

LC56-14A AMD Schematics

RESISTOR

| Symbol name | Value | Tolerance (J: 5%, F: 1%, D: 0.5%, B: 0.1 %) | Rating 0402=> 1/16W, 25V 0603 => 1/16W, 75V 0805 => 1/10W, 100V | Size 2=>0402, 3=>0603, 5=>0805, 6=>1206, 0=>1210 |
|-------------|----------|--|--|--|
| 10KR3 | 10K Ohm | If no letter, it means J: 5% | 1/16W, 75V | 0603 |
| 33D3R5 | 33.3 Ohm | If no letter, it means J: 5% | 1/10W, 100V | 0805 |
| 1KR3F | 1K Ohm | F: 1% | 1/16W, 75V | 0603 |

The naming rule is value + R + size + tolerance
For the value, it can be read by the number before R. (R means resistor)
For the tolerance, it can be read from the last letter.
For the rating, we don't show on the symbol name.
For the size, R2=>0402, R3=>0603, R5=>0805,.....

CAPACITOR

| Symbol name | Value | Tolerance (M: +/-20, K: +/-10, Z: +80/-20) | Rating | Size 2=>0402, 3=>0603, 5=>0805, 6=>1206, 0=>1210 |
|---------------|-------|---|--------|--|
| SCD1U10V2MX-1 | 0.1uF | M/X5R | 10V | 0402 |
| SC10U6D3V5MX | 10uF | M/X5R | 6.3V | 0805 |
| SC2D2U16V5ZY | 2.2uF | Z/Y5V | 16V | 0805 |

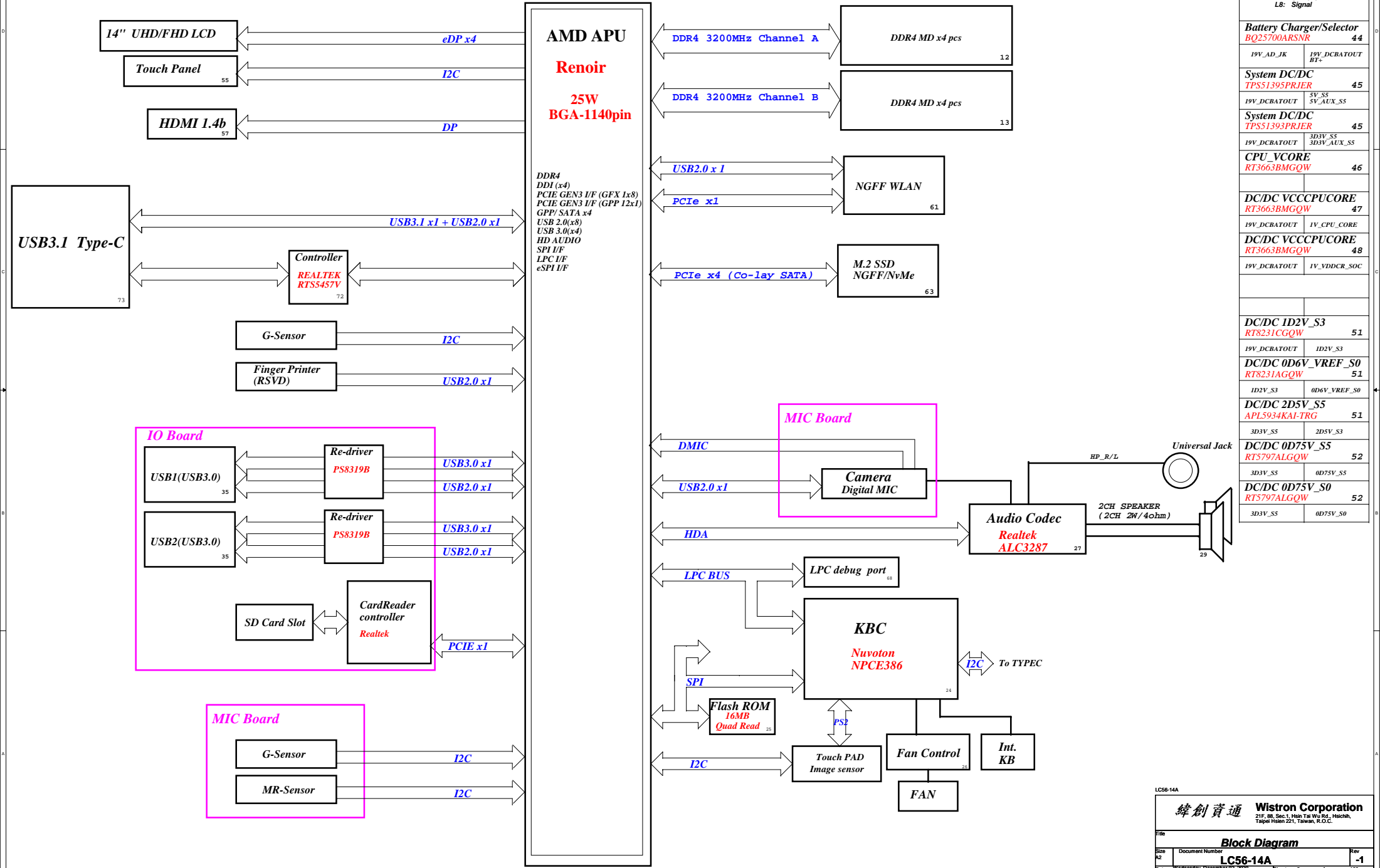
The naming rule is
Capacitor type + value + rating + size + tolerance + material
SCD1U10V2MX-1
SC=> SMT Ceramic, TC=> POS cap or SP cap
D1U => 0.1uF
10V => the voltage rating is 10V
2=> 0402, 3=>0603, 5=>0805
M=>tolerance M, K, Z
X=> X7R/X5R, Y=> Y5V
-1 => symbol version, nonsense to EE characteristic

Properties

| | |
|------------------------|---|
| DY | DUMMY, NOT ASM, not assemble |
| DDP/ SDP | Memory down BOM Control |
| DDR4_CTRL | Memory down setting (SDP / DDP) |
| MEM_IDx_x | Memory ID for SW Team (BOM Control) |
| PCB_ID | PCB ID for SW Team (PCB version) |
| SKU_ID | SKU ID for SW Team (Model ID) |
| HDT | Debug Connector |
| PSL/ Non PSL | Support / Non Support KBC Power Switched Logic |
| AOU/NON_AOU | Support / Non Support Always On USB |
| EMMC | Embedded Multi Media Card |
| MS | Modern stand by |
| SHARE_ROM NON_SHARE | SPI ROM BOM Control |
| 7718 | thermal sensor select |
| PTC | Positive Temperature Coefficient circuit |
| WOV | Wake On Voice |

LC56 AMD Block Diagram

IO/Sensor BD



| PCB Layer Stackup | |
|-------------------|--|
| L1: Signal | |
| L2: GND/POWER | |
| L3: Signal | |
| L4: Signal | |
| L5: GND/POWER | |
| L6: Signal | |
| L7: GND/POWER | |
| L8: Signal | |

| | | |
|--|--------------|----|
| Battery Charger/Selector BQ25700ARSNR | | 44 |
| 19V_AD_JK | 19V_DCBATOUT | |
| System DC/DC TPS51395PRJER | | 45 |
| 19V_DCBATOUT | 5V_S5 | |
| | 5V_AUX_S5 | |
| System DC/DC TPS51393PRJER | | 45 |
| 19V_DCBATOUT | 3D3V_S5 | |
| | 3D3V_AUX_S5 | |
| CPU_VCORE RT3663BMGQW | | 46 |
| DC/DC VCCCPUCORE RT3663BMGQW | | 47 |
| 19V_DCBATOUT | 1V_CPU_CORE | |
| DC/DC VCCCPUCORE RT3663BMGQW | | 48 |
| 19V_DCBATOUT | 1V_VDDCR_SOC | |
| DC/DC 1D2V_S3 RT8231CGQW | | 51 |
| 19V_DCBATOUT | 1D2V_S3 | |
| DC/DC 0D6V_VREF_S0 RT8231AGQW | | 51 |
| 1D2V_S3 | 0D6V_VREF_S0 | |
| DC/DC 2D5V_S5 APL5934KAI-TRG | | 51 |
| 3D3V_S5 | 2D5V_S3 | |
| DC/DC 0D75V_S5 RT5797ALGQW | | 52 |
| 3D3V_S5 | 0D75V_S5 | |
| DC/DC 0D75V_S0 RT5797ALGQW | | 52 |
| 3D3V_S5 | 0D75V_S0 | |

-1

D

C

B

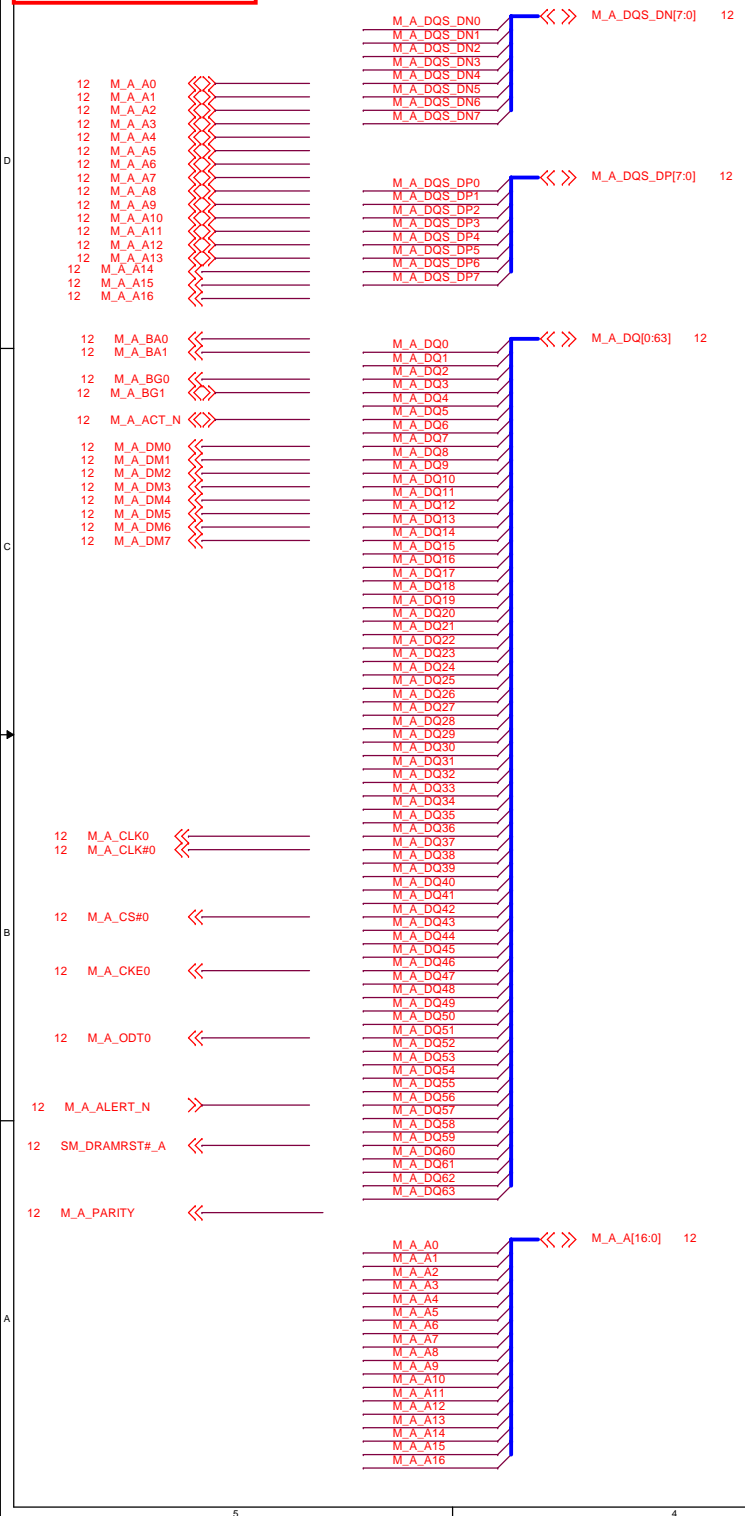
A

(Blanking)

LC56-14A

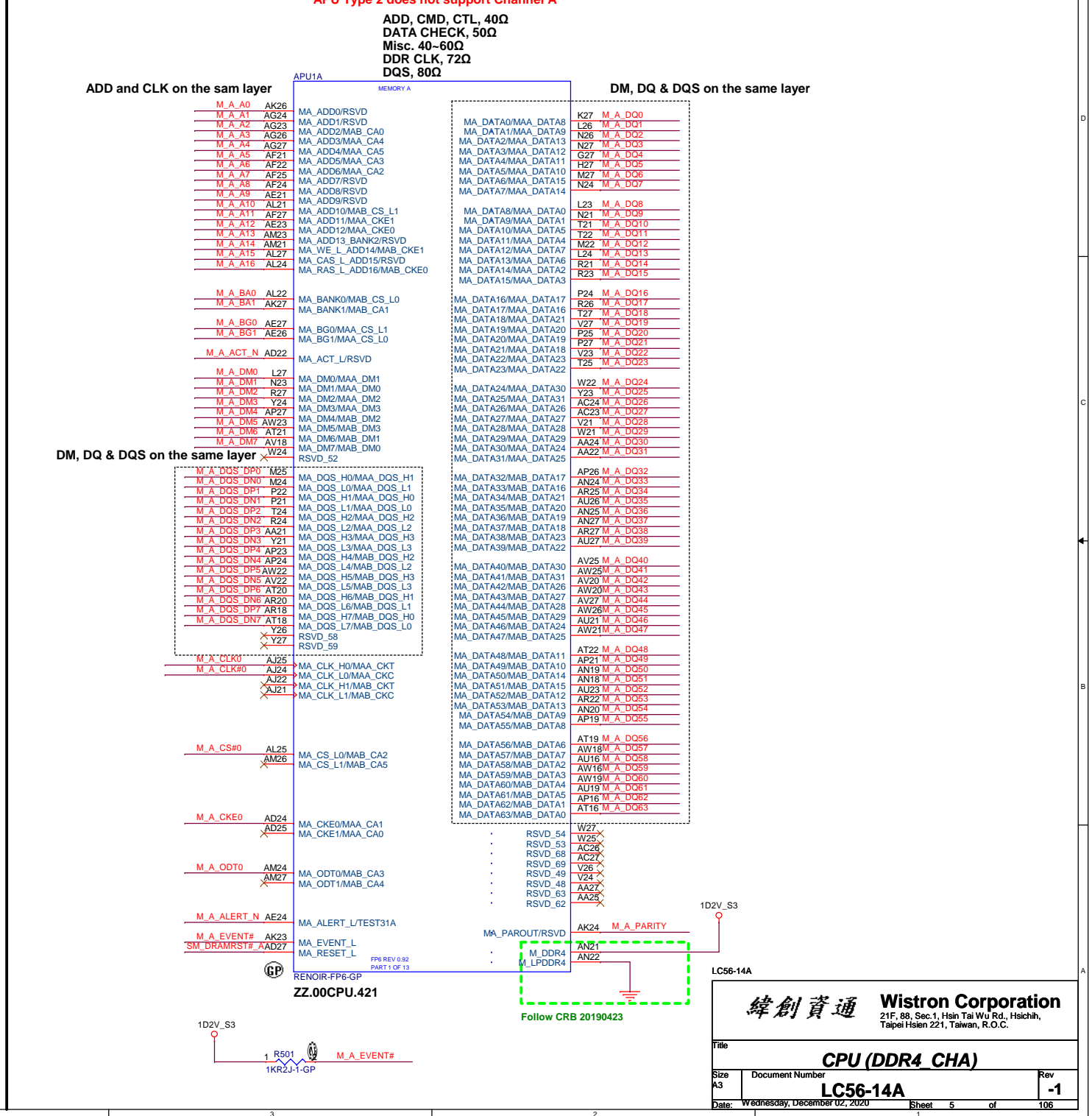
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|--|------------------------------|----------------|
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| Title | | |
| CPU (RSVD) | | |
| Size | Document Number | Rev |
| A4 | LC56-14A | -1 |
| Date: | Wednesday, December 02, 2020 | Sheet 4 of 106 |

SSID = CPU

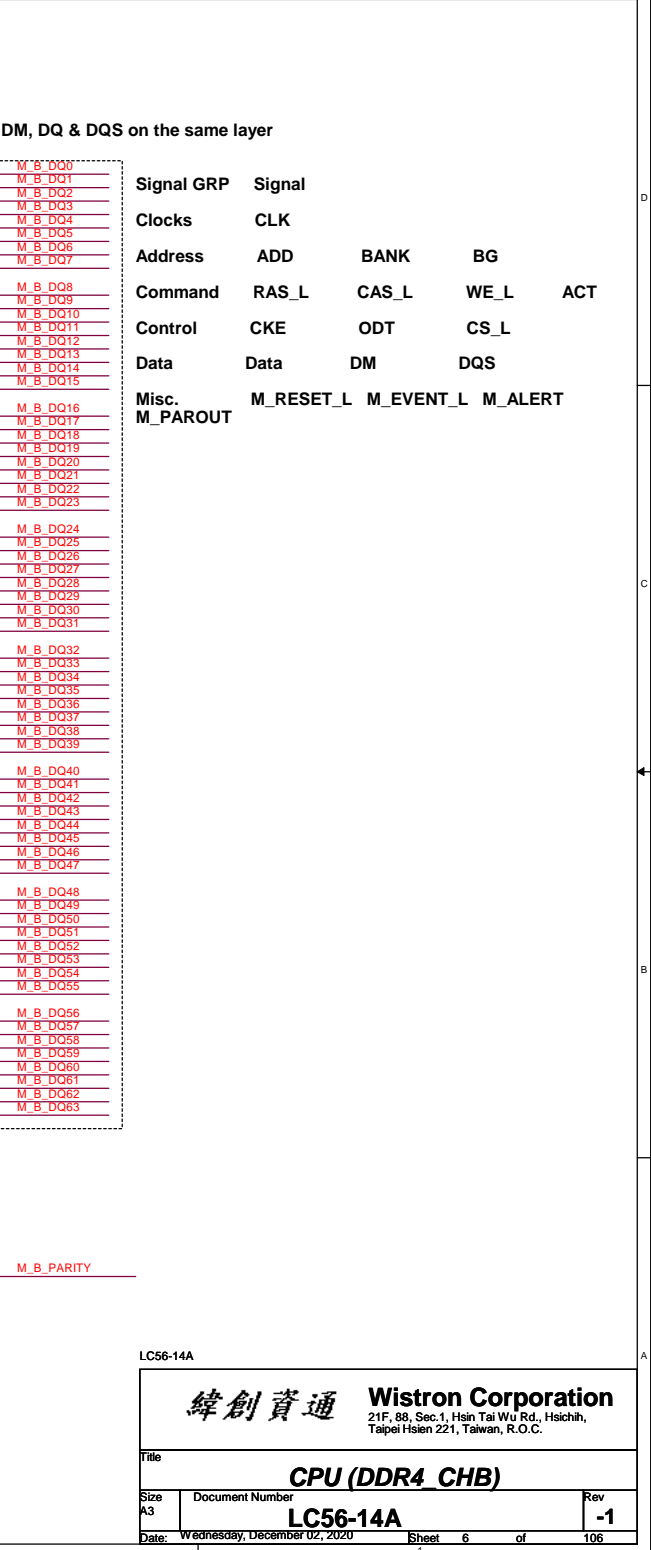
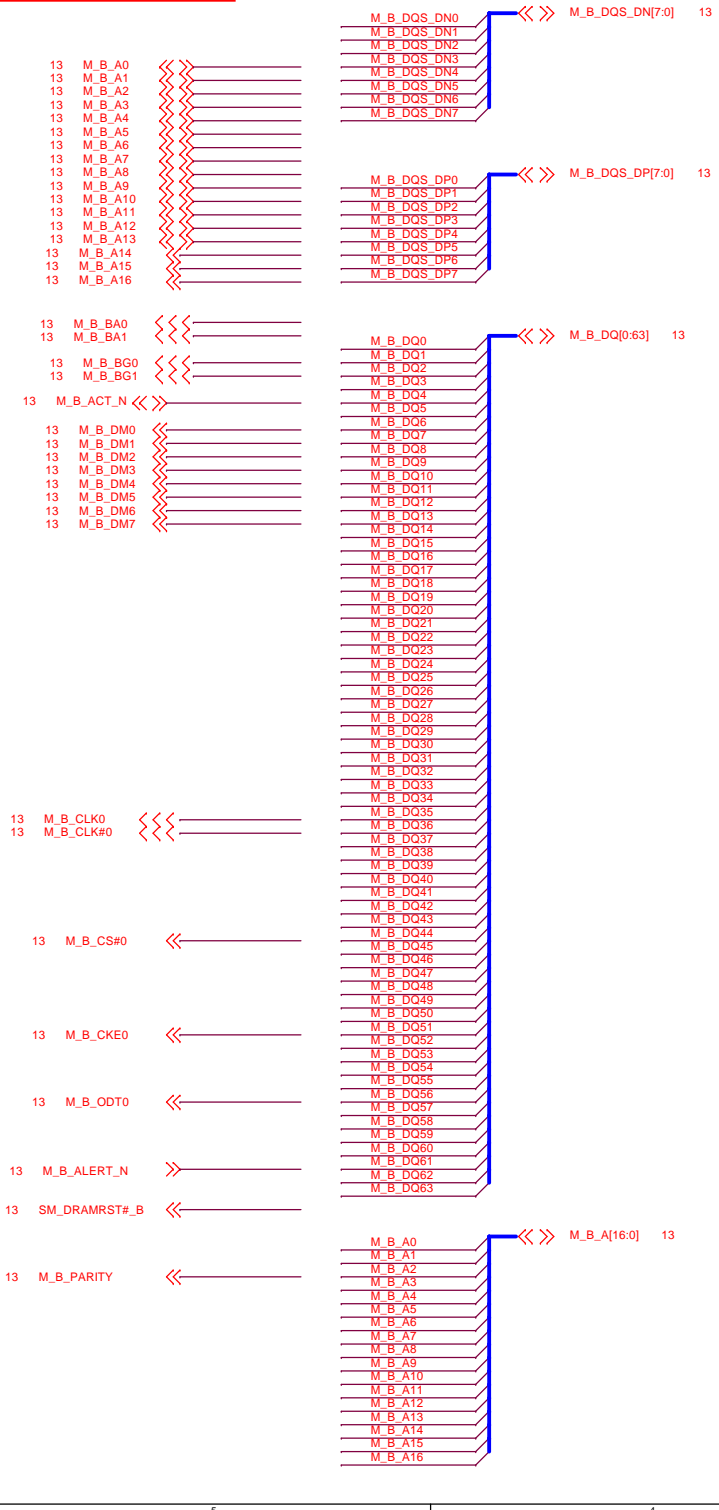


APU Type 2 does not support Channel A

ADD, CMD, CTL, 40Ω
DATA CHECK, 50Ω
Misc. 40~60Ω
DDR CLK, 72Ω
DQS, 80Ω



SSID = CPU



LC56-14A

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Title CPU (DDR4 CHB)

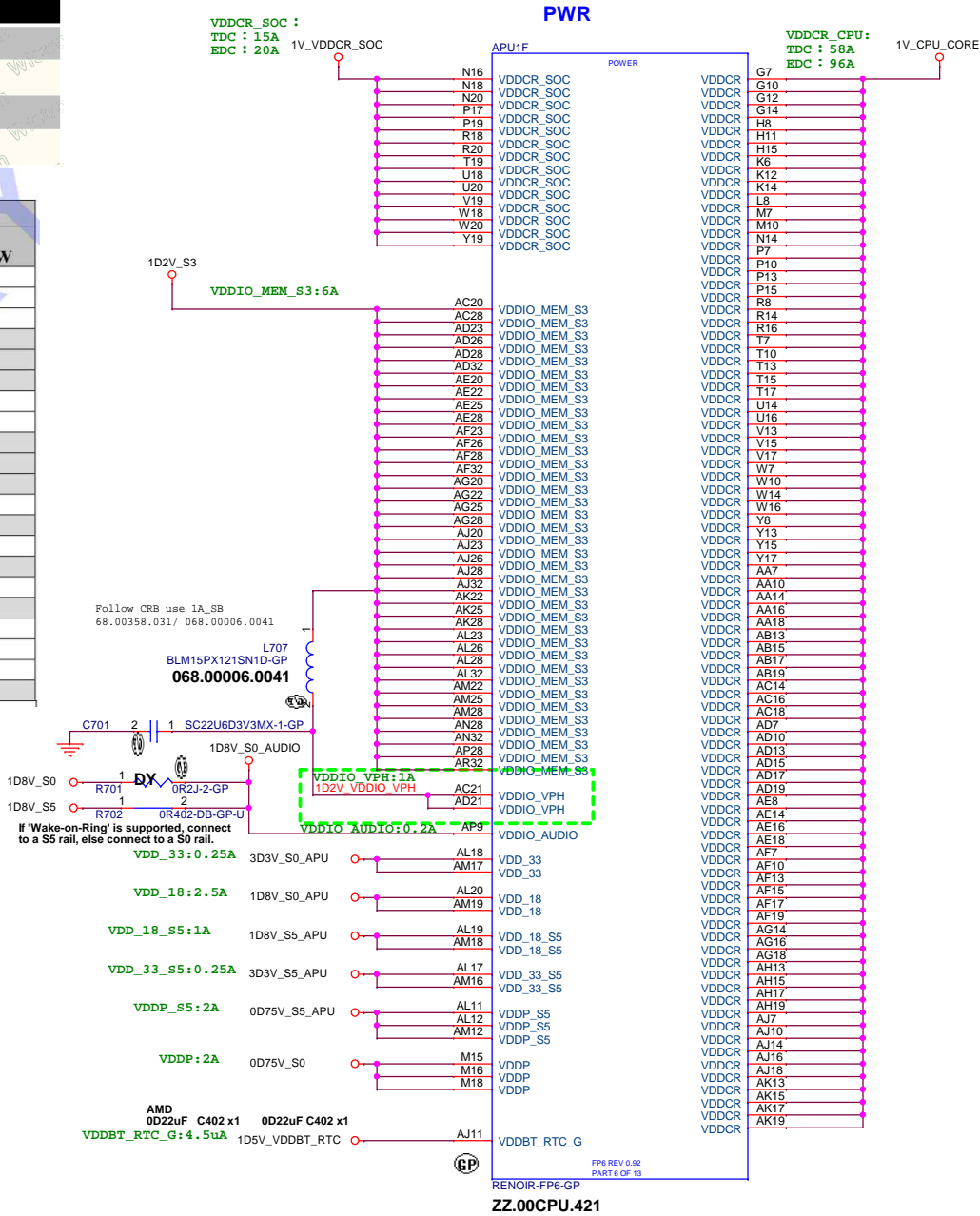
Size A3 Document Number LC56-14A Rev -1

Date: Wednesday, December 02, 2020 Sheet 6 of 106

| SVI | FP4 – Bristol Ridge | FP5 – Raven Ridge |
|----------|-------------------------|----------------------------|
| Supply 1 | VDDCR_CPU – x86 Cores | VDDCR_VDD – x86 Cores, GPU |
| Supply 2 | VDDCR_NB – Rest Of Chip | VDDCR_SOC – Rest Of Chip |
| Supply 3 | VDDCR_GFX – GPU | N/A |
| Sum@15W | TDC: 56A, EDC: 87A | TDC: 45A, EDC: 58A |

Table 5. FP6 Processor Voltage Supply Currents

| Supply ¹ | Nominal Voltage at Pkg Ball (V) ² | Condition | SYSTEM_CONFIGURATION | | | | | |
|---------------------------|--|---------------------------|----------------------|-------|-------|-------|-------|-------|
| | | | 1 10W | 2 15W | 3 25W | 4 35W | 5 45W | 6 54W |
| VDDCR_VDD | Variable (0.65–TBD) ⁵ | TDC ³ | 20 | 33 | 44 | 51 | | 58 |
| | | EDC | 34 | 50 | 70 | 90 | | 96 |
| | | Max Loadstep ⁴ | 29 | 43 | 65 | 76 | | 84 |
| VDDCR_SOC | Variable (0.7–TBD) ⁵ | TDC ³ | 10 | 13 | | | 15 | |
| | | EDC | 13 | 17 | | | 20 | |
| | | Max Loadstep ⁴ | | | | | | |
| VDDIO_MEM_S3 ⁶ | 1.10 | TDC | | | | 6.00 | | |
| | 1.20 | TDC | | | | 6.00 | | |
| | 1.10 | TDC | | | | 1.00 | | |
| VDDIO_VPH ⁷ | 1.20 | TDC | | | | 1.00 | | |
| | 1.80 | TDC | | | | 1.00 | | |
| VDDP | 0.75 | TDC | | | | 2.00 | | |
| VDDP_S5 | 0.75 | TDC | | | | 2.00 | | |
| VDD_18 | 1.80 | TDC | | | | 2.50 | | |
| VDD_18_S5 | 1.80 | TDC | | | | 1.00 | | |
| VDD_33 | 3.30 | TDC | | | | 0.25 | | |
| VDD_33_S5 | 3.30 | TDC | | | | 0.25 | | |
| VDDIO_AUDIO | 1.20 | TDC | | | | 0.20 | | |
| | 1.50 | TDC | | | | 0.20 | | |
| | 1.80 | TDC | | | | 0.20 | | |
| VDDBT_RTC_G | 3.00 | TDC | | | | 4.5μA | | |



15.3.5 VDDIO_VPH Power Delivery and Decoupling

VDDIO_VPH is the dedicated supply voltage for DisplayPort 0 and PCIe phys. When DisplayPort 0 is used for DP or TMDs, the source of VDDIO_VPH can be the same source as VDD_18.

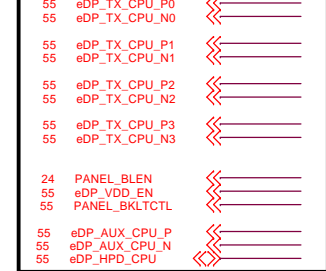
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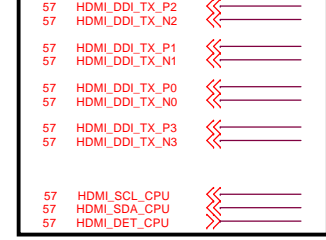
| | | | | |
|---------|------------------------------|----------|----------------|--------|
| Title | | | CPU(ALL POWER) | |
| Size A3 | Document Number | LC56-14A | | Rev -1 |
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SSID = PCH

eDP



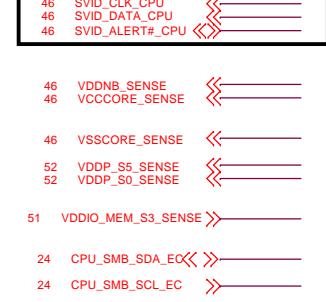
HDMI



HDT

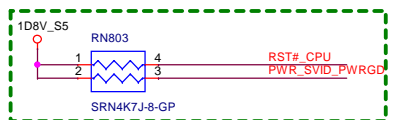


SVID

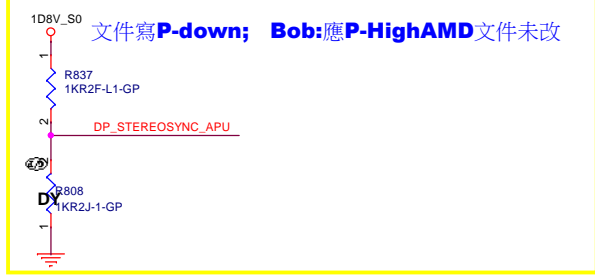
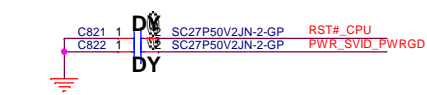
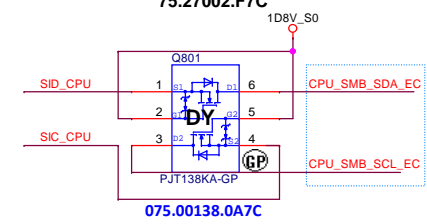
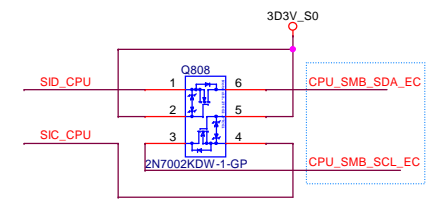
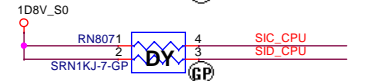
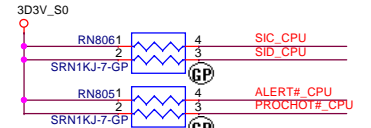
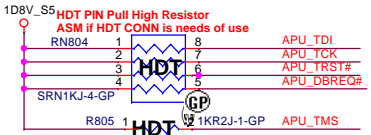


DISPLAY/SVUI/JTAG/TEST

APU Type I(CZ): 1D8V
APU Type II(CZ-L): 3D3V



HDT EVT stage要上



文件寫P-down; Bob:應P-HighAMD文件未改

| DisplayPort | Device |
|-------------|----------|
| 0 | eDP |
| 1 | HDMI out |

| SVC | SVD | OUTPUT VOLTAGE (V) |
|-----|-----|--------------------|
| 0 | 0 | 1.1 |
| 0 | 1 | 1.0 |
| 1 | 0 | 0.9 |
| 1 | 1 | 0.8 |

eDP

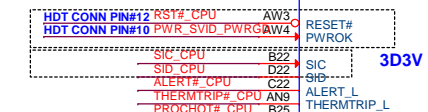
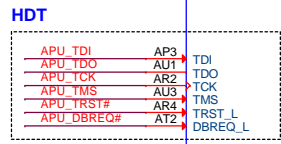
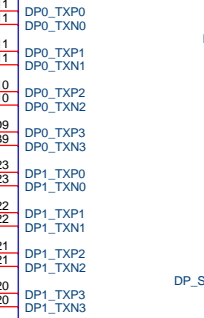
HDMI

HDT

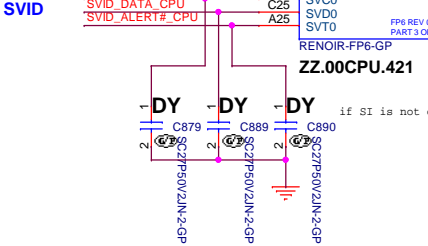
HDT

SVID

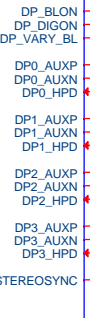
APU1C



an output signal as overtemperature condition



DISPLAY/SVUI/JTAG/TEST



eDP

HDMI

DP_STEREO_SYNC_APU

TEST4

TEST5

TEST6

TEST14

TEST15

TEST16

TEST17

TEST31

TEST41

ANALOGIO_0

ANALOGIO_1

SMU_ZVDD

VDDP_S5_SENSE

VDDP_S0_SENSE

VDDCR_SOC_SENSE

VDDCR_SENSE

VDDIO_MEM_S3_SENSE

VSS_SENSE_A

VSS_SENSE_B

RENOIR-FP6-GP

ZZ.00CPU.421

if SI is not ok, suggest that install capacitor.

C879

C889

C890

APU Type I 1D8V

APU Type II 3D3V

PINOUT

Description

DP_BLOK

DP_DIGON

DP_VARY_BL

BL_ENABLE

LCD_VCC_ENABLE

BL_PWM

DisplayPort

Device

0

1

2

3

eDP

HDMI

DP_STEREO_SYNC_APU

TEST4

TEST5

TEST6

TEST14

TEST15

TEST16

TEST17

TEST31

TEST41

ANALOGIO_0

ANALOGIO_1

SMU_ZVDD

VDDP_S5_SENSE

VDDP_S0_SENSE

VDDCR_SOC_SENSE

VDDCR_SENSE

VDDIO_MEM_S3_SENSE

VSS_SENSE_A

VSS_SENSE_B

RENOIR-FP6-GP

ZZ.00CPU.421

if SI is not ok, suggest that install capacitor.

C879

C889

C890

075.00138.0A7C

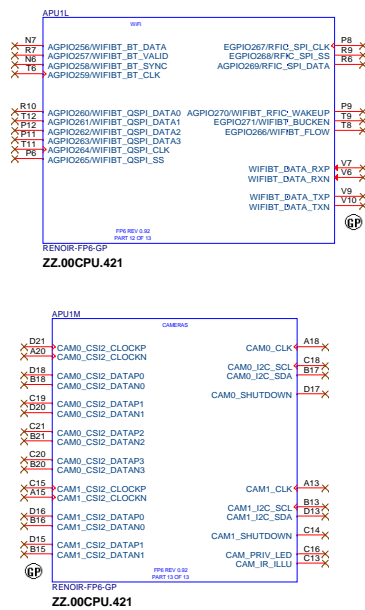
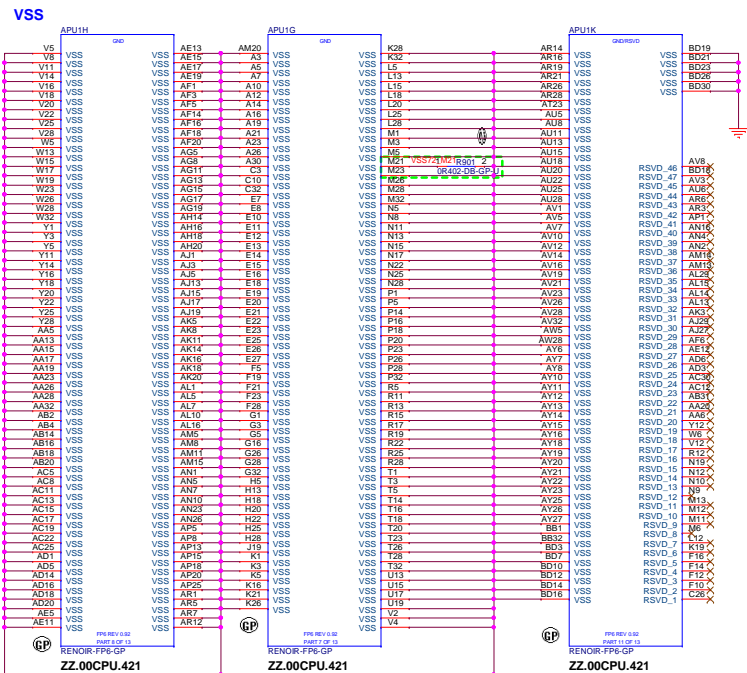
075.00138.0A7C

075.00138.0A7C

LC56-14A

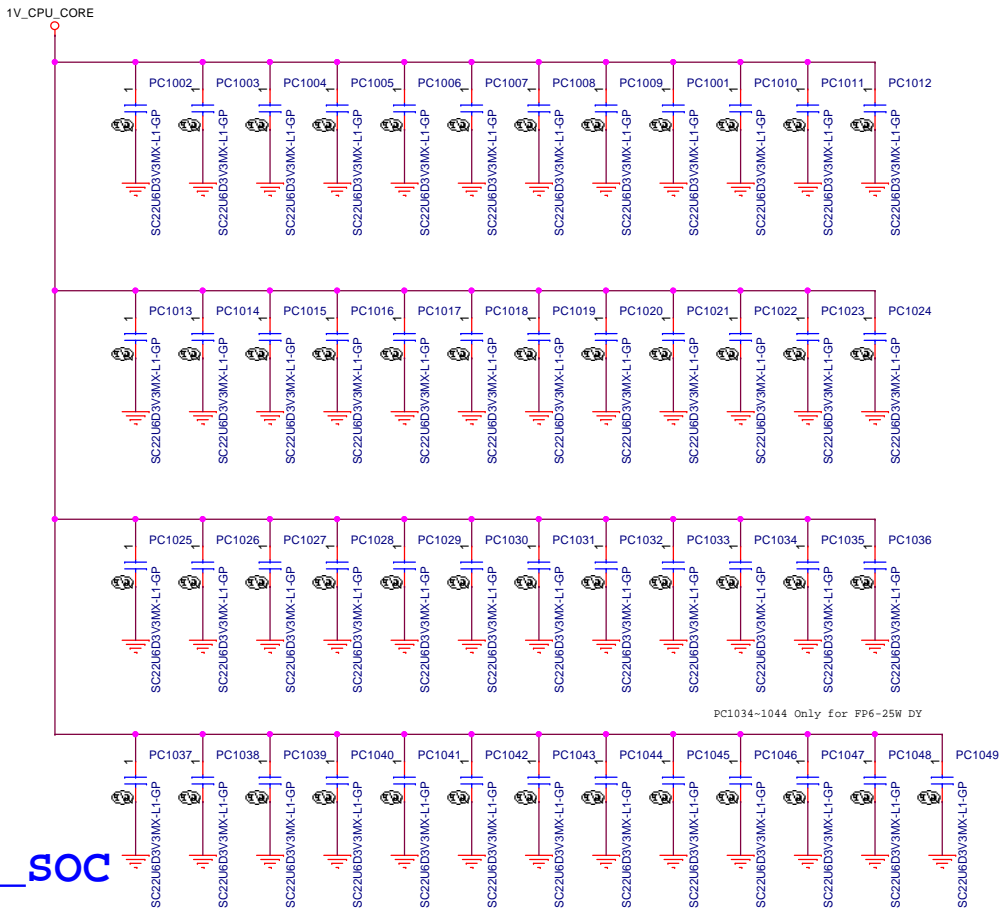
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Title CPU(DP/SVID/HDT/TEST)
Size A3 Document Number LC56-14A Rev -1
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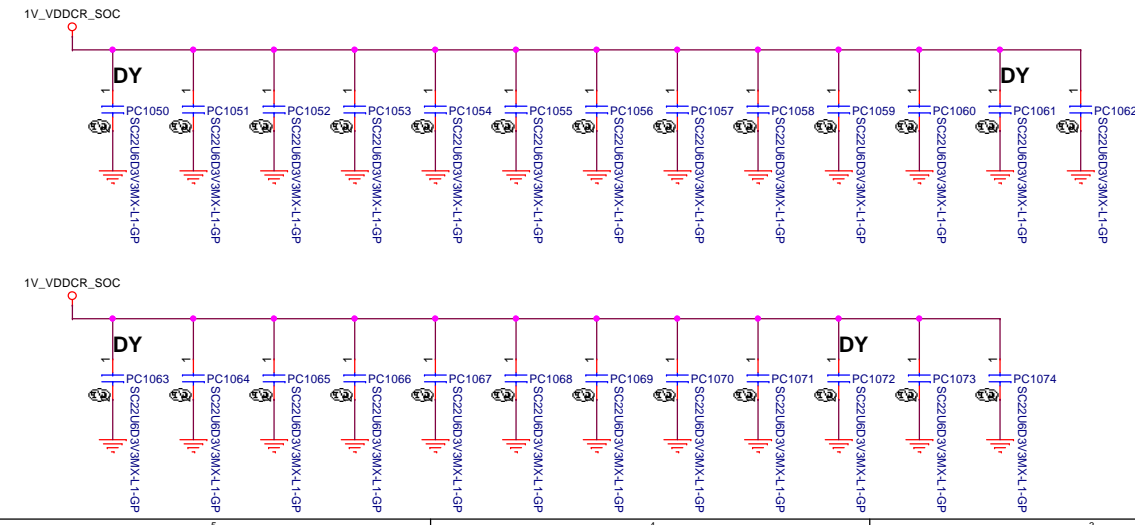


Main Func = CPU

1V_VDDCORE AMD_FP6_35W



1V_VDDCR_SOC



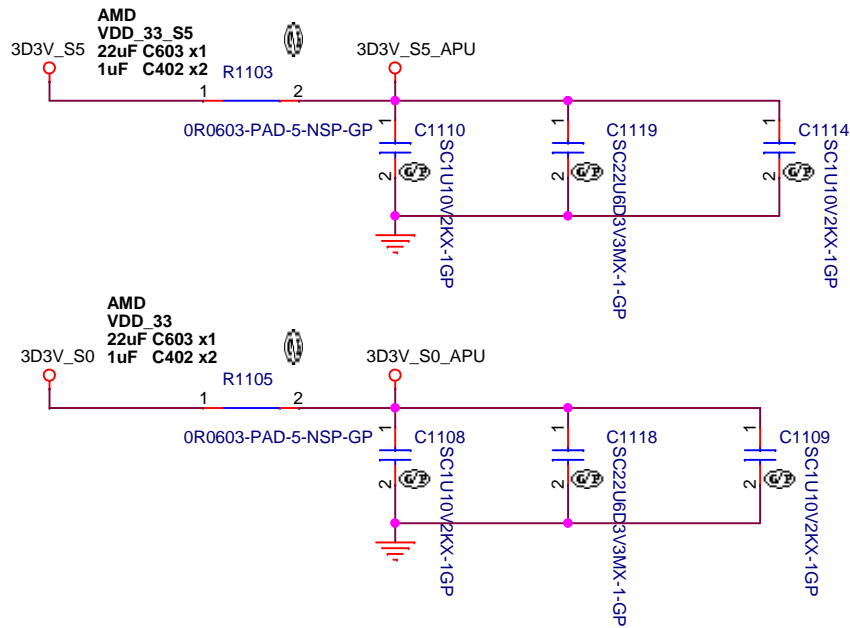
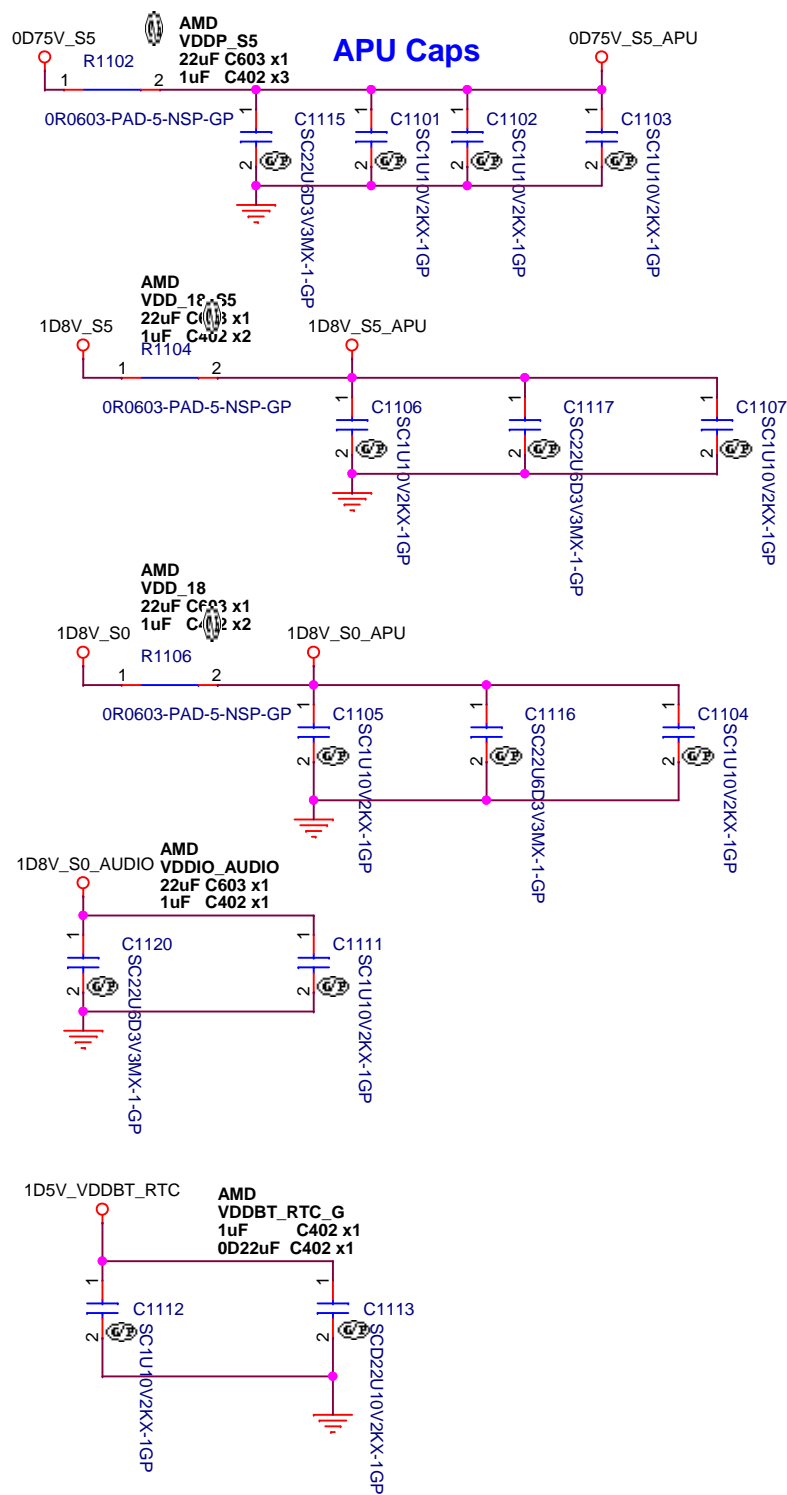


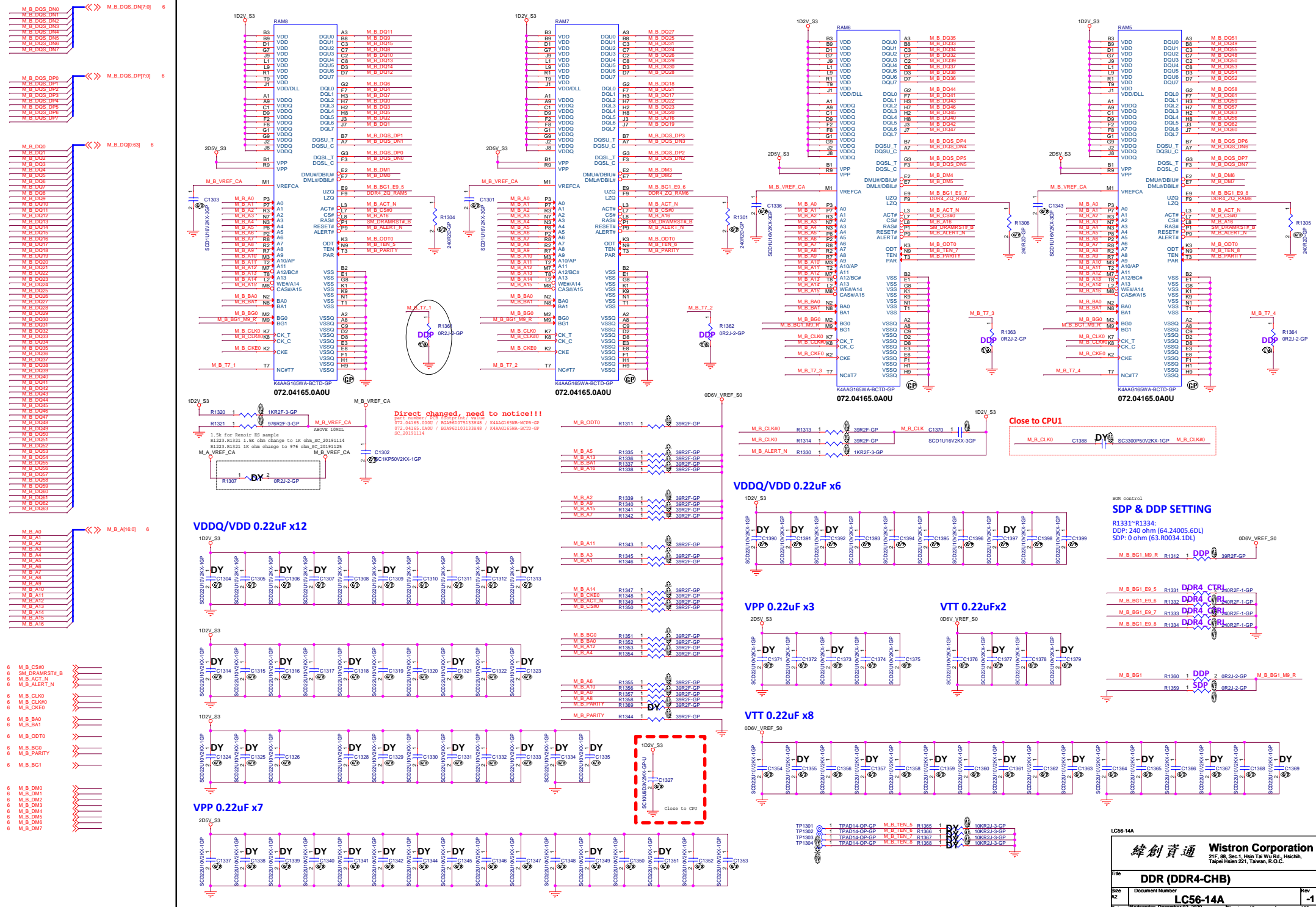
Table 110. Decoupling Capacitors for Processor Power

| Capacitor | | VDDCR | VDDCR_SOC | VDDIO_MEM_S31, 2 | VDDP | VDDP_S5 | VDD_18 | VDD_18_S5 | VDD_33_S5 | VDD_33 | VDDIO_AUDIO | VDDBT_RTC_G |
|--------------|-------------------------|-------|-----------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|
| Value | Package Size / Material | | | | | | | | | | | |
| 22 μ F | 0603 XSR | 16BU | 7BU | 9BU | 2BO | 1BO | 1BO | 1BO | 1BO | 1BO | 1BO | - |
| 1.0 μ F | 0402 XSR | - | 1BU | 2BU | 4BU + 4BO | 2BU + 1BO | 1BU + 1BO | 1BU + 1BO | 1BU + 1BO | 1BU + 1BO | 1BU | 1BU |
| 0.22 μ F | 0402 XSR | - | - | 4(split) | - | - | - | - | - | - | - | 1BU |
| 180 pF | 0402 COG NP0 | 1BU | 1BU | 1BU + 2(split) | 1BU | - | - | - | - | - | - | - |

LC56-14A

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Main Func = DIMM2



D

D

C

C

(Blanking)

B

B

A

A

LC56-14A

| | | |
|---|-------------------------------------|-------------------|
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| Title <div>DDR (RSVD)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
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5

4

3

2

1

D

D

C

C

(Blanking)

B

B

A

A

LC56-14A

| | | |
|---|-------------------------------------|-------------------|
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| Title <div>FCH (RSVD)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
| Date: Wednesday, December 02, 2020 | | Sheet 15 of 106 |

SSD

| | | | |
|----|------------------|---|-------|
| 63 | SSD_CLK_CPU_P | ↔ | _____ |
| 63 | SSD_CLK_CPU_N | ↔ | _____ |
| 63 | SSD_CLKREQ_CPU_N | ↔ | _____ |

```

61 WLAN_CLK_CPU_P
61 WLAN_CLK_CPU_N
61 WLAN_CLKREQ_CPU_N

```

66 CARD_CLK_CPU_P <<—
66 CARD_CLK_CPU_N <<—
66 CARD_CLKREQ_CPU_N >>—

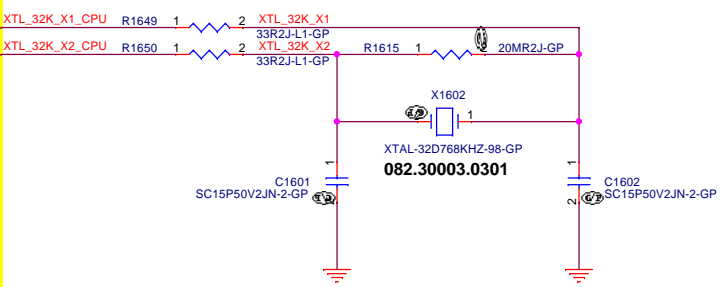
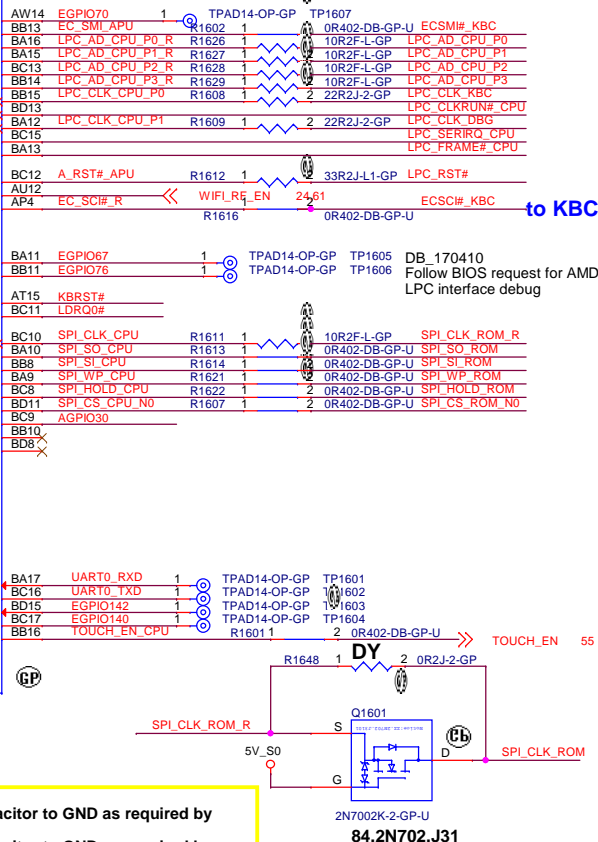
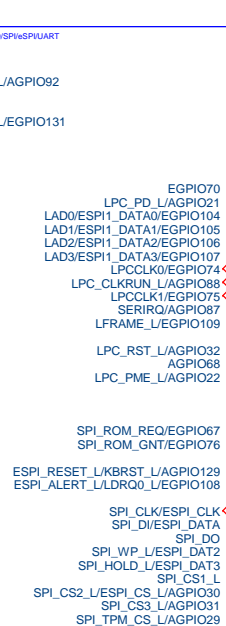
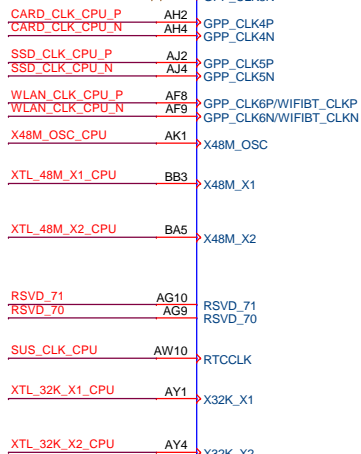
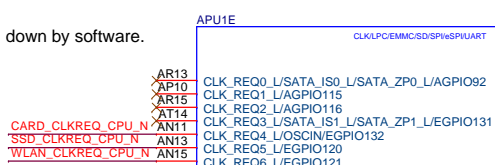
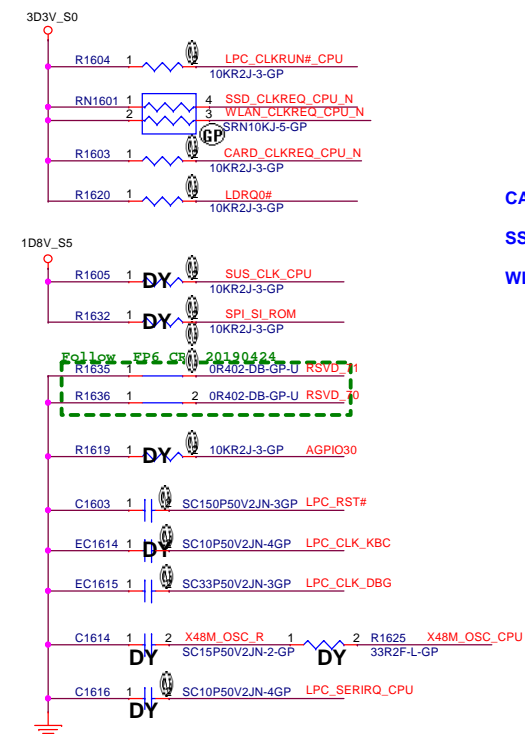
| | | | |
|-------|---------------|---|-------|
| 20,25 | SPI_CLK_ROM | ↔ | _____ |
| 25 | SPI_SO_ROM | ↔ | _____ |
| 25 | SPI_SI_ROM | ↔ | _____ |
| 25 | SPI_WP_ROM | ↔ | _____ |
| 25 | SPI_HOLD_ROM | ↔ | _____ |
| 25 | SPI_CS_ROM_N0 | ↔ | _____ |

| | | |
|-------|-----------------|--|
| 24 | ECSM#_KBC | |
| 24,68 | LPC_AD_CPU1_P0 | |
| 24,68 | LPC_AD_CPU1_P1 | |
| 24,68 | LPC_AD_CPU1_P2 | |
| 24,68 | LPC_AD_CPU1_P3 | |
| 24 | LPC_CLK_KBC | |
| 24 | LPC_CLKRUN#_CPU | |
| 68 | LPC_CLK_DBG | |
| 24,68 | LPC_SERIRQ_CPU | |
| 24,68 | LPC_FRAME#_CPU | |
| 24,68 | LPC_RST# | |
| 68 | UART0_RXD | |
| 68 | UART0_TXD | |
| 68 | EC_SMI_APU | |

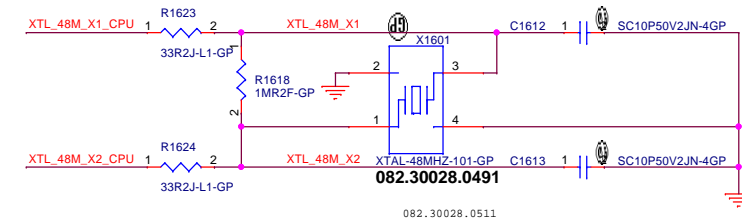


| P | GPP CLK port | AMD | Device |
|---|--------------|---------|--------|
| 0 | | GFX | NC |
| 1 | | LAN | NC |
| 2 | | WWAN | NC |
| 3 | | PCIETBT | NC |
| 4 | | PCIEDT | CARD |
| 5 | | SSD | SSD |
| 6 | | WLAN | WLAN |

GFX & GPP CLK, 85Ω
SATA & USB, 90Ω



Note:
Connected to 48-MHz Fundamental XTAL (± 10 PPM) with a capacitor to GND as required by XTAL (typically 22 pF) and 1-M ohm 5% resistor to X48M_X2.
Connected to 48-MHz Fundamental XTAL (± 10 PPM) with a capacitor to GND as required by XTAL (typically 22 pF) and 1-M ohm 5% resistor to X48M_X1.



| | | |
|-------------------------|-------|-------|
| | C1601 | C1602 |
| SEIKO 082.30003.0301 | 15pF | 15pF |
| EPSON 082.30003.0191 | 15pF | 15pF |
| NDK 082.30003.0221 | | |
| TXC 082.30003.0231 | | |

HARMONY
82.30026.371->
HOSONIC
082.30028.0491
Need 10ppm

| | | |
|---------------------------|-------|-------|
| | C1612 | C1613 |
| HOSONIC 082.30028.0491 | 10pF | 10pF |
| HOSONIC 082.30028.0511 | | |

LC56-14A

緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

FCH (CLK/LPC/SPI/EMMC/SD/UA)

Size

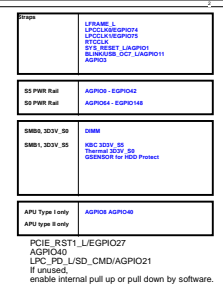
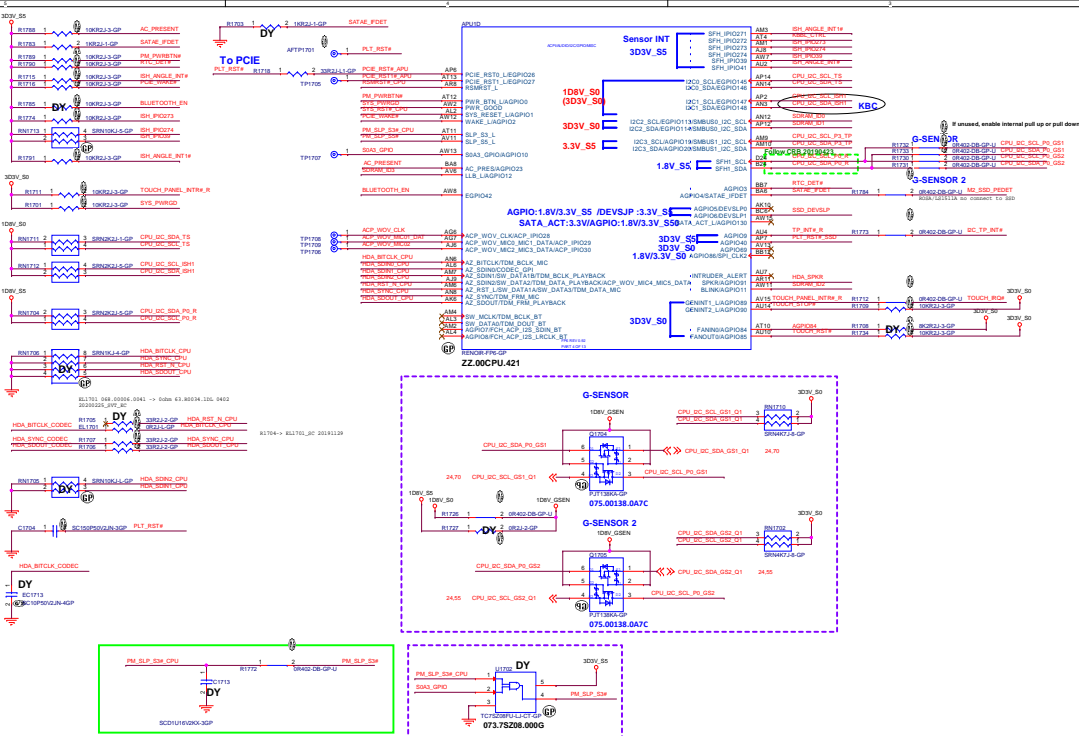
Document Number

LC56-14A

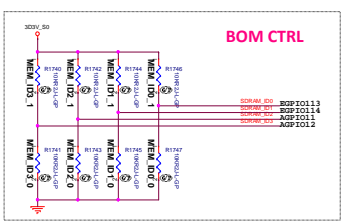
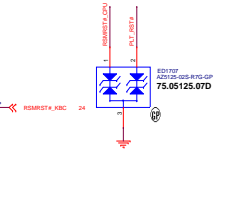
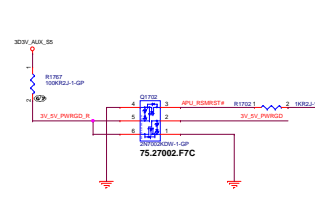
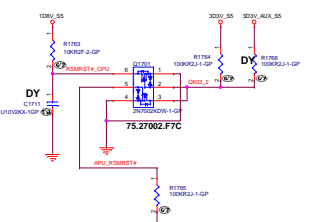
Date: Wednesday, December 02, 2020

Sheet 16 of 106

-1



| TEST2 | TEST1 | TEST0 | Description |
|-------|-------|-------|---|
| 0 | 0 | 0 | FCH TAP accessible from APU when TAPEN is asserted FCH JTAG pins are overloaded for multiple functions, in this configuration the FCH JTAG are used as non-JTAG pins |
| 0 | 0 | 1 | Reserved |
| 0 | 1 | X | Reserved |
| 1 | TMS | 0 | FCH JTAG multi-function pins are configured as JTAG pins, in this configuration the FCH TAP can be accessed from FCH JTAG pins |
| 1 | TMS | 1 | Use on ATE only Yuba JTAG enabled |



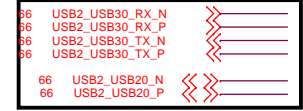
| VTV/ST/ST/ST/ST | | | | | | | | | | |
|---|------------|---|------------|----------|---------|------------|-------------|------|----------|----------|
| Memory Configuration | | Memory Supplier | | | | | | | | |
| 00: 4GB 01: 8GB 10: 16GB 11: (Reserve) | | 00: Samsung 01: Micron 10: SK Hynix 11: SK Hynix | | | | | | | | |
| AGPIO12 | AGPIO11 | EGPIO14 | EGPIO13 | | | | | | | |
| SDRAM_ID03 | SDRAM_ID02 | SDRAM_ID01 | SDRAM_ID00 | Supplier | Density | PN | | | | |
| 0 | 0 | 0 | 0 | SAMSUNG | 4GB | SM30N76632 | SDPp16 8GB | 3200 | EVT | SIT |
| 0 | 1 | 0 | 0 | SAMSUNG | 4GB+4GB | SM30N76632 | SDPp16 8GB | 3200 | SKU4 | SKU3,13 |
| 1 | 0 | 0 | 0 | SAMSUNG | 8GB+8GB | SM30N76632 | SDPp16 16GB | 3200 | SKU7 | SKU7 |
| 0 | 0 | 0 | 1 | MICRON | 4GB | SM30N76570 | SDPp16 8GB | 3200 | SKU1 | SKU1 |
| 0 | 1 | 0 | 1 | MICRON | 4GB+4GB | SM30N76570 | SDPp16 8GB | 3200 | SKU6,7,8 | SKU6,7,8 |
| 1 | 0 | 1 | 0 | MICRON | 8GB+8GB | SM30N76641 | SDPp16 16GB | 3200 | SKU3,3-1 | SKU8 |
| 0 | 1 | 0 | 1 | KINGSTON | 8GB+8GB | SM30N76802 | SDPp16 16GB | 3200 | | |
| 0 | 1 | 1 | 0 | SK HYNIX | 4GB | SM30N76420 | SDPp16 8GB | 3200 | | |
| 0 | 1 | 1 | 0 | SK HYNIX | 4GB+4GB | SM30N76420 | SDPp16 8GB | 3200 | | |
| 0 | 1 | 0 | 1 | SK HYNIX | 8GB+8GB | SM30N76640 | DDPp16 16GB | 3200 | SKU5 | SKU5,10 |
| 0 | 0 | 1 | 1 | SK HYNIX | 4GB | SM30N76625 | SDPp16 8GB | 3200 | SKU1 | SKU9 |
| 0 | 1 | 1 | 1 | SK HYNIX | 4GB+4GB | SM30N76625 | SDPp16 8GB | 3200 | SKU2 | SKU2,12 |

Main Func = USB

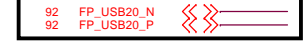
USB3.0 Port1



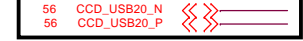
USB3.0 Port2



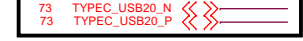
Finger Printer



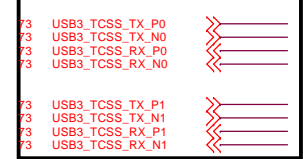
IR Camera



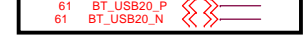
Type C USB20



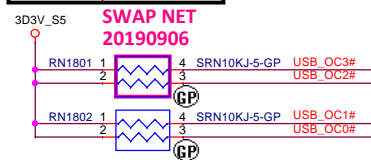
Type-C



BT



| USB_OC0# | USB3.0 Power |
|----------|--------------|
| USB_OC1# | USB3.0 Power |
| USB_OC2# | Type C |
| USB_OC3# | N/A |



Type-C

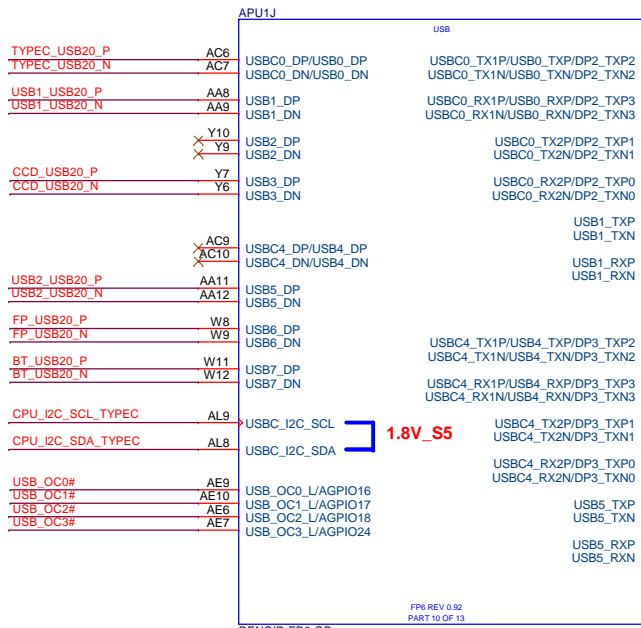
USB2.0 Port1

Camera

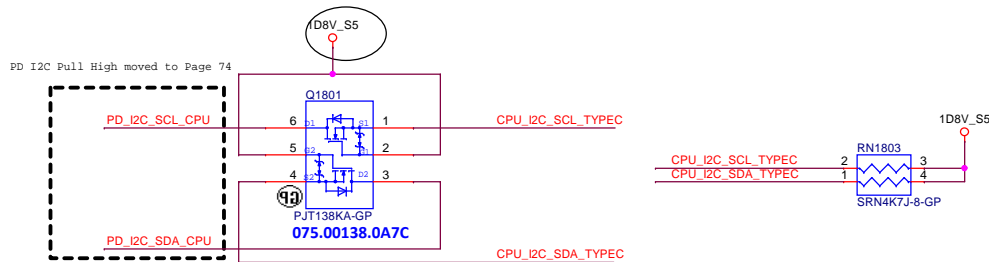
USB2.0 Port5

Finger Printer RSVD

BlueTooth



AGPIO13/USB_OC5_L
If unused,
enable internal pull up or pull down by software.

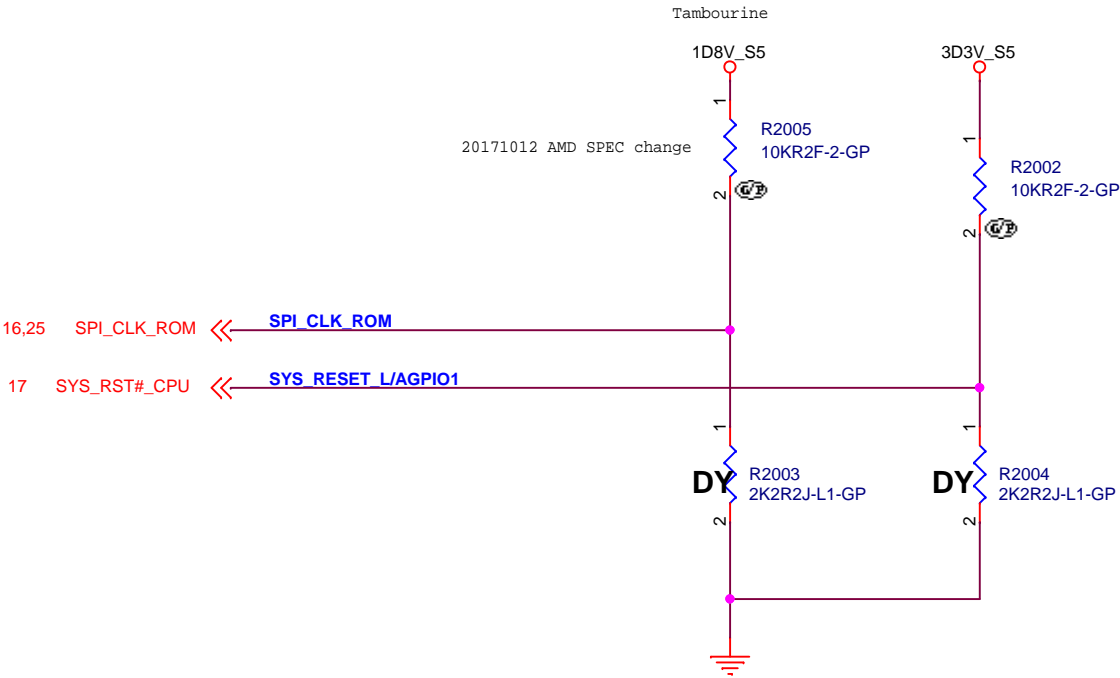


(Blanking)

LC56-14A

| | | |
|---|-------------------------------------|-------------------|
| <div><div>緯創資通</div><div>Wistron Corporation</div><div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div></div> | | |
| Title <div>FCH (RSVD)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
| Date: Wednesday, December 02, 2020 | | Sheet 19 of 106 |

STRAP PINS



| | PIN SPI_CLK NET SPI_CLK_ROM | PIN SYS_RESET_L//AGPIO1 NET SYS_RST#_CPU |
|-----------|---|--|
| PULL HIGH | Configured for internal clock-generator 10kΩ(± 5%) pull-up resistor to VDD_18 (DEFAULT) | Normal powerup / reset timing 10KΩ(± 5%) pull-up resistor to VDD_33_S5 (DEFAULT) |
| PULL LOW | Reserved | Reserved |

LC56-14A

緯創資通

Wistron Corporation

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

FCH (Strap)

Size
A4

Document Number
LC56-14A

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-1

Date: Wednesday, December 02, 2020

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| | | |
|---|-------------------------------------|-------------------|
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| Title <div>FCH (RSVD)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
| Date <div>Wednesday, December 02, 2020</div> | | Sheet 21 of 106 |

(Blanking)

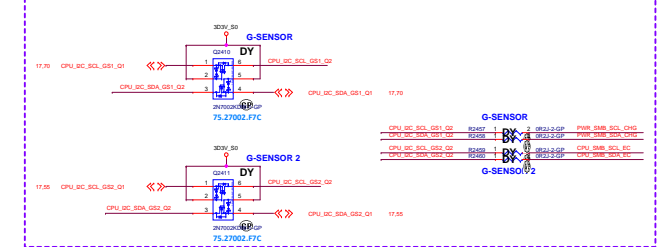
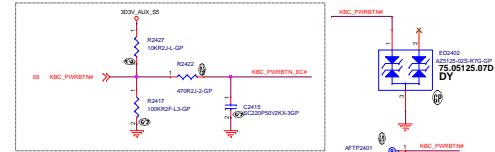
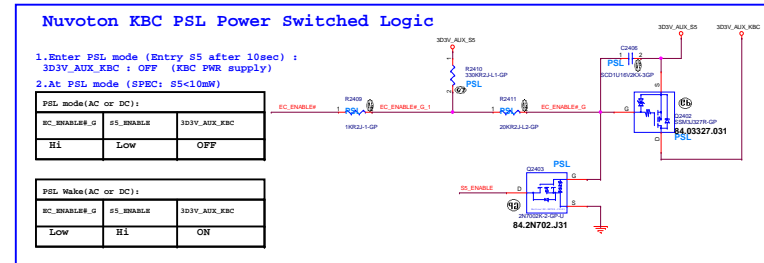
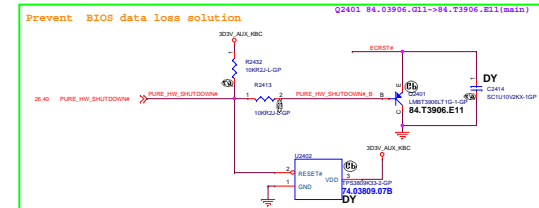
LC56-14A

| | | |
|--|-------------------------------------|-------------------|
| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title <div>FCH (RSVD)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
| Date: Wednesday, December 02, 2020 | | Sheet 22 of 106 |

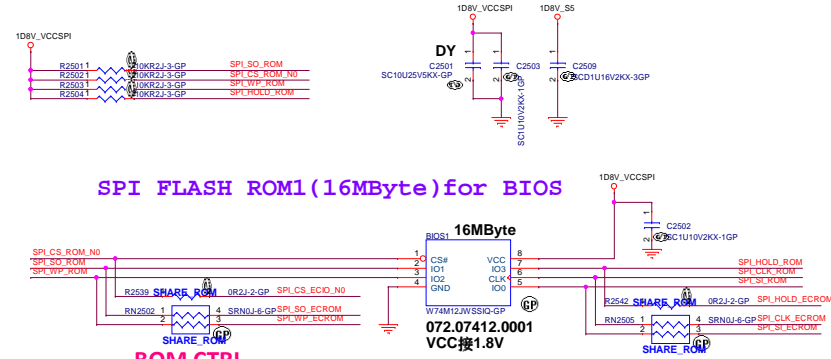
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LC56-14A

| | | |
|--|------------------------------|-----------------|
| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title | | |
| FCH (RSVD) | | |
| Size | Document Number | Rev |
| A4 | LC56-14A | -1 |
| Date: | Wednesday, December 02, 2020 | Sheet 23 of 106 |



SSID = Flash.ROM



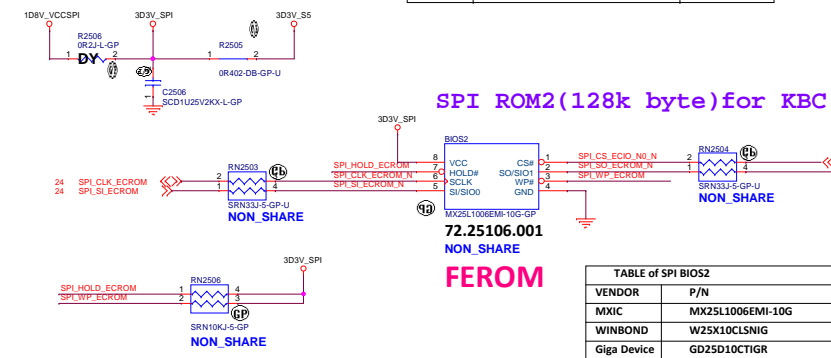
BOM CTRL

EVT DIP

BOM CTRL

Need BOM control to 072.07412.0001 (16M RPMC)

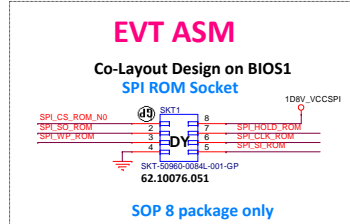
| TABLE of SPI BIOS1 | | |
|--------------------|--------------|----------------|
| VENDOR | P/N | Wistron P/N |
| WINBOND | W74M12JW55IQ | 072.07412.0001 |
| | | |
| | | |



FEROM

| TABLE of SPI BIOS2 | | |
|--------------------|-----------------|----------------|
| VENDOR | P/N | Wistron P/N |
| MXIC | MX25L1006EM-10G | 72.25106.001 |
| WINBOND | W25X10CLSNIG | 72.02510.001 |
| Giga Device | GD25D10CTIGR | 072.25D10.08D0 |

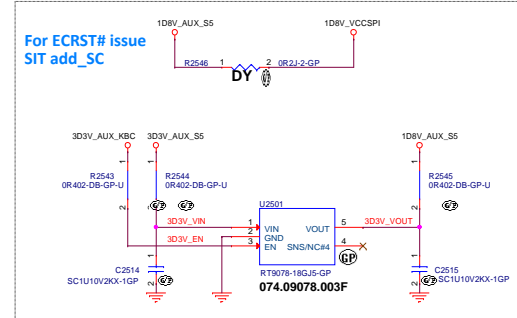
RSVD



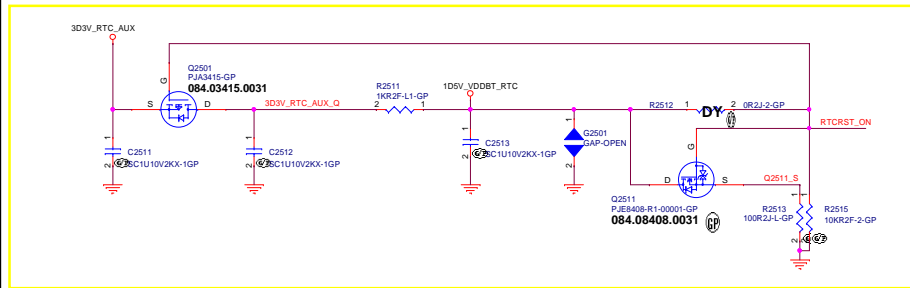
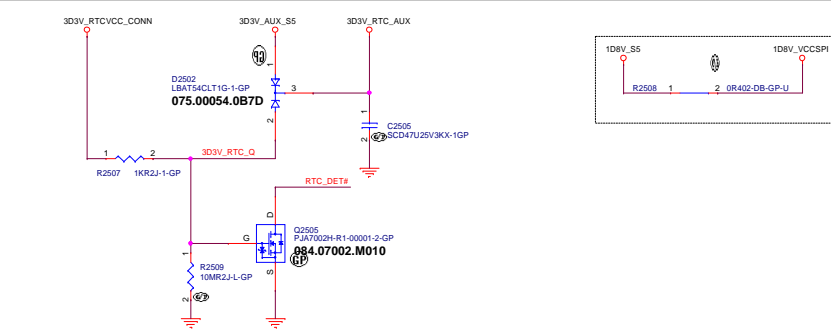
Co-Layout Design on BIOS2

FEROM Socket

remove BIOS2 socket
BIOS1.BIOS2 size is not same



SSID = RBAT



Close to Thermal sensor

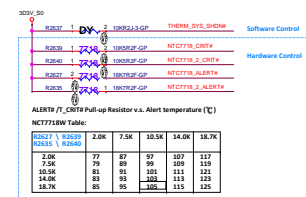
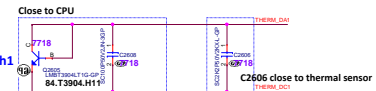
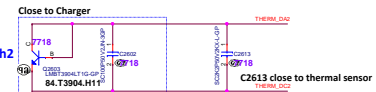
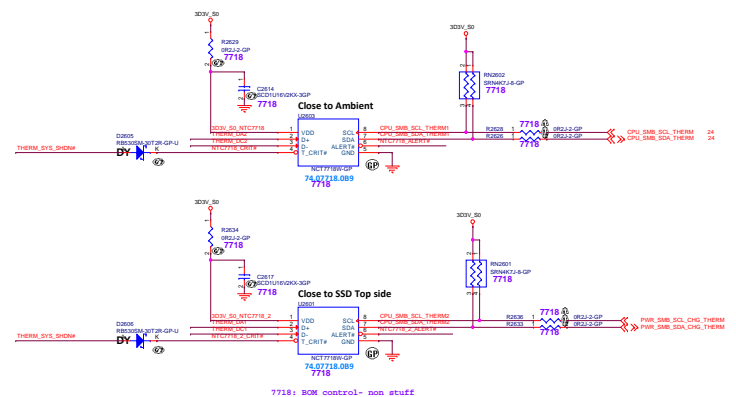
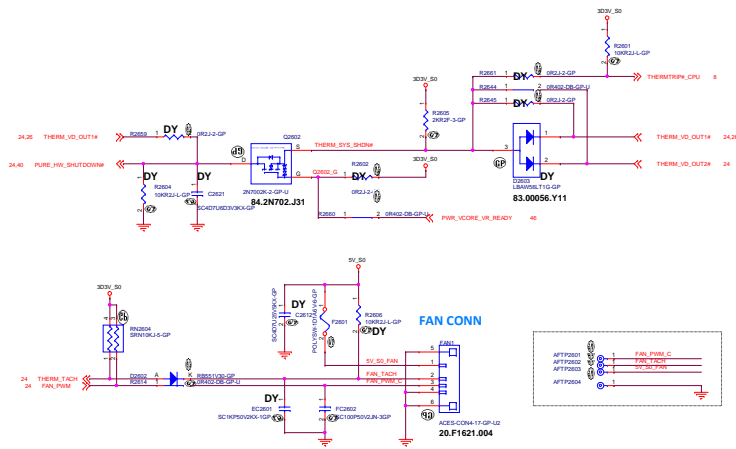
@CPU

Close to CPU chips

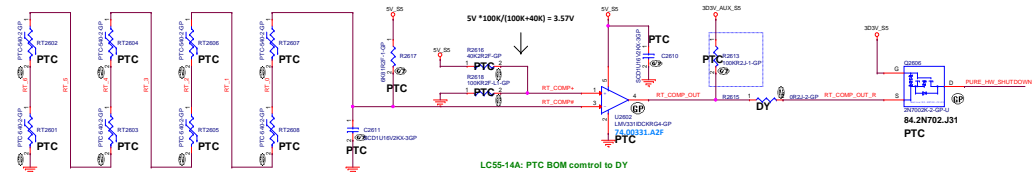
Close to Ambient chips

Close to SSD chips

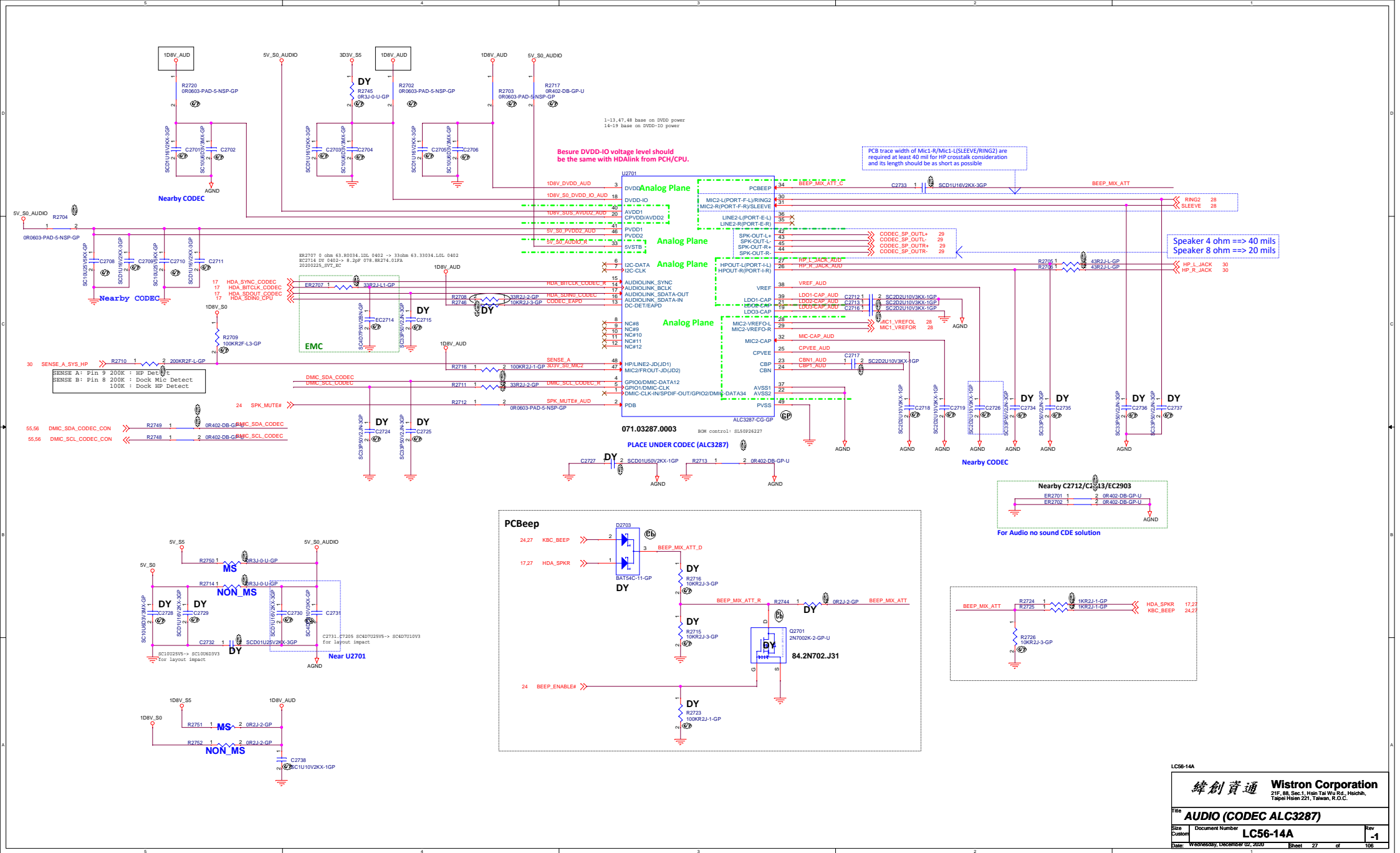
Close to Charger chips



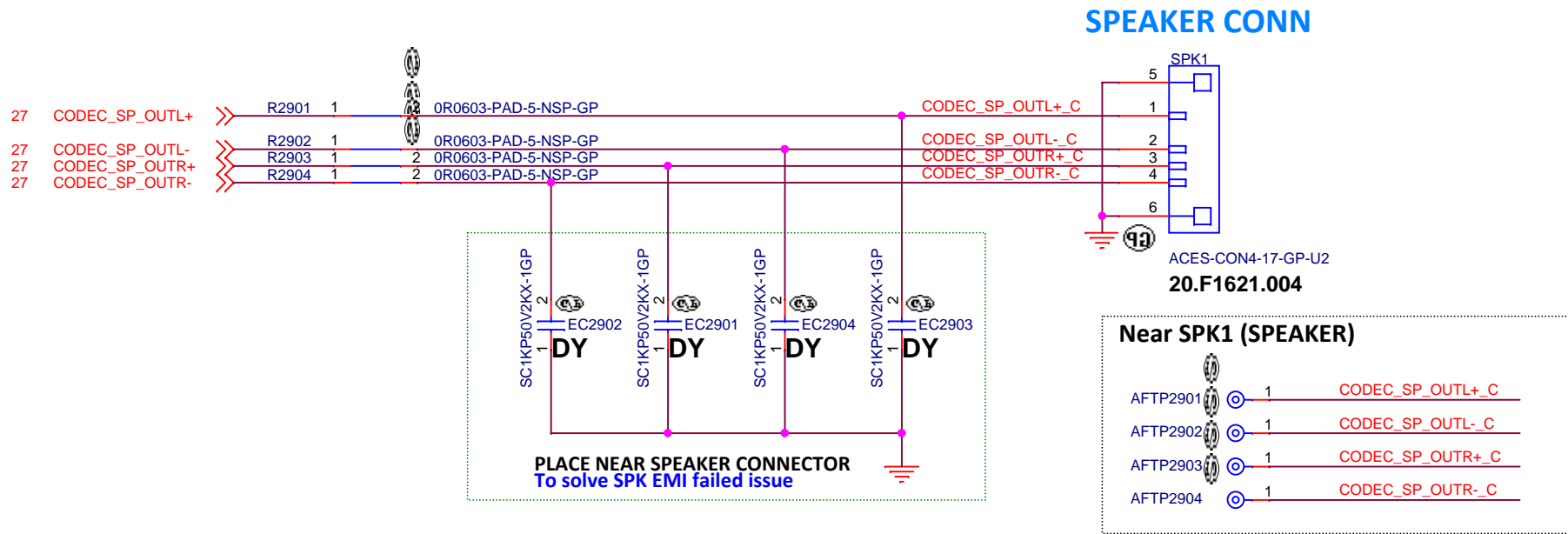
| ID | Target | Function |
|--------|--------|---------------|
| RT2601 | PU5101 | 1D2V_S3 |
| RT2602 | PU4801 | 1V_VCCGT |
| RT2603 | PQ5201 | 1D05V_SUS |
| RT2604 | PU4701 | 1V_CPU_CORE |
| RT2605 | PQ4505 | 5V_S5 |
| RT2606 | PQ4506 | 3D3V_S5 |
| RT2607 | PU4404 | Charger-Buck |
| RT2608 | PU4406 | Charger-Boost |



| | | |
|-------------------|------|-----|
| RT_COMP_OUT | High | Low |
| PURE_HW_SHUTDOWN# | High | Low |

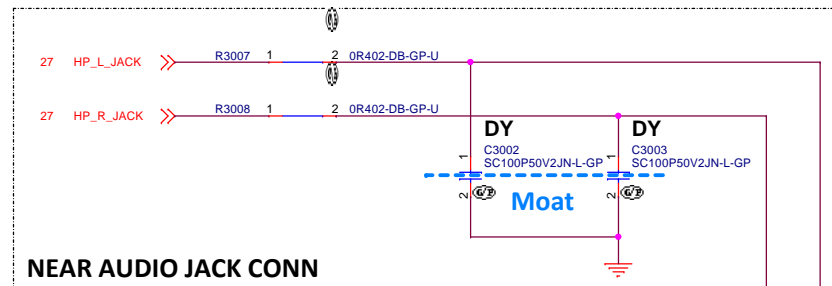


Main Func = AUDIO



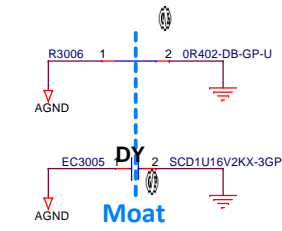
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| | | | | | |
|--|------------------------------------|----------|----------------------------|--------|------------------|
| 緯創資通 | | | Wistron Corporation | | |
| 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C. | | | | | |
| Title AUDIO (SPEAKER) | | | | | |
| Size A4 | Document Number LC56-14A | | | | Rev -1 |
| Date: Wednesday, December 02, 2020 | | Sheet 29 | | of 106 | |

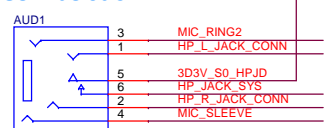


AUDIO JACK SENSE
CLOSE TO CODEC
6-10 mil trace recommend

HGND A/HGND B trace width >70mil,
changed to sharp will be better.

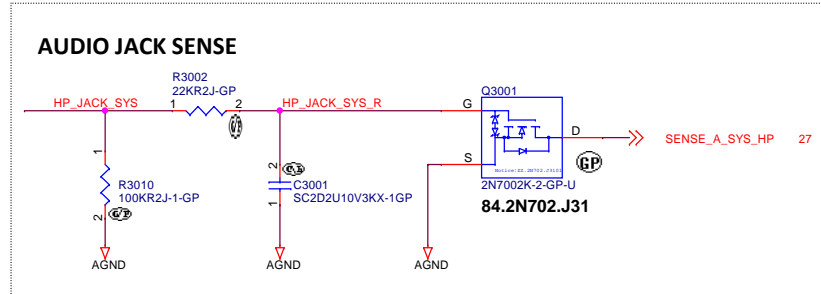
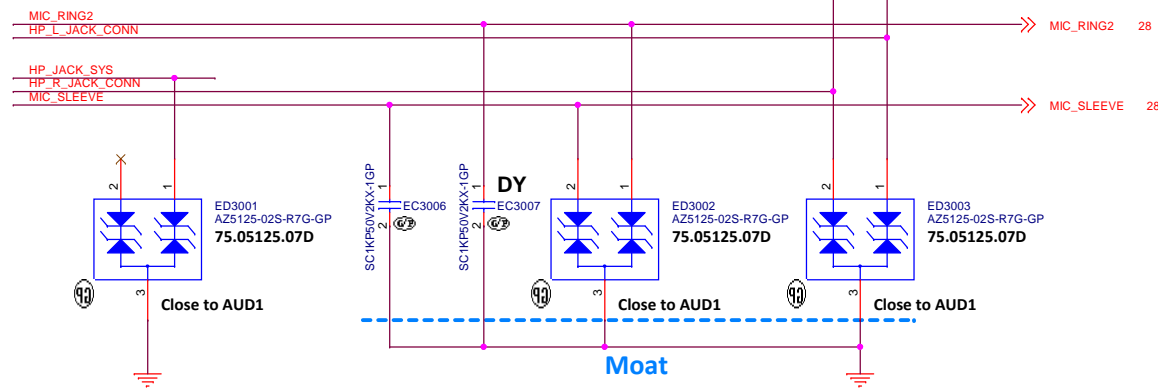
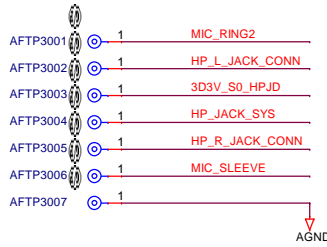


Combo Jack



AUDIO-JK704-GP
022.10002.0D21
022.10002.0I11-> 022.10002.0D21
FVT

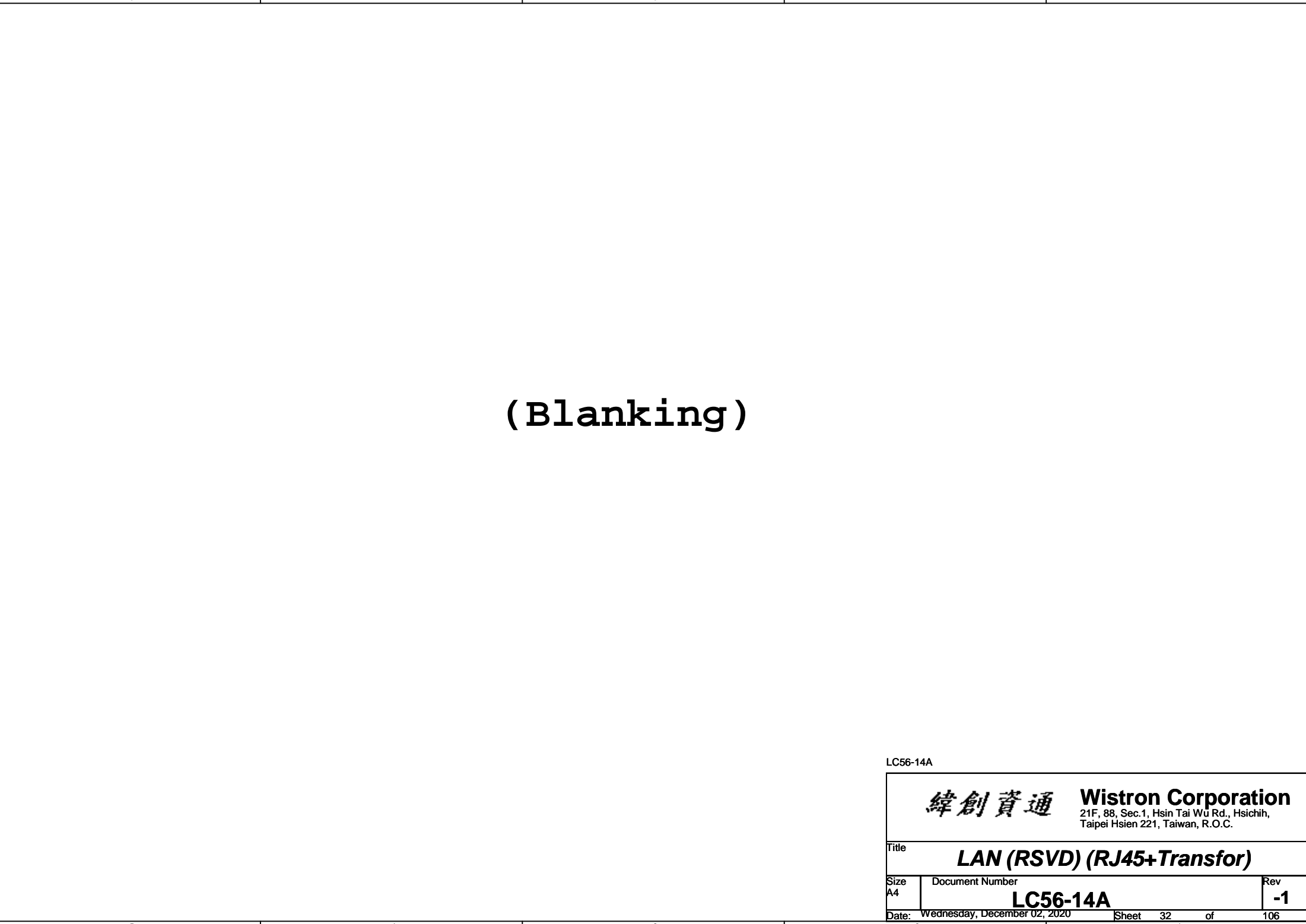
Near AUD1 (AUDIO)



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LC56-14A

| | |
|--|-------------------------------------|
| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | |
| Title <div>LAN (RSVD)</div> | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> |
| Date <div>Wednesday, December 02, 2020</div> | Rev <div>-1</div> |
| Sheet 31 of 106 | |



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| | | |
|---|-------------------------------------|-------------------|
| <div><div>緯創資通</div><div>Wistron Corporation</div><div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div></div> | | |
| Title <div>LAN (RSVD) (RJ45+Transfor)</div> | | |
| Size <div>A4</div> | Document Number <div>LC56-14A</div> | Rev <div>-1</div> |
| Date: Wednesday, December 02, 2020 | | Sheet 32 of 106 |

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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **CARD READER (RSVD)(SDIO/CONN)**

Size A4 Document Number **LC56-14A**

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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **USB (RSVD) (USB2.0 CONN)**

Size A4 Document Number **LC56-14A**

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Date: Wednesday, December 02, 2020 Sheet 34 of 106

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緯創資通

Wistron Corporation
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Taipei Hsien 221, Taiwan, R.O.C.

Title **USB (RSVD)(USB3.0 Conn)**

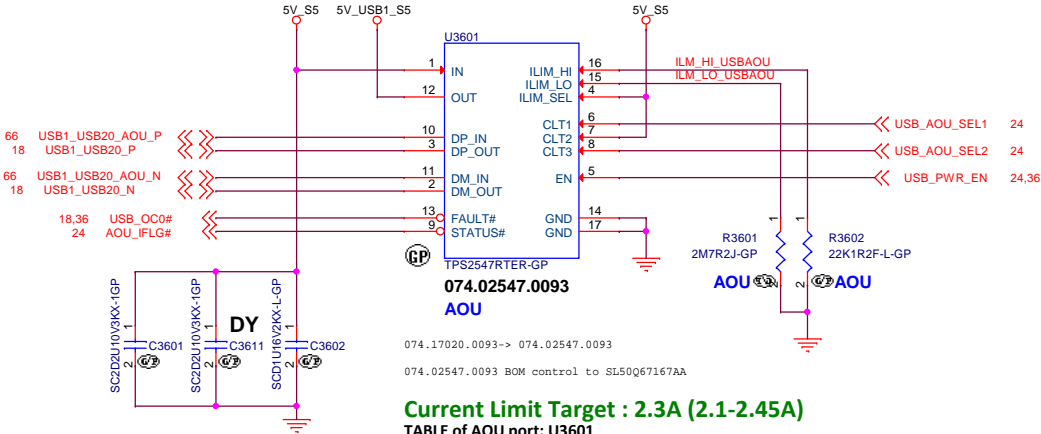
Size A4 Document Number **LC56-14A**

Rev **-1**

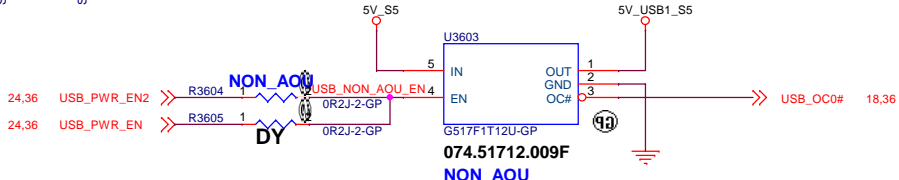
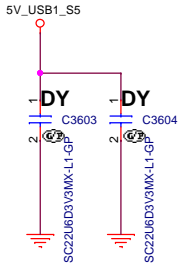
Date: Wednesday, December 02, 2020 Sheet 35 of 106

Main Func = USB Charger

For USB3.0 System Port1 (For AOU)



Layout Note: Close 5V_USB1_S5



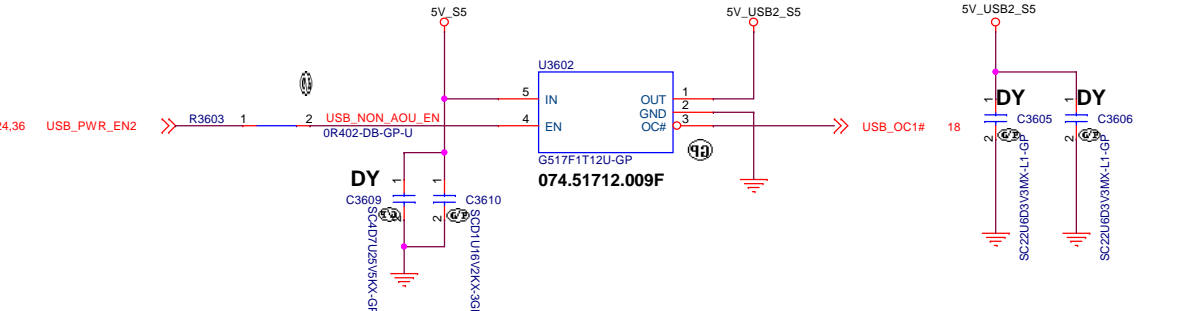
Current Limit Target : 2.3A (2.1-2.45A)

TABLE of AOU port: U3601

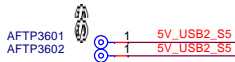
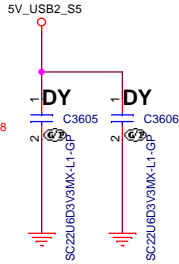
| | Vendor | Vendor P/N | Wistron P/N |
|-----|--------|---------------|----------------|
| 1st | TI | SN1702001RTER | SL50Q67167AA |
| 2nd | TI | TPS2547RTER | 074.02547.0093 |

SN1702001RTER is not equivalent device of TPS2546RTER

For USB3.0 System Port2



Layout Note: Close 5V_USB2_S5



LC56-14A

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LC56-14A

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Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **USB (RSVD)(PCIE to USB3.0)**

Size A4 Document Number **LC56-14A**

Rev **-1**

Date: Wednesday, December 02, 2020 Sheet 37 of 106

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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

USB (RSVD)(USB Redriver/Hub)

Size
A4

Document Number

LC56-14A

Rev
-1

Date: Wednesday, December 02, 2020

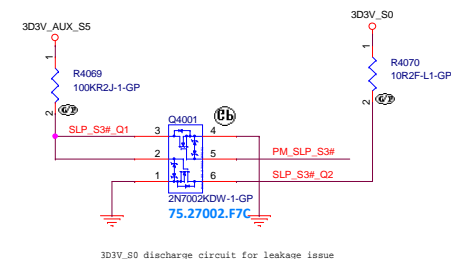
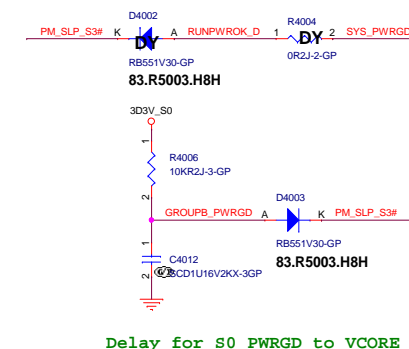
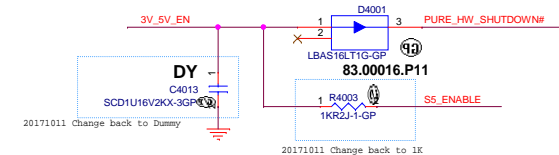
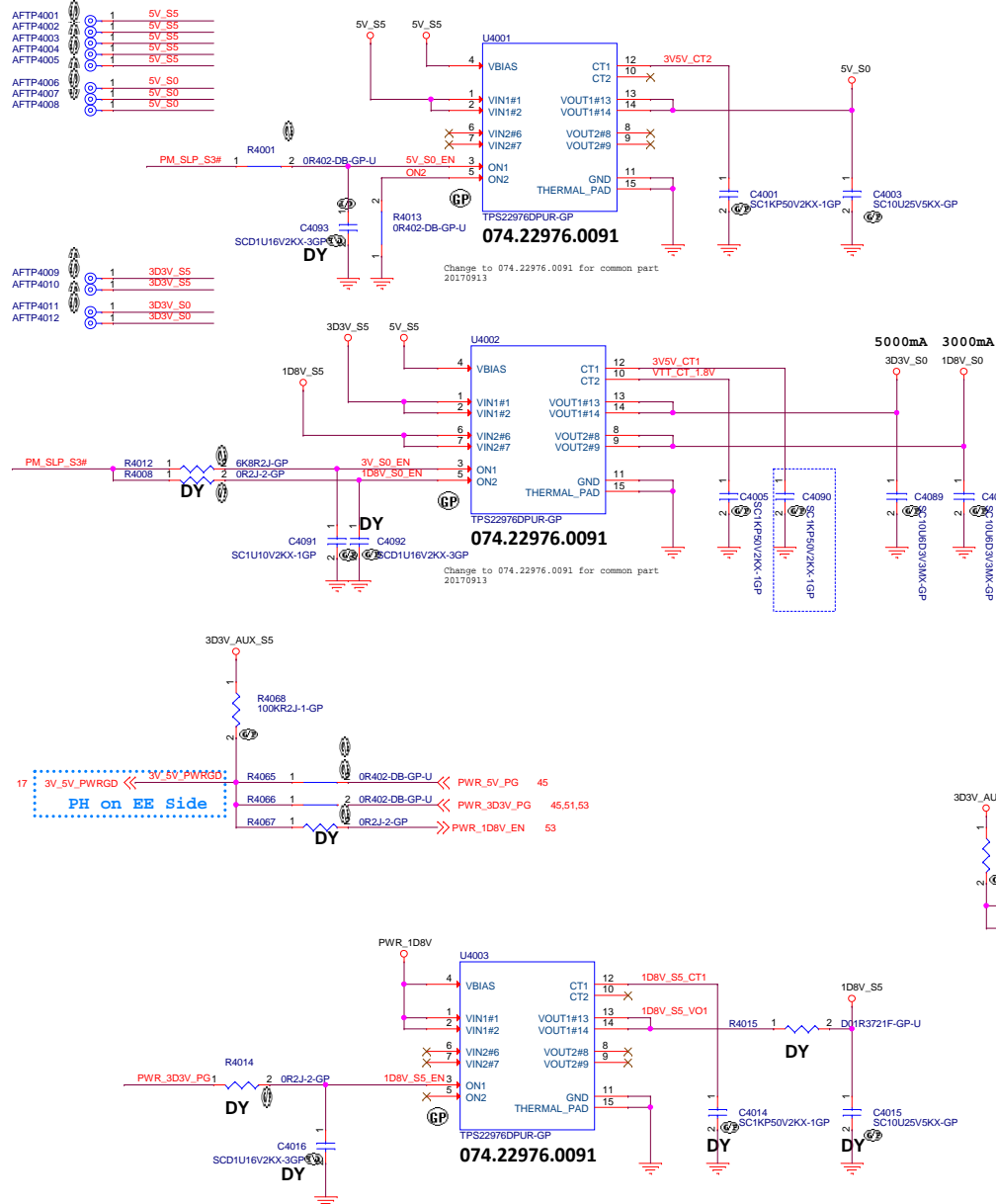
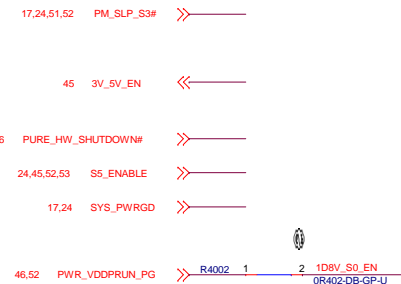
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LC56-14A

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| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title | | |
| Sequence (RSVD) | | |
| Size | Document Number | Rev |
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| Date: Wednesday, December 02, 2020 | | Sheet 39 of 106 |

Power Sequence



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Title

Sequence (RSVD) (DS3/S0ix)

Size
A4

Document Number

LC56-14A

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-1

Date: Wednesday, December 02, 2020

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LC56-14A

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Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **INT IO (RSVD)(TYPEC DC-DC)**

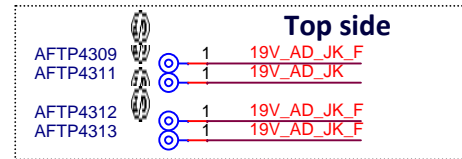
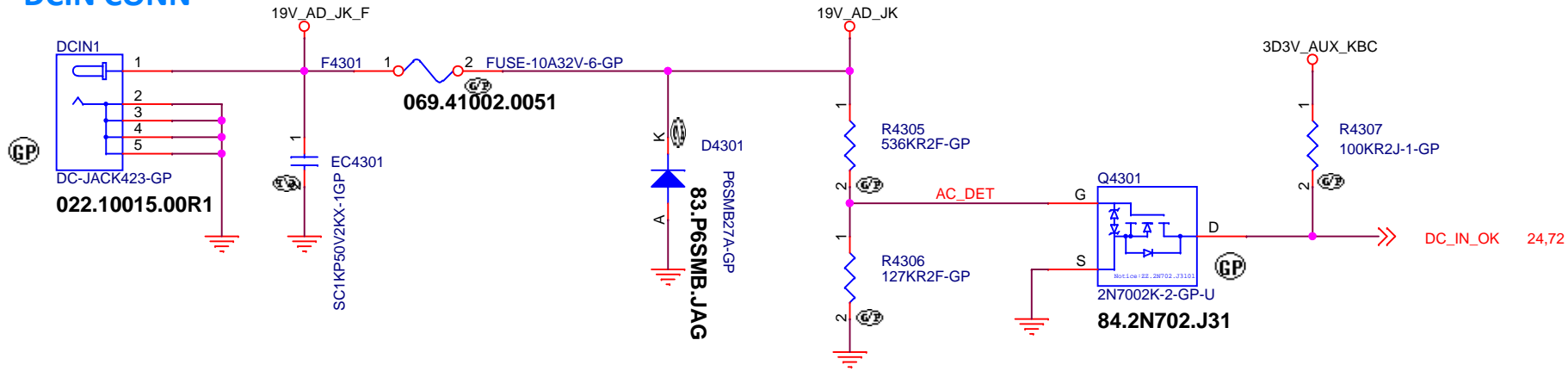
Size A4 Document Number **LC56-14A**

Rev **-1**

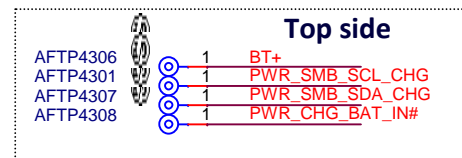
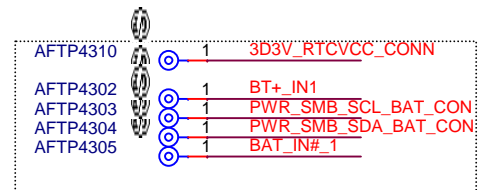
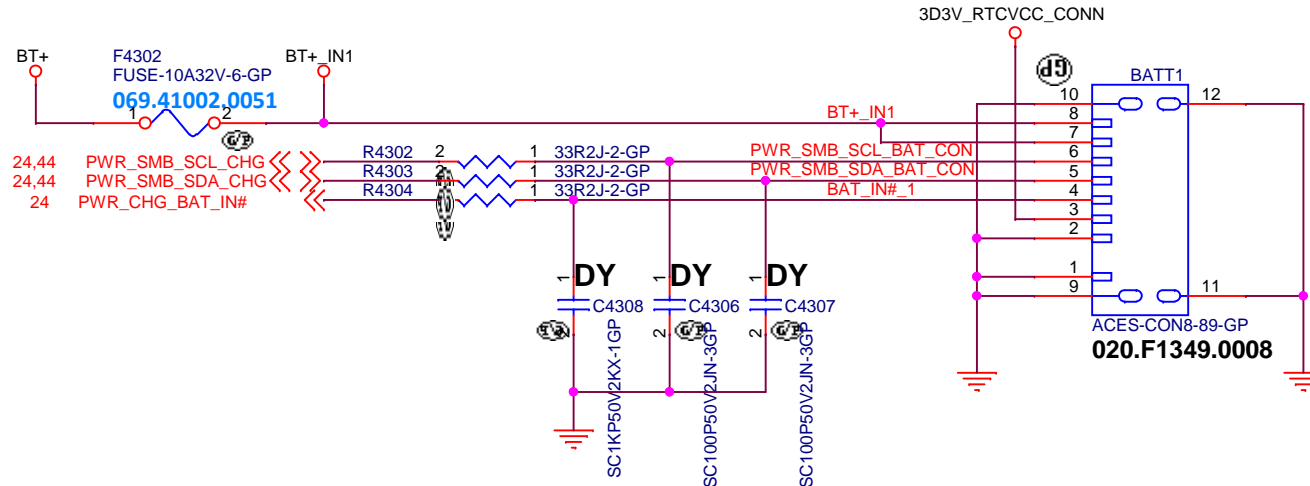
Date: Wednesday, December 02, 2020 Sheet 42 of 106

DCIN CONN

Total MLCC capacitance at DCIN connector is smaller than 1000pf to avoid LC resonance



Main Battery Connector



LC56-14A

緯創資通

Wistron Corporation

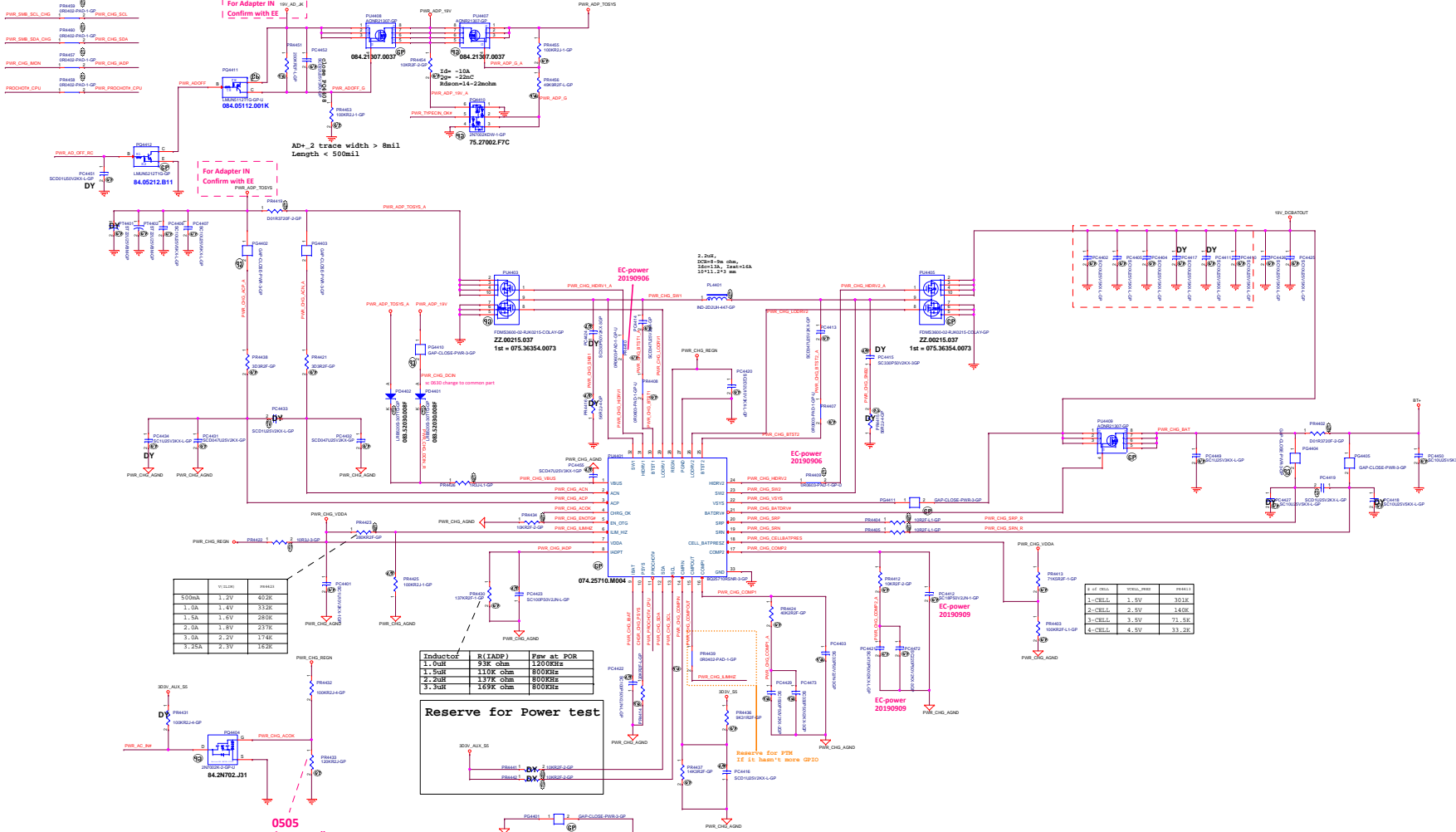
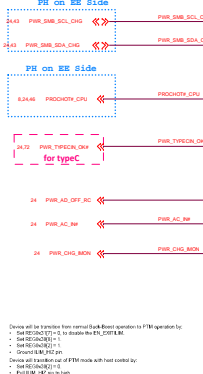
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **INT IO (DCIN/BATT CONN)**

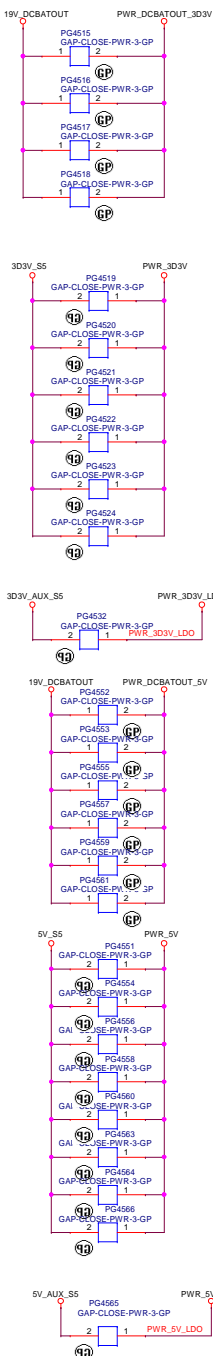
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| Size A4 | Document Number LC56-14A | Rev -1 |
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|------------|------------------------------------|

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6.24.4 PROCH074.CPU PROCH074.CPU

SVID



26 PWR_VCORE_VR_READY PWR_VCORE_VR_READY

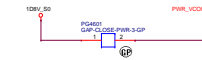
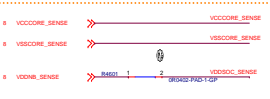
24 PWR_VCORE_FUOOD PWR_VCORE_FUOOD

40.52 PWR_VCORE_VR_EN PWR_VCORE_VR_EN

47 PWR_VCORE_VR_EN PWR_VCORE_VR_EN

6.08 PWR_VCORE_FUOOD PWR_VCORE_FUOOD

FP6 V sense



PROCH074.CPU PWR_VCORE_DCP_L

SVID_ALERT#_CPU PWR_VCORE_SVT

SVID_CLK_CPU PWR_VCORE_SVC

SVID_DATA_CPU PWR_VCORE_SVD

30V_50 PWR_VCORE_FUOOD

PWR_VCORE_VR_READY PWR_VCORE_FUOOD

PWR_VCORE_FUOOD PWR_VCORE_FUOOD

PWR_VCORE_FUOOD PWR_VCORE_FUOOD

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PWR_VCORE_FUOOD PWR_VCORE_FUOOD

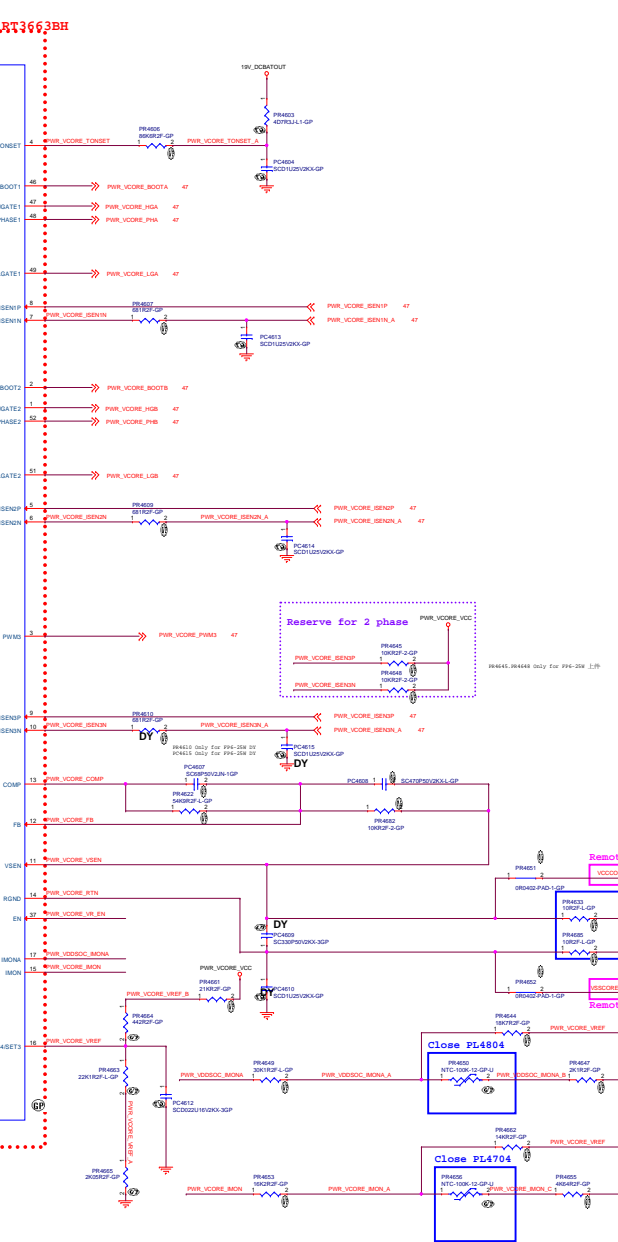
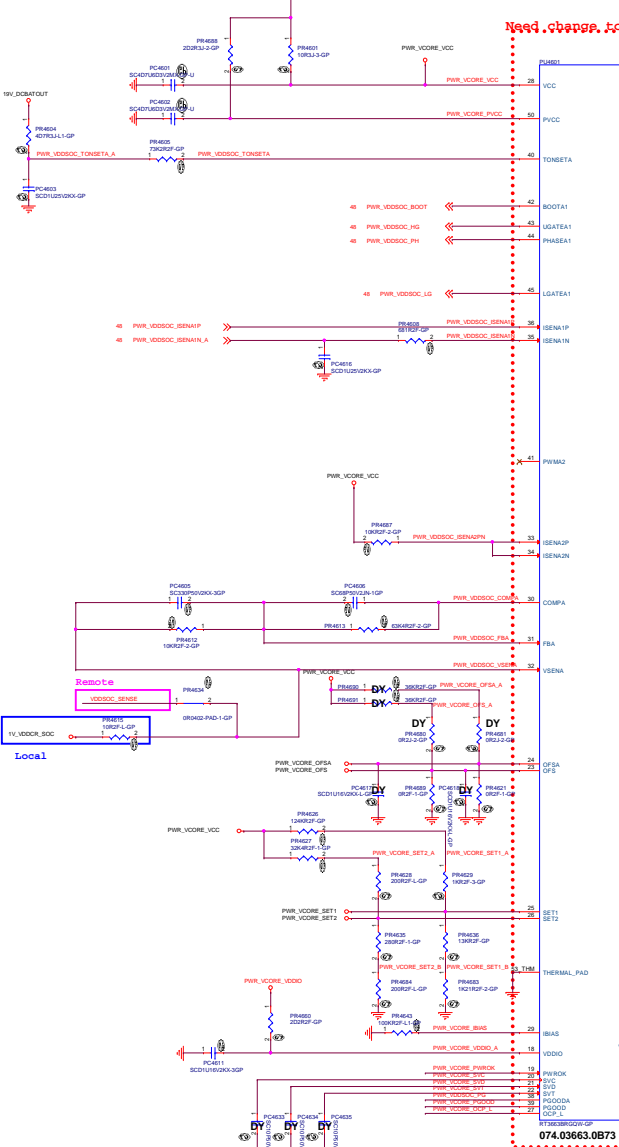
PWR_VCORE_FUOOD PWR_VCORE_FUOOD

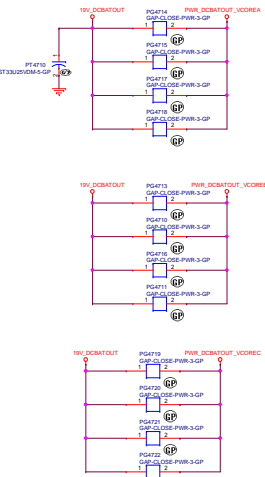
PWR_VCORE_FUOOD PWR_VCORE_FUOOD

PWR_VCORE_FUOOD PWR_VCORE_FUOOD

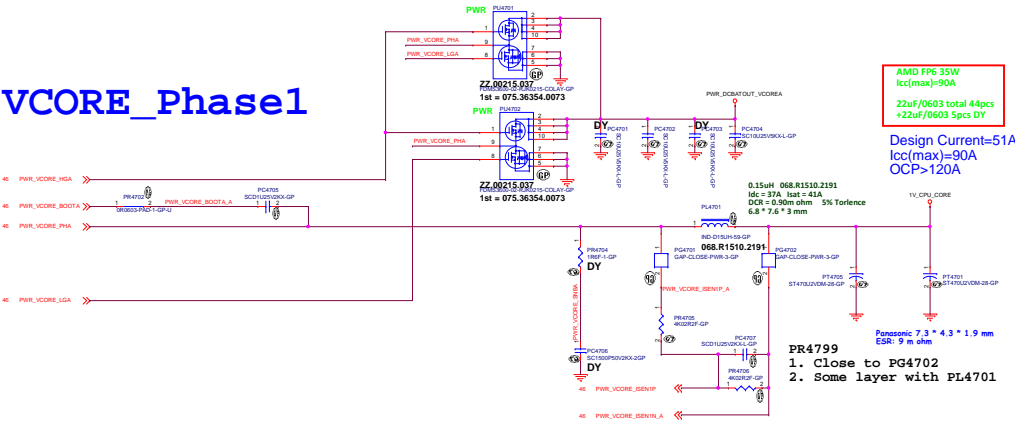
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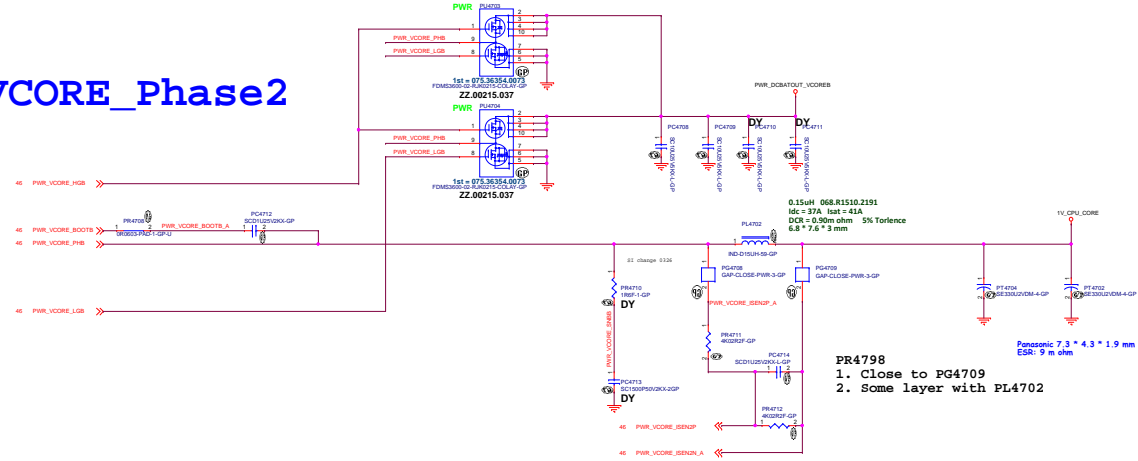




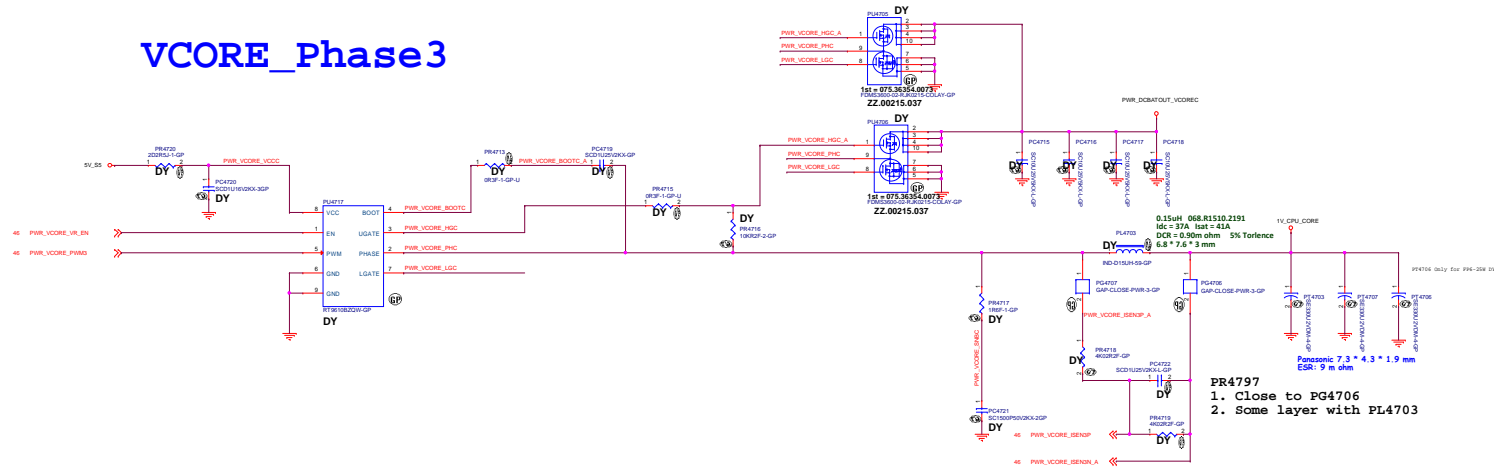
VCORE_Phase1



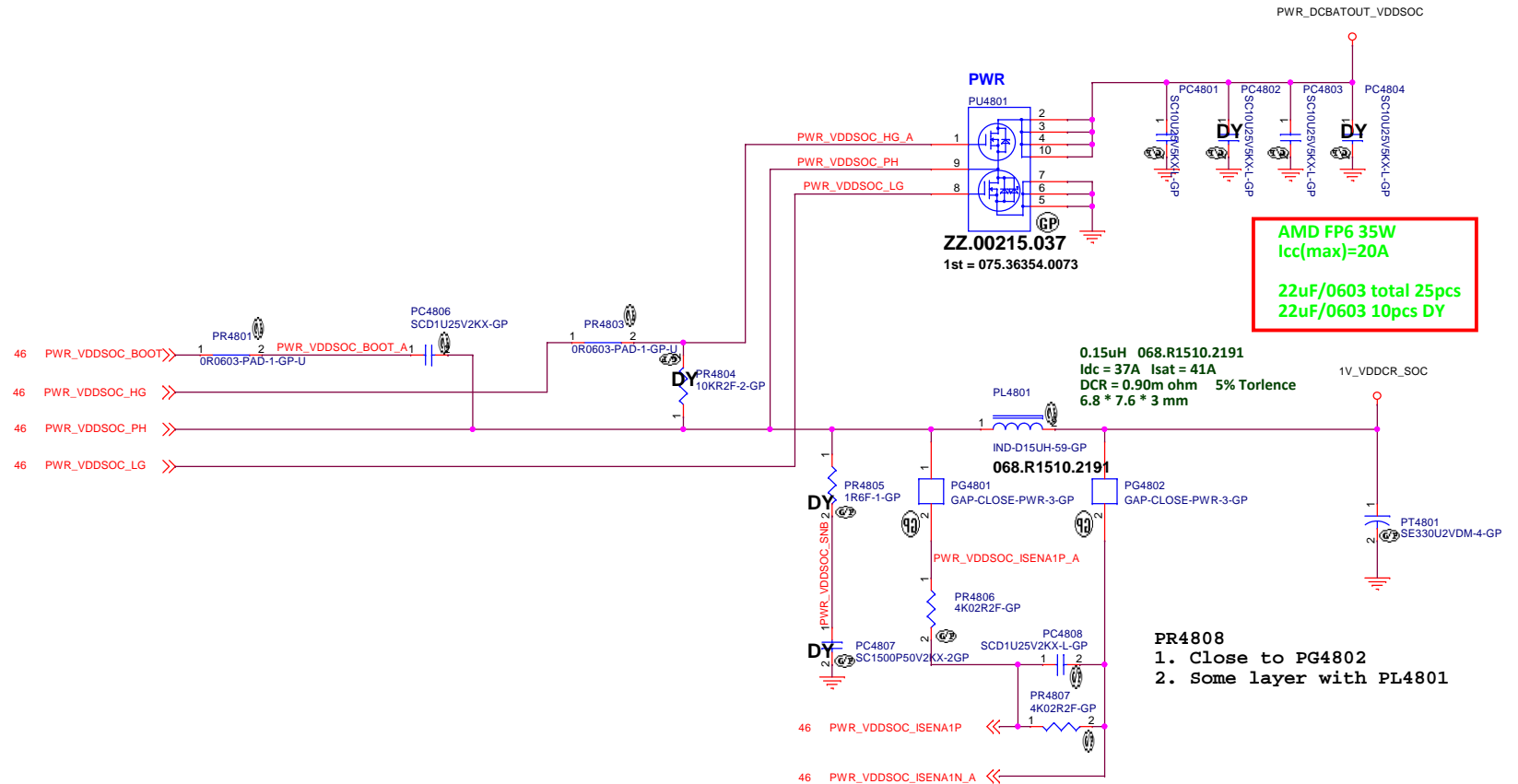
VCORE_Phase2



VCORE_Phase3



VDDSOC_Phase1



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Title **POWER_RT3663BC_CPUCORE(3/3)**

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|------------|------------------------------------|------------------|
| Size A3 | Document Number LC56-14A | Rev -1 |
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Taipei Hsien 221, Taiwan, R.O.C.

Title

Power (RSVD)

Size
A4

Document Number

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-1

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Taipei Hsien 221, Taiwan, R.O.C.

Title

Power (RSVD)

Size
A4

Document Number

LC56-14A

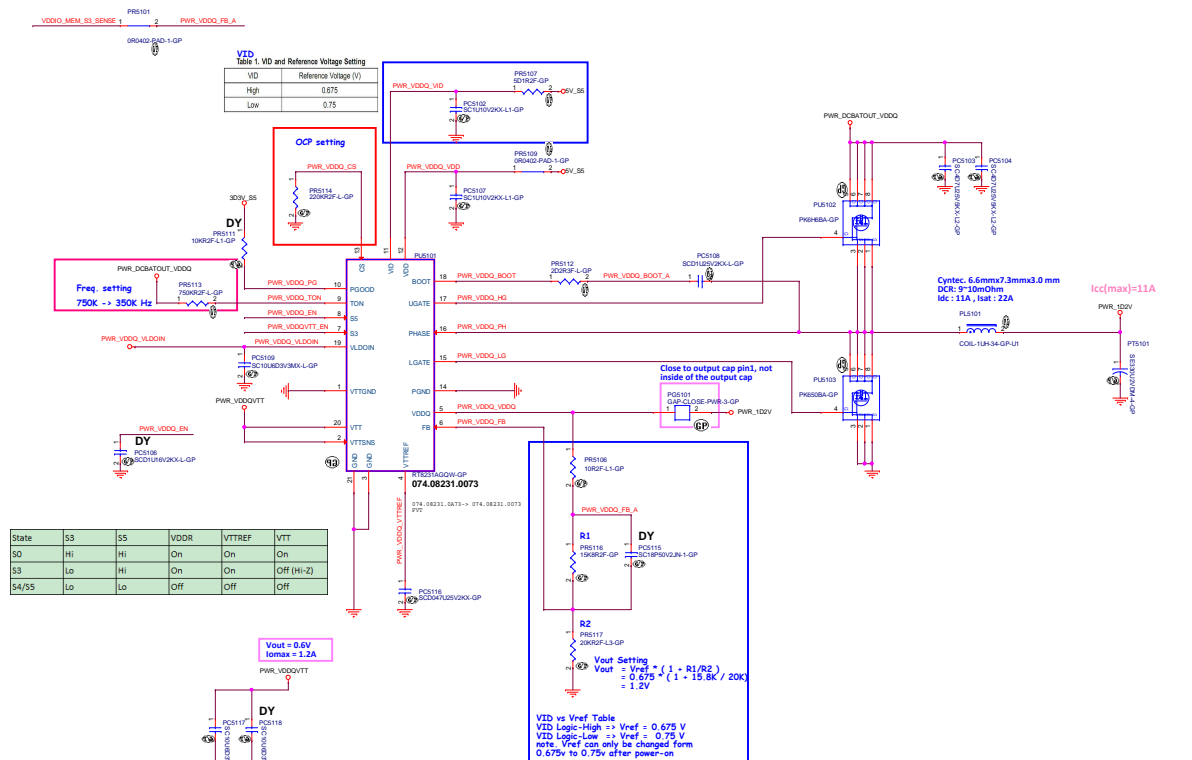
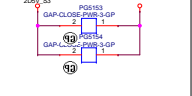
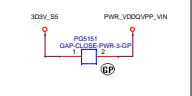
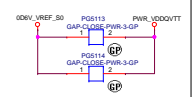
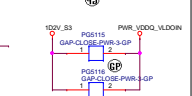
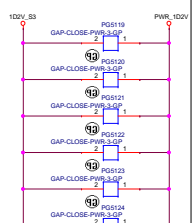
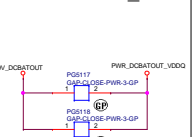
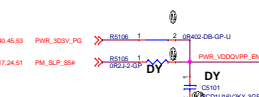
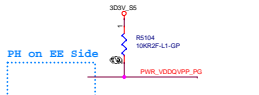
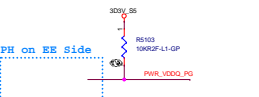
Rev
-1

Date: Wednesday, December 02, 2020

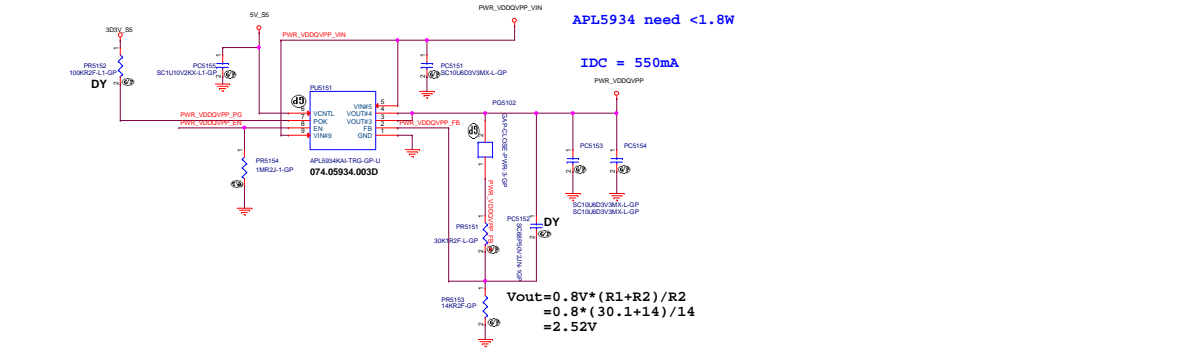
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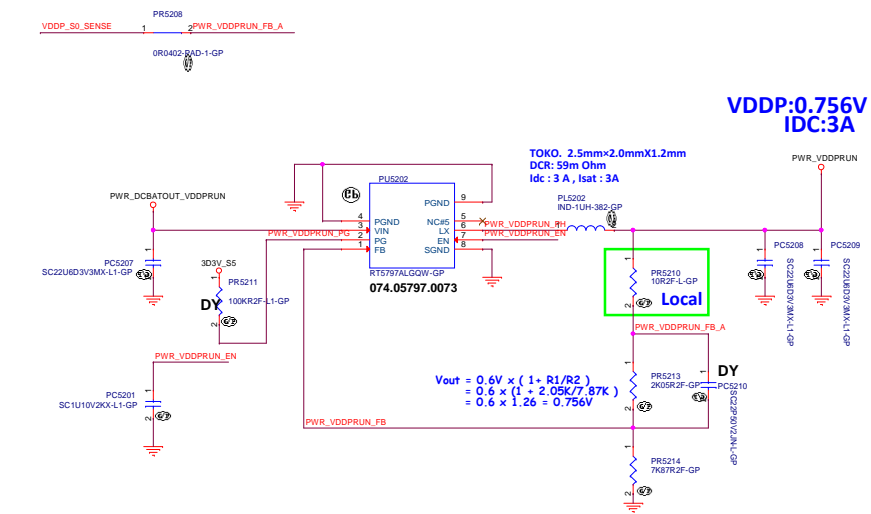
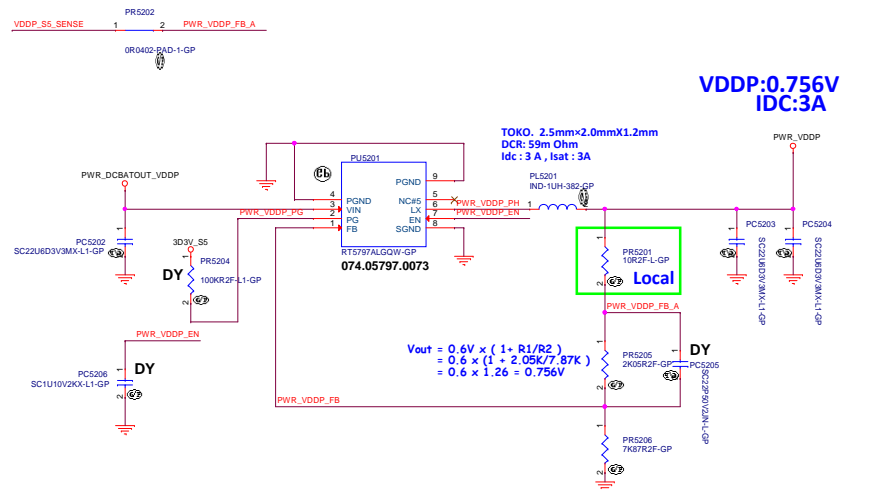
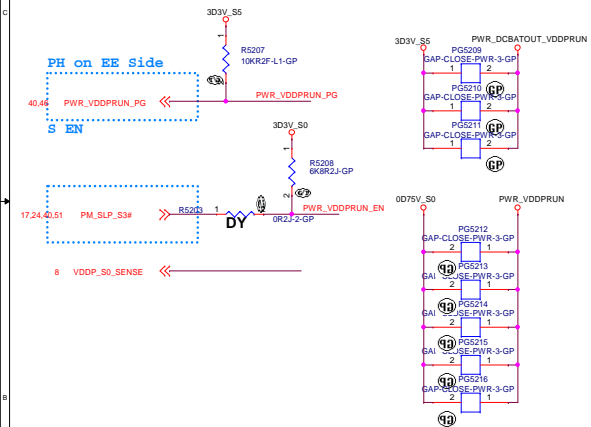
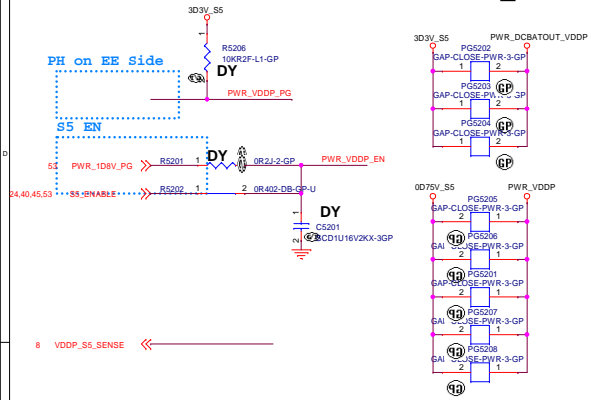


APL5934 for 2D5V



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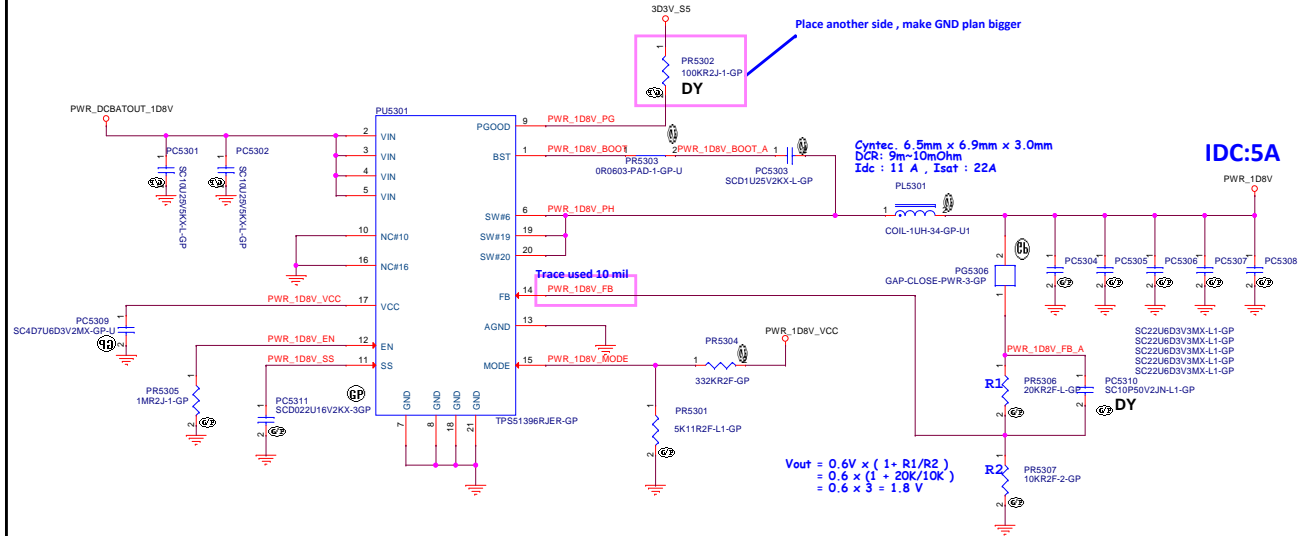
LC58-14A

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Taipei Hsien 221, Taiwan, R.O.C.

| | |
|-------|----------------------------|
| Title | POWER (RT5797_VDDP) |
|-------|----------------------------|

| | | |
|------------------------------------|------------------------------------|------------------|
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| Date: Wednesday, December 02, 2020 | Sheet 52 of | 108 |

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$$\begin{aligned} V_{out} &= 0.6V \times (1 + R1/R2) \\ &= 0.6 \times (1 + 20K/10K) \\ &= 0.6 \times 3 = 1.8V \end{aligned}$$

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Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

Power (RSVD)

Size
A4

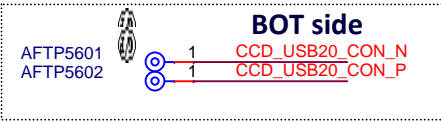
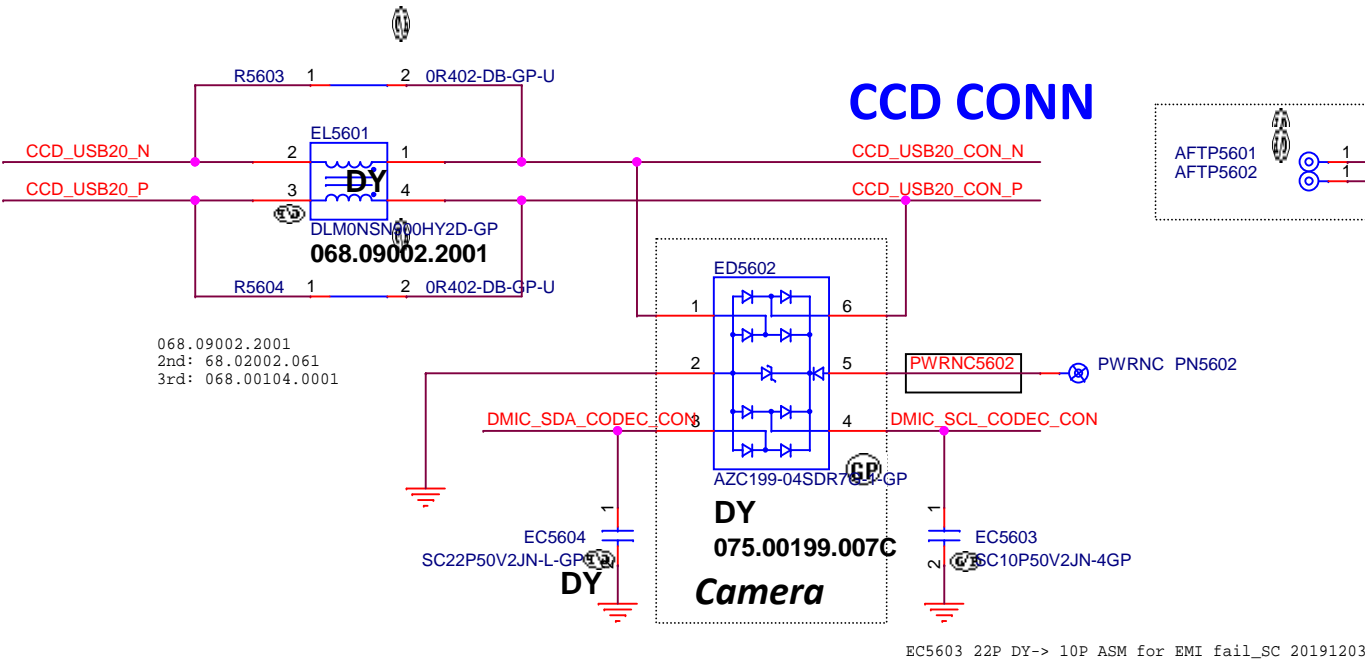
Document Number

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Date: Wednesday, December 02, 2020

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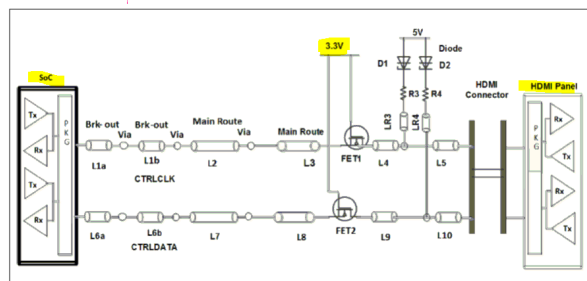
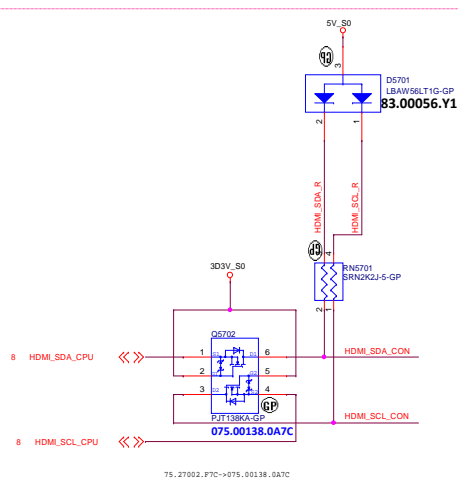
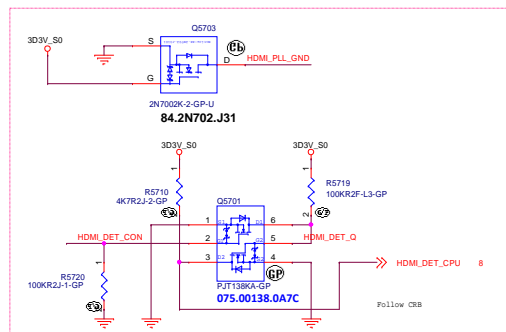
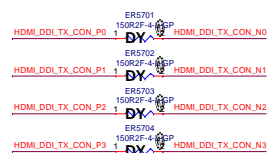
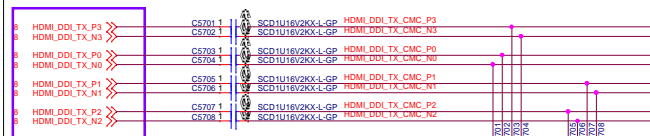


LC56-14A

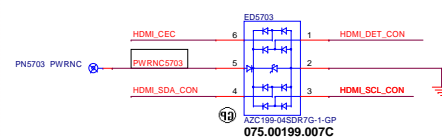
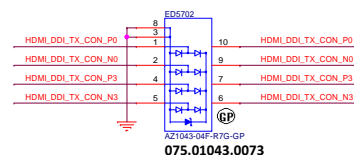
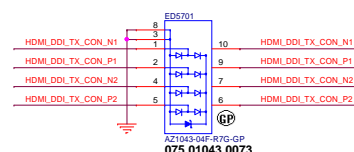
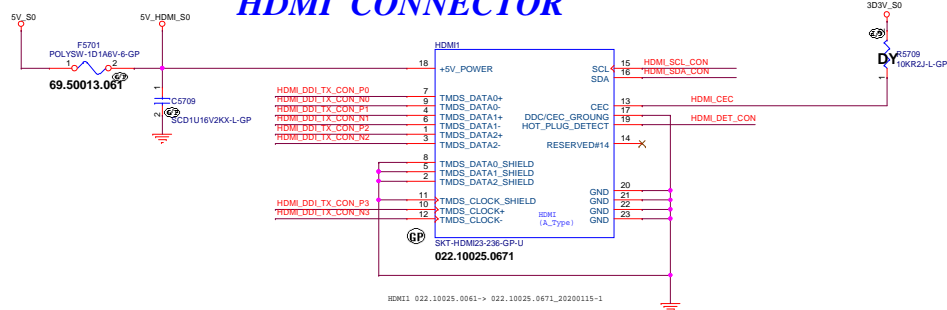
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|-------------------------|------------------------------|--|-----------------|
| 緯創資通 | | Wistron Corporation | |
| | | 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C. | |
| Title | | | |
| Display (CRT/IR Camera) | | | |
| Size | Document Number | | Rev |
| A4 | LC56-14A | | -1 |
| Date: | Wednesday, December 02, 2020 | | Sheet 56 of 106 |

HDMI

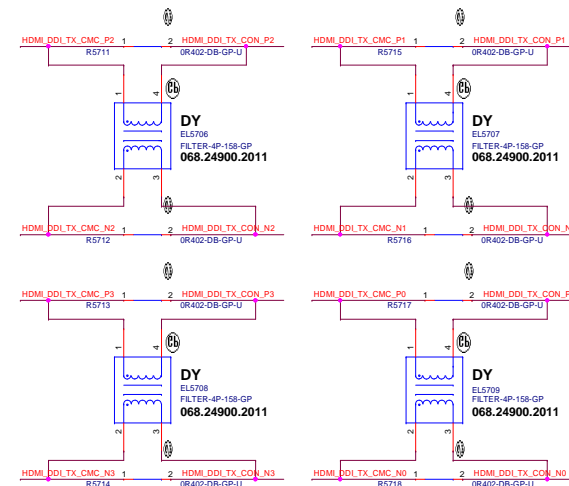
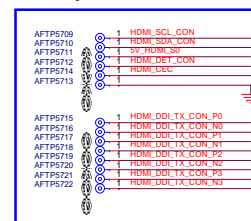
HDMI Passive Level Shifter



HDMI CONNECTOR



Test point



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Taipei Hsien 221, Taiwan, R.O.C.

Title **Display (RSVD) DP / DVI**

Size A4 Document Number **LC56-14A**

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Date: Wednesday, December 02, 2020 Sheet 58 of 106

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| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title | | |
| Display (RSVD) | | |
| Size | Document Number | Rev |
| A4 | LC56-14A | -1 |
| Date: Wednesday, December 02, 2020 | | Sheet 59 of 106 |

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Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **INT IO (RSVD)(HDD/ODD)**

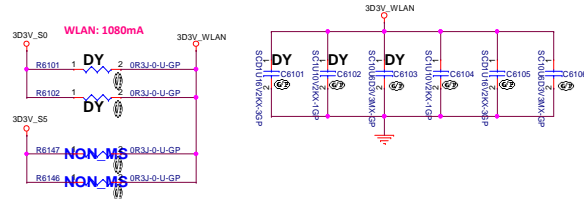
Size A4 Document Number **LC56-14A**

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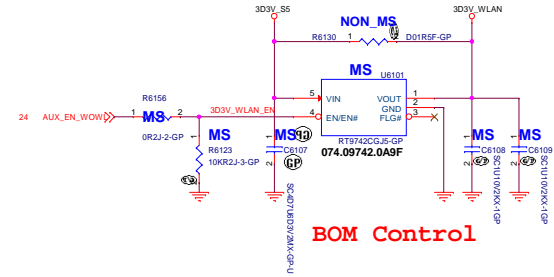
Date: Wednesday, December 02, 2020 Sheet 60 of 106

WLAN

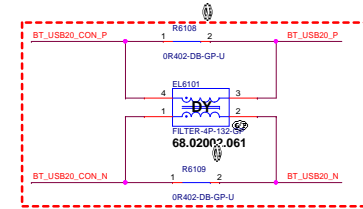
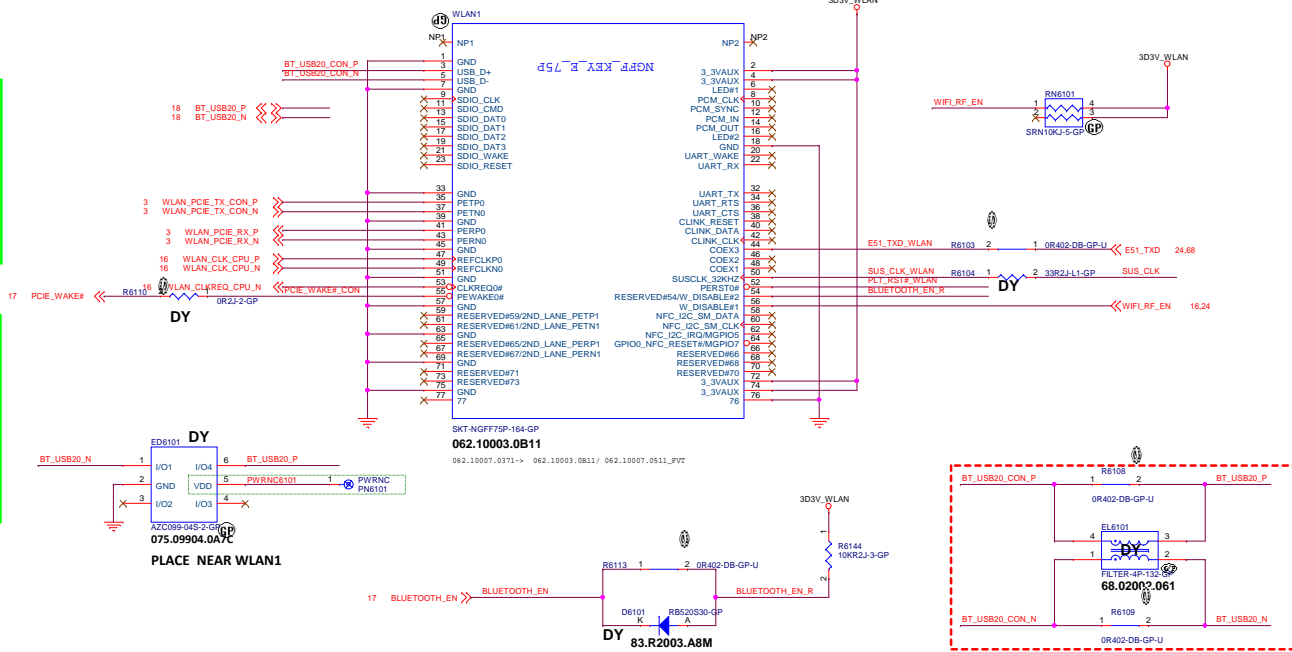
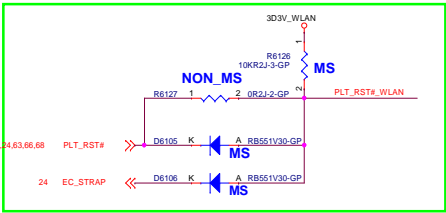
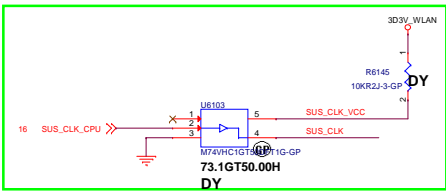
Modern Standby CIRCUIT



Lite on NFA344 device lost
BOM control R6101.R6102 DY/ R6146.R6147 ASM



M.2 Key-E FOR WLAN / BT



LC58-14A

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Taipei Hsien 221, Taiwan, R.O.C.

| | | | |
|-----------------------------------|------------------------------------|--|------------------|
| Title INT IO (WLAN M.2) | | | |
| Size A2 | Document Number LC56-14A | | Rev -1 |
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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **INT IO (RSVD)(WWAN)**

Size A4 Document Number **LC56-14A**

Date: Wednesday, December 02, 2020

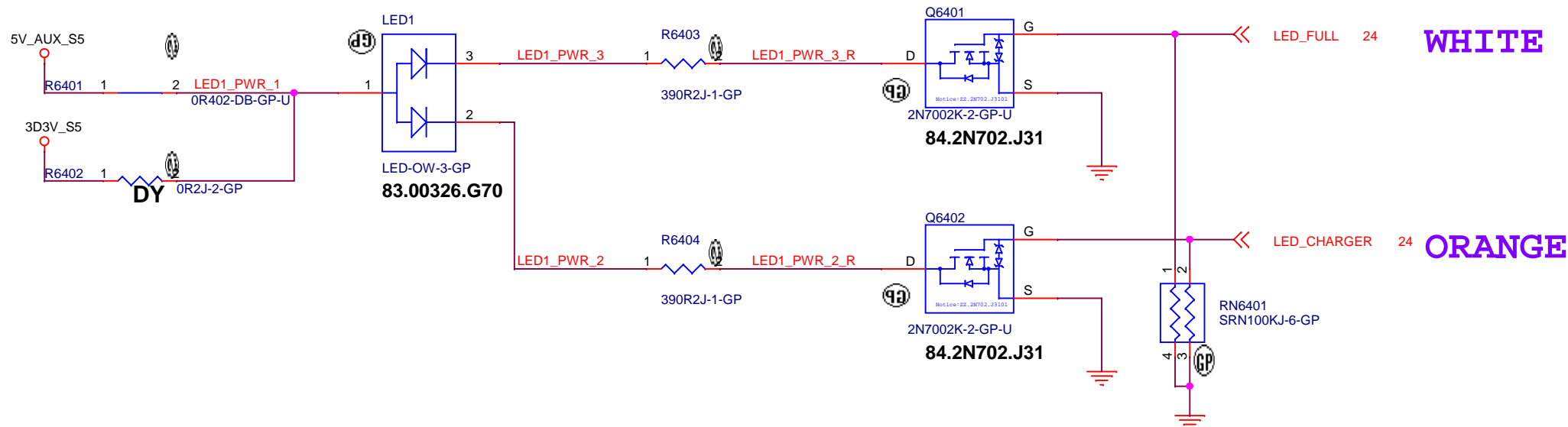
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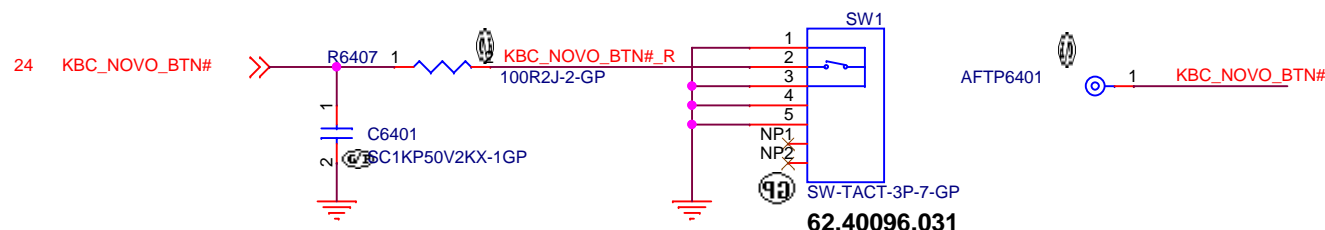
LED

DC-IN

Charger LED



NOVO BUTTON



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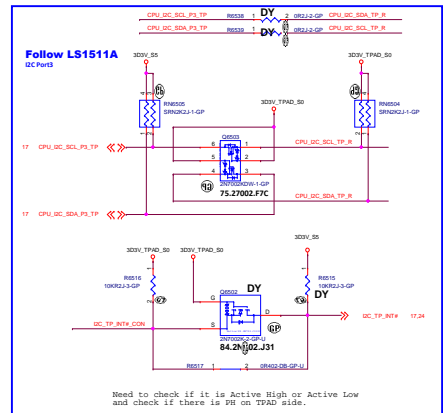
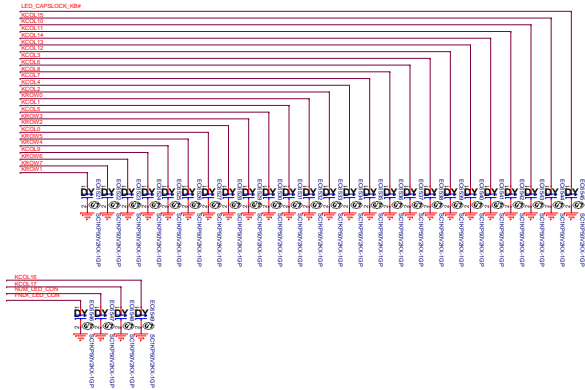
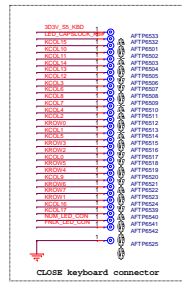
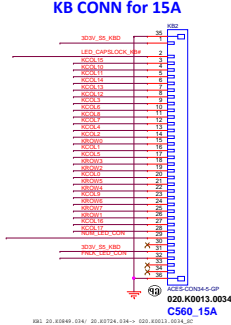
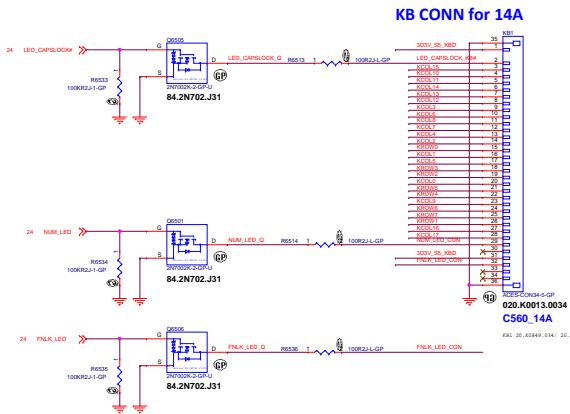
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title **LED / Button / Power Button**

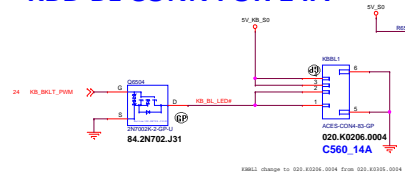
Size A4 Document Number **LC56-14A** Rev **-1**

Date: Wednesday, December 02, 2020 Sheet 64 of 106

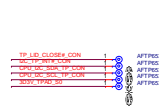
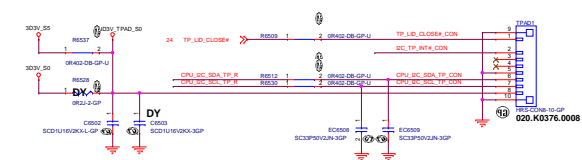
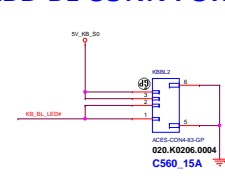
KBD CONN



KBD BL CONN FOR 14A



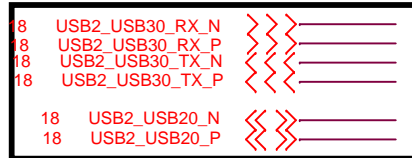
KBD BL CONN FOR 15A



USB3.0 Port1



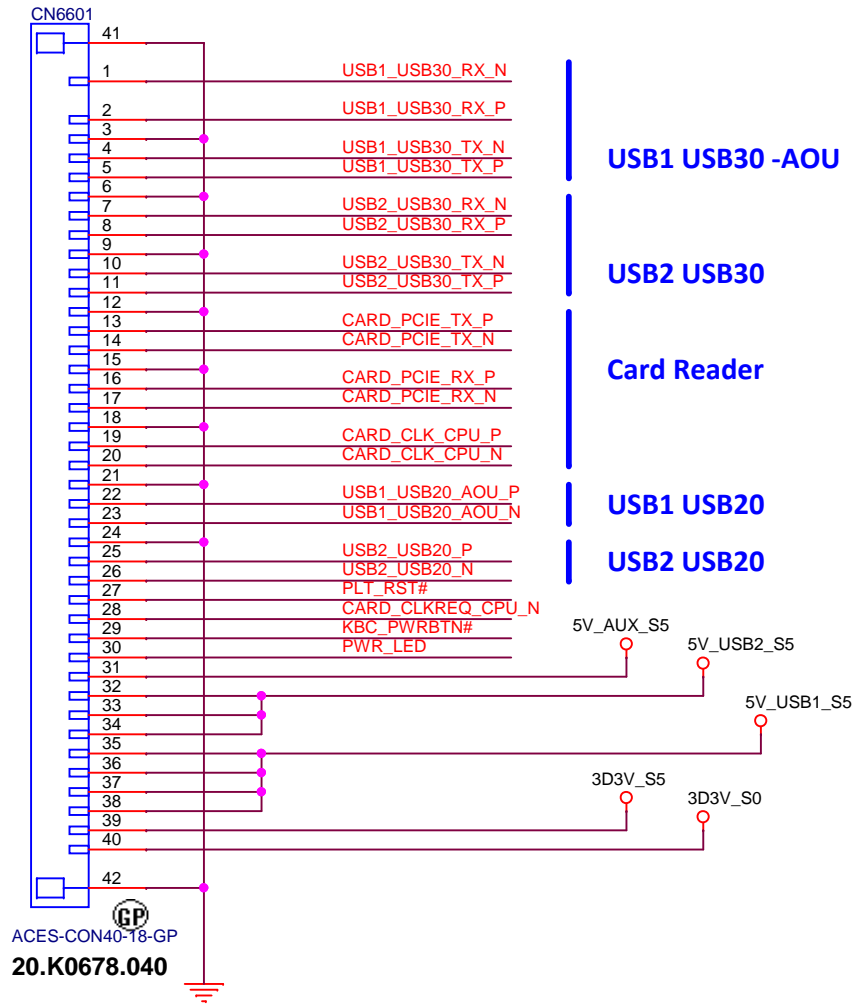
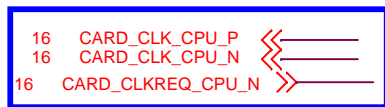
USB3.0 Port2



CARD



CARD



LC56-14A

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| | | 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C. | |
| Title IO BOARD CONN | | | |
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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

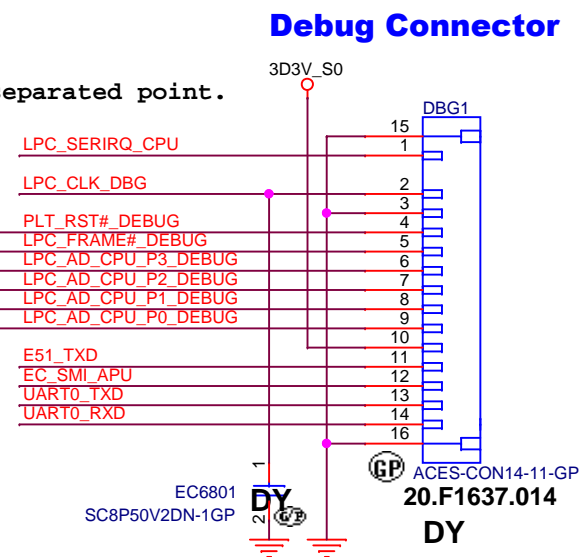
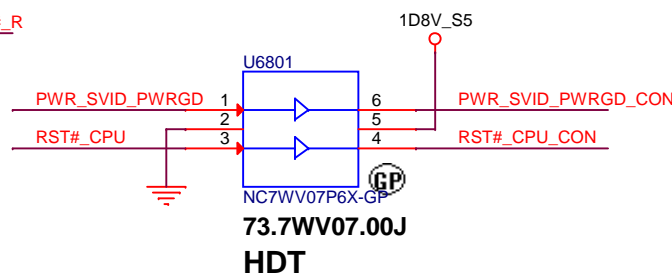
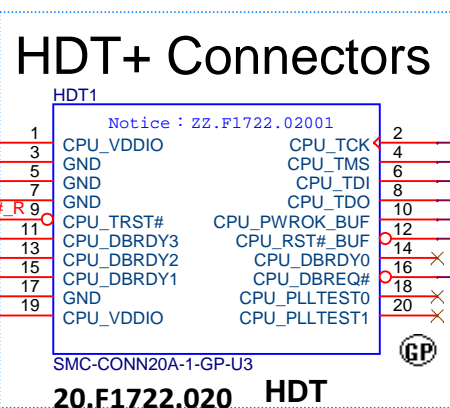
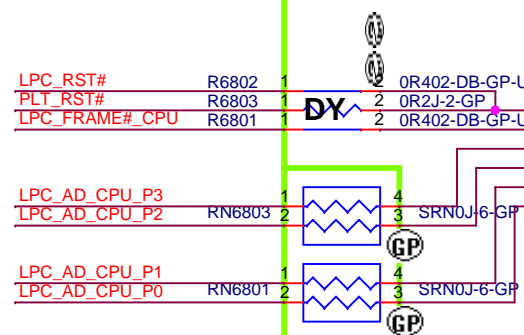
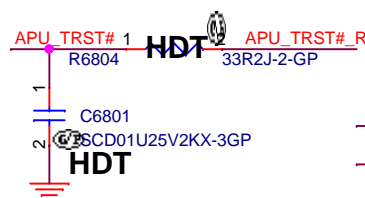
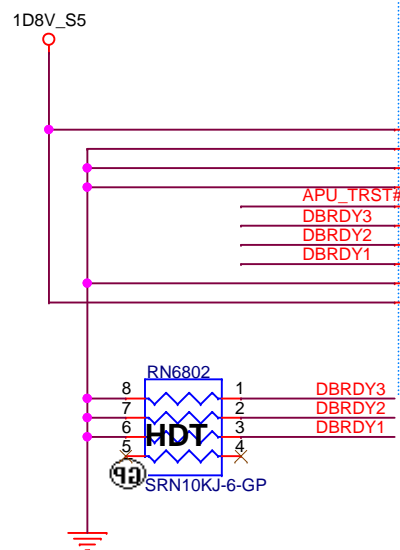
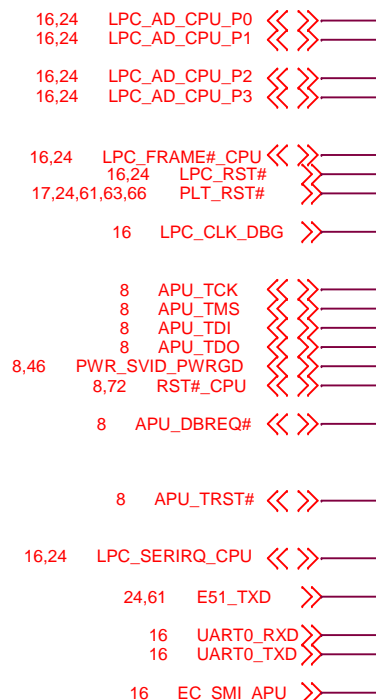
Title **SENSOR (RSVD)(HALL-SENSOR)**

Size A4 Document Number **LC56-14A**

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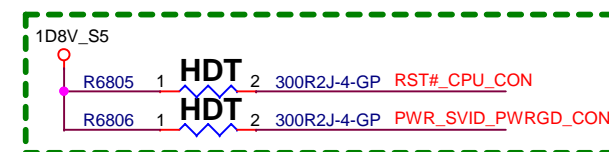
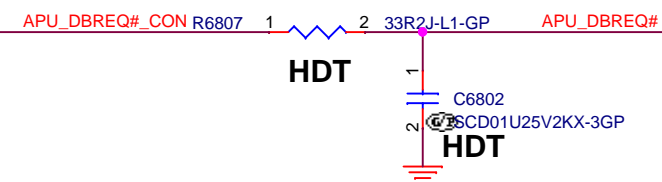
SSID = DEBUG PORT



DBG1: EVT stage要上

20.D0075.110: Dummy Pad with solder mask is ZZ.00PAD.Y41
DB1 Optional: New one smaller LPC connector is 20.F1180.010.

20.F1180.010: Dummy Pad with solder mask is ZZ.00PAD.GV1



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| Title |
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Debug (LPC/HDT)

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Taipei Hsien 221, Taiwan, R.O.C.

Title

Sensor (RSVD) (GYROSCOPE/PRESSURE)

Size
A4

Document Number

LC56-14A

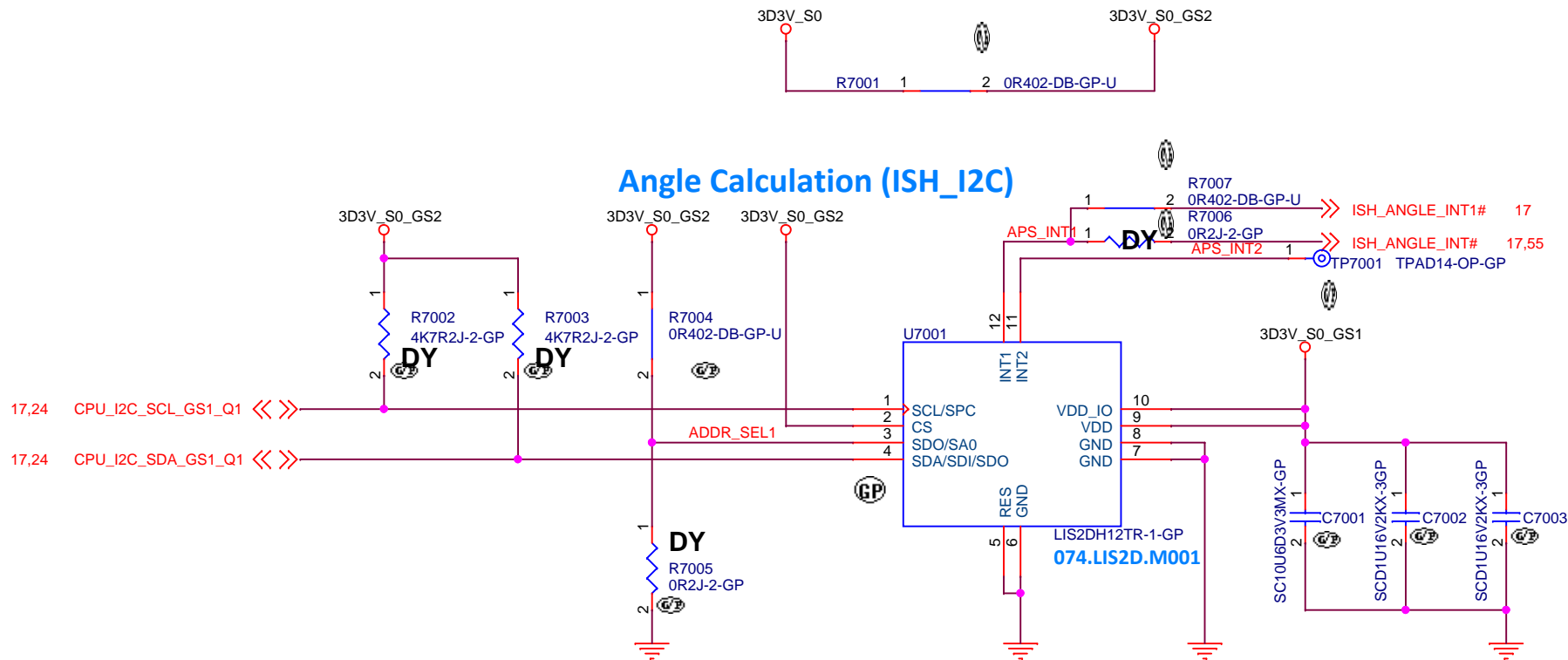
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To ISH

Angle Calculation (ISH_I2C)



TABLE

| CS | Mode Selection |
|----|----------------|
| H | I2C Mode |
| L | SPI Mode |

← Logic

TABLE for Angle Detection (U7001): Tri-axis Digital Accelerometer

| P/N | ADDR_SEL1 | Address |
|------------|-----------|------------------------------------|
| LIS2DH12TR | H L | 32h(W) & 33h(R) 30h(W) & 31h(R) |
| | | |

← Logic

TABLE of G-Sensor (U7001)

| Vendor | P/N | Wistron P/N |
|--------|------------|----------------|
| ST | LIS2DH12TR | 074.LIS2D.M001 |
| | | |

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| | | | |
|------------------------------------|------------------------------------|--|------------------|
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| Title Sensor (G-sensor) | | | |
| Size A4 | Document Number LC56-14A | | Rev -1 |
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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

EXT IO (TBT Re-Timer-1 RSVD)

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KBC and PD communication

EC_SMB_SDA_CPU <-> EC_SMB_SDA_PD
 EC_SMB_SCL_CPU <-> EC_SMB_SCL_PD
 PD_RST_N_CPU <-> PD_RST_N_PD

CPU and PD communication

PD_SDA_CPU <-> PD_SDA_PD
 PD_SCL_CPU <-> PD_SCL_PD
 PD_RST_N_CPU <-> PD_RST_N_PD

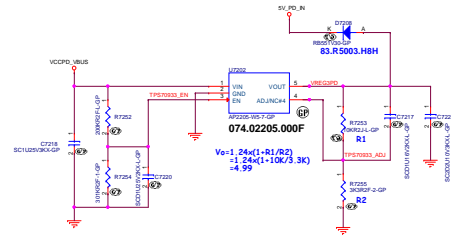
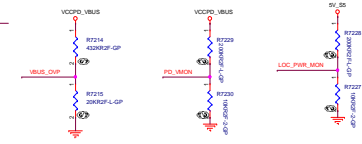
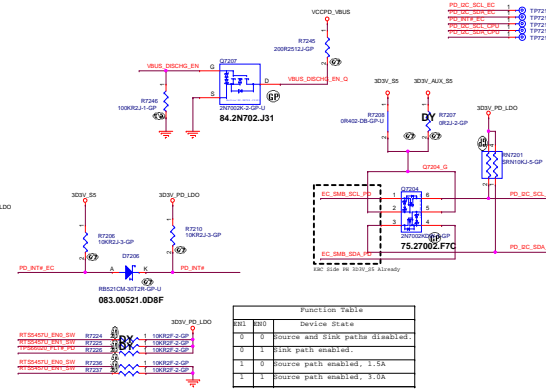
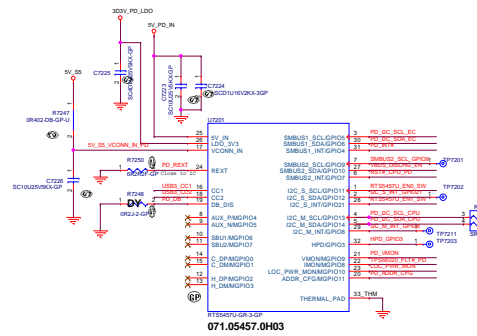
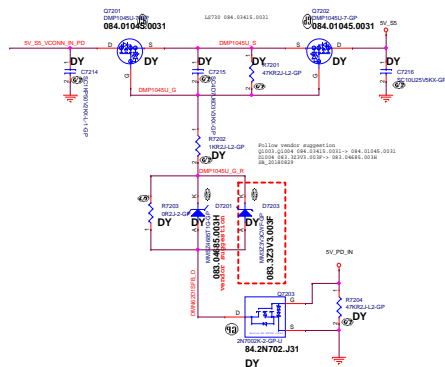
KBC Control VBUS Power to System

KBC <-> VBUS

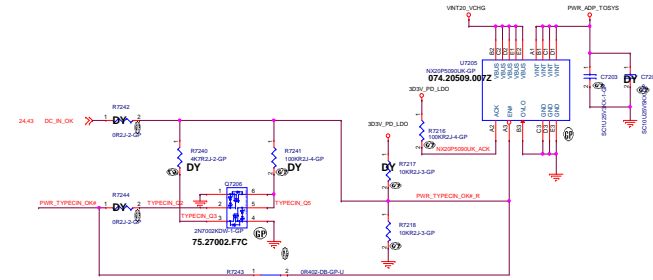
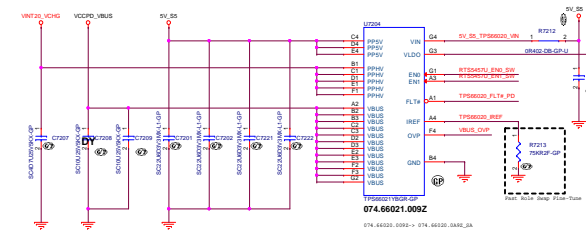
TYPE C AOU Power source to PD Input

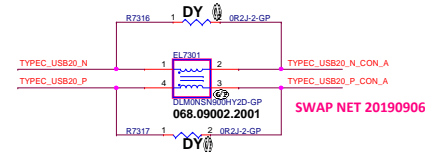
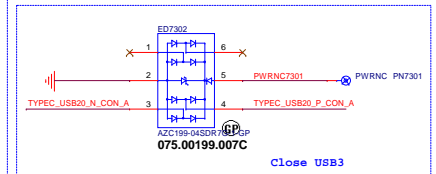
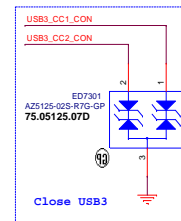
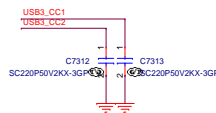
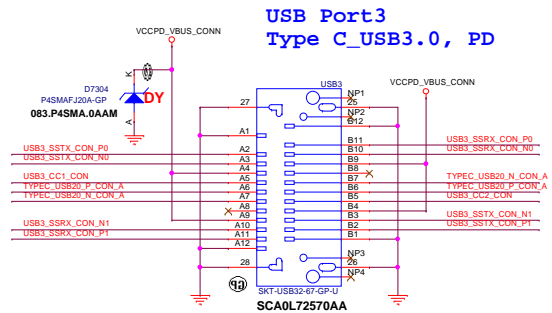
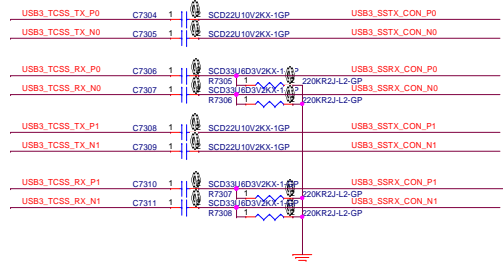
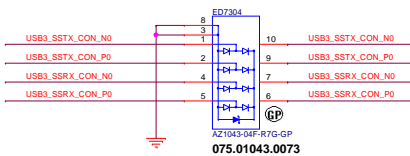
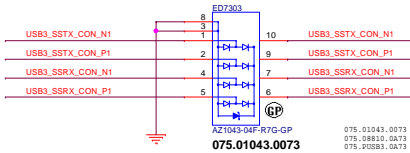
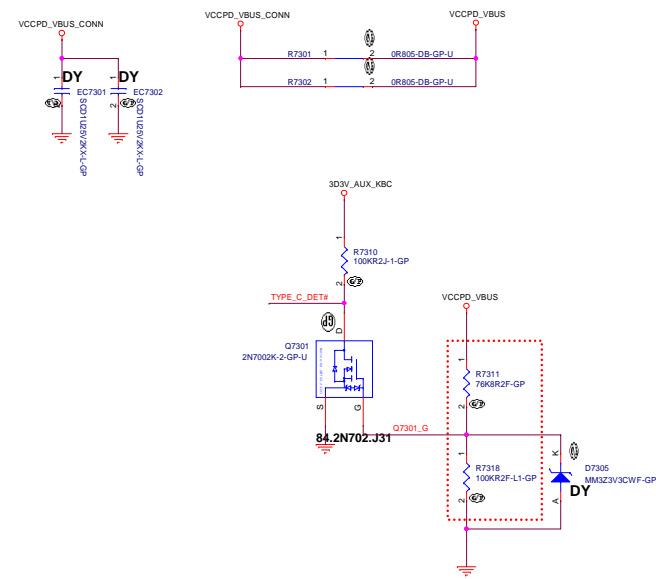
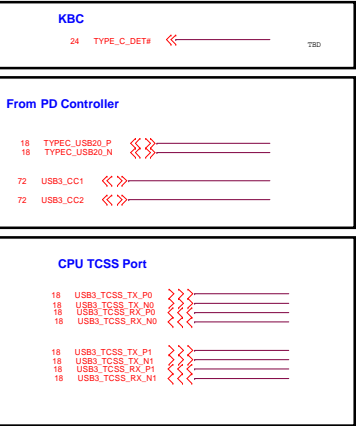
5V_SW_LDO <-> PD_IN

| Slave Addr | PULL-HIGH RESISTOR (R721) | PULL-LOW RESISTOR (R722) | VOLTAGE |
|-------------|------------------------------|-----------------------------|-------------------|
| addr0: data | NC | 10.0k | ~8.2V |
| addr1: data | NC | 10.0k | ~6.2V < < 6.5V |
| addr2: data | 33.0k | 10.0k | ~0.6V < < 1.0V |
| addr3: data | 33.0k | 10.0k | > 1.0V |



| Vender | Vender P/N | Wistron P/N |
|--------|-------------|----------------|
| DIODES | AP2205-WS-7 | 074.02205.000F |
| GMT | G2920T11U | 074.02920.003F |
| DIODES | | 74.02204.03F |





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緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
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Title

EXT IO (TBT Re-Timer-2 RSVD)

Size
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緯創資通

Wistron Corporation
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Title **EXT IO (TypeC Controller-2 RSVD)**

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緯創資通

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Title **GPU (RSVD) (PEG 1/5)**

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Title **GPU (RSVD) (DIGITAL 2/5)**

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Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
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Title

GPU (RSVD) (VRAM 3/5)

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Title

GPU (RSVD) (GPIO 4/5)

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| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title GPU (RSVD) (PWR/GND 5/5) | | |
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| | | | |
|-------------|--|--|--|
| LC56-14A | | Wistron Corporation | |
| 緯創資通 | | 231, 28, Sec. 2, Hsin-Tsa Road, Taipei, Taiwan, R.O.C. | |
| Rev | | GPU (RSVD) | |
| Part Number | | LC56-14A | |
| Rev | | 1 | |

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| LC56-14A | |
| 緯創資通 Wistron Corporation 110, Sec. 2, Zhongxing Rd., Hsinchu, Taiwan, R.O.C. | |
| GPU (RSVD) | |
| Document Number | LC56-14A |
| Revision | 1 |

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| LC56-14A | |
| 緯創資通 Wistron Corporation | |
| 21F, 8th, Sec. 1, Hsin-Tai Wu Rd., Hsinchu, Taiwan 305, R.O.C. | |
| Tel: +886 (0)3 591 9000 | |
| Fax: +886 (0)3 591 9001 | |
| E-mail: service@wistron.com.tw | |
| GPU (RSVD) | |
| Part Number | LC56-14A |
| Revision | 1.0 |

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| LC56-14A | |
| 緯創資通 Wistron Corporation 21F, 8th. Sec. 1, 15th. Tia Wu Rd., Hsinchu Taipei Taiwan 305, Taiwan, R.O.C. | |
| GPU (RSVD) | |
| Part | Document Number |
| LC56-14A | 1 |
| Date: 10/20/2010 | |

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Title **GPU (RSVD) (Power_VGA_CORE)**

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| <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> | | |
| Title GPU (RSVD) (Power_others) | | |
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Taipei Hsien 221, Taiwan, R.O.C.

Title

GPU (RSVD) (Discharge/Sequence)

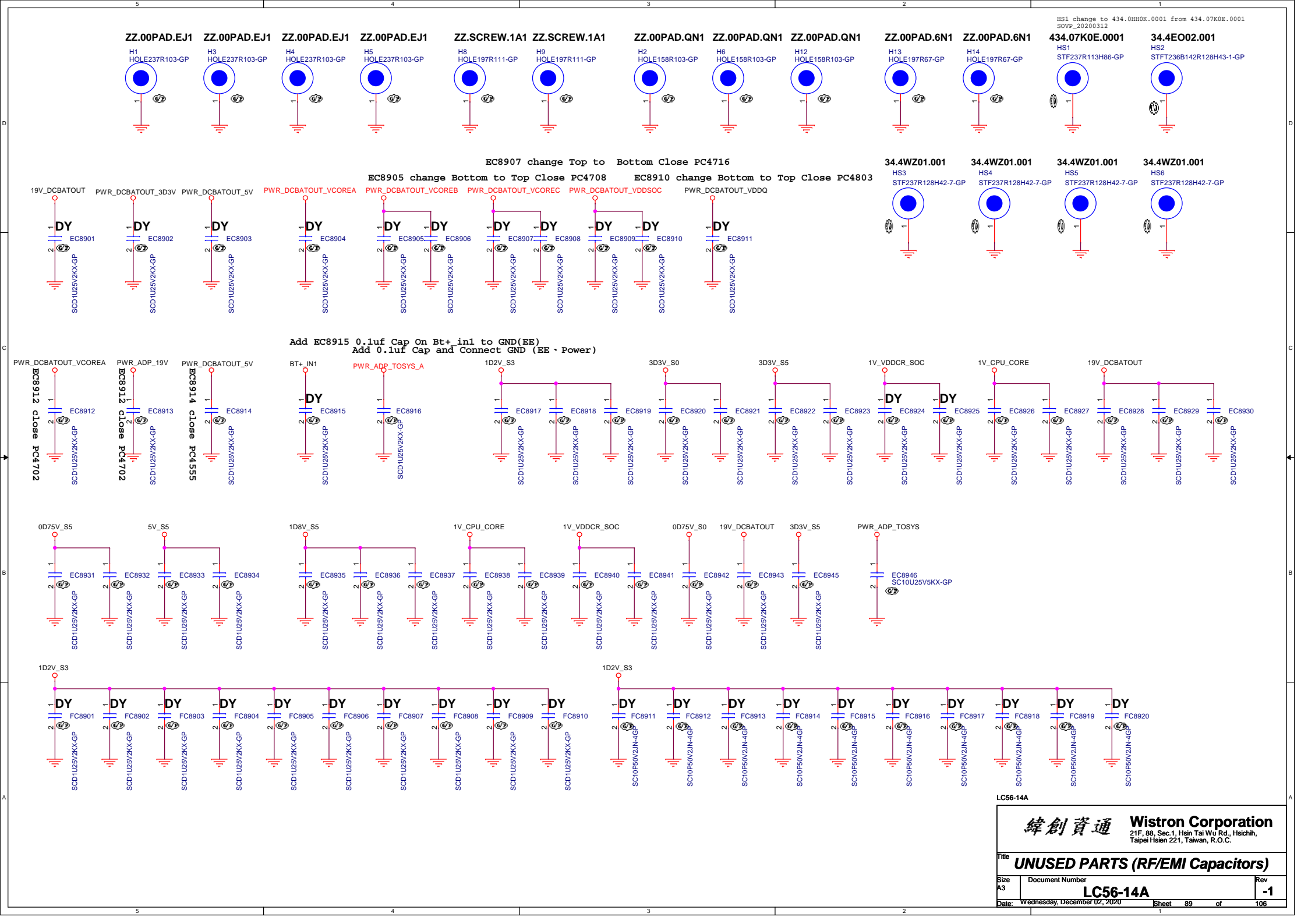
Size
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Title **(RESERVED)**

Size
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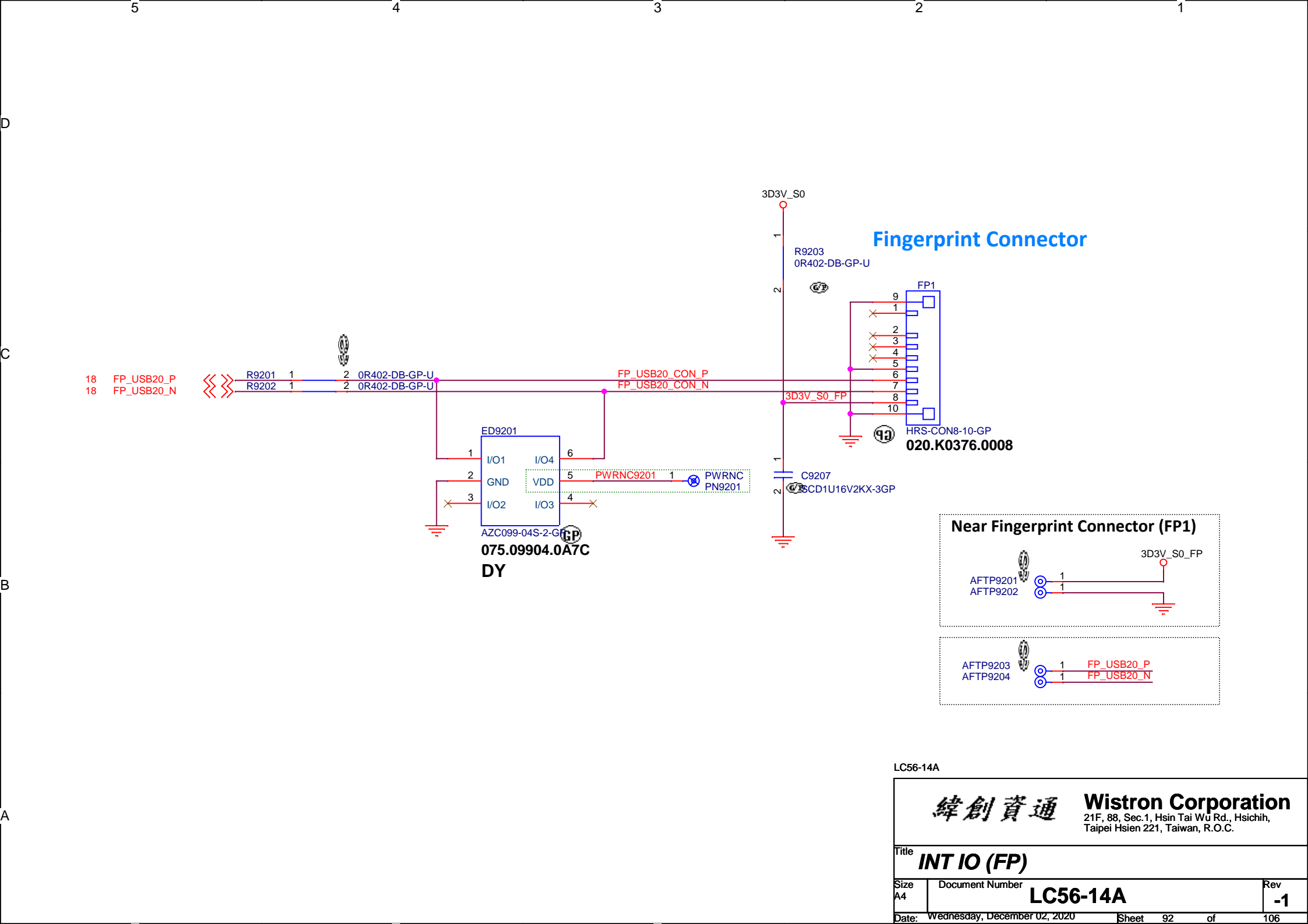
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Title

TYPEC DP RTS5455

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緯創資通

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Title

TYPEC PD Controller

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| Title Debug (RSVD)(XDP debug) | | |
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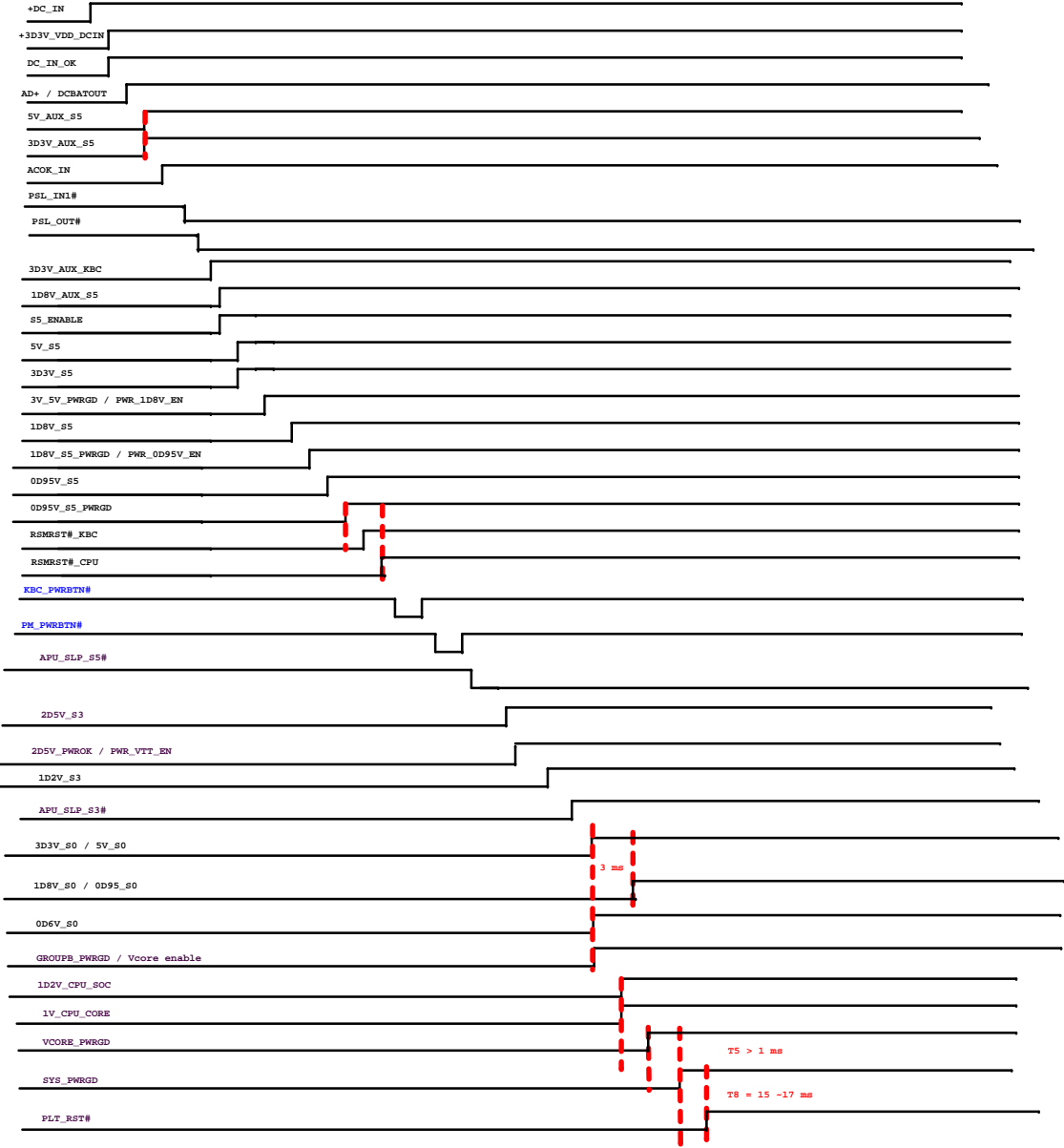
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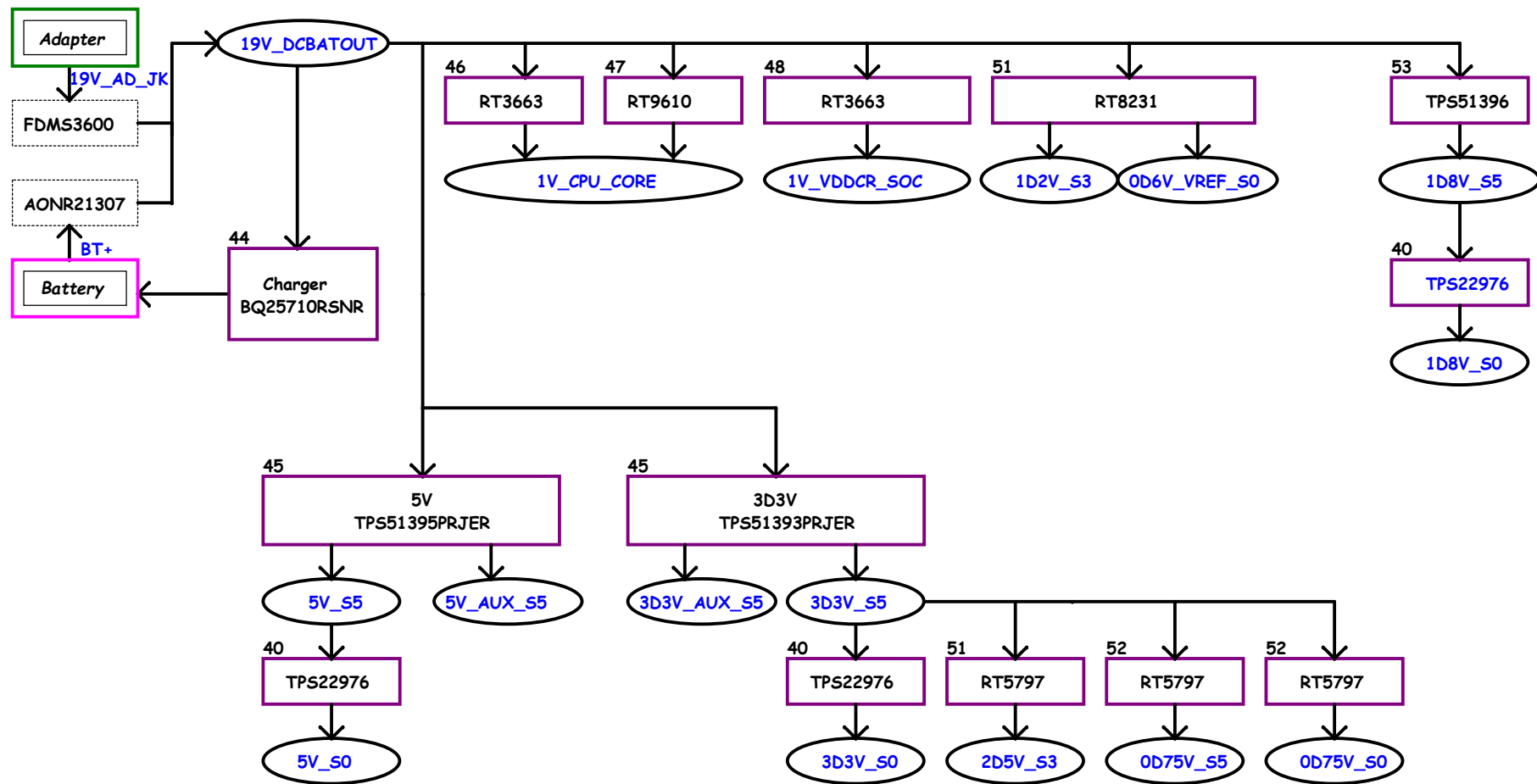
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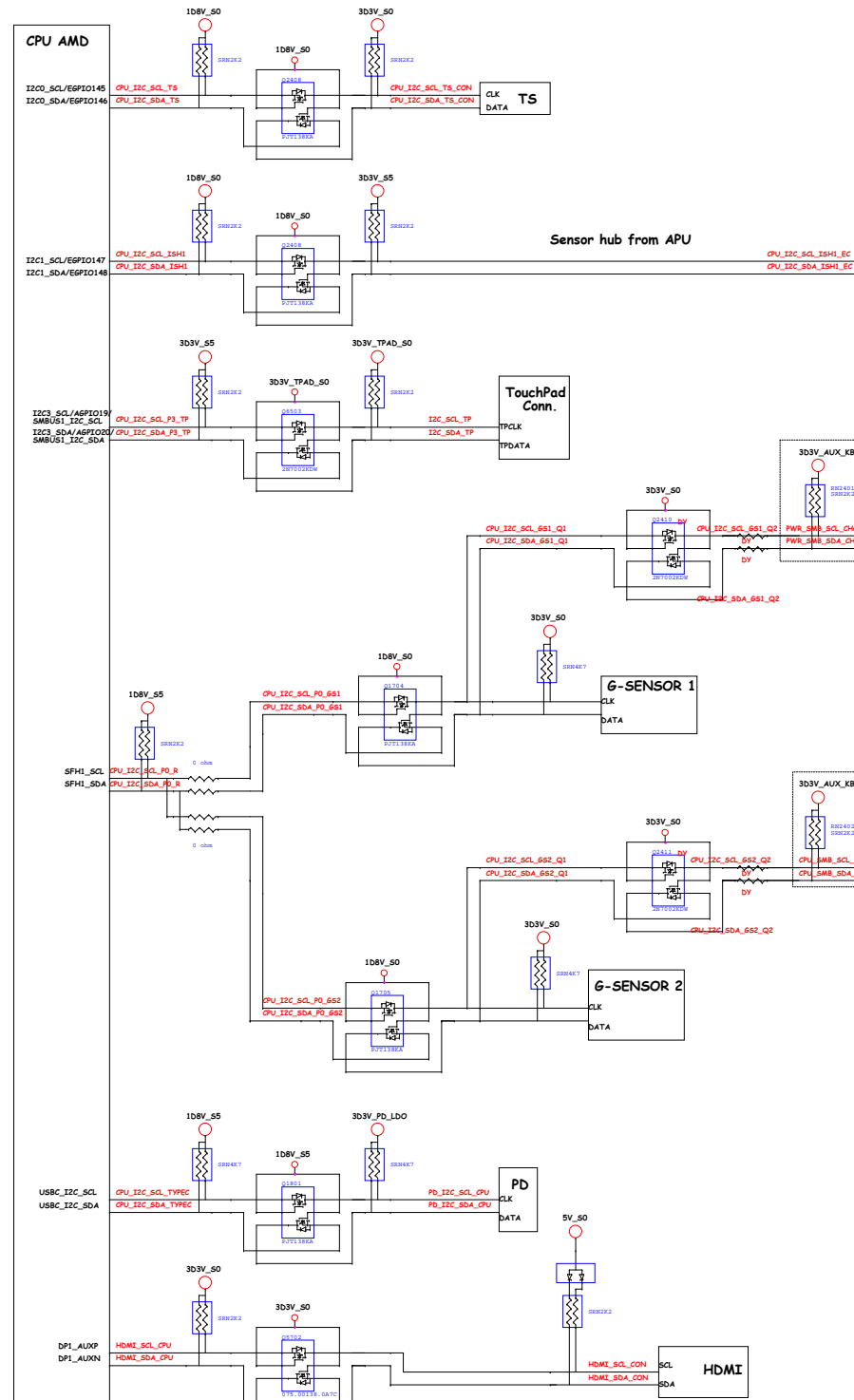


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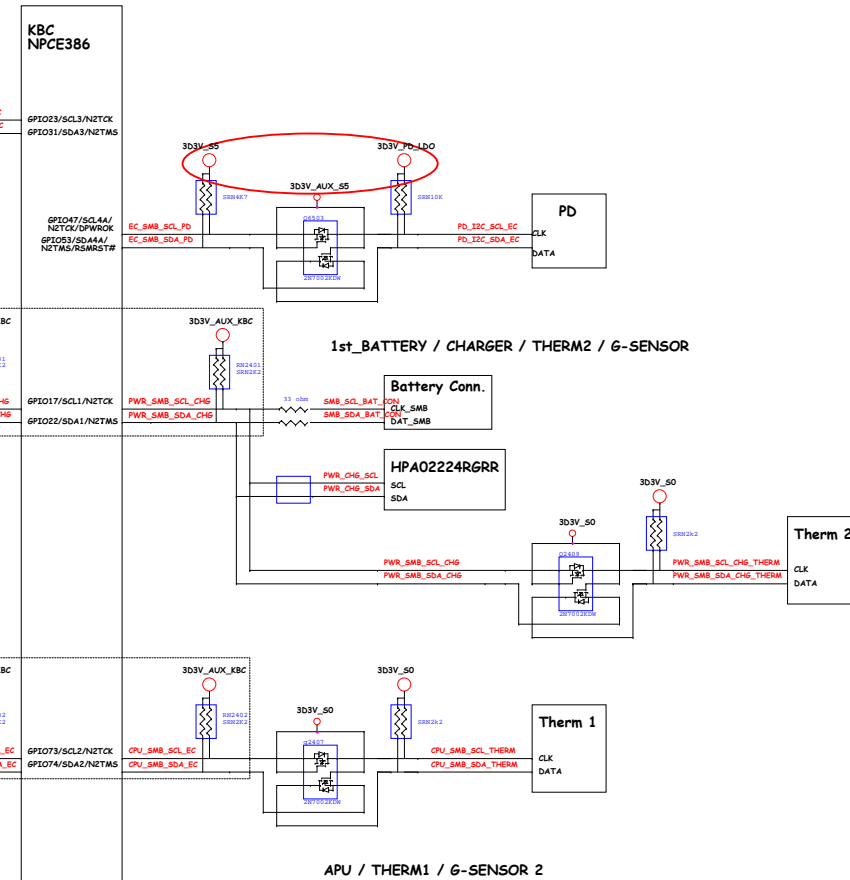


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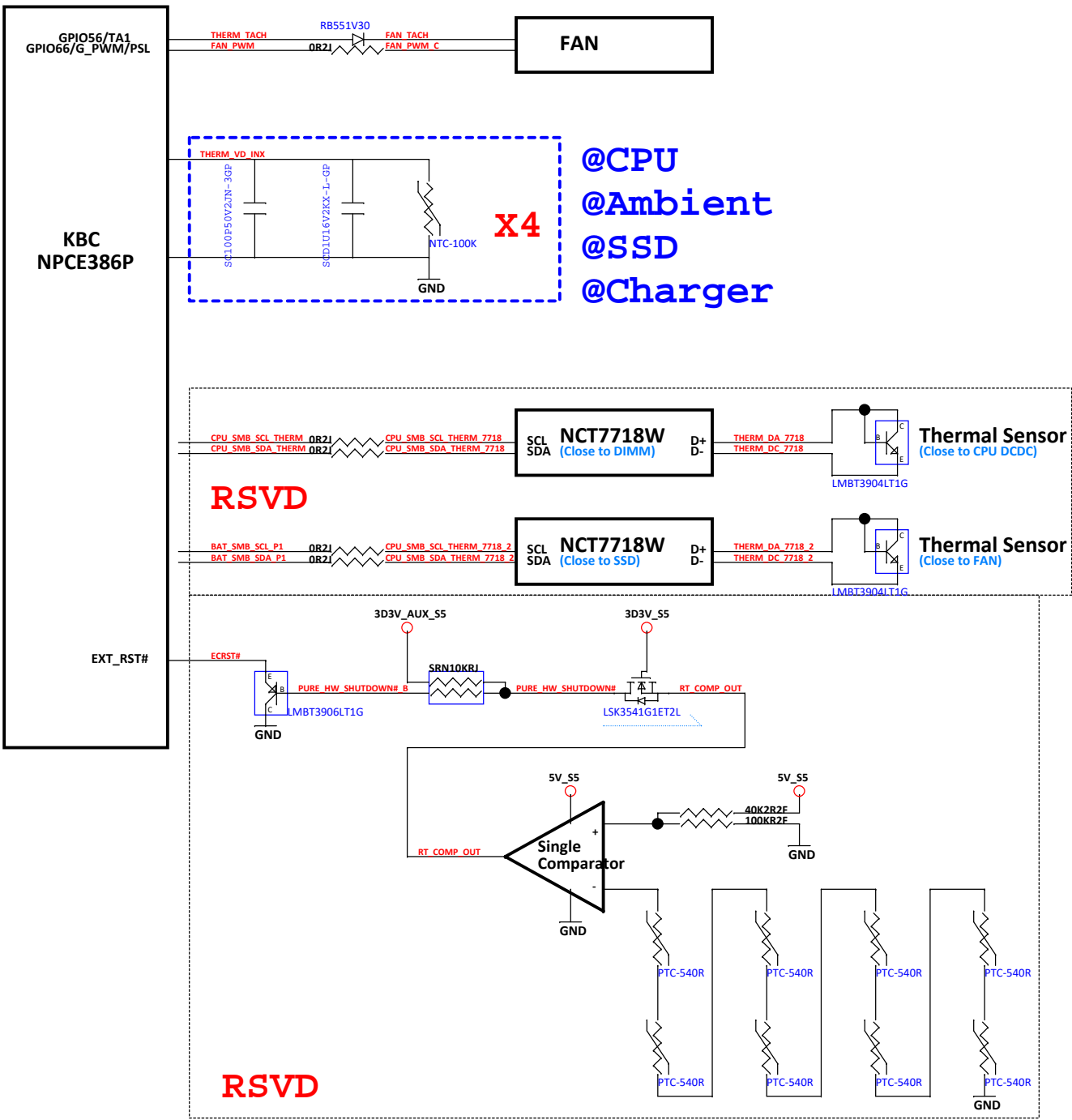
PCH SMBus Block Diagram



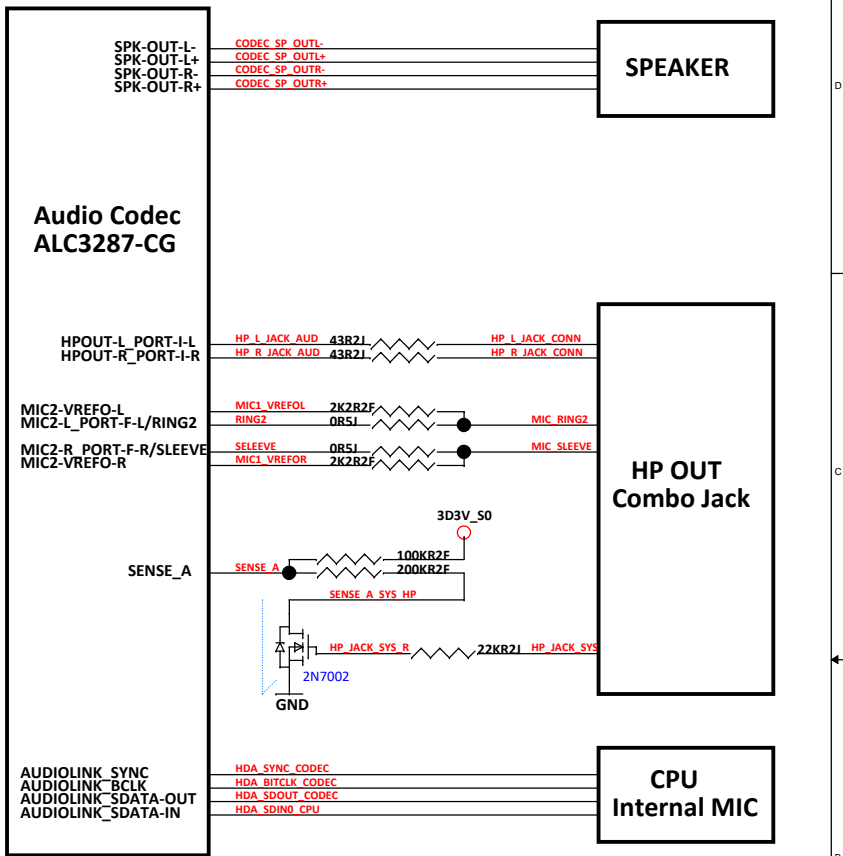
KBC SMBus Block Diagram



Thermal Block Diagram



Audio Block Diagram



CLK Block Diagram

