

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|

BOM Groups

| BOM GROUP | BOM OPTIONS |
|-------------------|---|
| X1795_COMMON | SCH,PCB,ALTERNATE,COMMON,X1795_COMMON1,X1795_COMMON2,X1795_COMMON3,X1795_PROGPARTS |
| X1795_COMMON1 | X1795_USBC,SYSDET:FET,BOARD_ID,BOARD_REV:110 |
| X1795_COMMON2 | EDP_ENABLE,XDP:YES,SKIP_5V3V3:AUDIBLE,RF_TUNING |
| X1795_COMMON3 | LOADRC:YES,SE:PROD_2019 |
| X1795_PROGPARTS | BBR_XT_ROM:PVT,BBR_WR_ROM:PVT,WIFI_ROM:PVT,BT_ROM:PVT |
| X1795_DEVEL:ENG | ALTERNATE,ESPI_DBG,DBGLD,USBC_DBG,XDP_CONN:YES,WIFI_DBG,SSD_DBG,FAN_DBG,DEBUG_BUTTON,LOADISNS,SENSOR:DEV,BOOTCFG0 |
| X1795_DEVEL:DVT | ALTERNATE,USBC_DBG,XDP_CONN:YES,WIFI_DBG |
| X1795_DEVEL:PVT | ALTERNATE |
| USBC_MLB_TBT_OPTS | BBR_FORCE_PWR:ACE,BBR_GP6:BBR_S0 |
| USBC_MLB_TBT | BBR_X_PWR:SWSW_VOUTLV,BBR_T_PWR:SWSW_VOUTLV,BBR_PERST:PLTRST,BBR_RST:SPLIT |
| X1795_USBC | BBR_TR:QSA1,ACE2:B2,USBC_MLB_TBT,USBC_MLB_TBT_OPTS |
| CMPT:THRSSD | POLY:33UF |
| CMPT:512GSSD | POLY:27UF |

```
board_rev TABLE
P0a NO DFR: 000
P0a with DFR: 001
P1a NO DFR: 010
P1a with DFR: 011
P1b with DFR: 100
evt-01: 101
evt-02: 101
DFR: 110
```

BOM Variants

| BOM NUMBER | BOM NAME | BOM OPTIONS |
|------------|--------------------------------|---|
| 685-00325 | COMMON BOM,MLB-WELL,X1795 | X1795_COMMON |
| 985-01186 | DEV BOM,MLB-WELL,X1795 | X1795_DEVEL:ENG |
| 939-08546 | PCBA,MLB-WELL,NO CPU,X1795 | BASE_BOM,DEVEL_BOM,ALTERNATE |
| 939-08545 | PCBA,MLB-WELL,CPU SOCKET,X1795 | BASE_BOM,DEVEL_BOM,ALTERNATE,CPU:SOCKET |

P0: DC1 CPU SOCKET, DC2 NO CPU

Variable BOM Groups

Development/Base BOMs

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|---------------------------|---------------|----------|------------|
| 685-00325 | 1 | COMMON BOM,MLB-WELL,X1795 | BASE | CRITICAL | BASE_BOM |
| 985-01186 | 1 | DEV BOM,MLB-WELL,X1795 | DEVEL | CRITICAL | DEVEL_BOM |

APN POLY CAPS

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|---------------------------|---------------|----------|------------|
| 128S00093 | 41 | TANT, PLOY, NEC 33uF, 16V | ----- | CRITICAL | POLY: 33UF |
| 128S00093 | 15 | TANT, PLOY, NEC 33uF, 16V | ----- | CRITICAL | POLY: 33UF |
| 128S00106 | 41 | TANT, PLOY, NEC 27uF, 18V | ----- | CRITICAL | POLY: 27UF |
| 128S00106 | 15 | TANT, PLOY, NEC 27uF, 18V | ----- | CRITICAL | POLY: 27UF |

DRAM


| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|--|---------------------------------|----------|-------------|
| 333S00180 | 4 | 1C,SDRAM,LPDDR4x-4266,16GBIT,19NM,HYN,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:HY_8G |
| 333S00205 | 4 | 1C,SDRAM,LPDDR4x-4266,16GBIT,18NM,MIC,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:MI_8G |
| 333S00218 | 4 | 1C,SDRAM,LPDDR4x-4266,16GBIT,19NM,SS,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:SS_8G |
| 333S00181 | 4 | 1C,SDRAM,LPDDR4x-4266,32GBIT,21NM,HYN,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:HY_16G |
| 333S00206 | 4 | 1C,SDRAM,LPDDR4x-4266,32GBIT,18NM,MIC,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:MI_16G |
| 333S00219 | 4 | 1C,SDRAM,LPDDR4x-4266,32GBIT,19NM,SS,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:SS_16G |
| 333S00204 | 4 | 1C,SDRAM,LPDDR4x-3733,64GBIT,19NM,HYN,H,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:HY_32G |
| 333S00207 | 4 | 1C,SDRAM,LPDDR4x-4266,64GBIT,19NM,MIC,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:MI_32G |
| 333S00220 | 4 | 1C,SDRAM,LPDDR4x-4266,64GBIT,16NM,MIC,BGA200 | 02300_1,02300_2,02300_3,02300_4 | CRITICAL | DRAM:SS_32G |

Main DRAM SPD Straps

| BOM GROUP | BOM OPTIONS | NOTE |
|----------------|--|------|
| DRAMCFG:HY_8G | DRAM:HY_8G, RAMCFG3_L, RAMCFG2_L, RAMCFG1_L, RAMCFG0_L | 0x10 |
| DRAMCFG:MI_8G | DRAM:MI_8G, RAMCFG3_L, RAMCFG2_L, RAMCFG1_L | 0x11 |
| DRAMCFG:SS_8G | DRAM:SS_8G, RAMCFG3_L, RAMCFG2_L, RAMCFG0_L | 0x12 |
| DRAMCFG:HY_16G | DRAM:HY_16G, RAMCFG3_L, RAMCFG1_L, RAMCFG0_L | 0x14 |
| DRAMCFG:MI_16G | DRAM:MI_16G, RAMCFG3_L, RAMCFG1_L | 0x15 |
| DRAMCFG:SS_16G | DRAM:SS_16G, RAMCFG3_L, RAMCFG0_L | 0x16 |
| DRAMCFG:HY_32G | DRAM:HY_32G, RAMCFG2_L, RAMCFG1_L, RAMCFG0_L | 0x18 |
| DRAMCFG:MI_32G | DRAM:MI_32G, RAMCFG2_L, RAMCFG1_L | 0x19 |
| DRAMCFG:SS_32G | DRAM:SS_32G, RAMCFG2_L, RAMCFG0_L | 0x1A |

CPU DRAM CFG Chart

| CAPACITY | CFG 3 | CFG 2 | | VENDOR | CFG 1 | CFG 0 |
|----------|-------|-------|--|---------|-------|-------|
| 8 | 0 | 0 | | HYNIX | 0 | 0 |
| 16 | 0 | 1 | | MICRON | 0 | 1 |
| 32 | 1 | 0 | | SAMSUNG | 1 | 0 |
| RSVD | 1 | 1 | | RSVD | 1 | 1 |

| | | | |
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| BOM Configuration | | | |
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| | evt-3 | | |
| | PAGE | | |
| | 3 OF 150 | | |
| | SHEET | | |
| | 3 OF 109 | | |

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C

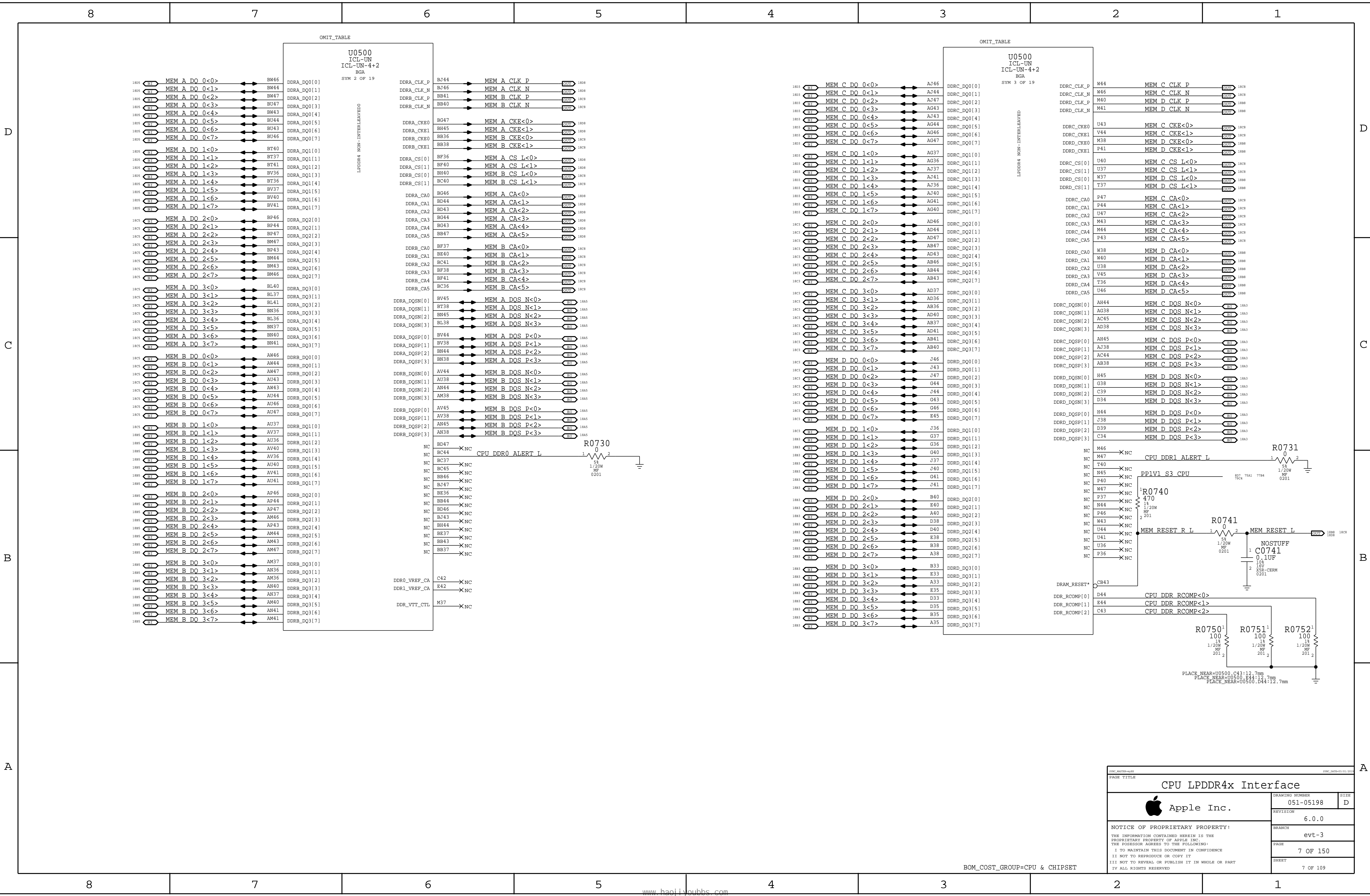
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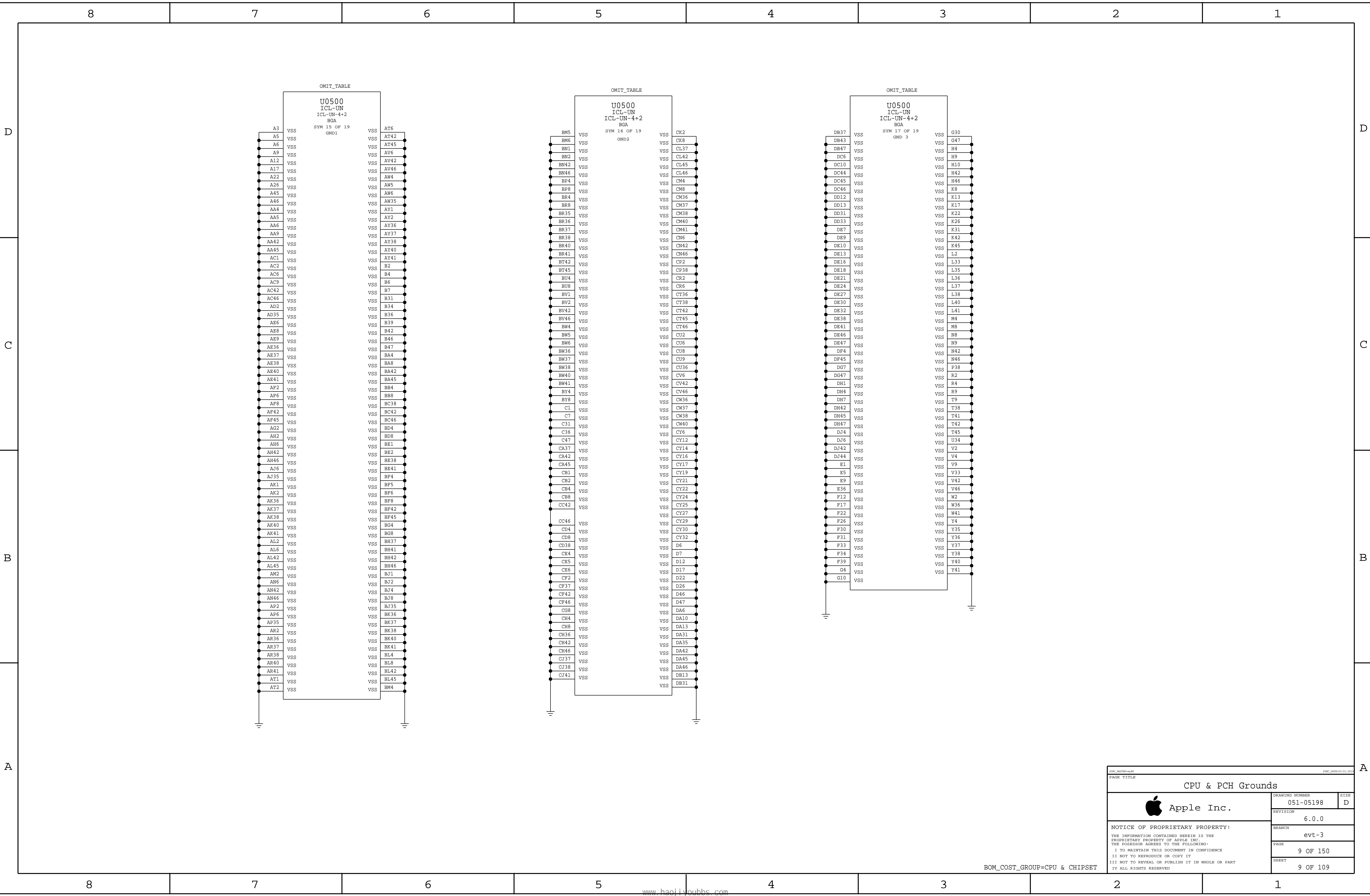


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|  Apple Inc. | DRAWING NUMBER | 051-05198 |
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| | | SHEET | 7 OF 109 |



SYMC_MATTER=evt3E
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SYMC_DATE=01/01/2016

CPU & PCH Grounds

 Apple Inc.

DRAWING NUMBER
051-05198

REVISION
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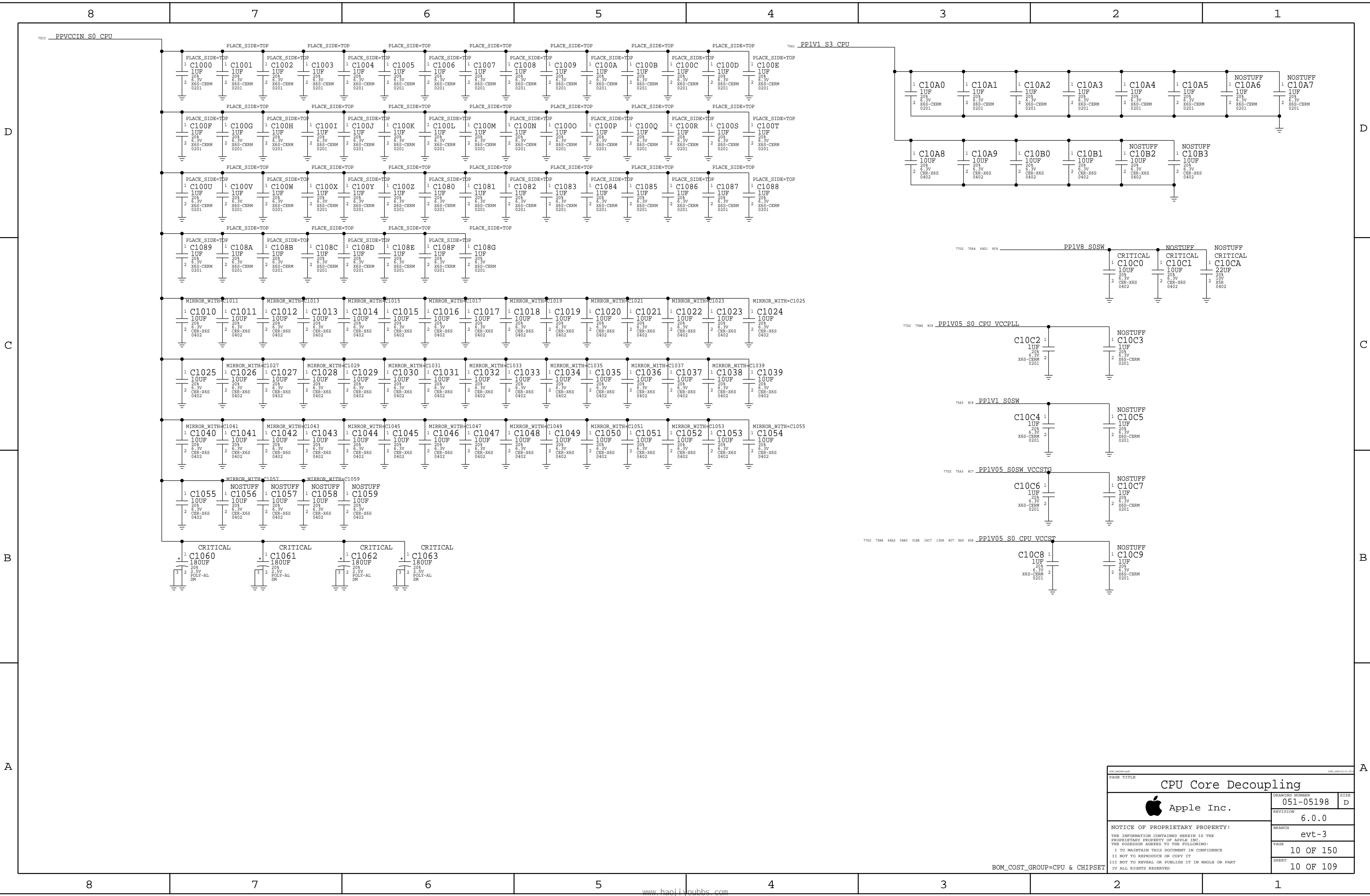
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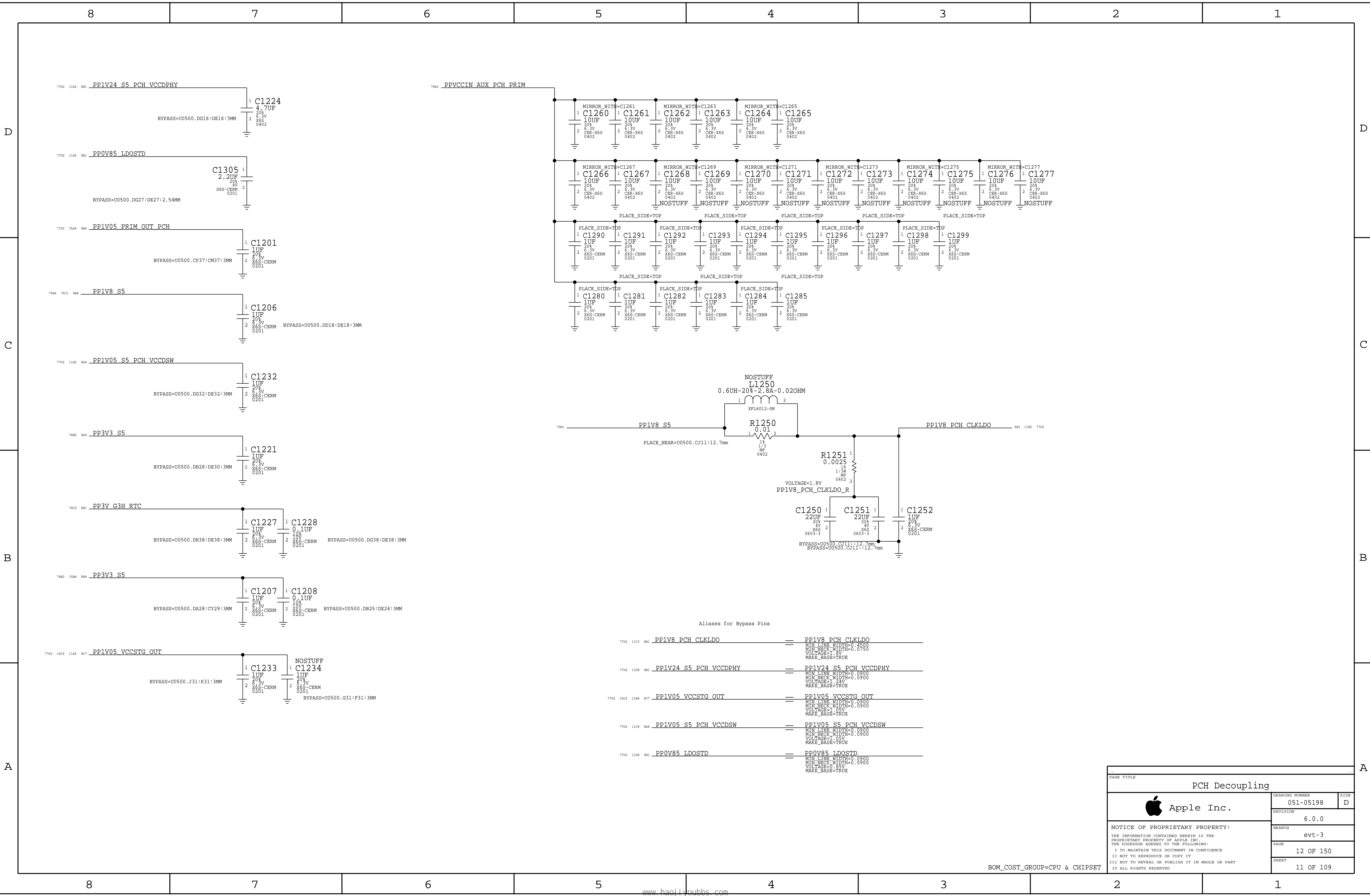
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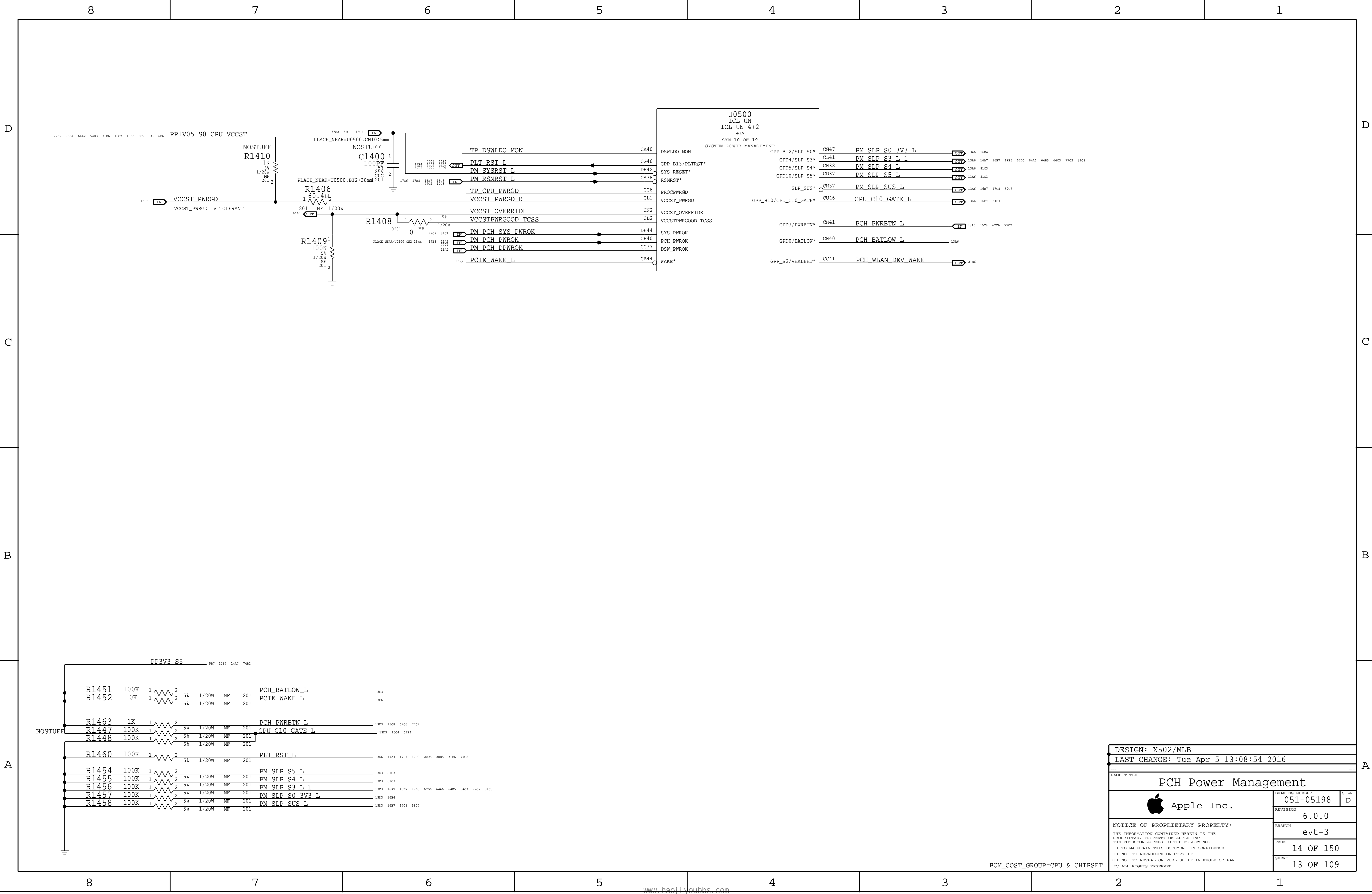


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| | SHEET | 10 OF 109 |



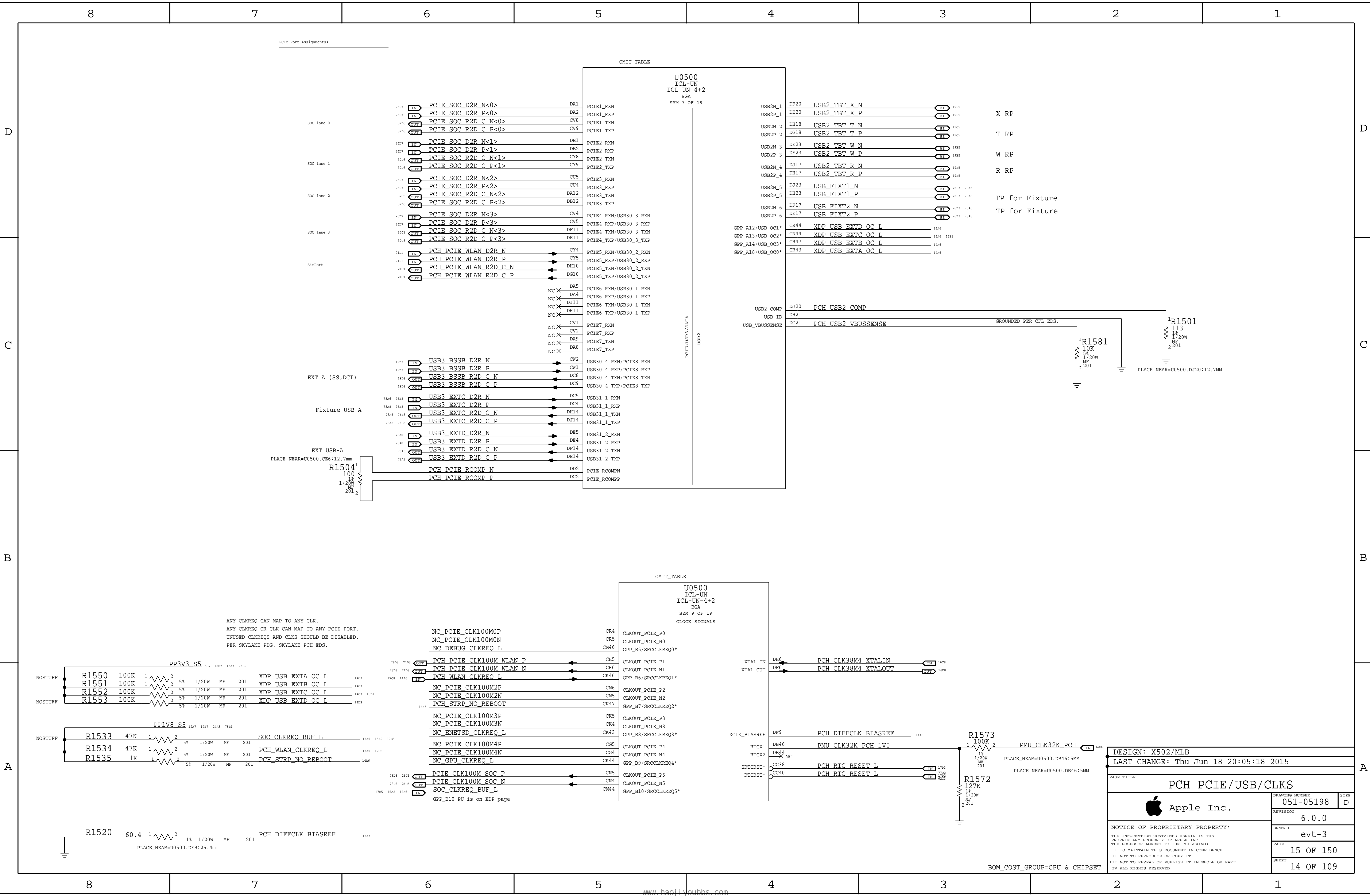
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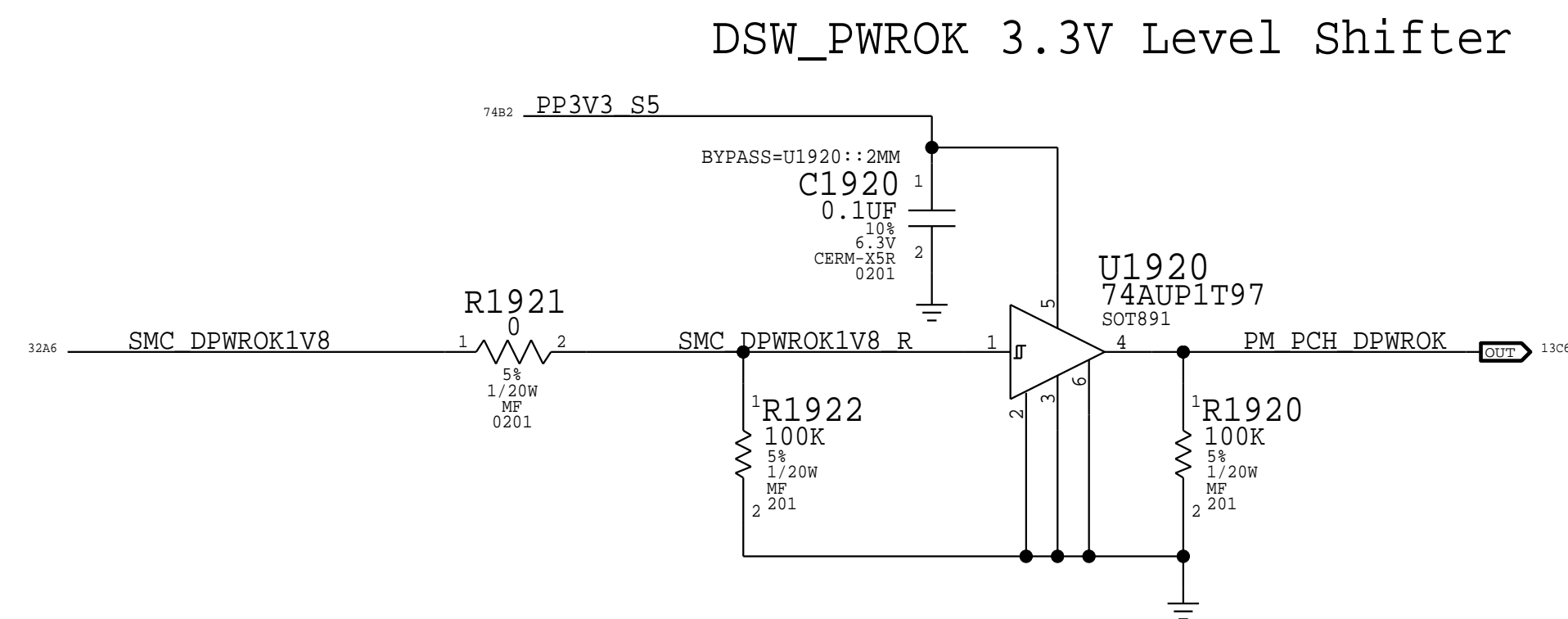
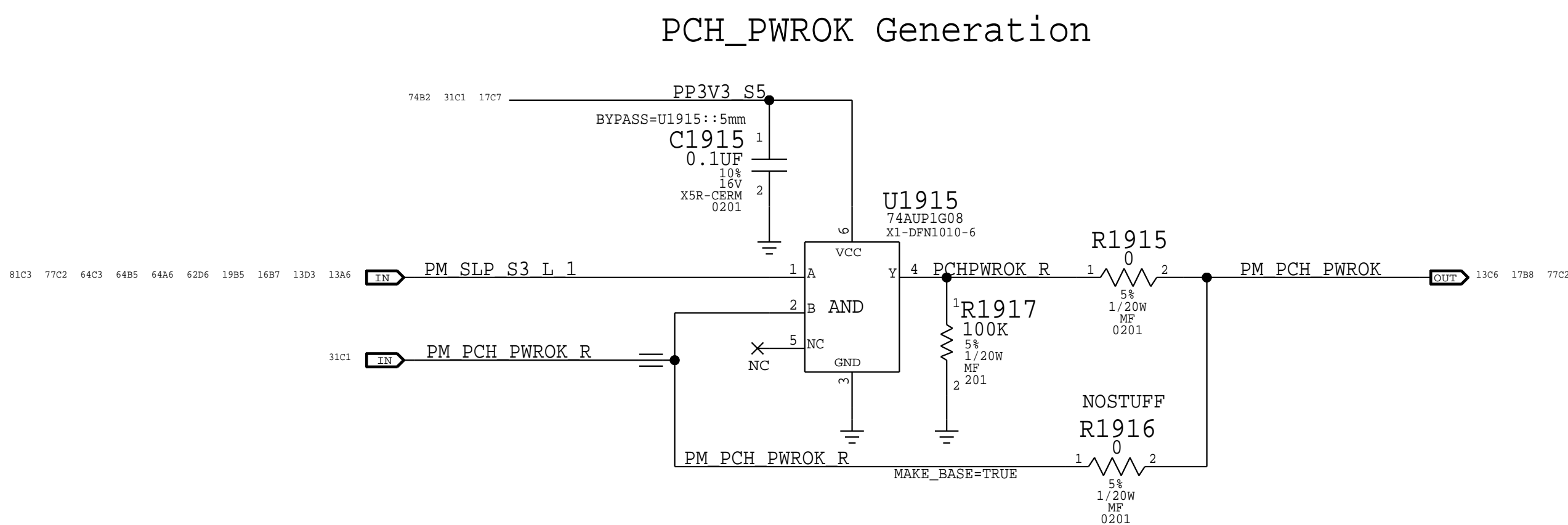
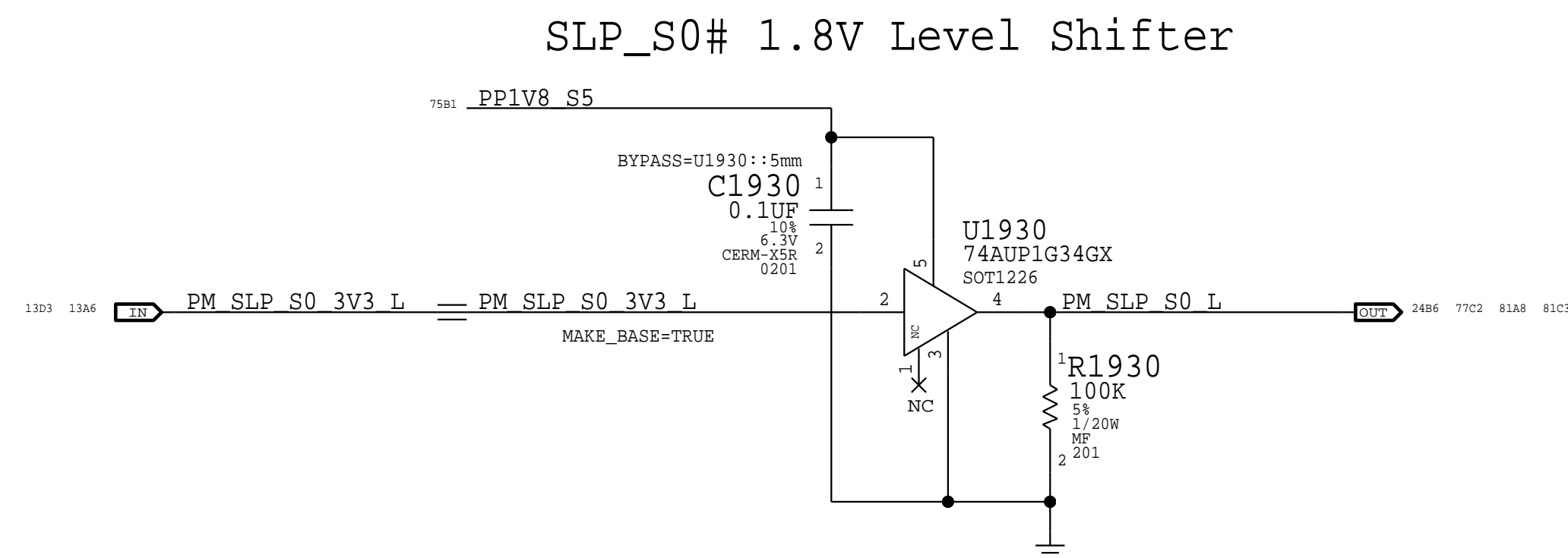
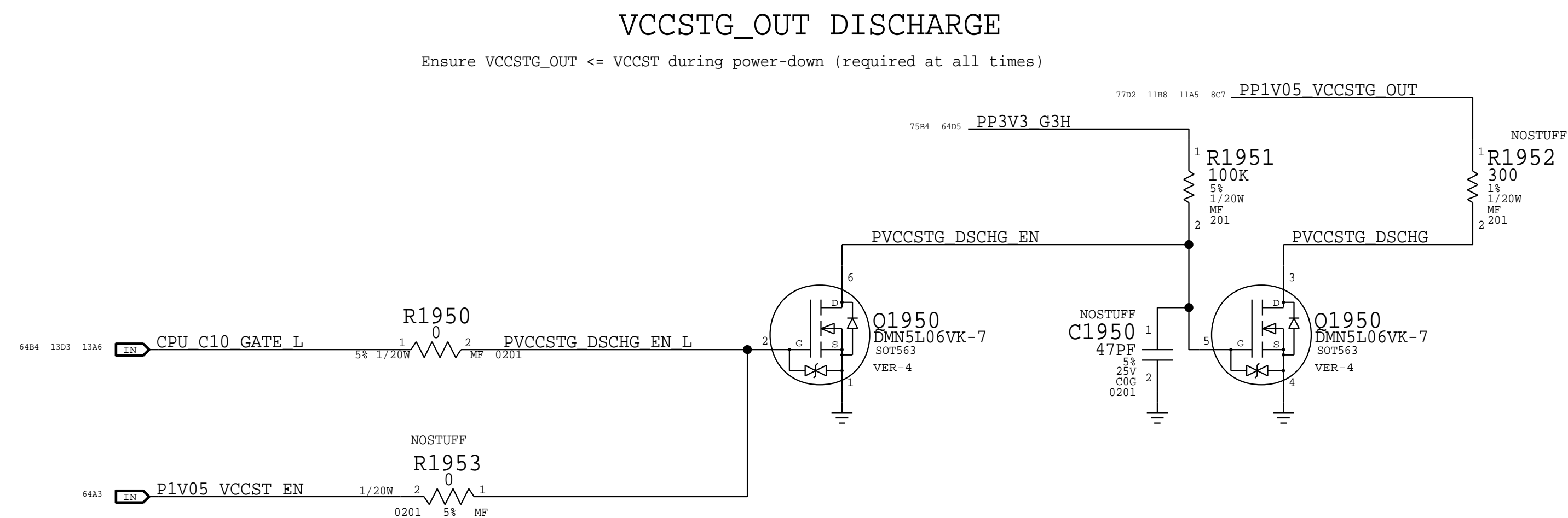
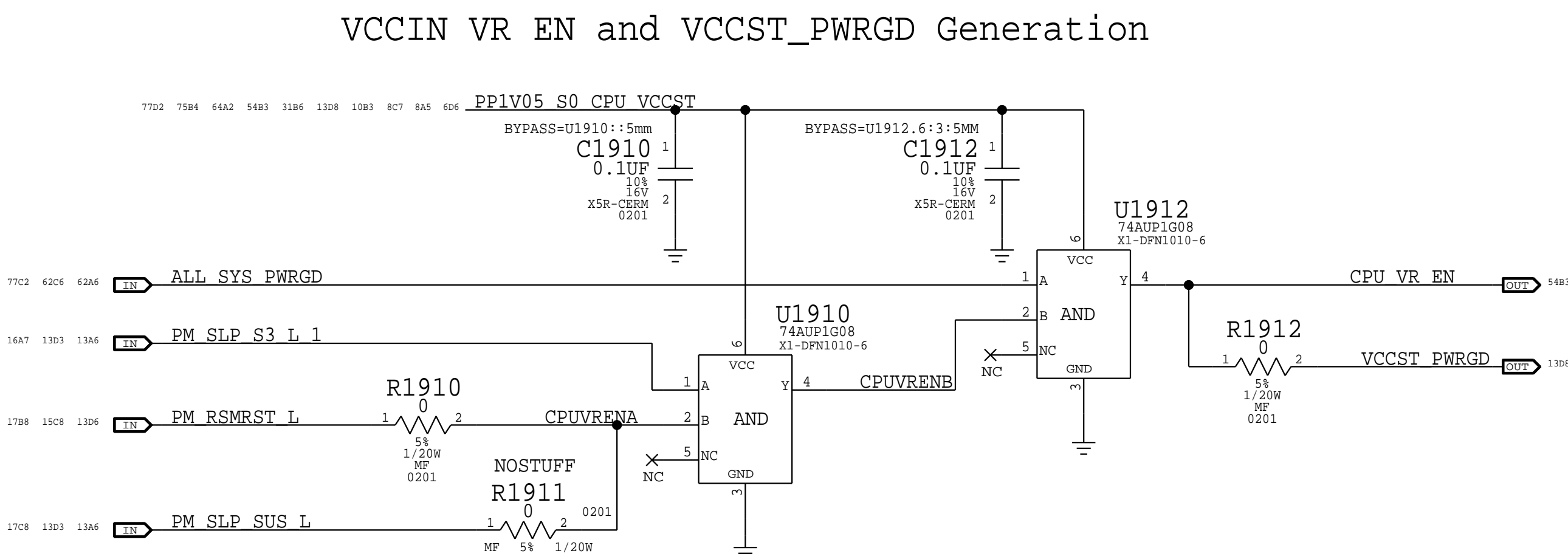
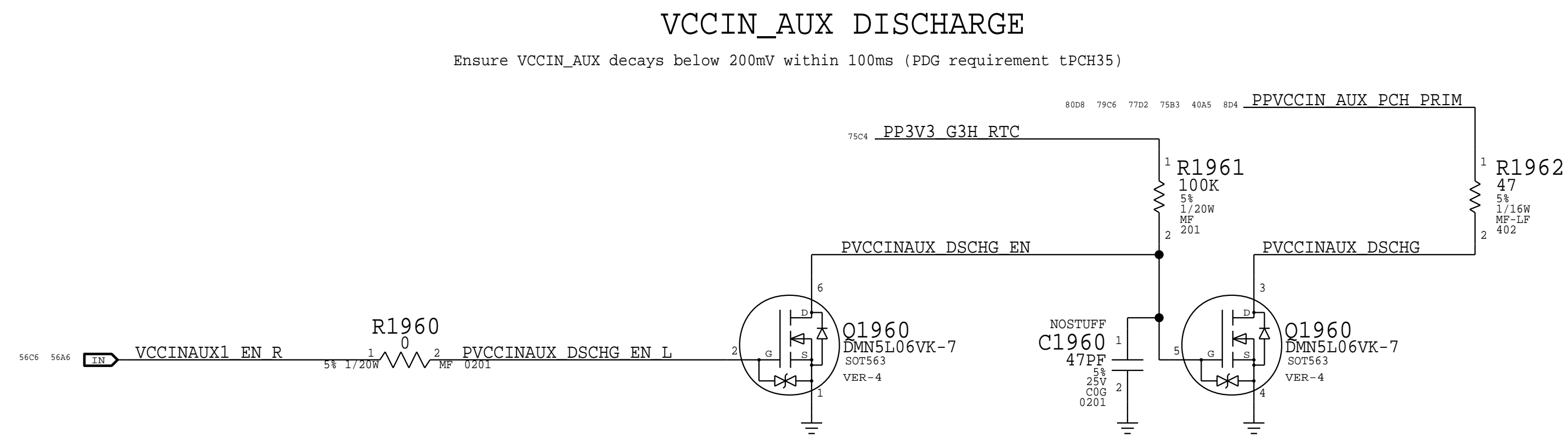
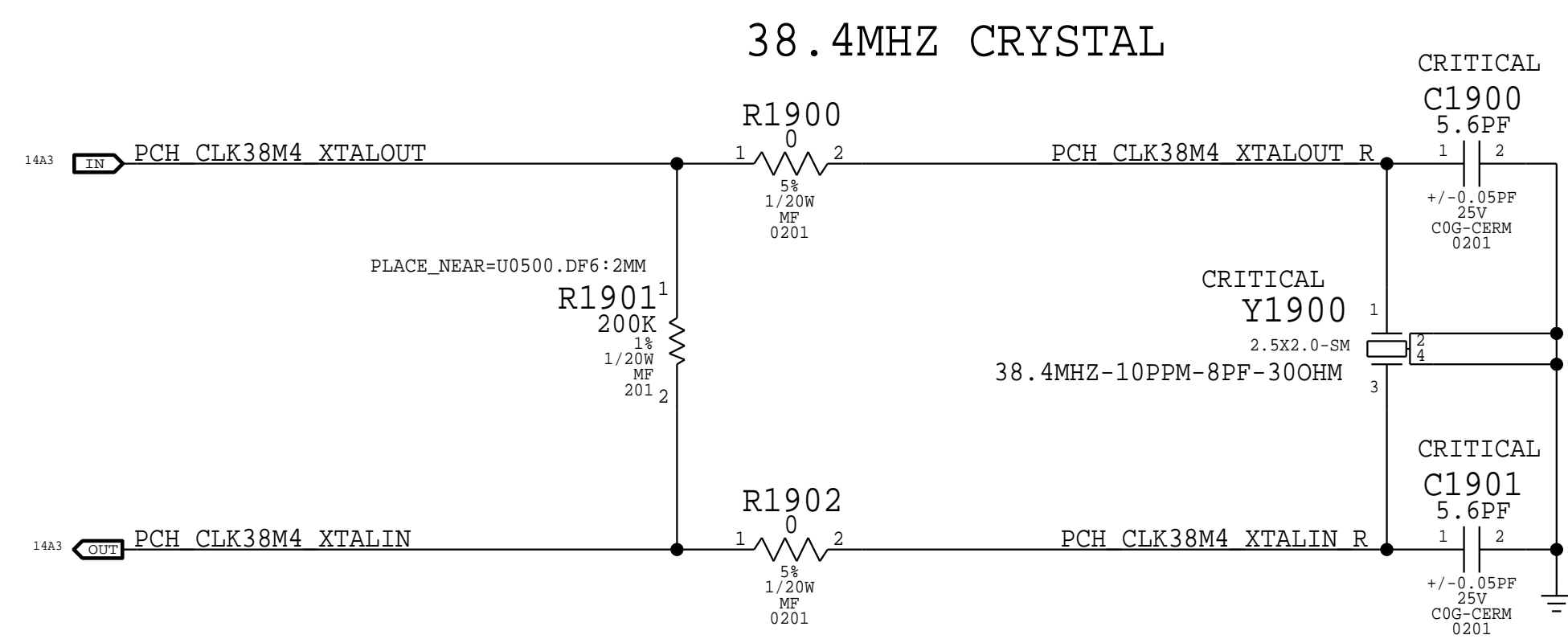
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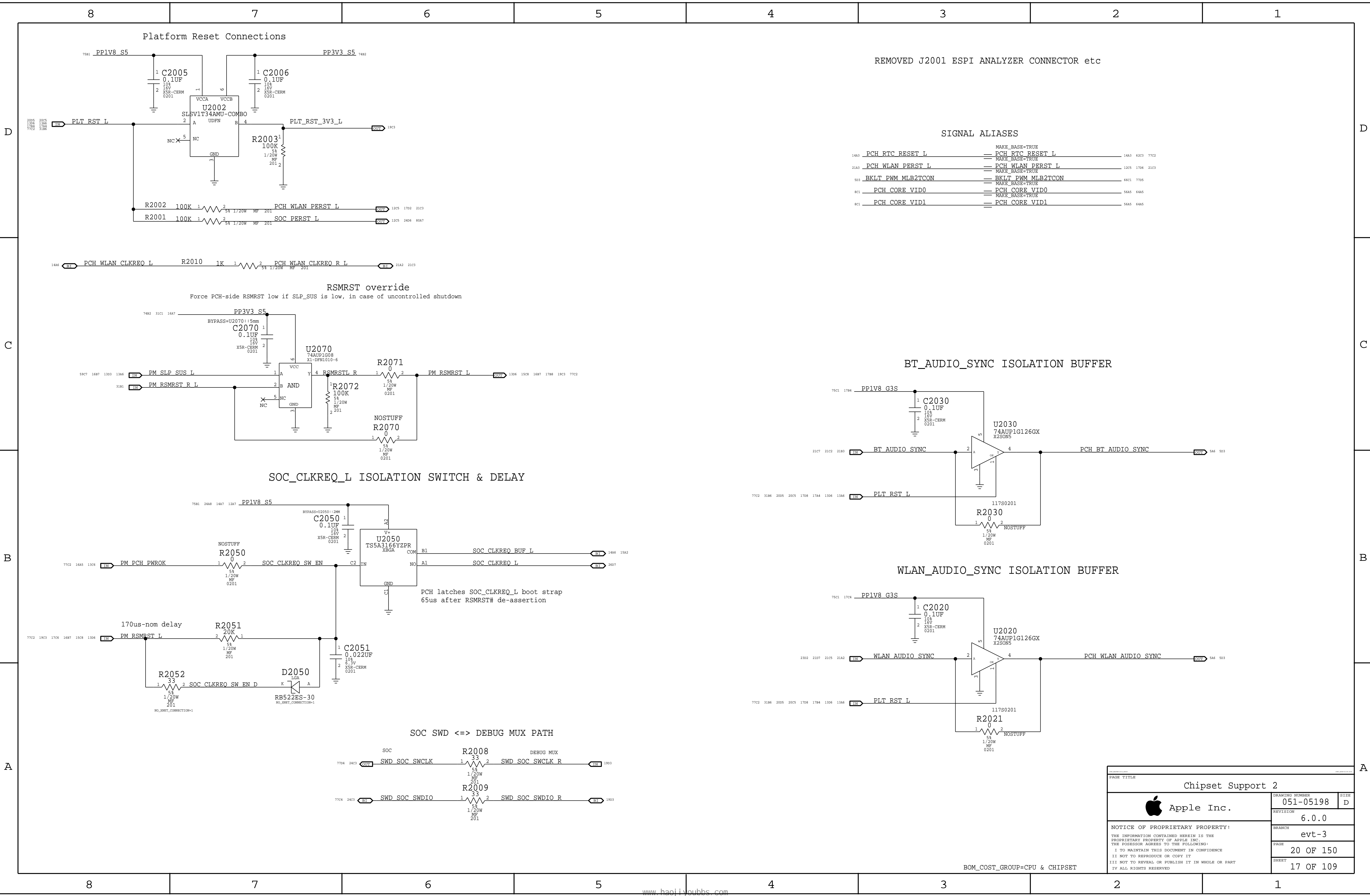
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BOM_COST_GROUP=CPU & CHIPSET





| | | | |
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| SYNCHMASTER7218_DAVID | | SYNCHDATE=03/20/2018 | |
| PAGE TITLE | | | |
| Chipset Shared Support | | | |
|  Apple Inc. | DRAWING NUMBER | | 051-05198 |
| | REVISION | | D |
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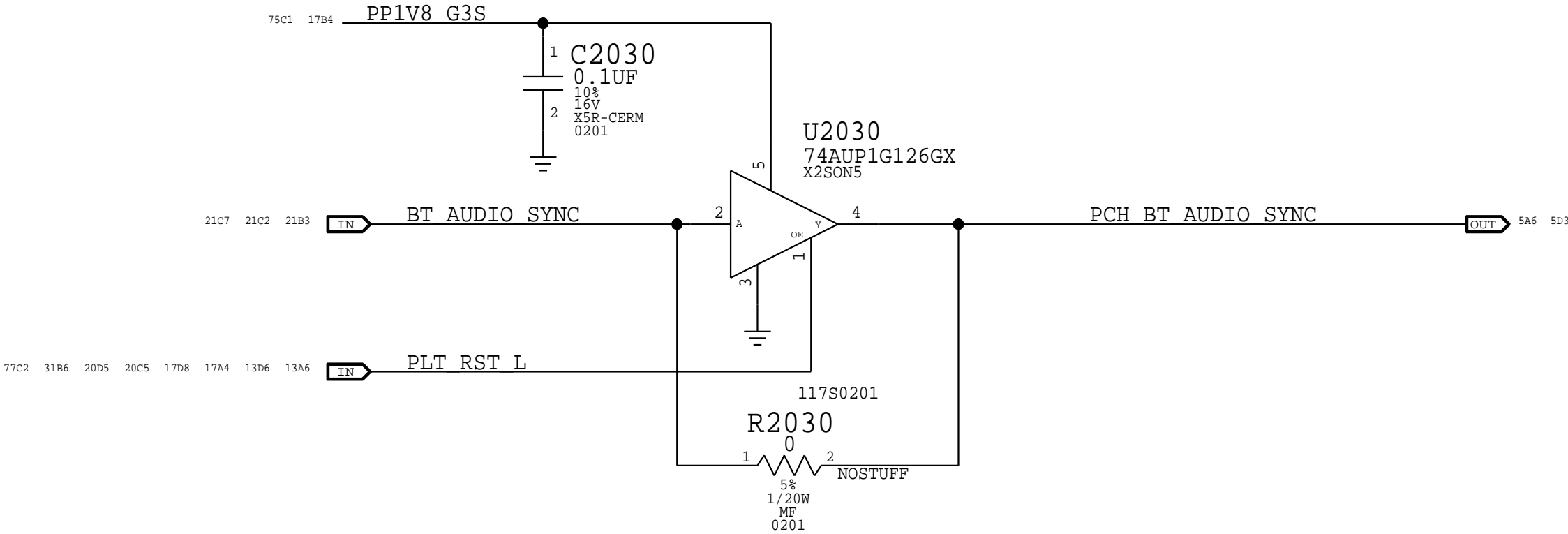


REMOVED J2001 ESPI ANALYZER CONNECTOR etc

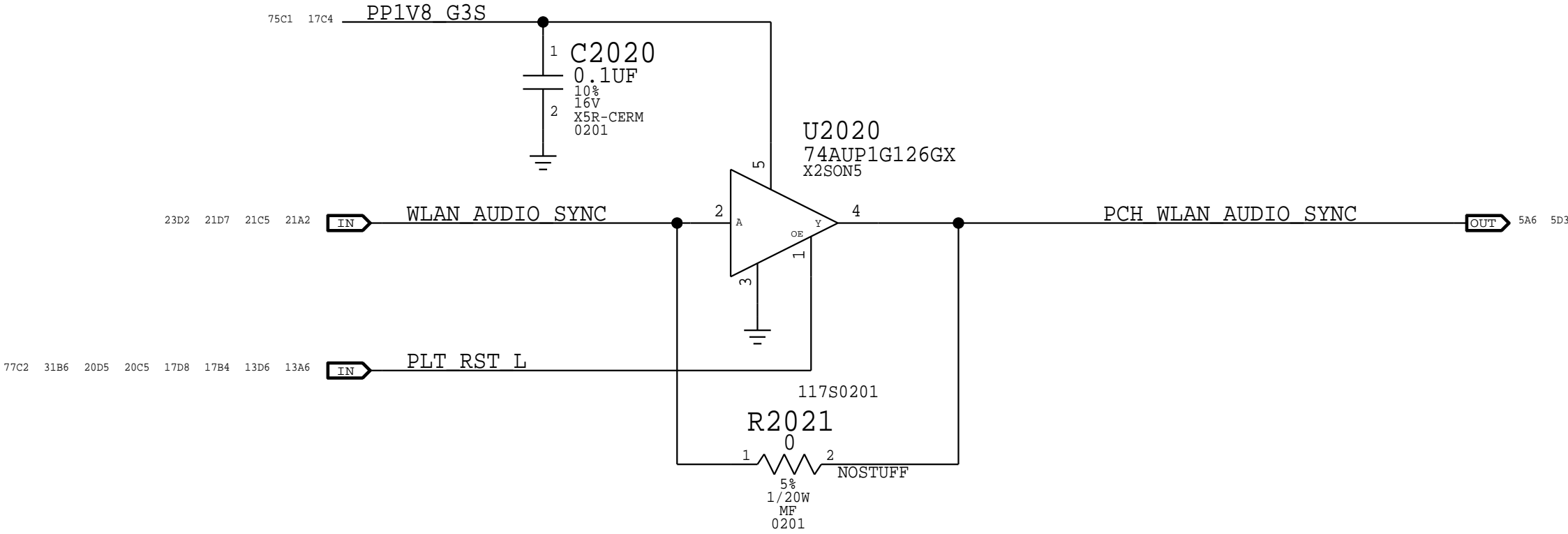
SIGNAL ALIASES

| | | | | | | |
|------|-------------------|----------------|-------------------|------|------|------|
| 14A3 | PCH RTC RESET L | MAKE_BASE=TRUE | PCH RTC RESET L | 14A3 | 62C3 | 77C2 |
| 21A3 | PCH WLAN PERST L | MAKE_BASE=TRUE | PCH WLAN PERST L | 12C5 | 17D6 | 21C3 |
| 5D3 | BKLT PWM MLB2TCON | MAKE_BASE=TRUE | BKLT PWM MLB2TCON | 66C1 | 77D5 | |
| 8C1 | PCH CORE VID0 | MAKE_BASE=TRUE | PCH CORE VID0 | 56A5 | 64A5 | |
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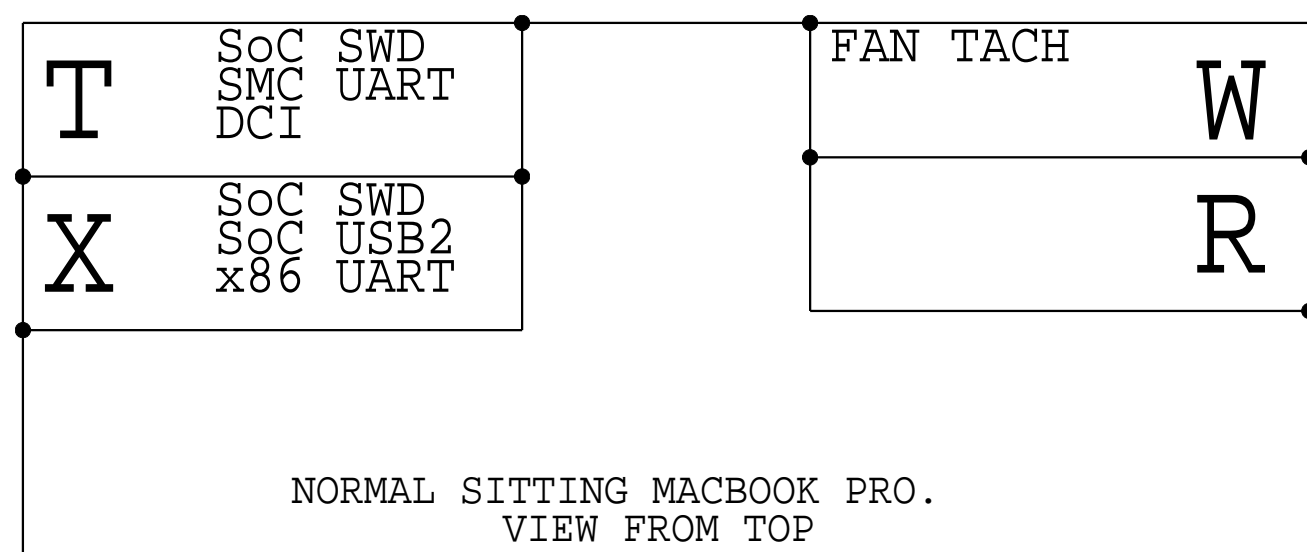
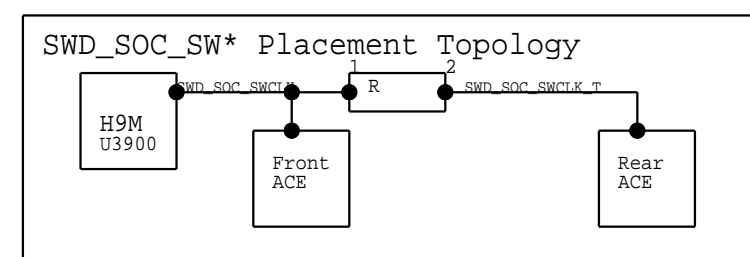
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WLAN_AUDIO_SYNC ISOLATION BUFFER

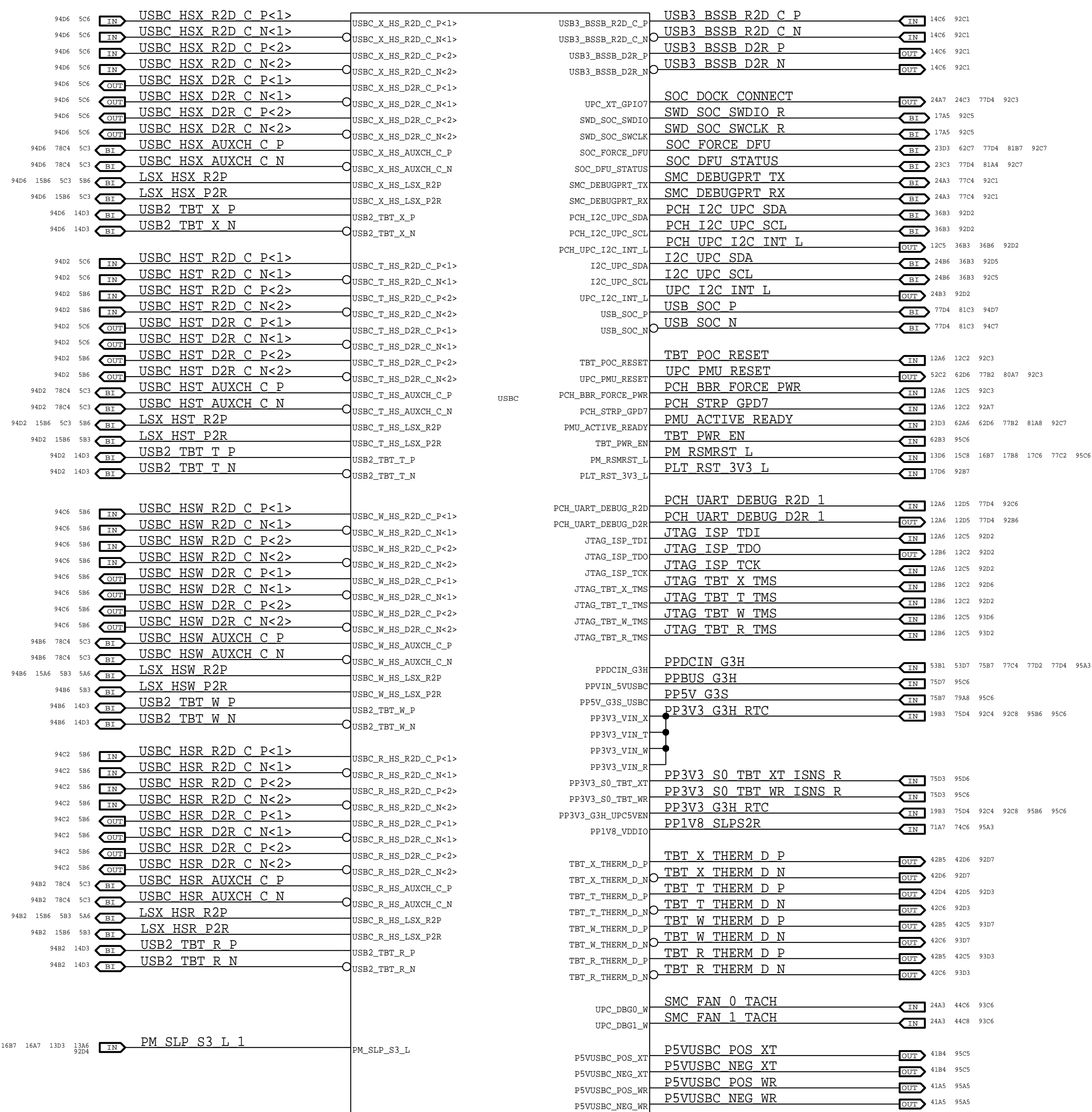
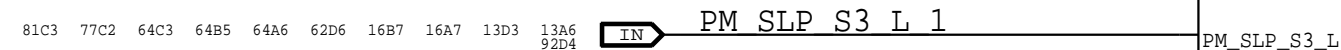



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| | PAGE | 20 OF 150 |
| | SHEET | 17 OF 109 |



| Port | I2C_ADDR | I2CM_CNFG | I2C1_OA | I2C1_AA | I2C2_OA | I2C2_AA |
|------|-----------------|-----------------|---------|---------|---------|---------|
| X | GND (0) | PU (3) | 0x38 | 0x6B | 0x38 | 0x6B |
| T | FLOAT (7) | PU (3) | 0x3F | 0x6B | 0x3F | 0x6B |
| W | VERRIDE OTP (3) | VERRIDE OTP (3) | 0x3B | 0x6B | 0x3B | 0x6B |
| R | VERRIDE OTP (4) | VERRIDE OTP (3) | 0x3C | 0x6B | 0x3C | 0x6B |

ALL 4 BURNSIDE BRIDGE I2C ADDRESS = 0x18



| | | | | | |
|--|--|----------------|--|------|--|
| PAGE TITLE | | DRAWING NUMBER | | SIZE | |
| USB-C | | 051-05198 | | D | |
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D

C

B

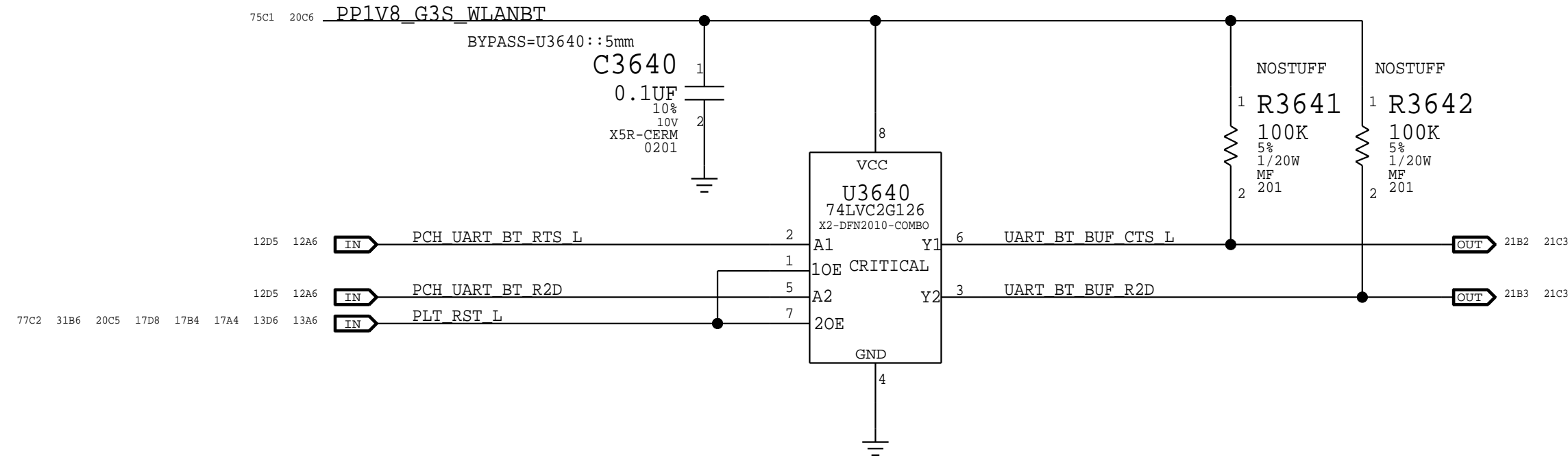
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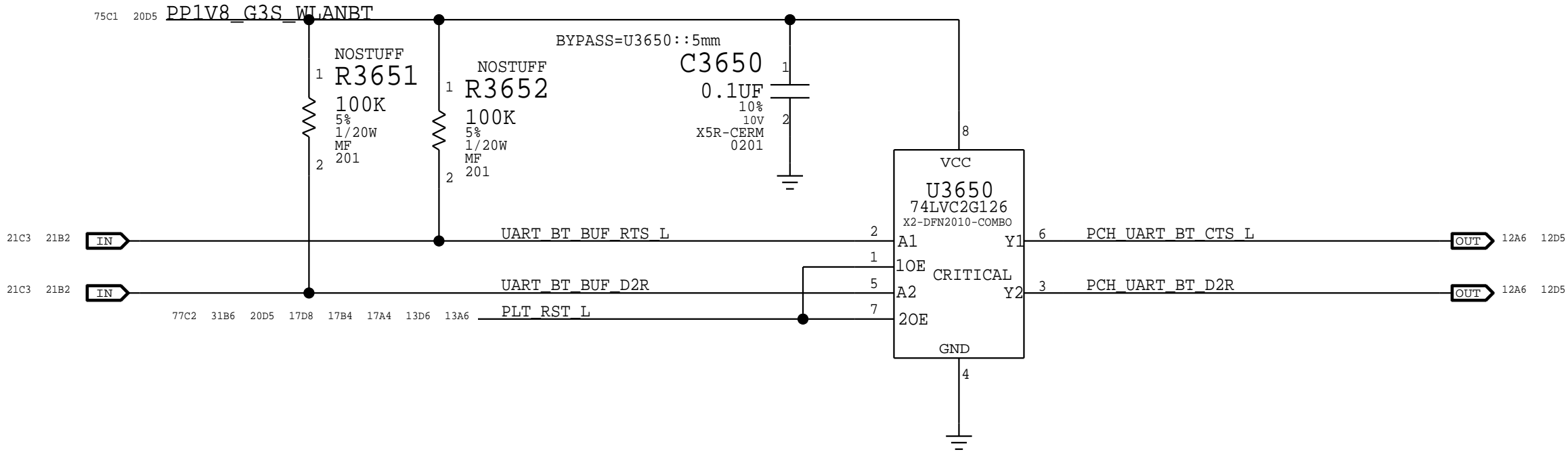
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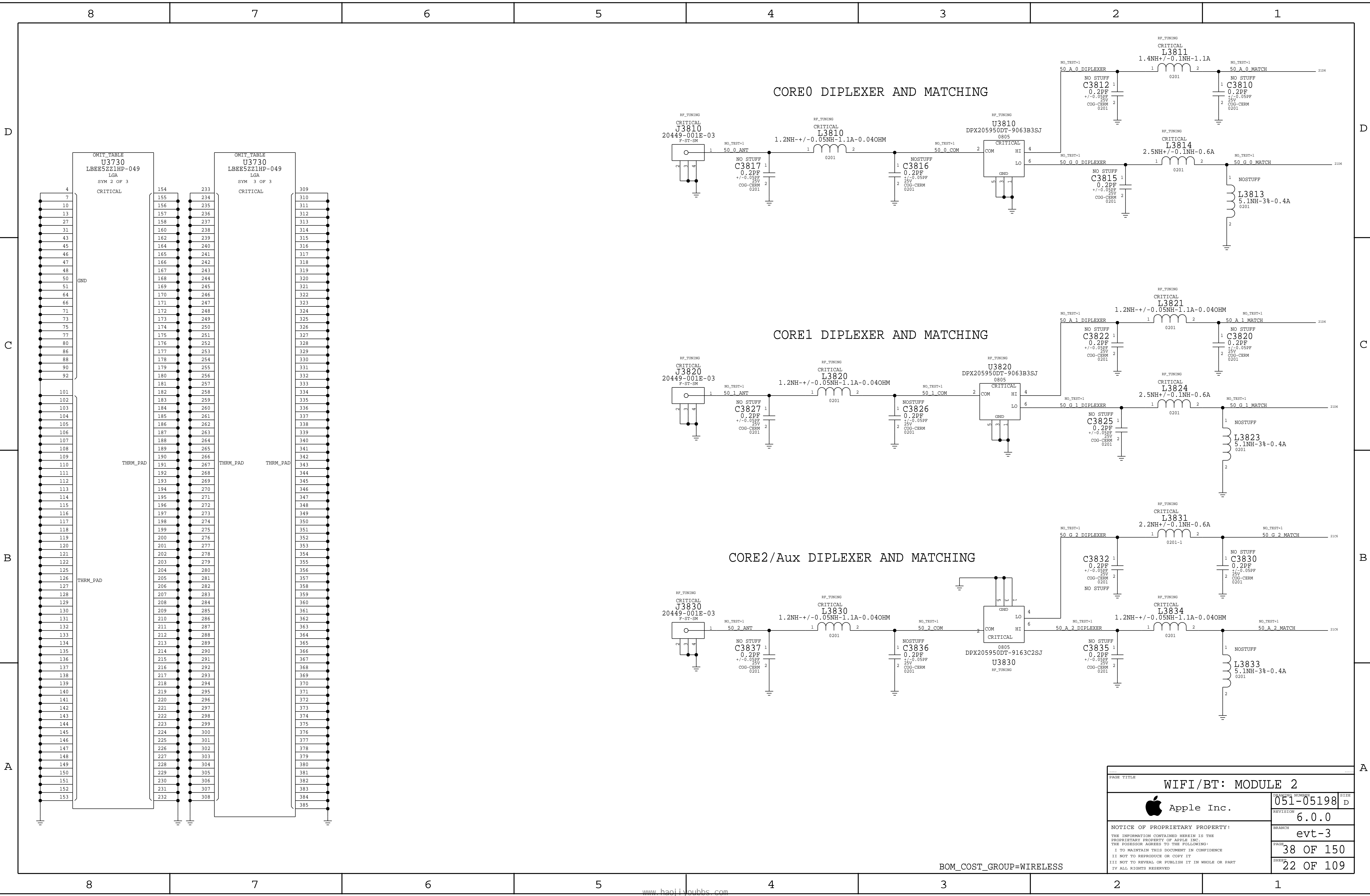
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radar 47644489
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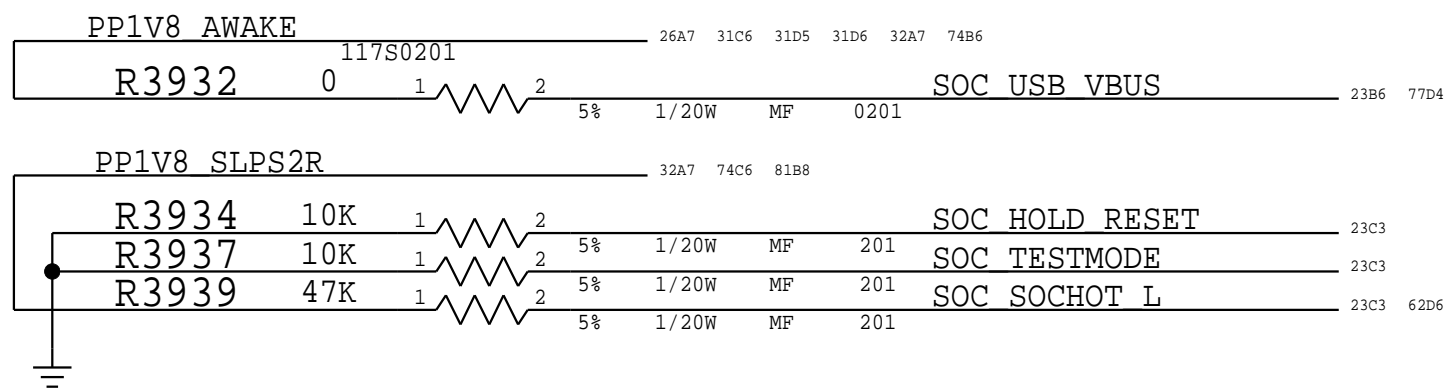
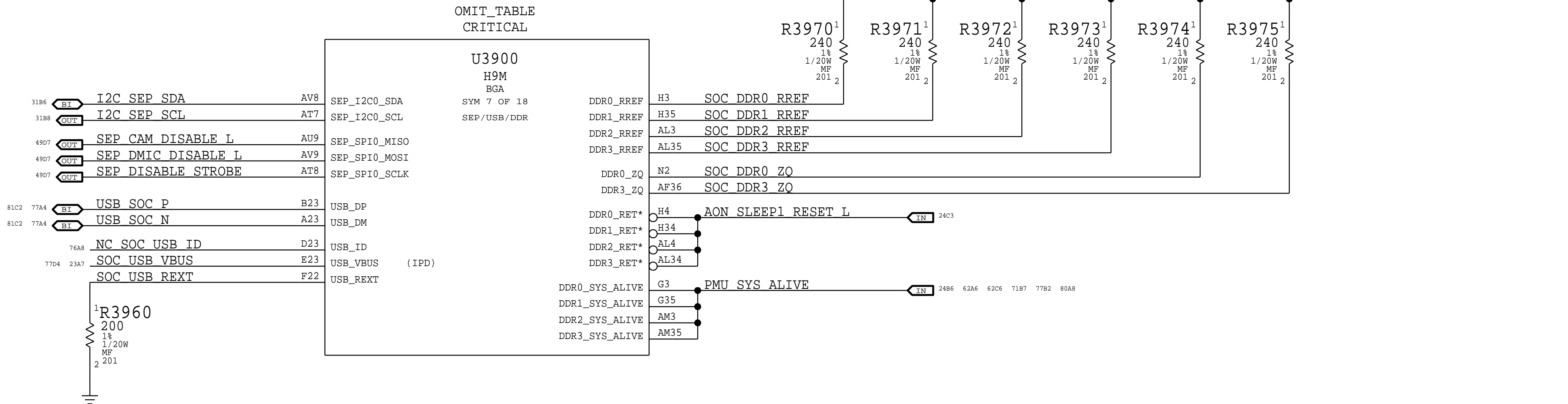
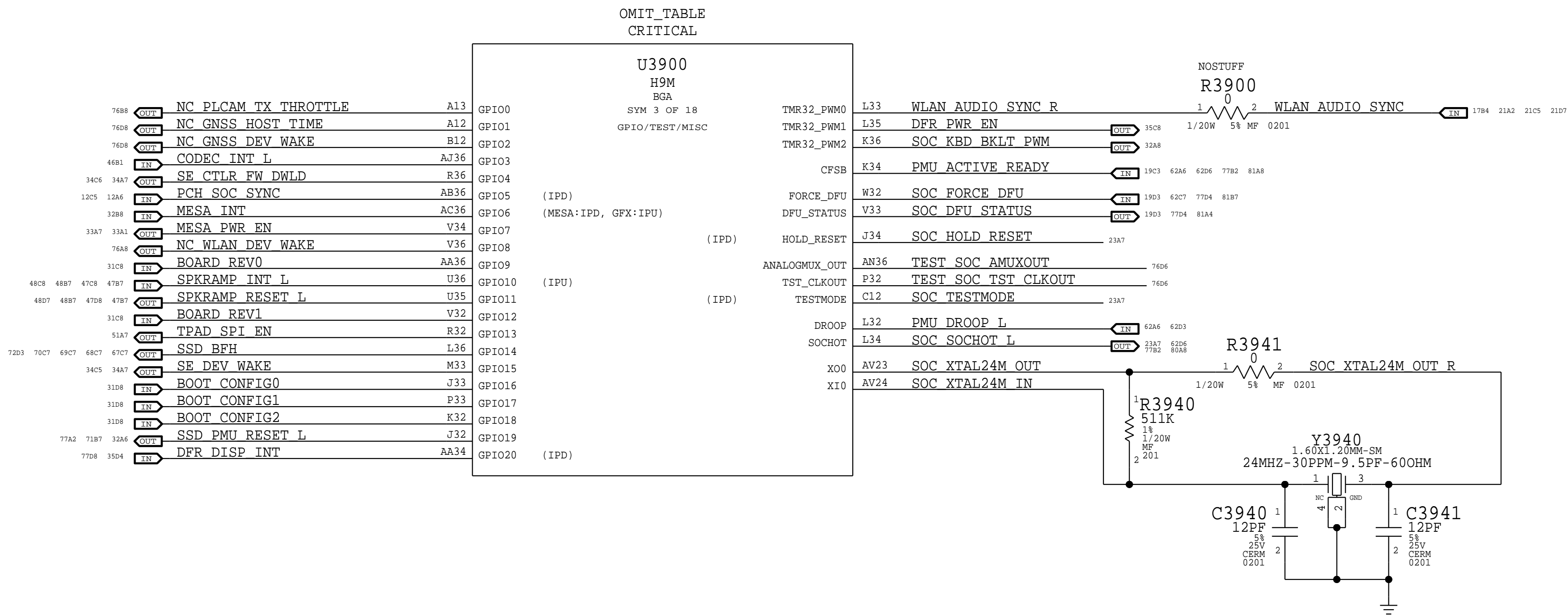
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| | | | PAGE | | 36 OF 150 |
| | | | SHEET | | 20 OF 109 |




| | | | |
|---|----------------|-----------|-----------|
| PAGE TITLE | | | |
| WIFI/BT: MODULE 2 | | | |
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| | | SHEET | 22 OF 109 |

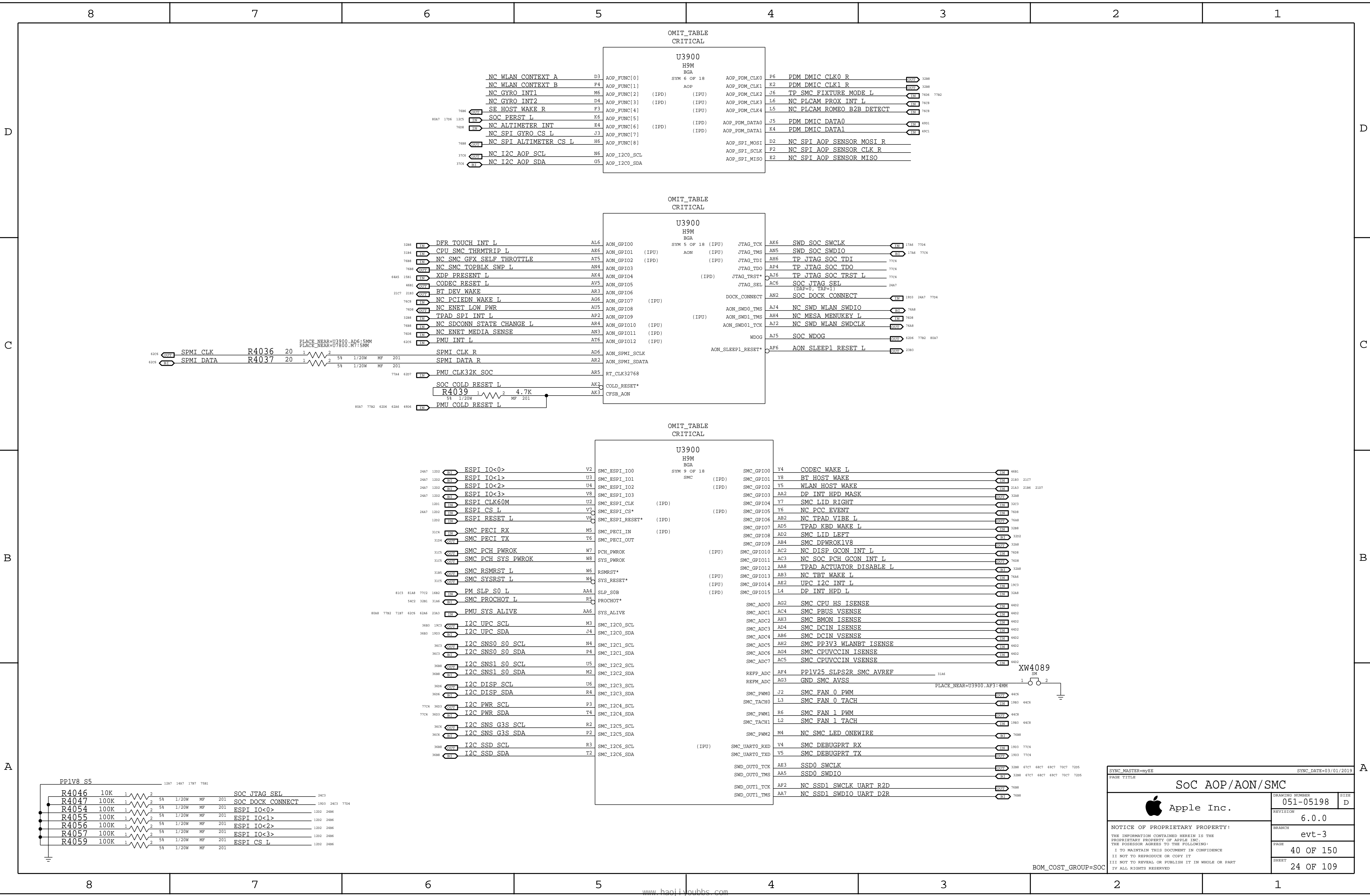
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Note 1) IPU represents SW configured state, not HW default



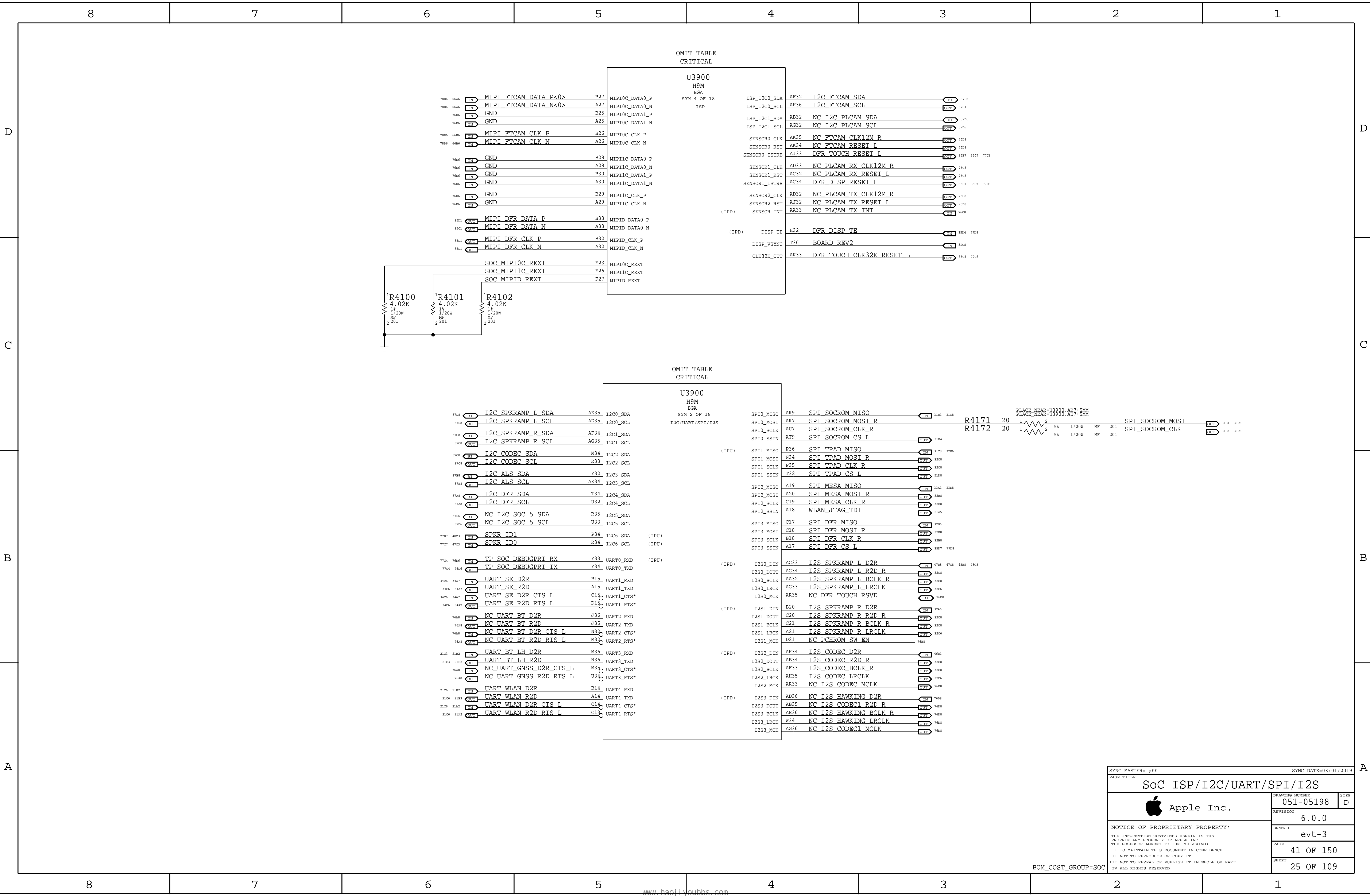
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| SoC GPIO/SEP/USB/DDR/Test | | | |
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| | REVISION | 6.0.0 | |
| | BRANCH | evt-3 | |
| | PAGE | 39 OF 150 | |
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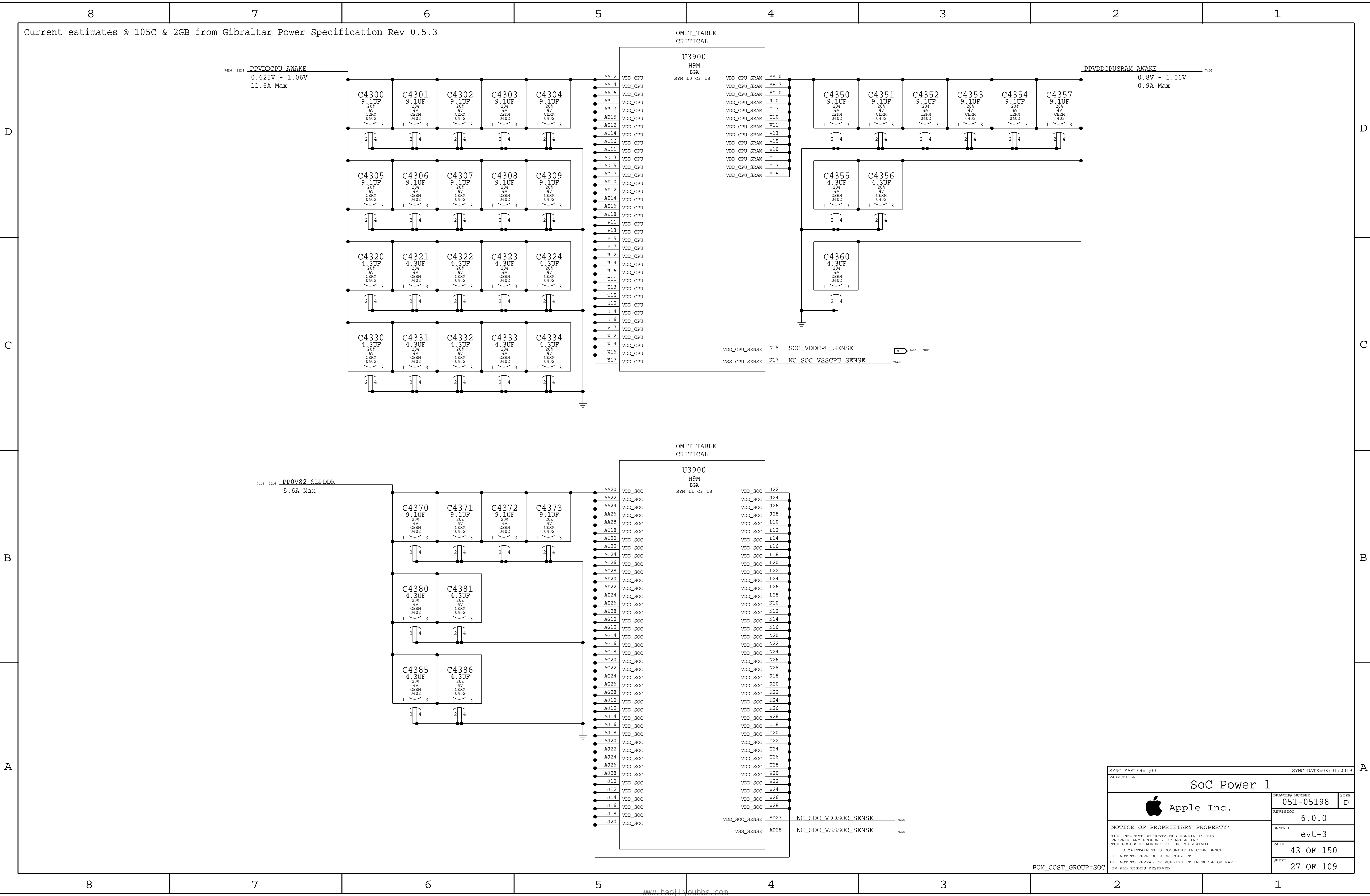
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|  Apple Inc. | | SoC AOP/AON/SMC | |
| | | DRAWING NUMBER | 051-05198 |
| | | SIZE | D |
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| | | BRANCH | evt-3 |
| | | PAGE | 40 OF 150 |
| | | SHEET | 24 OF 109 |
| | | | |

BOM_COST_GROUP=SoC

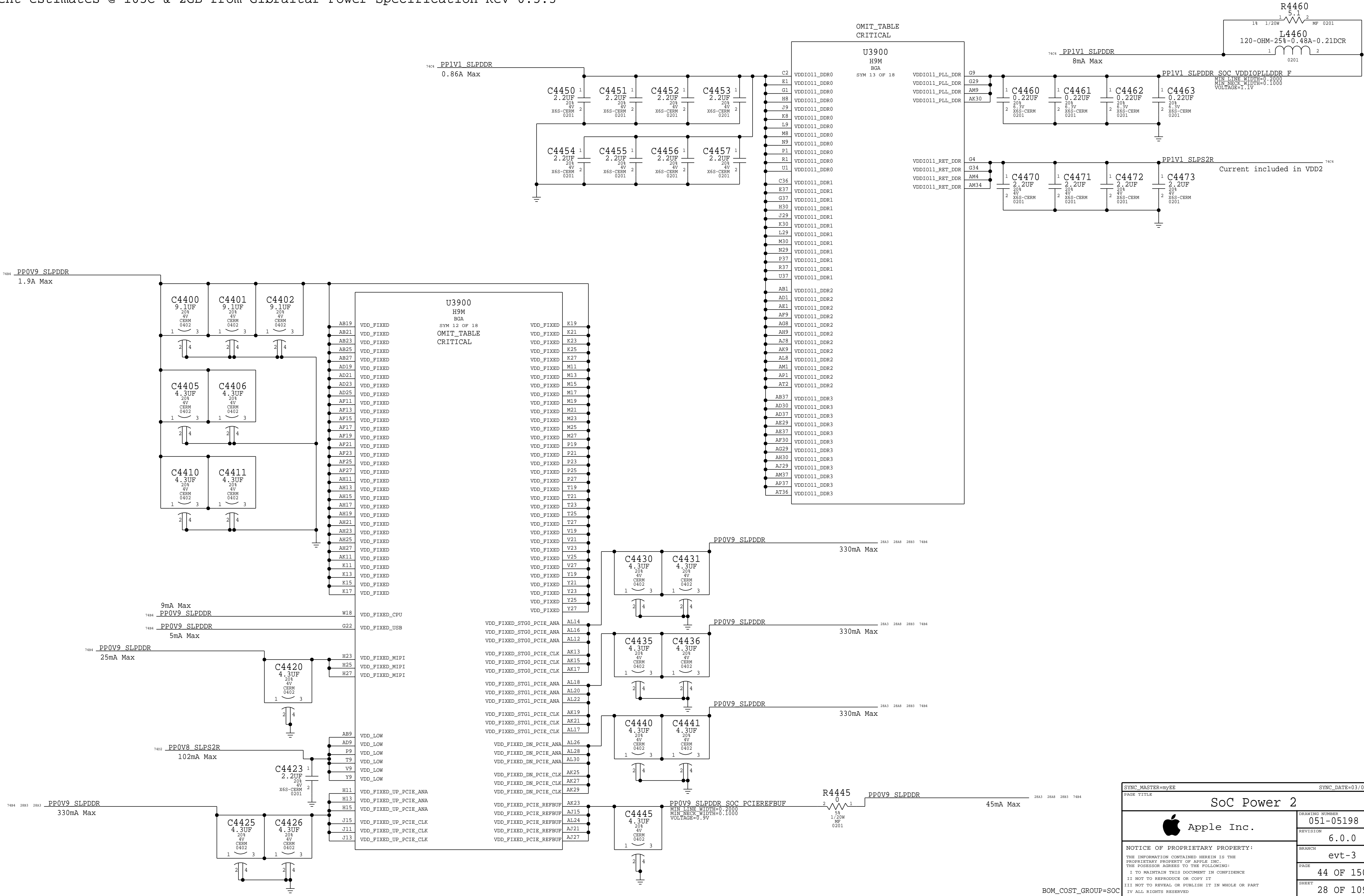



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|--|----------------|----------------------|-----------|
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|  Apple Inc. | DRAWING NUMBER | 051-05198 | SIZE |
| | REVISION | 6.0.0 | D |
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| | | SHEET | 25 OF 109 |
| | | | |

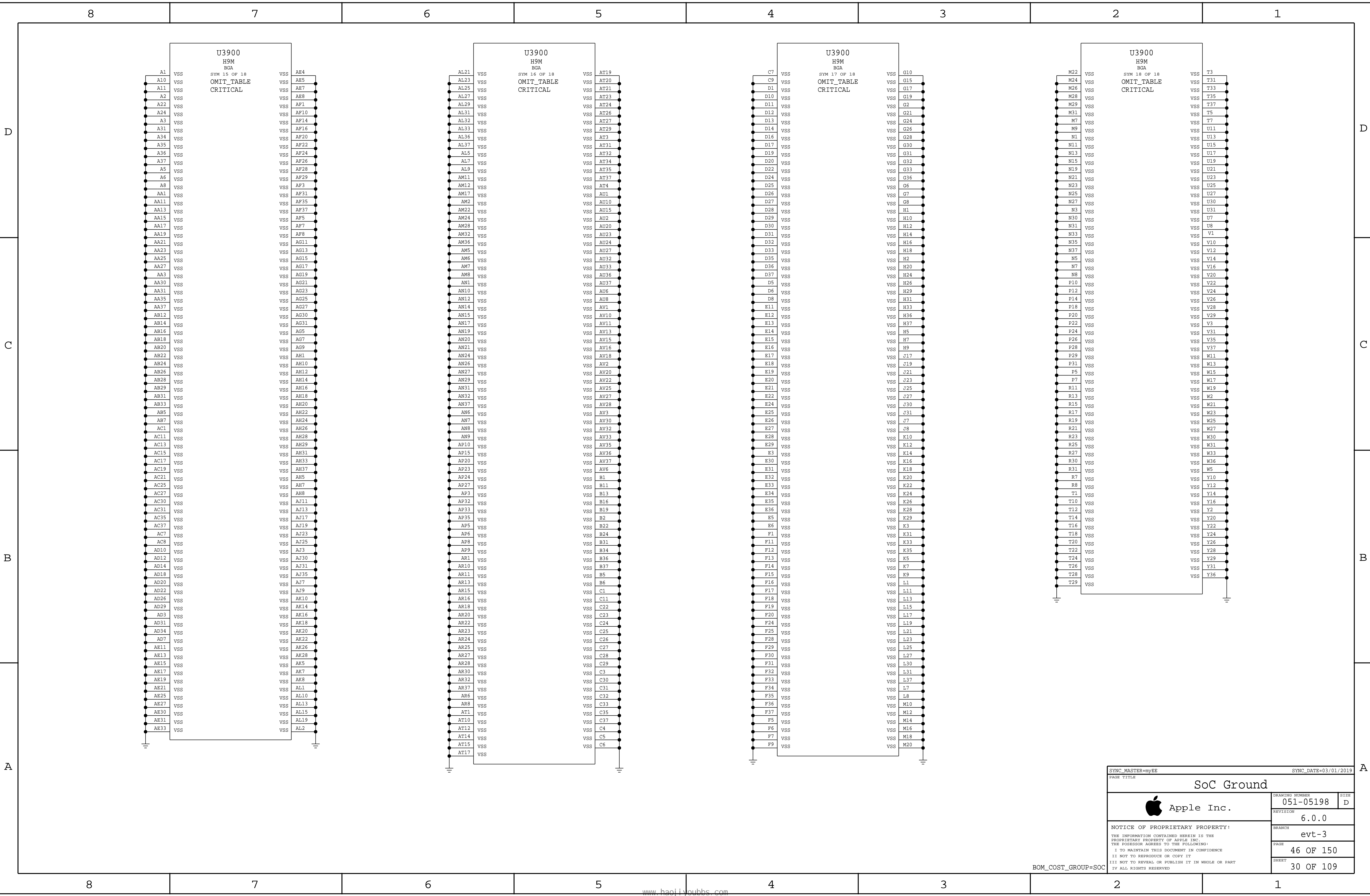
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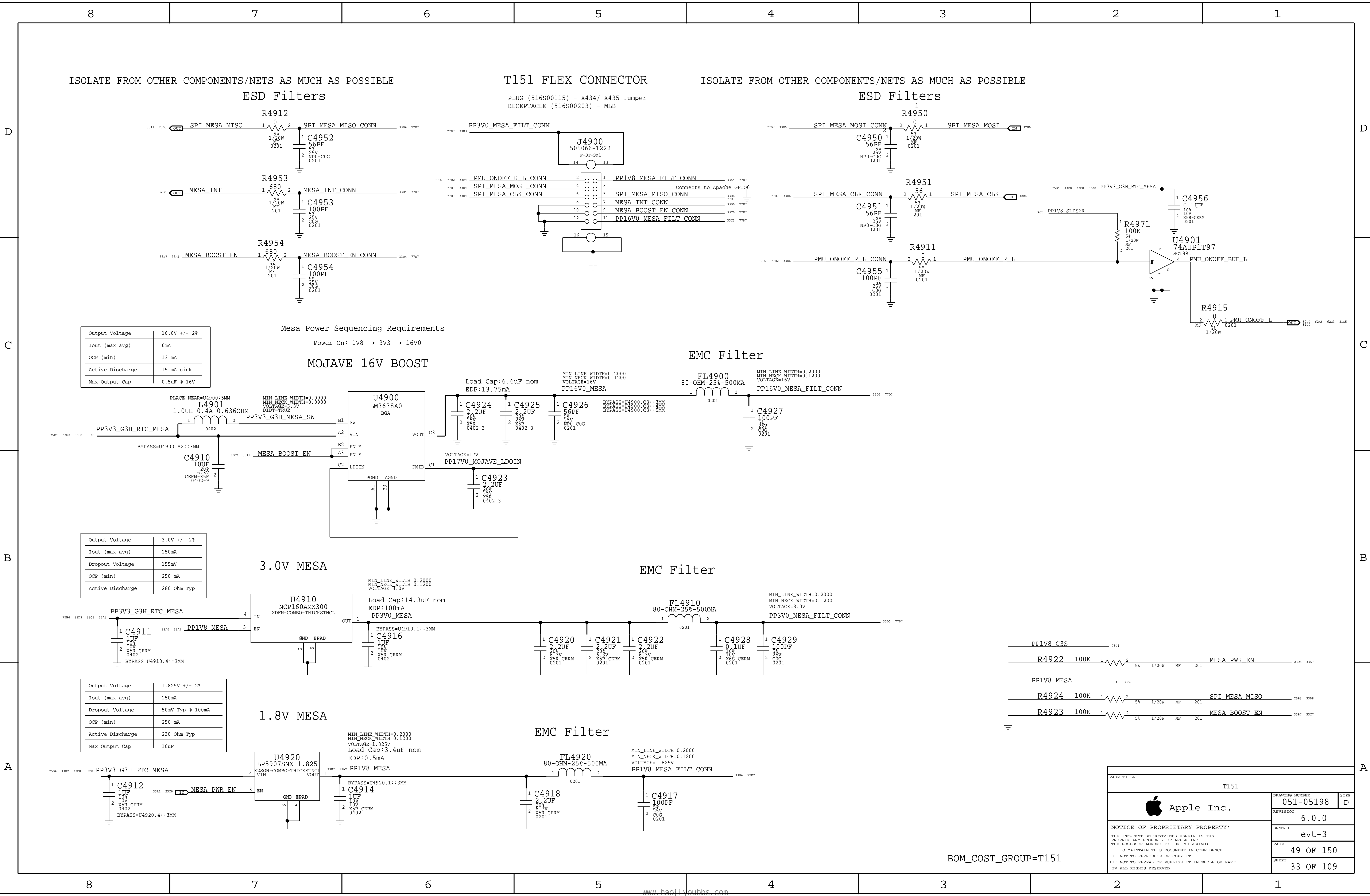
Current estimates @ 105C & 2GB from Gibraltar Power Specification Rev 0.5.3




| | | | |
|---|------------|----------------------|-----------|
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| PAGE TITLE | | | |
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|  | Apple Inc. | DRAWING NUMBER | 051-05198 |
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| | | BRANCH | evt-3 |
| | | PAGE | 44 OF 150 |
| | | SHEET | 28 OF 109 |
| | | | |



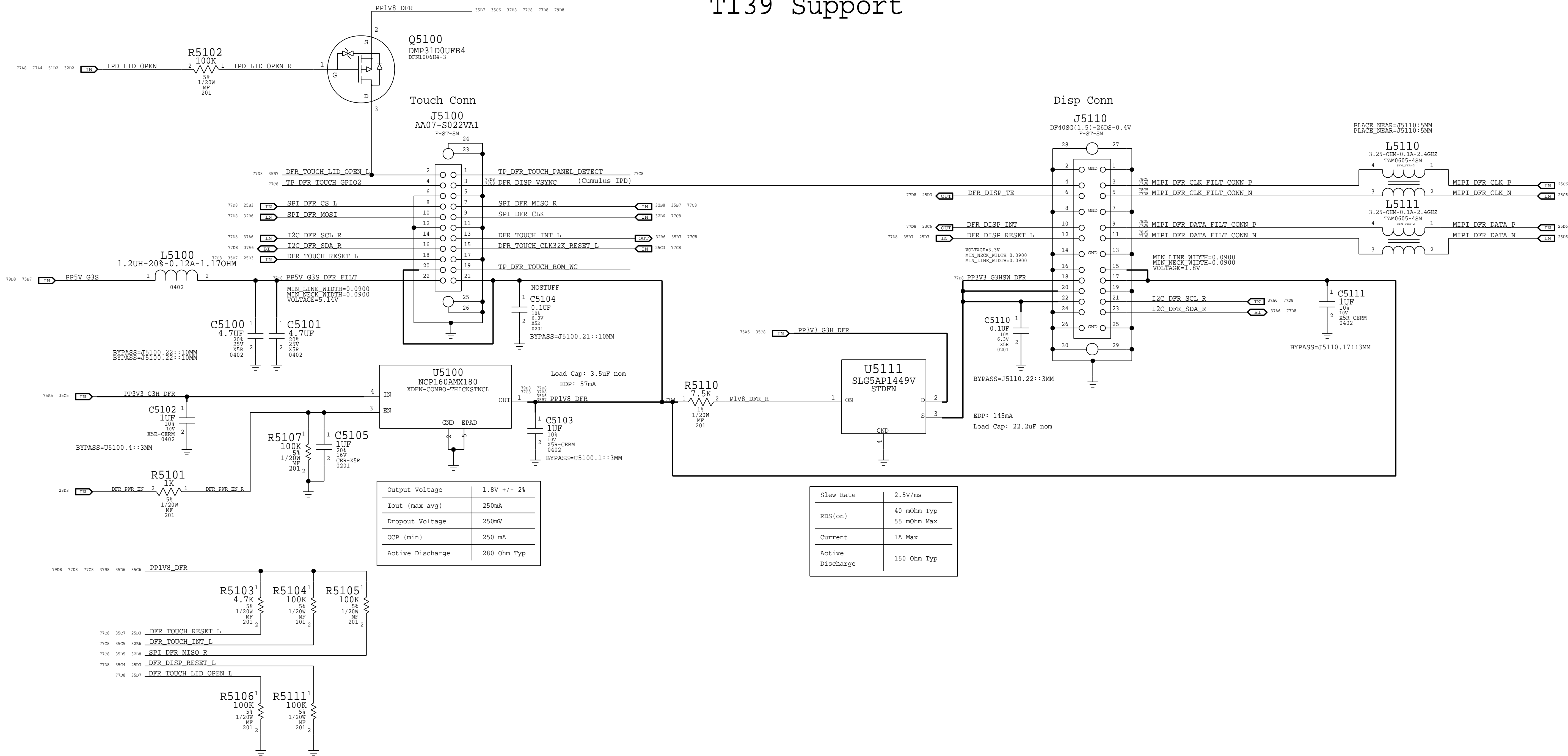
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|  Apple Inc. | DRAWING NUMBER | | SIZE |
| | 051-05198 | | D |
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| | | evt-3 | |
| | | PAGE | 46 OF 150 |
| | | SHEET | 30 OF 109 |




BOM_COST_GROUP=T151

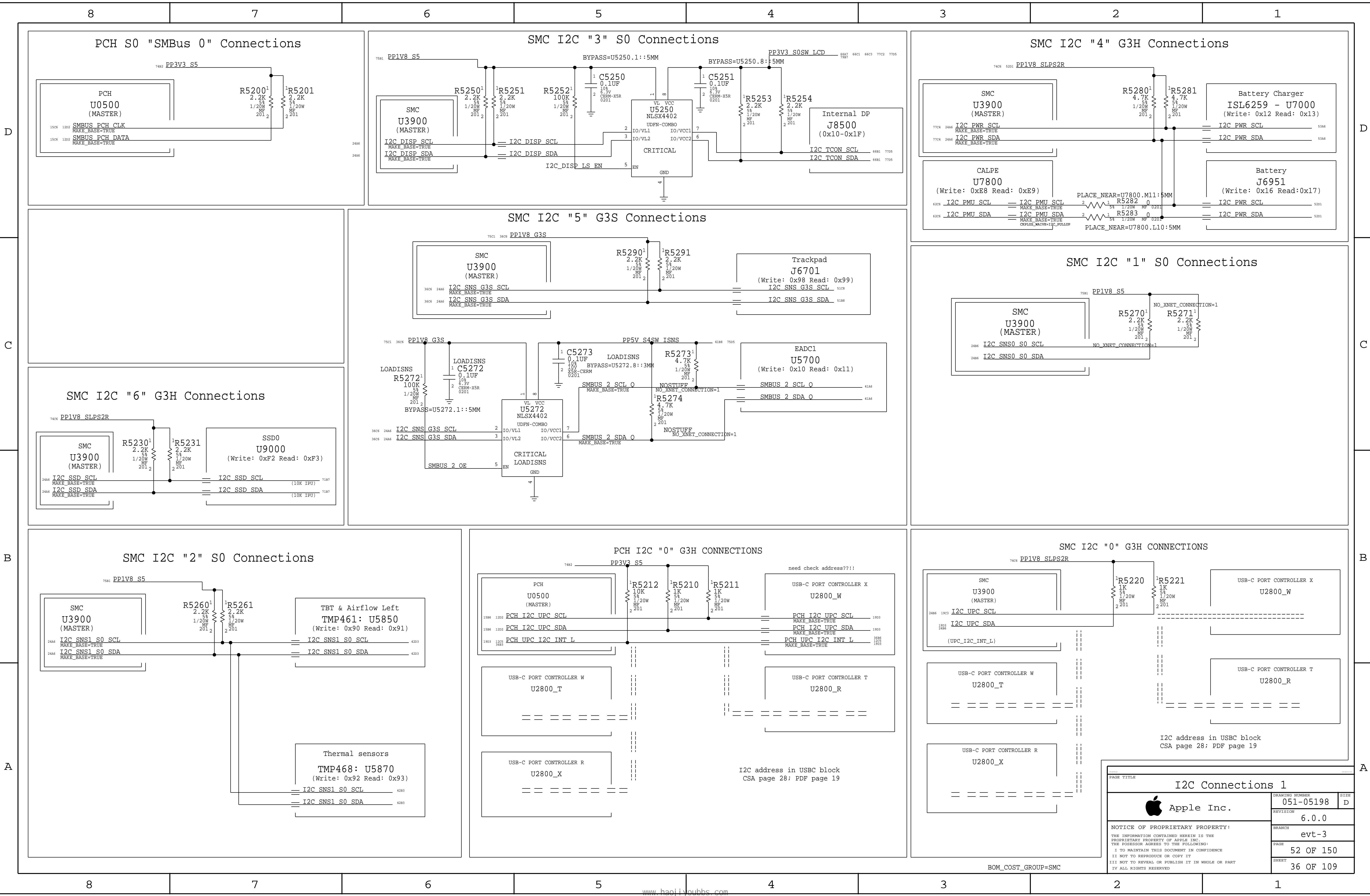
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| PAGE TITLE | | |
| T151 | | |
|  Apple Inc. | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 49 OF 150 |
| | SHEET | 33 OF 109 |

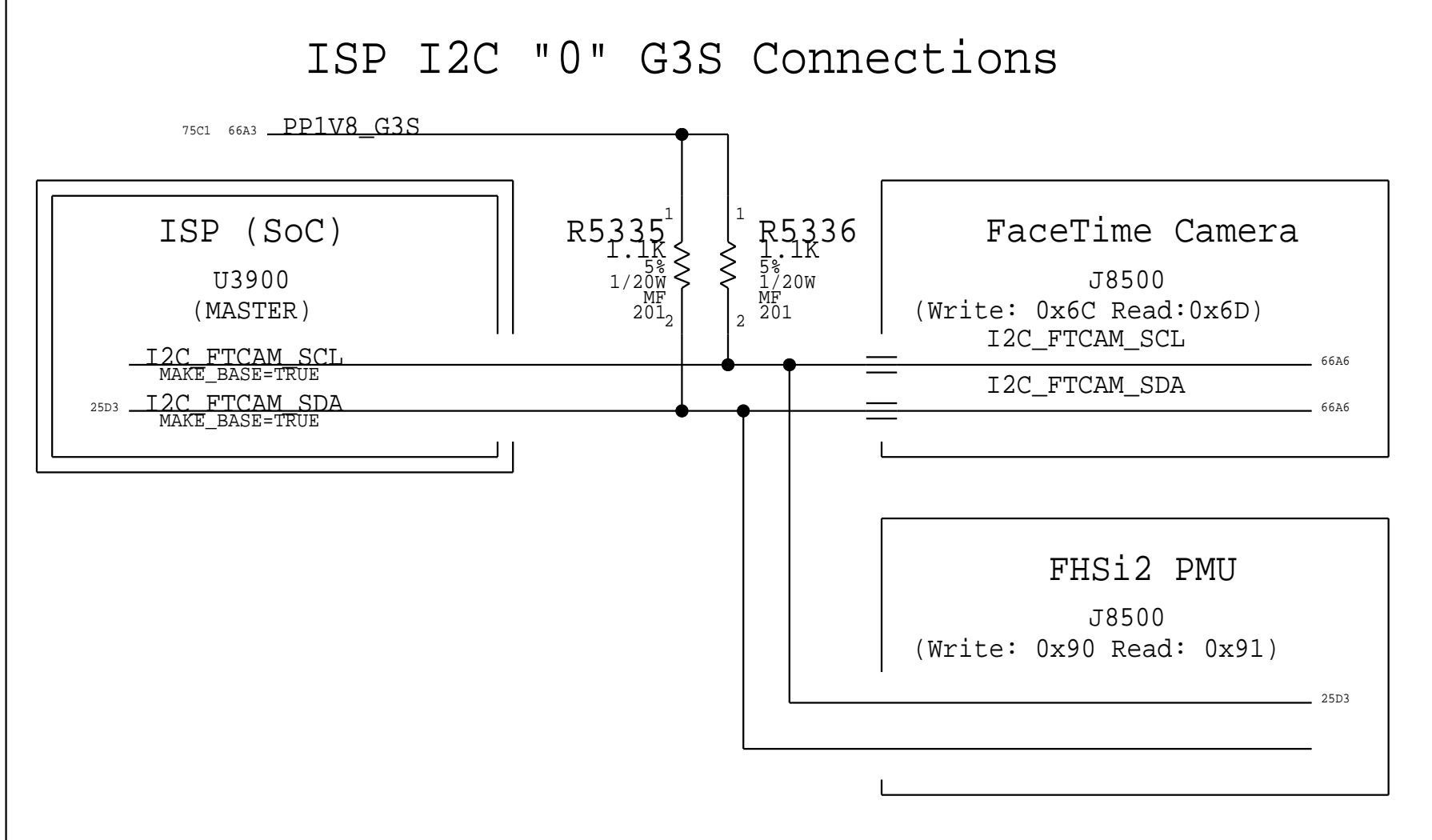
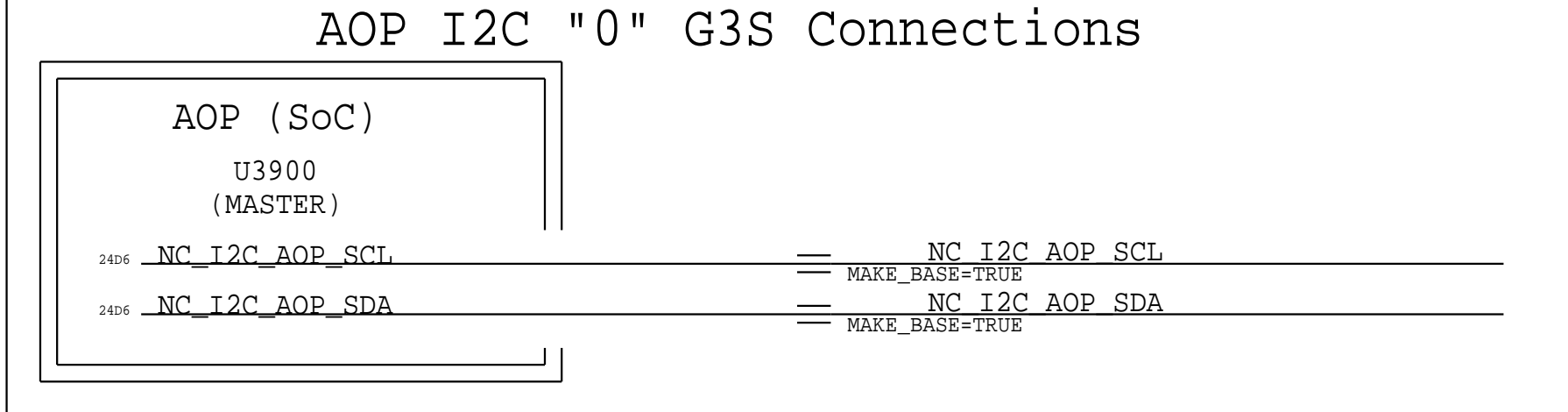
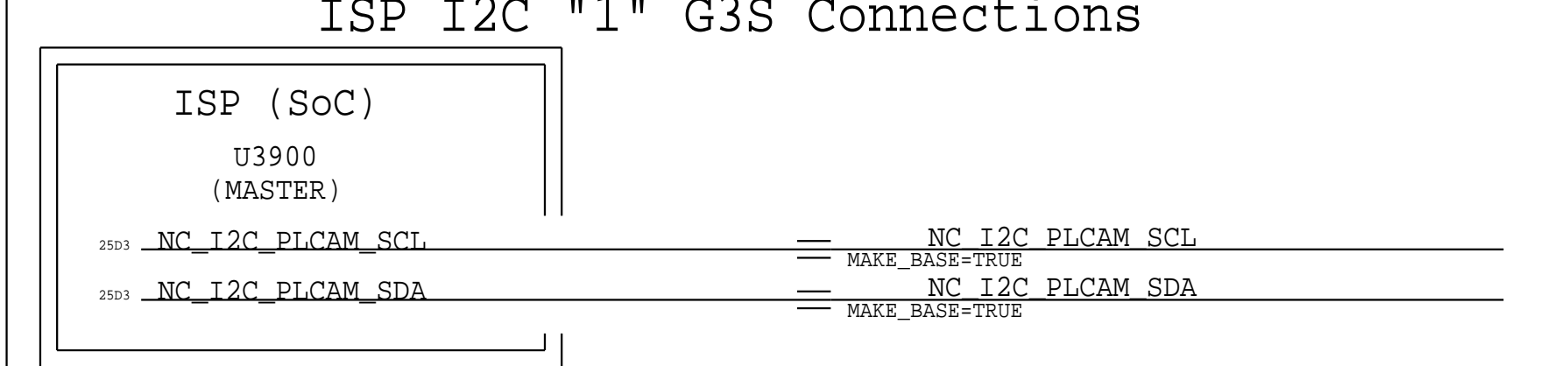
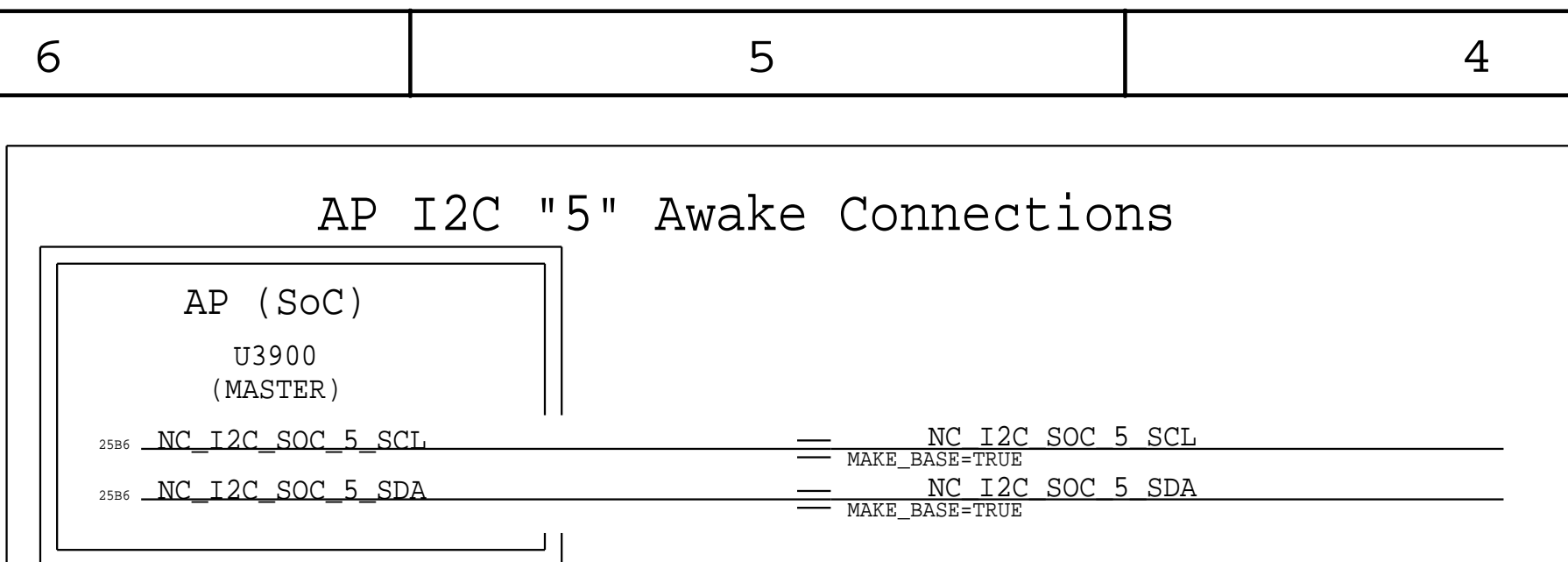
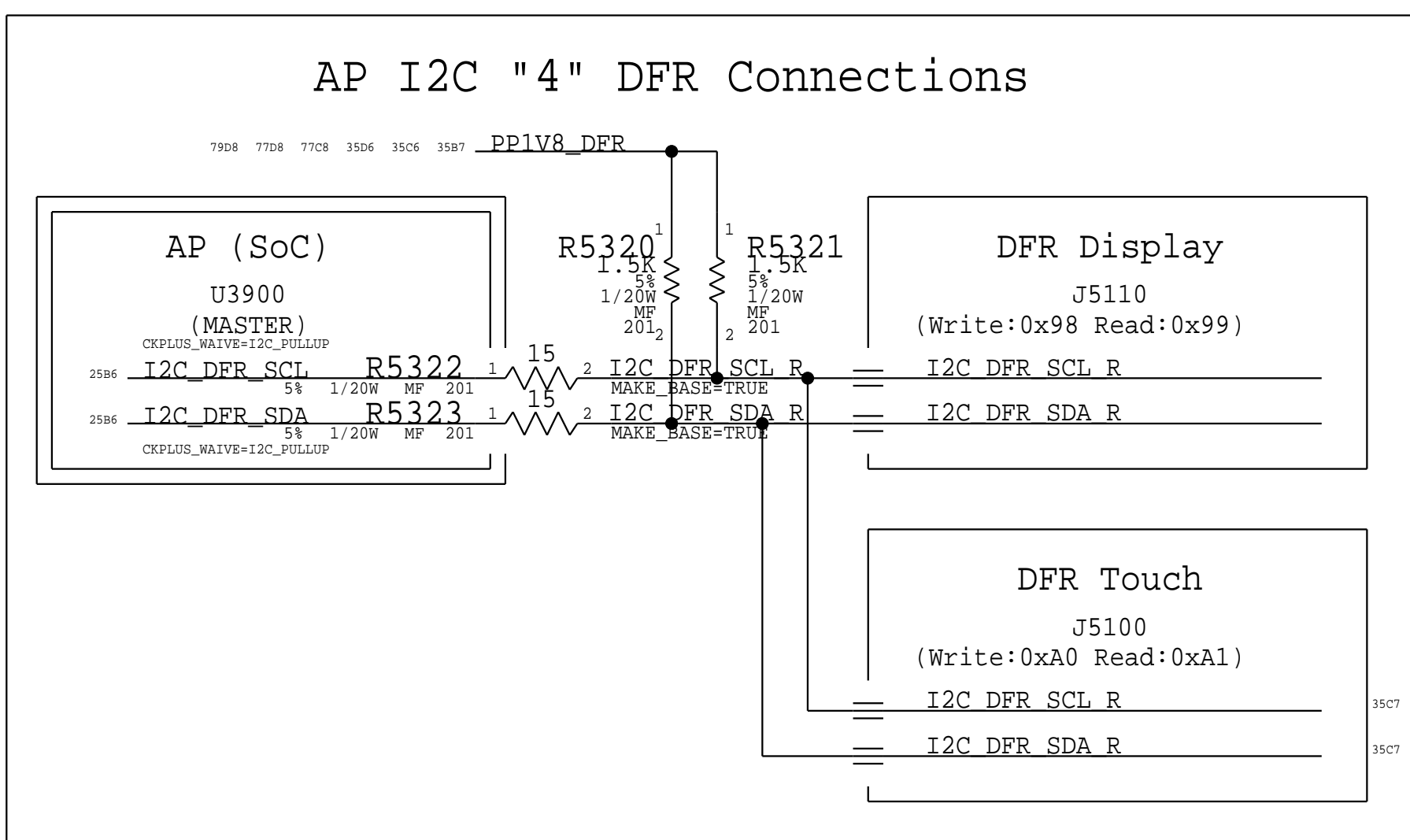
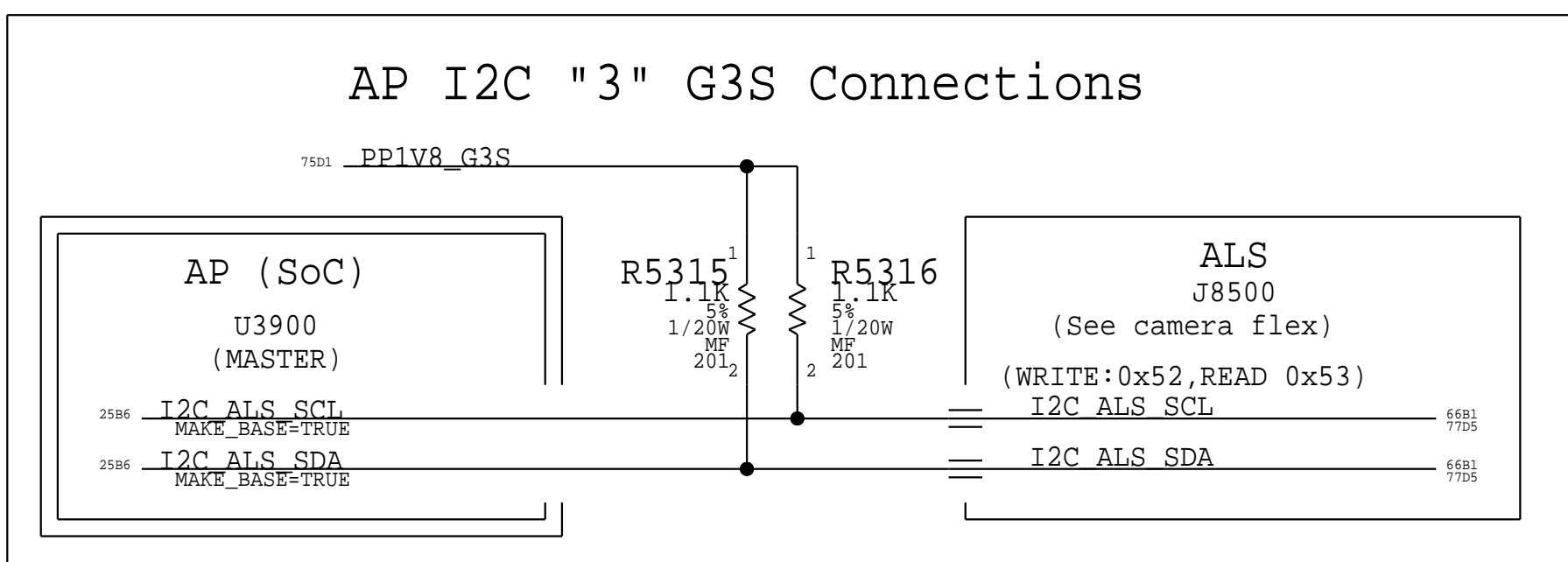
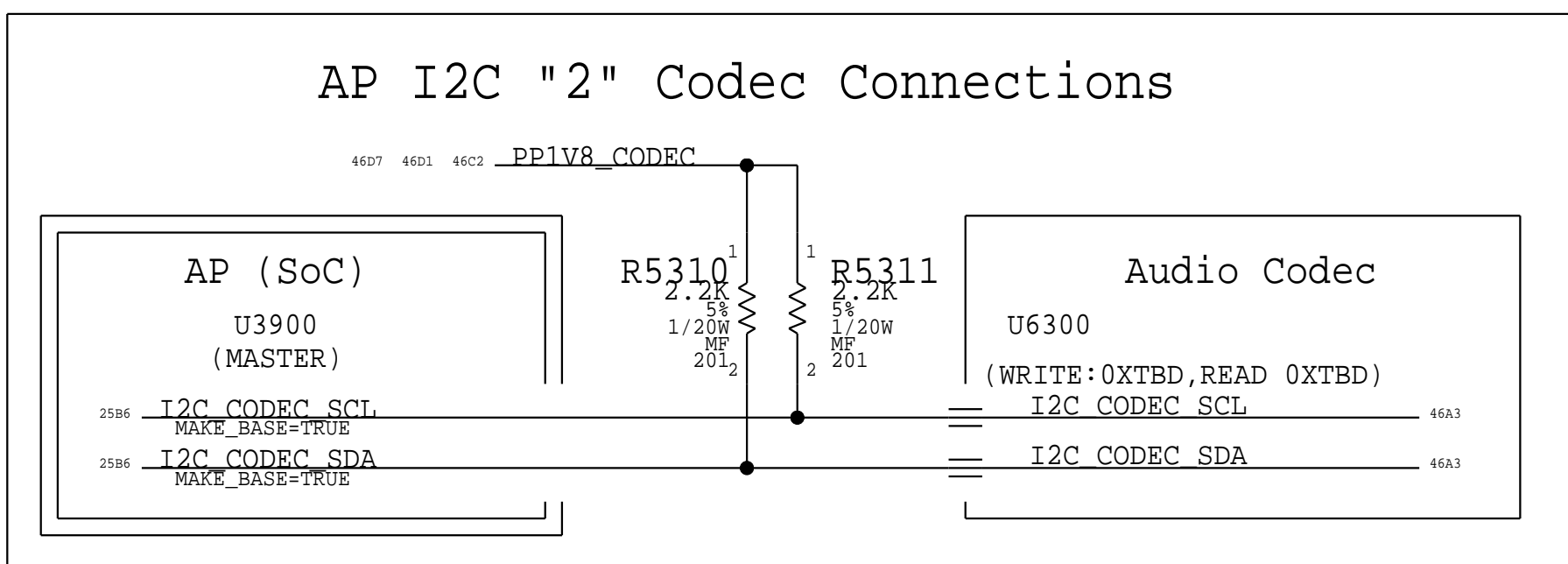
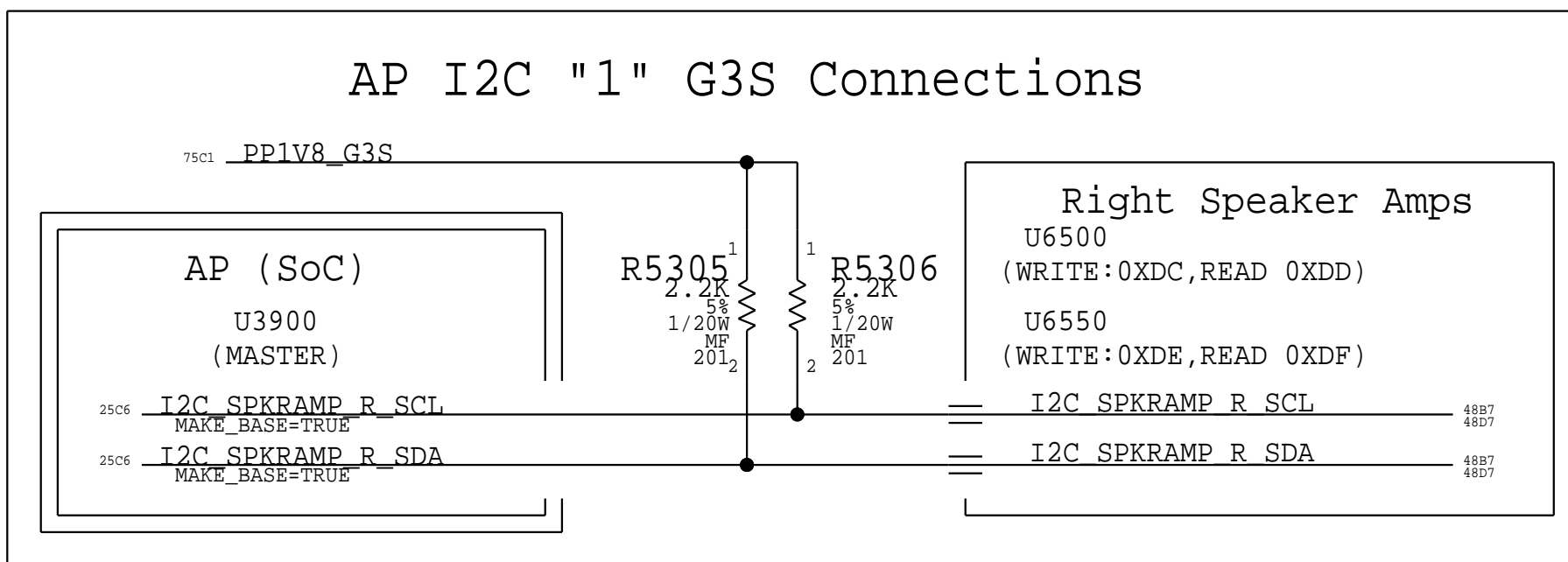
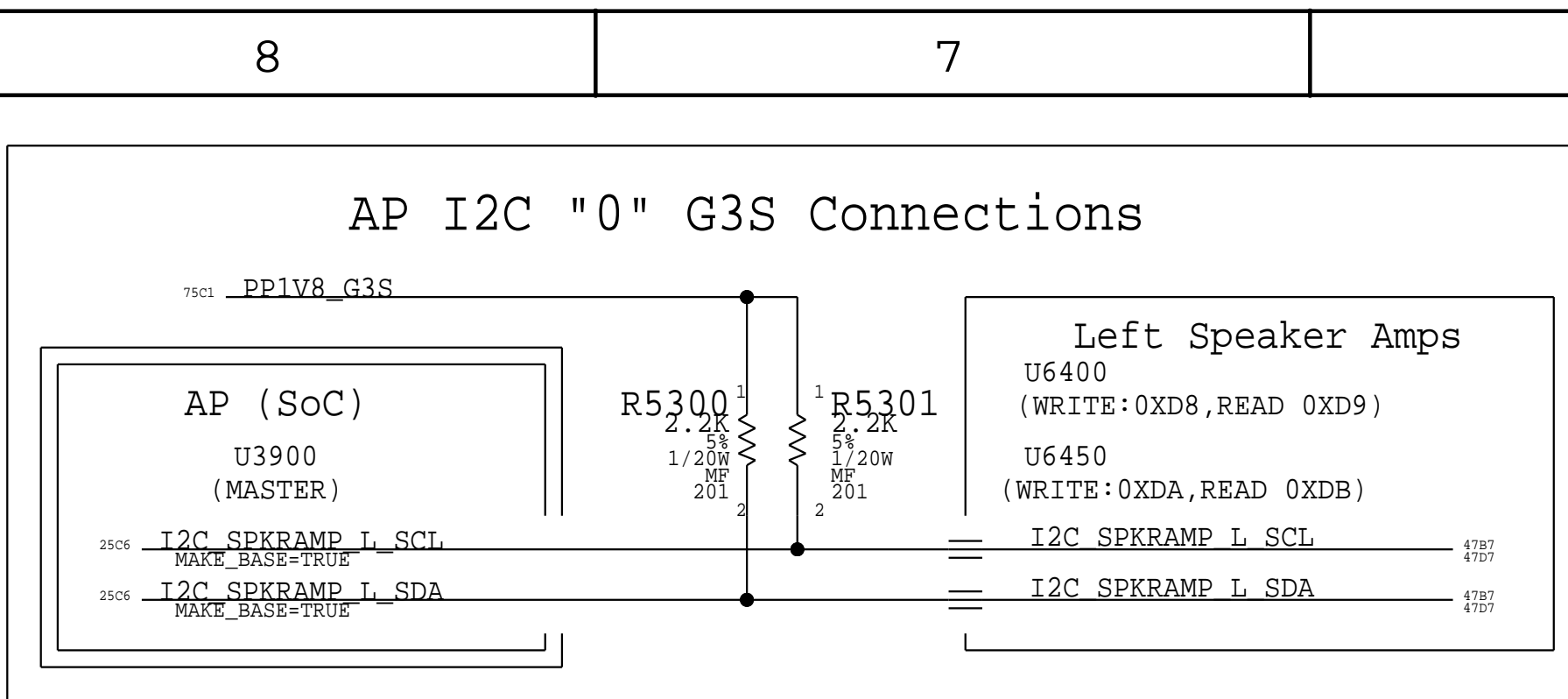
T139 Support




BOM_COST_GROUP=T139

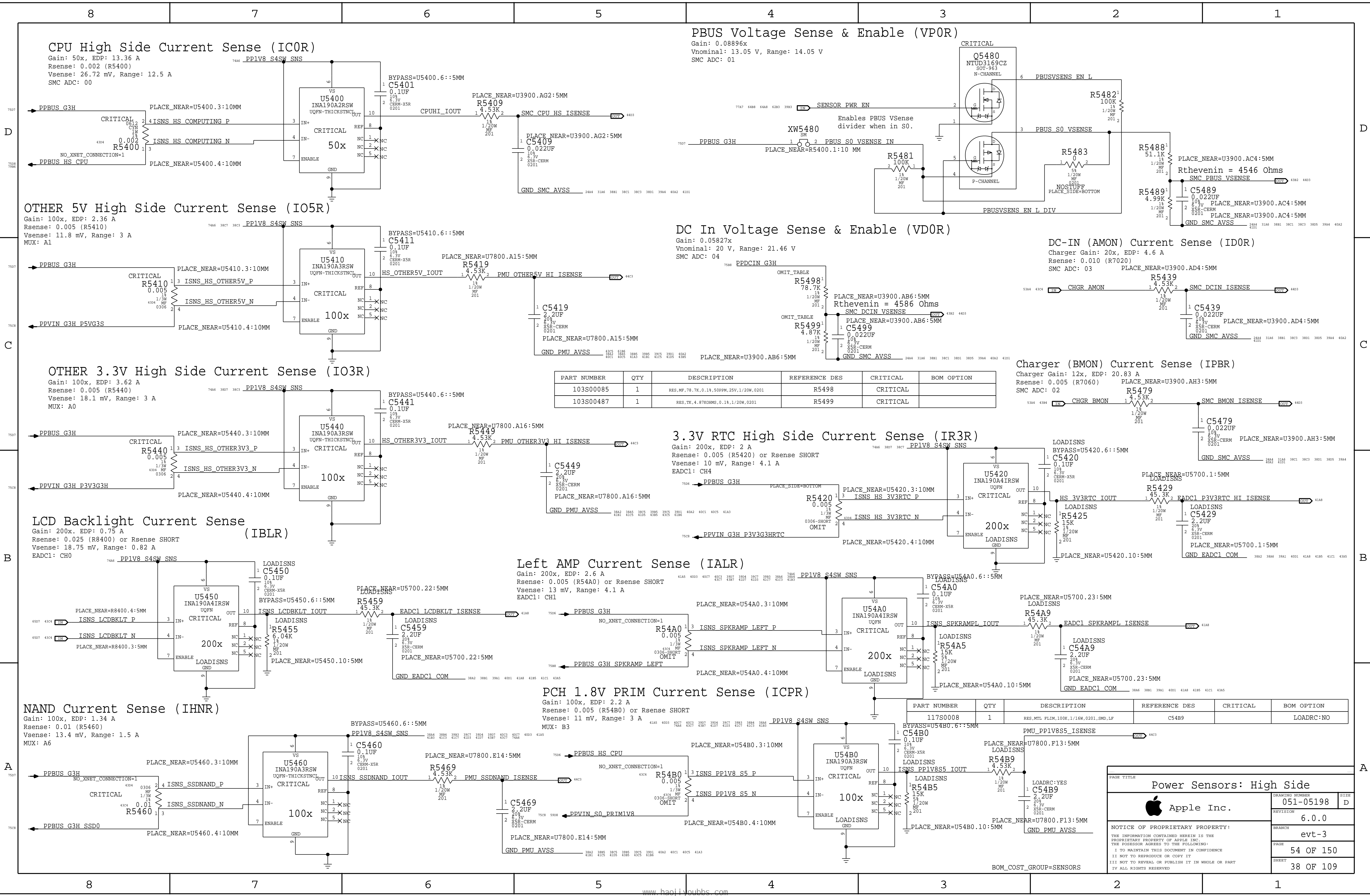
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| T139 Support | | |
|  Apple Inc. | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 51 OF 150 |
| | SHEET | 35 OF 109 |






| Device | SMC IF | ADDR. (8b) |
|-------------------------|--------|------------|
| ACE XA | I2C0 | 0X70/1 |
| ACE XB | I2C0 | 0X7E/F |
| ACE TA | I2C0 | 0X40/1 |
| ACE TB | I2C0 | 0X4E/F |
| NC. | I2C1 | |
| Temp. Sensor Left | I2C2 | 0X90/1 |
| Temp. Sensor Right | I2C2 | 0X96/7 |
| Platform Thermal Sensor | I2C2 | 0X92/3 |
| PCH | I2C2 | 0X88/9 |
| TCON | I2C3 | 0X10-1F |
| Charger | I2C4 | 0X12/3 |
| Battery | I2C4 | 0X16/7 |
| Calpe | I2C4 | 0XE8/9 |
| Trackpad | I2C5 | 0X98/9 |
| EADC1 | I2C5 | 0X10/1 |
| EADC2 | I2C5 | 0X12/3 |
| SSD | I2C6 | 0XF2/3 |
| SoC IF | | |
| Left Spkr Amp.(U6400) | I2C0 | 0XD8/9 |
| Left Spkr Amp.(U6450) | I2C0 | 0XDA/B |
| Right Spkr Amp.(U6500) | I2C1 | 0XDC/D |
| Right Spkr Amp.(U6550) | I2C1 | 0XDE/F |
| Audio Codec | I2C2 | 0X90/1 |
| ALS | I2C3 | 0X52/3 |
| DFR Display | I2C4 | 0X98/9 |
| DFR Touch | I2C4 | 0XA0/1 |
| NC. | I2C5 | |
| Spkr ID1 | I2C6 | |
| Spkr ID0 | I2C6 | |
| SIP IF | | |
| FT Camera | I2C0 | 0X6C/D |
| FHSi2 | I2C0 | 0X90/1 |
| NC. | I2C1 | |
| AOP IF | | |
| NC. | I2C0 | |

| | | | |
|---|----------------|------------|------|
| PAGE NUMBER | | PAGE TOTAL | |
| PAGE TITLE | | | |
| I2C Connections 2 | | | |
|  Apple Inc. | DRAWING NUMBER | | SIZE |
| | 051-05198 | | D |
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| | 6.0.0 | | |
| | BRANCH | | |
| | evt-3 | | |
| | PAGE | 53 OF 150 | |
| | SHEET | 37 OF 109 | |



| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|--|---------------|----------|------------|
| 103S00085 | 1 | RES,MP,78.7K,0.14,50PPM,25V,1/20W,0201 | R5498 | CRITICAL | |
| 103S00487 | 1 | RES,TK,4.87KOHMS,0.14,1/20W,0201 | R5499 | CRITICAL | |

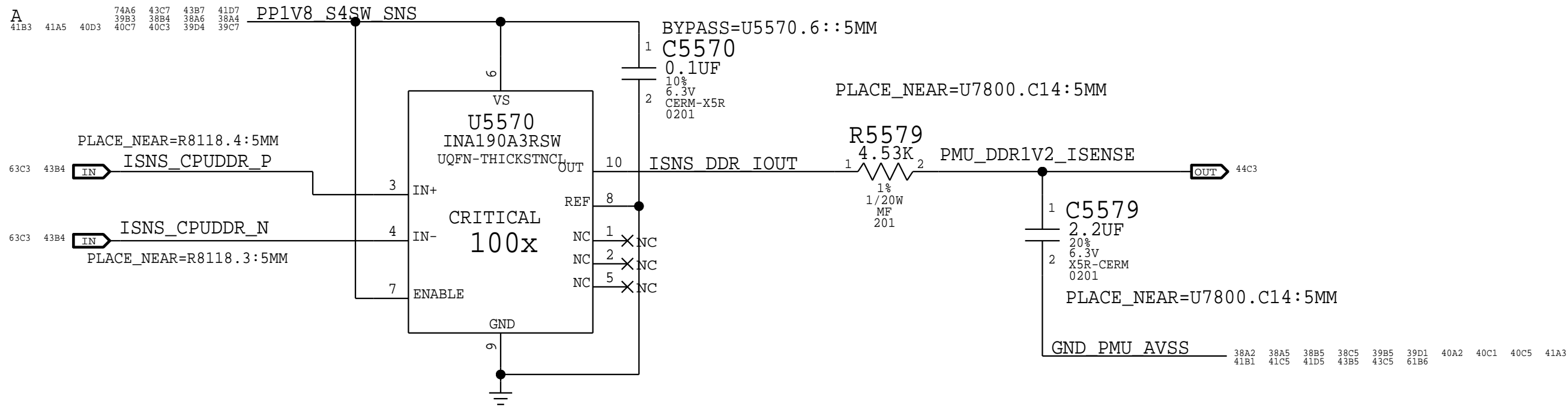
| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|------------|
| 117S0008 | 1 | RES,MTL,FLIM,100K,1/16W,0201,SMD,LF | C54B9 | | LOADRC:NO |

| | | | | |
|--|--|----------------|--------------------------|------|
| PAGE TITLE | | | Power Sensors: High Side | |
|  Apple Inc. | | DRAWING NUMBER | 051-05198 | SIZE |
| | | REVISION | 6.0.0 | D |
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| | | PAGE | 54 OF 150 | |
| | | SHEET | 38 OF 109 | |

D

DDR 1.1V S3 (CPU & Memory) Current Sense (IM0C)

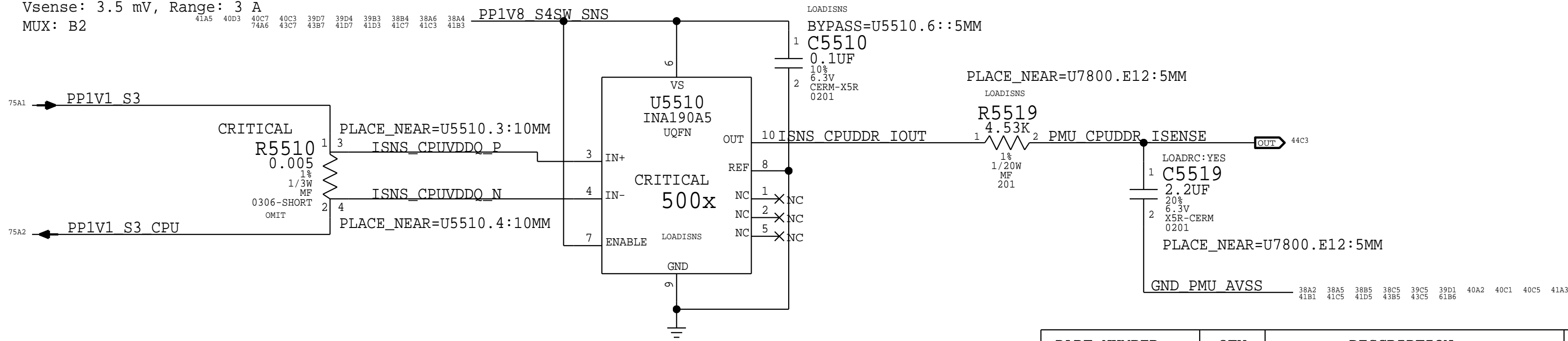
Gain: 100x, EDP: 6.9 A
Rsense: 0.002 (R8118)
Vsense: 13.8 mV, Range: 7.5 A
MUX: A4



C

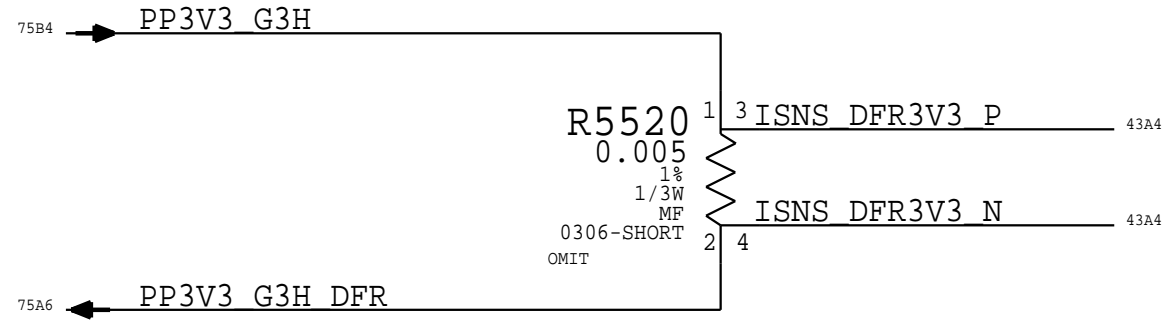
CPU DDR 1.1V S3 (CPU Only) Current Sense (IMCC)

Gain: 500x, EDP: 3.5 A
Rsense: 0.001 (R5510) or Rsense SHORT
Vsense: 3.5 mV, Range: 3 A
MUX: B2



B

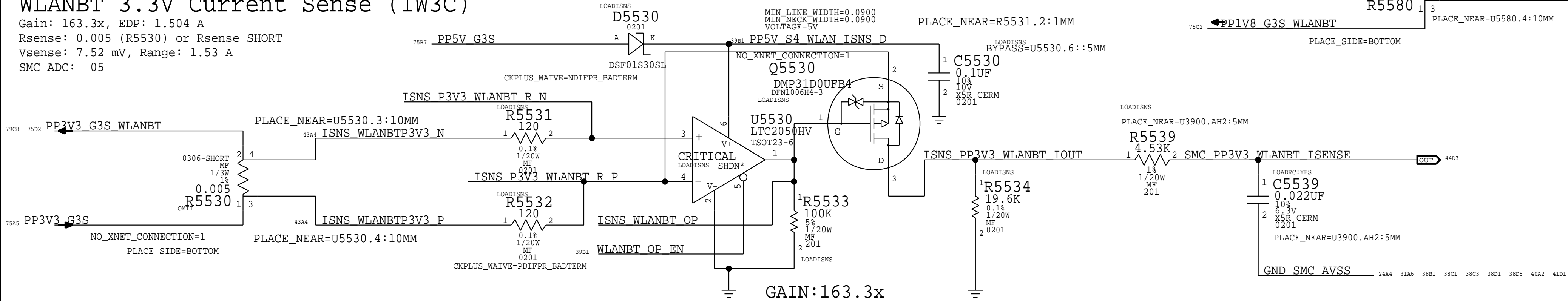
DFR Current Sense



A

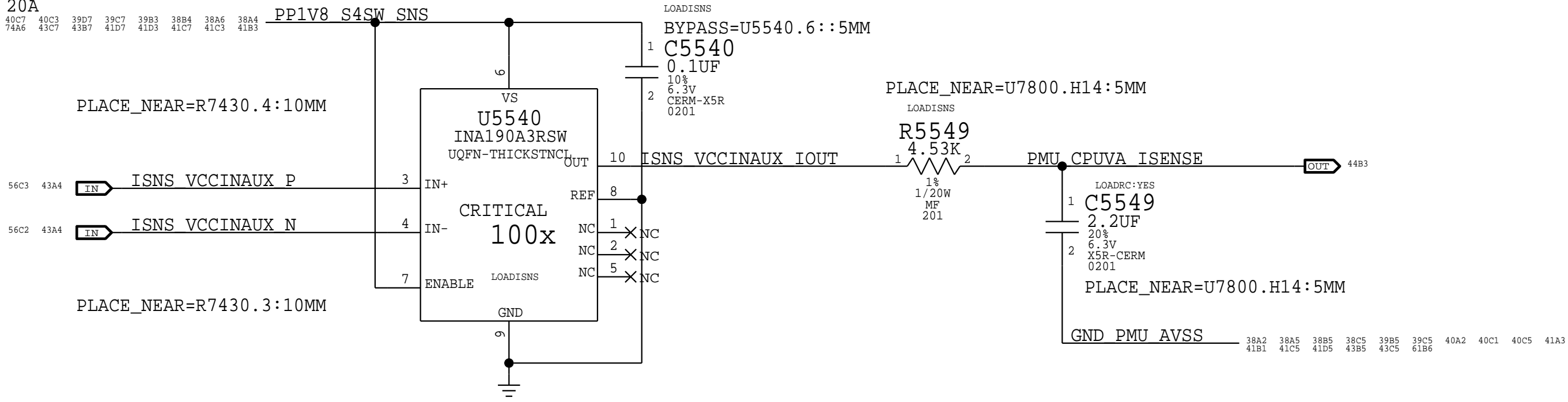
WLANBT 3.3V Current Sense (IW3C)

Gain: 163.3x, EDP: 1.504 A
Rsense: 0.005 (R5530) or Rsense SHORT
Vsense: 7.52 mV, Range: 1.53 A
SMC ADC: 05



CPU VCCIN_AUX 1.8V Current Sense (ICAC)

Gain: 100x, EDP: 19 A
Rsense: 0.00075 (R7430)
Vsense: 14.25 mV, Range: 20A
MUX: B2



D

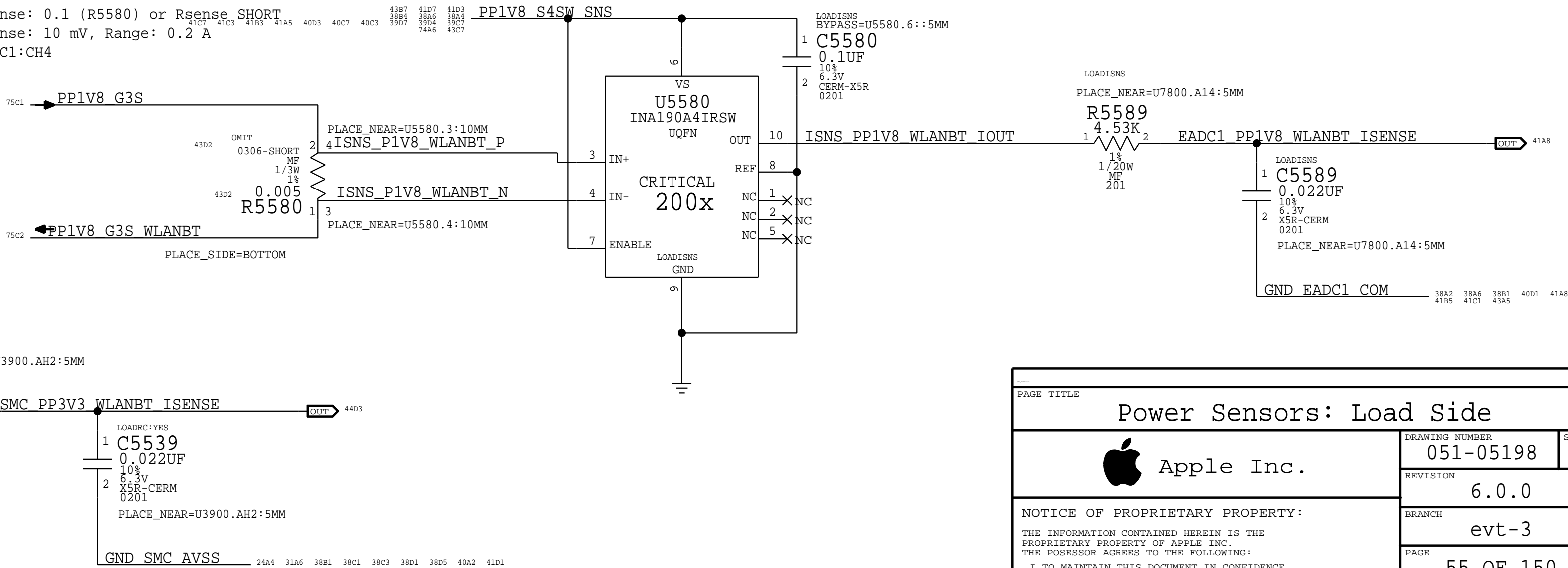
C

B

A

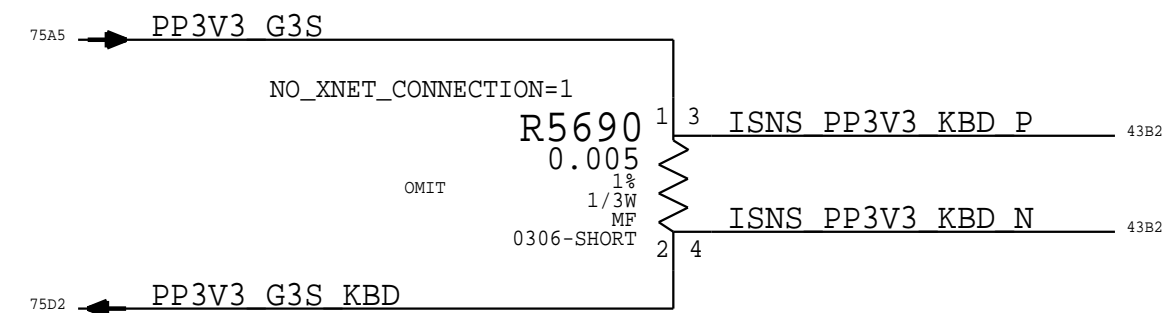
WLANBT 1.8V Current Sense (IW2C)

Gain: 200x, EDP: 0.1 A
Rsense: 0.1 (R5580) or Rsense SHORT
Vsense: 10 mV, Range: 0.2 A
EADC1:CH4



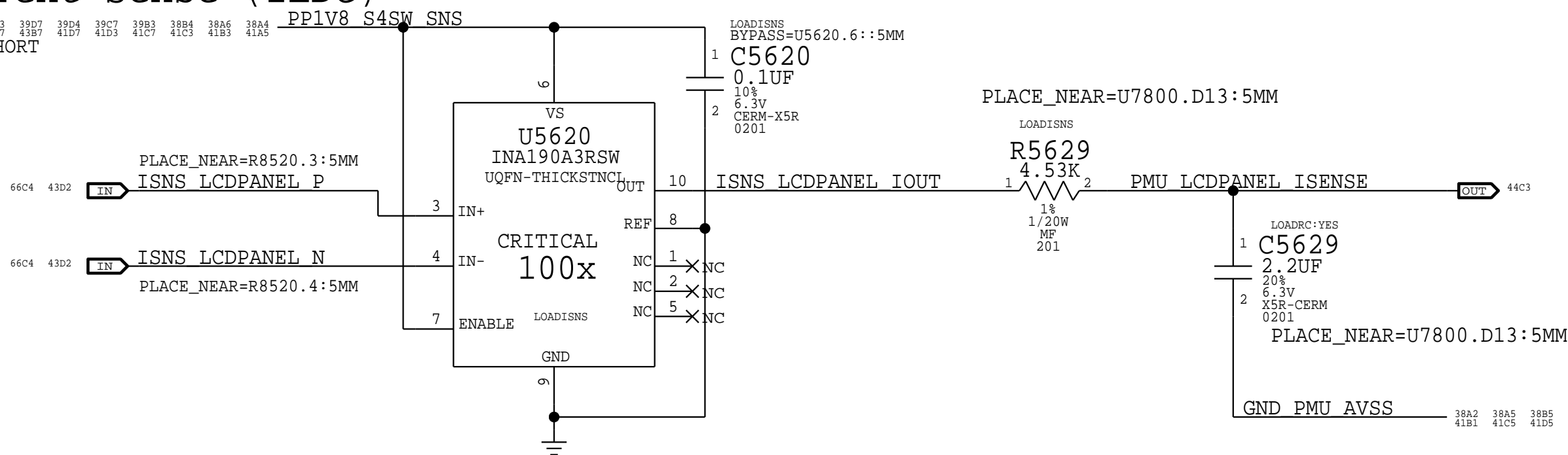
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|---|----------------|-----------|
| Power Sensors: Load Side | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 55 OF 150 |
| | SHEET | 39 OF 109 |

Keyboard 3V Current Sense

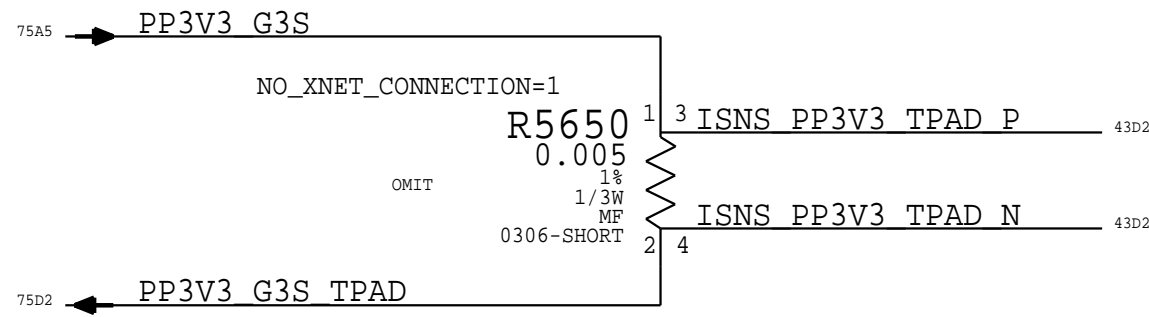


LCD Panel 3V Current Sense (ILDC)

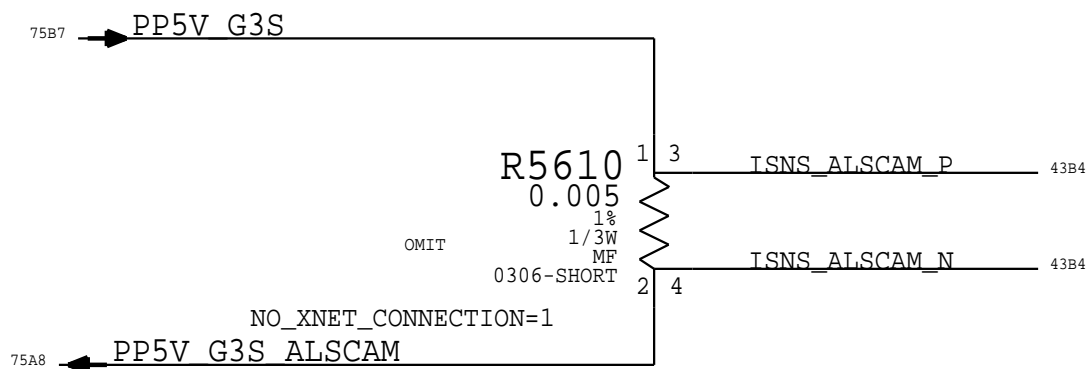
Gain: 100x. EDP: 1 A
RSENSE: 0.01 (R8520) or Rsense SHORT
Vsense: 10 mV, Range: 1.5 A
MUX: B0



Trackpad 3V Current Sense

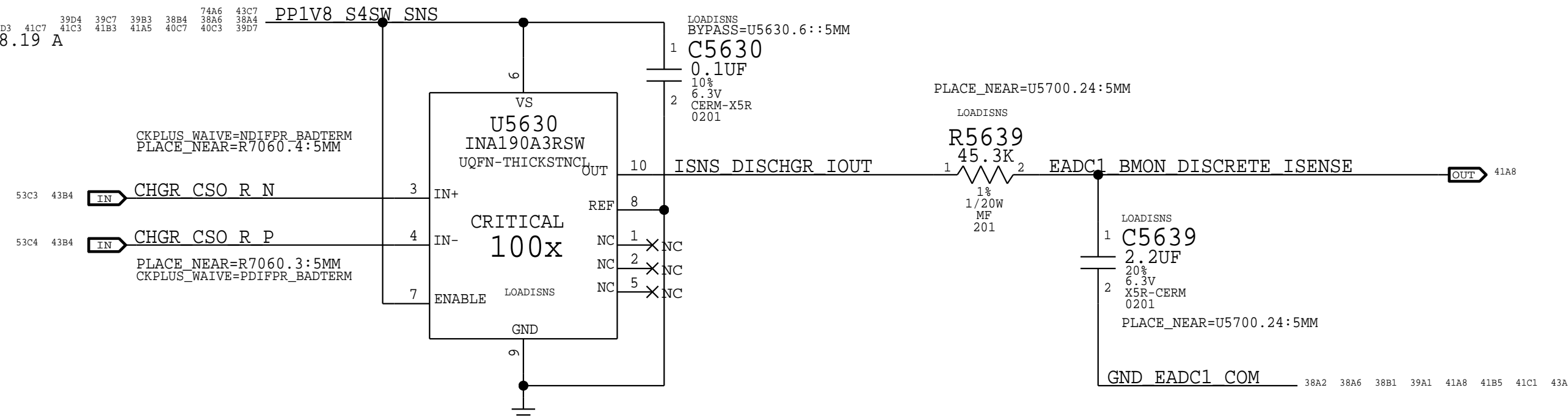


ALS/Camera Current Sense (ICMC)



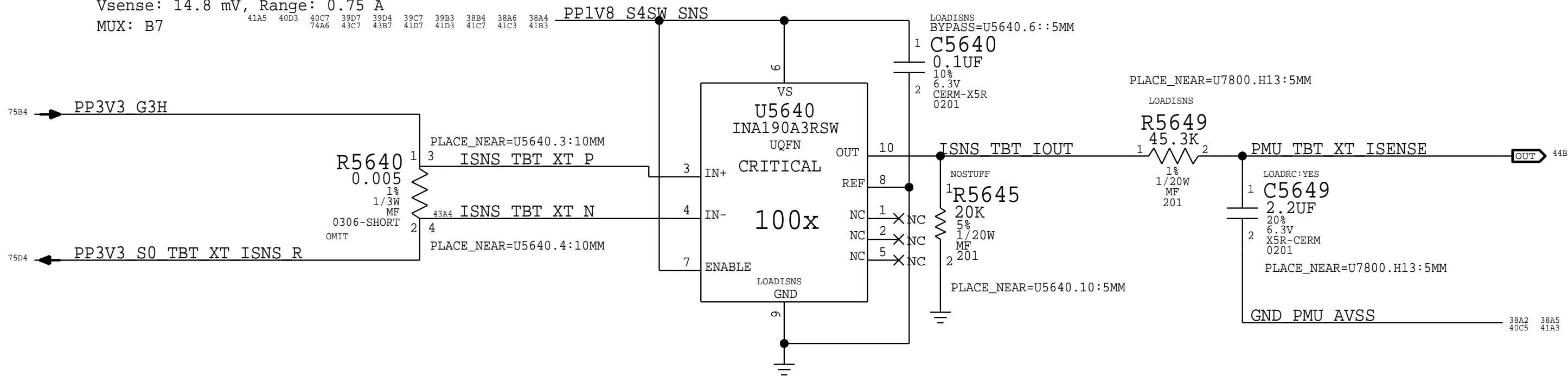
Battery Discrete Current Sense (IPOR)

Gain: 100x. EDP: 8 A
Rsense: 0.005 (R7060)
Vsense: 40 mV, Range: 8.19 A
EADC2: CH5

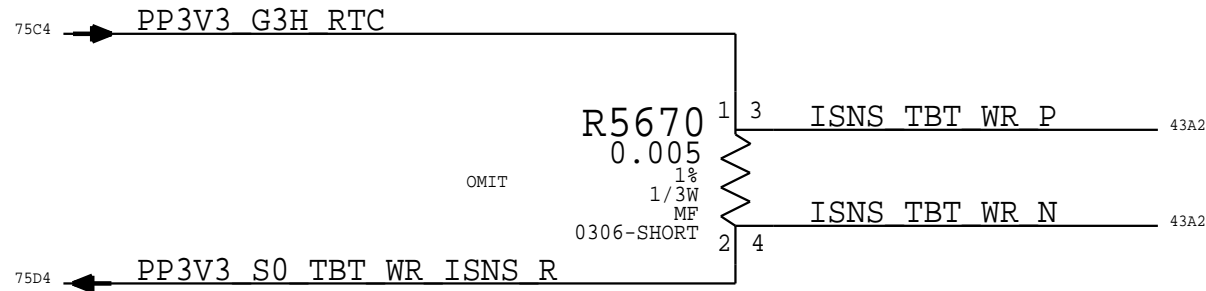


Thunderbolt TBT Current Left (IULC)

Gain: 100x. EDP: 0.74 A
Rsense: 0.02 (R5640) or Rsense SHORT
Vsense: 14.8 mV, Range: 0.75 A
MUX: B7



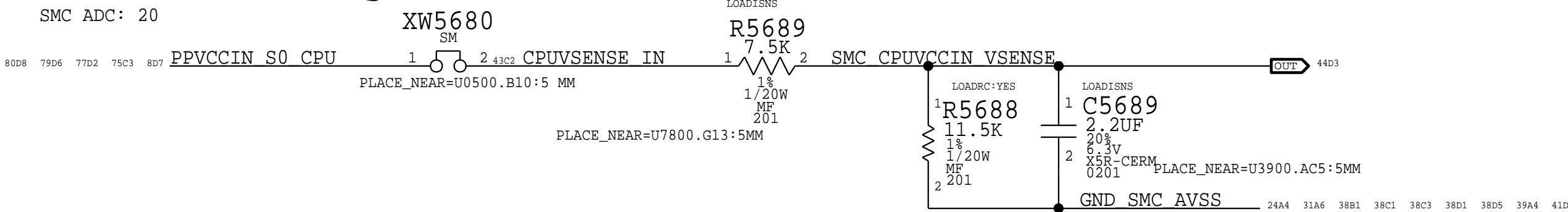
Thunderbolt TBT Current Right



| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|------------|
| 117S0008 | 2 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | C5649,C5629 | | LOADRC:NO |
| 117S0008 | 0 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | | | LOADRC:NO |
| 117S0008 | 2 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | R5608,R5688 | | LOADRC:NO |

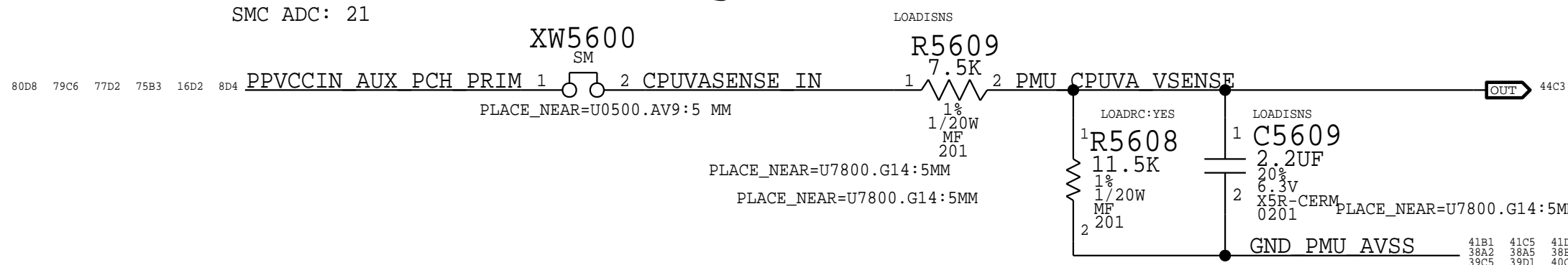
CPU VCCIN Voltage Sense (VCVC)

SMC ADC: 20



CPU VCCIN_AUX Voltage Sense (VCAC)

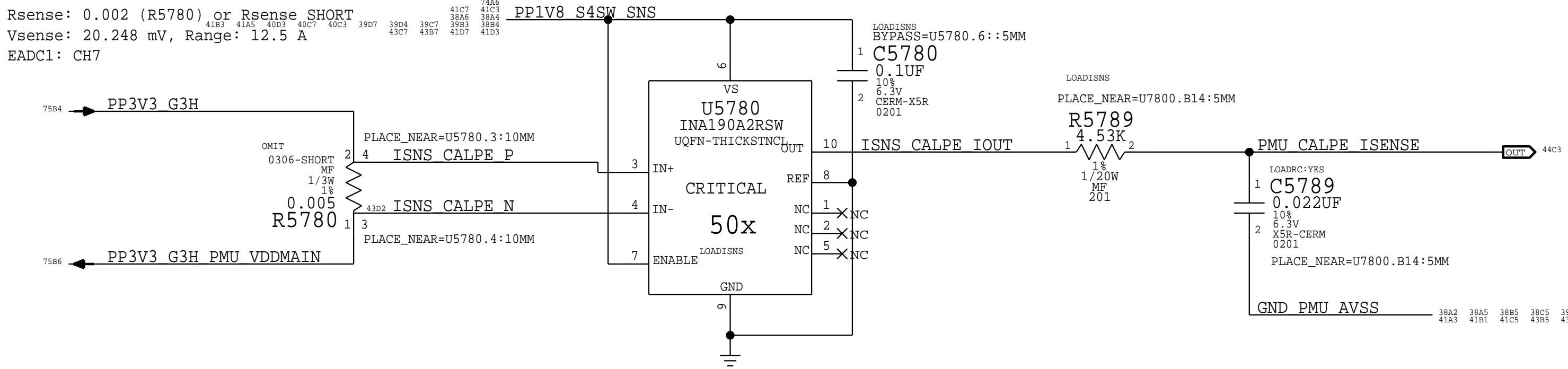
SMC ADC: 21



| PAGE TITLE | | |
|---|----------------|-----------|
| Power Sensors: Extended | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 56 OF 150 |
| | SHEET | 40 OF 109 |

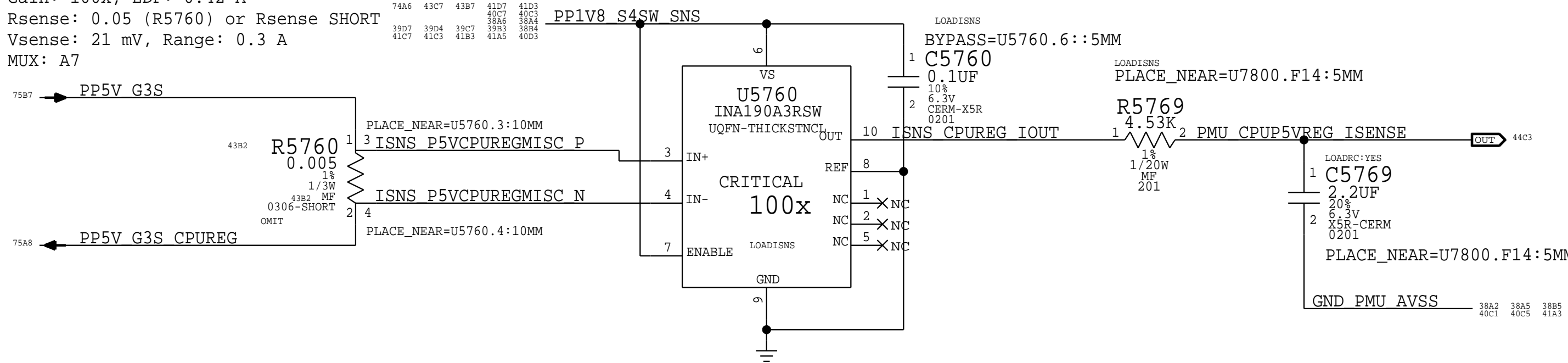
CALPE 3.3V INPUT Current Left (IP3C)

Gain: 50x, EDP: 10.124 A
Rsense: 0.002 (R5780) or Rsense SHORT
Vsense: 20.248 mV, Range: 12.5 A
EADC1: CH7



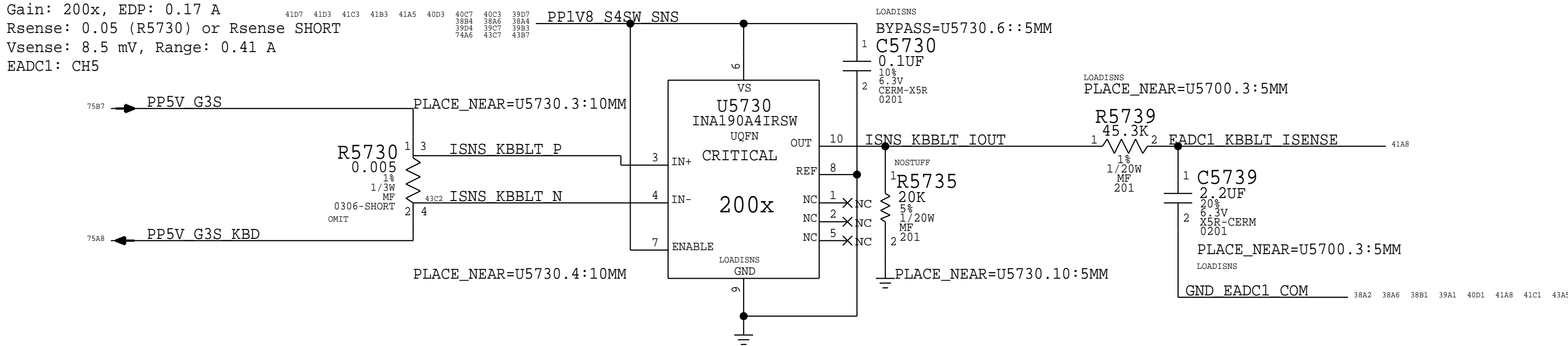
CPU REG.5V Current Sense (IC5C)

Gain: 100x, EDP: 0.42 A
Rsense: 0.05 (R5760) or Rsense SHORT
Vsense: 21 mV, Range: 0.3 A
MUX: A7

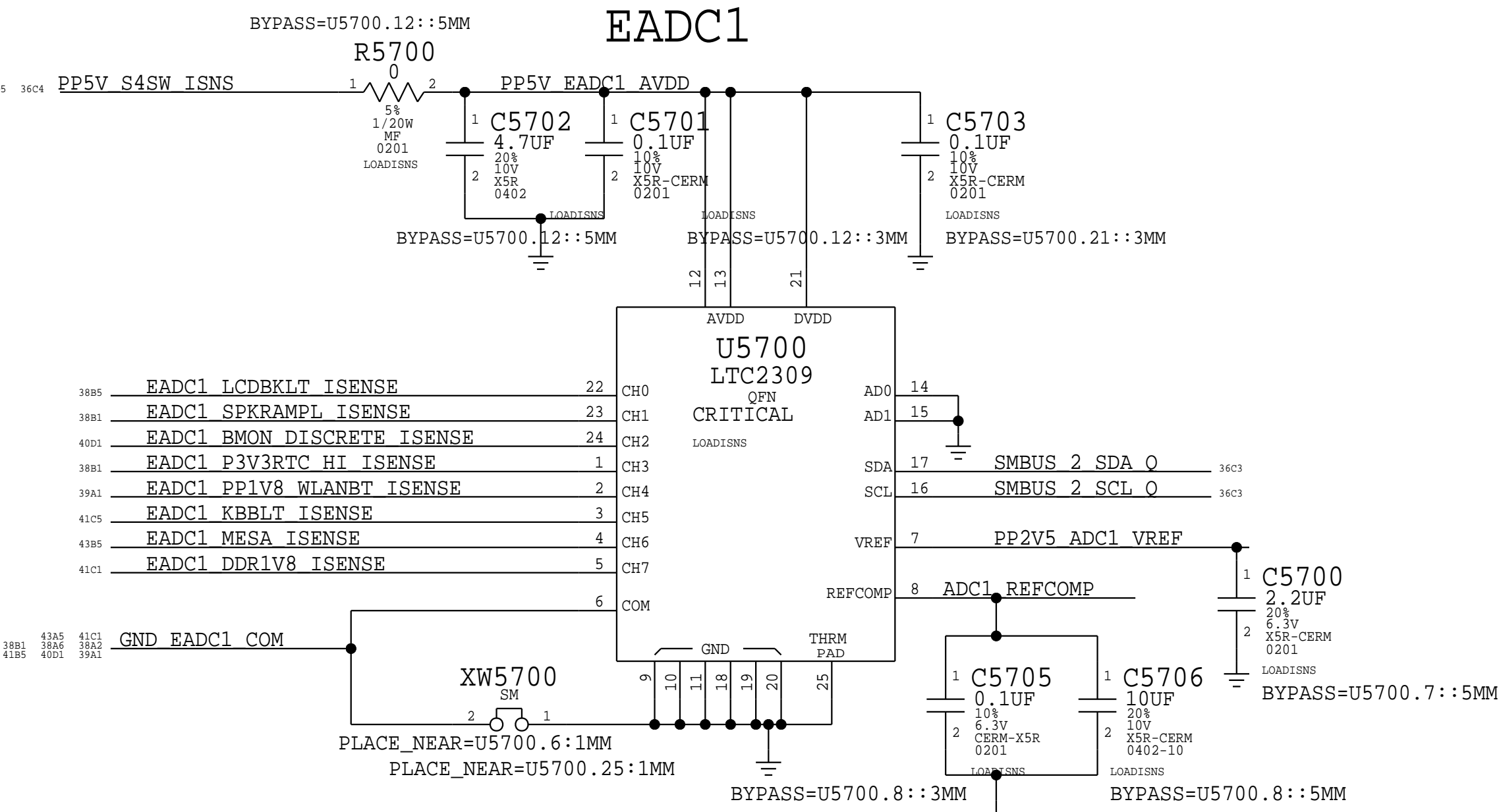


KB backlite Current Sense (IKBC)

Gain: 200x, EDP: 0.17 A
Rsense: 0.05 (R5730) or Rsense SHORT
Vsense: 8.5 mV, Range: 0.41 A
EADC1: CH5

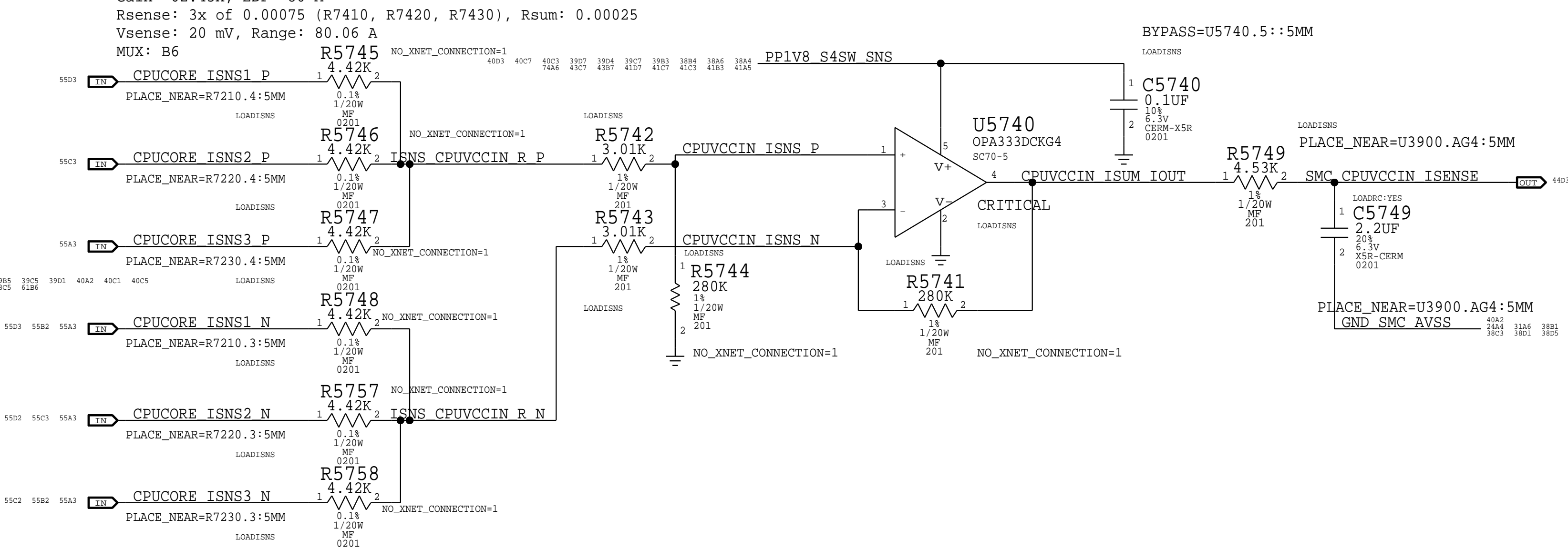


EADC1



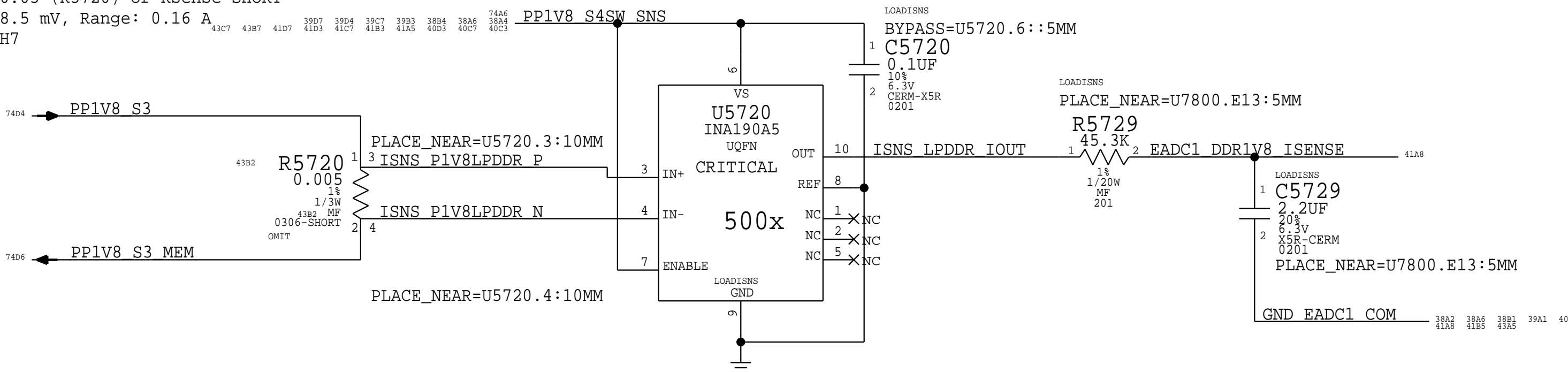
CPU VCCin Current Sense (ICVC)

Gain: 62.45x, EDP: 80 A
Rsense: 3x of 0.00075 (R7410, R7420, R7430), Rsum: 0.00025
Vsense: 20 mV, Range: 80.06 A
MUX: B6



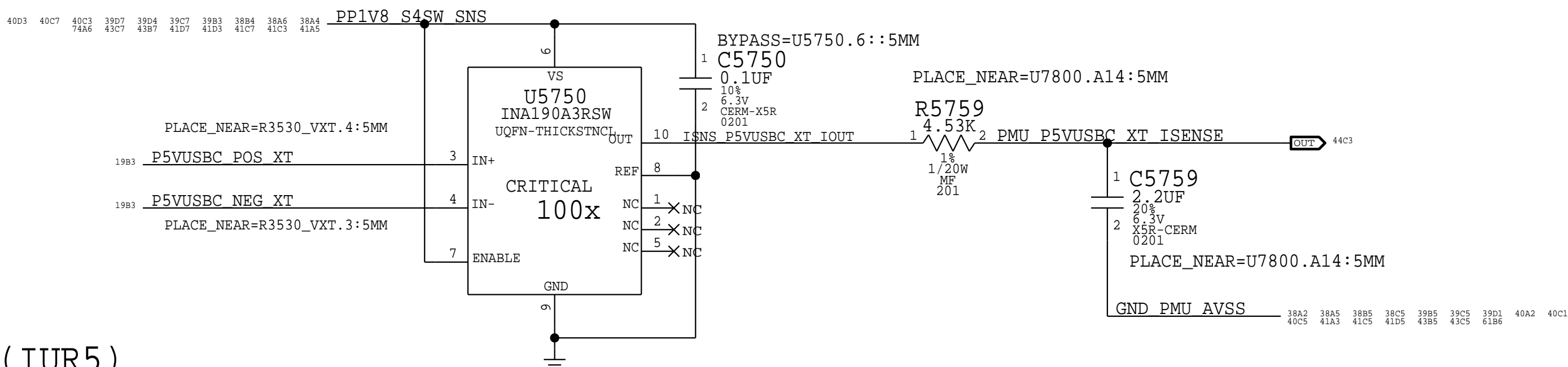
LPDDR 1.8V Current Sense (IM1C)

Gain: 500x, EDP: 0.17 A
Rsense: 0.05 (R5720) or Rsense SHORT
Vsense: 8.5 mV, Range: 0.16 A
EADC1: CH7



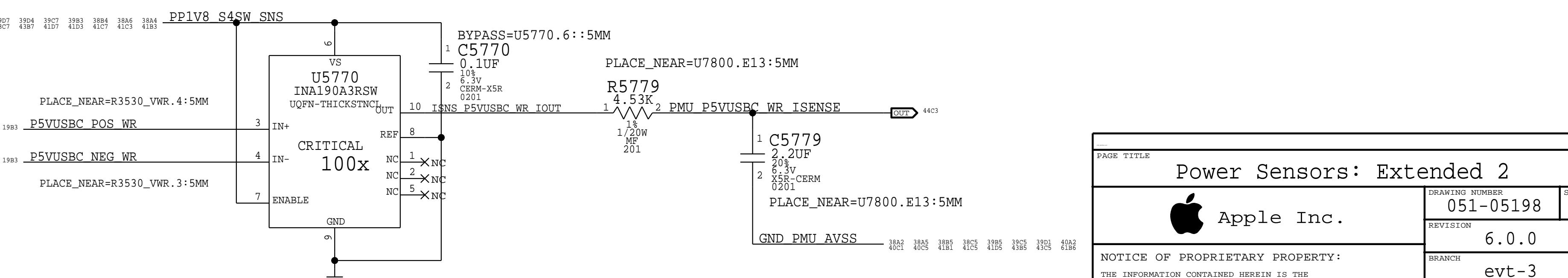
USBC LEFT 5V Current Sense (IUL5)

Gain: 100x, EDP: 6.6 A
Rsense: 0.002 (R3530_VXT)
Vsense: 13.2 mV, Range: 7.5 A
MUX: A2



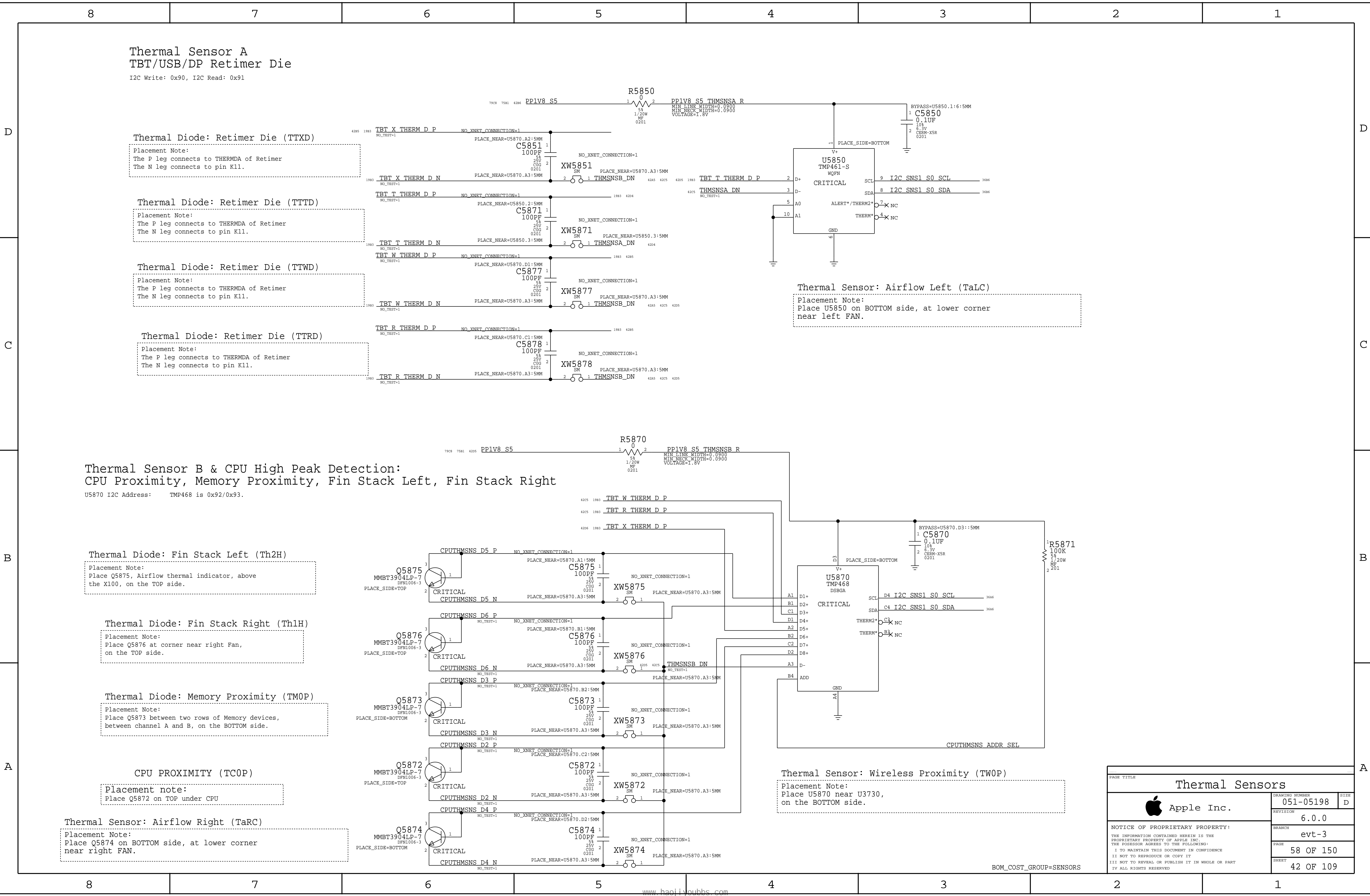
USBC RIGHT 5V Current Sense (IUR5)

Gain: 100x, EDP: 6.6 A
Rsense: 0.002 (R3530_VWR)
Vsense: 13.2 mV, Range: 7.5 A
MUX: B1



| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|------------|
| 117S0008 | 2 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | C5789,C5769 | | LOADRC:NO |
| 117S0008 | 0 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | | | LOADRC:NO |
| 117S0008 | 1 | RES,MTL FLIM,100K,1/16W,0201,SMD,LF | C5749 | | LOADRC:NO |

| | | |
|---|----------------|-----------|
| PAGE TITLE | | |
| Power Sensors: Extended 2 | | |
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| | PAGE | 57 OF 150 |
| | | SHEET |
| | | 41 OF 109 |



Thermal Sensor A TBT/USB/DP Retimer Die

I2C Write: 0x90, I2C Read: 0x91

Thermal Diode: Retimer Die (TTXD)

Placement Note:
The P leg connects to THERMDA of Retimer
The N leg connects to pin K11.

Thermal Diode: Retimer Die (TTTD)

Placement Note:
The P leg connects to THERMDA of Retimer
The N leg connects to pin K11.

Thermal Diode: Retimer Die (TTWD)

Placement Note:
The P leg connects to THERMDA of Retimer
The N leg connects to pin K11.

Thermal Diode: Retimer Die (TTRD)

Placement Note:
The P leg connects to THERMDA of Retimer
The N leg connects to pin K11.

Thermal Sensor B & CPU High Peak Detection: CPU Proximity, Memory Proximity, Fin Stack Left, Fin Stack Right

U5870 I2C Address: TMP468 is 0x92/0x93.

Thermal Diode: Fin Stack Left (Th2H)

Placement Note:
Place Q5875, Airflow thermal indicator, above
the X100, on the TOP side.

Thermal Diode: Fin Stack Right (Th1H)

Placement Note:
Place Q5876 at corner near right Fan,
on the TOP side.

Thermal Diode: Memory Proximity (TM0P)

Placement Note:
Place Q5873 between two rows of Memory devices,
between channel A and B, on the BOTTOM side.

CPU PROXIMITY (TC0P)

Placement note:
Place Q5872 on TOP under CPU

Thermal Sensor: Airflow Right (TaRC)


Placement Note:
Place Q5874 on BOTTOM side, at lower corner
near right FAN.

Thermal Sensor: Airflow Left (TaLC)

Placement Note:
Place U5850 on BOTTOM side, at lower corner
near left FAN.

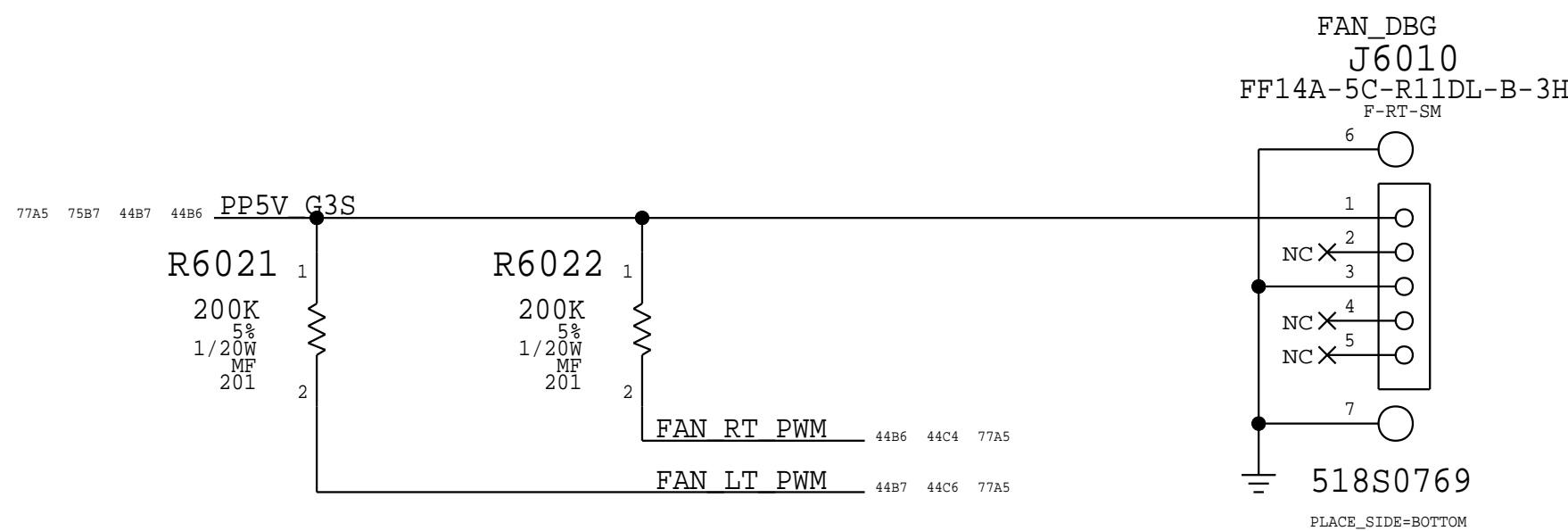
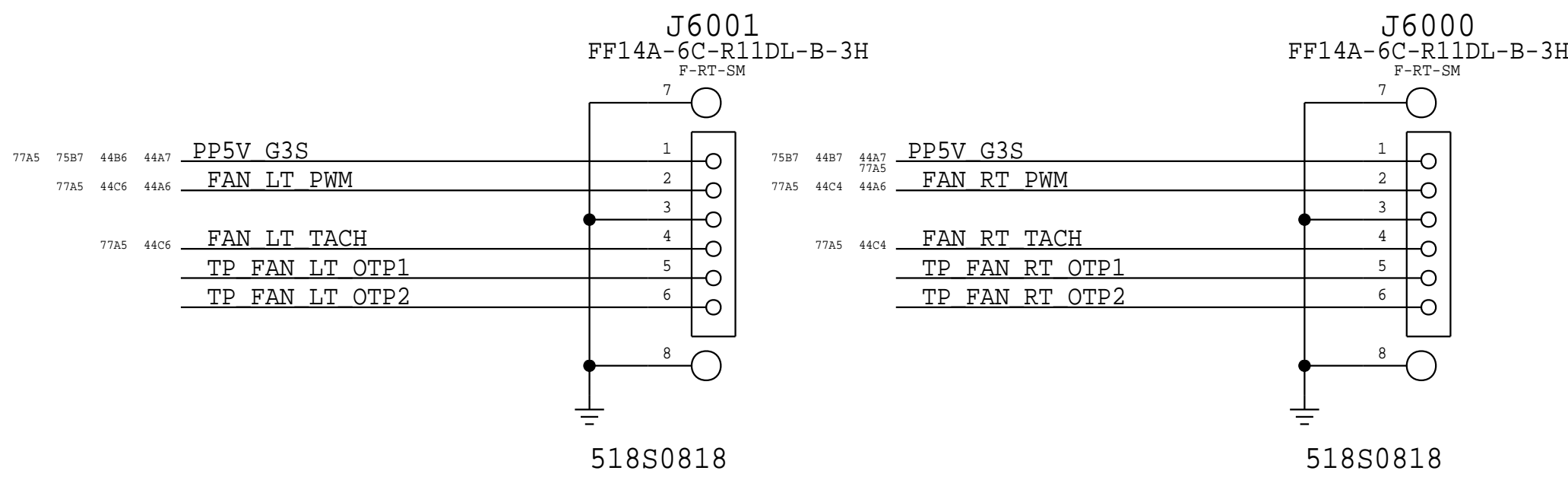
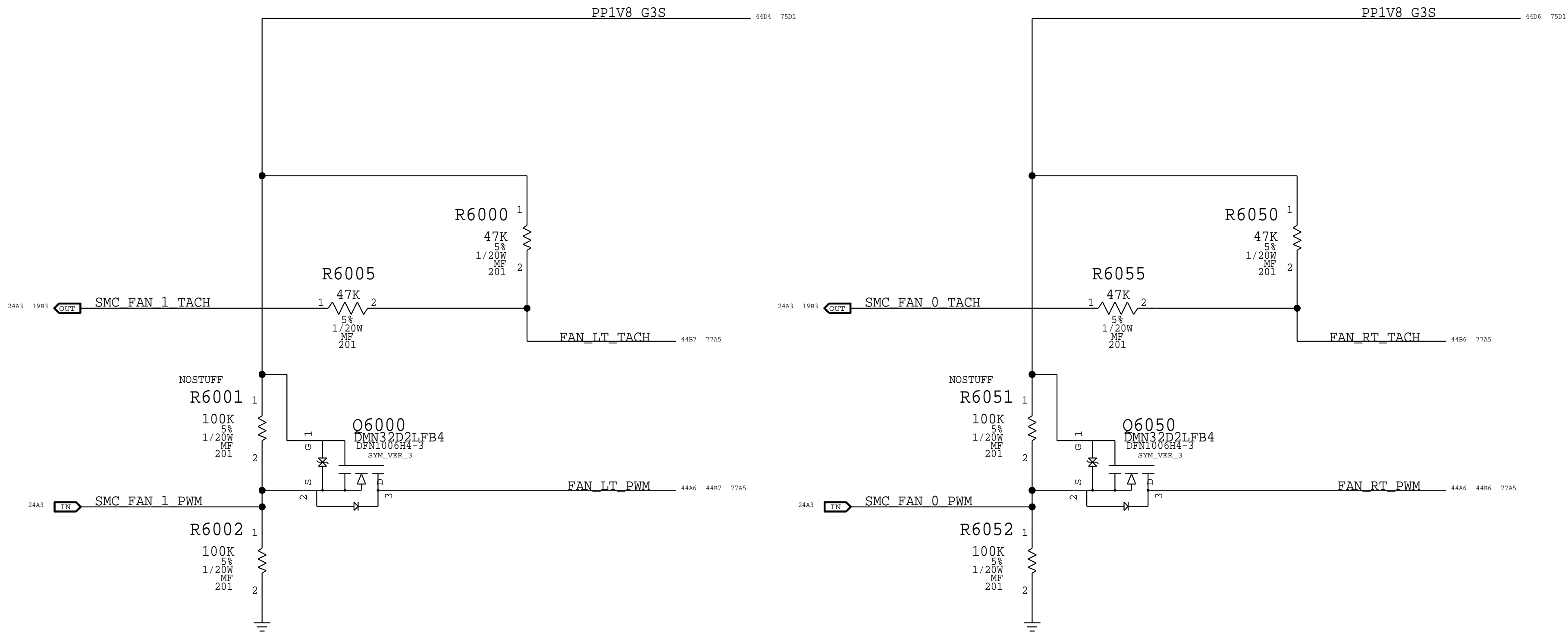
Thermal Sensor: Wireless Proximity (TW0P)

Placement Note:
Place U5870 near U3730,
on the BOTTOM side.

| PAGE TITLE | | |
|---|----------------|-----------|
| Thermal Sensors | | |
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| | PAGE | 58 OF 150 |
| | SHEET | 42 OF 109 |

BOM_COST_GROUP=SENSORS

FAN CONTROL



SMC ADC Assignments

| | | | | | | |
|------|----|-------------------------|----|-------------------------|-----|------|
| 3805 | IN | SMC CPU HS ISENSE | == | SMC CPU HS ISENSE | OUT | 2483 |
| 4382 | IN | SMC PBUS VSENSE | == | SMC PBUS VSENSE | OUT | 2483 |
| 38C1 | IN | SMC BMON ISENSE | == | SMC BMON ISENSE | OUT | 2483 |
| 38C1 | IN | SMC DCIN ISENSE | == | SMC DCIN ISENSE | OUT | 2483 |
| 4382 | IN | SMC DCIN VSENSE | == | SMC DCIN VSENSE | OUT | 2483 |
| 39A4 | IN | SMC PP3V3 WLANBT ISENSE | == | SMC PP3V3 WLANBT ISENSE | OUT | 2483 |
| 41D1 | IN | SMC CPUVCCIN ISENSE | == | SMC CPUVCCIN ISENSE | OUT | 2483 |
| 40B2 | IN | SMC CPUVCCIN VSENSE | == | SMC CPUVCCIN VSENSE | OUT | 24A3 |

KBL-U NB Assignments

CPUPT ISNS
IACORE ISNS

ADC5
ADC6

Desktop Assignments

GPU_AUX
GPU_CORE
12V VSNS
12V ISNS
Same

ADC0
ADC1
ADC2
ADC3
ADC4-7

PMU ADC Assignments

| | | | | | | |
|------|----|------------------------|----|------------------------|-----|------|
| 38C5 | IN | PMU OTHER3V3 HI ISENSE | == | PMU OTHER3V3 HI ISENSE | OUT | 6206 |
| 38C5 | IN | PMU OTHER5V HI ISENSE | == | PMU OTHER5V HI ISENSE | OUT | 6206 |
| 41B1 | IN | PMU P5VUSBC XT ISENSE | == | PMU P5VUSBC XT ISENSE | OUT | 6206 |
| 41D5 | IN | PMU CALPE ISENSE | == | PMU CALPE ISENSE | OUT | 6206 |
| 39C5 | IN | PMU DDR1V2 ISENSE | == | PMU DDR1V2 ISENSE | OUT | 6206 |
| 41B5 | IN | PMU OCARINA ISENSE | == | PMU OCARINA ISENSE | OUT | 6206 |
| 38A5 | IN | PMU SSDNAND ISENSE | == | PMU SSDNAND ISENSE | OUT | 6206 |
| 41C5 | IN | PMU CPU5VREG ISENSE | == | PMU CPU5VREG ISENSE | OUT | 6206 |
| | IN | NC PMU AMUX AY | == | NC PMU AMUX AY | OUT | 6206 |
| 40C5 | IN | PMU LCDPANEL ISENSE | == | PMU LCDPANEL ISENSE | OUT | 6206 |
| 41A3 | IN | PMU P5VUSBC WR ISENSE | == | PMU P5VUSBC WR ISENSE | OUT | 6206 |
| 39C5 | IN | PMU CPUDDR ISENSE | == | PMU CPUDDR ISENSE | OUT | 6206 |
| 38A2 | IN | PMU PP1V8S5 ISENSE | == | PMU PP1V8S5 ISENSE | OUT | 6206 |
| 41C5 | IN | PMU DDRVDDQ ISENSE | == | PMU DDRVDDQ ISENSE | OUT | 6286 |
| 40A2 | IN | PMU CPUVA VSENSE | == | PMU CPUVA VSENSE | OUT | 6286 |
| 39D1 | IN | PMU CPUVA ISENSE | == | PMU CPUVA ISENSE | OUT | 6286 |
| 40C1 | IN | PMU TBT XT ISENSE | == | PMU TBT XT ISENSE | OUT | 6286 |
| | IN | NC PMU AMUX BY | == | NC PMU AMUX BY | OUT | 6286 |

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|---|----------------|-----------|
| PAGE TITLE | | |
| Fans/SMC/AMUX Support | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 60 OF 150 |
| | SHEET | 44 OF 109 |

BOM_COST_GROUP=FAN


| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | | | | | | | | | | | | | |
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| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | | | | | | | | | | | | | |

DESIGN: X502/DEV MLB U

LAST CHANGE: Wed Feb 18 17:12:24 2015

PAGE TITLE

Audio Placeholder

 Apple Inc.

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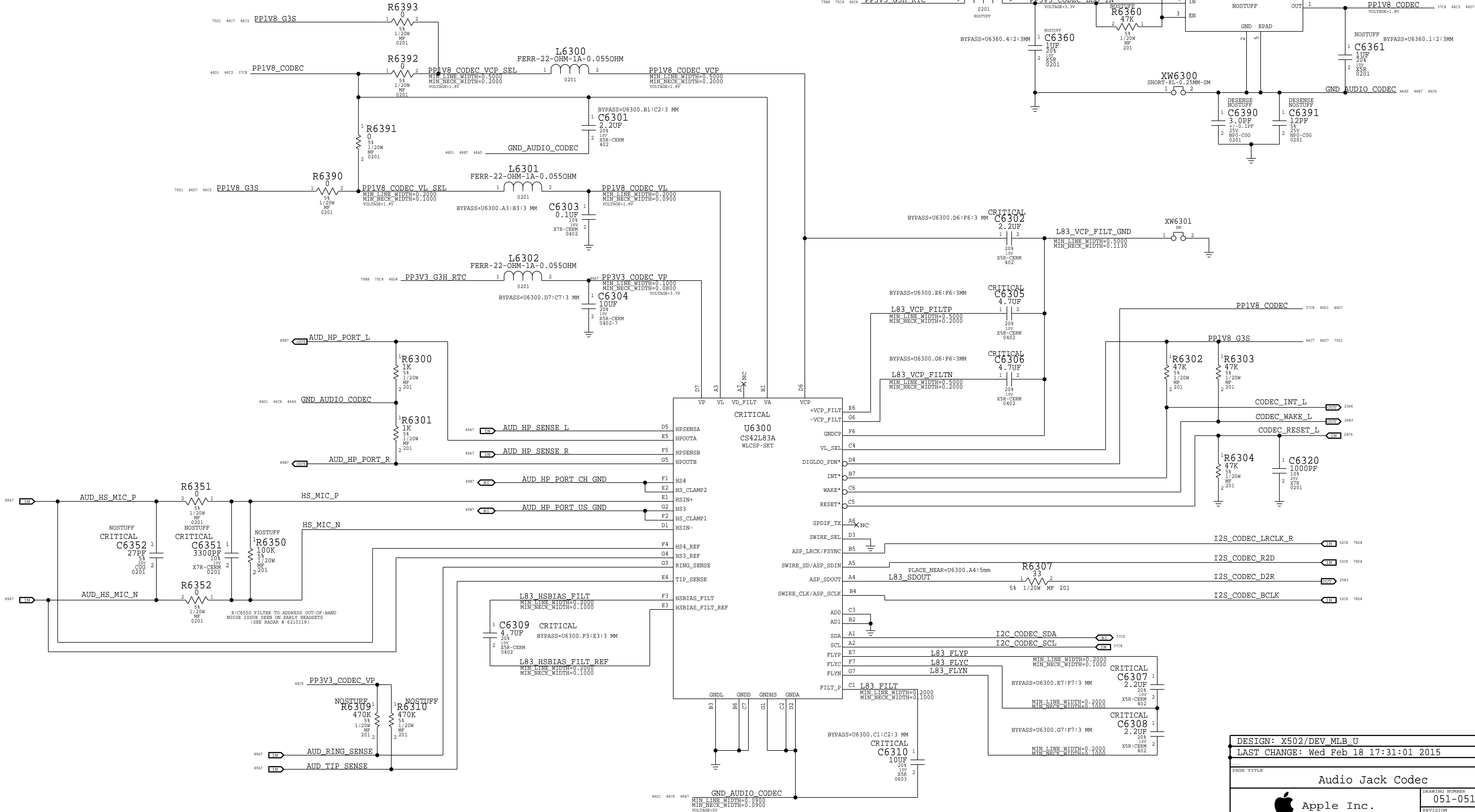
PAGE
62 OF 150

SHEET
45 OF 109

SIZE
D

BOM_COST_GROUP=AUDIO

| AUDIO JACK CODEC I2C ADDRESS | | |
|------------------------------|------|----------|
| AD1 | AD0 | ADDRESS |
| GND | GND | 0x48 <-- |
| GND | 1.8V | 0x49 |
| 1.8V | GND | 0x4A |
| 1.8V | 1.8V | 0x4B |

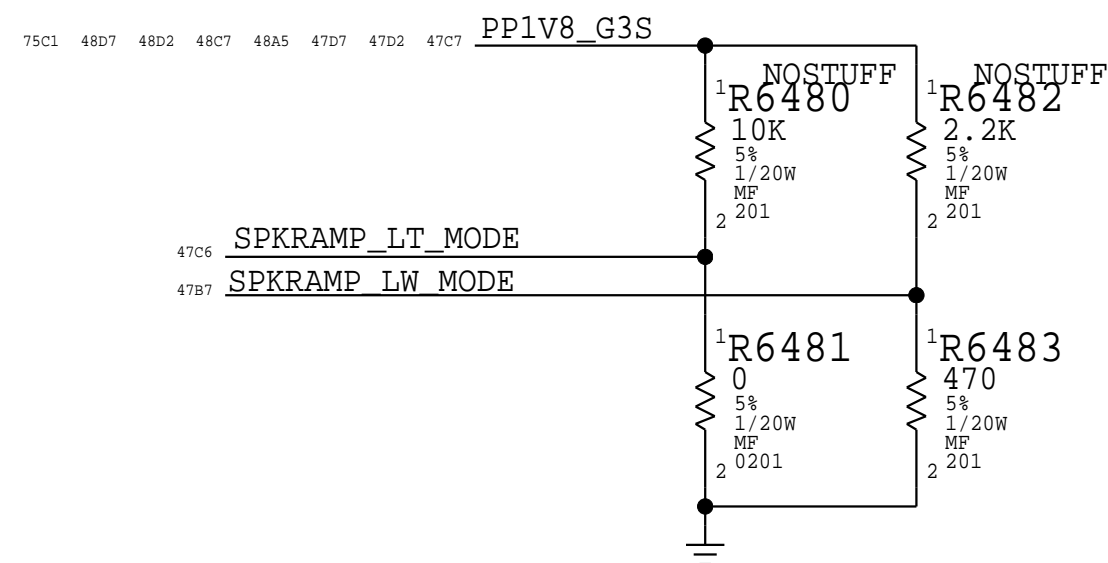
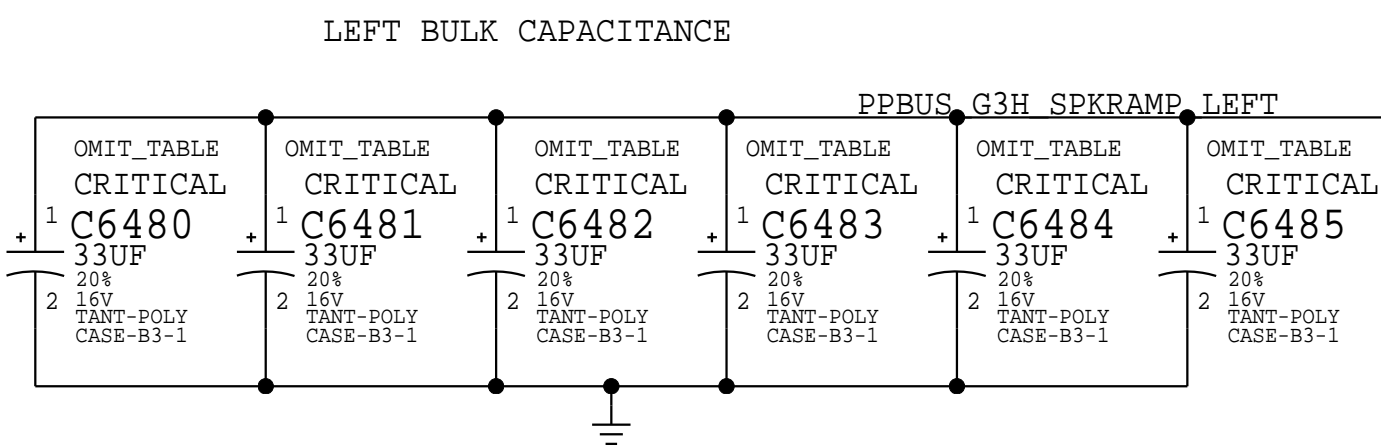
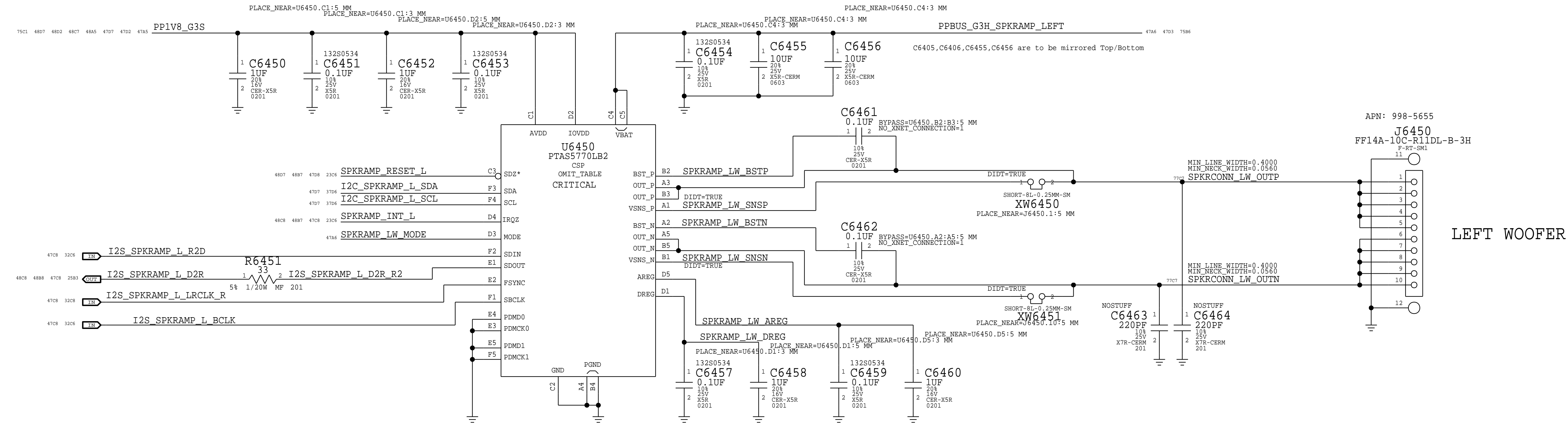
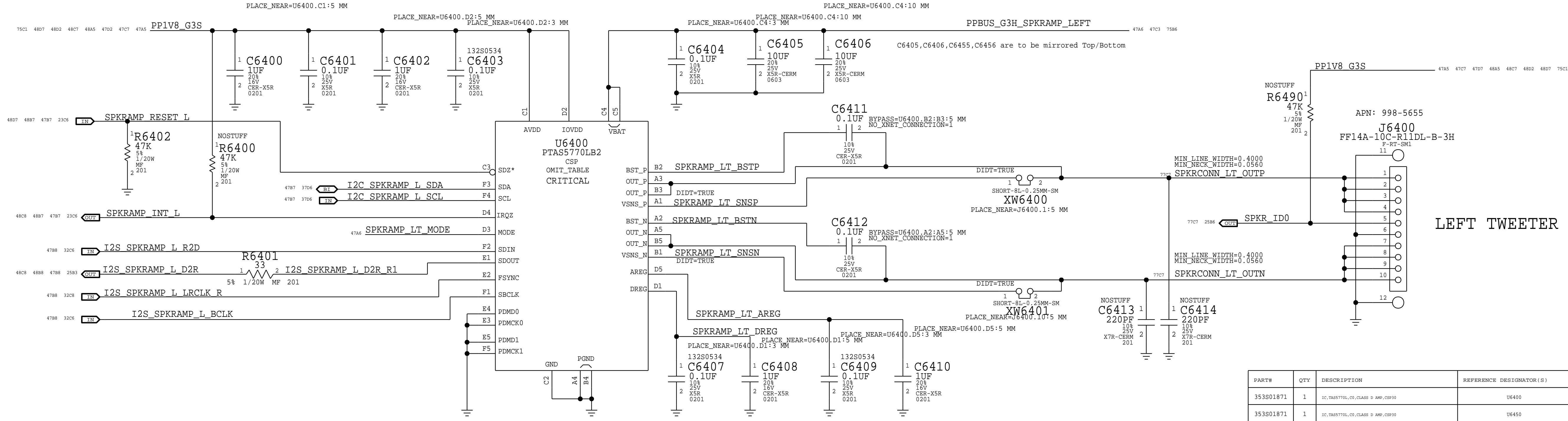


BOM_COST_GROUP=AUDIO

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| DESIGN: X502/DEV_MLB_U | | |
| LAST CHANGE: Wed Feb 18 17:31:01 2015 | | |
| PAGE TITLE | | |
| Audio Jack Codec | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 63 OF 150 |
| | SHEET | 46 OF 109 |


2X MONO SPEAKER LEFT AMPLIFIERS

APN: 353S01252
GAIN: 0DBFS = xxVRMS



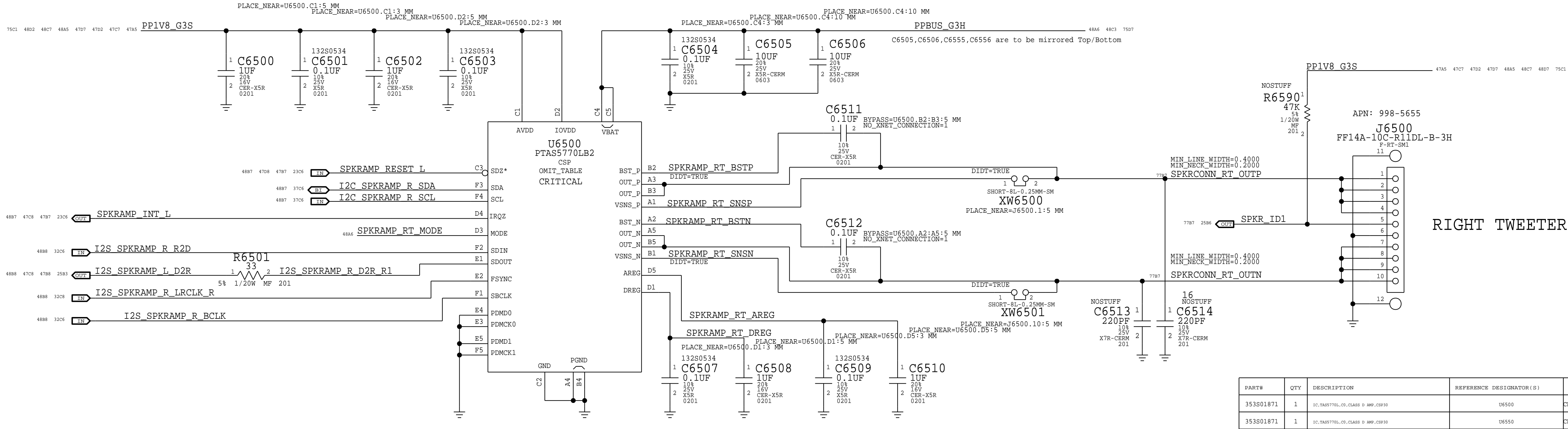
| MODE | PIN | I2C ADDR | CHANNEL |
|--------------|-----|----------|---------|
| GND | | 0x31 | L TW |
| 470 to GND | | 0x32 | L WF |
| 470 to IOVDD | | 0x33 | R TW |
| 2k2 to GND | | 0x34 | R WF |
| 2k2 to IOVDD | | 0x35 | |
| 10k to GND | | 0x36 | |
| 10k to IOVDD | | 0x37 | |
| 47k to IOVDD | | 0x38 | |

BOM_COST_GROUP=AUDIO

| | | |
|---|----------------|--------------------|
| PAGE TITLE | | |
| Audio Left Amplifiers | | |
|  Apple Inc. | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
| | BRANCH | evt-3 |
| | PAGE | 64 OF 150 |
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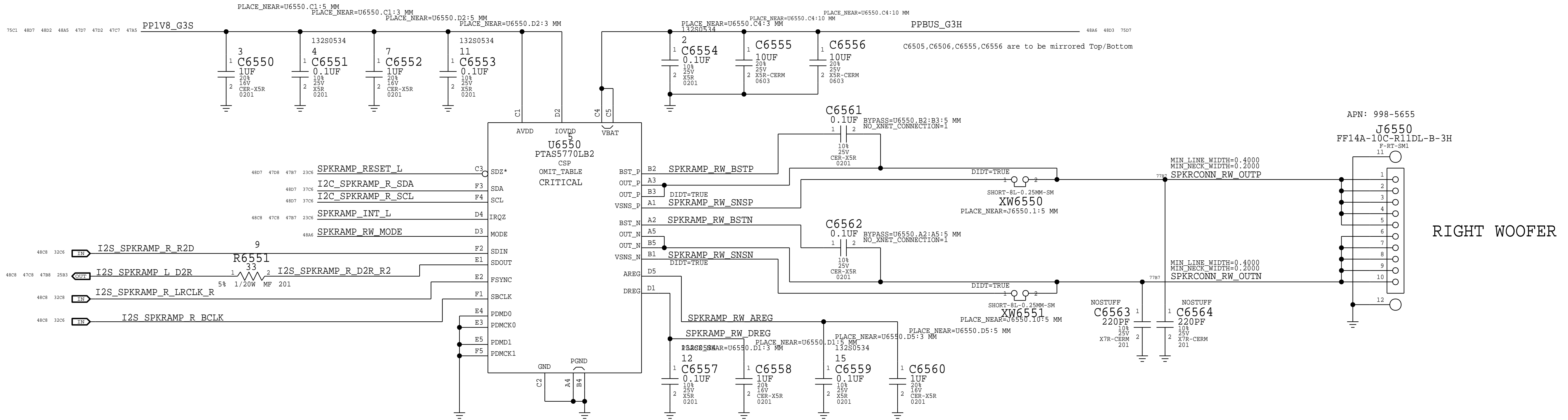
2X MONO SPEAKER RIGHT AMPLIFIERS

APN: 353S01252
GAIN: 0DBFS = xxVRMS

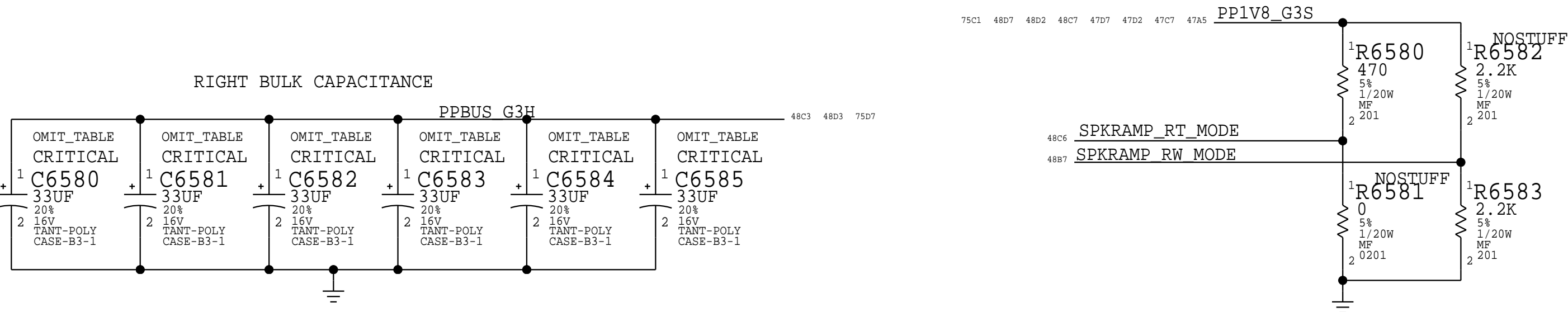


RIGHT TWEETER

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|-----------|-----|----------------------------------|-------------------------|----------|------------|
| 353S01871 | 1 | 10-TAS770L-C0, CLASS D AMP, C930 | U6500 | CRITICAL | |
| 353S01871 | 1 | 10-TAS770L-C0, CLASS D AMP, C930 | U6550 | CRITICAL | |



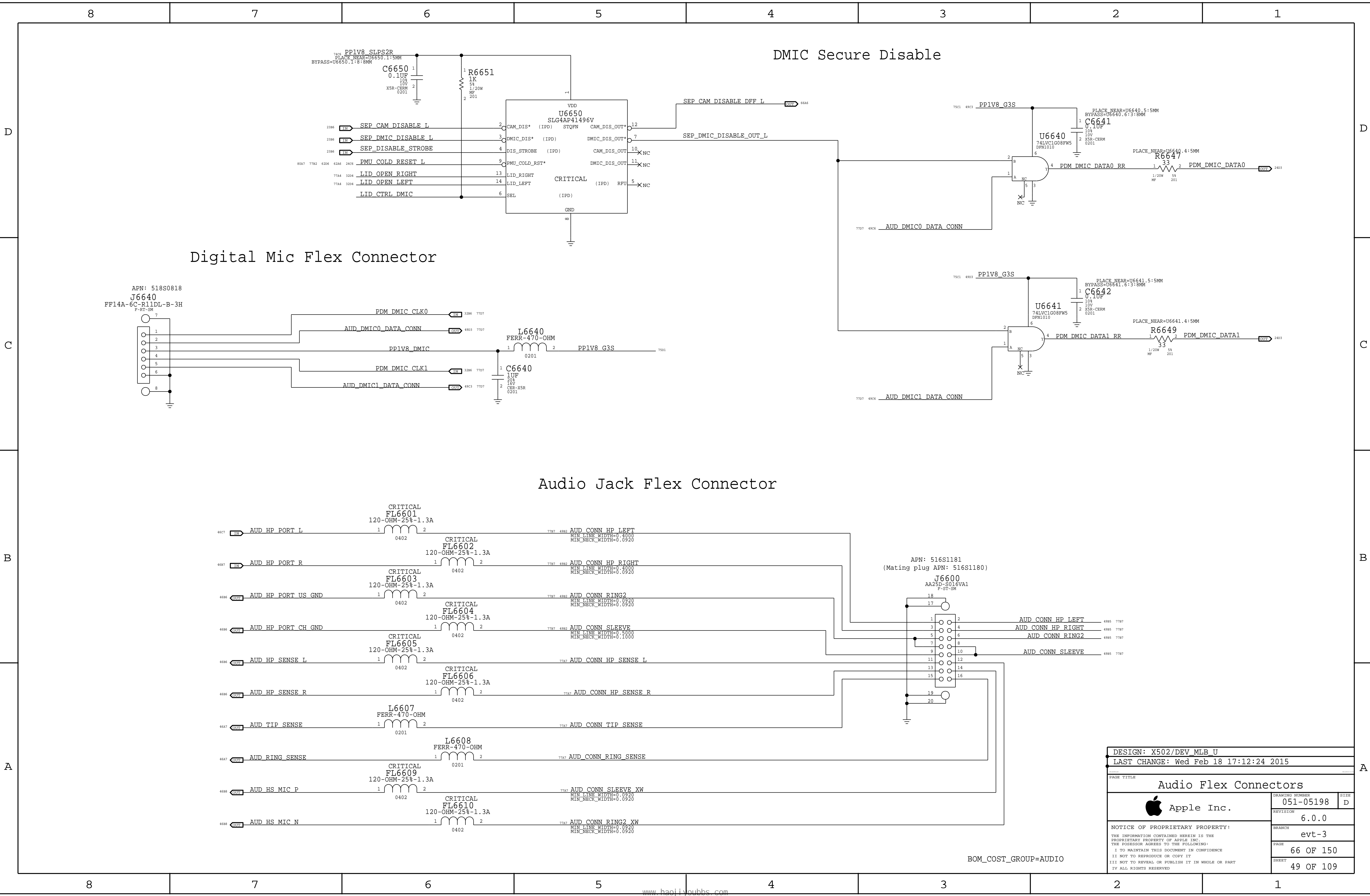
RIGHT WOOFER



| MODE | PIN | I2C ADDR | CHANNEL |
|--------------|-----|----------|---------|
| GND | | 0x31 | L TW |
| 470 to GND | | 0x32 | L WF |
| 470 to IOVDD | | 0x33 | R TW |
| 2k2 to GND | | 0x34 | R WF |
| 2k2 to IOVDD | | 0x35 | |
| 10k to GND | | 0x36 | |
| 10k to IOVDD | | 0x37 | |
| 47k to IOVDD | | 0x38 | |

BOM_COST_GROUP=AUDIO

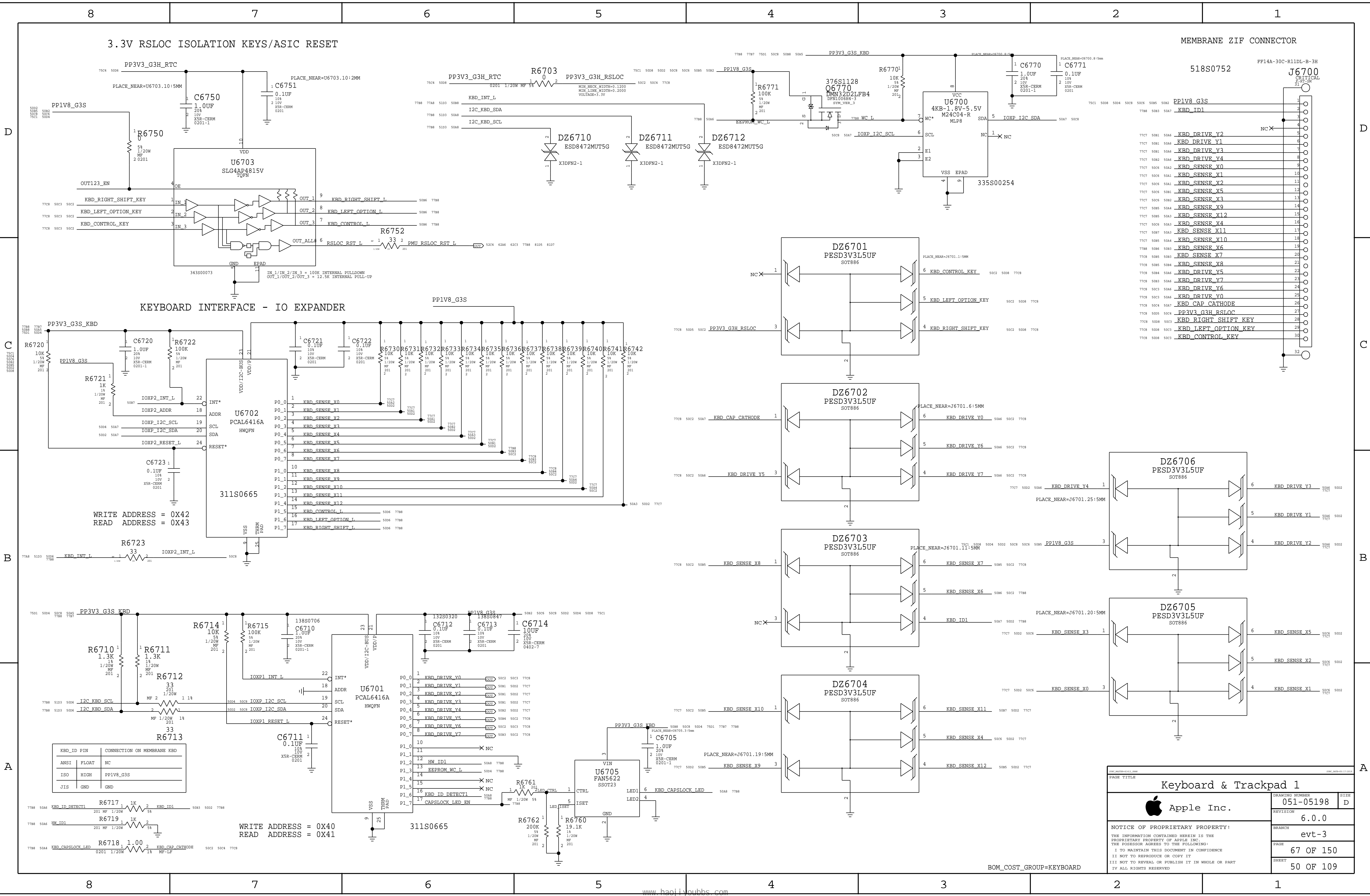
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| DRAWING NUMBER | | SIZE |
| 051-05198 | | D |
| REVISION | | 6.0.0 |
| BRANCH | | evt-3 |
| PAGE | | 65 OF 150 |
| SHEET | | 48 OF 109 |
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Digital Mic Flex Connector

Audio Jack Flex Connector

| | | |
|---|----------------|--------------------|
| DESIGN: X502/DEV MLB_U | | |
| LAST CHANGE: Wed Feb 18 17:12:24 2015 | | |
| PAGE TITLE | | |
| Audio Flex Connectors | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 66 OF 150 |
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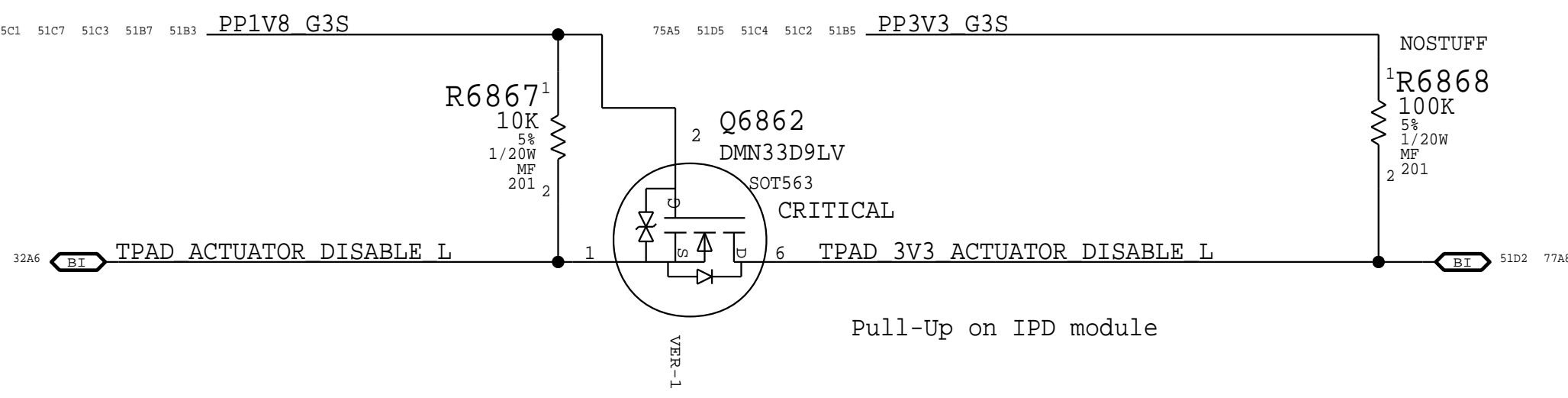
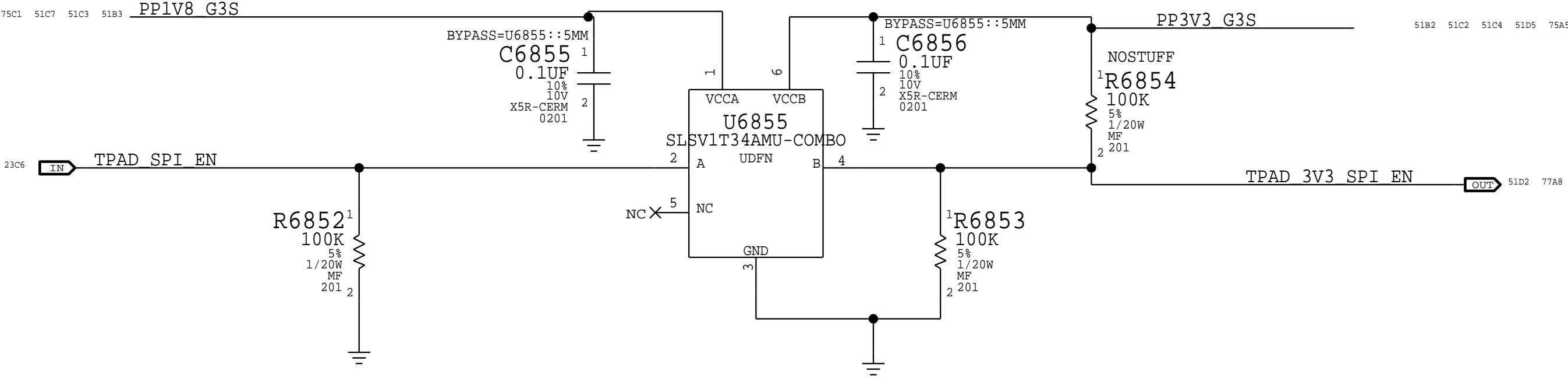
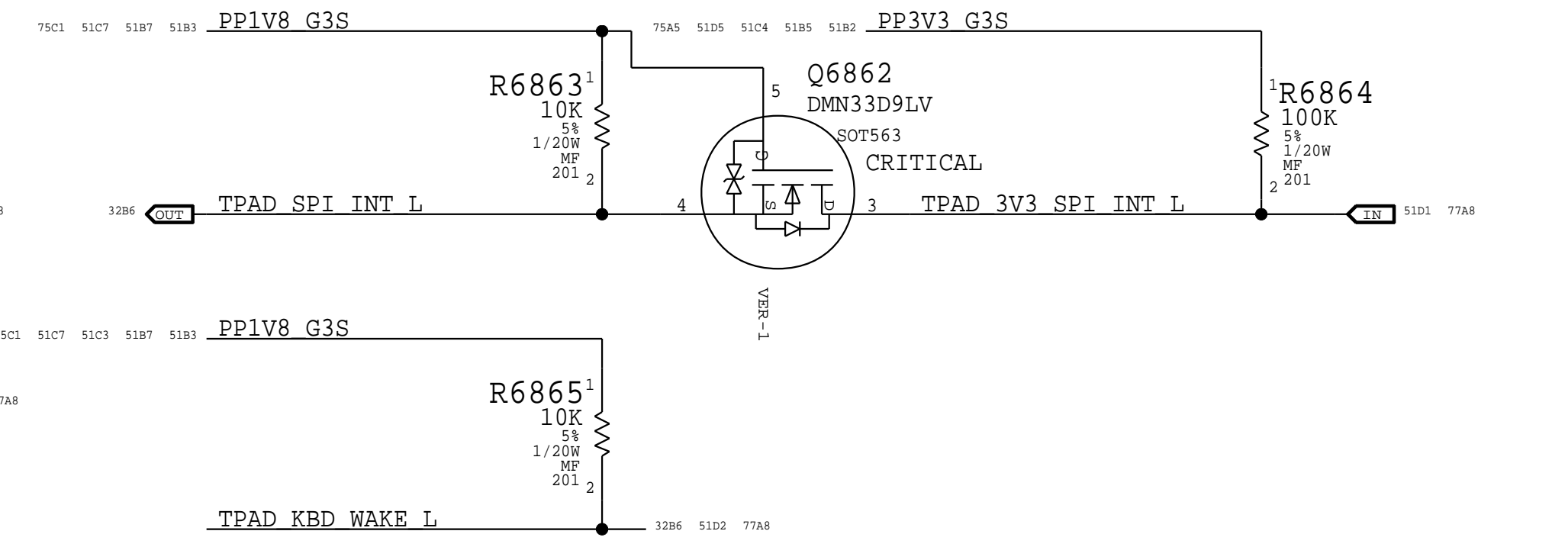
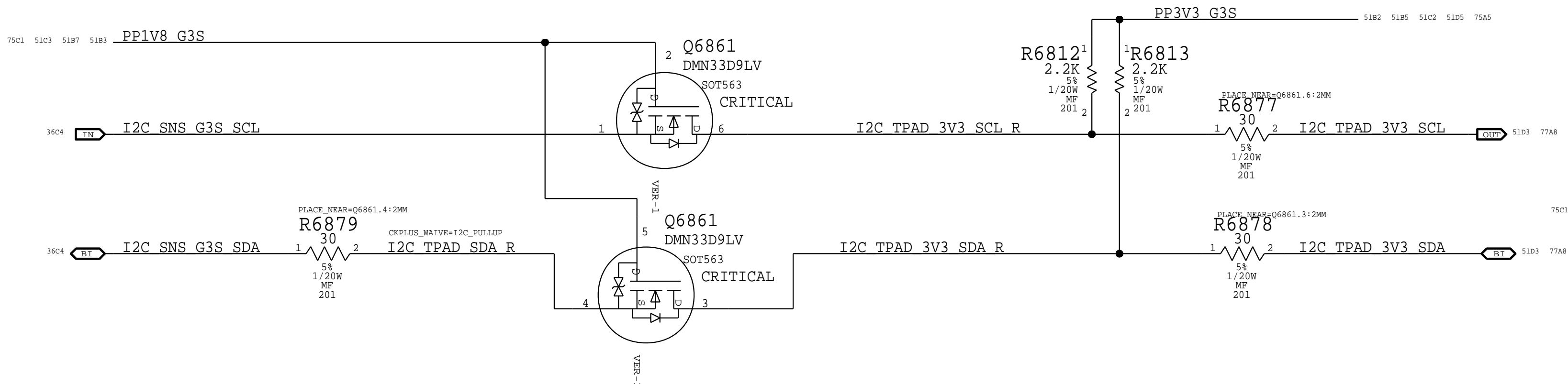
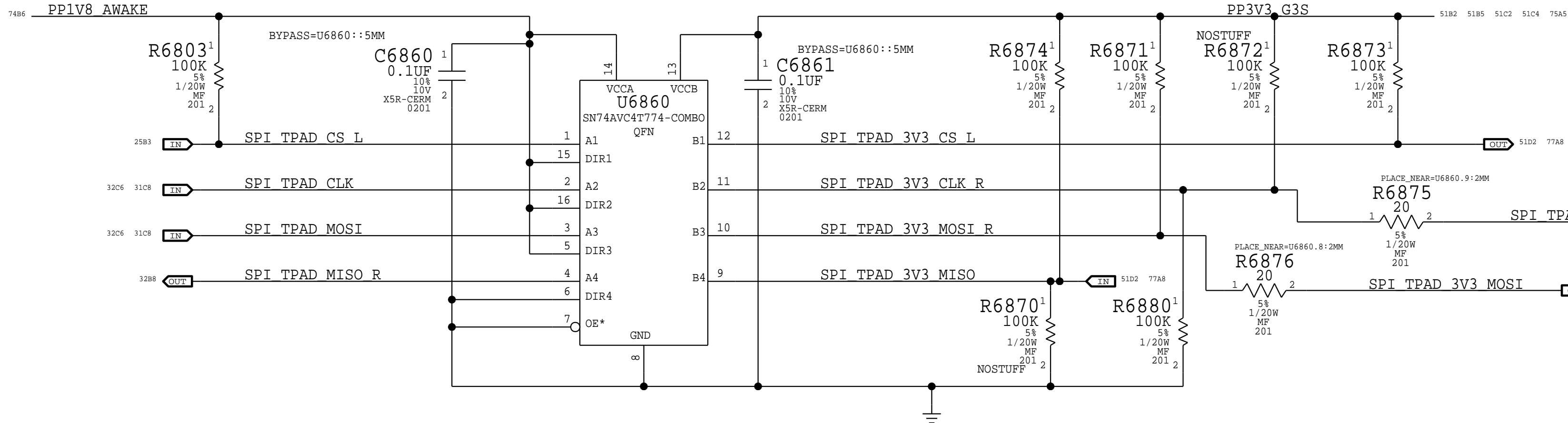
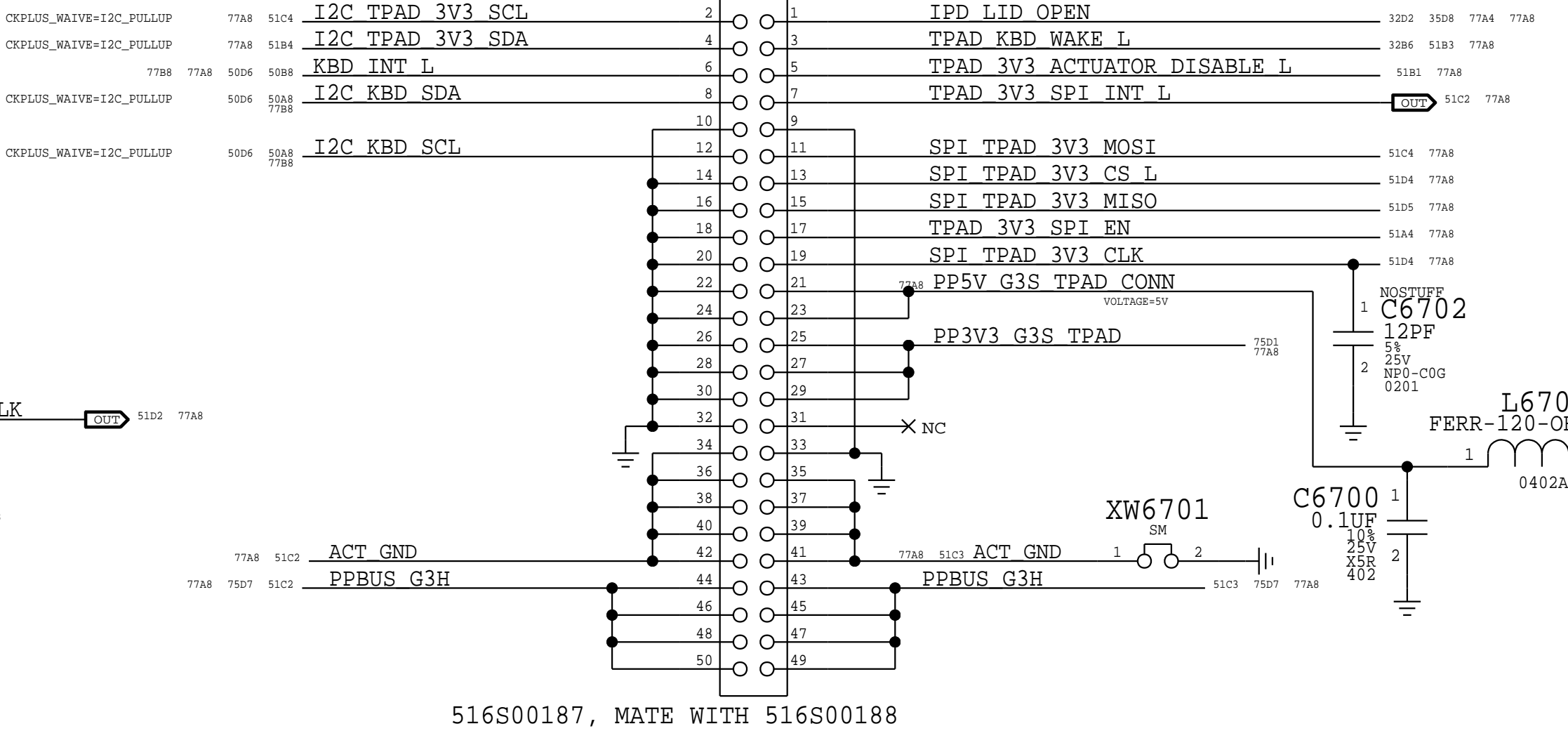


| | | |
|---|----------------|-----------|
| PAGE TITLE | | |
| Keyboard & Trackpad 1 | | |
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| | REVISION | 6.0.0 |
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| | PAGE | 67 OF 150 |
| | SHEET | 50 OF 109 |

Trackpad Level Shifting

TPAD CONNECTOR

J6701
DF40C-50DS-0.4V-51
F-ST-SM



| | | |
|--|----------------|-----------|
| PAGE TITLE | | |
| Keyboard & Trackpad 2 | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 68 OF 150 |
| | SHEET | 51 OF 109 |

BOM_COST_GROUP=TRACKPAD

D

C

B

A

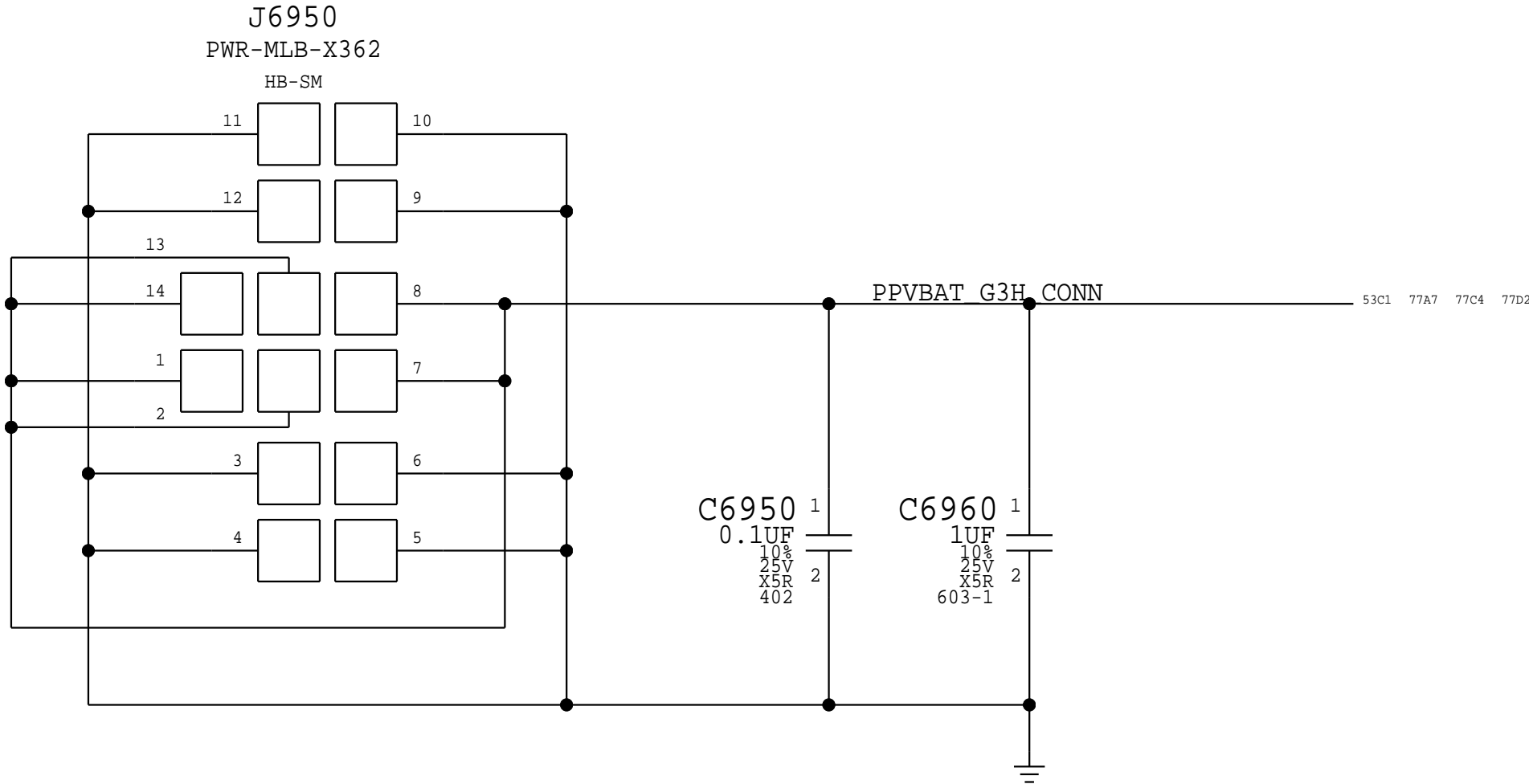
D

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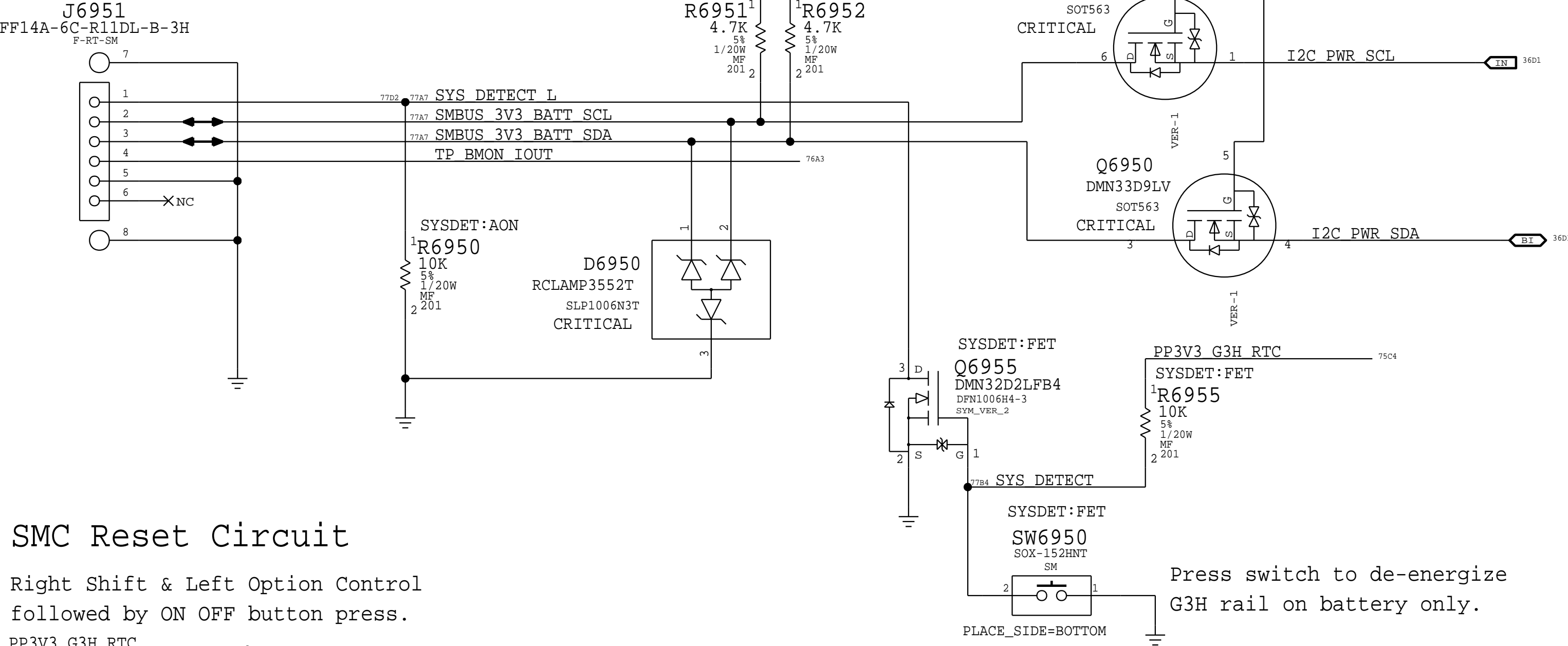
J79 Battery Hotbar Flex Pads



BMU POWER FLEX HOTBAR'd TO THE MLB:

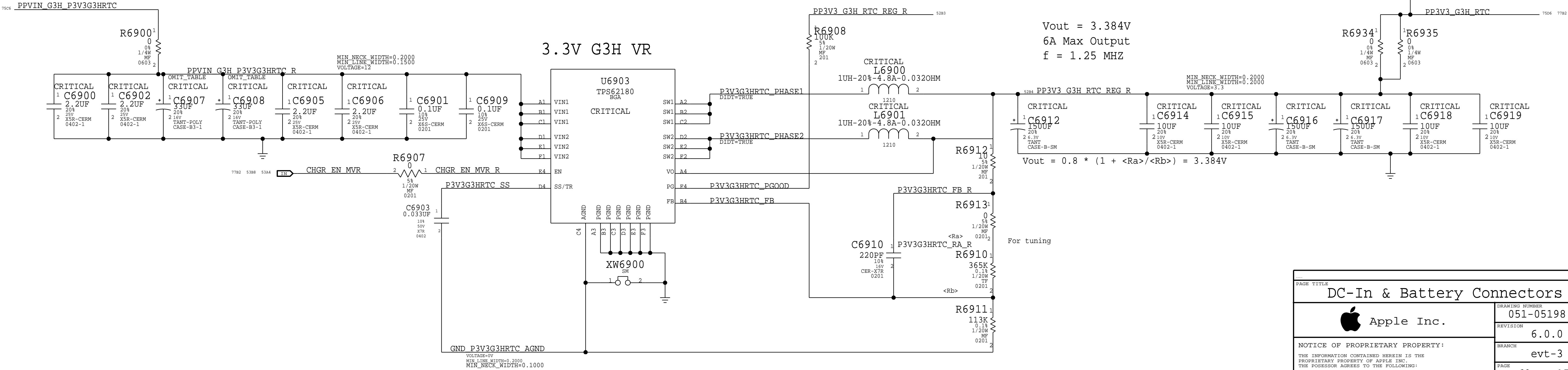
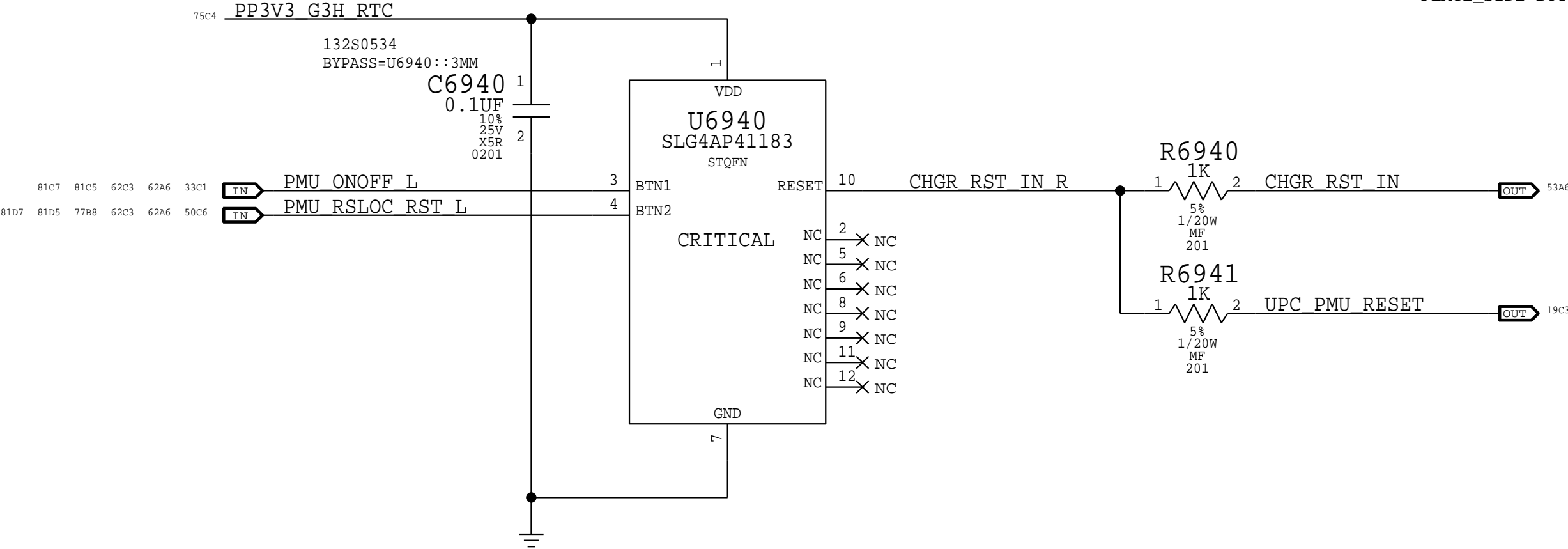
| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|------------------------|---------------|----------|------------|
| 632-00566 | 1 | PCBA,FLEX,BMU PWR,X362 | J6950 | CRITICAL | |

APN: 518S0818



SMC Reset Circuit

Right Shift & Left Option Control followed by ON OFF button press.



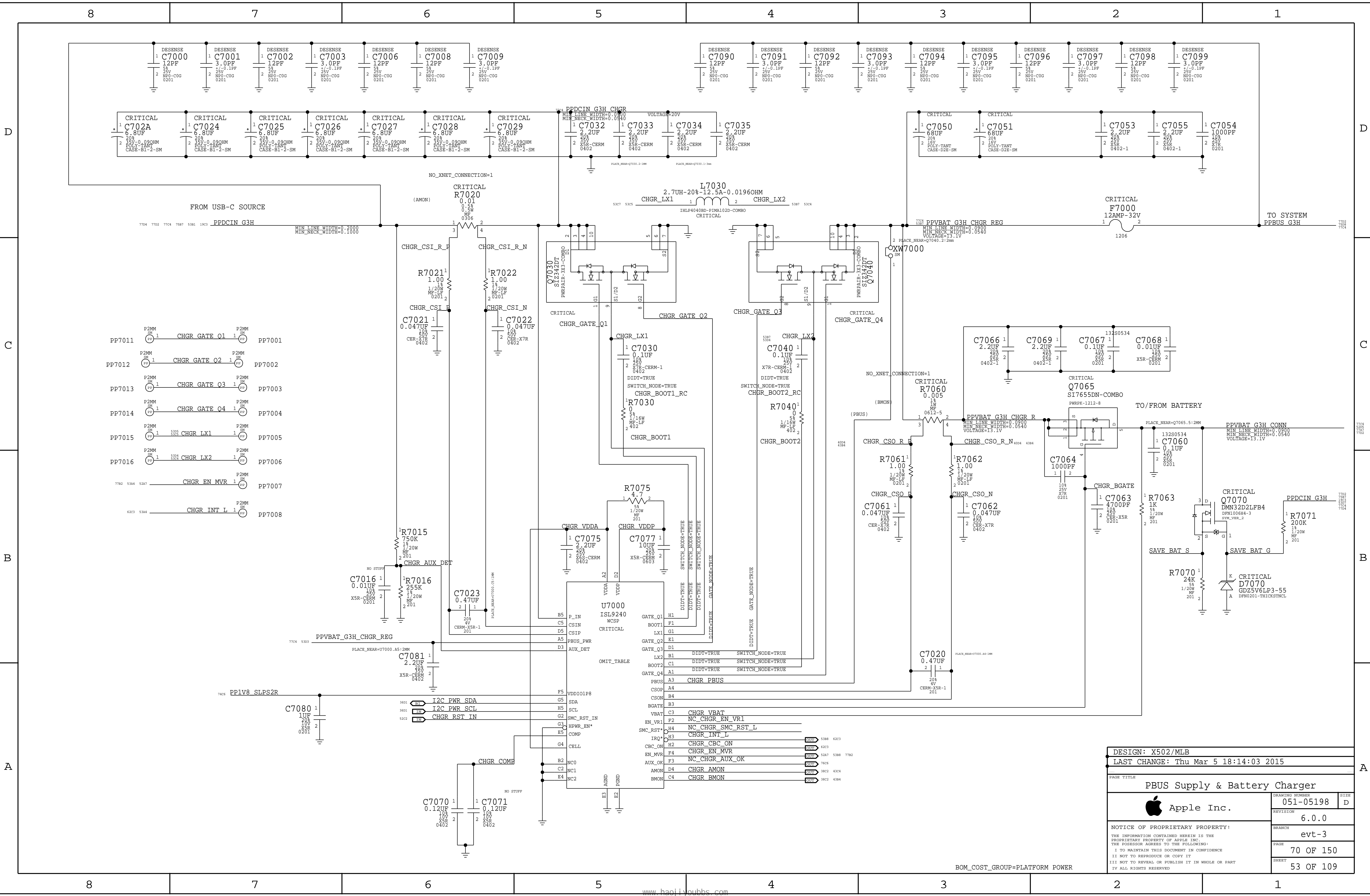
Vout = 3.384V
6A Max Output
f = 1.25 MHZ

Vout = 0.8 * (1 + <Ra>/<Rb>) = 3.384V

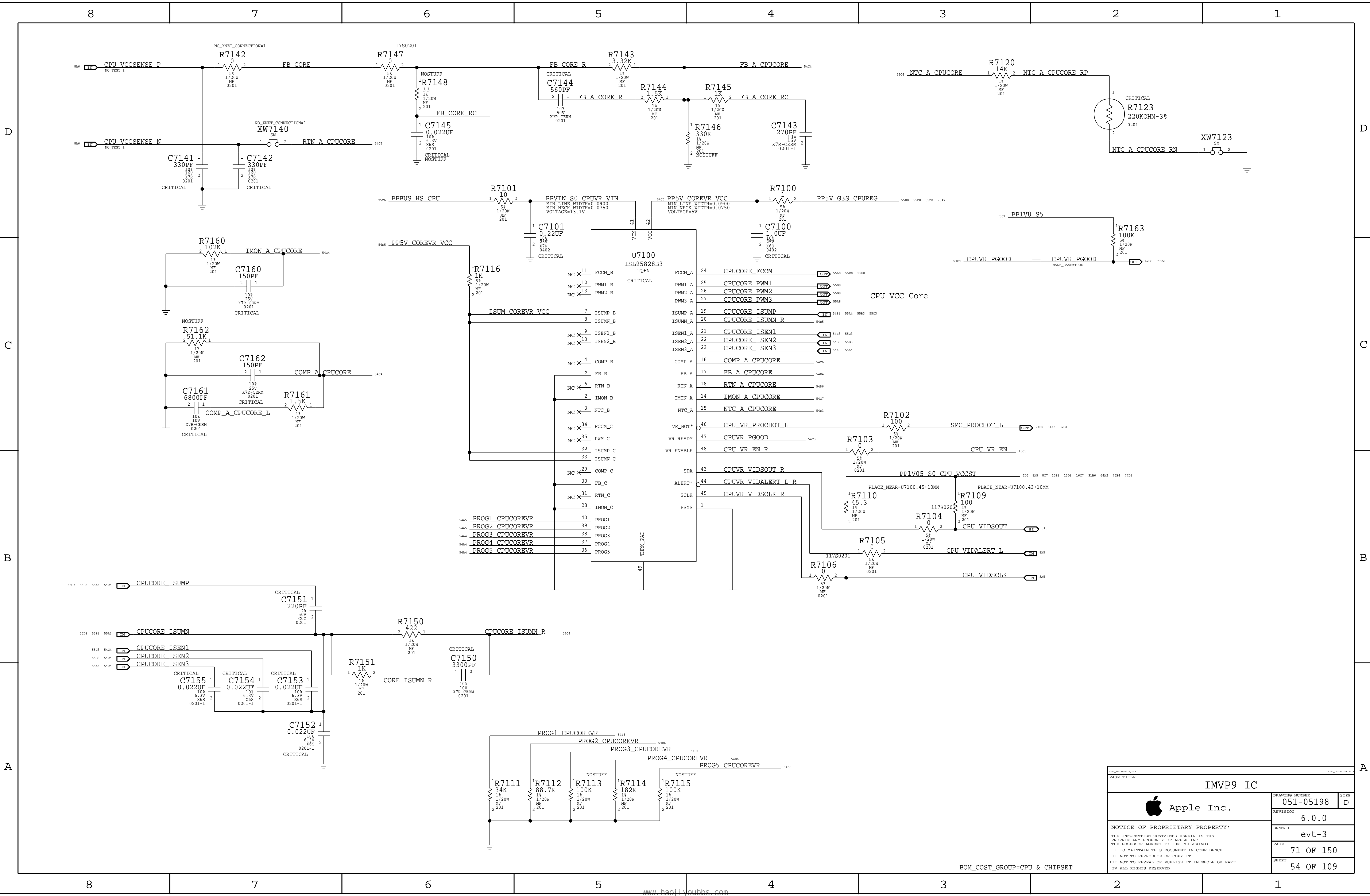
For tuning


| PAGE TITLE | | |
|---|----------------|-----------|
| DC-In & Battery Connectors | | |
| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 69 OF 150 |
| | SHEET | 52 OF 109 |

BOM_COST_GROUP=PLATFORM POWER

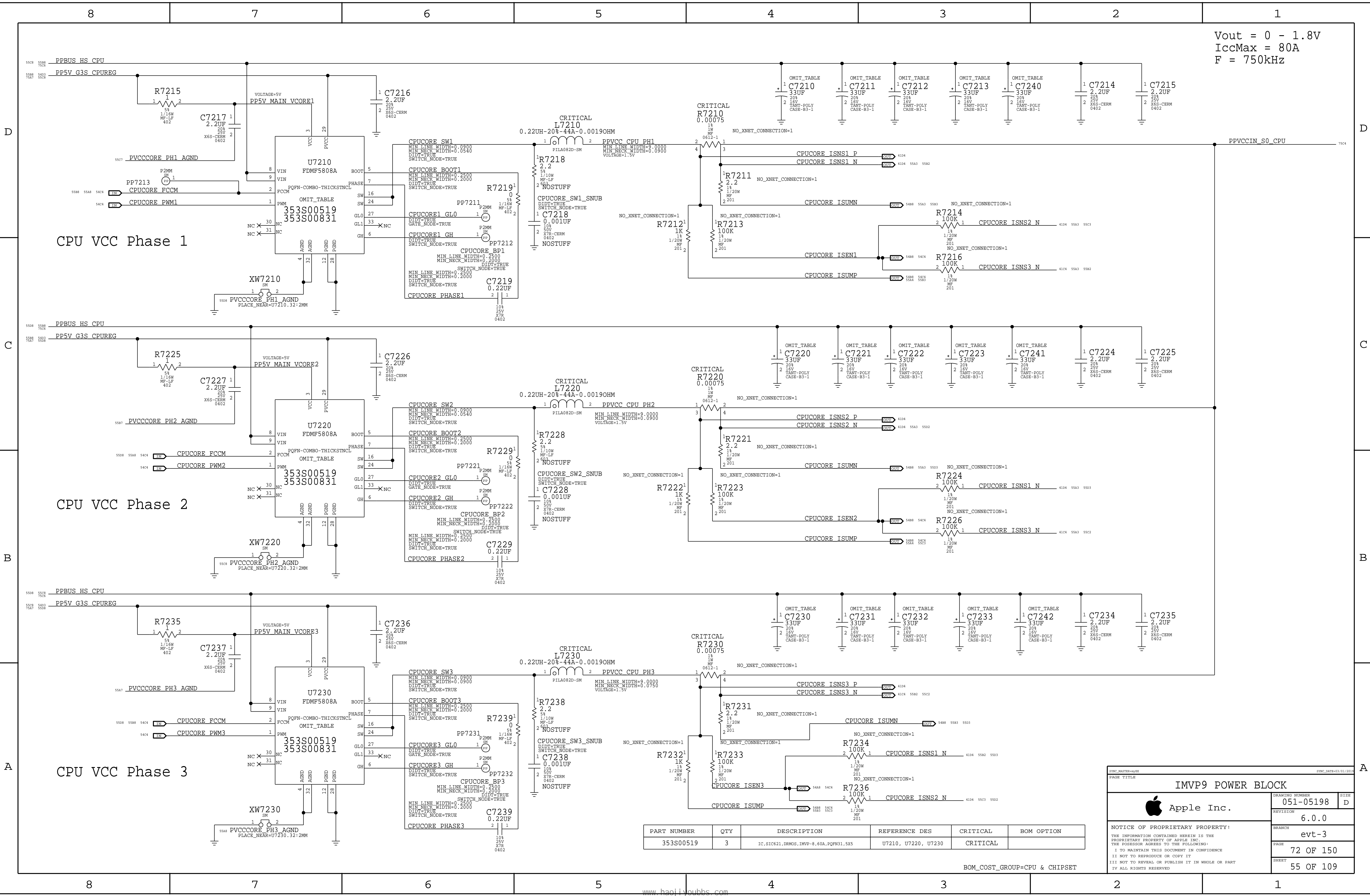


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| DESIGN: X502/MLB | | |
| LAST CHANGE: Thu Mar 5 18:14:03 2015 | | |
| PAGE TITLE | | |
| PBUS Supply & Battery Charger | | |
| | DRAWING NUMBER | 051-05198 |
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| | SHEET | 53 OF 109 |



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|---|----------------|-----------|
| PAGE TITLE | | |
| IMVP9 IC | | |
|  Apple Inc. | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | PAGE | 71 OF 150 |
| | SHEET | 54 OF 109 |

BOM_COST_GROUP=CPU & CHIPSET




| | | | | | |
|----------------|--|--|-----------|--|--|
| DRAWING NUMBER | | | SIZE | | |
| 051-05198 | | | D | | |
| REVISION | | | 6.0.0 | | |
| BRANCH | | | evt-3 | | |
| PAGE | | | 72 OF 150 | | |
| SHEET | | | 55 OF 109 | | |

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|---------------------------------------|---------------------|----------|------------|
| 353S00519 | 3 | IC,S1C621,DRMOS,IMVP-8,60A,PQFN31,5X5 | U7210, U7220, U7230 | CRITICAL | |


BOM_COST_GROUP=CPU & CHIPSET

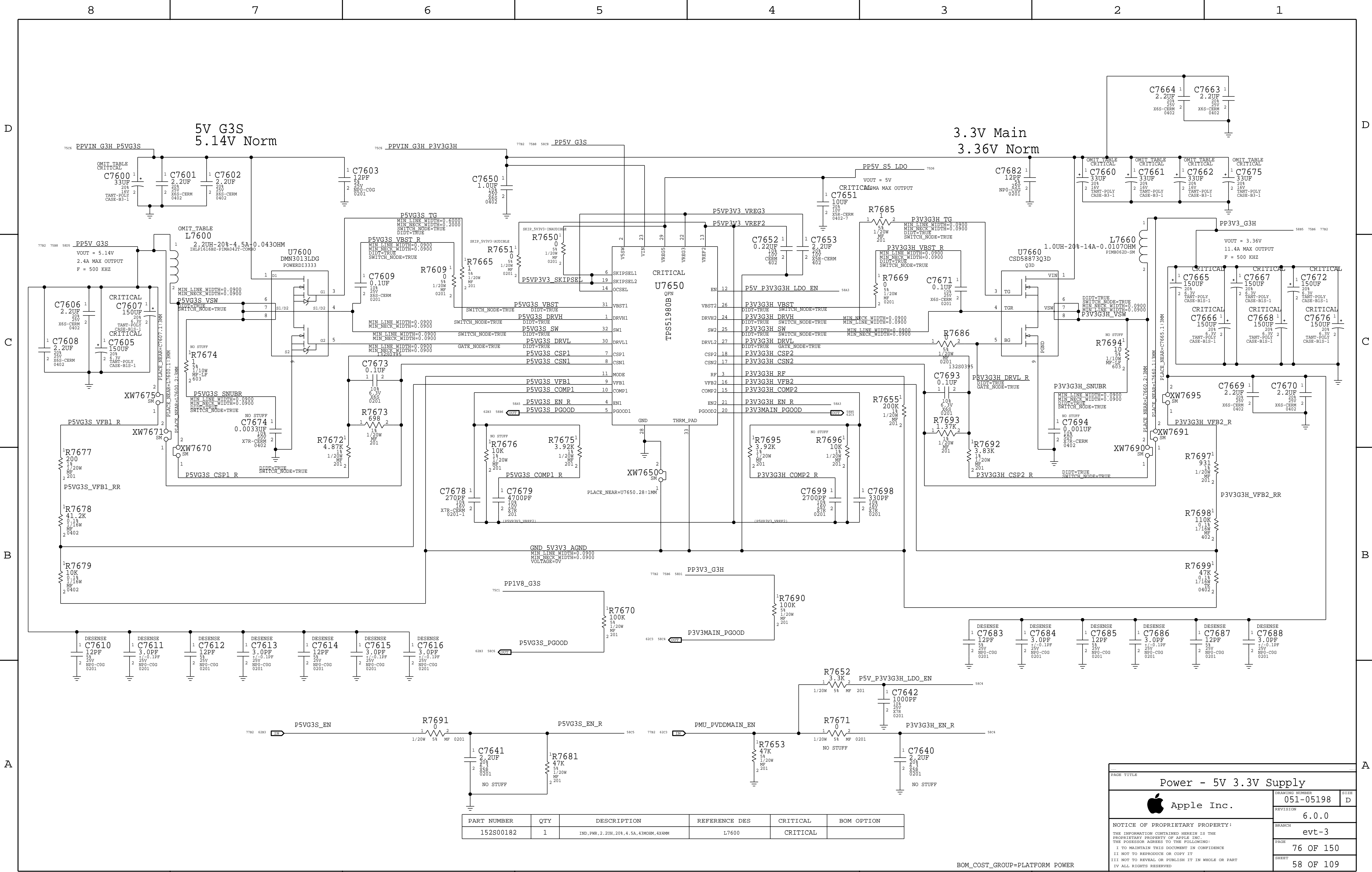
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Power - 5V 3.3V Supply

Apple Inc.

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REVISION: 6.0.0

BRANCH: evt-3

PAGE: 76 OF 150

SHEET: 58 OF 109

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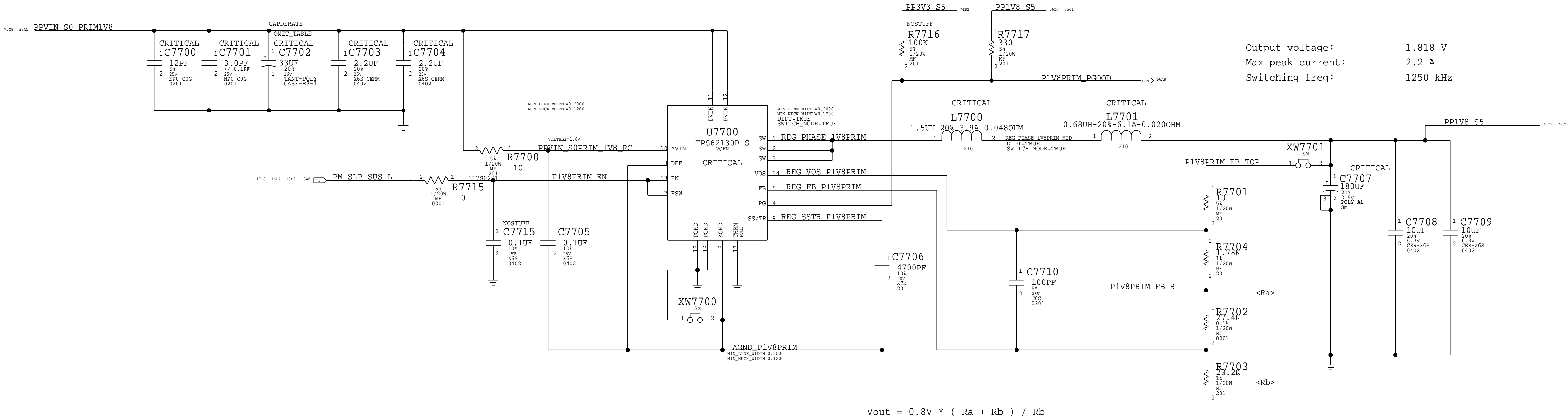
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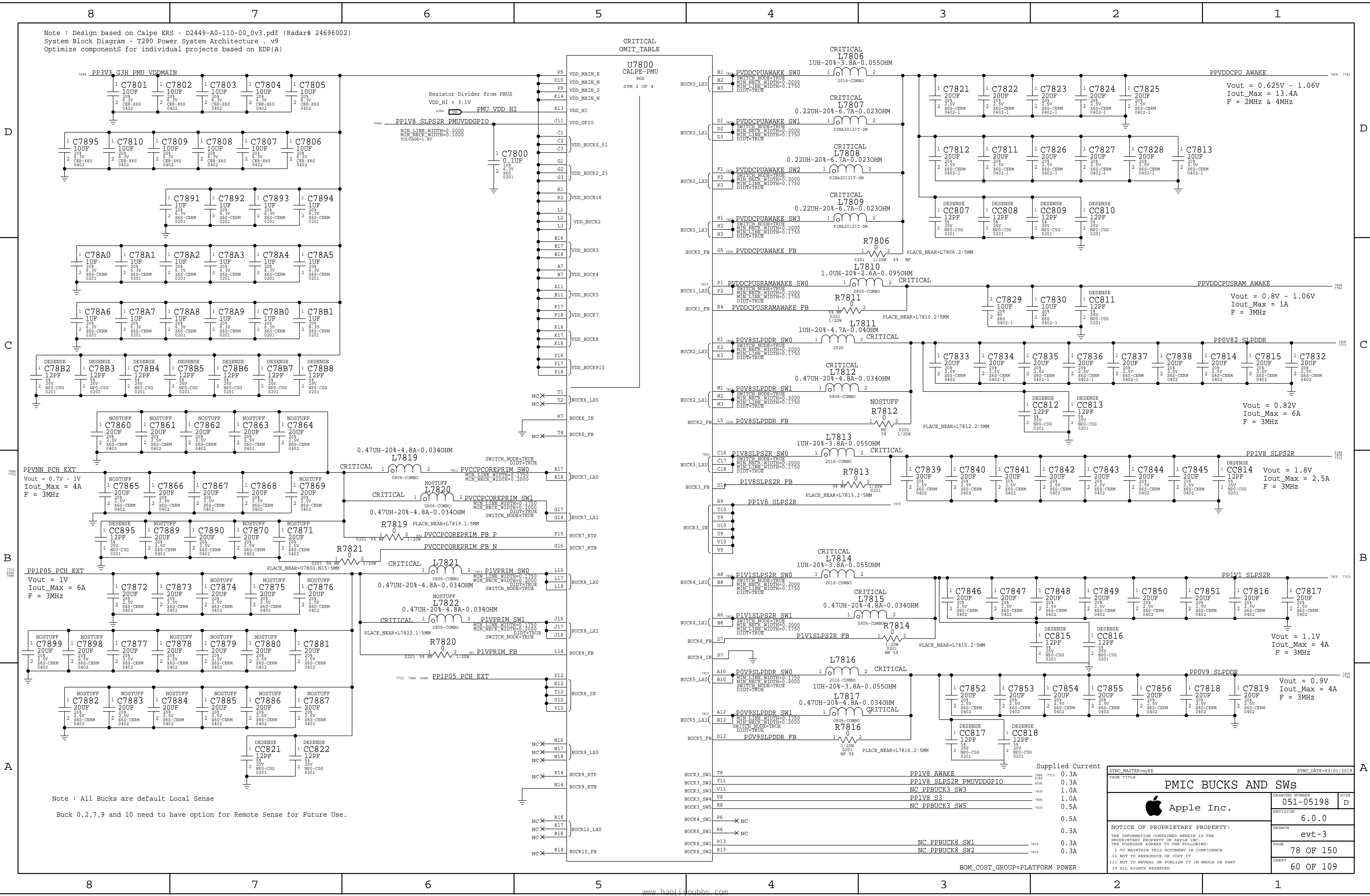
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|  Apple Inc. | DRAWING NUMBER | 051-05198 |
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Note : Design based on Calpe ERS - D2449-A0-110-00_0v3.pdf (Radar# 24696002)
System Block Diagram - T290 Power System Architecture . v9
Optimize components for individual projects based on EDP(A)

CRITICAL
OMIT_TABLE

U7800
CALPE-PMU
BSA
SYM 2 OF 4

Note : All Bucks are default Local Sense
Buck 0,2,7,9 and 10 need to have option for Remote Sense for Future Use.

| Supplied Current | |
|------------------------|----------------|
| PP1V8 AWAKE | 7488 77C3 0.3A |
| PP1V8 SLPS2R PMUVDGPI0 | 81A4 60D6 0.3A |
| NC PPBUCK3 SW3 | 76C6 1.0A |
| PP1V8 S3 | 74D6 1.0A |
| NC PPBUCK3 SW5 | 76C6 0.5A |
| PP1V8 SLPS2R | 74C6 0.5A |
| PP1V8 SLPS2R | 74C6 0.3A |
| NC PPBUCK8 SW1 | 76C6 0.3A |
| NC PPBUCK8 SW2 | 76C6 0.3A |

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| PMIC BUCKS AND SWS | | | |
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| PAGE | | 78 OF | 150 |
| SHEET | | 60 OF | 109 |

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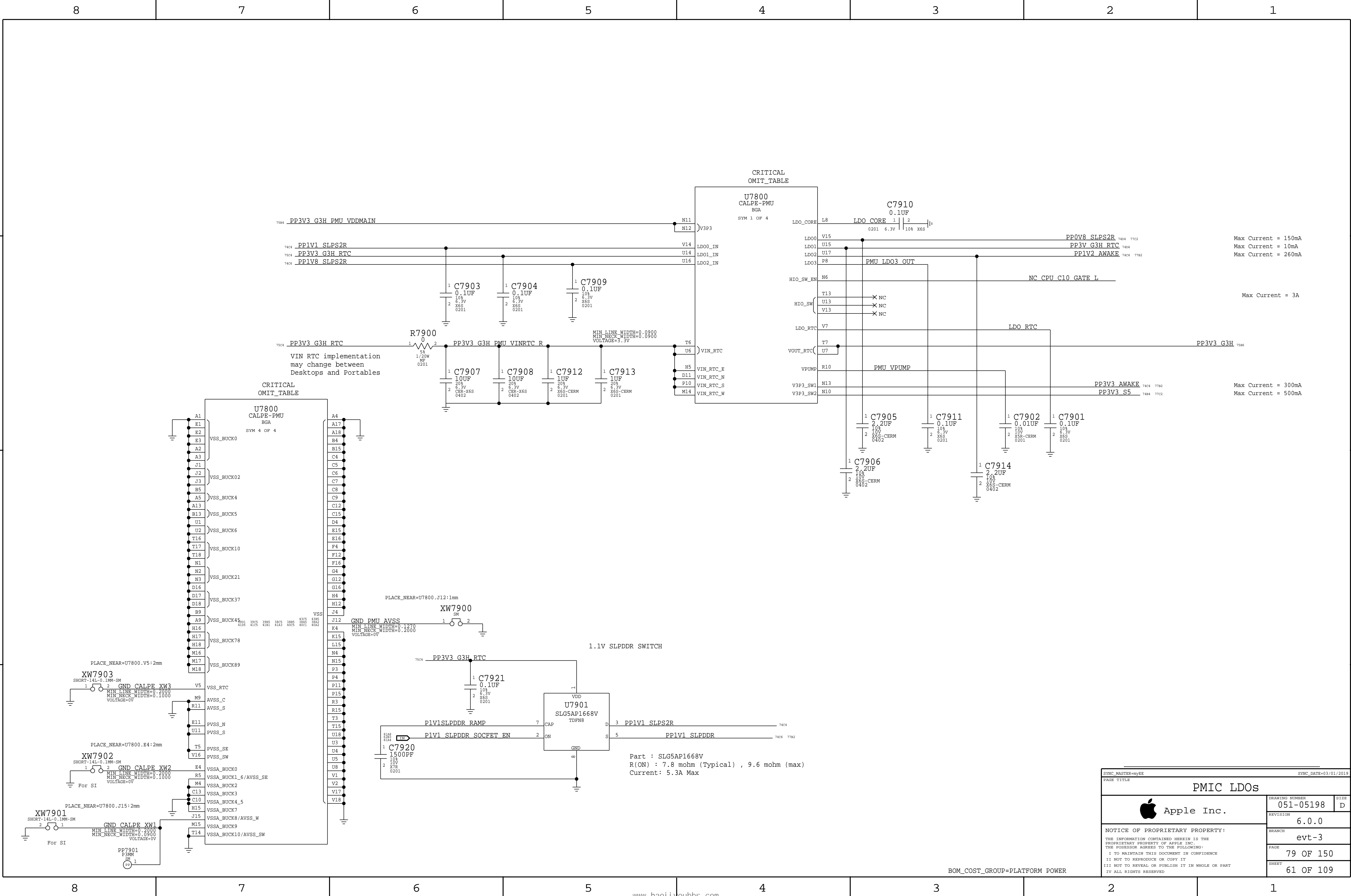
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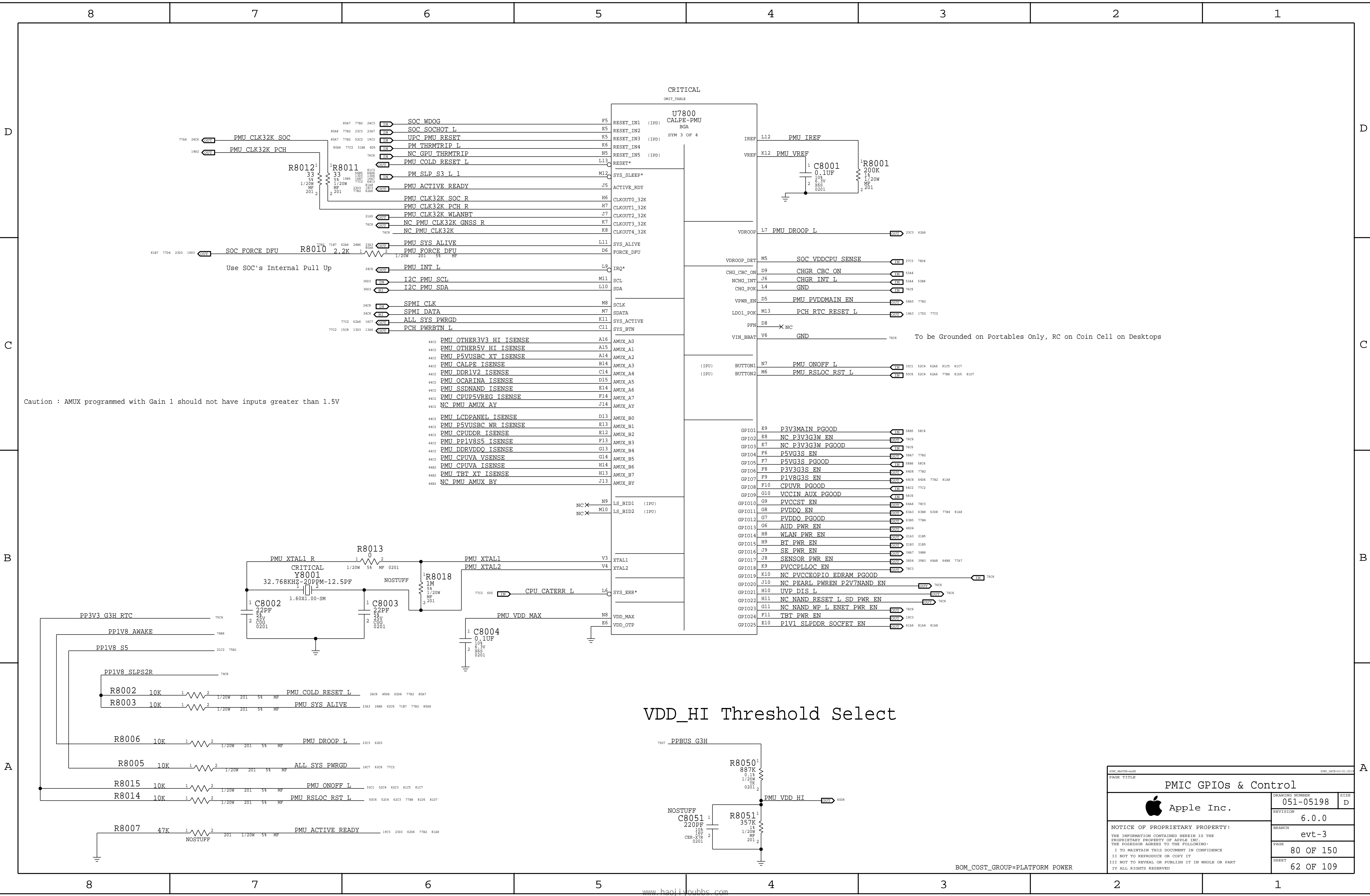
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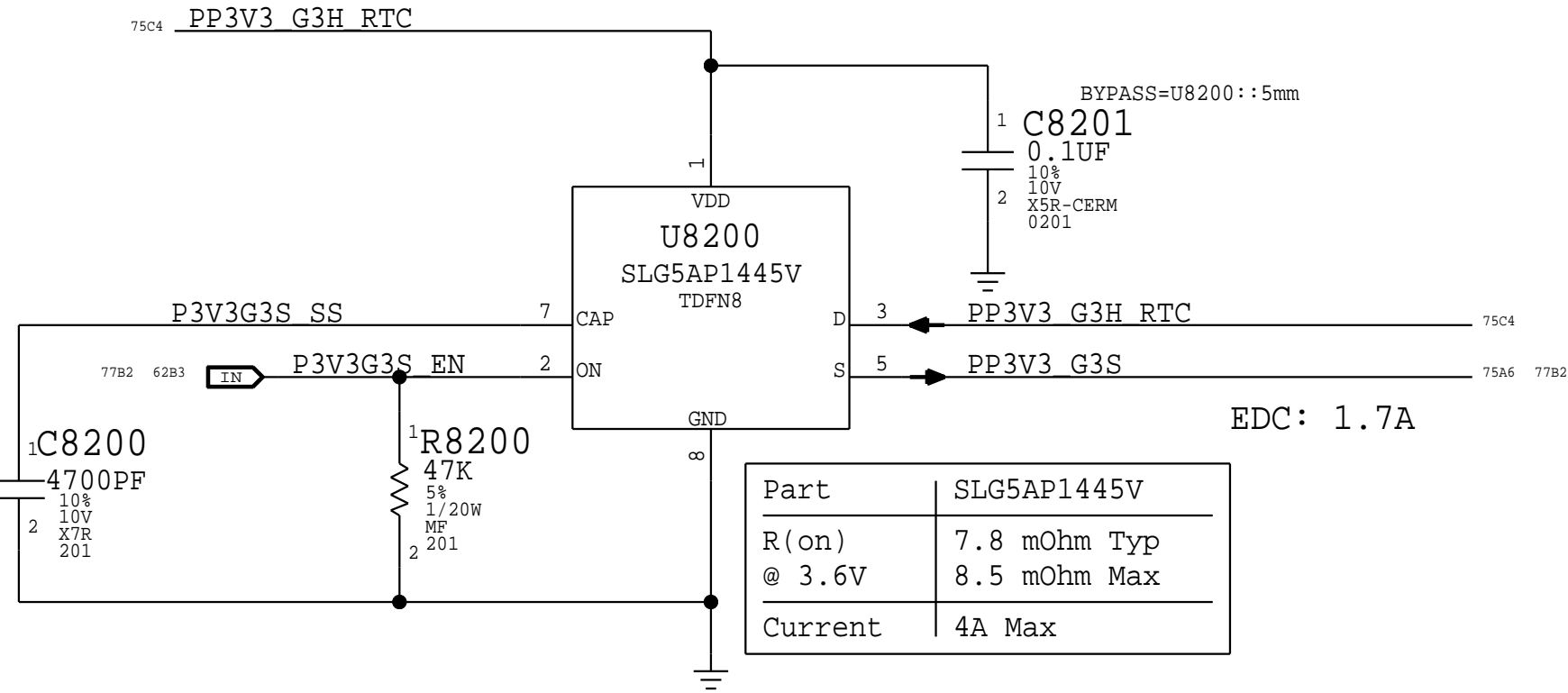
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| | | | SHEET | 61 OF 109 | |



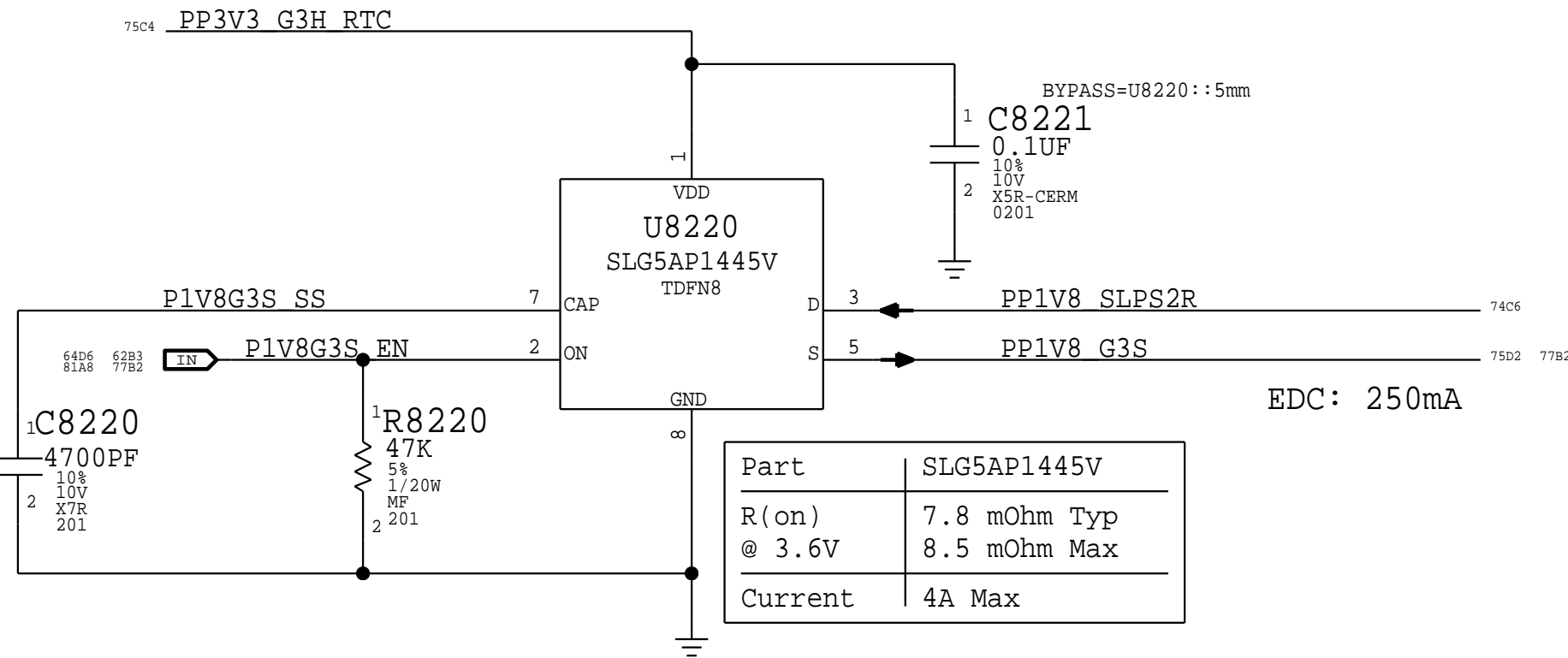
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| PMIC GPIOs & Control | | |
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| | BRANCH | evt-3 |
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Note: Load switches may be larger than necessary

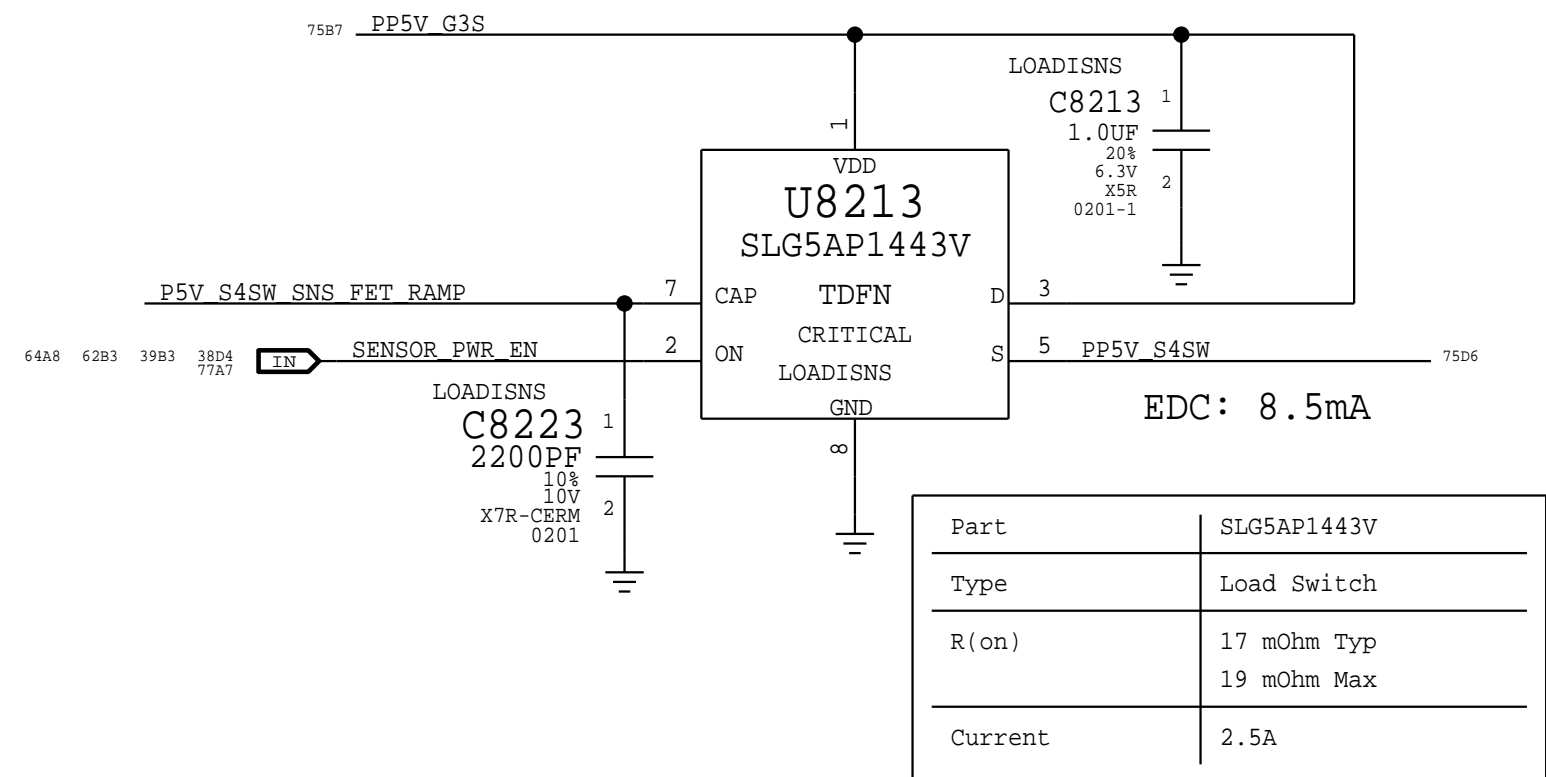
3.3V G3 Standby Switch



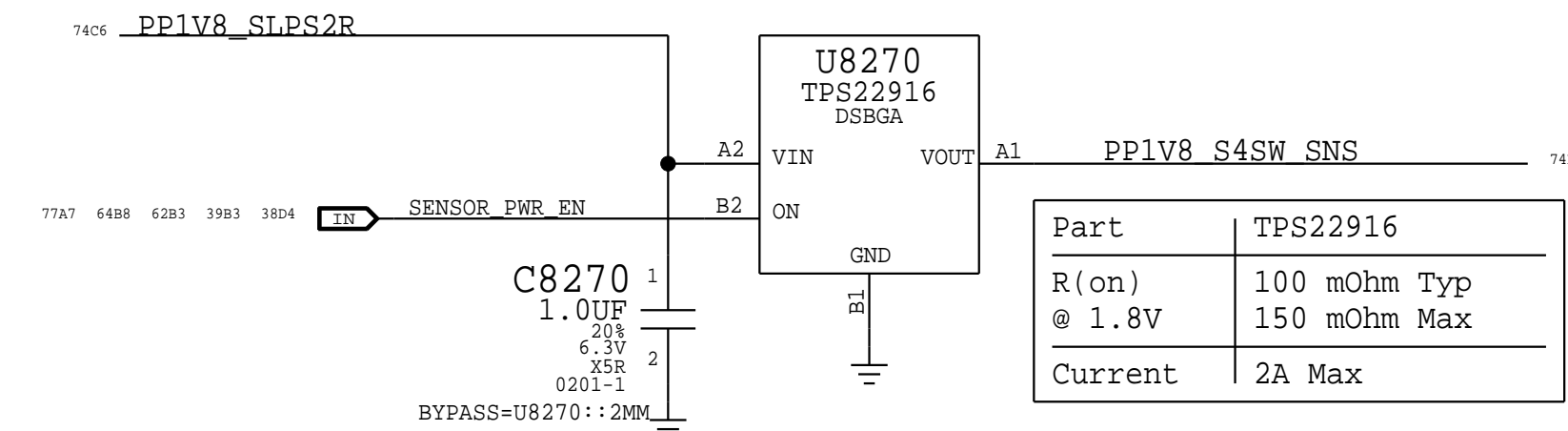
1.8V G3 Standby Switch



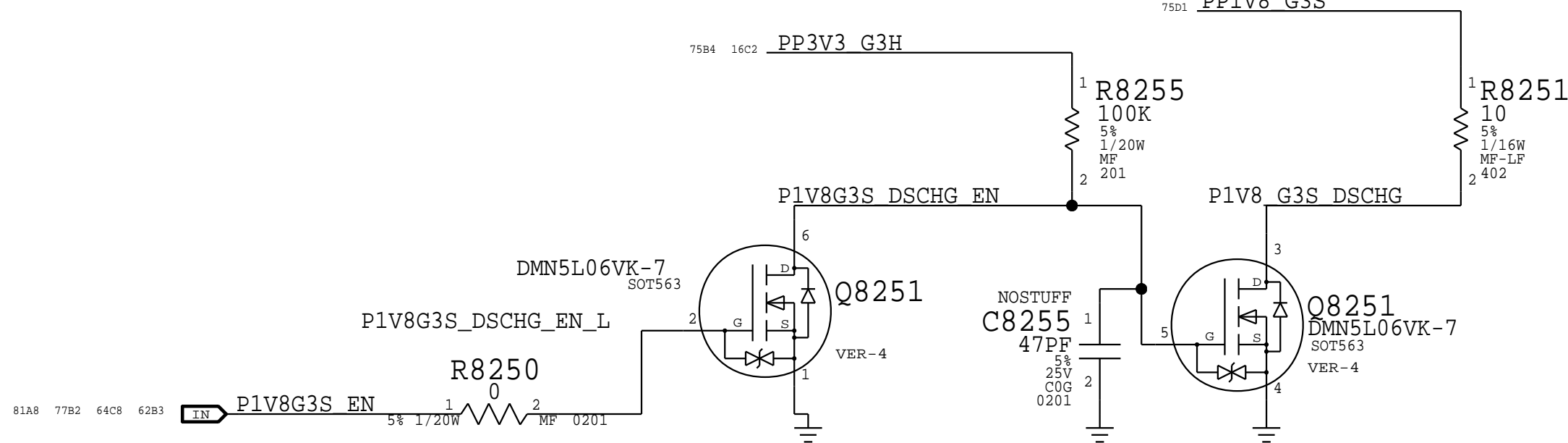
5V Sensor Switch



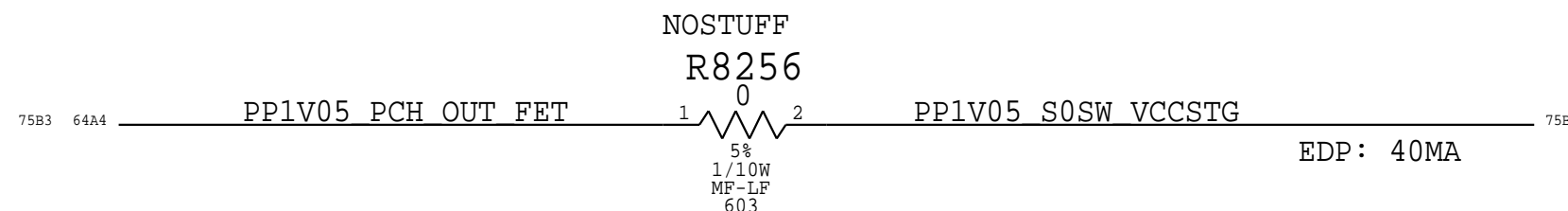
1.8V Sensor Switch



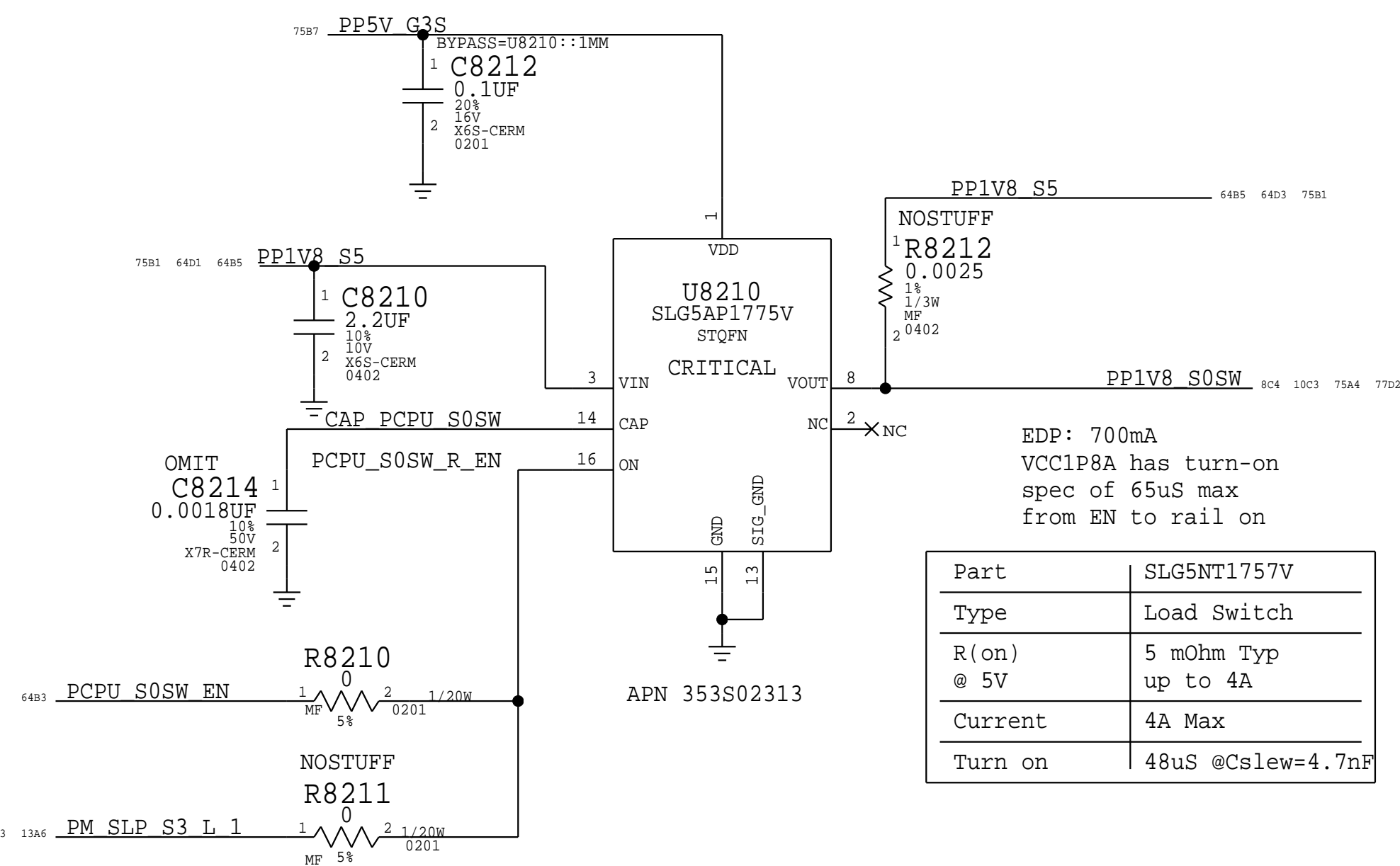
PP1V8_G3S DISCHARGE



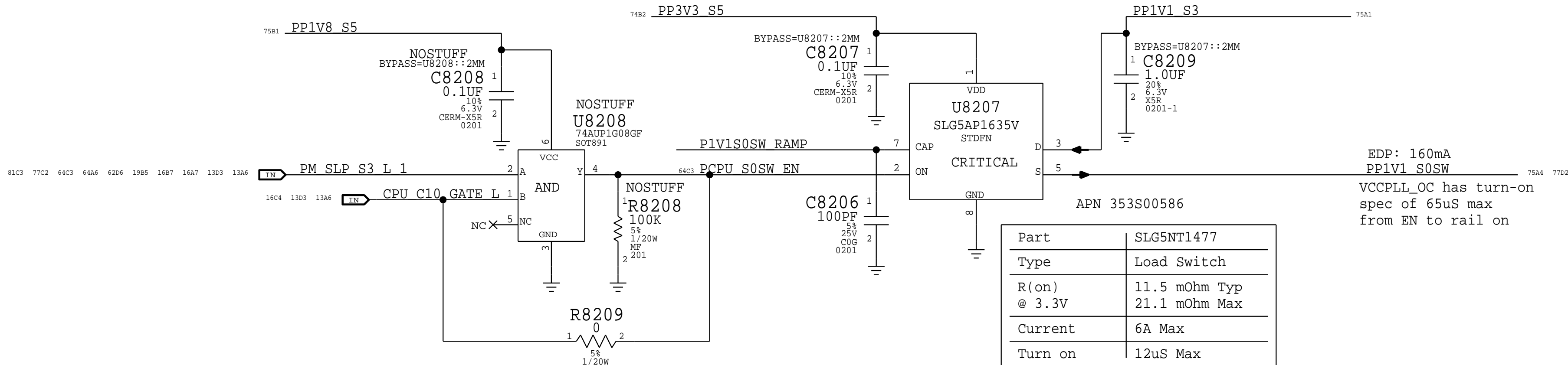
1.05 VCCSTG "SWITCH"



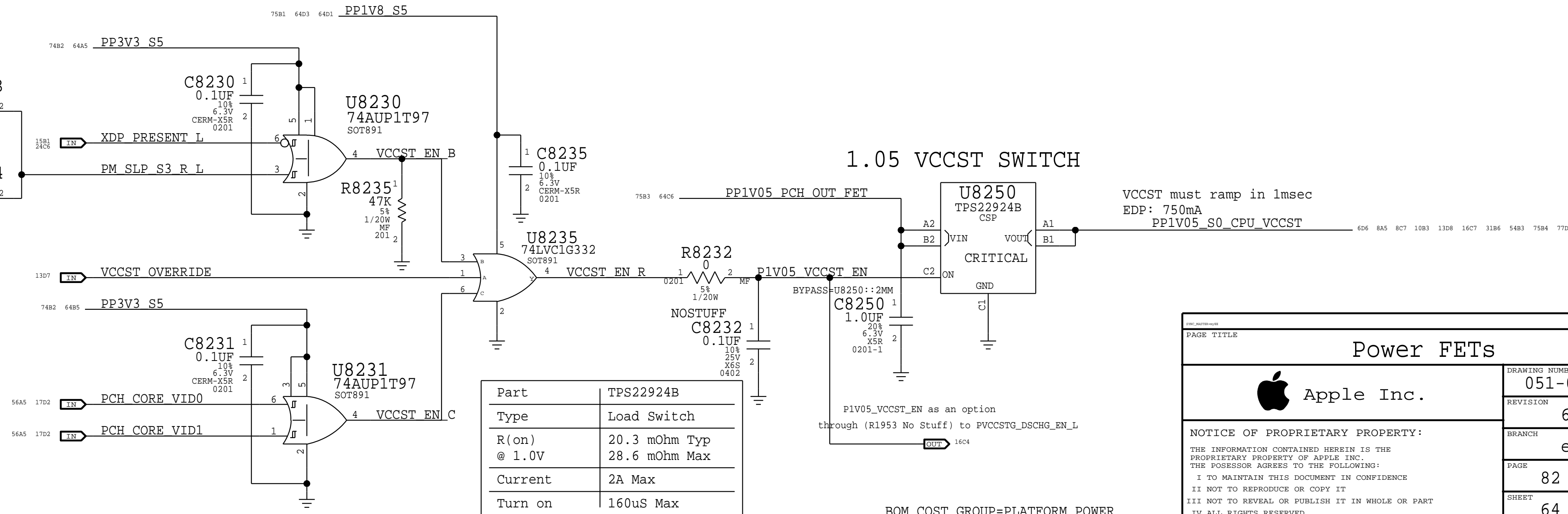
VCC1P8A Switch



1.2V S0SW VCCPLL_OC Switch

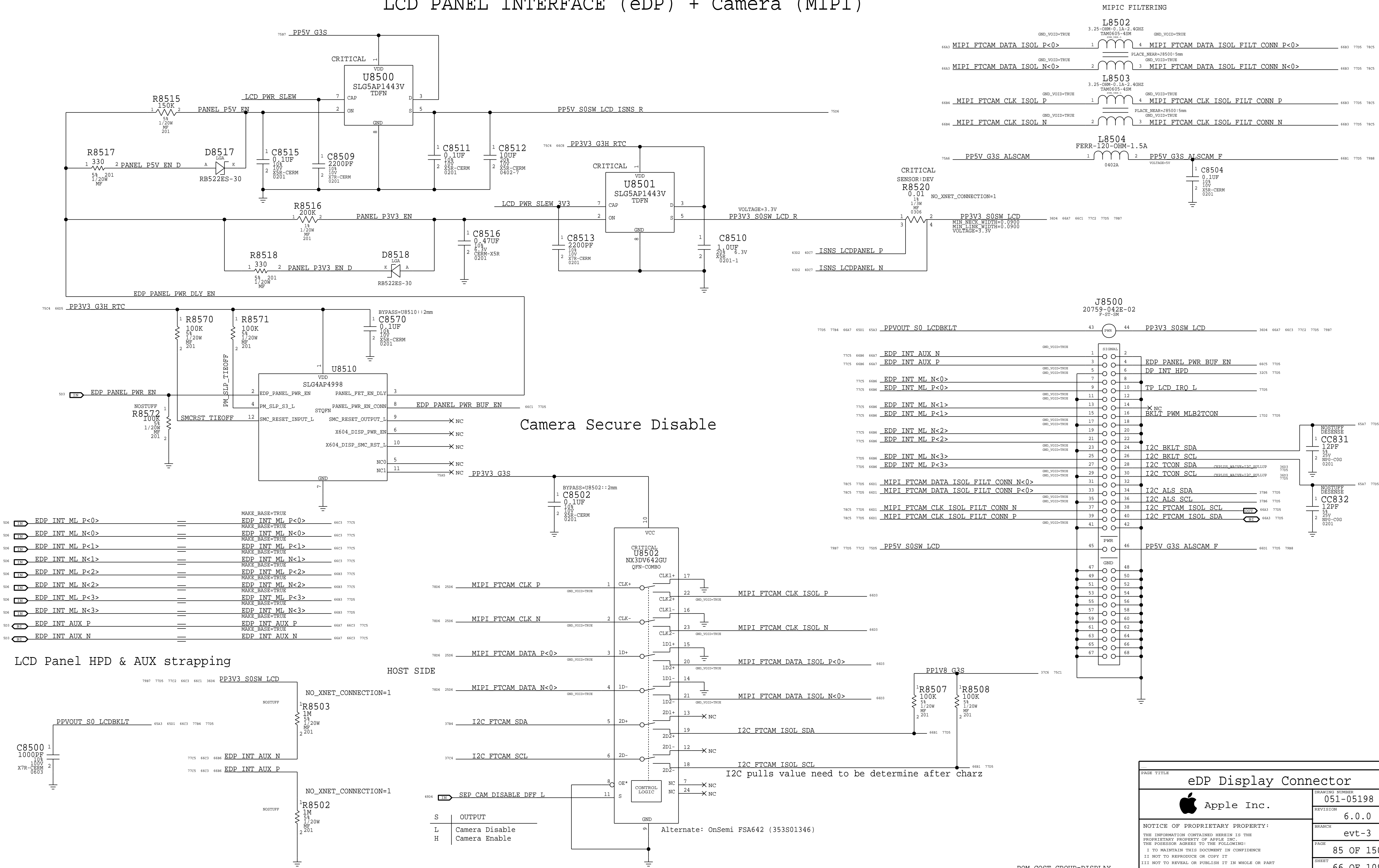


1.05 VCCST SWITCH



| Power FETs | | |
|---|----------------|-----------|
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LCD PANEL INTERFACE (eDP) + Camera (MIPI)



| PAGE TITLE | | |
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| eDP Display Connector | | |
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| | SHEET | 66 OF 109 |

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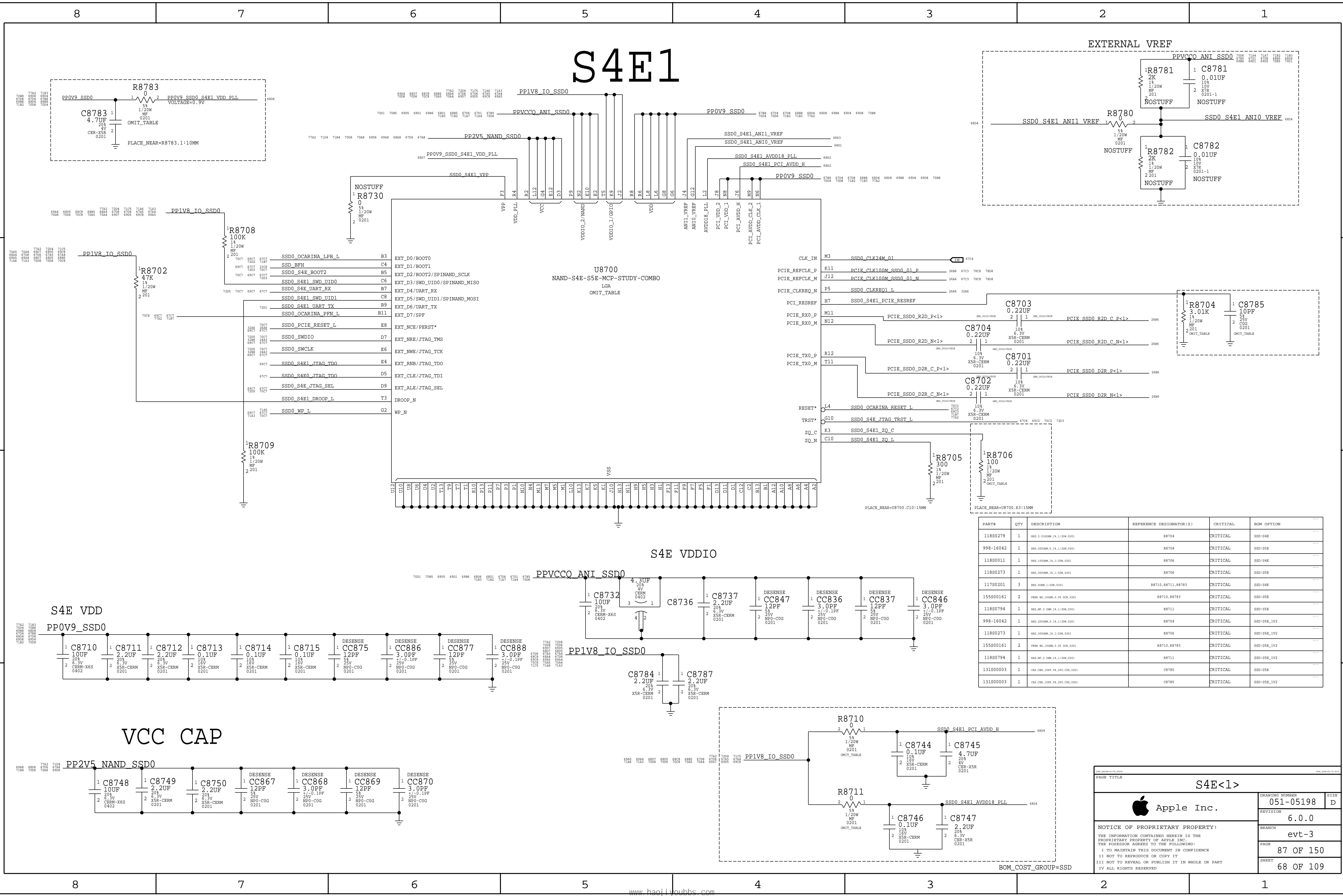
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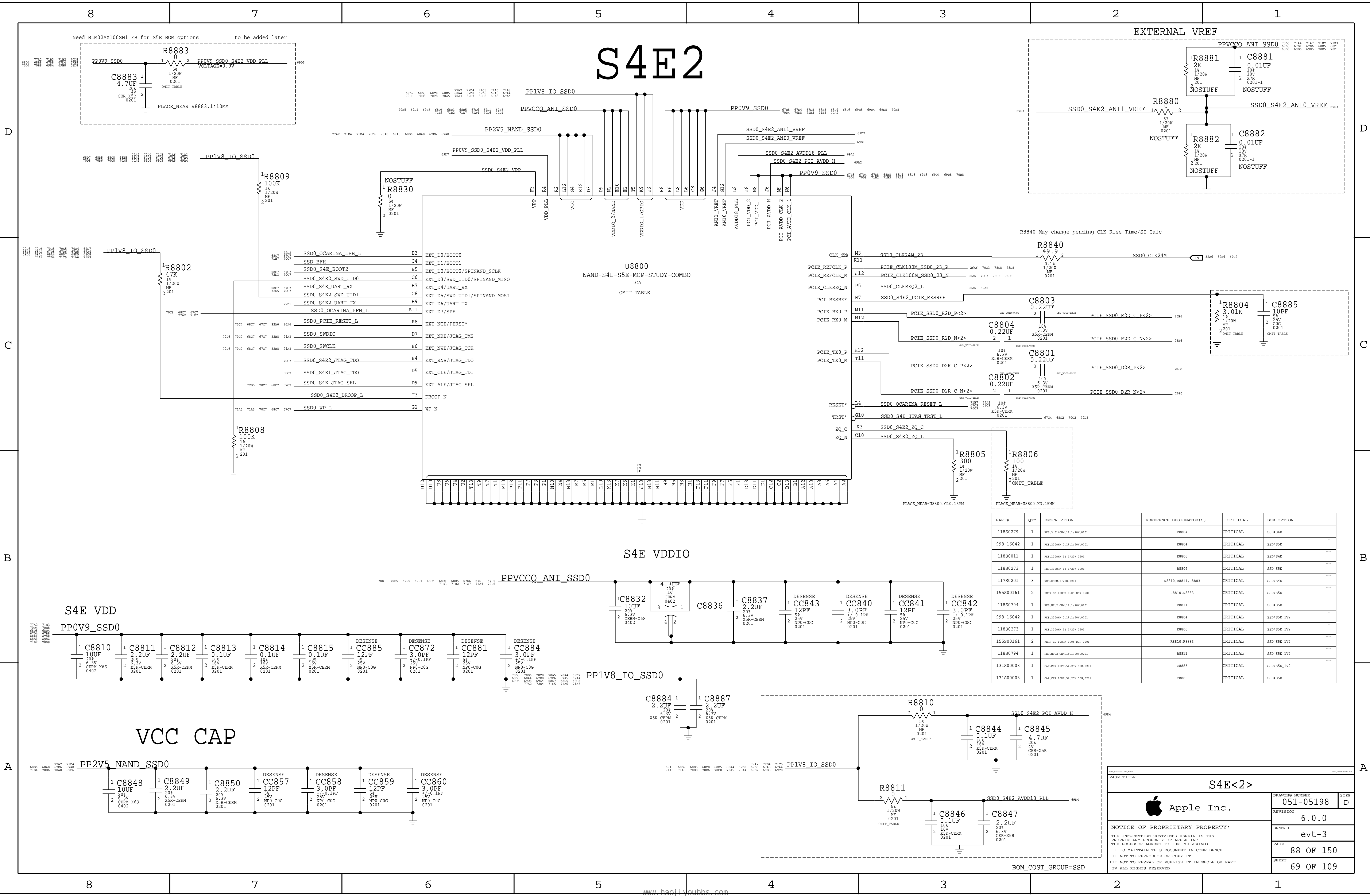
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| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|-----------|-----|-------------------------------------|-------------------------|----------|---------------|
| 118S0279 | 1 | RES, 1, 11000M, 1%, 1/20W, 0201 | R8704 | CRITICAL | SSD<S4E |
| 998-16042 | 1 | RES, 20000M, 0.1%, 1/20W, 0201 | R8704 | CRITICAL | SSD<S5E |
| 118S0011 | 1 | RES, 10000M, 1%, 1/20W, 0201 | R8706 | CRITICAL | SSD<S4E |
| 118S0273 | 1 | RES, 10000M, 1%, 1/20W, 0201 | R8706 | CRITICAL | SSD<S5E |
| 117S0201 | 3 | RES, 000M, 1/20W, 0201 | R8710, R8711, R8783 | CRITICAL | SSD<S4E |
| 155S00161 | 2 | PERM, 80, 1000M, 0.05 DCR, 0201 | R8710, R8783 | CRITICAL | SSD<S5E |
| 118S0794 | 1 | RES, NP, 2 OHM, 1%, 1/20W, 0201 | R8711 | CRITICAL | SSD<S5E |
| 998-16042 | 1 | RES, 20000M, 0.1%, 1/20W, 0201 | R8704 | CRITICAL | SSD<S5E<_I_V2 |
| 118S0273 | 1 | RES, 10000M, 1%, 1/20W, 0201 | R8706 | CRITICAL | SSD<S5E<_I_V2 |
| 155S00161 | 2 | PERM, 80, 1000M, 0.05 DCR, 0201 | R8710, R8783 | CRITICAL | SSD<S5E<_I_V2 |
| 118S0794 | 1 | RES, NP, 2 OHM, 1%, 1/20W, 0201 | R8711 | CRITICAL | SSD<S5E<_I_V2 |
| 131S00003 | 1 | CAP, CER, 100PF, 1%, 25V, COG, 0201 | C8785 | CRITICAL | SSD<S5E |
| 131S00003 | 1 | CAP, CER, 100PF, 1%, 25V, COG, 0201 | C8785 | CRITICAL | SSD<S5E<_I_V2 |

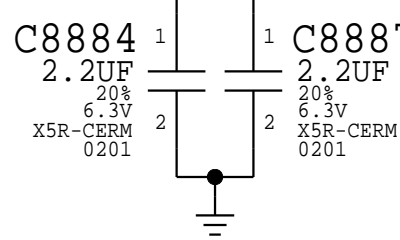
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| | | PAGE | 87 OF 150 | | |
| | | SHEET | 68 OF 109 | | |



S4E2

S4E VDDIO

PPVCCQ ANI SSD0

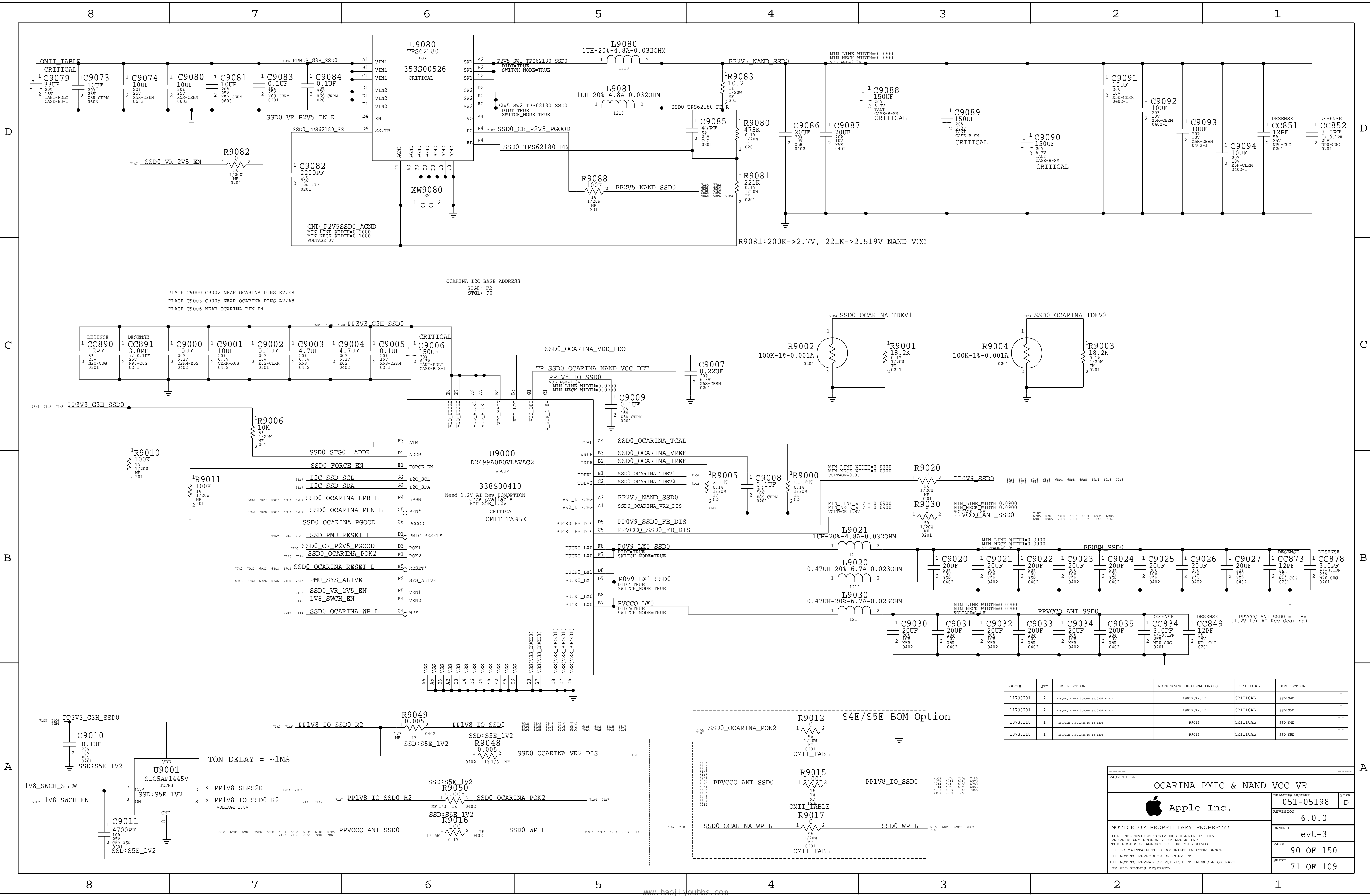


PP1V8 IO SSD0



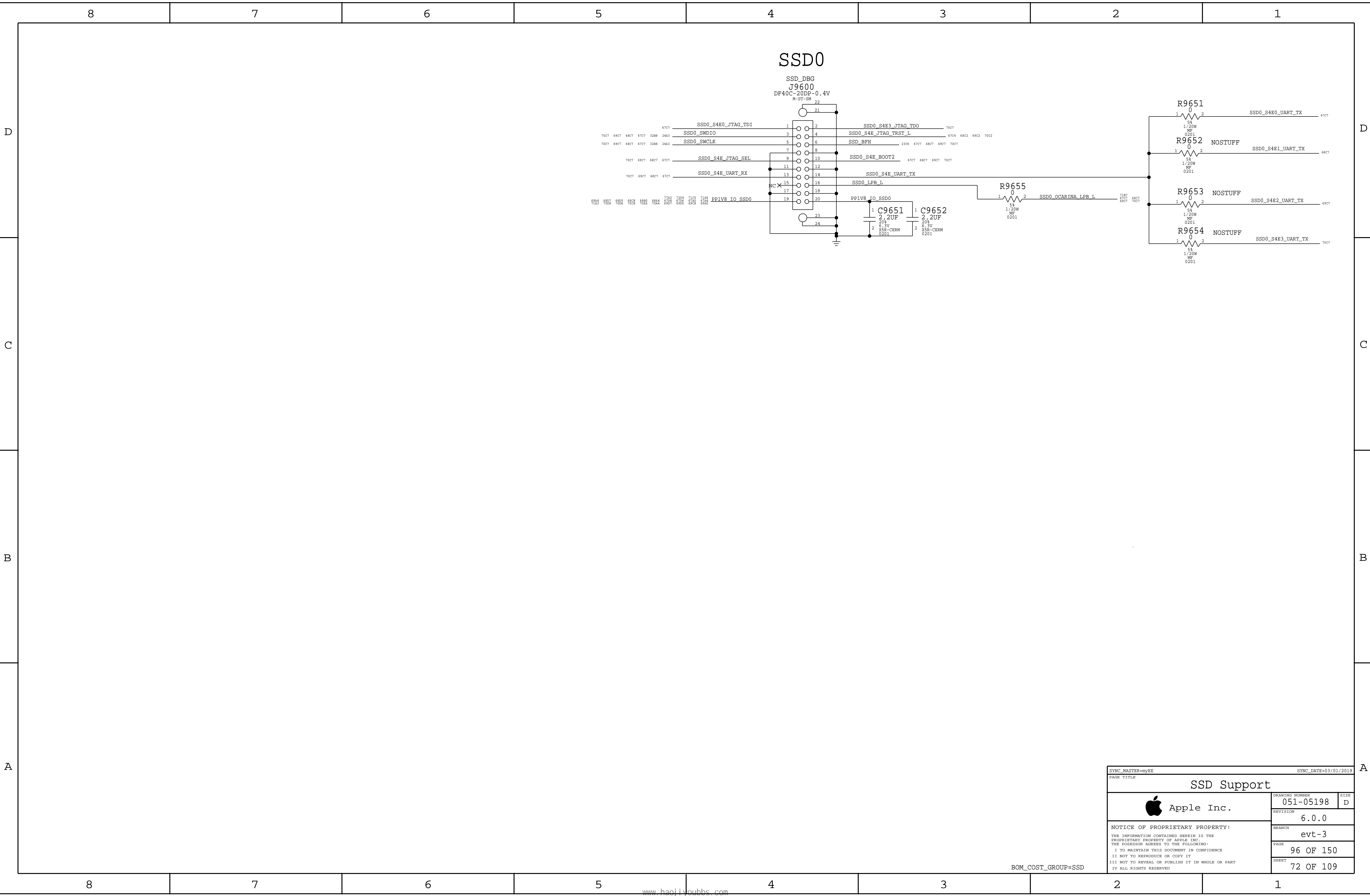
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| 998-16042 | 1 | RES,200OHM,0.1%,1/20W,0201 | R8804 | CRITICAL | SSD<S5E |
| 118S0011 | 1 | RES,100OHM,1%,1/20W,0201 | R8806 | CRITICAL | SSD<S4E |
| 118S0273 | 1 | RES,300OHM,1%,1/20W,0201 | R8806 | CRITICAL | SSD<S5E |
| 117S0201 | 3 | RES,COHM,1/20W,0201 | R8810,R8811,R8883 | CRITICAL | SSD<S4E |
| 155S00161 | 2 | FERR,80,100OHM,0.05 DCR,0201 | R8810,R8883 | CRITICAL | SSD<S5E |
| 118S0794 | 1 | RES,NF,2 OHM,1%,1/20W,0201 | R8811 | CRITICAL | SSD<S5E |
| 998-16042 | 1 | RES,200OHM,0.1%,1/20W,0201 | R8804 | CRITICAL | SSD<S5E_1V2 |
| 118S0273 | 1 | RES,300OHM,1%,1/20W,0201 | R8806 | CRITICAL | SSD<S5E_1V2 |
| 155S00161 | 2 | FERR,80,100OHM,0.05 DCR,0201 | R8810,R8883 | CRITICAL | SSD<S5E_1V2 |
| 118S0794 | 1 | RES,NF,2 OHM,1%,1/20W,0201 | R8811 | CRITICAL | SSD<S5E_1V2 |
| 131S00003 | 1 | CAP,CER,10PF,5V,25V,COG,0201 | C8885 | CRITICAL | SSD<S5E_1V2 |
| 131S00003 | 1 | CAP,CER,10PF,5V,25V,COG,0201 | C8885 | CRITICAL | SSD<S5E |

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| Apple Inc. | DRAWING NUMBER | 051-05198 |
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| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|------------------------------------|-------------------------|----------|------------|
| 117S0201 | 2 | RES,NP,1A,MAX,0.008M,5A,0201,BLACK | R9012,R9017 | CRITICAL | SSD:S4E |
| 117S0201 | 2 | RES,NP,1A,MAX,0.008M,5A,0201,BLACK | R9012,R9017 | CRITICAL | SSD:S5E |
| 107S0118 | 1 | RES,PTLM,0.0100M,1W,1A,1206 | R9015 | CRITICAL | SSD:S4E |
| 107S0118 | 1 | RES,PTLM,0.0100M,1W,1A,1206 | R9015 | CRITICAL | SSD:S5E |

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| | | | PAGE | | 96 OF 150 | |
| | | | SHEET | | 72 OF 109 | |
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PAGE
98 OF 150

SHEET
73 OF 109

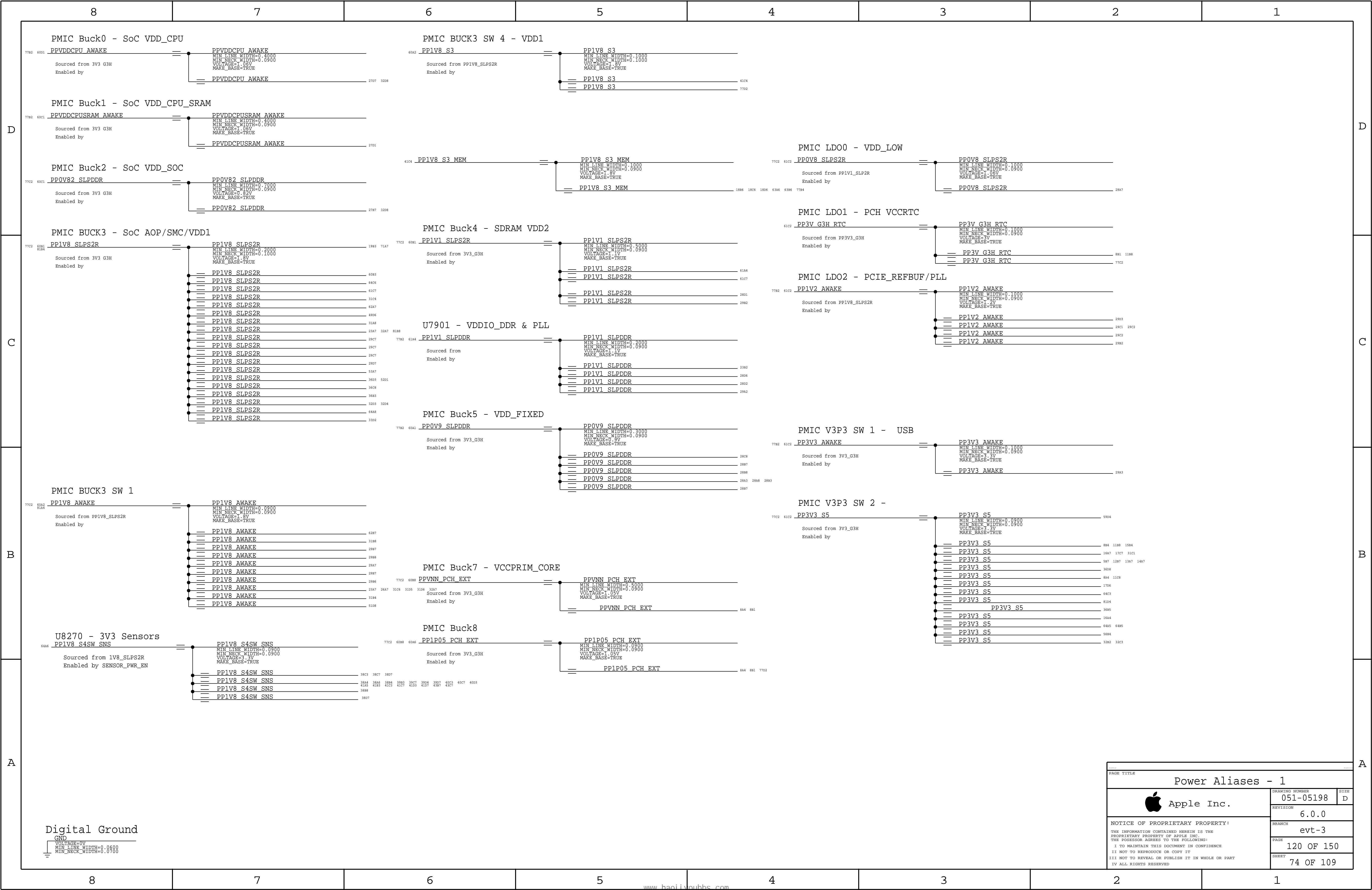
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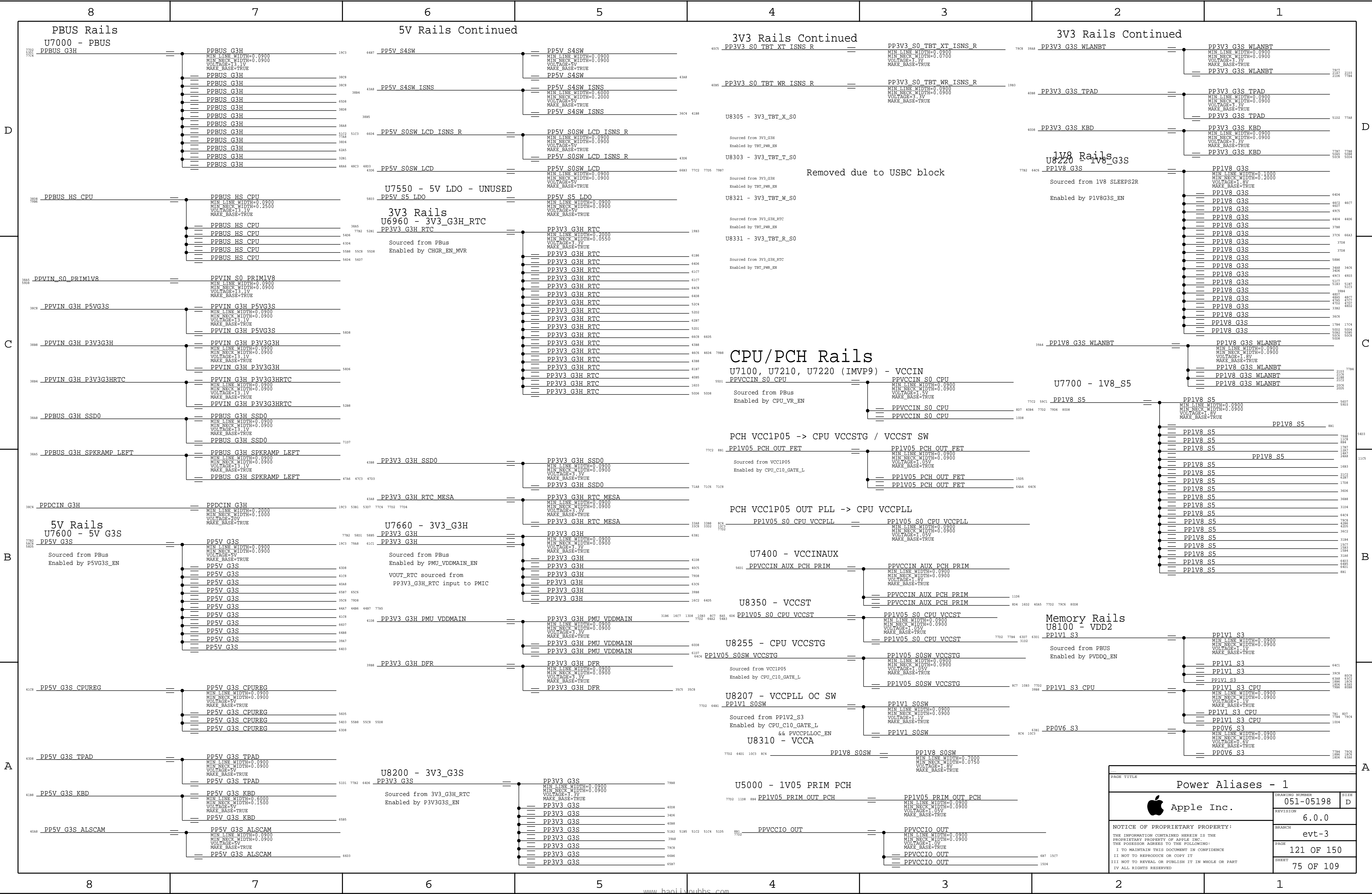
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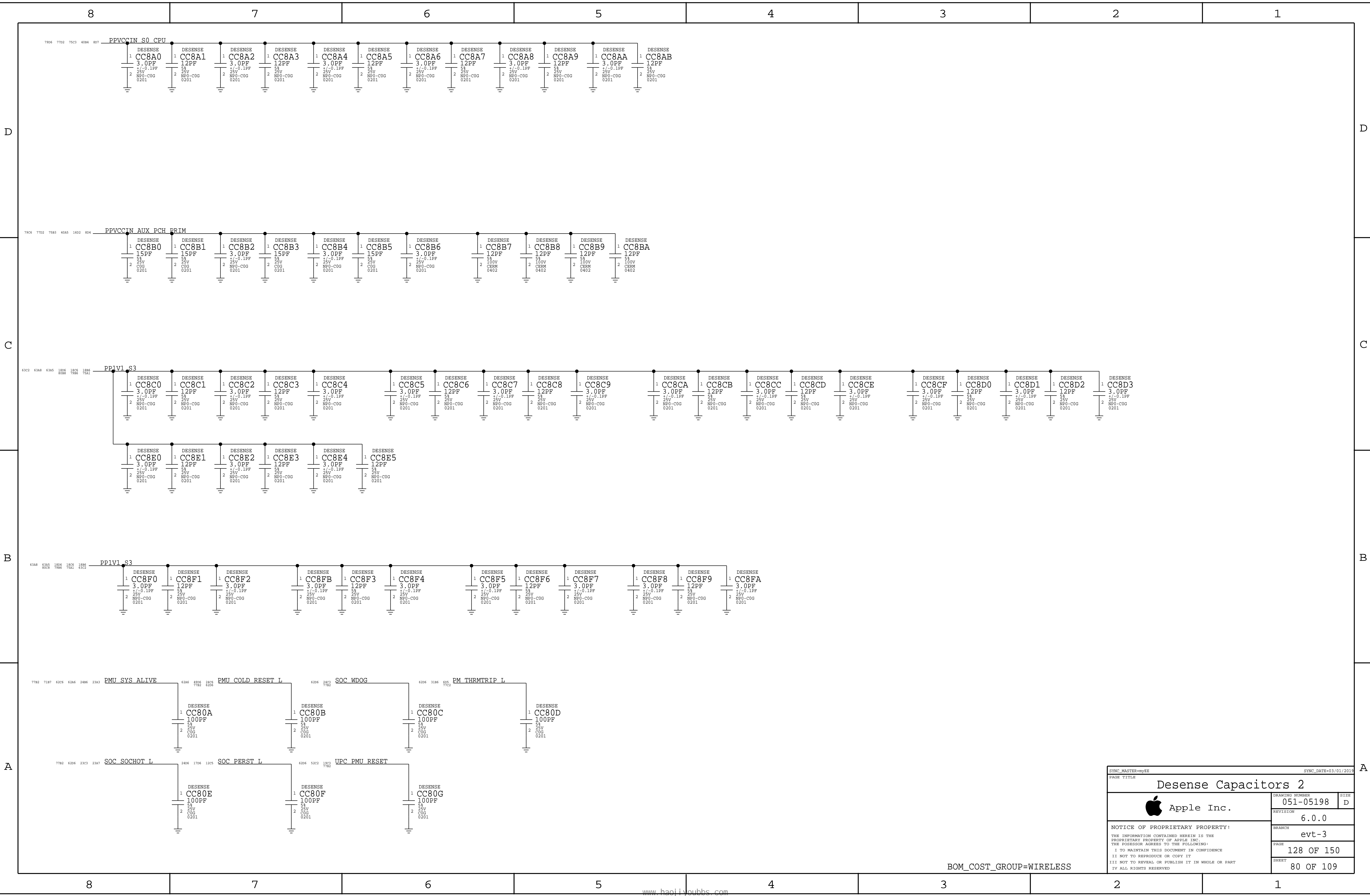
www.haojiyoubbs.com


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| | | PAGE | | 98 OF 150 | |
| | | SHEET | | 73 OF 109 | |

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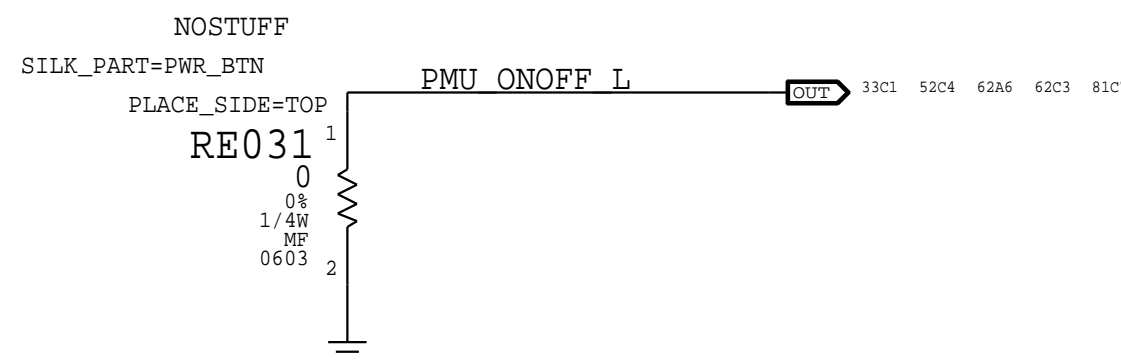
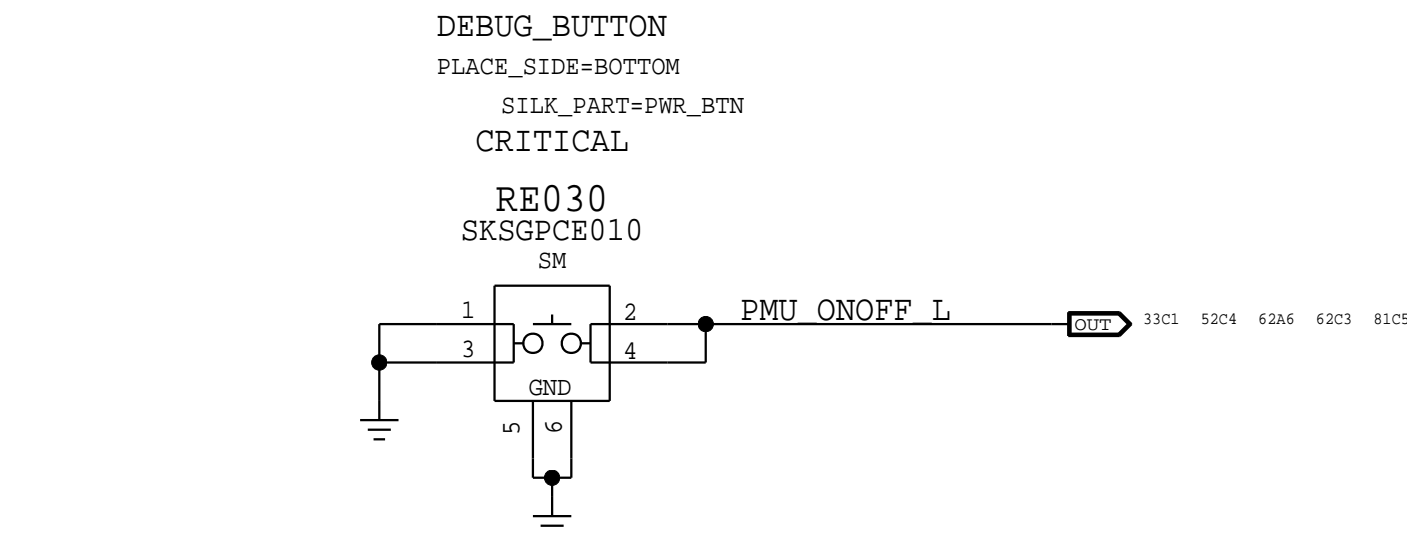
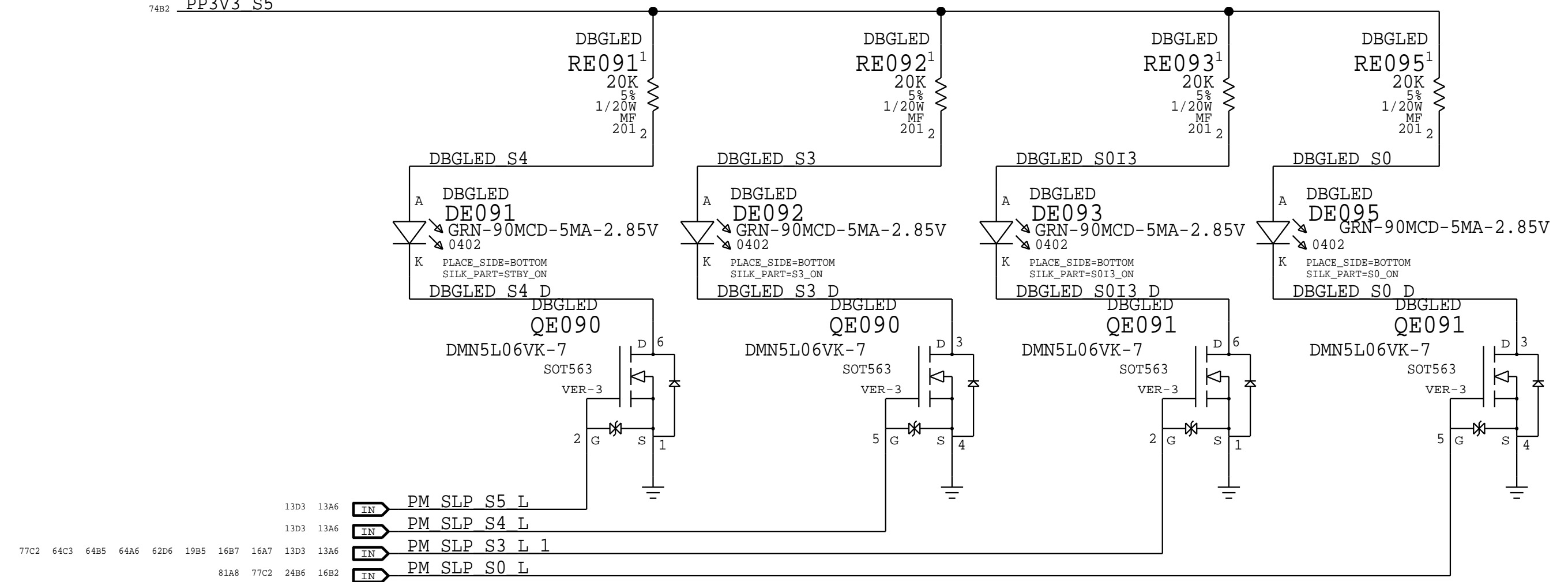
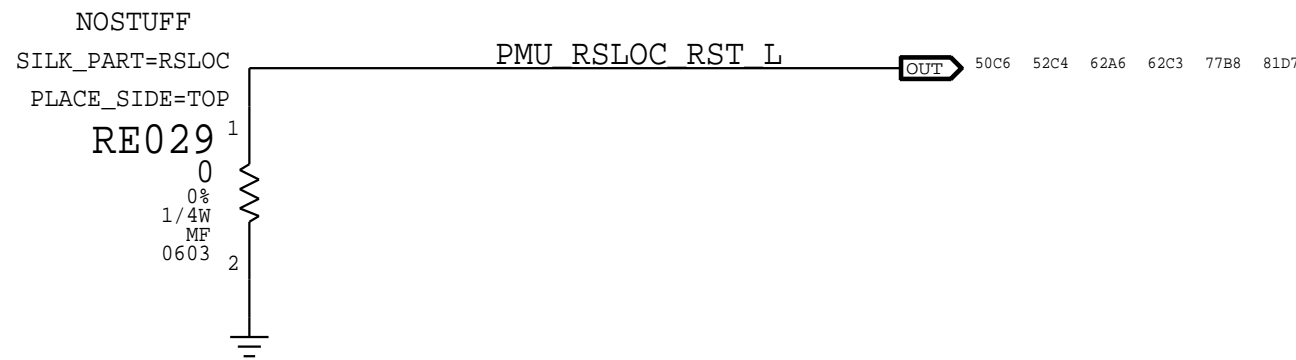
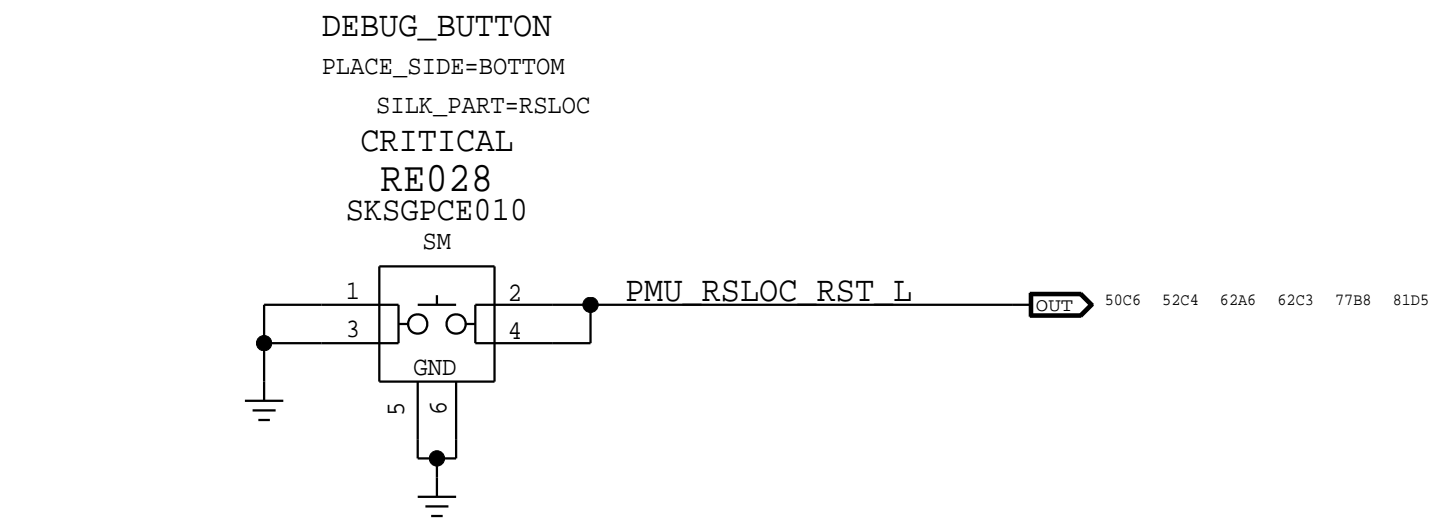


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|  Apple Inc. | DRAWING NUMBER | 051-05198 | SIZE |
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| | PAGE | 128 OF 150 | |
| | SHEET | 80 OF 109 | |

BOM_COST_GROUP=WIRELESS

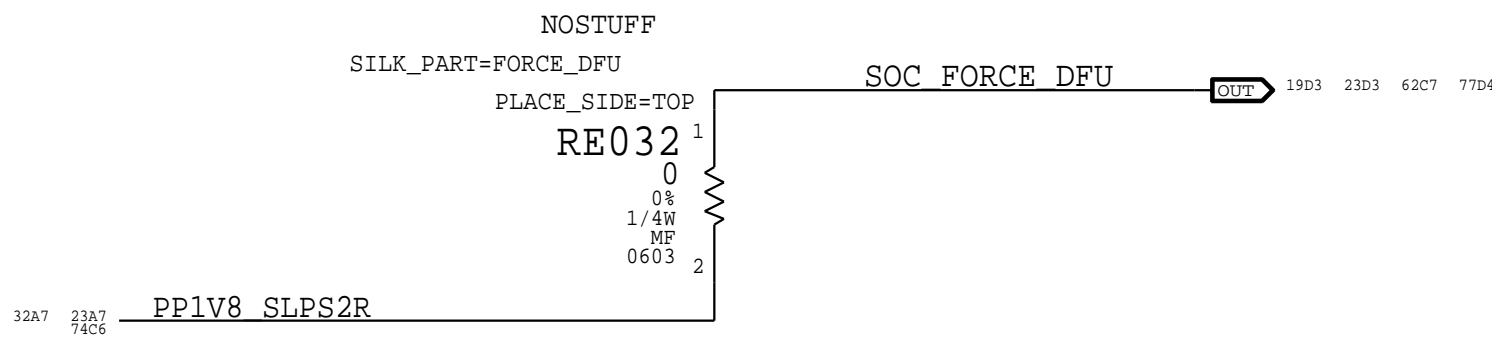
Debug Power "Buttons"

Power State Debug LEDs
(For development only)



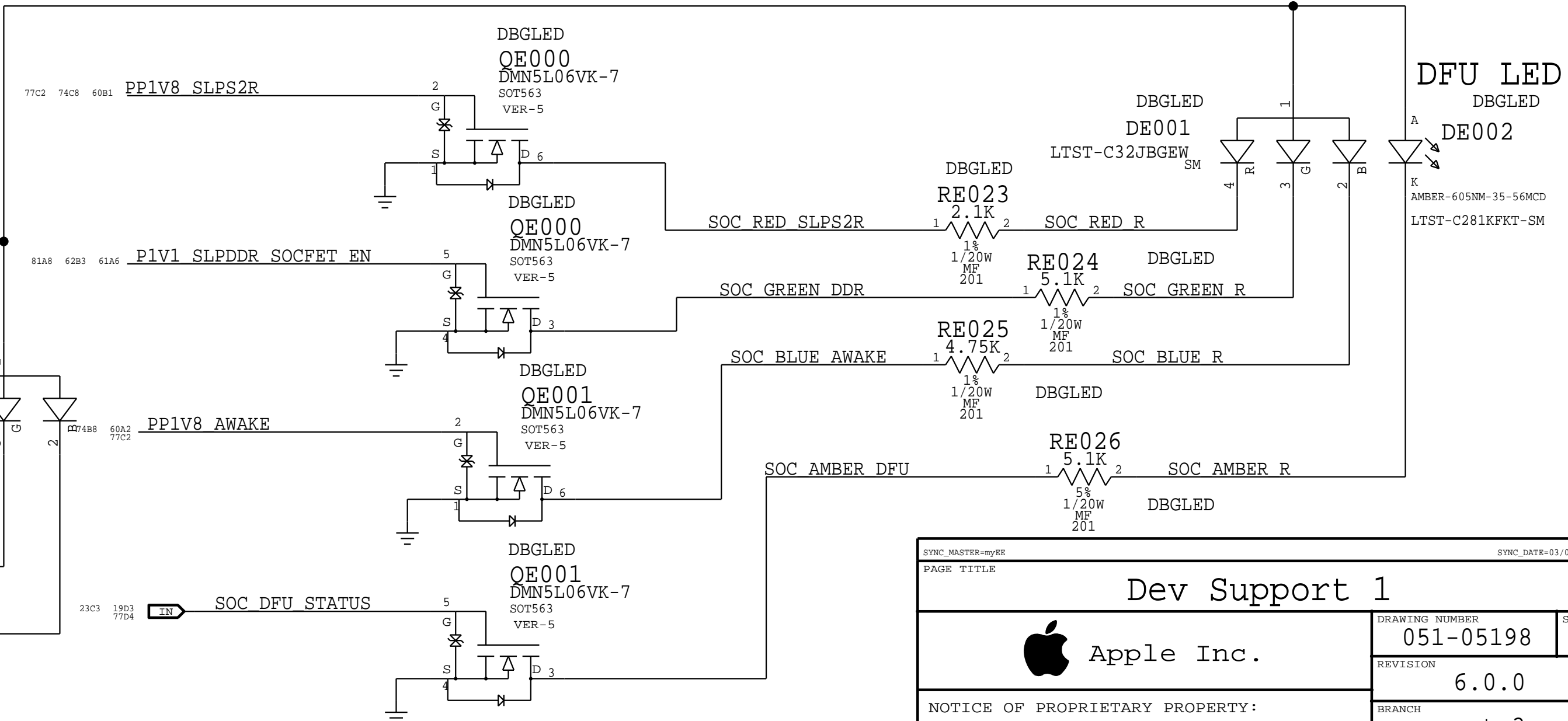
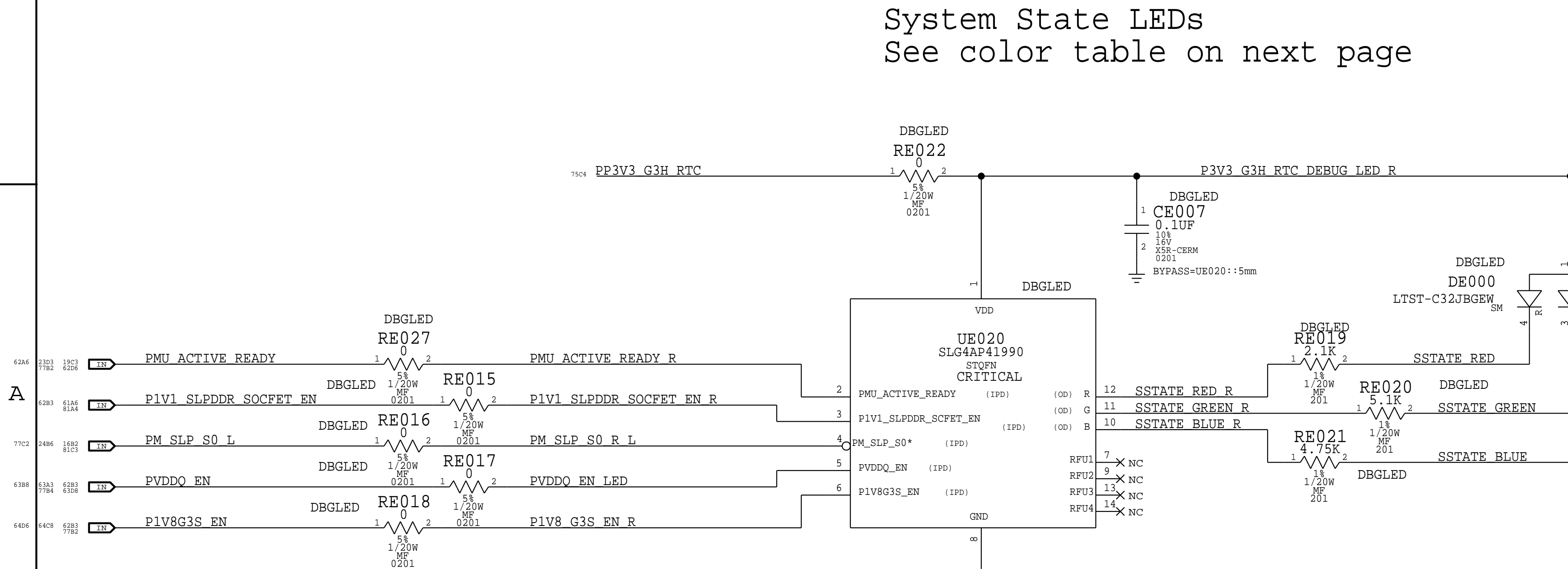
77D4 19C3 USB SOC P == USB SOC P 23B6 77B4
MAKE_BASE=TRUE

77D4 19C3 USB SOC N == USB SOC N 23B6 77B4
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System State LEDs
See color table on next page

SOC State LEDs



| | | | | | | | | |
|---|--|--|----------------|--|--|------------|--|--|
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| Dev Support 1 | | | 051-05198 | | | D | | |
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| | | | PAGE | | | 140 OF 150 | | |
| | | | SHEET | | | 81 OF 109 | | |

Confluence:

<https://confluence.appsit.apple.com/confluence/display/J214EE/Mac+HW+EE+Home>

Kismet:

AFP://KISMET.APPLE.COM/KISMET-PROJECTS/J214

Useful Wiki Links:

Schematic Conventions - <https://hmts.ecs.apple.com/wiki/index.php/User:Wferry/SchConventions>

Schematic Design Wiki - https://hmts.ecs.apple.com/wiki/index.php/Schematic_Design

J214 HW Radar:


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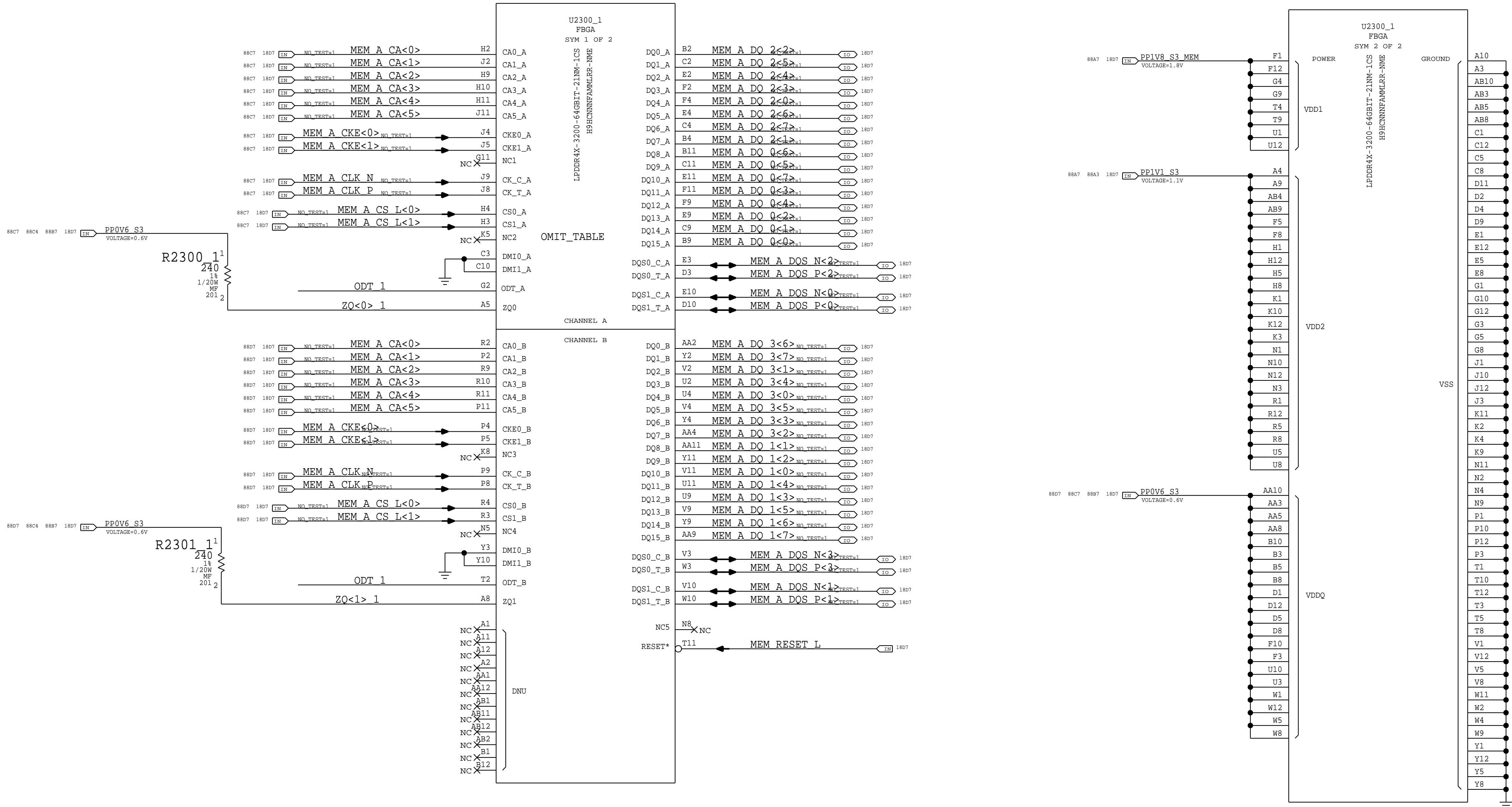
Page Allocations - box file

BLOCK Table

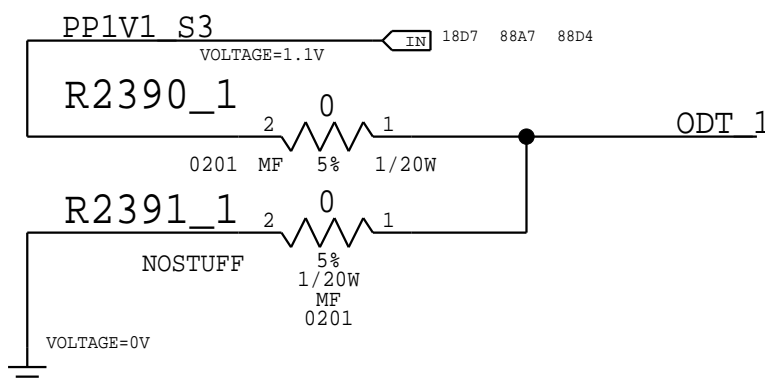
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| J214.ASARHANGNEJAD | MLB_WELL.USBC | 5.0.8 | S | 2019_12_10_14:41:47 |
| J214.ASARHANGNEJAD | MLB_WELL.USBC_CONNECTOR | 5.0.8 | S | 2019_12_10_14:42:14 |
| J214.ASARHANGNEJAD | MLB_WELL.USBC_SW | 5.0.8 | S | 2019_12_10_14:42:37 |
| J214.ASARHANGNEJAD | MLB_WELL.USBC_VR | 5.0.8 | S | 2019_12_10_14:43:28 |
| J214.ASARHANGNEJAD | MLB_WELL.ACE2BBR | 5.0.8 | S | 2019_12_10_14:43:02 |


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| | | SHEET | | 87 OF 109 | |

LPDDR4x SUB CHANNEL



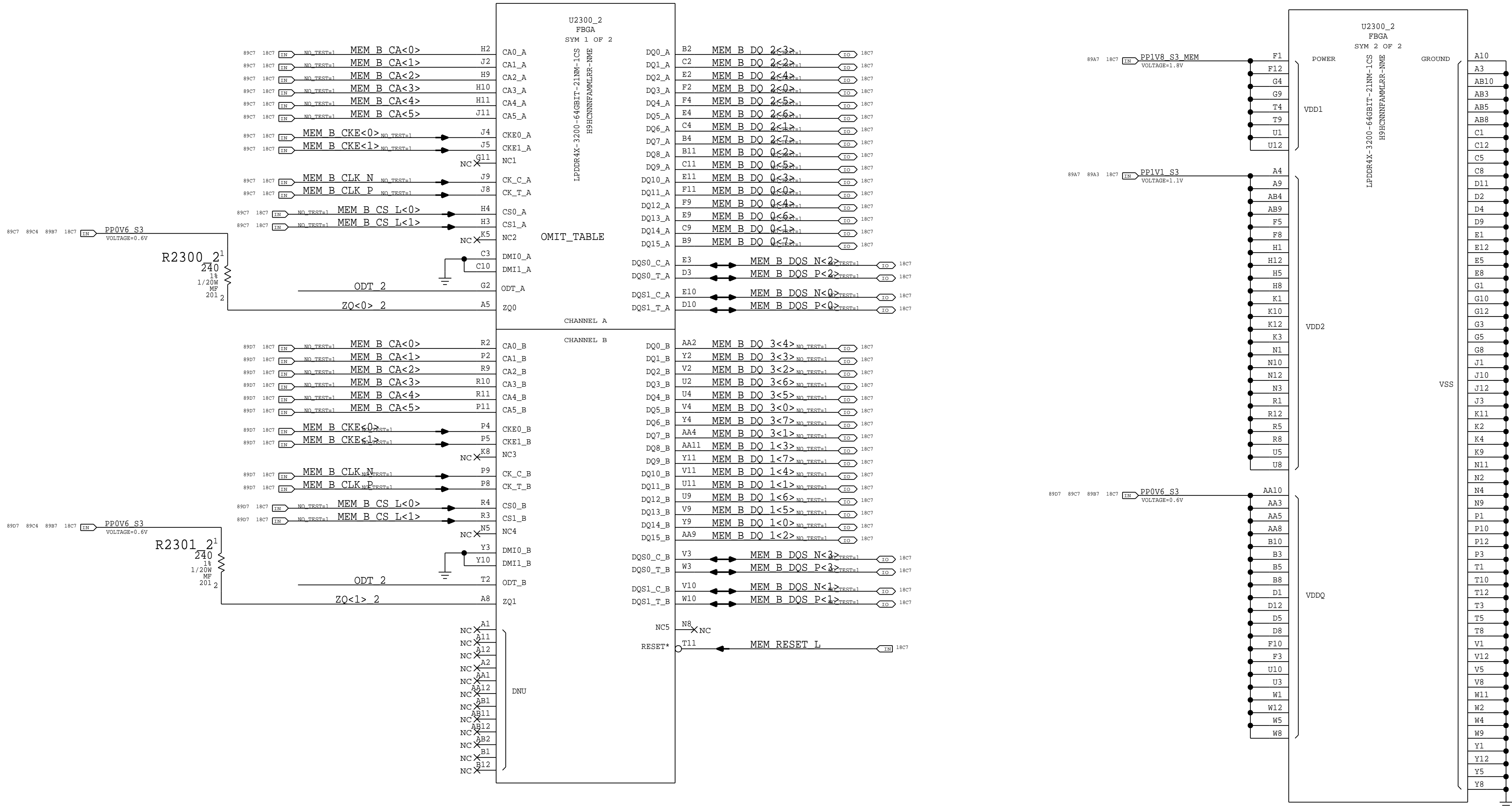
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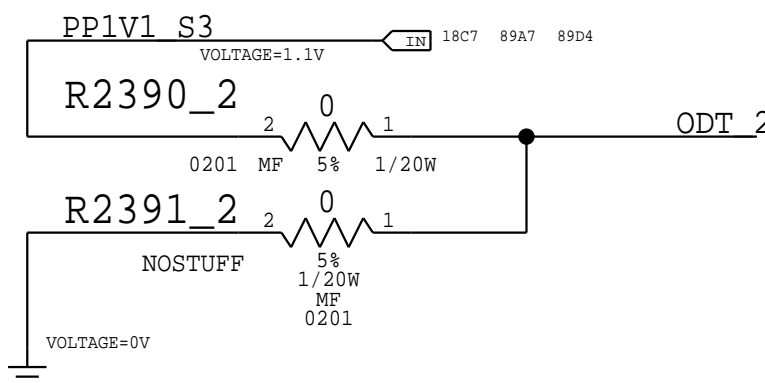
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| LPDDR4x Sub-Channel | | | | | | |
|  Apple Inc. | | | DRAWING NUMBER | | SIZE | |
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| | | | SHEET | | 88 OF 109 | |
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
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LPDDR4x SUB CHANNEL



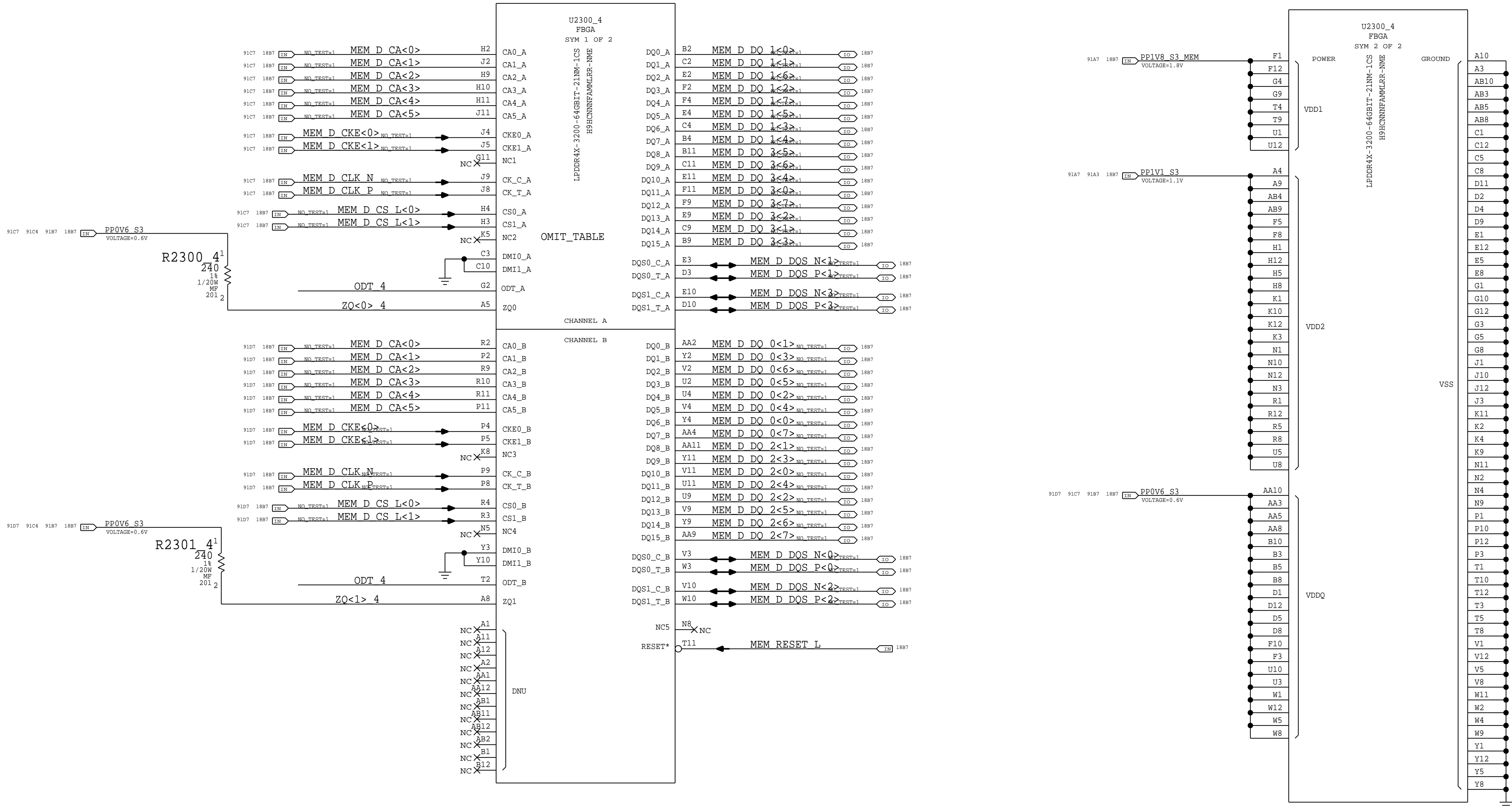
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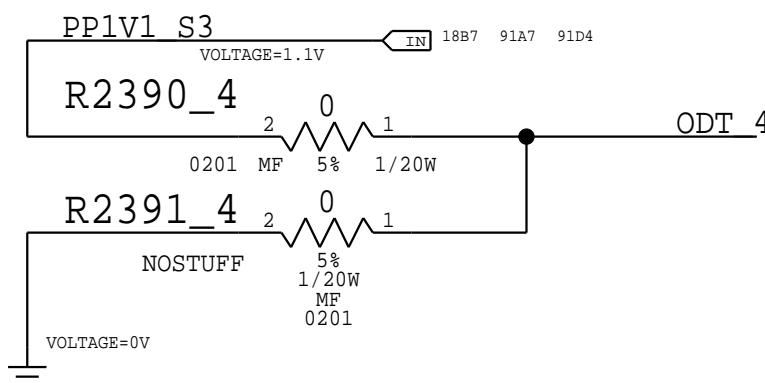
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| | | | BRANCH | | evt-3 | |
| | | | PAGE | | 1 OF 1 | |
| | | | SHEET | | 89 OF 109 | |
| | | | | | | |


BOM_COST_GROUP=DRAM

LPDDR4x SUB CHANNEL

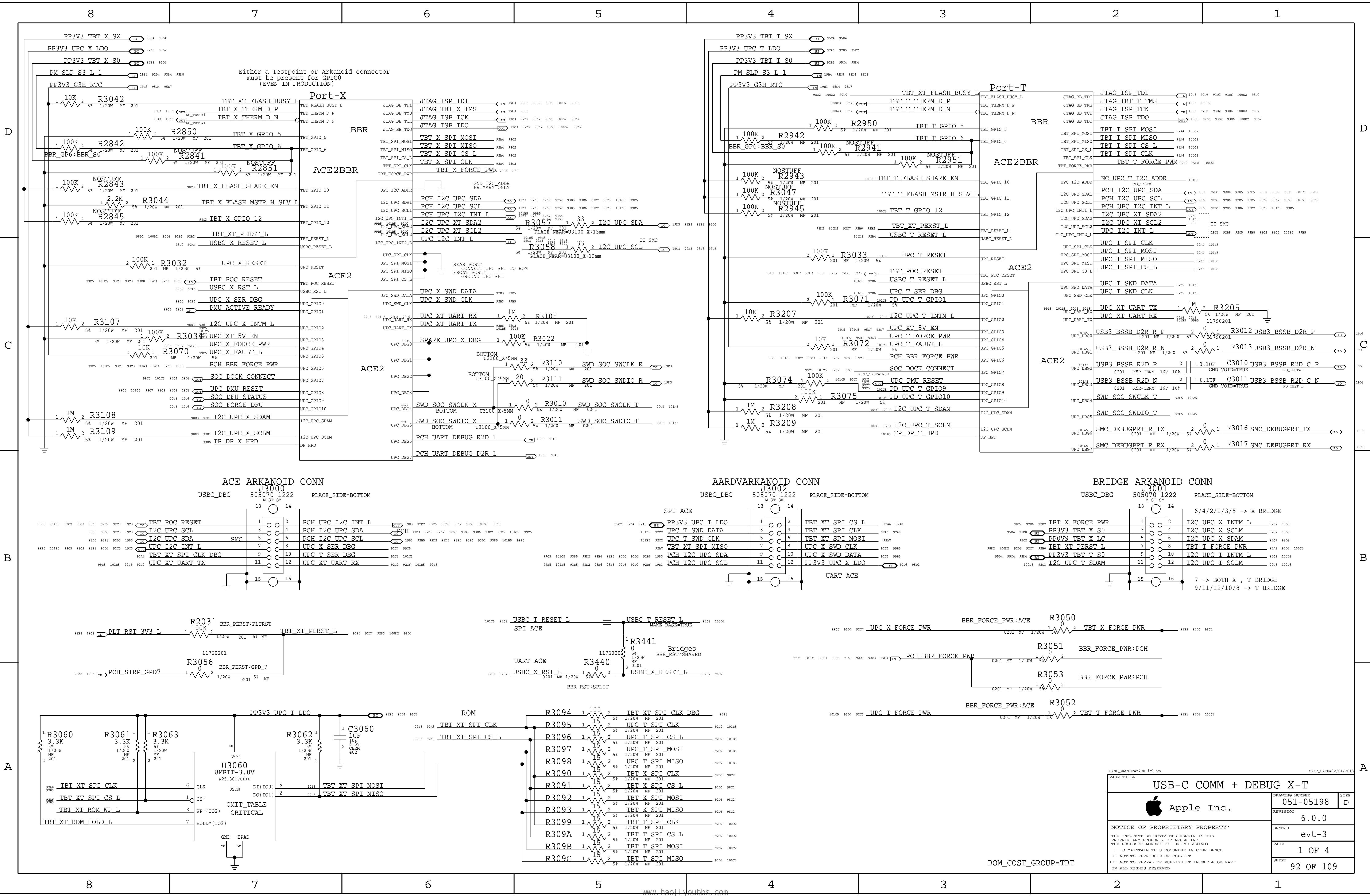


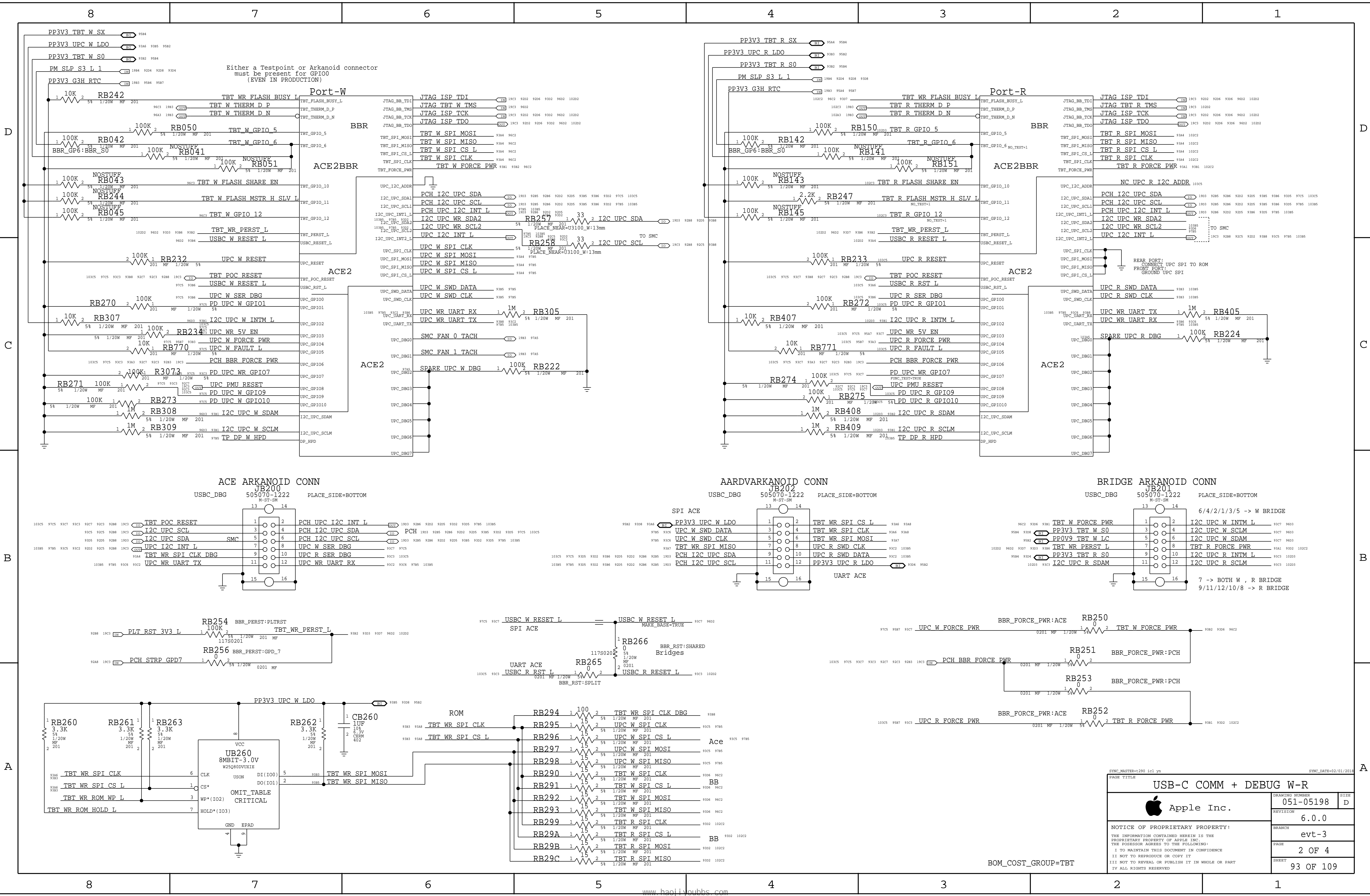
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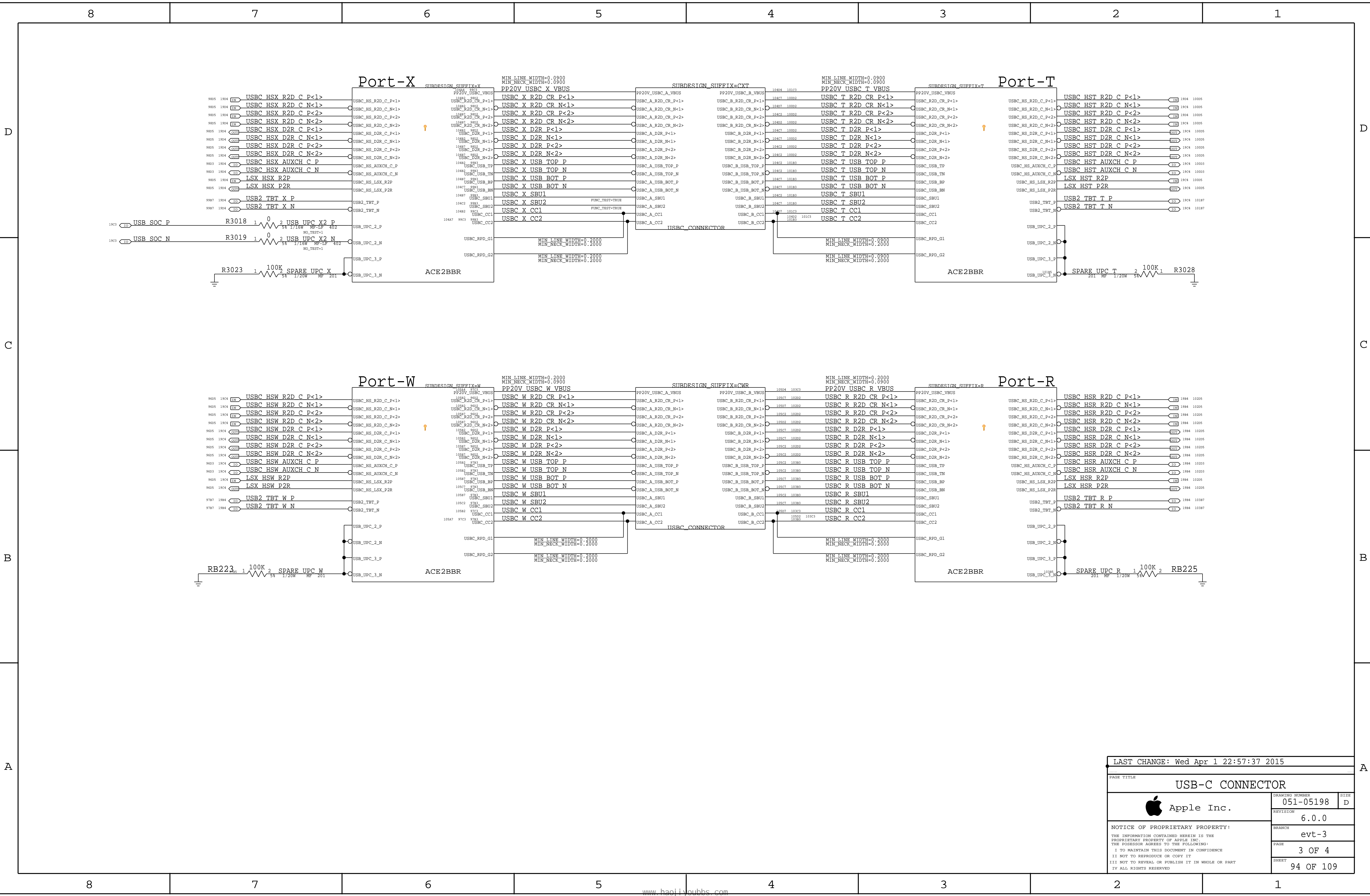


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| | | | SHEET | | 91 OF 109 |
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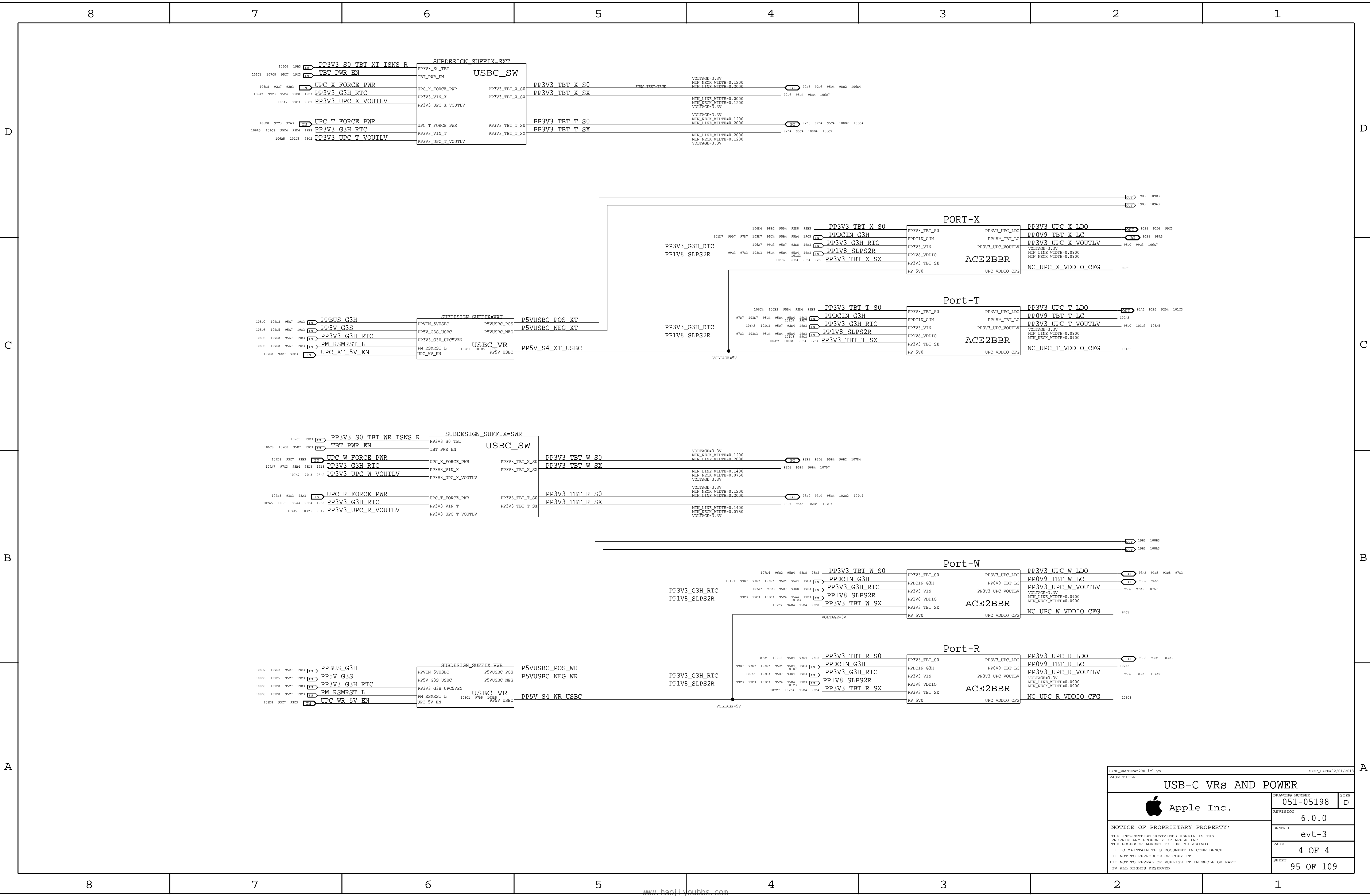
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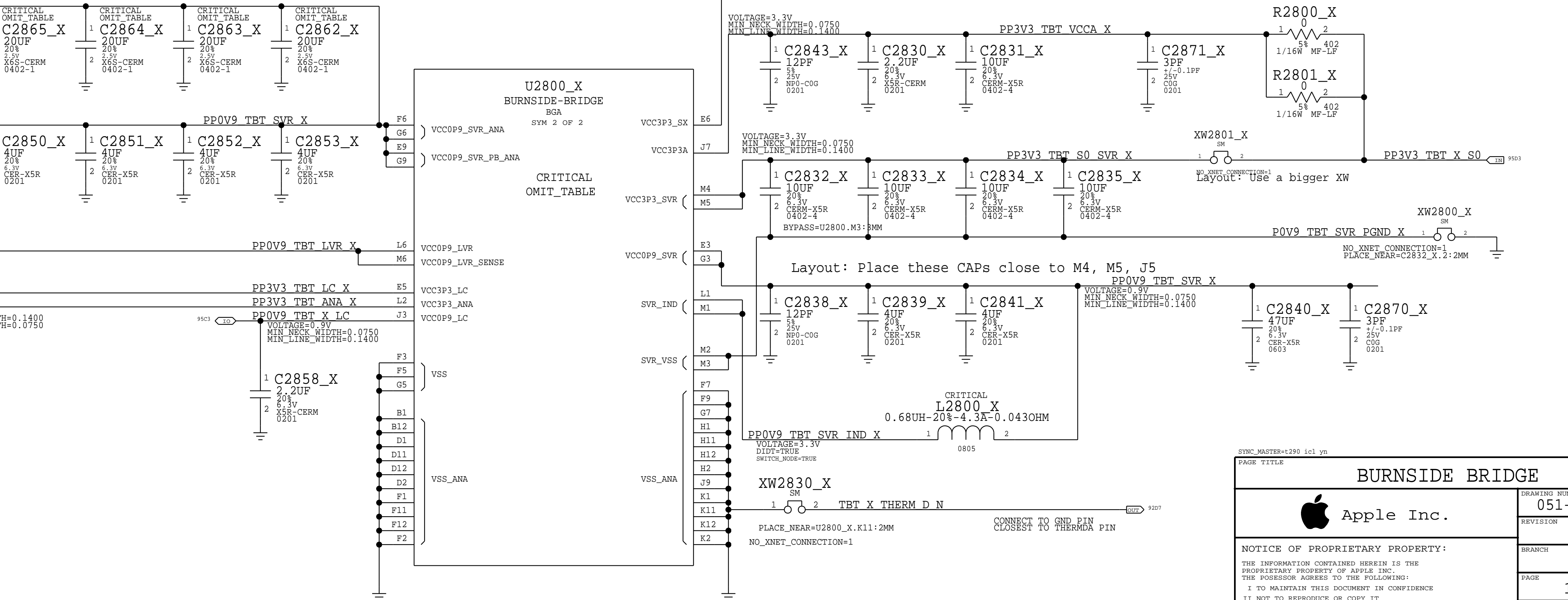


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| | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | SHEET | 94 OF 109 |



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|---|----------------|-----------|
| PAGE TITLE | | |
| USB-C VRs AND POWER | | |
|  Apple Inc. | DRAWING NUMBER | 051-05198 |
| | REVISION | 6.0.0 |
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| | SHEET | 95 OF 109 |

PCB layout for the PP0V9 TBT X LC filter. The layout shows a top layer with components C2865_X, C2864_X, C2863_X, and C2862_X, each with a 20F capacitor and an X5R-CERM capacitor. A bottom layer shows components C2861_X, C2860_X, C2850_X, C2851_X, C2852_X, and C2853_X, each with a 40F capacitor and an X5R-CERM capacitor. A central section shows components C2856_X, C2857_X, and C2858_X, each with a 2.2UF capacitor and an X5R-CERM capacitor. The layout includes various labels for critical omit tables, voltage levels, and dimensions.



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| | PAGE | 1 OF 2 |
| | SHEET | 98 OF 109 |

ACE2 USB-C PORT CONTROLLER (UPC)

D

C

B

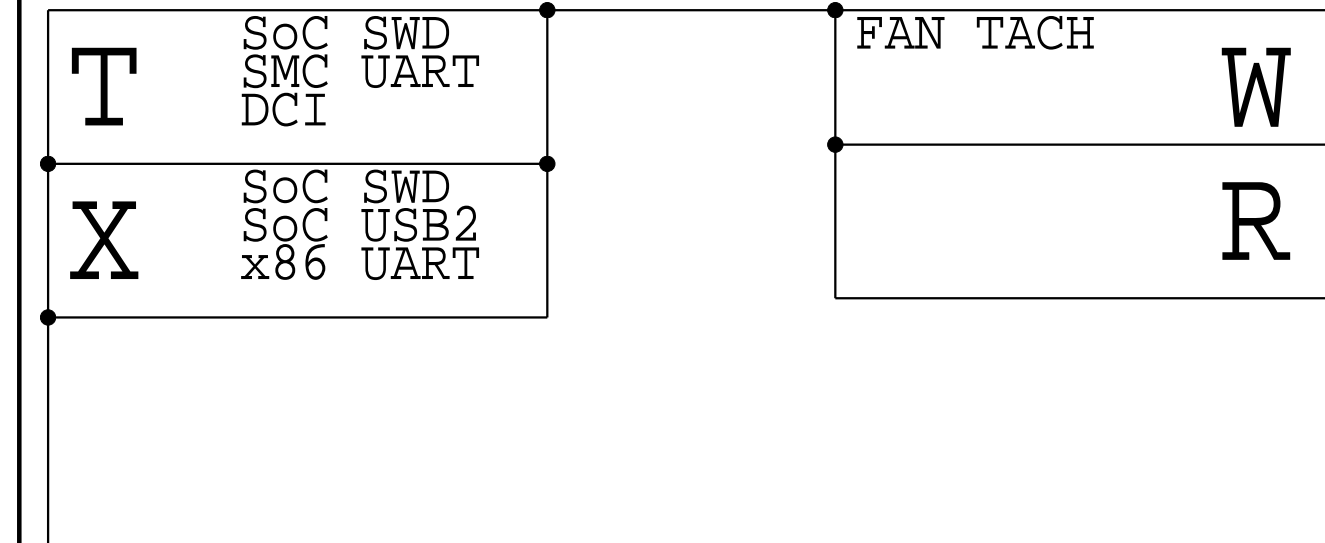
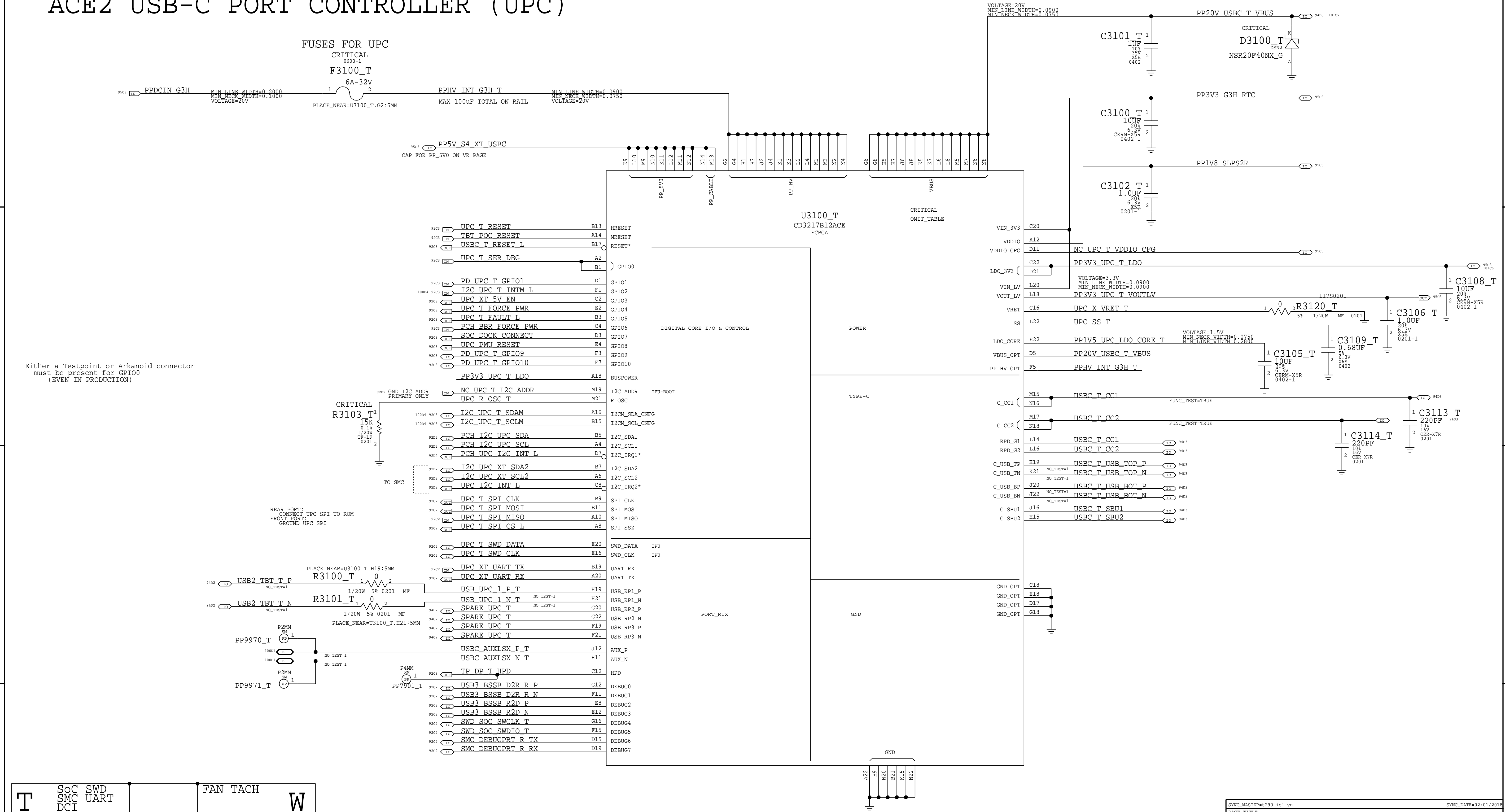
A

D

C

B

A



| Port | I2C_ADDR | I2C_CNFG | I2C1_OA | I2C1_AA | I2C2_OA | I2C2_AA |
|------|------------------|------------------|---------|---------|---------|---------|
| X | GND (0) | PU (3) | 0x38 | 0x6B | 0x38 | 0x6B |
| T | FLOAT (7) | PU (3) | 0x3F | 0x6B | 0x3F | 0x6B |
| W | OVERRIDE OTP (3) | OVERRIDE OTP (3) | 0x3B | 0x6B | 0x3B | 0x6B |
| R | OVERRIDE OTP (4) | OVERRIDE OTP (3) | 0x3C | 0x6B | 0x3C | 0x6B |

BOM_COST_GROUP=USB-C

SYNC_MASTER=t290 icl yn

SYNC_DATE=02/01/2018

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DRAWING NUMBER
051-05198

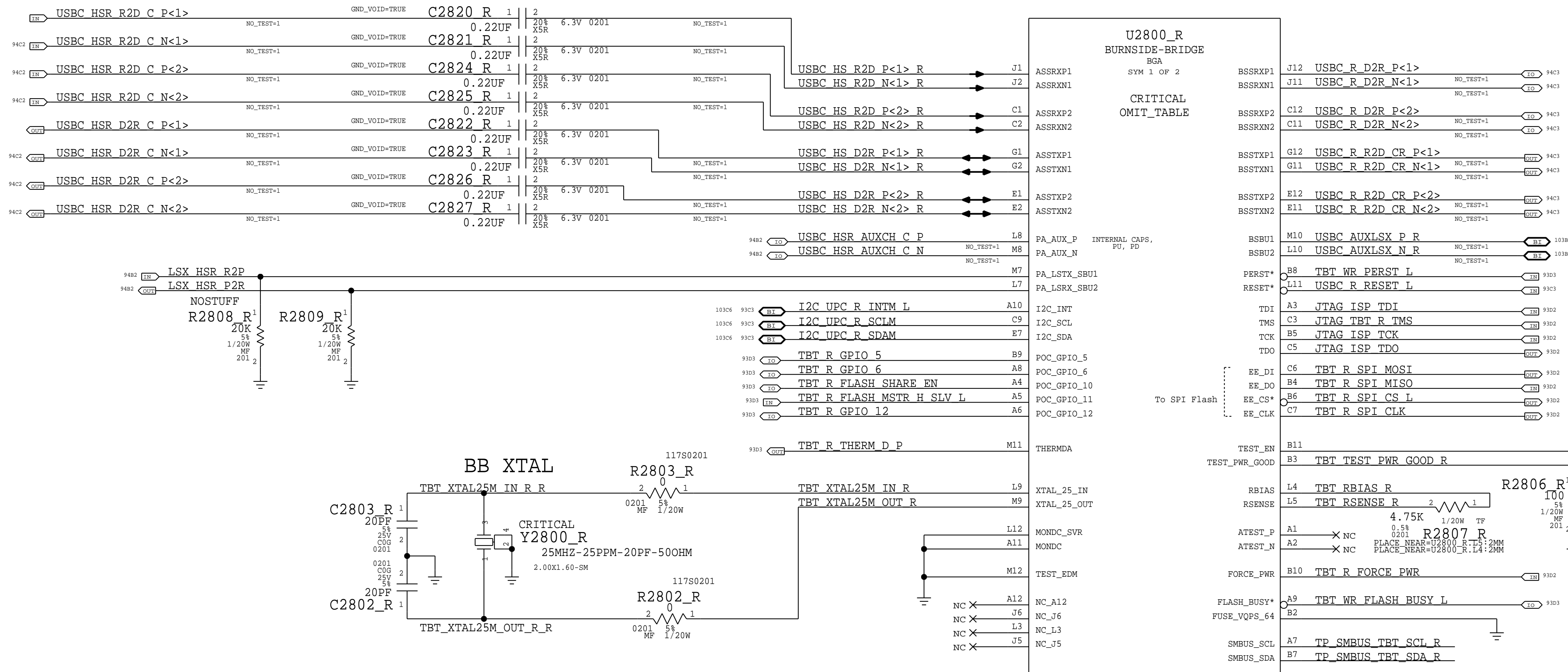
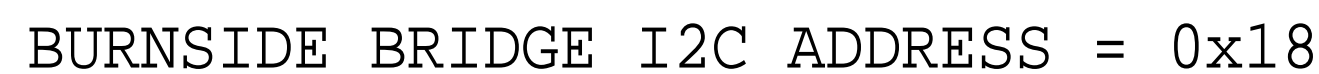
REVISION
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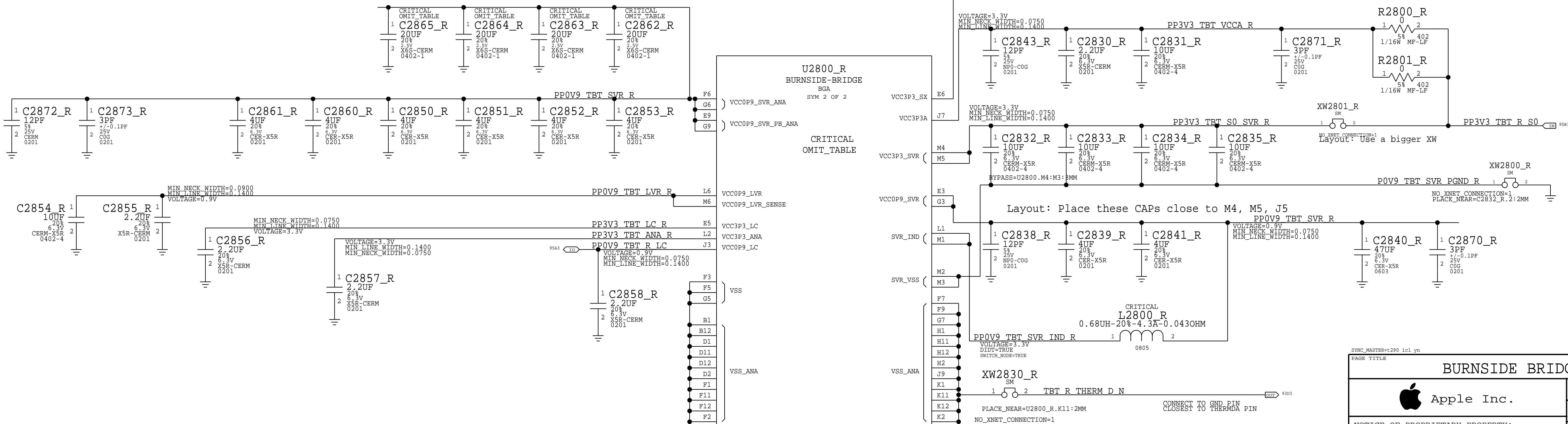
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PAGE
2 OF 2

SHEET
101 OF 109



| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|-----------|-----|--------------------------------------|-------------------------|----------|------------|
| 138S00035 | 4 | CAP,CER,200P,20%,2.5V,X6S,HR2TL,0402 | C2862,C2863,C2864,C2865 | CRITICAL | |



| | | | |
|--|--|----------------------|--|
| SYNC_MASTER=290 icl syn | | SYNC_DATE=02/01/2018 | |
| PAGE TITLE | | | |
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|  Apple Inc. | | DRAWING NUMBER | |
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| | | evt-3 | |
| | | PAGE | |
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| | | SHEET | |
| | | 102 OF 109 | |

D

C

B

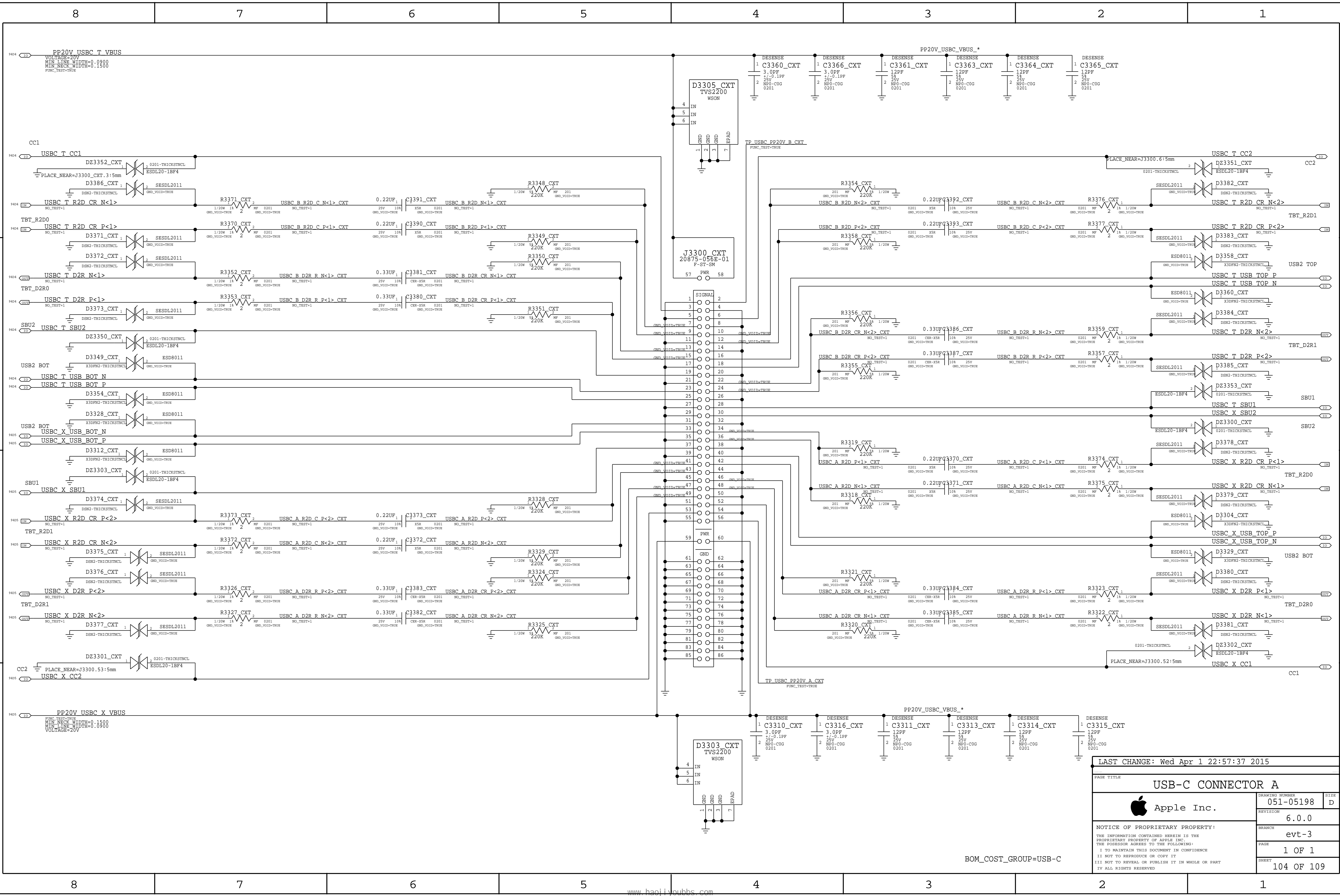
A

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A



BOM_COST_GROUP=USB-C

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| | DRAWING NUMBER | 051-05198 |
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| | PAGE | 1 OF 1 |
| | SHEET | 104 OF 109 |

D

C

B

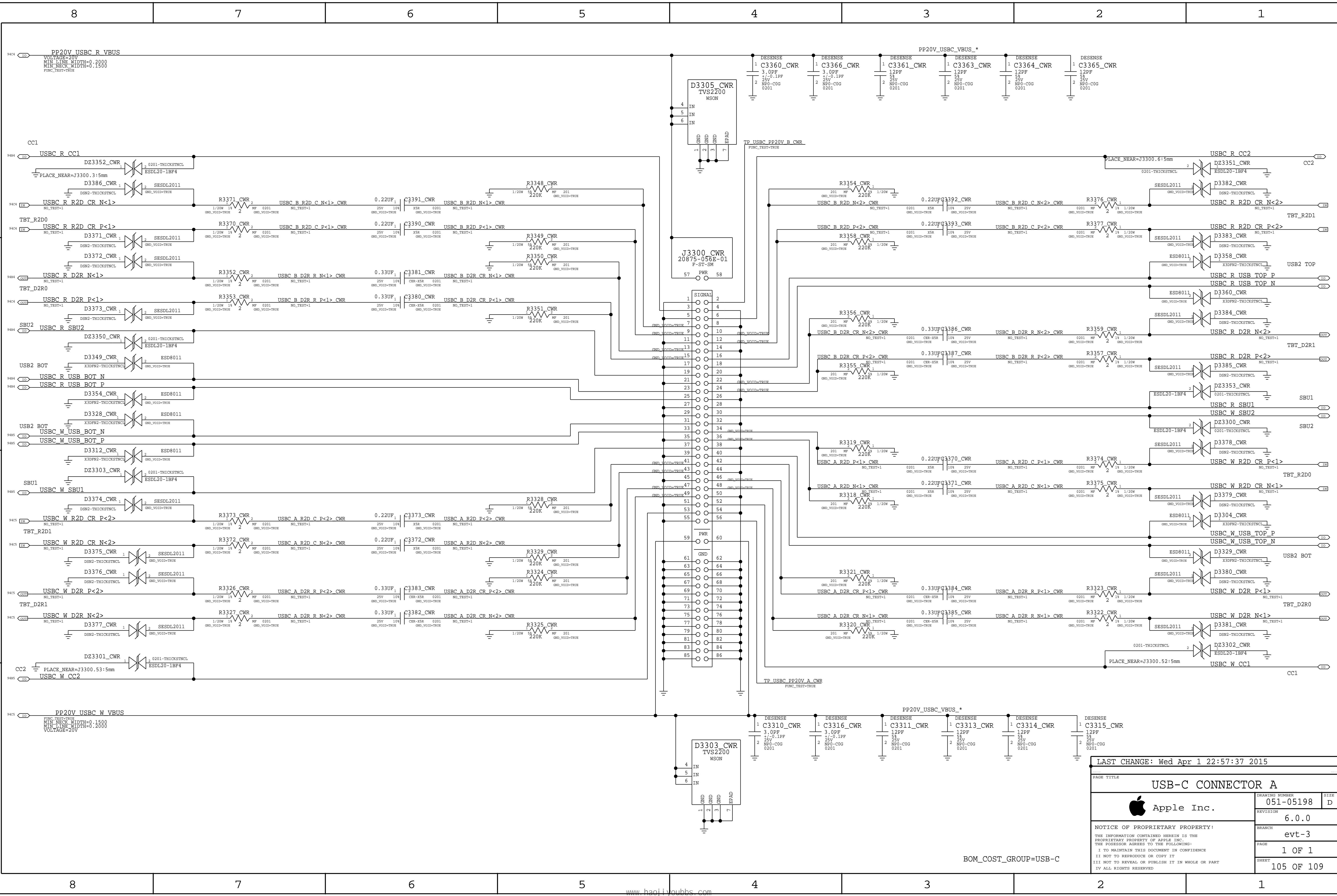
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| | PAGE | 1 OF 1 |
| | SHEET | 105 OF 109 |

BOM_COST_GROUP=USB-C

3.3V S0SW TBT Switch

Pin 1 on SLG5AP1756V is a comparator input.
It is used to sense the presense of the SX rail.

| | |
|---------------|------------------------------|
| Part | SLG5AP1756V |
| Type | Load Switch |
| R(on) @ 4A | 7.8 mOhm Typ TBD mOhm Max |
| Current | 4A Max |

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|-------------------------|
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8301 | | BBR_X_PWR:SWSW_VOUTLV |
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8301 | | BBR_X_PWR:SWSW_FORCEPWR |


| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|-------------------------|
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8321 | | BBR_T_PWR:SWSW_VOUTLV |
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8321 | | BBR_T_PWR:SWSW_FORCEPWR |

| BOMOPTION | BBR XA SX Rail | BBR XA S0 Rail | Load Switch Enable |
|-----------|-----------------|----------------|--------------------|
| a | VOUTLV_SW_CALPE | LD-SW | CALPE/SMC |
| bi | SWSW_VOUTLV | LD-SW | ACE2 VOUT_LV |
| bii | SWSW_FORCEPWR | LD-SW | ACE2/PCH FORCEPWR |

| BOMOPTION | BBR XA SX Rail | BBR XA S0 Rail | Load Switch Enable |
|-----------|-----------------|----------------|--------------------|
| a | VOUTLV_SW_CALPE | LD-SW | CALPE/SMC |
| bi | SWSW_VOUTLV | LD-SW | ACE2 VOUT_LV |
| bii | SWSW_FORCEPWR | LD-SW | ACE2/PCH FORCEPWR |
| c | BBR_XA_PWR | BBR XA S0 Rail | --- |

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|----------------------------------|---------------|----------|---------------------------|
| 113S0022 | 1 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3412 | | BBR_X_PWR:VOUTLV_SW_CALPE |
| 113S0022 | 1 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3411 | | BBR_X_PWR:SWSW_VOUTLV |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3411,R3412 | | BBR_X_PWR:SWSW_FORCEPWR |

| | | | | | |
|----------|---|----------------------------------|-------------------|--|---------------------------|
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3415,R3416 | | BBR_T_PWR:VOUTLV_SW_CALPE |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3414,R3416 | | BBR_T_PWR:SWSW_VOUTLV |
| 113S0022 | 3 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3414,R3415,R3416 | | BBR_T_PWR:SWSW_FORCEPWR |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3417,R3442 | | BBR_T_PWR:BBR_X_PWR |

| | | | | | |
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|  Apple Inc. | | | DRAWING NUMBER | 051-05198 | SIZE |
| | | | REVISION | 6.0.0 | D |
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| | | | SHEET | 106 OF 109 | |

BOM_COST_GROUP=TBT

3.3V S0SW TBT Switch

Pin 1 on SLG5AP1756V is a comparator input.
It is used to sense the presense of the SX rail.

| | |
|---------------|------------------------------|
| Part | SLG5AP1756V |
| Type | Load Switch |
| R(on) @ 4A | 7.8 mOhm Typ TBD mOhm Max |
| Current | 4A Max |

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|-------------------------|
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8301 | | BBR_X_PWR:SWSW_VOUTLV |
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8301 | | BBR_X_PWR:SWSW_FORCEPWR |


| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|-------------------------------------|---------------|----------|-------------------------|
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8321 | | BBR_T_PWR:SWSW_VOUTLV |
| 117S0201 | 1 | RES,MP,1A MAX,0.0 OHM,5%,0201,BLACK | R8321 | | BBR_T_PWR:SWSW_FORCEPWR |

| BOMOPTION | BBR XA SX Rail | BBR XA S0 Rail | Load Switch Enable |
|-----------|-----------------|----------------|--------------------|
| a | VOUTLV_SW_CALPE | LD-SW | CALPE/SMC |
| bi | SWSW_VOUTLV | LD-SW | ACE2 VOUT_LV |
| bii | SWSW_FORCEPWR | LD-SW | ACE2/PCH FORCEPWR |

| BOMOPTION | BBR XA SX Rail | BBR XA S0 Rail | Load Switch Enable |
|-----------|-----------------|----------------|--------------------|
| a | VOUTLV_SW_CALPE | LD-SW | CALPE/SMC |
| bi | SWSW_VOUTLV | LD-SW | ACE2 VOUT_LV |
| bii | SWSW_FORCEPWR | LD-SW | ACE2/PCH FORCEPWR |
| c | BBR_XA_PWR | BBR XA S0 Rail | --- |

| PART NUMBER | QTY | DESCRIPTION | REFERENCE DES | CRITICAL | BOM OPTION |
|-------------|-----|----------------------------------|---------------|----------|---------------------------|
| 113S0022 | 1 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3412 | | BBR_X_PWR:VOUTLV_SW_CALPE |
| 113S0022 | 1 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3411 | | BBR_X_PWR:SWSW_VOUTLV |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3411,R3412 | | BBR_X_PWR:SWSW_FORCEPWR |

| | | | | | |
|----------|---|----------------------------------|-------------------|--|---------------------------|
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3415,R3416 | | BBR_T_PWR:VOUTLV_SW_CALPE |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3414,R3416 | | BBR_T_PWR:SWSW_VOUTLV |
| 113S0022 | 3 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3414,R3415,R3416 | | BBR_T_PWR:SWSW_FORCEPWR |
| 113S0022 | 2 | RES,MP,1A MAX,0OHM,5,0603,SMD,LF | R3417,R3442 | | BBR_T_PWR:BBR_X_PWR |

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| Power FETs TBT S0 | | | | | | |
|  Apple Inc. | | | DRAWING NUMBER | | SIZE | |
| | | | 051-05198 | | D | |
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| | | | BRANCH | | evt-3 | |
| | | | PAGE | | 1 OF 1 | |
| | | | SHEET | | 107 OF 109 | |
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BOM_COST_GROUP=TBT

