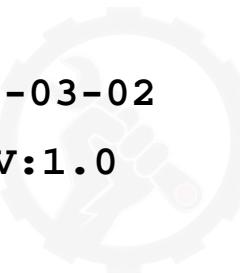


LCFC Confidential

330-IGM M/B EG431/EG532 Schematics Document
Intel Geminilake M-Processor with DDR4 + AMD LV2-R17M-M1-70 GPU

2018-03-02

REV:1.0



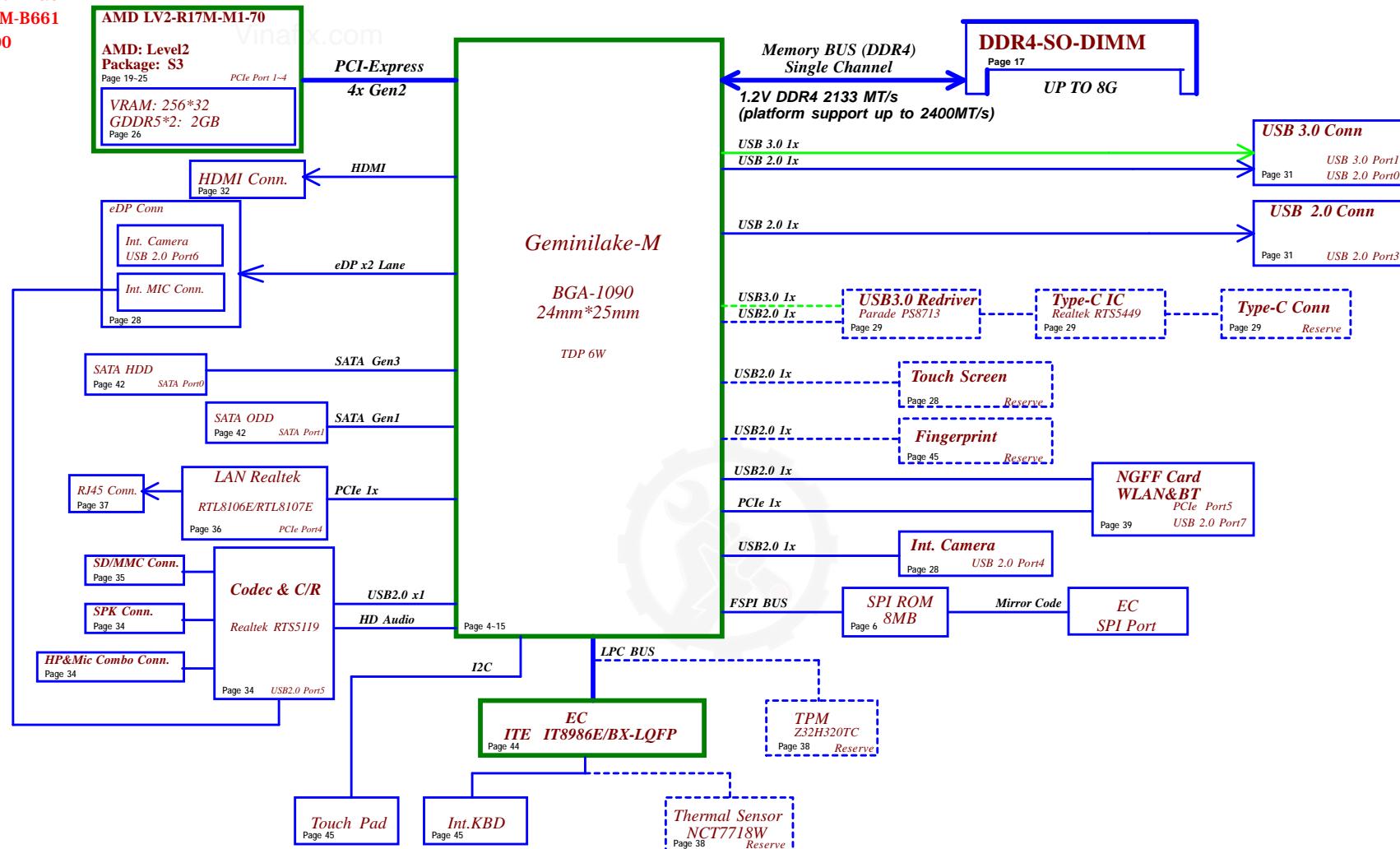
| Security Classification | LC Future Center Secret Data | | | Title | Cover Page | Rev |
|--|------------------------------|-----------------|------------|-------------|-----------------|------------------------------|
| Issued Date | 2013/08/08 | Deciphered Date | 2014/01/21 | EG431/EG532 | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THE INFORMATION CONTAINED HEREIN IS NOT TO BE COPIED OR DISCLOSED UNLESS IT CONTAINS INFORMATION THAT CAN BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | 1.0 |
| A | B | C | D | E | Sheet 1 of 80 | Date: Friday, March 02, 2018 |

LCFC confidential

File Name : TURING 4D&5D

Board Number : NM-B661

PN : DA600013W00



Voltage Rails (O --> Means ON , X--> Means OFF)

| State | Power Plane | | +3VALW_SOC +1.24VALW +1.8VALW | +5VS +3VS +1.8VS +1.05VS +0.6VS +CPU_CORE +VNN | +1.2V |
|--------------------------------------|-------------|--------------|-------------------------------------|--|-------|
| | V20B+ | +3VL +5VL | | | |
| S0 | 0 | 0 | 0 | 0 | 0 |
| S3 | 0 | 0 | 0 | 0 | X |
| S5 S4/AC Only | 0 | 0 | 0 | X | X |
| S5 S4 Battery only | 0 | X | X | X | X |
| S5 S4 AC & Battery don't exist | X | X | X | X | X |

SMBUS Control Table

| | SOURCE | VGA | BATT | IT8986HE | SODIMM | WLAN_WIMAX | Thermal Sensor | PCH | TP Module | Charger | PMIC |
|--------------|------------|-----|------|----------|--------|------------|----------------|------------|-----------|---------|------|
| EC_SMB_CKO | EC | | X | V | X | X | X | X | X | X | V |
| EC_SMB.DAO | +3VL | | X | | | | | | | | |
| EC_SMB.CK1 | EC | | X | V | +3VL | X | X | X | X | V | X |
| EC_SMB.DA1 | +3VL | | | | | | | | | | |
| EC_SMB.CK2 | EC | | V | +3VS | X | V | V | X | X | X | X |
| EC_SMB.DA2 | +3VS | | | | | | | | | | |
| PCH_SMB_CLK | PCH | | X | X | V | +3VS | V | +3VALW_PCH | X | X | X |
| PCH_SMB_DATA | +3VALW_SOC | | | | | | | | | | |

EC SM Bus0 address

| Device | Address |
|--------|---------|
| PMIC | 0x68 |

EC SM Bus1 address

| Device | Address |
|---------------|---------|
| Smart Battery | 0x16 |

EC SM Bus2 address

| Device | Address |
|----------------|---------------|
| Thermal Sensor | 0x98(reserve) |

PCH SM Bus address

| Device | Address |
|-------------|---------|
| DDR SO-DIMM | 0xA0 |

| Device | Address |
|--------|---------|
| Wlan | Rsvd |

I2C4/I2C7 Bus address (Touch Pad)

| Device | Address |
|------------|---------|
| Slave | 0x15 |
| Descriptor | 0x0001 |

RCOMP RESISTOR REQUIREMENT

| INTERFACE | PIN NAME | LOCATION | VALUE(ohm) |
|---|----------------------------|----------|------------|
| Memory | MEM_CH0_RCOMP | RC1 | 110 +/-1% |
| | MEM_CH1_RCOMP | RC2 | 110 +/-1% |
| USB2 | USB2_RCOMP | RC64 | 113 +/-1% |
| USB3/PCIe/SATA | PCIE2_USB3_SATA3_RCOMP_P/N | RC63 | 100 +/-1% |
| PCIe Refclk | PCIE_REF_CLK_RCOMP | RC62 | 56 +/-1% |
| DP/eDP*/HDMI* | EDP_RCOMP_P/N | RC79 | 100 +/-1% |
| MDSI | MDSI_RCOMP | RC78 | 150 +/-1% |
| CNVi | CNV_WT_RCOMP | RC48 | 150 +/-1% |
| SMBUS/GPIO/EMMC for all 1.8V only and 1.8V mode operation of 1.8/3.3V CFIQ interfaces | EMMC_RCOMP | RC20 | 200 +/-1% |

| STATE | SIGNAL | SLP_S0# | SLP_S3# | SLP_S4# | SLP_S5# | +VALW | +V | +VS/VTT | Clock |
|------------------------|--------|---------|---------|---------|---------|-------|-----|---------|-------|
| Full ON | | HIGH | HIGH | HIGH | HIGH | ON | ON | ON | ON |
| SOIX(Power On Suspend) | | LOW | HIGH | HIGH | HIGH | ON | ON | ON | OFF |
| S3 (Suspend to RAM) | | LOW | LOW | HIGH | HIGH | ON | ON | OFF | OFF |
| S4 (Suspend to Disk) | | LOW | LOW | LOW | HIGH | ON | OFF | OFF | OFF |
| S5 (Soft OFF) | | LOW | LOW | LOW | LOW | ON | OFF | OFF | OFF |

USB Port Table

| XHCI | Port | Port device |
|---------|------|------------------------|
| USB 3.0 | 0 | USB3.0 |
| | 1 | Type C(RSVD) |
| USB 2.0 | 0 | Type C(USB 2.0)(RSVD) |
| | 1 | USB3.0 (2.0) |
| | 2 | Touch Screen(RSVD) |
| | 3 | USB2.0 |
| | 4 | Finger Print(RSVD) |
| | 5 | CARD READER |
| | 6 | CAMERA |
| | 7 | BT |

DDI PORT LIST

| Port | Device |
|------|--------|
| DDIO | HDMI |
| DDI1 | NC |
| eDP | eDP |

PCIE PORT LIST

| Port | Device | BIOS Device ID Map | CLK REQ |
|------|--------|--------------------------|---------|
| 0 | | | |
| 1 | dGPU | PCIe1(Func0):Root Port#3 | CLKREQ0 |
| 2 | | | |
| 3 | | | |
| 4 | LAN | PCIe0(Func0):Root Port#1 | CLKREQ1 |
| 5 | WLAN | PCIe0(Func1):Root Port#2 | CLKREQ2 |

BOM Structure Table

| BOM Structure | BTO Item |
|---------------|-------------------------------|
| EMC@ | For EMC part |
| EMC_NS@ | For EMC un-stuff part |
| EMC_15@ | EMC 15" part |
| EMC_14@ | EMC 14" part |
| EMC_USB@ | EMC USB Tvs part |
| 1284_EMC@ | 1284 LAN Transformer EMC part |
| CD@ | Cost Down part |
| RF@ | For RF part |
| RF_NS@ | For RF un-stuff part |
| RF_PXNS@ | For RF GPU un-stuff part |
| 14@ | For 14" part |
| 15@ | For 15" part |
| 8106E@ | 8106E LAN SKU part@ |
| 8107E@ | 8107E LAN SKU part@ |
| 1284@ | 1284 LAN Transformer part |
| 8400M@ | 8400M LAN Transformer part |
| PX@ | Discrete GPU SKU part |
| TOPAZ@ | TOPAZ dGPU SKU part |
| EXO@ | R16M-M1-30 dGPU SKU part |
| UMA@ | UMA SKU id part |
| TMSEN@ | Thermal Sensor part |
| TMSEN_PX@ | dGPU Thermal Sensor part |
| TMSEN_UMA@ | UMA Thermal Sensor part |
| TPM@ | TPM part |
| NUVOTON@ | NOVOTON TPM part |
| NATIONZ@ | NATIONZ TPM part |
| TS@ | Touch Screen part |
| FP@ | Finger Print part |
| KBL@ | KB Backlight part |
| UART@ | UART debug part |
| RTCRST@ | Clear RTCRST# function part |
| ME@ | ME part |
| @ | un-stuff part |
| HDMI@ | HDMI Logo part |
| N4100@ | GLK N4100 CPU part |
| N4000@ | GLK N4000 CPU part |
| N5000@ | GLK N5000 CPU part |
| M8GX2@ | Micron 8GbX2 VRAM X76 SKU |
| S8GX2@ | Samsung 8GbX2 VRAM X76 SKU |
| H8GX2@ | Hynix 8GbX2 VRAM X76 SKU |
| M8G@ | Micron 8GbX2 VRAM |
| S8G@ | Samsung 8GbX2 VRAM |
| H8G@ | Hynix 8GbX2 VRAM |
| PCB@ | MB PCB part |
| ODD@ | ODD PCB part |

LC Future Center Secret Data

Issued Date 2013/08/08 Deciphered Date 2014/01/21

This sheet of engineering drawing is the proprietary property of LC Future Center, and contains confidential and trade secret information. This sheet may not be transferred from the custody of the competent division of R&D department to other division or to any third party without prior written consent of LC Future Center.

Title

Notes List

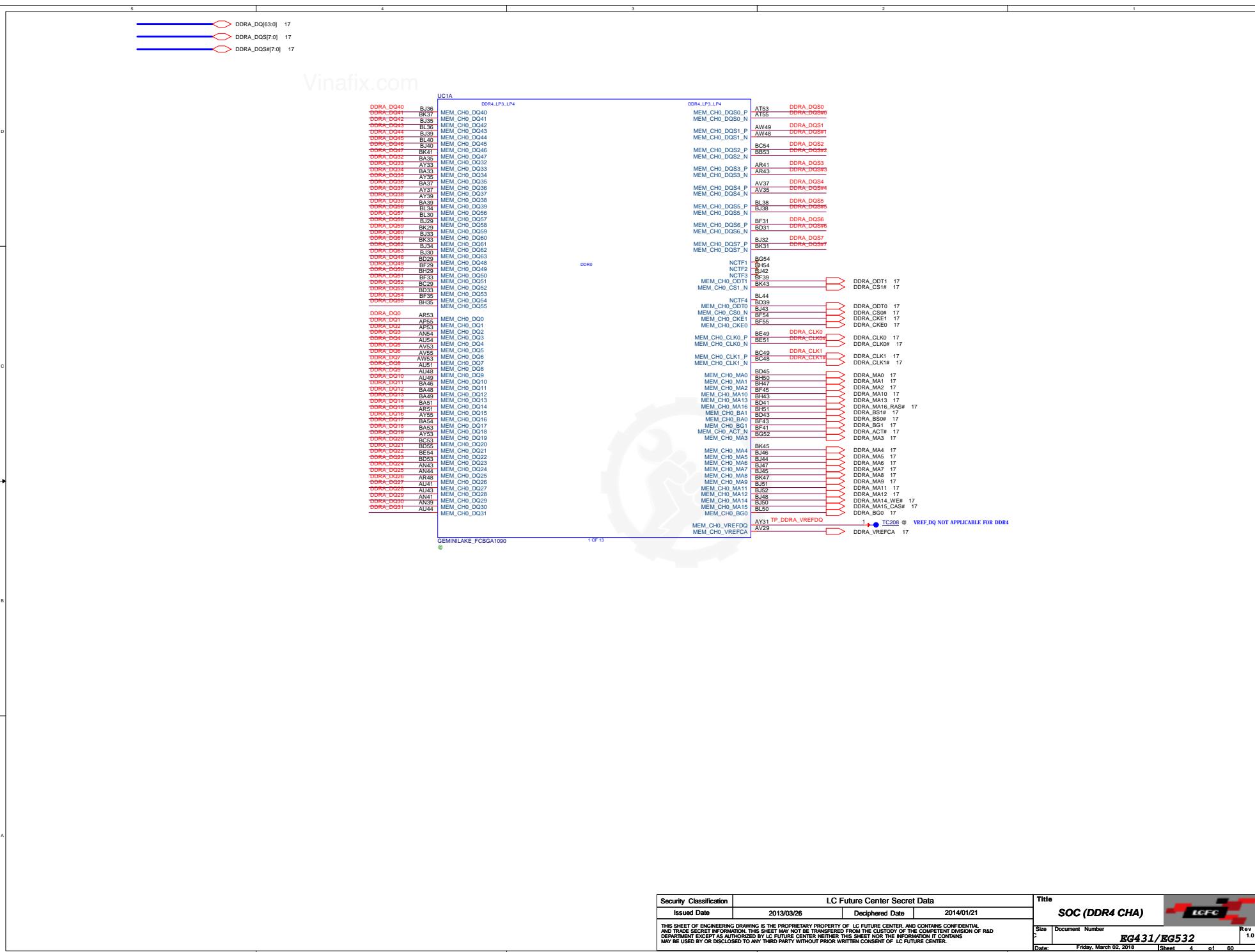


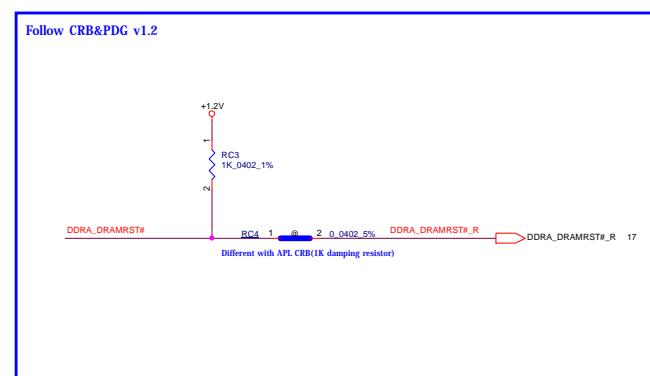
Rev 1.0

EG431/EG532

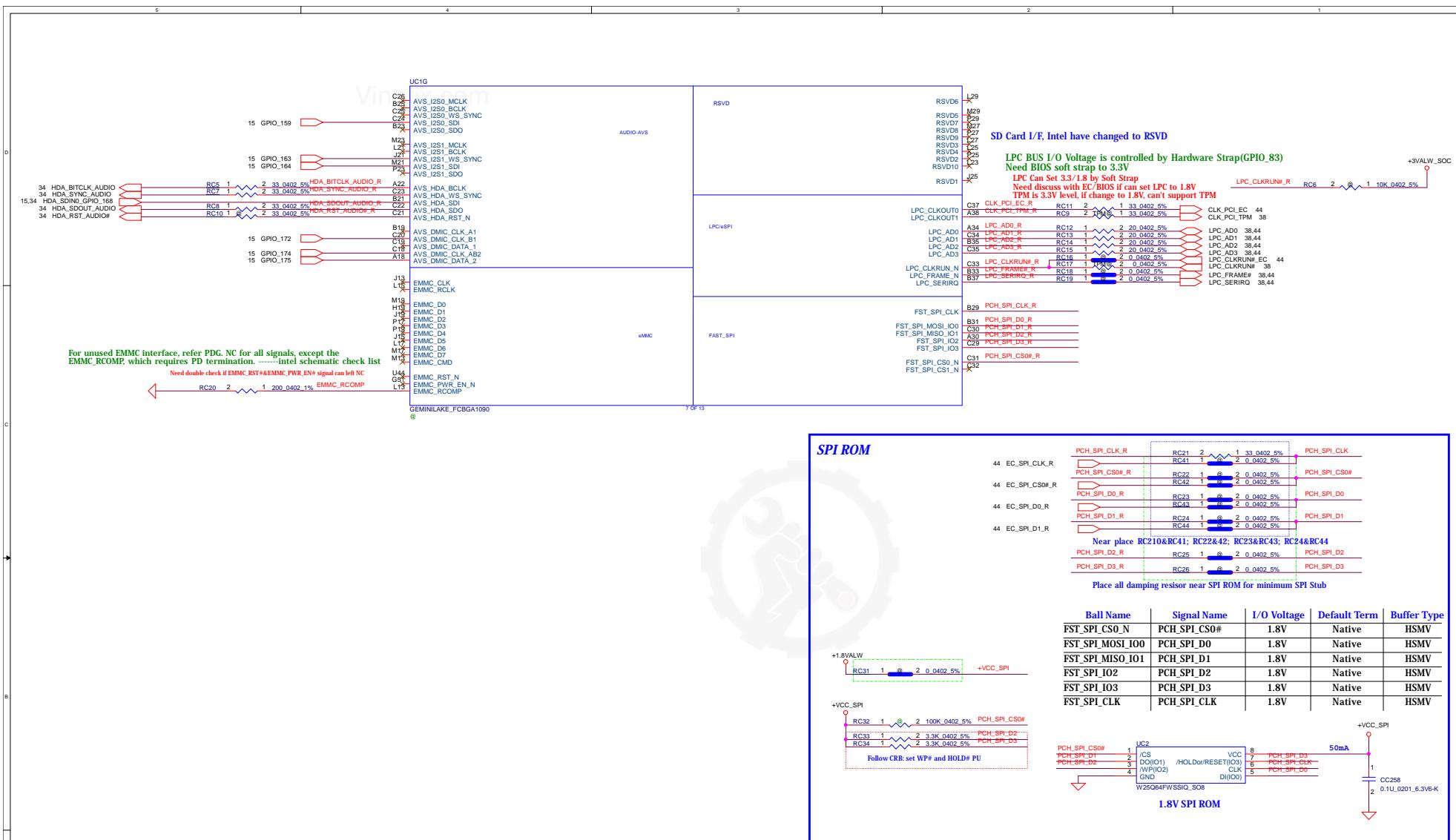
Date: Friday, March 02, 2018

Sheet 3 of 80

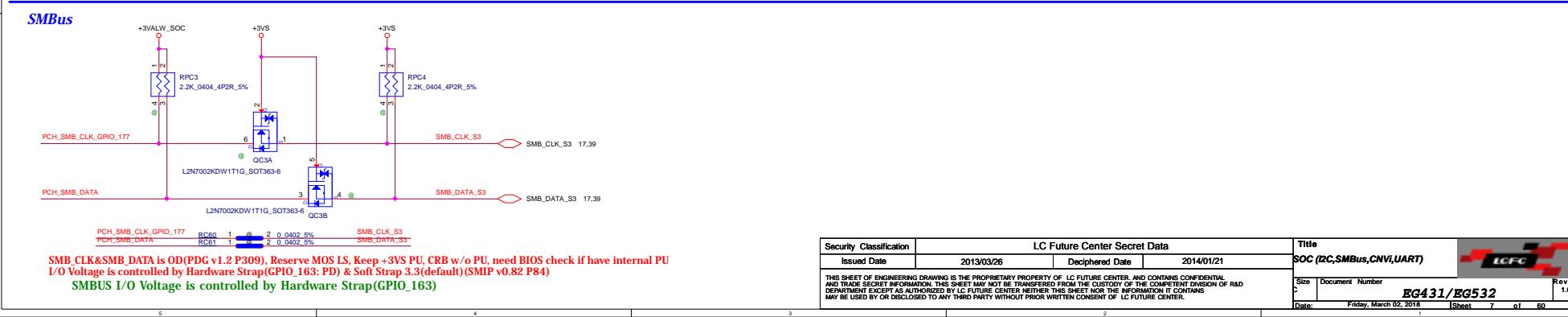
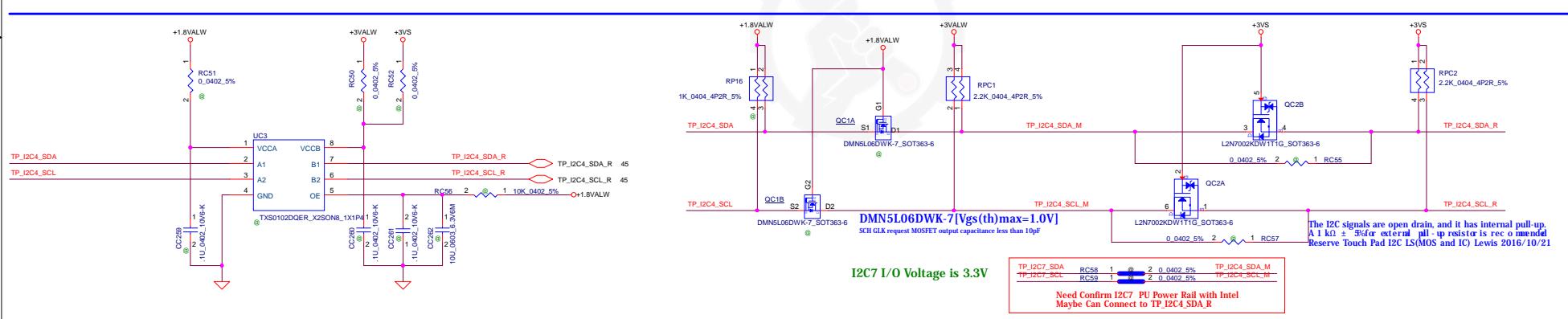
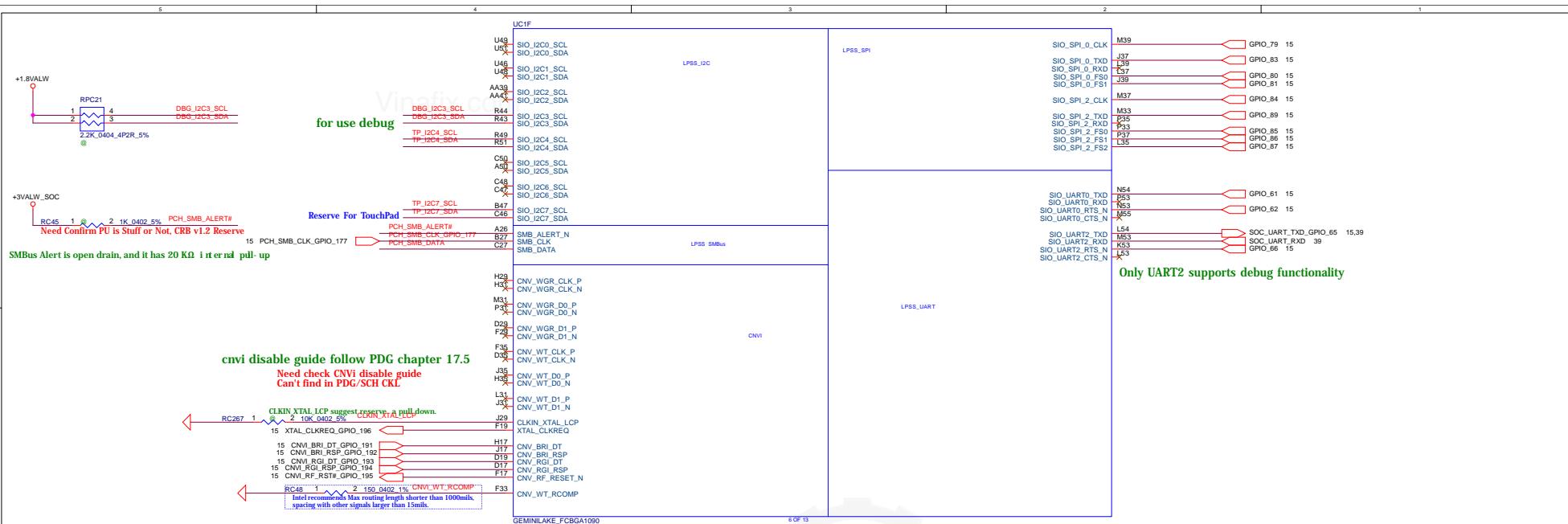




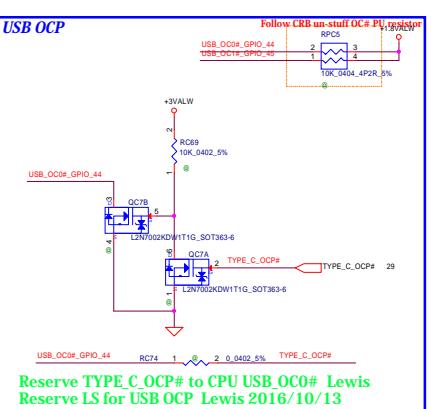
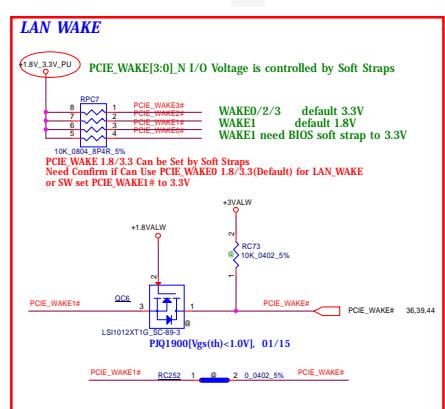
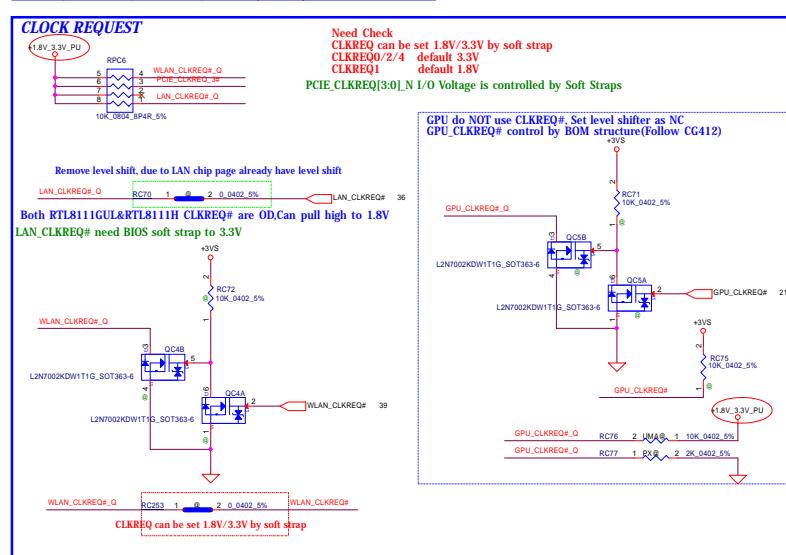
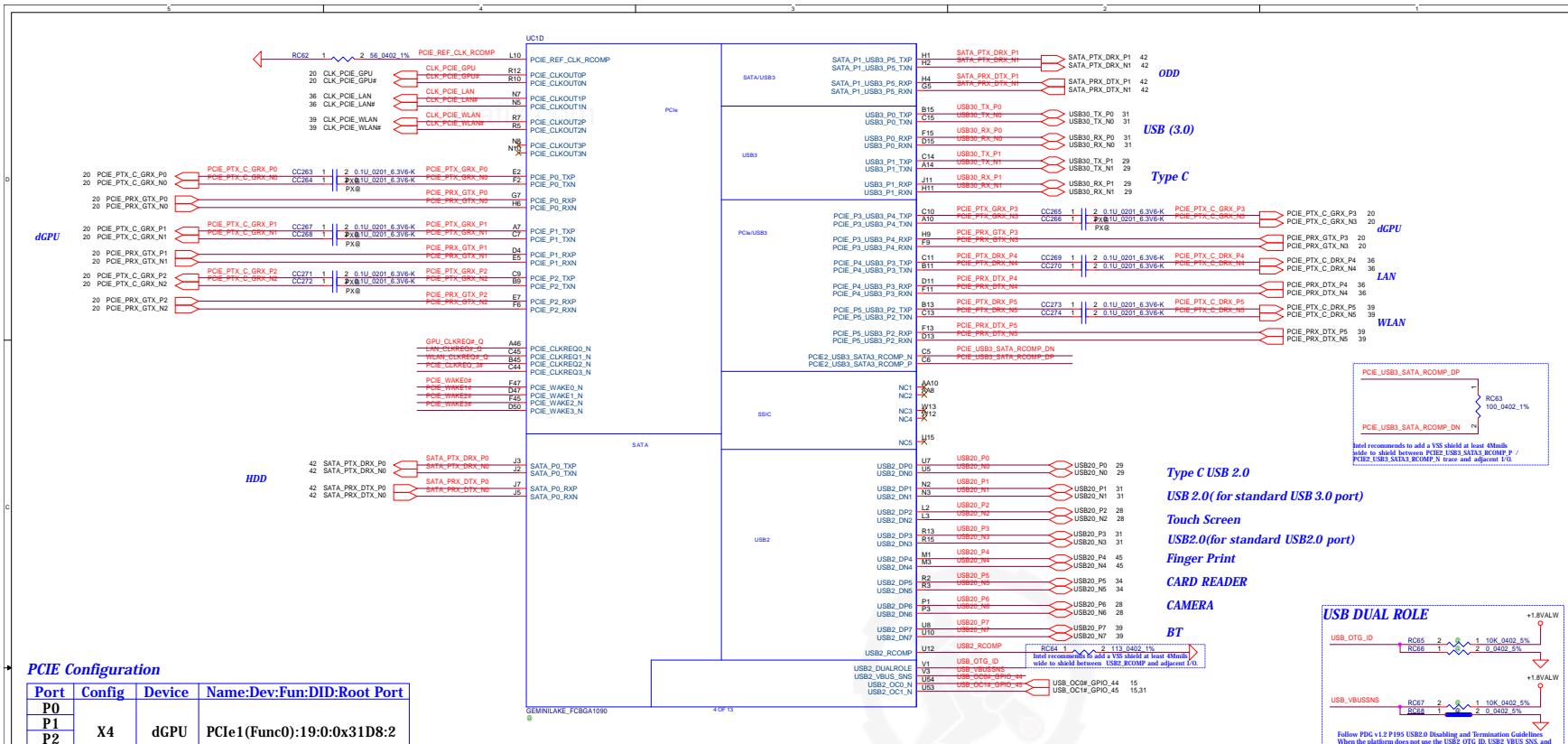
| | | | | | | |
|--|-------------------------------------|--------------------|-------------|------------------------|------------|-----------|
| Security Classification | LC Future Center Secret Data | | | Title | | |
| Issued Date | 2013/03/26 | | | Deciphered Date | 2014/01/21 | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL INFORMATION. IT IS TO BE KEPT SECRET AND NOT DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF R&D DEPARTMENT. IT IS NOT AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THIS DRAWING CONTAINS INFORMATION WHICH MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document Number | | | Rev | | |
| | | EG431/EG532 | | 1.0 | | |
| Date | Friday, March 02, 2018 | | Spec | 5 | s | ct |
| | | | | 60 | | |



| | | | | | | |
|---|------------------------------|-----------------|------------|--------------------|---------------------|------|
| Security Classification | LC Future Center Secret Data | | | Title | | |
| Issued Date | 2013/03/26 | Deciphered Date | 2014/01/21 | SOC | (Audio,eMMC,LPC,SP) | ICFC |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE TRADE SECRET OF LC FUTURE CENTER. IT IS THE PROPERTY OF THE COMPANY OR DIVISION OF R&D DEPARTMENT, EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | Rev. |
| | | | | EG431/EG532 | | 1.0 |
| Date: | Friday, March 02, 2018 | | Sheet | 8 | of | 60 |



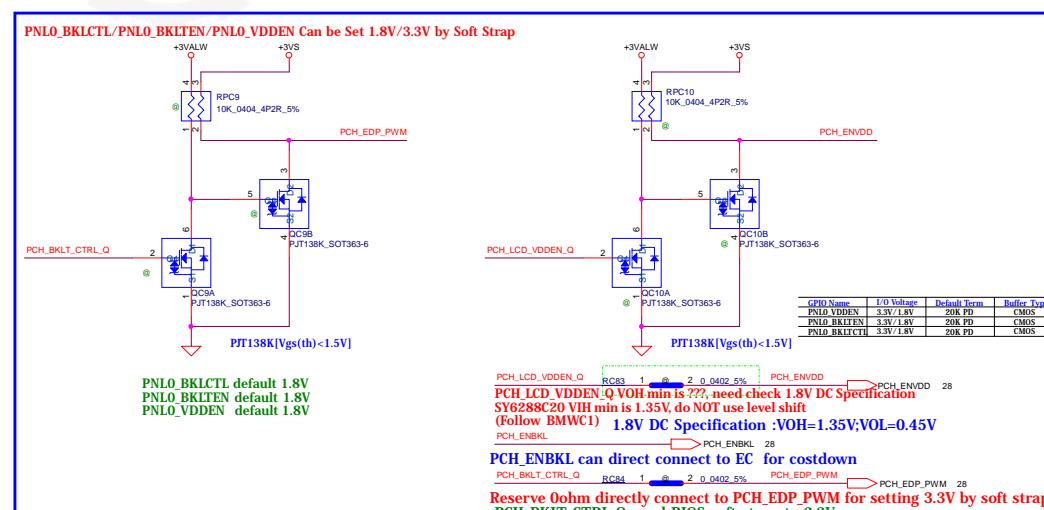
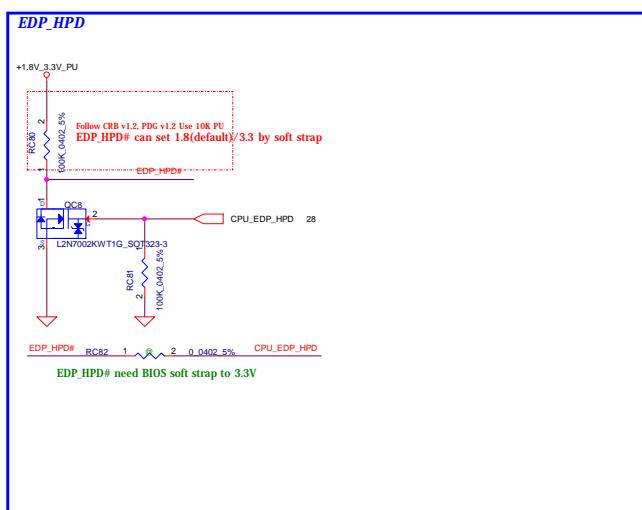
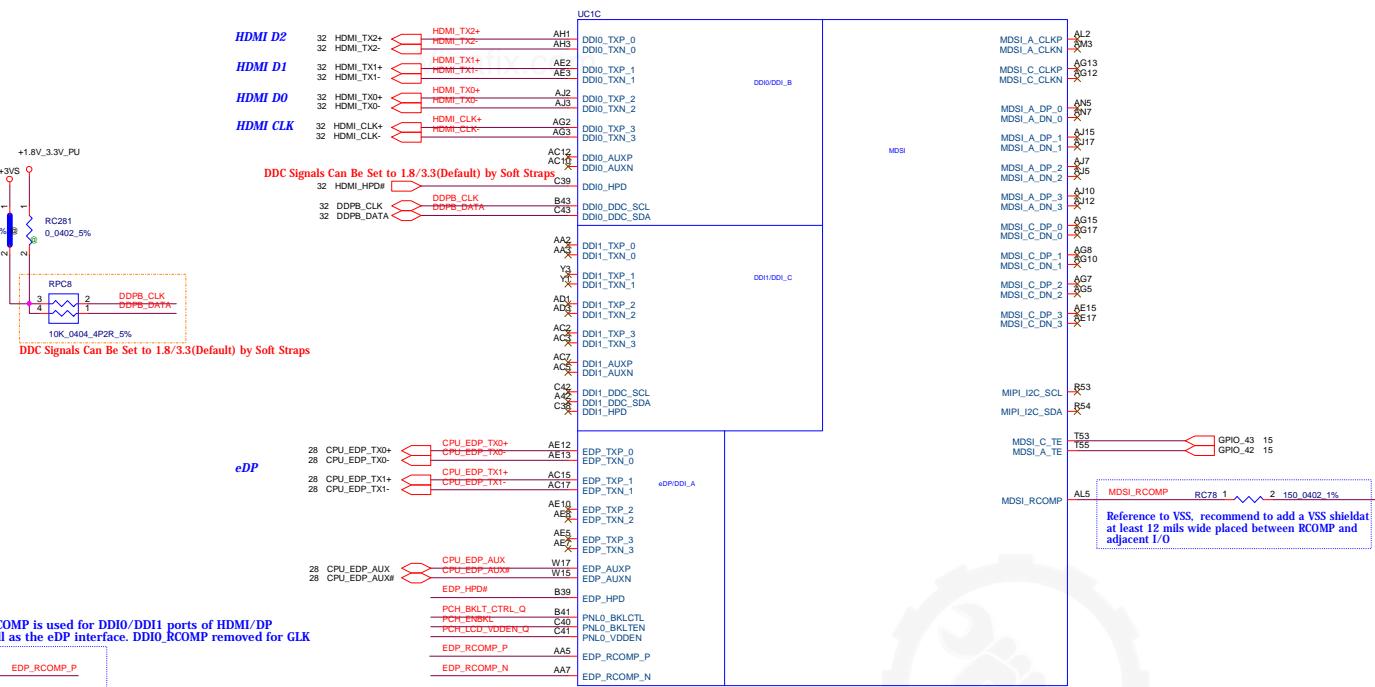
| Security Classification | LC Future Center Secret Data | | | Title |  | |
|--|------------------------------|-----------------|------------------------|------------------------------|---|-------|
| Issued Date | 2013/03/26 | Deciphered Date | 2014/01/21 | SOC (I2C, SMBus, CNVi, UART) | | |
| This sheet of engineering drawing is the proprietary property of LC Future Center, and contains confidential and trade secret information. This sheet may not be transferred from the custody of the competent division of R&D department except as authorized by LC Future Center. Neither this sheet nor the information it contains may be used by or disclosed to any third party without prior written consent of LC Future Center. | C | Size | Document Number | EG431 / EG532 | Rev. | 1.0 |
| | | Date: | Friday, March 02, 2018 | Sheet | 7 | of 60 |

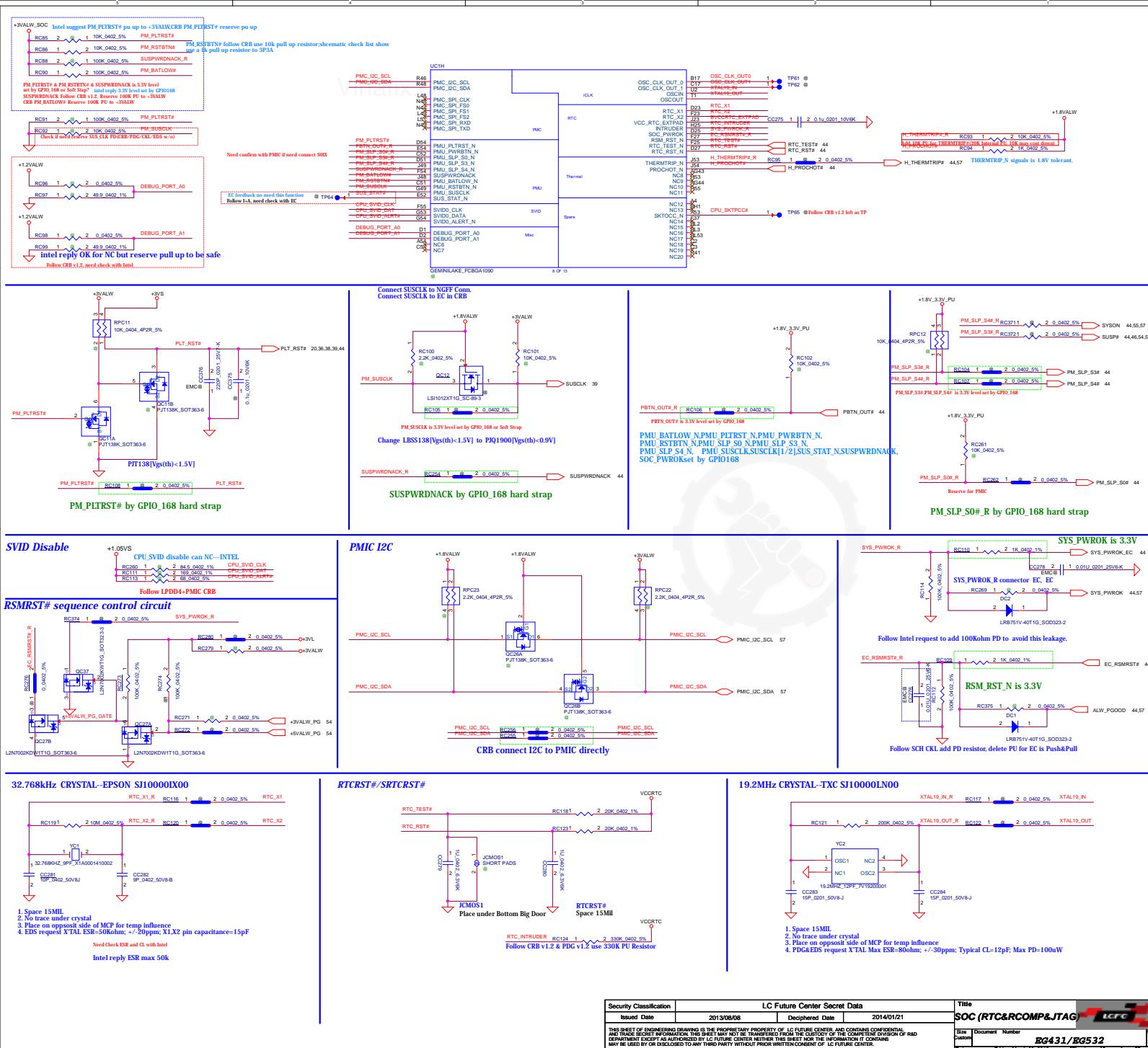


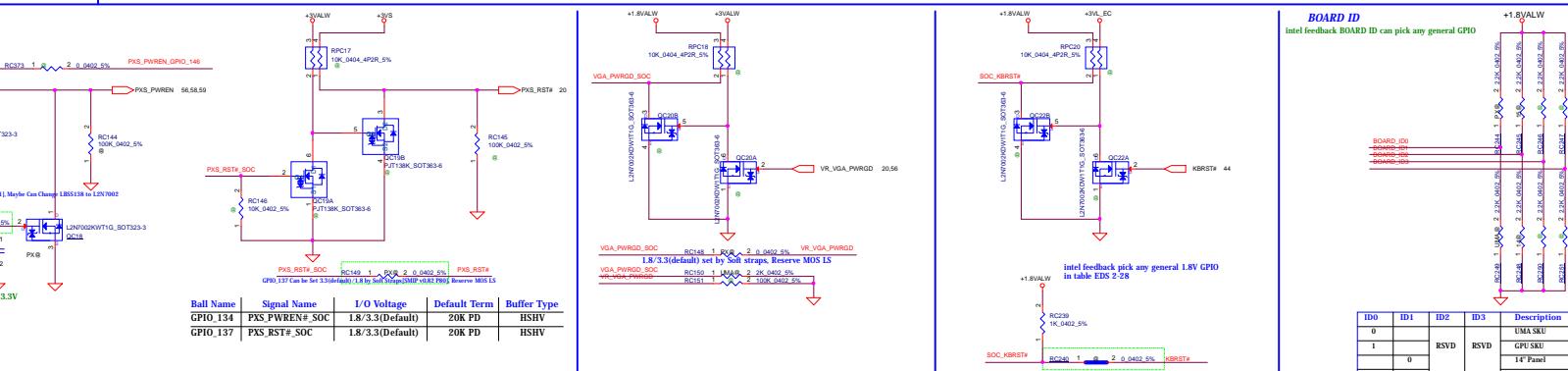
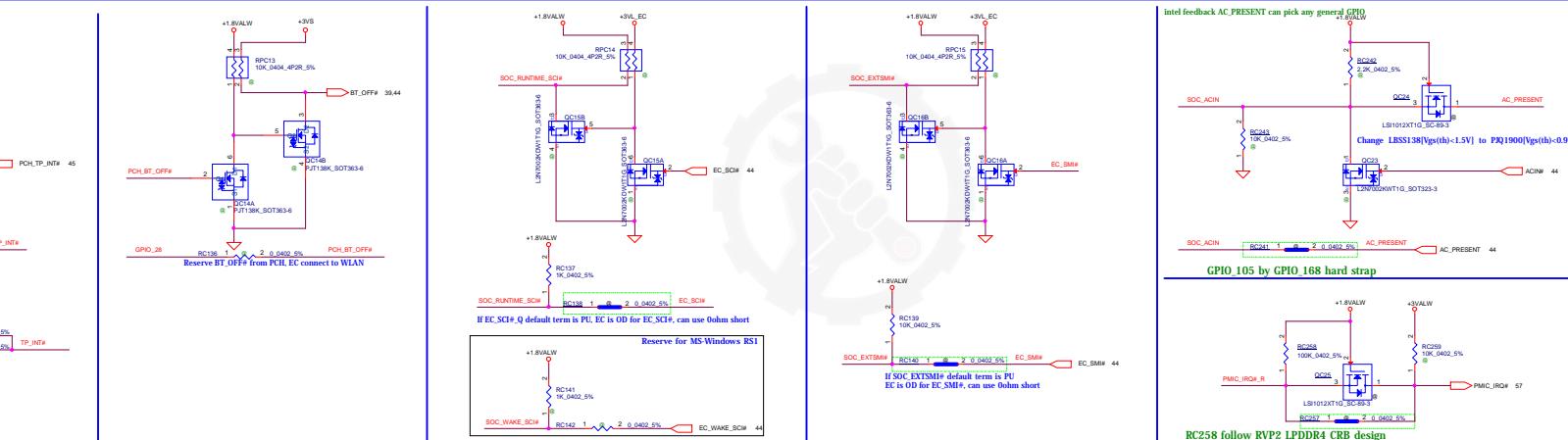
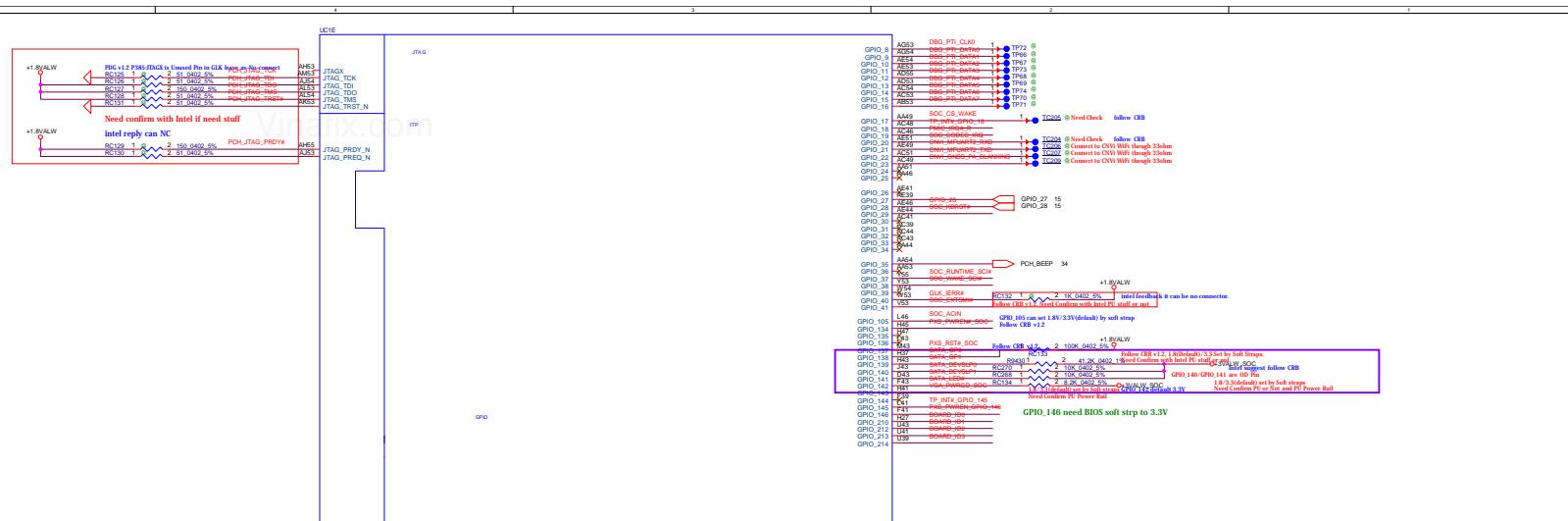
| | |
|-------------------------|---------------------------|
| Security Classification | LC Future Center Secret D |
| Issued Date | 2013/03/26 |

DDI PORT LIST

| Port | Device | HPD Net | HPD Pin |
|------|--------|-----------|---------|
| DDI0 | HDMI | HDMI_HPD# | C39 |
| DDI1 | N/A | N/A | C38 |
| eDP | eDP | EDP_HPD# | B39 |

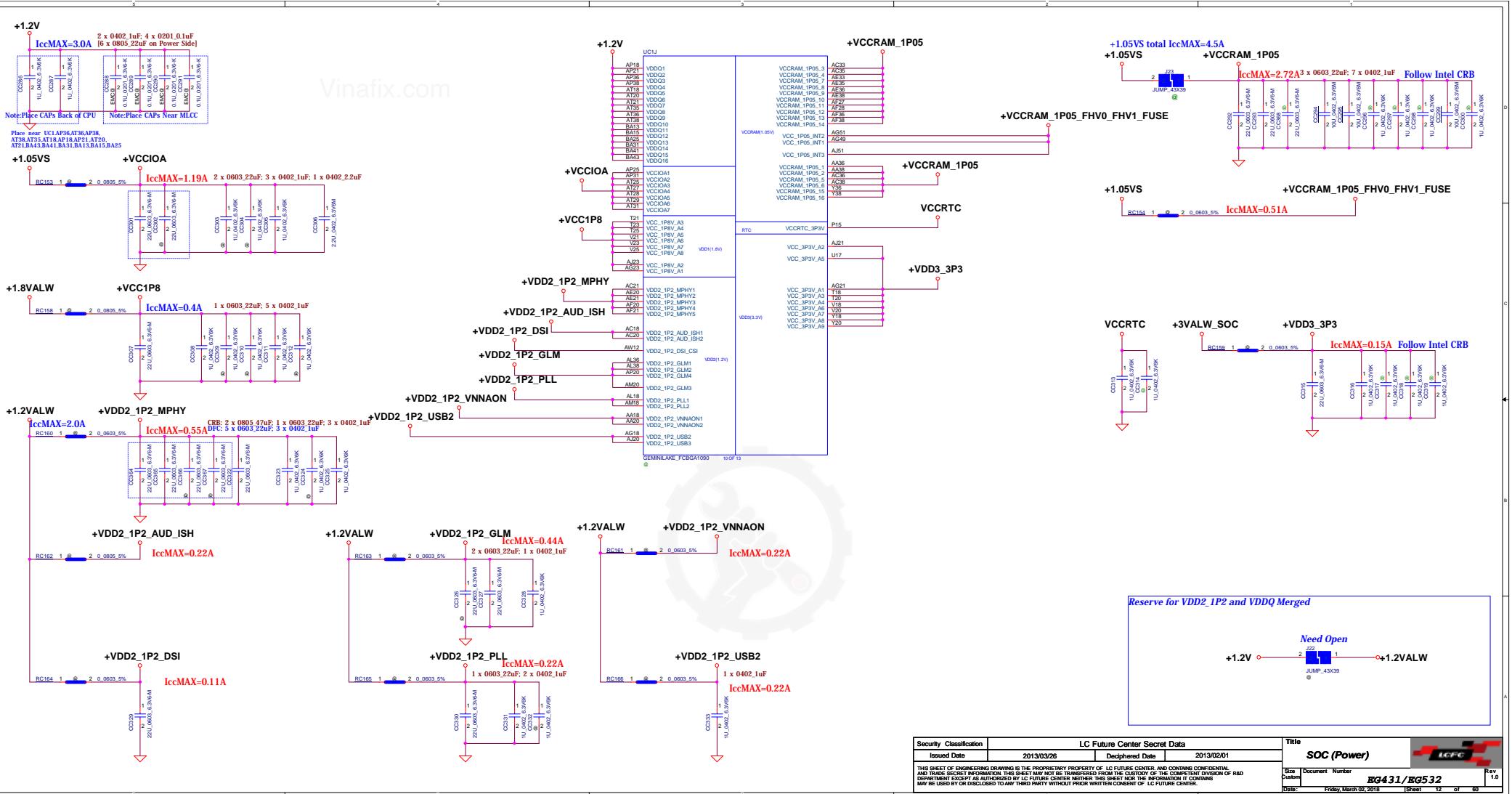




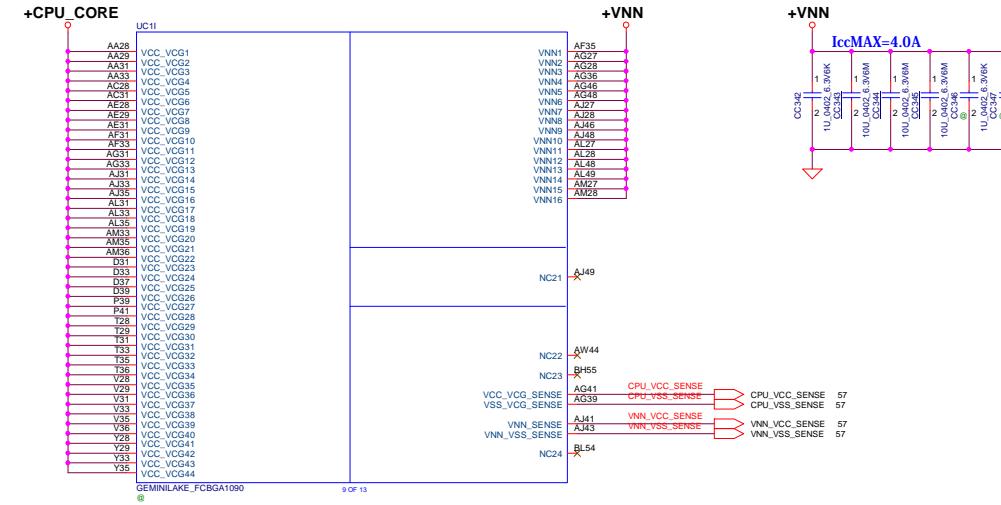
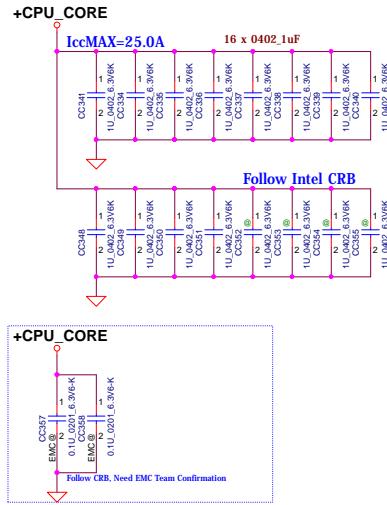


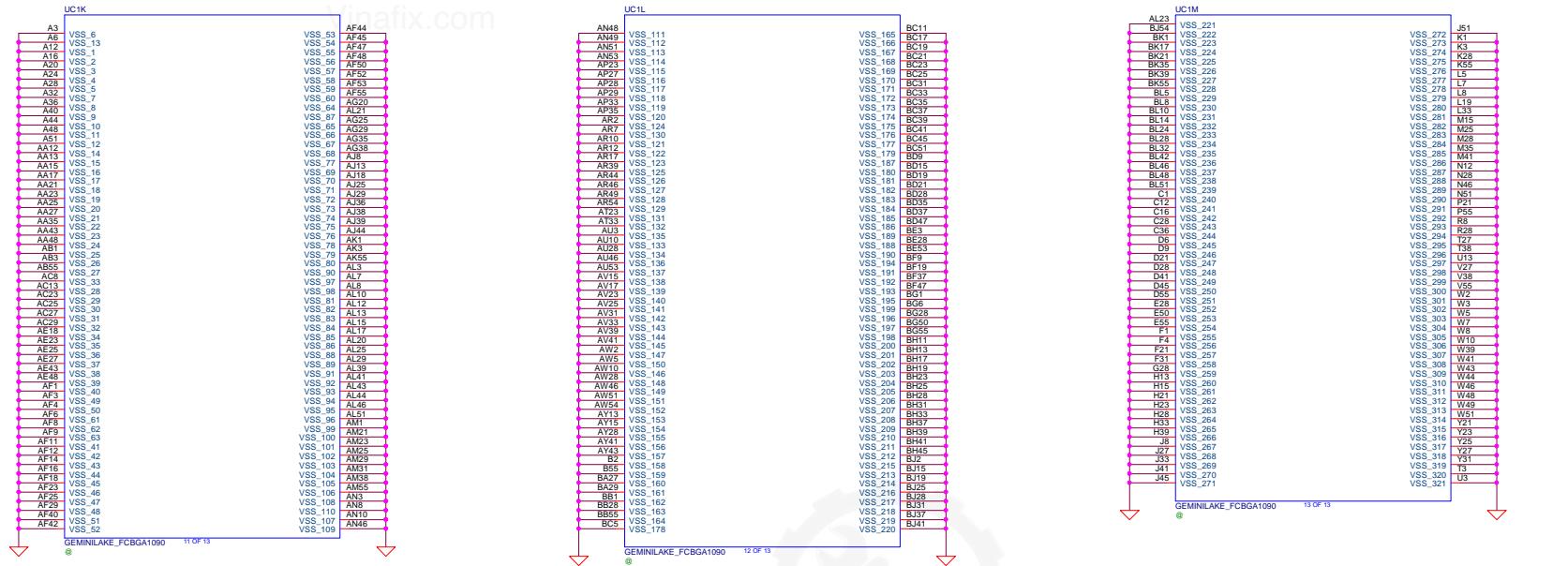
| Security Classification | LC Future Center Secret Data | | |
|---|------------------------------|-----------------|-------------|
| Issued Date | 2013/08/08 | Deciphered Date | 2014/01/21 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. IT IS RESTRICTED FROM EXTERNAL DISTRIBUTION. DUPLICATION OF THIS DRAWING IS PROHIBITED EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. WHETHER IN WHOLE OR IN PART, THIS SHEET OF DRAWING MAY NOT BE USED OR DISCLOSED TO ANY THIRD PARTY WITHOUT WRITTEN CONSENT OF LC FUTURE CENTER. | | | |
| ID0 | ID1 | ID2 | ID3 |
| 0 | | | Description |
| 1 | RSVD | RSVD | UMA SKU |
| | 0 | 0 | GPU SKU |
| | 1 | 1 | 14" Panel |
| | 1 | 1 | 15" Panel |

| Title | | EG431/EG532 |
|-------------|------------------------|----------------|
| Doc. Number | EG431/EG532 | Rev 1.0 |
| Date | Friday, March 03, 2018 | Sheet 11 of 60 |



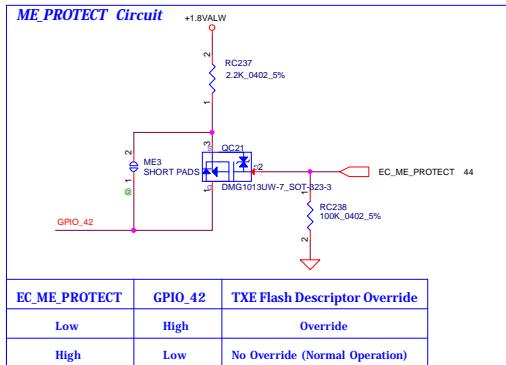
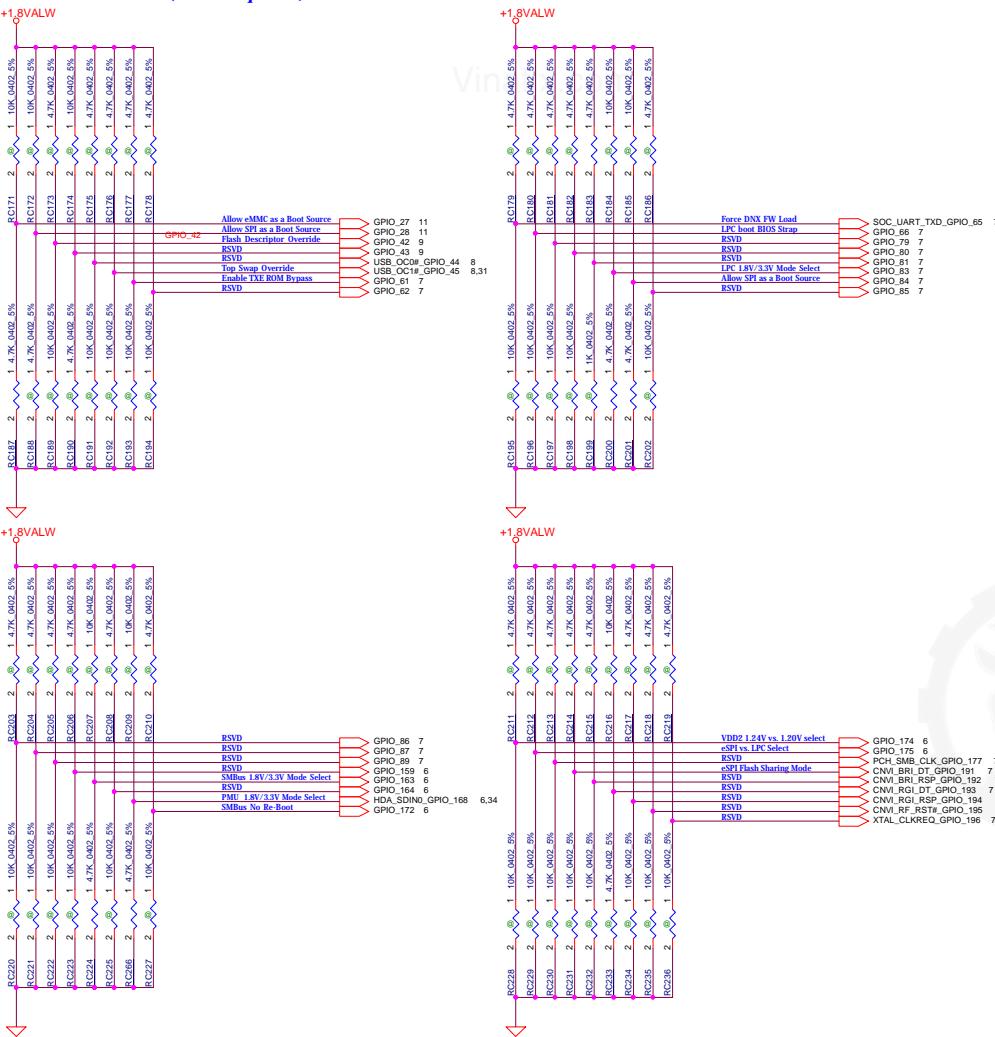
| | | | | | |
|--|-------------------------------------|------------------------|--------------|--------------------|---|
| Security Classification | LC Future Center Secret Data | | Title | | |
| Issued Date | 2013/03/26 | Deciphered Date | 2013/02/01 | SOC (Power) |  |
| <p>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. IT IS TO BE KEPT SECURE AND IS NOT TO BE COPIED OR DISCLOSED OUTSIDE OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</p> | | | | | |
| Size | Document Number | | | Rev | 1.0 |
| Custom | EG431 / EG532 | | | | |
| Date: | Friday, March 08, 2013 | Sheet | 12 | of | 60 |





| | | | | | | |
|---|-------------------------------------|------------------------|------------|------------------|---|-----------------|
| Security Classification | LC Future Center Secret Data | | | Title | | |
| Issued Date | 2013/03/26 | Deciphered Date | 2013/02/01 | SOC (VSS) |  | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL INFORMATION WHICH IS NOT TO BE COPIED OR DISCLOSED EXCEPT BY AUTHORIZED PERSONNEL OF THE COMPANY OR DIVISION OF R&D DEPARTMENT, EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR ANY INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | Rev. |
| | | | | C | EG431/EG532 | 1 |
| | | | | Date: | Friday, March 02, 2018 | Sheet: 14 of 60 |

Hardware STRAPS(Follow up CRB)



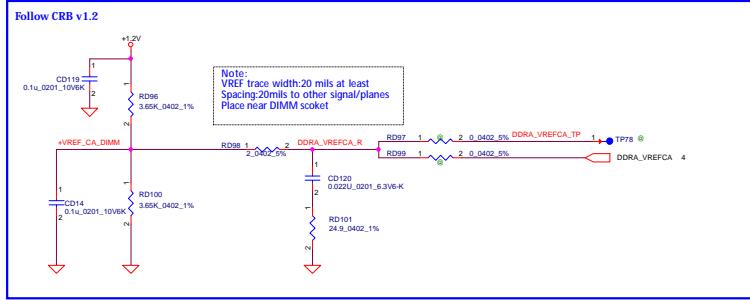
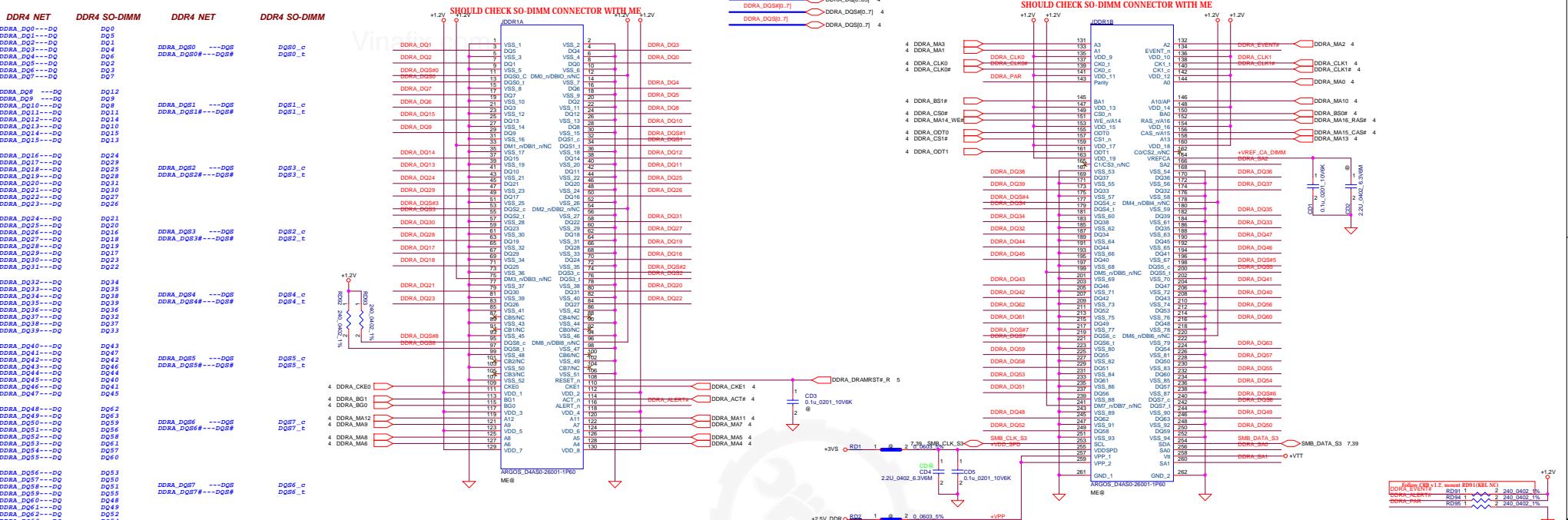
| EC_ME_PROTECT | GPIO_42 | TXE Flash Descriptor Override |
|---------------|---------|--------------------------------|
| Low | High | Override |
| High | Low | No Override (Normal Operation) |

| GPIO# | Purpose | Internal Termination | Schematics Setting | Pin Usage | Remark |
|----------|------------------------------|----------------------|--------------------|--|---|
| GPIO_27 | Allow eMMC as a boot source | 20K PU | 4.7K PD | If = Enable(Default): 0 = Disable[✓] If platform is using SPI as the boot device, then provide a pull-down for this strap to disable eMMC | Follow CRB(v1.2 P58); EDS(v1.2 P39); PDG(v1.2 P469) |
| GPIO_28 | Allow SPI as a boot source | 20K PU | Floating | If platform is using SPI as the boot device, then provide a pull down for this strap to disable SPI | Follow CRB(v1.2 P58); EDS(v1.2 P39); PDG(v1.2 P469) |
| GPIO_42 | Flash Descriptor Override | 20K PD | Floating | ✓ = Override; 0 = No Override(Normal Operation)[✓] This strap enables platform override to override security features in the SPI | Follow CRB(v1.2 P58); EDS(v1.2 P39); PDG(v1.2 P380) |
| GPIO_43 | RSVD | 20K PU | Floating | Ensure that this strap is pulled HIGH when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P39) |
| GPIO_44 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P39) |
| GPIO_45 | Top swap override | 20K PD | Floating | ✓ = Enable: 0 = Disable(Default)[✓] This strap enables platform override where the core logic will be swapped for a SPI boot chip | Follow CRB(v1.2 P57); EDS(v1.2 P39) |
| GPIO_61 | Enable TXE ROM Bypass | 20K PD | Floating | ✓ = Enable: 0 = Disable(Default)[✓] This strap tells TXE 3.0 to bypass Read-Only Memory | Follow CRB(v1.2 P58); EDS(v1.2 P39); PDG(v1.2 P380) |
| GPIO_62 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P39) |
| GPIO_65 | Force DNX FW Load | 20K PD | Floating | 1 = Force: 0 = Do Not Force[Default][✓] This strap is a recovery strap for corrupted FW image, will force TXE3.0 to execute a Dnx fw | Follow CRB(v1.2 P58); EDS(v1.2 P40); PDG(v1.2 P471) |
| GPIO_66 | LPC boot BIOS strap | 20K PD | Floating | ✓ = Enable: 0 = Disable(Default)[✓] The board should stop this low and do not use otherwise | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_79 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_80 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P58); EDS(v1.2 P40) |
| GPIO_81 | RSVD | 20K PU | 4.7K PU | Ensure that this strap is pulled HIGH when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P58); EDS(v1.2 P40) |
| GPIO_83 | LPC 1.8V/3.3V mode select | 20K PD | 4.7K PD | ✓=buffers set to 1.8V mode 0= buffers set to 3.3V mode (default)[✓] | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_84 | Allow SPI as a boot source | 20K PU | 4.7K PD | 1=enable 0=enable (default)[✓] | Follow CRB(v1.2 P58); EDS(v1.2 P40) |
| GPIO_85 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P58); EDS(v1.2 P40) |
| GPIO_86 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P58); EDS(v1.2 P40) |
| GPIO_87 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_89 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_159 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_163 | SBMbus 1.8V/3.3V mode select | 20K PD | 4.7K PD | ✓=buffers set to 1.8V mode 0= buffers set to 3.3V mode (default)[✓] | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_164 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_168 | PMU 1.8V/3.3V mode select | 20K PD | 4.7K PD | ✓=buffers set to 1.8V mode 0= buffers set to 3.3V mode (default)[✓] | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_172 | SBMbus No Re-Boot | 20K PD | Floating | ✓ = Enable: 0 = Disable (default)[✓] Note: Platforms should strap this LOW. Functionality is handled by the IMC | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_174 | VDDP 1.24V vs. 1.20V select | 20K PD | Floating | ✓ = VDDP 1.24V 0 = VDDP 1.20V (default) Need Check | Follow CRB(v1.2 P57); EDS(v1.2 P40) |
| GPIO_175 | eSPI vs. LPC | 20K PD | Floating | ✓ = eSPI mode 0 = 1.2V mode (default) Note: The default for AW0 will be eSPI due to a bug on | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_177 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_191 | eSPI Flash Sharing Mode | 20K PD | Floating | eSPI Flash Sharing Mode: 0=SPI master attached to sharing (SAFS); 1=eSPI master attached to sharing (MAFS). default[✓] | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_192 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_193 | RSVD | 20K PU | Floating | Ensure that this strap is pulled HIGH when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_194 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_195 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |
| GPIO_196 | RSVD | 20K PD | Floating | Ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation | Follow CRB(v1.2 P57); EDS(v1.2 P41) |



| Security Classification | LC Future Center Secret Data | | | Title | LCFC |
|---|------------------------------|-----------------|-------------|--------------------|------------------------|
| Issued Date | 2013/08/08 | Deciphered Date | 2014/01/21 | P12-SOC (GPIO&HDA) | Rev 1.0 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. NO PARTS OF THIS SHEET MAY BE COPIED OR REPRODUCED, NOR MAY IT OR ITS CONTENTS BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | |
| Size | C | Document Number | EG431/EG532 | Date: | Friday, March 02, 2018 |
| Sheet | 16 | of | 80 | | |

DDR4 Swap Mapping table



SPD Address = AOH



| | | | | | |
|--|------------------|--------------------|------------------------------|------------------------|--------------|
| 0 KSA00 75Y | | | LC Future Center Secret Data | | |
| Security Classification: | Issued Date: | Declassified Date: | TIN | | |
| SECRET | 2013/08/08 | 2013/08/08 | Blank | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPERTY THAT OWNERSHIP OF LC FUTURE CENTER, AND CONSTITUTE CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE CONFIDENTIAL DIVISION OF RAD ENGINEERING DRAWING DEPARTMENT OF LC FUTURE CENTER. THIS SHEET MAY NOT BE COPIED OR REPRODUCED IN WHOLE OR PART. THIS SHEET MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | |
| Ref: | Document Number: | Customer Ref: | Page: | Date: | Page No: |
| EG431/EG532 | | | 15 | Friday, March 08, 2013 | 10 - 21 - 20 |

Power-Up/Down Sequence

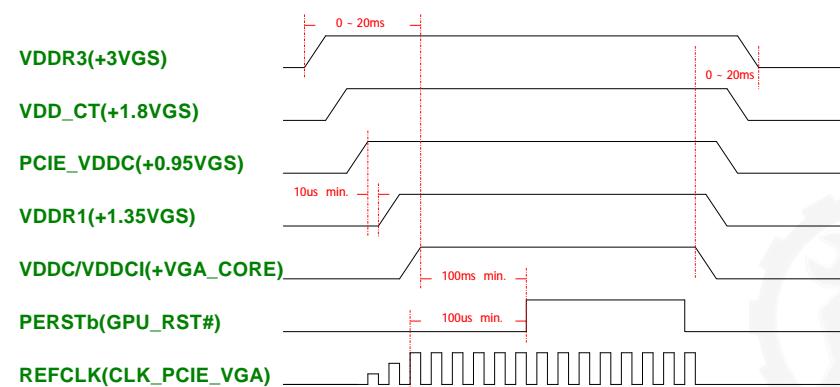
"Topaz" has the following requirements with regards to power-supply sequencing to avoid damaging the ASIC:

All the ASIC supplies must reach their respective nominal voltages within 20 ms of the start of the ramp-up sequence, though a shorter ramp-up duration is preferred. The maximum slew rate on all rails is 50 mV/ μ s.

It is recommended that the 3.3-V rail ramp up first.

The 3.3-V, 1.8-V, and 0.95-V rails must reach their ready state at least 10 μ s before VDDC, VDDCI, and VMEMIO start to ramp up.

The power rails that are shared with other components on the system should be gated for the dGPU so that when the dGPU is powered down (for example AMD PowerXpress idle state), all the power rails are removed from the dGPU. The gate circuits must meet the slew rate requirement (such as \leq 50 mV/ μ s) For power down, reversing the ramp-up sequence is recommended.

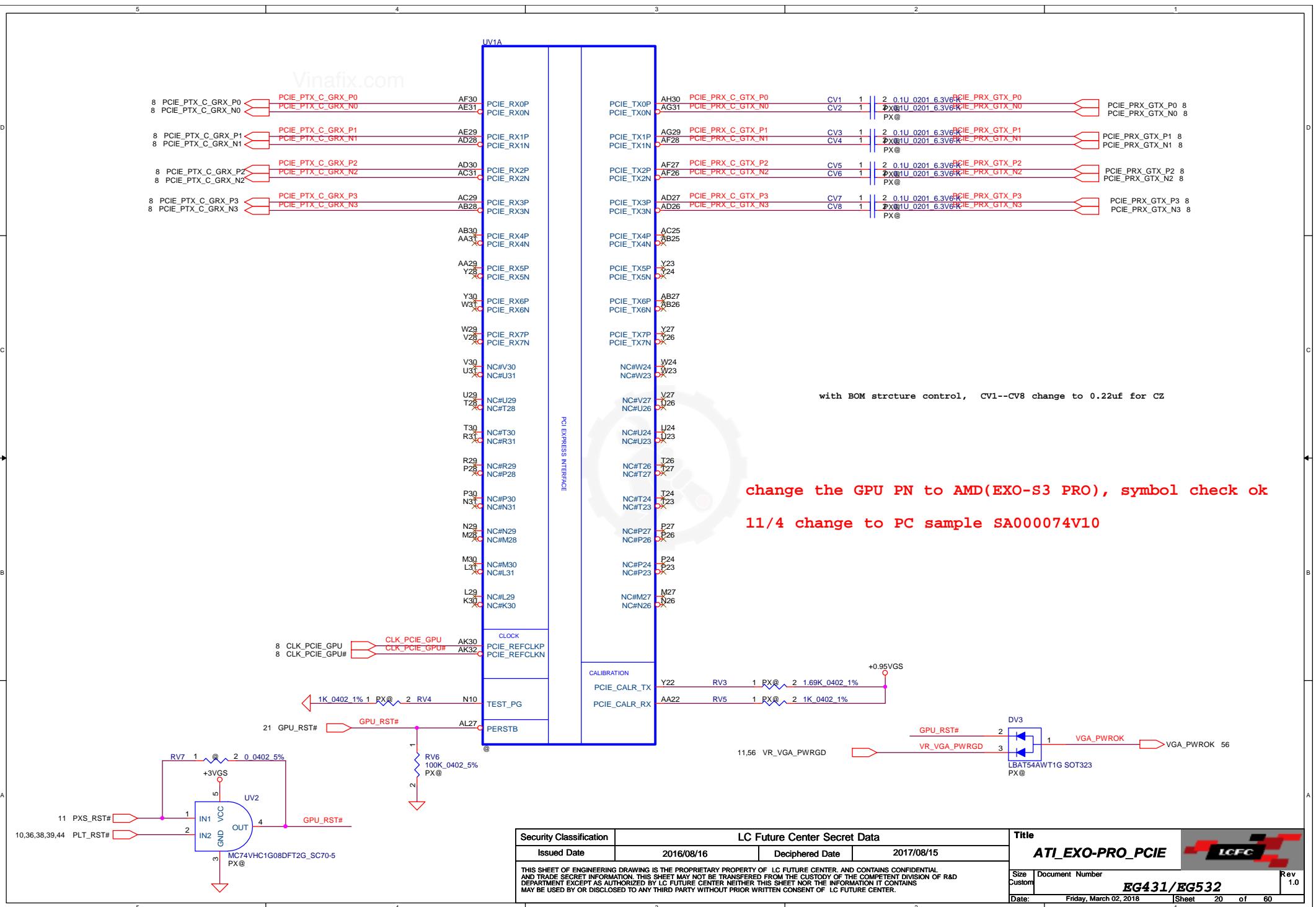


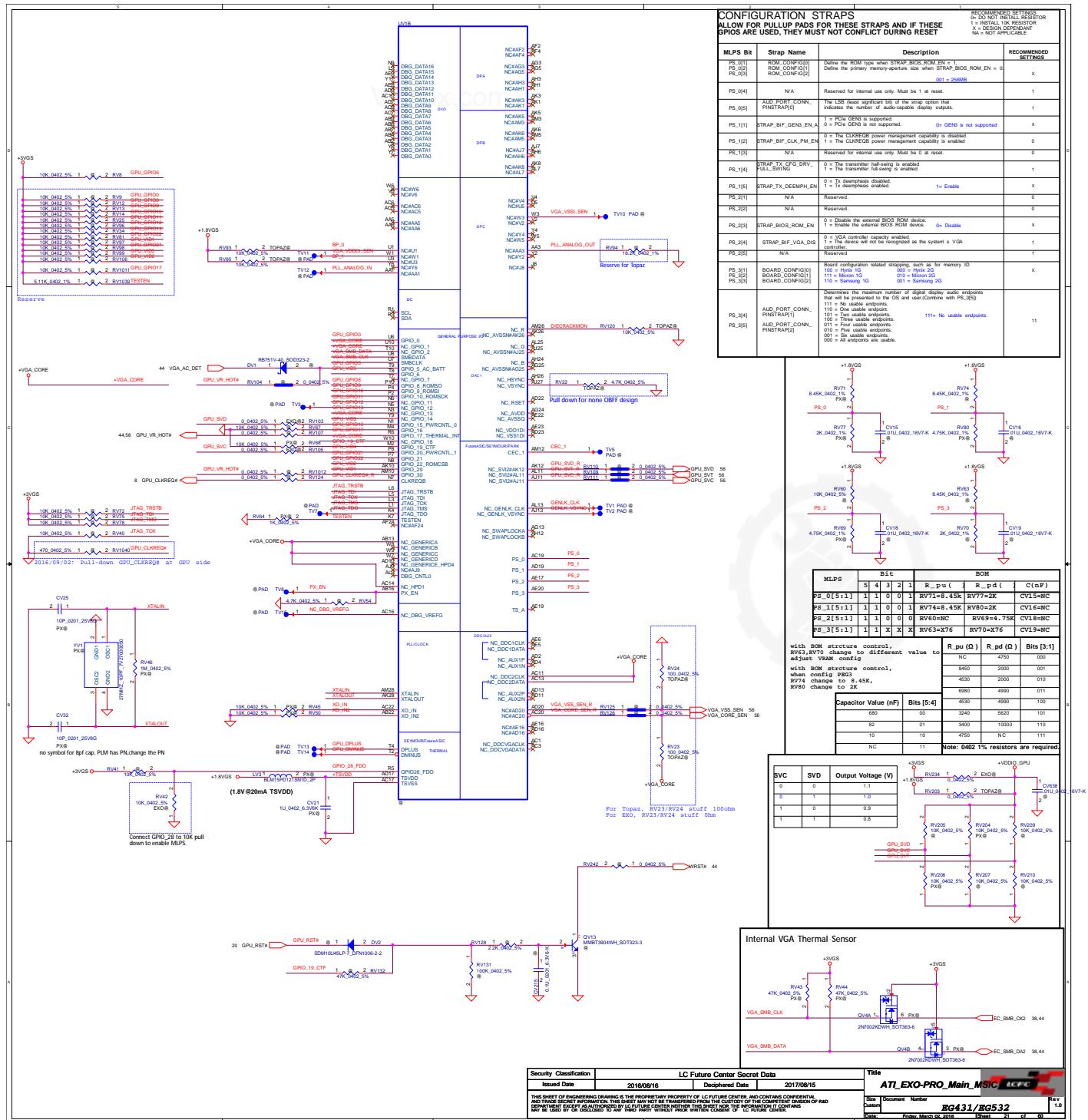
VRAM ID config

| Memory Type | VRAM ID PS_3[3:1] | PU resistor RV63 | PD resistor RV70 |
|-------------|---------------------------|------------------|------------------|
| 256Mx16 | Hynix H5GC8H24MJR-R0C | 100 | 4.53K |
| | Micron MT51J256M32HF-70:A | 111 | 4.75K |
| | Samsung K4G80325FB-HC28 | 110 | 3.4K |
| | 000 | NC | 4.75K |
| | 010 | 4.53K | 2K |
| | 001 | 8.45K | 2K |

FBGA Code: D9SxD

| | | | | |
|---|------------------------------|-----------------|------------|----------------|
| Security Classification | LC Future Center Secret Data | | | Title |
| Issued Date | 2016/08/16 | Deciphered Date | 2017/08/15 | VGA Notes List |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Rev 1.0 |
| Size | Document Number | | | |
| Custom | | | | |
| Date: | EG431/EG532 | | | |
| Friday, March 02, 2018 | | Sheet | 19 | of 60 |

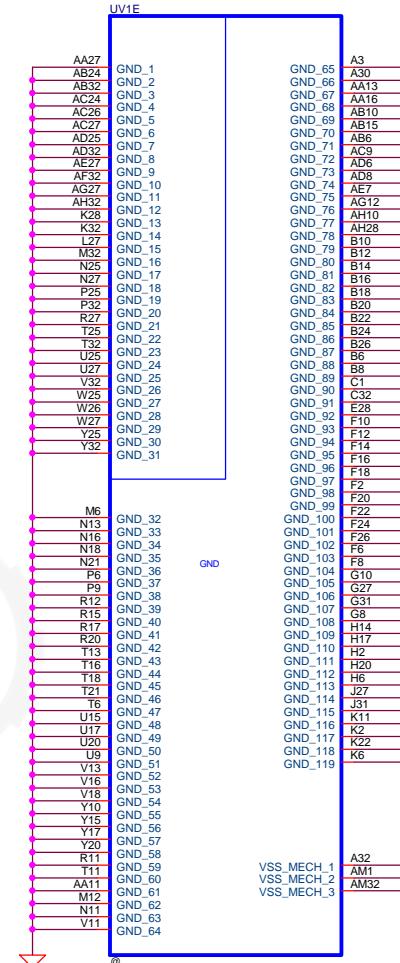
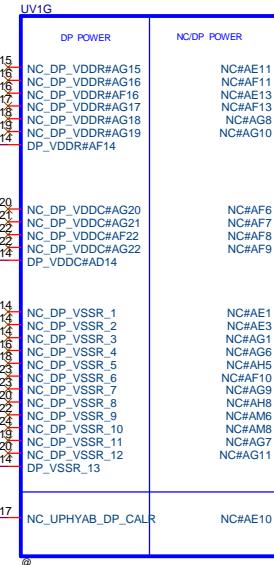
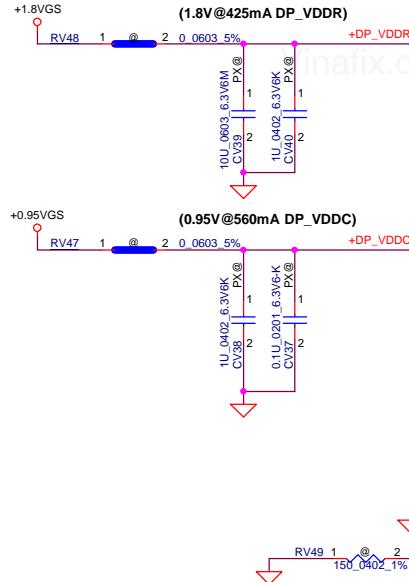




Vinafix.com

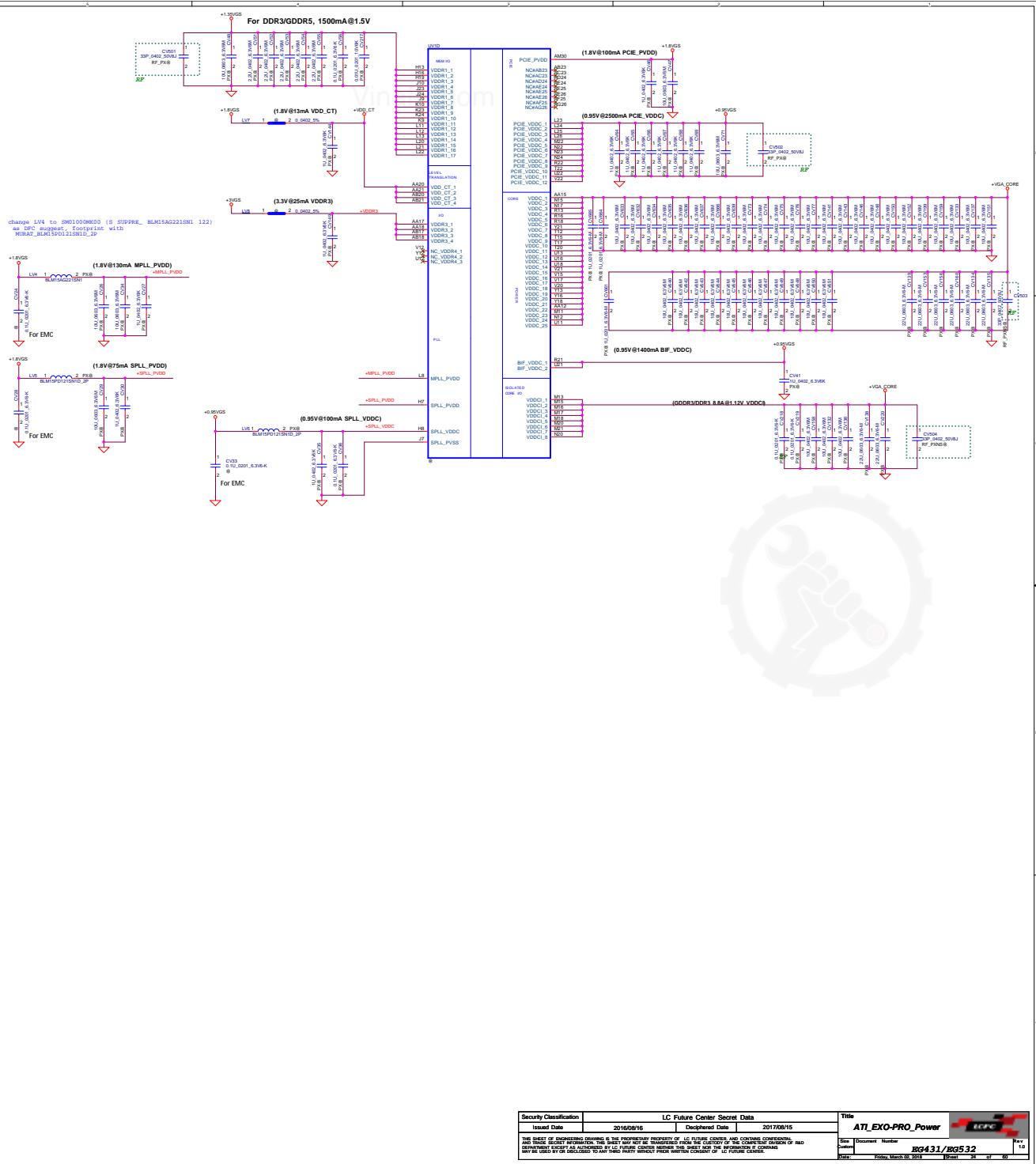


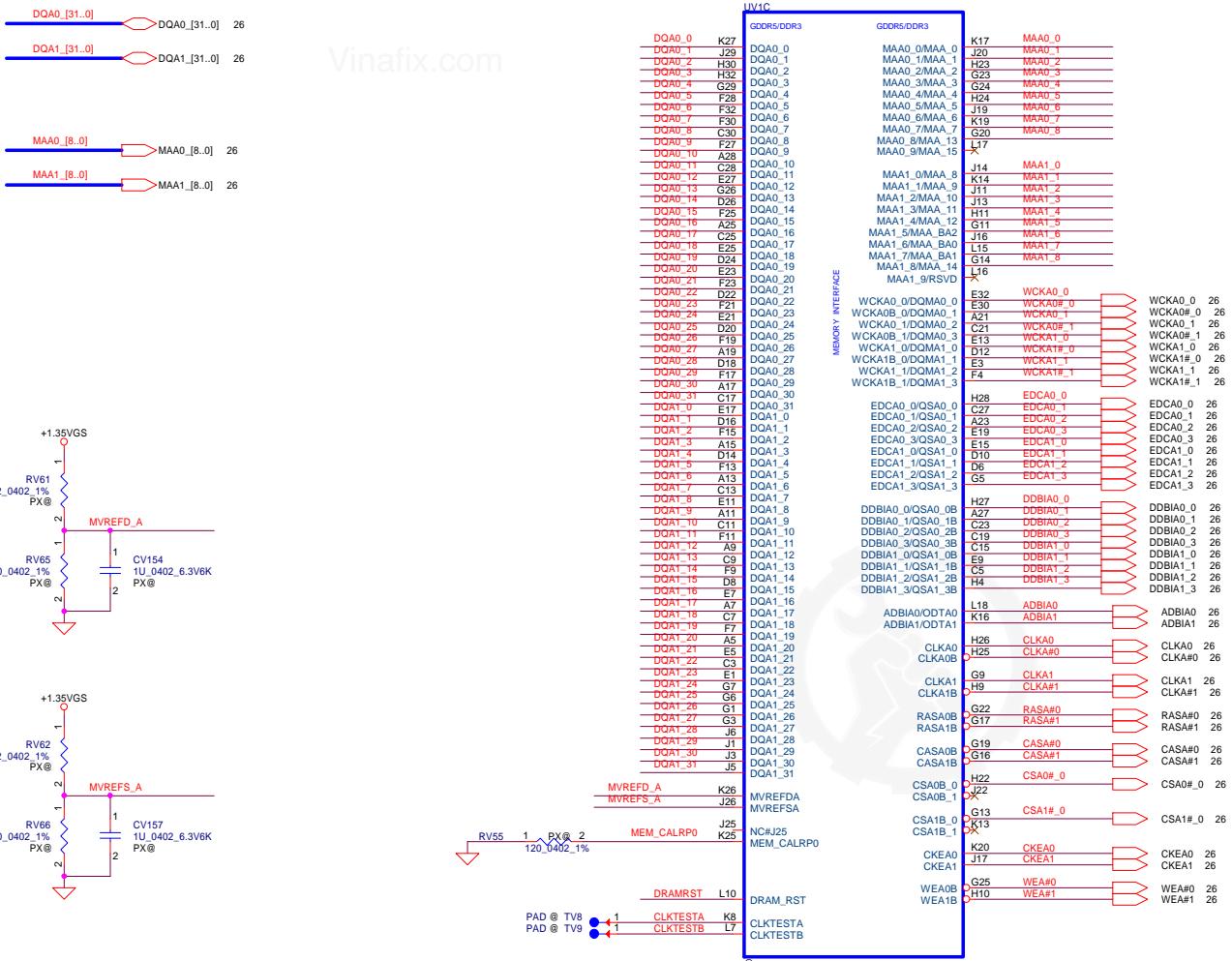
| Security Classification | | LC Future Center Secret Data | | | | Title | |
|---|------------|------------------------------|------------|------------------|--|--------|------------------------|
| Issued Date | 2016/08/16 | Deciphered Date | 2017/08/15 | ATI_EXO-PRO_TMDP | | LGFC | |
| <small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small> | | | | | | Size | Document Number |
| | | | | | | Custom | EG431/EG532 |
| | | | | | | Date: | Friday, March 02, 2018 |
| | | | | | | Sheet | 22 of 60 |



| Security Classification | LC Future Center Secret Data | | |
|--|------------------------------|-----------------|------------|
| Issued Date | 2016/08/16 | Deciphered Date | 2017/08/15 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | |

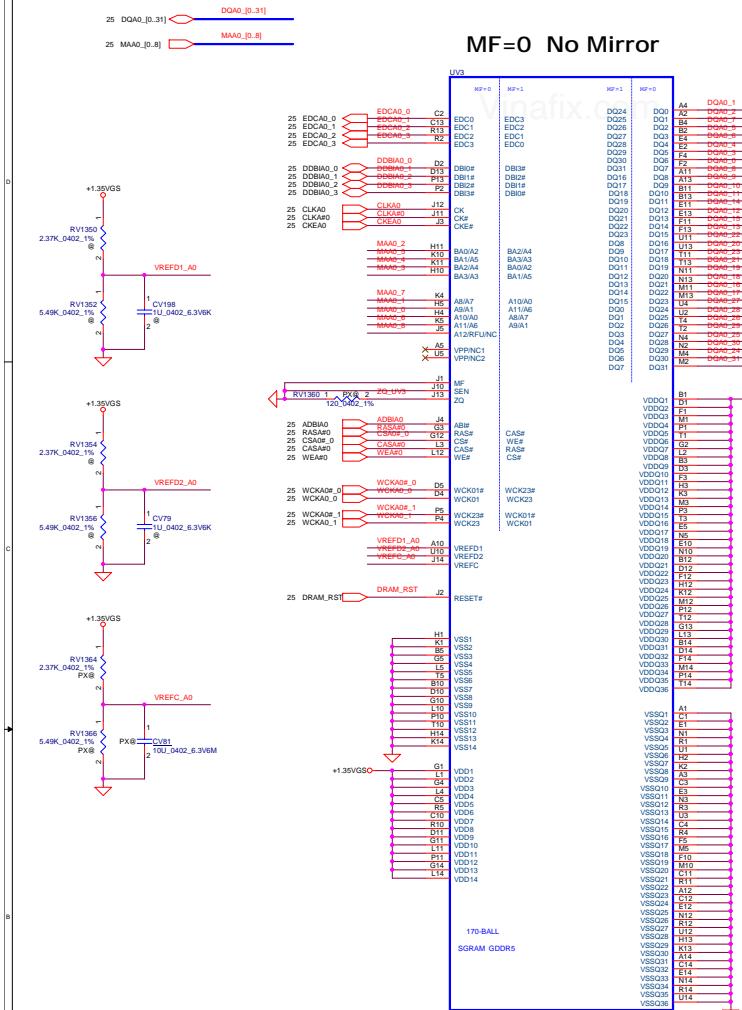
| Title | ATI_EXO-PRO_DP Power | LCFC | Rev 1.0 |
|--------|----------------------|------------------------------|----------------|
| Size | Document Number | | |
| Custom | EG431/EG532 | Date: Friday, March 02, 2018 | Sheet 23 of 60 |



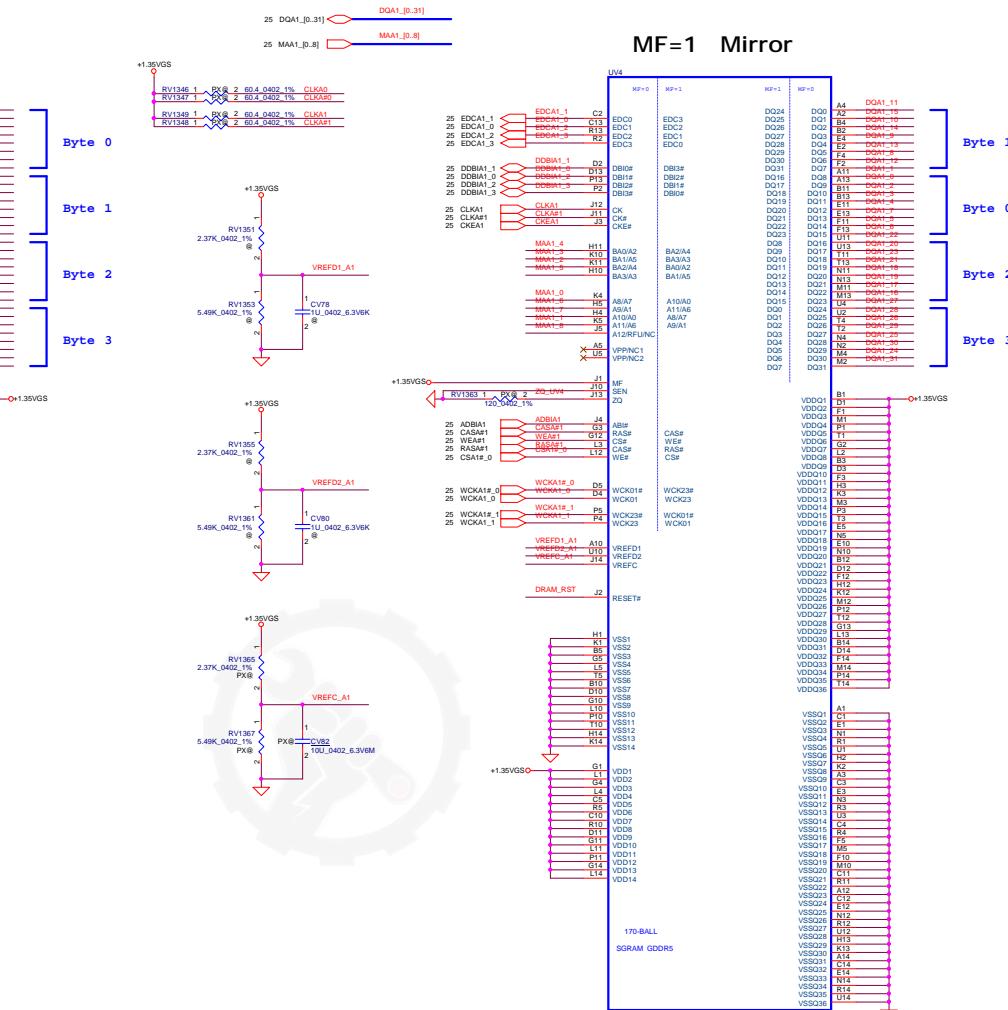


| Security Classification | LC Future Center Secret Data | | |
|---|------------------------------|-----------------|------------|
| Issued Date | 2016/08/16 | Deciphered Date | 2017/08/15 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | |

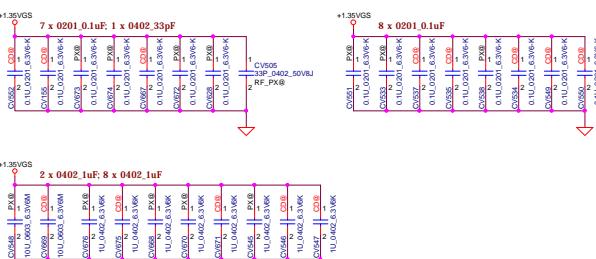
MF=0 No Mirror



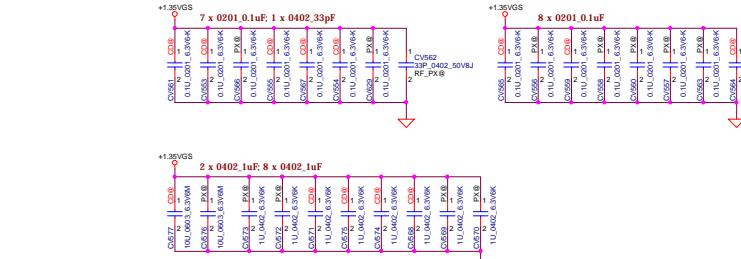
MF=1 Mirror



Place Near at UV3 Side



Place Near at UV4 Side



Security Classification

LC Future Center Secret Data

Title

ATI_R17M-P1-50_VRAM



Issued Date: 2017/06/24 Declassified Date: 2018/06/23

THIS SHEET OF ENGINEERING DRAWING IS THE PROPERTY OF LC FUTURE CENTER. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OR RAD DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.

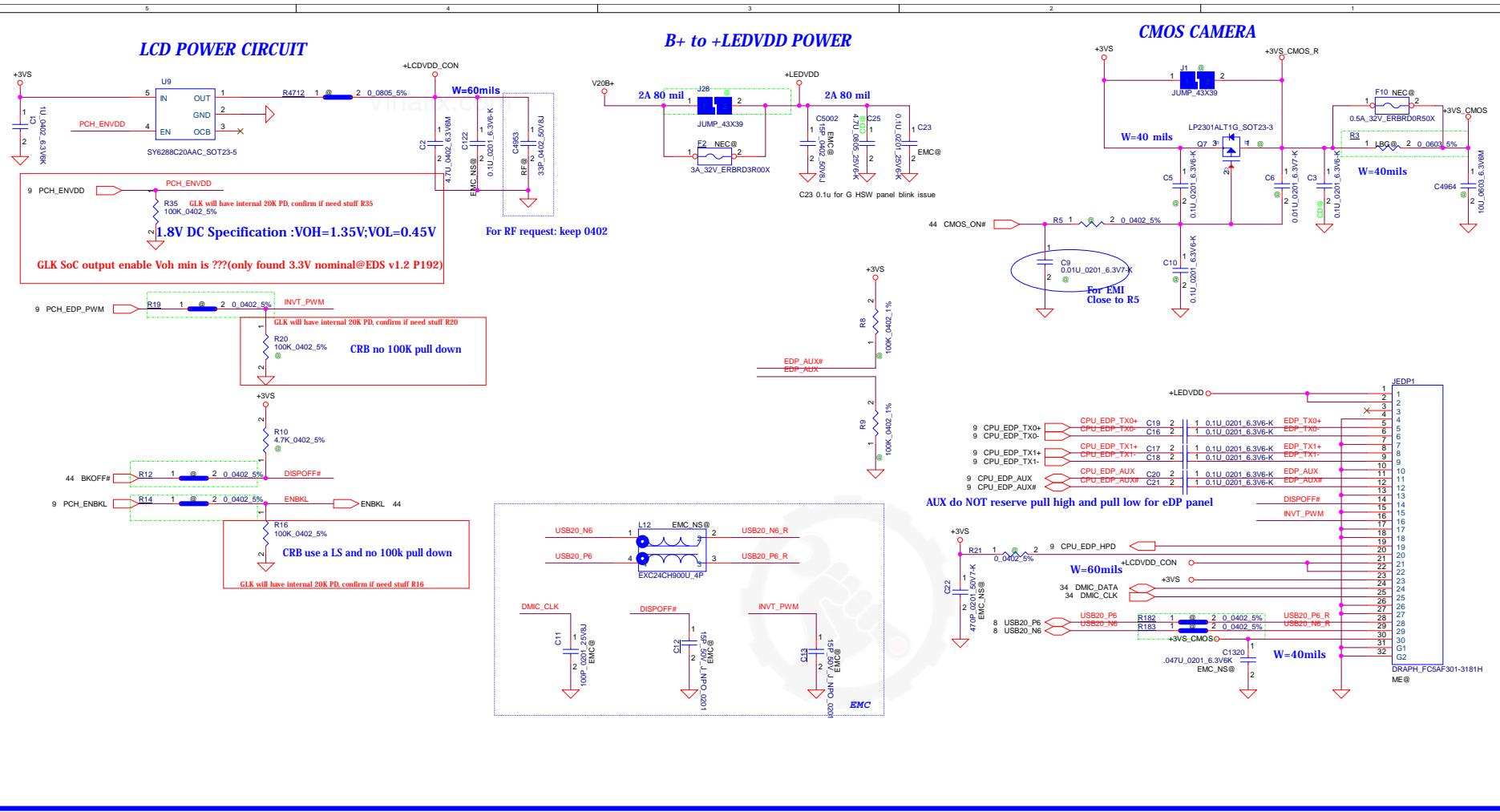
Size Document Number: EG431/EG532 Rev. 1.0

Date: Friday, March 02, 2018 Sheet 28 of 60

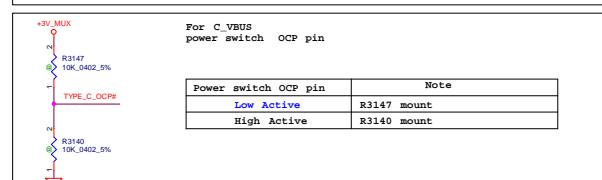
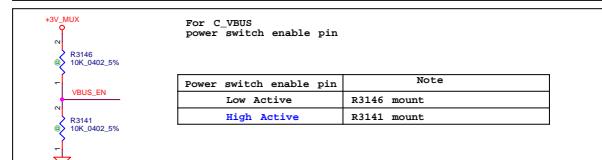
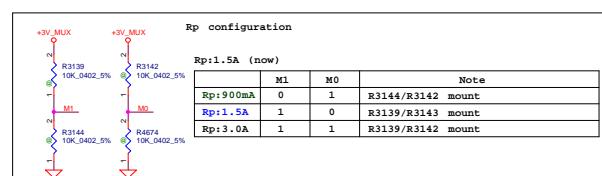
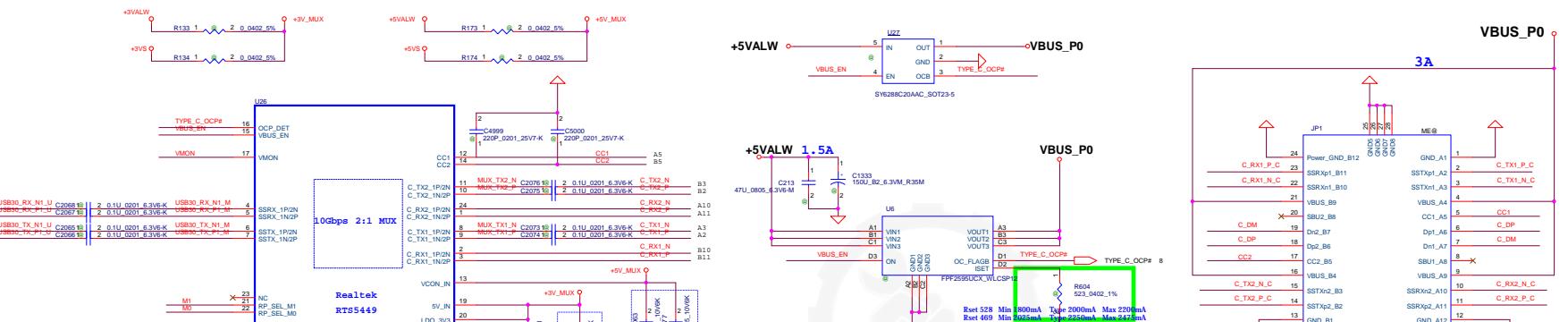
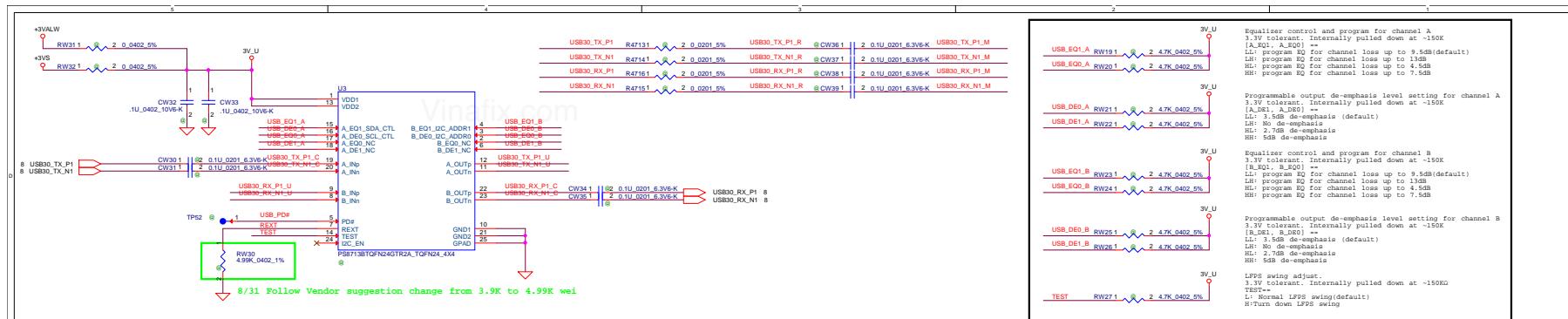
Vinafix.com



| Security Classification | LC Future Center Secret Data | | | Title | BLANK | | LCFC |
|---|------------------------------|-----------------|------------|-------|-----------------|-----|------|
| Issued Date | 2017/06/24 | Deciphered Date | 2018/06/23 | Size | Document Number | Rev | 1.0 |
| <small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small> | | | | | | | |



| Security Classification | LC Future Center Secret Data | | | Title | | |
|---|------------------------------|-----------------|-------------|-------|-----|--|
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/08 | LCFC | Rev | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF RAD DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document Number | Custon | EG431/EG532 | Rev | 1.0 | |
| Date: | Friday, March 02, 2018 | Sheet | 28 | of | 60 | |

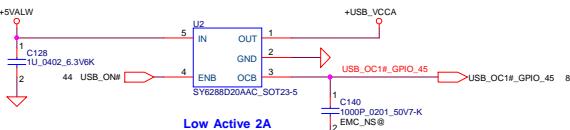




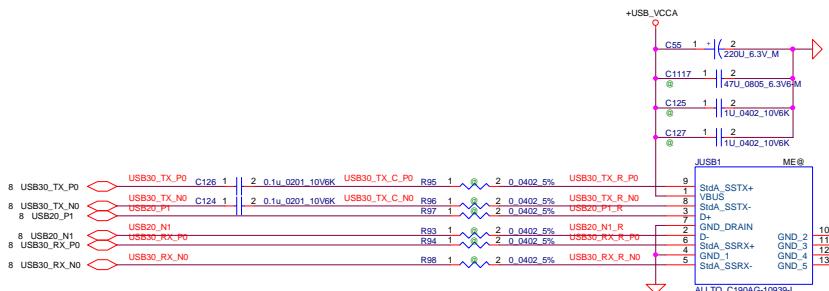
| | | | | | | |
|---|------------------------------|-----------------|------------|---|-----------------|---|
| Security Classification | LC Future Center Secret Data | | | Title | BLANK | |
| Issued Date | 2015/08/20 | Deciphered Date | 2016/08/20 |  | | Rev 1.0 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. NO PARTS THEREOF MAY BE COPIED OR REPRODUCED, NOR MAY IT OR ITS CONTENTS BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | Date: Friday, March 02, 2018 Sheet 30 of 60 |
| | | | | EG431/EG532 | | |

USB3.0 Port X 1

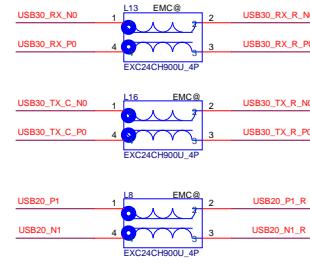
Vinafix.com



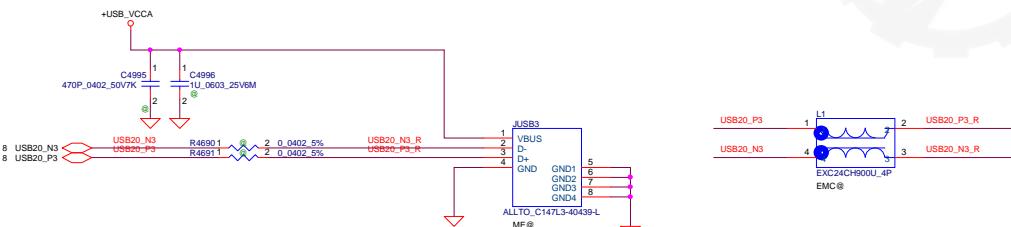
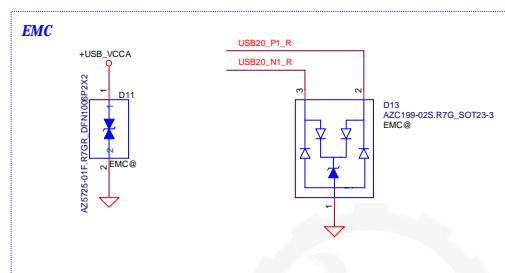
Low Active 2A



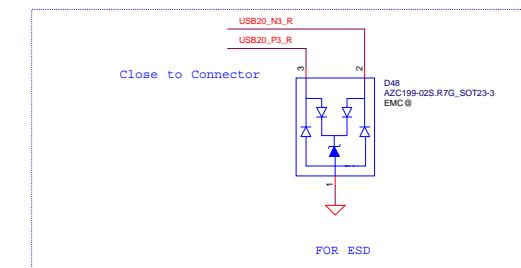
09/05 Update USBConn. P/N DC021609011 wei



EMC



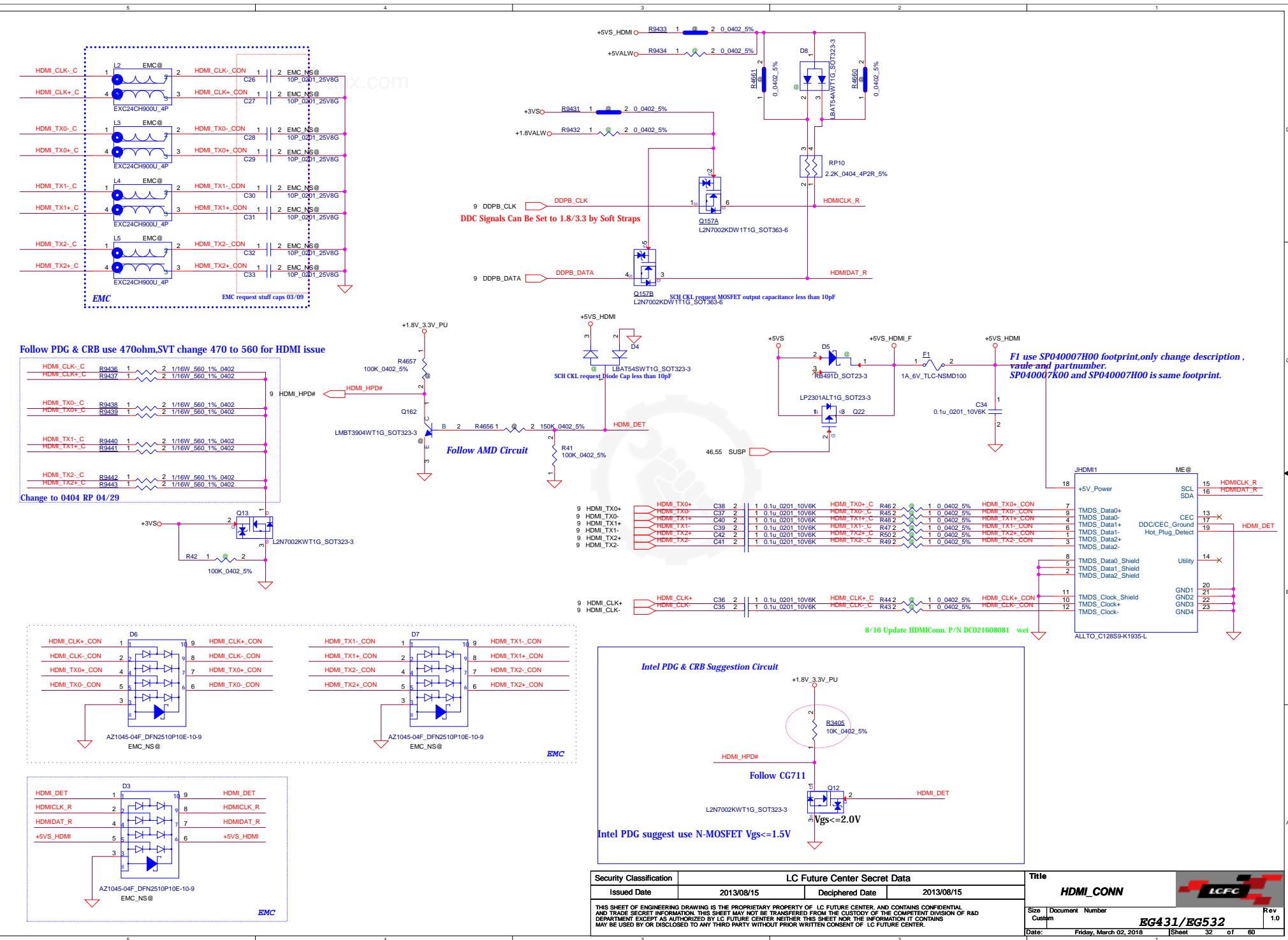
Update footprint symbol lewis



Close to Connector

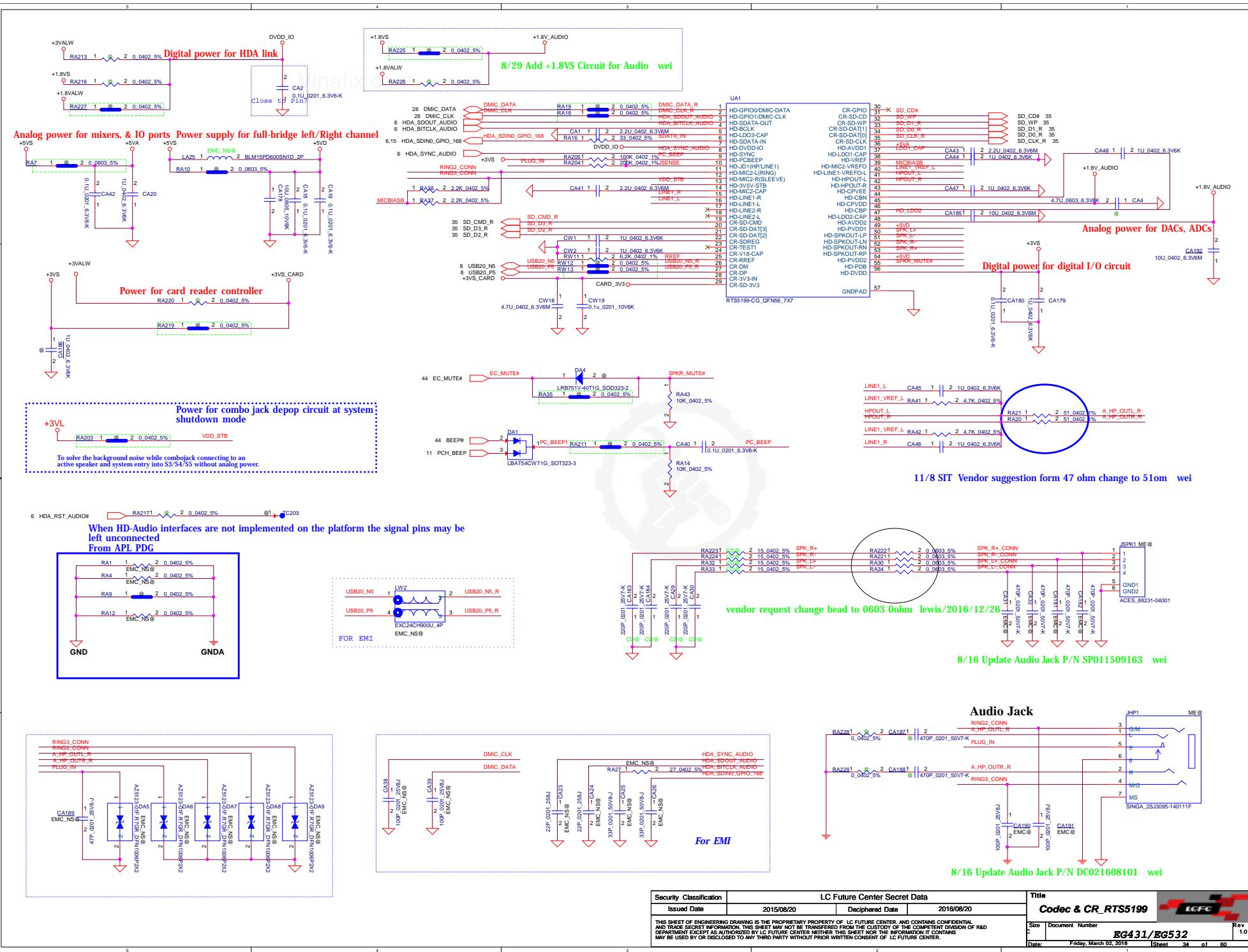
FOR ESD

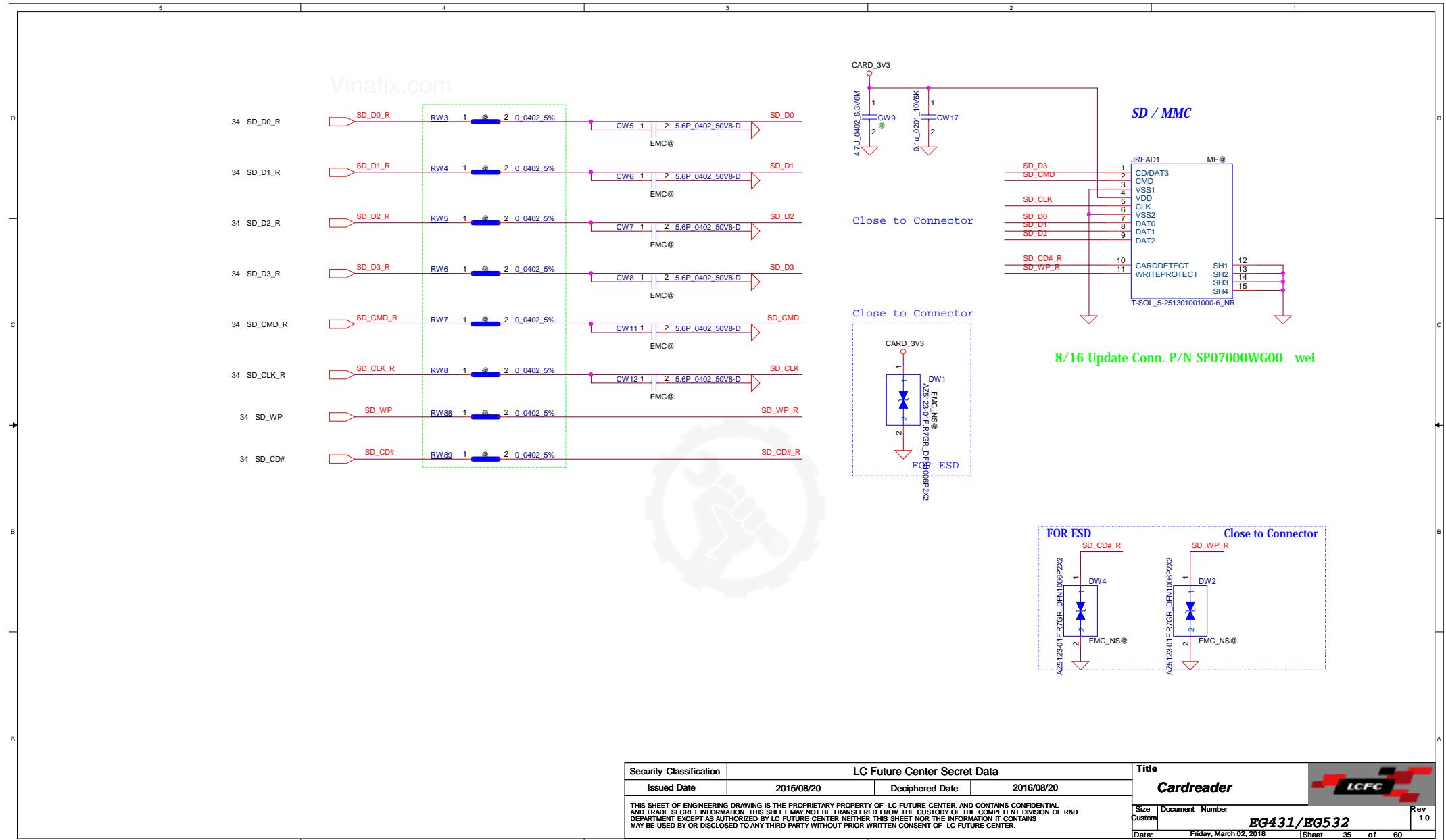
| Security Classification | LC Future Center Secret Data | | Title |
|---|------------------------------|-----------------|--------------------|
| Issued Date | Deciphered Date | Deciphered Date | LC3.0&USB2.0 CONN. |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THE INFORMATION CONTAINED HEREIN IS UNPUBLISHED PROPRIETARY INFORMATION, WHICH MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | |
| Size | Document Number | Rev | EG431/EG532 |
| Date: | Friday, March 02, 2018 | Sheet | 31 of 60 |



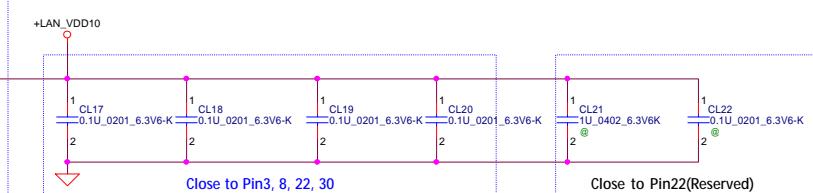
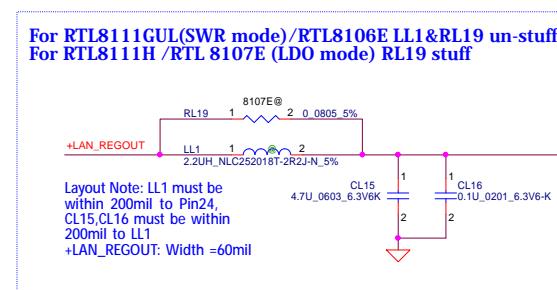
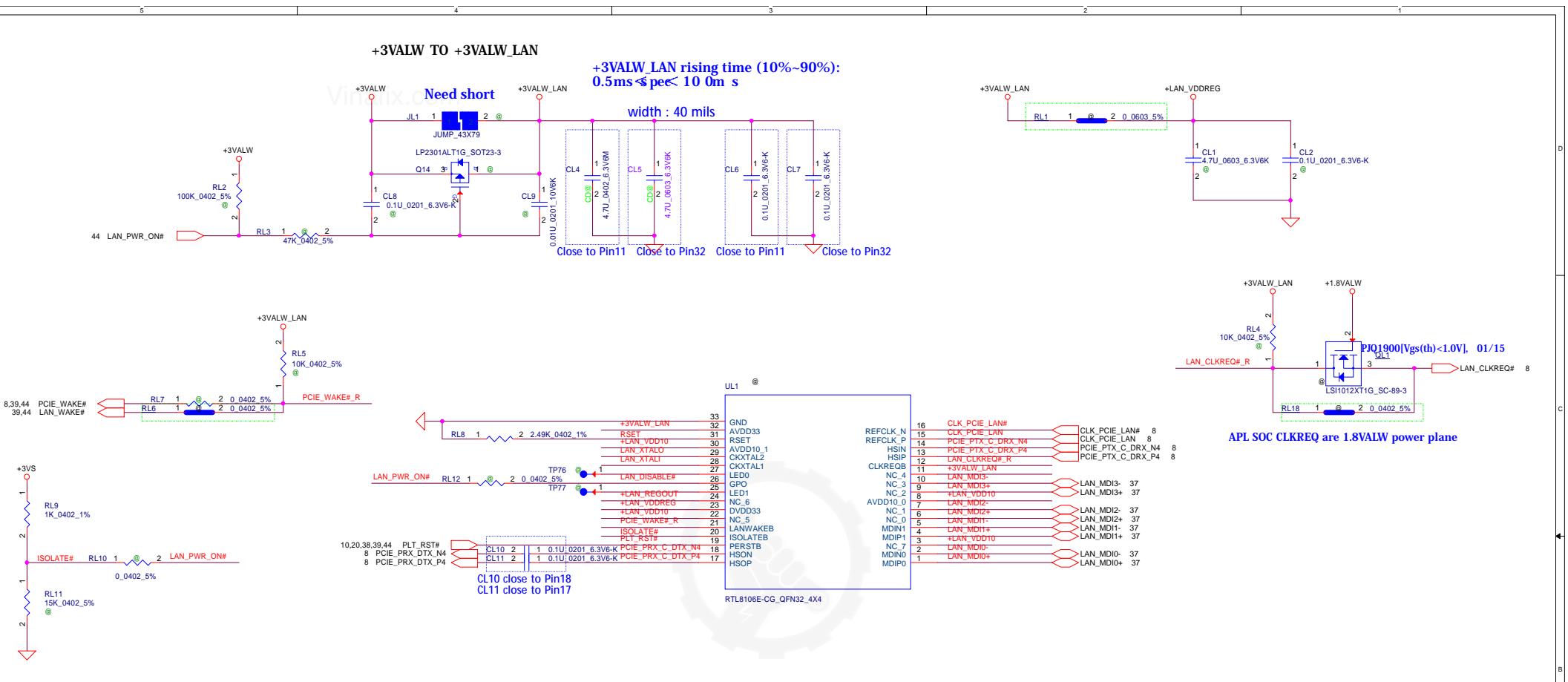


| | | | | | | |
|--|------------------------------|-----------------|------------|-------|-----------------|---|
| Security Classification | LC Future Center Secret Data | | | Title | Blank | |
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/05 | LCFC | | Rev 1.0 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. NO PARTS OF THIS SHEET MAY BE COPIED OR REPRODUCED. THIS SHEET CONTAINS INFORMATION WHICH IS THE PROPERTY OF LC FUTURE CENTER. IT MAY NOT BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | Date: Friday, March 02, 2018 Sheet 33 of 80 |
| EG431/EG532 | | | | | | |



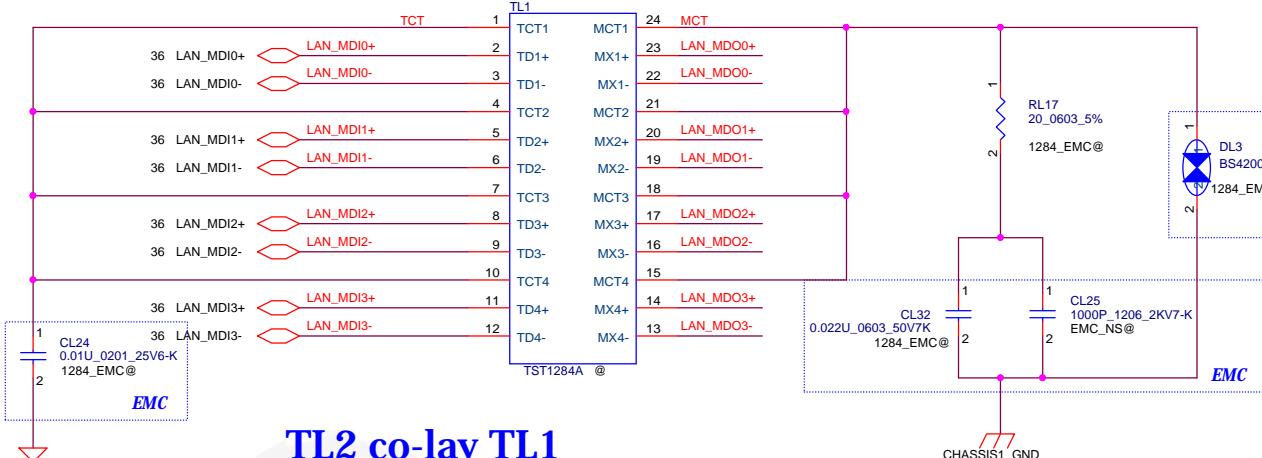
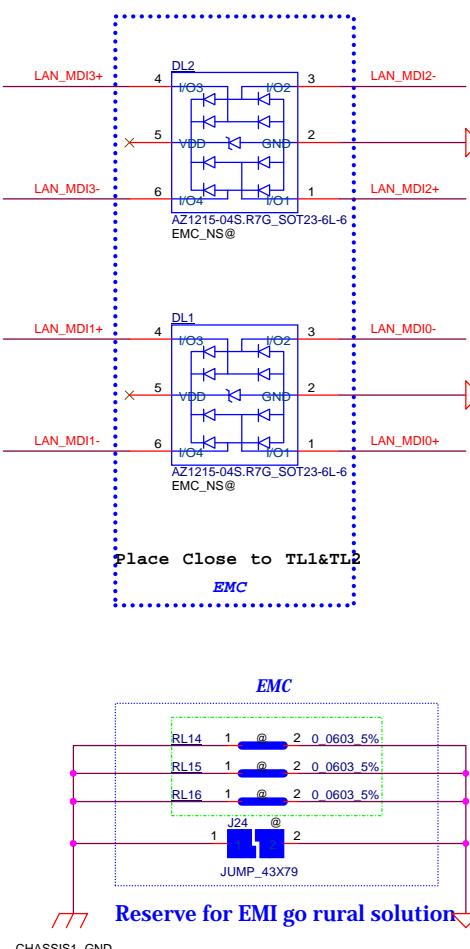


| Security Classification | LC Future Center Secret Data | | | Title | | |
|---|------------------------------|-----------------|------------------------|------------|-------------|---------|
| Issued Date | 2015/08/20 | Deciphered Date | 2016/08/20 | Cardreader | EG431/EG532 | Rev 1.0 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT, EXCEPT AS APPROVED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document Number | Date: | Friday, March 02, 2018 | Sheet | 35 | of 60 |

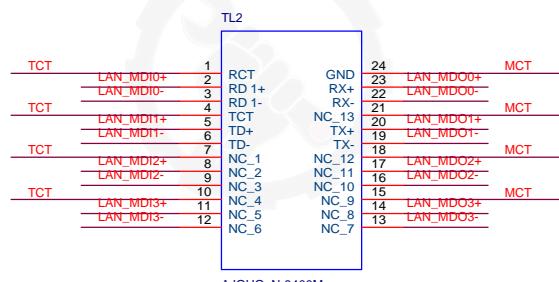


| | | | | | | | | | | | |
|---|------------------------------|-----------------|------------|--------|----------------------------|-------|---|-------|----|----|----|
| Security Classification | LC Future Center Secret Data | | | Title | <i>LAN_RTL8106E</i> | |  | | | | |
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/05 | Size | Document Number | Rev | 1.0 | | | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT TO ANY OTHER DIVISION OR CENTER OF LC FUTURE CENTER. NO PART OF THIS SHEET CONTAINS INFORMATION WHICH MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Custom | <i>EG431/EG532</i> | Date: | Friday, March 02, 2018 | Sheet | 36 | of | 60 |

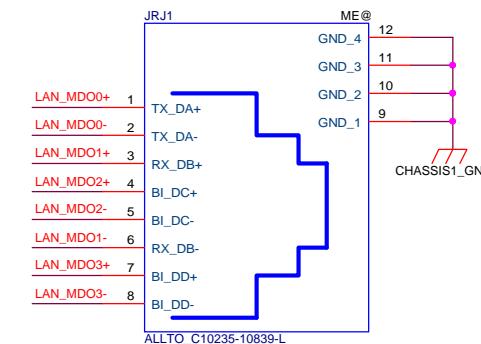
**change TL1 PN SP050008C00 to SP050009G00;
TL1 is SP050008C00 footprint**



TL2 co-lay TL1



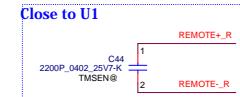
Need short



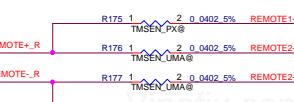
8/16 Update RJ45 P/N DC021608091 wei

| | | | | | |
|--|------------------------------|-----------------|-------------|-----------------|---|
| Security Classification | LC Future Center Secret Data | | | Title |  |
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/05 | LAN_Transformer | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | |
| Size | Document Number | B | EG431/EG532 | Rev | 1.0 |
| Date: | Friday, March 02, 2018 | Sheet | 37 | of | 60 |

Thermal Sensor

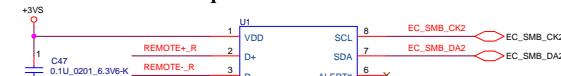


Set Thermal Sensor as a BOM Structure

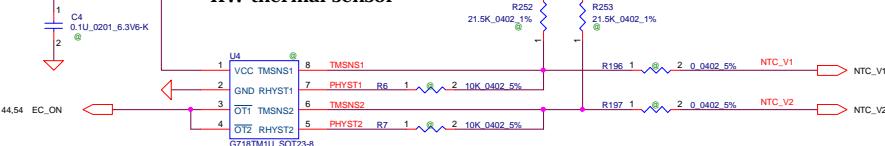


REMOTE+/- R, REMOTE1+/-, REMOTE2+/-:
Trace width/space:10/10 mil
Trace length:<8"

SMSC thermal sensor placed near DIMM



HW thermal sensor



Over temperature threshold:
RSET=3*RTMH

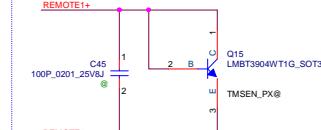
92+/-30C

Hysteresis temperature threshold.

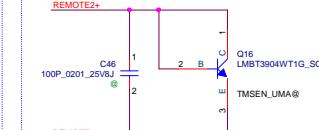
RHYST=(RSET*RTML)/(3*RTML-RSET)

56+/-30C

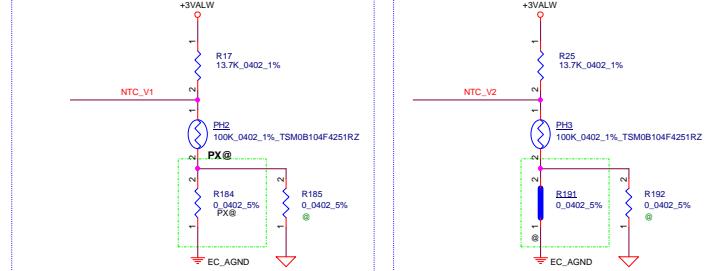
Near GPU&VRAM



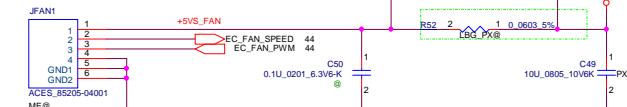
Near CPU Core



Near CPU

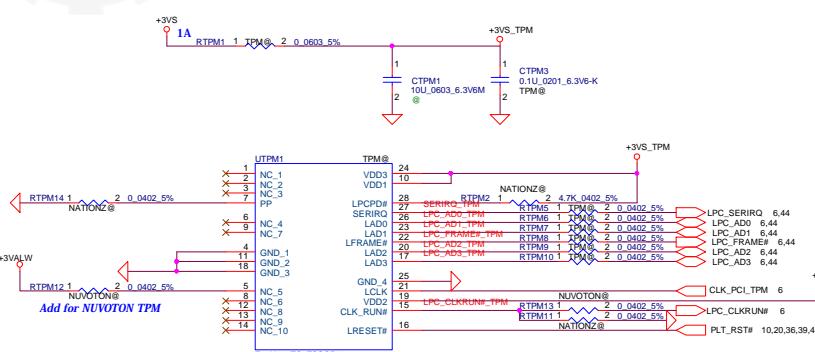


FAN Conn



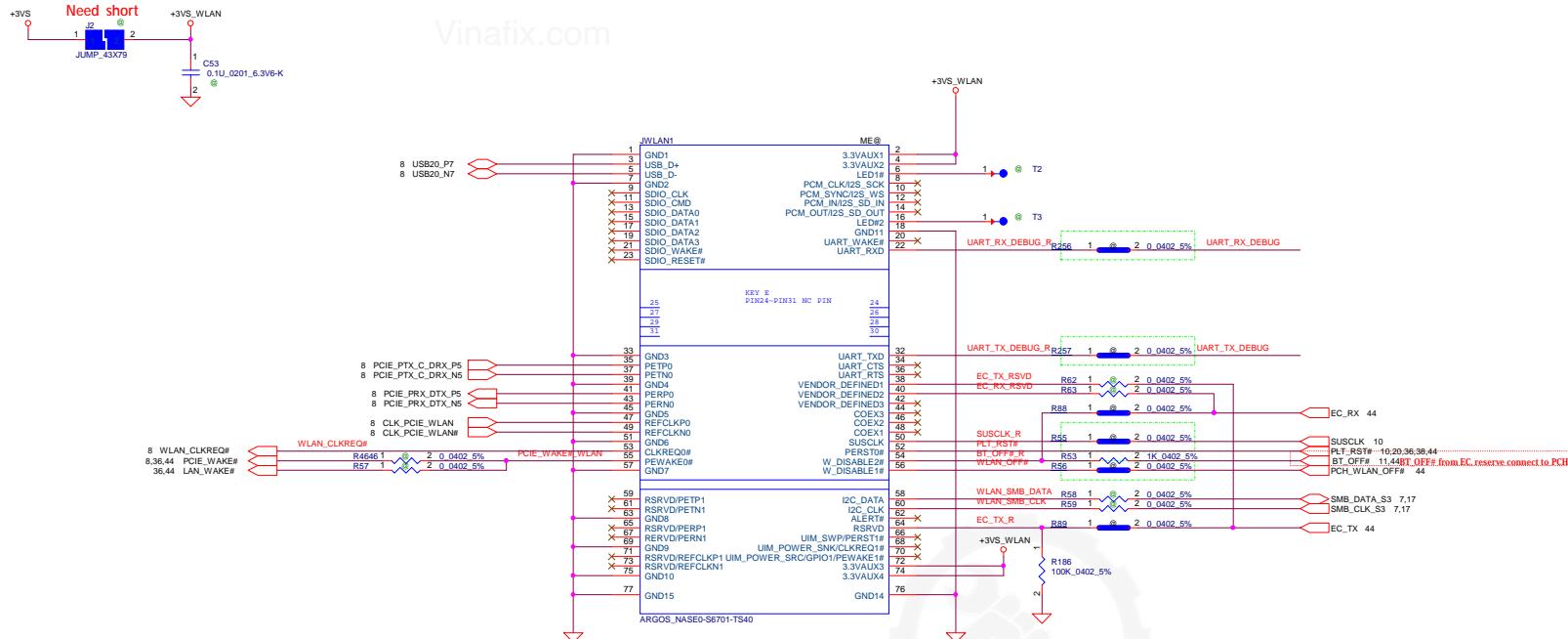
Update FAN conn. footprint to SP020008X0J
SP020012200 main source is SP020008X0J
Lewis 2016/10/14

TPM

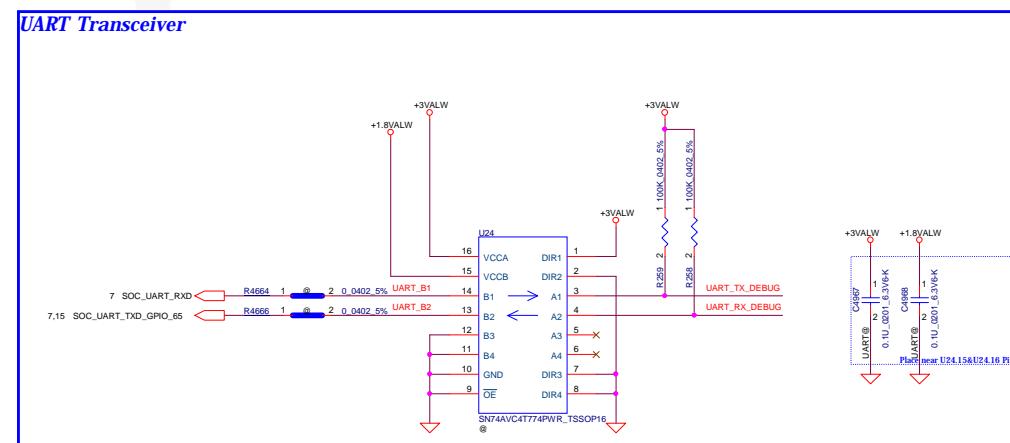


| Security Classification | LC Future Center Secret Data | | Title |
|---|------------------------------|-------|-------------|
| Issued Date | Deciphered Date | Rev | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THE INFORMATION CONTAINED HEREIN IS UNPUBLISHED PROPRIETARY INFORMATION, WHICH MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | |
| C | Document Number | | EG431/EG532 |
| Date: | Friday, March 02, 2018 | Sheet | 38 of 80 |

Mini-Express Card(WLAN/WiMAX)



**8/16 Update Conn. P/N SP070013200 we
Copy DG421 symbol**



| | | | | | | | | | | | |
|--|------------------------------|--|-----------------|------------|-----------|----|--|--|--|--|--|
| Security Classification | LC Future Center Secret Data | | | Title | NGFF WLAN | | | | | | |
| Issued Date | 2013/08/08 | | Deciphered Date | 2013/08/05 | | | | | | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE TRADE SECRET OF THE COMPANY. THIS SHEET IS THE PROPERTY OF A DIVISION OF R&D DEPARTMENT. EXCEPT AS AUTHORIZED BY LC FUTURE CENTER, NEITHER THIS SHEET NOR ANY INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | | | | | | |
| Size C | Document Number | | EG431/EG532 | | | | | | | | |
| Date: | Friday, March 02, 2018 | | Sheet | 38 | of | 60 | | | | | |

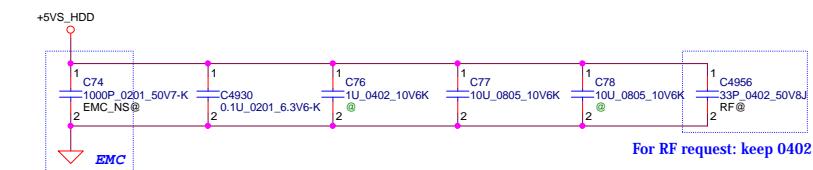
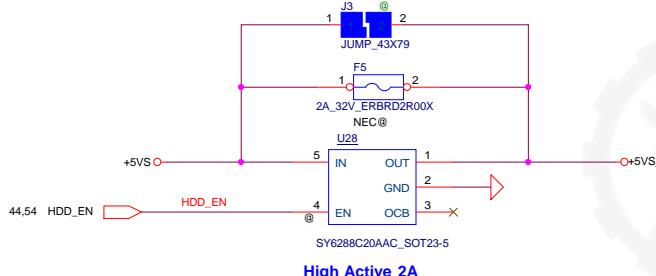
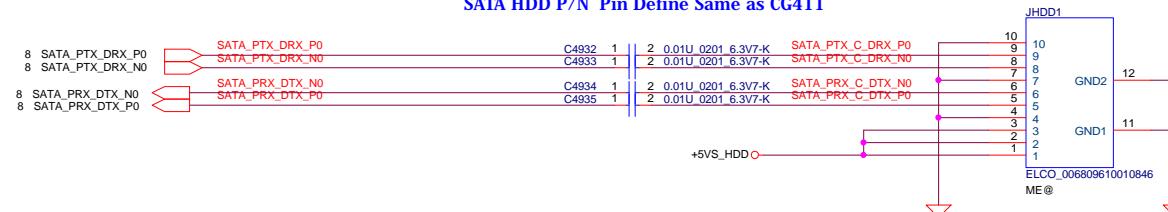
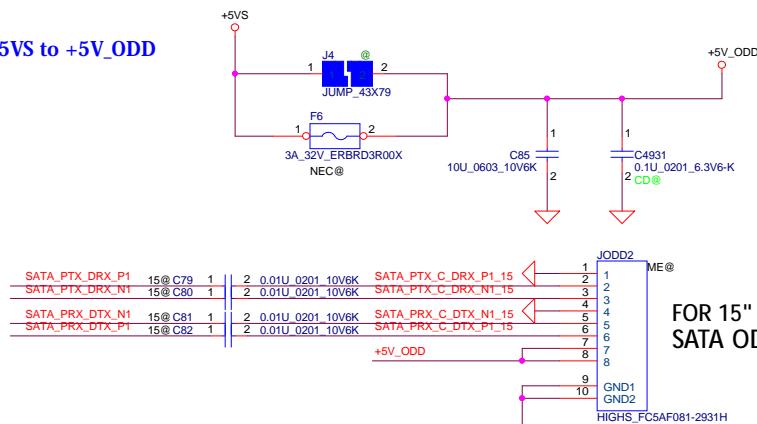


| Security Classification | LC Future Center Secret Data | | | Title | | |
|--|------------------------------|-----------------|------------------------|--------|-----------------|-------|
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/05 | Blank | Document Number | Rev |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Custom | EG431/EG532 | 1.0 |
| | | Date: | Friday, March 02, 2018 | Sheet | 40 | of 60 |

Vinafix.com



| Security Classification | LC Future Center Secret Data | | | Title | LCFC | |
|--|------------------------------|-----------------|------------|-------|------------------------|----------------|
| Issued Date | 2014/12/11 | Deciphered Date | 2015/12/11 | Blank | EG431/EG532 | Rev 1.0 |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | Size | Document Number | Custom |
| | | | | Date: | Friday, March 02, 2018 | Sheet 41 of 60 |

SATA HDD Conn.**SATA HDD P/N Pin Define Same as CG411****+5VS to +5V_ODD**

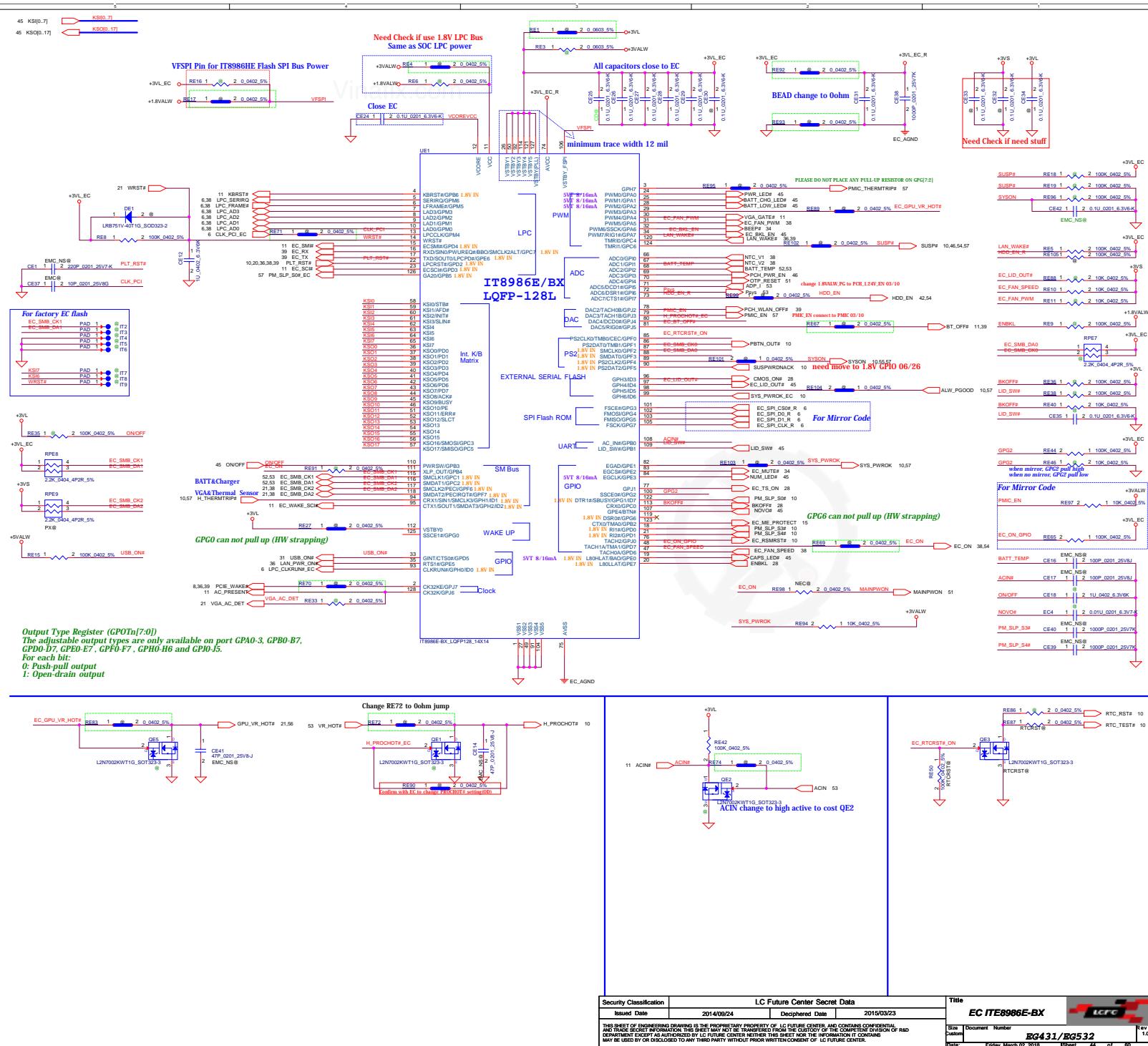
8/16 Update Conn. P/N SP01001YV00 wei



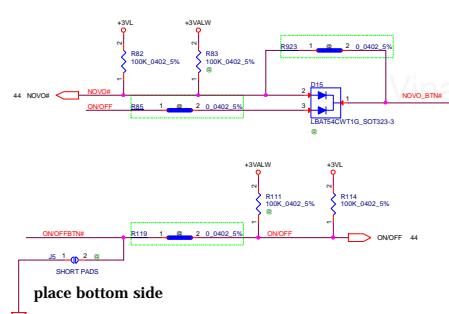
| Security Classification | | LC Future Center Secret Data | | Title | |
|--|------------------------|------------------------------|-------------|--------------|-----|
| Issued Date | Deciphered Date | 2013/08/08 | 2013/08/05 | HDD/ODD CONN | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | |
| Size | Document Number | Custom | EG431/EG532 | Rev | 1.0 |
| Date: | Friday, March 02, 2018 | Sheet | 42 | of | 60 |



| Security Classification | | | | LC Future Center Secret Data | | | | Title | | | | | | | | | |
|--|------------------------|------------|----------|------------------------------|---|------------|---|-------|---|---|---|--|--|--|--|--|--|
| Issued Date | | 2013/08/08 | | Deciphered Date | | 2013/08/05 | | Blank | |  Rev 1.0 | | | | | | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | | | | | | | | | | | | |
| Size | Document Number | Custom | Rev 1.0 | EG431/EG532 | | | | | | | | | | | | | |
| Date: | Friday, March 02, 2018 | Sheet | 43 of 60 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | |



ON/OFF switch



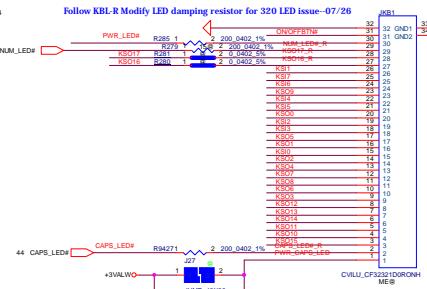
Novo button

8/31 Update the P/N SN100008W00 wei

8/16 Del Power Button wei

K/B Connector

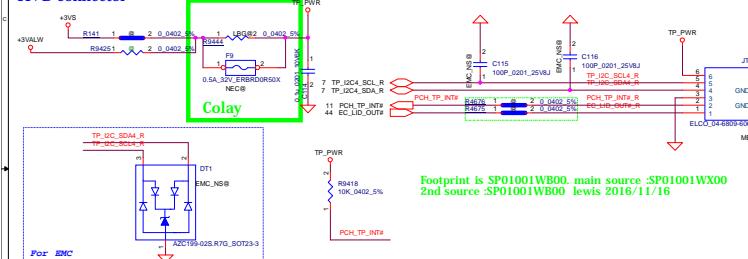
Follow KBL-R Modify LED damping resistor for 320 LED issue-07/26



8/23 PWR LED function under check

8/23 PWR LED function under check

TP/B Connector

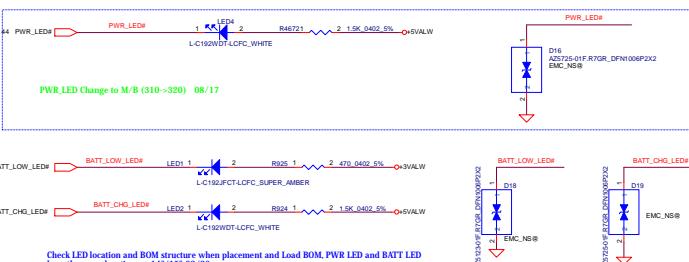


Finger Print Connector

To be confirm Pin define

8/23 Update FG Conn. P/N SP01001Y00 wei

LED

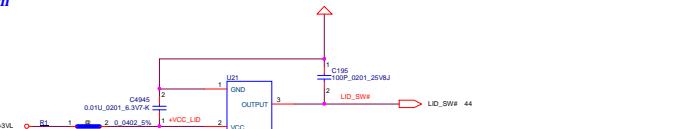


KB Backlight Connector

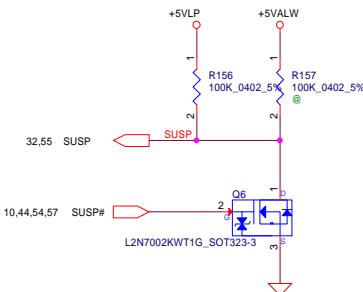
| Security Classification | LC Future Center Secret Data | | Title |
|-------------------------|------------------------------|----------------|-------------------------|
| Issued Date | Declassified Date | Control Number | Rev |
| 2013/08/08 | 2013/08/05 | EKA31/EKG532 | KBD/PWR/IO/LED/TP Conn. |
| 2013/08/08 | 2013/08/05 | EKA31/EKG532 | Rev 1.0 |

THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE CONFIDENTIAL DIVISION OF RAD ENGINEERING AND DESIGN INC. (EKA) UNLESS APPROVED IN WRITING BY THE CONFIDENTIAL DIVISION. THIS SHEET MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.

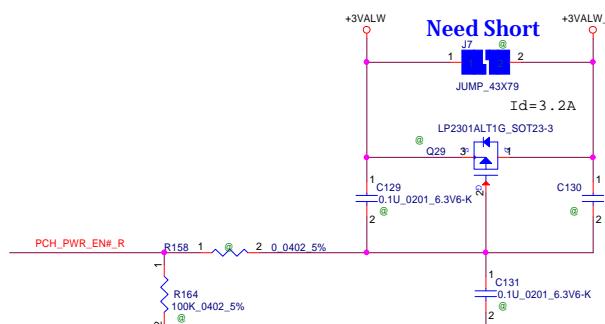
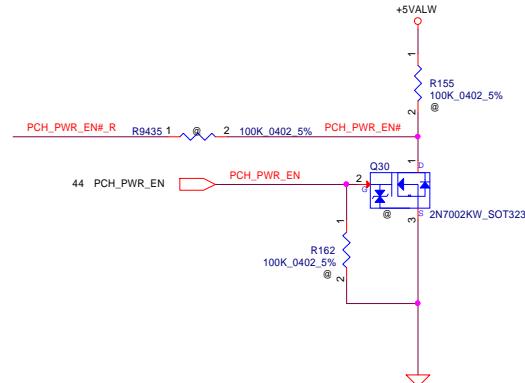
LID Switch



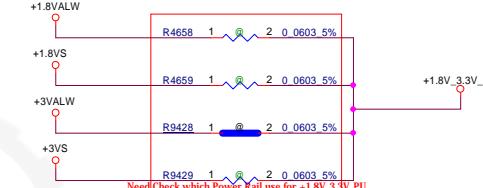
Delete +5VS/+3VS Load Switch



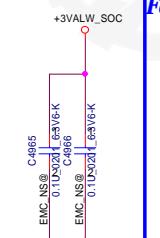
+3VALW to +3VALW_SOC



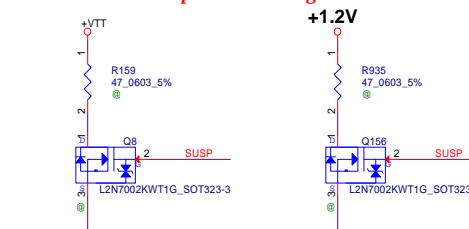
+1.8V_3.3V_PU Power Rail for 1.8/3.3 Select by Soft Strap



For DisCharge



Need Check with power discharge



LC Future Center Secret Data

Issued Date 2013/08/15 Deciphered Date 2013/08/15

THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.

Title

DC V TO VS INTERFACE



EG431/EG532

Rev 1.0

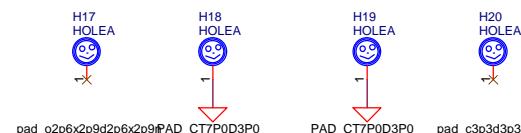
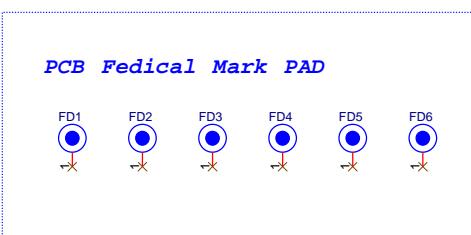
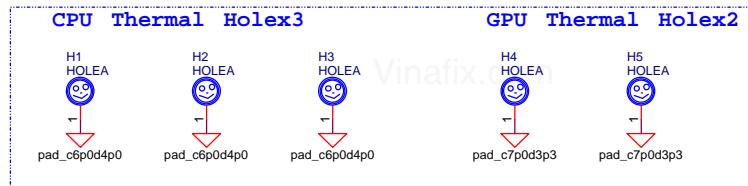
Size

Document Number

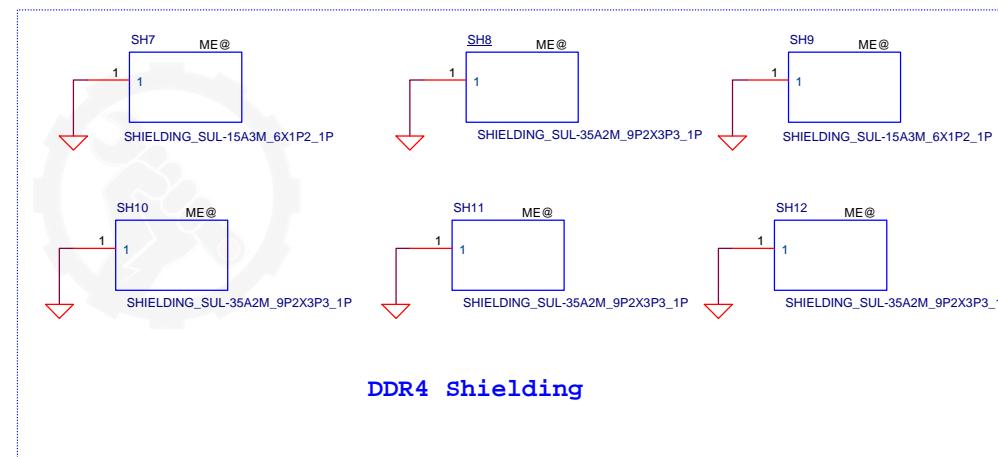
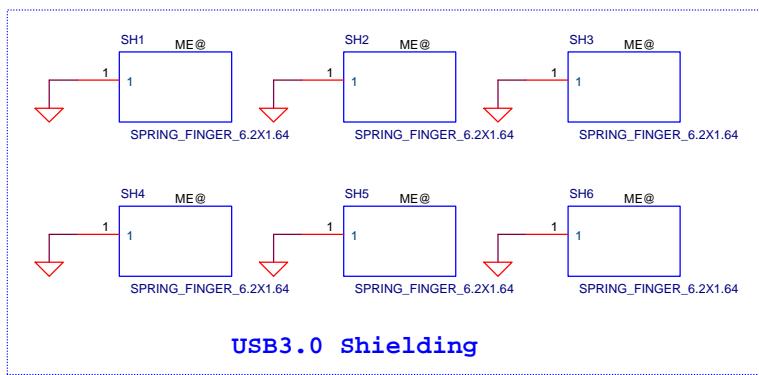
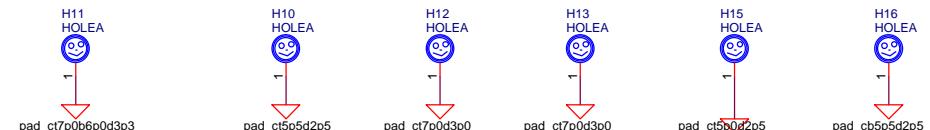
Custom

Date:

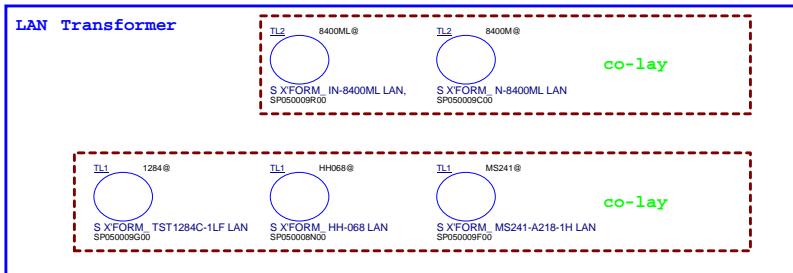
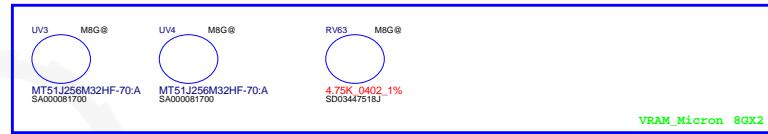
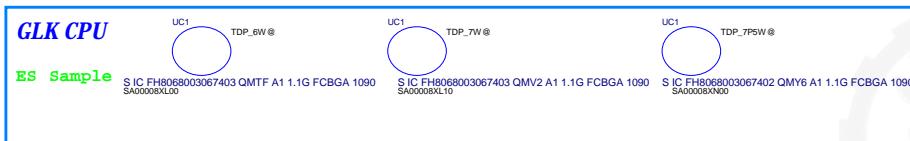
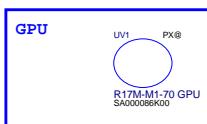
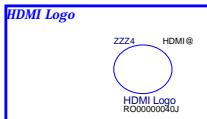
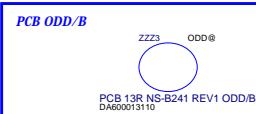
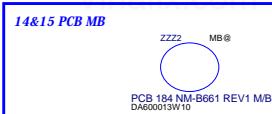
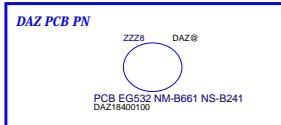
Friday, March 02, 2018 Sheet 46 of 60



WLAN Standoff



| Security Classification | LC Future Center Secret Data | | | Title | | |
|--|------------------------------|-----------------|------------|-------|------|-----|
| Issued Date | 2013/08/08 | Deciphered Date | 2013/08/05 | Hole | LCFC | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document Number | | | | | Rev |
| B | | | | | | 1.0 |
| Date: | Friday, March 02, 2018 | Sheet | 47 | of | 60 | |

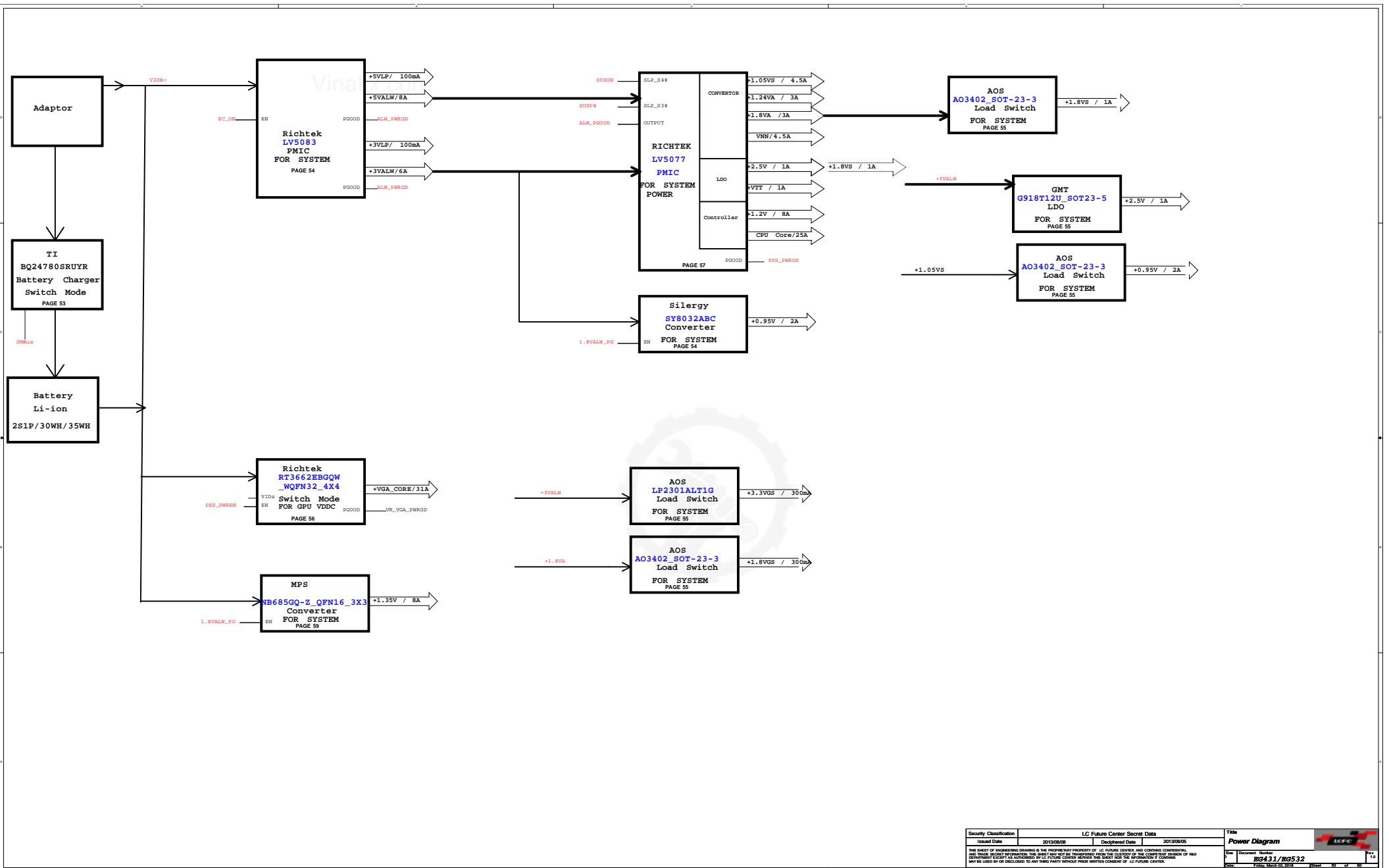


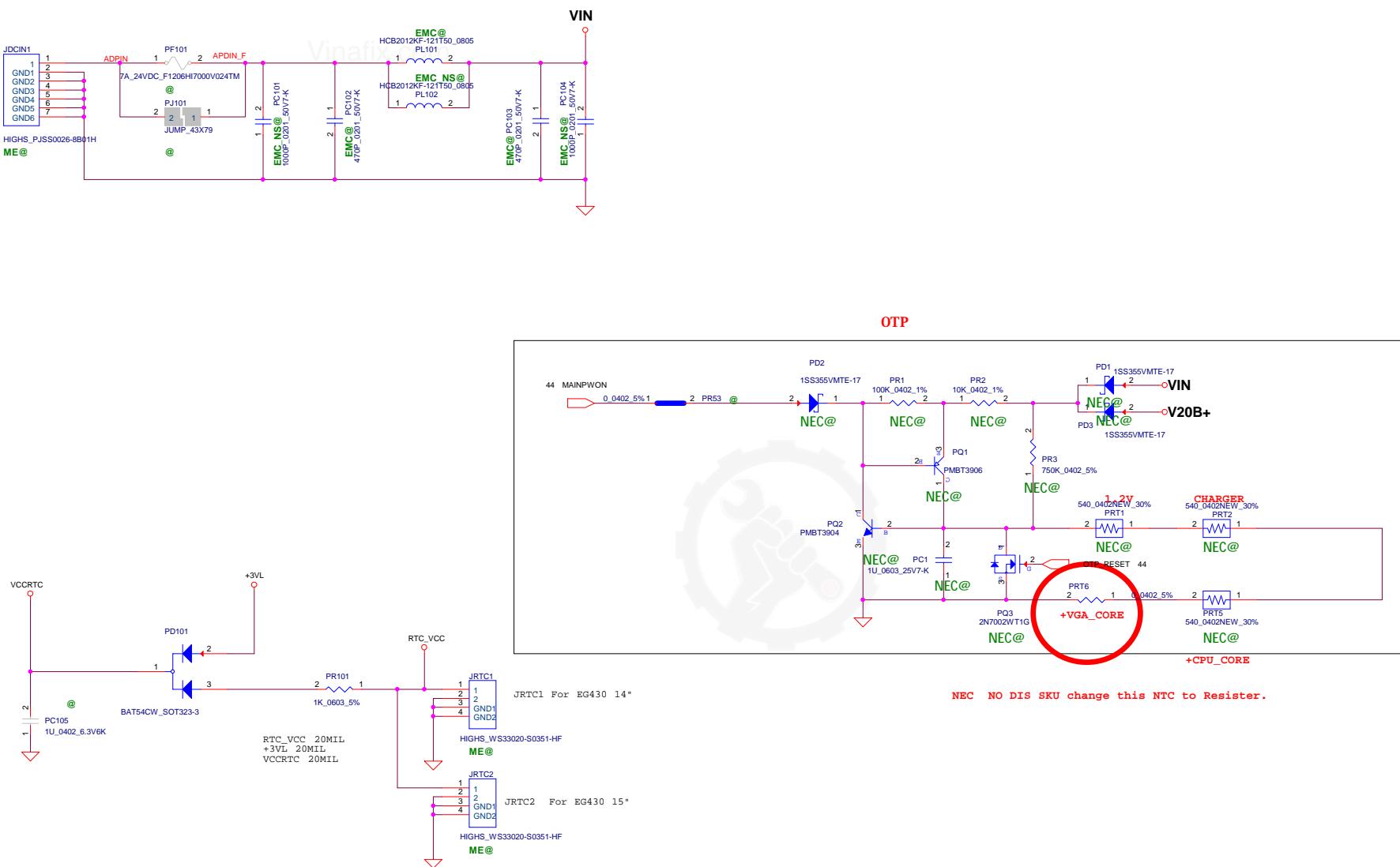
VRAM ID config

| Memory Type | VRAM ID PS.3[3:1] | PU resistor RV63 | PD resistor RV70 |
|-------------|---------------------------|------------------|------------------|
| 256Mx16 | Hynix H5GC8H24MJR-ROC | 100 | 4.53K |
| | Micron MT51J256M32HF-70:A | 111 | 4.75K |
| | Samsung K4G80325FB-HC28 | 110 | 3.4K |
| | 000 | NC | 4.75K |
| | 010 | 4.53K | 2K |
| | 001 | 8.45K | 2K |

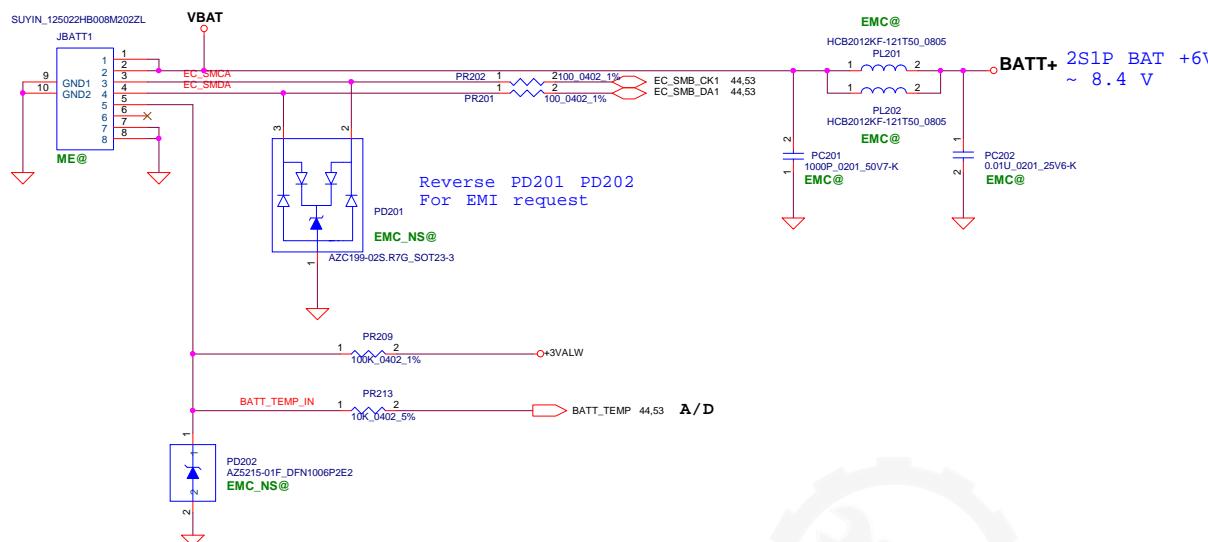


| Security Classification | | | | LC Future Center Secret Data | | | | Title | | | | | | | |
|-------------------------|-----------------|------------|--|------------------------------|--|------------|--|-------|------------------------|---|----------|--|--|--|--|
| Issued Date | | 2013/08/08 | | Deciphered Date | | 2013/08/05 | | Blank | |  | | | | | |
| Size | Document Number | | | | | | | | | Rev | 1.0 | | | | |
| Custom | EG431/EG532 | | | | | | | Date: | Friday, March 02, 2018 | Sheet | 49 of 60 | | | | |

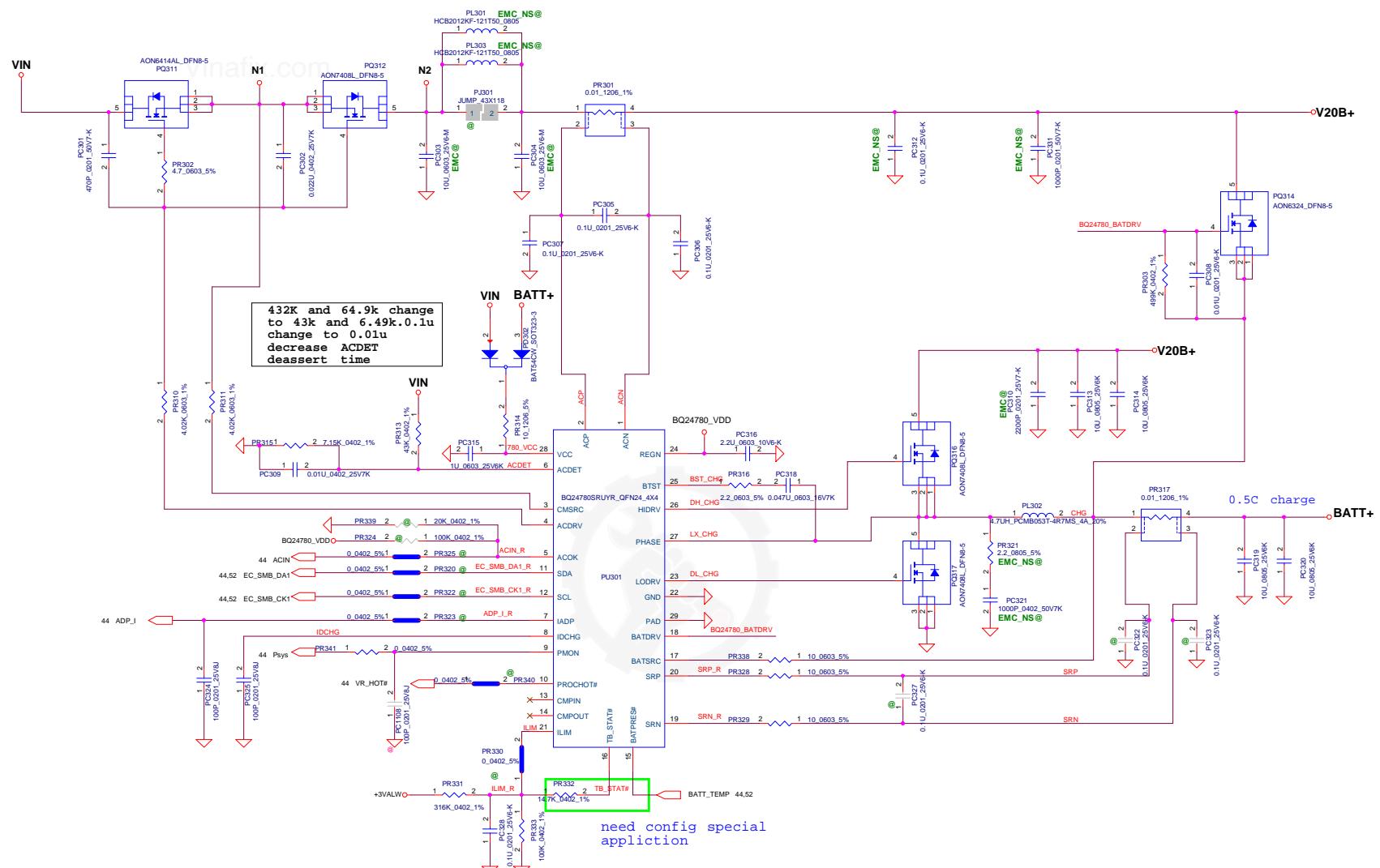




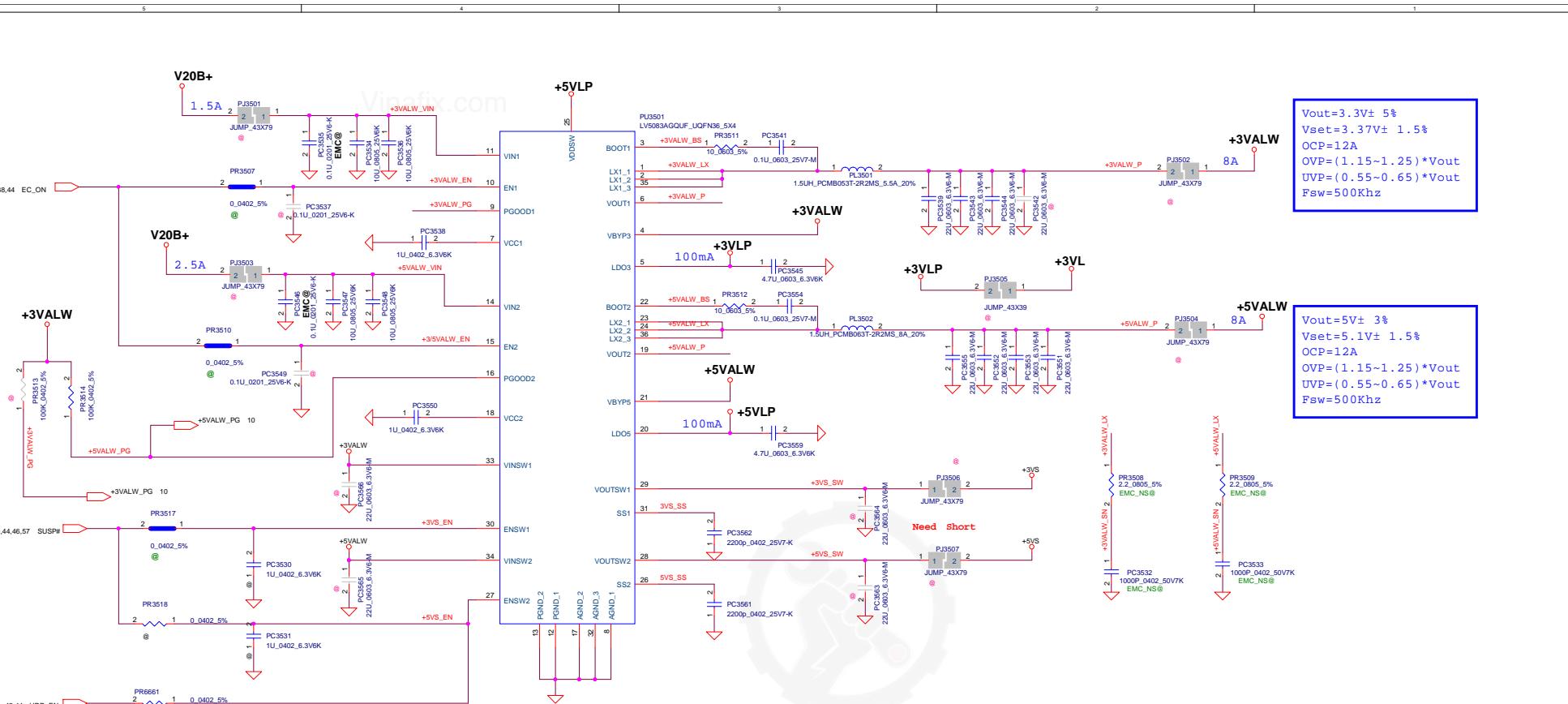
| Security Classification | LC Future Center Secret Data | | | Title | PWR-DCIN / RTC charger |  |
|---|------------------------------|-----------------|------------|-------|------------------------|---|
| Issued Date | 2015/08/20 | Deciphered Date | 2016/08/20 | Size | Document Number | Rev |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Custom | | | | | EG431/EG532 | 1.0 |
| Date | Friday, March 02, 2018 | Sheet | 51 | of | 60 | |



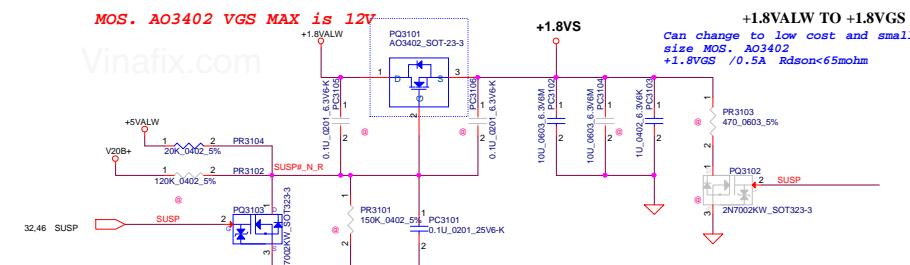
| Security Classification | | LC Future Center Secret Data | | | Title | |
|--|------------------------|------------------------------|------------|----------------------|-------|------|
| Issued Date | 2015/08/20 | Deciphered Date | 2016/08/20 | PWR-BATTERY CONN/OTP | | LCFC |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document Number | Rev | | | | |
| Custom | | 1.0 | | | | |
| | EG431/EG532 | | | | | |
| Date: | Friday, March 02, 2018 | Sheet | 52 | of | 60 | |



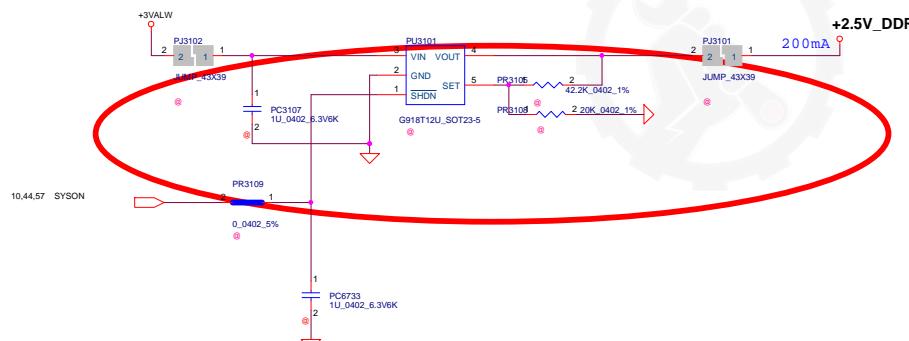
| | | | | | | |
|--|------------------------------|--------|----|-------------|---|-----|
| Security Classification | LC Future Center Secret Data | | | Title | | |
| Issued Date | 2015/08/20 | | | PWR-CHARGER |  | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THAT SHEET NOR THE INFORMATION CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document | Number | | | | Rev |
| C | | | | EG431/EG532 | | 1.0 |
| Date: | Friday, March 02, 2018 | Sheet | 53 | of | 60 | |



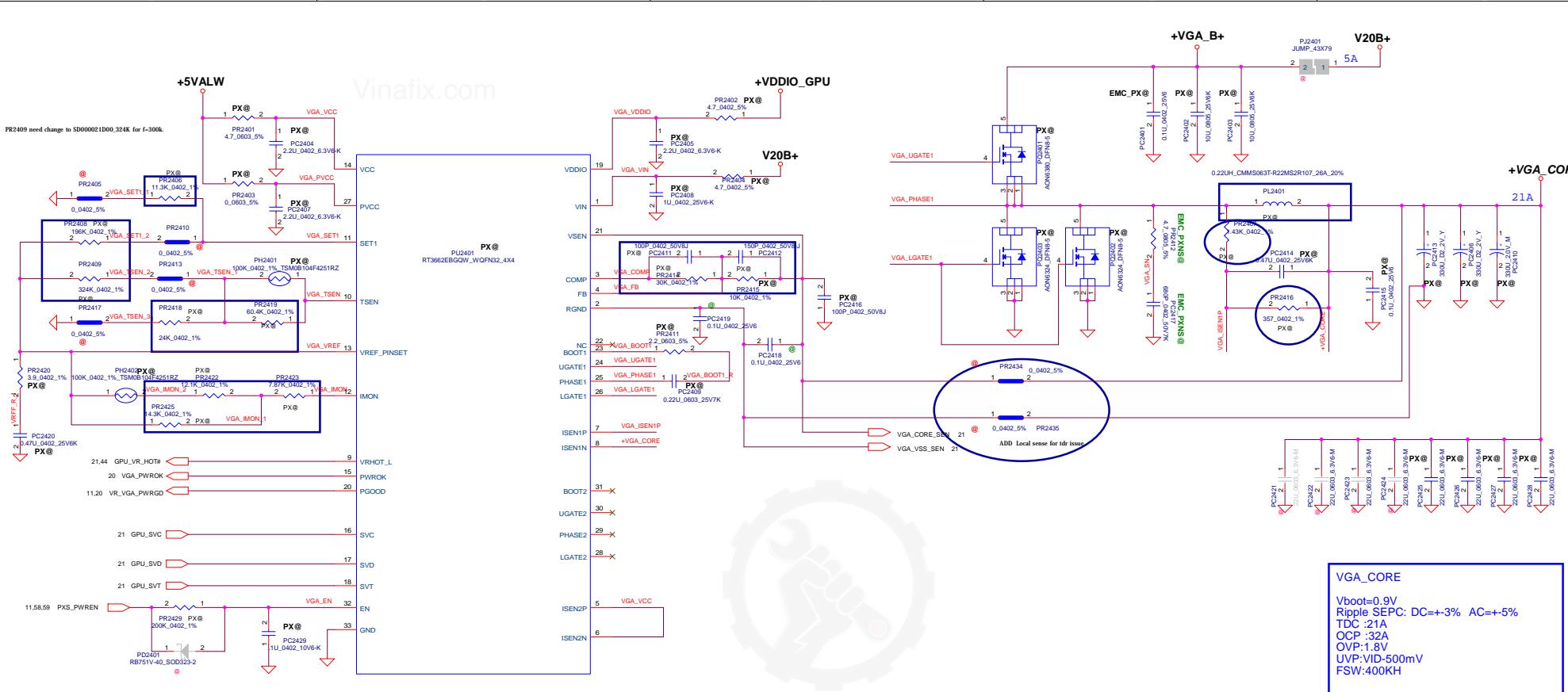
| | | | | | | |
|---|------------------------------|--------|----|-----------------|---|-----|
| Security Classification | LC Future Center Secret Data | | | Title | | |
| Issued Date | 2015/08/20 | | | PWR_3VALV/5VALV |  | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER. CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THIS SHEET OF DRAWING IS FOR INTERNAL USE ONLY. THIS SHEET OF DRAWING CONTAINS INFORMATION WHICH IS THE TRADE SECRET OF LC FUTURE CENTER. THIS SHEET OF DRAWING MAY NOT BE COPIED OR REPRODUCED IN WHOLE OR IN PART. THIS SHEET OF DRAWING MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | |
| Size | Document | Number | | | | Rev |
| S | | | | EG431/EG532 | | 1.0 |
| Date: | Friday, March 02, 2018 | Sheet | 54 | of | 60 | |



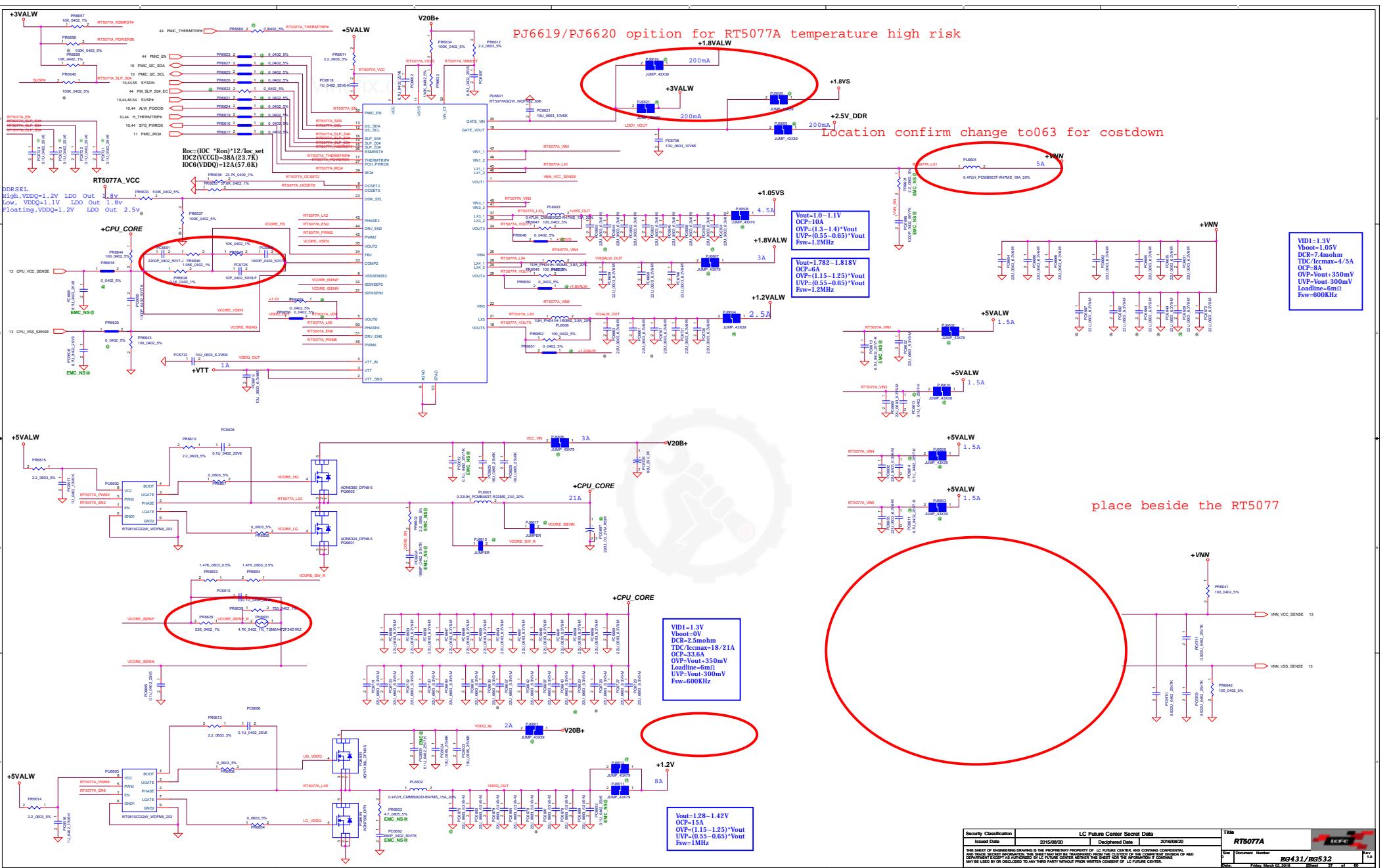
**RT5077A Test high temperature must add this solution
SDV Must Add in bom**

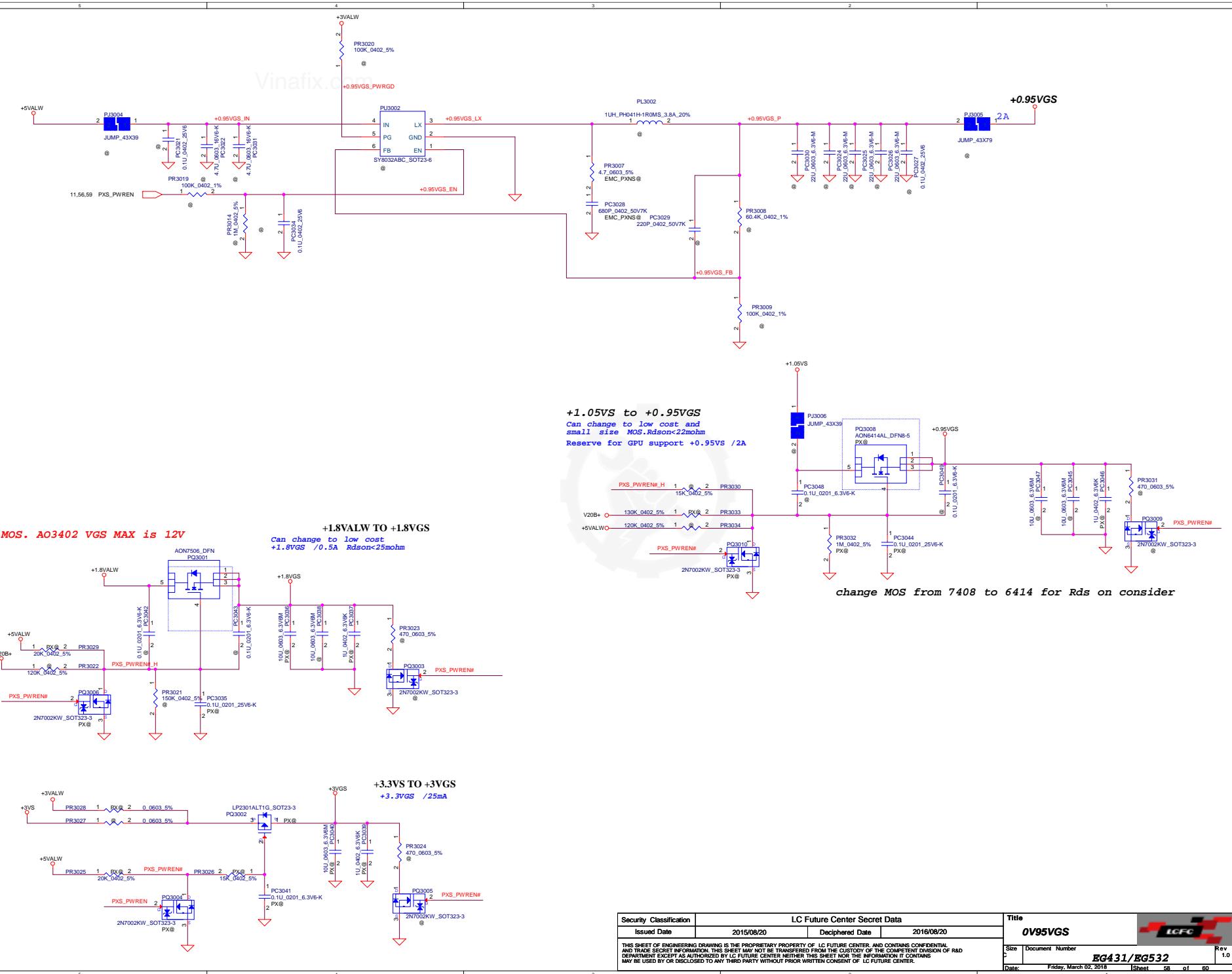


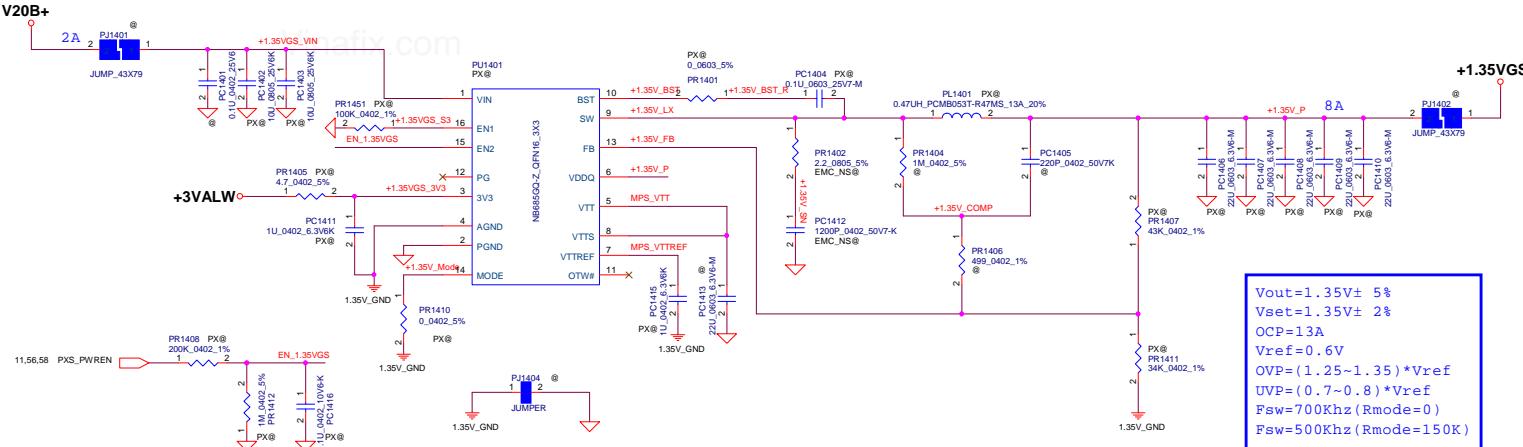
| | | | | | | | |
|---|------------------------------|--------------------|----|-----------------|------------|--|--|
| Security Classification | LC Future Center Secret Data | | | Title | | | |
| Issued Date | 2015/08/20 | | | Deciphered Date | 2016/08/20 | | |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE TRADE SECRET OF LC FUTURE CENTER. IT IS TO BE KEPT IN A SECURE DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | | | |
| Size | Document Number | | | | Rev | | |
| | | EG431/EG532 | | | 1.0 | | |
| Date | Friday, March 02, 2018 | Spec | 55 | s1 | 60 | | |



| Security Classification | LC Future Center Secret Data | | Title |
|---|------------------------------|------------|------------------|
| Issued Date | Deciphered Date | 2016/08/20 | PWR-VGA_CORE_AMD |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER AS AUTHORIZED, AND MAY NOT BE COPIED, REPRODUCED, OR DISCLOSED TO ANY THIRD PARTY, EXCEPT AS AUTHORIZED IN WRITING BY THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THIS SHEET OF ENGINEERING DRAWING MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | |
| Size | Document Number | Rev. 1.0 | |
| Date: | Friday, March 02, 2018 | Sheet | 56 of 60 |







| Security Classification | LC Future Center Secret Data | | | Title |
|--|------------------------------|-----------------|------------|--------------------|
| Issued Date | 2016/08/16 | Deciphered Date | 2017/08/15 | PWR+1.05VGS/+1.35V |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT OF LC FUTURE CENTER. THE INFORMATION CONTAINED HEREIN IS UNPUBLISHED PROPRIETARY INFORMATION WHICH MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | |
| Size | Document Number | | | Rev 1.0 |
| | | | | EG431/EG532 |
| Date: | Friday, March 02, 2018 | Sheet | 59 | of 60 |

20161216:SDV to SIT
 1.p56-p57 add R=100ohm,C=680pF in FB pin;
 2.pr3324 change to 55.4kohm.pr3323 change to 24.3k;
 3.VNN pr3430 from 0ohm change to 20ohm, pr3428 from 210 change to 249ohm,pr3410 from 34k to 35.7k;
 4.Vcore pr3330 from 0ohm change to 20ohm, pr3328 change from 287ohm to 402ohm,pr3327 change from 28.7k to 23.2k, pr3304 change from 24k to 30k;
 5. GPU change 14 items to support AMD request.

20161219:SDV to SIT
 1.DEL 8pcs MLCC for VNN test result.(PC3422,PC3426,PC3434,PC3436,PC3437,PC3432,PC3435,PC3433)

20161226:SDV to SIT
 1. PMIC change 1.24V Vin from 3VALW to 1.8VALW;
 2.change PR2431 from PX@ to @, PR2433 from @ to PX@.
 3.change PR734 to @.

20170104:SDV to SIT
 1. PMIC change LV5075B TO LV5075A



| Security Classification | | LC Future Center Secret Data | | Title | |
|--|------------------------|------------------------------|------------|-------|-------------|
| Issued Date | 2013/08/08 | Diciphered Date | 2014/01/21 | Blank | IGFC |
| THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER. | | | | | |
| Size | Document Number | Custom | Rev | 1.0 | EG431/EG532 |
| Date: | Friday, March 02, 2018 | Sheet | 60 | of | 60 |