2012 Component Training
Ivy Platform Series

GRMA Brain_HUNG

Ivy 7 Series – Agenda

- **Platform Structure**
  - **CPU feature introduce**
  - **Intel 7 series chipset architecture**
- **Critical Power Flow**
- **Clock Distribution**
- **Power Sequence**
- **Problem Debug**
  - **Can’t power on**
  - **Power auto shutdown**
  - **All dots, zero, and no display**
  - **Power part**

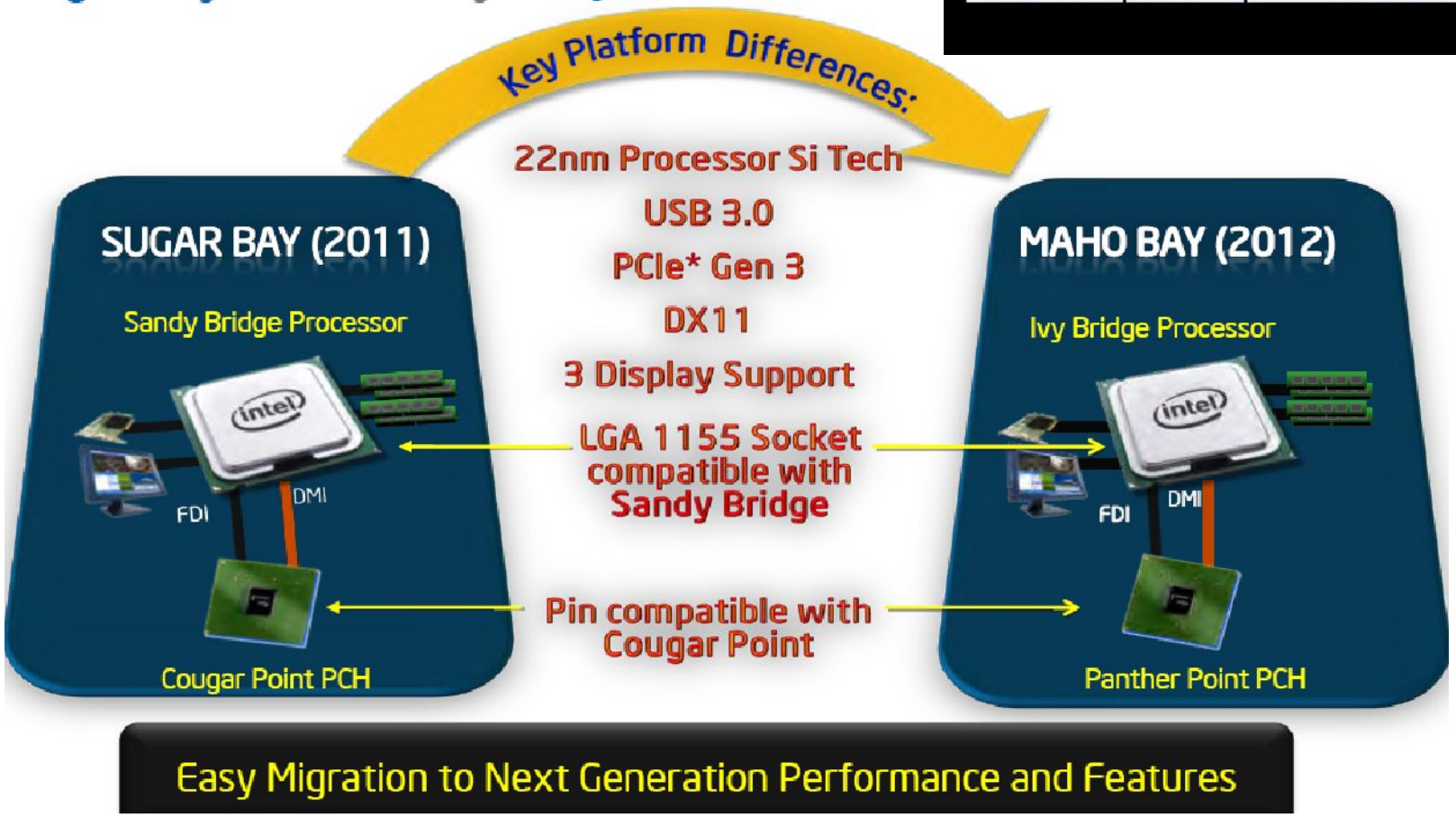
CPU Feature introduce

PCIe Architecture	Raw Bit Rate	Max Total Bandwidth for x16 Link
PCIe 2.0	5.0 GT/s	16 GB/s
PCIe 3.0	8.0 GT/s	32 GB/s

2X Faster

Platform Overview

Sugar Bay to Maho Bay Platform Transition



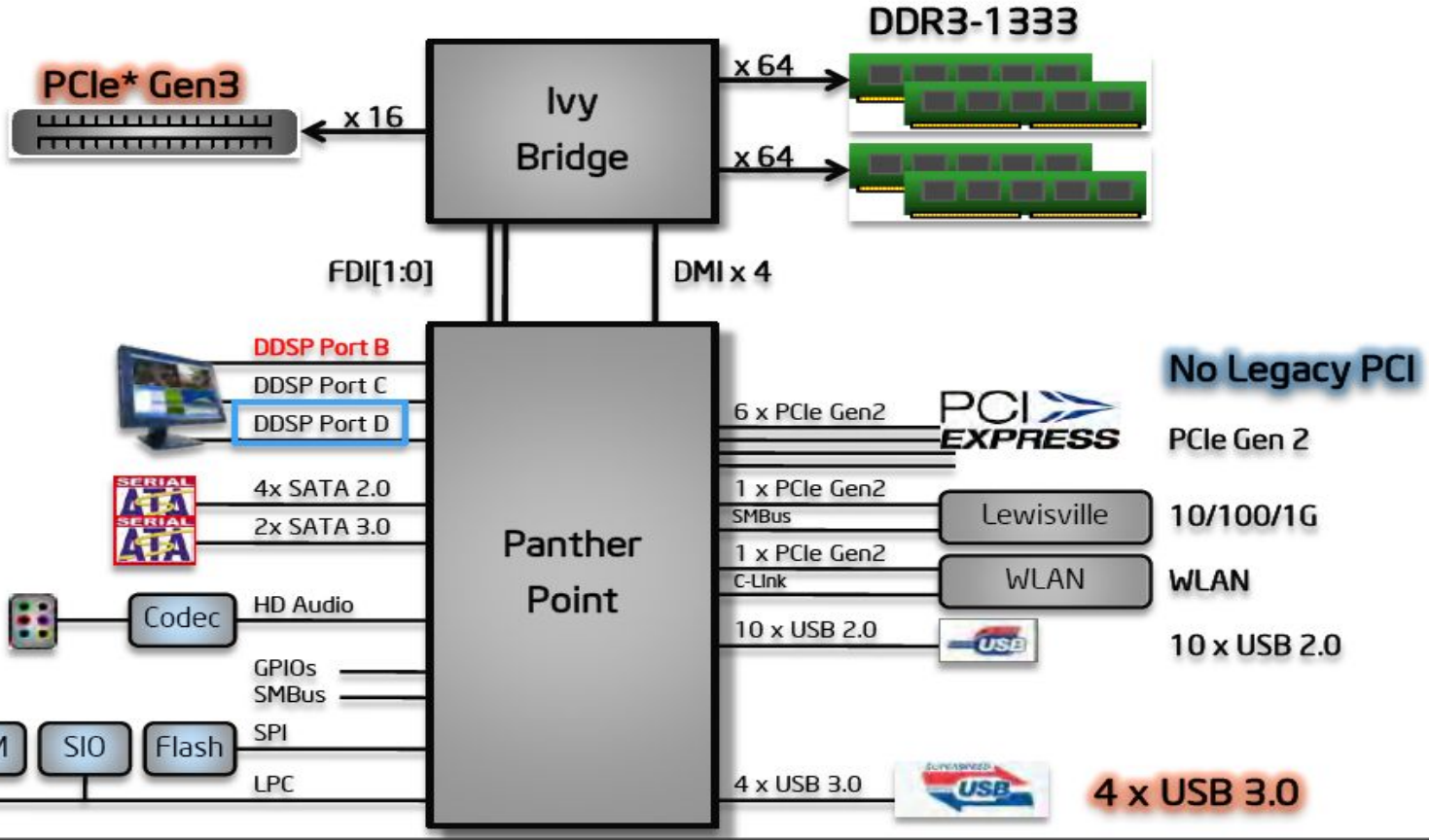
Easy Migration to Next Generation Performance and Features

Intel 7 Series Chipset Architecture

Platform Enabling Overview

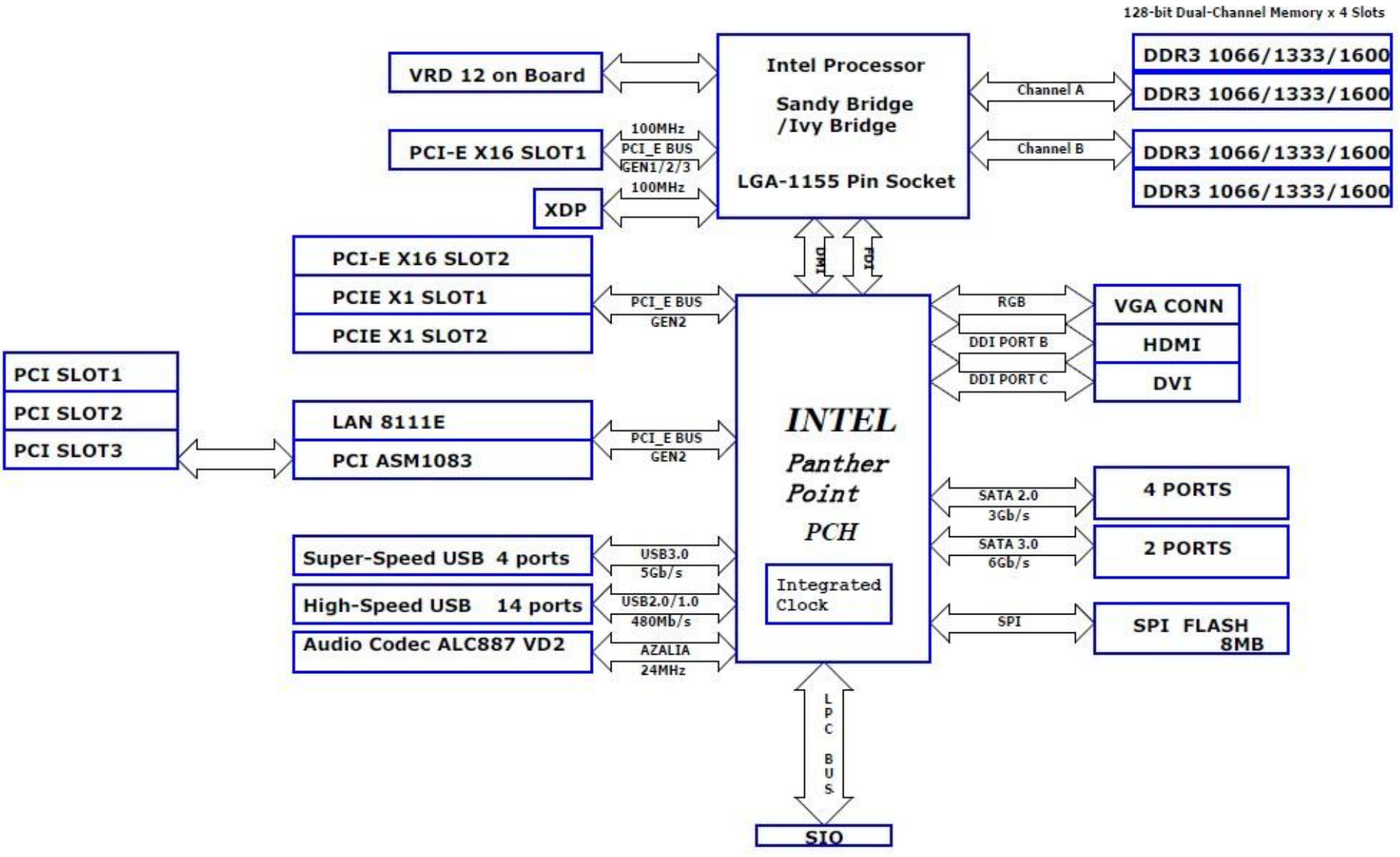
Maho Bay Block Diagram

CDI/ IBP

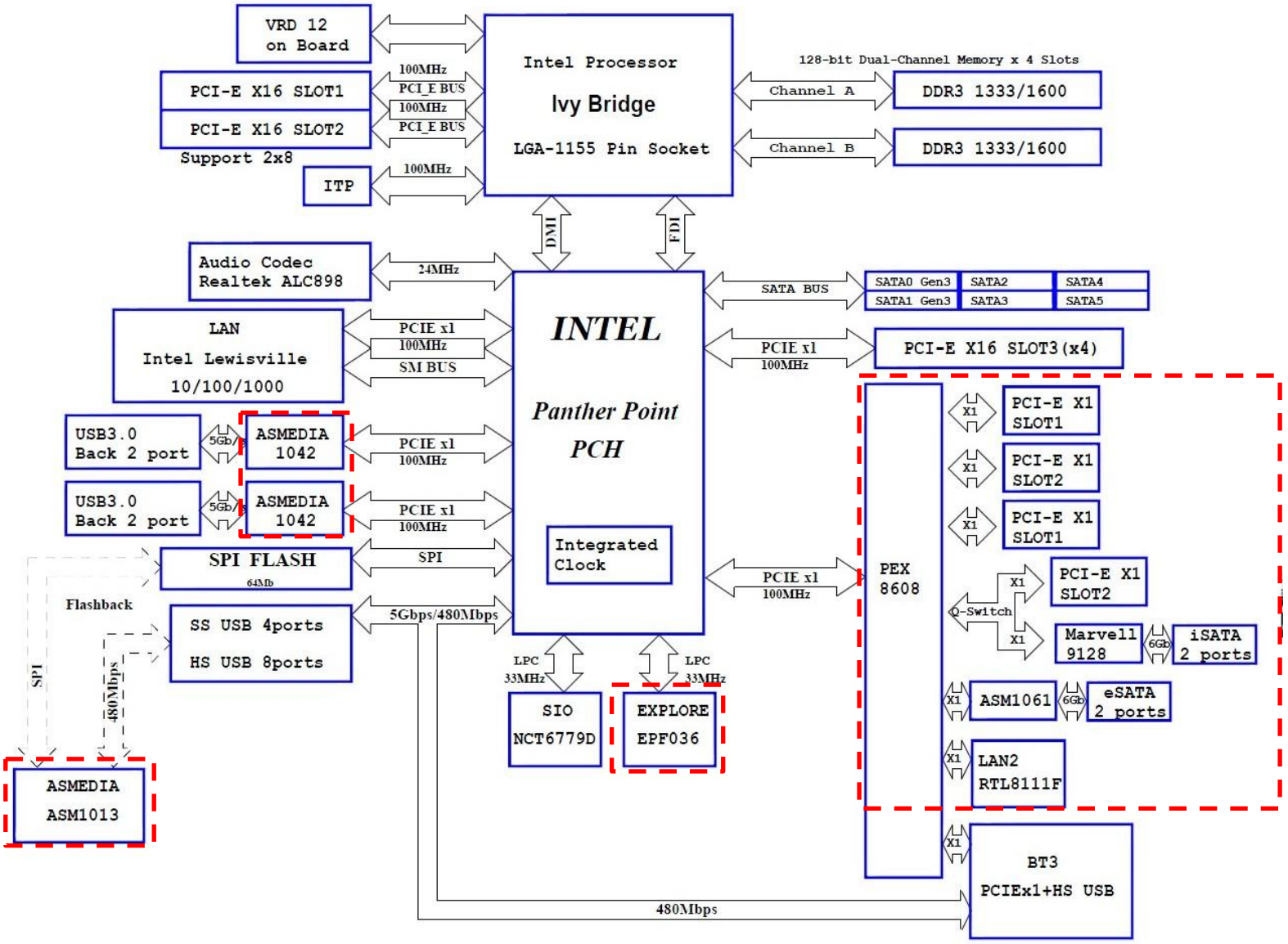


Leadership with Feature and Technology Rich Platforms

P8Z77-V LX Architecture



P8Z77-V DELUXE Architecture



PCH Feature introduce

Table 1-2. Desktop Panther Point Chipset SKUs

Feature Set		SKU Name					
		Q77	Q75	B75	Z77	Z75	H77
PCI Express* 2.0 Ports		8	8	8	8	8	8
PCI Interface		Yes	Yes	Yes	No[3]	No[3]	No[3]
Total number of USB ports		14	14	12[4]	14	14	14
• USB 3.0 Capable Ports (SuperSpeed and all USB 2.0 speeds)		4	4	4	4	4	4
• USB 2.0 Only Ports		10	10	8	10	10	10
Total number of SATA ports		6	6	6	6	6	6
• SATA Ports (6 Gb/s, 3 Gb/s, and 1.5 Gb/s)		2[5]	1[6]	1[6]	2[5]	2[5]	2[5]
• SATA Ports (3 Gb/s and 1.5 Gb/s only)		4	5	5	4	4	4
HDMI/DVI/VGA/DisplayPort*/eDP*		Yes	Yes	Yes	Yes	Yes	Yes
Integrated Graphics Support		Yes	Yes	Yes	Yes	Yes	Yes
Intel® Rapid Storage Technology	AHCI	Yes	Yes	Yes	Yes	Yes	Yes
	RAID 0/1/5/10 Support	Yes	Yes[7]	No	Yes	Yes	Yes
	Intel® Smart Response Technology	Yes	No	No	Yes	No	Yes
Intel® Anti-Theft Technology		Yes	Yes	Yes	Yes	Yes	Yes
Intel® Active Management Technology 8.0		Yes	No	No	No	No	No
Intel Fast Flash Standby[8]		Yes	No	No	No	No	No

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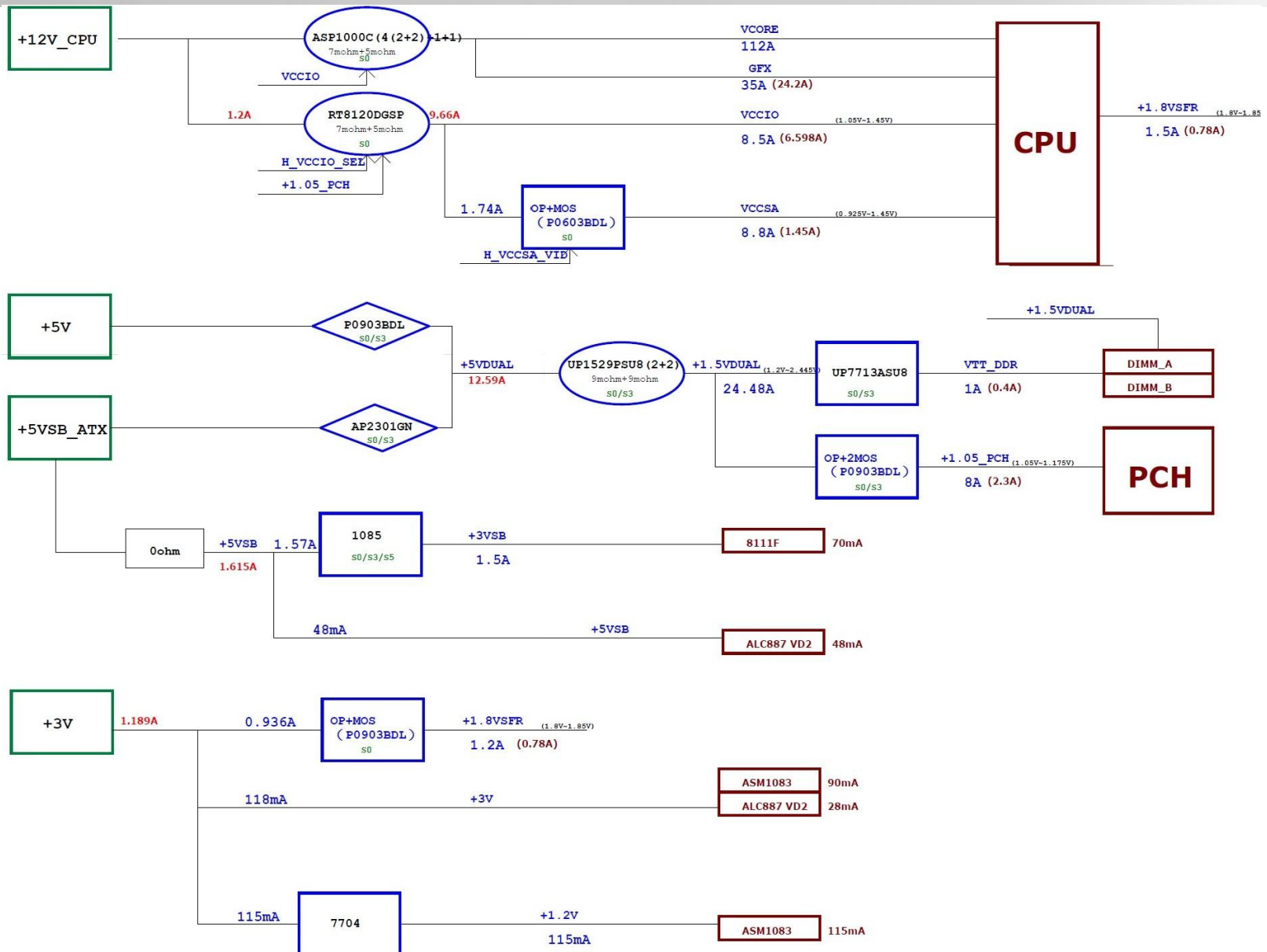
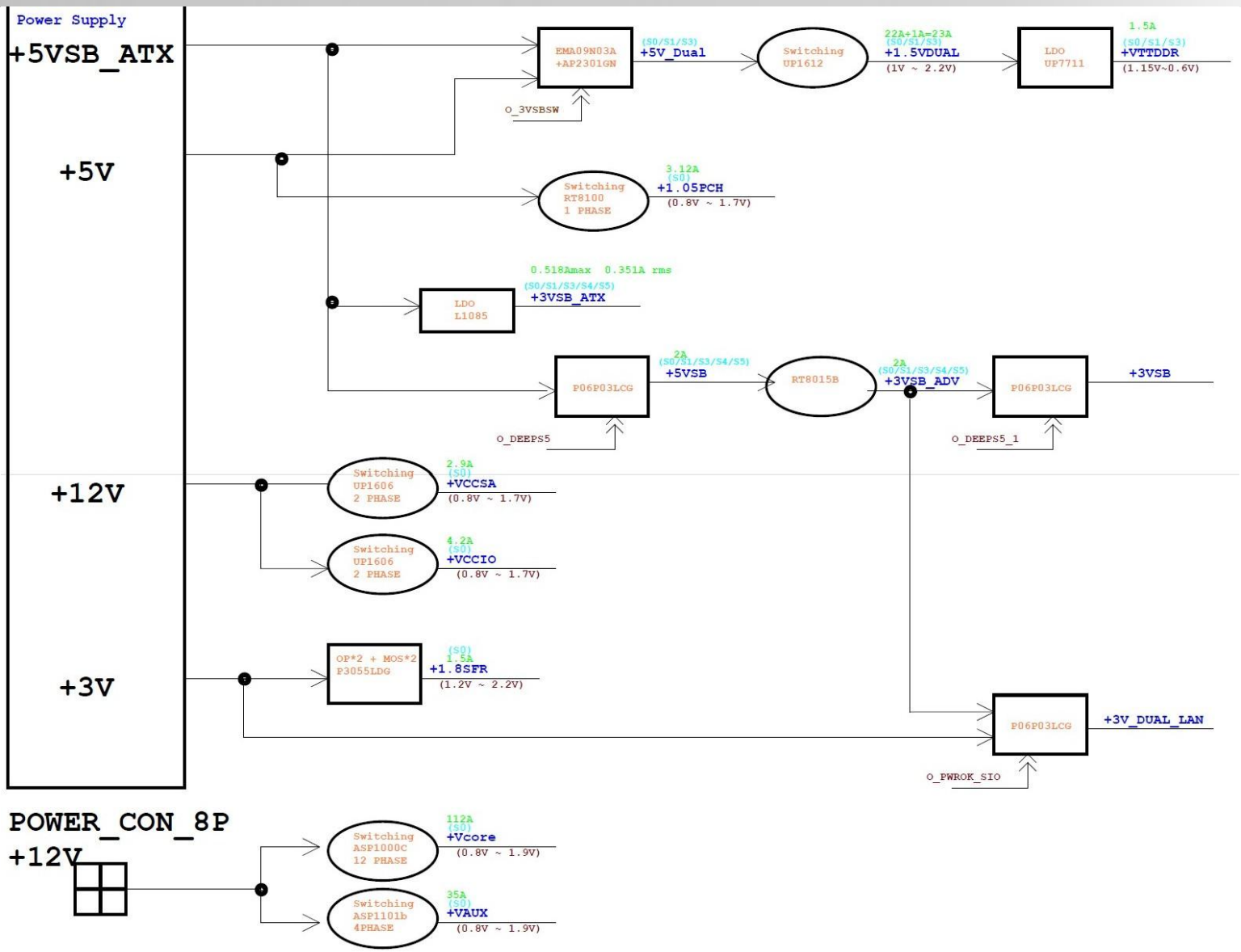
P8Z77-V LX Power Flow



P8Z77-V DELUXE Power Flow



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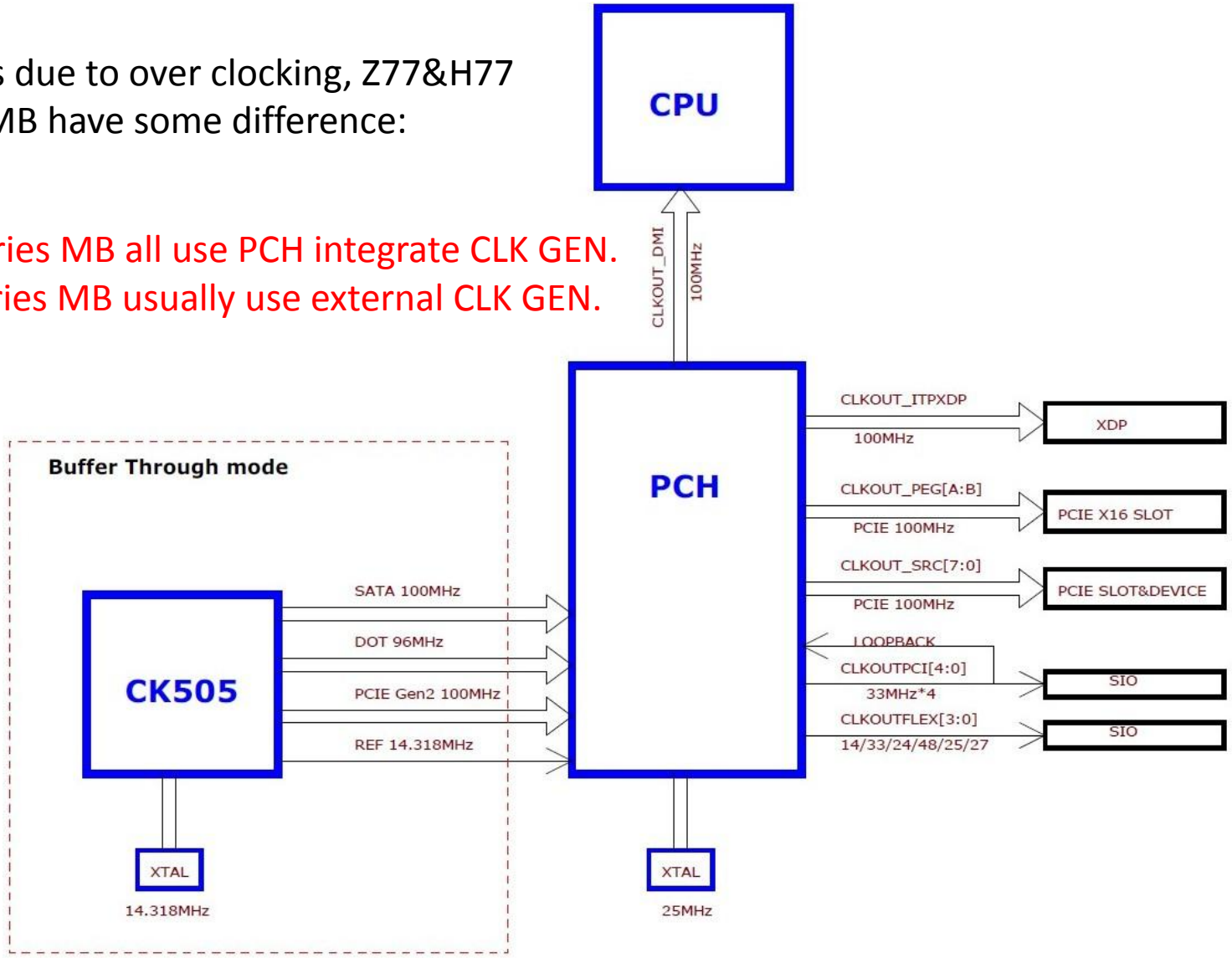
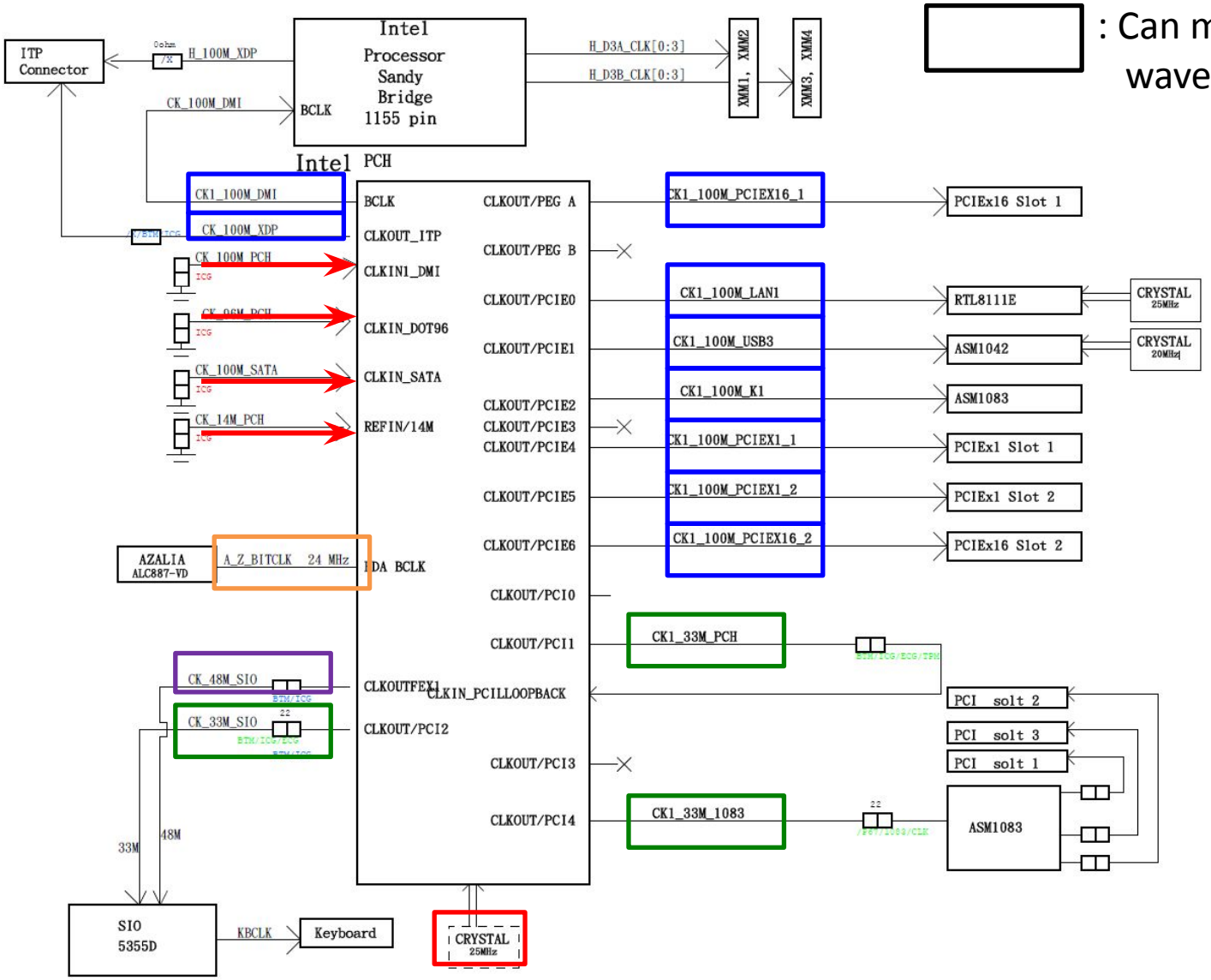
7 Series Clock Distribution

7 Series due to over clocking, Z77&H77 series MB have some difference:

Z77 series MB all use PCH integrate CLK GEN.
H77 series MB usually use external CLK GEN.

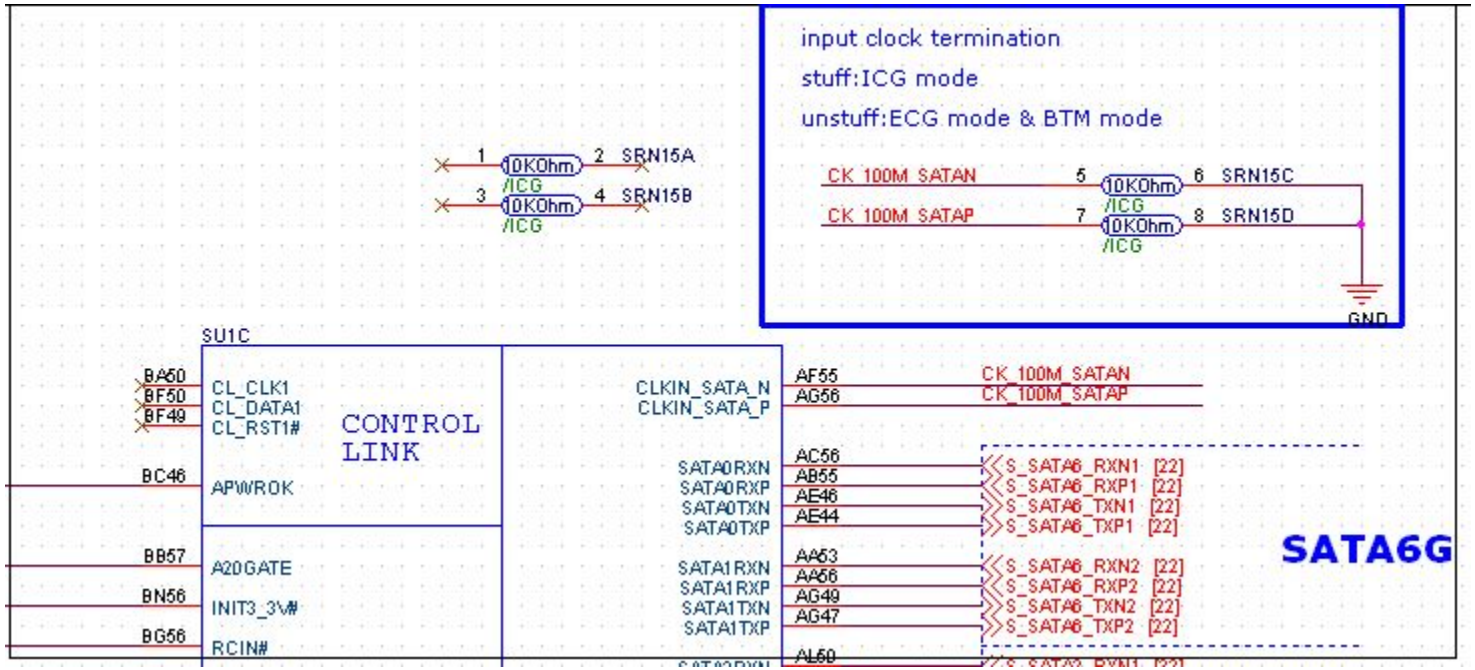


P8Z77-V LE Clock Distribution



SATA clock

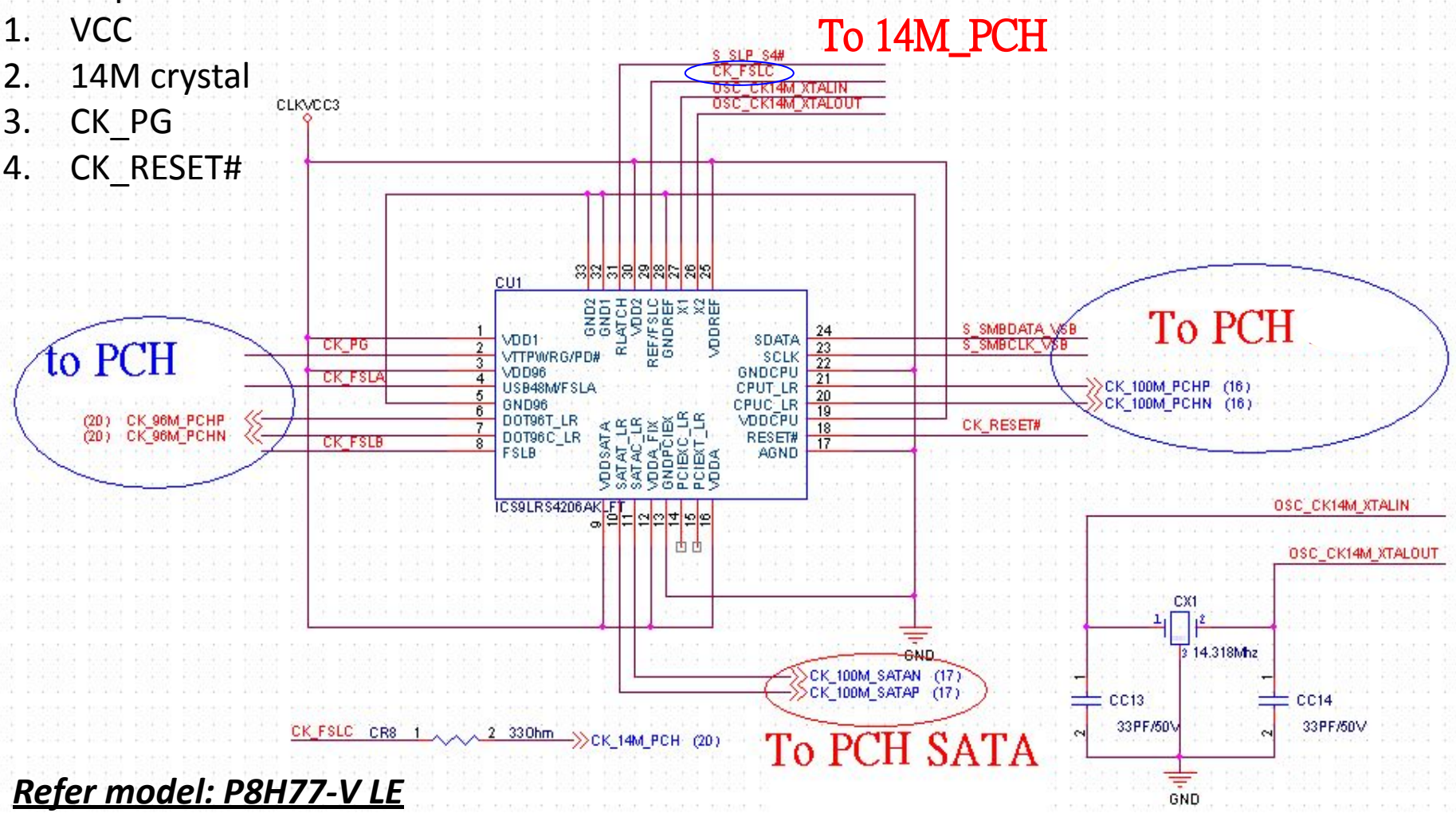
1. If PCH internal provide CLK, it will use two 10K ohm resistors to connect to ground.
2. If not, external CLK generator will provide 100M Hz frequency for PCH



External CLK GEN (ICS9LRS4206)

Check point:

1. VCC
2. 14M crystal
3. CK_PG
4. CK_RESET#



Refer model: P8H77-V LE

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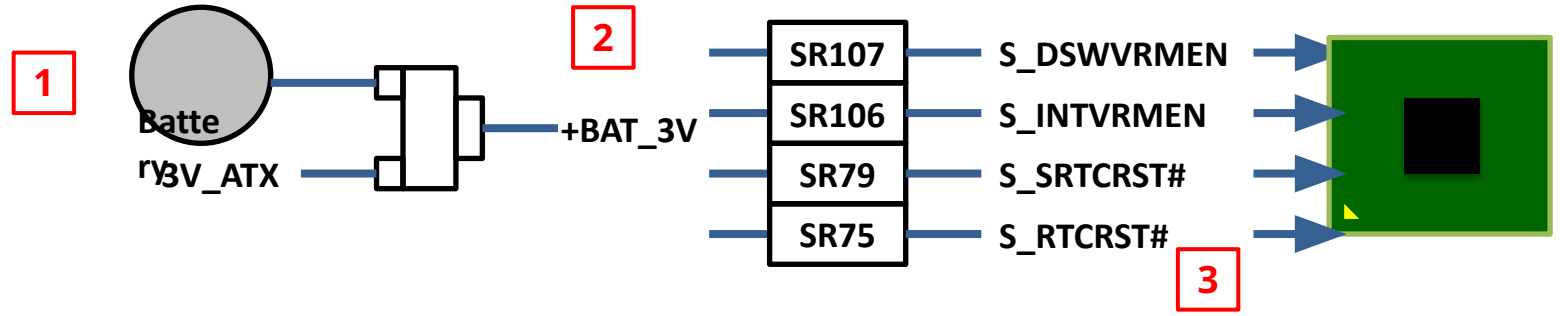
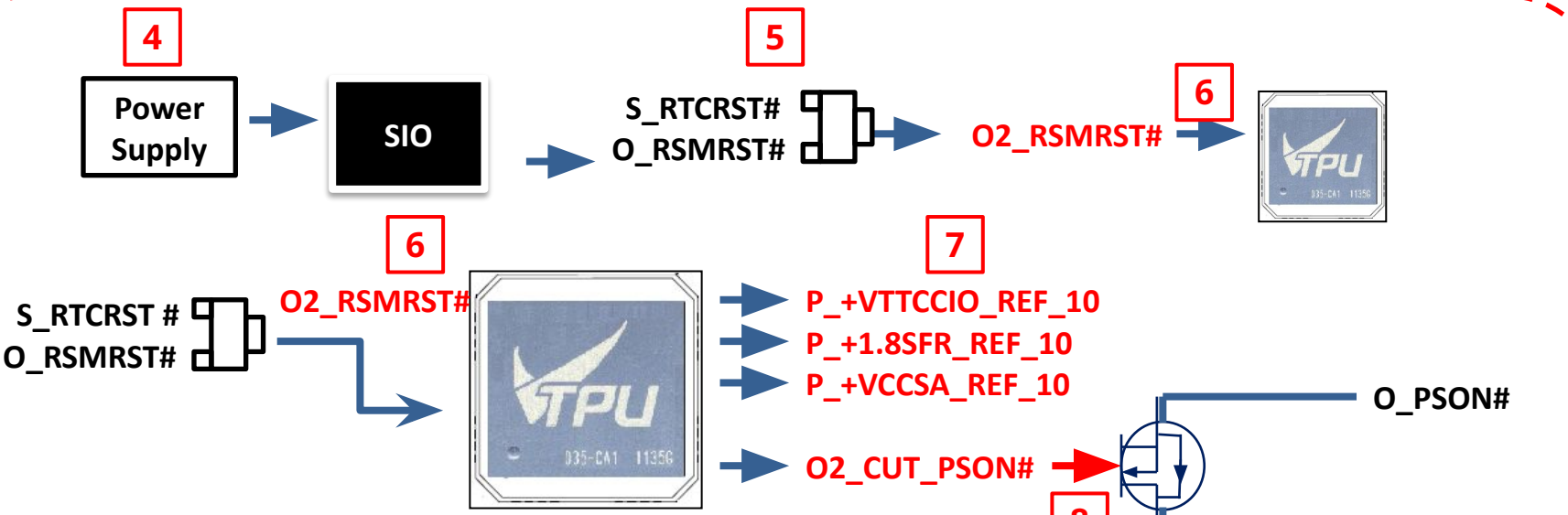
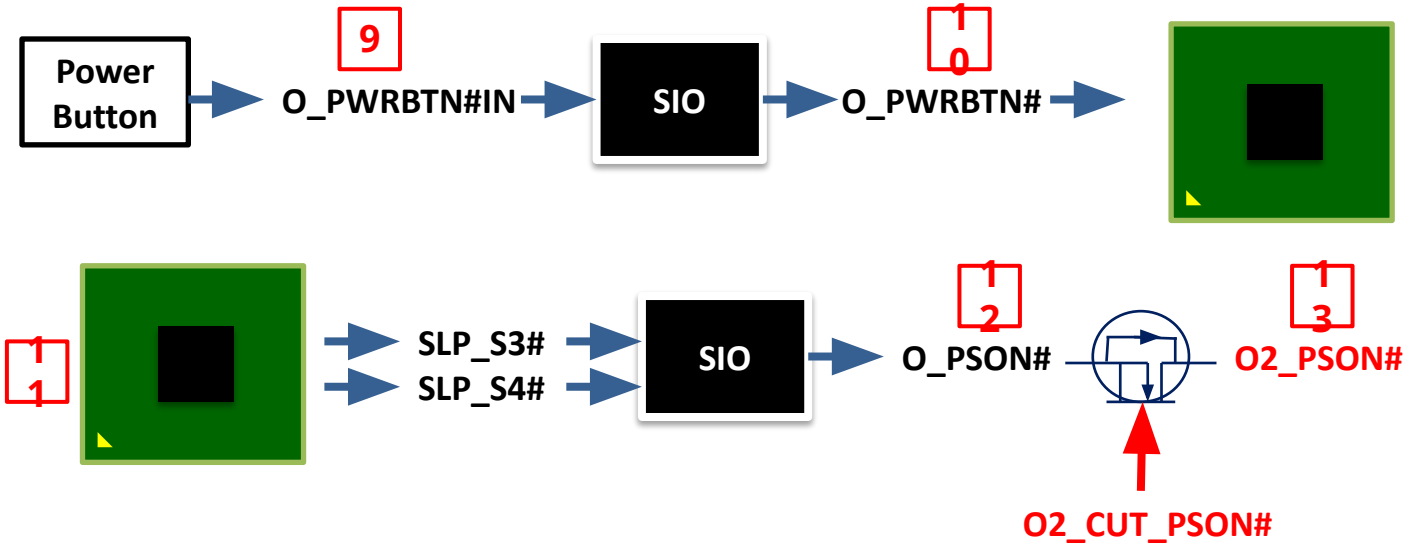
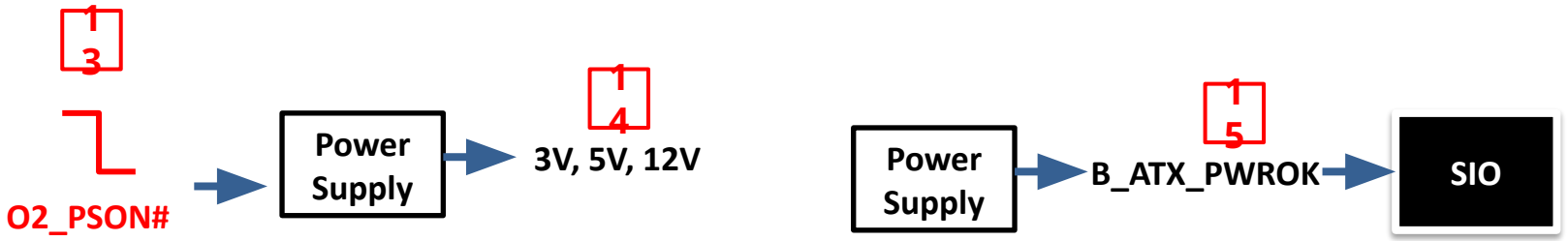
Power on sequence



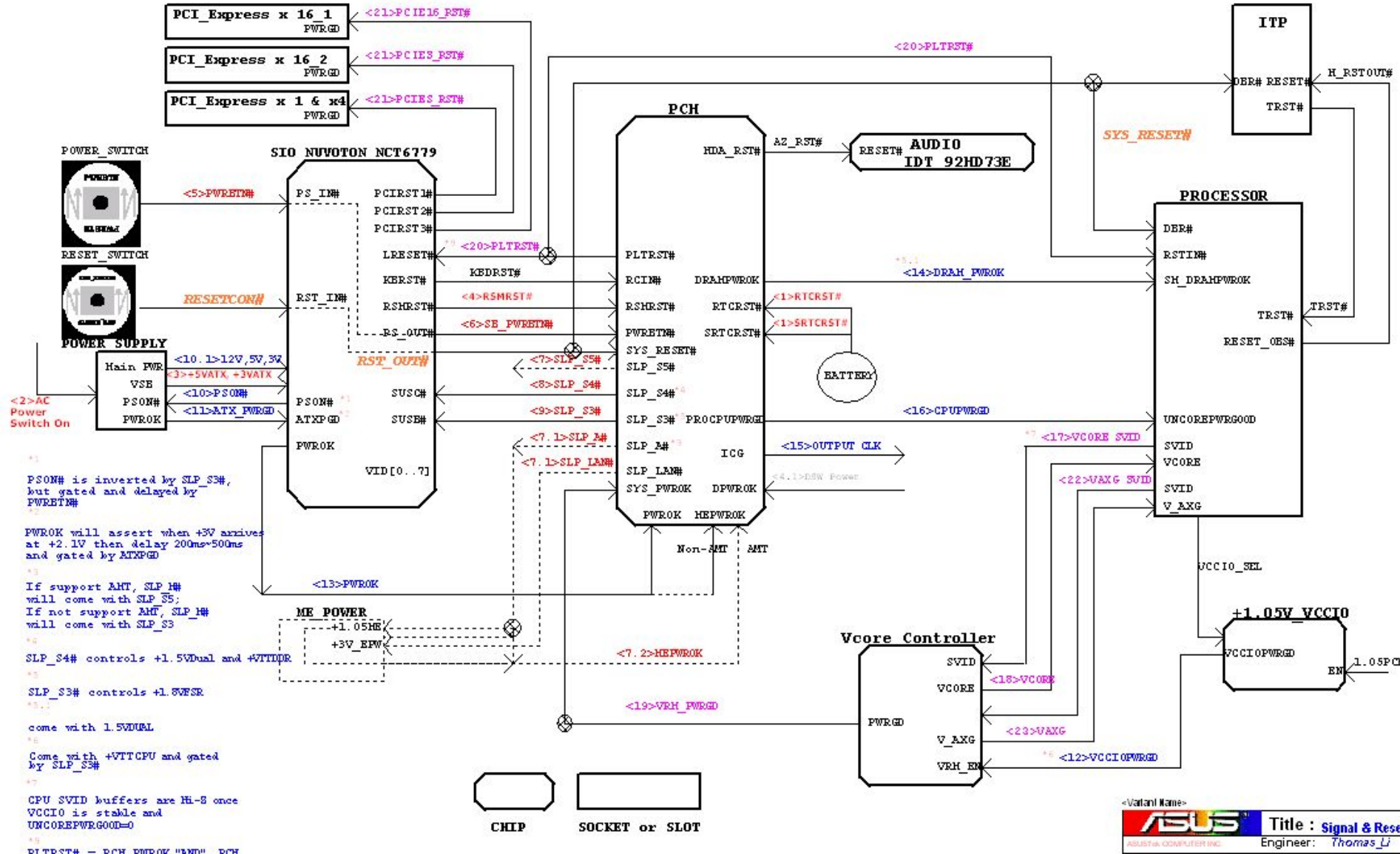


Power on sequence





Power on sequence



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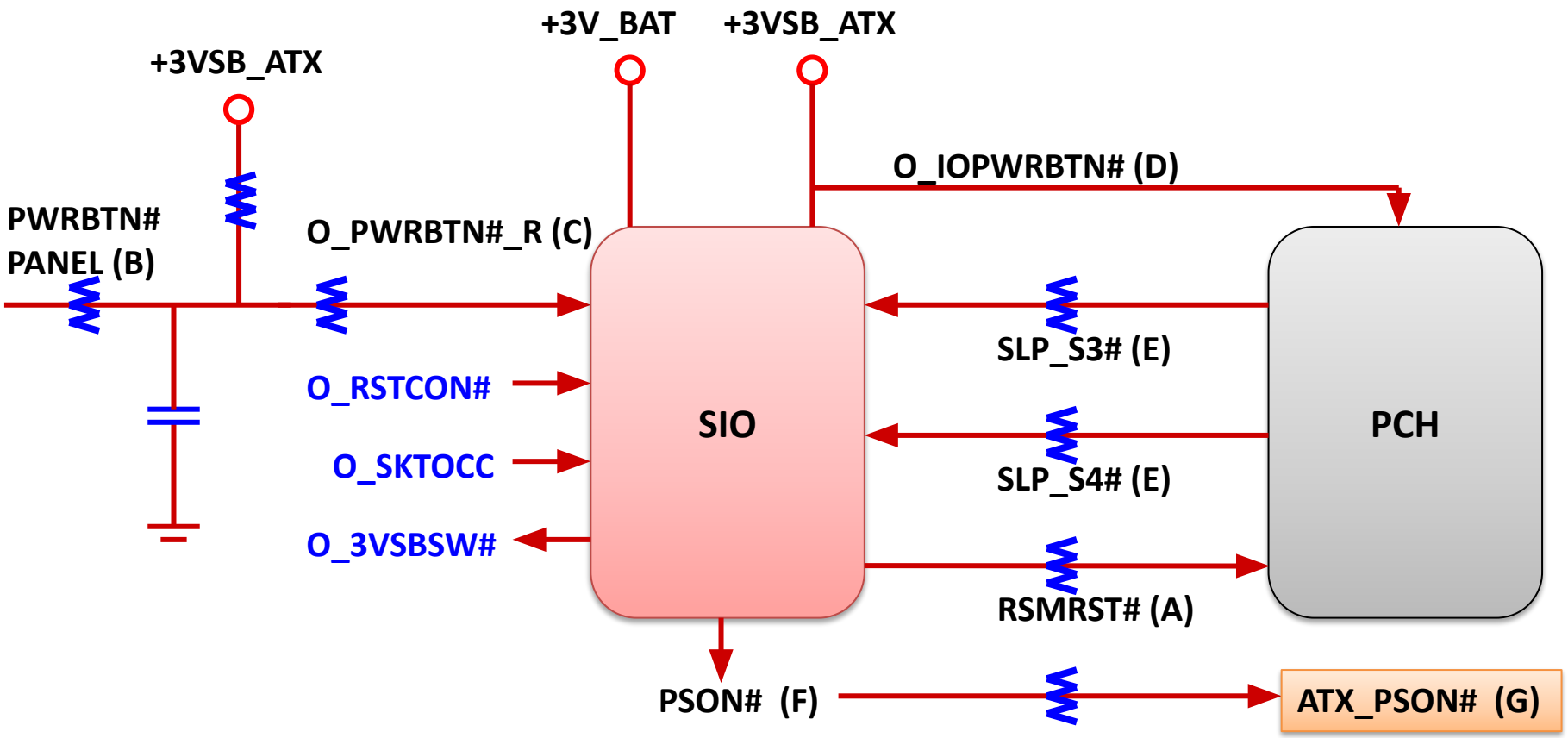
Debug - Can’t power on (1)

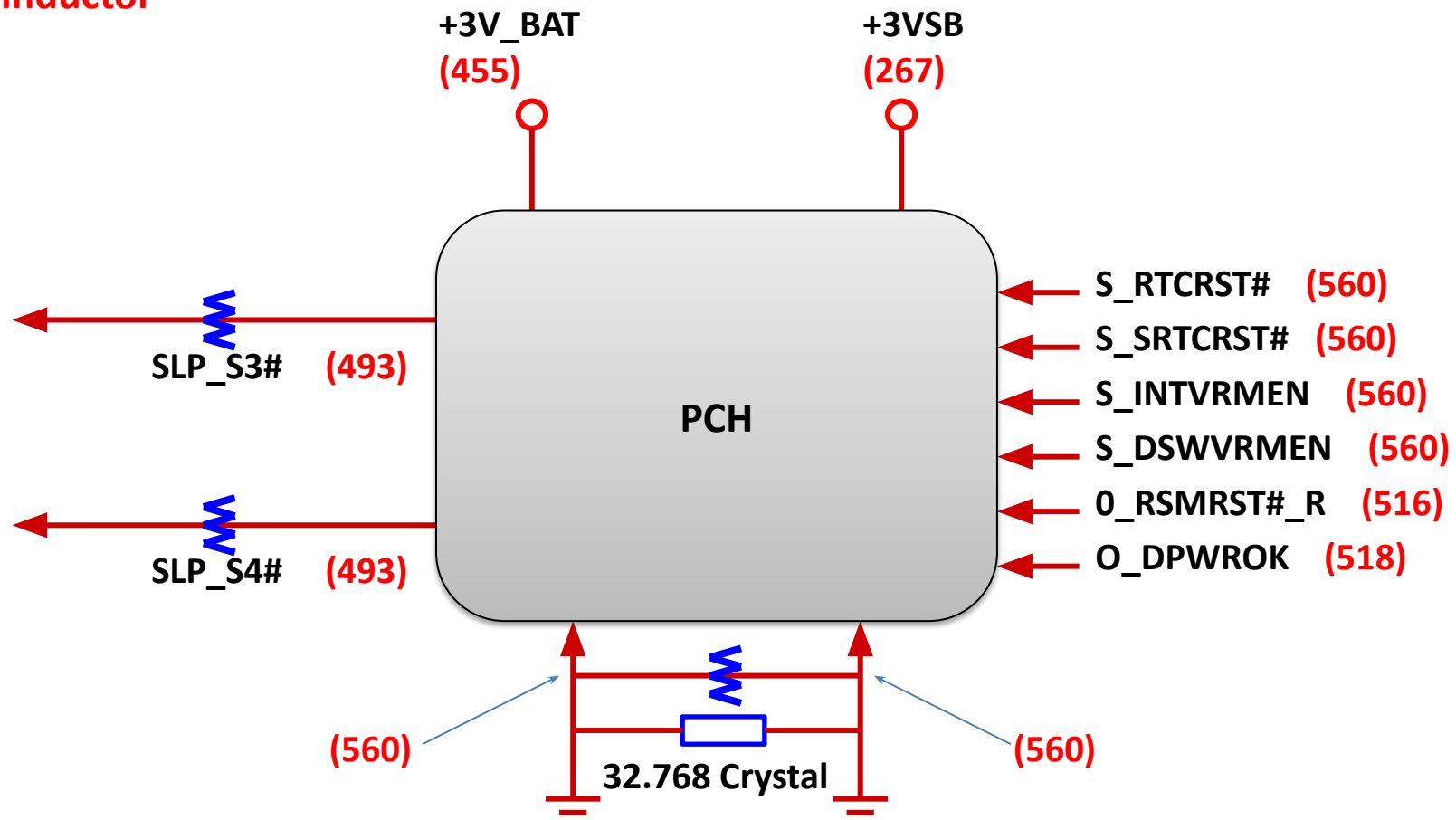
1. Check SIO power sequence and working condition:



Debug - Can’t power on (2)

2. Check PCH power sequence and working condition

3. Other condition: make sure 5V_DUAL & 1.5VDUAL is low; 1.5V_DUAL phase inductor

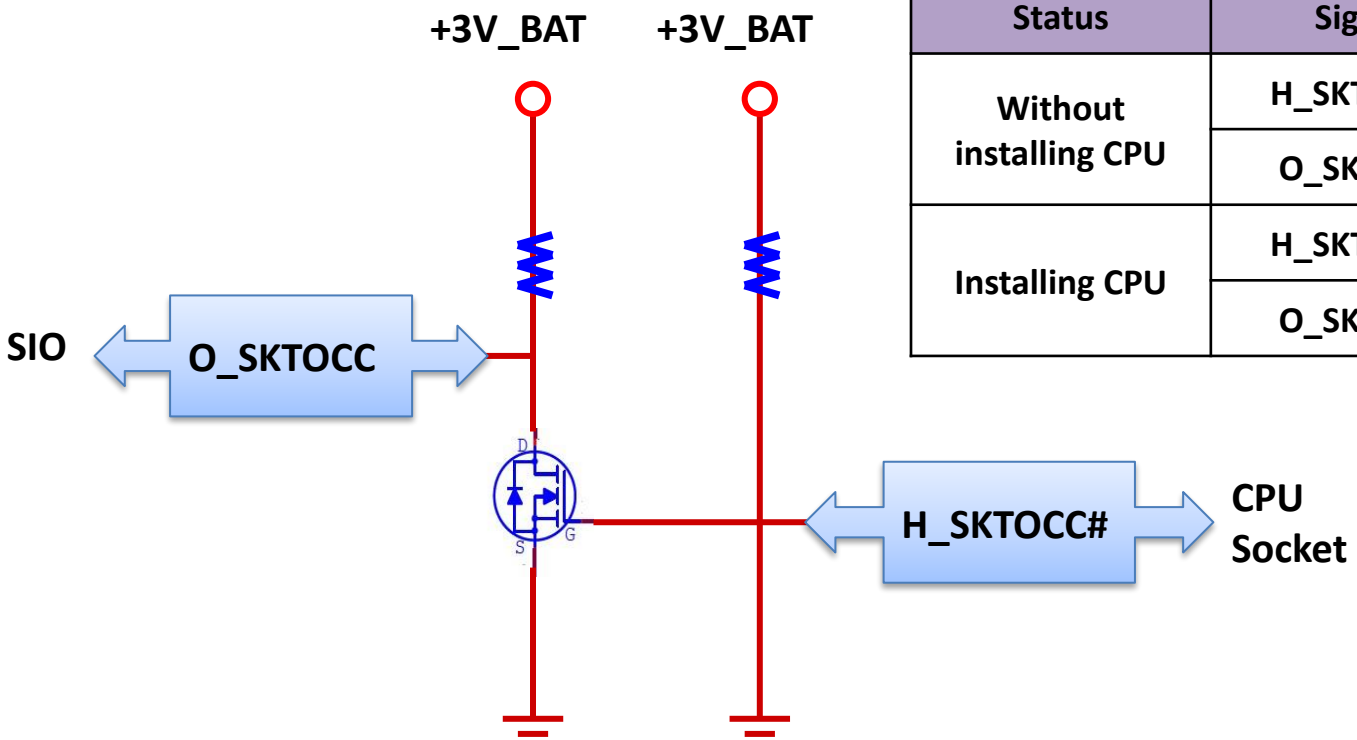


*(red part): using multi meter with diode status, red(VΩmA) to ground & black to test via

Debug - Can’t power on (3)

4. O_SKTOCC: SIO uses this pin to detect MB with CPU or not.

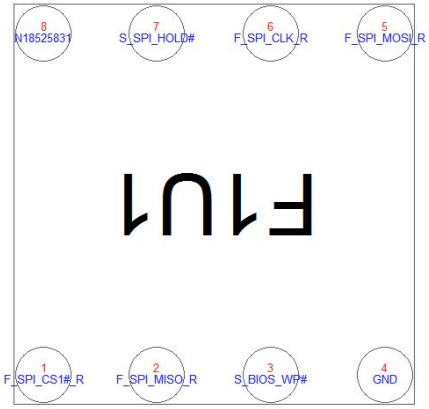
At G3, before installing CPU, H_SKTOCC# voltage level is high; after installing CPU, H_SKTOCC# signal will get low.

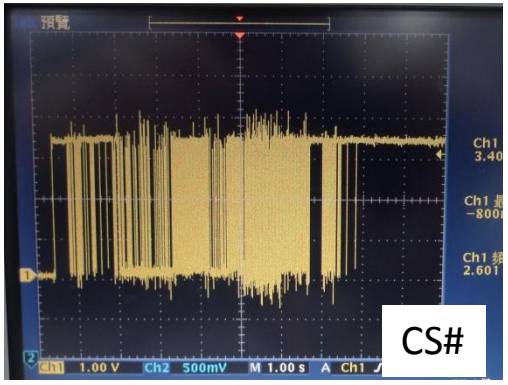


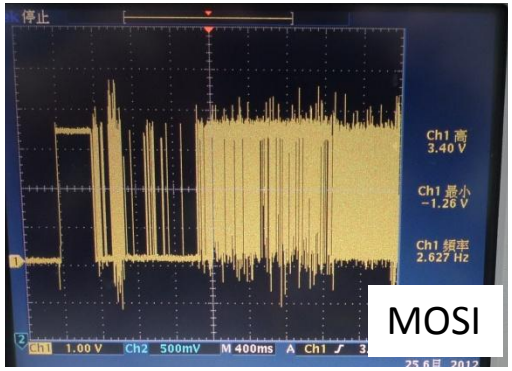
Status	Signal	Power level
Without installing CPU	H_SKTOCC#	High
	O_SKTOCC	Low
Installing CPU	H_SKTOCC#	Low
	O_SKTOCC	High

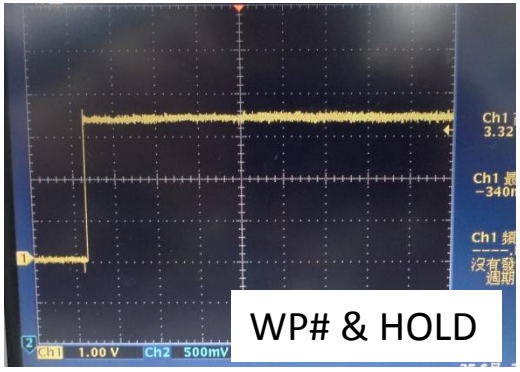
Debug – Power auto shutdown (1)

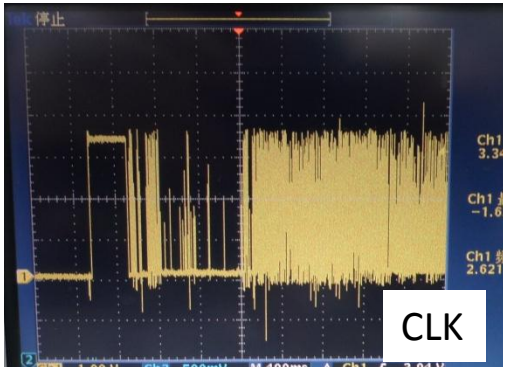
1. Update BIOS or exchange another BIOS chipset
2. Make sure that MB has no crack, trace open and components missing or damage
3. Check DMI (or FDI) LED bus signals are ok.
4. Check main voltage impedance. If ok, short with PSON to check main voltage.
5. 12V/5V/3V/5VDUAL/1.5VDUAL/ VTTDDR/1.05PCH/1.8SFR/VCCSA/ VCCIO/VCORE
6. When power on, BIOS signals will start to receive command & send data.

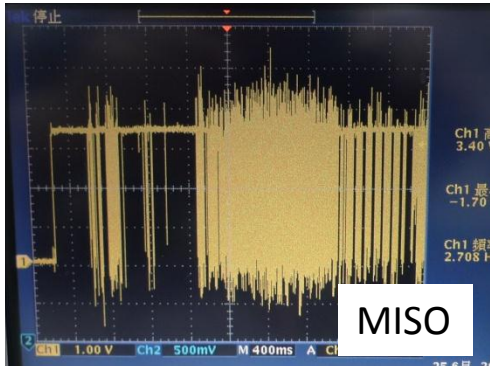






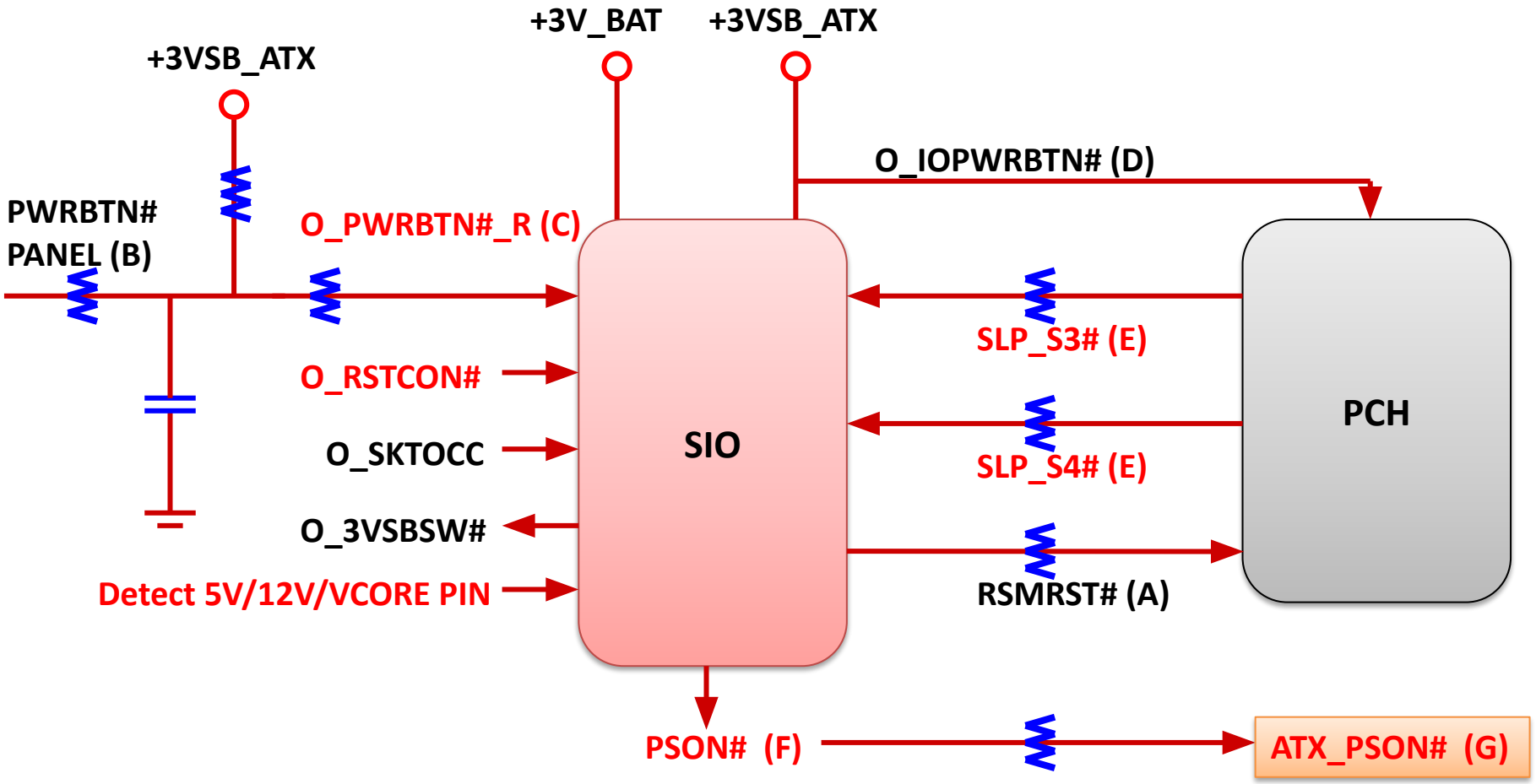






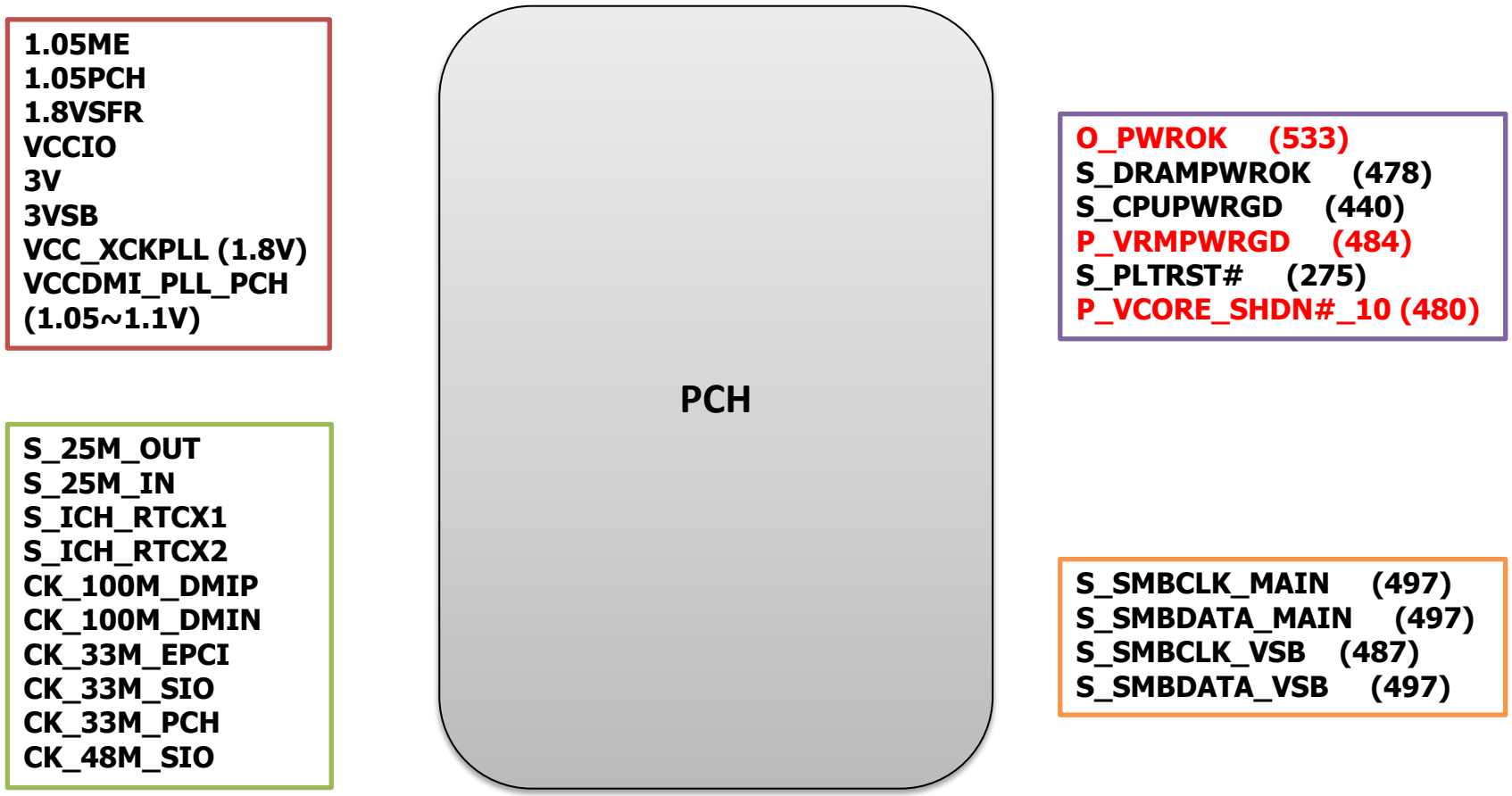
Debug – Power auto shutdown (2)

7. Follow the sequence, measure that PSON#, SLP_S3, SLP_S4, PWRBTN# and RSTCON# are normal or not.



Debug – Power auto shutdown (2)

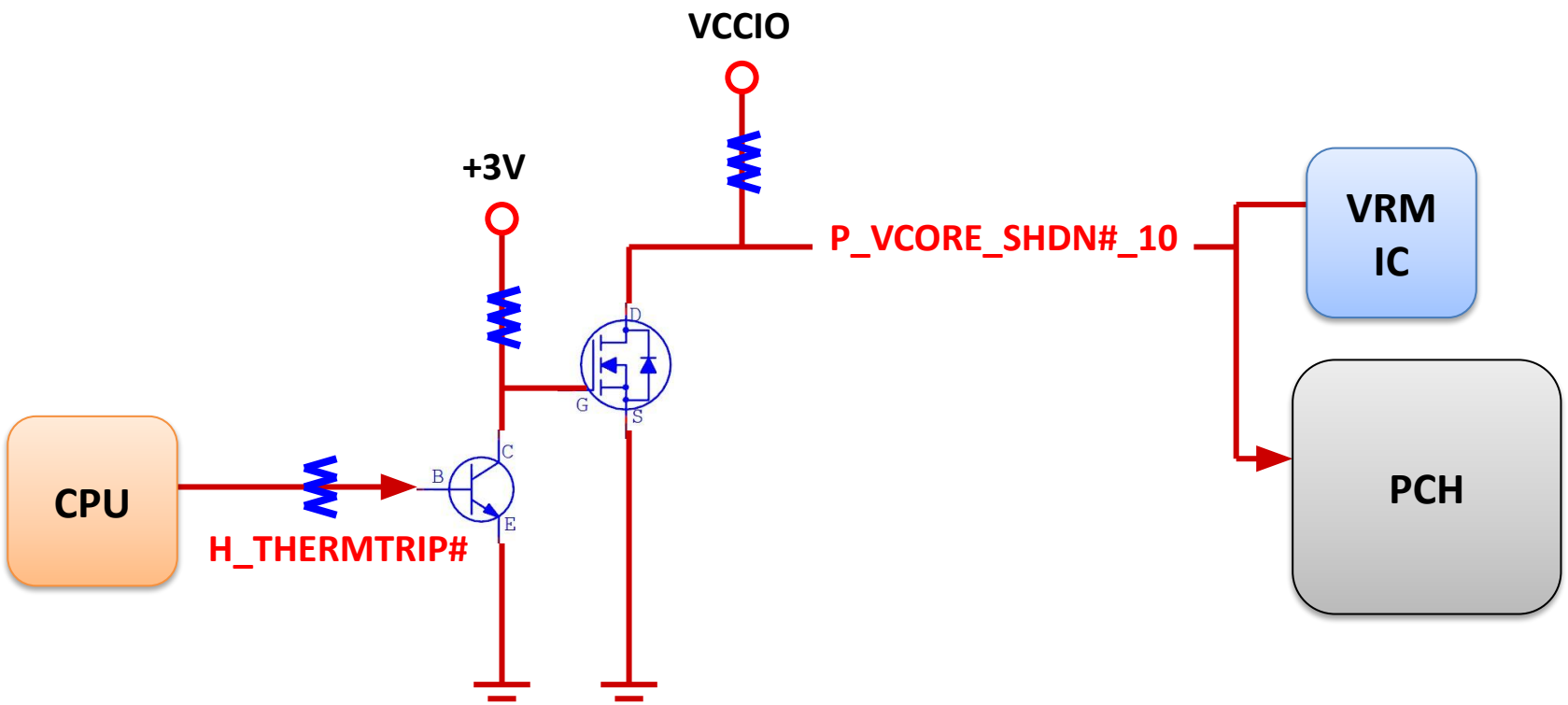
10. If PCH working condition is abnormal, MB also will shutdown.



Debug – Power auto shutdown (3)

Problem with power shutdown: THERMAL signals, voltage, PCH working condition and the power sequence (power ok signals)

8. **If H_THERMTRIP# is low, P_VCORE_SHDN#_10 will pull low to PCH.**
9. **If VCORE is abnormal, VRM IC will also use P_VCORE_SHDN#_10 to pull low.**



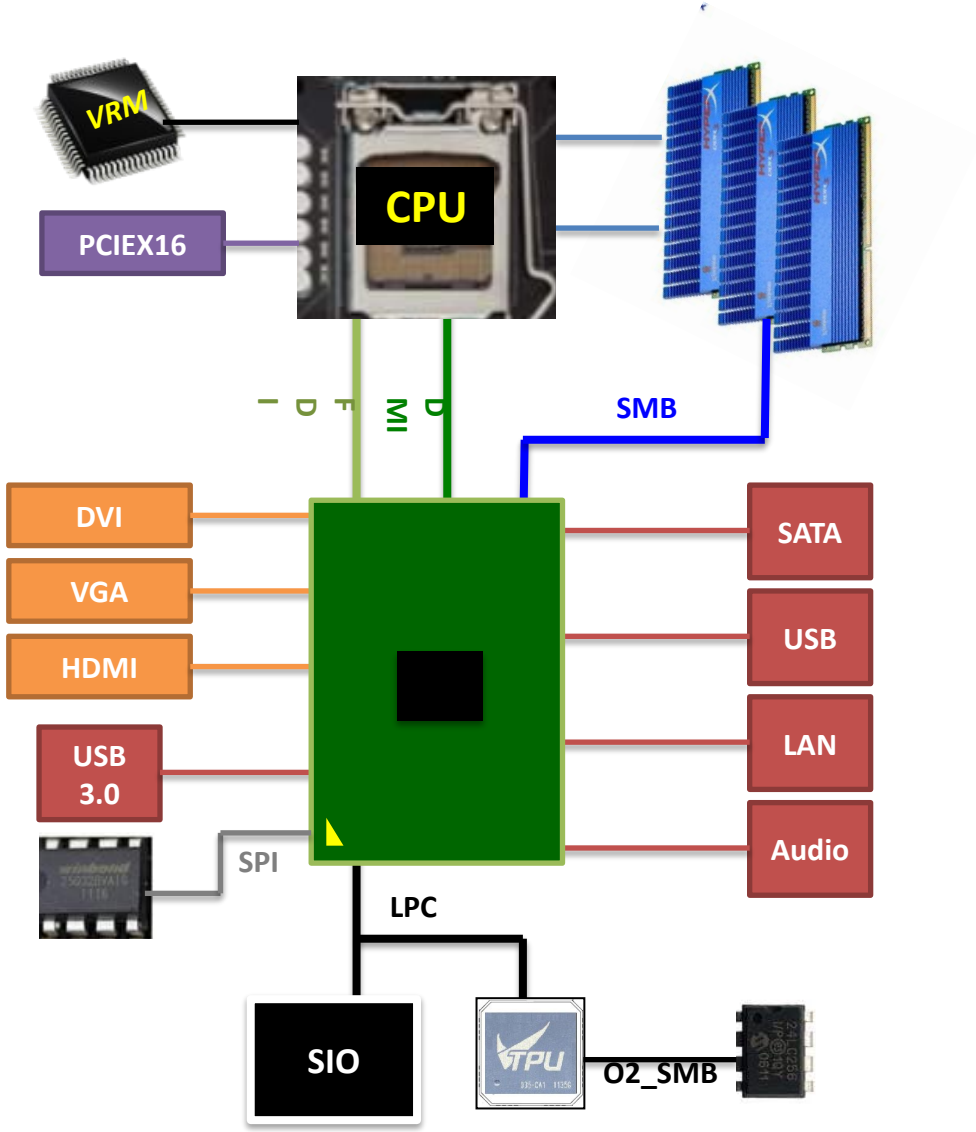
Debug – All dots, zero, and no display

Before 00:

1. Power on
2. Power/CLK/RST
3. CPURST#

After 00 and CPURST#:

1. CPU to PCH (DMI)
2. PCH to BIOS (SPI)
3. SPI to PCH (SPI)
4. PCH to CPU (DMI)
   PCH to MEMORY (SMB)
5. CPU to MEMORY
6. PCH to SIO (LPC)
   PCH to EC
7. PCH to DEVICE
8. CPU to PCH (FDI)
9. PCH to DVI/VGA/HDMI
   CPU to PCIEX16



Debug – All dots, zero, and no display

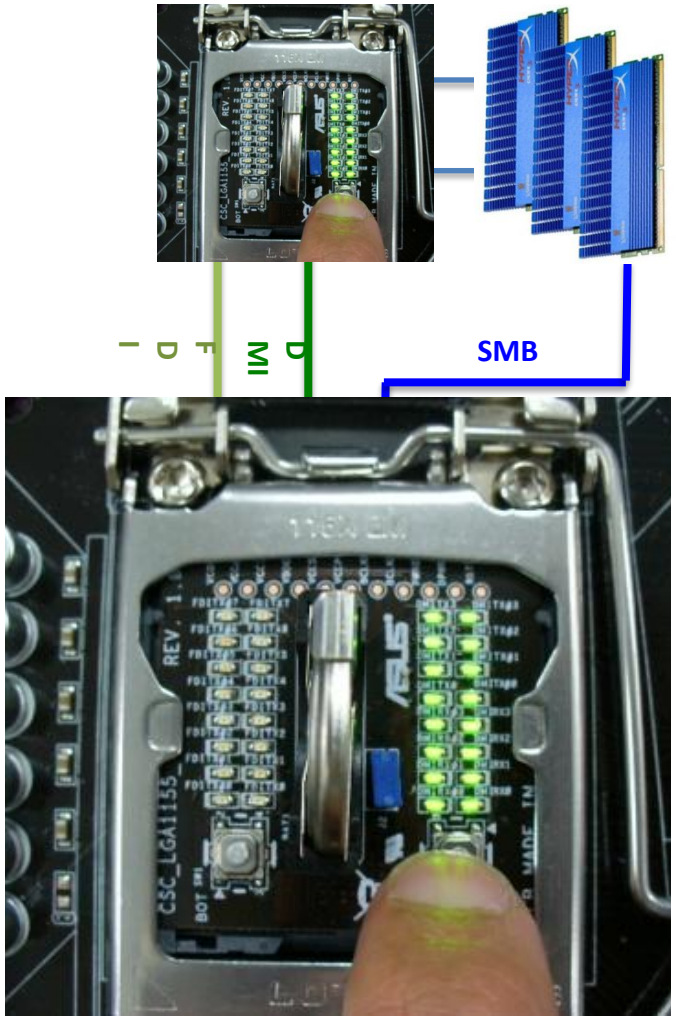
Measure BUS:

1. DMI:
   - H_DMI_RXN/P[0:3]
   - H_DMI_TXN/P[0:3]
   - S_DMICOMP
   - S_DMIRBIAS
   - VCCDMI_PLL_PCH

2. FDI:
   - H_FDI_INT
   - H_FDI_COMP
   - H_FDI_FSYNC[0:1]
   - H_FDI_LSYNC[0:1]
   - H_FDI_TXN/P[0:7]

3. SMB:
   - S_SMBCLK_MAIN
   - S_SMBDATA_MAIN
   - S_SMBCLK_PCI
   - S_SMBDATA_PCI

4. Memory to CPU
   - D3A_DQ[0:63]
   - D3A_MA[0:15]
   - D3A_DQSN/P[0:7]
   - D3A_BA[0:2]
   - D3_RESET#
   - D3A_CLKP/N[0:1]
   - D3A_CS#[0:1]
   - D3A_ODT[0:1]
   - D3A_CKE[0:1]
   - D3A_WE#
   - D3A_RAS#
   - D3A_CAS#



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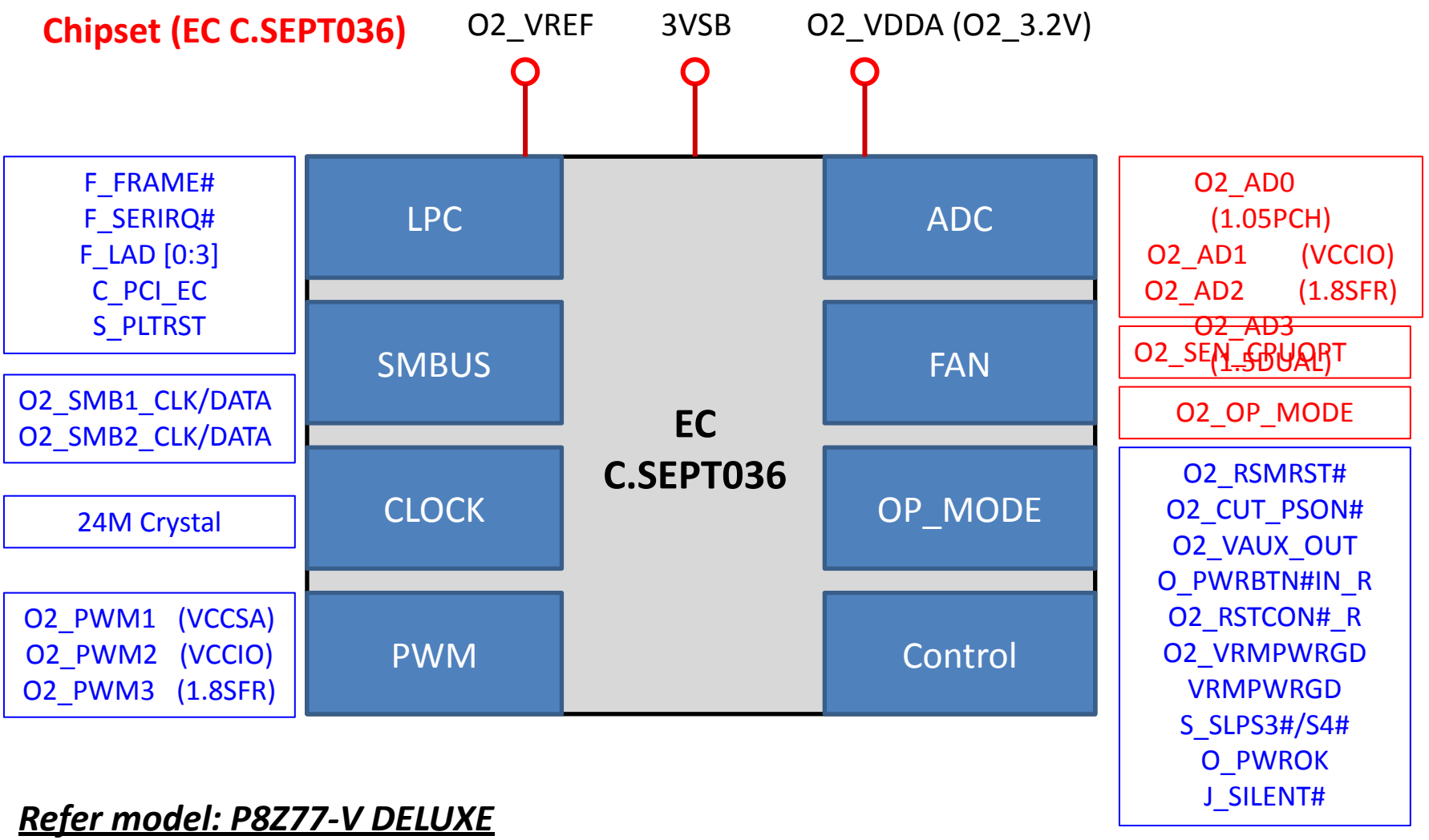
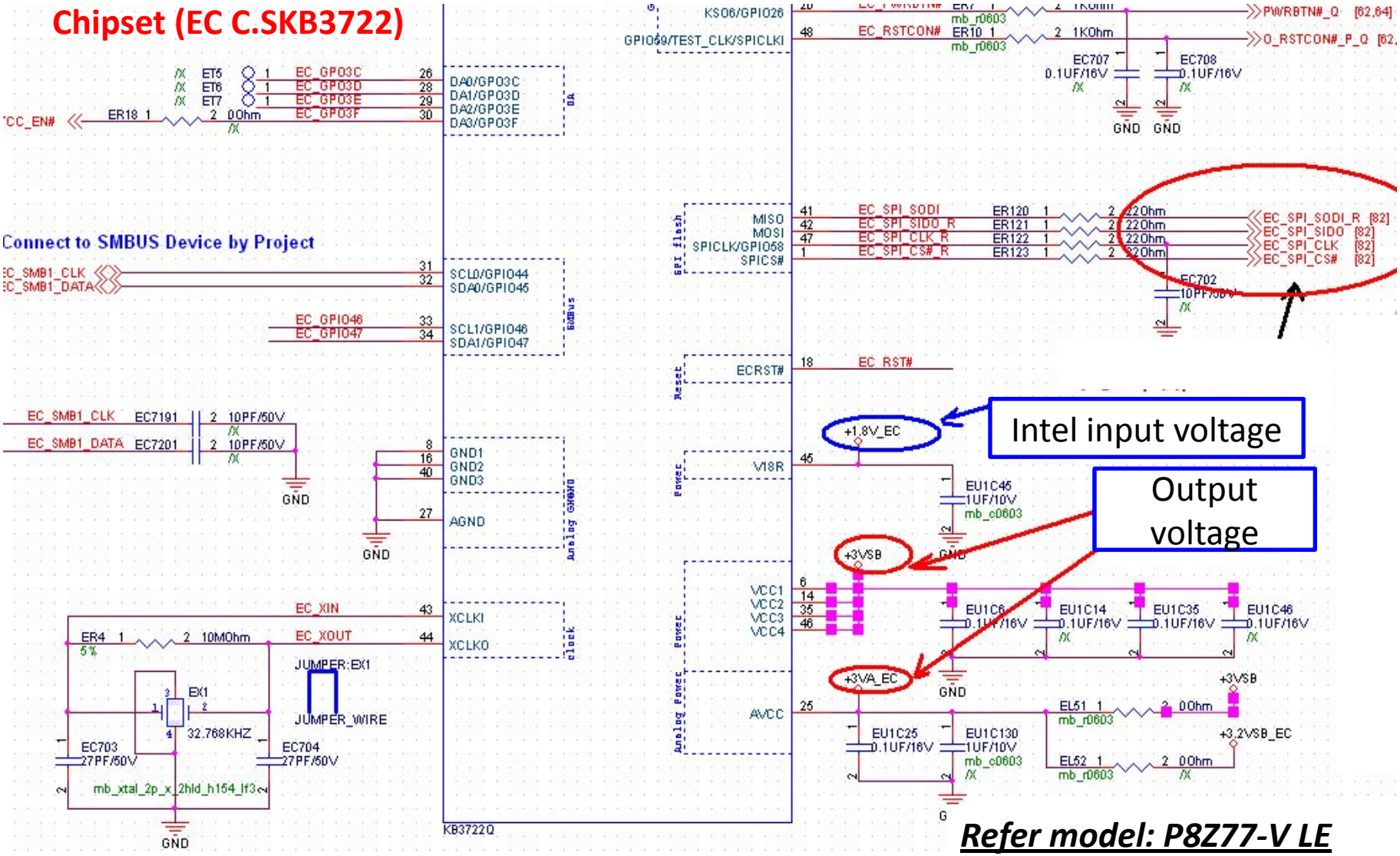


Refer model: P8Z77-V DELUXE

Debug – All dots, zero, and no display



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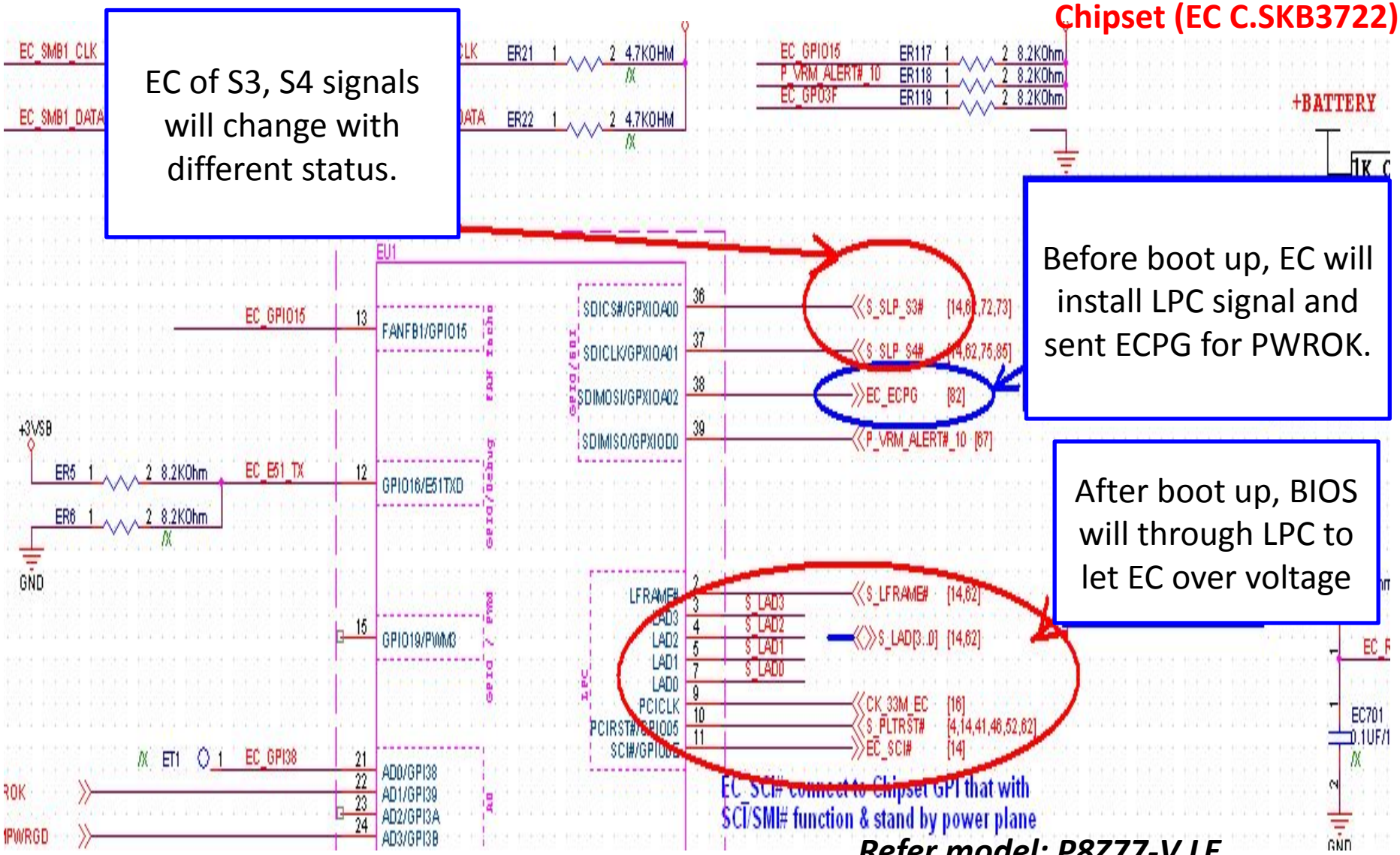
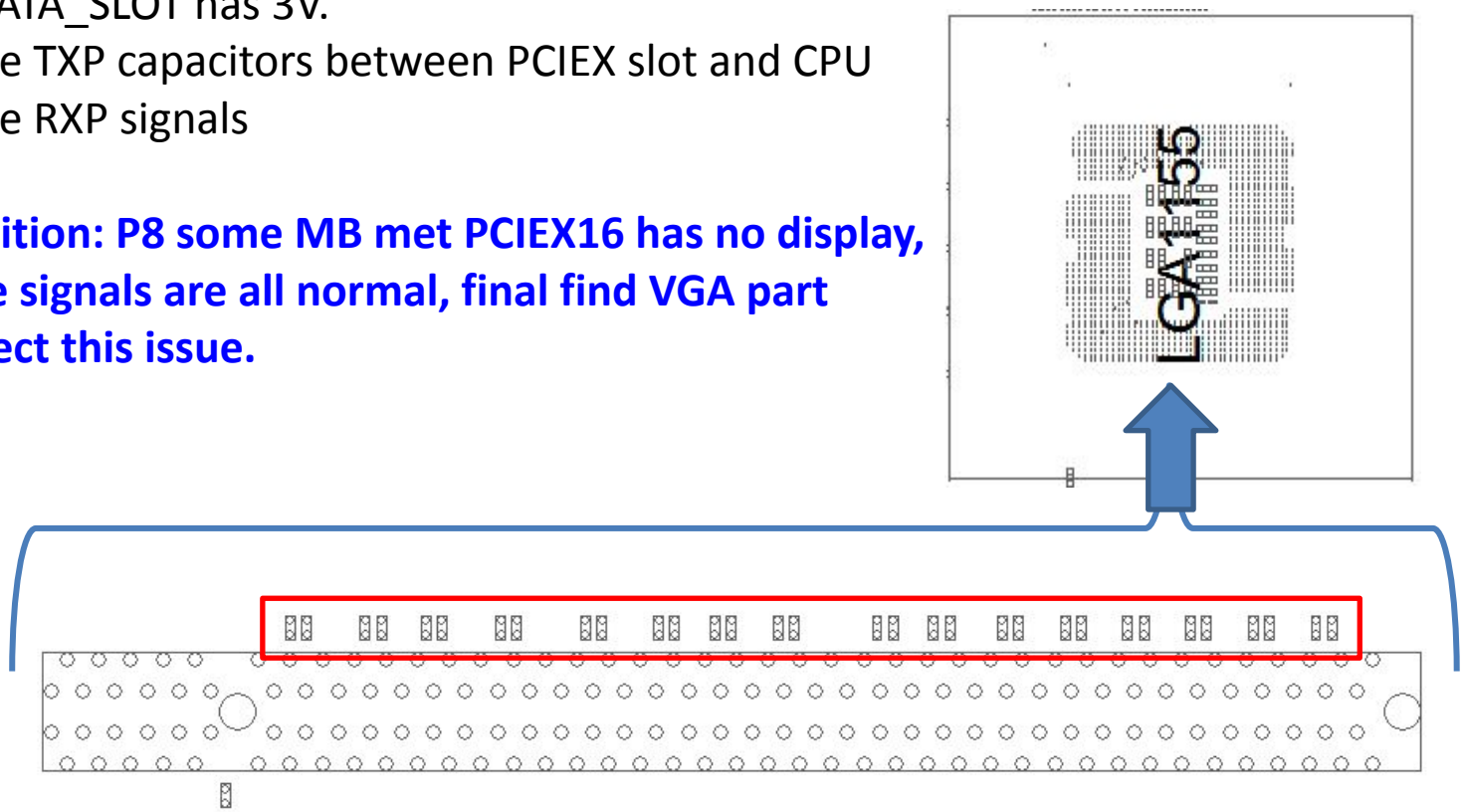


Debug – No display (PCIEX16)

1. Measure CPU voltage: VCORE, GFX, VCCIO, VCCSA, 1.8SFR, 1.5VDUAL
2. Check 12V, 3V, 3VSB on PCIEX slot.
3. CK_100M_X16SL1N/P, 100M Hz frequency from SB.
4. O_X16_RST#, reset signal from SIO.
5. S_SMBCLK_SLOT has 3V.
6. S_SMBDATA_SLOT has 3V.
7. Check the TXP capacitors between PCIEX slot and CPU
8. Check the RXP signals

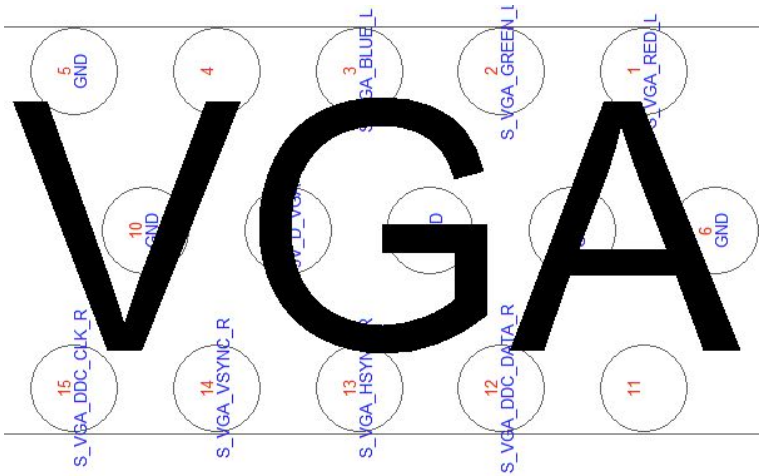
Others condition: P8 some MB met PCIEX16 has no display, Check above signals are all normal, final find VGA part signal to affect this issue.



Debug – No display (VGA)

1. FDI and DMI Bus, make sure that all LED lights are normal
2. CPU voltage: VCORE, GFX, VCCIO, VCCSA, 1.8SFR, 1.5VDUAL
3. P_GFX_OK_10, when debug code run to b2, P_GFX_OK_10 will pull high to 3V, at the same time, GFX power will drop from 1V to 0.4~0.5V
4. +5V_D_VGA has 5V
5. Check the RGB GND impedance (77 ohm)
6. Check S_VGA_VSYNC and S_VGA_HYSNC GND impedance (500 ohm)
7. Check VGA_DDC_CLK and VGA_DDC_DATA impedance (538 ohm)
8. Check PCH V_3P3_DAC_FB (3V)
9. S_DAC_IREF(0.6), after b2 code, this signal's power level will raise up
10. 25M Hz crystal
11. Other device also will affect this problem

EX: P8P67 LE halt at b2
Exchange USB3.0 IC (ASM1042)
To solve this case

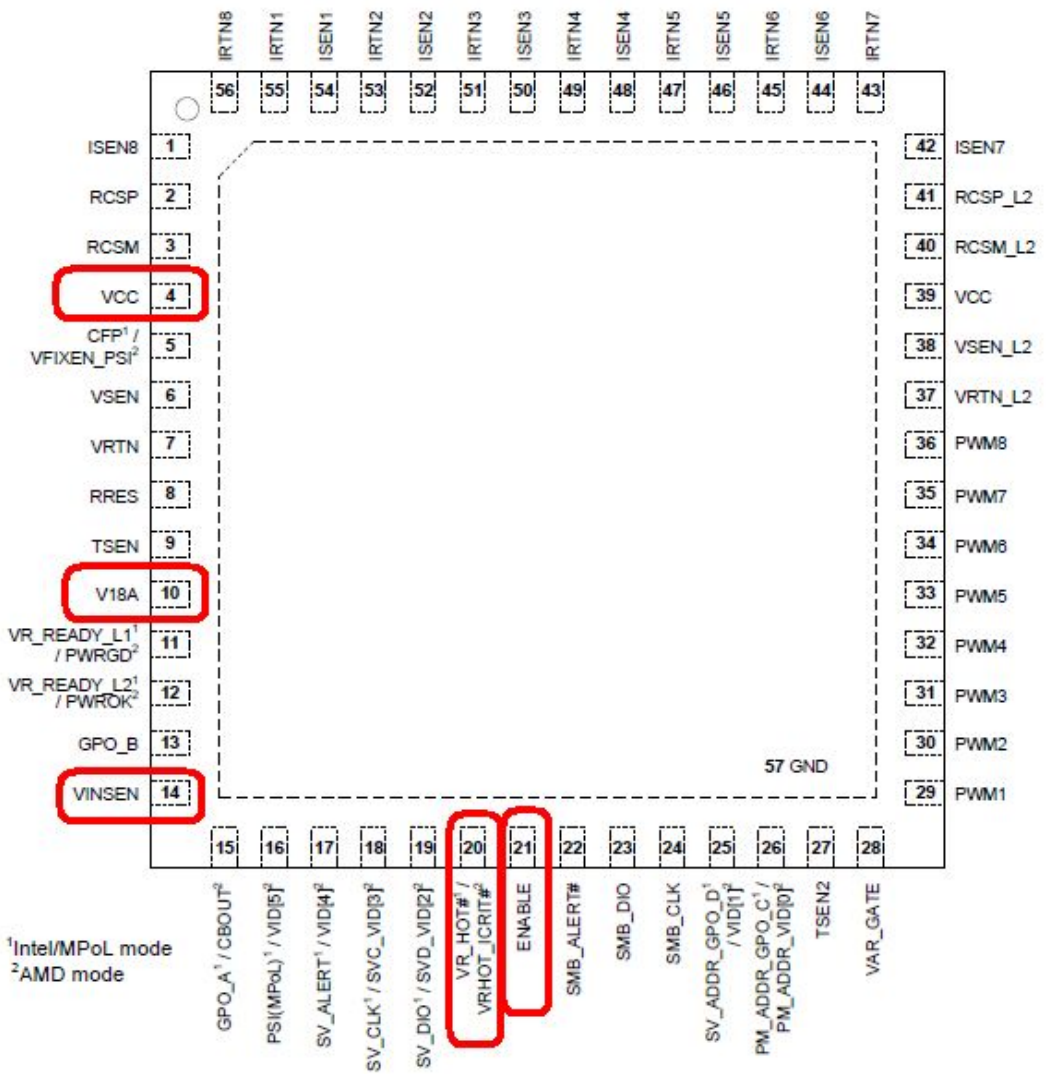


ASP1000C

- Vcc=3.3V
- Vinsen = 0.86V
- VRHot = Vcc
- EN=3.3V

- Sequence
- 1.2.3 first
- En signal

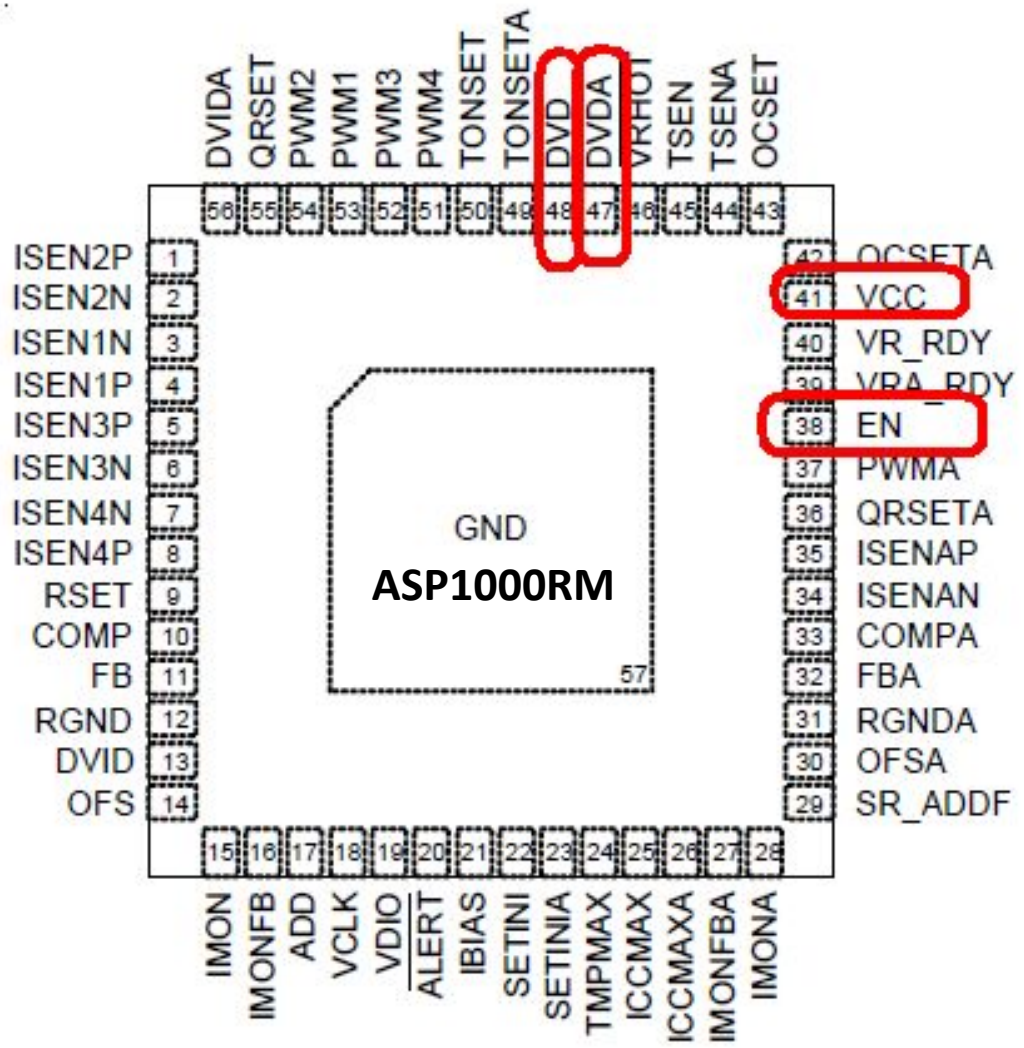
- V18A= 1.8V



ASP1000RM

- Vcc= 5V
- DVD= 1.5V≧1.11
- DVDA = 1.33V≧1.11
- EN= VCCIO≒1.05

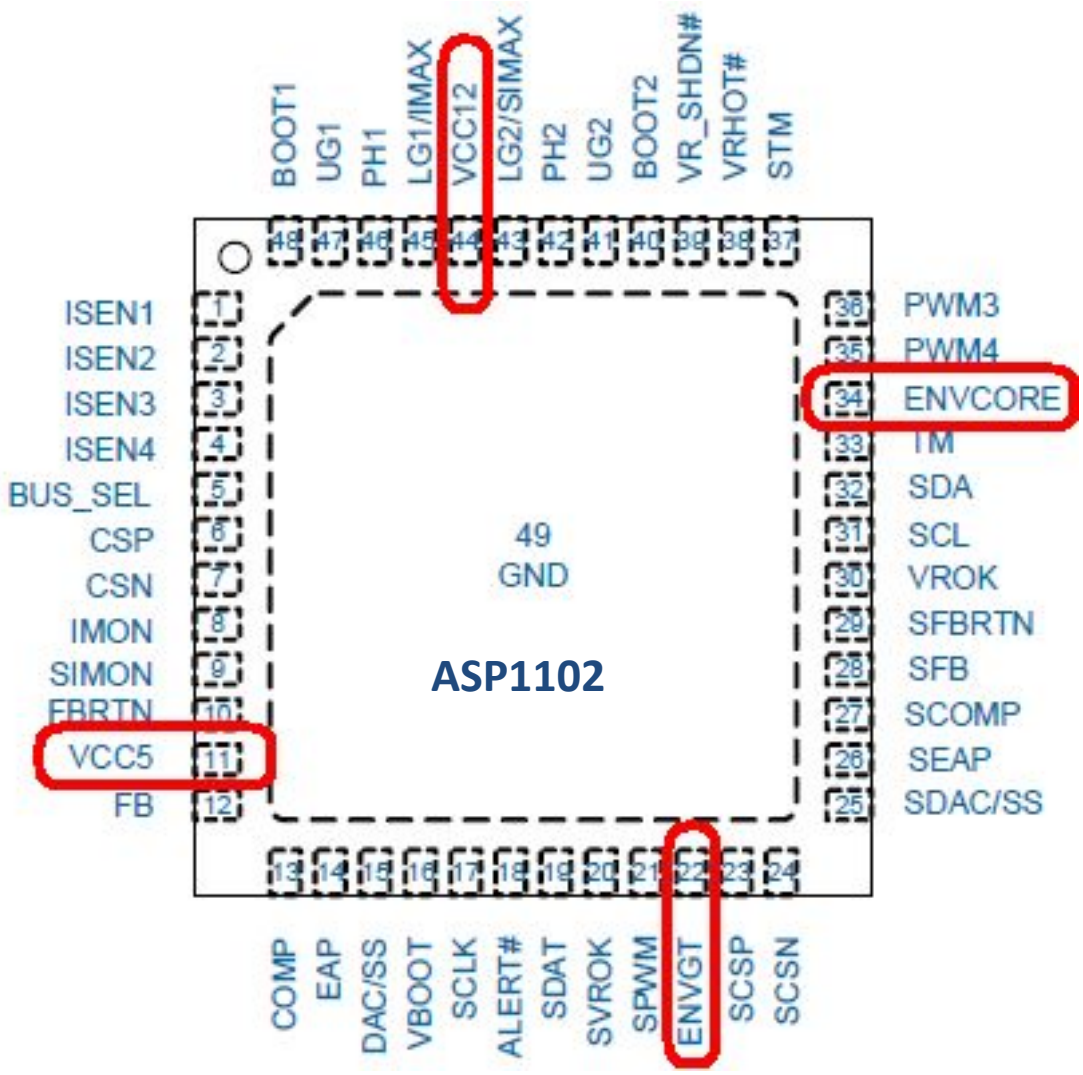
- Sequence
- 1.2.3 first
- EN signal



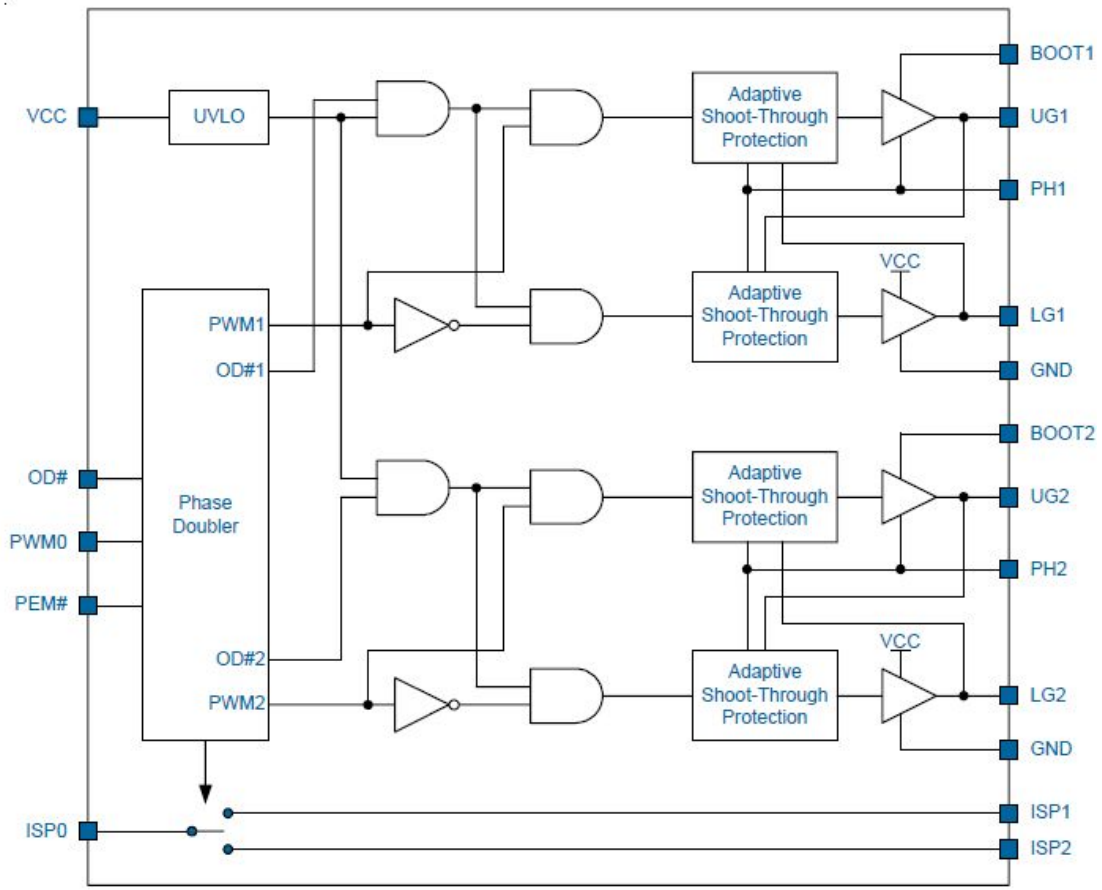
ASP1102

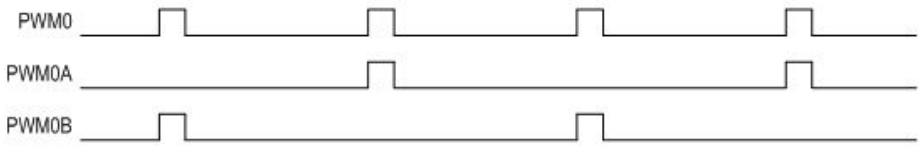
- Vcc5= 5V
- Vcc12= 12V
- EN=VCCIO≒ 1.05V

- Sequence
- 1.2 first
- EN signal

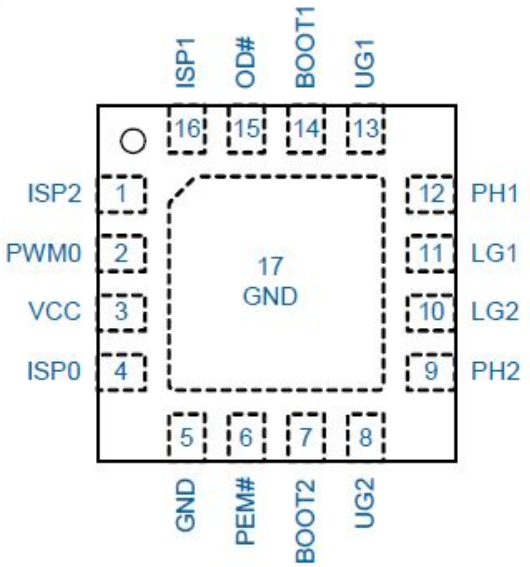


VCORE Driver (ASP0A13)

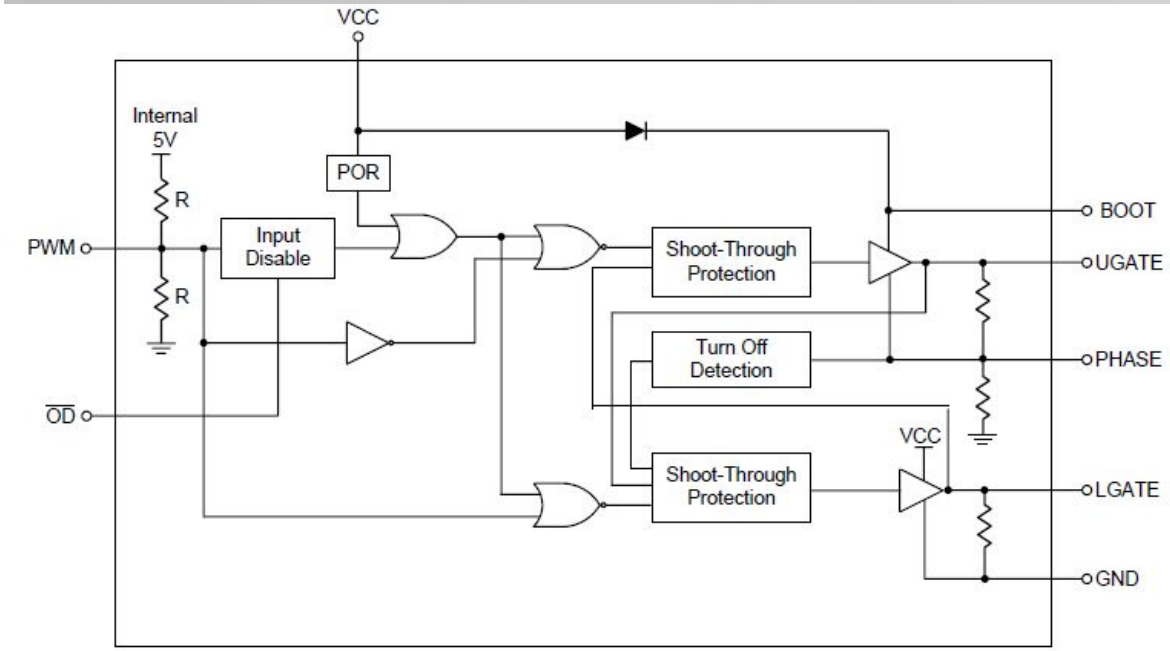




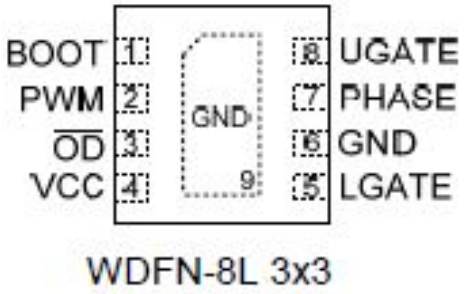
ASP0A13



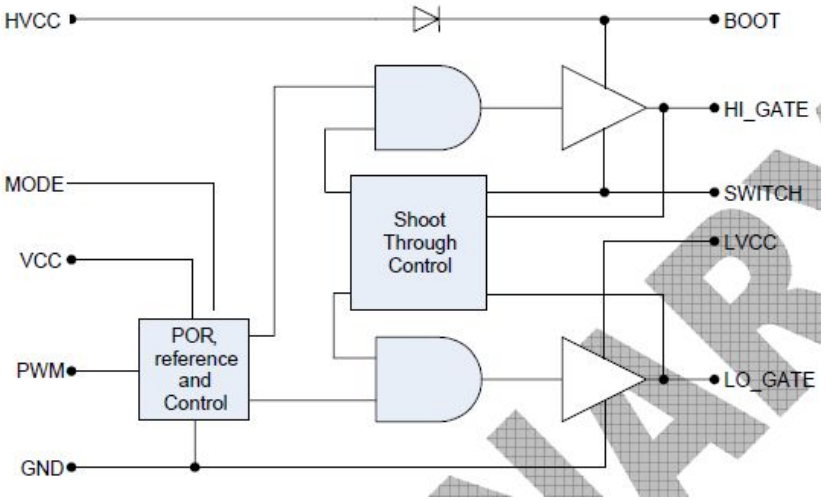
VCORE Driver (ASP0A13)



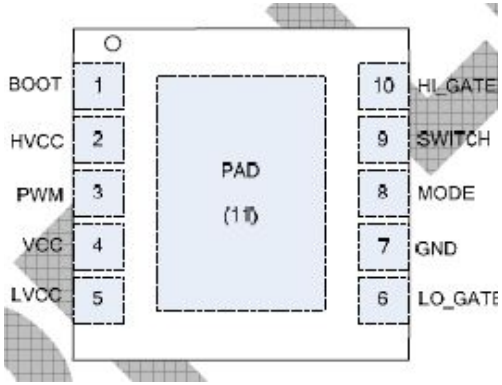
RT9611



WDFN-8L 3x3

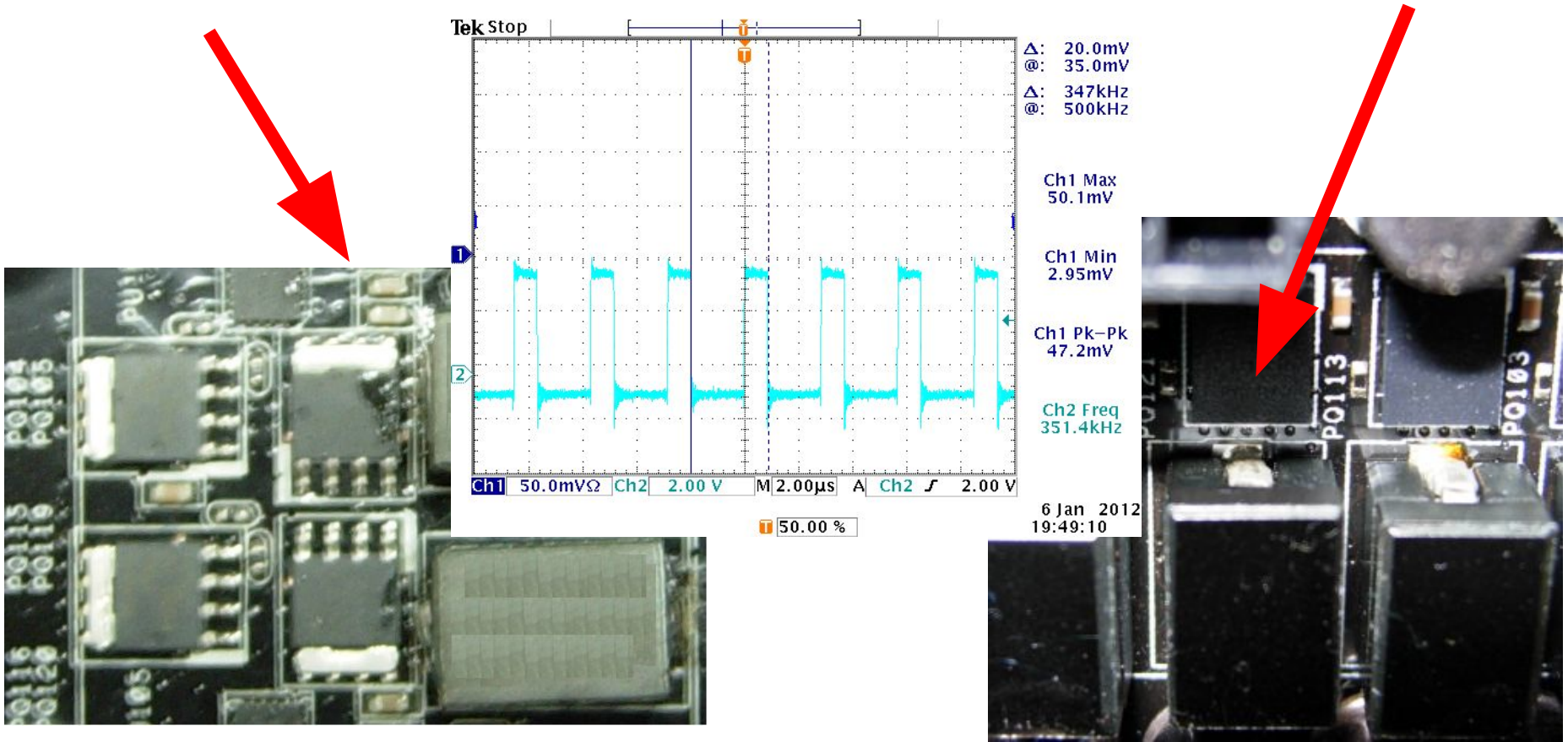


IR8510



Debug - Vcore Repairing

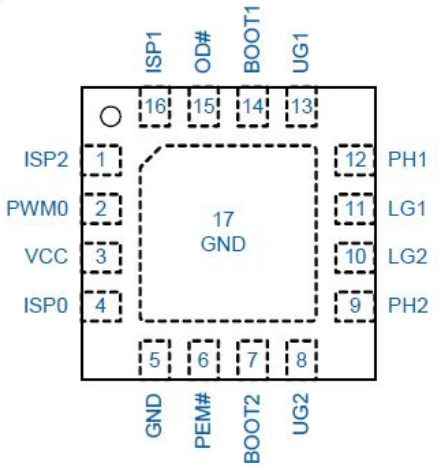
- Vcore voltage output of each phase must have the correct waveform
- Empty board boot to Vcore is about 1V boot voltage .
- After installing CPU, it is set with the SVID voltage, so the value is different.
- VCORE run normally, but still halts at 00=>check PG signals.



Debug - Driver and Component

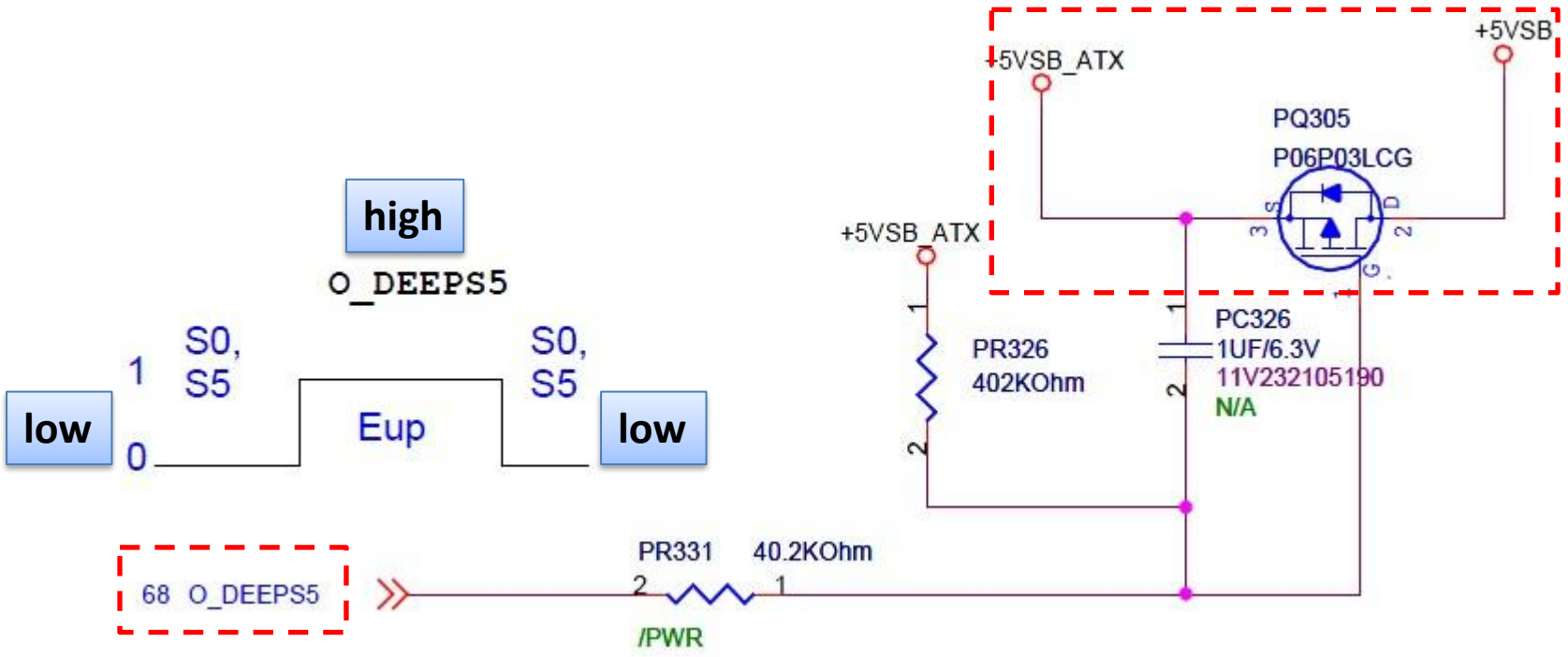
If you suspect that other components are burned, such as the Driver

- To see whether the appearance of any abnormalities.
- Impedance measure:
  Measuring the ESD diodes, the terminal is connected to GND.
- To remove the component measurement is abnormal compared to the impedance and normal components of each pin to ground.
- If Vcore is short circuit and +3.3 V is short circuit, SIO may have burned.



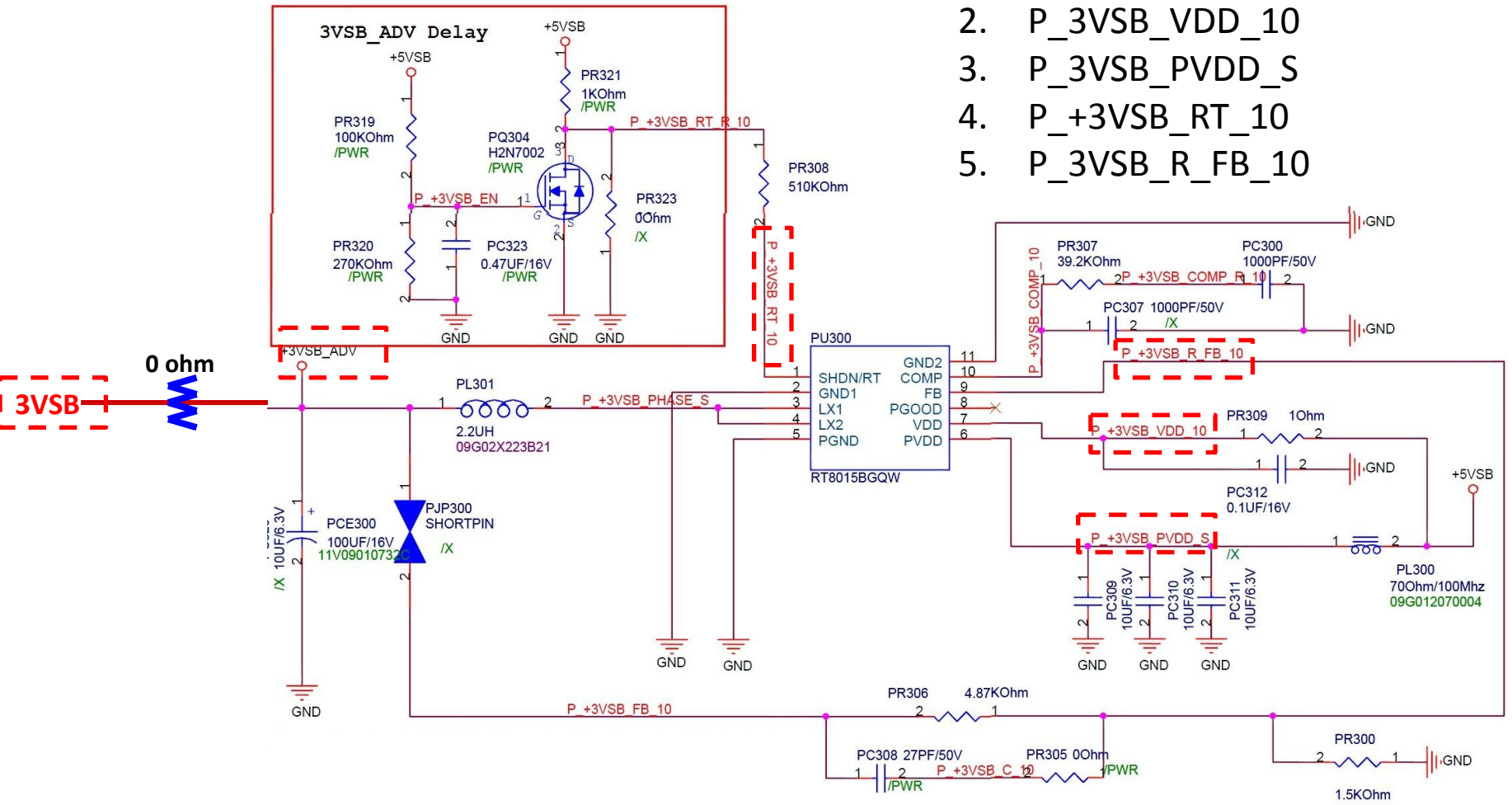
Debug – 5VSB

1. Clear COMS and let MB at load default status
2. Check +5VSB_ATX
3. Check O_DEEPS5 and PQ305



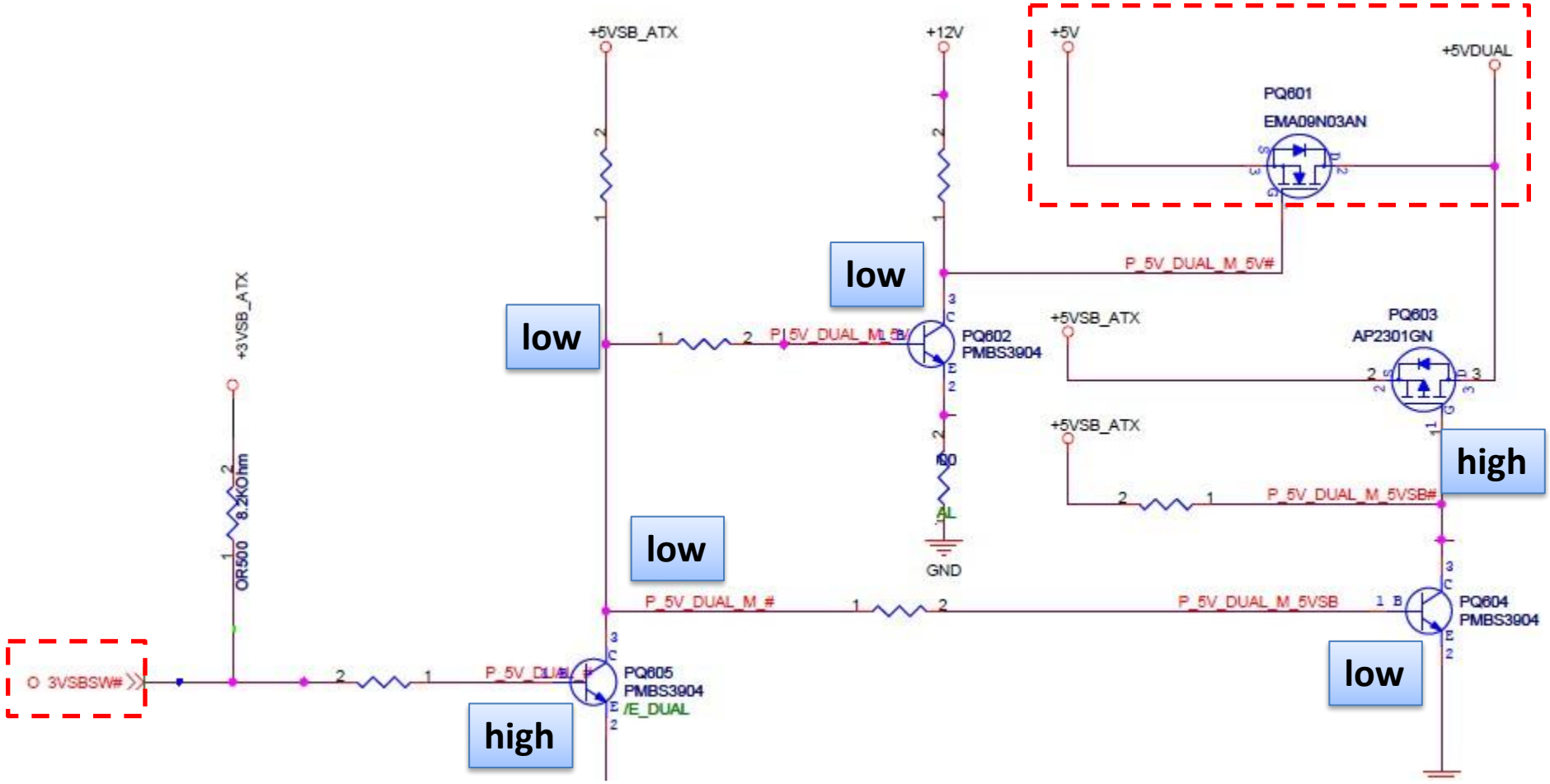
Debug – 3VSB_ADV & 3VSB

1. 5VSB
2. P_3VSB_VDD_10
3. P_3VSB_PVDD_S
4. P_+3VSB_RT_10
5. P_3VSB_R_FB_10



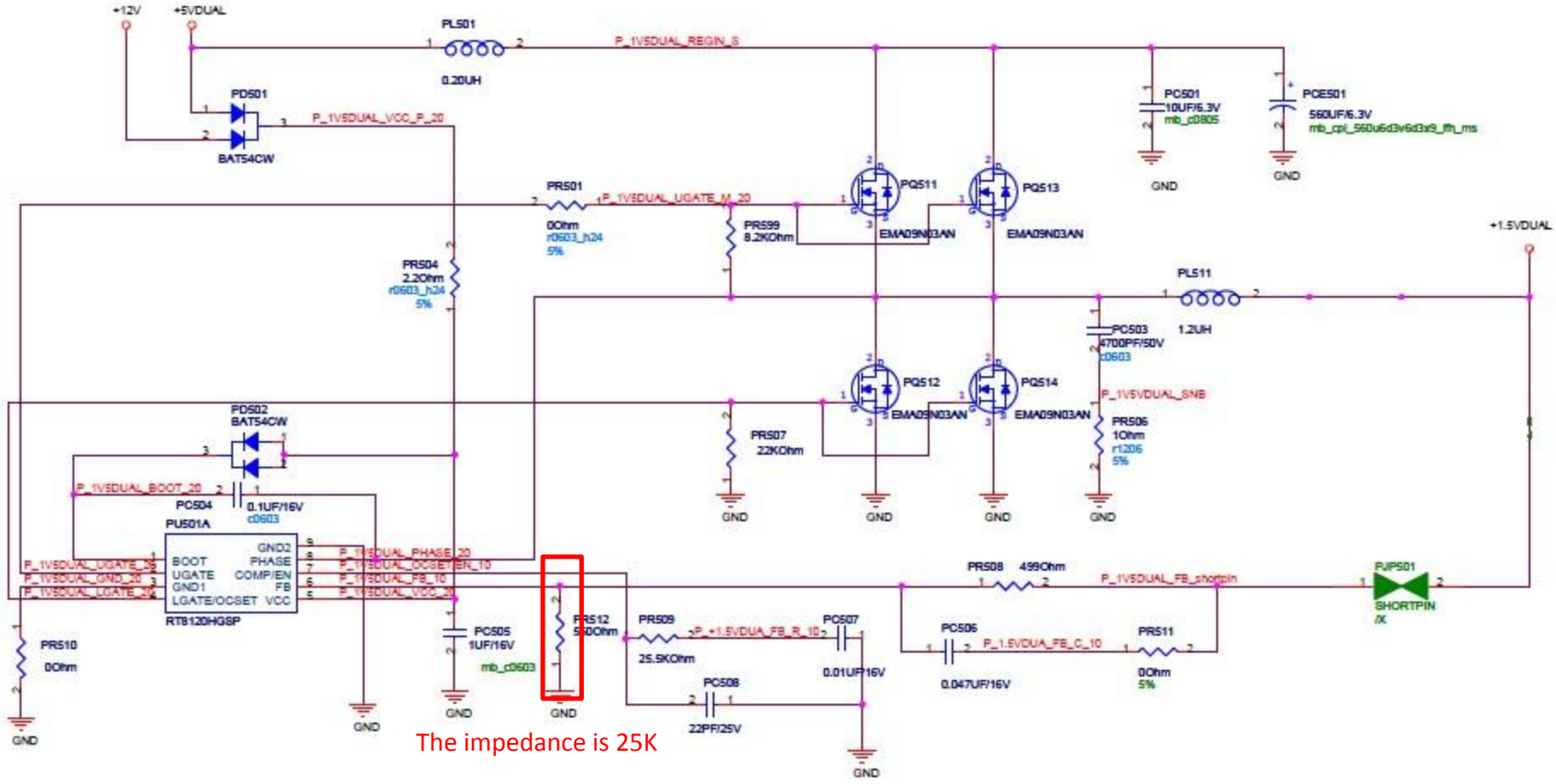
Debug – 5VDUAL

1. Check O_3VSBSW# (At S0 and S5 status, this signal has 3V)
2. Check PQ601 PIN1(12V) and PIN3(5V)

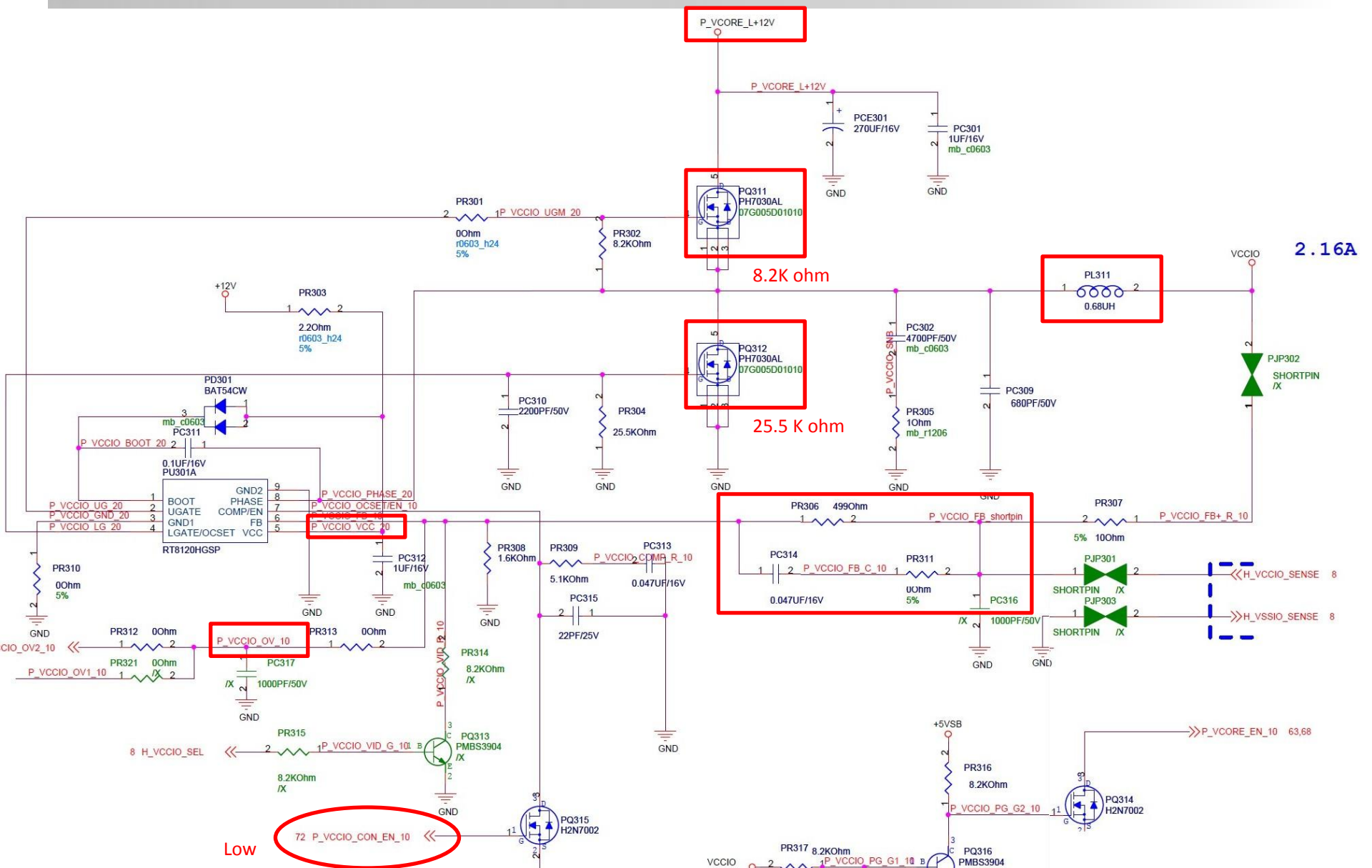


Debug – 1.5VDUAL

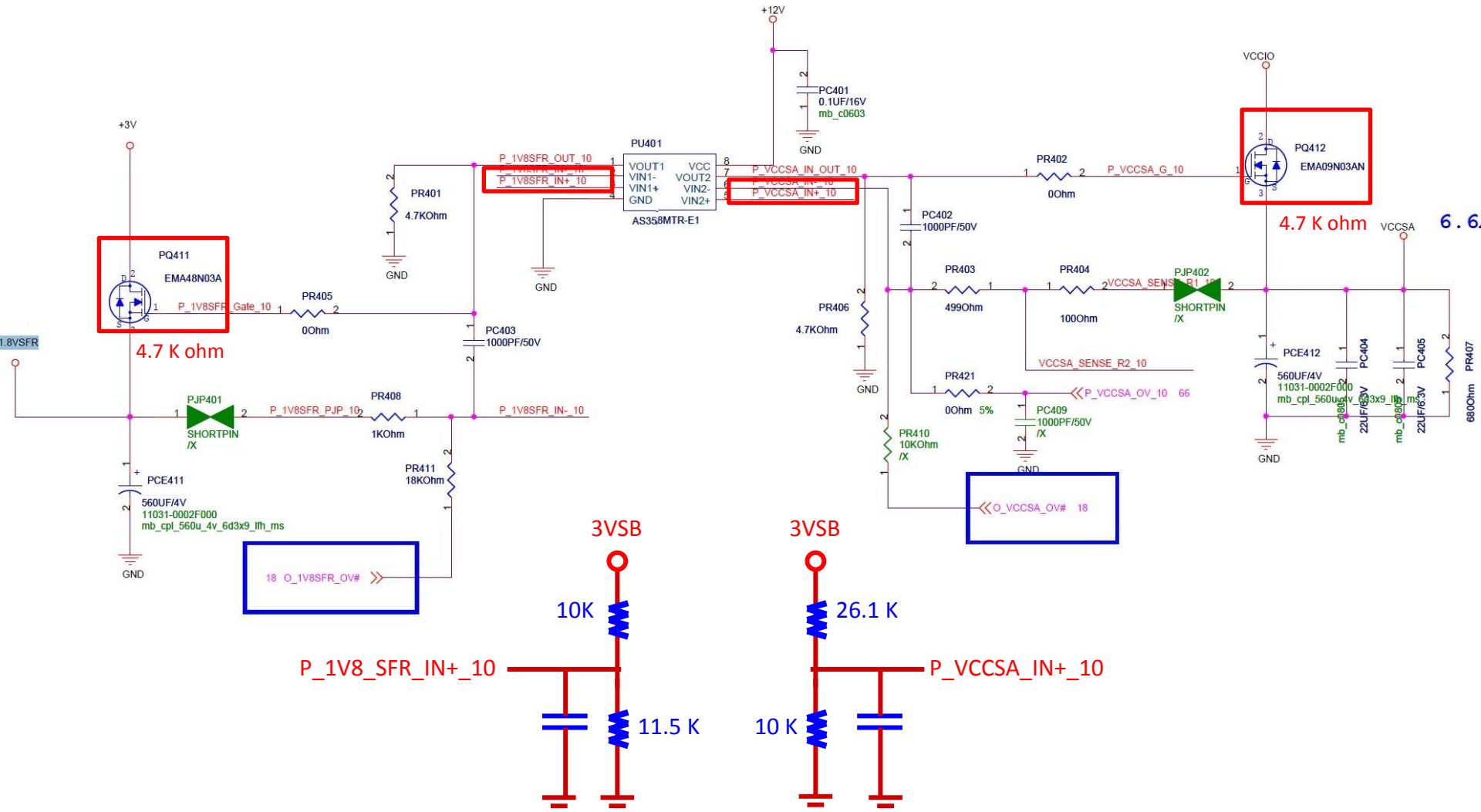
1. 5VDUAL and PU501 VCC
2. Check P_1V5DUAL_OCSET/EN_10
3. Check MOS
6. Check P_1V5DUAL_FB_10 has 0.8V
7. Check NCT3933 working condition (VCC, S_SMBDATA_VSB, S_SMBCLK_VSB)



Debug – VCCIO


P_VCORE_L+12V
PCE301
270UF/16V
PC301
1UF/16V
mb_c0603
PR301
0Ohm
r0603_h24
5%
P_VCCIO_UGM_20
PR302
8.2KOhm
PQ311
PH7030AL
07G005D01010
8.2K ohm
2.16A
VCCIO
PL311
0.68UH
+12V
PR303
2.2Ohm
r0603_h24
5%
PQ312
PH7030AL
07G005D01010
25.5 K ohm
PC302
4700PF/50V
mb_c0603
PC309
680PF/50V
PJP302
SHORTPIN
/X
PD301
BAT54CW
mb_c0603
PC311
0.1UF/16V
PU301A
RT8120HGSP
BOOT
UGATE
GND1
LGATE/OCSET
GND2
PHASE
COMP/EN
FB
VCC
P_VCCIO_BOOT_20
P_VCCIO_UG_20
P_VCCIO_GND_20
P_VCCIO_LG_20
P_VCCIO_PHASE_20
P_VCCIO_OCSET/EN_10
P_VCCIO_FB_20
P_VCCIO_VCC_20
PC310
2200PF/50V
PR304
25.5KOhm
PR305
1Ohm
mb_r1206
PR306
499Ohm
P_VCCIO_FB_shortpin
PR307
5% 10Ohm
P_VCCIO_FB+_R_10
PC312
1UF/16V
mb_c0603
PR308
1.6KOhm
PR309
5.1KOhm
PC313
0.047UF/16V
P_VCCIO_COMP_R_10
PC314
0.047UF/16V
P_VCCIO_FB_C_10
PR311
0Ohm
5%
PJP301
SHORTPIN
/X
H_VCCIO_SENSE 8
PC316
1000PF/50V
PJP303
SHORTPIN
/X
H_VSSIO_SENSE 8
PR310
0Ohm
5%
PC315
22PF/25V
PR312 0Ohm
PR321 0Ohm
/X
P_VCCIO_OV_10
PR313 0Ohm
PC317
1000PF/50V
/X
PR314
8.2KOhm
/X
P_VCCIO_VID_R_10
PR315
8.2KOhm
/X
8 H_VCCIO_SEL
P_VCCIO_VID_G_10
PQ313
PMBS3904
/X
72 P_VCCIO_CON_EN_10
PQ315
H2N7002
Low
+5VSB
PR316
8.2KOhm
P_VCCIO_PG_G2_10
PQ314
H2N7002
P_VCORE_EN_10 63,68
PR317 8.2KOhm
P_VCCIO_PG_G1_10
PQ316
PMBS3904
VCCIO
GND

Debug – 1.8SFR & VCCSA



Q&A

Thank You!