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# HP Typhon Z170 u-ATX Ver: 1.0

**CPU:**  
INTEL-SkyLake LGA1151

**System Chipset:**  
INTEL Z170

**OnBoard Chipset:**  
HD Audio Codec:ALC1150  
LAN-RTL8161GSH-CG  
SIO:NCT 6683 D-T  
Flash ROM: 8 MB SPI Quad read  
HDMI level shift ASM1442K

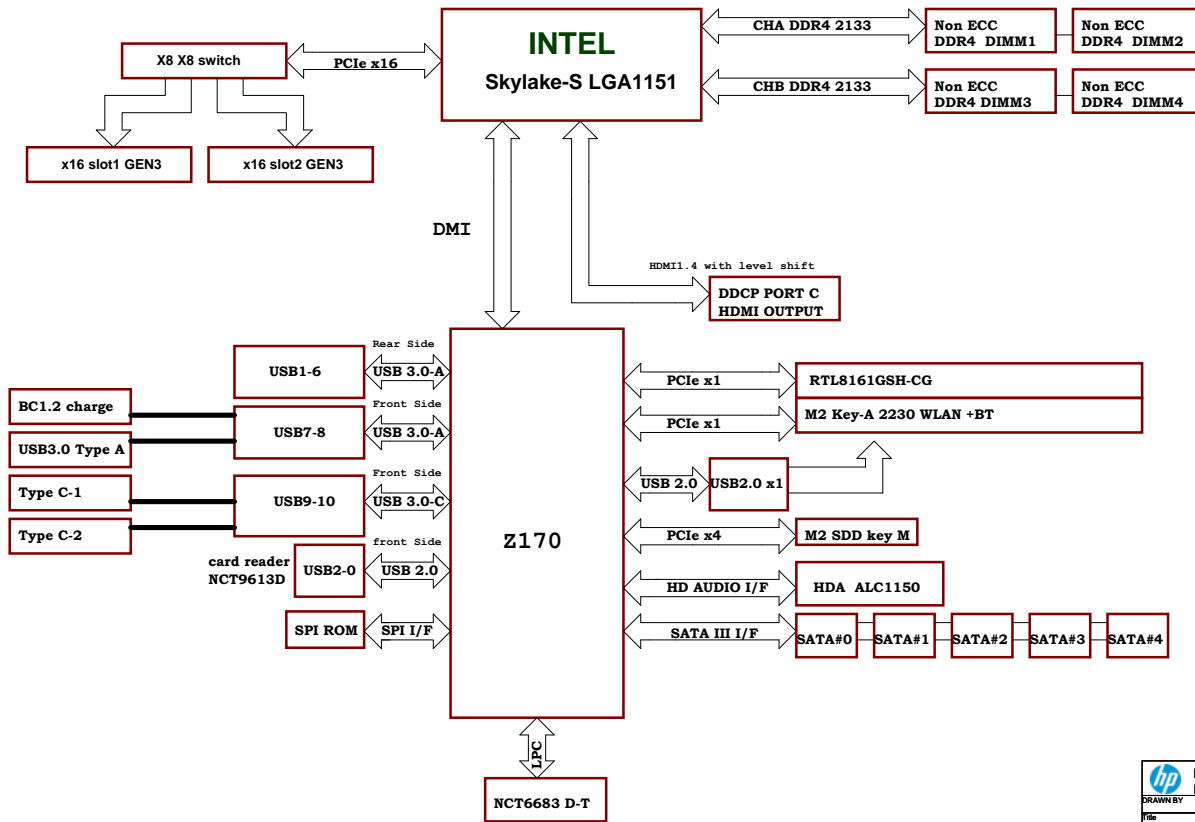
**Main Memory:**  
DDR4 (2133MHz) \* 4 (2 DIMM per channel )

**Expansion Slots:**  
PCI Express (X16) Slot \* 2  
M2 SSD key-M 4 lanes  
M2 WLAN key A 1 lane

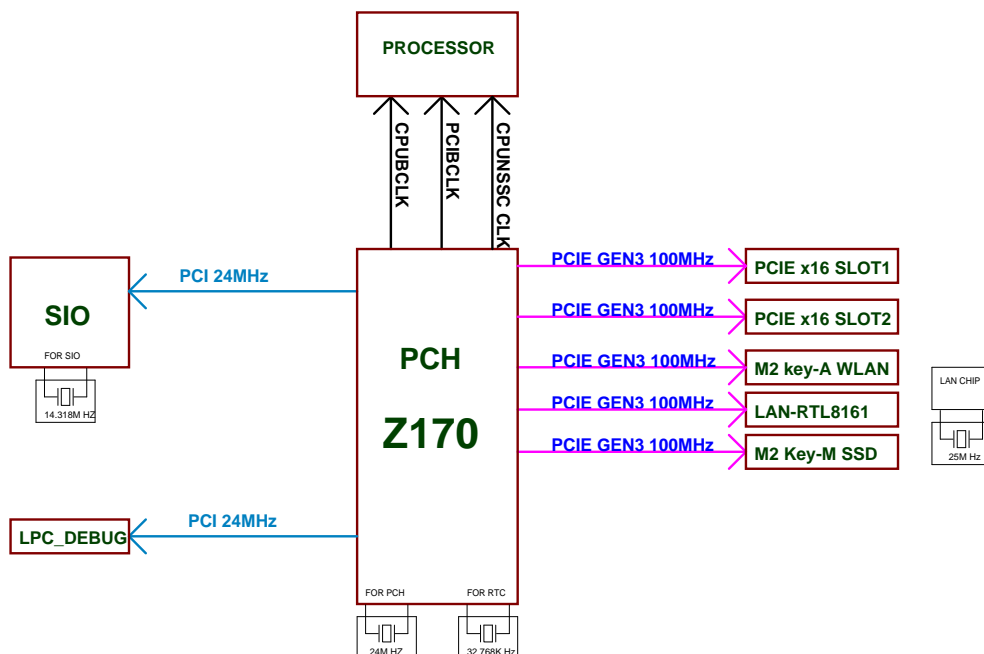
**PWM:**  
IMVP8 - Onsemi 81203 6Phase(VCCP)+2Phase(VCCGT)

**USB pin header:**  
USB2.0 X1(2 port) for card reader and NCT 9612D(MCU)  
USB3.0 X1(2 port) for Type A (1 port support BC 1.2 charge)  
USB3.0 X1(2 port) for Type C 2 port without PD

# Block Diagram

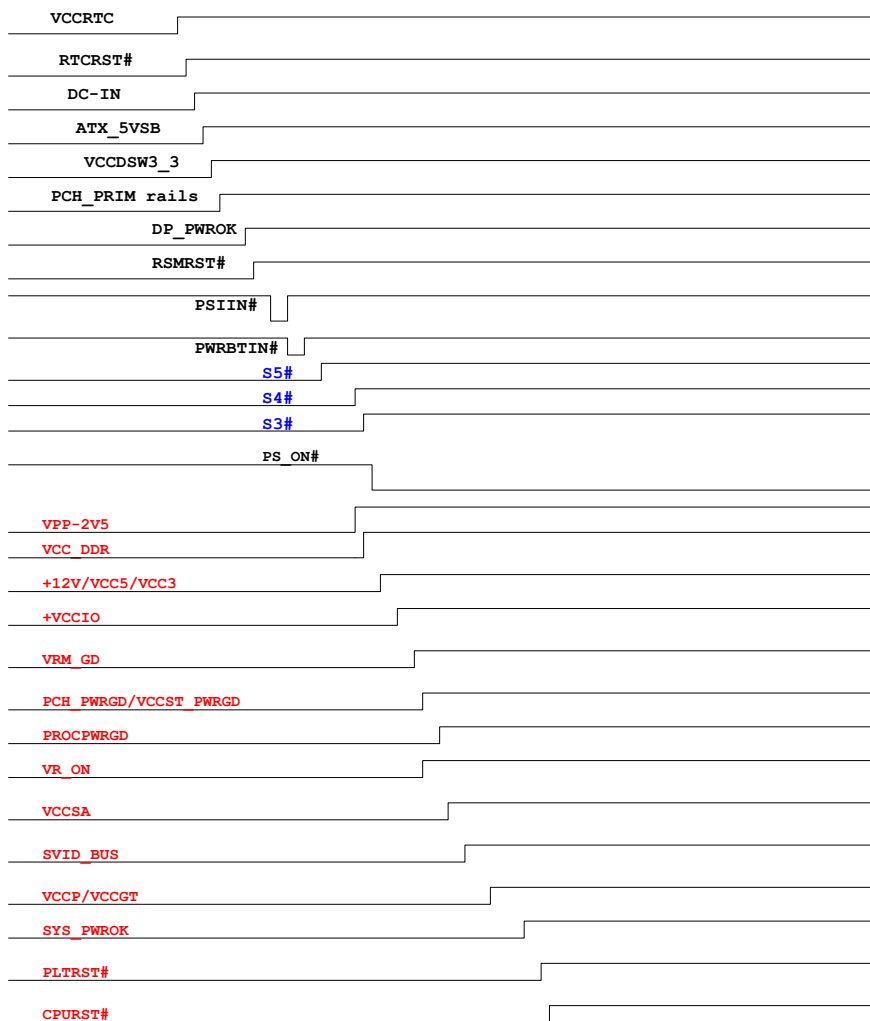


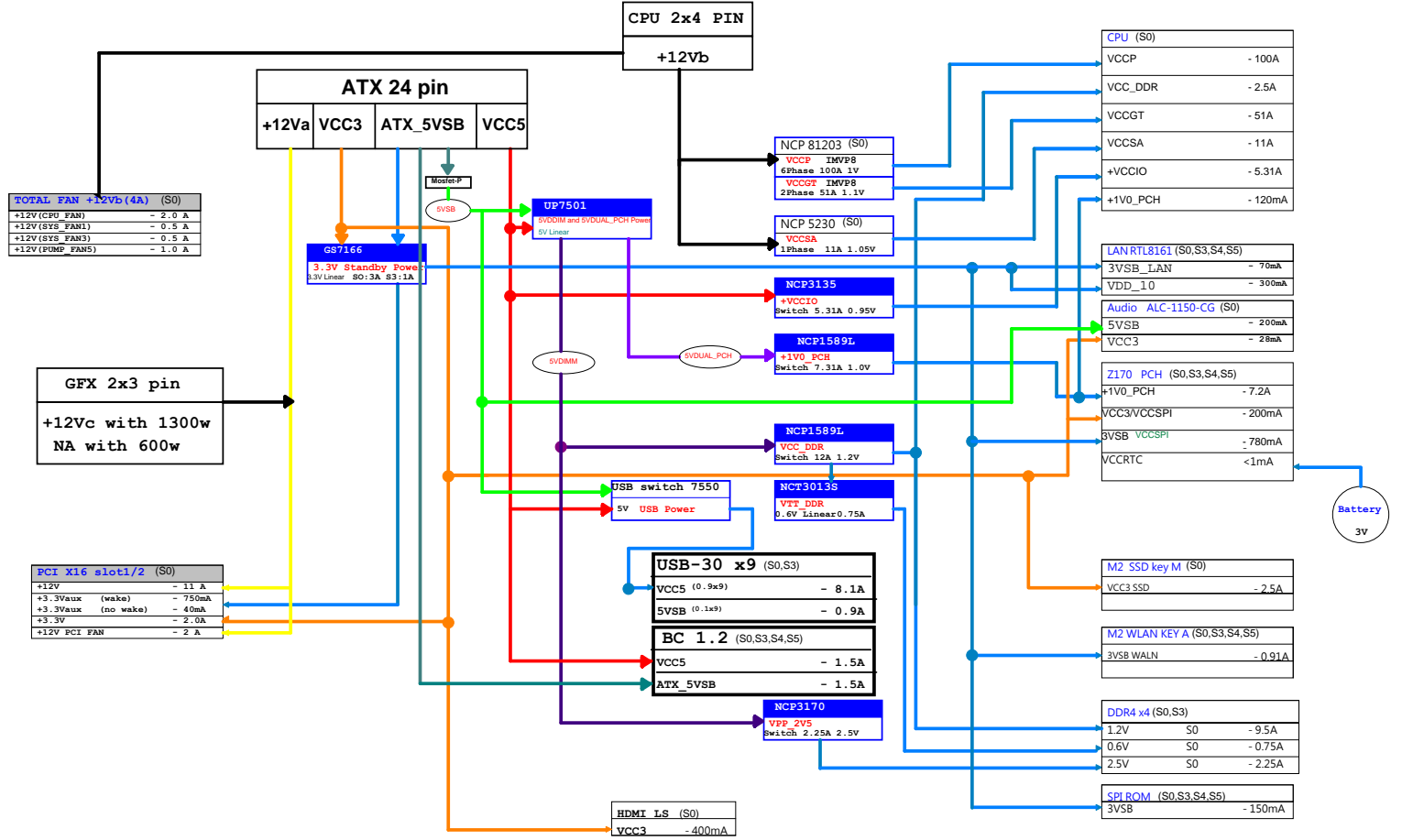
## CLK MAP



## Power ON Sequence

G3-->S5-->S0





Sunrise Point Z170

0	1		GPP_E0	I/O	primary 3.3V	SATAGP0	SATAGP0	strapping by M2 devices		Pull-up 10Kohm to VCC3	high: PCIE low:SATA
0	1		GPP_E1	I/O	primary 3.3V	SATAGP1	SATAGP1	strapping by resistor or		Pull-up 10Kohm to VCC3	high: PCIE low:SATA
0	1		GPP_E2	I/O	primary 3.3V	SATAGP2	SATAGP2	strapping by resistor or		Pull-down 10Kohm to VCC3	low:SATA
x	1		GPP_E3	I/O	primary 3.3V	GPI		NA		Pull-up 10Kohm to VCC3	
x	1		GPP_E4	I/O	primary 3.3V	GPI		NA		Pull-up 10Kohm to VCC3	
x	1		GPP_E5	I/O	primary 3.3V	GPI		NA		Pull-up 10Kohm to VCC3	
x	1		GPP_E6	I/O	primary 3.3V	GPI		NA		Pull-up 10Kohm to VCC3	
x	1		GPP_E7	I/O	primary 3.3V	GPI		NA		Pull-up 10Kohm to VCC3	
x	1		GPP_E8	I/O	primary 3.3V	GPI	SATA_LED#	active low by PCH		Pull-up 10Kohm to VCC3	
x	1		GPP_E9	I/O	primary 3.3V	GPI	OC#0	active low by USB OC		Pull-up 10Kohm to USB	
x	1		GPP_E10	I/O	primary 3.3V	GPI	OC#1	active low by USB OC		Pull-up 10Kohm to USB	
x	1		GPP_E11	I/O	primary 3.3V	GPI	OC#2	active low by USB OC		Pull-up 10Kohm to USB	
x	1		GPP_E12	I/O	primary 3.3V	GPI	OC#3	always high level		Pull-up 10Kohm to 3VSB	
0	1		GPP_F0	I/O	primary 3.3V	GPI	SATAGP3	strapping by resistor or		Pull-down 10Kohm to VCC3	low:SATA
0	1		GPP_F1	I/O	primary 3.3V	GPI	SATAGP4	strapping by resistor or		Pull-down 10Kohm to VCC3	low:SATA
x	1		GPP_F2	I/O	primary 3.3V	GPI	SATAGP5	NA, don't care		Pull-down 10Kohm to VCC3	
0	1		GPP_F3	I/O	primary 3.3V	GPI	SATAGP6	strapping by resistor or		Pull-up 10Kohm to VCC3	high: PCIE
0	1		GPP_F4	I/O	primary 3.3V	GPI	SATAGP7	strapping by resistor or		Pull-up 10Kohm to VCC3	high: PCIE

0	1		GPP_G0	I/O	primary 3.3V	GPI	ODD_SW+	ODD eject event by low		Pull-up 10Kohm to VCC3	
x	1		GPP_G1	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G2	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G3	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G4	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G5	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G6	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G7	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G8	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G9	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G10	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G11	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G12	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G13	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G14	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G15	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G16	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G17	I/O	primary 3.3V	GPI		NA			
x	1		GPP_G18	I/O	primary 3.3V	GPI	NMI#			Pull-up 10Kohm to 3VSB	
0	1		GPP_G19	I/O	primary 3.3V	GPI	ASM31_SMI#	USB31 SMI# low trigger to		Pull-up 10Kohm to 3VSB	

x	1		GPP_H21	I/O	primary 3.3V	GPI		NA			
x	1		GPP_H22	I/O	primary 3.3V	GPI		NA			
x	1		GPP_H23	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I0	I/O	primary 3.3V	GPI		NA			
0	1		GPP_I1	I/O	primary 3.3V	GPI	HDMI_PORTC_HPD	active high when connect	PD 20K		
x	1		GPP_I2	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I3	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I4	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I5	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I6	I/O	primary 3.3V	GPO		NA		PD 20K	
0	1		GPP_I7	I/O	primary 3.3V	GPI	DDPC_CTRLCLK	HDMI I2C			
0	1		GPP_I8	I/O	primary 3.3V	GPO	DDPC_CTRLDATA	HDMI I2C active high by	PD 20K	Pull-up 2.2Kohm to VCC3	
x	1		GPP_I9	I/O	primary 3.3V	GPI		NA			
x	1		GPP_I10	I/O	primary 3.3V	GPO		NA		PD 20K	
x	1		GP00	I/O	primary 3.3V	GPI	BATLOW#			Pull-up 10Kohm to 3VSB	
x	1		GP01	I/O	primary 3.3V	GPI	ACPRESENT			Pull-up 10Kohm to 3VSB	
x	1		GP02	I/O	primary 3.3V	LAN_WAKE#	LAN_WAKE#			Pull-up 100Kohm to	+FATX 3VSB
x	1		GP03	I/O	primary 3.3V	PWRBTN#	PWRBTN#			Pull-up 4.7Kohm to 3VSB	
x	1		GP04	I/O	primary 3.3V	SLP_S3#					

NCT 6683 D-T

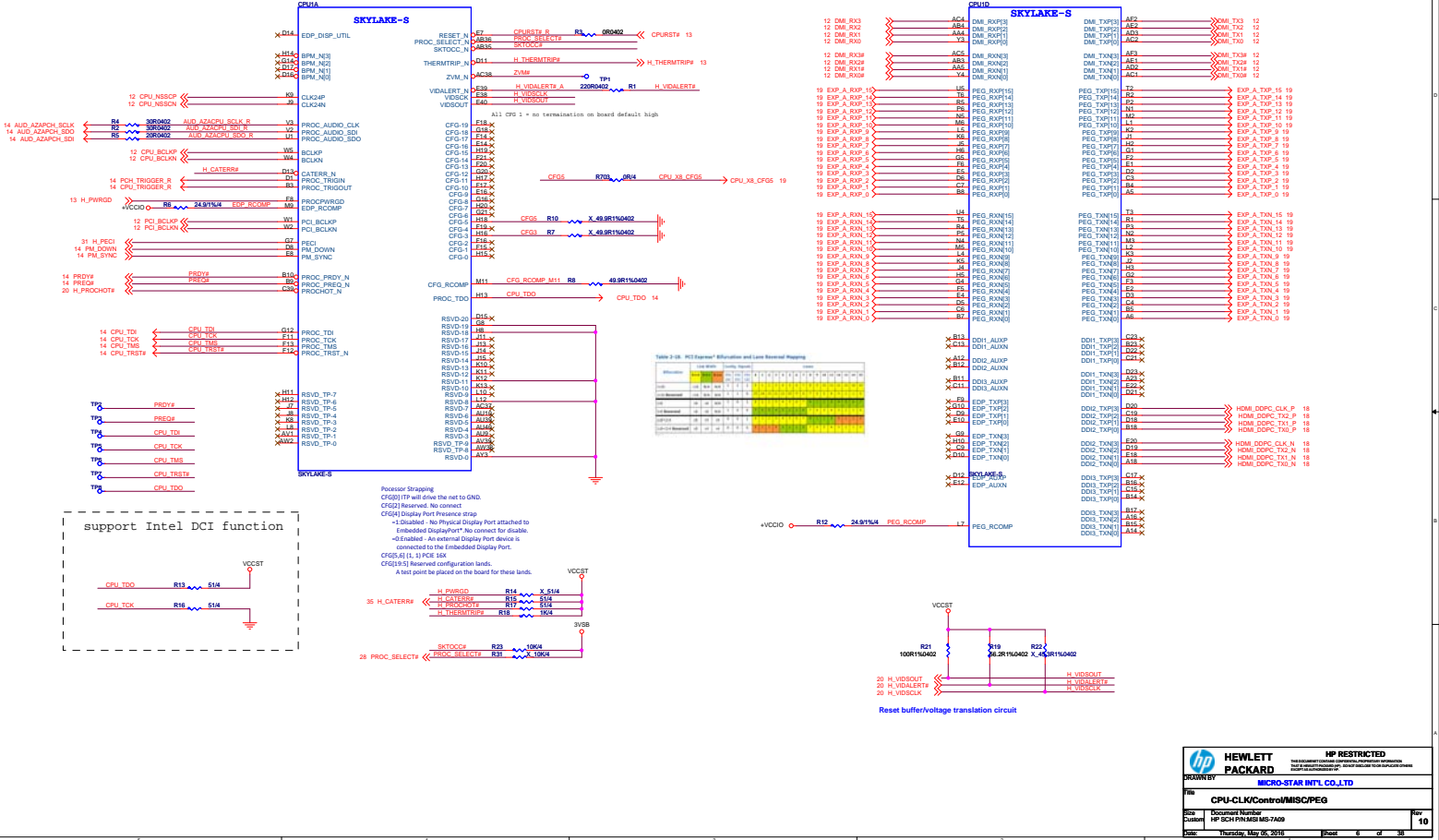
37	GPIO37	PE	P2_DQ4H	NC	CDR_ACTIVE	I	external: PD to GND	low	TRD GPIO for EC
38	GPIO38	PE	P2_DQ4H	NC	CDR_PRESNTE	I	external: PU 3VSB	high	PRESNTE low level if DDPX plug-in
39	GPIO39	BUSY	P2_DQ4H	NC	CDR_PWRGD	I	external: PU 3VSB	low	CDR resume power well and
40	GPIO39	ACK#	P2_DQ4H	GPIO	LED_VSB	O/OD	external: PU 3VSB	high	input pin. GPI for EC.
41	GPIO39	PD7	P2_DQ4H	GPIO	RUSB_ON	O/OD	external: PU +FATX_3VSB	high	active by high level at AP01 S0
42	GPIO39	PD8	LED_A	GPIO	FUSB_ON	O/OD	external: PU +FATX_3VSB	high	state. GPO for EC.
43	GPIO39	PD8	LED_B	GPIO	CDR_BSDW	O/OD	external: PU 3VSB	high	support USB wake up from non
44	GPIO37	PD4	LED_C	GPIO	CDR_Whitew	O/OD	external: PU 3VSB	high	deep S5 for Steambox
45	GPIO40	PD3	LED_D	GPIO	LAN_ON	O/OD	external: PU 3VSB	high	application. GPO for EC.
46	GPIO41	PD2	LED_E	GPIO	ME_DISABLE	O/OD	external: PU 3VSB	high	support USB wake up from non
47	GPIO42	PD1	LED_F	GPIO	USB0_cable_detect#	I/OD	external: PU 3VSB	high	deep S5 for Steambox
48	GPIO43	PD0	LED_G	GPIO	M2_WALN_DET#	I/OD	external: PU 3VSB	high	application. GPO for EC.
49	GPIO44	SUNW	P1_DQ4H	GPIO	M2_SSD_detect#	I/OD	external: PU 3VSB	high	TRD GPIO for EC.
50	GPIO45	INITE	P1_DQ4H	GPIO	HDMI_DDPX_HPD	I/OD	HDMI cable and monitor	low	TRD GPIO for EC.
51	GPIO46	ERR#	P1_DQ4H	GPIO	FP_AUDIO_DET#	I/OD	external: PU VCC3	high	detect NCT SSD device plug-in if
52	GPIO47	APDR	P1_DQ4H	GPIO	PAS_DET#	I/OD	external: PU 3VSB	high	trigger by low level. GPI for EC.

DDR-4 DIMM Config.

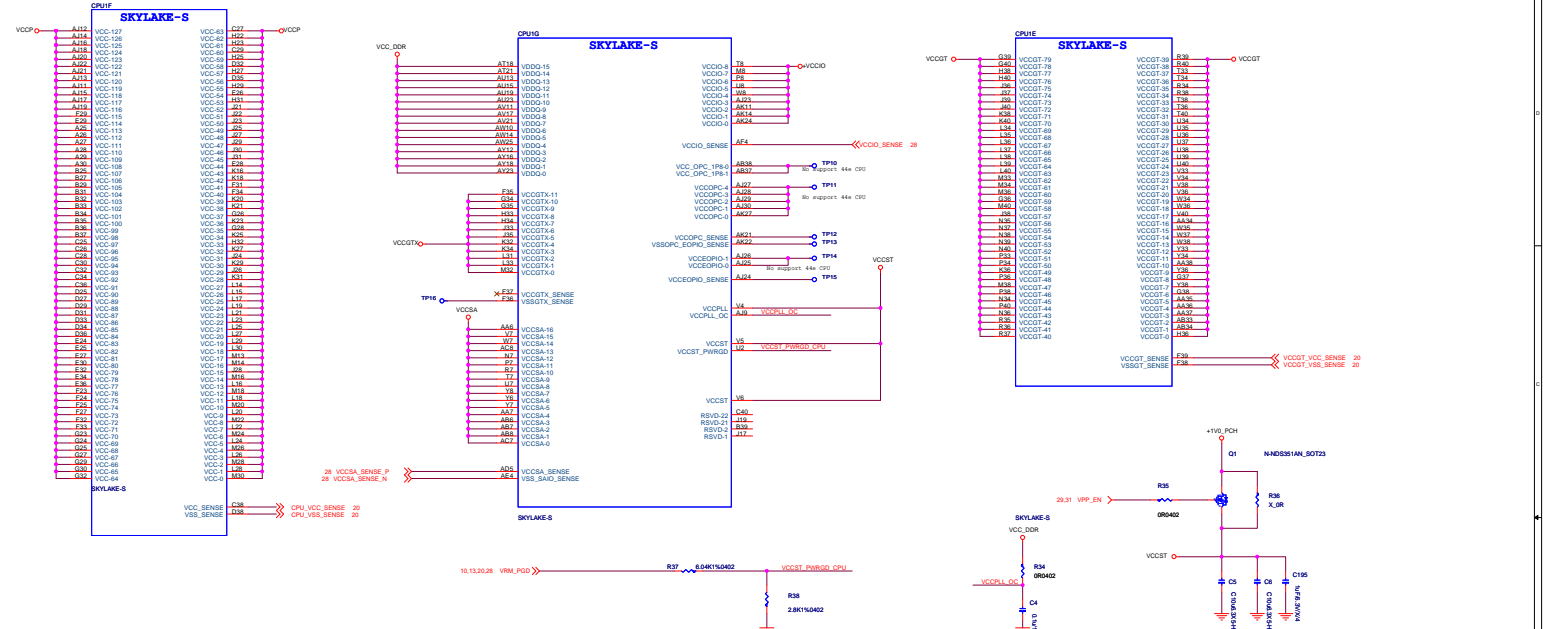
DEVICE	ADDRESS	CLOCK
DIMM1	000	MEM_MA_CLK_H0/L0 MEM_MA_CLK_H1/L1
DIMM2	001	MEM_MA_CLK_H2/L2 MEM_MA_CLK_H3/L3
DIMM3	010	MEM_MB_CLK_H0/L0 MEM_MB_CLK_H1/L1
DIMM4	011	MEM_MB_CLK_H2/L2 MEM_MB_CLK_H3/L3

Power On Strapping Table form NCT6683 D-T

Symbol	Value	Description
BIOS_SEL	0	BIOS address is 28029h
BIOS_SEL	1	BIOS address is 80029h
BIOS_SEL	2	BIOS address is 40029h
BIOS_SEL	3	BIOS address is 00029h
BIOS_SEL	4	BIOS address is 60029h
BIOS_SEL	5	BIOS address is 20029h
BIOS_SEL	6	BIOS address is 80029h
BIOS_SEL	7	BIOS address is 40029h
BIOS_SEL	8	BIOS address is 00029h
BIOS_SEL	9	BIOS address is 60029h
BIOS_SEL	10	BIOS address is 20029h
BIOS_SEL	11	BIOS address is 80029h
BIOS_SEL	12	BIOS address is 40029h
BIOS_SEL	13	BIOS address is 00029h
BIOS_SEL	14	BIOS address is 60029h
BIOS_SEL	15	BIOS address is 20029h
BIOS_SEL	16	BIOS address is 80029h
BIOS_SEL	17	BIOS address is 40029h
BIOS_SEL	18	BIOS address is 00029h
BIOS_SEL	19	BIOS address is 60029h
BIOS_SEL	20	BIOS address is 20029h
BIOS_SEL	21	BIOS address is 80029h
BIOS_SEL	22	BIOS address is 40029h
BIOS_SEL	23	BIOS address is 00029h
BIOS_SEL	24	BIOS address is 60029h
BIOS_SEL	25	BIOS address is 20029h
BIOS_SEL	26	BIOS address is 80029h
BIOS_SEL	27	BIOS address is 40029h
BIOS_SEL	28	BIOS address is 00029h
BIOS_SEL	29	BIOS address is 60029h
BIOS_SEL	30	BIOS address is 20029h
BIOS_SEL	31	BIOS address is 80029h





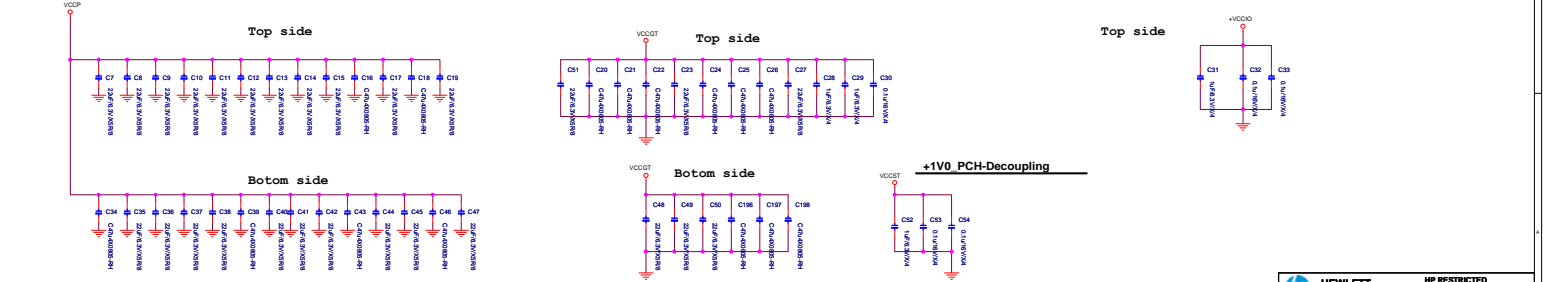


**+CPU VCCP-Decoupling**

**VCCGT-Decoupling**

**+1.2V DDR-Decoupling**

**+VCCIO-Decoupling**





CPU1H

## SKYLAKE-S

N0	VSS-373	VSS-310	F4
E37	VSS-372	VSS-309	F7
H37	VSS-371	VSS-308	F10
H38	VSS-370	VSS-307	E31
K35	VSS-369	VSS-306	E33
K37	VSS-368	VSS-305	G19
K38	VSS-367	VSS-304	A131
M35	VSS-366	VSS-303	E35
M37	VSS-365	VSS-302	F26
M38	VSS-364	VSS-301	F28
N33	VSS-363	VSS-300	F30
P35	VSS-362	VSS-299	G3
P37	VSS-361	VSS-298	G6
P38	VSS-360	VSS-297	G11
R33	VSS-359	VSS-296	G13
T36	VSS-358	VSS-295	G15
T37	VSS-357	VSS-294	G22
T38	VSS-356	VSS-293	G31
U33	VSS-355	VSS-292	G33
V35	VSS-354	VSS-291	H24
V37	VSS-353	VSS-290	H1
V38	VSS-352	VSS-289	H4
W33	VSS-351	VSS-288	H7
Y35	VSS-350	VSS-287	H9
Y37	VSS-349	VSS-286	H26
AA33	VSS-348	VSS-285	H28
A7	VSS-347	VSS-284	E17
A15	VSS-346	VSS-283	H21
A17	VSS-345	VSS-282	H30
B6	VSS-344	VSS-281	J3
B24	VSS-342	VSS-280	J6
C5	VSS-341	VSS-279	J32
C6	VSS-340	VSS-278	J34
C8	VSS-339	VSS-277	J10
B26	VSS-338	VSS-276	J12
B28	VSS-337	VSS-275	K15
C16	VSS-336	VSS-274	J18
C18	VSS-335	VSS-273	J20
C22	VSS-334	VSS-272	K17
C24	VSS-333	VSS-271	K22
C26	VSS-332	VSS-270	K24
C33	VSS-331	VSS-269	J34
C35	VSS-330	VSS-268	K26
D4	VSS-329	VSS-267	K1
D7	VSS-328	VSS-266	K4
E16	VSS-327	VSS-265	K7
C33	VSS-326	VSS-264	K14
C35	VSS-325	VSS-263	K33
D24	VSS-324	VSS-262	K3
D26	VSS-323	VSS-261	L3
D28	VSS-322	VSS-260	L6
E3	VSS-321	VSS-259	L9
E6	VSS-320	VSS-258	L11
E8	VSS-319	VSS-257	L13
E10	VSS-318	VSS-256	K30
E12	VSS-317	VSS-255	M15
E14	VSS-316	VSS-254	M17
E16	VSS-315	VSS-253	M19
E18	VSS-314	VSS-252	M21
E20	VSS-313	VSS-251	M23
E22	VSS-312	VSS-250	M25
E24	VSS-311	VSS-249	L32
E26	VSS-310	VSS-248	M1

CPU1H

## SKYLAKE-S

M4	VSS-247	VSS-184	AF40
M7	VSS-246	VSS-183	AG1
M10	VSS-245	VSS-182	AG2
M12	VSS-244	VSS-181	AG3
M27	VSS-243	VSS-179	AG5
N3	VSS-242	VSS-178	AG8
N6	VSS-241	VSS-177	AG33
N9	VSS-240	VSS-176	AG36
P1	VSS-239	VSS-175	AH5
P4	VSS-238	VSS-174	AH8
R3	VSS-237	VSS-173	AH33
RE	VSS-236	VSS-172	AH36
RA	VSS-235	VSS-171	AH37
F40	VSS-234	VSS-170	AH38
K19	VSS-233	VSS-169	AH39
T1	VSS-232	VSS-168	AH40
T4	VSS-231	VSS-167	AJ1
E13	VSS-230	VSS-166	AJ4
U3	VSS-229	VSS-165	AJ5
U6	VSS-228	VSS-164	AJ8
C14	VSS-227	VSS-163	AK23
V1	VSS-226	VSS-162	AK22
A13	VSS-225	VSS-161	AK23
V6	VSS-224	VSS-160	AK22
C12	VSS-223	VSS-159	AK23
W3	VSS-222	VSS-158	AK23
W6	VSS-221	VSS-157	AK23
G17	VSS-220	VSS-156	AK23
I16	VSS-219	VSS-155	AK23
Y5	VSS-218	VSS-154	AK23
AA3	VSS-217	VSS-153	AK23
AA6	VSS-216	VSS-152	AK23
E11	VSS-215	VSS-151	AK23
AB5	VSS-214	VSS-150	AK23
AB39	VSS-213	VSS-149	AK23
AC3	VSS-212	VSS-148	AK23
AC6	VSS-211	VSS-147	AK23
AC33	VSS-210	VSS-146	AK23
AC34	VSS-209	VSS-145	AK23
AC35	VSS-208	VSS-144	AK23
F22	VSS-207	VSS-143	AK23
AD1	VSS-206	VSS-142	AK23
AD4	VSS-205	VSS-141	AK23
AD6	VSS-204	VSS-140	AK23
AD7	VSS-203	VSS-139	AK23
AD8	VSS-202	VSS-138	AK23
AD33	VSS-201	VSS-137	AK23
AD36	VSS-200	VSS-136	AK23
AD37	VSS-199	VSS-135	AK23
AD38	VSS-198	VSS-134	AK23
AD39	VSS-197	VSS-133	AK23
AD40	VSS-196	VSS-132	AK23
AE3	VSS-195	VSS-131	AK23
AE3	VSS-194	VSS-130	AK23
AE8	VSS-193	VSS-129	AK23
AE33	VSS-192	VSS-128	AK23
AE36	VSS-191	VSS-127	AK23
AF1	VSS-190	VSS-126	AK23
AF5	VSS-189	VSS-125	AK23
AF8	VSS-188	VSS-124	AK23
AF33	VSS-187	VSS-123	AK23
AF36	VSS-186	VSS-122	AK23
AF37	VSS-185		


SKYLAKE-S

CPU1J

## SKYLAKE-S

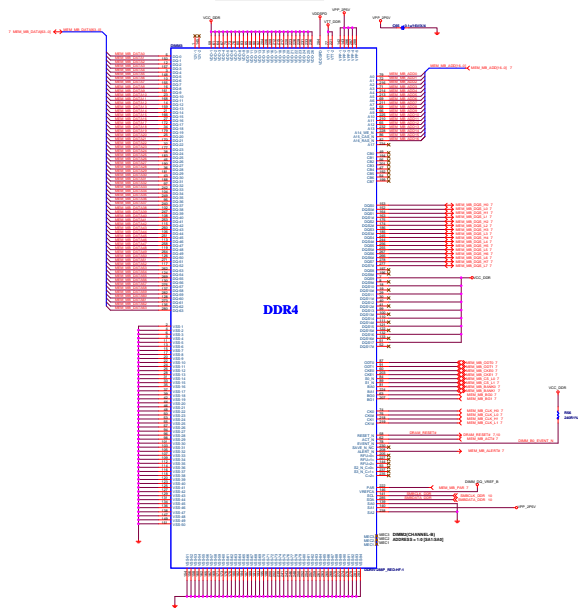
AL36	VSS-121	VSS-56	AR30
AM6	VSS-120	VSS-55	AR31
AM11	VSS-119	VSS-54	AR32
AM14	VSS-118	VSS-53	AR33
AM15	VSS-117	VSS-52	AR34
AM19	VSS-116	VSS-51	AR35
AM24	VSS-115	VSS-50	AR36
AM27	VSS-114	VSS-49	AR37
AM30	VSS-113	VSS-48	AR38
AM31	VSS-112	VSS-47	AR39
AM32	VSS-111	VSS-46	AR40
AM33	VSS-110	VSS-45	AT6
AM34	VSS-109	VSS-44	AT7
AM35	VSS-108	VSS-43	AT8
AM36	VSS-107	VSS-42	AT9
AM37	VSS-106	VSS-41	AT10
AM38	VSS-105	VSS-40	AT11
AM39	VSS-104	VSS-39	AT12
AN1	VSS-103	VSS-38	AT13
AN4	VSS-102	VSS-37	AT14
AN5	VSS-101	VSS-36	AT15
AN6	VSS-100	VSS-35	AT16
AN7	VSS-99	VSS-34	AT17
AN8	VSS-98	VSS-33	AT18
AN9	VSS-97	VSS-32	AT19
AN10	VSS-96	VSS-31	AT20
AN11	VSS-95	VSS-30	AT21
AN12	VSS-94	VSS-29	AT22
AN13	VSS-93	VSS-28	AT23
AN14	VSS-92	VSS-27	AT24
AN15	VSS-91	VSS-26	AT25
AN16	VSS-90	VSS-25	AT26
AN17	VSS-89	VSS-24	AT27
AN18	VSS-88	VSS-23	AT28
AN19	VSS-87	VSS-22	AT29
AN20	VSS-86	VSS-21	AT30
AN21	VSS-85	VSS-20	AT31
AN22	VSS-84	VSS-19	AT32
AN23	VSS-83	VSS-18	AT33
AN24	VSS-82	VSS-17	AT34
AP1	VSS-81	VSS-16	AT35
AP4	VSS-80	VSS-15	AT36
AP7	VSS-79	VSS-14	AT37
AP27	VSS-78	VSS-13	AT38
AP30	VSS-77	VSS-12	AT39
AP36	VSS-76	VSS-11	AT40
AP37	VSS-75	VSS-10	AT41
AP40	VSS-74	VSS-9	AT42
AR1	VSS-73	VSS-8	AT43
AR2	VSS-72	VSS-7	AT44
AR3	VSS-71	VSS-6	AT45
AR4	VSS-70	VSS-5	AT46
AR11	VSS-69	VSS-4	AT47
AR14	VSS-68	VSS-3	AT48
AR15	VSS-67	VSS-2	AT49
AR16	VSS-66	VSS-1	AT50
AR17	VSS-65		
AR18	VSS-64		
AR19	VSS-63		
AR20	VSS-62		
AR21	VSS-61		
AR24	VSS-60		
AR27	VSS-59		

SKYLAKE-S

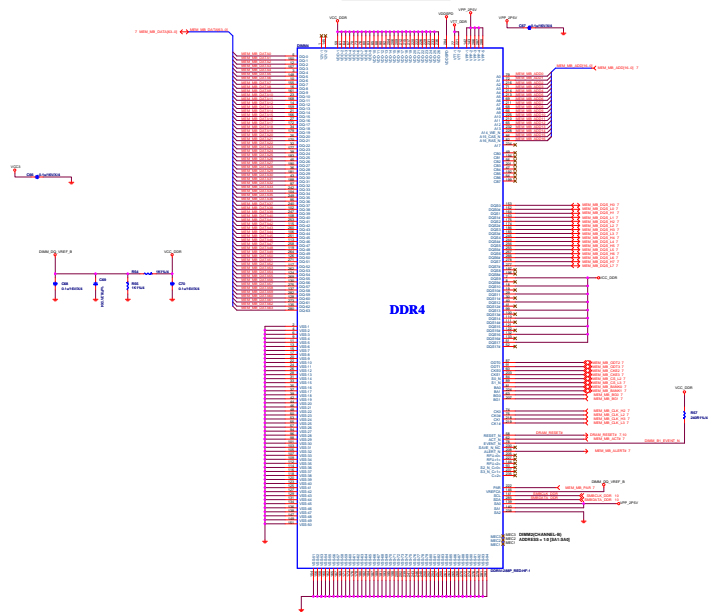
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Size		Document Number		HP SCH PIN-MSI MS-7A09	
Custom		Date		Thursday, May 05, 2016	
		Sheet		9 of 38	

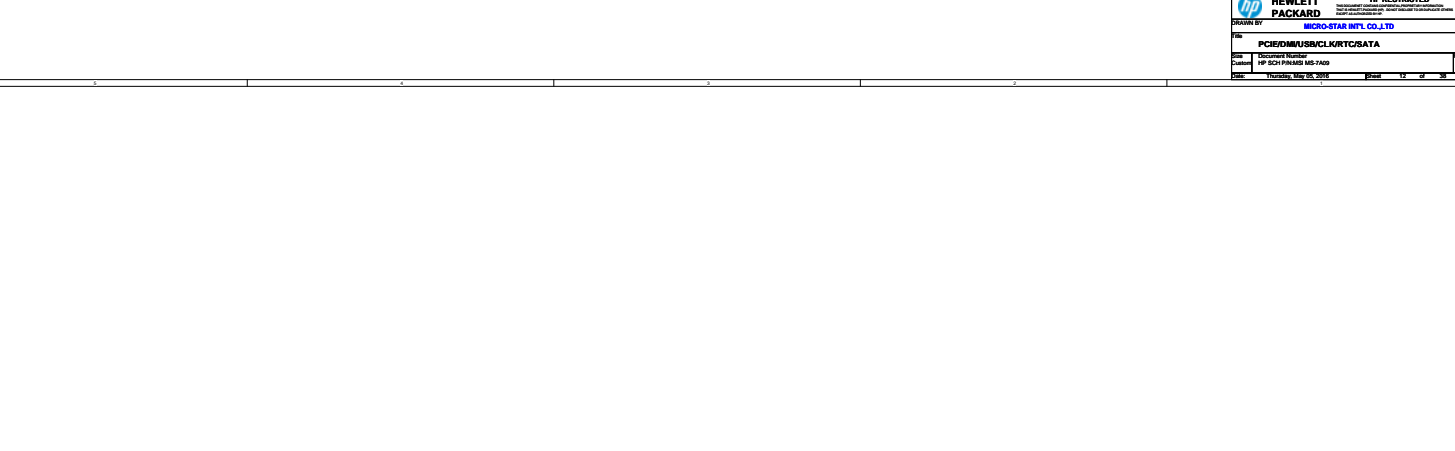
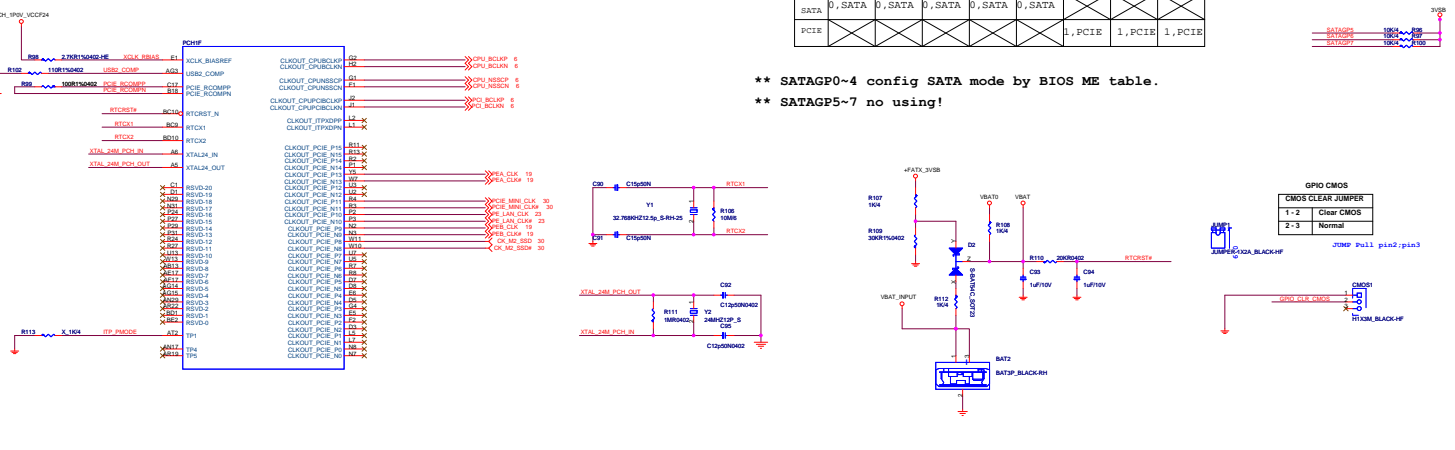
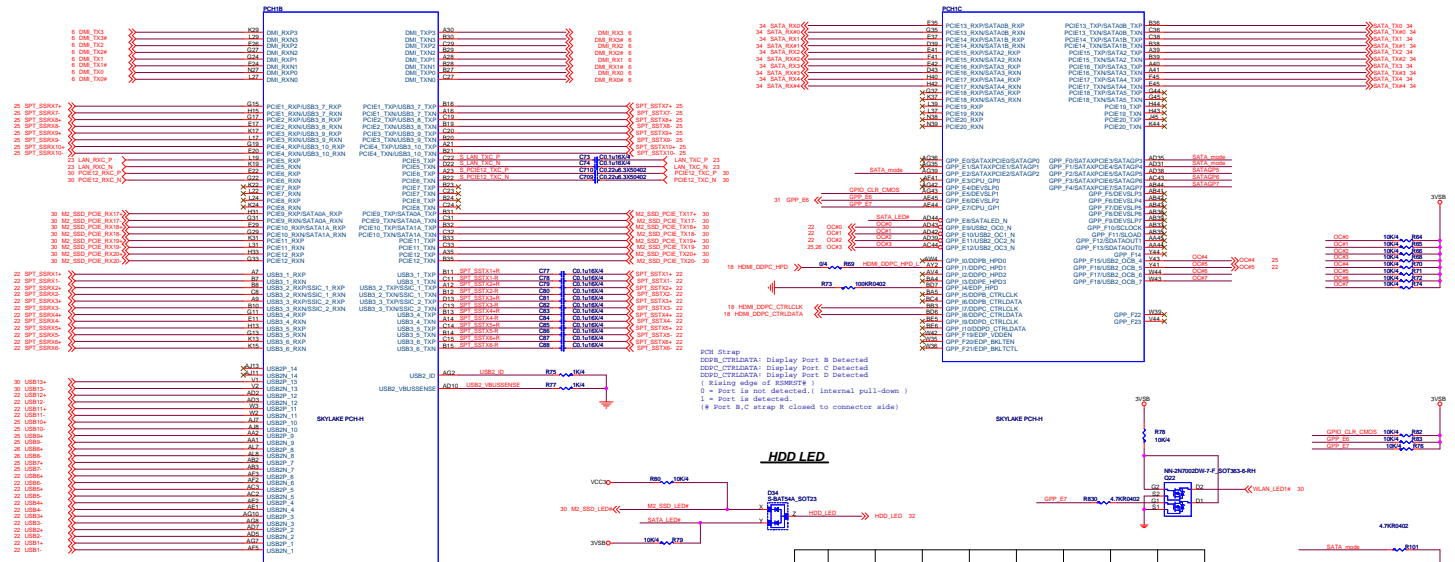


DDR4 DIMM\_B0



DDR4 DIMM\_B1

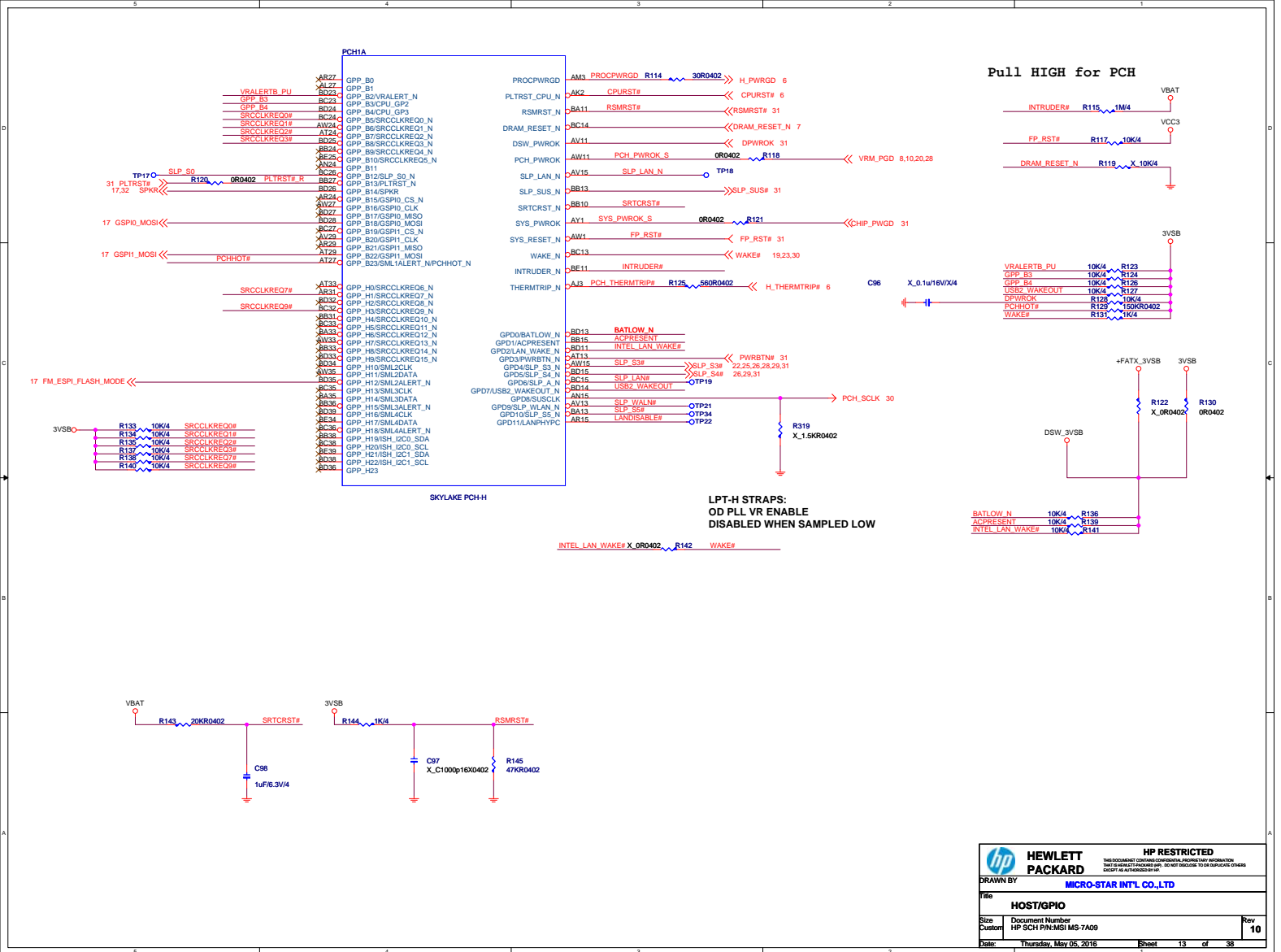


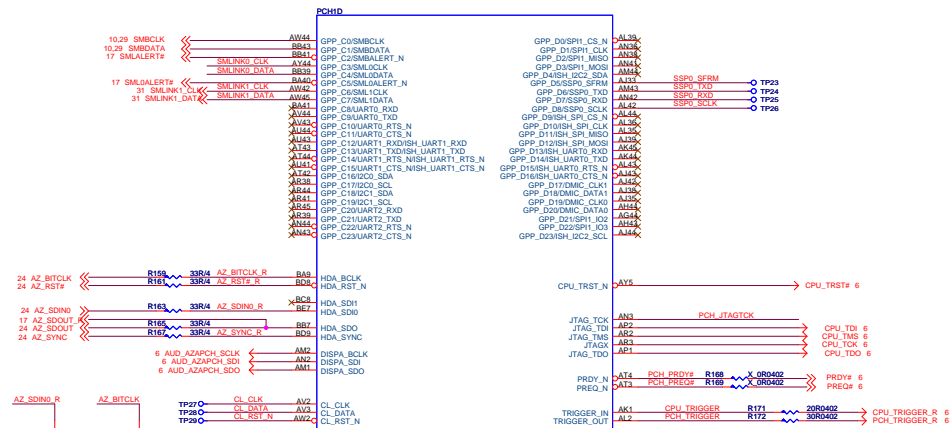


\*\* SATA0P0~4 config SATA mode by BIOS ME table.  
\*\* SATA0P5~7 no using!

SATAGP0	SATAGP1	SATAGP2	SATAGP3	SATAGP4	SATAGP5	SATAGP6	SATAGP7
SATA	0, SATA	0, SATA	0, SATA	0, SATA	1, PCIE	1, PCIE	1, PCIE
PCIE							

GPIO CMOS	
1-2	Clear CMOS
2-3	Normal

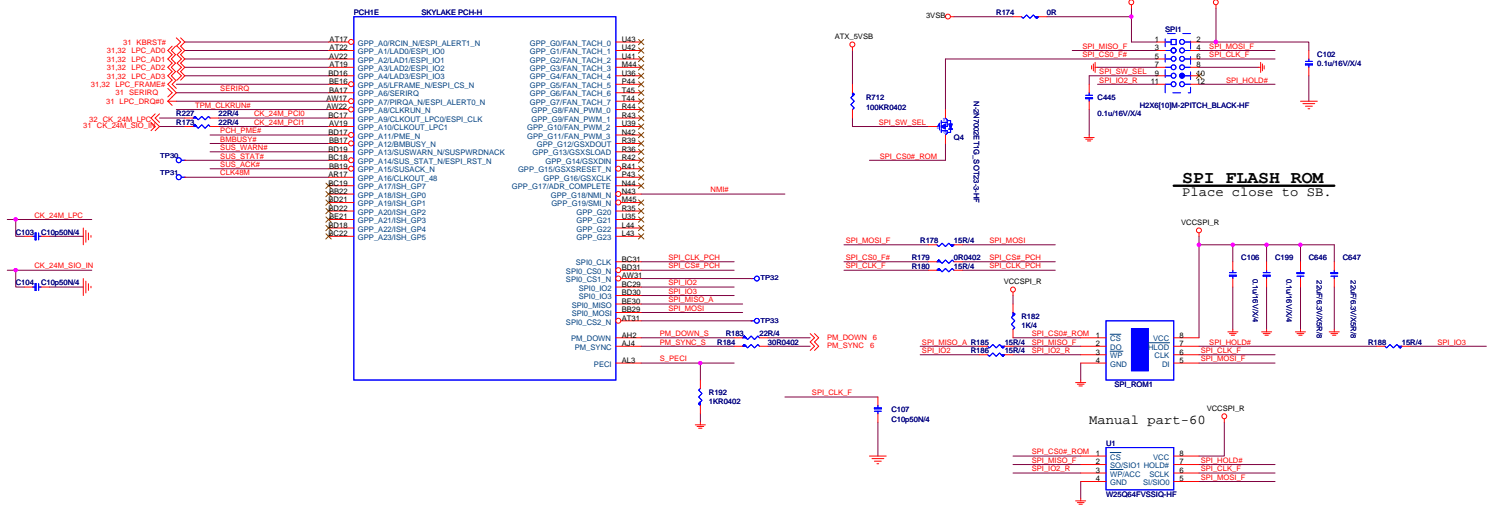




## SPI DEBUT PROT

Close to SPI ROM

Part Number: N31-2061341-H06

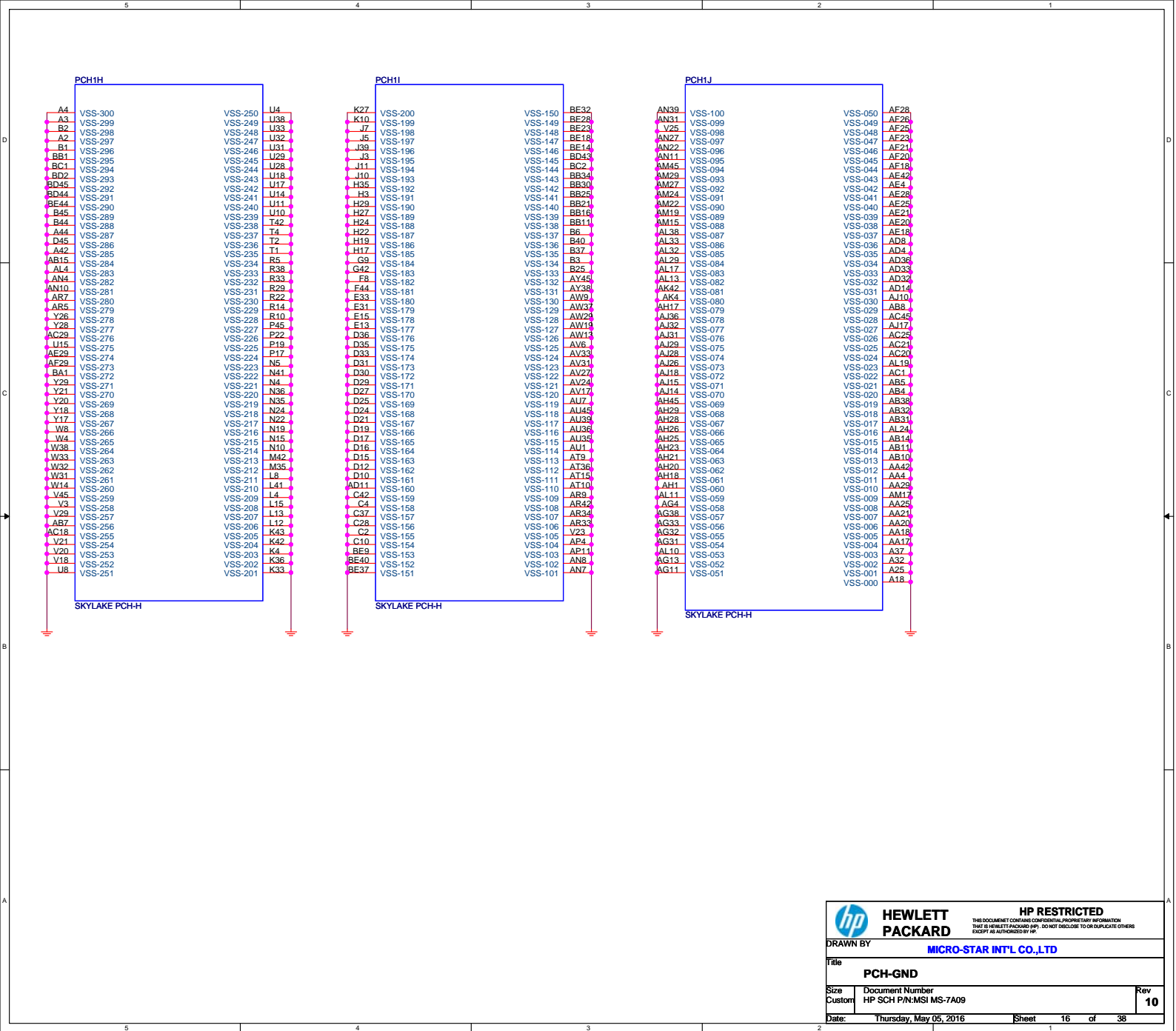



8M Main-Winbond M31-25Q6443-W03

8M AVL-MXIC M31-25L6482-M24

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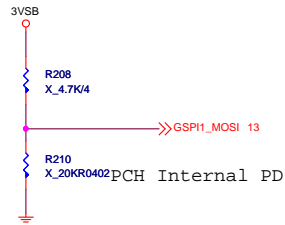
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<b>Custom</b>	HP SCH P/N-MSI MS-7A09	<b>10</b>

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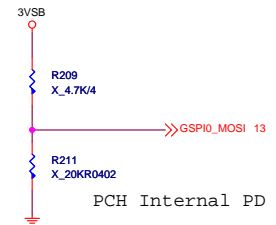


## GPP-B strapping

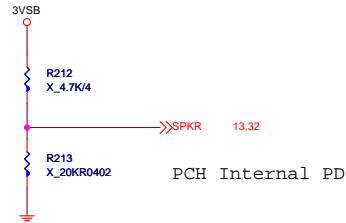
GSPII_MOSI	GPP_B22
LPC	1
SPI	0 **



GSPI0_MOSI	GPP_B18
Enable no boot	1
disable No boot	0 **

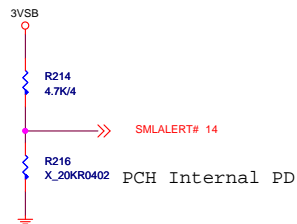


SWAP OVERRIDE STRAP	GPP_B14
ENABLE	1
DISABLE	0 **(default)



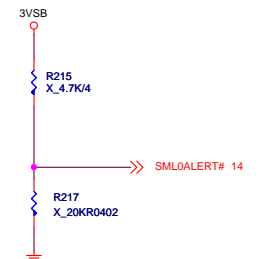
## GPP-C strapping

TLS	SMLALERT#
ENABLE	1 **
DISABLE	0



### HW strapping

boot type	SML0ALERT#
ESPI	1
LPC	0 **(default)

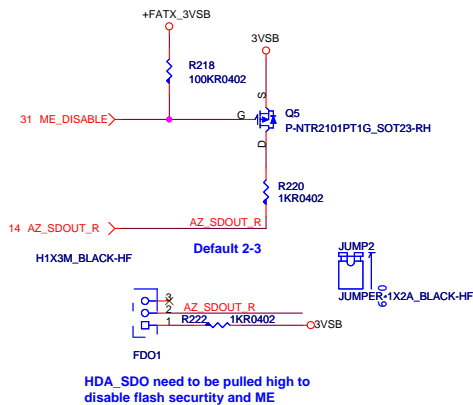
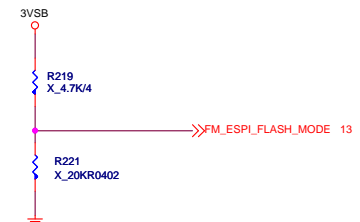



### HW strapping

#### ESPI flash sharing mode

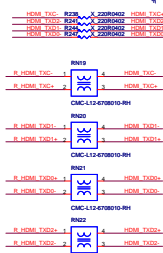
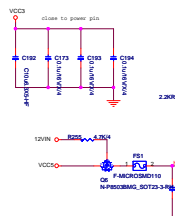
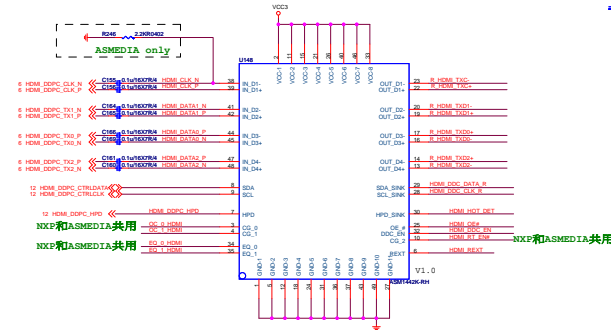
	GPP_H12
Slave	1
Master	0 **(default)

PCH Internal PD

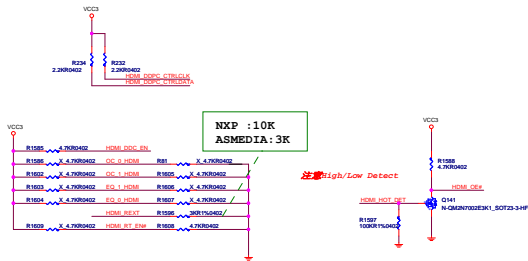
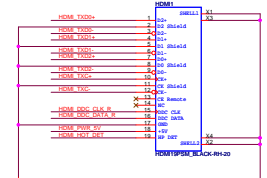
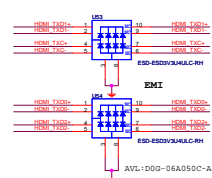


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Date:		Thursday, May 05, 2016		Sheet	17 of 38

**HDMI1.4 with level shifter (4K x 2K supporting)**

Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings

Port	Digital Display Interface Differential Pairs	HDMI Signals	PCB Digital Display Interface Pins
Port B	DGSP_B_TX0_DN	TMDS_DATA22_P	DDI0B_0N
	DGSP_B_TX0_DP	TMDS_DATA22_N	DDI0B_0P
	DGSP_B_TX1_DN	TMDS_DATA18_P	DDI0B_1N
	DGSP_B_TX1_DP	TMDS_DATA18_N	DDI0B_1P
	DGSP_B_TX2_DN	TMDS_DATA14_P	DDI0B_2P
	DGSP_B_TX2_DP	TMDS_DATA14_N	DDI0B_2N
	DGSP_B_TX3_DN	TMDS_CLK_P	DDI0B_3P
	DGSP_B_TX3_DP	TMDS_CLK_N	DDI0B_3N
	DGSPB_HPD	DGSPB_HPD0	Hot plug detect used by HDMI Port B.
	SDVO_CTRL0_CLK	HDMI0B_CTRL_CLK	HDMI DDC lines for Port B
SDVO_CTRL0_DATA	HDMI0B_CTRL_DATA		

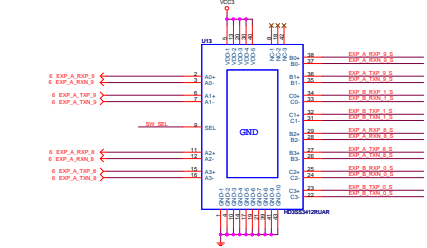
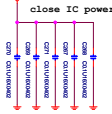


	"0"	"1"	note
SDC_SH	SDC level shifter disable	SDC level shifter enable	internal pull-up at -500K ohm.
SPD_INP	Input 51 ohm termination resistor enable	the input termination ; resistors are set to high impedances	internal pull-downs at -500K ohm.
DS	enable	the chip is power down, and input termination resistors will be at high impedance.	internal pull-downs at -500K ohm.
SPD_SINK	disable	enable	internal pull-ups at -500K ohm; 5V tolerant.
SDCSPV_EN	For SDC level shifting configuration, please refer to Table.		
SRX0	analog current generation.		

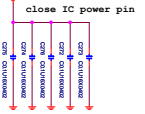
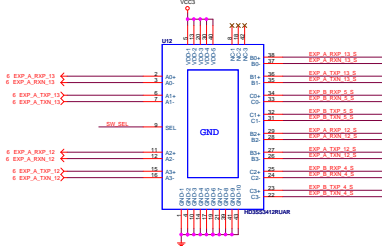
[DCC_EN, DCCBYEN_EN]	DCC Passive Switch	DCC Active Buffer	PC1, PC0	note
1, 0, 0	On	OFF	00	8 dB
1, 1, 0	Off	On	01	4 dB
1, 1, 1	OFF	OFF	10	12 dB

EMI cap.

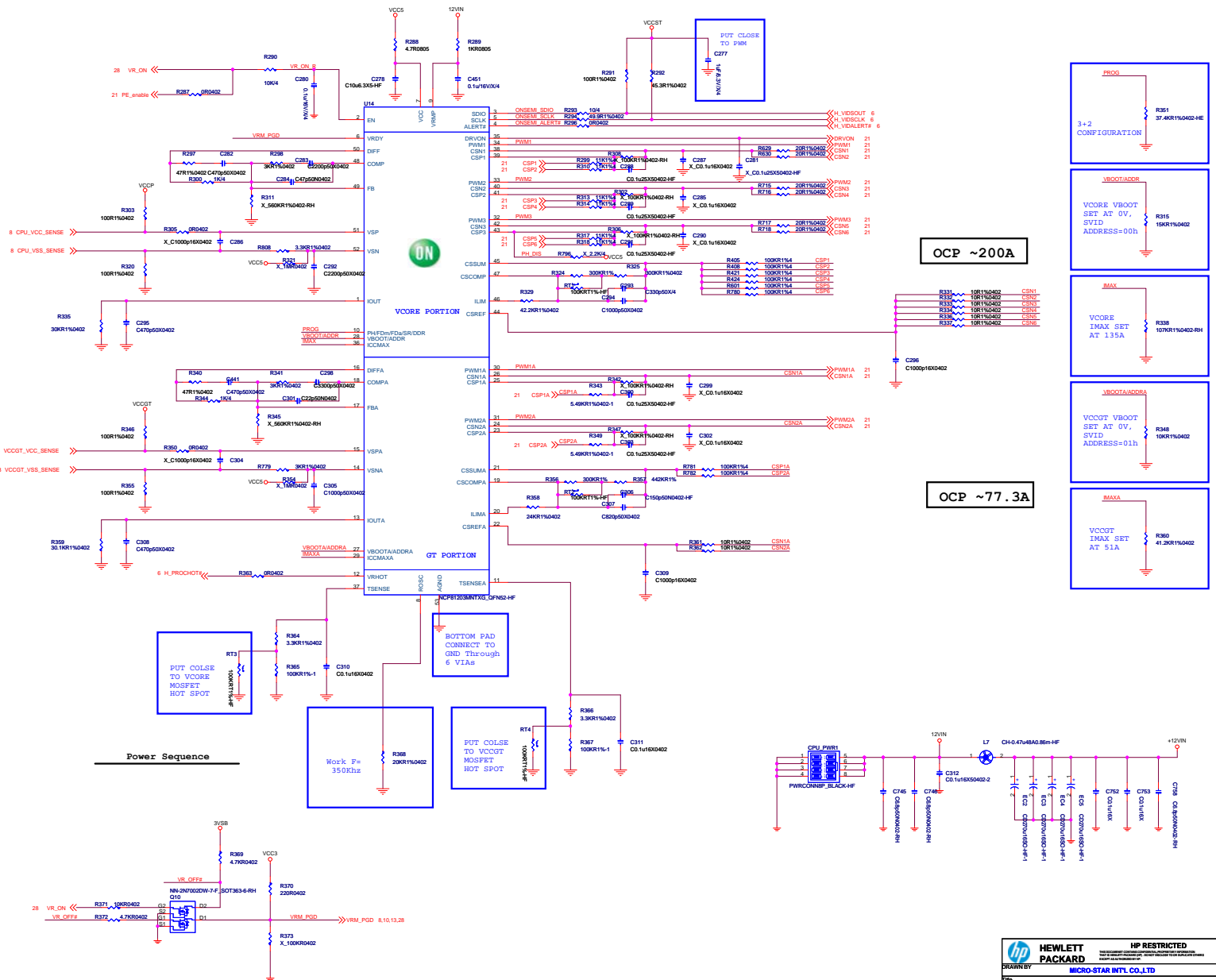


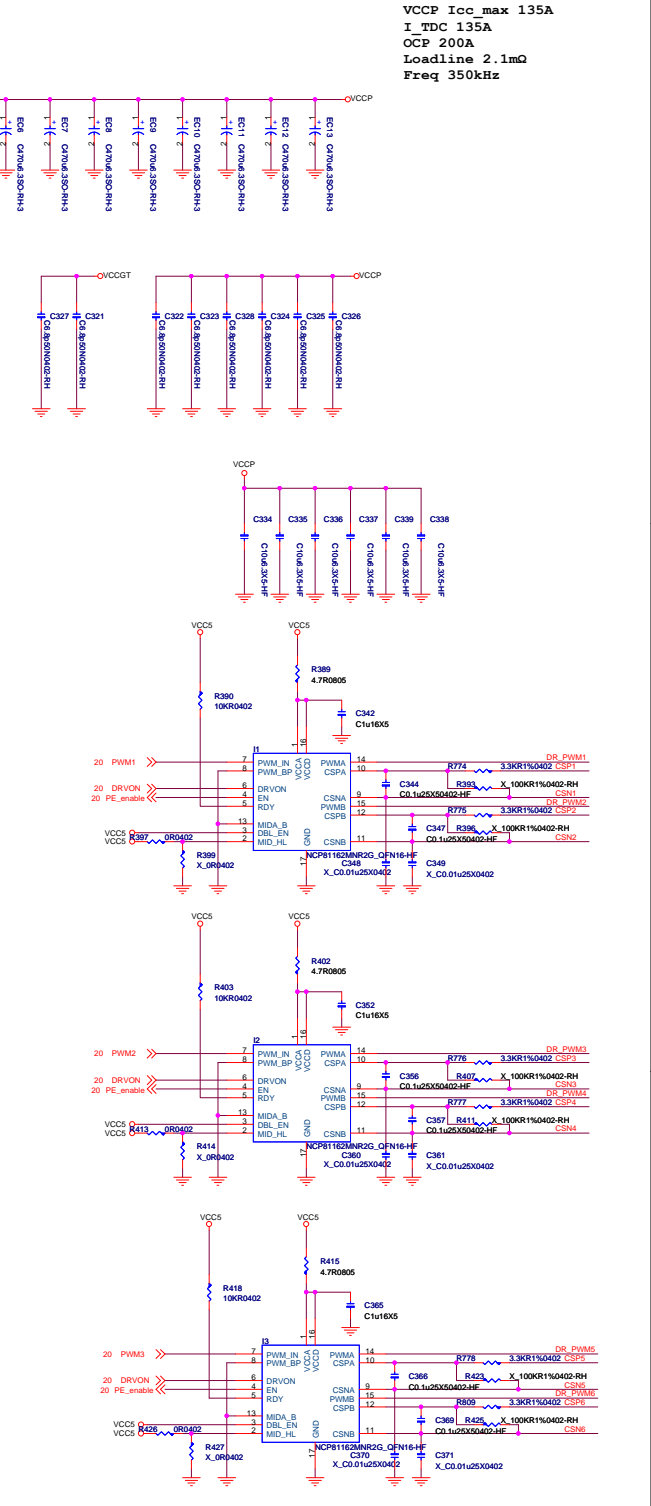
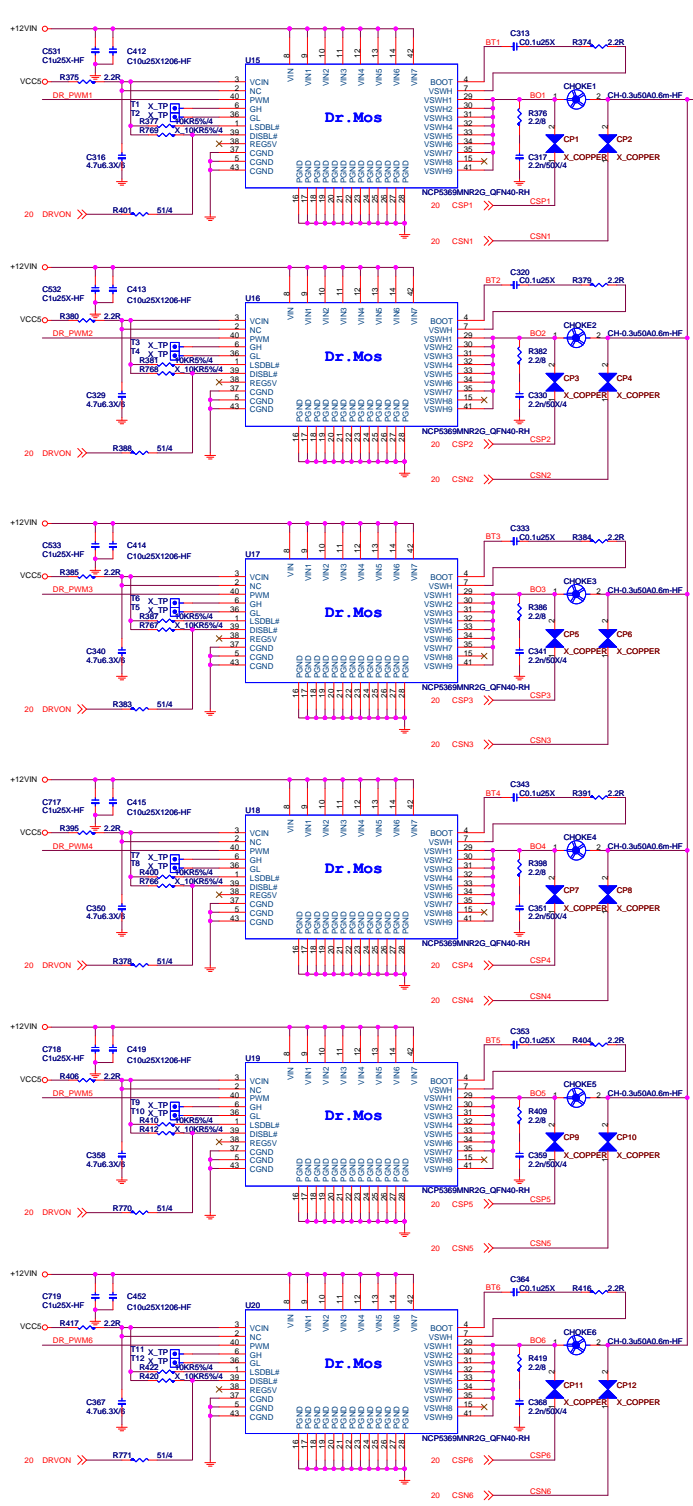
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FCL EXPRESS AIR SLOT



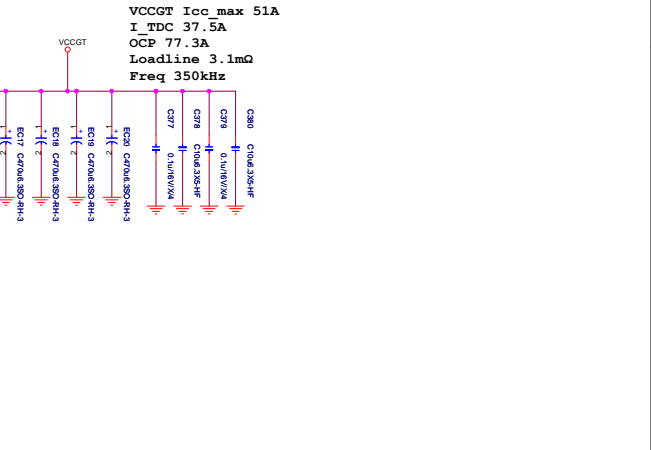
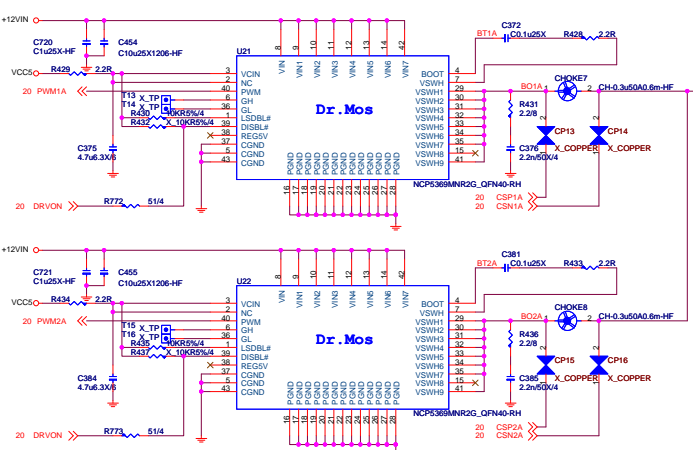
### **VOLTAGE REGULATOR MODULE (VRD12.5)**



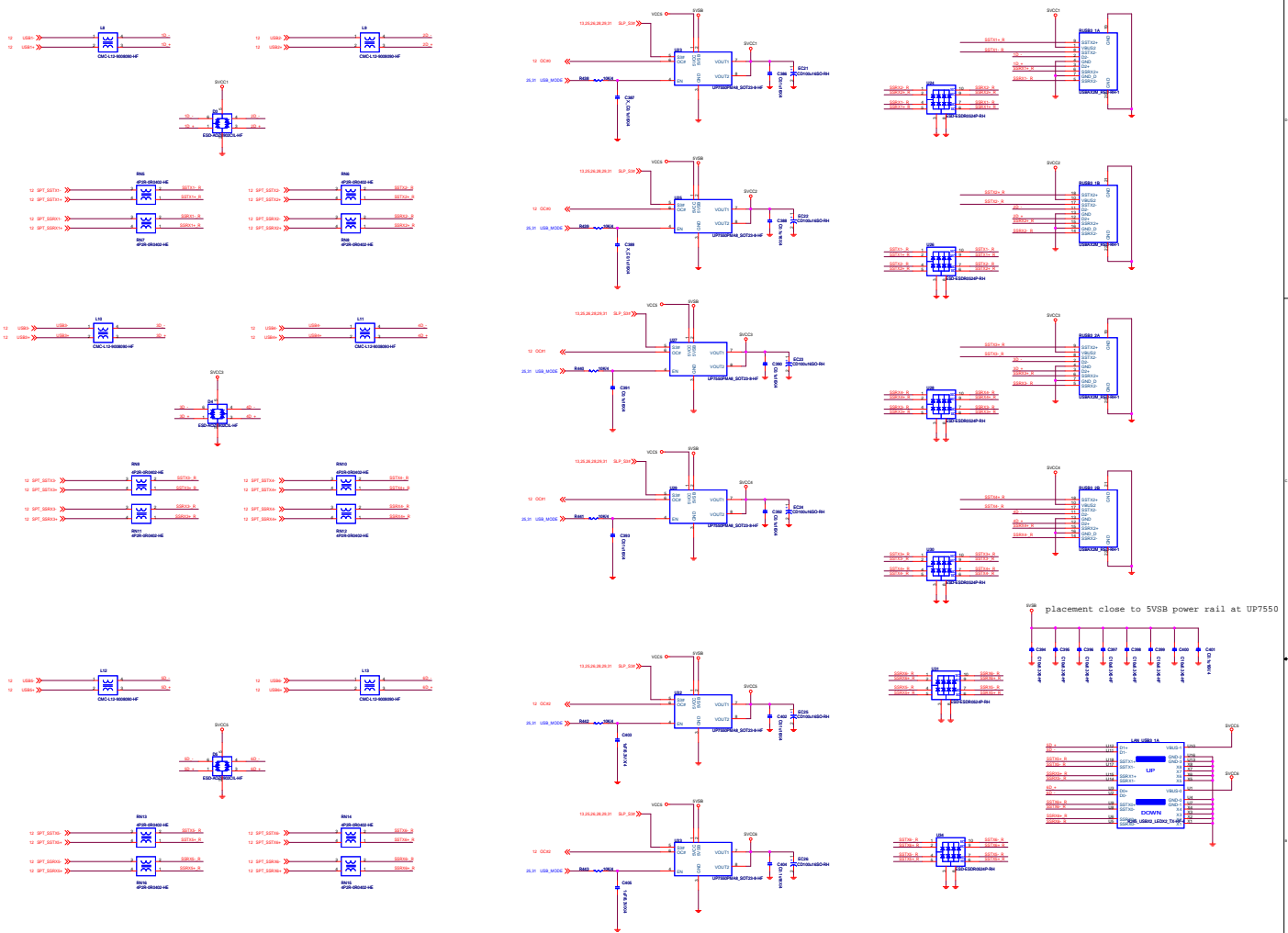


VCCP Icc\_max 135A  
I\_TDC 135A  
OCP 200A  
Loadline 2.1mQ  
Freq 350kHz

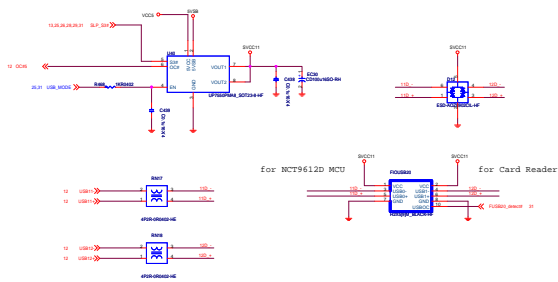
VCCGT Icc\_max 51A  
I\_TDC 37.5A  
OCP 77.3A  
Loadline 3.1mQ  
Freq 350kHz



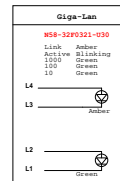
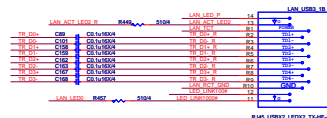
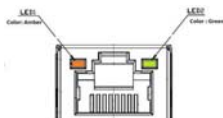
## REAR USB3.0



## FRONT USB2.0 PIN HEADER

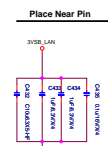
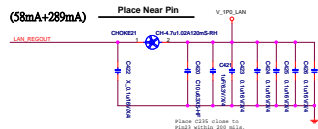
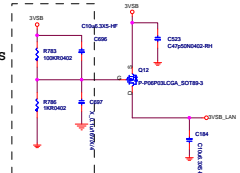


## LAN Connector

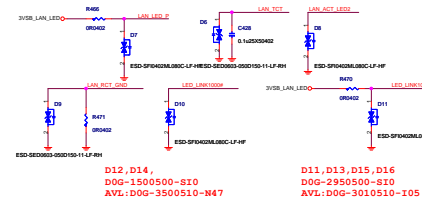
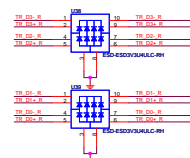


WCOL	CH	Speed	Activatable Mode			
			SG	S/N/TA	IS	
Active LED	IG R/B	R/B	Active	Active	Active	
	100MA R/B	R/B	Active	Active	Active	
	IG R/B	R/B	Active	Active	Active	
	100MA R/B	R/B	Active	Active	Active	
Link Speed LED	IG R/B	Green	Green	Green	Green	
	100MA R/B	Green	Green	Green	Green	
	IG R/B	Green	Green	Green	Green	
	100MA R/B	Green	Green	Green	Green	
WCOL	CH	Speed	SG	S/N/TA	IS	
Active LED	IG R/B	R/B	Active	Active	Active	
	100MA R/B	R/B	Active	Active	Active	
	IG R/B	R/B	Active	Active	Active	
	100MA R/B	R/B	Active	Active	Active	
Link Speed LED	IG R/B	Green	Green	Green	Green	
	100MA R/B	Green	Green	Green	Green	
	IG R/B	Green	Green	Green	Green	
	100MA R/B	Green	Green	Green	Green	
Link OFF	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	
	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	
Active LED	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	
	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	
Link Speed LED	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	
	IG R/B	Off	Off	Off	Off	
	100MA R/B	Off	Off	Off	Off	

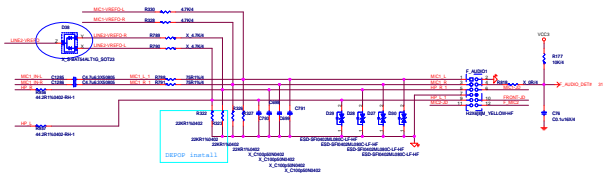
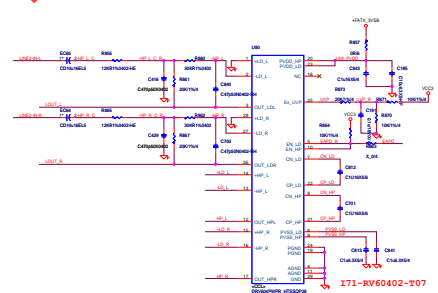
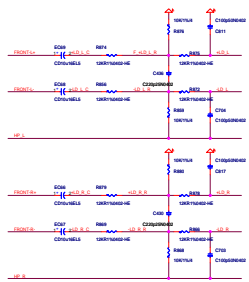
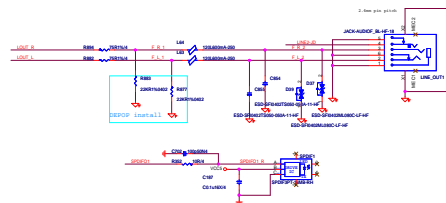
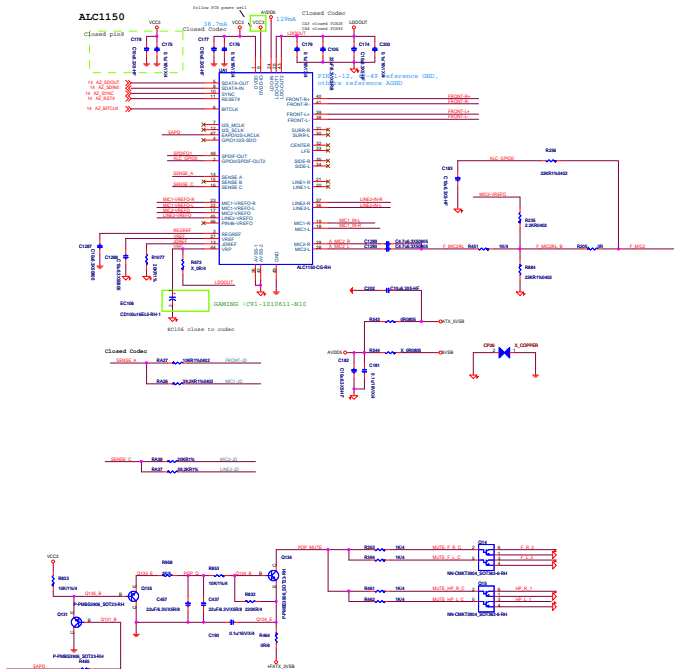
rise time >0.5ms



**ESD**



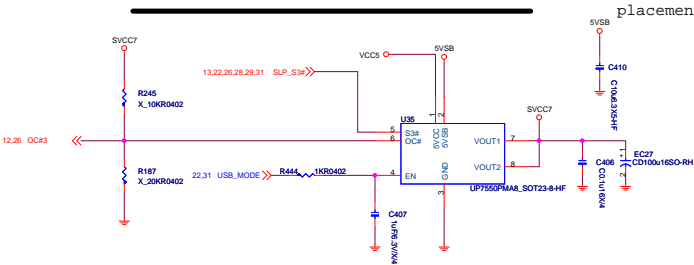
ALC1150



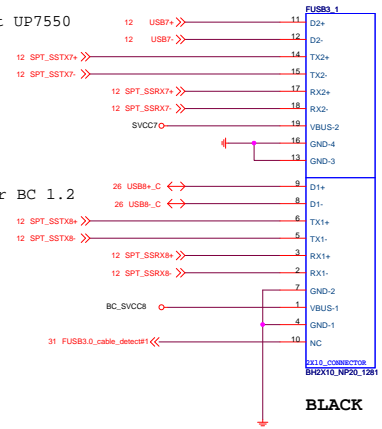


## FRONT USB3.0-1 TYPE A

placement close to 5VSB power rail at UP7550

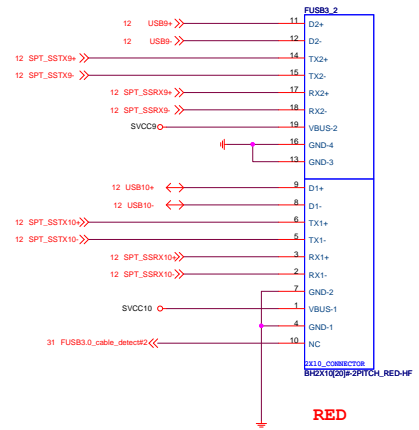
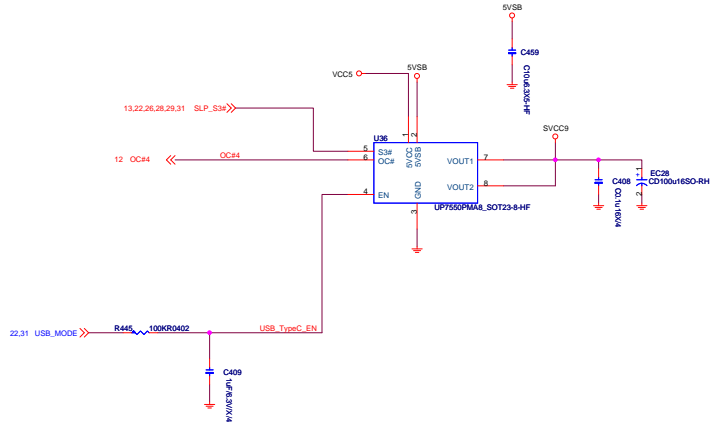


For BC 1.2



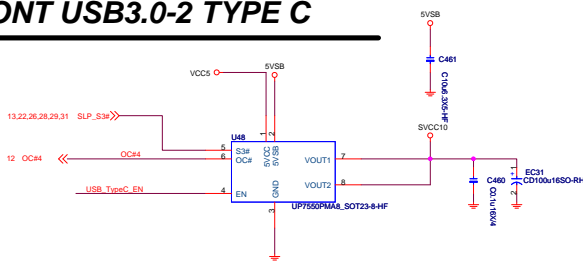
## FRONT USB3.0-1 TYPE C

placement close to 5VSB power rail at UP7550

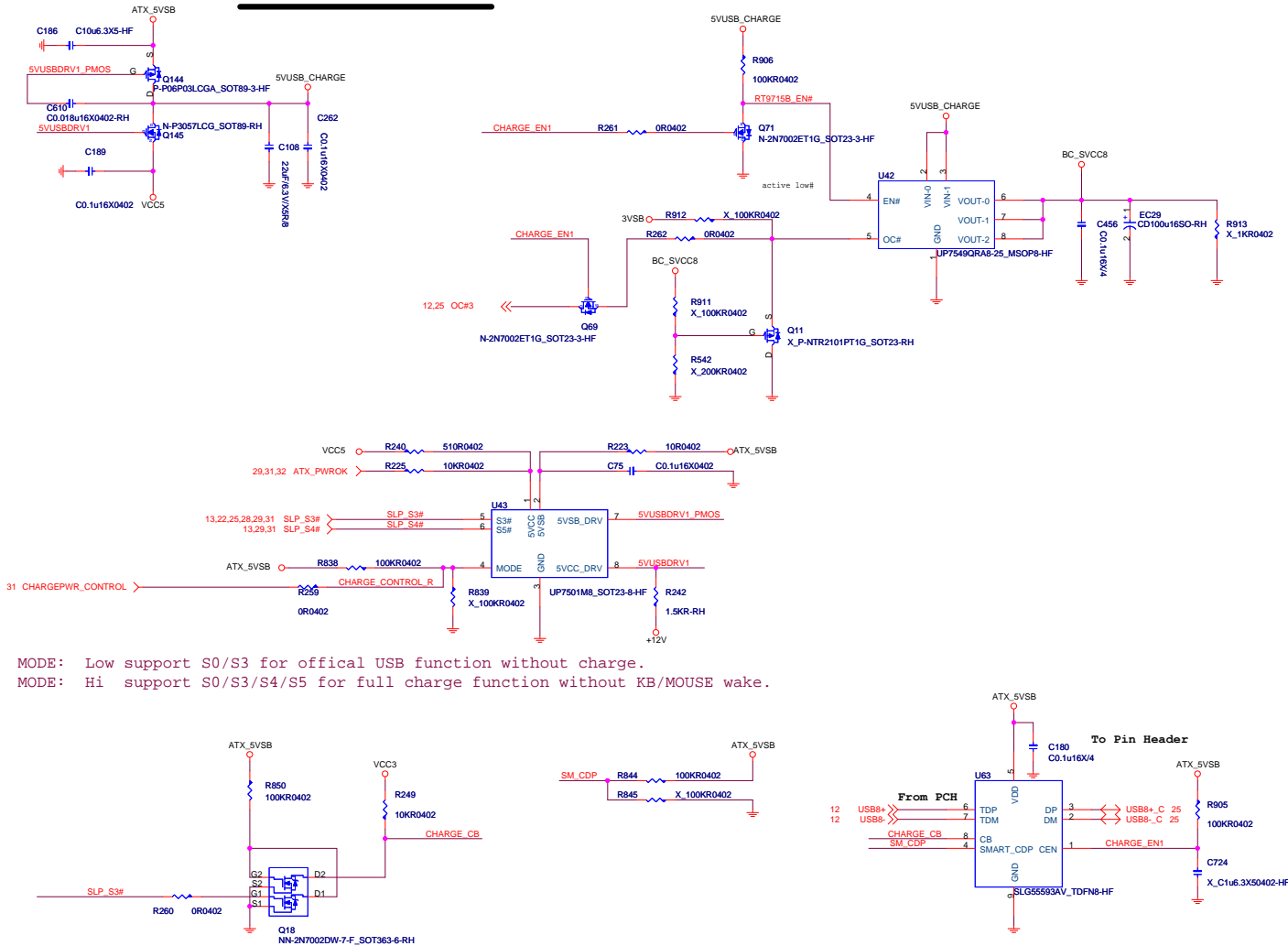


## FRONT USB3.0-2 TYPE C

placement close to 5VSB power rail at UP7550



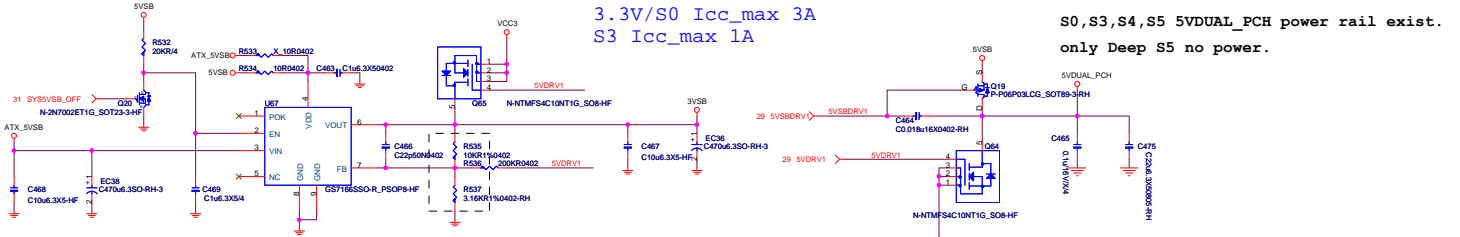
# USB CHARGE for BC 1.2



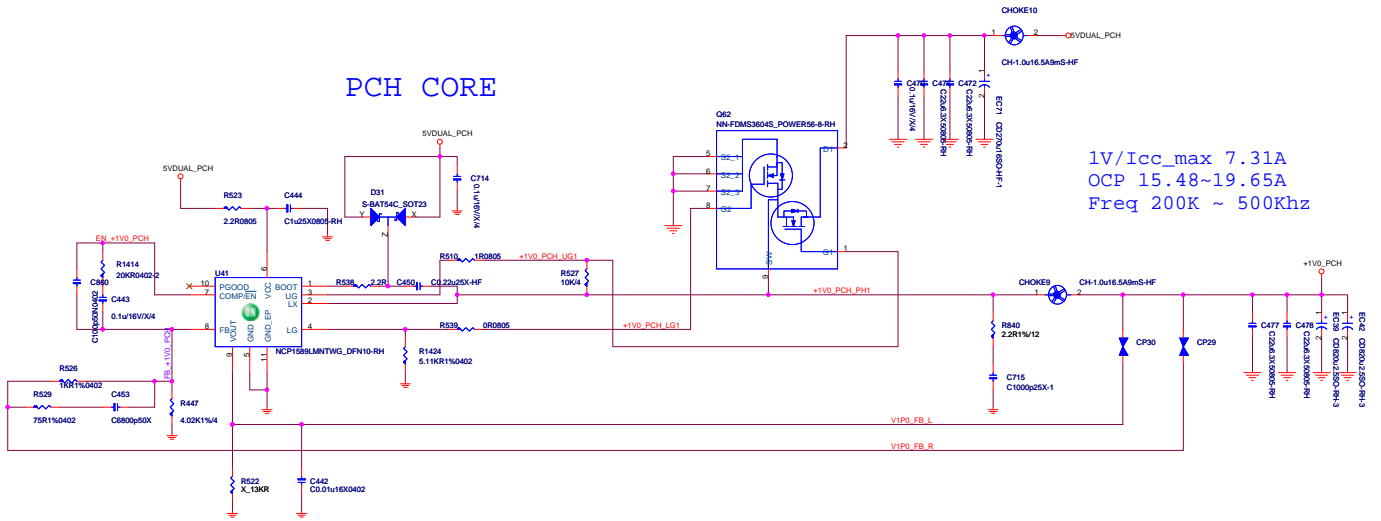
CB MODE: Low support S0/S3 for offical USB function without charge.  
 CB MODE: Hi support S0/S3/S4/S5 for full charge function without KB/MOUSE wake.

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Date:	Thursday, May 05, 2016	Sheet	26 of 38

### 3VSB Power Rail



### PCH CORE

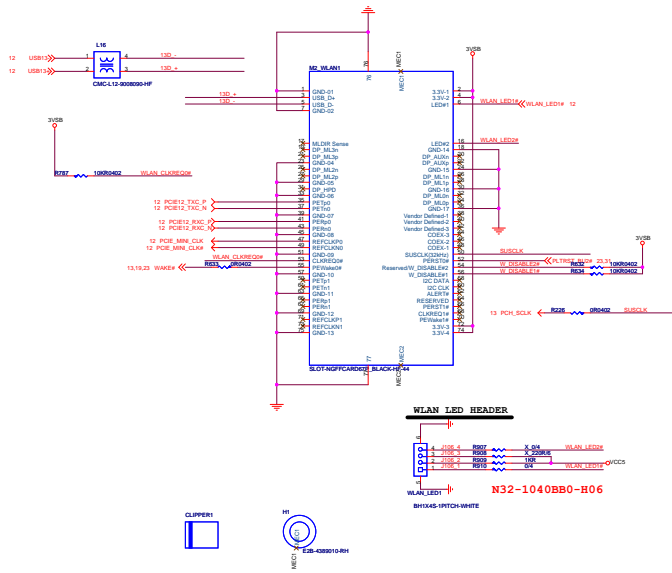


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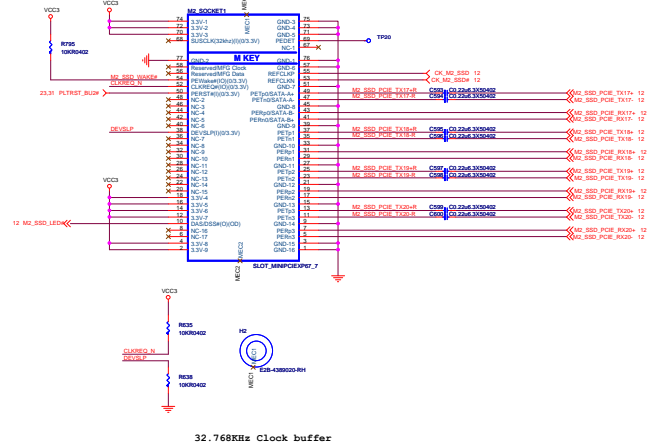




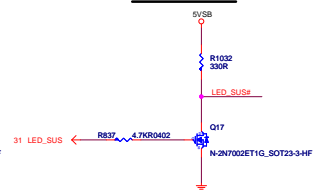
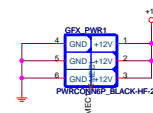
# WLAN Key A plating GF & Height 8.5mm



# M2 SSD-KEY-M



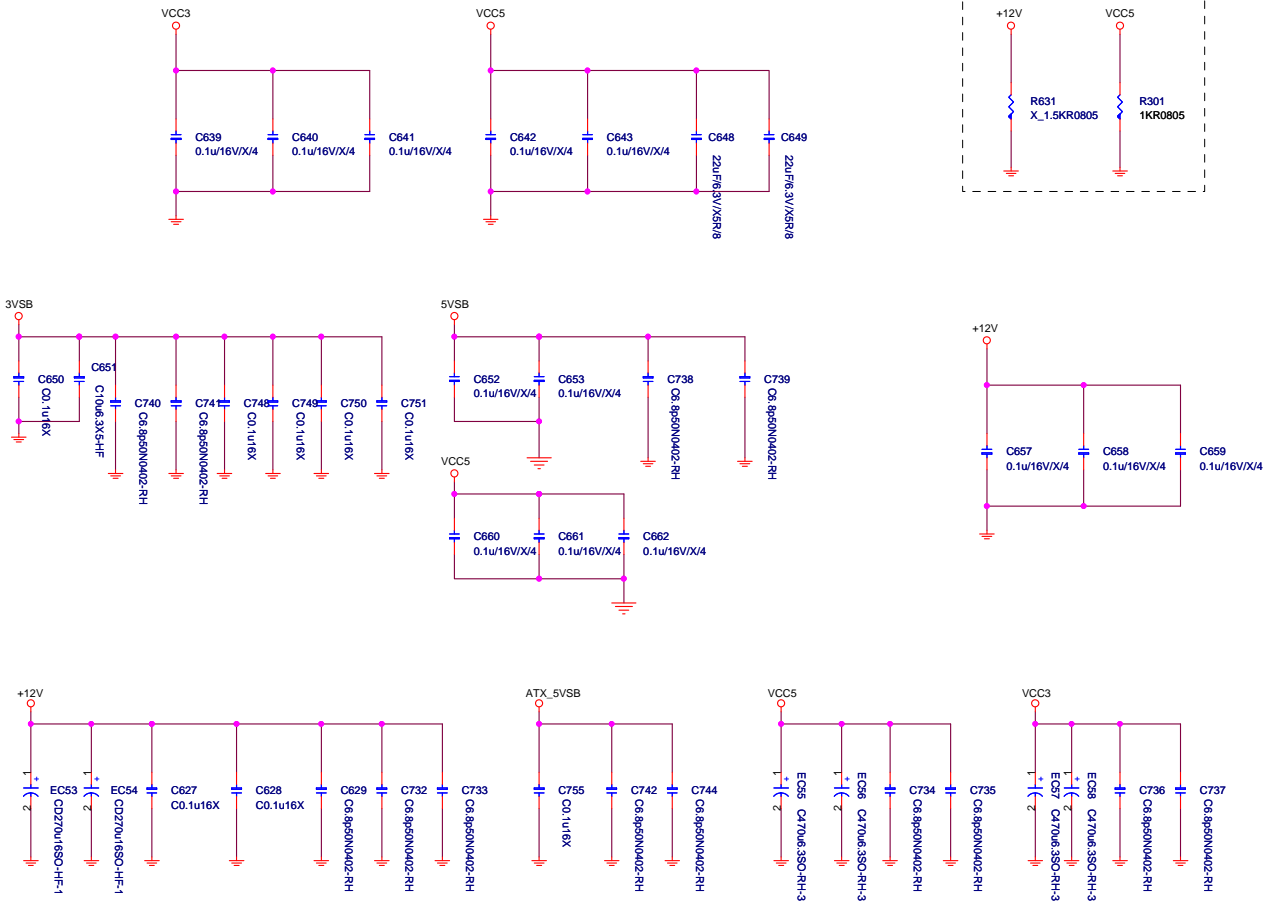






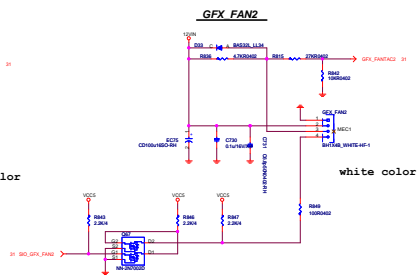
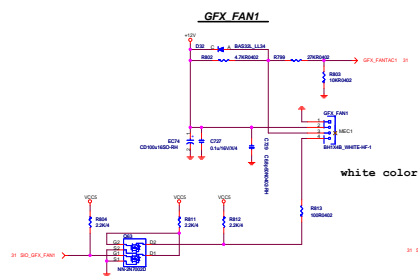
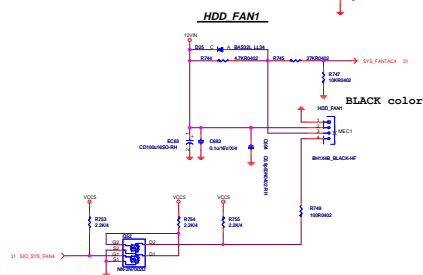
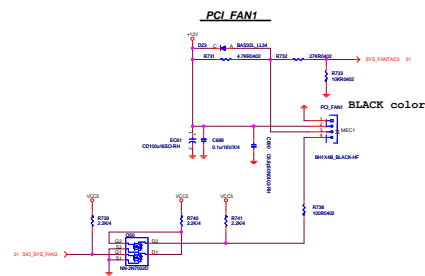
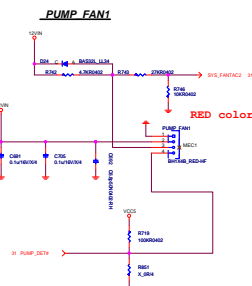
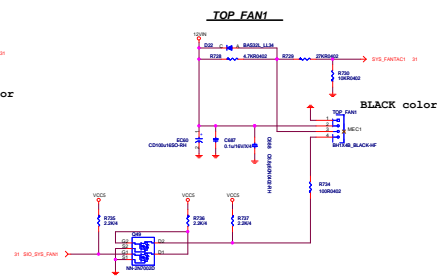
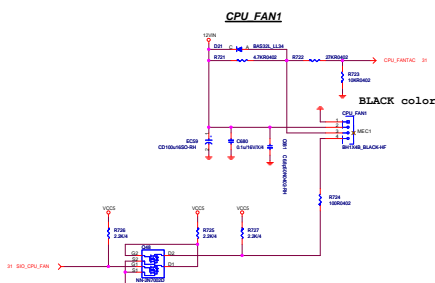
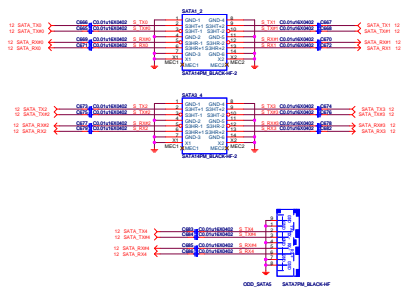
## EMI Decoupling Cap

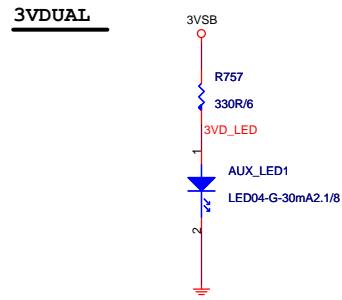
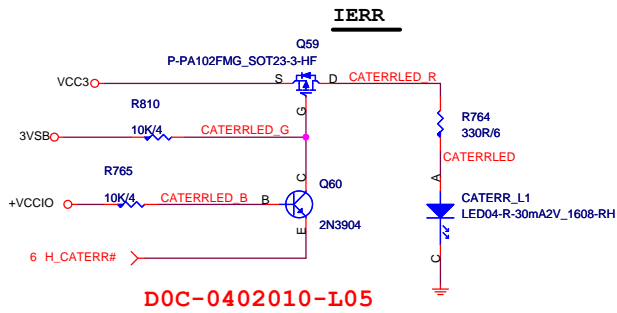
## discharge patch resistor




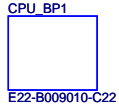
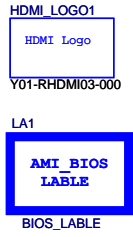
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		<small>DRAWN BY</small> <b>MICRO-STAR INT'L CO.,LTD</b>	
<small>Title</small> <b>EMEMI solution</b>			
<small>Size</small> Custom	<small>Document Number</small> HP SCH P/N/MSI MS-7A09		<small>Rev</small> <b>10</b>
<small>Date:</small> Thursday, May 05, 2016 <span style="float: right;"><small>Sheet</small> 33 <small>of</small> 38</span>			

# SATA port

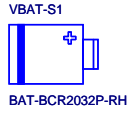




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Title		<b>SYSTEM signal LED display</b>			
Size	Document Number				Rev
Custom	HP SCH P/N:MSI MS-7A09				<b>10</b>
Date:	Thursday, May 05, 2016	Sheet	35	of	38
2		1			

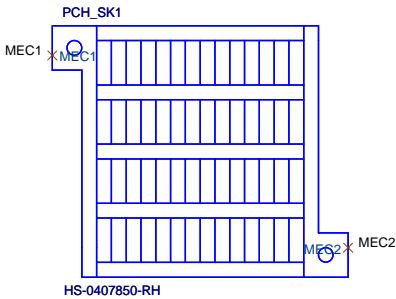
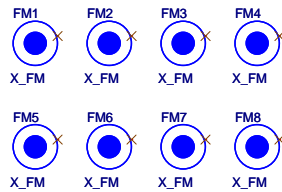


E22-B009010-C22  
AVL:E93-0000099-A21

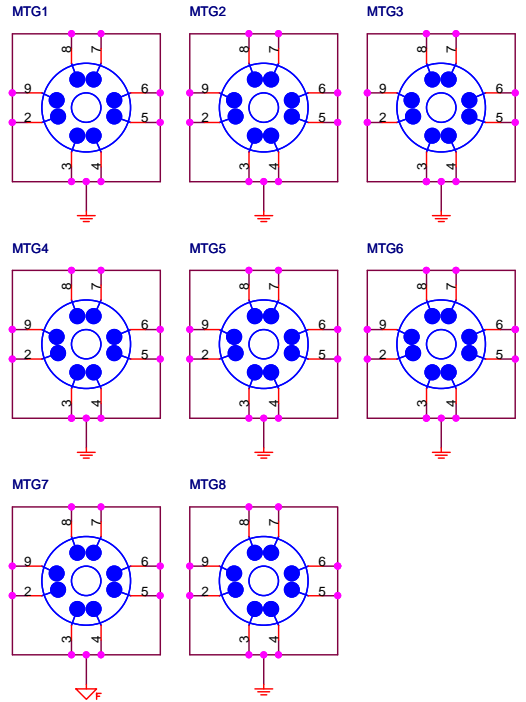


E21-AC71010-L06  
AVL:E21-7826010-F02

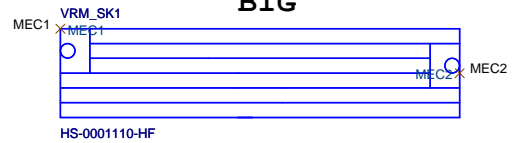
### Optical Fiducial Marks-X



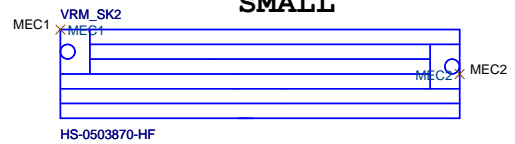
### Mounting Holes



### BIG

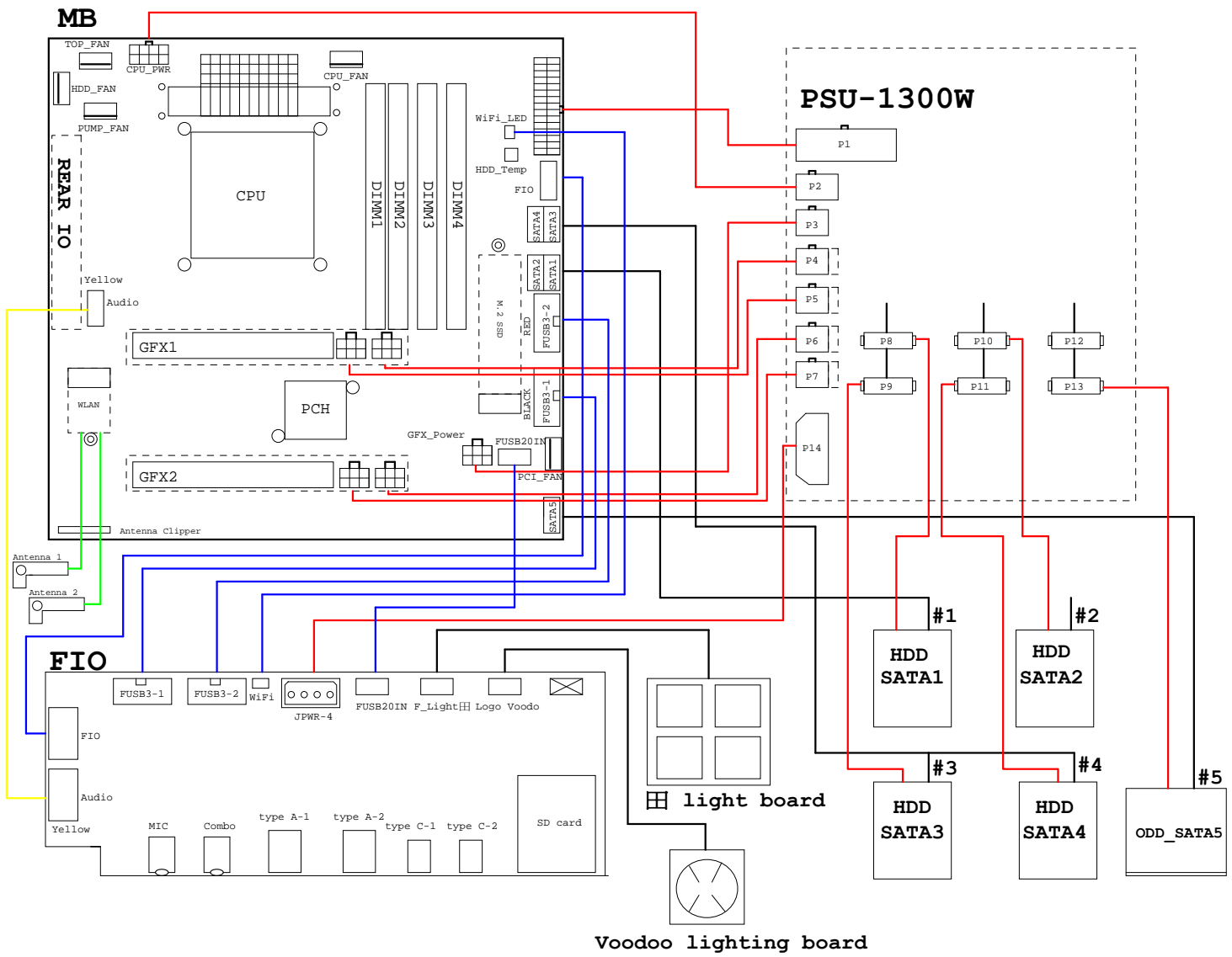


### SMALL



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Title <b>Manual Parts</b>					
Size Custom	Document Number HP SCH P/N:MSI MS-7A09				Rev <b>10</b>
Date: Thursday, May 05, 2016		Sheet 36		of 38	

## SYSTEM cable routing for 1300w PSU



# SYSTEM cable routing for 600w PSU

