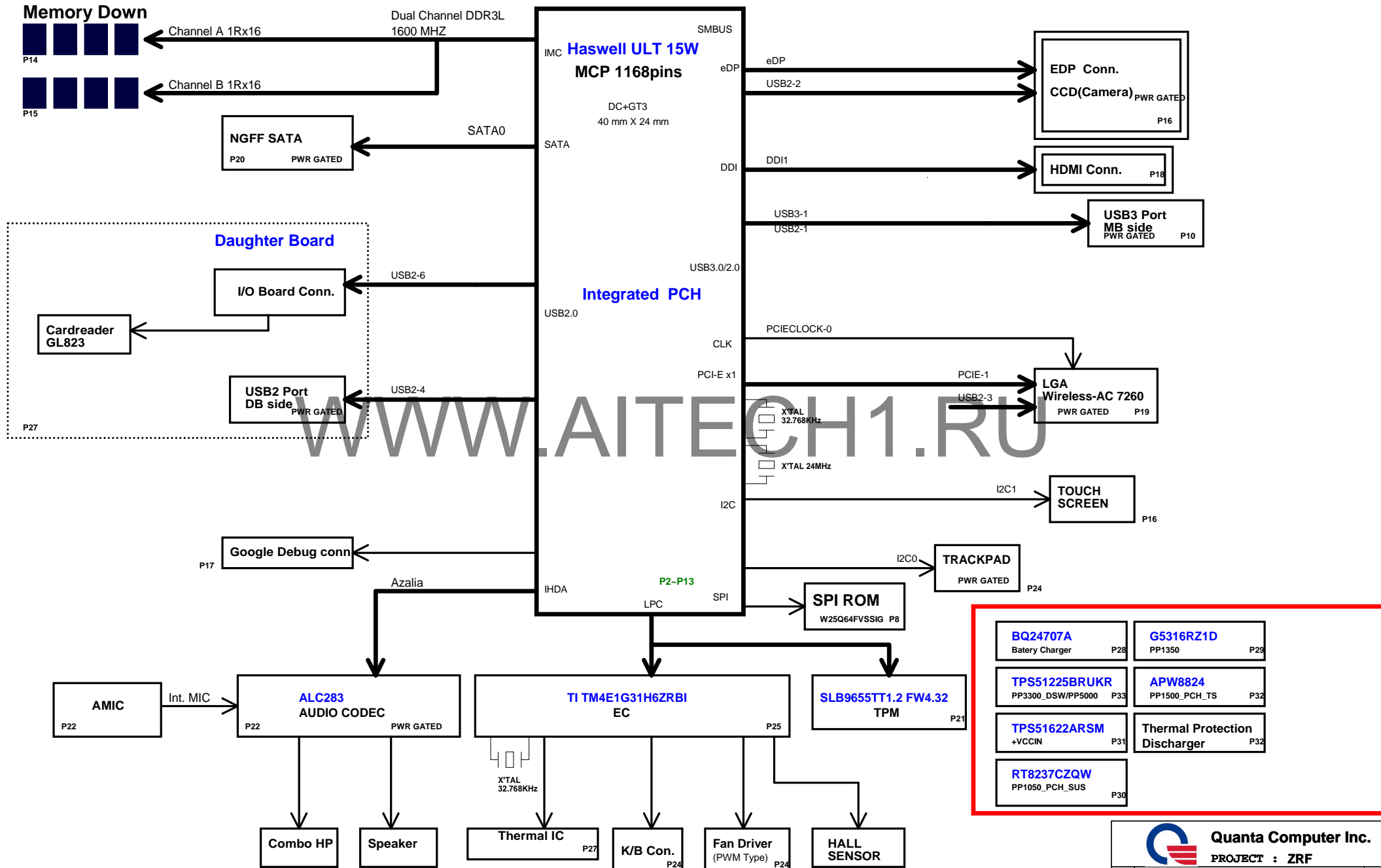


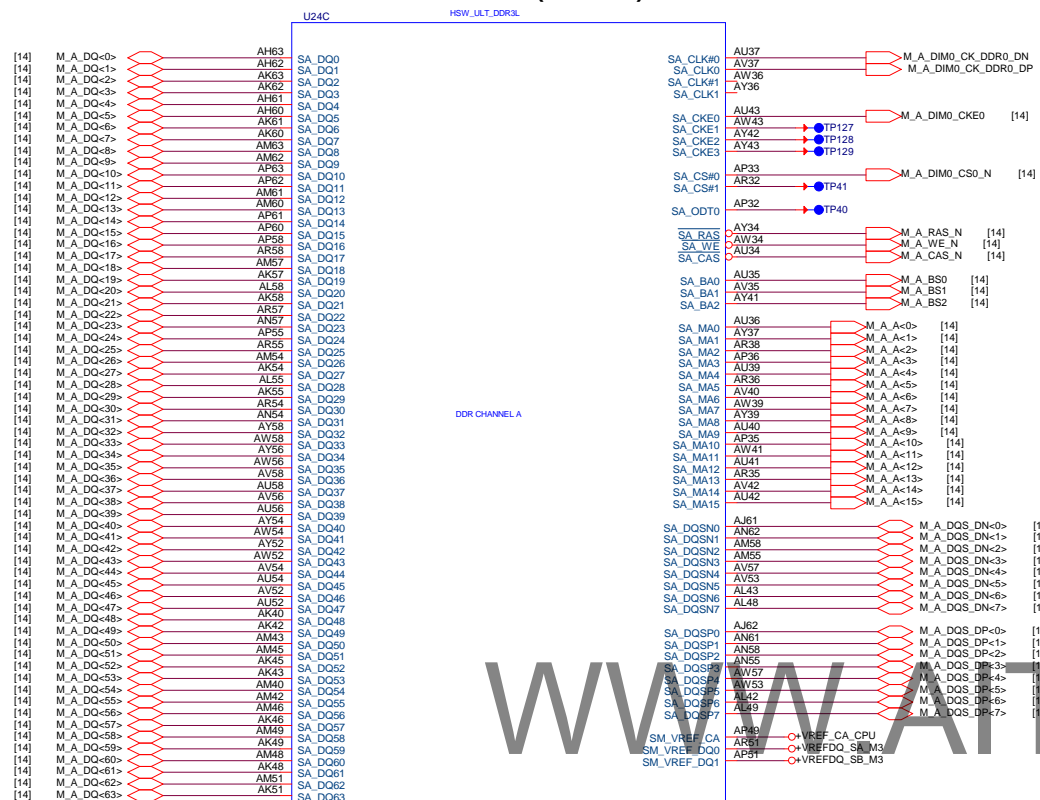
# Melvita (ZRF) SHB ULT SYSTEM BLOCK DIAGRAM

01



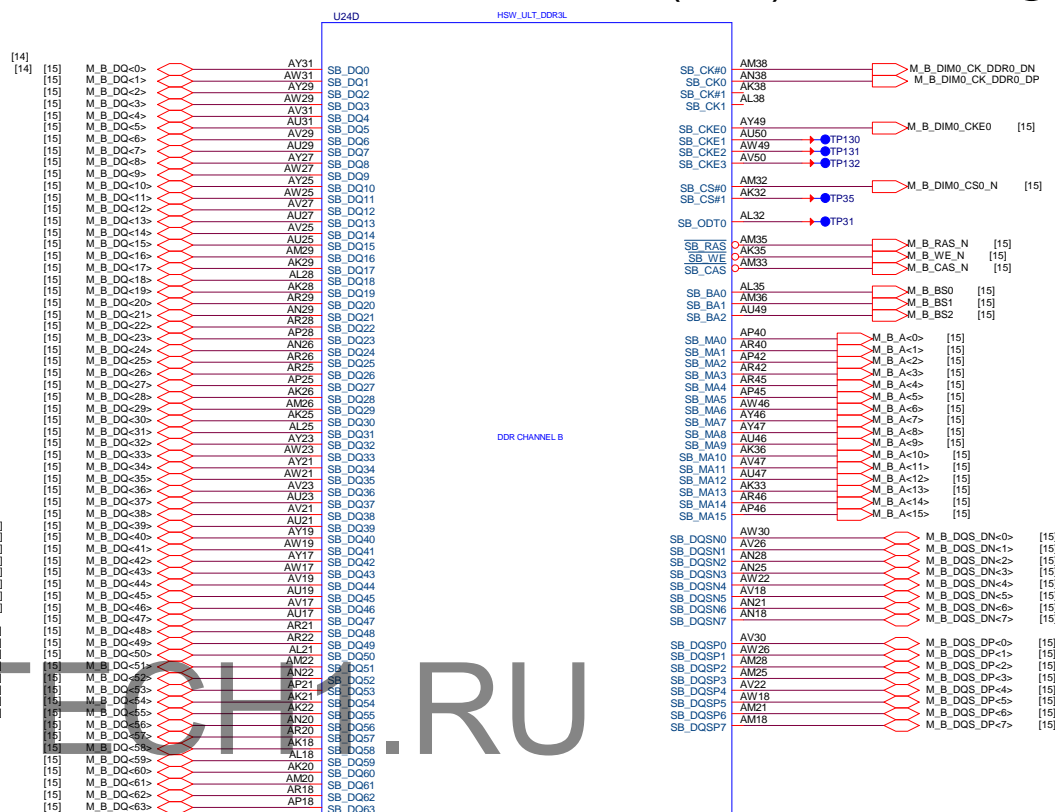


Haswell ULT (DDR3L)



3 OF 19

## Haswell Processor (DDR3L)



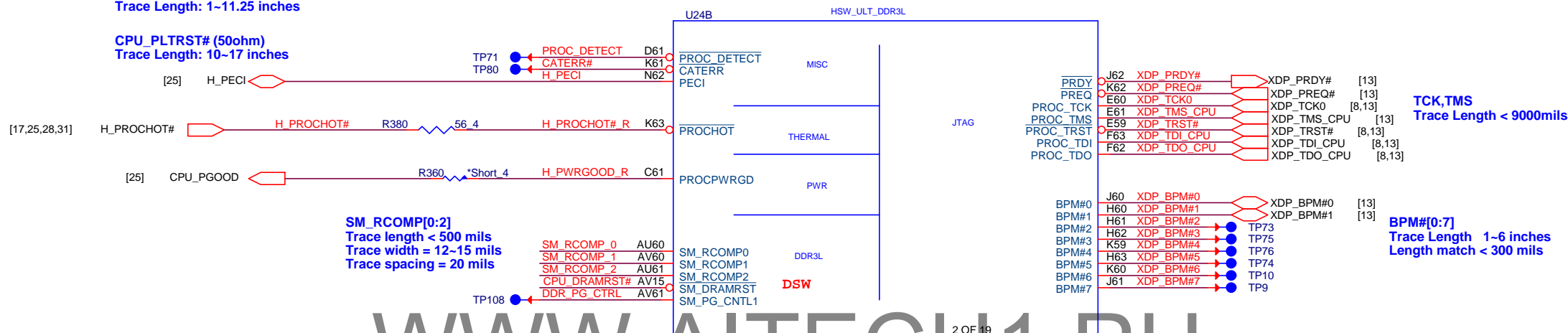
4 OF 19

## Haswell ULT (SIDE BAND)

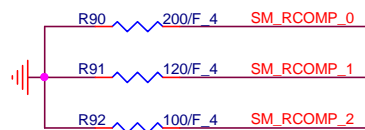
H\_PECI (50ohm)  
Route on microstrip only  
Spacing >18 mils  
Trace Length: 0.4~6.125 inches

H\_PWRGOOD (50ohm)  
Trace Length: 1~11.25 inches

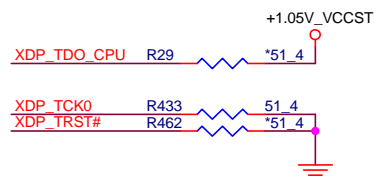
CPU\_PLTRST# (50ohm)  
Trace Length: 10~17 inches



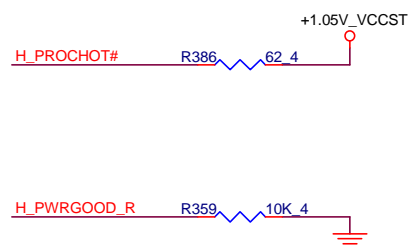
## DRAM COMP



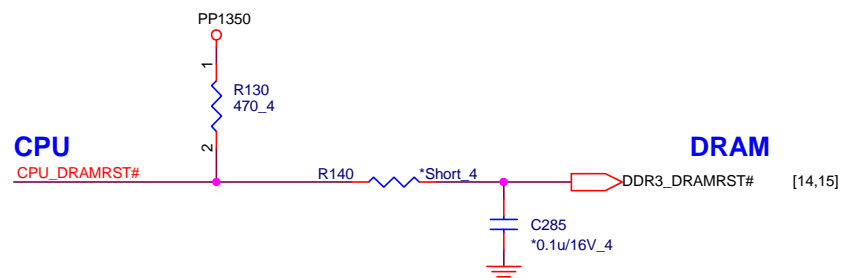
## XDP PU/PD



## PU/PD of CPU



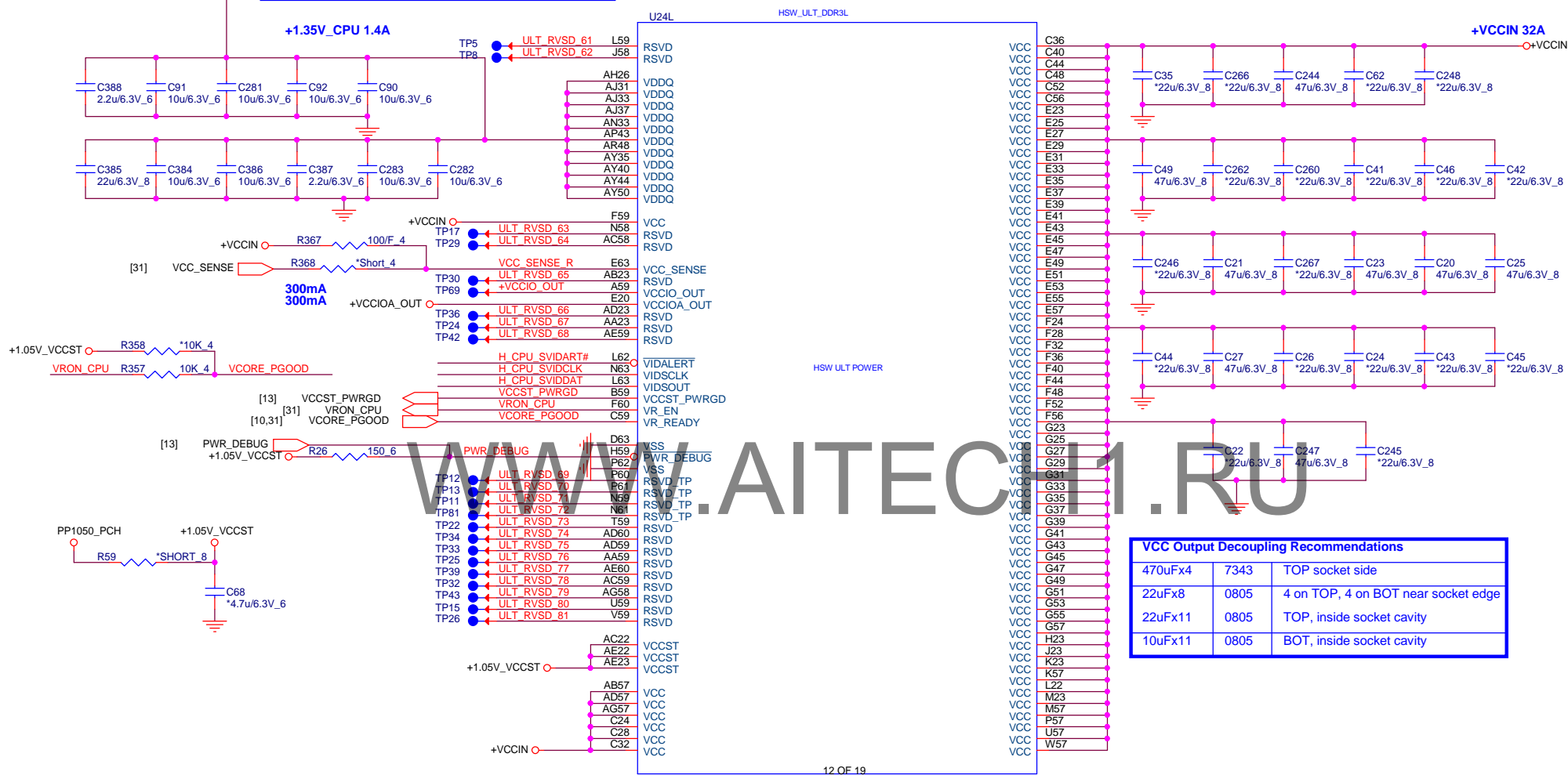
## DRAMRST



## Haswell ULT (POWER)

## VDDQ Output Decoupling Recommendations

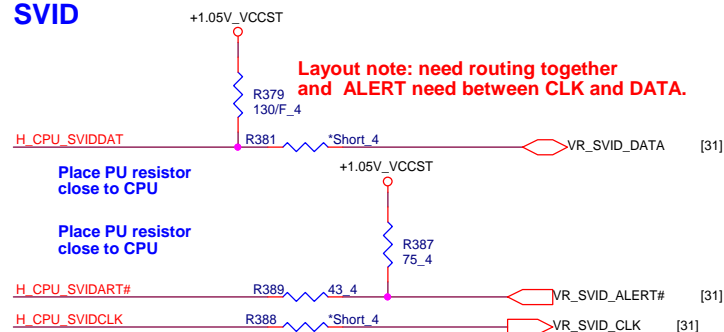
330uFx2	7343	BOT socket side
22uFx11	0805	5 on TOP, 6 on BOT inside socket cavity
10uFx10	0805	5 on TOP, 5 on BOT inside socket cavity



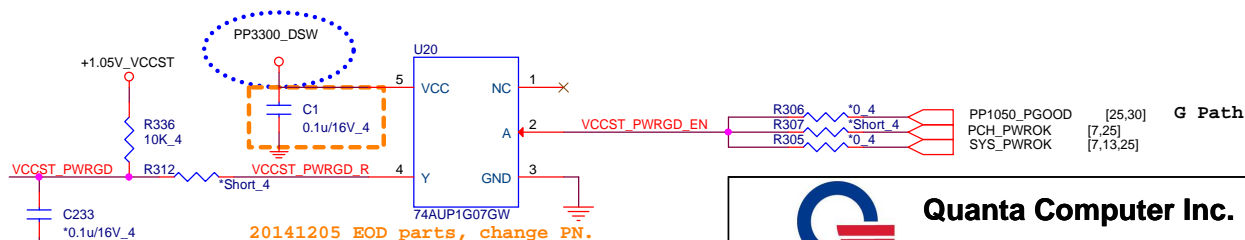
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12 OF 19

## SVID



## VCCST PWRGD



**Quanta Computer Inc.**  
PROJECT : ZRF

Size Document Number  
Haswell 4/5 (POWER)

Date: Monday, January 12, 2015 Sheet 5 of 38


Rev A



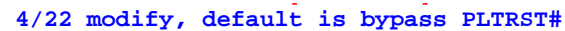
1 0

FAULT) NORMAL OPERATION; NO STALL STALL

CFG0 R417 \*1K 4

 <b>Quanta Computer Inc.</b> <b>PROJECT : ZRF</b>	
Size	Document Number <b>Haswell 5/5 (CFG/GND)</b> Date: <b>Monday, January 12, 2015</b>
	Sheet <b>6</b> of <b>38</b> Rev <b>A</b>

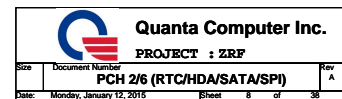
# 07



**PROJECT : ZRF**

Size	Document Number <b>PCH 1/6 (PM)</b>	Rev A
Date:	Monday, January 12, 2015	Sheet 7 of 38

## 08





## Haswell ULT PCH (CLOCK)

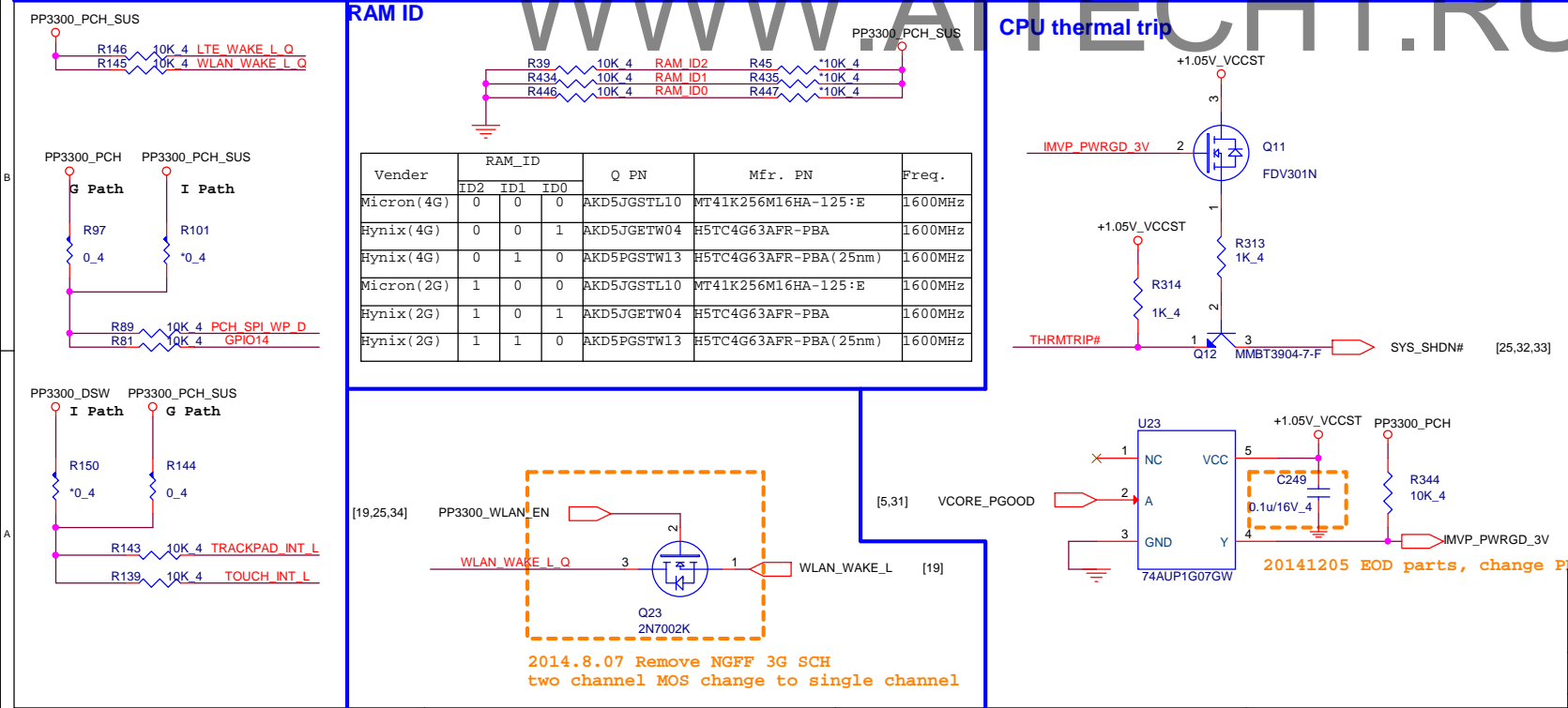
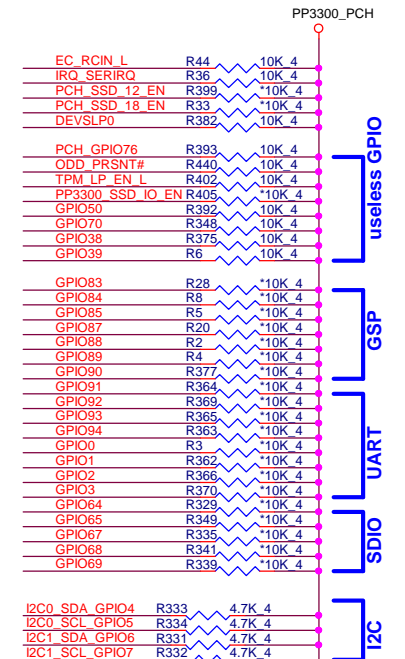
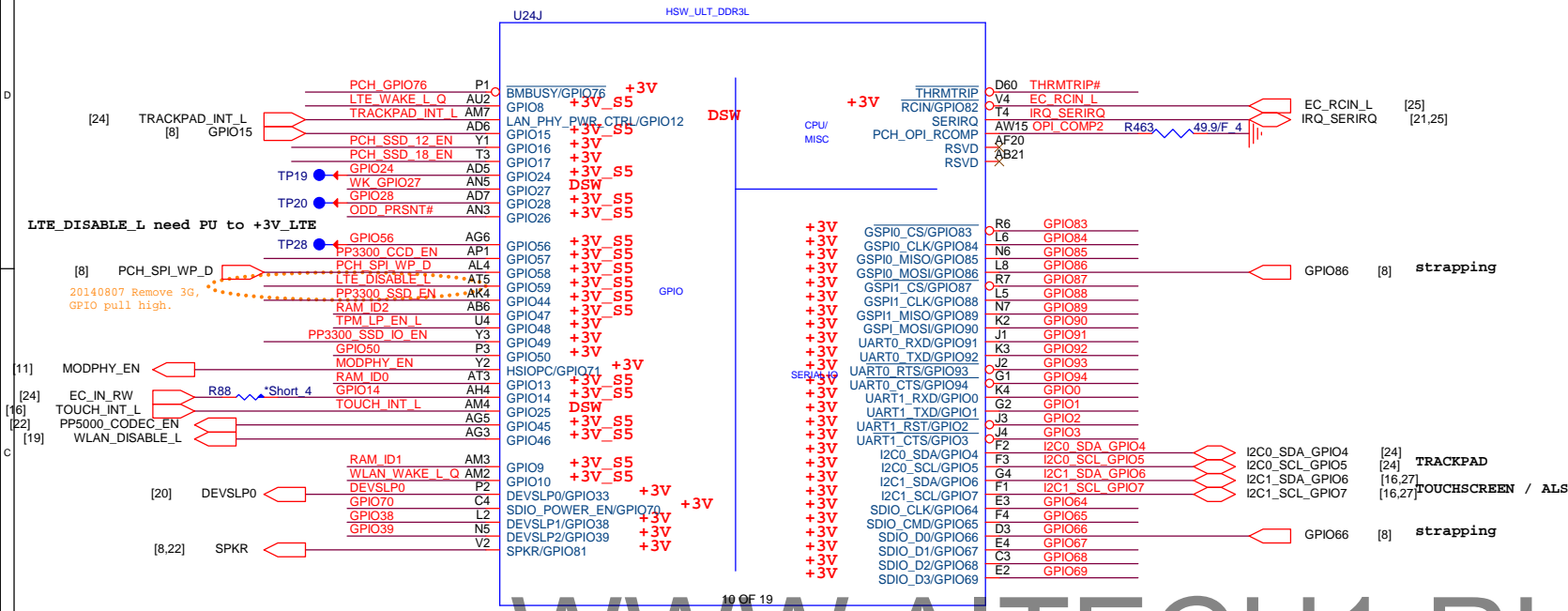


The screenshot shows a schematic diagram for USB Overcurrent protection. It features a USB connector labeled "PP1300 PCH SUS" connected to a resistor network. The network includes resistors R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R312, R313, R314, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R326, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R345, R346, R347, R348, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R362, R363, R364, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R375, R376, R377, R378, R379, R380, R381, R382, R383, R384, R385, R386, R387, R388, R389, R390, R391, R392, R393, R394, R395, R396, R397, R398, R399, R400, R401, R402, R403, R404, R405, R406, R407, R408, R409, R410, R411, R412, R413, R414, R415, R416, R417, R418, R419, R420, R421, R422, R423, R424, R425, R426, R427, R428, R429, R430, R431, R432, R433, R434, R435, R436, R437, R438, R439, R440, R441, R442, R443, R444, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R607, R608, R609, R610, R611, R612, R613, R614, R615, R616, R617, R618, R619, R620, R621, R622, R623, R624, R625, R626, R627, R628, R629, R630, R631, R632, R633, R634, R635, R636, R637, R638, R639, R640, R641, R642, R643, R644, R645, R646, R647, R648, R649, R650, R651, R652, R653, R654, R655, R656, R657, R658, R659, R660, R661, R662, R663, R664, R665, R666, R667, R668, R669, R670, R671, R672, R673, R674, R675, R676, R677, R678, R679, R680, R681, R682, R683, R684, R685, R686, R687, R688, R689, R690, R691, R692, R693, R694, R695, R696, R697, R698, R699, R700, R701, R702, R703, R704, R705, R706, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R860, R861, R862, R863, R864, R865, R866, R867, R868, R869, R870, R871, R872, R873, R874, R875, R876, R877, R878, R879, R880, R881, R882, R883, R884, R885, R886, R887, R888, R889, R890, R891, R892, R893, R894, R895, R896, R897, R898, R899, R900, R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000, R1001, R1002, R1003, R1004, R1005, R1006, R1007, R1008, R1009, R1010, R1011, R1012, R1013, R1014, R1015, R1016, R1017, R1018, R1019, R1020, R1021, R1022, R1023, R1024, R1025, R1026, R1027, R1028, R1029, R1030, R1031, R1032, R1033, R1034, R1035, R1036, R1037, R1038, R1039, R1040, R1041, R1042, R1043, R1044, R1045, R1046, R1047, R1048, R1049, R1050, R1051, R1052, R1053, R1054, R1055, R1056, R1057, R1058, R1059, R1060, R1061, R1062, R1063, R1064, R1065, R1066, R1067, R1068, R1069, R1070, R1071, R1072, R1073, R1074, R1075, R1076, R1077, R1078, R1079, R1080, R1081, R1082, R1083, R1084, R1085, R1086

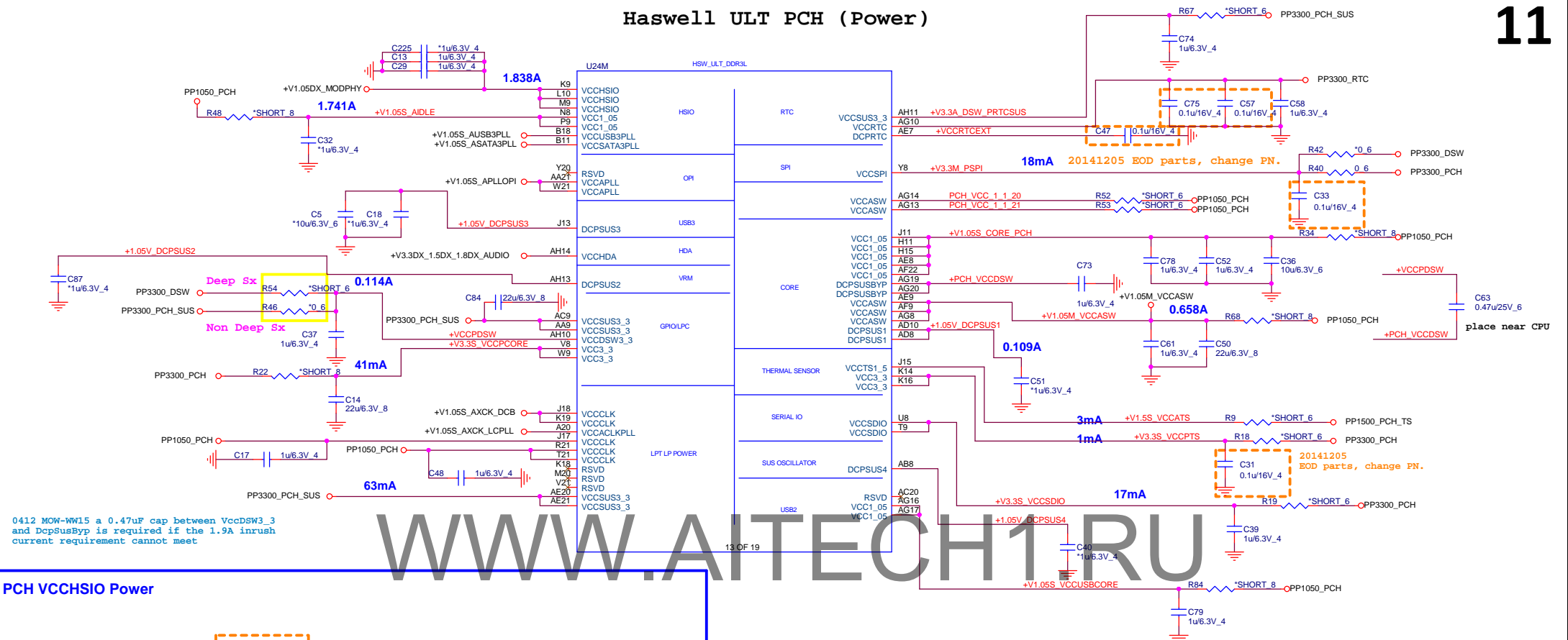
# Haswell ULT PCH (GPIO,CPU/MISC,NCTF)

## PCH GPIO PU/PD

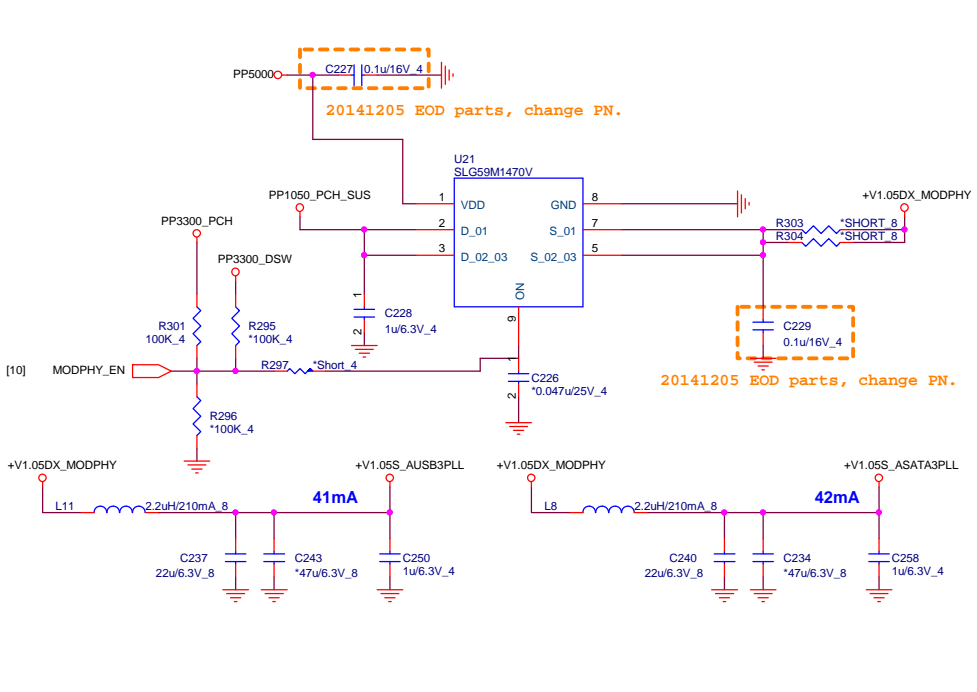
10



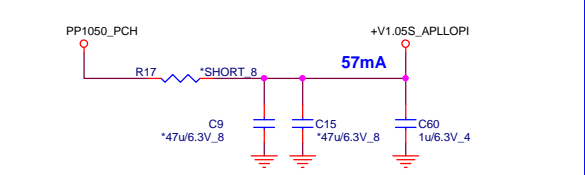
## Haswell ULT PCH (Power)



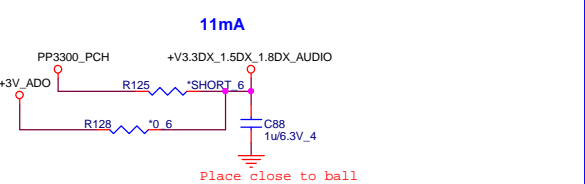
## PCH VCCHSIO Power



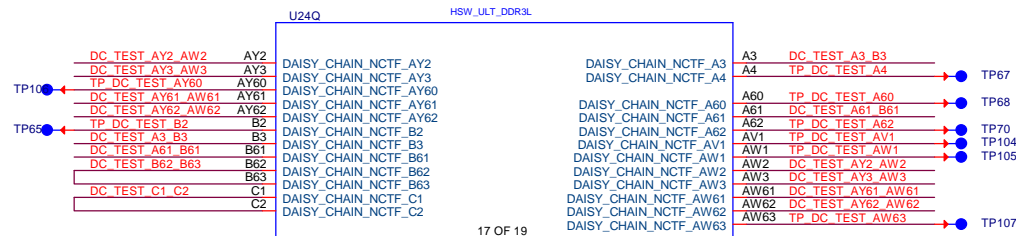
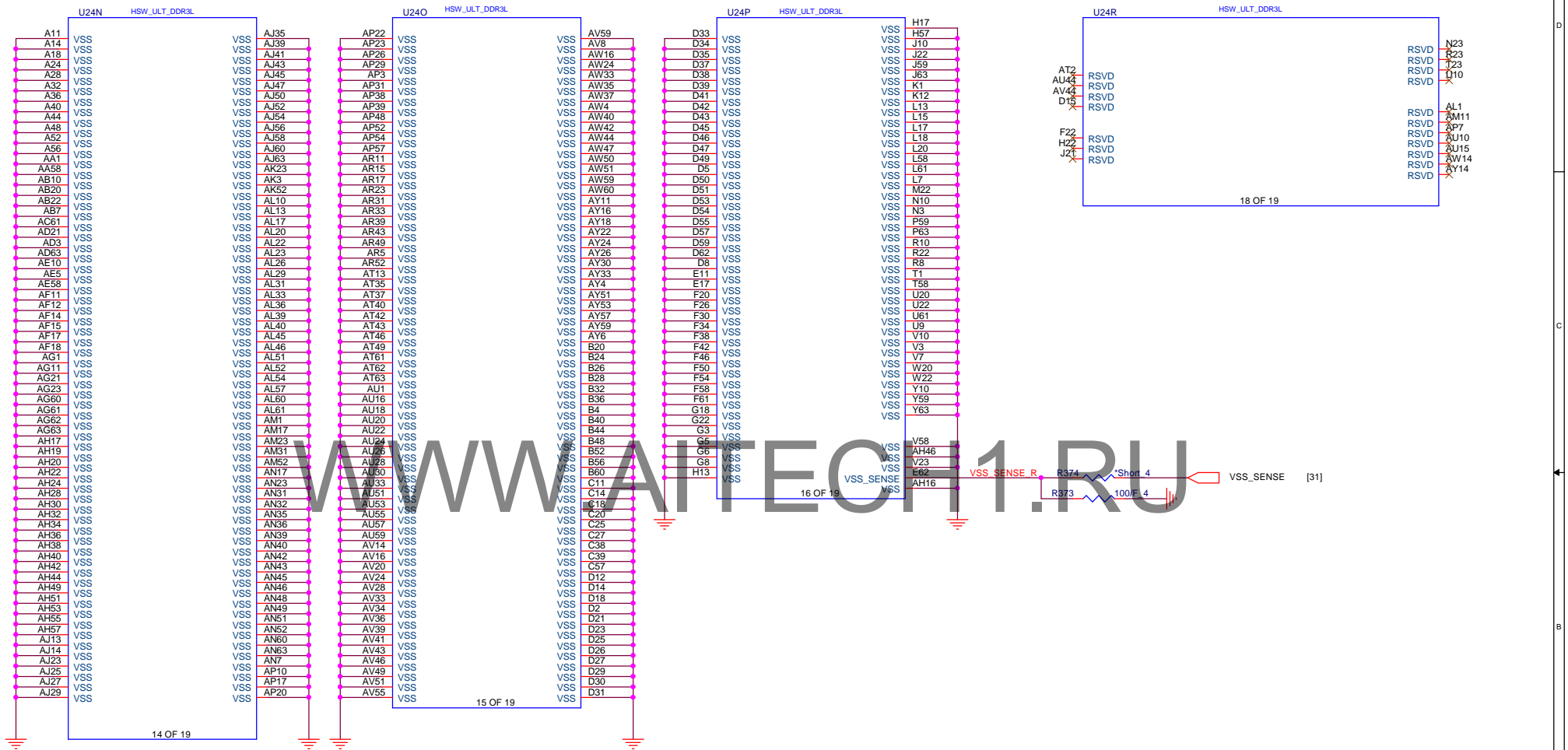
### VCCAPLL power



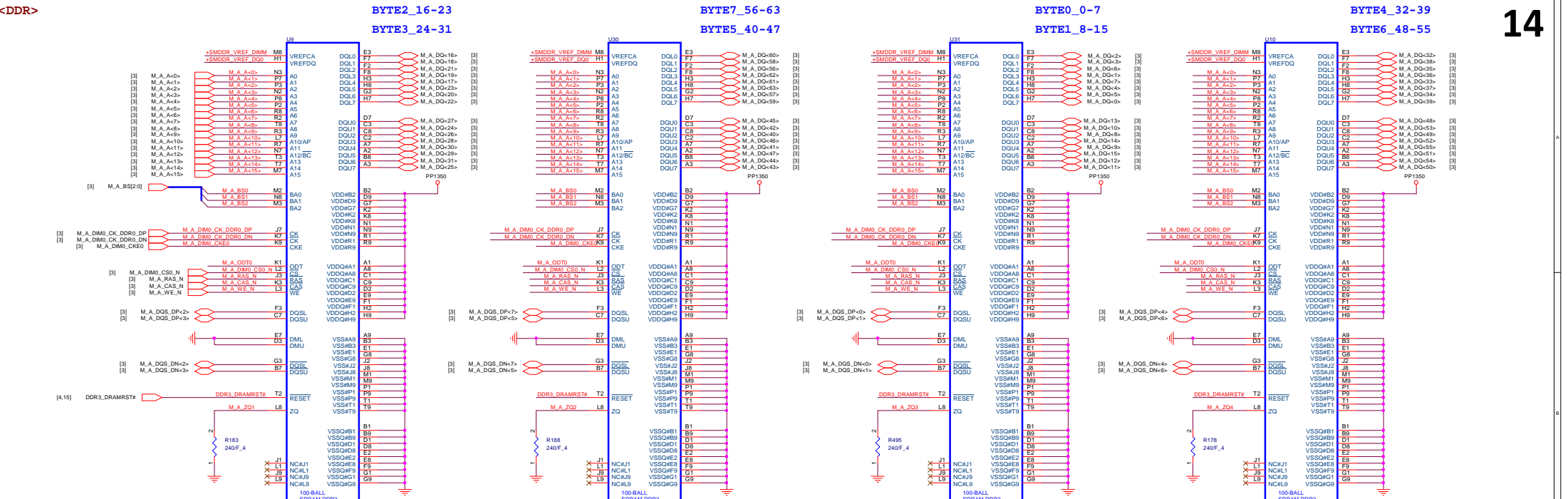
## PCH HDA Power



## Haswell ULT (GND)



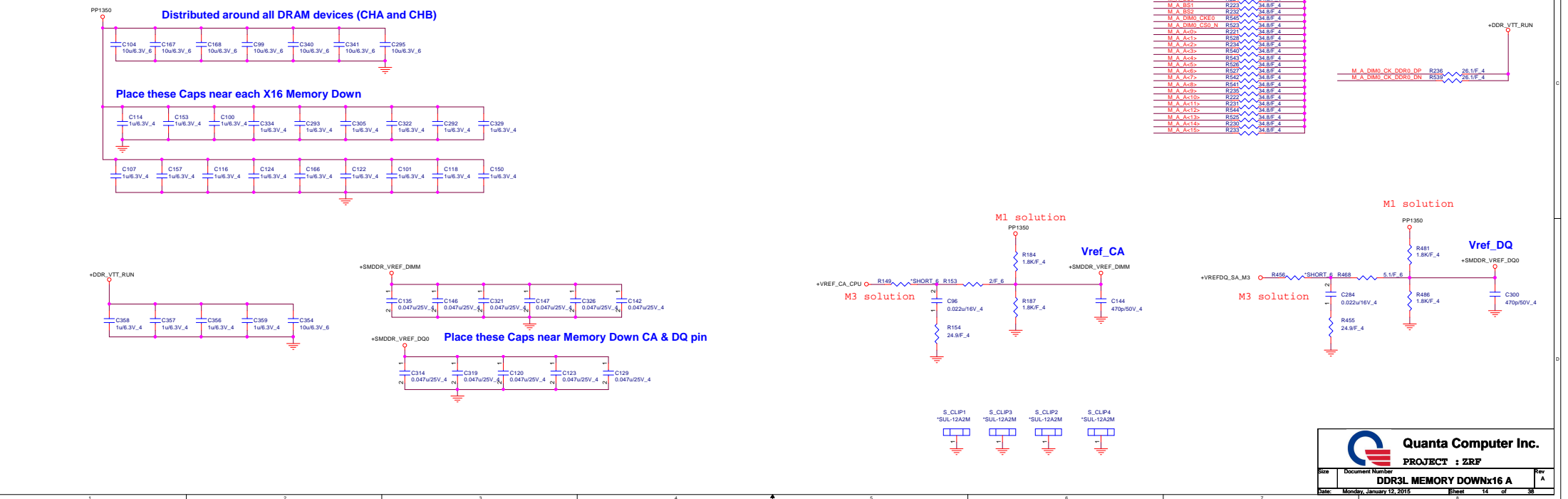




Vendor	P/N
Hynix	AKD5JGST400
Elpida	AKD5JGST404

Micron/MT41K256M16HA-125/E/AKD5JGSTL02 for proto board

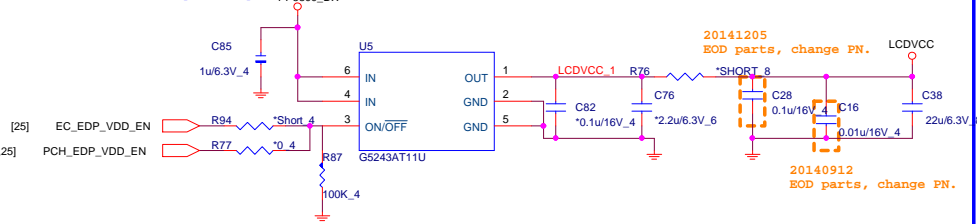
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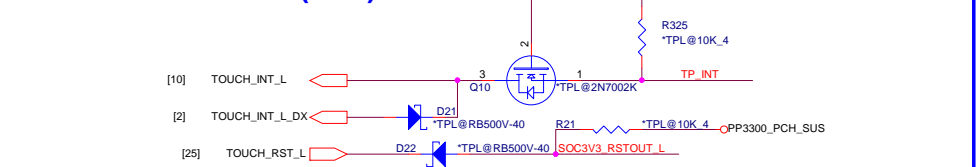




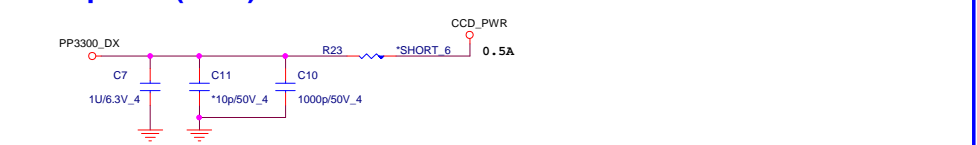
LVDS Power(LDS)



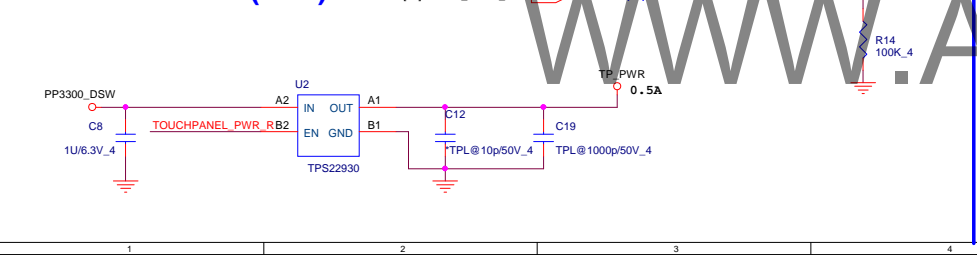
Touch Panel INT/RST(TSN)



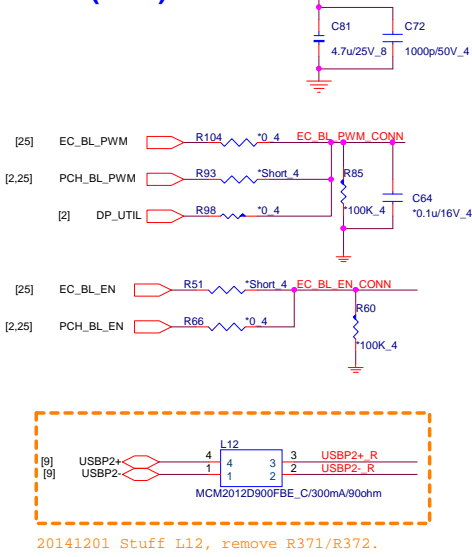
CCD power(CCD)



Touch Pad Power(TPD)



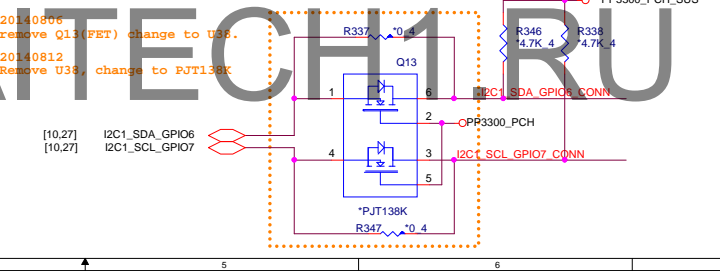
LVDS(LDS)



20141201 Stuff L12, remove R371/R372.

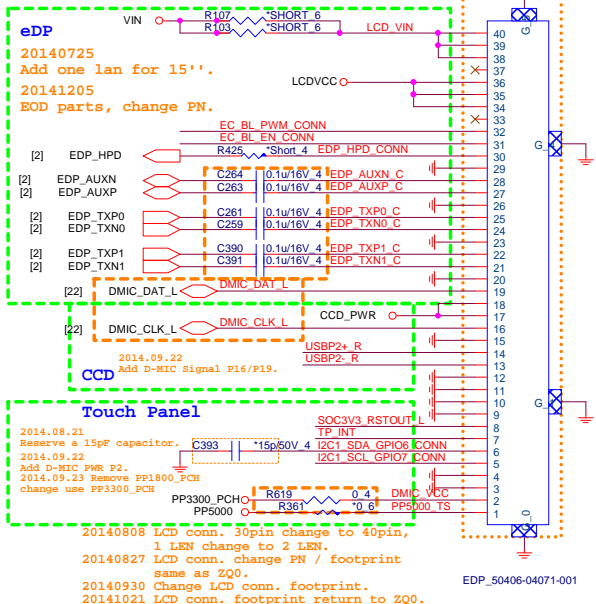
CCD (CCD)

Touch Panel level shift(TSN)



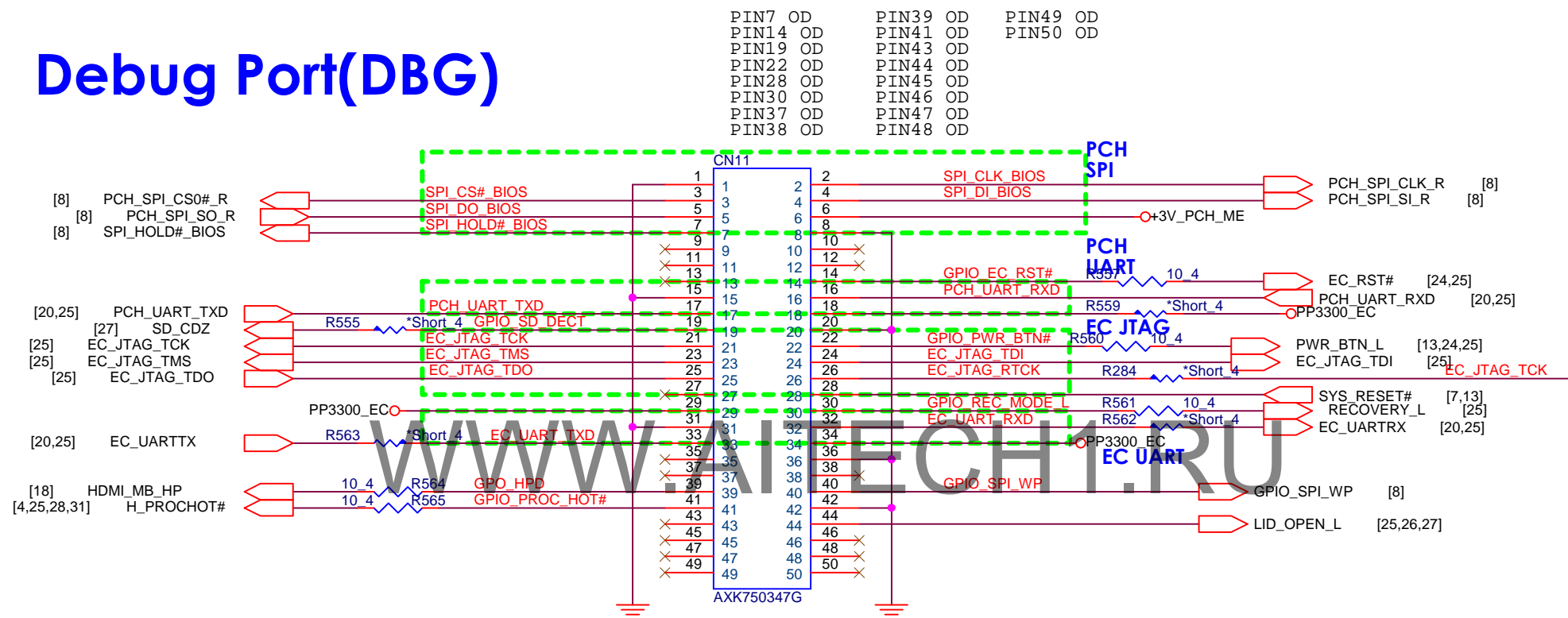
LVDS\_CONN  
DFHS40FS095  
footprint lvds-cvs5402mlrb-nh-40p-1

16





# Debug Port(DBG)

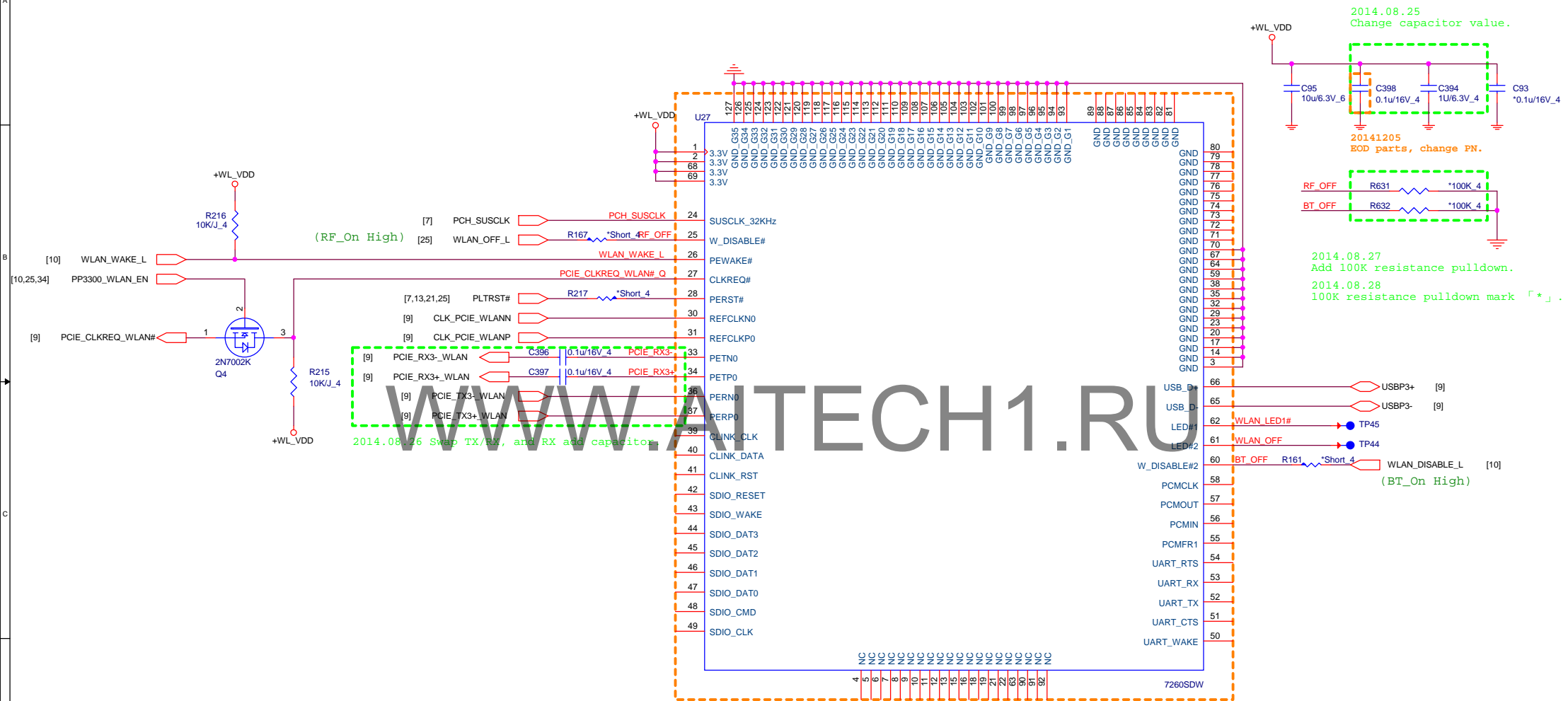


**Quanta Computer Inc.**

**PROJECT : ZRF**

Size	Document Number	Rev A
<b>Google Debug</b>		
Date:	Monday, January 12, 2015	Sheet 17 of 38

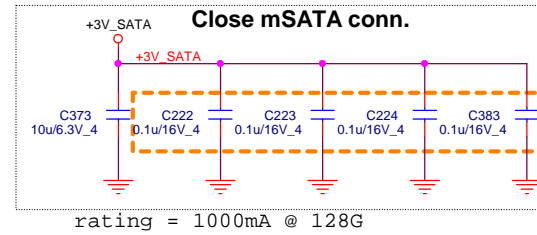
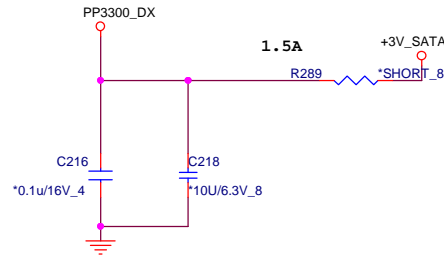




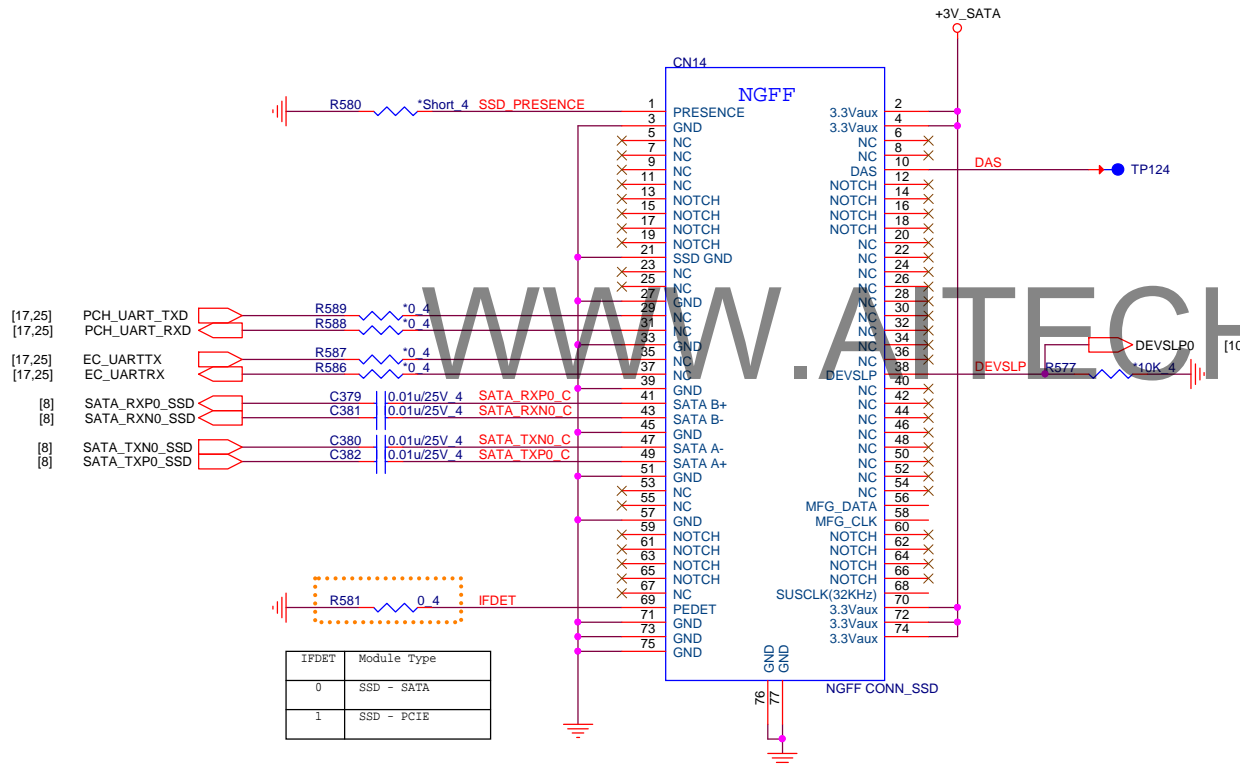
20140820 On board IC change to same as ZS8 connector  
 20140822 Return to another wifi onboard module 7260SDW  
 20140826 Change wifi onboard module 7260SDW footprint  
 20140909 Change wifi onboard module 7260SDW footprint  
 20141014 Change wifi onboard module 7260SDW PN.

# NGFF SSD connector. San Disk SSD Card.


20



20141205 EOD parts, change PN.



IFDET	Module Type
0	SSD - SATA
1	SSD - PCIE

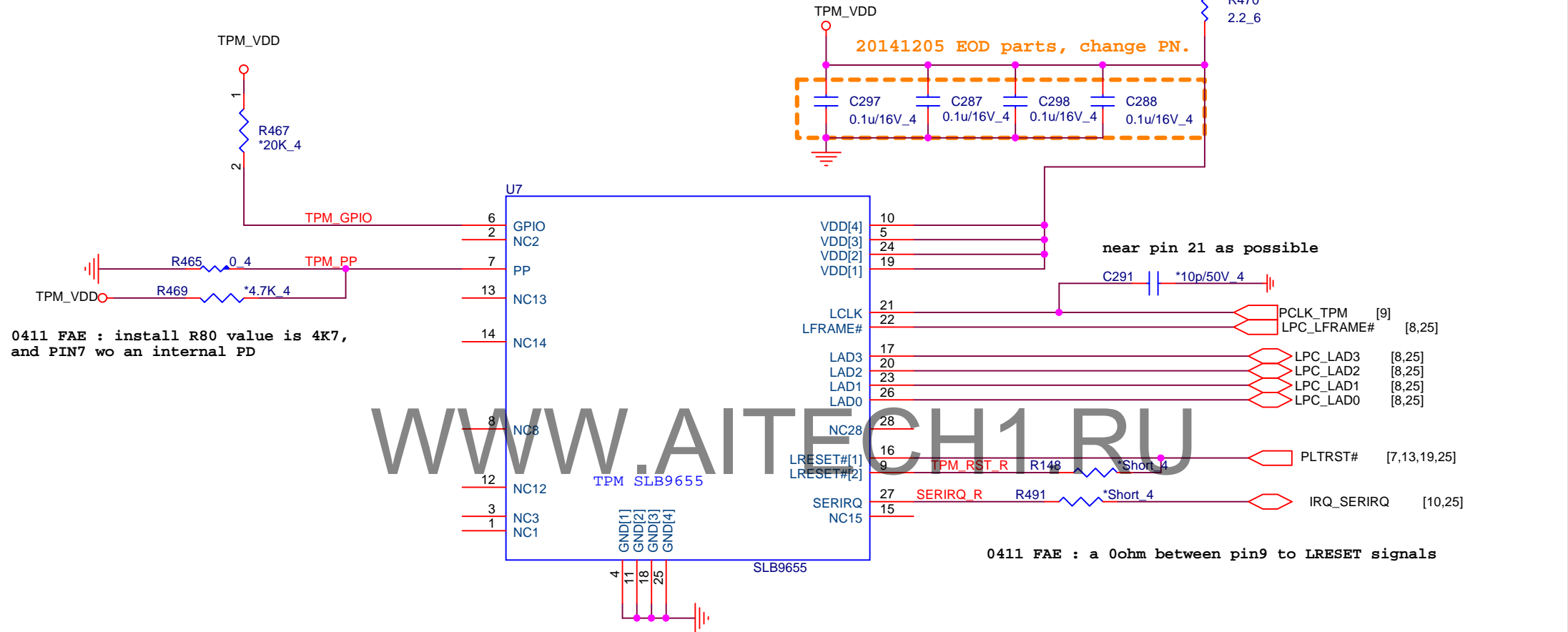


**Quanta Computer Inc.**  
PROJECT : ZRF

Size	Document Number	Rev
	<b>NGFF SSD</b>	A
Date:	Monday, January 12, 2015	Sheet 20 of 38

# TPM (TPM)

21



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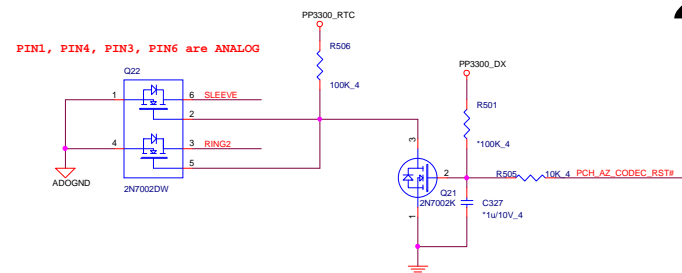
PROJECT : ZRF

Size	Document Number	Rev A
TPM SLB9655 / LED		

Date: Monday, January 12, 2015 Sheet 21 of 38

22

### Grounding circuit(ADO)

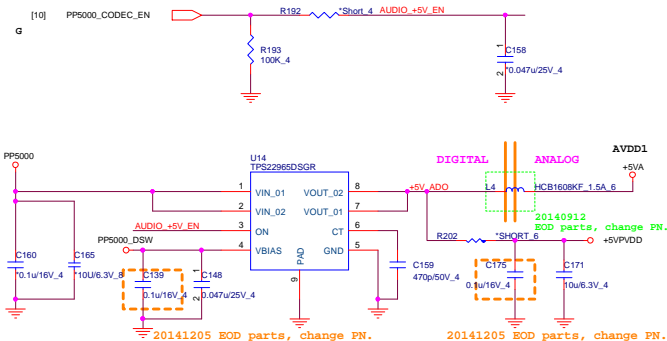


## D-Mic

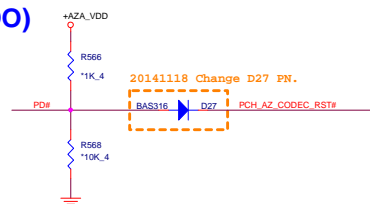


20140922 Remove A-MIC, add D-MIC same as Hugo(ZHQ)

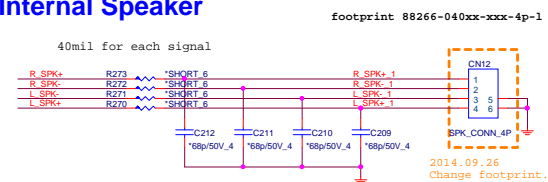
### Codec PWR 5V(ADO)



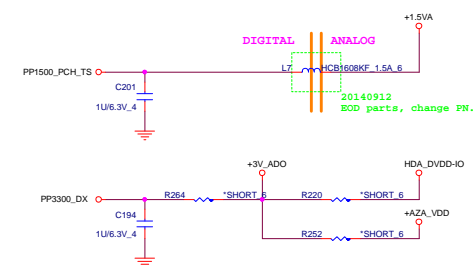
## Mute(ADO)



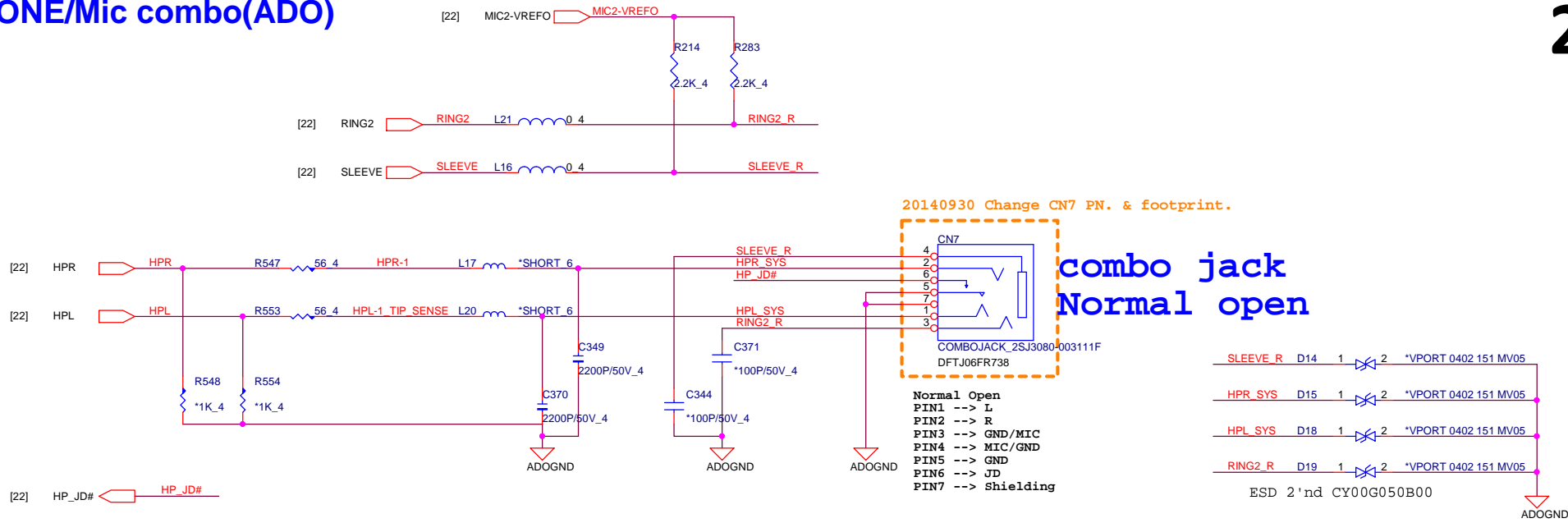
## Internal Speaker



### Codec PWR 3V/1.5V(ADO)

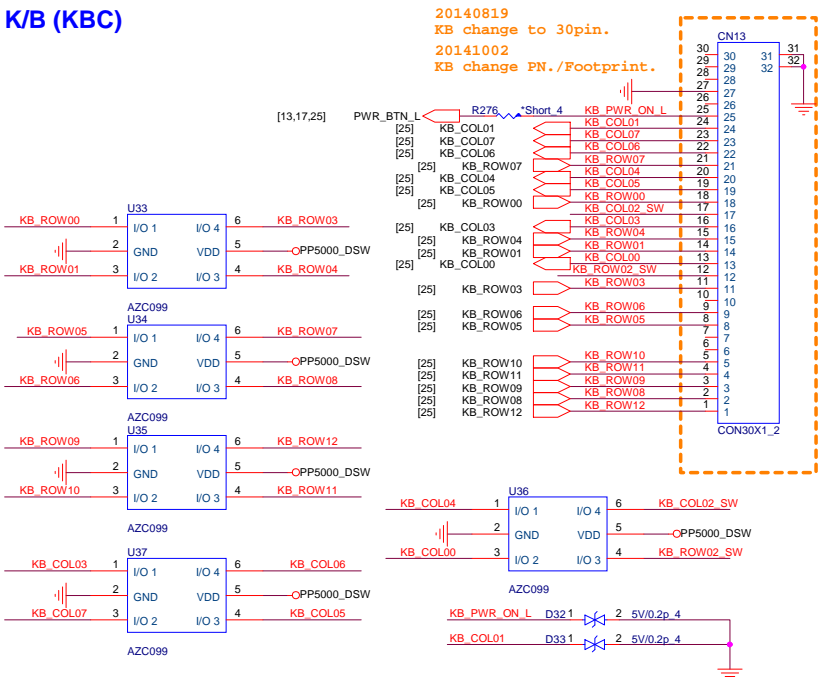


HEADPHONE/Mic combo(ADO)

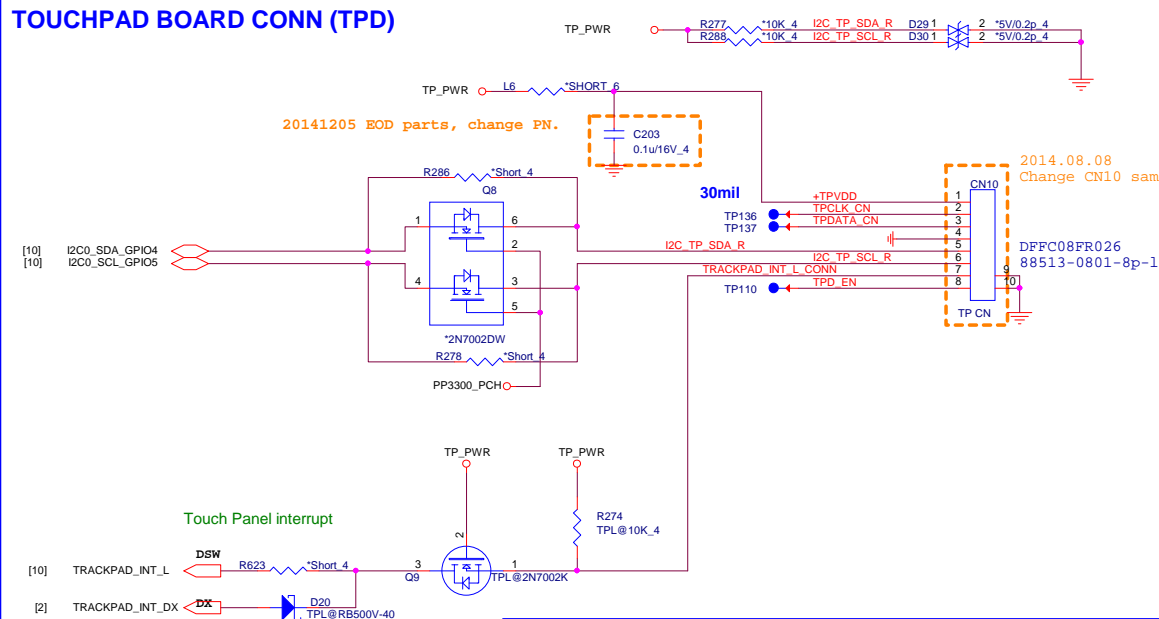


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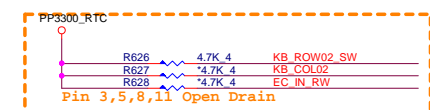
**K/B (KBC)**



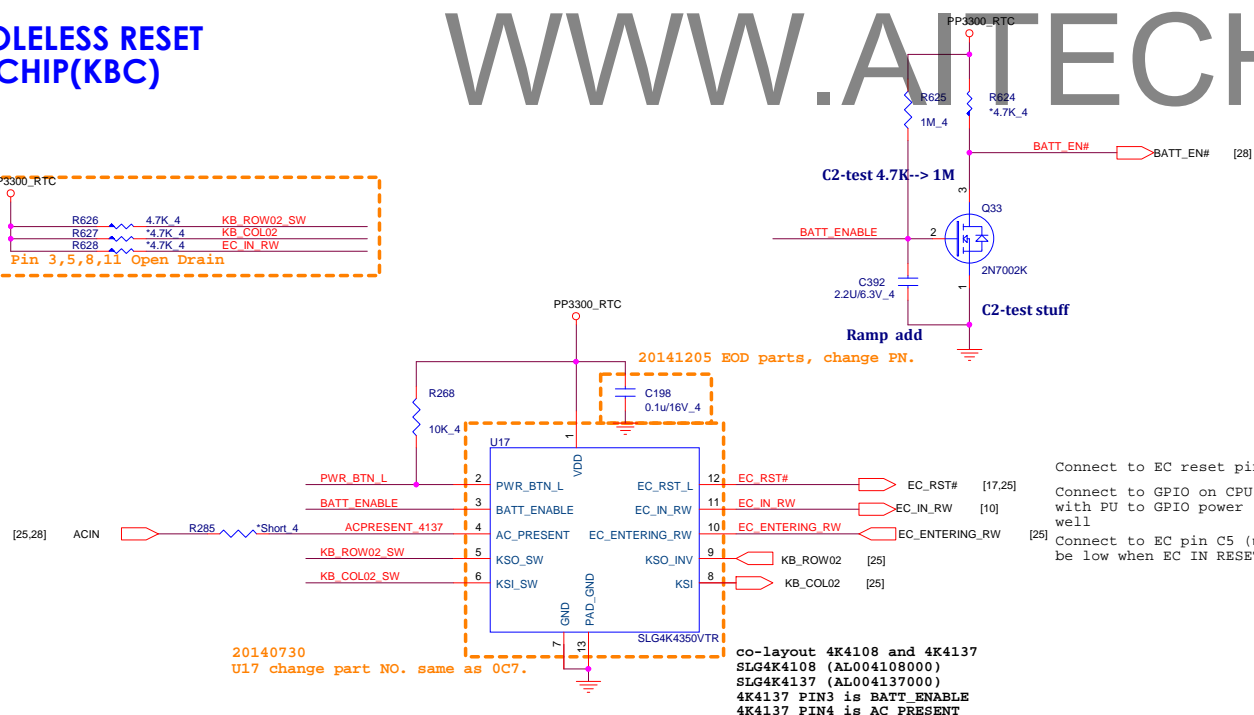
## TOUCHPAD BOARD CONN (TPD)



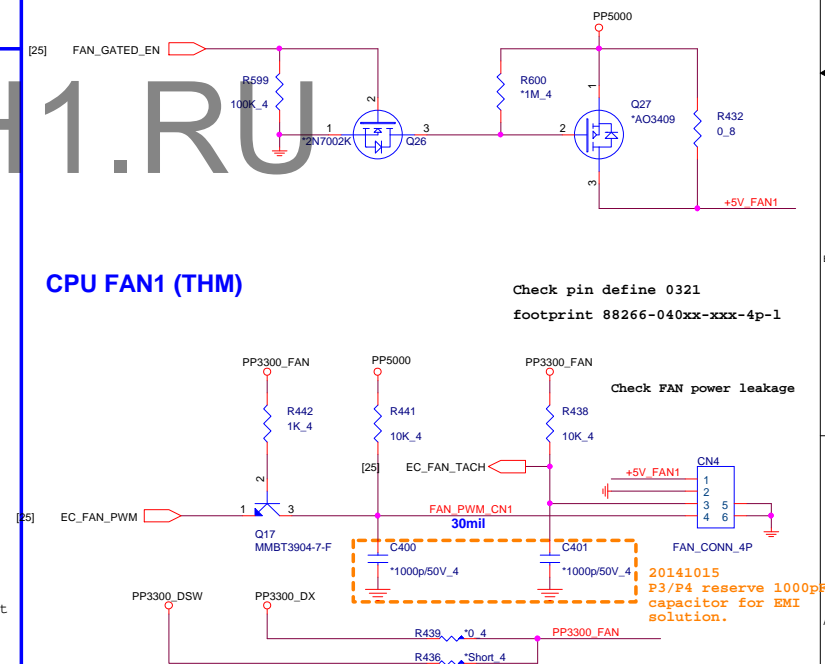
## HOLELESS RESET 2-CHIP(KBC)



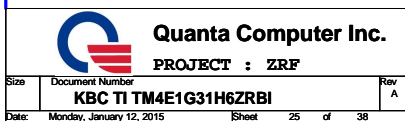
www.AITECH1.RU



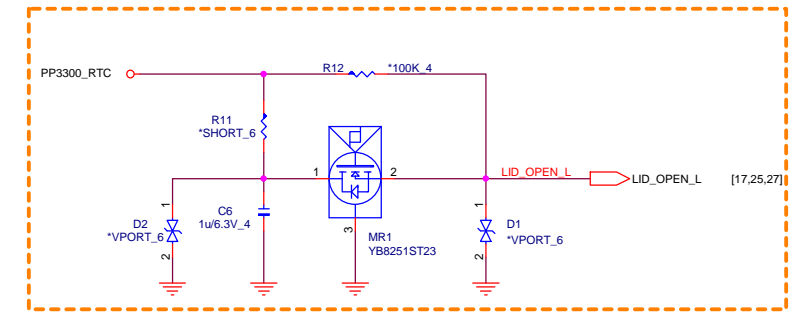
## CPU FAN1 (THM)





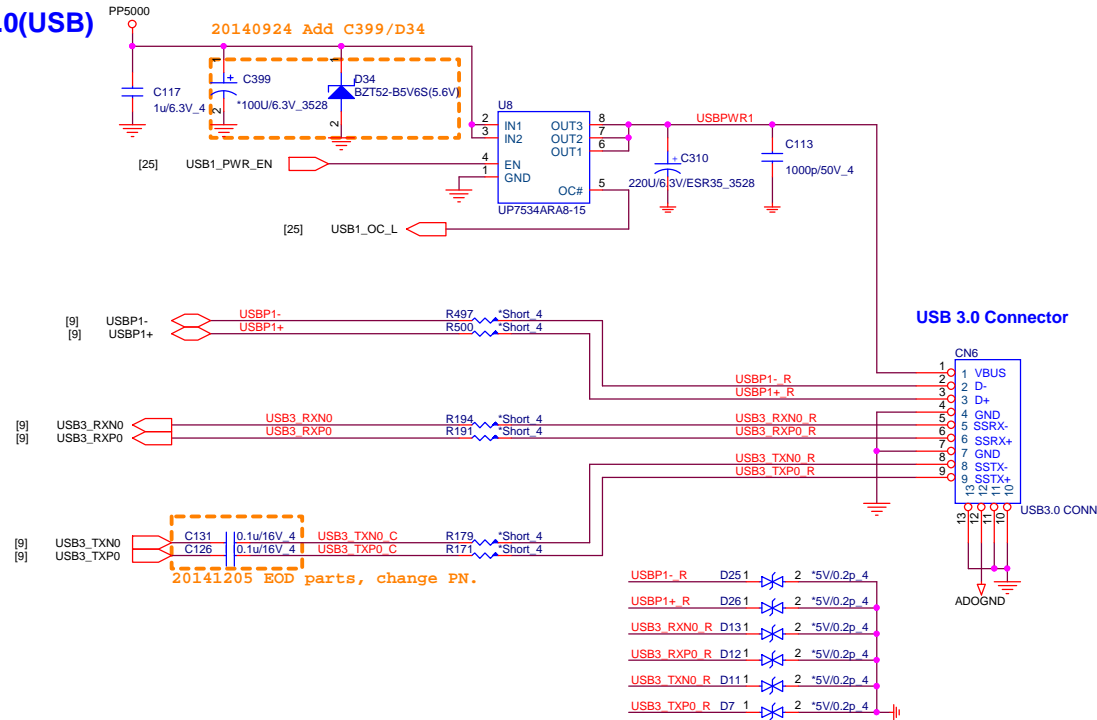


## Lid Switch (HSR)

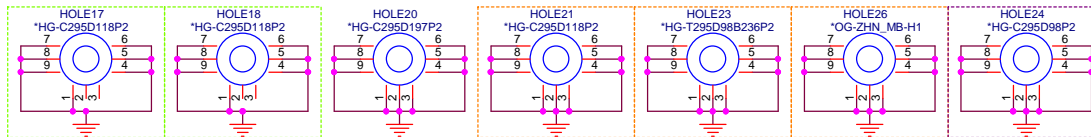


20140923 Add Lid Switch (HSR)

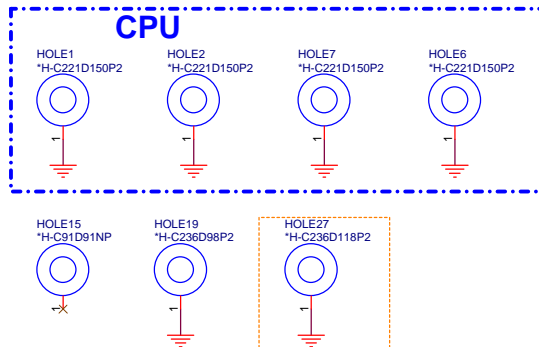
## USB 3.0 Connector



## HOLE(OTH)



## CPU



## 20140828

1. Add HOLE27
2. Change HOLE17/HOLE18/HOLE21/HOLE22 /HOLE23/HOLE26 footprint
3. Remove HOLE9/HOLE16

## 20140829

1. Change HOLE27 footprint
2. HOLE17/HOLE18/HOLE22 remove Pin1/Pin2/Pin3

## 20140901

1. Remove HOLE22

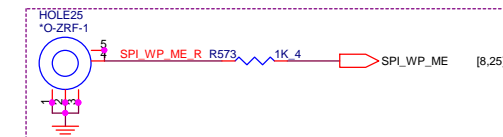
## 20140923

1. Remove battery enable, change to HOLE24

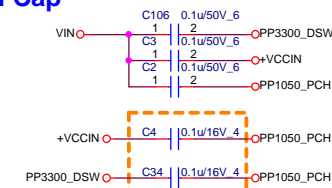
## 20140926

1. HOLE24 change footprint.
2. HOLE25 Add more 2pin & change footprint.
3. Remove HOLE3/4/5/8/10/11/12/13/14.

## ROM WP#



## EMI Cap



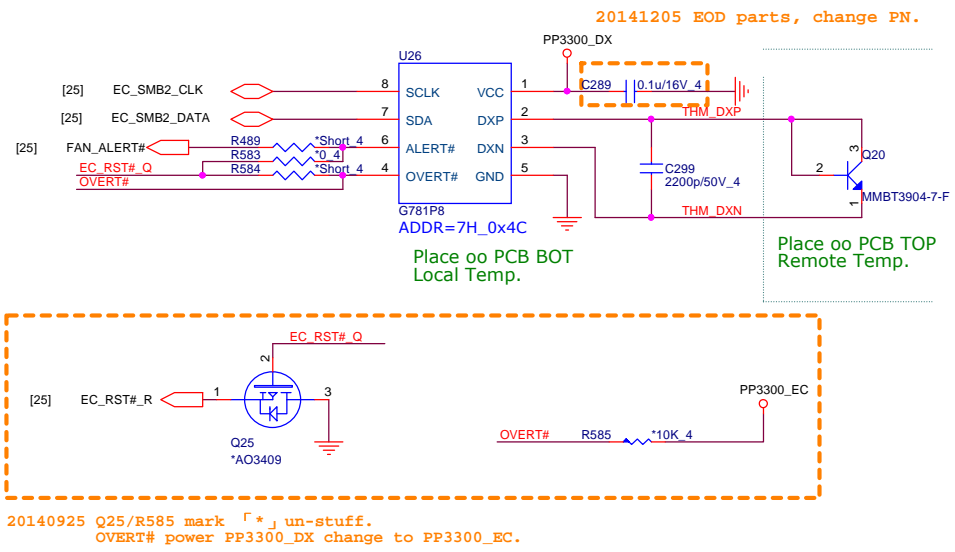
20141205 EOD parts, change PN.



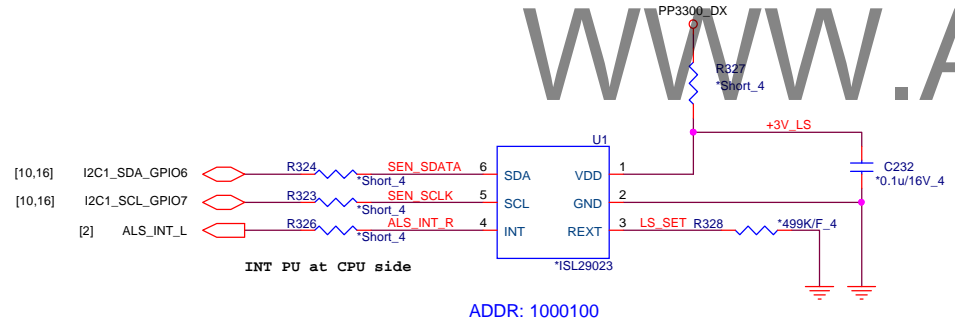
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PROJECT : ZRF

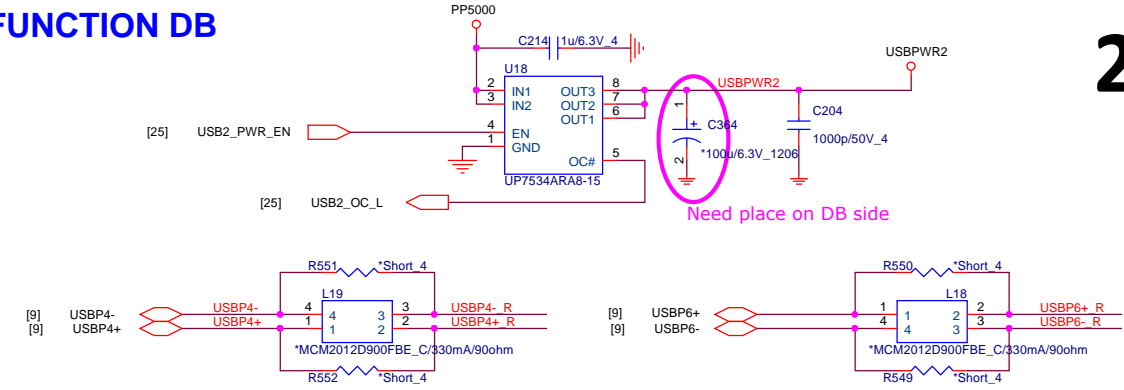
# Thermal Sensor(THM)



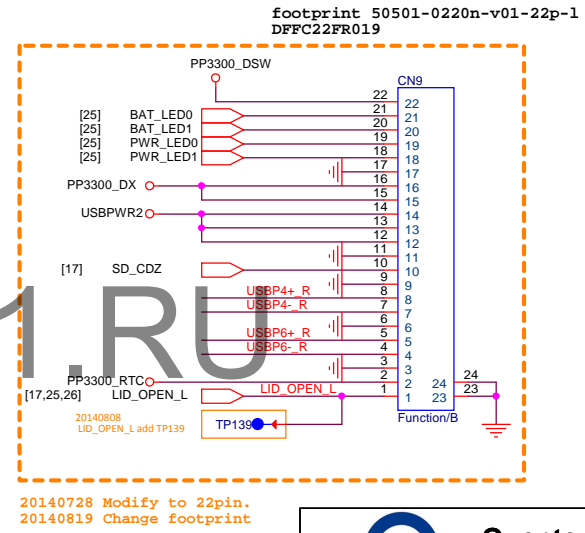
# Light sensor & TP (ALS)



# FUNCTION DB

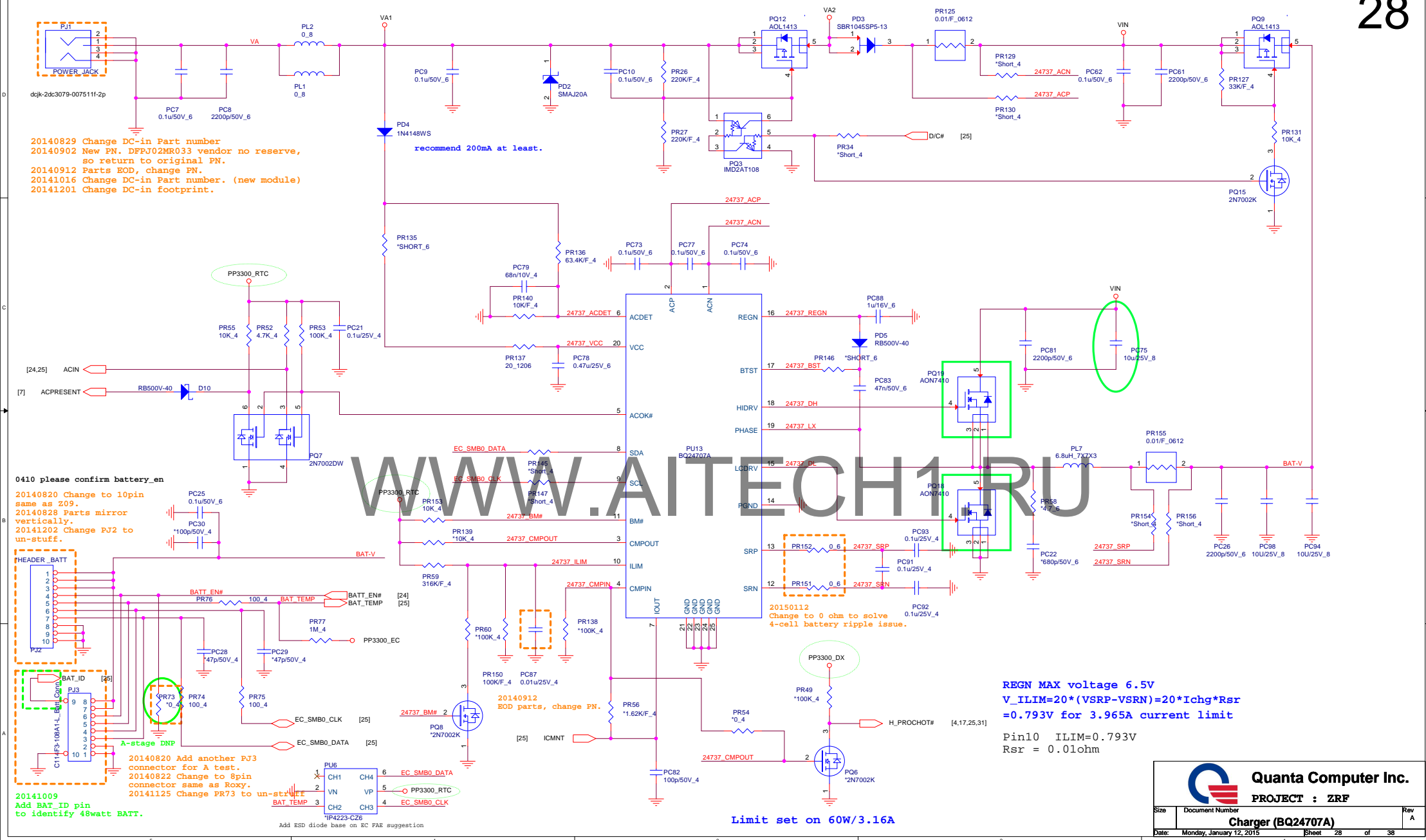


HSR	+3VPCU
	LID_OPEN_L
	GND
LED	+3VPCU
	LED x 4
	GND
USB	+3V x 2
	USBP0+
	USBP0-
	GND x 2
CR	CR_DET
	+3V x 2
	USBP6+
	USBP6-
	GND x 2
LID	PP3300_RTC
	LID_OPEN_L



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PROJECT : ZRF

Size	Document Number	Rev
	DB/ALS/Thermal sensor	A
Date:	Monday, January 12, 2015	Sheet 27 of 38



TDC : 0.75A  
PEAK : 1A  
Width : 40mil

TDC : 0.38A  
PEAK : 0.5A  
Width : 20mil

+DDR\_VTT\_RUN

PR66 \*SHORT\_6

PC108  
10u/6.3V\_6

PC109  
10u/6.3V\_6

PP3300\_EC

PR164  
100K/F\_4

PP1350\_PGOOD

51216\_S3

PP1350\_EN

PR162 \*Short\_4

PR78 200K/F\_4

PR79 61.9K/F\_4

VREF=1.8V

20141205 EOD parts, change PN.

PC101  
0.1u/16V\_4

PR68 10K/F\_4

PR67 30.1K/F\_4

PC100 0.01u/25V\_4

20140912 EOD parts, change PN.

PCH\_SLP\_S3\_L PR163 \*Short\_4

PCH\_SLP\_S5\_L PR80 \*0\_4

OCP=6A  
L ripple current  
= $(19-1.35)*1.35/(3.3u*400k*19)$   
=0.95A  
Vtrip=[ $6-(0.95/2)$ ]\*14mohm  
=0.07735V  
Rlimit=0.07335/10uA\*8=61.88Kohm

Greater than or equal 40mil

PP5000\_DSW

PR160 \*Short\_4

PC104 10u/6.3V\_6

PC103 1u/10V\_4

PO21 AON7410

PR161 2/F\_6

PC105 0.1u/50V\_6

51216\_DRVH

51216\_VBST

51216\_SW

51216\_DRVH

51216\_SW

51216\_SW

PR72 \*4.7\_6

PC27 \*680p/50V\_6

PC107 0.1u/50V\_6

PC99 330u/2V\_7343

Close to output cap

1.35 Volt +/- 5%  
TDC : 3.35A  
PEAK : 4.46A  
OCP : 6A  
Width : 140mil

Mode	Frequency	Discharge mode
200K	400K	Tracking Discharge
100K	300K	Tracking Discharge

	S3	S5	+1.35VSUS	REF	VTT
S0	1	1	ON	ON	ON
S3 (main on off)	0	1	ON	ON	OFF
S4/S5	0	0	OFF	OFF	OFF

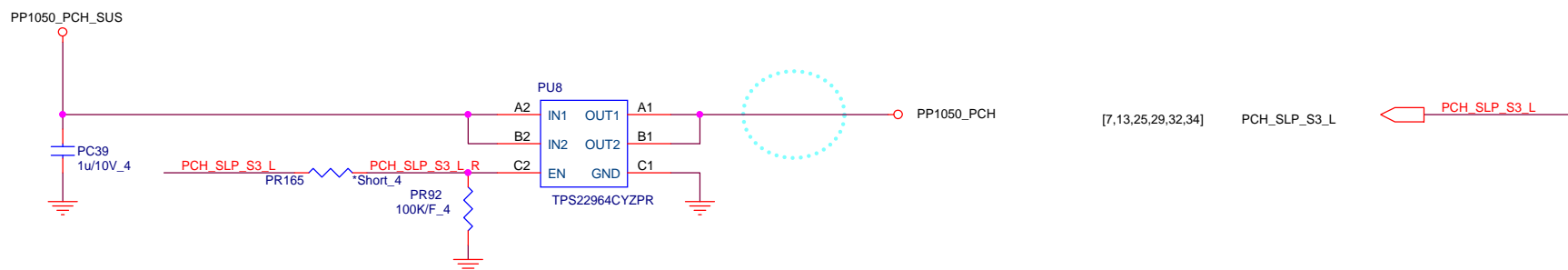
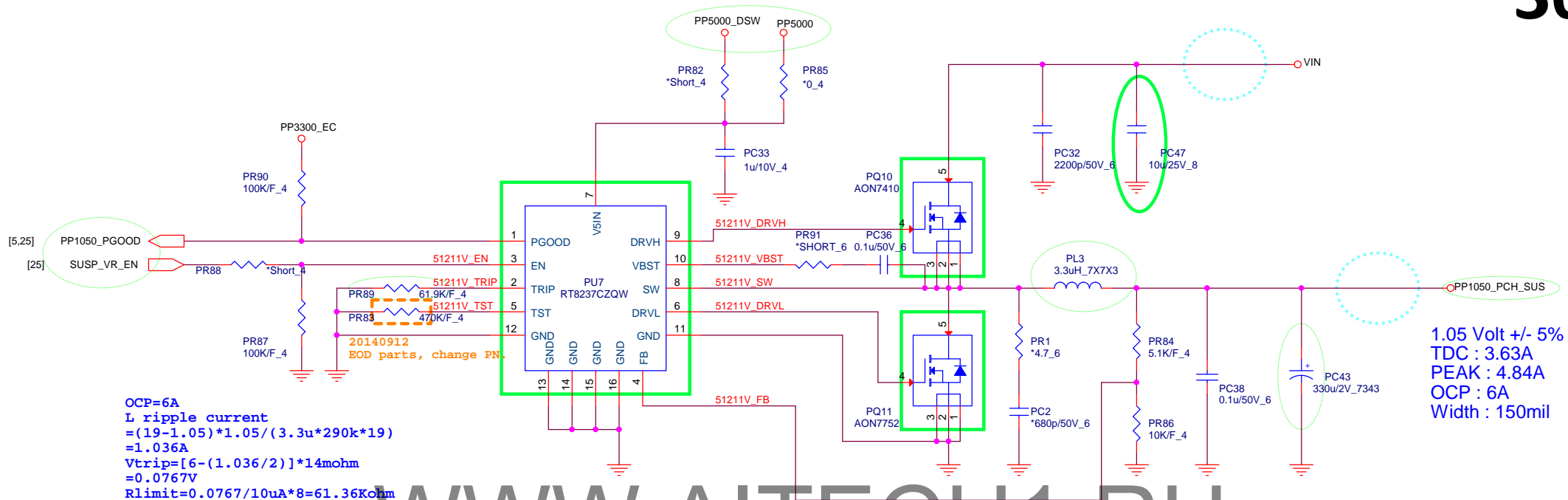


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PROJECT : ZRF

Size Document Number  
DDR 1.35V (G5316) Rev A

Date: Monday, January 12, 2015 Sheet 29 of 38

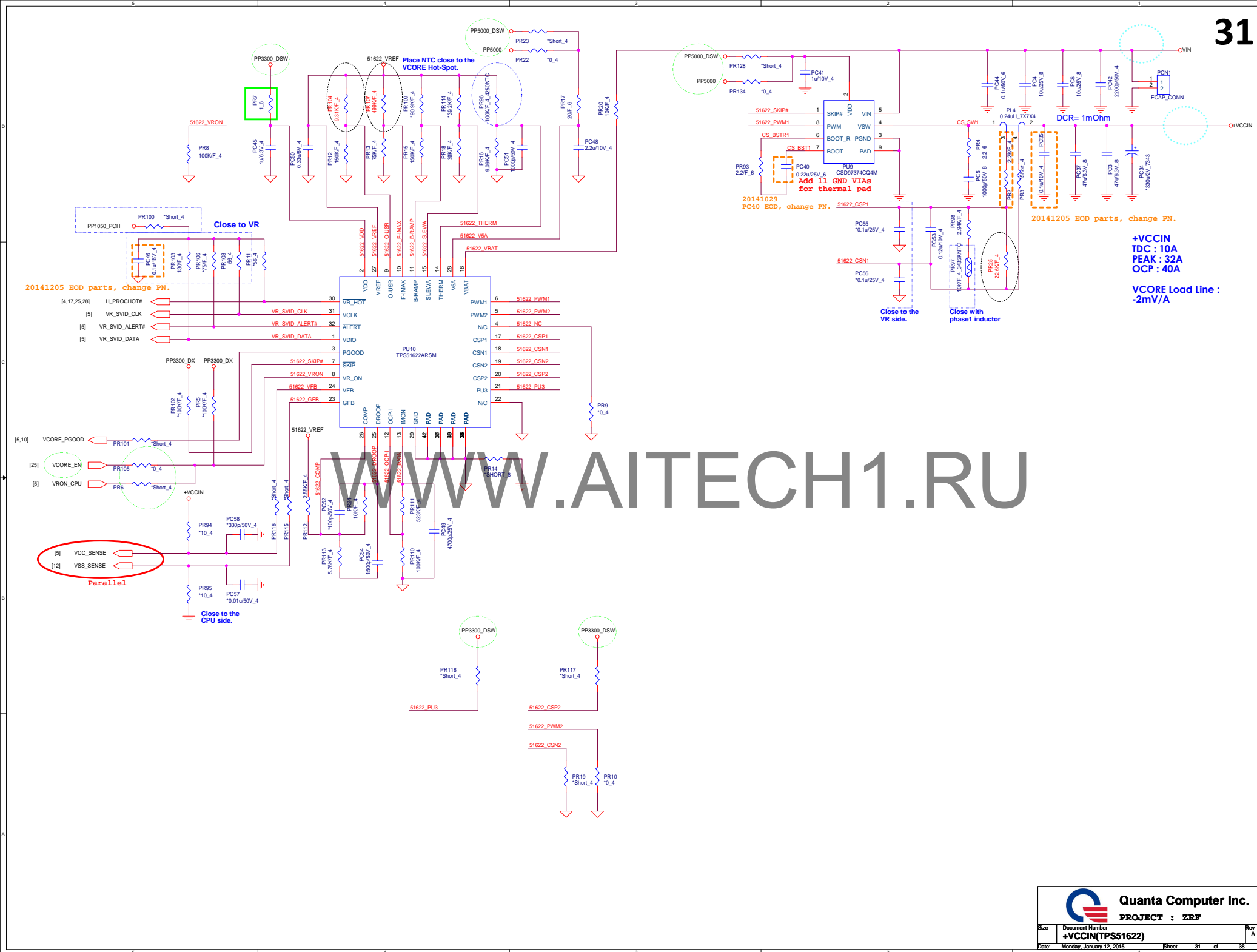


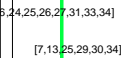
Quanta Computer Inc.

PROJECT : ZRF

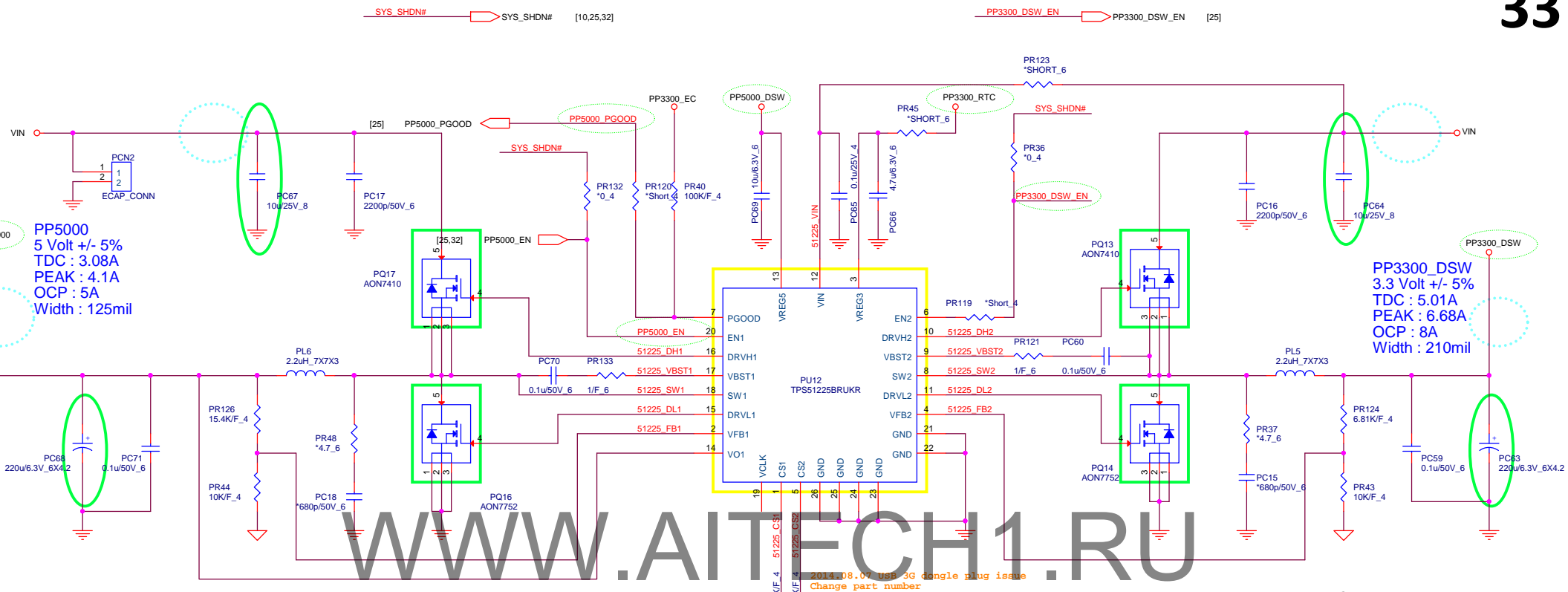
Size	Document Number	Rev
	<b>+1.05V (RT8237)</b>	A

Date: Monday, January 12, 2015 Sheet 30 of 38





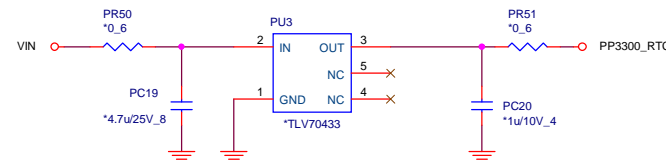



**OCP:5A**


$L(\text{ripple current}) = (9-5) \cdot 5 / (2.2 \mu \cdot 0.3 \text{M} \cdot 9) = 3.367 \text{A}$   
 $I_{\text{ocp}} = 5 - (3.367/2) = 3.316 \text{A}$   
 $V_{\text{th}} = (3.316 \text{A} \cdot 14 \text{m}\Omega) + 1 \text{mV} = 47.43 \text{mV}$   
 $R(\text{Ilim}) = (47.43 \text{mV} \cdot 8) / 10 \mu \text{A} = 37.94 \text{K}$


**OCP:8A**

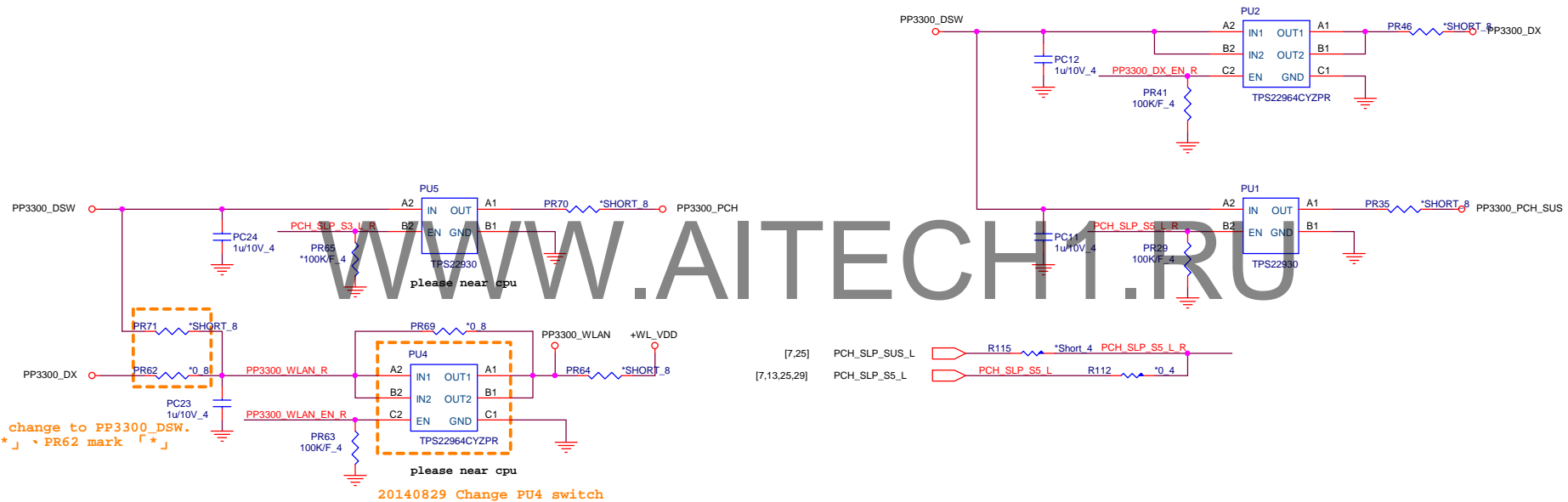
$L(\text{ripple current}) = (9-3.3) \cdot 3.3 / (2.2 \mu \cdot 0.355 \text{M} \cdot 9) \sim 2.676 \text{A}$   
 $I_{\text{ocp}} = 8 - (2.676/2) = 6.662 \text{A}$   
 $V_{\text{th}} = (6.662 \text{A} \cdot 14 \text{m}\Omega) + 1 \text{mV} = 94.27 \text{mV}$   
 $R(\text{Ilim}) = (94.27 \text{mV} \cdot 8) / 10 \mu \text{A} = 75.41 \text{K}$





[7,13,25,29,30,32] PCH\_SLP\_S3\_L  PCH\_SLP\_S3\_L PR166 \*Short\_4 PCH\_SLP\_S3\_L\_R

[25] PP3300\_DX\_EN  PP3300\_DX\_EN PR167 \*Short\_4 PP3300\_DX\_EN\_R

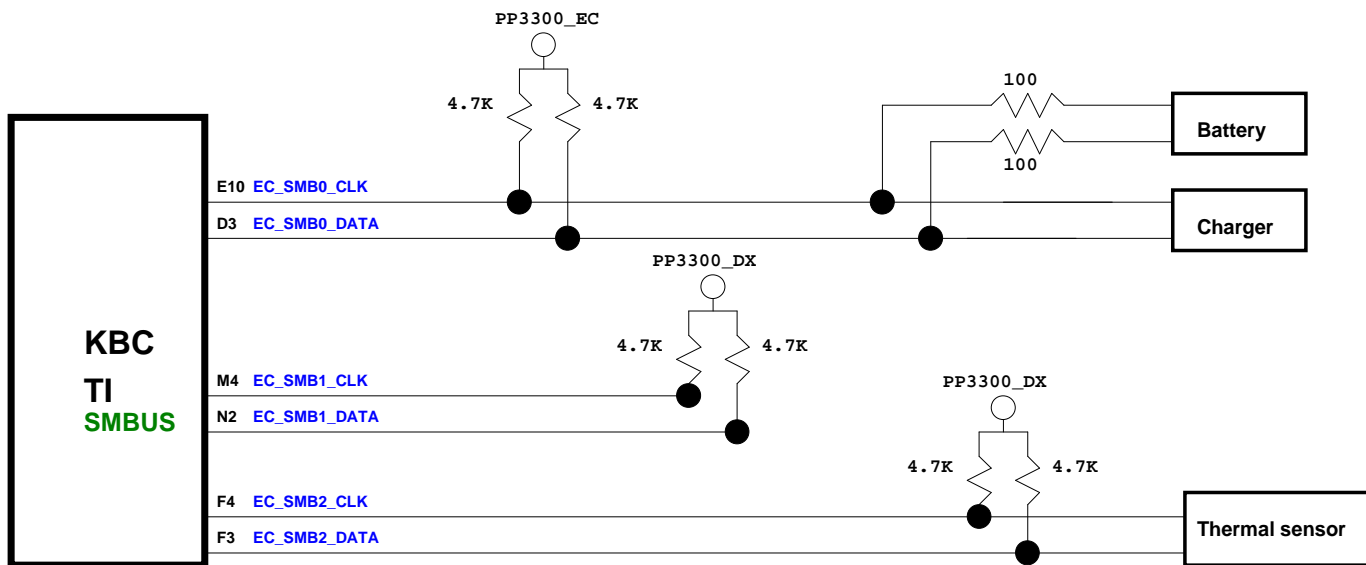
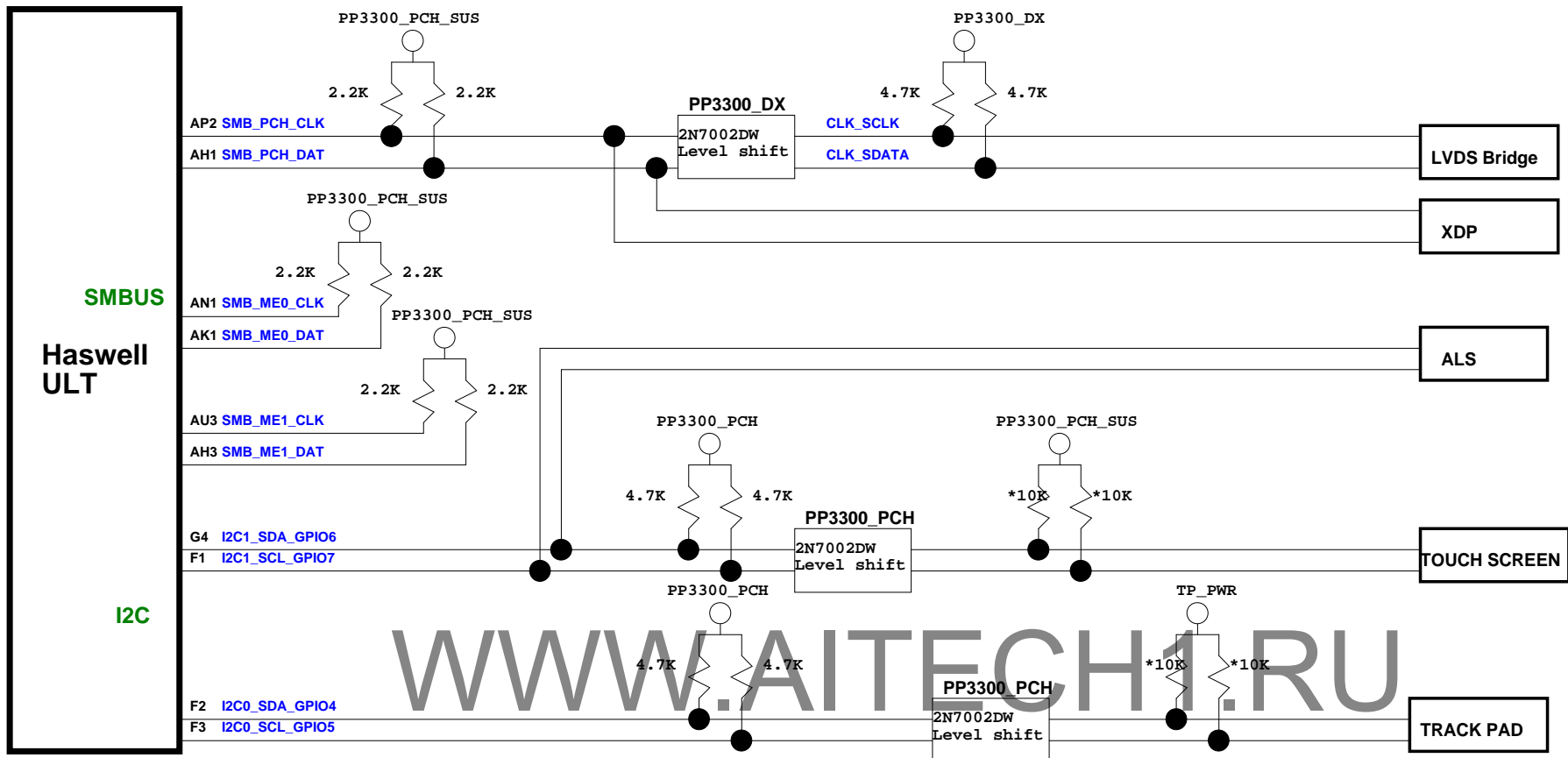
[10,19,25] PP3300\_WLAN\_EN  PP3300\_WLAN\_EN PR168 \*Short\_4 PP3300\_WLAN\_EN\_R

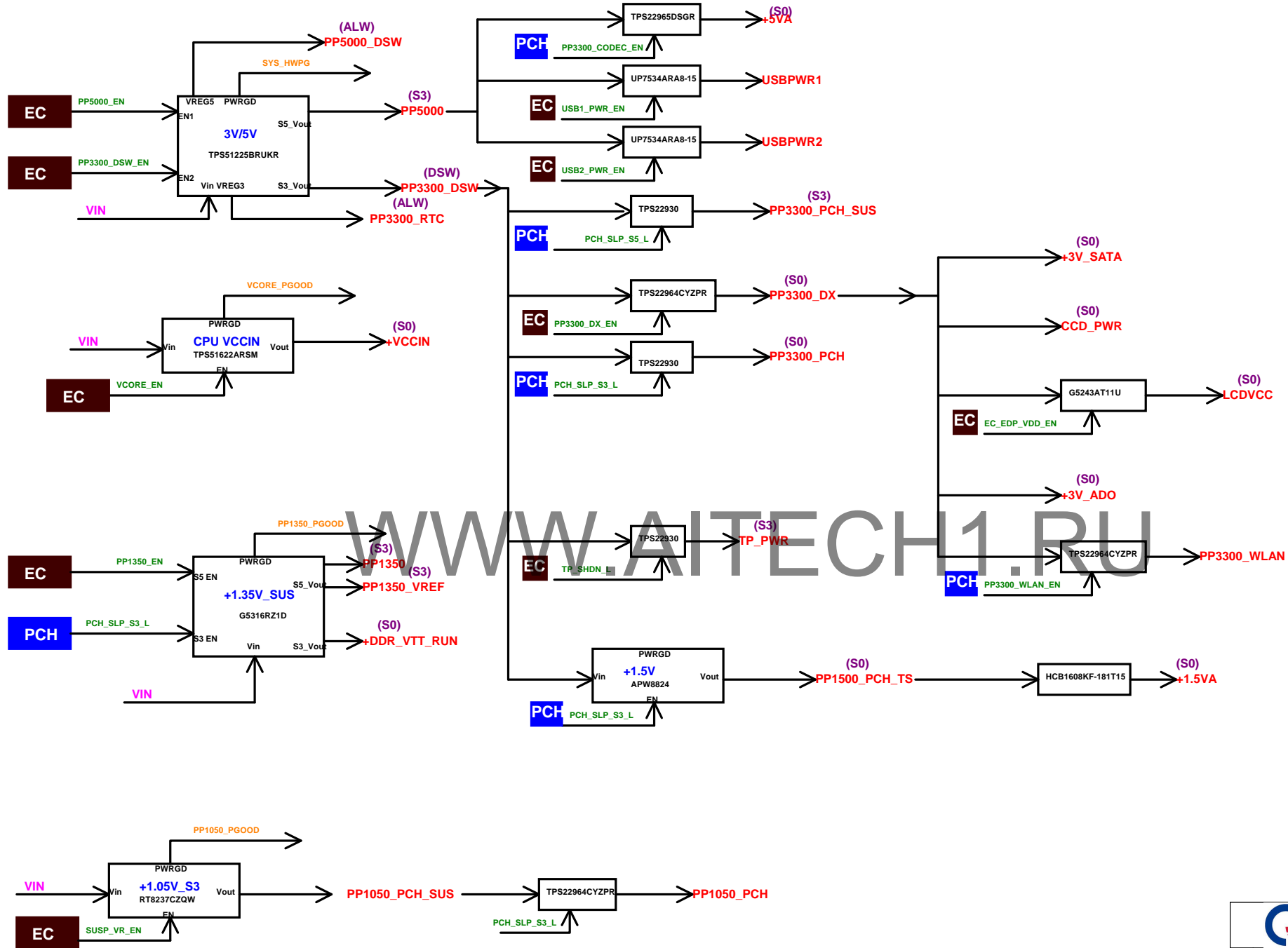


[7,25] PCH\_SLP\_SUS\_L  R115 \*Short\_4 PCH\_SLP\_S5\_L\_R

[7,13,25,29] PCH\_SLP\_S5\_L  PCH\_SLP\_S5\_L R112 \*0.4

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