ROHM USB Type-C Power Delivery Evaluation Board Manual

BM92A15MWV-EVK-001

Ver.1.00

Date:03-Mar,2017

Introduction

This board is dedicated to receiving power with USB Type-C Power Delivery and requests the maximum voltage from the voltage profile (PDO) that the power supply side has.
If you want to check the operation of Power Delivery, please prepare power supply capable USB Type-C Power Delivery device and USB Type-C dedicated cable.
Please use selling separately “BM92A21MWV-EVK-001” for power supply capable USB Type-C Power Delivery device.

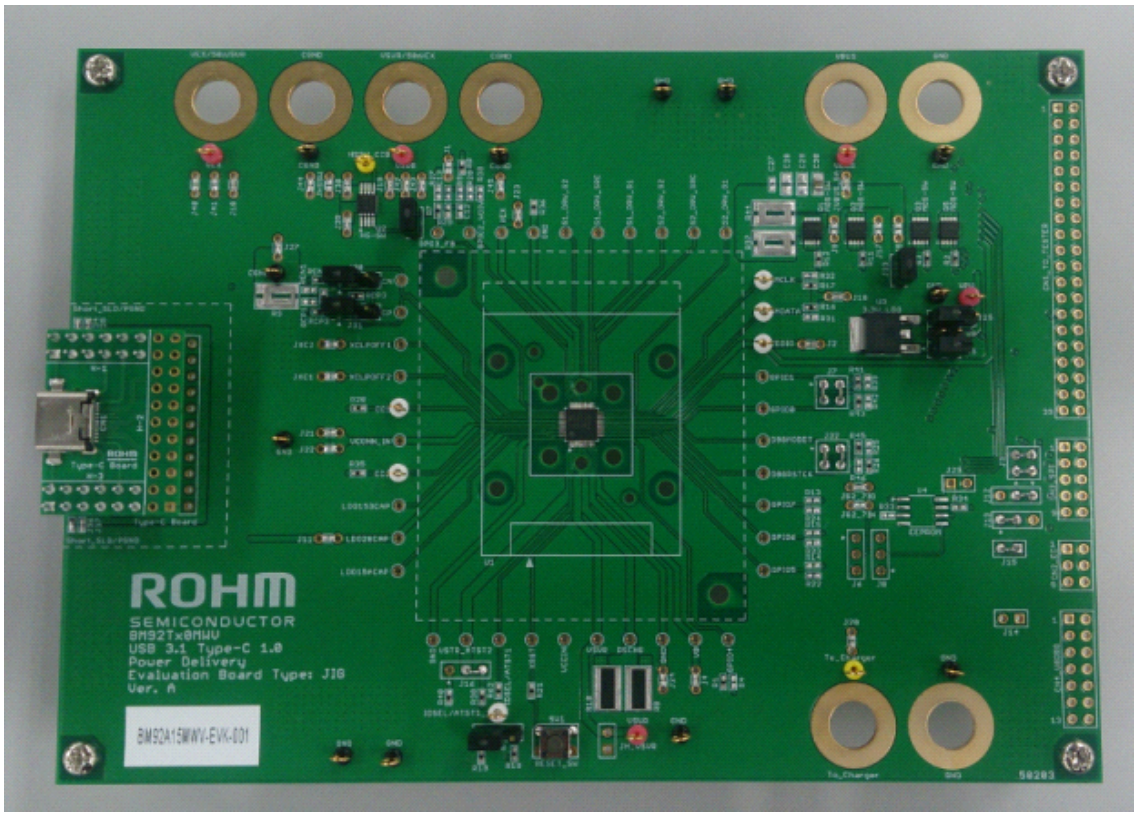

Figure1. Evaluation Board Photo

Evaluation Board Circuit and Pin Explanation

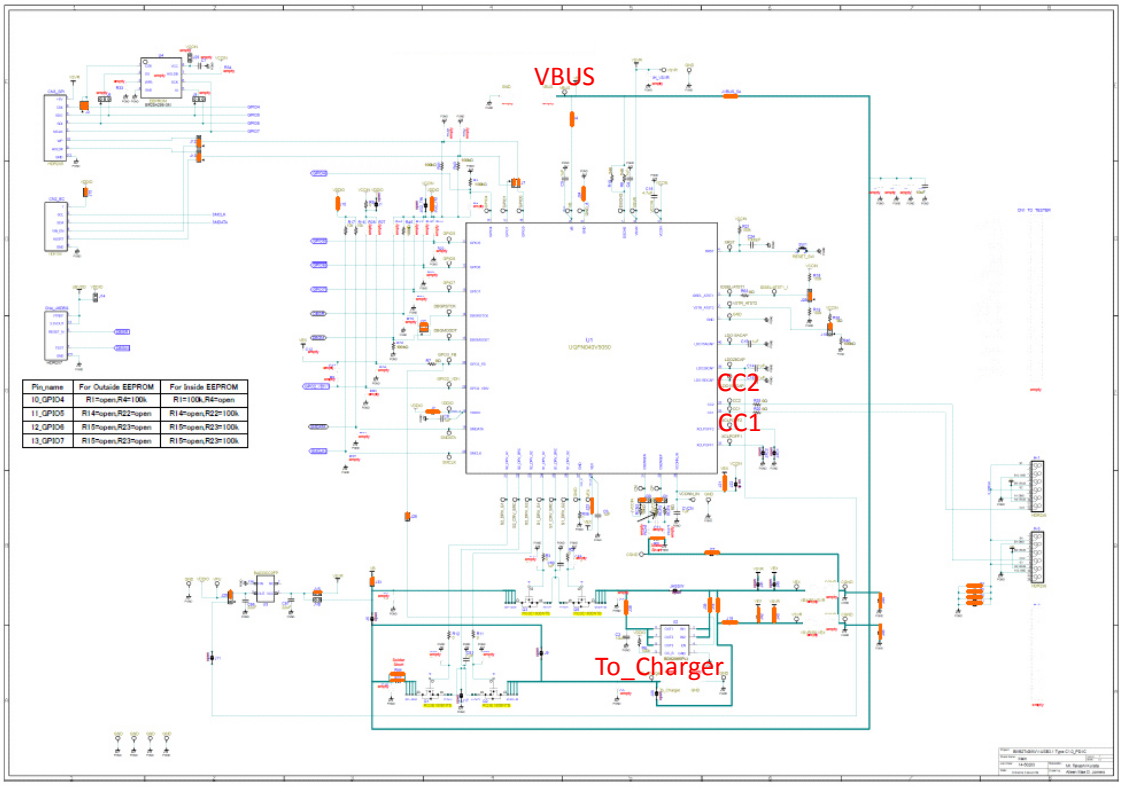

Figure2. Evaluation Board Circuit

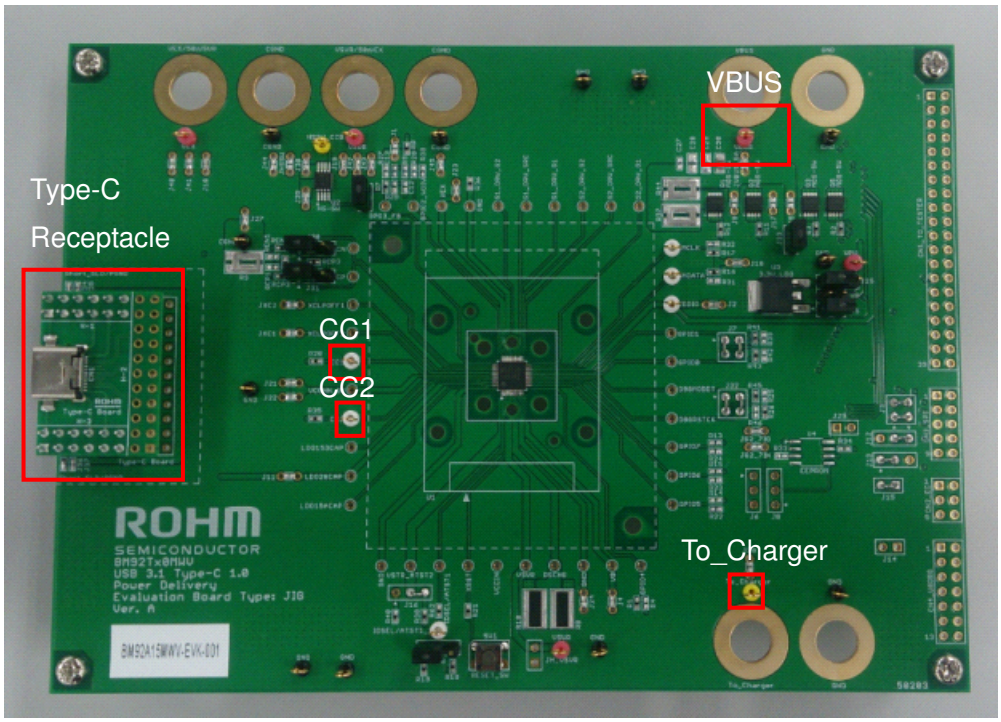

Figure3. Evaluation Board Photo

- VBUS pin：VBUS voltage input pin. You can monitor the VBUS voltage supplied from the Source side.
- CC1,CC2 pin：You can monitor the communication waveform (BMC waveform) with USB Power Delivery.
- To_Charger pin：The pin at the end of the FET on the VBUS Line. In an actual system, a current load will be drawn from this pin.

How to use and evaluate

1. This board is compatible with Dead Battery, so it can be operated without power supply. As shown in the picture below, you can check the Power Delivery operation by simply connecting a USB Power Delivery device capable of supplying power with Type-C dedicated cable.

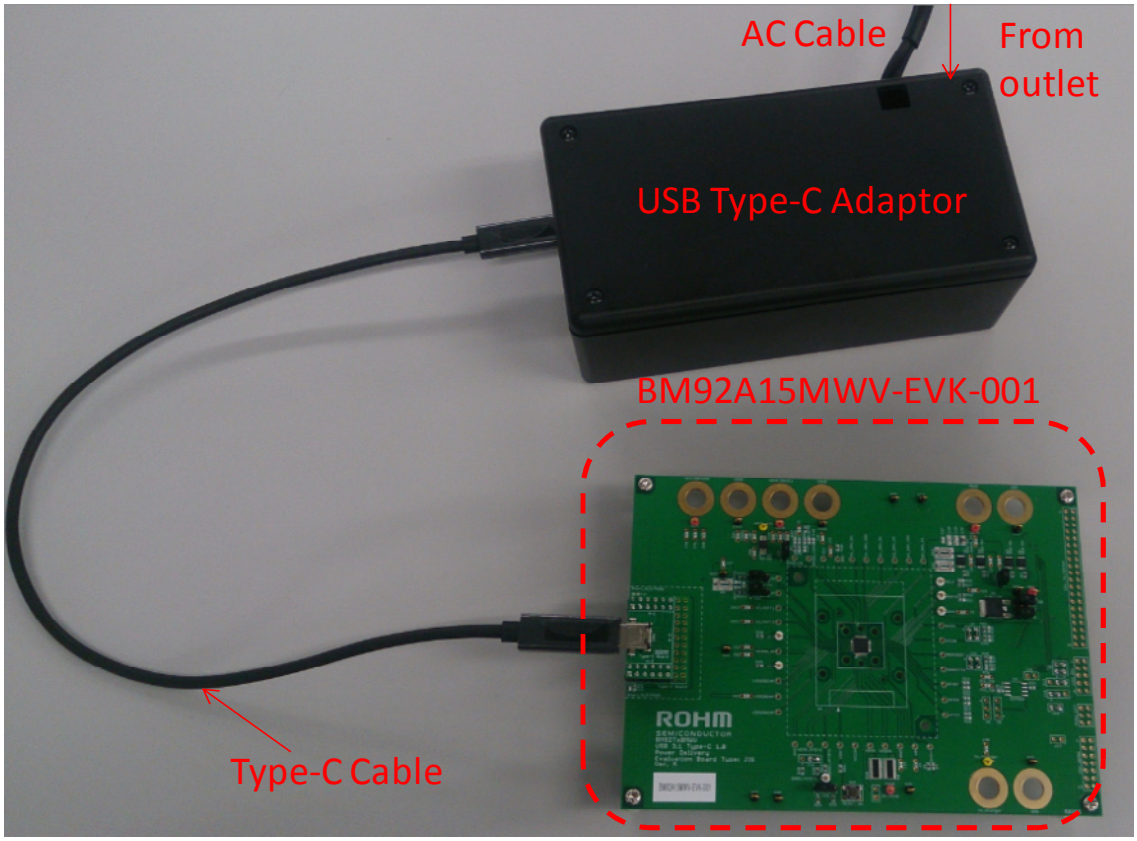

Figure4. Device connection photo using Type-C cable

Power Delivery Operating Waveform

When connecting this board (Sink side) and power supply device (Source side) using Type-C dedicated cable, the Source side detects the Sink side and outputs 5V voltage to the VBUS pin. After outputting 5V voltage on the Source side, it communicates with the Type-C controller IC in the dedicated cable to acquire cable information.

After communicating with the cable on the Source side, the Source side transmits its own power profile information to the Sink side. (Source Capability)

The Sink side requests an appropriate voltage from the power profile to the Source side. (Request)

In response to the Sink side voltage request, if the Source side is able to deal with it, notifies the Sink side that it acknowledged. (Accept)

The Source side outputs the requested voltage to the VBUS pin.

After outputting the required voltage, the Source side notifies the Sink side that the requested voltage has been output. (PS_RDY)

After confirming the requested voltage, the Sink side turns on the FET switch on the VBUS line.

・20V negotiation waveform

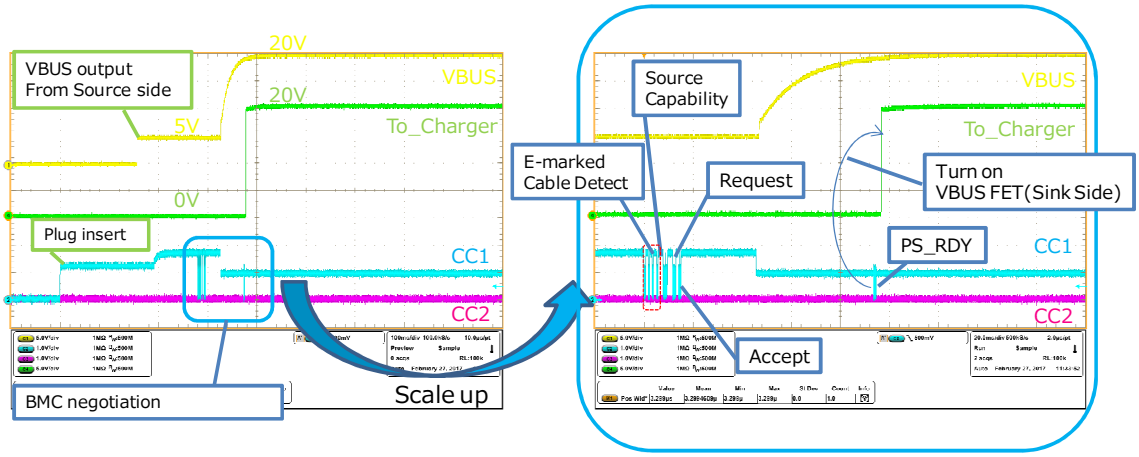

Figure5. Power Delivery negotiation waveform

Evaluation Board Layout

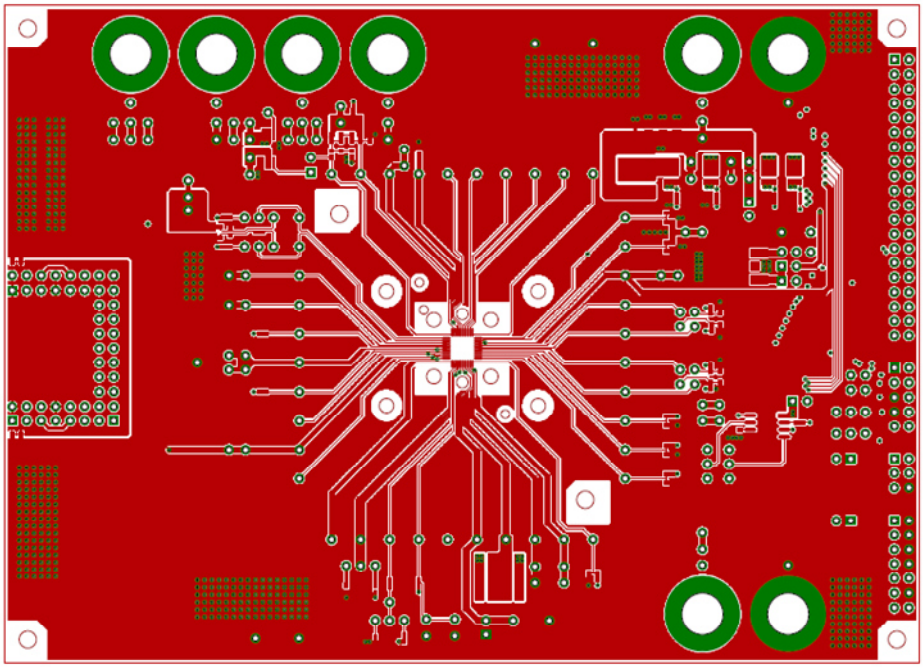

Figure6. Top Layer Layout

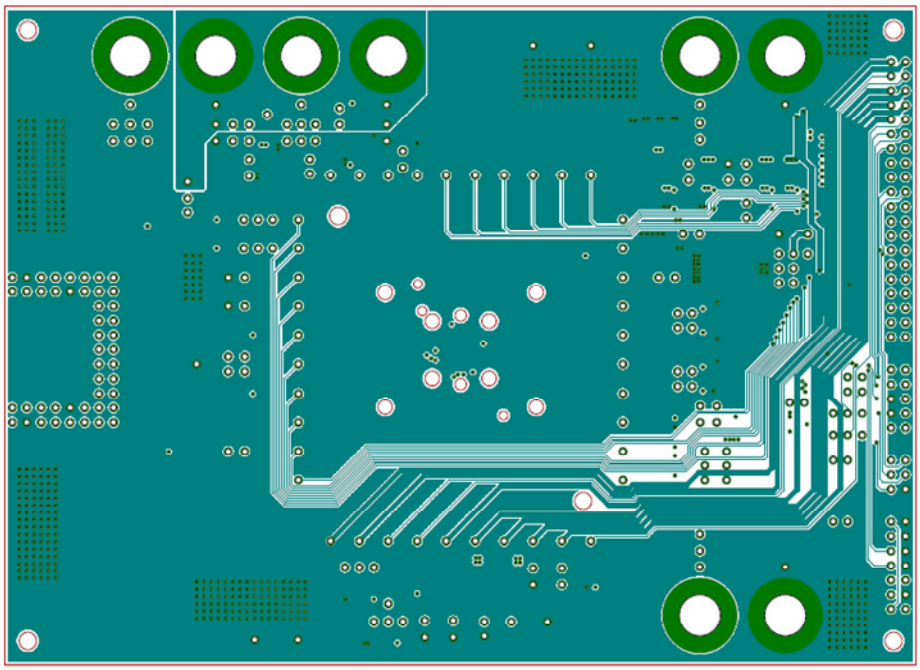

Figure7. Second Layer Layout

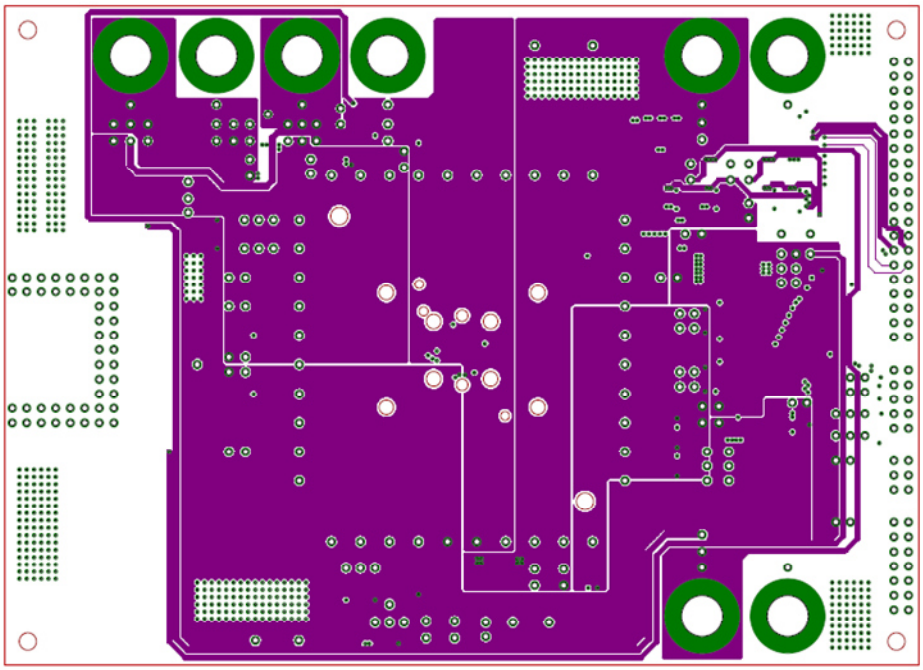

Figure8. Third Layer Layout

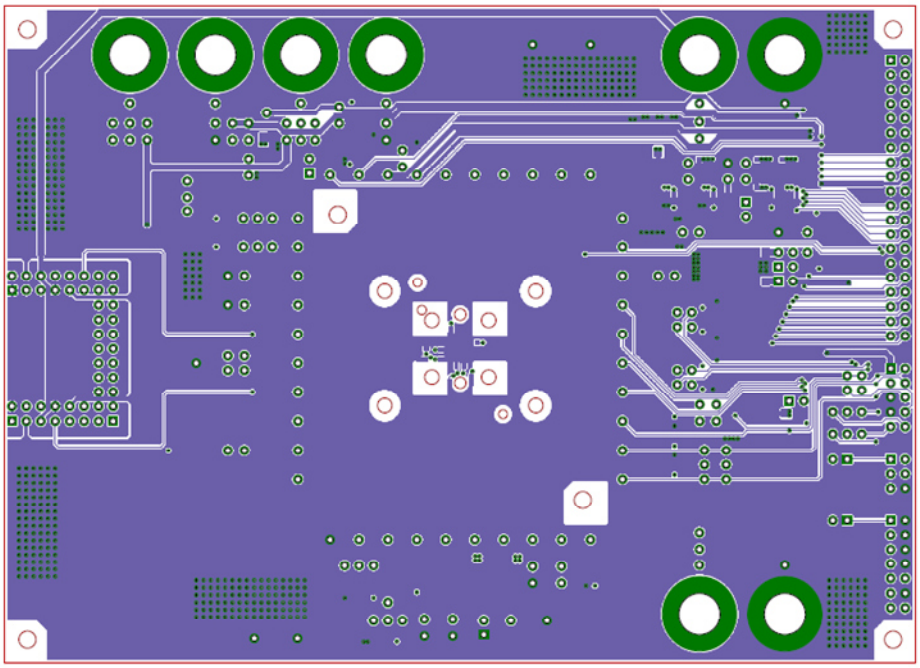

Figure9. Bottom Layer Layout

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