



## R-Car StarterKit 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.



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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”

R-Car Starter Kit Pro

M3:RTP0RC7796SKBX0010S

R-Car Starter Kit Premier

H3:RTP0RC7795SKBX0010S

Rev.1.10

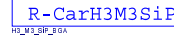
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|--|---|---------------|-------------|
| Renesas Electronics Corporation                  |   |               |             |
| R-Car_Gen3Starterkit                             |   |               |             |
| Doc<br>No  | Document Number<br>R-Car_Gen3Starterkit | A1BD1-16-0137 | Rev<br>1.10 |
| Date: 10/06/2016, October 27, 2016 Page: 1 of 16 |   |               |             |



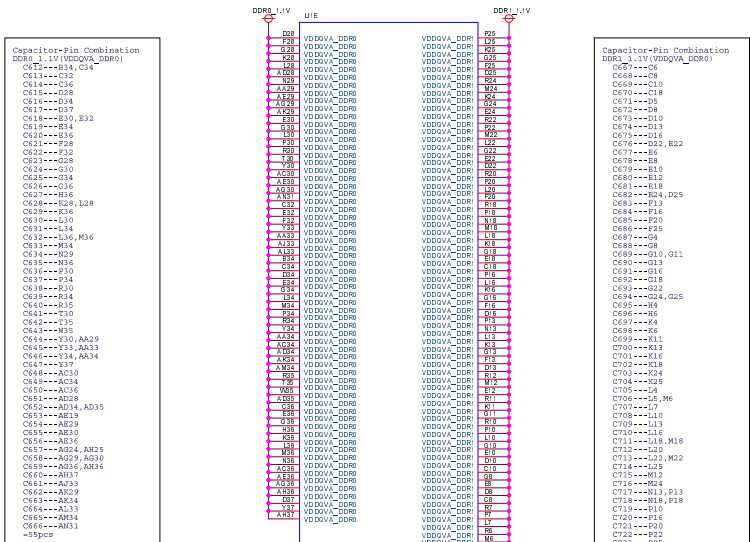


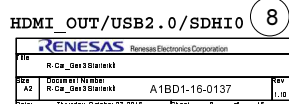


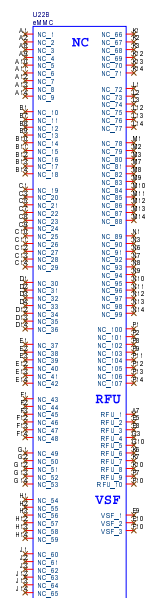


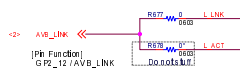
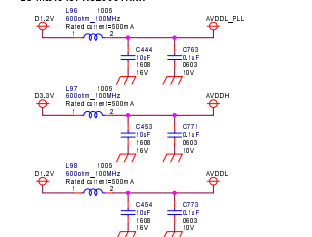
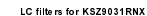
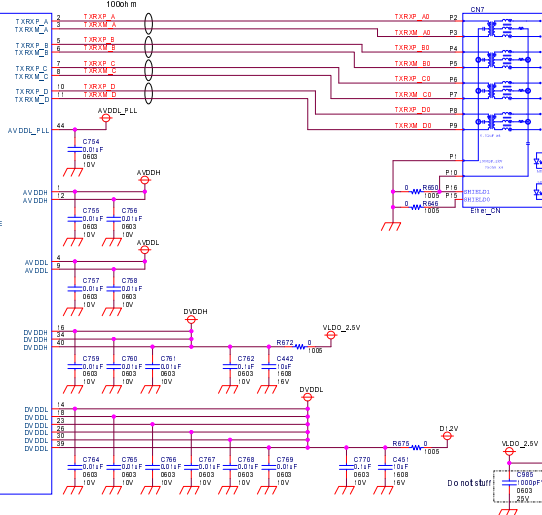
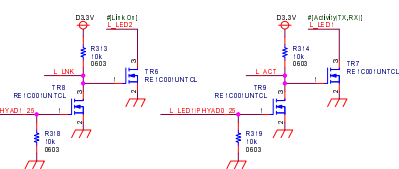
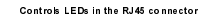
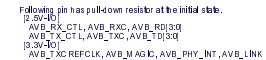
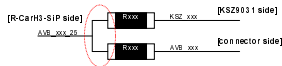












**Note :**

To make RGMII connection to ComExpress change below component mount/unmount

| Element                           | Measure | Change, per day |
|-----------------------------------|---------|-----------------|
| Temperature                       | °C      | 0.01            |
| Humidity                          | %       | 0.02            |
| Light intensity                   | lux     | 0.05            |
| Sound intensity                   | dB      | 0.01            |
| Soil moisture                     | %       | 0.01            |
| Air quality (PM2.5)               | µg/m³   | 0.01            |
| Water level                       | m       | 0.01            |
| Plant growth rate                 | %       | 0.01            |
| Animal behavior                   | %       | 0.01            |
| Human activity                    | %       | 0.01            |
| Weather forecast                  | %       | 0.01            |
| Disaster risk                     | %       | 0.01            |
| Health status                     | %       | 0.01            |
| Economic activity                 | %       | 0.01            |
| Social stability                  | %       | 0.01            |
| Environmental impact              | %       | 0.01            |
| Energy consumption                | %       | 0.01            |
| Transportation efficiency         | %       | 0.01            |
| Education level                   | %       | 0.01            |
| Healthcare access                 | %       | 0.01            |
| Food security                     | %       | 0.01            |
| Water supply                      | %       | 0.01            |
| Waste management                  | %       | 0.01            |
| Urban planning                    | %       | 0.01            |
| Infrastructure development        | %       | 0.01            |
| Government efficiency             | %       | 0.01            |
| Public safety                     | %       | 0.01            |
| Community engagement              | %       | 0.01            |
| Research and innovation           | %       | 0.01            |
| Art and culture                   | %       | 0.01            |
| Religion and spirituality         | %       | 0.01            |
| Philosophy and ethics             | %       | 0.01            |
| Science and technology            | %       | 0.01            |
| History and heritage              | %       | 0.01            |
| Language and communication        | %       | 0.01            |
| Mathematics and logic             | %       | 0.01            |
| Art and design                    | %       | 0.01            |
| Music and sound                   | %       | 0.01            |
| Dance and movement                | %       | 0.01            |
| Theater and film                  | %       | 0.01            |
| Literature and writing            | %       | 0.01            |
| Visual arts                       | %       | 0.01            |
| Performing arts                   | %       | 0.01            |
| Media and journalism              | %       | 0.01            |
| Advertising and marketing         | %       | 0.01            |
| Public relations                  | %       | 0.01            |
| Business and industry             | %       | 0.01            |
| Finance and economics             | %       | 0.01            |
| Law and justice                   | %       | 0.01            |
| Politics and governance           | %       | 0.01            |
| International relations           | %       | 0.01            |
| Global issues                     | %       | 0.01            |
| Human rights                      | %       | 0.01            |
| Environment and nature            | %       | 0.01            |
| Climate change                    | %       | 0.01            |
| Biodiversity                      | %       | 0.01            |
| Conservation                      | %       | 0.01            |
| Renewable energy                  | %       | 0.01            |
| Space exploration                 | %       | 0.01            |
| Artificial intelligence           | %       | 0.01            |
| Robotics                          | %       | 0.01            |
| Biotechnology                     | %       | 0.01            |
| Medicine and health               | %       | 0.01            |
| Psychology and behavior           | %       | 0.01            |
| Sociology and culture             | %       | 0.01            |
| Anthropology                      | %       | 0.01            |
| Archaeology                       | %       | 0.01            |
| Geography and earth science       | %       | 0.01            |
| Geology                           | %       | 0.01            |
| Physics and astronomy             | %       | 0.01            |
| Chemistry and materials           | %       | 0.01            |
| Biology and life science          | %       | 0.01            |
| Ecology and environmental science | %       | 0.01            |
| Marine biology                    | %       | 0.01            |
| Botany and horticulture           | %       | 0.01            |
| Zoology and animal science        | %       | 0.01            |
| Genetics and molecular biology    | %       | 0.01            |
| Immunology and microbiology       | %       | 0.01            |
| Cell and tissue biology           | %       | 0.01            |
| Developmental biology             | %       | 0.01            |
| Physiology and anatomy            | %       | 0.01            |
| Neuroscience and psychology       | %       | 0.01            |
| Behavioral science                | %       | 0.01            |
| Education and pedagogy            | %       | 0.01            |
| Teaching and learning             | %       | 0.01            |
| Curriculum and assessment         | %       | 0.01            |
| Research and scholarship          | %       | 0.01            |
| Academic writing                  | %       | 0.01            |
| Journalism and media              | %       | 0.01            |
| Public communication              | %       | 0.01            |
| Writing and editing               | %       | 0.01            |
| Editing and proofreading          | %       | 0.01            |
| Design and layout                 | %       | 0.01            |
| Printing and production           | %       | 0.01            |
| Distribution and sales            | %       | 0.01            |
| Marketing and promotion           | %       | 0.01            |
| Customer service                  | %       | 0.01            |
| Support and maintenance           | %       | 0.01            |
| Quality control                   | %       | 0.01            |
| Compliance and regulation         | %       | 0.01            |
| Legal and ethics                  | %       | 0.01            |
| Insurance and risk management     | %       | 0.01            |
| Finance and accounting            | %       | 0.01            |
| Human resources                   | %       | 0.01            |
| Operations and management         | %       | 0.01            |
| Project management                | %       | 0.01            |
| Business development              | %       | 0.01            |
| Strategic planning                | %       | 0.01            |
| Leadership and management         | %       | 0.01            |
| Communication and collaboration   | %       | 0.01            |
| Teamwork and productivity         | %       | 0.01            |
| Time management                   | %       | 0.01            |
| Organization and structure        | %       | 0.01            |
| Workflow and efficiency           | %       | 0.01            |
| Automation and technology         | %       | 0.01            |
| Software development              | %       | 0.01            |
| Hardware and networking           | %       | 0.01            |
| IT support and maintenance        | %       | 0.01            |
| Security and privacy              | %       | 0.01            |
| Compliance and regulation         | %       | 0.01            |
| Legal and ethics                  | %       | 0.01            |
| Insurance and risk management     | %       | 0.01            |
| Finance and accounting            | %       | 0.01            |
| Human resources                   | %       | 0.01            |
| Operations and management         | %       | 0.01            |
| Project management                | %       | 0.01            |
| Business development              |         |                 |

| Unbound | Bound | Change value |
|---------|-------|--------------|
| R642,   | C985, | 100ohm ->22  |

|       |       |       |
|-------|-------|-------|
| R648, | R643, | R724, |
| R654. | R644. | R725. |

|       |       |       |
|-------|-------|-------|
| R651, | R651, | R722, |
| R660, | R651, | R726, |
| R665, | R652, | R727, |

R665, R652, R727,  
R669, R656, R728,

R641, R657, R729,  
R647, R662.

|       |       |
|-------|-------|
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| R659, | R666, |

R659, R666,  
R664, R667,

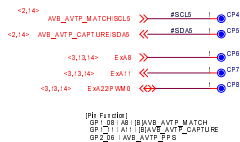
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|-------|-------|
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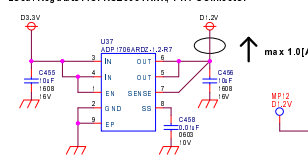
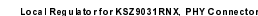
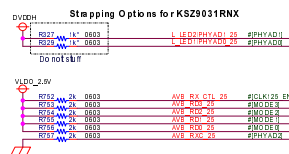
R658, R873,  
R661 R874,

R875

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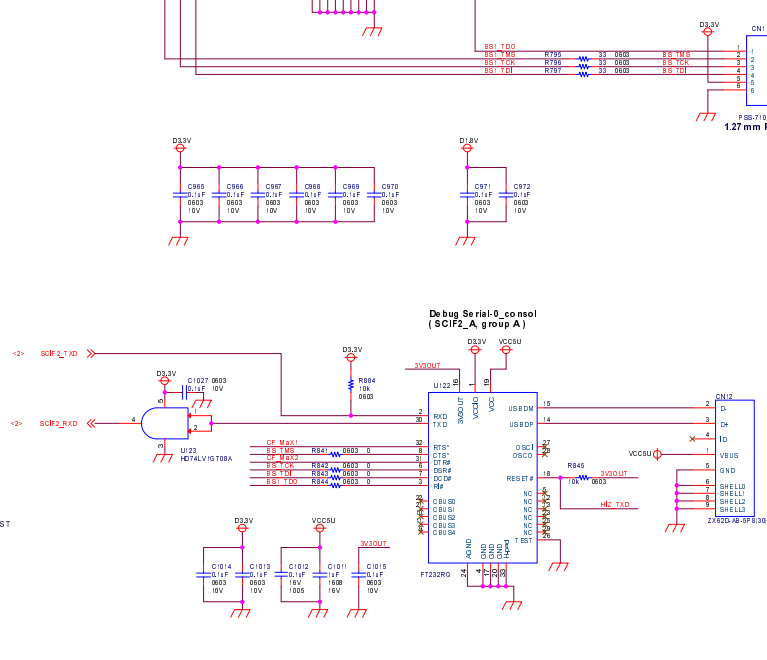
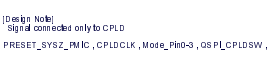
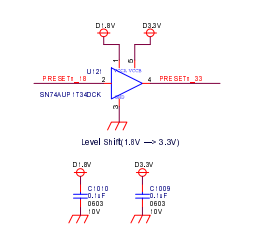
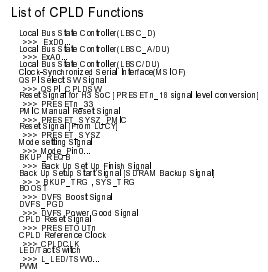
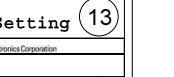
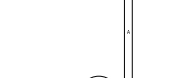
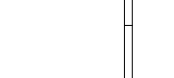
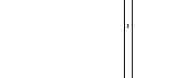
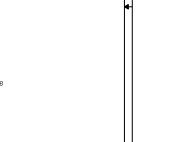
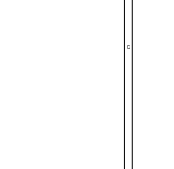
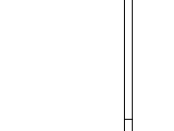
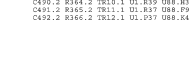
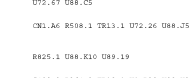
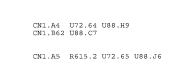
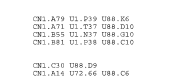
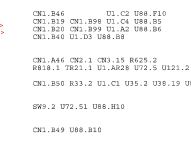
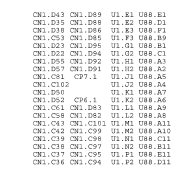
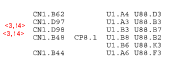
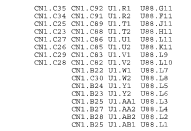
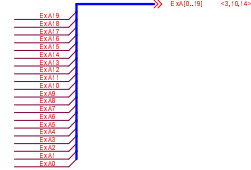
```
[Pin Function]
GP1_08 | A1 | [B]AVB_AVTP_MATCH
GP1_11 | A11 | [B]AVB_AVTP_CAPTURE
GP2_06 | AVB_AVTP_PPS
```



EtherAVB (GbPHY)

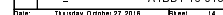


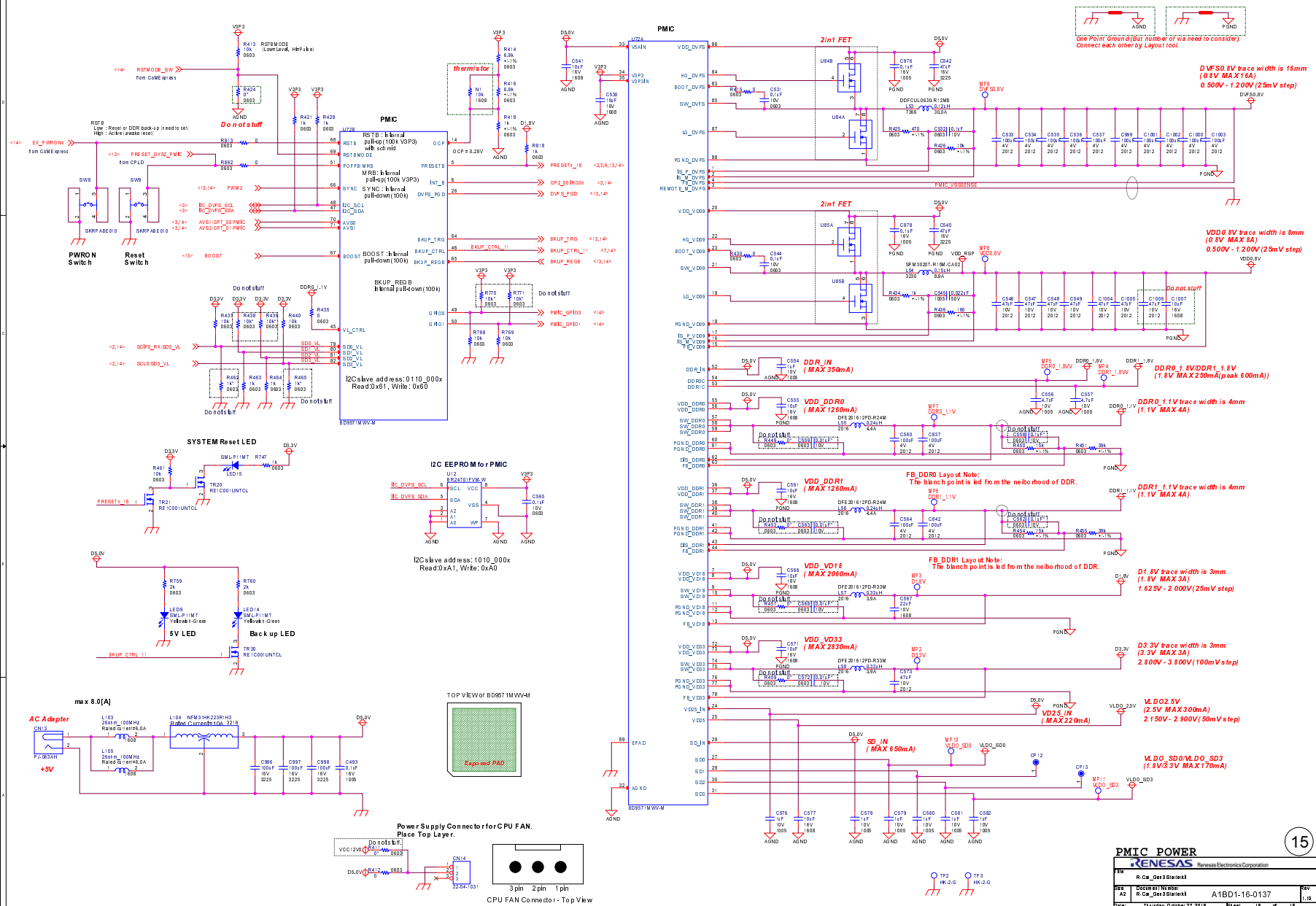






### Matched trace length and Differential Impedance





R-Car Starter Kit Premier  
R-Car Starter Kit Pro

*Renesas*  
**R-Car**

**RENESAS**

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