



R-Car Starter Kit Premier Schematic

RTP0RC77951SKBX010SA03

S/N: 20201-20400, 25051-25550

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General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

- The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

The state of the product is undefined at the moment when power is supplied.

- The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

Access to reserved addresses is prohibited.

- The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

After applying a reset, only release the reset line after the operating clock signal has become stable.

When switching the clock signal during program execution, wait until the target clock signal has stabilized.

- When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

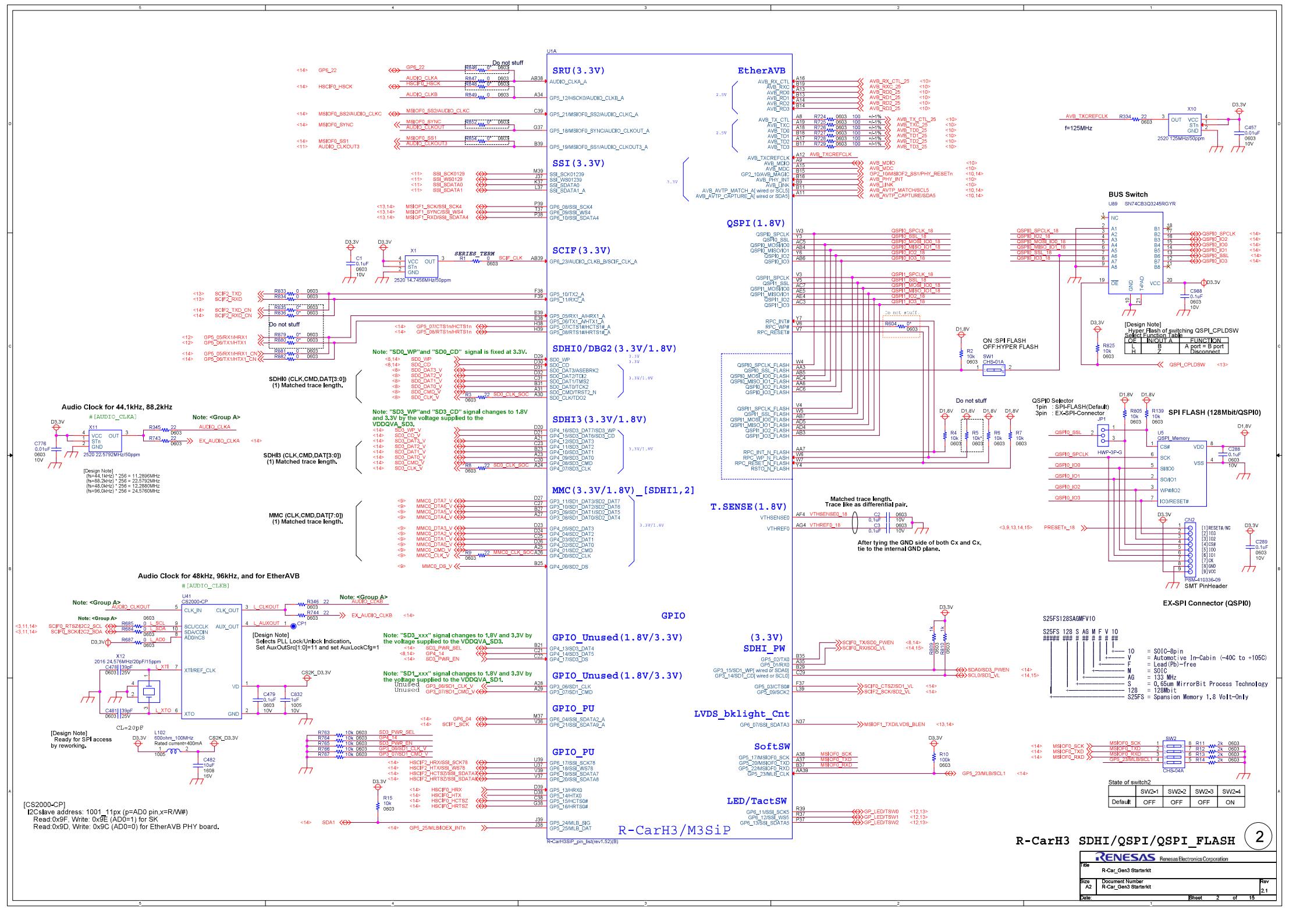
- The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

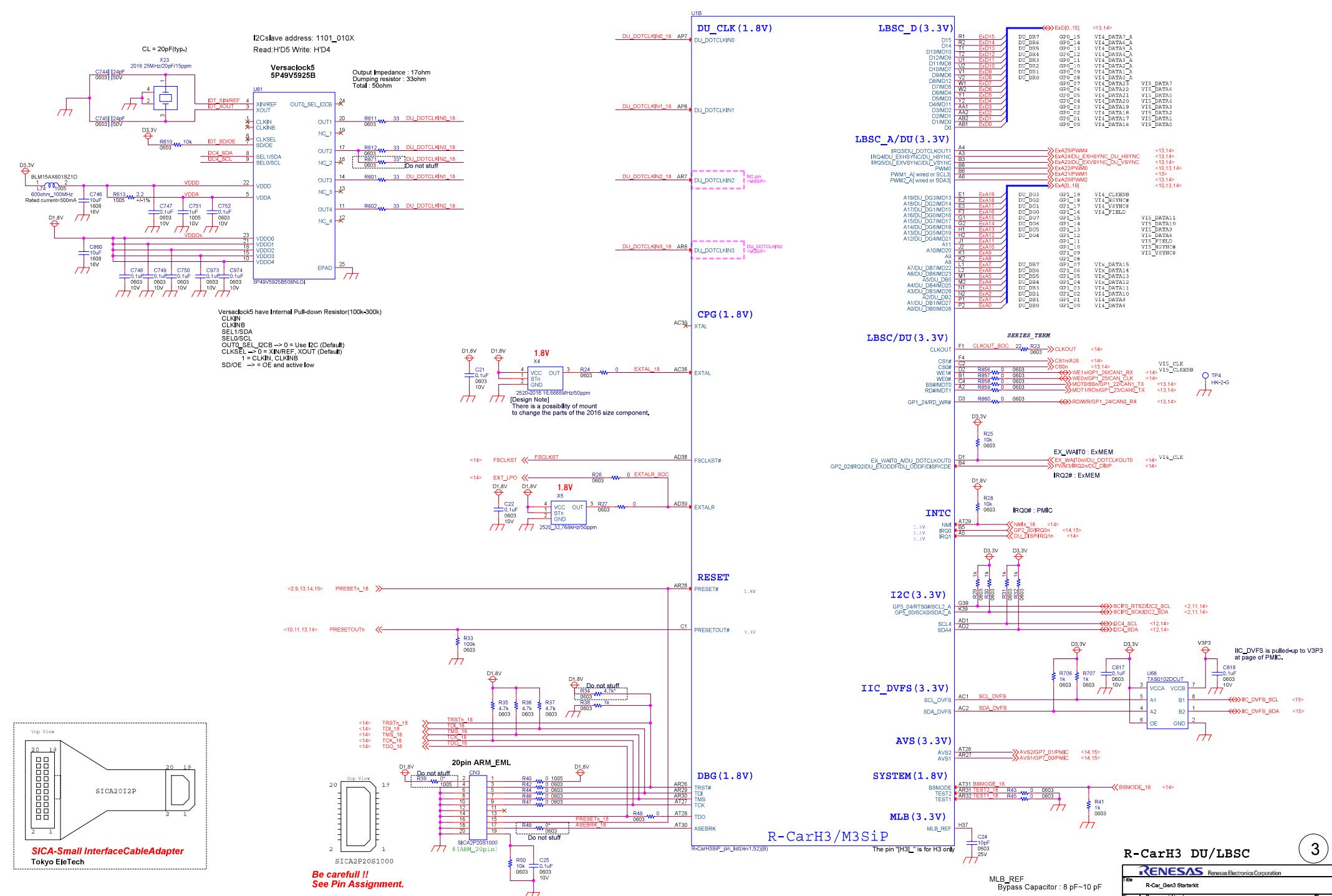
P01: TITLE
P02: R-CarH3_SD/QSPI
P03: R-CarH3_DU/LBSC
P04: R-CarH3_USB/HDMI
P05: R-CarH3_POW1
P06: R-CarH3_POW2
P07: R-CarH3_LPDDR_POW
P08: HDMI_OUT/USB2.0/SD
P09: MMC0
P10: EtherAVB (GbPHY)
P11: Audio
P12: DEBUG_SCIF/LED/TactSW
P13: R-CarH3_Mode_Setting
P14: R-CarH3_Module_I/F
P15: POWER PMIC

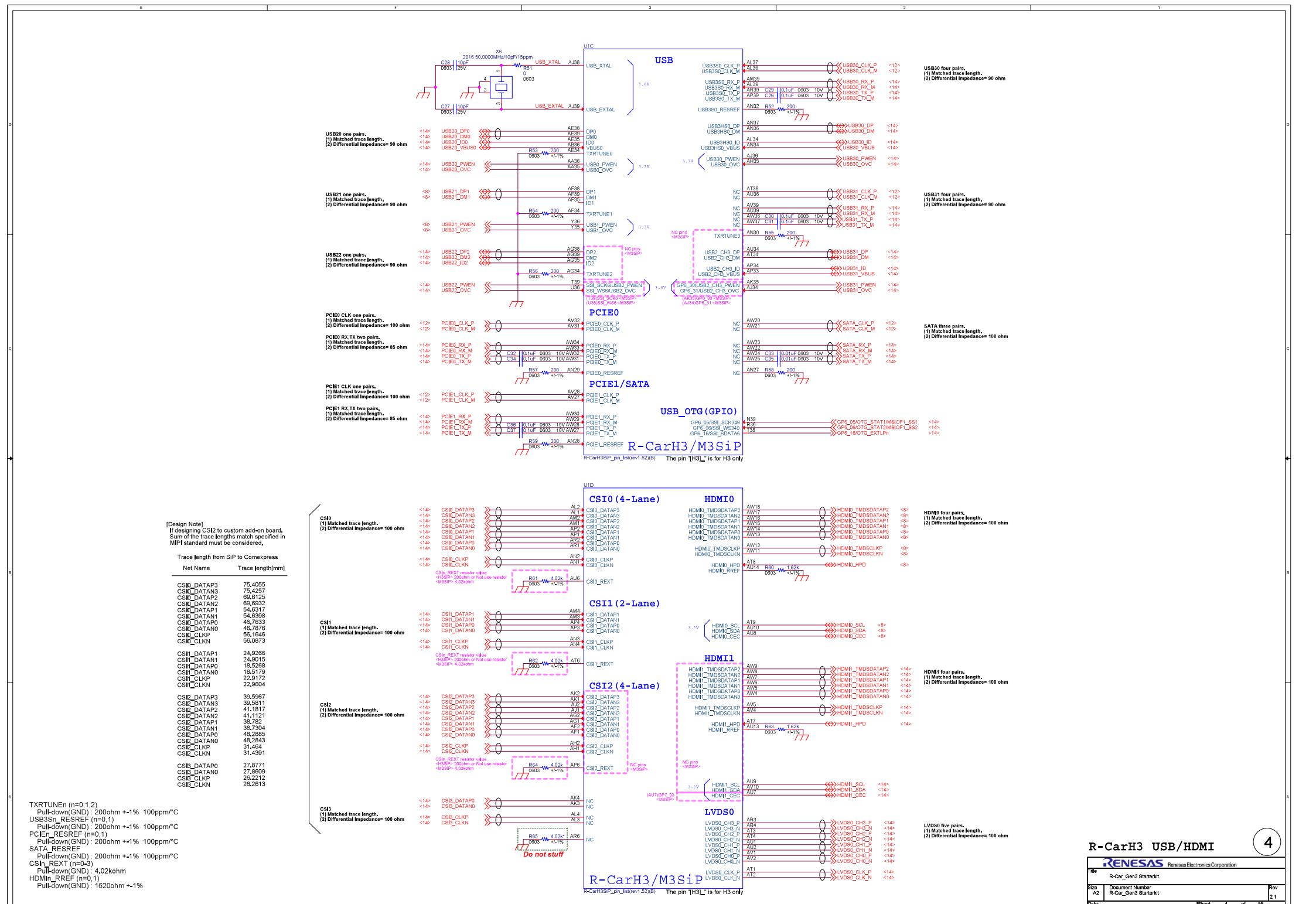
"R-CarH3 System Board "H3 Starter Kit"**H3:RTP0RC77951SKBX010SA03**

Rev.2.1 / PCB rev2.0

R-Car Starter Kit Premier**R-Car H3 v2.0 DDR8GB SK = 20201-20400****R-Car H3 v3.0 DDR8GB SK = 25051-25550**

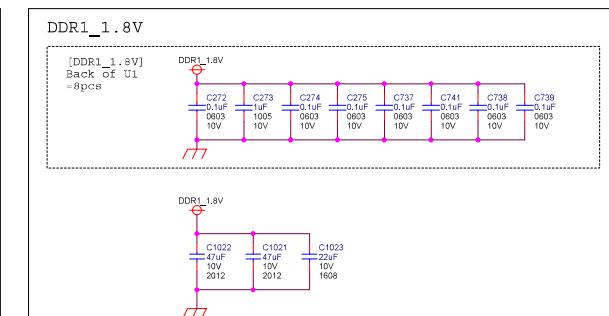
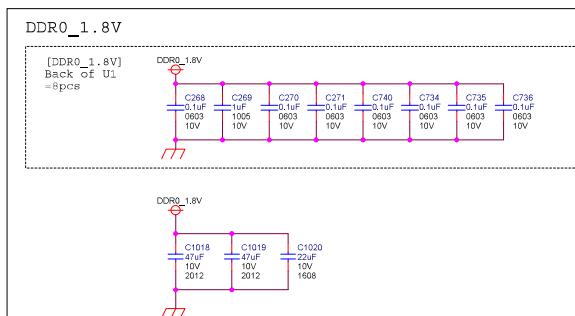
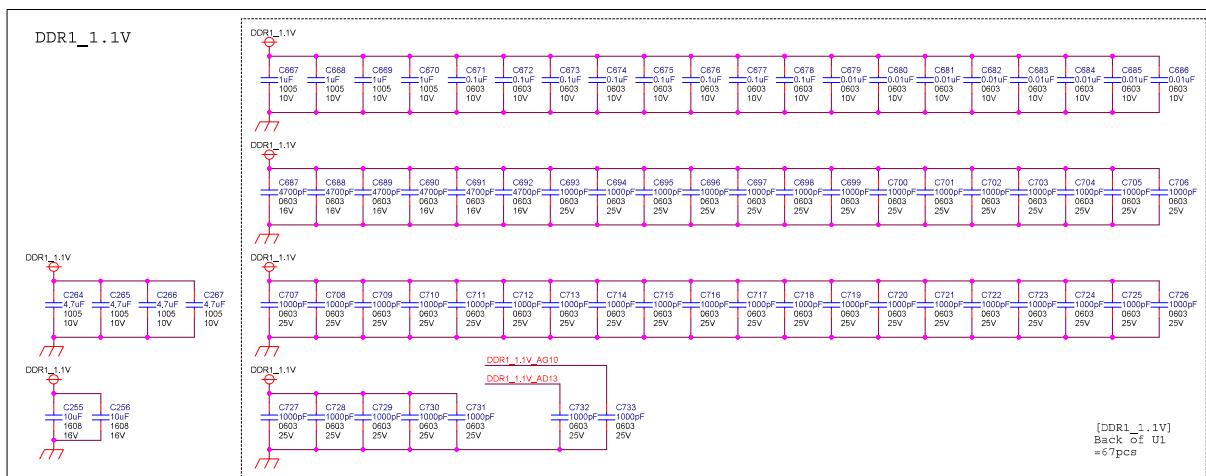
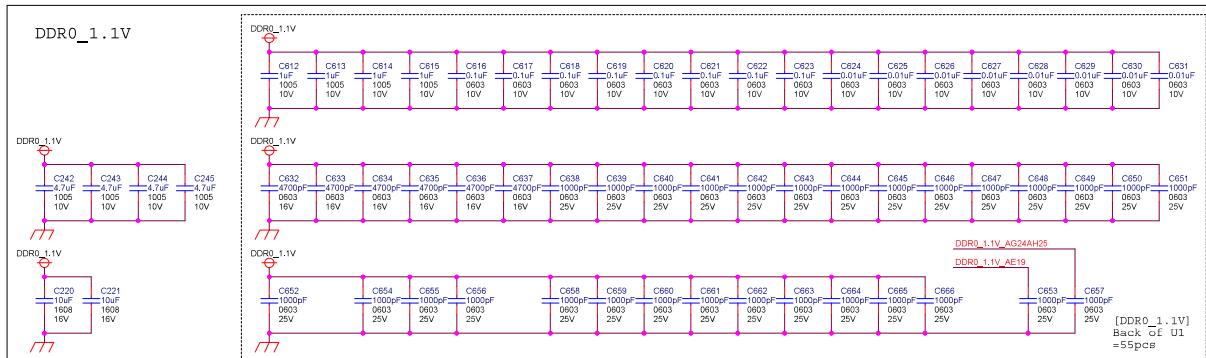


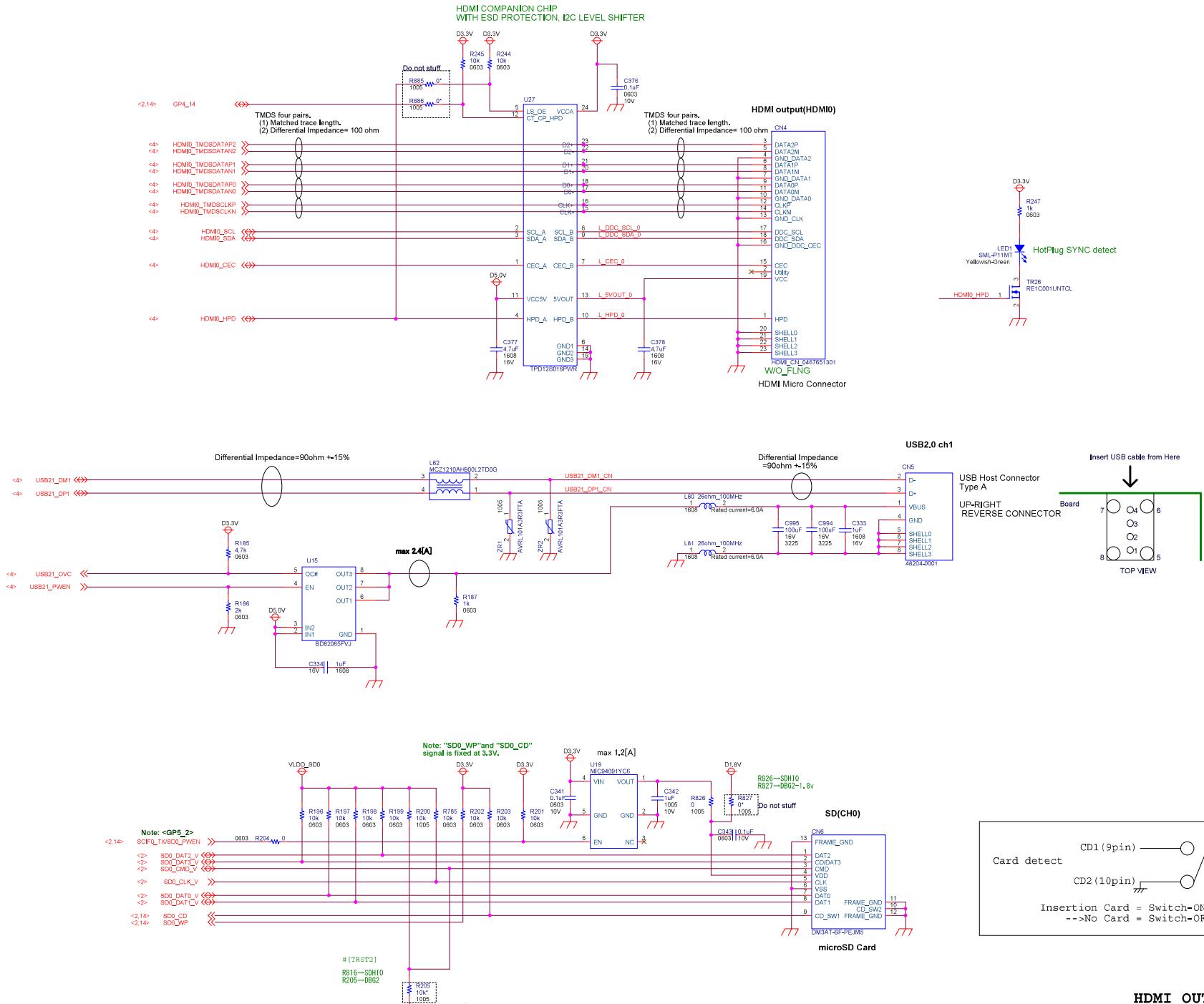




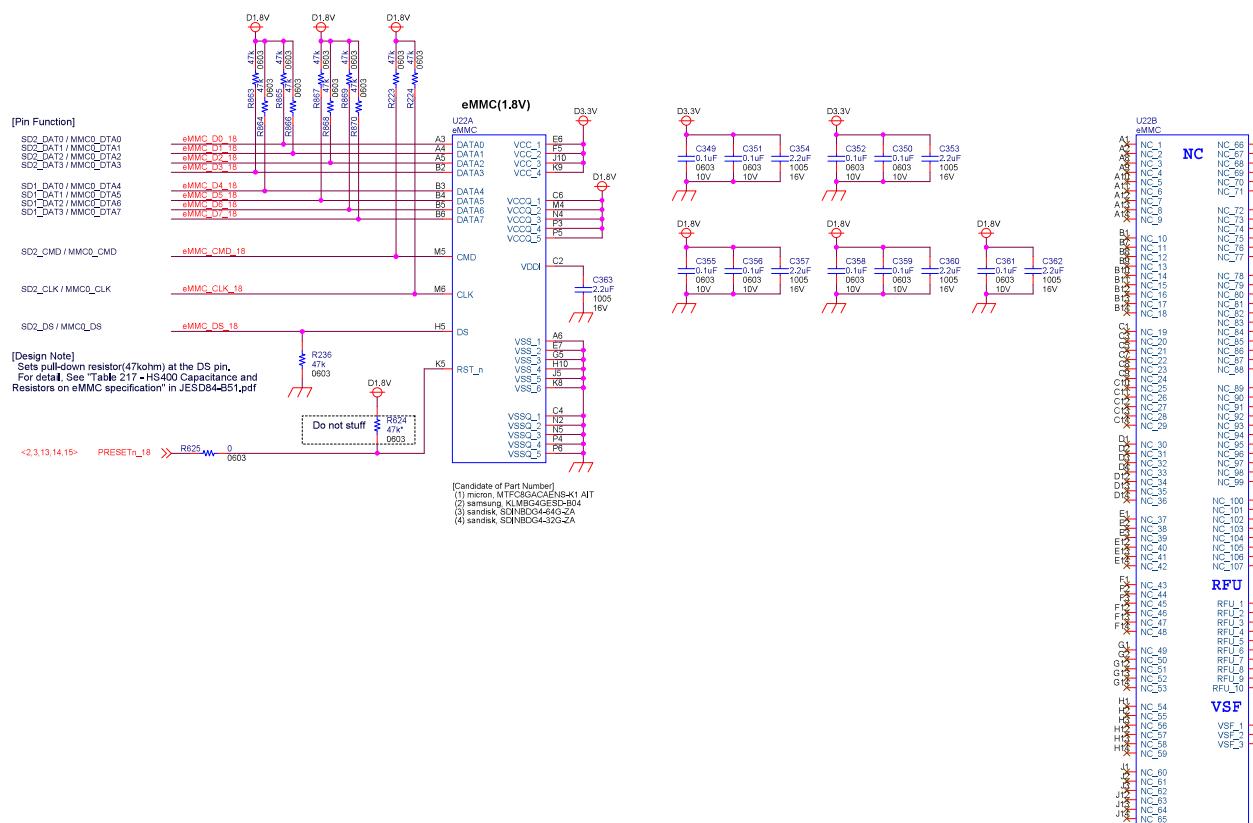
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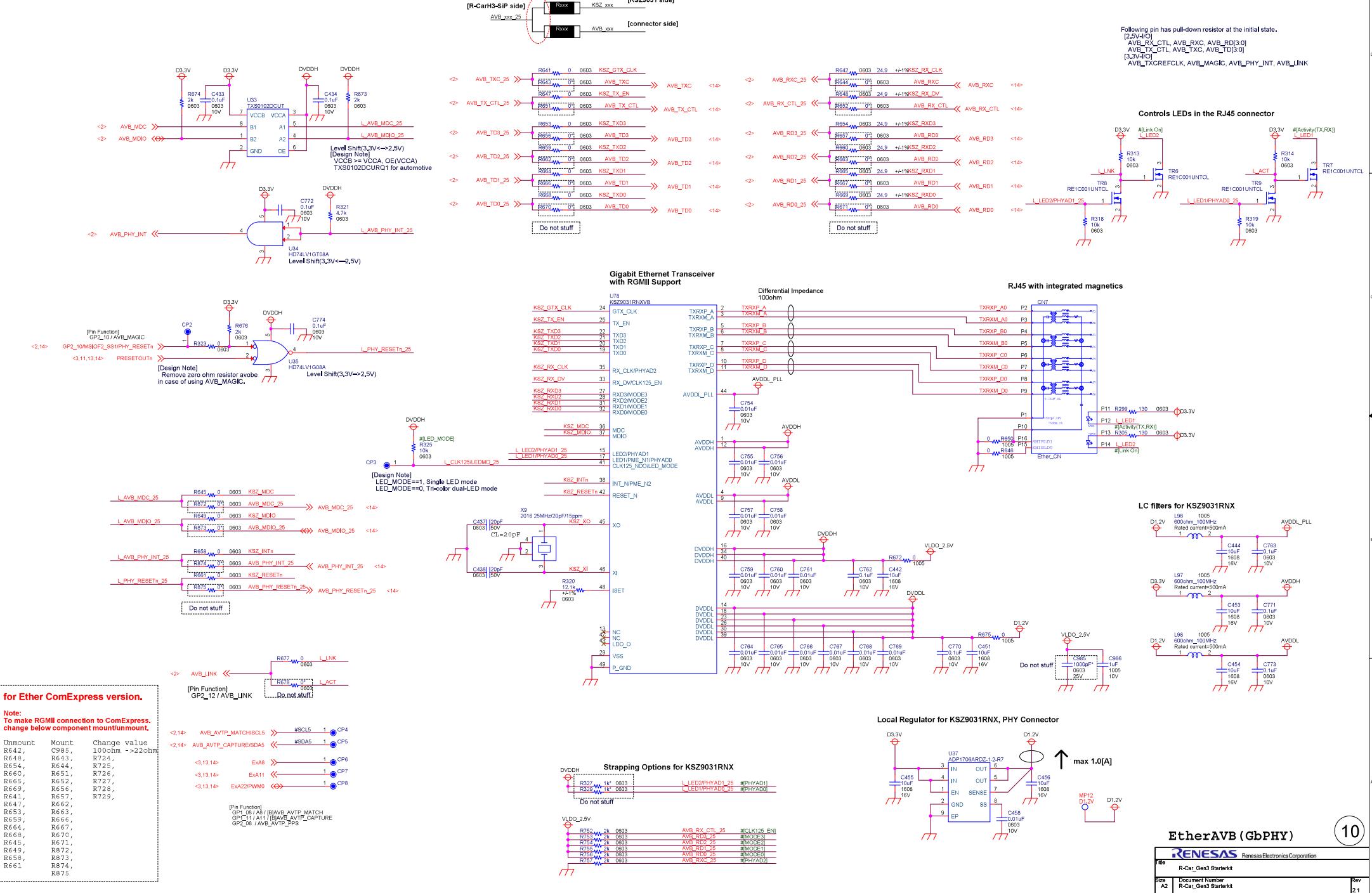


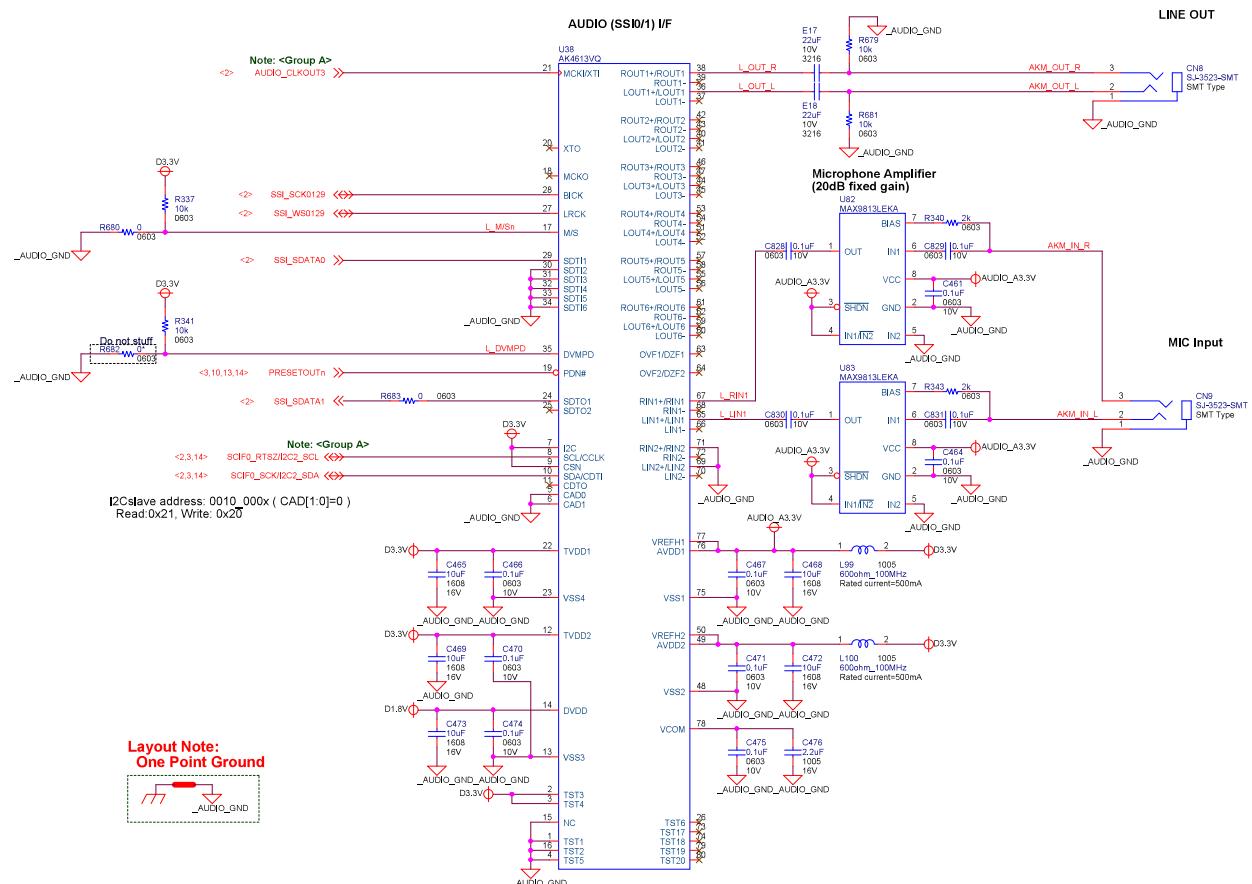


<2> MMC0_DTA0_V <> R225_W 0 0603 eMMC_D0_18
 <2> MMC0_DTA1_V <> R226_W 0 0603 eMMC_D1_18
 <2> MMC0_DTA2_V <> R227_W 0 0603 eMMC_D2_18
 <2> MMC0_DTA3_V <> R228_W 0 0603 eMMC_D3_18
 <2> MMC0_DTA4_V <> R229_W 0 0603 eMMC_D4_18
 <2> MMC0_DTA5_V <> R231_W 0 0603 eMMC_D5_18
 <2> MMC0_DTA6_V <> R230_W 0 0603 eMMC_D6_18
 <2> MMC0_DTA7_V <> R232_W 0 0603 eMMC_D7_18
 <2> MMC0_CMD_V <> R233_W 0 0603 eMMC_CMD_18
 <2> MMC0_CLK_V <> R234_W 0 0603 eMMC_CLK_18
 <2> MMC0_DS_V <> R235_W 0 0603 eMMC_DS_18



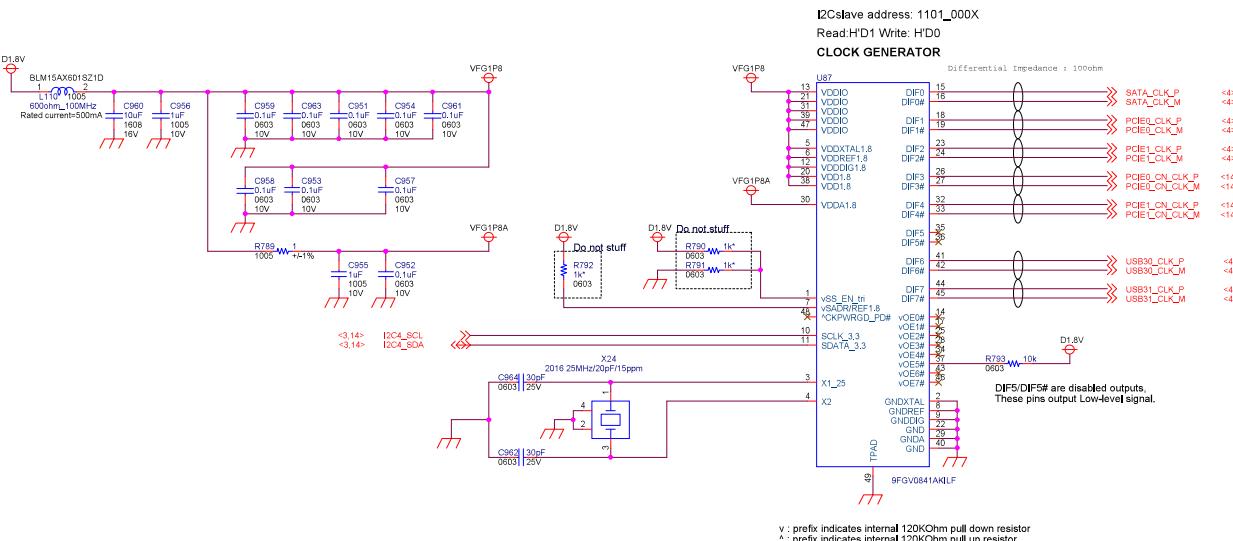
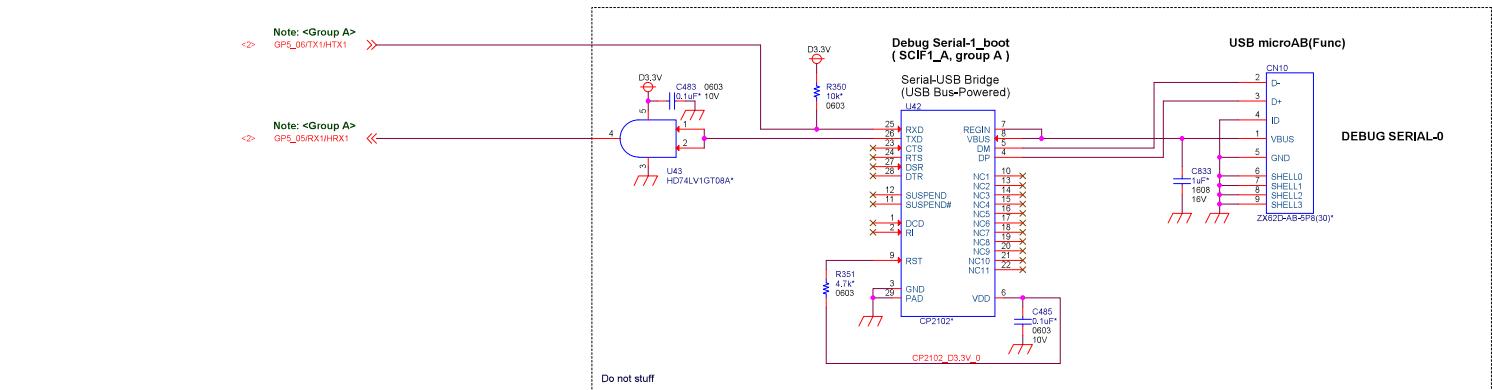
Ethernet AVB GbPHY and PHY Connector





AUDIO

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Date	2.1

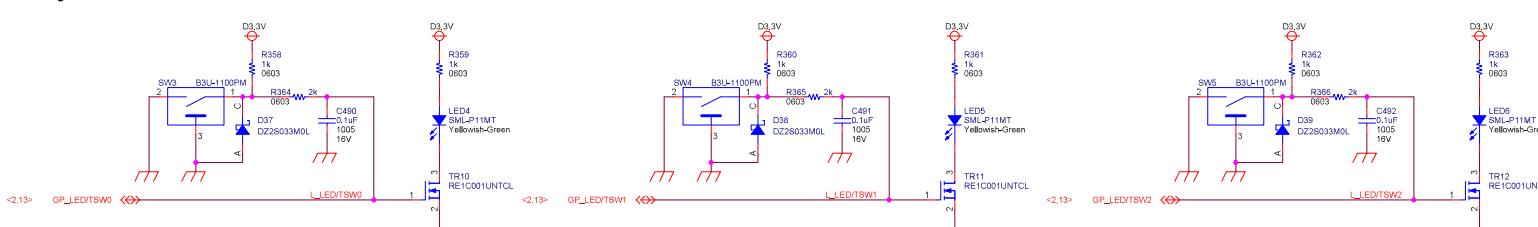


CKPWRGD_PDN#	SMBus_OE bit	DIF#	CE#	Trig_O/P	Comp_O/P	REF
0	X	1	0	Low	Running	HIZ
1	0	1	0	Low	Running	Low
1	1	1	1	Low	Low	Low

SMBus Address Selection Table (I2C Slave address)		
State of SADR on first application of CKPWRGD_PDN#	SADR	Address + Read/Write Bit

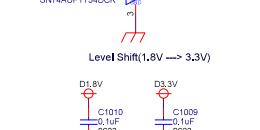
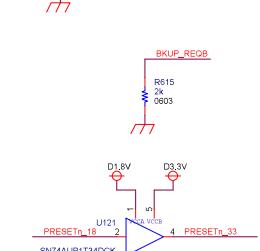
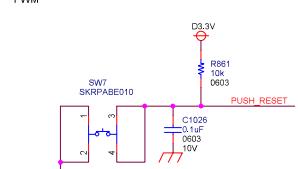
Select Spread Spectrum Table		
vSS_EN_Irr	Spread Spectrum	M' is Mid Voltage = 0.5VDD = 0.9V.
M	43.25%	This setting can be controlled by software,
1	-0.7%	Refer to datasheet chapter of "SMBus Table : SS Readback and Control Register"

GLED / Tact Switch
General Purpose LEDs or Tactile Switches
Following LEDs and Switches are connected to GPIO of R-CarH3-SiP



List of CPLD Functions

Local Bus State Controller(LBSC_D)
 >>> EX00
 Local Bus State Controller(LBSC_A/DU)
 >>> EXA0
 Local Bus State Controller(LBSC_C/DU)
 GP6_08 : General Serial Interface(MSIOF)
 QSPI Select SW Signal
 >>> QSPI_CPLDSW
 Reset Signal for H3 SoC [PRESETn_18 signal level conversion]
 >>> PRESETn_33
 PMIC Manual Reset Signal
 >>> PMIC_RESETn
 Reset Signal [From LUCY]
 >>> PRESETn_SYSZ
 Mode_Pin0-3
 >>> Mode_Pin4
 BKUP_RESETn
 CKPDCLK : Clock Divide Clock
 >>> CKPDCLK
 LED/Tact Switch
 >>> LED/LEDSW0...
 PWM



[Design Note]
 Signal connected only to CPLD
 PRESETn_SYSZ_PMIC , CPLDCLK , Mode_Pin0-3 , QSPI_CPLDSW , BOOST

250.22.57.92MHz/50ppm

C1008 0.1uF 0603 10V

C1009 0.1uF 0603 10V

C1010 0.1uF 0603 10V

C1011 0.1uF 1005 16V

C1012 0.1uF 1005 16V

C1013 0.1uF 0603 10V

C1014 0.1uF 0603 10V

C1015 0.1uF 0603 10V

C1016 0.1uF 0603 10V

C1017 0.1uF 0603 10V

C1018 0.1uF 0603 10V

C1019 0.1uF 0603 10V

C1020 0.1uF 0603 10V

C1021 0.1uF 0603 10V

C1022 0.1uF 0603 10V

C1023 0.1uF 0603 10V

C1024 0.1uF 0603 10V

C1025 0.1uF 0603 10V

C1026 0.1uF 0603 10V

C1027 0.1uF 0603 10V

C1028 0.1uF 0603 10V

C1029 0.1uF 0603 10V

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C1034 0.1uF 0603 10V

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C1036 0.1uF 0603 10V

C1037 0.1uF 0603 10V

C1038 0.1uF 0603 10V

C1039 0.1uF 0603 10V

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C1050 0.1uF 0603 10V

C1051 0.1uF 0603 10V

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C1075 0.1uF 0603 10V

C1076 0.1uF 0603 10V

C1077 0.1uF 0603 10V

C1078 0.1uF 0603 10V

C1079 0.1uF 0603 10V

C1080 0.1uF 0603 10V

C1081 0.1uF 0603 10V

C1082 0.1uF 0603 10V

C1083 0.1uF 0603 10V

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C1085 0.1uF 0603 10V

C1086 0.1uF 0603 10V

C1087 0.1uF 0603 10V

C1088 0.1uF 0603 10V

C1089 0.1uF 0603 10V

C1090 0.1uF 0603 10V

C1091 0.1uF 0603 10V

C1092 0.1uF 0603 10V

C1093 0.1uF 0603 10V

C1094 0.1uF 0603 10V

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C1099 0.1uF 0603 10V

C1100 0.1uF 0603 10V

C1101 0.1uF 0603 10V

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C1103 0.1uF 0603 10V

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C1110 0.1uF 0603 10V

C1111 0.1uF 0603 10V

C1112 0.1uF 0603 10V

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C1119 0.1uF 0603 10V

C1120 0.1uF 0603 10V

C1121 0.1uF 0603 10V

C1122 0.1uF 0603 10V

C1123 0.1uF 0603 10V

C1124 0.1uF 0603 10V

C1125 0.1uF 0603 10V

C1126 0.1uF 0603 10V

C1127 0.1uF 0603 10V

C1128 0.1uF 0603 10V

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C1176 0.1uF 0603 10V

C1177 0.1uF 0603 10V

C1178 0.1uF 0603 10V

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C1188 0.1uF 0603 10V

C1189 0.1uF 0603 10V

C1190 0.1uF 0603 10V

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C1194 0.1uF 0603 10V

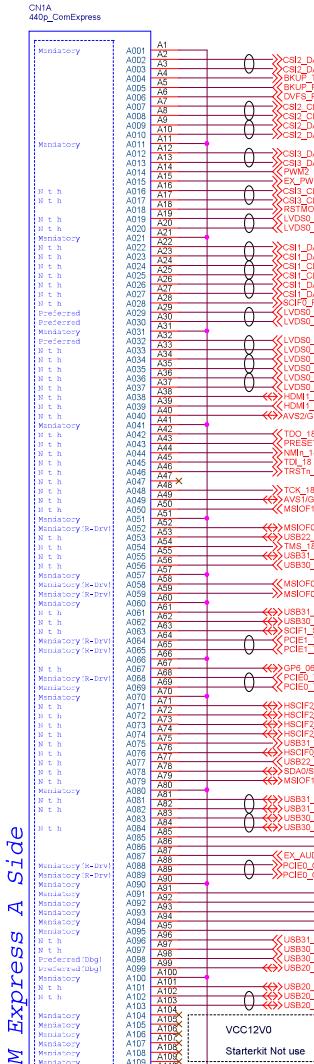
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C1196 0.1uF 0603 10V

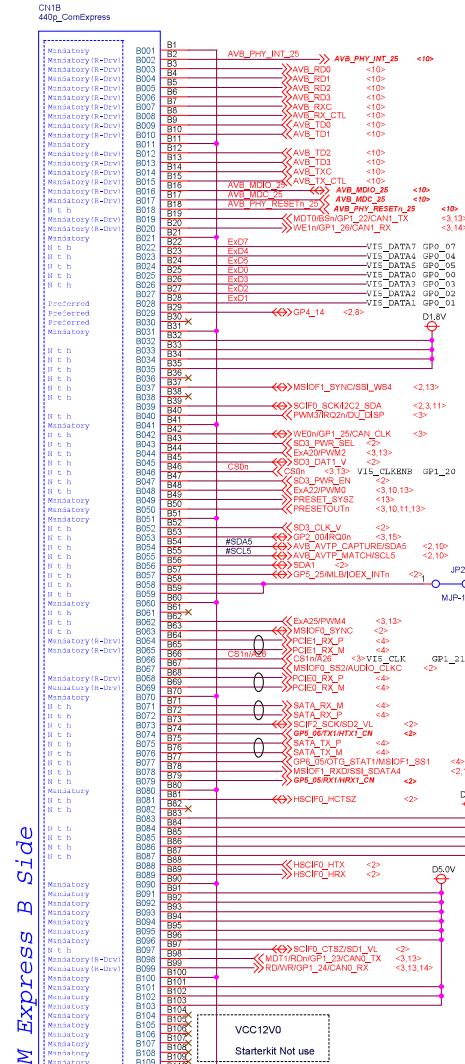
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C1198 0.1uF 0603 10V

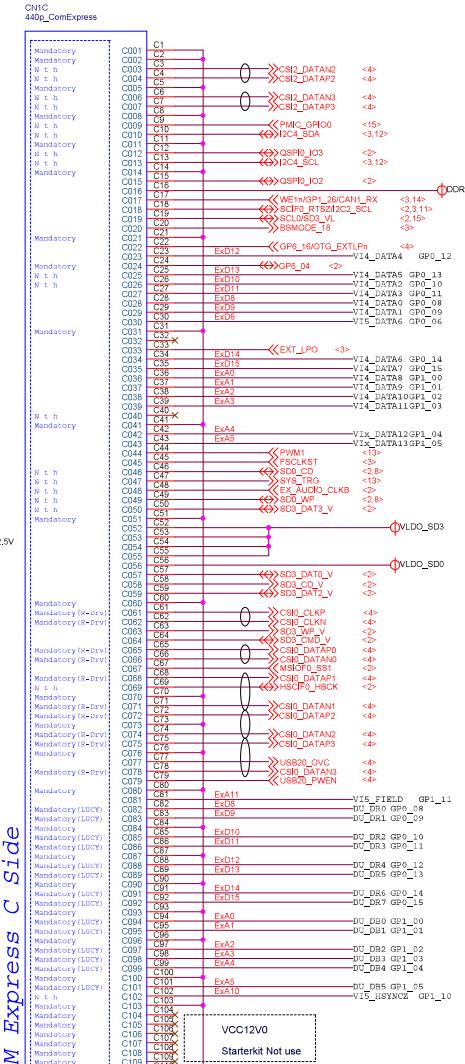
Matched trace length and Differential Impedance



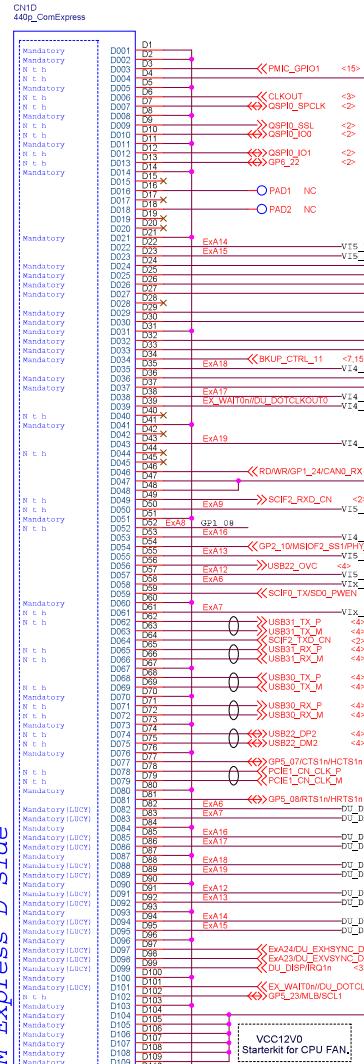
Com Express 440pin



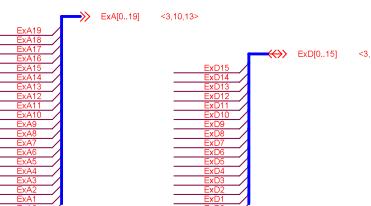
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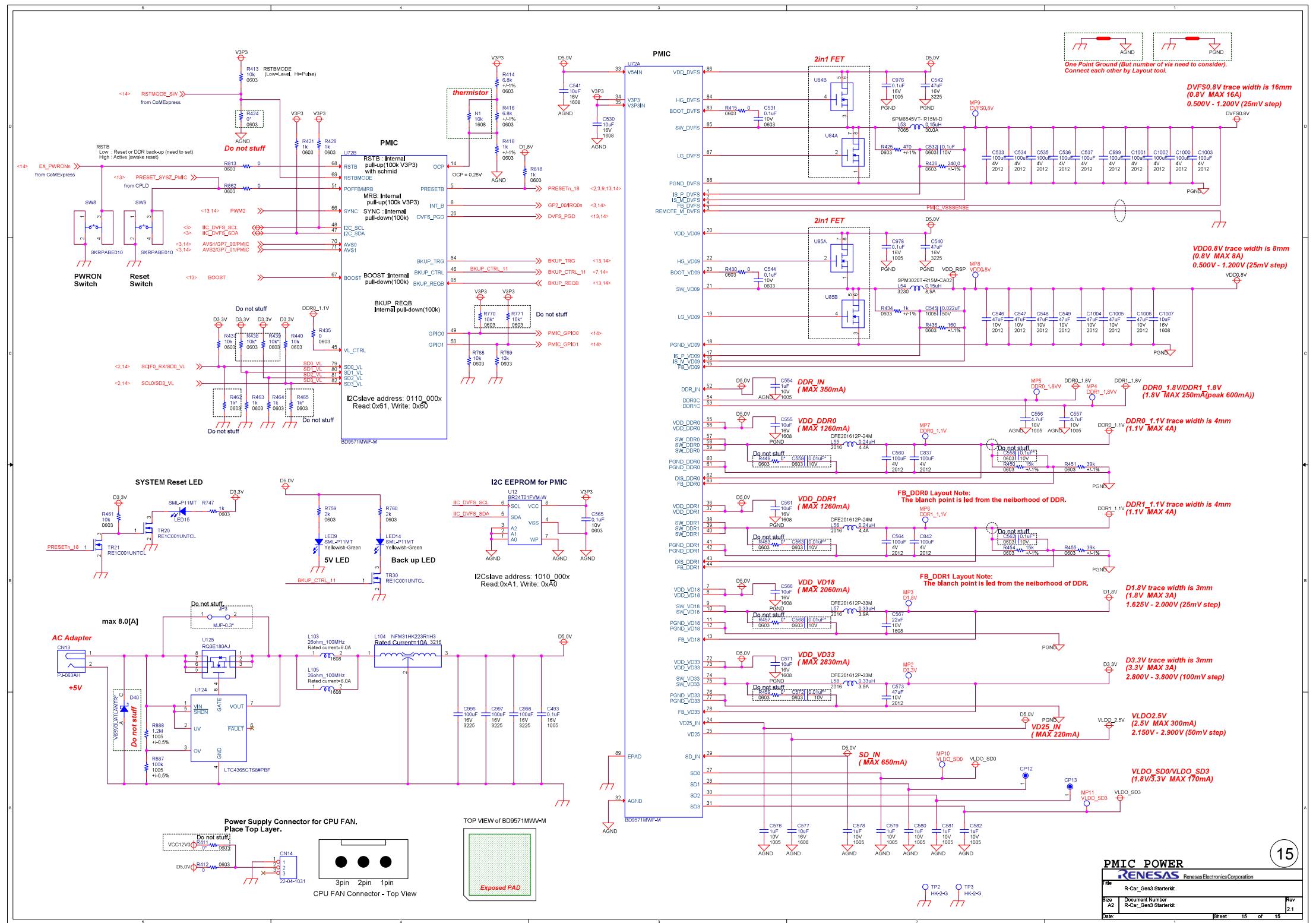


Com Express 440pin



Com Express 440pin





RTP0RC77951SKBX010SA03
S/N: 20201-20400, 25051-25550

