

Arroyo DVT Schematics

PCB Version : 715G4788M0D XTAL LIST

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	PARTS	DIP/SMT	Frequency	PPM	CL
1	X2	SMT	25MHz	±20	12pF/15pF
2	X3	SMT	NC/25MHz	±20	10pF/10pF
3	X4	SMT	32.768KHz	±20	10pF/8.2pF
4	X5	SMT	25MHz	±20	12pF/15pF
5	X6	SMT	NC/32.768KHz	±20	12pF/12pF

USB LIST

PORT	NET NAME	FUNCTION
USB_HSD0P/N	USB0_DEBUG_P/N	REAR IO
USB_HSD1P/N	USB1P/N	REAR IO
USB_HSD2P/N	USB2P/N	REAR IO
USB_HSD3P/N	USB3P/N	REAR IO
USB_HSD4P/N	USB4P/N	SIDE IO
USB_HSD5P/N	USB5P/N	SIDE IO
USB_HSD8P/N	USB8_WLAN_P/N	WLAN/BT
USB_HSD11P/N	USB11_WEBCAM_P/N	WEBCAM

SATA LIST

PORT	NET NAME	FUNCTION
SATA_TX0P/N	SATA0_TXP/N	SATA HDD
SATA_RX0P/N	SATA0_RXP/N	
SATA_TX1P/N	SATA1_TXP/N	SATA ODD
SATA_RX1P/N	SATA1_RXP/N	

PCI-E LIST

PORT	NET NAME	FUNCTION
GPP_TX3P/N	PCIE_WLAN_TXP/N	WIRELESS LAN
GPP_RX3P/N	PCIE_WLAN_RXP/N	
GPP_TX1P/N	PCIE_LAN_TXP/N	LAN
GPP_RX1P/N	PCIE_LAN_RXP/N	
GPP_TX2P/N	PCIE_CARD_TXP/N	CARDREADER
GPP_RX2P/N	PCIE_CARD_RXP/N	

POWER STATES

STATE SIGNAL	VOTAGE	S0	S3	S5	G3	REMARK
FCH_SLP_S3#	-	HIGH	LOW	LOW	LOW	
FCH_SLP_S5#	-	HIGH	HIGH	LOW	LOW	
S5_PWR_ON	-	HIGH	HIGH	HIGH	LOW	S5_PWR_ON
+VBAT_IN	+3.3V	O	O	O	O	COIN BATTERY
+VIN	+19V	O	O	O	X	DC-IN
+3V_ALW/+5V_ALW	+3.3V/+5V	O	O	O	X	
+3V_S5	+3.3V	O	O	O	X	
+1.1V_S5	+1.1V	O	O	O	X	
+5V_S3	+5V	O	O	X	X	
+3V_S3	+3.3V	O	O	X	X	
+VDDIO_MEM	+1.5V	O	O	X	X	
+1.1V_S3	+1.1V	O	O	X	X	
+MEM_VTT	+0.75V	O	X	X	X	
+3V_S0/+5V_S0	+3.3V/+5V	O	X	X	X	
+1.8V_S0	+1.8V	O	X	X	X	
+12V_S0	+12V	O	X	X	X	
+1.1V_S0	+1.1	O	X	X	X	
+1.5V_S0	+1.5V	O	X	X	X	
+1.2V_S0	+1.2	O	X	X	X	
+1.05V_S0	+1.05V	O	X	X	X	
+VDDCR_CPU	SVC/SVD	O	X	X	X	
+VDDCR_NB	SVC/SVD	O	X	X	X	

ALWAYS

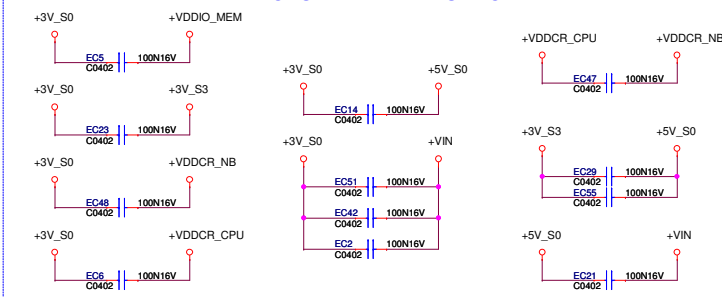
DC-in ALWAYS

S5

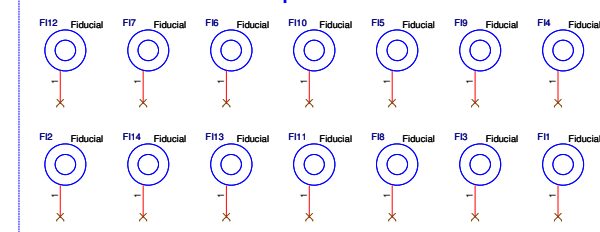
S3

S0

EMC POWER PLANE MOAT CAP

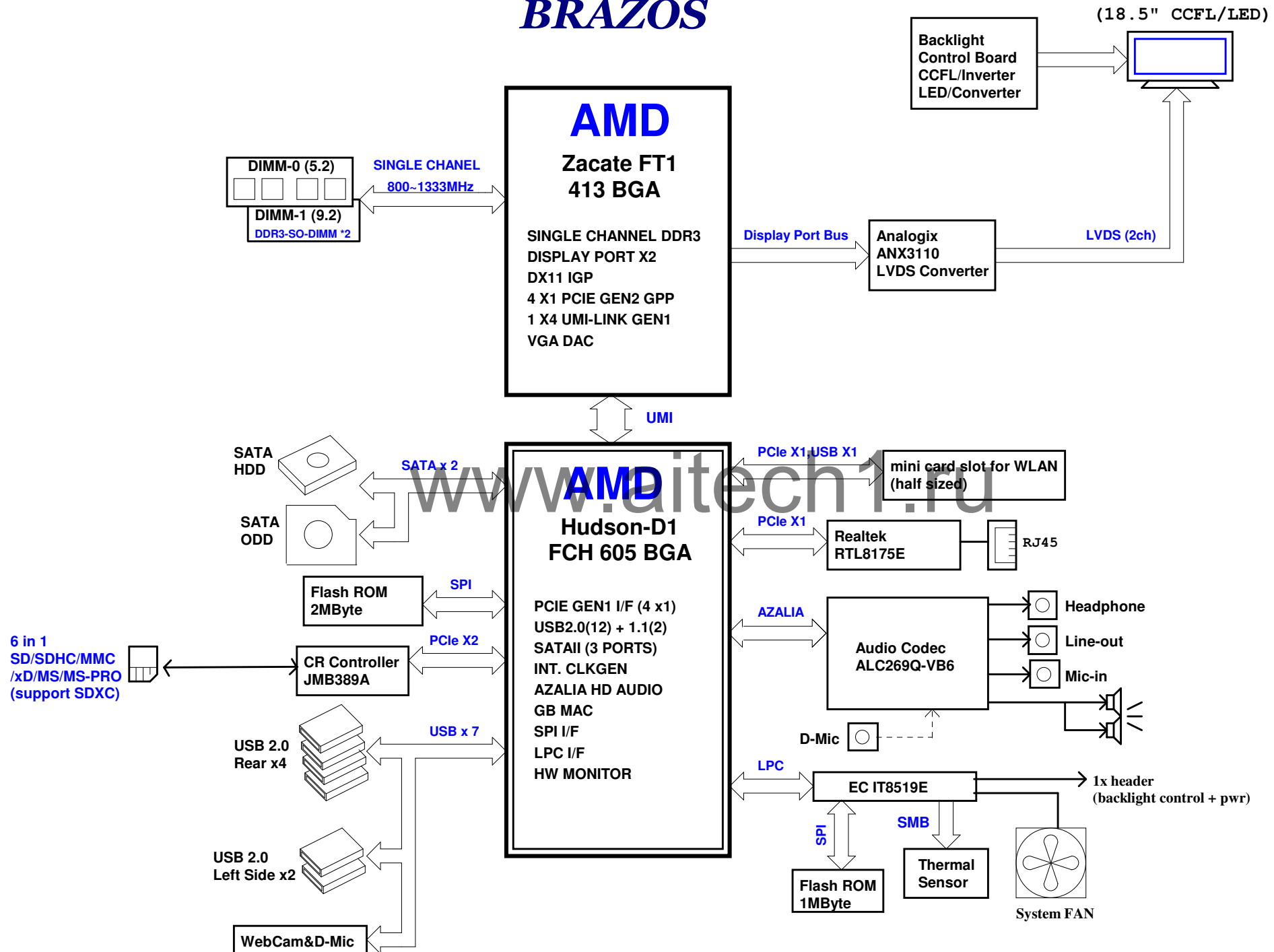


Optical Point



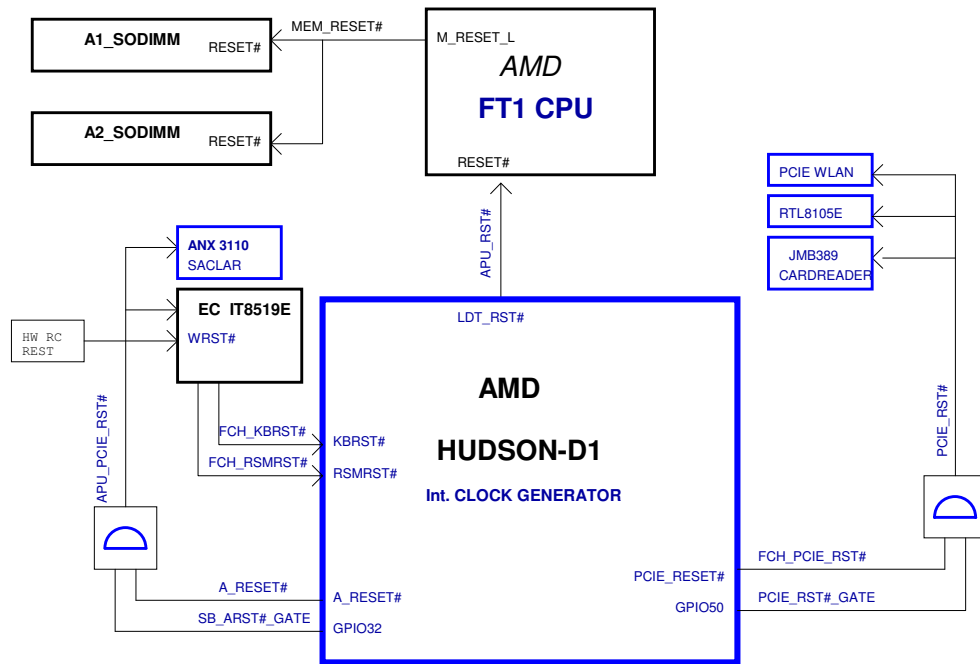
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TPV MODEL	715G4788M0D	Ellsworth	Rev	M0E
Key Component	TABLE OF CONTENTS	PCB NAME	715G4788M0D	
Date	Thursday, February 24, 2011	Sheet	1 of 27	備註 <備註>

BRAZOS

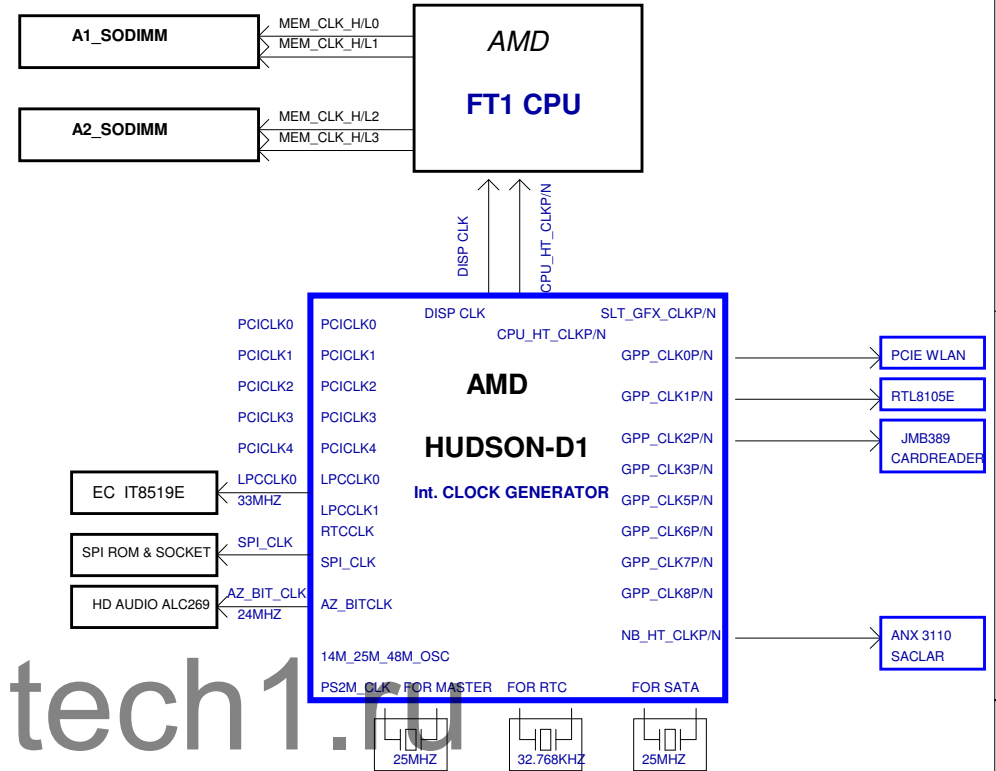


TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
TPV MODEL	715G4789M0D	Ellsworth	Rev	M0E
Key Component	SYSTEM BLOCK DIAGRAM	PCB NAME	715G4789M0D	備註 <備註>
Date	Thursday, February 24, 2011	Sheet	2 of 27	

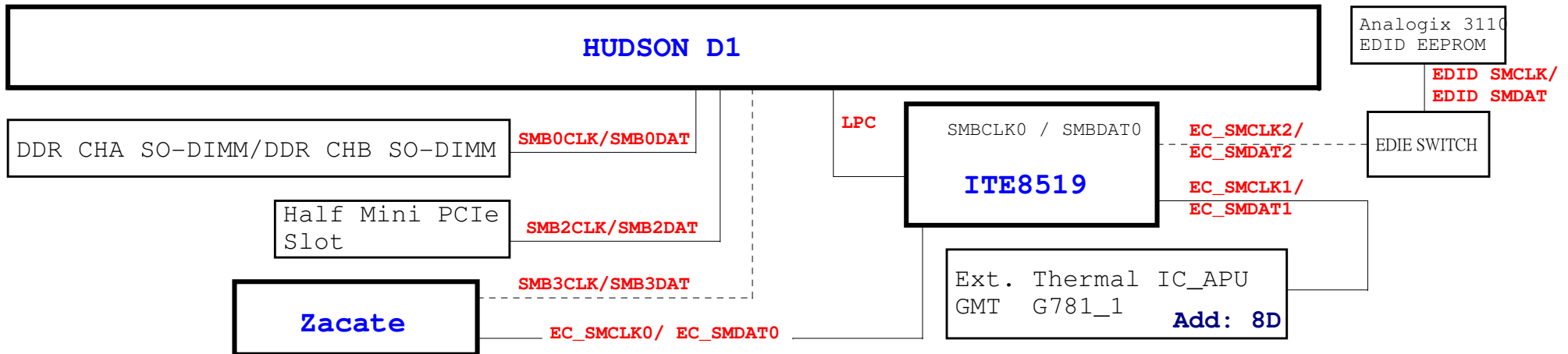
RESET Block Diagram



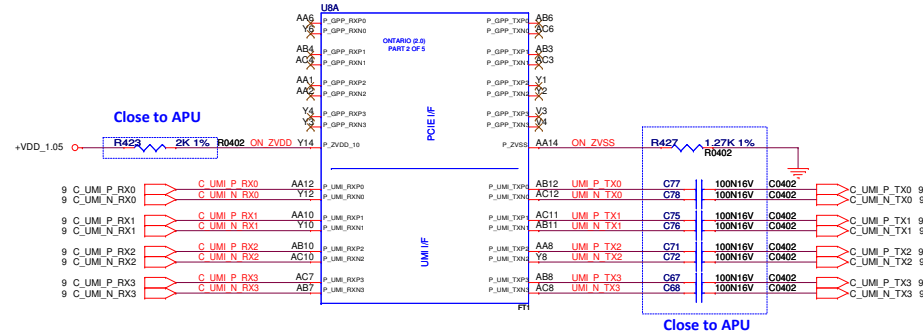
INTERNAL CLOCK MODE



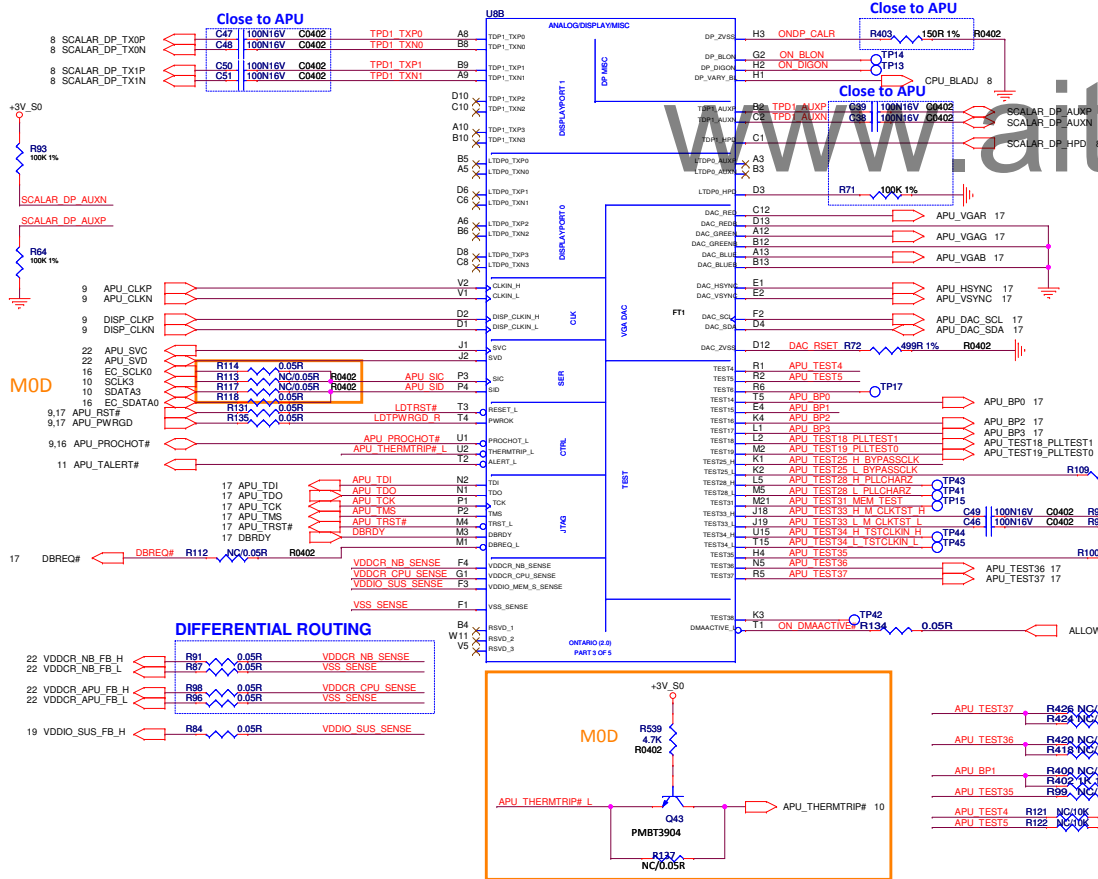
SM Bus MAP



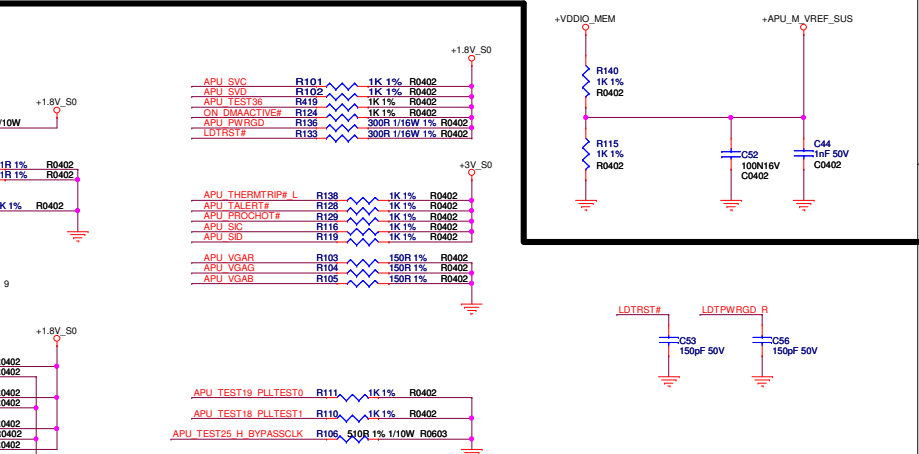
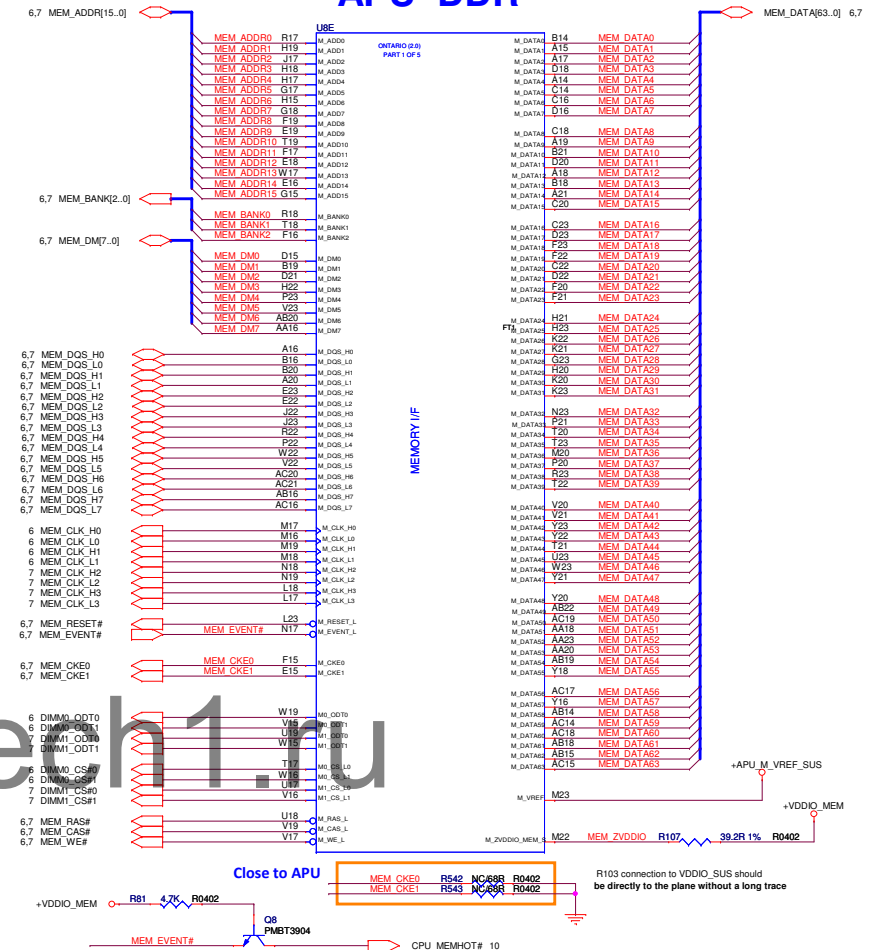
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線路圖編號 715G4789M00	TPV MODEL	Ellsworth	Rev	M0E
Key Component CLK/SMBUS/RESET MAP	PCB NAME	715G4789M00	Sheet	3 of 27
Date Thursday, February 24, 2011			備註	<備註>



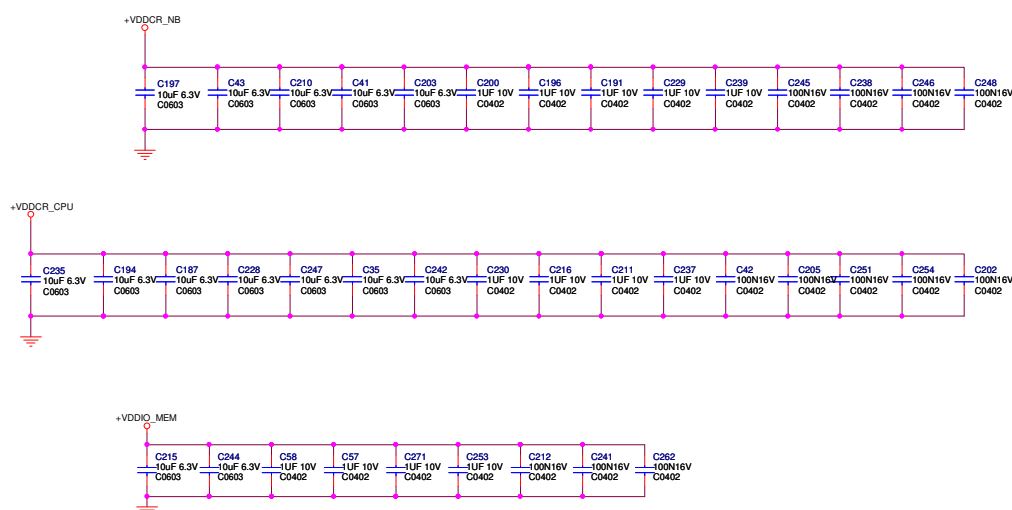
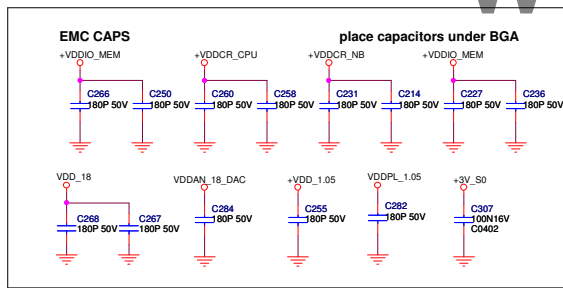
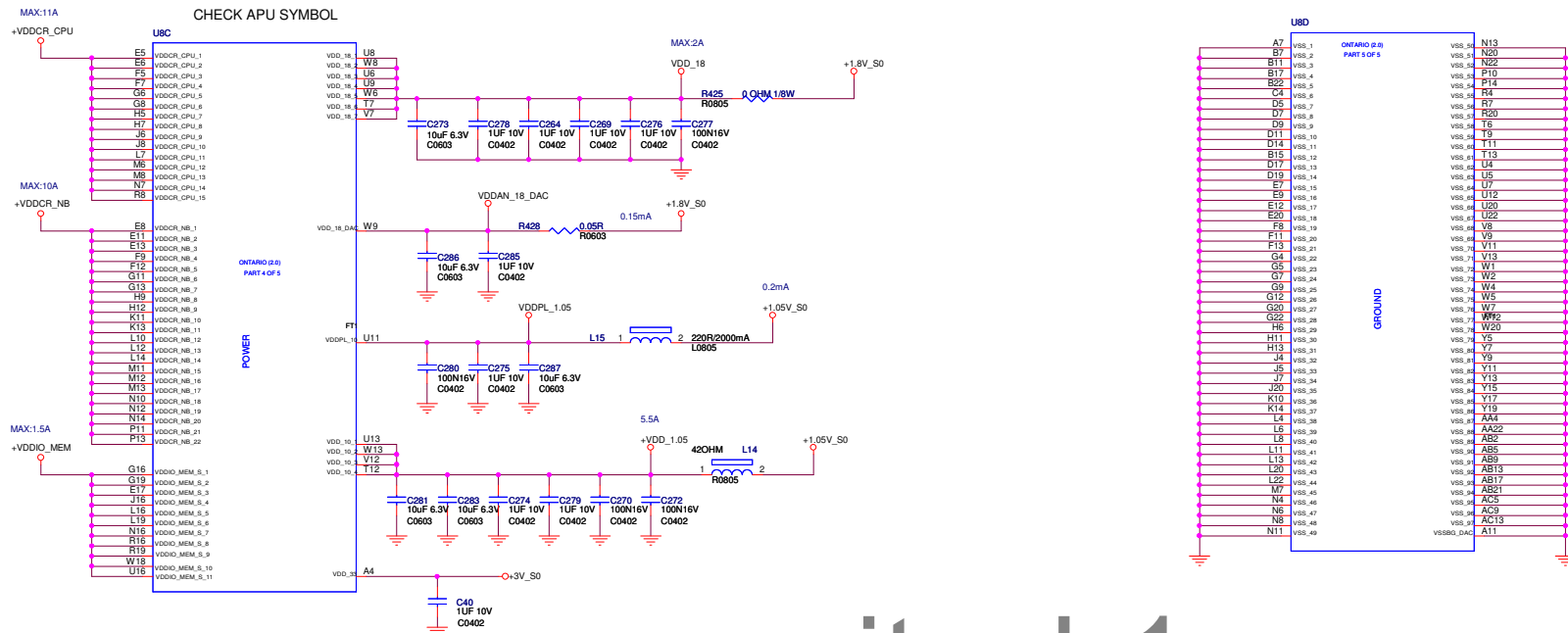
DP / VGA / CLK / CTRL / SENSE



APU DDR

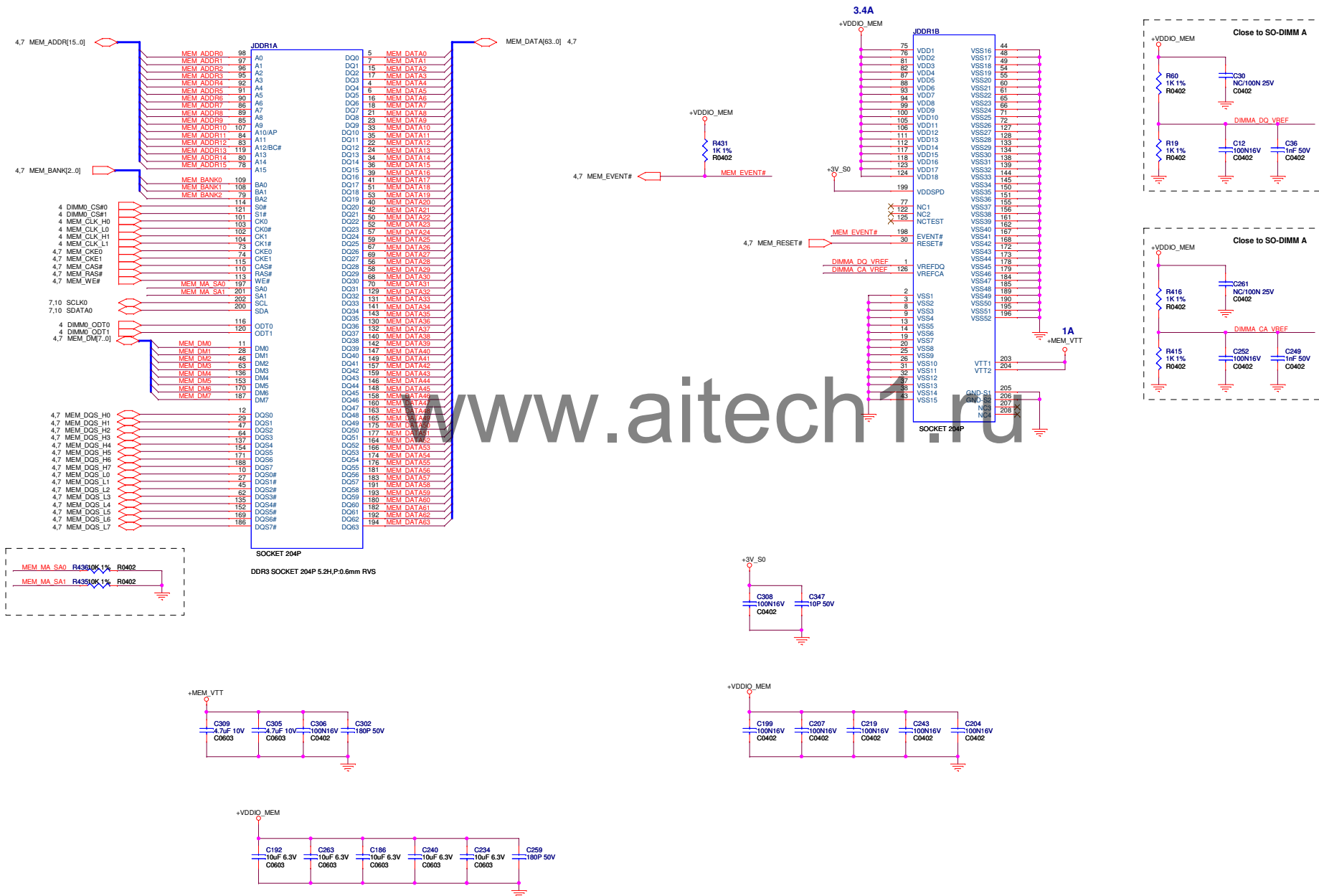


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Key Component AMD FT1 (I/2)	PCB Name	715G4788MDA	備註	<備註>
Date Thursday, February 24, 2011	Sheet	4 of 27		



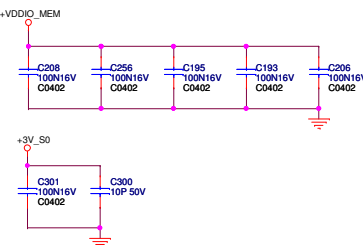
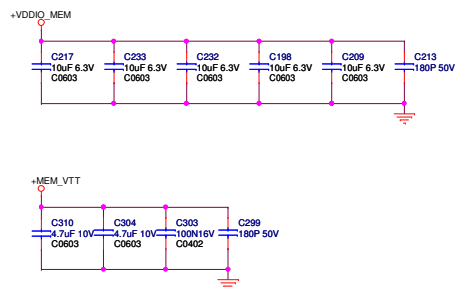
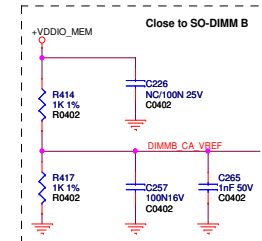
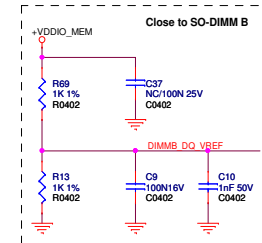
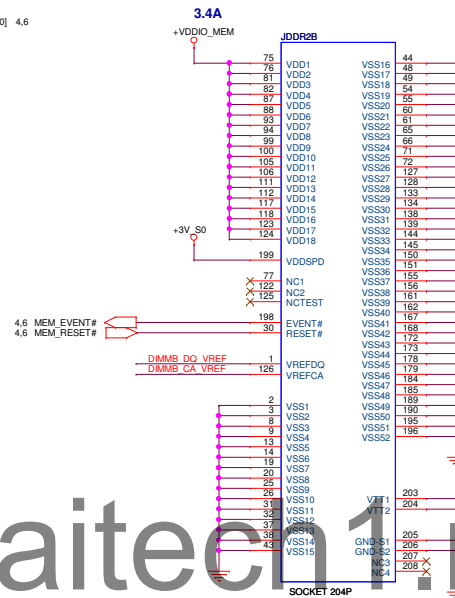
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线路图编号 715G4788M0A	TPV MODEL	Ellsworth	Rev	MDE
Key Component AMD FT1 (2/2)	PCB NAME	715G4788M0A	備註	<備註>
Date Thursday, February 24, 2011	Sheet	5 of 27		

CHA DDR 5.2H(DIMM-0)

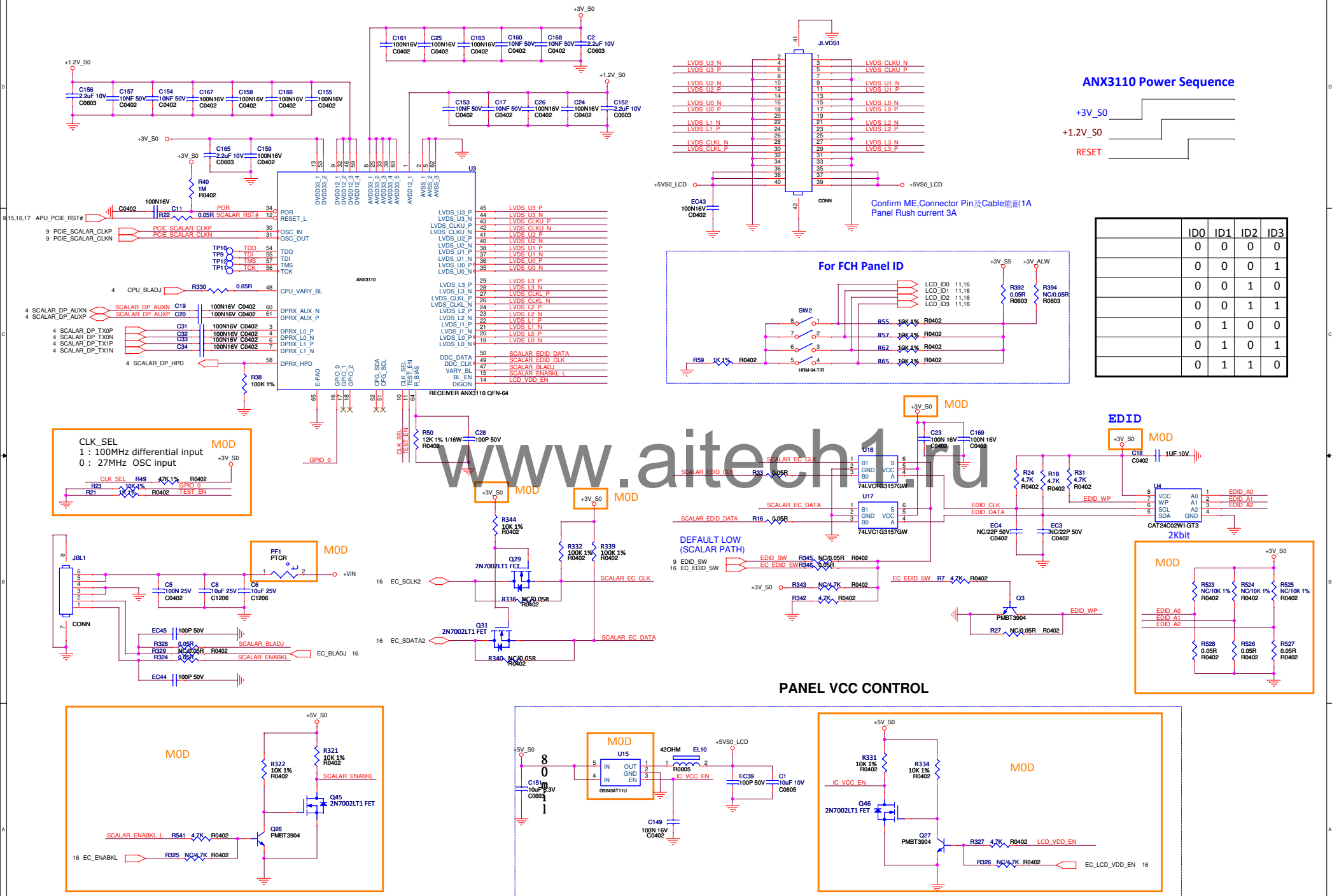


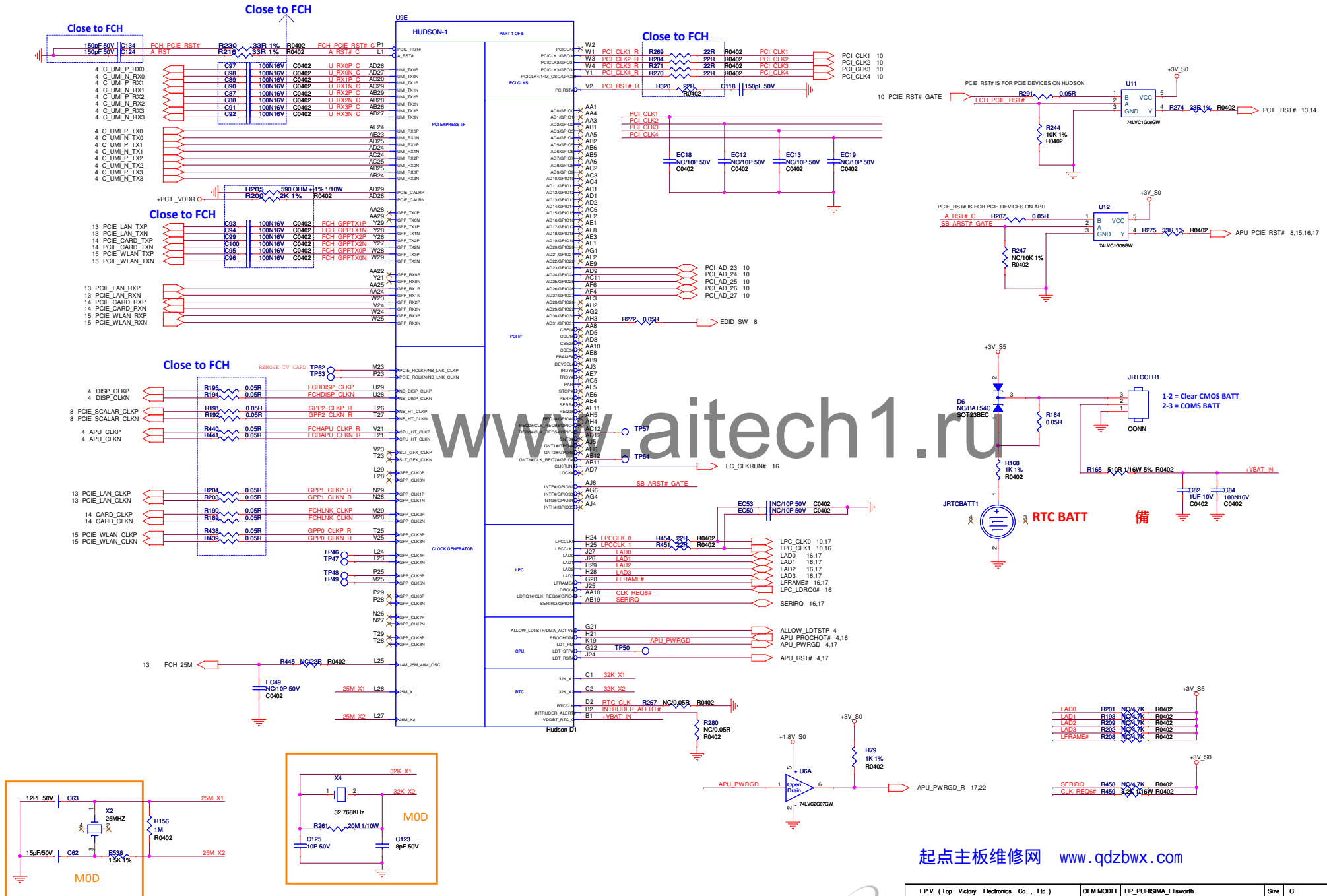
TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
线路图编号 715G4788M0A	TPV MODEL	Ellsworth	Rev	M0E
Key Component	DDR3 SODIMM A-1 CHANNEL	PCB NAME	715G4788M0A	備註 <備註>
Date	Thursday, February 24, 2011	Sheet	6 of 27	

CHB DDR 9.2H(DIMM-1)

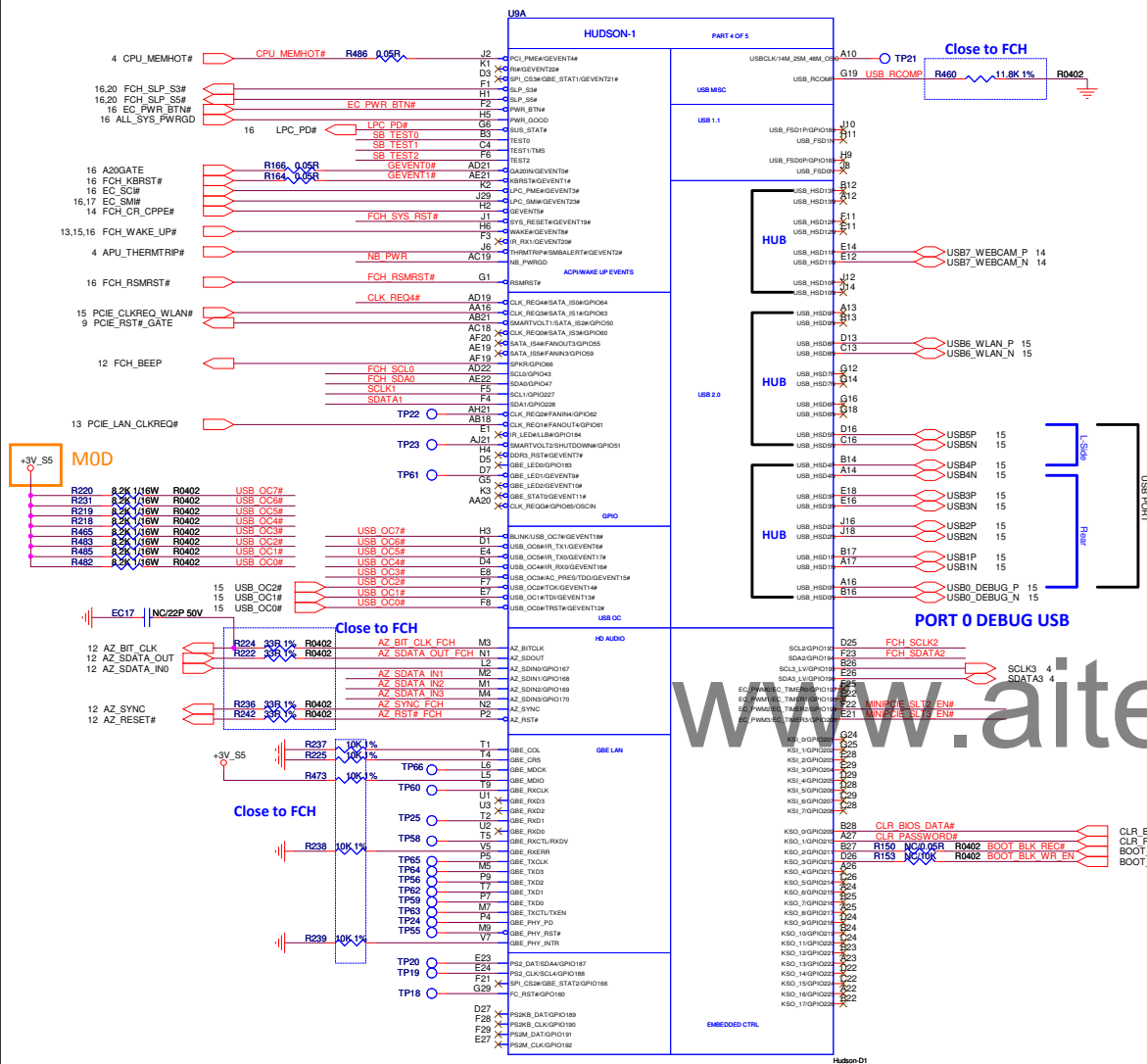


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线路图编号	715G4789M0A	Ellsworth	Rev	M0E
Key Component	DDR3 SODIMM A-2 CHANNEL	PCB NAME	715G4789M0A	備註 <備註>
Date	Thursday, February 24, 2011	Sheet	7 of 27	

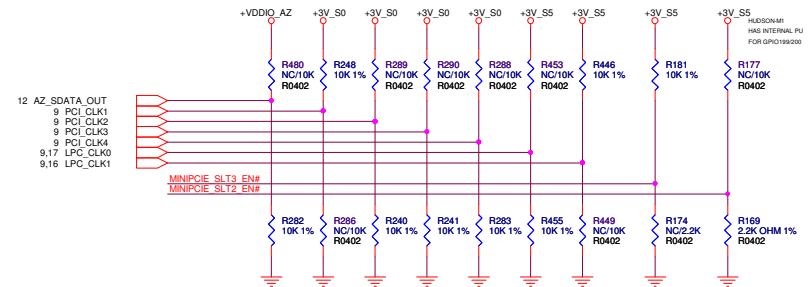


UMI / PCIE / CLK / PCI I/F / LPC / RTC

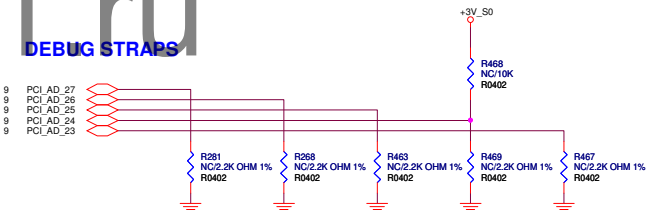
FCH CTL / HDA / USB



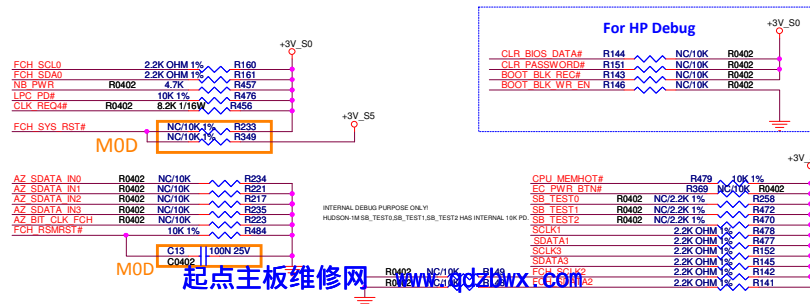
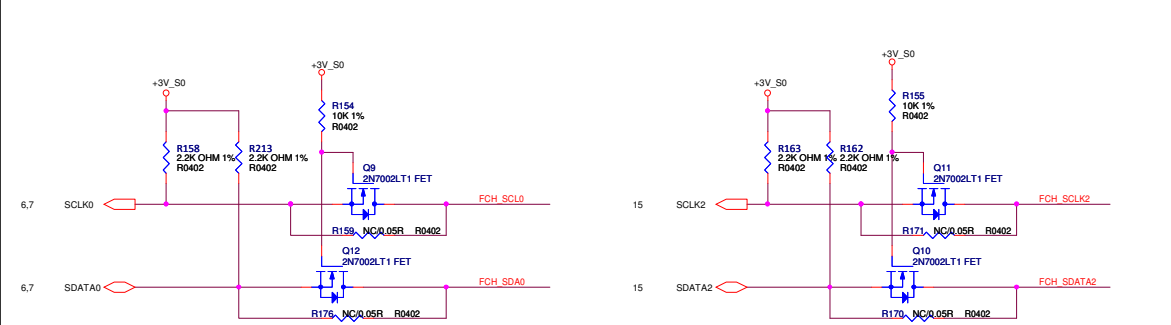
STRAP PINS



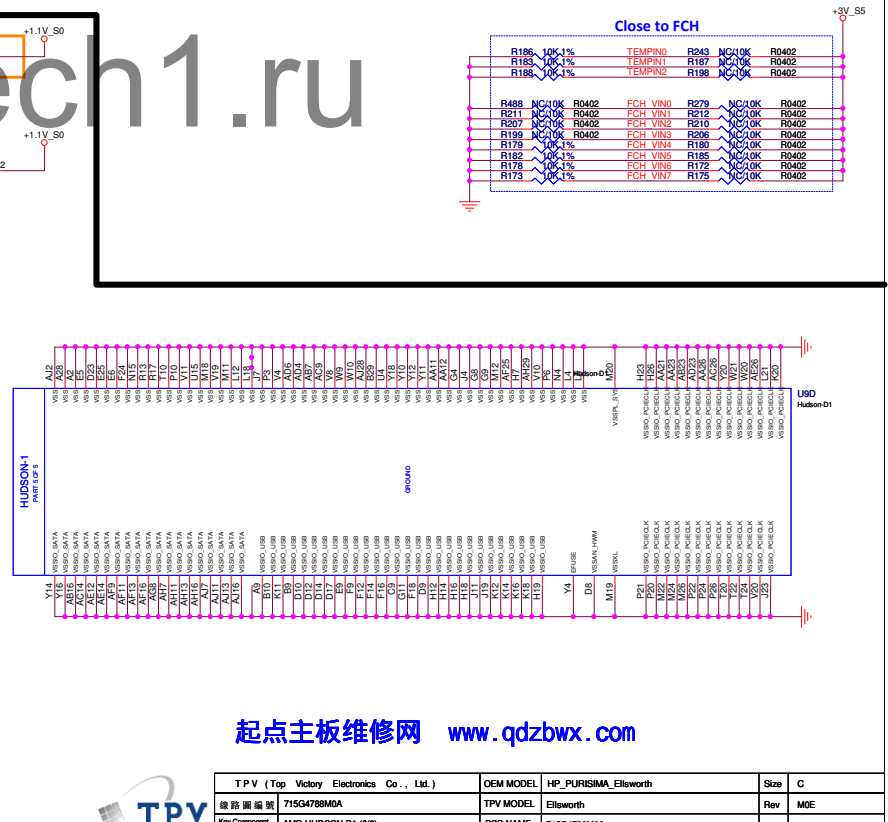
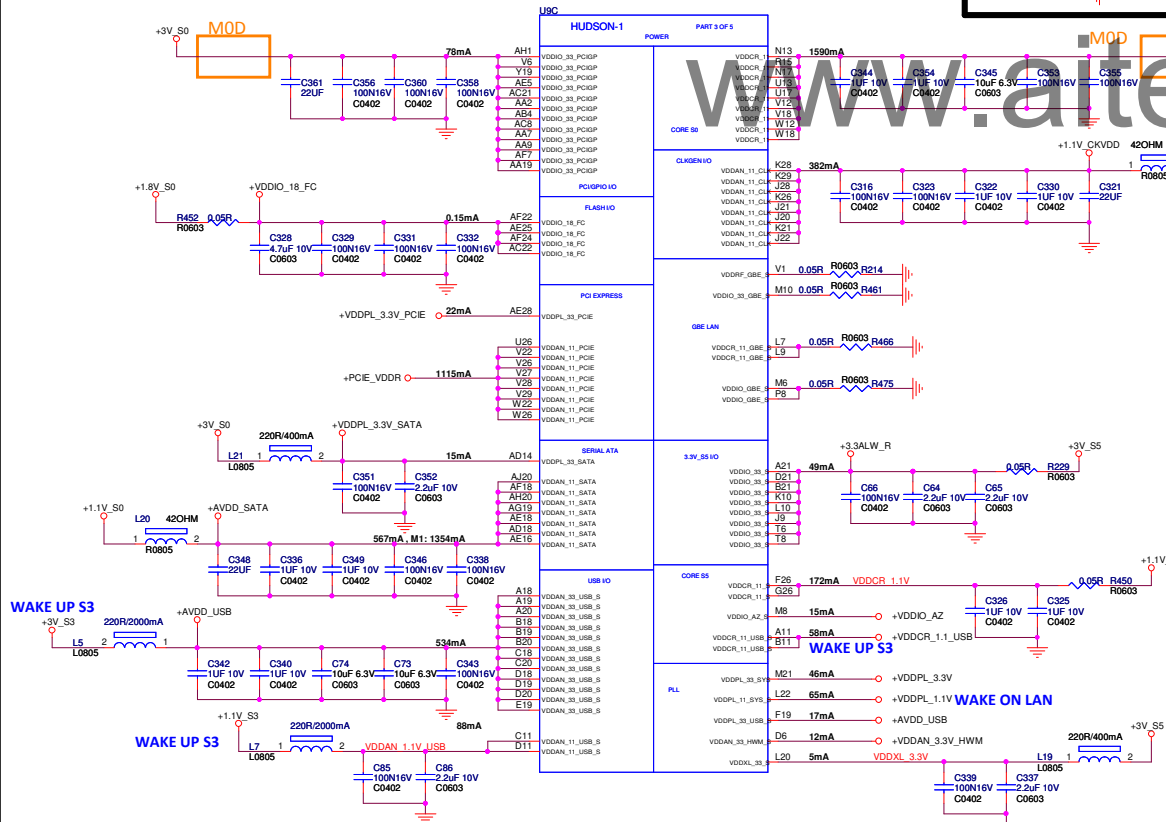
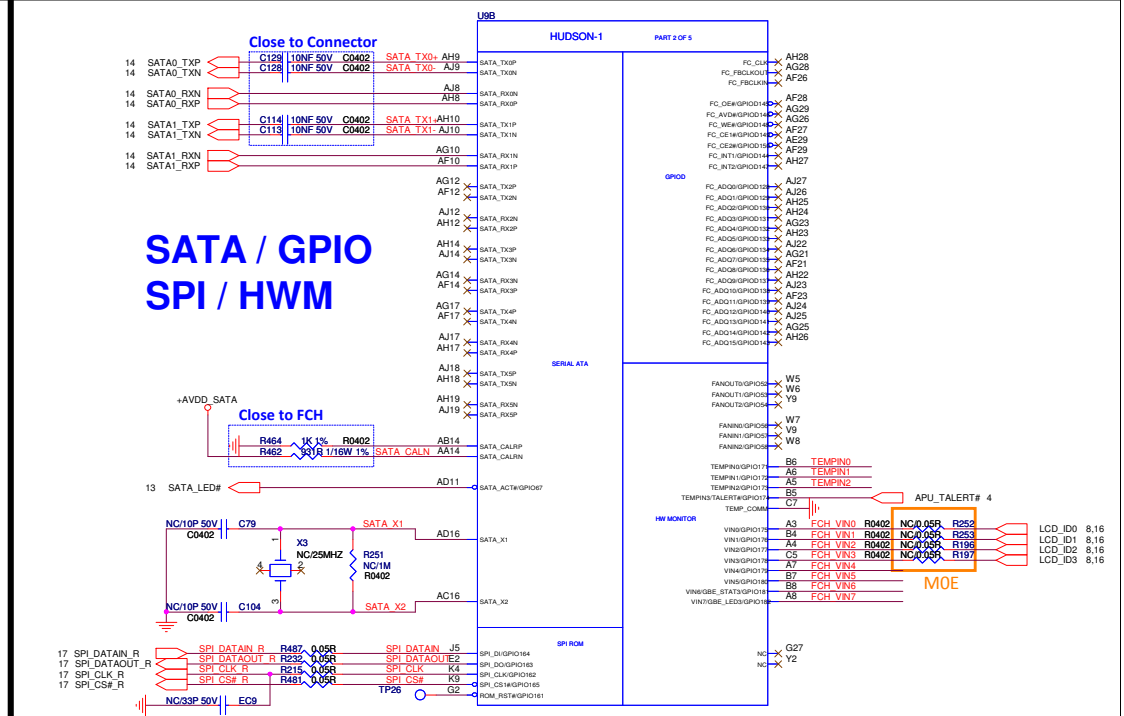
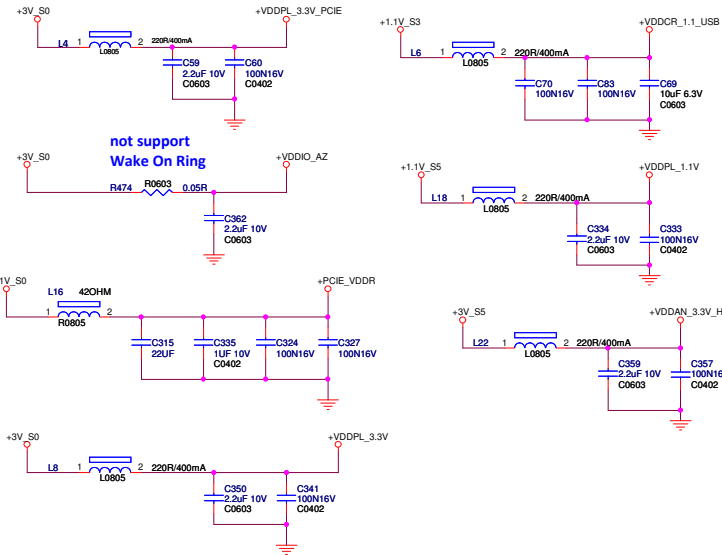
	AZ_50OUT	PCI_CLK1	PCI_CLK2	PCI_CLK3	PCI_CLK4	UPC_CLK0	UPC_CLK1	MNIPCE_SLT3_ENW GPID000	MNIPCE_SLT2_ENW GPID009
PULL "HIGH"	LOW POWER MODE	ALLOW PCIe Gen2	WATCHDOG TIMER ENABLE	USE SERIAL STRAP	non-Fusion Clock MODE	EC ENABLE	CLKGEN ENABLE DEFAULT	H4 = Reserved H5 = SPI ROM	
PULL "LOW"	PERFORMANCE MODE DEFAULT	FORCE PCIe Gen2 DEFAULT	WATCHDOG TIMER DISABLE DEFAULT	IGNOR DEBIAS STRAP DEFAULT	PUSION CLOCK MODE DEFAULT	EC DISABLE DEFAULT	CLKGEN DISABLED	LL+ = LPC ROM (DEFAULT) LL+ = FWH ROM	



	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL "HIGH"	USE PCI PULL DEFAULT	DISABLE I/LA AUTORUN DEFAULT	USE PCI PULL DEFAULT	USE DEFAULT PCI STRAPS DEFAULT	DISABLE PCI MEM BOOT DEFAULT
PULL "LOW"	BYPASS PCI PULL	ENABLE I/LA AUTORUN	BYPASS PCI PULL	USE EEPROM POE STRAPS	ENABLE PCI MEM BOOT



FCH PWR

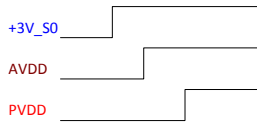


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TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
線路圖編號 715G4788MDA	TPV MODEL	Ellsworth	Rev	MDE
Key Component	AMD HUDSON D1 (3/3)	PCB NAME	715G4788MDA	
Date	Thursday, February 24, 2011	Sheet	11 of 27	備註 <備註>

AUDIO CODEC (ALC269Q)

Power Sequence



close to codec

close to codec

ANALOG

DIGITAL

moat

Headphone

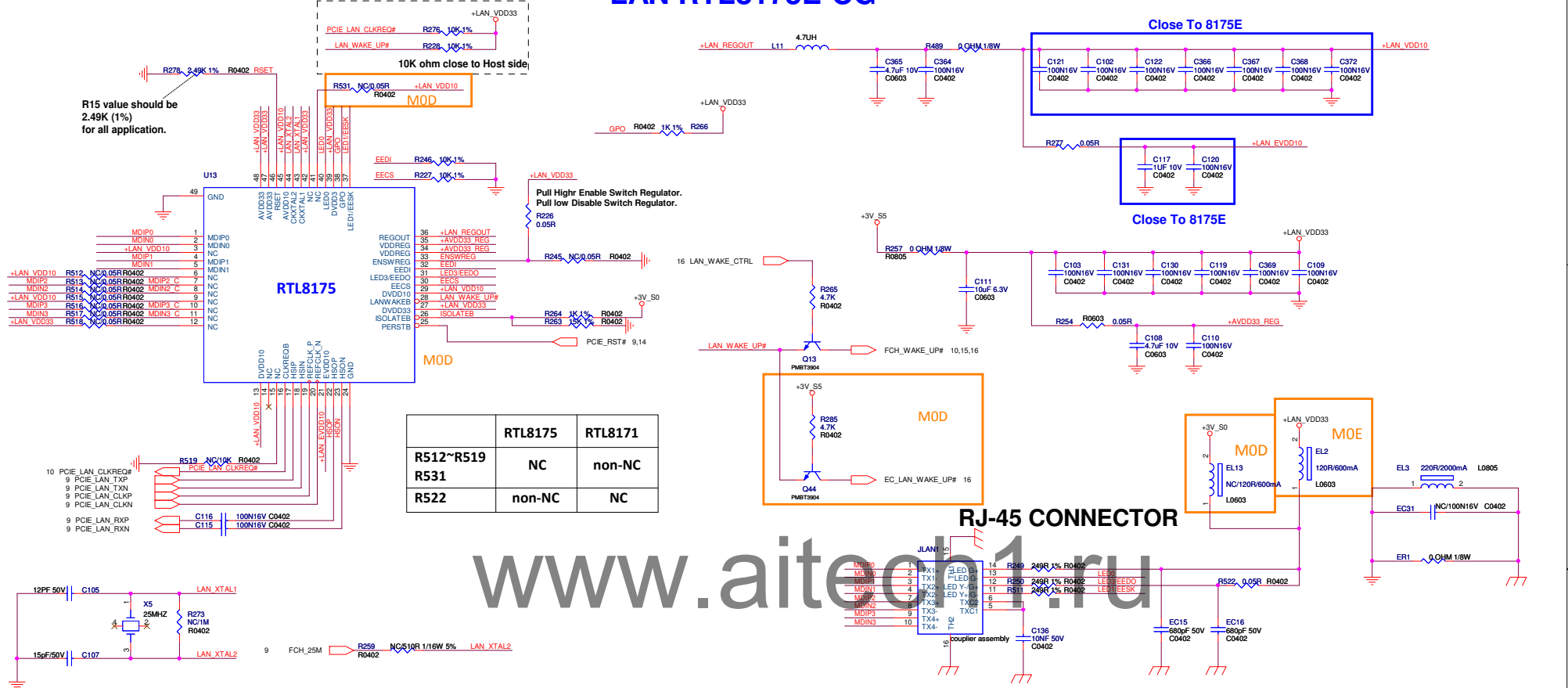
Internal Speaker

Line Out

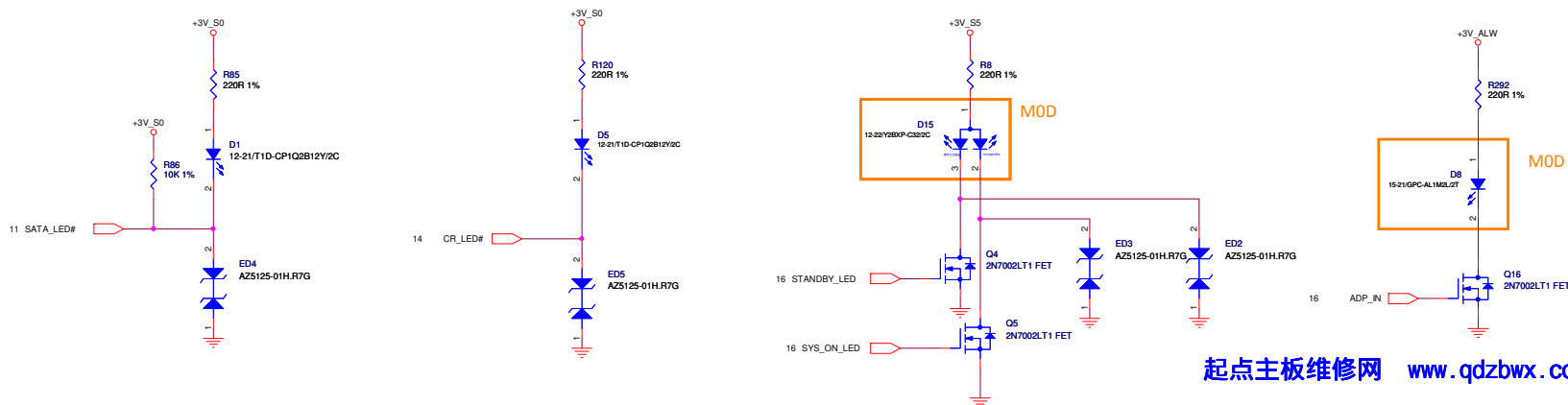
起点主板维修网 www.qdzbwx.com

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
TPV MODEL	715G4788M0A	Ellsworth	Rev	M0E
Key Component	AUDIO ALC269Q-VB	715G4788M0A	Sheet	12 of 27
Date	Thursday, February 24, 2011		备注	<備註>

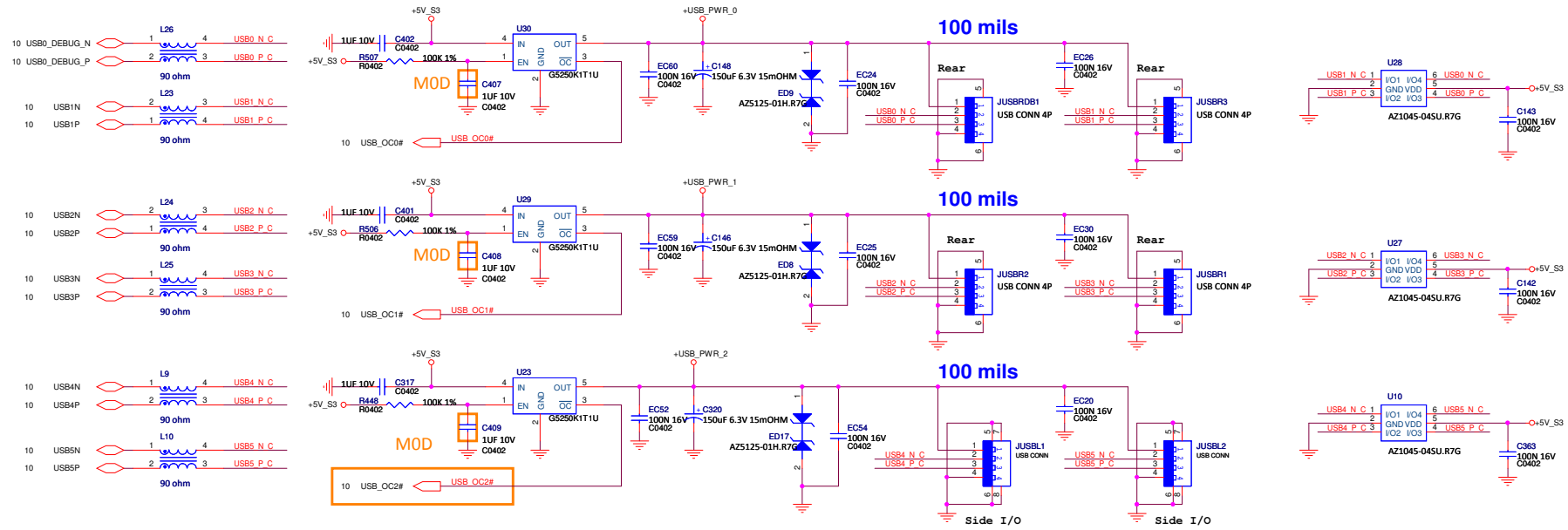
LAN RTL8175E-CG



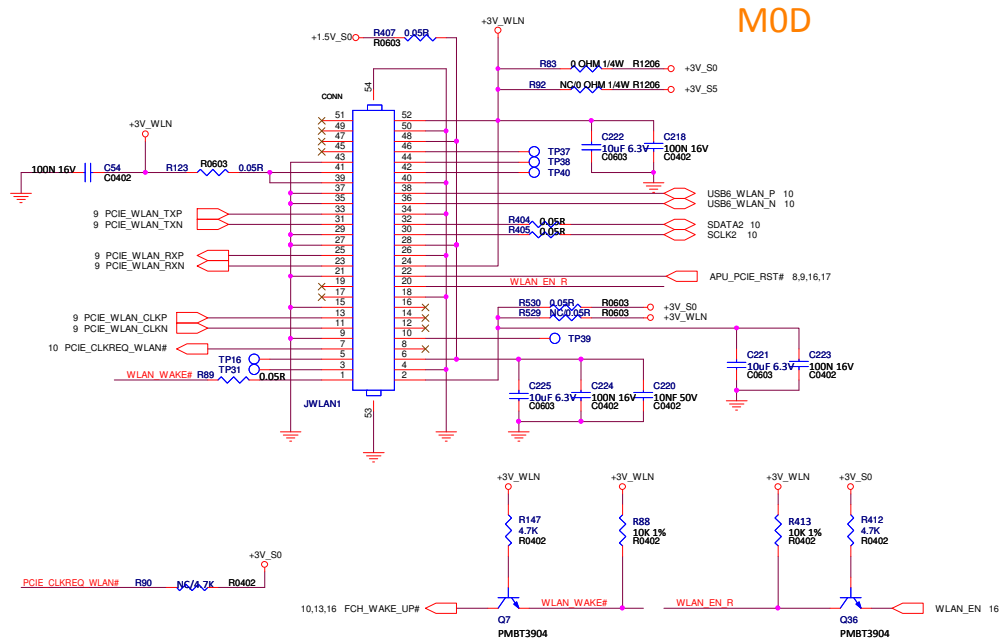
LED



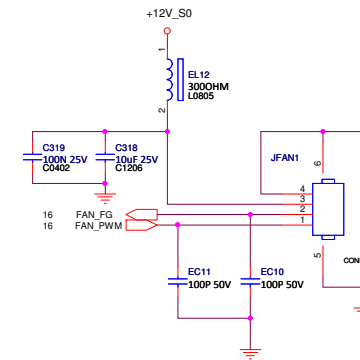
USB 2.0 (Rear/L-Side)



MINI PCI-E WLAN & BT



CPU Linear FAN Control

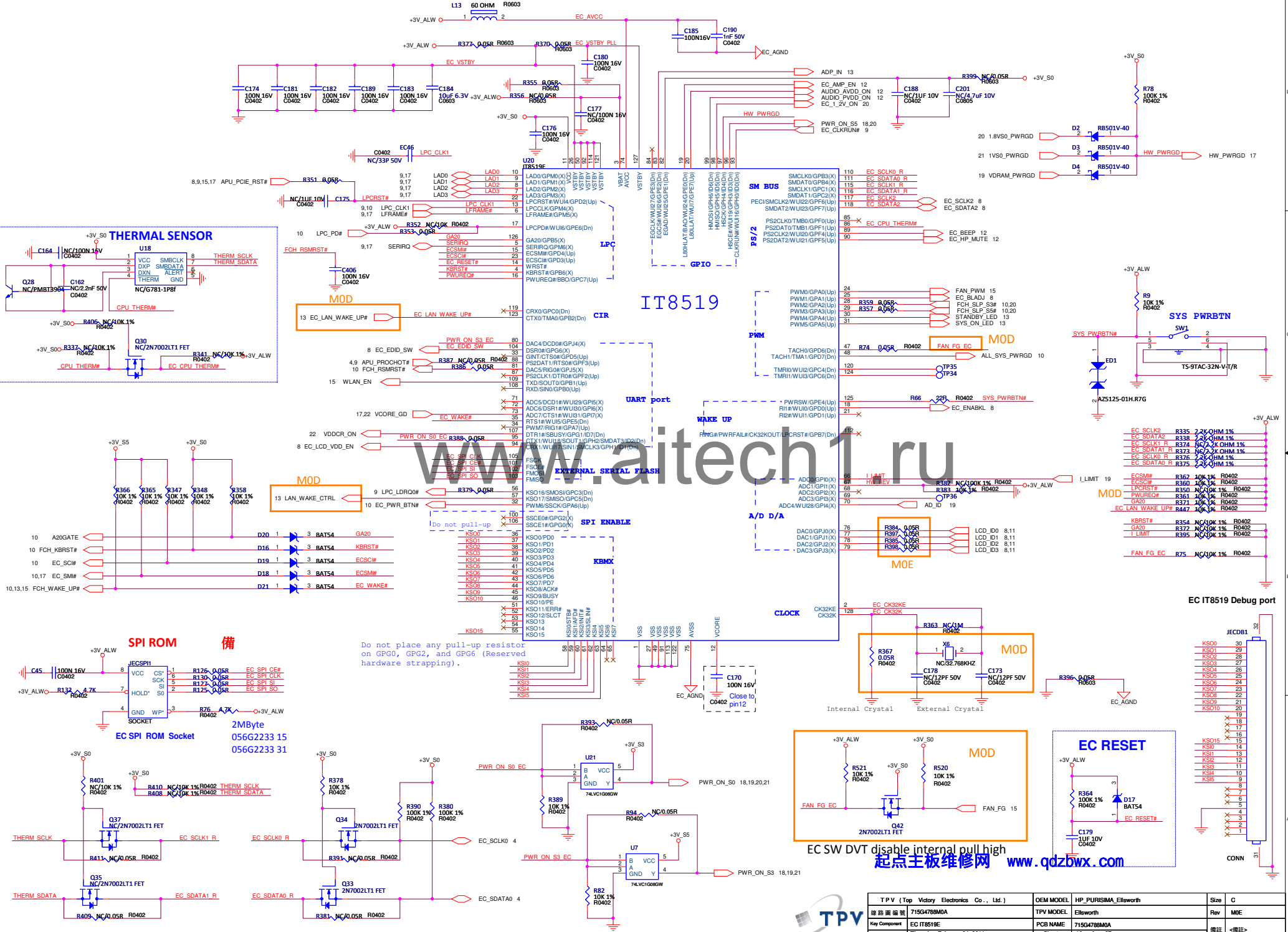


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TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
TPV MODEL	715G4788M0A	Ellsworth	Rev	M0E
Key Component	USB/MINI PCI-E/FAN	PCB NAME	715G4788M0A	備註 <備註>
Date	Thursday, February 24, 2011	Sheet	15 of 27	

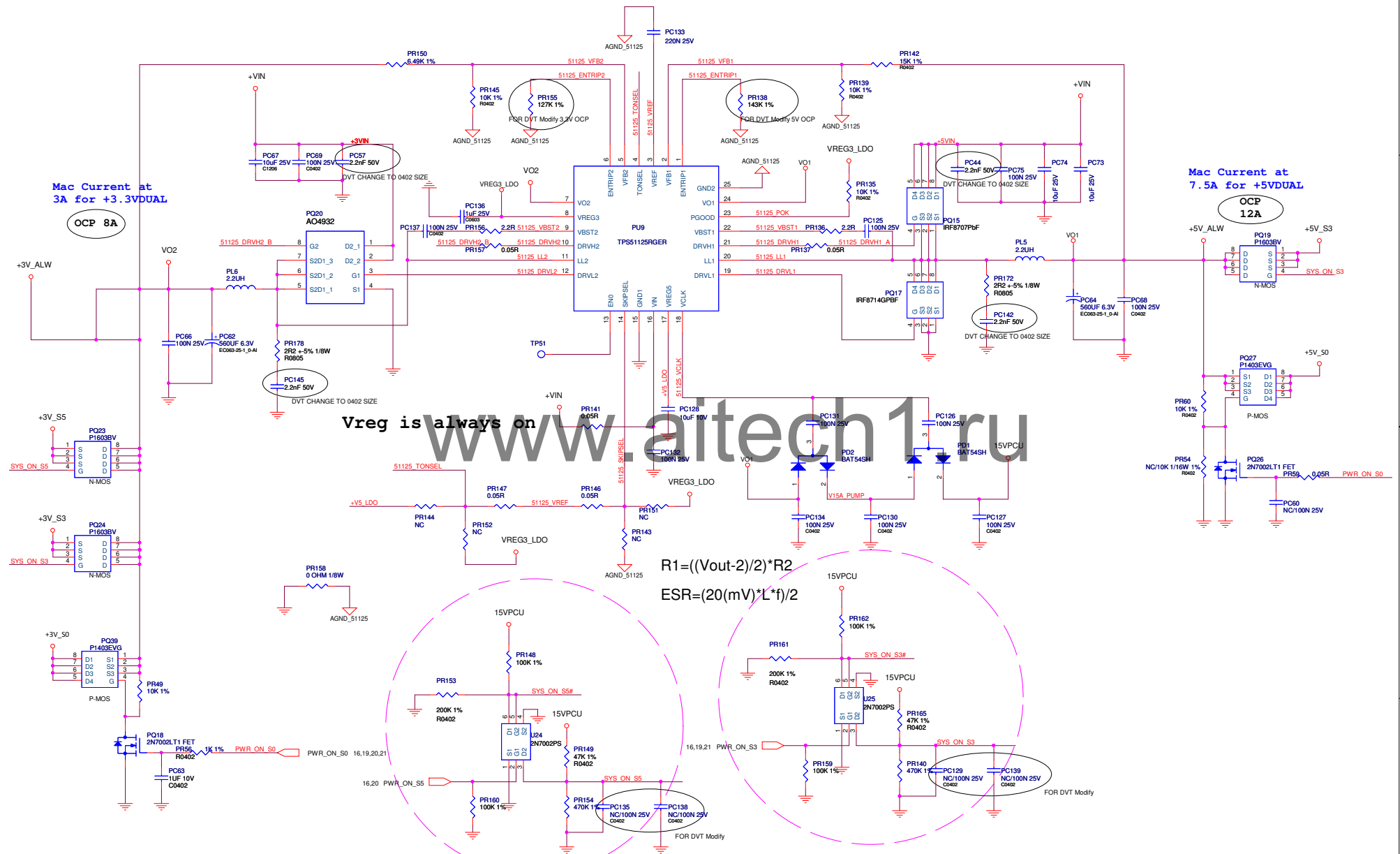
EC IT8519



www.aitech1.ru

TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP, PURISIMA, Ellsworth	Size	C
TPV MODEL	715G4788M0A	Ellsworth	Rev	M0E
Key Component	EC IT8519E	715G4788M0A	Sheet	16 of 27
Date	Thursday, February 24, 2011		备注	<備註>

**SYSTEM +3V_ALW/+3V_S5/+3V_S3/+3V_S0
+5V_ALW/+5V_S3/+5V_S0**



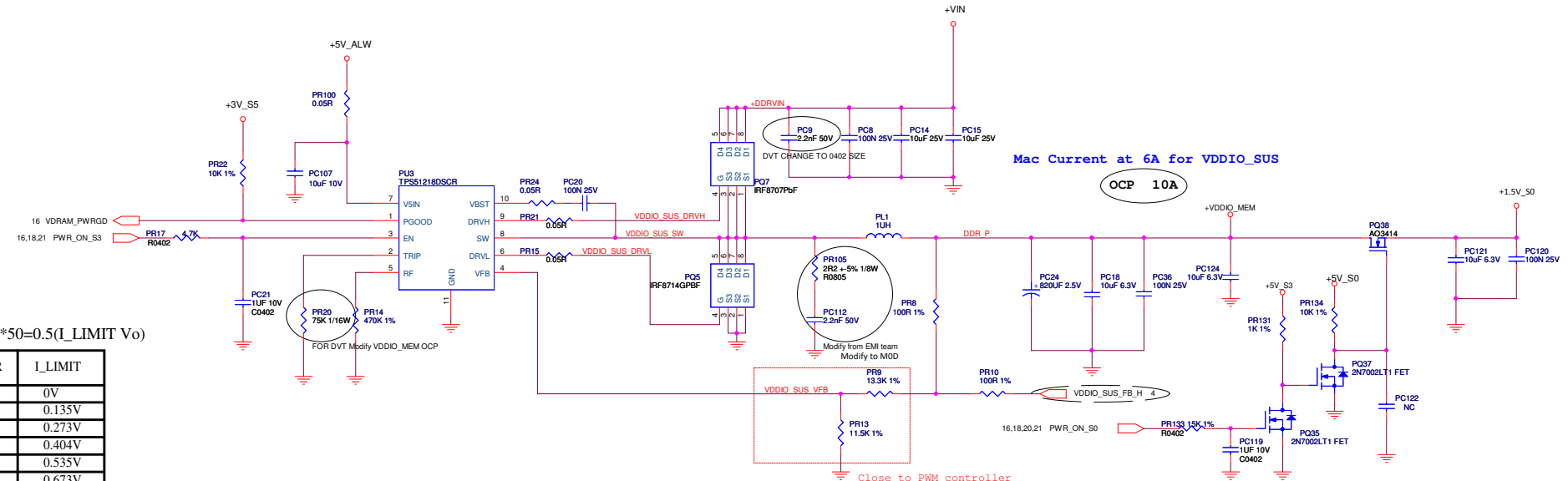
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TPV (Top Victory Electronics Co., Ltd.)		OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
線路圖編號		715G4788M0A	TPV MODEL	Ellsworth	Rev M0E
Key Component		SYSTEM +3V/-5V		PCB NAME	715G4788M0A
Date	Thursday, February 24, 2011	Sheet	18 of 27		備註 <備註>

VDDIO_SUS, MEM_VTT, DC-IN

$$1A * .01ohm * 50 = 0.5(I_LIMIT Vo)$$

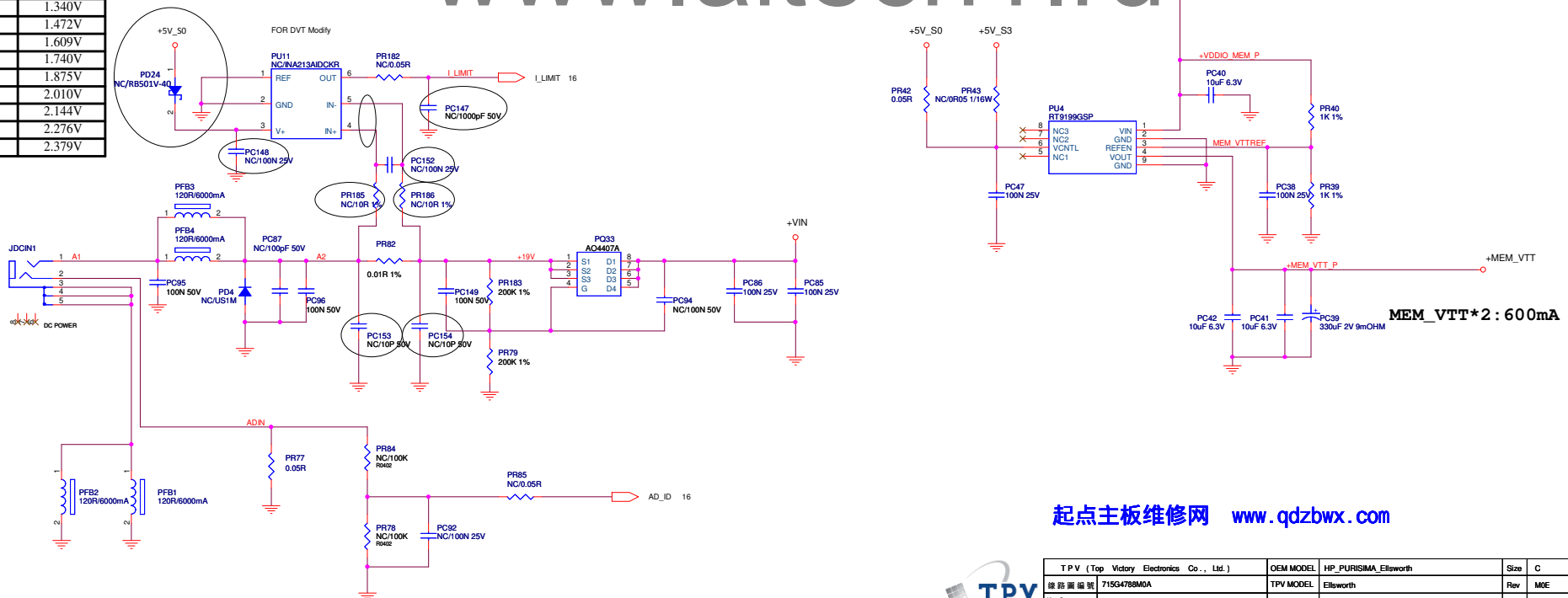
TOTAL POWER	I_LIMIT
0W	0V
5W	0.135V
10W	0.273V
15W	0.404V
20W	0.535V
25W	0.673V
30W	0.807V
35W	0.938V
40W	1.075V
45W	1.206V
50W	1.340V
55W	1.472V
60W	1.609V
65W	1.740V
70W	1.875V
75W	2.010V
80W	2.144V
85W	2.276V
90W	2.379V



$$V_{out} = 0.704V * (R1 + R2) / R2$$

$$ESR = L * f / 70$$

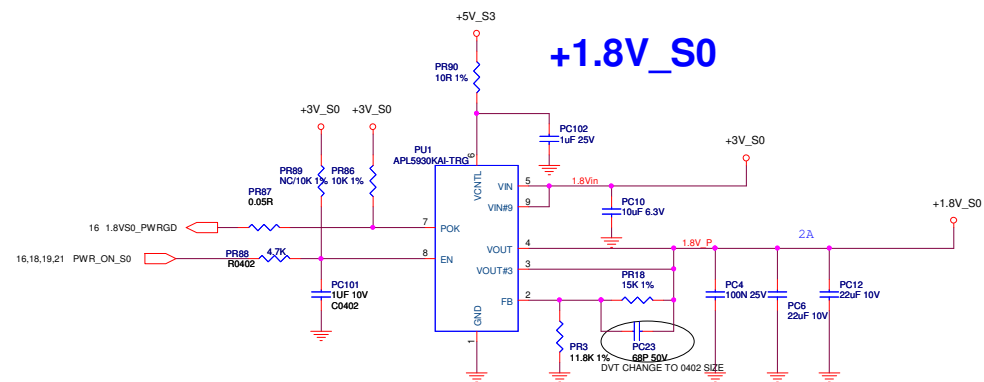
www.aitech1.ru



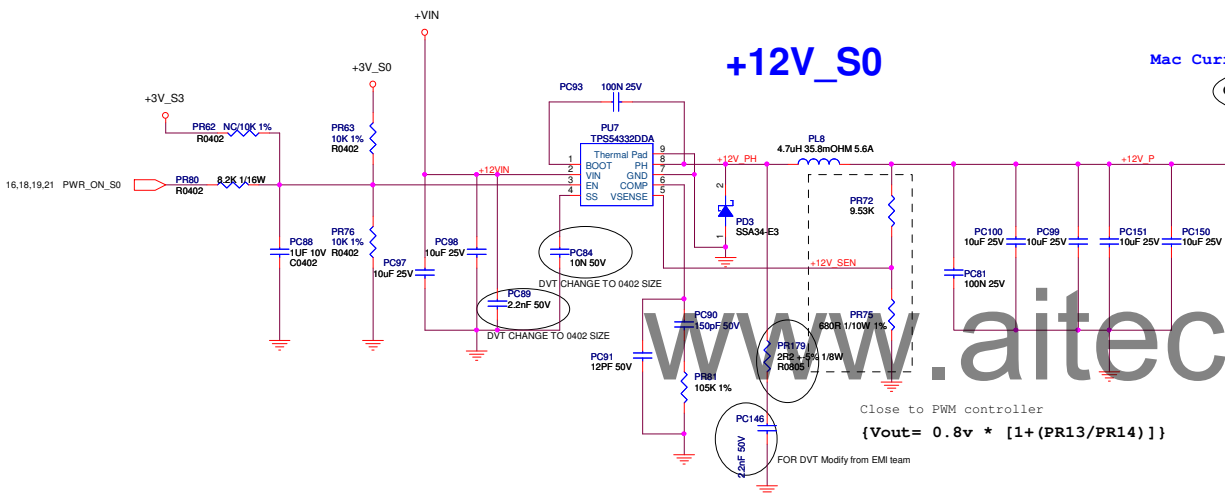
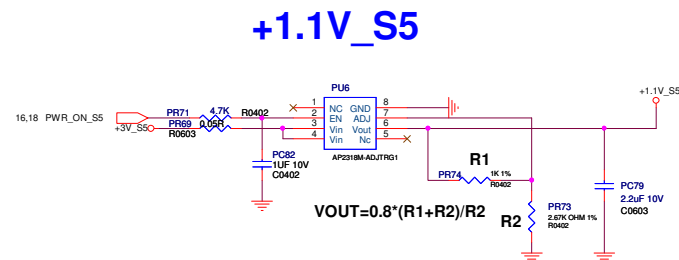
起点主板维修网 www.qdzbwx.com



TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
TPV MODEL	715G4788M0A	Ellsworth	Rev	M0E
Key Component	+VDDIO_MEM/MEM_VTT/DC-IN	PCB NAME	715G4788M0A	備註
Date	Thursday, February 24, 2011	Sheet	19 of 27	<備註>

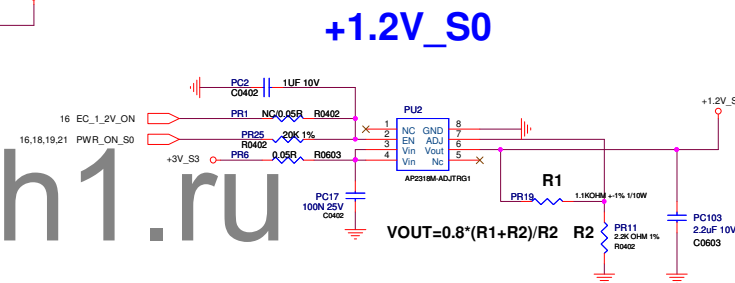


$$V_{out} = 0.8V * (R1 + R2) / R2$$

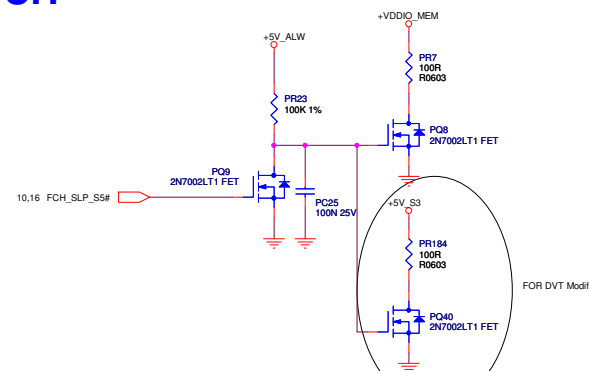
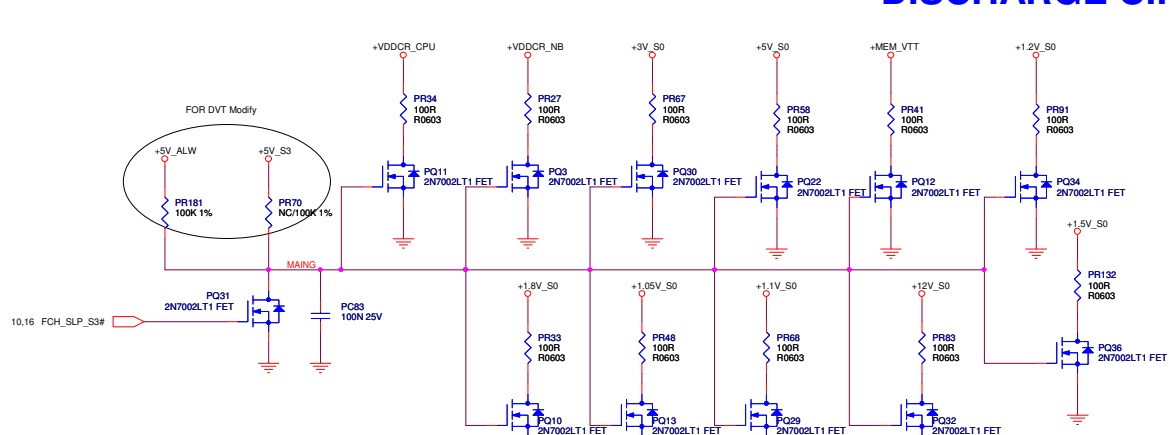


Mac Current at 2.5A for +V12S

OCP 4.5A



DISCHARGE CIRCUIT

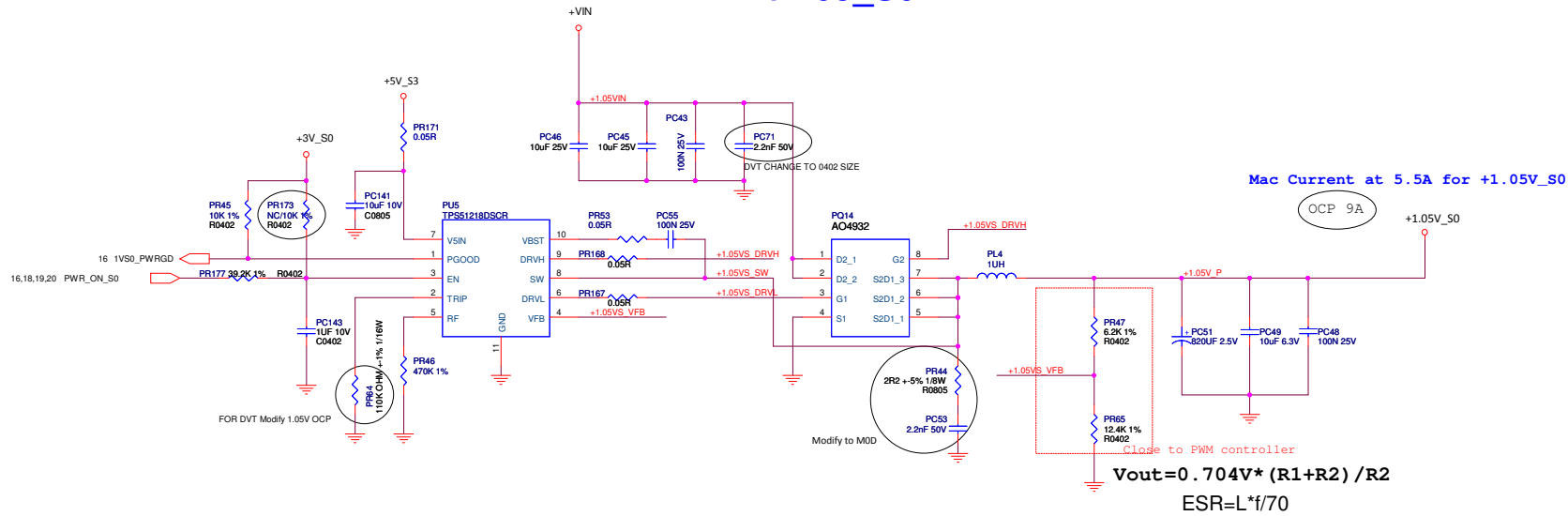


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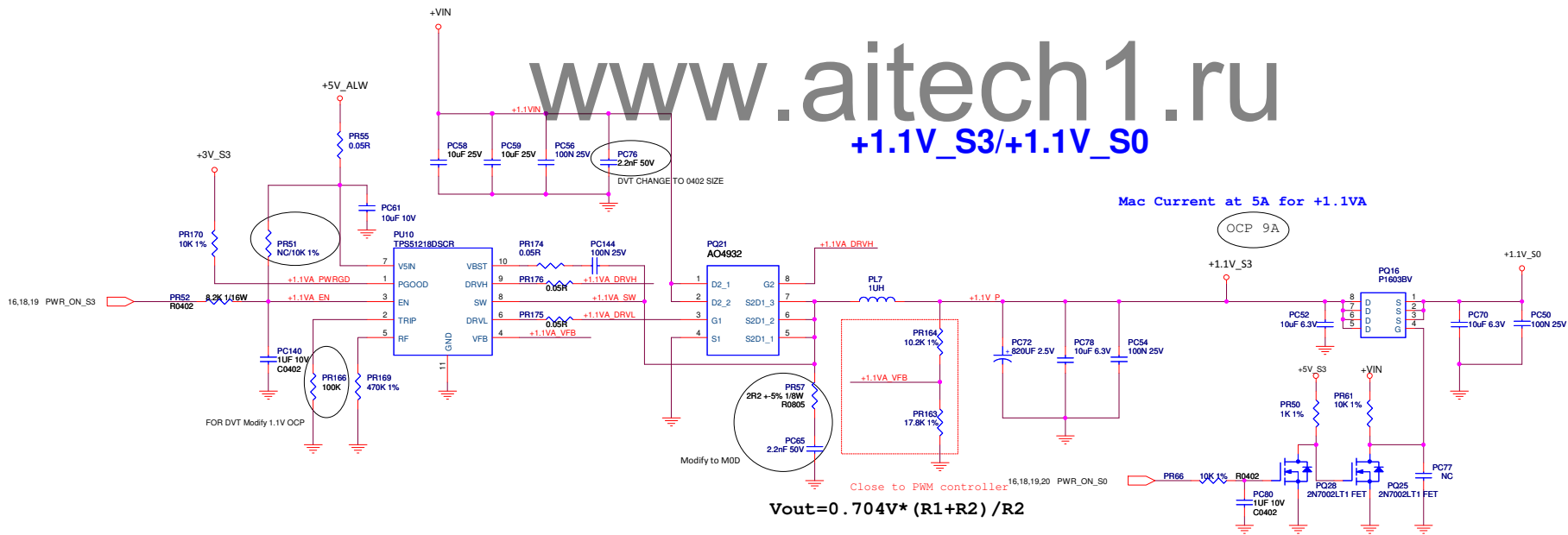
TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Elleworth	Size	C
TPV MODEL	715G4788M0A	Elleworth	Rev	M0E
Key Component	+1.8V/+12V/+1.2V/+1.1V/DIS	PCB NAME	715G4788M0A	備註 <備註>
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+1.05_S0



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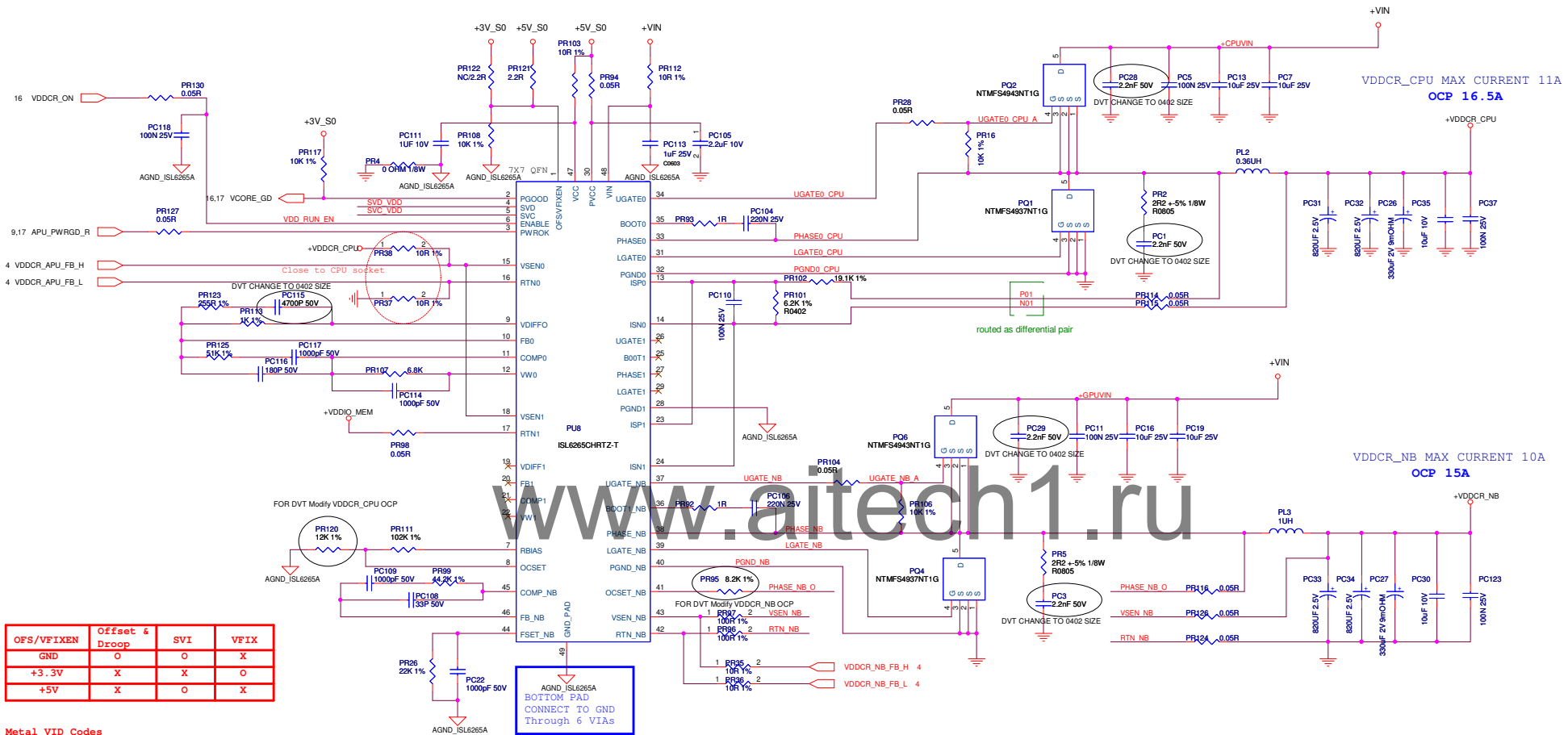
+1.1V_S3/+1.1V_S0



起点主板维修网 www.qdzbwx.com

T P V (Top Victory Electronics Co., Ltd.)		OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
線路圖編號		TPV MODEL	Ellsworth	Rev	MOE
Key Component	+1.1V_S3+1.05V	PCB NAME	715G4788MOA	備註	<備註>
Date	Thursday, February 24, 2011	Sheet	21 of 27		

VDDCR_CPU & VDDCR_NB



OFS/VFIXEN	Offset & Droop	SVC	VFIX
GND	O	O	X
+3.3V	X	X	O
+5V	X	O	X

Metal VID Codes

SVC	SVD	Output
0	0	1.1
0	1	1.0
1	0	0.9
1	1	0.8

VFIXEN VID Codes

SVC	SVD	Output
0	0	1.4
0	1	1.2
1	0	1.0
1	1	0.8

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TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
TPV MODEL	715G4788M0A	Ellsworth	Rev	M0E
Key Component	VDDCR_CPU/VDDCR_NB	PCB NAME	715G4788M0A	備註 <備註>
Date	Thursday, February 24, 2011	Sheet	22 of 27	

STACK UP 6L

Stack Up								
PCB Stack Up				Impedance				
Layer	Type	Thickness (mil)						
Top side solder mask			1.00 mils		Single end	理論値	differential	理論値
L1	TOP	copper+plating	1.58 mils		4 mils , 50Ω±15% 8 mils , 40Ω ±10% 10 mils , 35Ω ±15%	53.94Ω 38.75Ω 34.22Ω	5/6/5 mils , 85Ω±10% 4/8/4 mils , 100Ω±10% 4/5/4 mils , 90Ω±10% 7/5/7 mils , 72Ω±10%	83.03Ω 97.18Ω 86.49Ω 70.72Ω
		Prepreg	3.50 mils					
L2		copper	1.30 mils					
		core	4.00 mils					
L3	IN1	copper	0.70 mils		4 mils , 50Ω±15% 8.5 mils , 40Ω ±10% 10 mils , 35Ω ±15%	56Ω 39.1Ω 35.68Ω	5/5/5 mils , 85Ω±10% 4/7/4 mils , 100Ω±10% 5/6/5 mils , 90Ω±10% 7.5/5/7.5 mils , 72Ω±10%	84.33Ω 98.09Ω 87.21Ω 70.39Ω
		Prepreg+core	36.00 mils					
L4	IN2	copper	0.70 mils		4 mils , 50Ω±15% 8.5 mils , 40Ω ±10% 10 mils , 35Ω ±15%	56Ω 39.1Ω 35.68Ω	5/5/5 mils , 85Ω±10% 4/7/4 mils , 100Ω±10% 5/6/5 mils , 90Ω±10% 7.5/5/7.5 mils , 72Ω±10%	84.33Ω 98.09Ω 87.21Ω 70.39Ω
		core	4.00 mils					
L5		copper	1.30 mils					
		Prepreg	3.50 mils					
L6	Bottom	copper+plating	1.58 mils		4 mils , 50Ω±15% 8 mils , 40Ω ±10% 10 mils , 35Ω ±15%	53.94Ω 38.75Ω 34.22Ω	5/6/5 mils , 85Ω±10% 4/8/4 mils , 100Ω±10% 4/5/4 mils , 90Ω±10% 7/5/7 mils , 72Ω±10%	83.03Ω 97.18Ω 86.49Ω 70.72Ω
Bottom side solder mask			1.00 mils					
TOTAL			60.16 mils					
			1.53 mm					

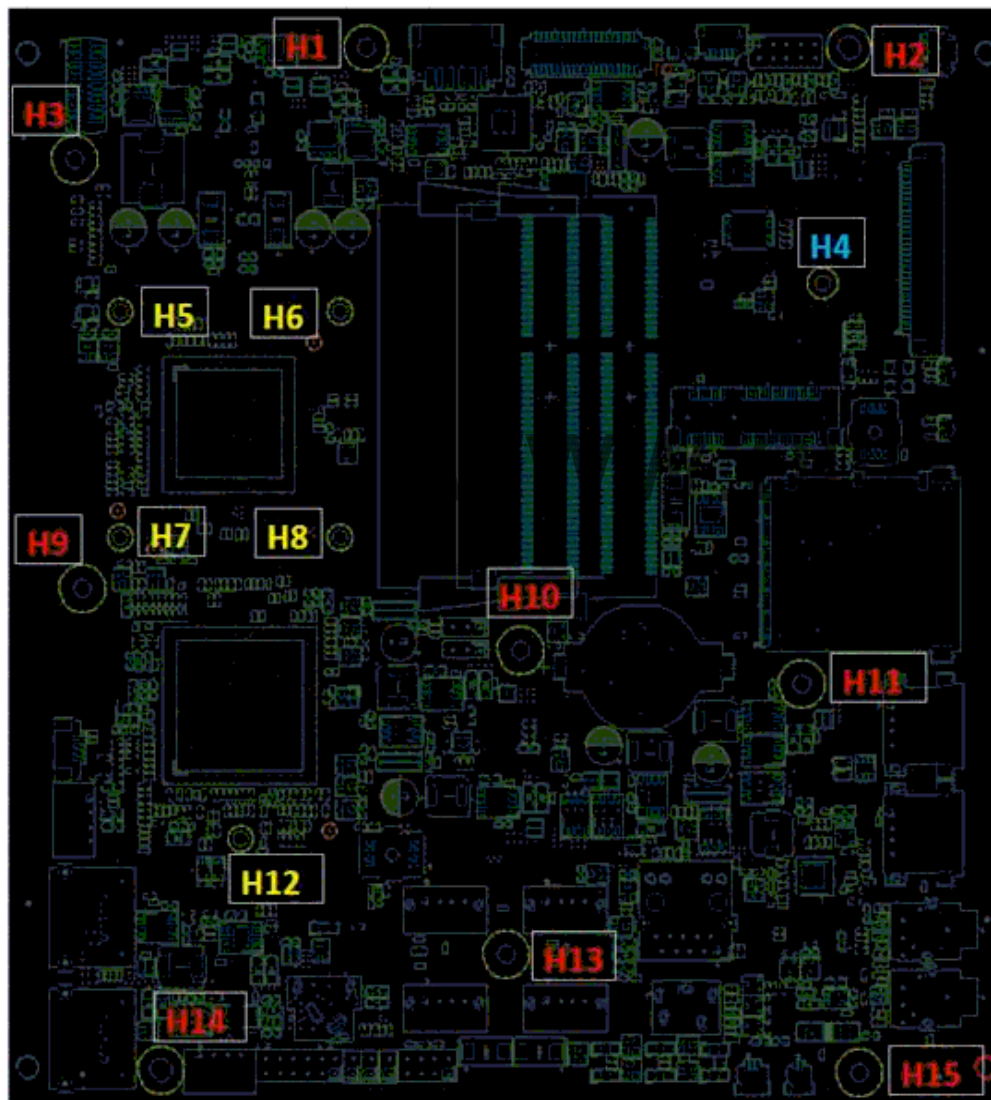
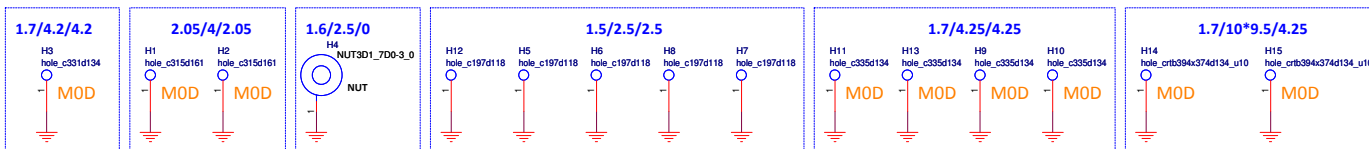
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TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISMA_Ellsworth	Size	C
線路圖編號 715G4788M0A	TPV MODEL	Ellsworth	Rev	M0E
Key Component STACK UP 6L	PCB NAME	715G4788M0A	備註 <備註>	
Date Thursday, February 24, 2011	Sheet	23 of 27		

SCREW HOLE PLACEMENT

/ (T)/ (B)



PCB SILK SCREEN

PCB color codes:

EVT (Red); Silkscreen (White)

DVT (Blue); Silkscreen (White)

PVT (Gold); Silkscreen (White)

Production (Green); Silkscreen (White)

HW_PWRGD --> D713,G (PS_ON#)

VCORE_GD --> D721,G (VRM_PWRGD)

FCH_PWRGD --> D715,G (POWERGOOD_140MS)

AUX_POWER --> D720,G

SLP_S3 --> D716,G

SLP_S5 --> D717,G

AMD HDT --> JHDT1

LPC HEADER --> JLPADB1

ROM Recovery --> JHPADB5

BBW_EN --> JHPADB4

USB WinDbg --> JUSBRDB1

DIMM0 --> JDDR52

DIMM1 --> JDDR92

T&I PCB Version = 0A , 0B , 0C.....

MP = M01 , M02.....

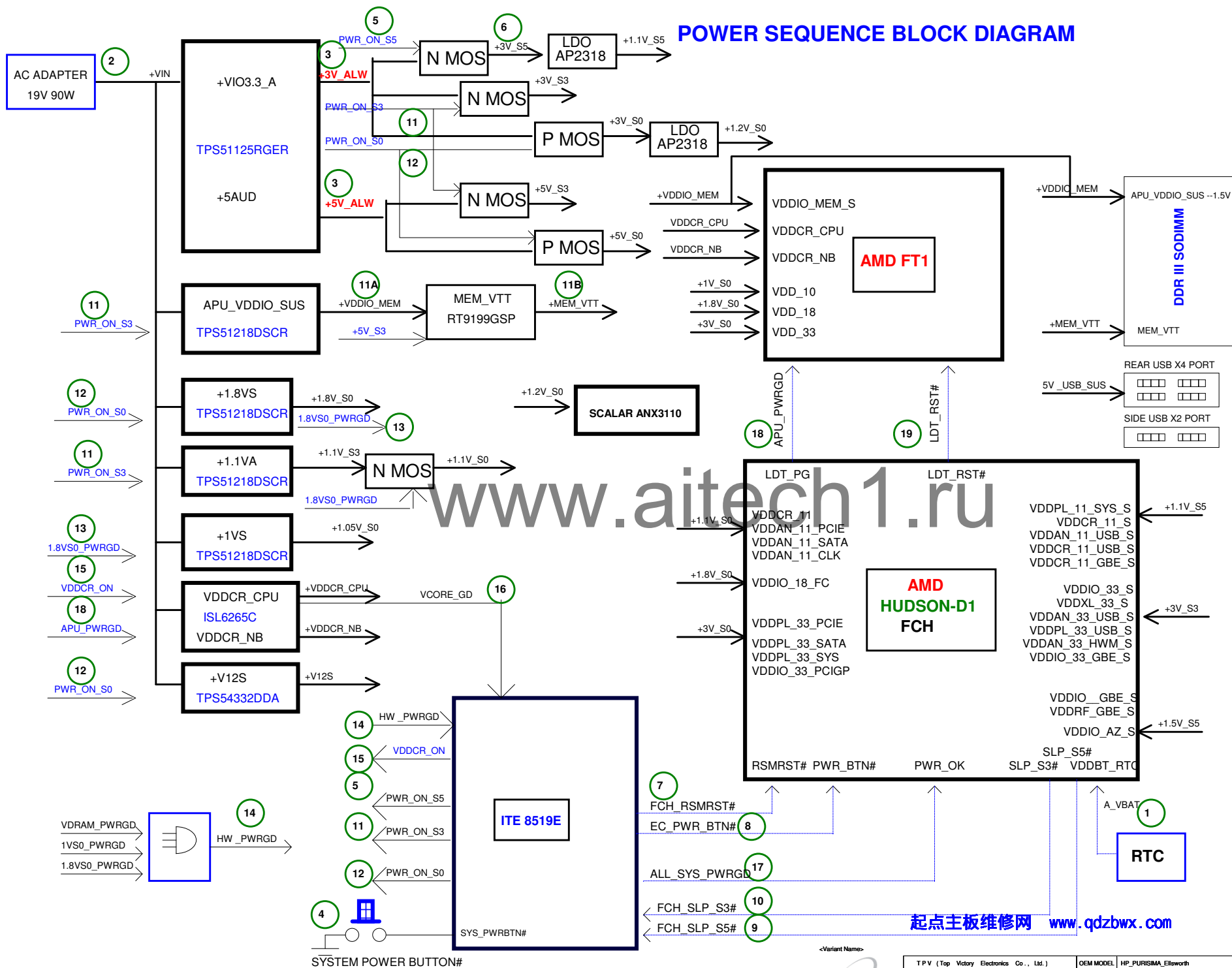
起点主板维修网 www.qdzbwx.com

<Variant Name>



TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
线路图编号	715G4788M0A	TPV MODEL	Ellsworth	Rev
Key Component	SCREW HOLE/SILK SCREEN	PCB NAME	715G4788M0A	M0E
Date	Thursday, February 24, 2011	Sheet	24 of 27	備註 <備註>

POWER SEQUENCE BLOCK DIAGRAM



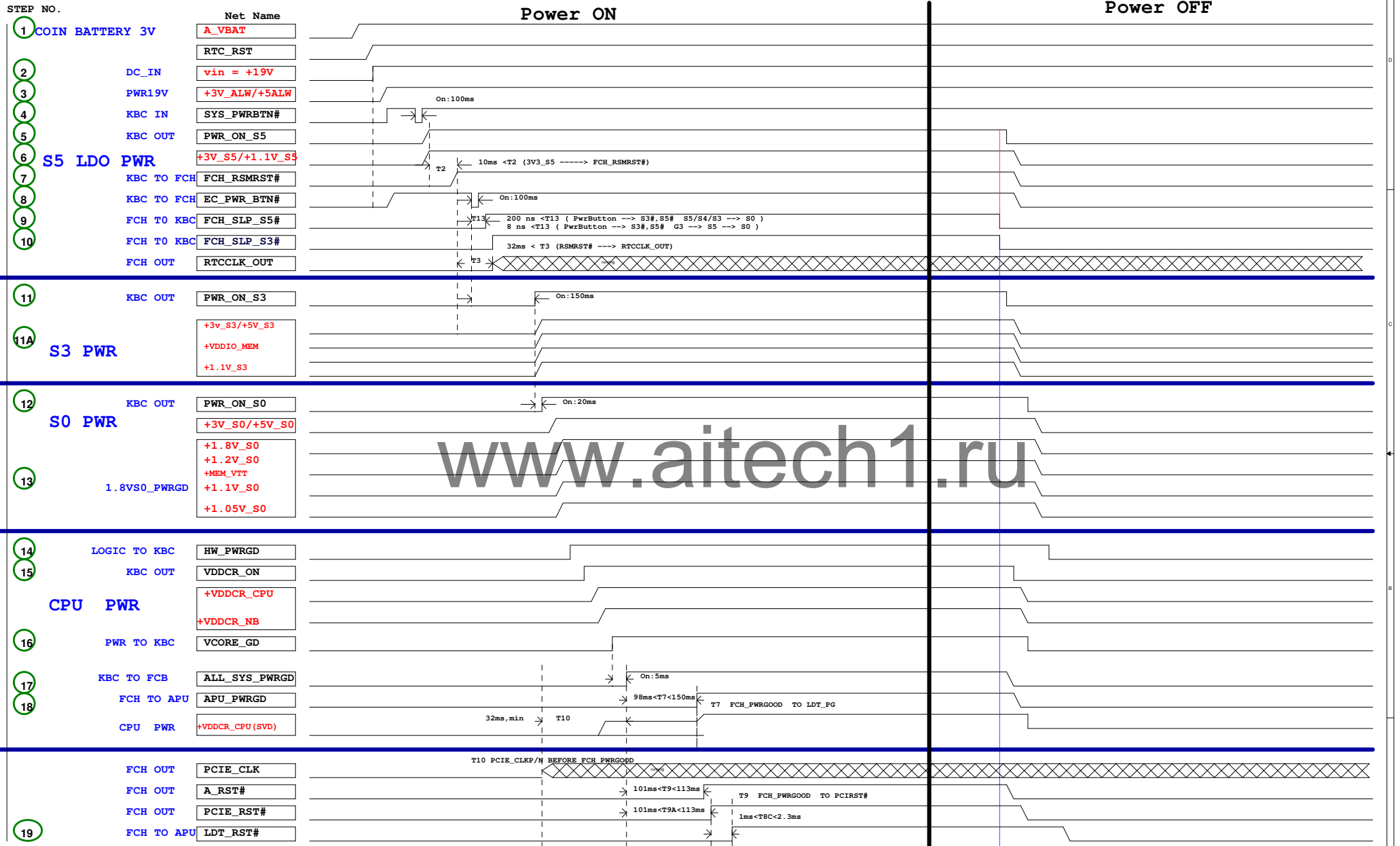
起点主板维修网 www.qdzbwx.com

<Variant Name>



TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL: HP_PURISIMA_Ellsworth	Size	C
TPV MODEL: 715G4789M0A	Ellsworth	Rev	M0E
Key Component: Power Sequence Diagram	PCB NAME: 715G4789M0A	Sheet	25 of 27
Date: Thursday, February 24, 2011		備註	<備註>

POWER SEQUENCE



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TPV (Top Victory Electronics Co., Ltd.)	OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
线路图编号 715G4788M0A	TPV MODEL	Ellsworth	Rev	M0E
Key Component POWER SEQUENCE	PCB NAME	715G4788M0A	Sheet	26 of 27
Date Thursday, February 24, 2011			備註	<備註>

Schematic Modify History

M0A --> M0B Modify date 2010/11/24~2010/11/25
(2010/11/26 gerber out for EVT)

- 1. Add R511~R519 , R522 for co-design RTL8105E and RTL8111E.
- 2. Modify SATA pin define because of HDD location reversefor ME concern.

M0B --> M0D Modify date 2010/12/29~2011/01/27
(2011/01/28 gerber out for DVT)

- 1. Remove EL1, webcam power connect to +5V_S0 and NC +3V_S0, only change BOM.
- 2. Add EL13, for LAN RJ45 LED behavior
- 3. Remove R437, For cardreader LED can't bright when insert card.
- 4. Remove EC7 EC8, For MS card no function, EMI cap is too large.
- 5. Remove C178 C173 X6, Add R367, foe reduce components X'tal of 32.768kHz to utilize EC internal clock.
- 6. Modify MINI PCI-e circuit, for meet PCI-e 1.0/1.1/2.0 and WLAN module request
- 7. Change R218 R219 R220 R231 R465 R482 R483 R485 USB OC pins pull high plane from +3V_S3 to +3V_S5.
- 8. USB OC pin of U23 change control signal to USB_OC2#.
- 9. ADD R158 R214, Add SM bus pull high resistors for SPD rom of DDR3.
- 10. Add EL13, For fix LAN LED status Matrix.
- 11.Change C381 from 10uf to 2.2uf, for internal speaker pop sound.
- 12. Change EC27 EC28 EC32 EC36 EC58 from 0.1uF to 0ohm, for HP pop sound
- 13. Remove R233, for avoid leak to +3V_S0
- 14. FAN_FG appear repeatedly, Close to the IC side changed its name to FAN_FG_EC
- 15. FAN_FG pull high for read the fan speed information
- 16. Modify CPU thermal SMBus(SID,SIC) path, From FCH side change to EC side
- 17. Add PQ40 PR184 for +5V_S3 discharge
- 18. Add R137 R539 Q43, Prevent Hudson leak to Zacate
- 19. Add PF1, for safety request
- 20. Add R321 R322 R325 R326 R327 R331 R334 R541 Q26 Q27 Q45 Q46 for ensure the stability of the panel when the power is turn on
- 21. Add R523~R528 for EDID ROM SMBus address
- 22. Add Q23 R351 R540, for EC to Hudson voltage two step issue
- 23. Remove R247, for APU_PCIE_RST# two step issue
- 24. Remove R164, Prevent Hudson leak to +3V_S0 power plane
- 25. Add R349, reserve Hudson SYS_RESET# external pull up.
- 26. Add R320 R323 R333 R368 R496 R501 R502 Q20 Q21 Q23 Q24 Q25, for reduce speaker pop sound
- 27. Change C105 from 10pF to 12pF, Change C107 from 10pF to 15pF, for LAN IC clock accuracy
- 28. Change C125 from 12pF to 10pF, change C123 from 12pF ro 8.2pF, for RTC accuracy
- 29. Remove R113 R114, Add R117 R118, Prevent Hudson leak to Zacate
- 30. Add R531, for co-design RTL8171 LAN controller
- 31. Modify RTL8175 wake up event circuit
- 32. Change D15, for HP power status LED color request
- 33. Add F1, for safety request
- 34. Add C407~C409, for USB power ramp issue
- 35. Add Q44 R285 and EC_LAN_WAKE_UP# signal, reserve wake on LAN path for EC request
- 36. NC EL11,Add EL14 and modify WEBCAM module pin define, for fix WEBCAM module request

PVT & MP de-pop circuit

page 16 for EC debug connector
JECDB1

page 17 for HP debug
JLPCDB1,R310,JHPDB5,C147,U31,Q22,D9~D14,R312~R317

page 17 for AMD debug
U5,R53,R56,R77,R80

page 17 for Tnl HW debug (CRT output function)
C3,C4,C7,C14,C15,C16,C21,C22,D22,D23,JCRTDB1
L1,L2,L3,Q1,Q2,R1,R2,R3,R4,R5,R6,R10,R11,R14
R15,R25,R26,R28,R29,R30,R32,R36,R37,U1,U2

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TPV (Top Victory Electronics Co., Ltd.)		OEM MODEL	HP_PURISIMA_Ellsworth	Size	C
線路圖編號 715G4788M0A		TPV MODEL	Ellsworth	Rev	M0E
Key Component	HISTORY	PCB NAME	715G4788M0A	備註 <備註>	
Date	Thursday, February 24, 2011	Sheet	27 of 27		