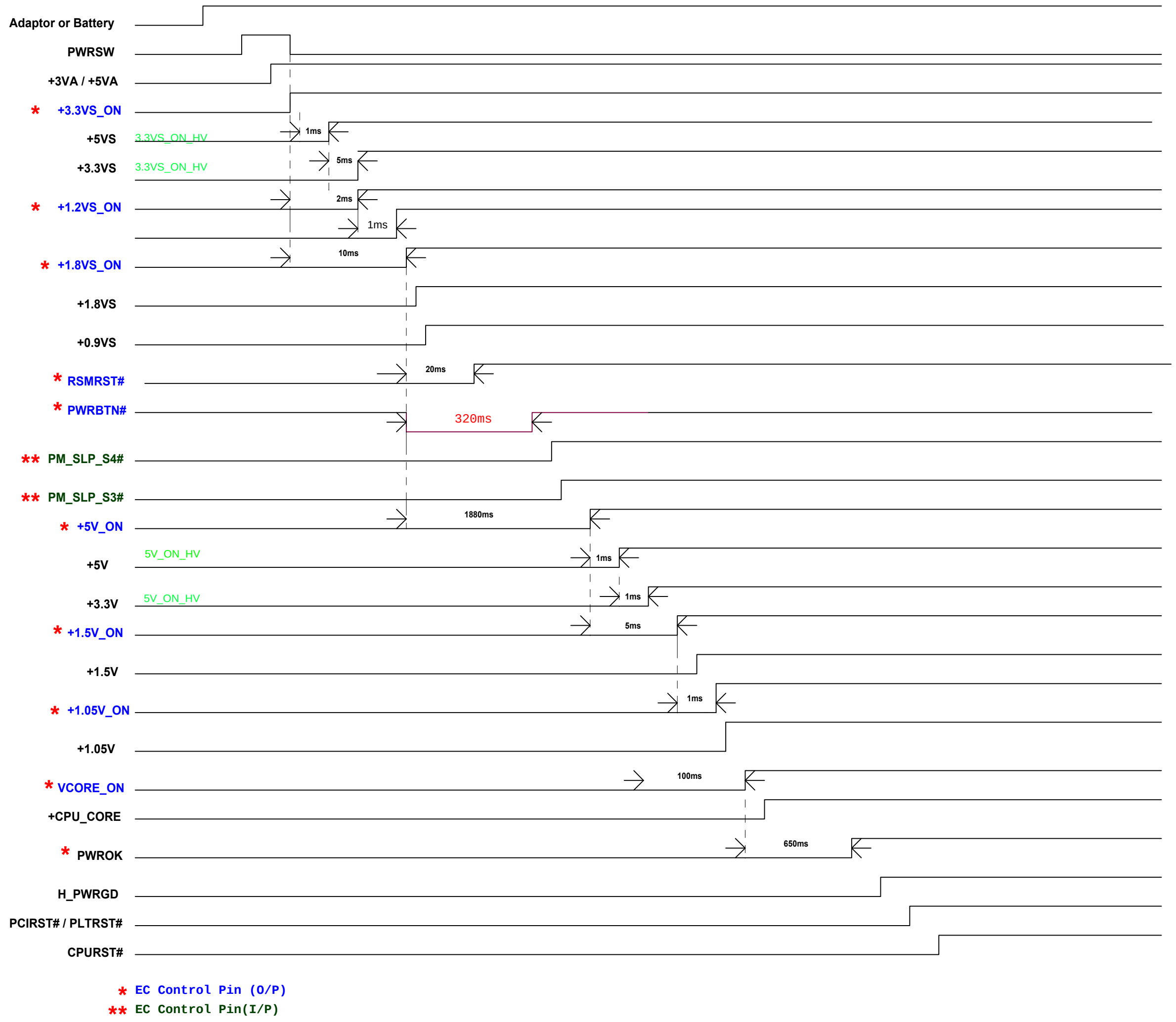
POWER BLOCK DIAGRAM



System Poewr On Sequence



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Title: A14HM02

Size: Custom | Document Number: POWER DIAGRAM & SEQUENCE | Rev: B

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ICH9M GPIO

GPIO0	PM_BM_BUSY#
GPIO1	EC_EXTSMI#
GPIO2	INT_PIRQE#
GPIO3	INT_PIRQF#
GPIO4	INT_PIRQG#
GPIO5	INT_PIRQH#
GPIO6	BIOS_REC
GPIO7	*N.C*(TACH3)
GPIO8	*N.C*
GPIO9	*N.C*(WOL_EN)
GPIO10	*N.C*(ALERT#)
GPIO11	SMB_ALERT#
GPIO12	LAN_PHYPC
GPIO13	*N.C*(GLAN_DOCK#)
GPIO14	*N.C*(NETDETECT)
GPIO15	PM_STPPCI#
GPIO17	*N.C*(TACH0)
GPIO18	*N.C*
GPIO19	SATA1GP
GPIO21	SATA0GP
GPIO22	*N.C*(SCLOCK)
GPIO23	LDRQ1#
GPIO24	CRB_SV_DET
GPIO25	PM_STPCPU#
GPIO26	PM_SLP_S4_STATE#
GPIO27	QRT_STATE0
GPIO28	QRT_STATE1
GPIO29	USB_OC#5
GPIO30	USB_OC#6
GPIO31	USB_OC#7
GPIO32	PM_CLKRUN#
GPIO33	HDA_DOCK_EN
GPIO34	*N.C*(HDA_DOCK_RST)
GPIO35	CLK_SATA_OE#
GPIO36	SATA2GP
GPIO37	SATA3GP
GPIO38	ODD_DET
GPIO39	ICH_GPIO39
GPIO40	USB_OC#1
GPIO41	USB_OC#2
GPIO42	USB_OC#3
GPIO43	USB_OC#4
GPIO48	MFG_MODE
GPIO49	H_PWRGD
GPIO50	PCI_REQ#1
GPIO51	PCI_GNT#1
GPIO52	PCI_REQ#2
GPIO53	PCI_GNT#2
GPIO54	PCI_REQ#3
GPIO55	PCI_GNT#3

ITE8510 GPIO

		Default Pull/Mode
GPA0	RF_LED#	UP / GPI
GPA1	EC_BSEL1	UP / GPI
GPA2	BTL_BEEP	UP / GPI
GPA3	WLAN_PWR#	UP / GPI
GPA4	P_ID0	UP / GPI
GPA5	P_ID1	UP / GPI
GPA6	PM_RSMRST#	UP / GPI
GPA7	EC_BL_PWM	UP / GPI
GPB0	PM_SLP_S4#	UP / GPI
GPB1	PM_SLP_S3#	UP / GPI
GPB2	+1.05V_ON	Dn / GPI
GPB3	BAT_SMBCLK	/ GPI
GPB4	BAT_SMBDAT	/ GPI
GPB5	H_A20GATE	/ GPO
GPB6	H_RCIN#	UP / Func1
GPB7	ENHANCE_USB#	Dn / GPI
GPC0	+1.5V_ON	Dn / GPI
GPC1	SMB_CLK_EC	/ GPI
GPC2	SMB_DAT_EC	/ GPI
GPC3	*N.C*	Dn / GPI
GPC4	SAVE POWER	Dn / GPI
GPC5	SLP_S4_COY	Dn / GPI
GPC6	+3.3VS_ON	Dn / GPI
GPC7	CRT_DETECT	UP / GPI
GPD0	ADAP_IN	UP / GPI
GPD1	PWRBTN#	UP / GPI
GPD2	PLT_RST#	UP / Func1
GPD3	*N.C*	UP / GPI
GPD4		UP / GPI
GPD5	PWR_USB_LED#	UP / GPI
GPD6	N.C	Dn / GPI
GPD7	SET_V	Dn / GPI
GPE0	LID#	Dn / GPI
GPE1	Fastcharge_EN	Dn / GPI
GPE2	PWROK	Dn / GPI
GPE3	Vcore_ON	Dn / GPI
GPE4	PWRSW	UP / GPI
GPE5	+1.2VS_ON	Dn / GPI
GPE6	WLAN_ON	Dn / GPI
GPE7	AMP_MUTE#	UP / GPI
GPF0	N.C	UP / GPI
GPF1	N.C	UP / GPI
GPF2	N.C	UP / GPI
GPF3	CHG_ON#	UP / GPI
GPF4	TP_CLK	UP / GPI
GPF5	TP_DATA	UP / GPI
GPF6	N.C	UP / GPI
GPF7	N.C	UP / GPI
GPG0	+3.3VA	Dn/GPO/TM
GPG1	+5V_ON	Dn/GPO/ID7
GPG2	N.C	
GPG6	WEBCAN_ON	Dn / GPI
GPH0	SAFTY_PROTECT	Dn/GPI/ID0
GPH1	+1.8VS_ON	Dn/GPI/ID1
GPH2	SENBAT_V	Dn/GPI/ID2
GPH3	CHG_G_LED	Dn/GPI/ID3
GPH4	CHG_R_LED	Dn/GPI/ID4
GPH5	BATOFF	Dn/GPI/ID5
GPH6	PWR_LED	Dn/GPI/ID6

ITE8510 GPIO

		Default Pull/Mode
GPI0	N.C	/GPI/ADC
GPI1	LCDSW0	/GPI/ADC
GPI2	LCDSW1	/GPI/ADC
GPI3	N.C	/GPI/ADC
GPI4	BAT_I	/GPI/ADC
GPI5	BATT_TEMP	/GPI/ADC
GPI6	ADAPTOR_1	/GPI/ADC
GPI7	BAT_V	/GPI/ADC
GPJ0	EC_BL_ON	/GPI/DAC
GPJ1	EC_PROCHOT	/GPI/DAC
GPJ2	FAN_CTRL0	/GPI/DAC
GPJ3	CHG_REF	/GPI/DAC
GPJ4	CHG_I	/GPI/DAC
GPJ5	PM_THROTTING#	/GPI/DAC

Penryn CPU

	CPU CORE(V)	ICC(A)	W	TEMP(℃)
IMVP-6+	1.05	44.0	36	

Cantiga

VCC	ICC(mA)	W	TEMP(℃)
+3.3V	262	0.87	105
+1.8VS	3249	5.73	
+1.5V	86	0.129	
+1.05	14688.52	15.43	

ICH9M

VCC	ICC(mA)	mW	TEMP(℃)
+5V	4	20	70
+5VS	2	10	
+3.3V	347	1145.1	
+3.3VS	212	699.6	
+1.5V	1988	2982	
+1.05V	1634	1715.7	

ITE8500

VCC	ICC(mA)	mW	TEMP(℃)
+3.3V	100	330	70

CLOCK GENERATOR

VCC	ICC(mA)	mW	TEMP(℃)
+3.3V	1000	3300	70

IDT92HD81

VCC	ICC(mA)	mW	TEMP(℃)
+3.3V(DVDD)	200	660	70
+5V(AVDD)	1000	5000	

ADM1032

VCC	ICC	mW	TEMP(℃)
+3.3V	170uA	0.56	150

JMC261

VCC	ICC(mA)	mW	TEMP(℃)
+3.3VS	300	990	70
+1.2VS	150	180	

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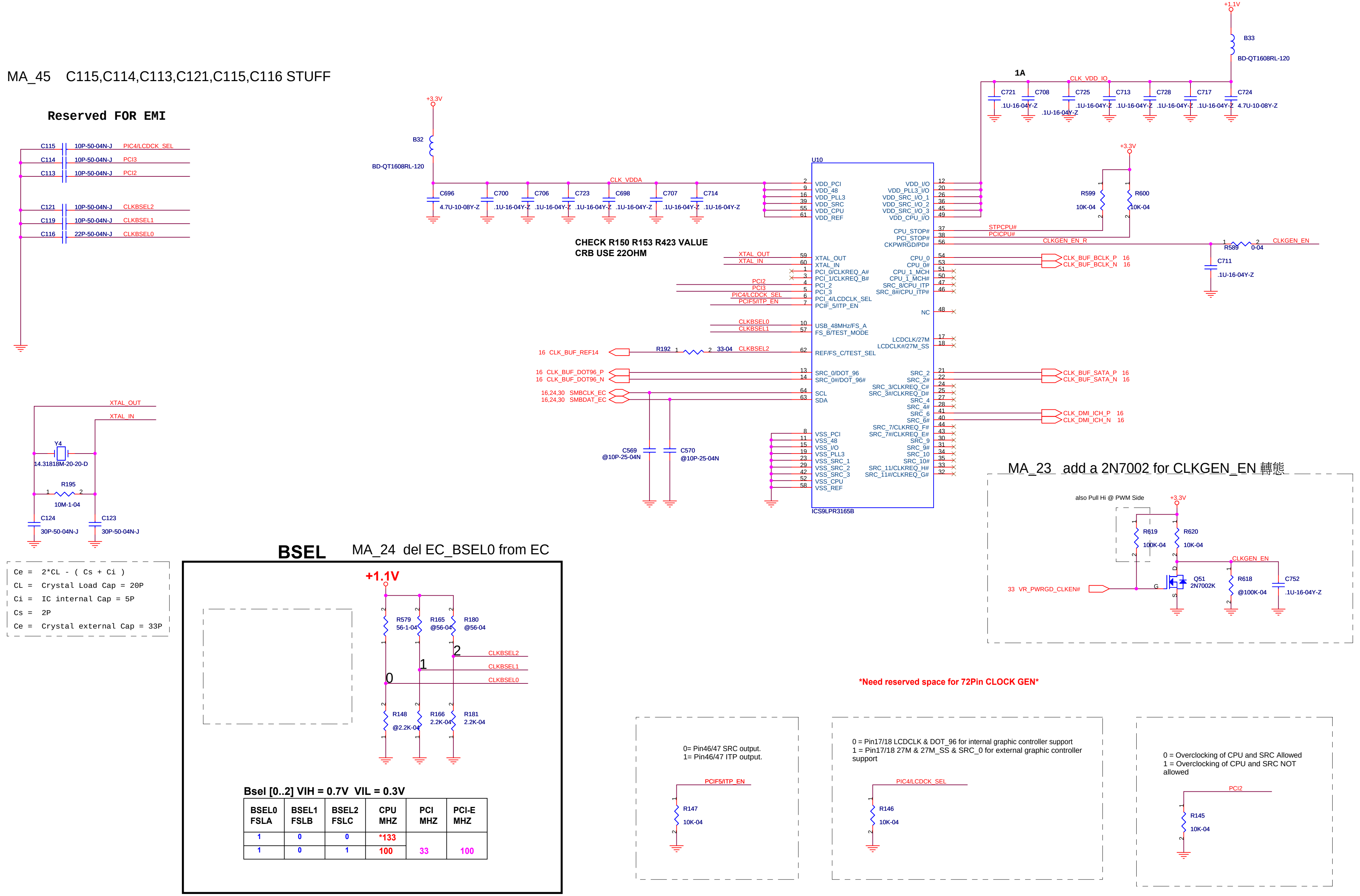
MA_45 C115,C114,C113,C121,C115,C116 STUFF



Ce = 2*CL - (Cs + Ci)
CL = Crystal Load Cap = 20P
Ci = IC internal Cap = 5P
Cs = 2P
Ce = Crystal external Cap = 33P

Bsel [0..2] VIH = 0.7V VIL = 0.3V

BSEL0 FSLA	BSEL1 FSLB	BSEL2 FSLC	CPU MHZ	PCI MHZ	PCI-E MHZ
1	0	0	*133		
1	0	1	100	33	100

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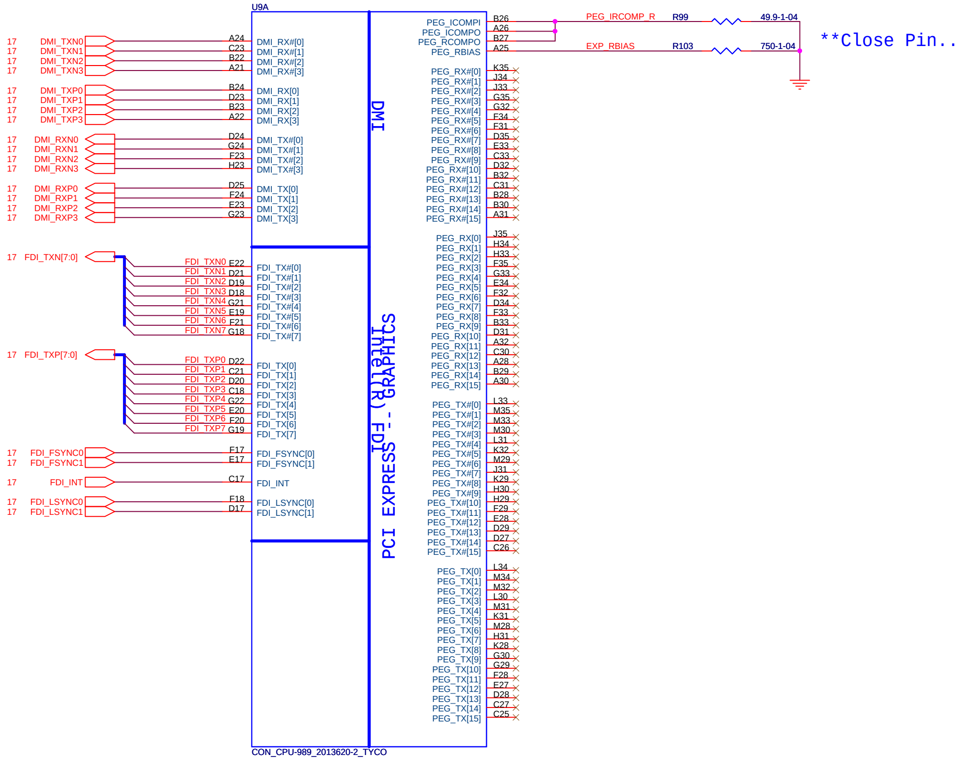
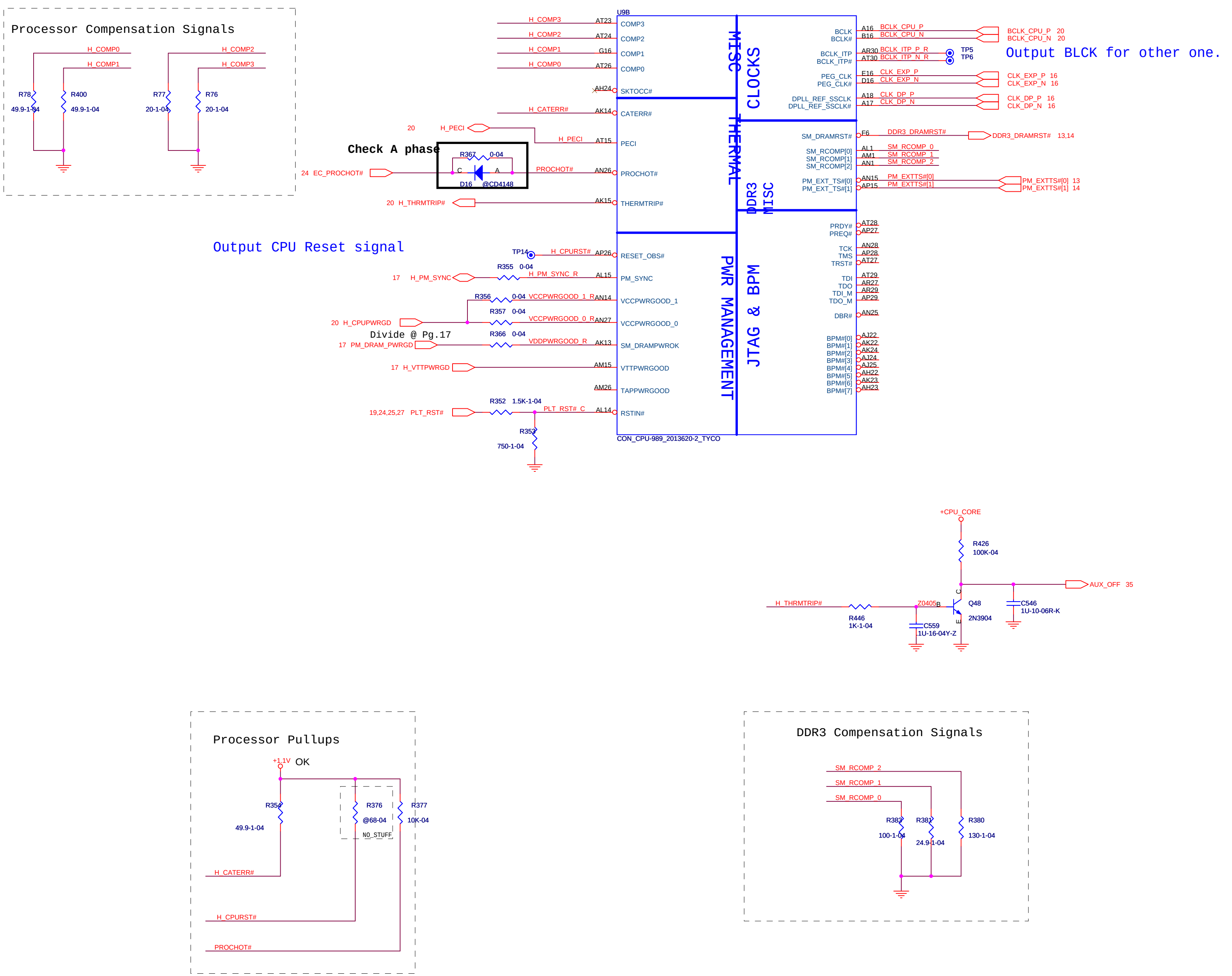
ARRANDALE/CLARKSFIELD PROCESSOR (DMI,PEG,FDI)



AUBURNDALE/CLARKSFIELD PROCESSOR (CLK,MISC,JTAG)



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Title	A14HM02
Size: Custom	Document Number: CPU_CLK/MISC/JTAG (2 of 7) — Rev: B
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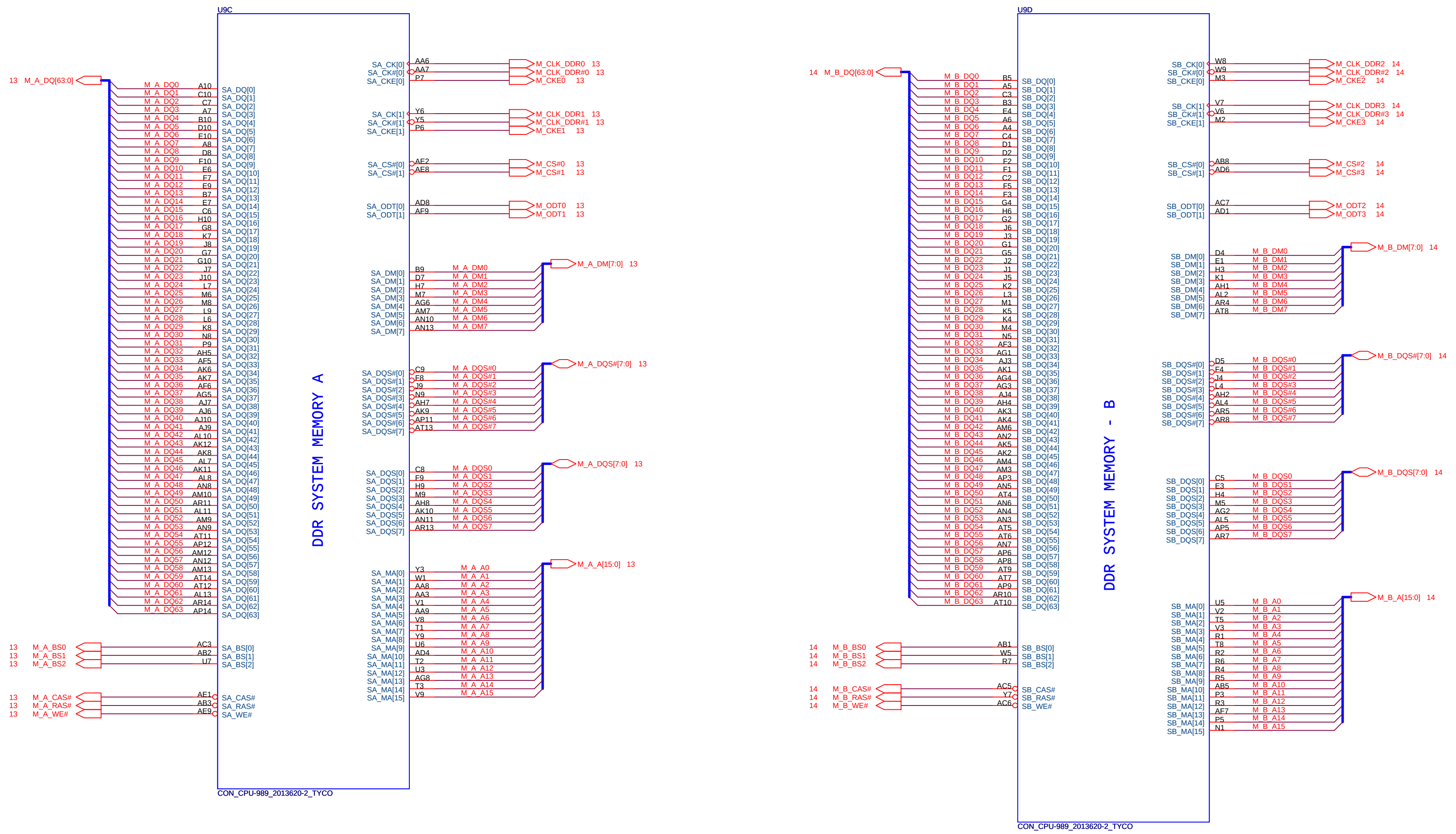
ARRANDALE/CLARKSFIELD PROCESSOR (DDR3)



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Size: Custom	Document Number: **CPU_DDR3 BUS (3 of 7)**	Rev: **B**
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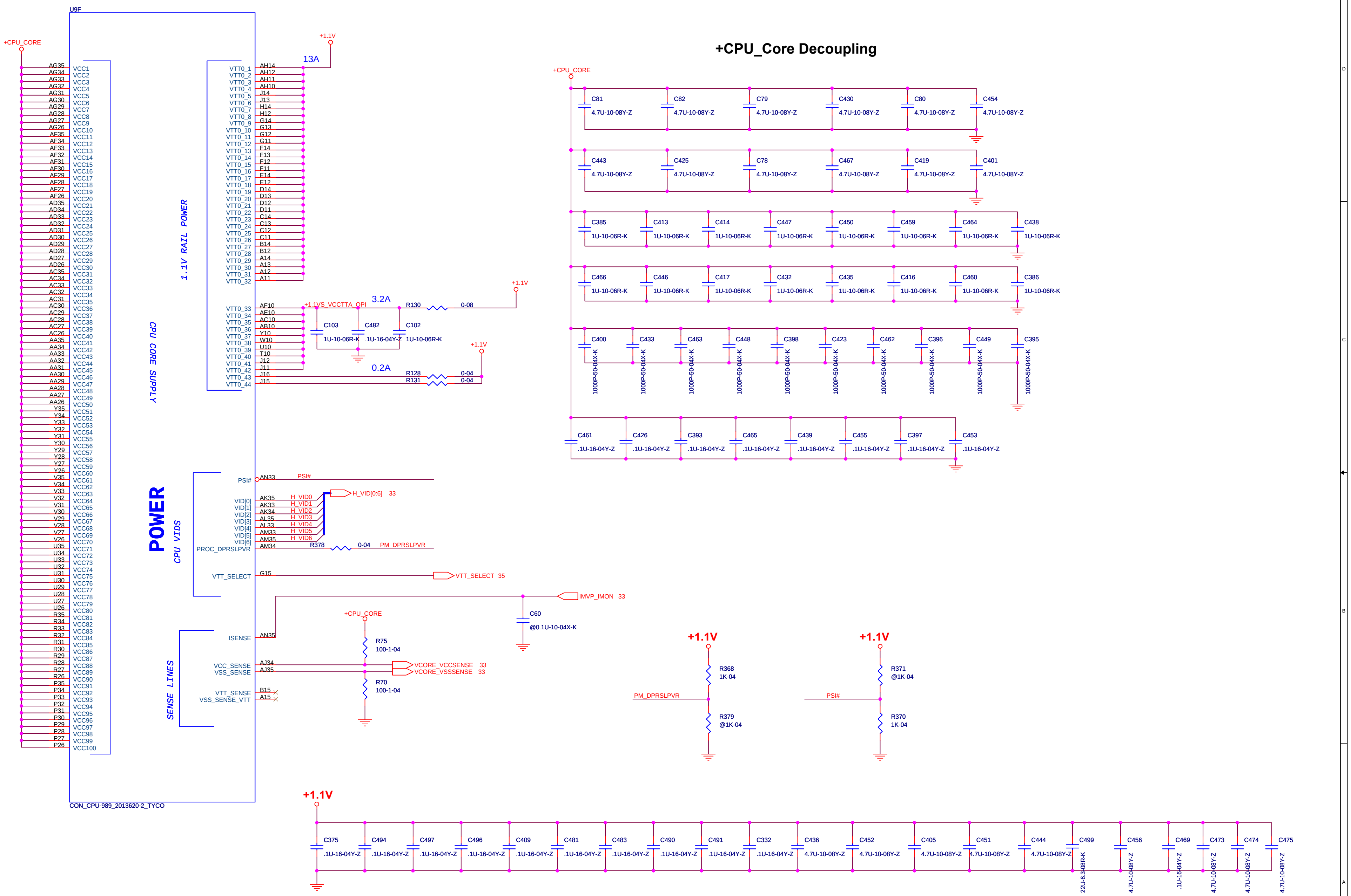

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Title: A14HM02

Size: Custom

Document Number: CPU_PWR (4 of 7)

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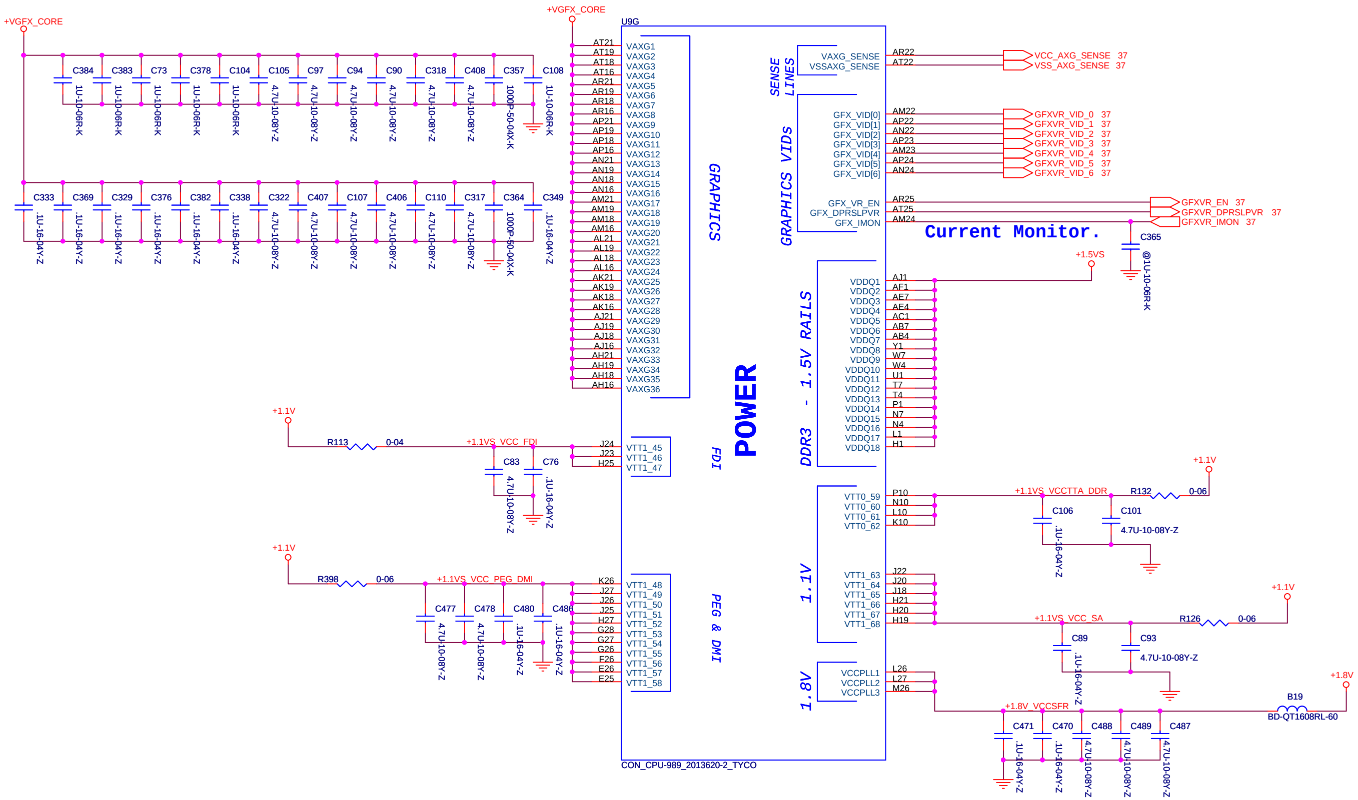
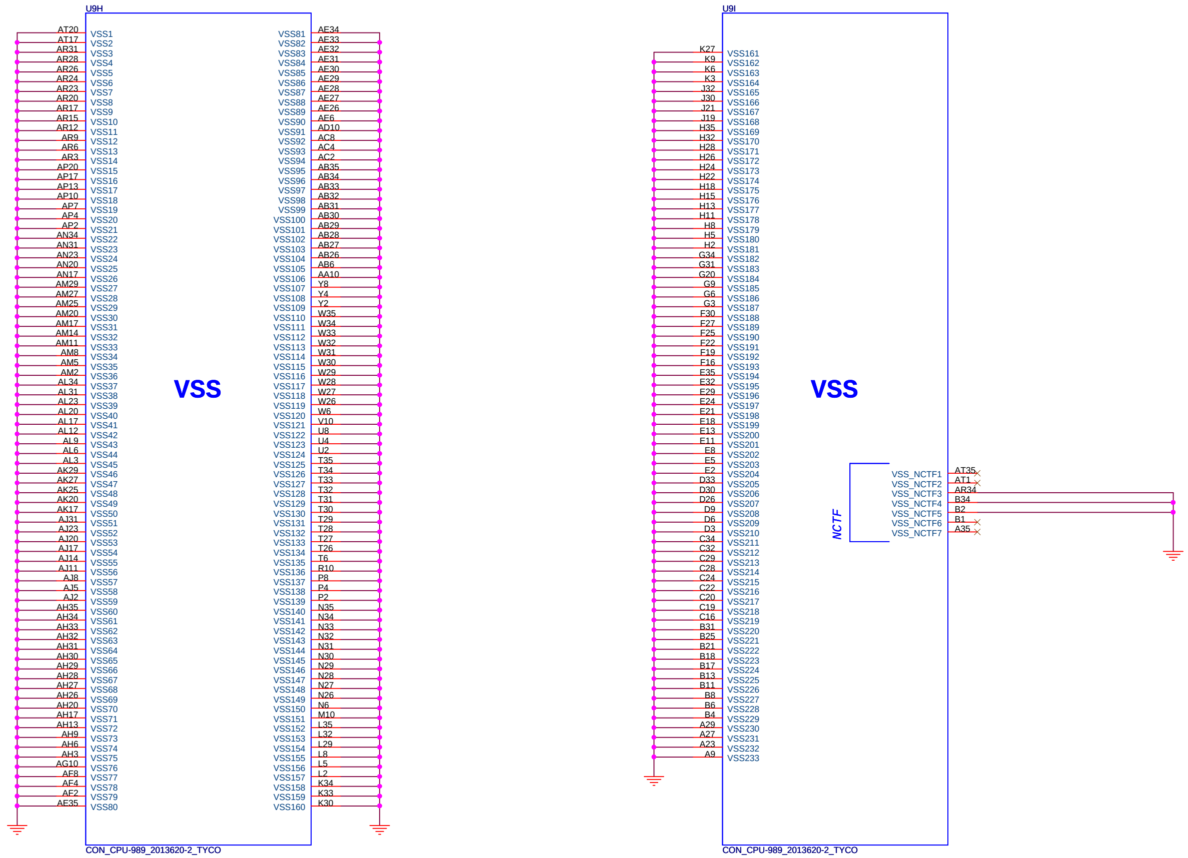
AUBURNDALE/CLARKSFIELD PROCESSOR (GRAPHICS POWER)



AUBURNDALE/CLARKSFIELD PROCESSOR (GND)



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Title	**A14HM02**	
Size: Custom	Document Number: **CPU_GND (6 of 7)**	Rev: B
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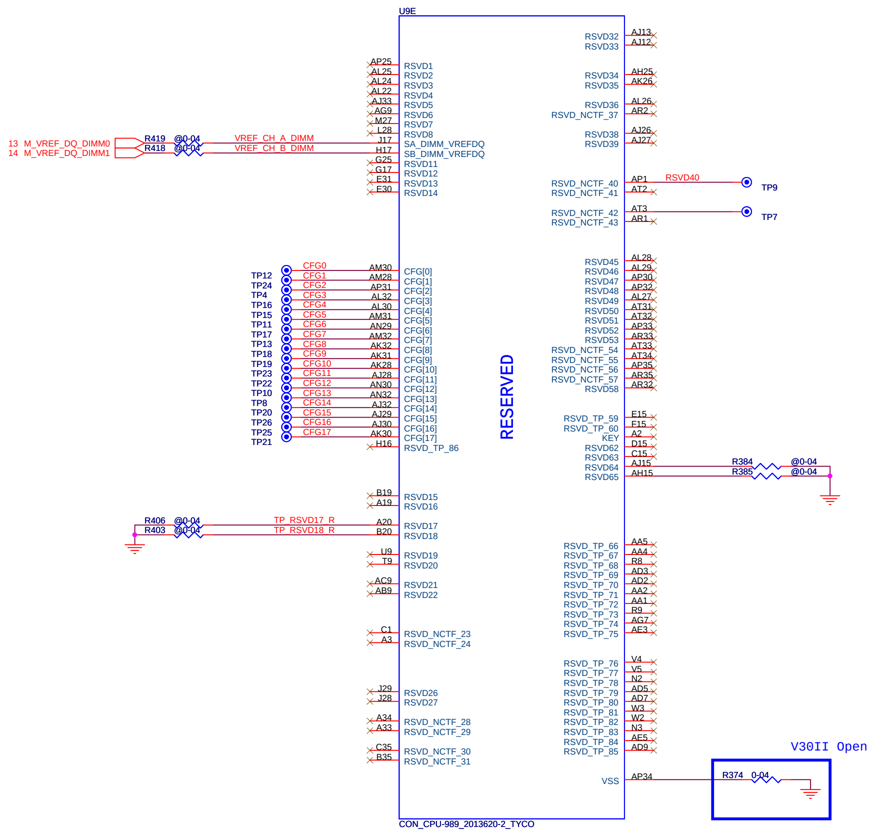
AUBURNDALE/CLARKSFIELD PROCESSOR (RESERVED)



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Title	A14HM02	
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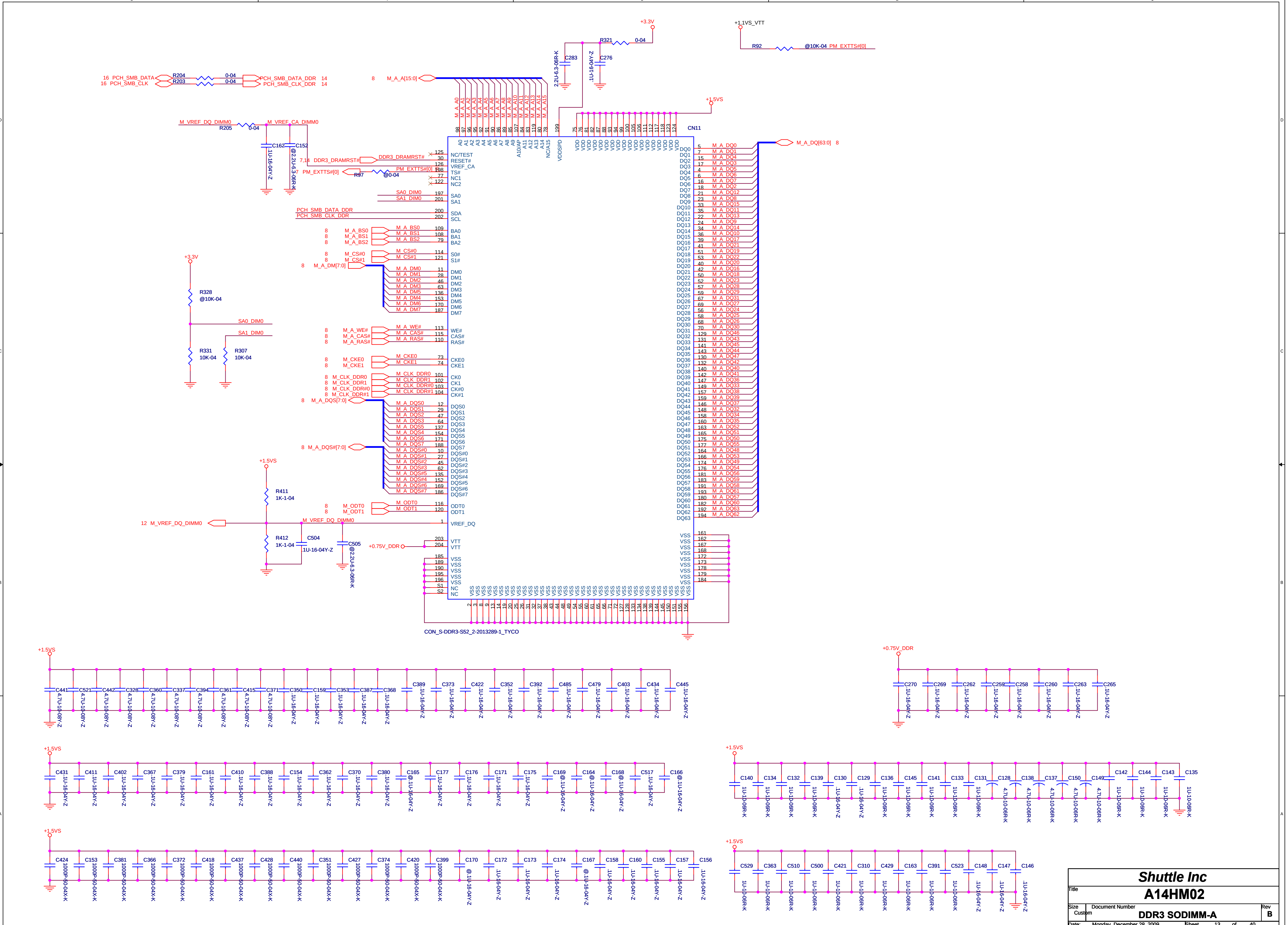

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Title	A14HM02
Size: Custom	Document Number: DDR3 SODIMM-A
Rev	B
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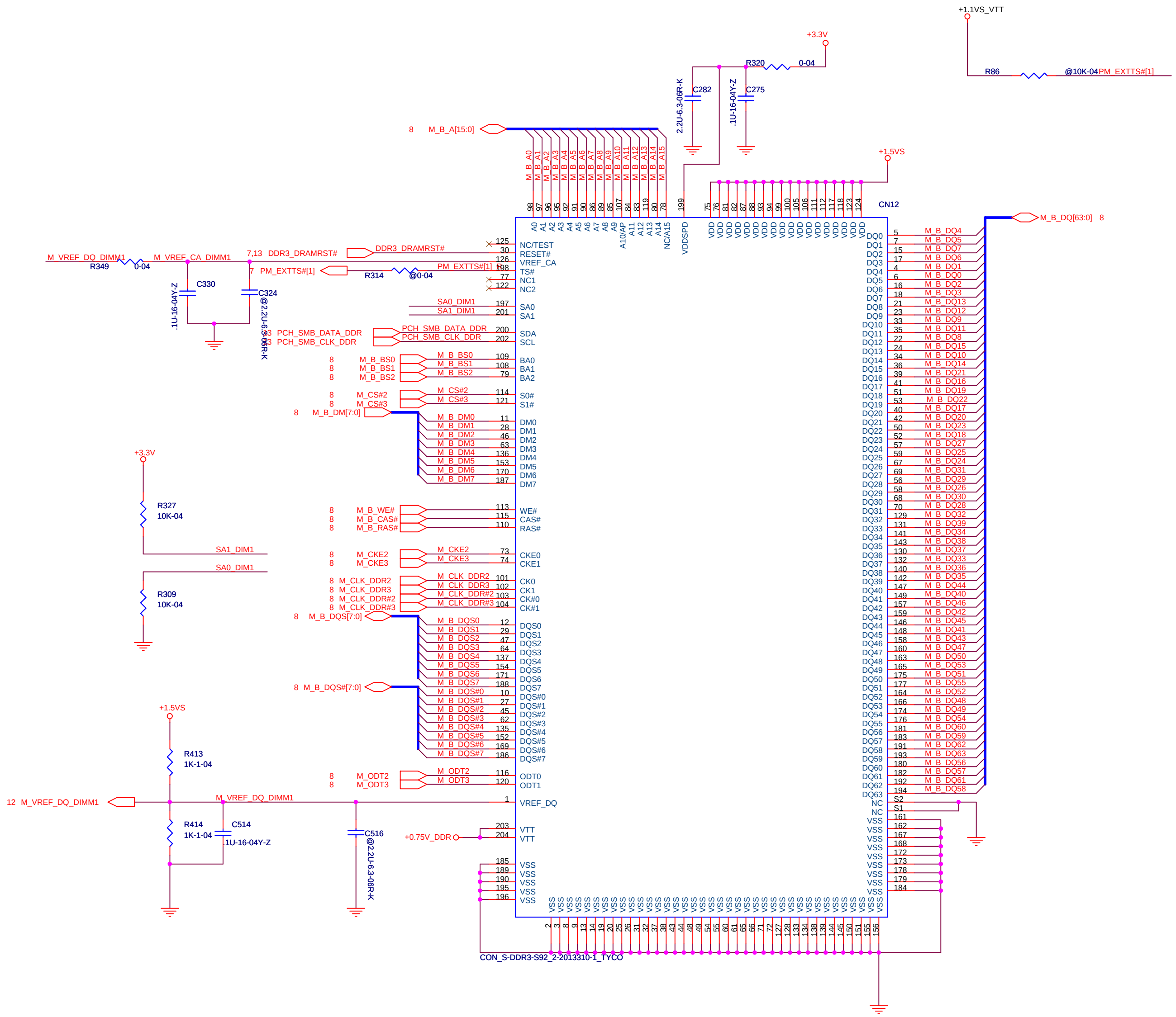

	Shuttle Inc
Title	**A14HM02**
Size: Custom	Document Number: **DDR3 SODIMM-B** — Rev: **B**
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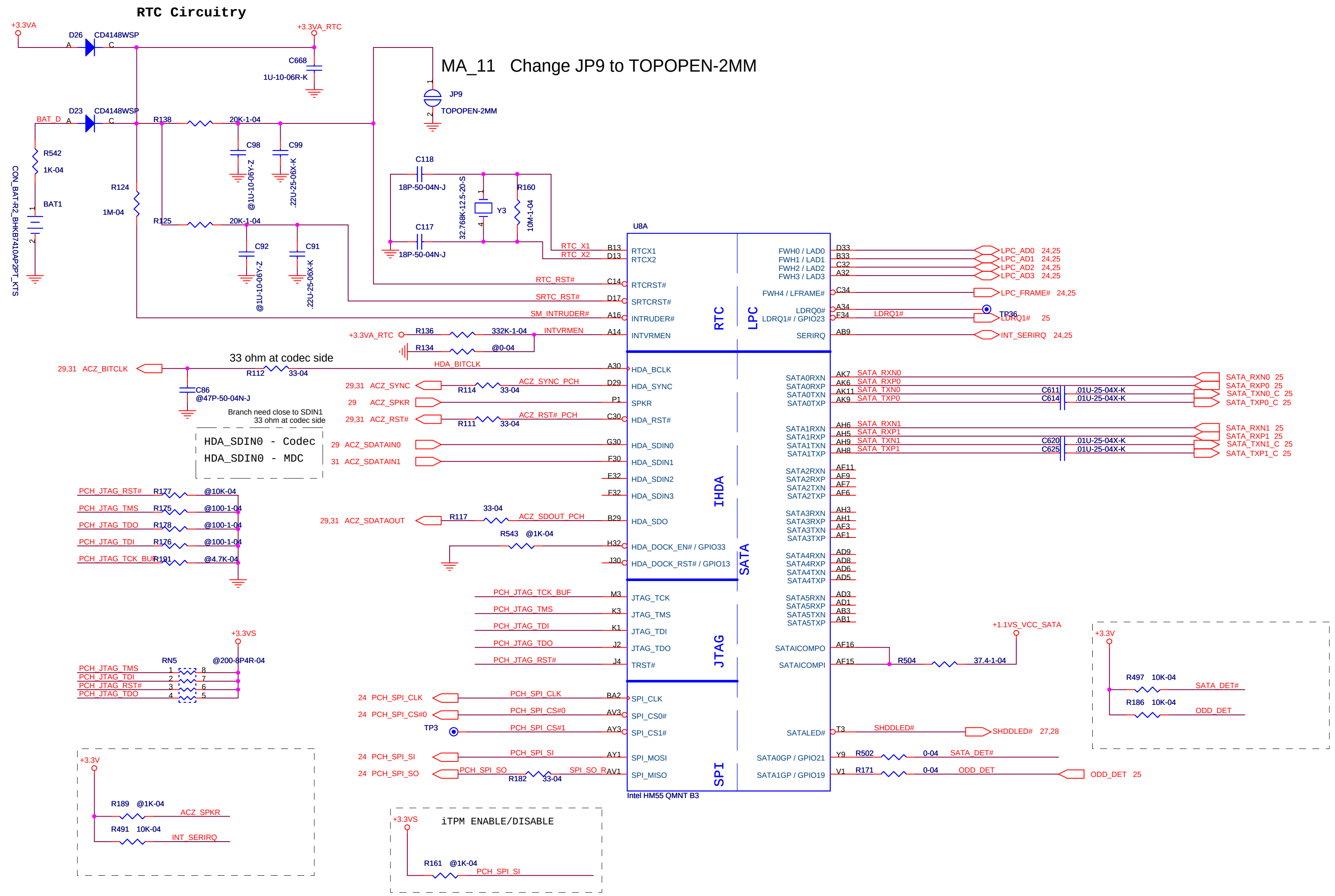

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Title: A14HM02

Size: Custom
Document Number: PCH_HDA/JTAG/SATA (1 of 9)
Rev: B

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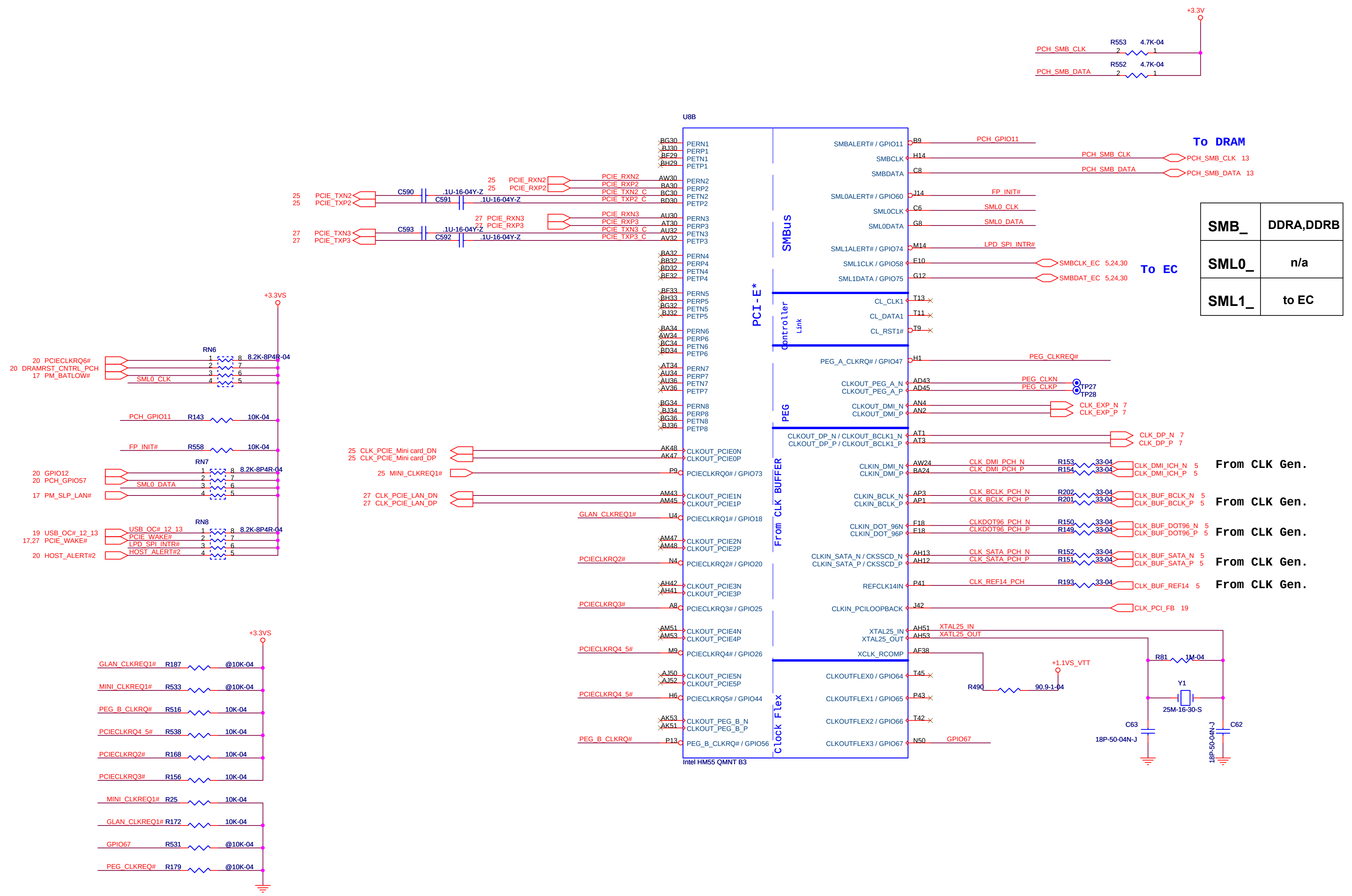

SMB_	DDRA,DDRB
SML0_	n/a
SML1_	to EC

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Title: **A14HM02**

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Custom	PCH_PCIE/CLK/SMBUS (2 of 9)	B

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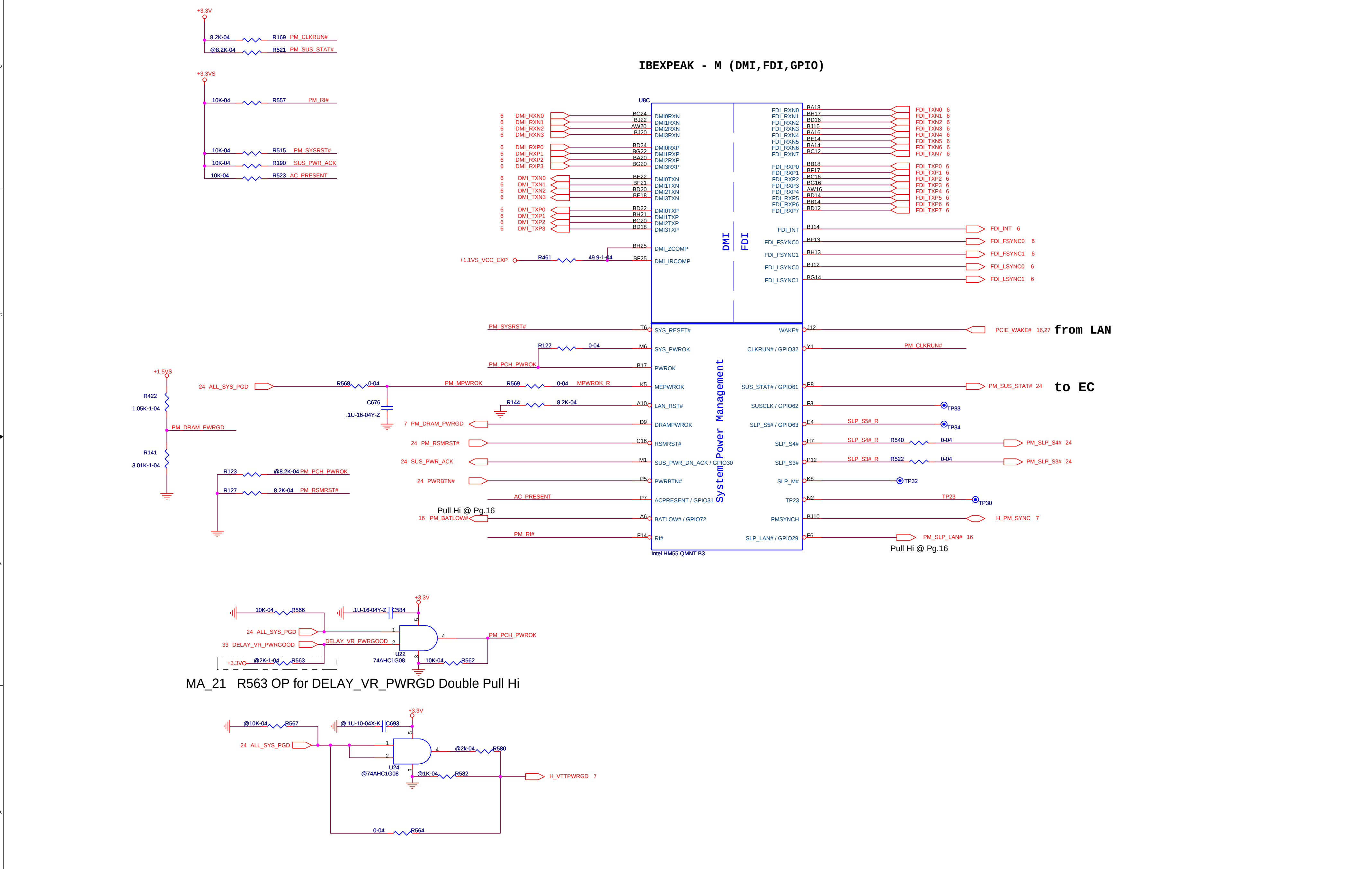
IBEXPEAK - M (DMI,FDI,GPIO)



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Title	A14HM02	
Size: Custom	Document Number: PCH_DMI/FDI/PM (3 of 9)	Rev: B
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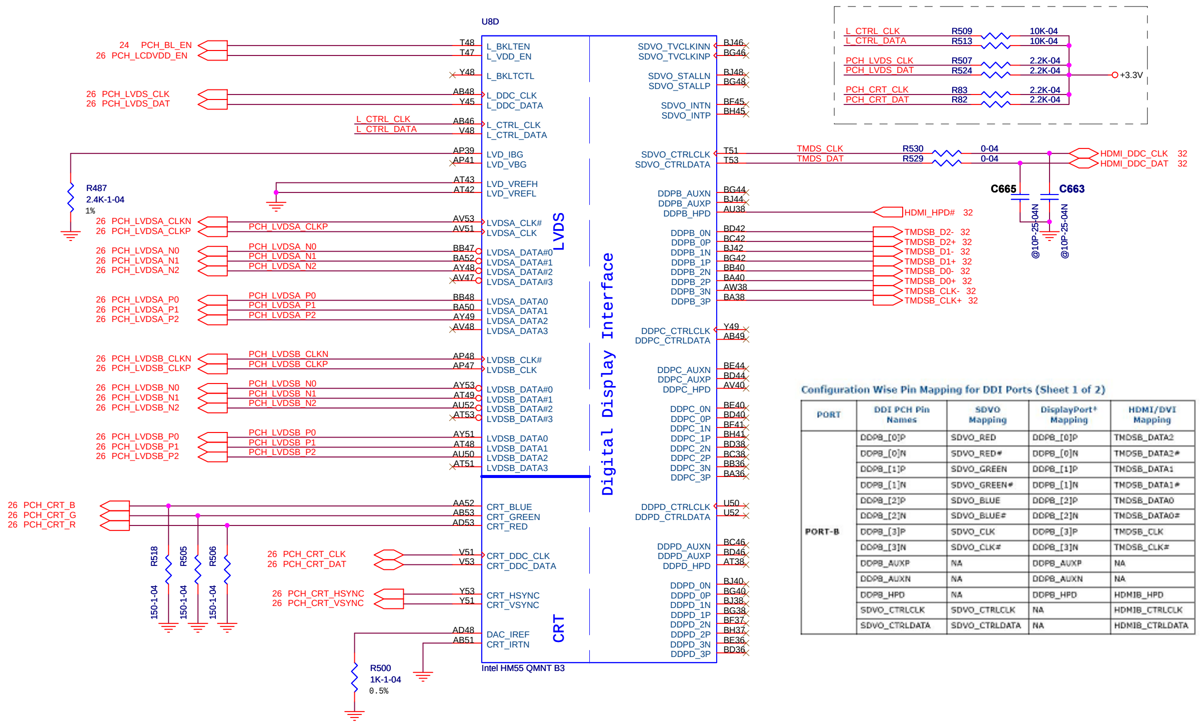

Configuration Wise Pin Mapping for DDI Ports (Sheet 1 of 2)

PORT	DDI PCH Pin Names	SDVO Mapping	DisplayPort* Mapping	HDMI/DVI Mapping
PORT-B	DDPB_[0]P	SDVO_RED	DDPB_[0]P	TMDSB_DATA2
	DDPB_[0]N	SDVO_RED#	DDPB_[0]N	TMDSB_DATA2#
	DDPB_[1]P	SDVO_GREEN	DDPB_[1]P	TMDSB_DATA1
	DDPB_[1]N	SDVO_GREEN#	DDPB_[1]N	TMDSB_DATA1#
	DDPB_[2]P	SDVO_BLUE	DDPB_[2]P	TMDSB_DATA0
	DDPB_[2]N	SDVO_BLUE#	DDPB_[2]N	TMDSB_DATA0#
	DDPB_[3]P	SDVO_CLK	DDPB_[3]P	TMDSB_CLK
	DDPB_[3]N	SDVO_CLK#	DDPB_[3]N	TMDSB_CLK#
	DDPB_AUXP	NA	DDPB_AUXP	NA
	DDPB_AUXN	NA	DDPB_AUXN	NA
	DDPB_HPD	NA	DDPB_HPD	HDMIB_HPD
	SDVO_CTRLCLK	SDVO_CTRLCLK	NA	HDMIB_CTRLCLK
	SDVO_CTRLDATA	SDVO_CTRLDATA	NA	HDMIB_CTRLDATA

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Title	A14HM02
Size: Custom	Document Number: PCH_LVDS/CRT/DDI (4 of 9)	Rev: B
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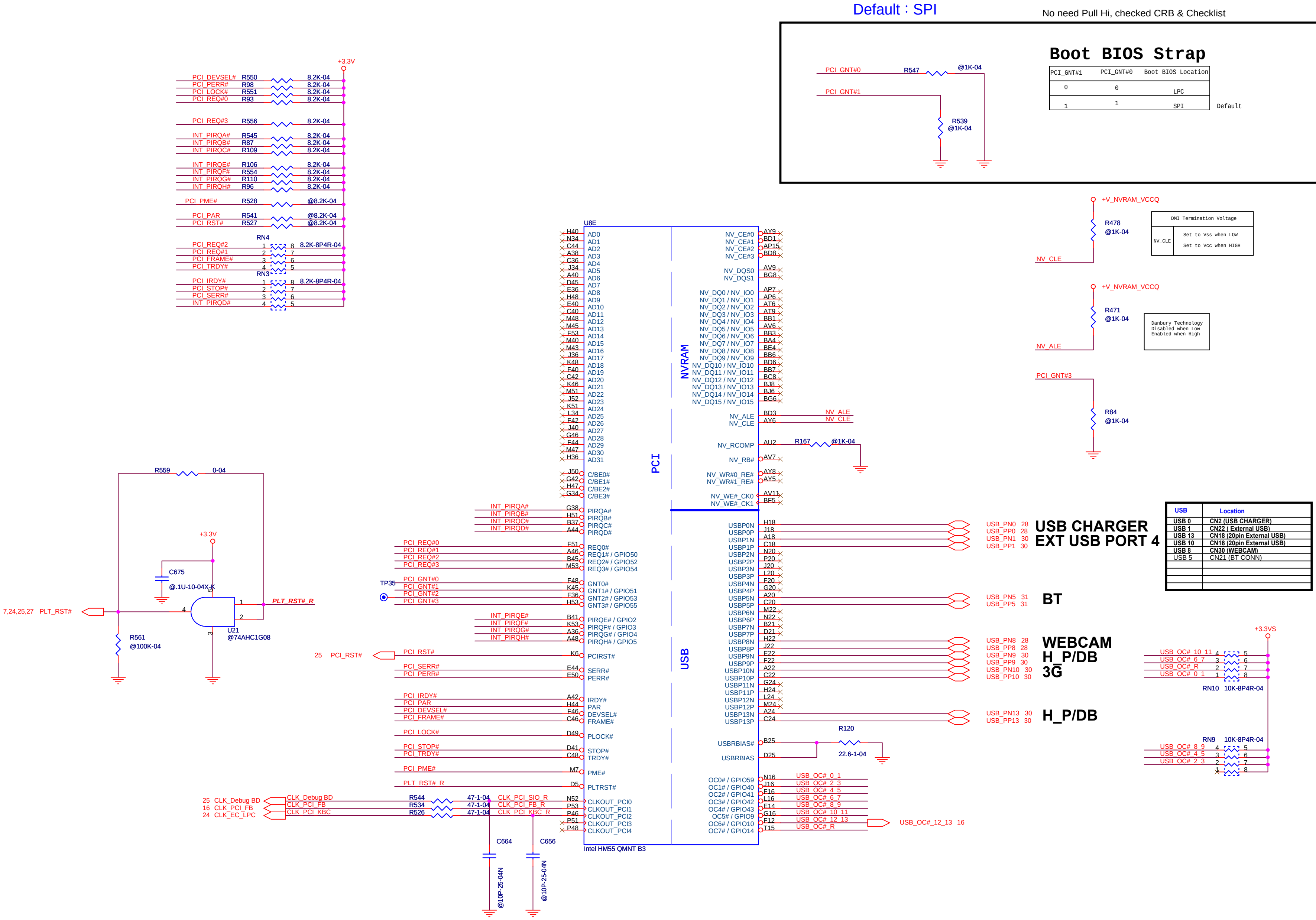

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Title	A14HM02
Size: Custom	Document Number: PCH_PCI/USB (5 of 9)
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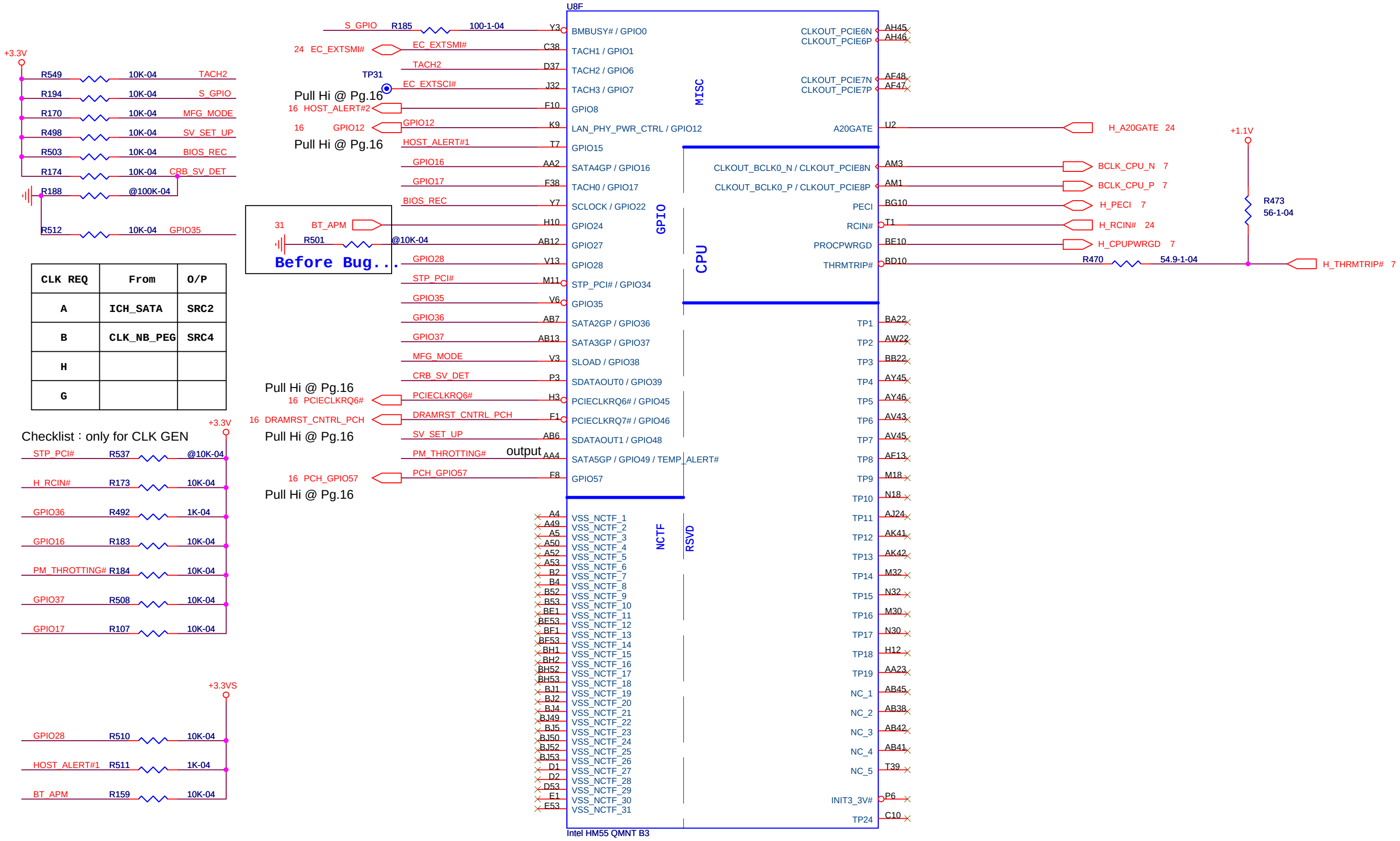

CLK REQ	From	O/P
A	ICH_SATA	SRC2
B	CLK_NB_PEG	SRC4
H		
G		

Shuttle Inc

Title: **A14HM02**

Size	Document Number	Rev
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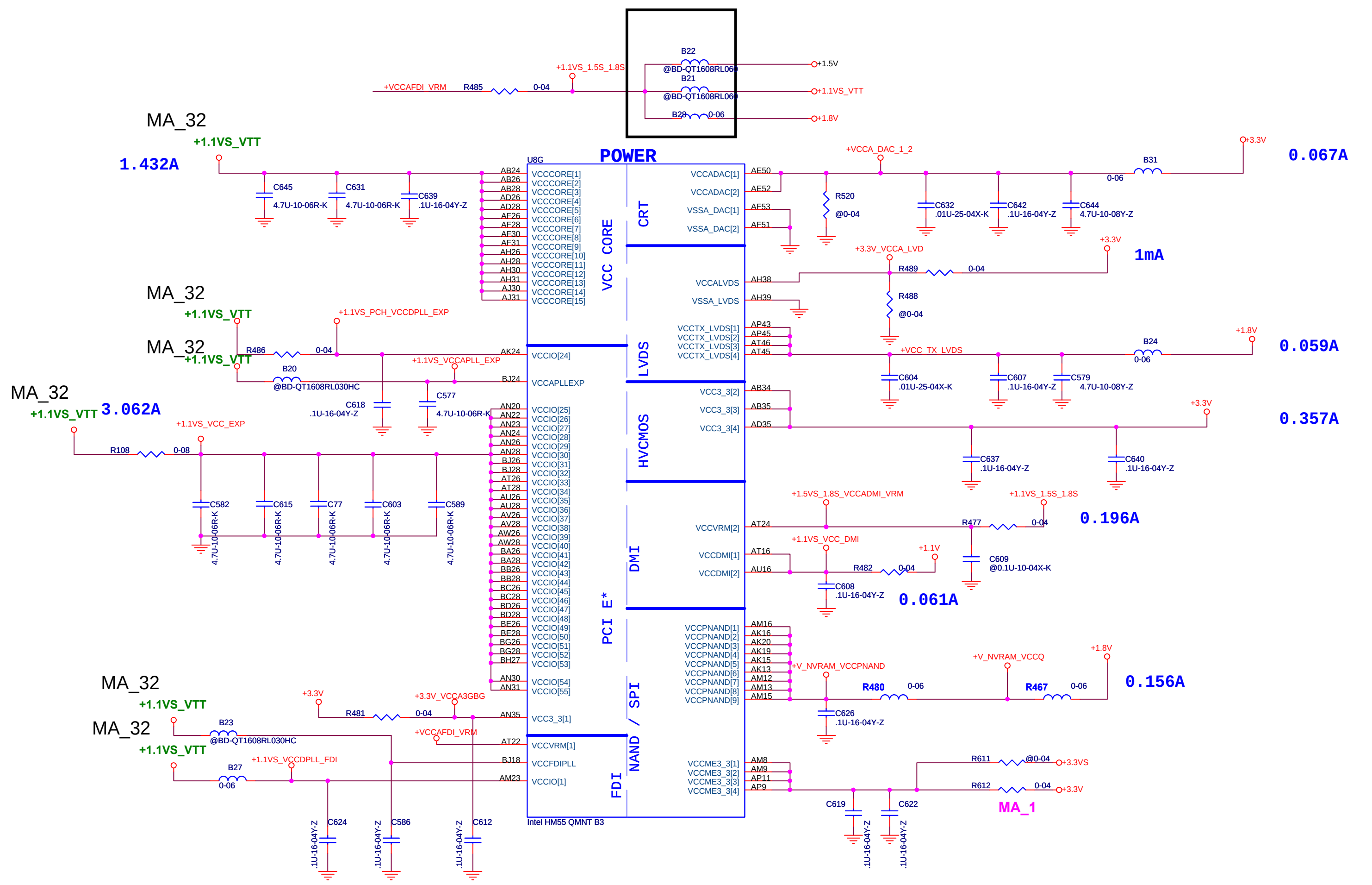

Shuttle Inc	
Title	A14HM02
Size: Custom	Document Number: PCH POWER-A (7 of 9)
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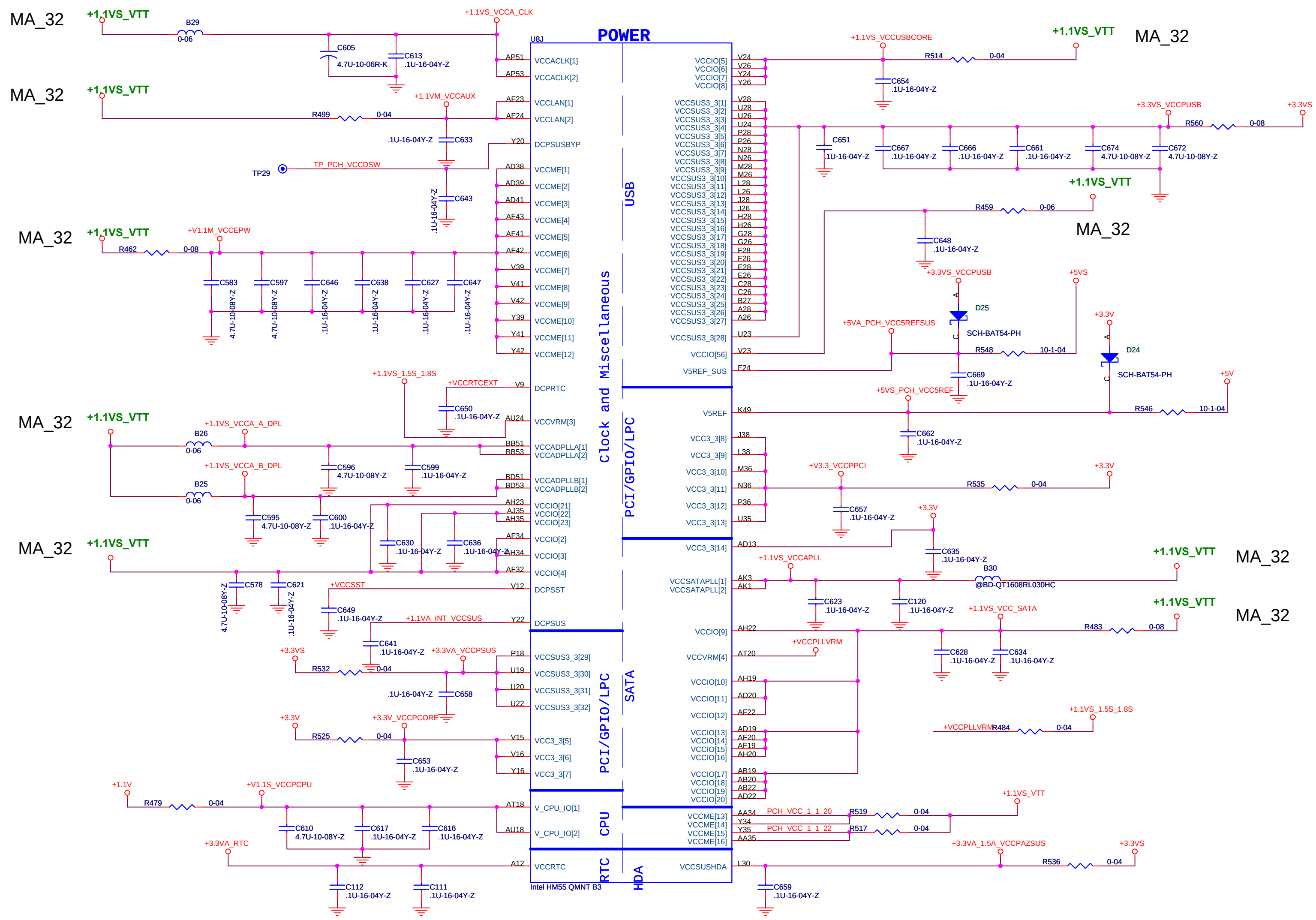

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Size: Custom	Document Number: **PCH POWER-B (8 of 9)**	Rev: **B**
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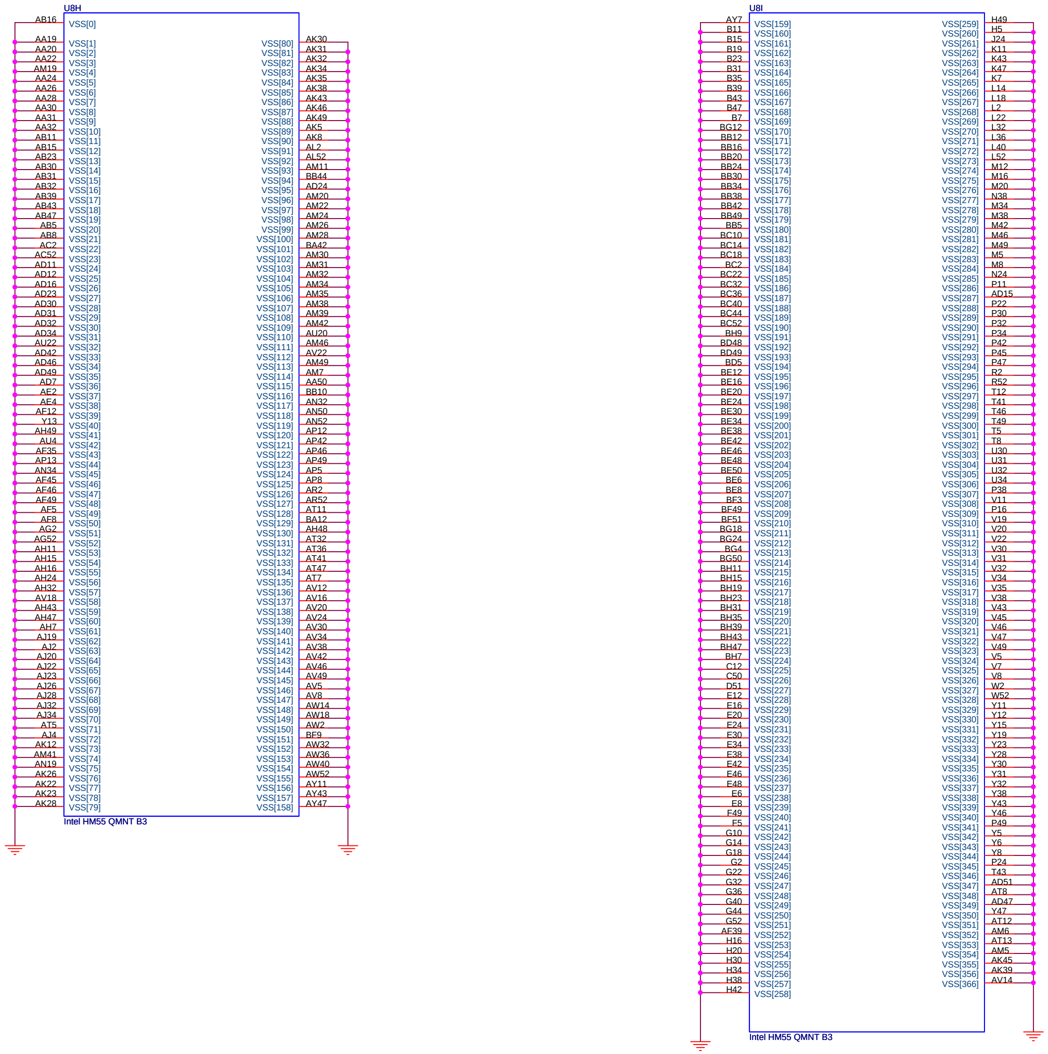

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Title: **A14HM02**

Size	Document Number	Rev
Custom	PCH GND (9 of 9)	B

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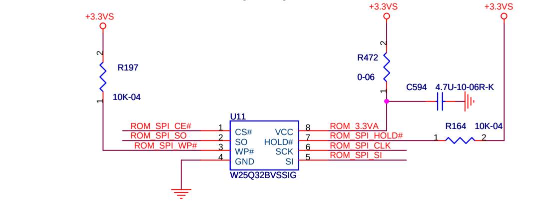
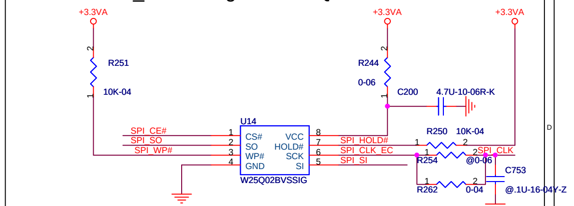
BIOS/ME FLASH ROM(SPI)



SPI ROM SIZE=4M Bytes

EC FLASH ROM(SPI)

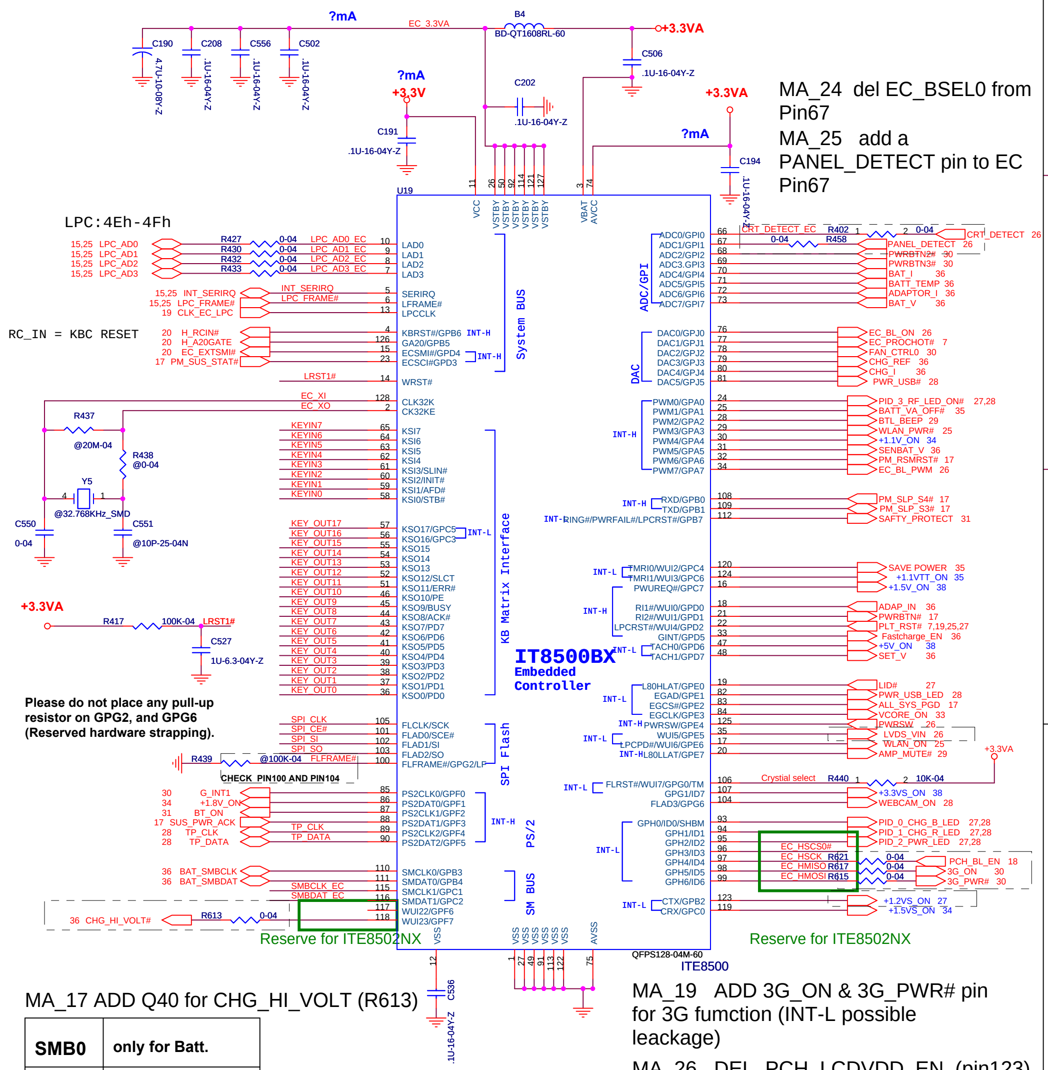
MA_38 EMI Add C753 @ SPI_CLK
MA_41 Change to W25Q02



SPI ROM SIZE=2M Bytes

LPC:4Eh-4Fh

RC_IN = KBC RESET



MA_24 del EC_BSEL0 from Pin67

MA_25 add a PANEL_DETECT pin to EC Pin67

Please do not place any pull-up resistor on GPG2, and GPG6 (Reserved hardware strapping).

MA_17 ADD Q40 for CHG_HI_VOLT (R613)

SMB0	**only for Batt.**
SMB1	**CLK GEN PCH,G-sensor**

ITE8500 only have 2-pairs SMBUS

MA_19 ADD 3G_ON & 3G_PWR# pin for 3G fumction (INT-L possible leackage)

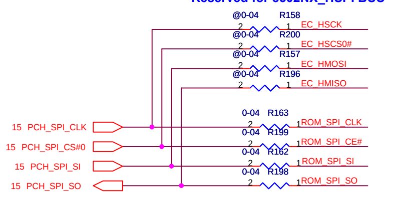
MA_26 DEL PCH_LCDVDD_EN (pin123), move +1.2VS_ON to Pin123

MA_27 Add LVDS_VIN pin to Pin 35

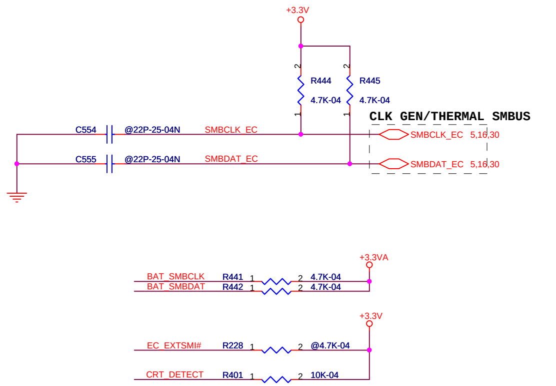
MA_31 Change PCH_BL_EN to EC pin 97

HSPI Select

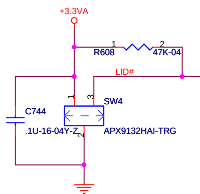
Reserved for 8502NX_HSPI BUS



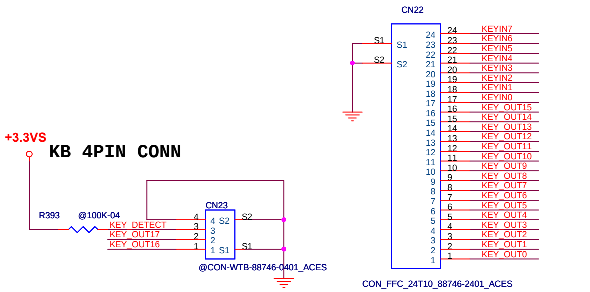
EC SMBUS LEVEL SHIFT



LID SW

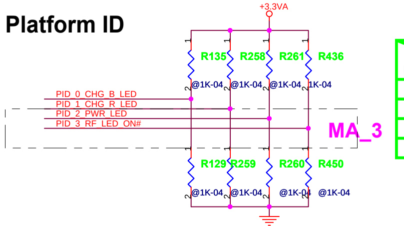


KEYBOARD Conn



Keyboard conn swap pin ok

Platform ID



ID / MODEL	(ID0)	(ID1)

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Title	**A14HM02**
Size: Custom	Document Number: **EC IT8500BX/BIOS/KB CONN** — Rev: **B**
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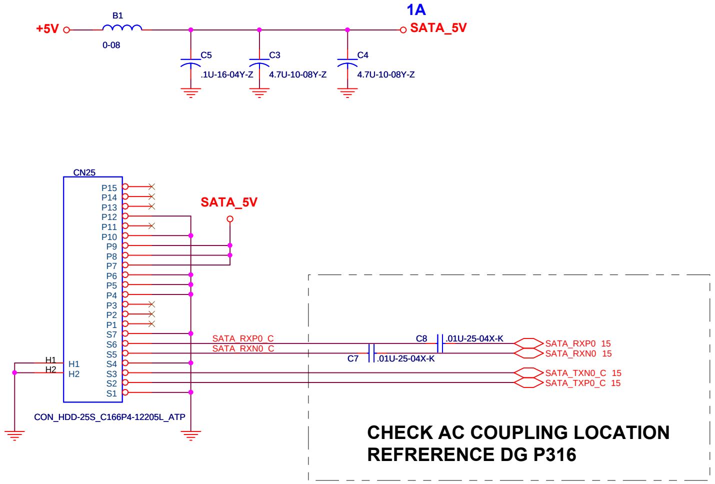
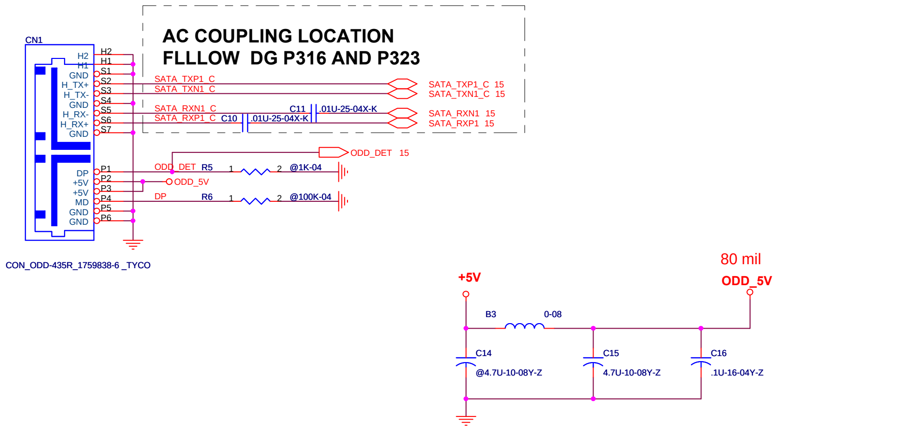
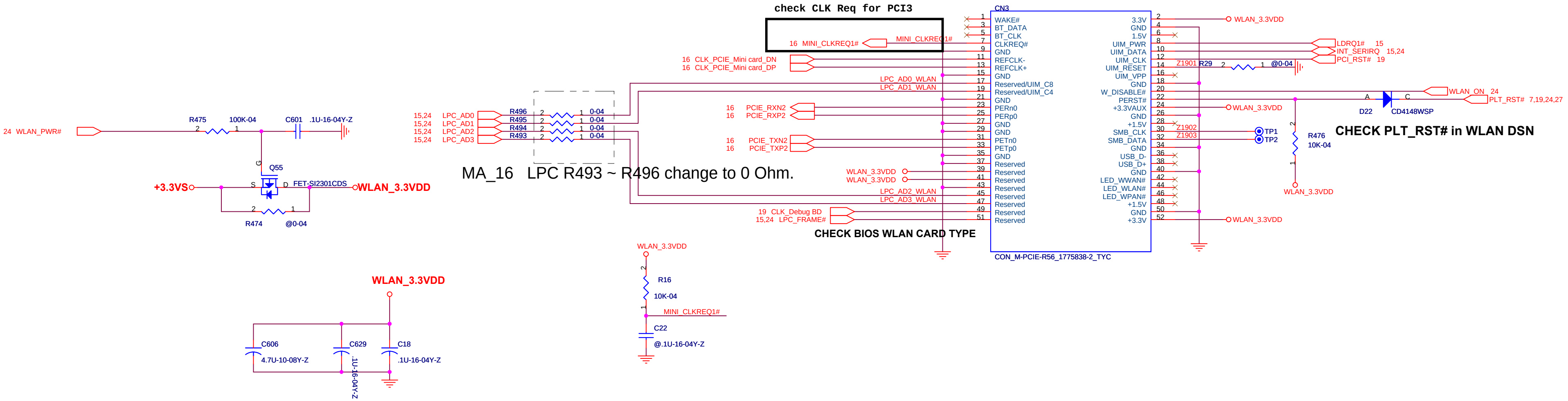
SATA-HDD



CD-ROM



MINI CARD CONN



Shuttle Inc		
Title	A14HM02	
Size Custom	Document Number HDD/ODD /MINI CARD	Rev B
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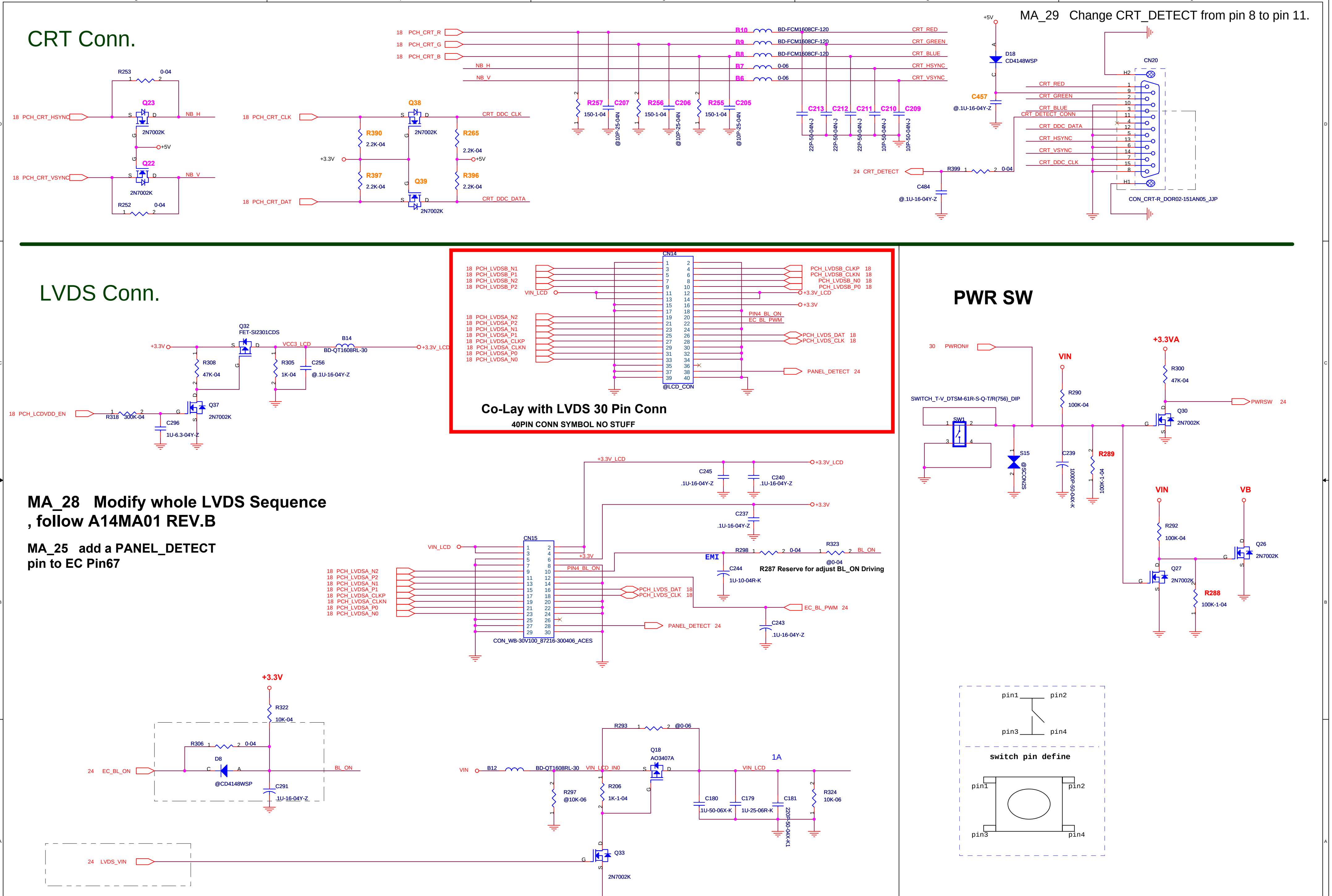
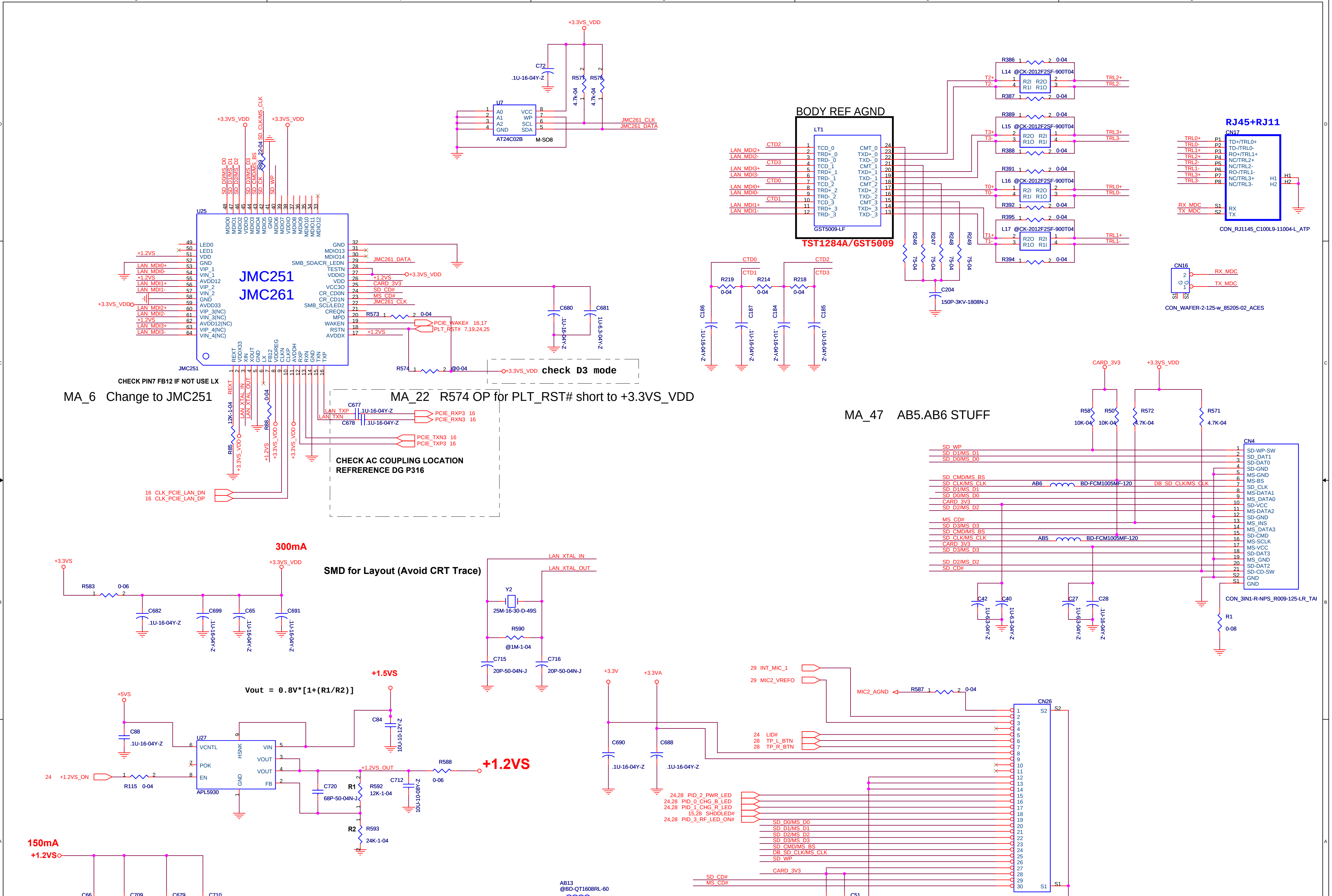


Shuttle Inc

Title: A14HM02

Size: Custom | Document Number: CRT/LVDS/PWR SW | Rev: B

Date: Monday, December 28, 2009 | Sheet 26 of 40



Shuttle Inc

Title: **A14HM02**

Size	Document Number	Rev
Custom	LAN/CARD READER/15DB/JMC251	B

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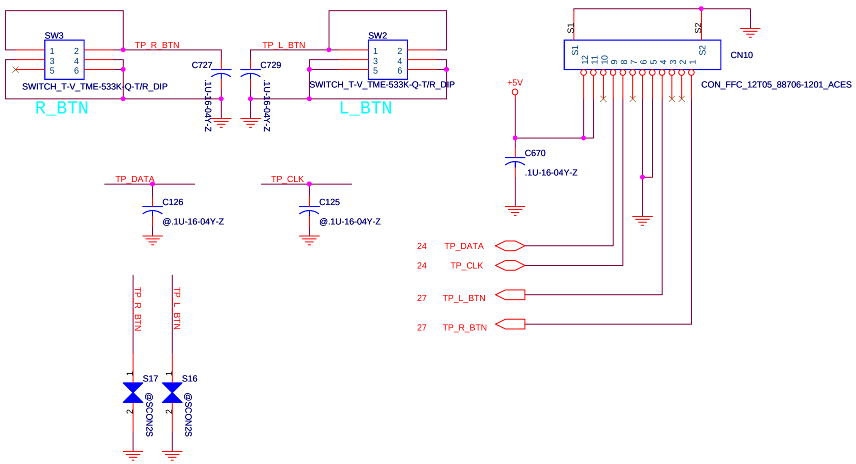
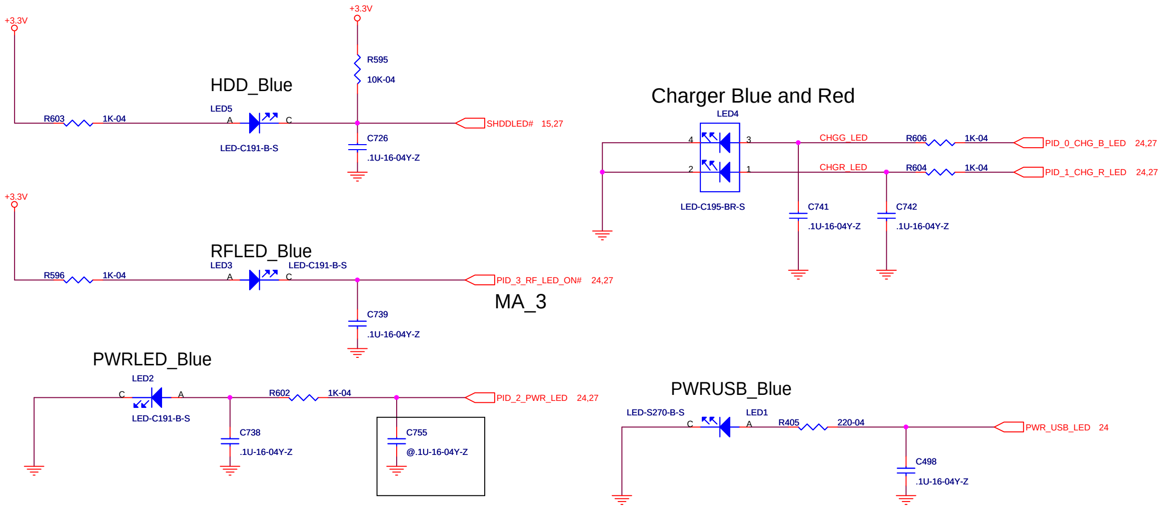
Touch Pad



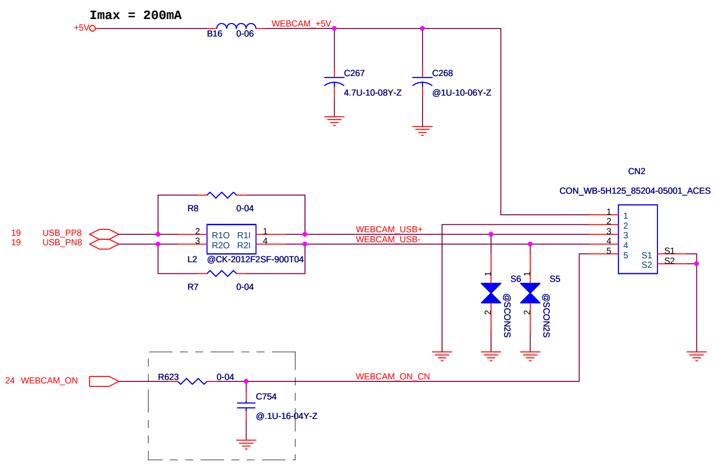
LED



MA_39 EMI Add C755 @ PID_2_PWR_LED

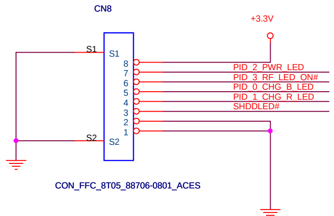
WEBCAM CON

WEBCAM_ON	
1	ON
0	OFF

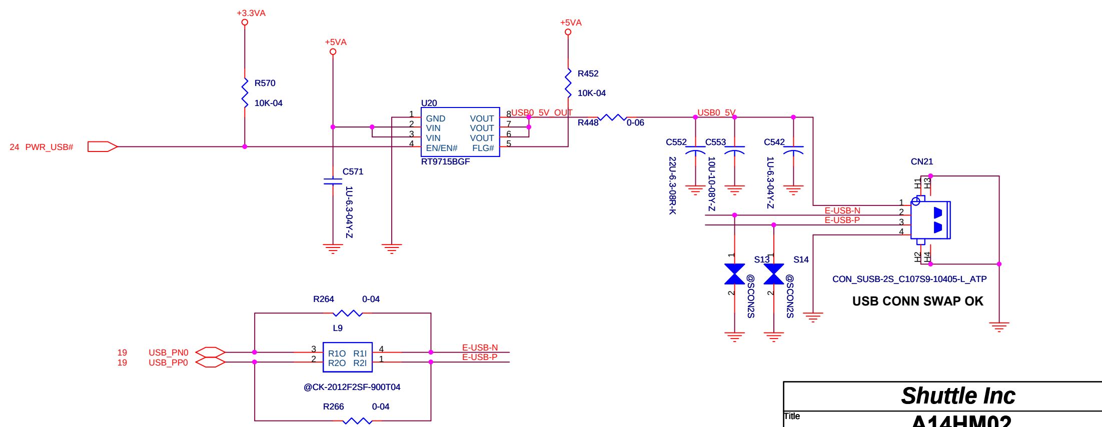


MA_40 EMI R623 C754 @WEBCAM_ON_CN

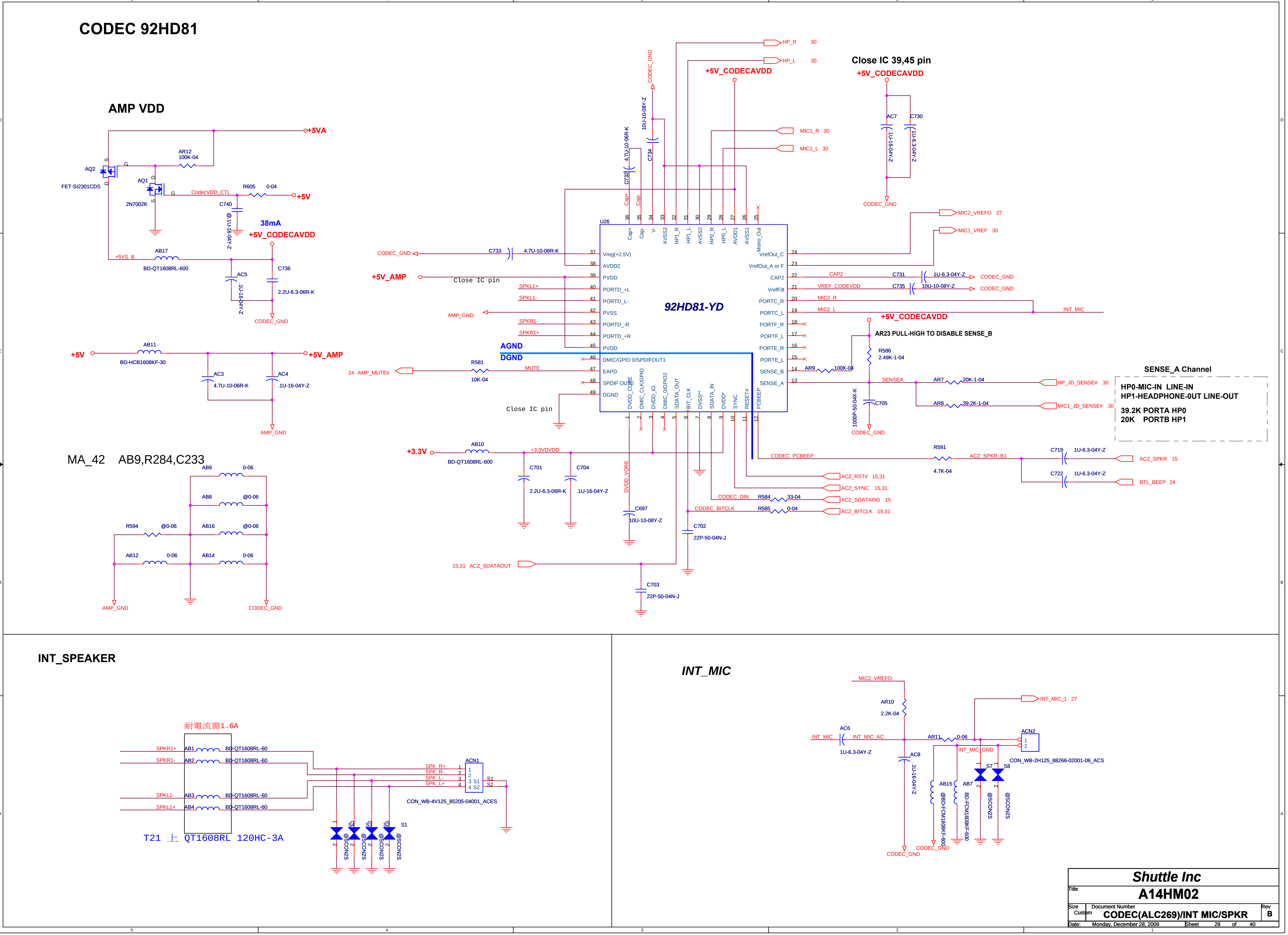
LED BD



ENHANCE USB Port

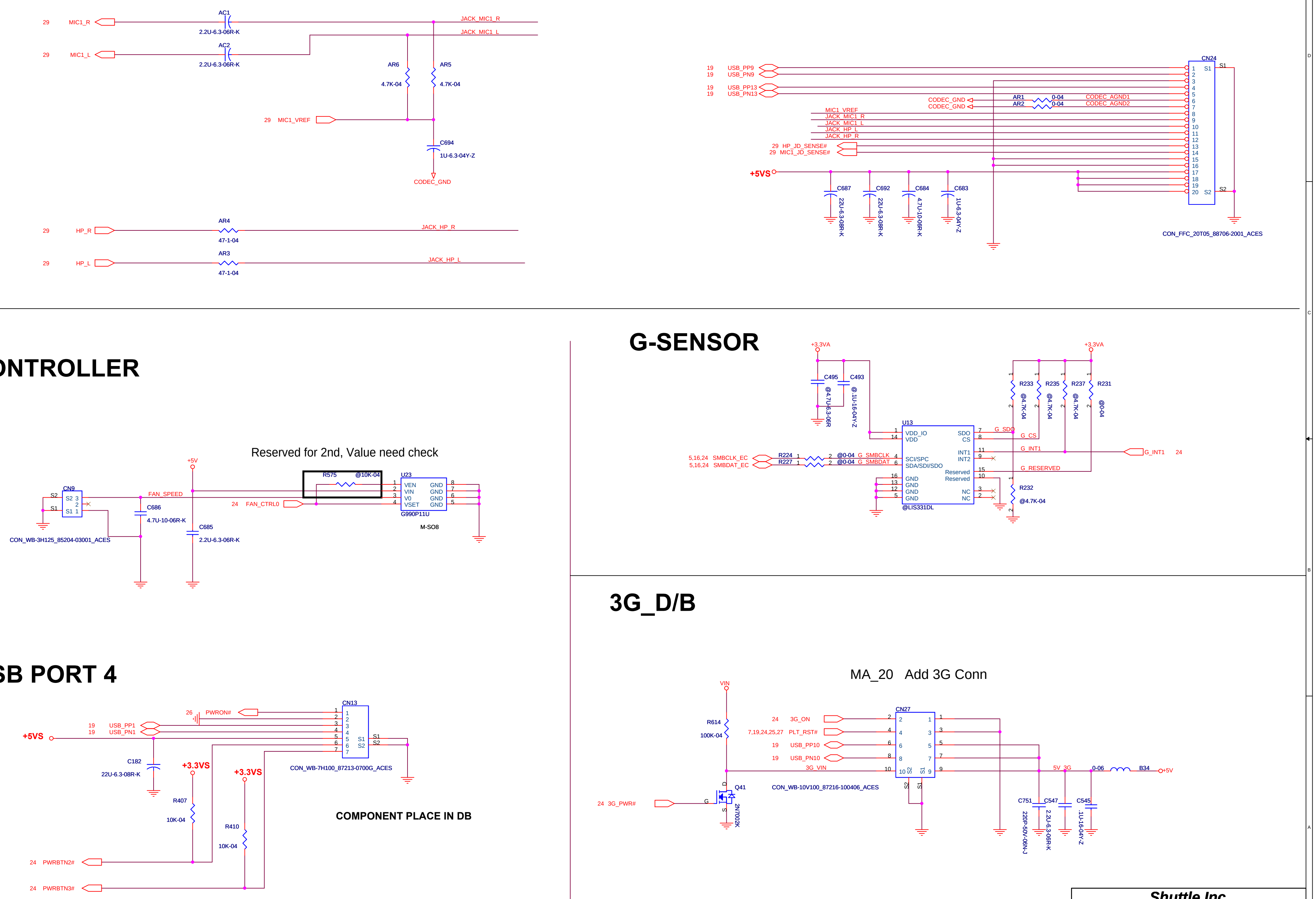


Shuttle Inc			
Title	**A14HM02**		
Size Custom	Document Number **TP/LED/WEBCAM/USB CHARGER**		Rev **B**
Date: Monday, December 28, 2009		Sheet 28 of 40	



Shuttle Inc		
Title	A14HM02	
Size: Custom	Document Number: CODEC(ALC269)/INT MIC/SPKR	Rev: B
Date: Monday, December 28, 2009	Sheet 29 of 40	

EXT MIC/EXT Line In/ EXT USB JACK



FAN CONTROLLER

G-SENSOR

Reserved for 2nd, Value need check

3G_D/B

EXT USB PORT 4

MA_20 Add 3G Conn

COMPONENT PLACE IN DB

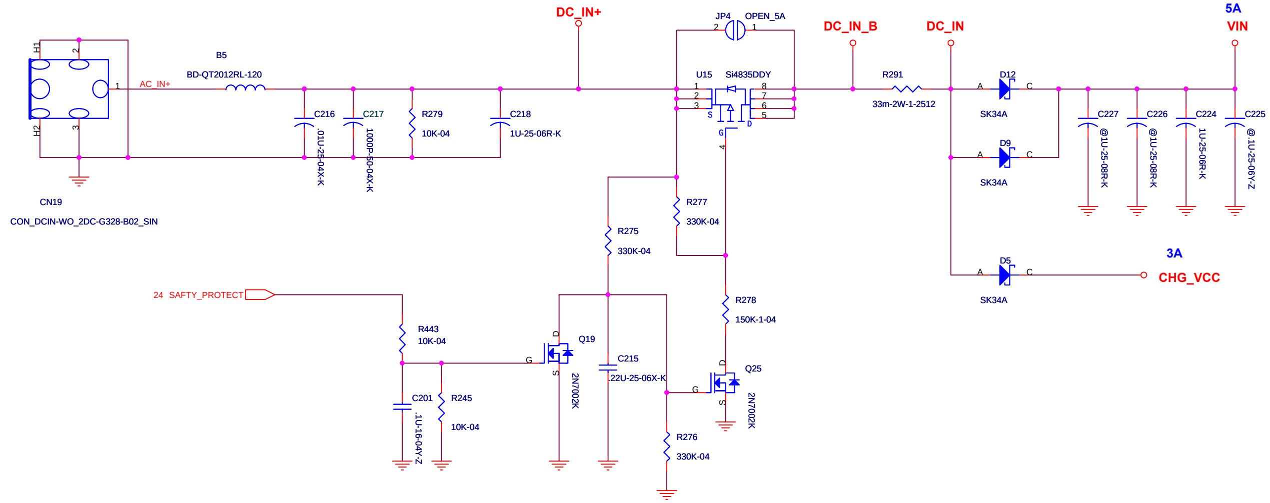
COMPONENT PLACE IN DB

CON_WB-10V100_87216-100406_ACES is SAME type as LVDS

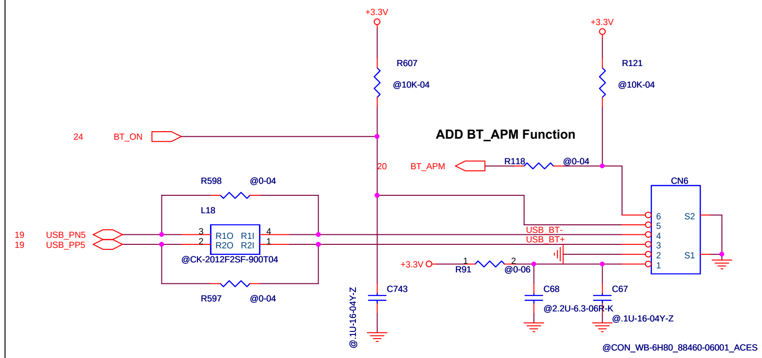
	Shuttle Inc
Title	**A14HM02**
Size Custom	Document Number **EXT_MIC/H_P/USB/FAN/G-SENSOR/3G** Rev **B**
Date:	Monday, December 28, 2009 Sheet 30 of 40

DC IN

PROJECT	A14HM02		
Adaptor	65W	90W	120W
Rsense	33m Ohm	25m Ohm	18m Ohm
Stop Charger	60W	80W	110W

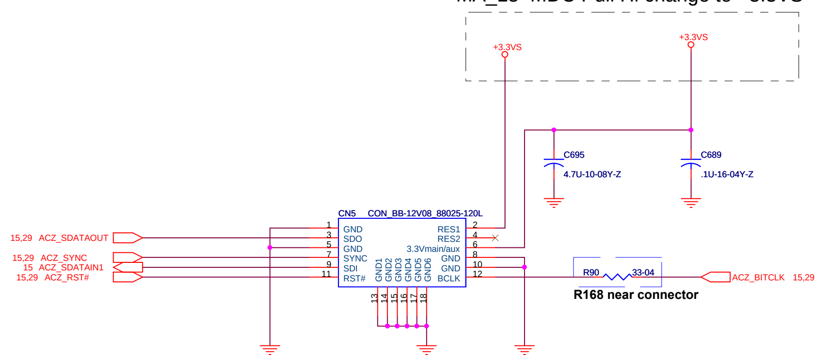


BT CONN

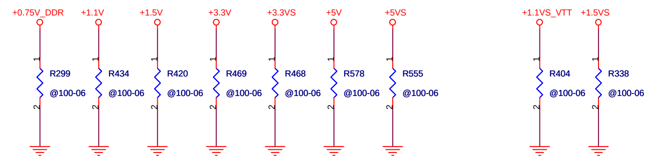


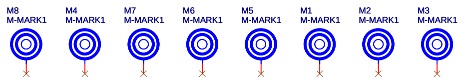
MDC

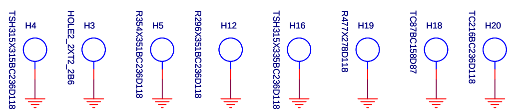
MA_15 MDC Pull Hi change to +3.3VS



Discharge Resistor





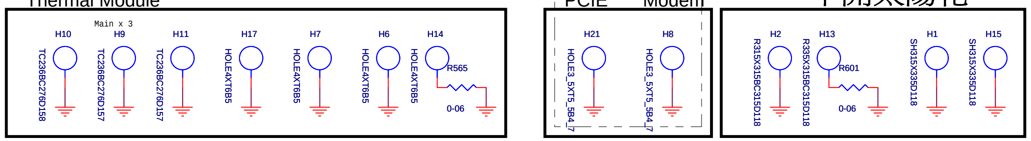


MA_8 H21 Change same footprint as H8

Thermal Module

PCIE Modem

不開太陽花



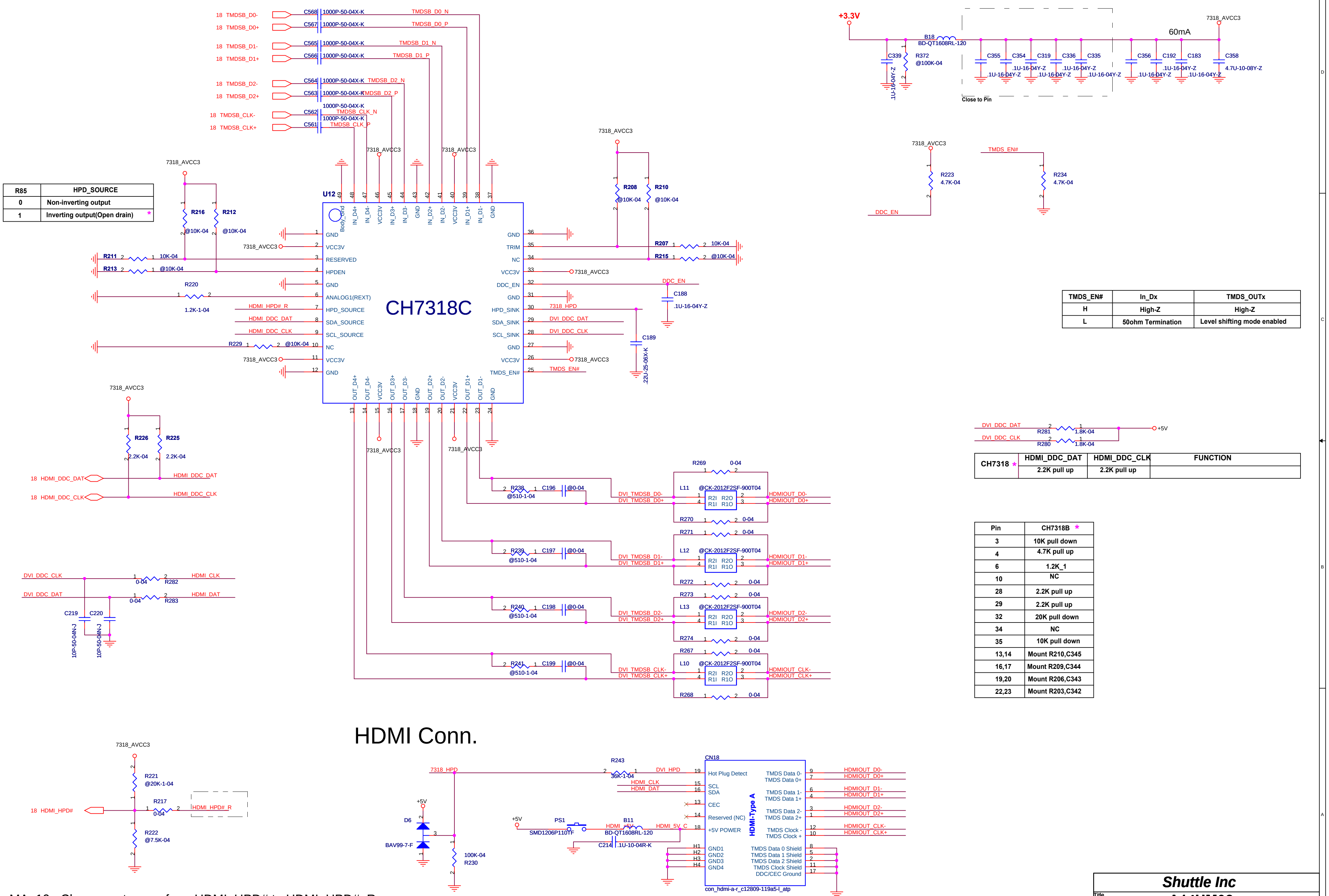
Shuttle Inc

Title: **A14HM02**

Size: Custom | Document Number: **DC IN/MDC/BT/D-Resistor** | Rev: **B**

Date: Monday, December 28, 2009 | Sheet 31 of 40

CH7318B LEVEL SHIFTER.



R85	HPD_SOURCE
0	Non-inverting output
1	Inverting output(Open drain) *

TMDS_EN#	In_Dx	TMDS_OUTx
H	High-Z	High-Z
L	50ohm Termination	Level shifting mode enabled

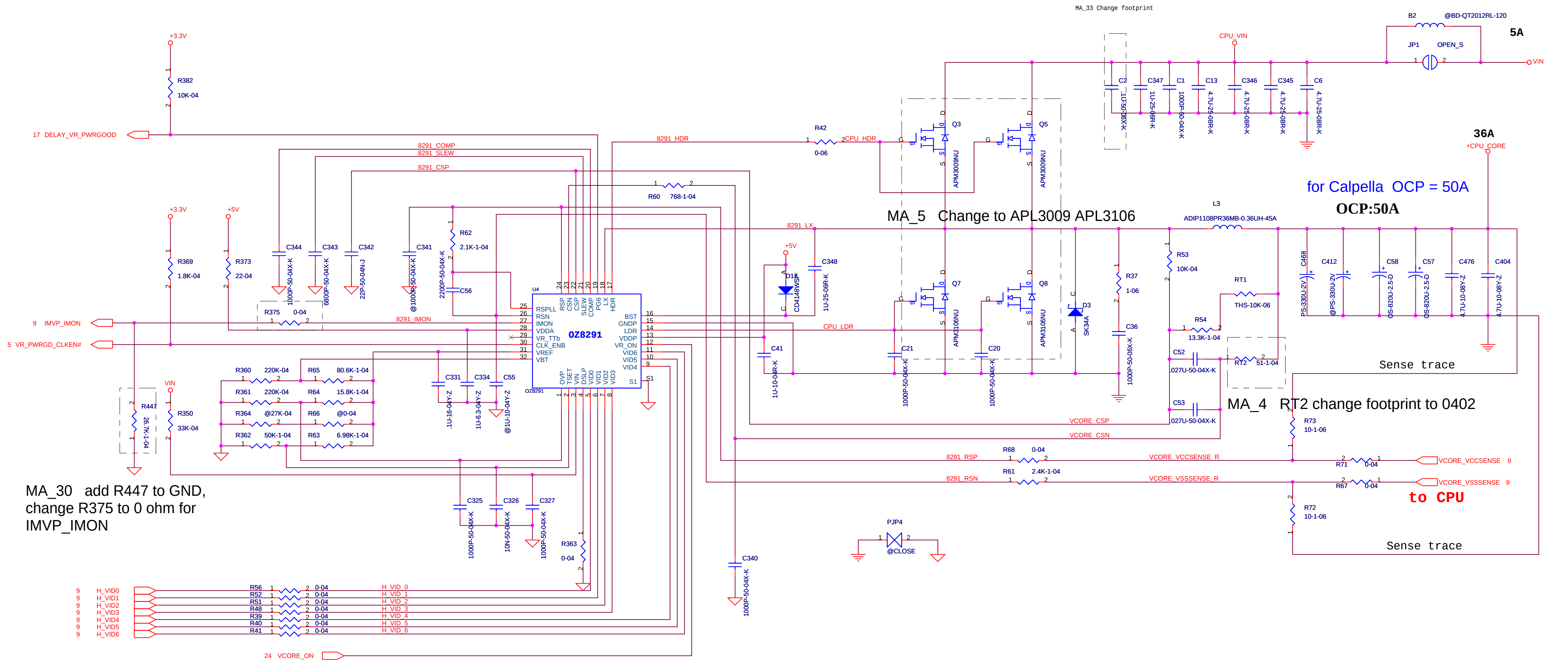
CH7318 *	HDMI_DDC_DAT	HDMI_DDC_CLK	FUNCTION
	2.2K pull up	2.2K pull up	

Pin	CH7318B *
3	10K pull down
4	4.7K pull up
6	1.2K_1
10	NC
28	2.2K pull up
29	2.2K pull up
32	20K pull down
34	NC
35	10K pull down
13,14	Mount R210,C345
16,17	Mount R209,C344
19,20	Mount R206,C343
22,23	Mount R203,C342

MA_10 Change net name from HDMI_HPD# to HDMI_HPD#_R

SMD1206P110TF => 33R-202006-E1S0

Shuttle Inc		
Title	A14HM02	
Size Custom	Document Number HDMI (CH7318C)	Rev B
Date: Monday, December 28, 2009	Sheet 32 of 40	

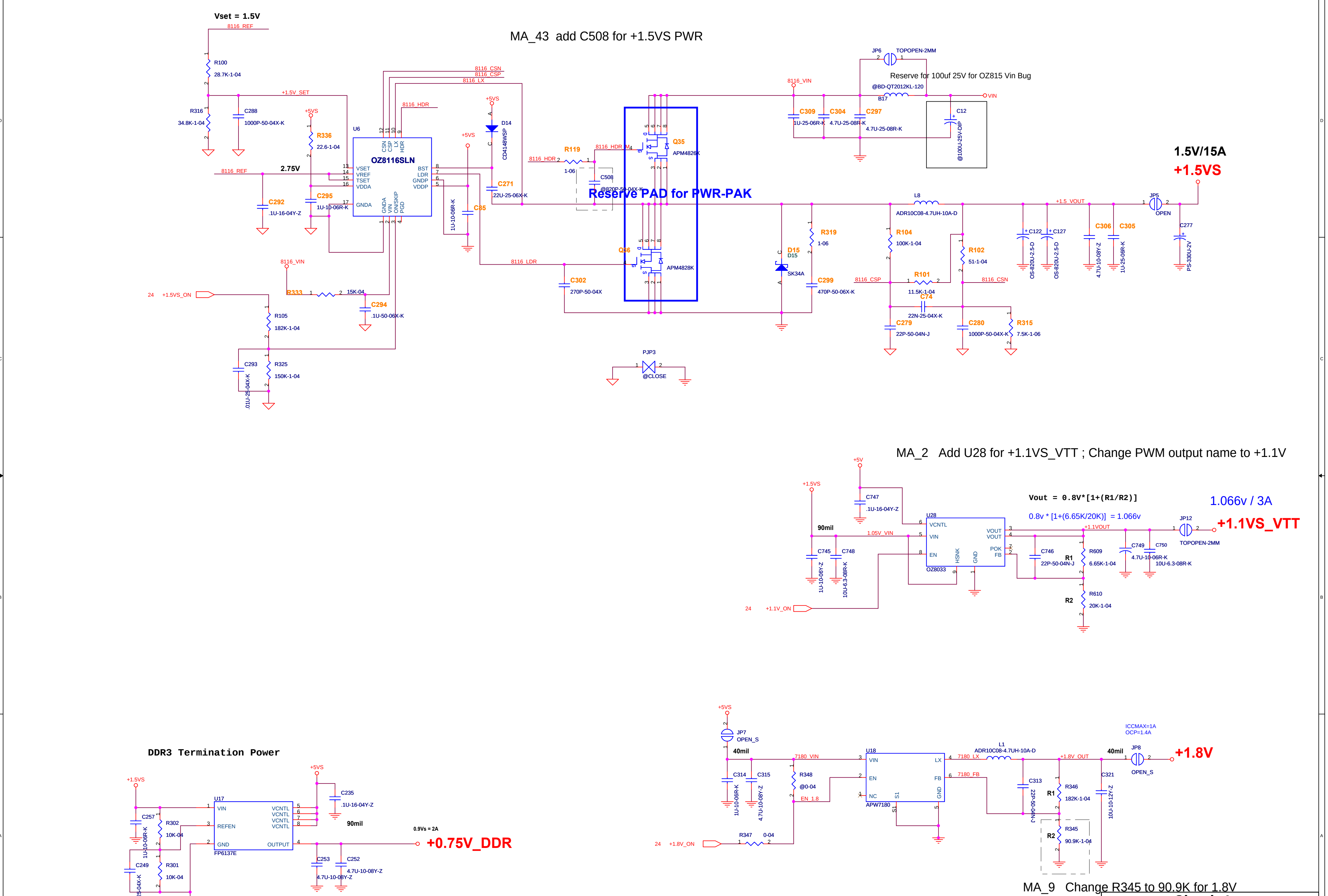


Shuttle Inc

Title: A14HM02

Size	Document Number	Rev
Custom	CPU CORE	B

Date: Monday, December 28, 2009 | Sheet 33 of 40



Shuttle Inc

Title: A14HM02

Size: Custom | Document Number: +1.5VS(OZ8116)/+0.75VS/+1.8V | Rev: B

Date: Monday, December 28, 2009 | Sheet 34 of 40

MA_37 Add R622 for VTT_SELECT (Q9 OP)

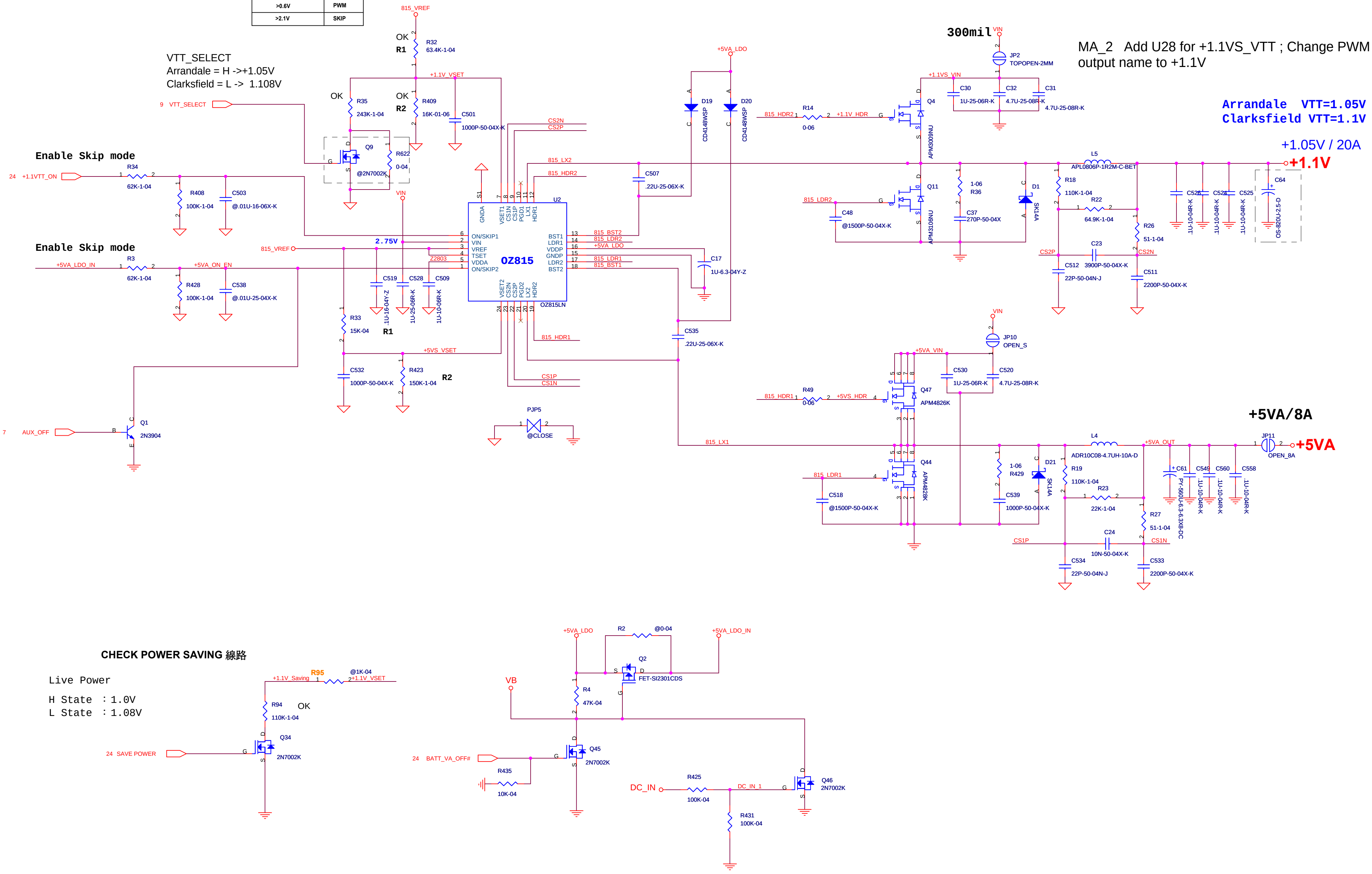
+1.8V/+5V_ON Voltage	Mode
<0.4V	OFF
>0.6V	PWM
>2.1V	SKIP

Output Voltage =[Vref x R2/(R1+R2)] x 2

MA_2 Add U28 for +1.1VS_VTT ; Change PWM output name to +1.1V

VTT_SELECT
Arrandale = H ->+1.05V
Clarksfield = L -> 1.108V

Arrandale VTT=1.05V
Clarksfield VTT=1.1V



Shuttle Inc		
Title	A14HM02	
Size: Custom	Document Number: +1.05VS/+5VA (OZ815)	Rev: B
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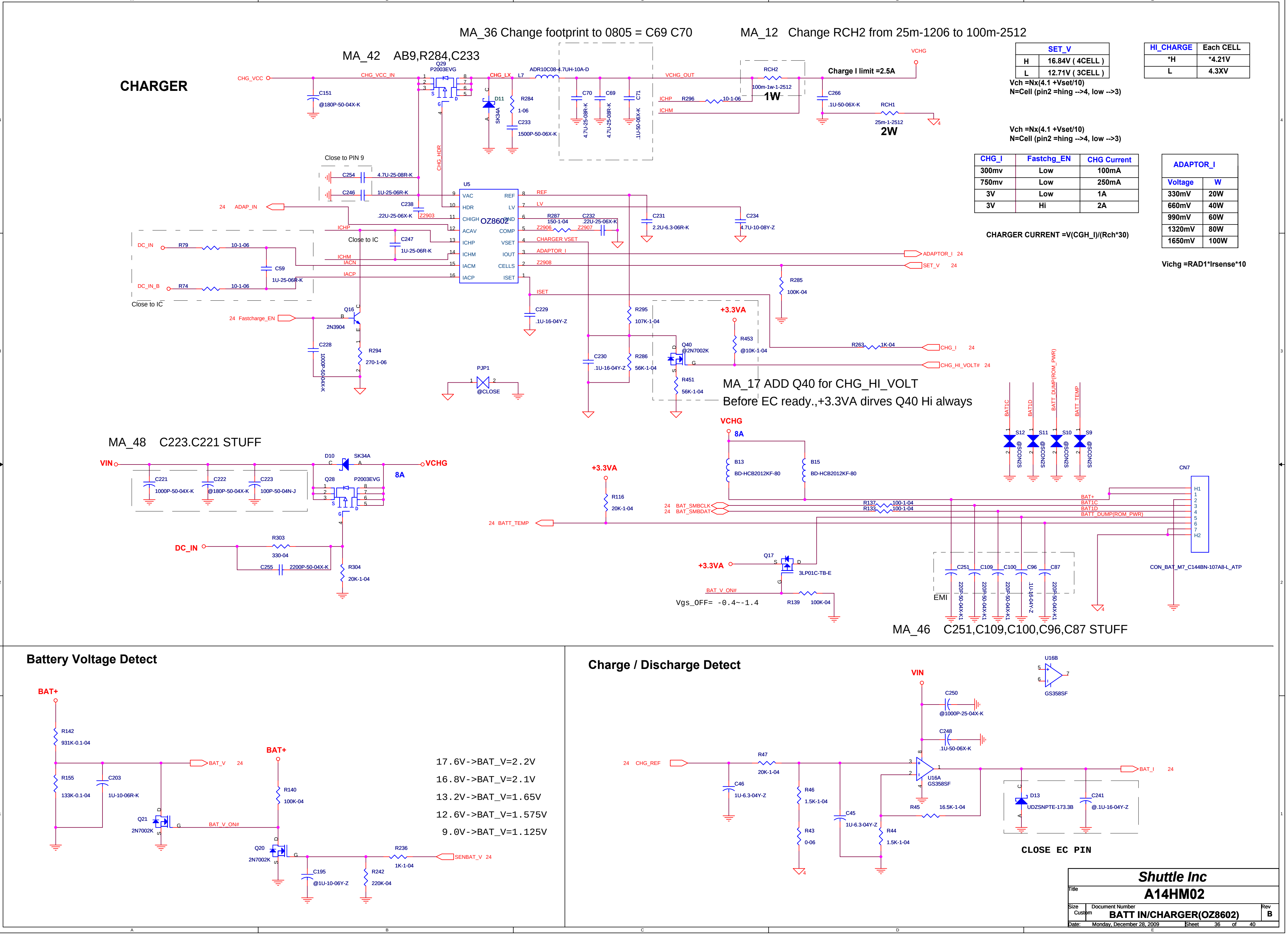
CHARGER



SET_V	
H	16.84V (4CELL)
L	12.71V (3CELL)

HI_CHARGE	Each CELL
*H	*4.21V
L	4.3XV

CHG_I	Fastchg_EN	CHG Current
300mv	Low	100mA
750mv	Low	250mA
3V	Low	1A
3V	Hi	2A

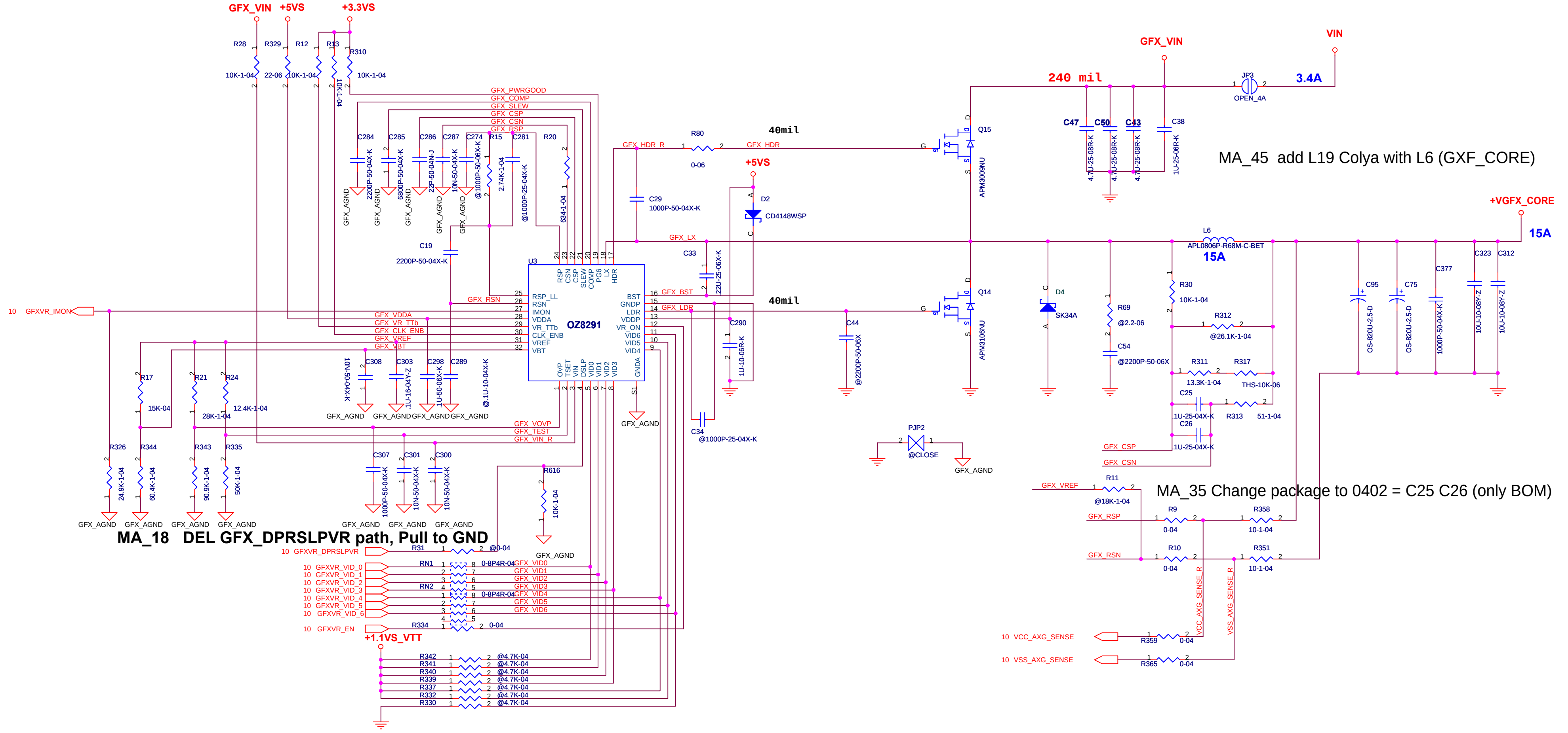
ADAPTOR_I	
Voltage	W
330mV	20W
660mV	40W
990mV	60W
1320mV	80W
1650mV	100W

Shuttle Inc

Title: A14HM02

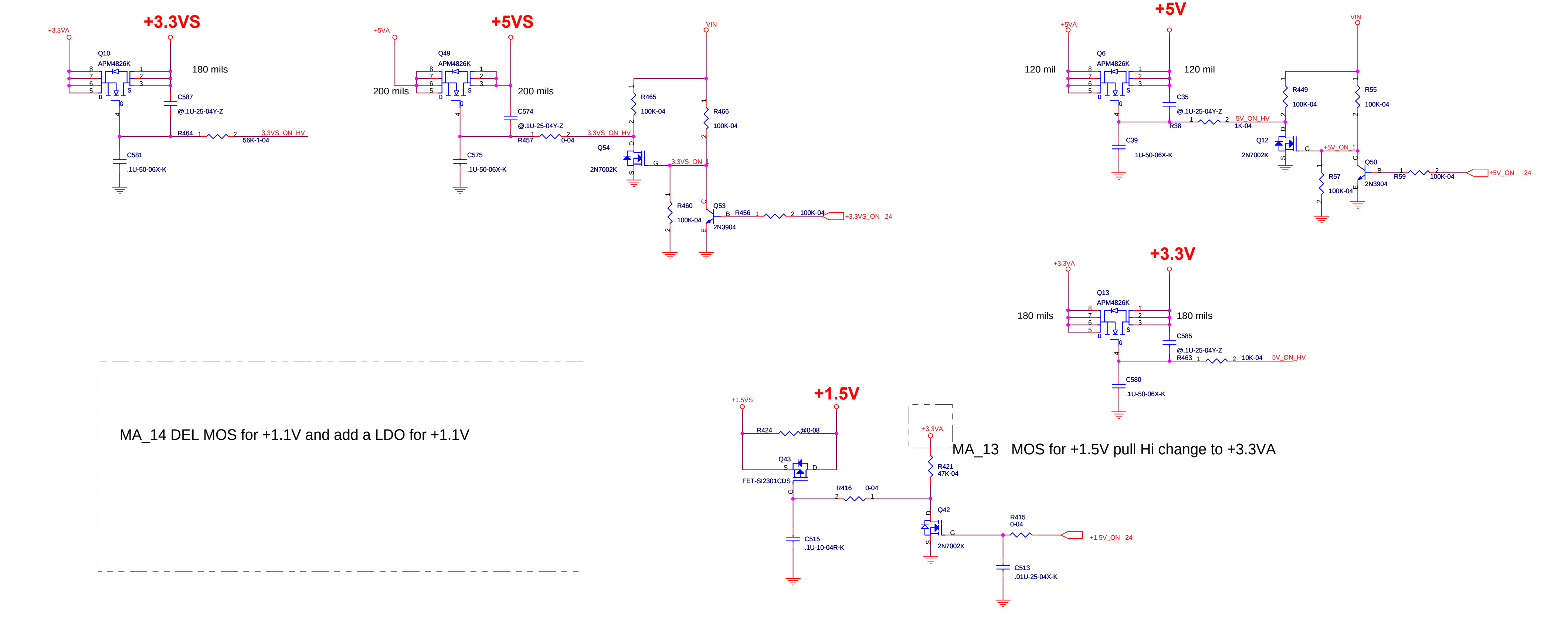
Size: Custom | Document Number: BATT IN/CHARGER(OZ8602) | Rev: B

Date: Monday, December 28, 2009 | Sheet 36 of 40

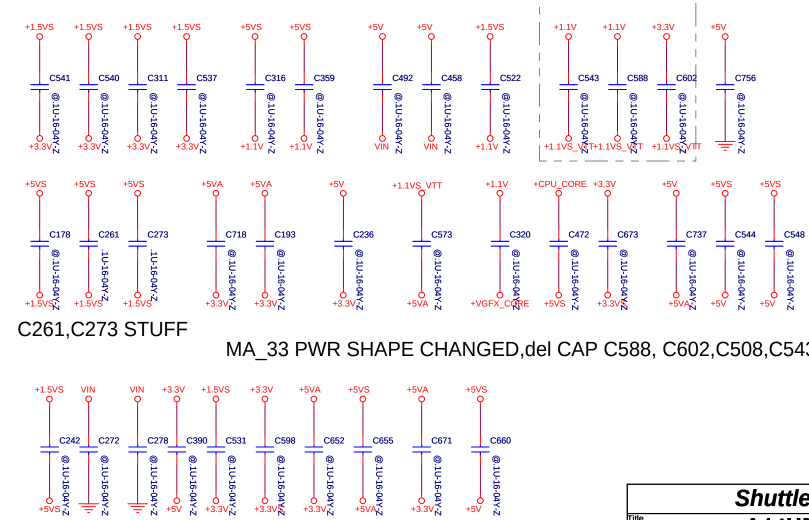


Shuttle Inc			
Title	A14HM02		
Size Custom	Document Number iGPU_CORE		Rev B
Date: Monday, December 28, 2009		Sheet 37 of 40	

VCCSW



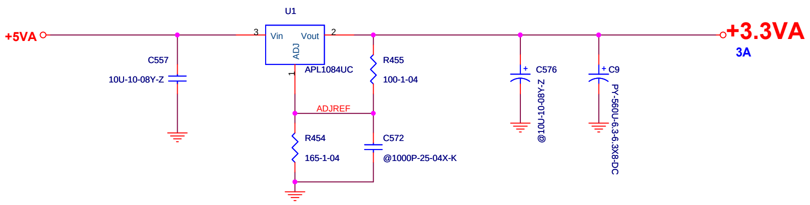
HIGH-SPEED CAP



MA_49 C261,C273 STUFF

MA_33 PWR SHAPE CHANGED,del CAP C588, C602,C508,C543, Add C543 C588 C602

LDO



Shuttle Inc	
Title	**A14HM02**
Size Custom	Document Number: **VCC SW/+3.3VA/HIGH-SPEED CAP** — Rev **B**
Date: Monday, December 28, 2009	Sheet 38 of 40

5 4 3 2 1

D

C

B

A

Shuttle Inc		
Title	**A14HM02**	
Size Custom	Document Number RESERVED	Rev **B**
Date: Monday, December 28, 2009	Sheet 39 of 40	

MA_1 MA3 RF_LED_ON# change to PID_3_RF_LED_ON# ,add Pull HI +3.3VA (1K)
MA_2 Add U28 for +1.1VS_VTT ; Change PWM output name to +1.1V
MA_3 RF_LED_ON# change to PID_3_RF_LED_ON# ,add Pull HI +3.3VA (1K)
MA_4 RT2 change footprint to 0402
MA_5 Q3 Q5 Q7 Q8 Change to APL3009 APL3106
MA_6 Change to JMC251 (ONLY BOM)
MA_7 Change to CH7318C (ONLY BOM)
MA_8 H21 Change same footprint as H8
MA_9 Change R345 to 90.9K for 1.8V
MA_10 Change net name from HDMI_HPD# to HDMI_HPD#_R
MA_11 Change JP9 to TOPOPEN-2MM
MA_12 Change RCH2 from 25m-1206 to 100m-2512
MA_13 MOS for +1.5V pull Hi change to +3.3VA
MA_14 follow MA_2, DEL MOS for +1.1V and add a LDO for +1.1V
MA_15 MDC Pull Hi change to +3.3VS
MA_16 LPC R493 to R496 change to 0 Ohm.
MA_17 ADD Q40 for CHG_HI_VOLT (R613)
MA_18 DEL GFX_DPRSLPVR path, Pull to GND (R31 OP ,Add R616)
MA_19 ADD 3G_ON & 3G_PWR# pin for 3G function
MA_20 Add 3G Conn
MA_21 R563 OP for DELAY_VR_PWRGD Double Pull Hi
MA_22 R574 OP for PLT_RST# short to +3.3VS_VDD
MA_23 add a 2N7002 circuit for CLKGEN_EN 轉態
MA_24 Del EC_BSEL0 from EC Pin67 ,
MA_25 add a PANEL_DETECT pin to EC Pin67
MA_26 DEL PCH_LCDVDD_EN (pin123), move +1.2VS_ON to Pin123
MA_27 Add LVDS_VIN pin to Pin 35
MA_28 Add whole LVDS Sequence , follow A14MA01 REV.B
MA_29 Change CRT_DETECT from pin 8 to pin 11.
MA_30 add R447 to GND, change R375 to 0 ohm for IMVP_IMON
MA_31 Change PCH_BL_EN to EC pin 97
MA_32 PCH power plane changes to +1.1VS_VTT => Follow CRB
MA_33 PWR SHAPE CHANGED,del CAP C588, C602,C508,C543, Add C543 C588 C602
MA_34 Change footprint C2
MA_35 Change package to 0402 = C25 C26 (only BOM)
MA_36 Change footprint to 0805 = C69 C70
MA_37 Add R622 for VTT_SELECT (Q9 OP)
MA_38 EMI Add C753 @ SPI_CLK
MA_39 EMI Add C755 @ PID_2_PWR_LED
MA_40 EMI R623 C754 @WEBCAM_ON_CN
MA_41 Change to W25Q02
*MA_42 AB9,R284,C233 STUFF
MA_43 add C508 for +1.5VS PWR
*MA_45 C115,C114,C113,C121,C115,C116 STUFF
*MA_46 C251,C109,C100,C96,C87 STUFF
*MA_47 AB5.AB6 STUFF
*MA_48 C223.C221 STUFF
*MA_49 C261,C273 STUFF

* = EMI Modified.

Shuttle Inc		
Title: A14HM02		
Size: Custom	Document Number: REV.A HISTORY	Rev: B
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