



Preliminary
Starter Kit Premier / M3 Starter Kit Pro
Schematic

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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.

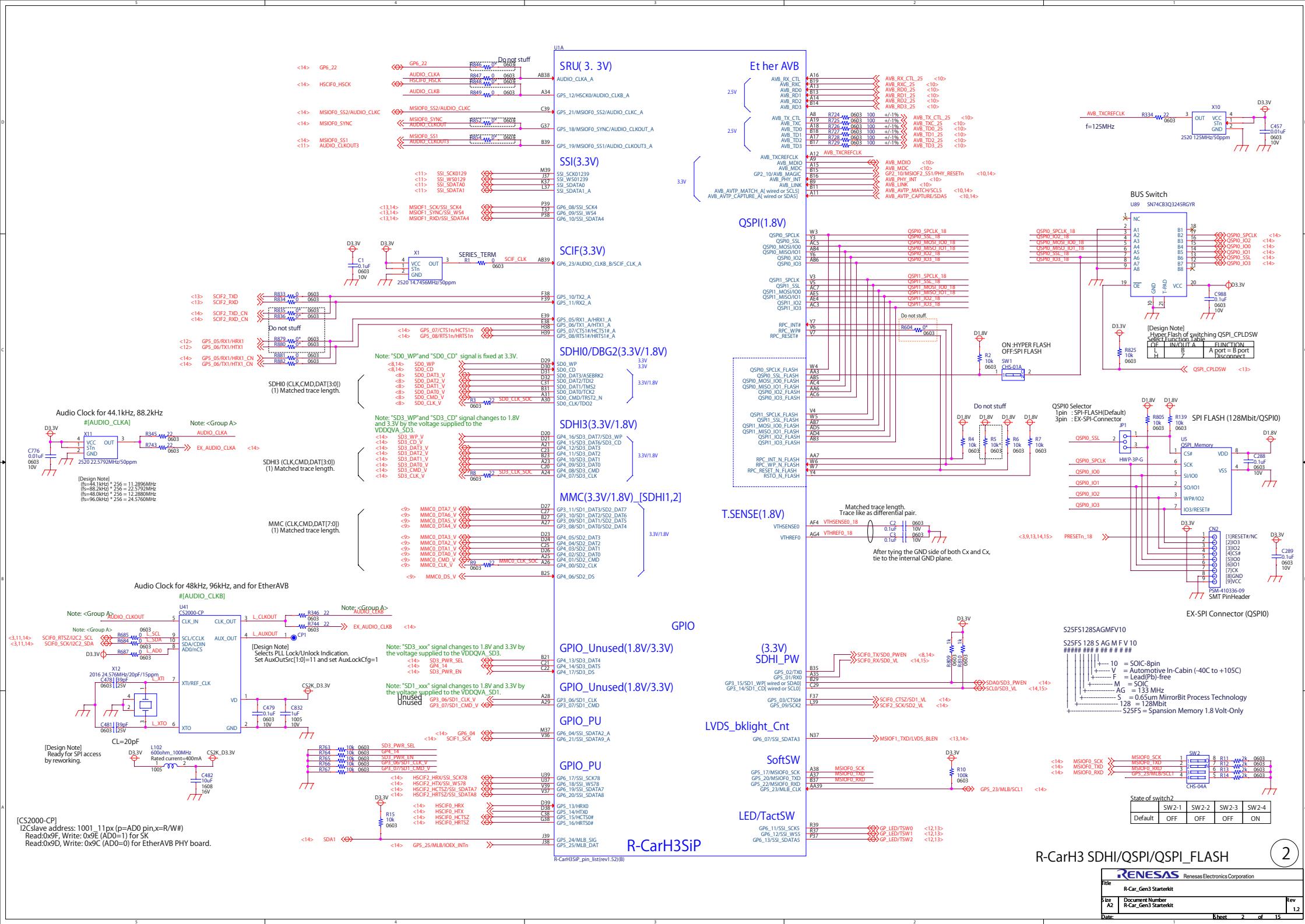
- The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic 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.

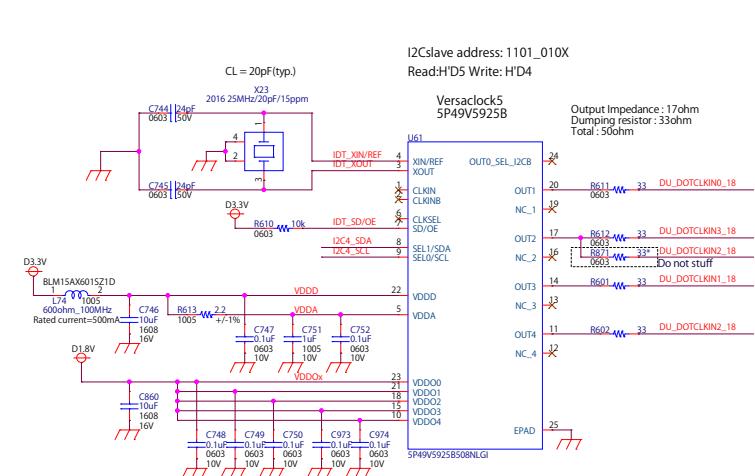
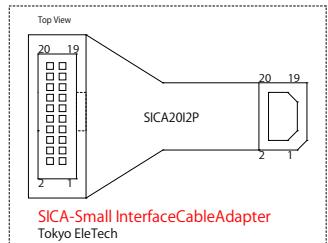
P01: TITLE
P02: R-CarH3_SD/QSPI
P03: R-CarH3_DU/LBSC
P04: R-CarH3_USB/HDMI
P05: R-CarH3_POW1
P06: R-CarH3_POW2
P07: R-CarH3_LPDDR_POW
P08: HDMI_OUT/USB2.0/SD
P09: MMC0
P10: EtherAVB(GbPHY)
P11: Audio
P12: DEBUG_SCIF/LED/TactSW
P13: R-CarH3_Mode_Setting
P14: R-CarH3_Module_I/F
P15: POWER PMIC

"R-Car_Gen3 Starterkit"

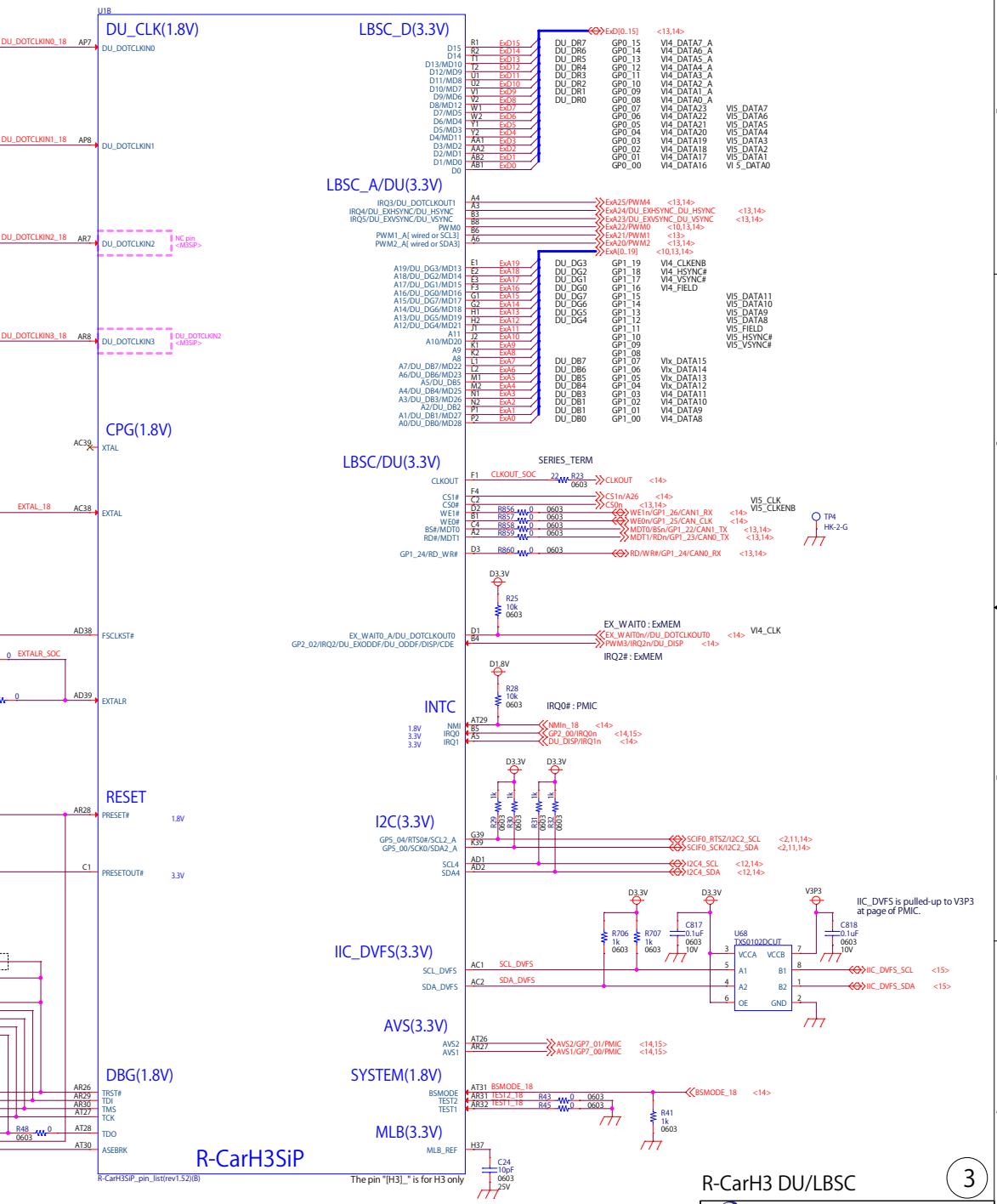
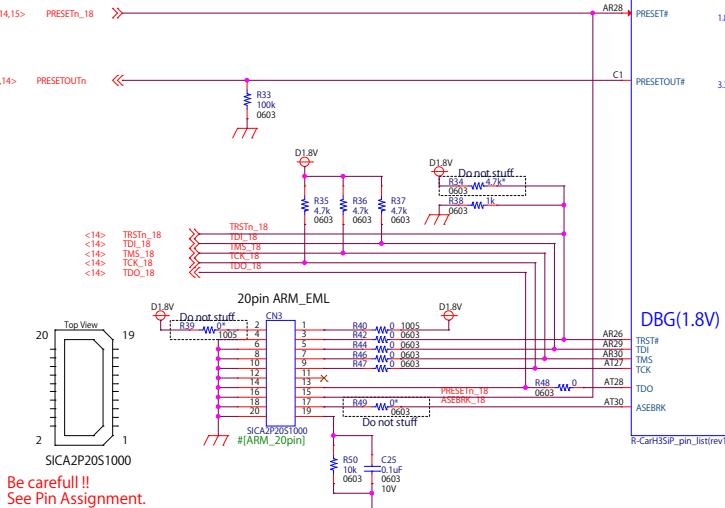
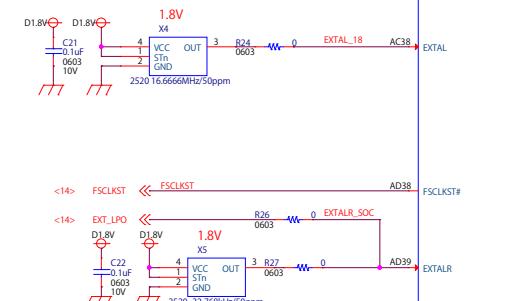
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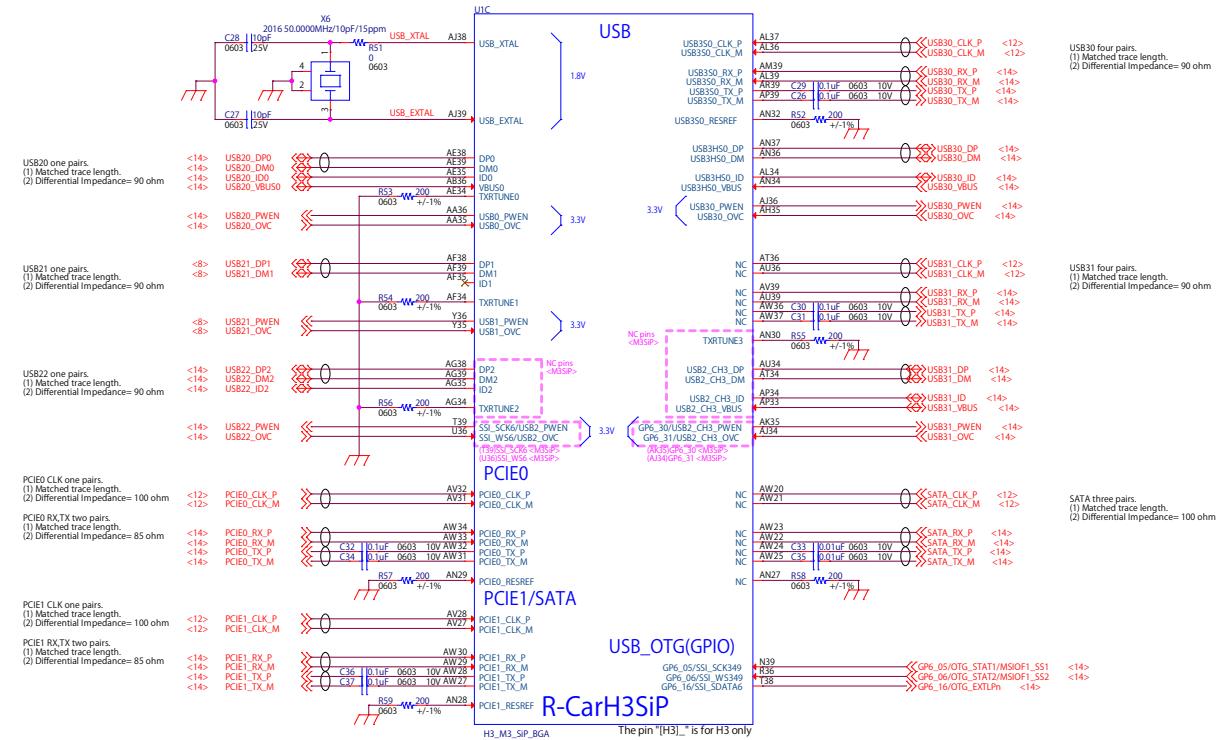
Rev.1.2



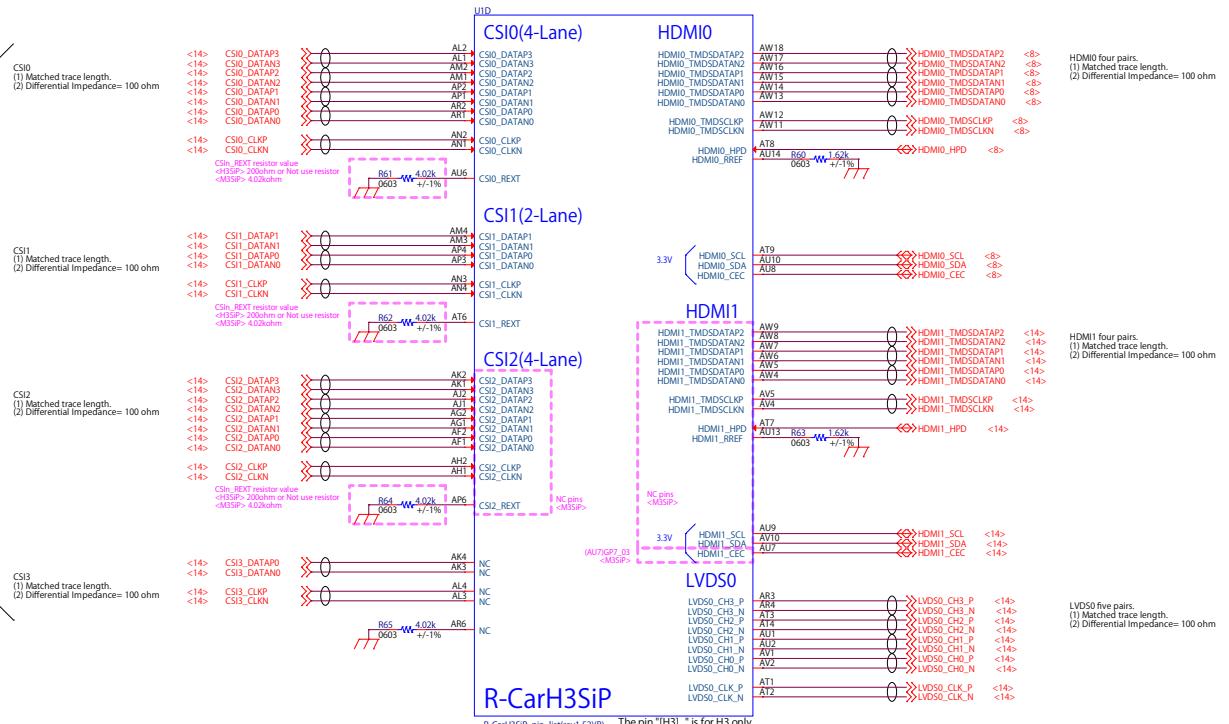


VersaClock5 has Internal Pull-down Resistor(100k-300k)
CLKIN
CLKIN
SEL/SDA
SEL/SCL
OUTO_SEL_I2CB (I2CB-->0 Use I2C (Default))
CLKSEL-->0=XIN/REF, XOUT (Default)
SD/OE--> OE and active low

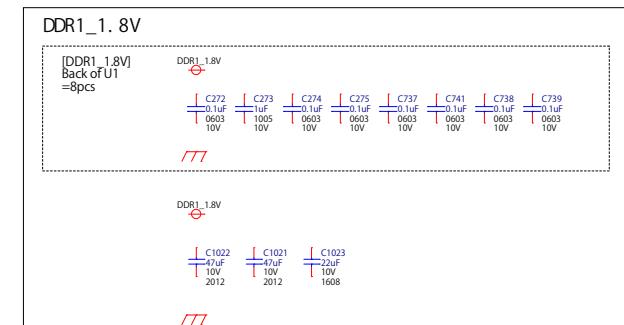
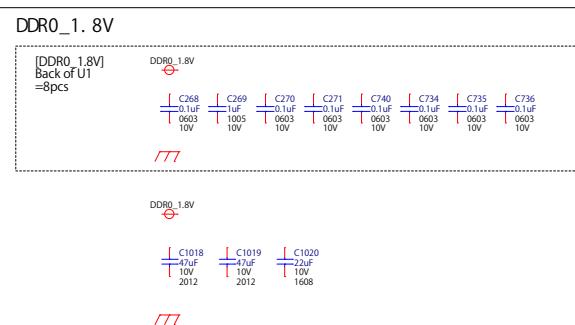
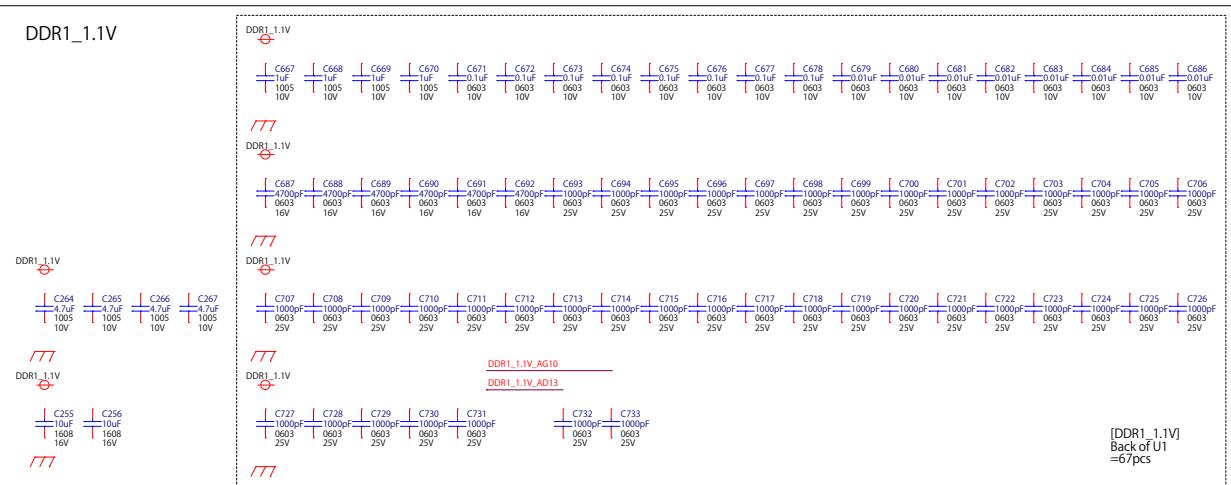
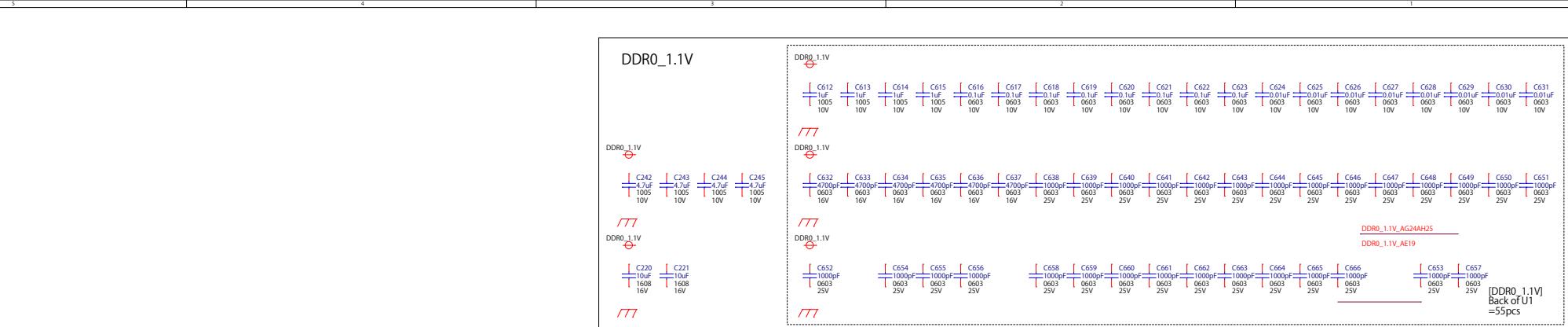


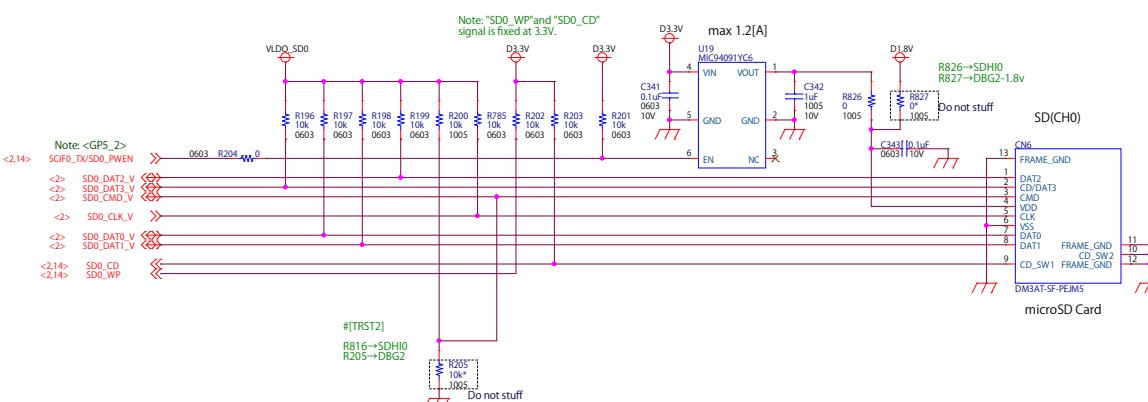
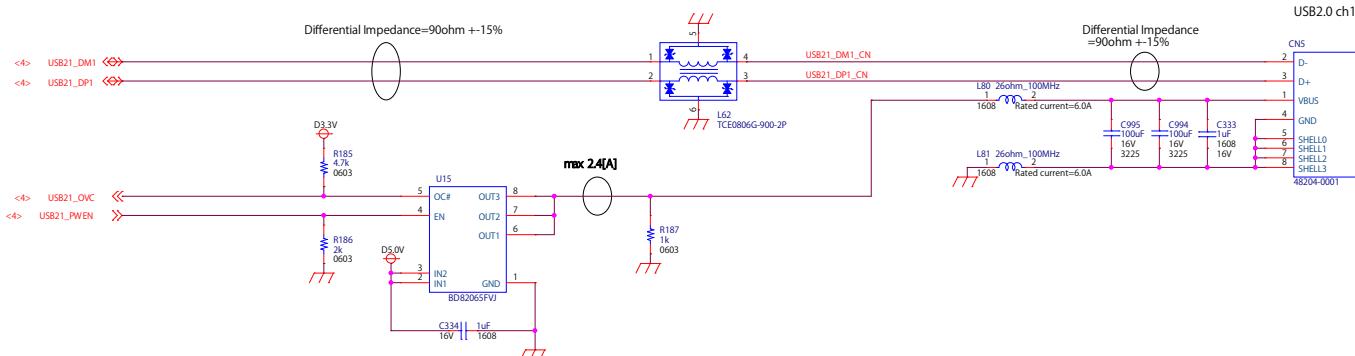
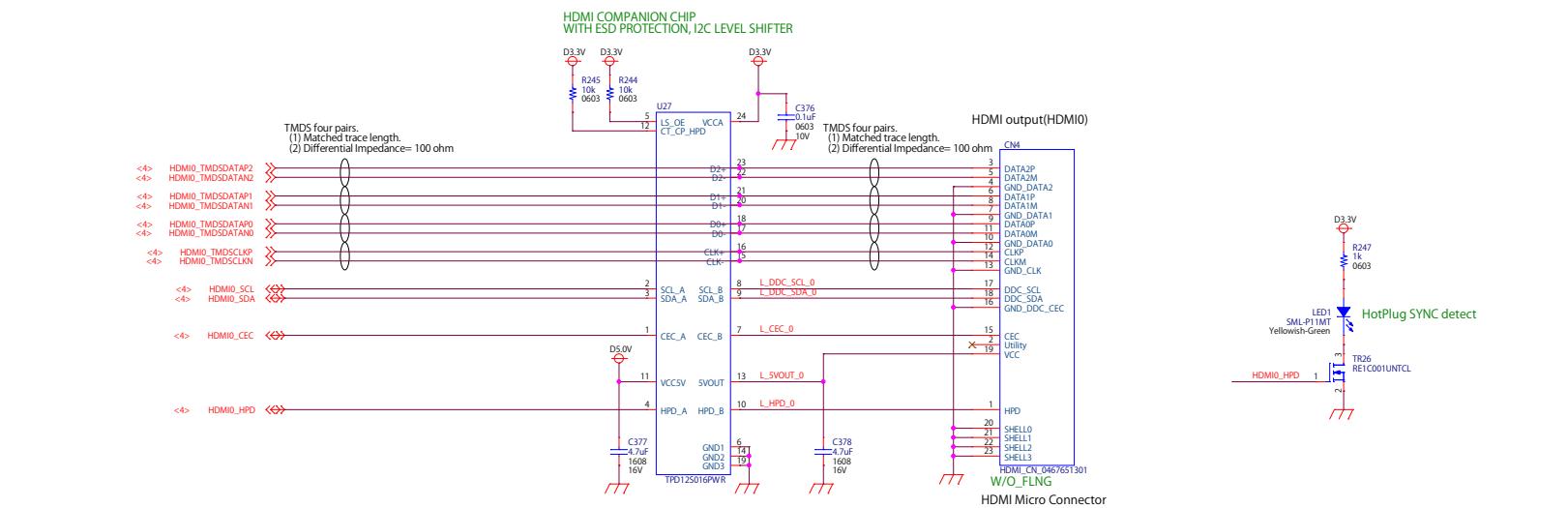


[Design Note] If designing CS12 to custom add-on board. Sum of the trace lengths match specified in MIP1 standard must be considered.	
Net Name	Trace length([mm])
CS10_DATAP3	75.4055
CS10_DATAN2	75.4257
CS10_DATAP2	69.6152
CS10_DATAN2	69.6932
CS10_DATAP1	54.6317
CS10_DATAN1	54.6398
CS10_DATAP0	46.7733
CS10_DATAN0	46.7876
CS10_CLKP	56.1646
CS10_CLKN	56.0873
CS11_DATAP1	24.9266
CS11_DATAN1	24.9015
CS11_DATAP0	18.5268
CS11_DATAN0	18.5179
CS11_CLKP	22.9172
CS11_CLKN	22.9604
CS12_DATAP3	39.5967
CS12_DATAN3	39.5811
CS12_DATAP2	41.1817
CS12_DATAN2	41.1721
CS12_DATAP1	38.782
CS12_DATAN1	38.7304
CS12_DATAP0	48.2885
CS12_DATAN0	48.2843
CS12_CLKP	31.464
CS12_CLKN	31.4391
CS13_DATAP0	27.8771
CS13_DATAN0	27.8809
CS13_CLKP	26.9112
CS13_CLKN	26.7613



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Title	R-Car_Gen3 Starterkit	
Size	A2	Document Number
Date	1	R-Car_Gen3 Starterkit 1.2





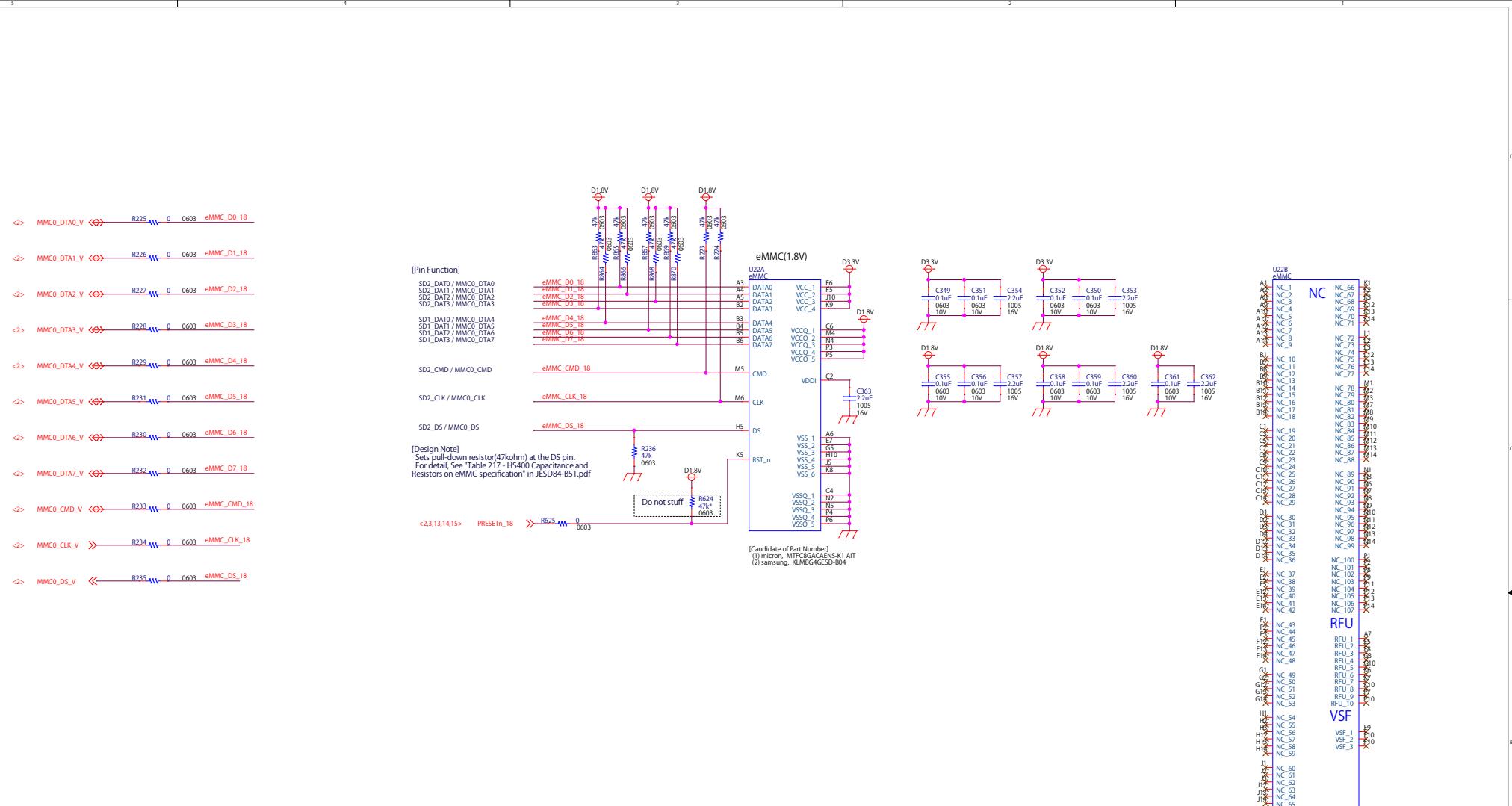
HDMI_OUT/USB2.0/SDH10

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Title R-Car_Gen3 Starterkit

5 Rev A2 Document Number R-Car_Gen3 Starterkit

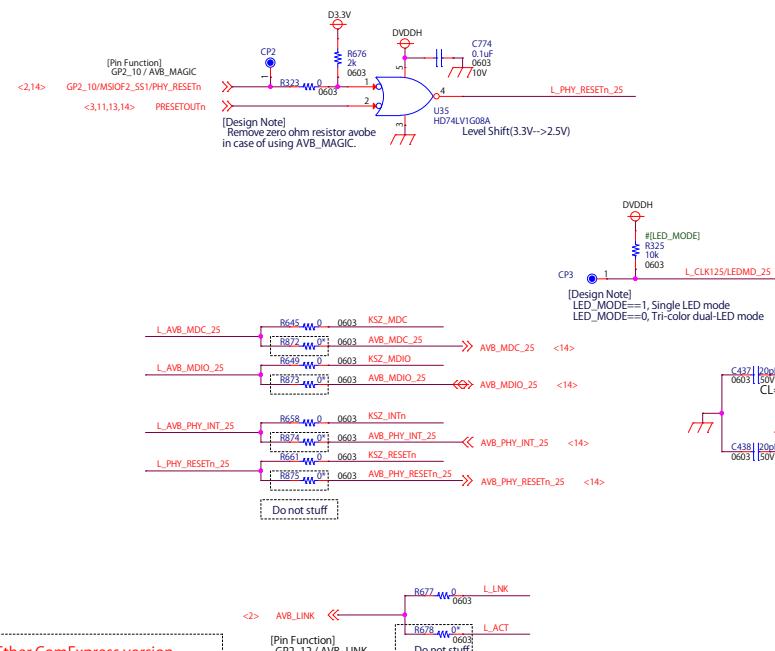
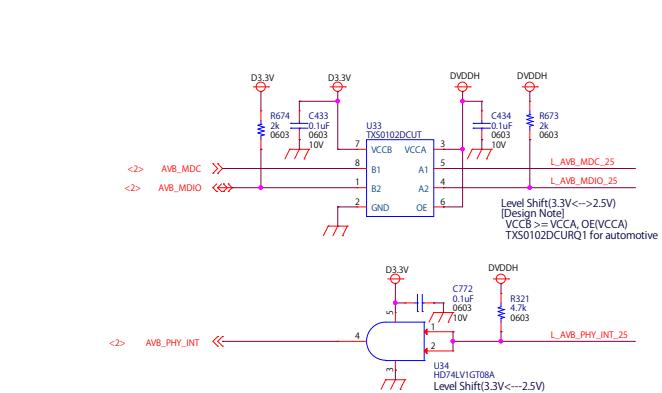
Date 1 Rev 1.2



MMC0

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Date	2023-01-01	1.2
Document Number	R-Car_Gen3 Starterkit	

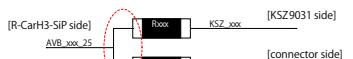
Ethernet AVB GbPHY and PHY Connector



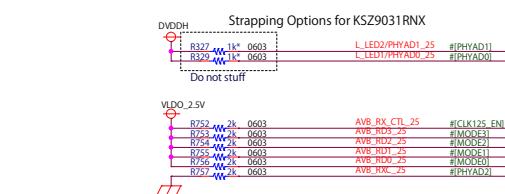
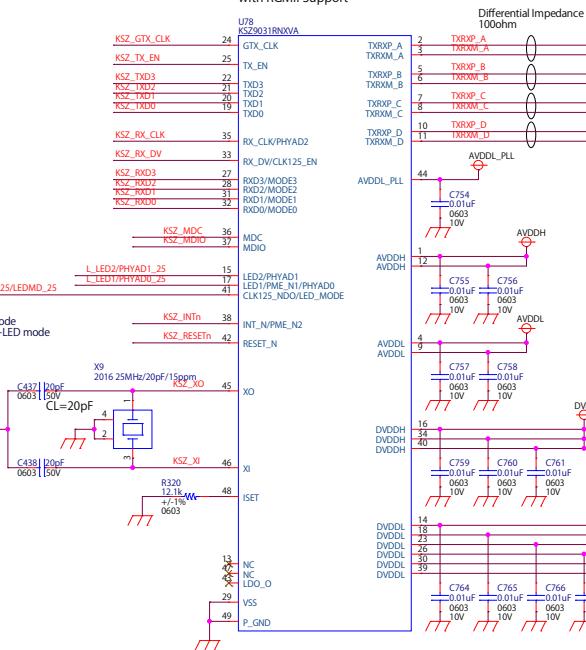
for Ether ComExpress version.

Note:
To make RGMI connection to ComExpress,
change below component mount/unmount.

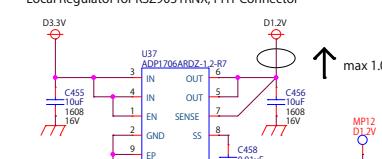
Unmount	Mount	Change value
R642	R985	180ohm ->220ohm
R648	R643	R724
R654	R644	R725
R660	R651	R726
R666	R652	R727
R669	R656	R728
R641	R657	R729
R653	R662	
R659	R666	
R664	R667	
R668	R670	
R645	R671	
R649	R872	
R658	R873	
R661	R874	
R675	R875	



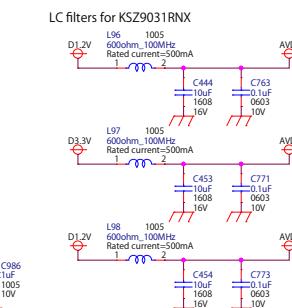
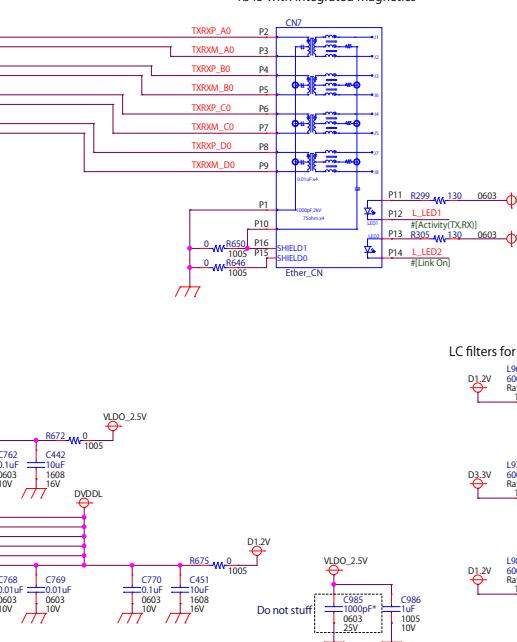
Gigabit Ethernet Transceiver
with RGMI Support



Local Regulator for KSZ9031RNX, PHY Connector

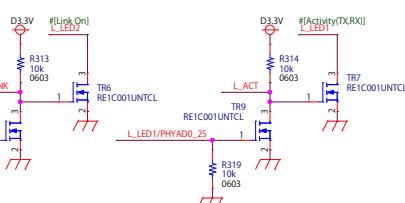


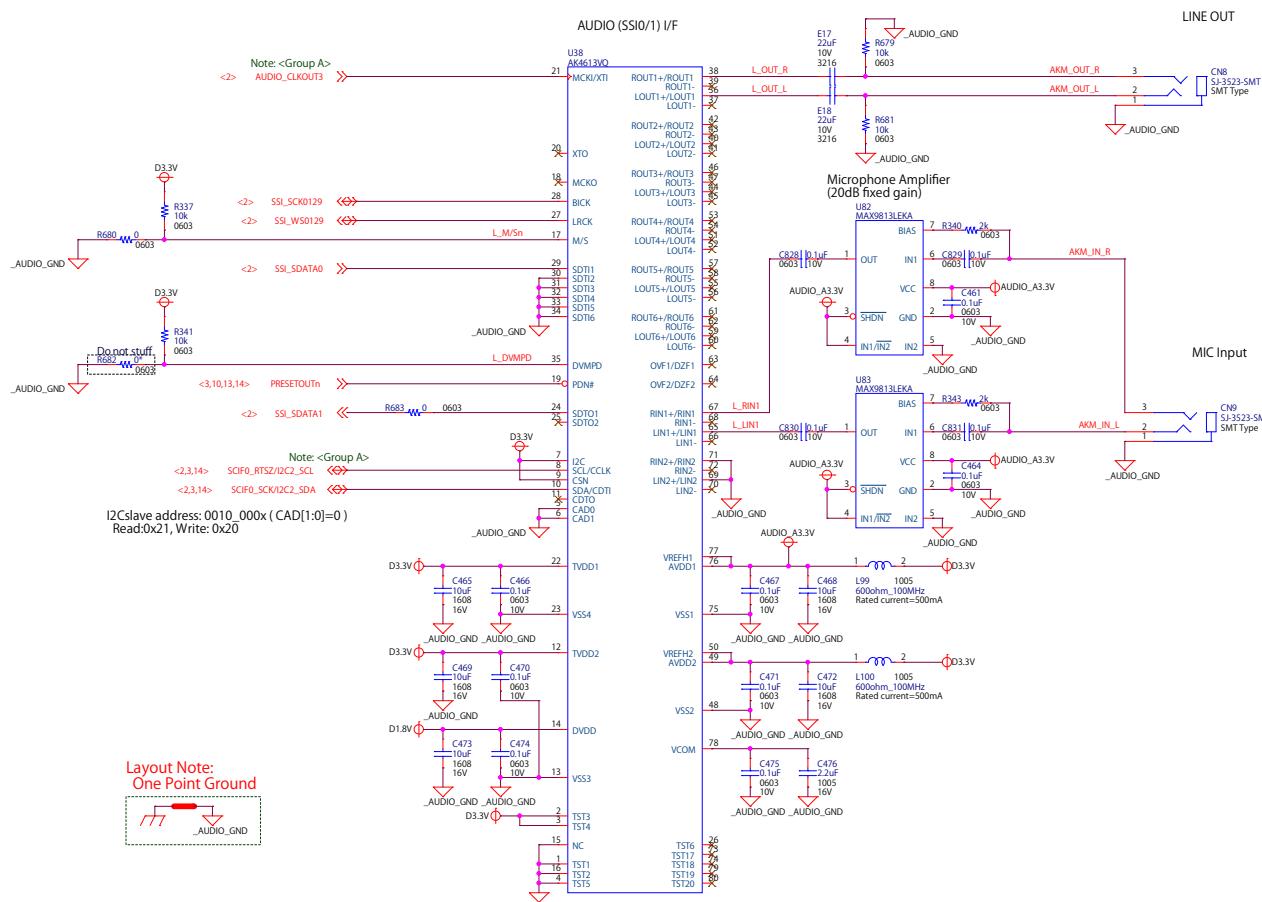
RJ45 with integrated magnetics

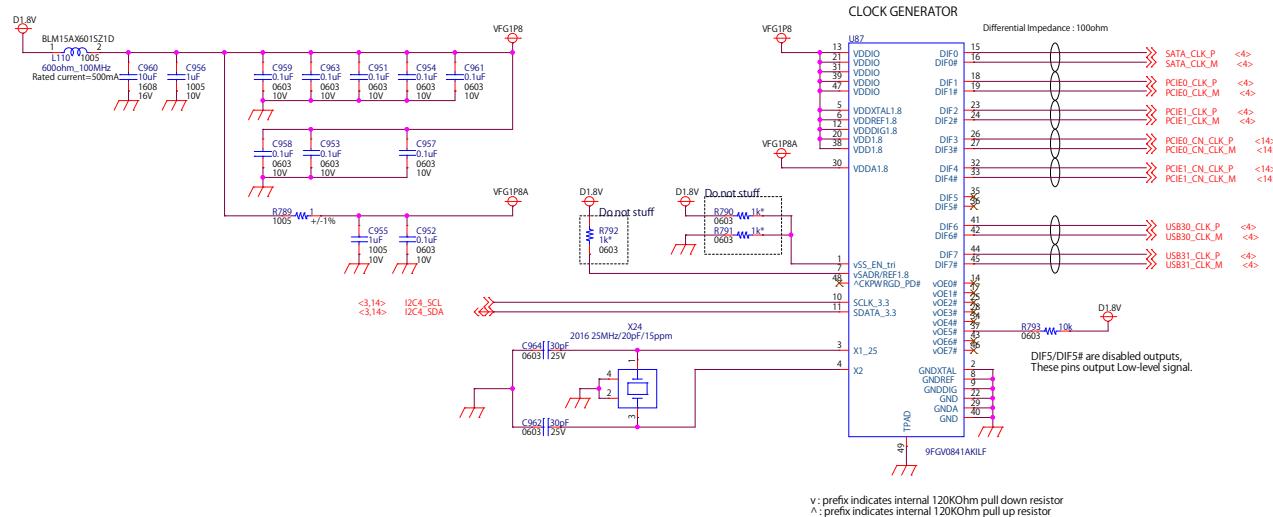
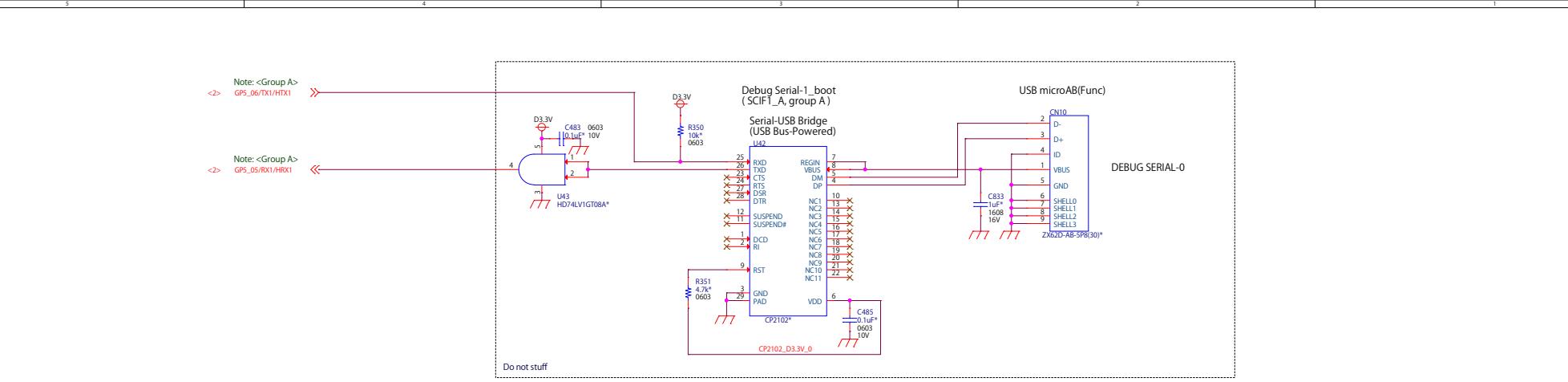


Following pin has pull-down resistor at the initial state.
[2.5V-I/O]
AVB_RX_CTL, AVB_RXC, AVB_RD[3:0]
AVB_TX_CTL, AVB_TXC, AVB_TD[3:0]
[3.3V-I/O]
AVB_TXCREFCLK, AVB_MAGIC, AVB_PHY_INT, AVB_LINK

Controls LEDs in the RJ45 connector

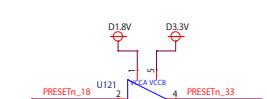
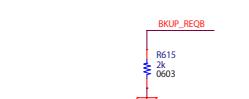
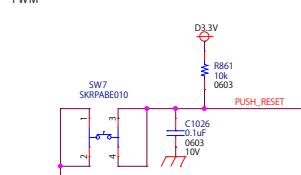






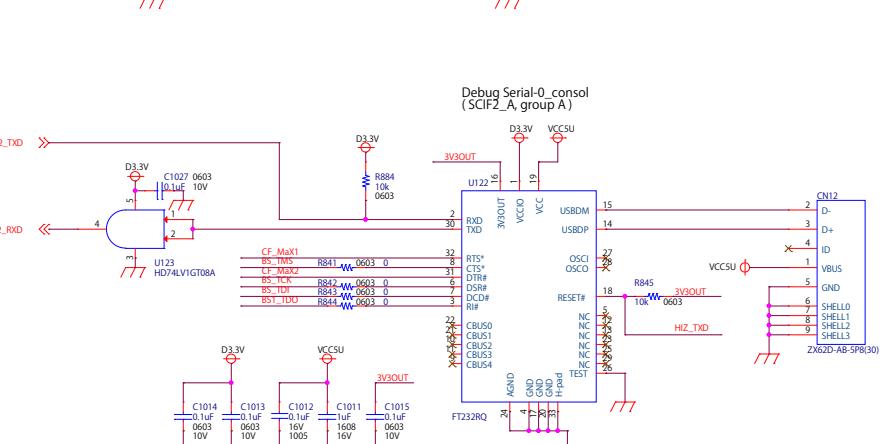
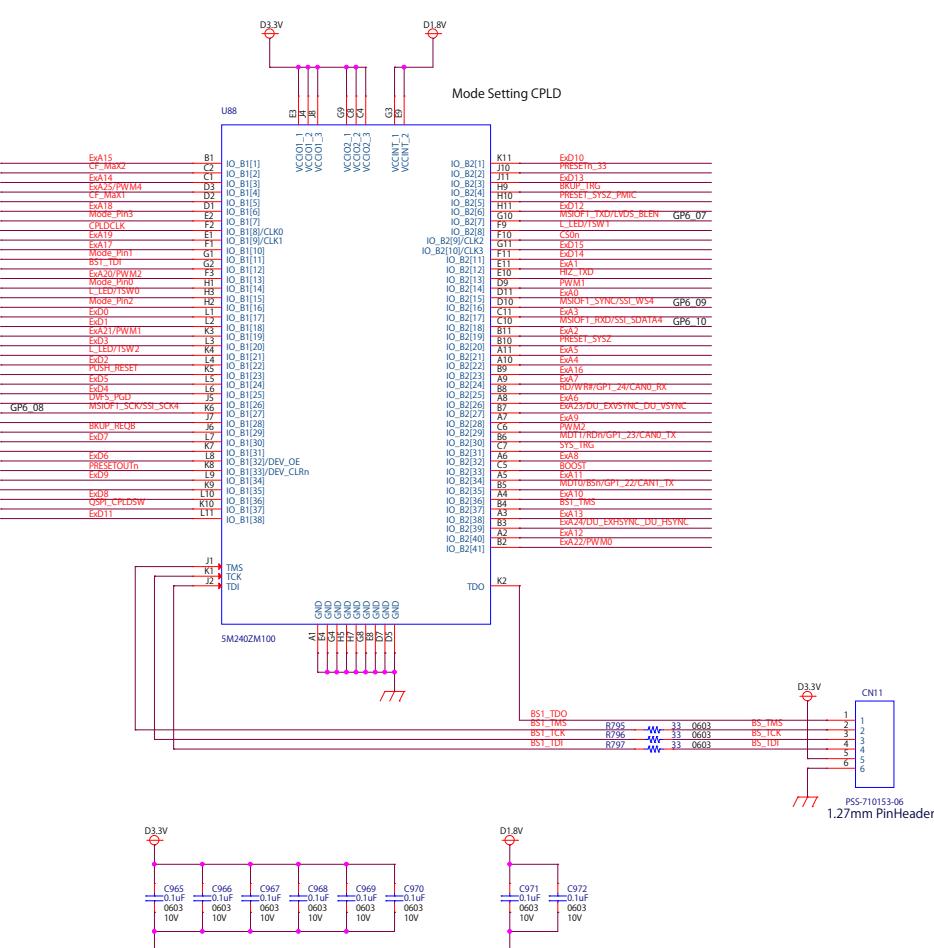
List of CPLD Functions

Local Bus State Controller(LBSC_D)
 >>> EX00 : Local Bus State Controller(LBSC_A/DU)
 >>> EX01 : Local Bus State Controller(LBSC_D/U)
 >>> EX02 : Clock-Synchronized Serial Interface(MSIOF)
 QSPI Select SW Signal
 >>> QSPI_CPLDSW
 Reset Signal for H3 Soc [PRESETn_18 signal level conversion]
 Reset Signal for I3 Soc [PRESETn_18 signal level conversion]
 PMIC Manual Reset Signal
 >>> PRESET_SYS : PMIC
 Reset Signal [From LUCY]
 >>> PRESET_SYS : Mode setting Signal
 Mode setting Pin0...
 BKUP_REQB : BKUP_REQB
 >>> Back Up Set Up Finish Signal
 Back Up Start Signal [SDRAM Backup Signal]
 >>> BKUP_REQ : BKUP_REQ, TRG, SYS_TRG
 BOOST : BOOST
 >>> DVFS_Boost : DVFS Boost Signal
 >>> DVFS_Power : DVFS Power Good Signal
 CPLD Reset Signal
 CPLD_PRESETOUT : CPLD Pre-set Output
 >>> CPLDCLK : CPLD CLK
 LED/act switch
 >>> CPLDSW : CPLDSW
 PWM : PWM_L, LED/TSW0...



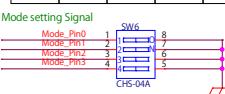
Level Shift(1.8V-> 3.3V)

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

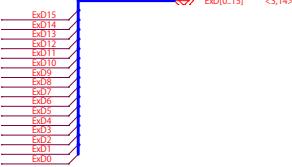


State of switch6			
	SW6-1	SW6-2	SW6-3
Default	OFF	OFF	OFF

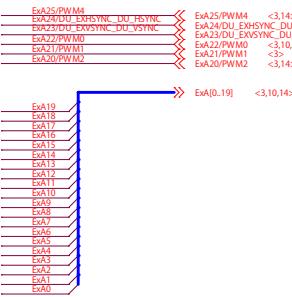
QSPI boot , DDR1600



Local Bus State Controller(LBSC_D)



Local Bus State Controller(LBSC_A/DU)



Local Bus State Controller(LBSC_D/U)



CN1 : COM Express Connector

U1 : R-Car SiP

U72 : PMIC BD9571MWV-M

U88 : CPLD 5M240ZM100

U89 : BUS SWITCH SN74CB3Q3245RGYR

CN1.C35 CN1.C92.U1.R1.U88.G11
CN1.C34 CN1.C91.U1.R2.U88.F11
CN1.C25 CN1.C89.U1.T1.U88.H11
CN1.C27 CN1.C86.U1.U1.U88.L11
CN1.C26 CN1.C85.U1.U2.U88.K11
CN1.C28 CN1.C82.U1.V1.U88.M11
CN1.C28 CN1.C82.U1.V2.U88.N11
CN1.B22 U1.W1.U88.S7
CN1.B24 U1.Y1.U88.L5
CN1.B23 U1.Y2.U88.L6
CN1.B25 U1.A2.U88.L4
CN1.B28 U1.A2.U88.L2
CN1.B28 U1.AB1.U88.L1

CN1.B62 U1.A4.U88.D3
CN1.D37 U1.A3.U88.B3
CN1.D98 U1.B3.U88.B7
CN1.B48 CP8.U1.B8.U88.B2
U1.B6 U88.K3
CN1.B44 U1.A6.U88.F3

CN1.D43 CN1.D89 U1.E1.U88.E1
CN1.D38 CN1.D86 U1.E3.U88.F1
CN1.C53 CN1.D85 U1.E1.U88.B9
CN1.D27 CN1.D84 U1.E1.U88.B1
CN1.D22 CN1.D94 U1.G2.U88.C1
CN1.D55 CN1.D92 U1.H1.U88.A3
CN1.C77 CN1.C93 U1.P1.U88.D2
CN1.C81 C7.1 U1.J1.U88.A5
CN1.C102 U1.J2.U88.A4
CN1.C61 C6.1 U1.K1.U88.A7
CN1.D52 C6.1 U1.K2.U88.A6
CN1.C61 CN1.D83 U1.I1.U88.A9
CN1.C58 CN1.D82 U1.I2.U88.A6
CN1.C42 CN1.C99 U1.M2.U88.A10
CN1.C39 CN1.C98 U1.N1.U88.C11
CN1.C37 CN1.C97 U1.N1.U88.C11
CN1.C37 CN1.C95 U1.P1.U88.E1
CN1.C36 CN1.C94 U1.P2.U88.D11

Local Bus State Controller(LBSC_D/U)



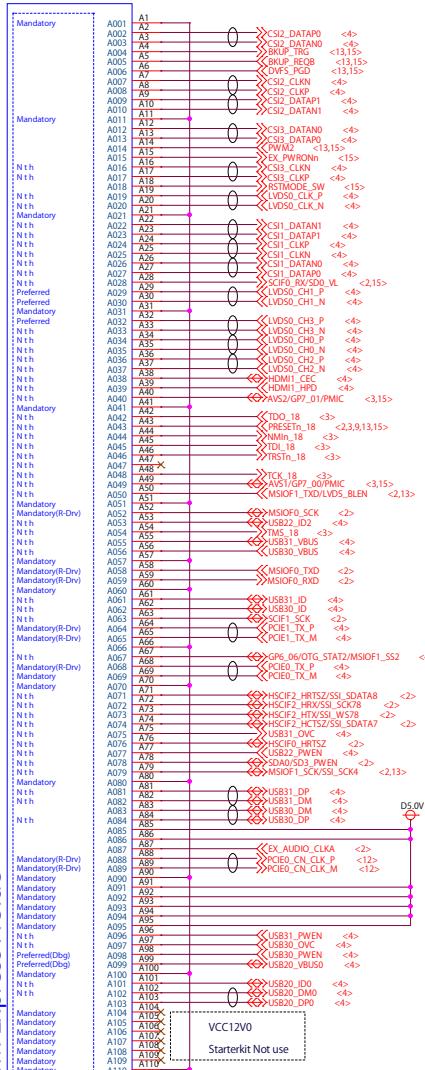
Reset Signal for H3 Soc [PRESETn_18 signal level conversion]

PRESETn_18

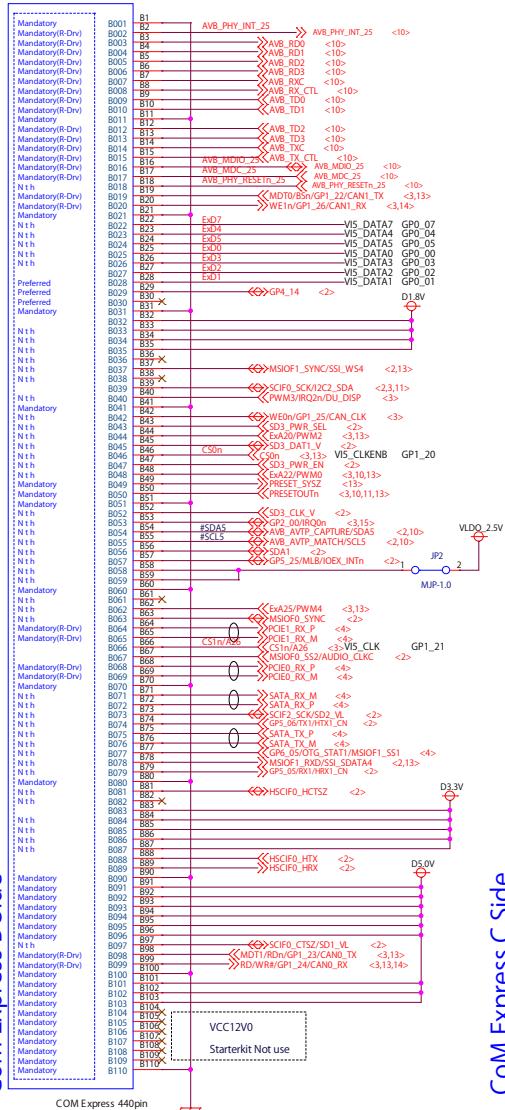
<-> PRESETOUTn

<-> PRESETn_18

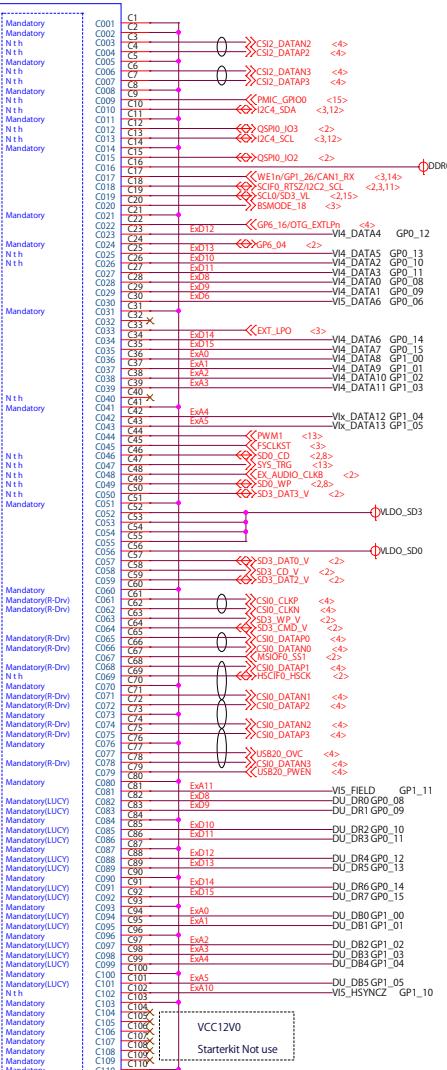
CN1A
440p_ComExpress



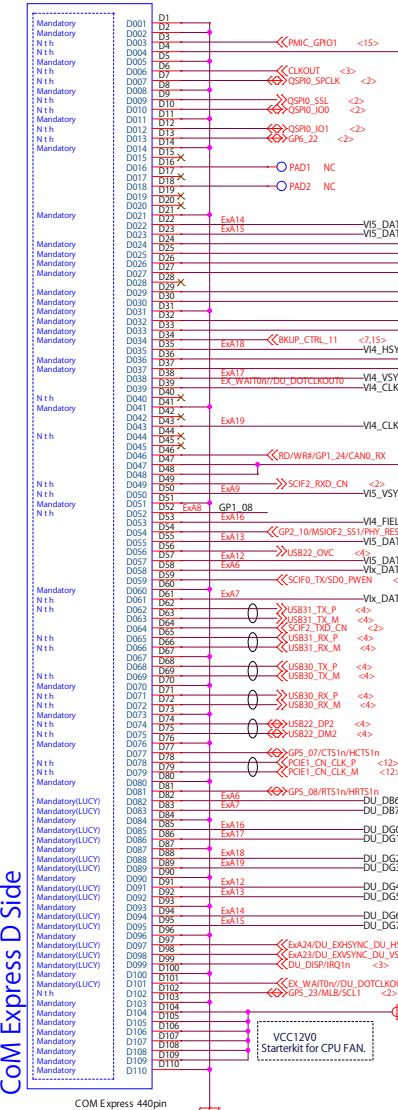
CN1B
440p_ComExpress



CN1C
440p_ComExpress



CN1D
440p_ComExpress

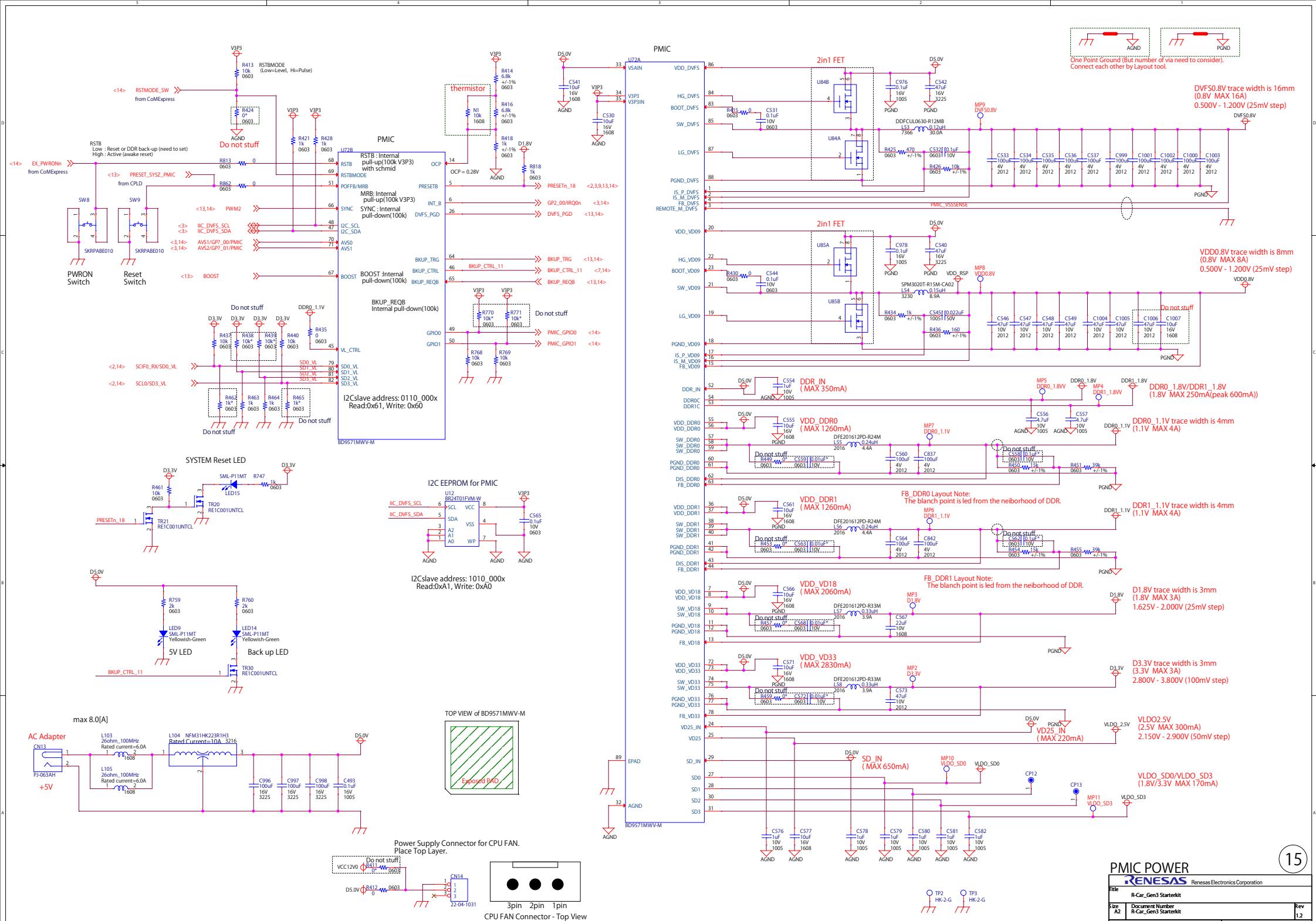


CoM Express A Side

CoM Express B Side

CoM Express C Side

CoM Express D Side



R-Car Starter Kit Premier

R-Car Starter Kit Pro



Renesas Electronics Corporation