ROHM USB Type-C Power Delivery Evaluation Board Manual

BM92A56MWV-EVK-001

Ver.1.00

Date:03-Mar,2017

Introduction

This board is dedicated to supplying power with USB Type-C Power Delivery, and voltage profile (PDO) is 5V, 9V, 12V, 15V, 20V.

If you want to check the operation of Power Delivery, please prepare capable of receiving power USB Type-C Power Delivery device and USB Type-C dedicated cable.

Please use selling separately “BM92A12MWV-EVK-001 (20V)”, “BM92A13MWV-EVK-001 (15V)” and “BM92A14MWV-EVK-001 (9V)” for capable of receiving power USB Type-C Power Delivery device.

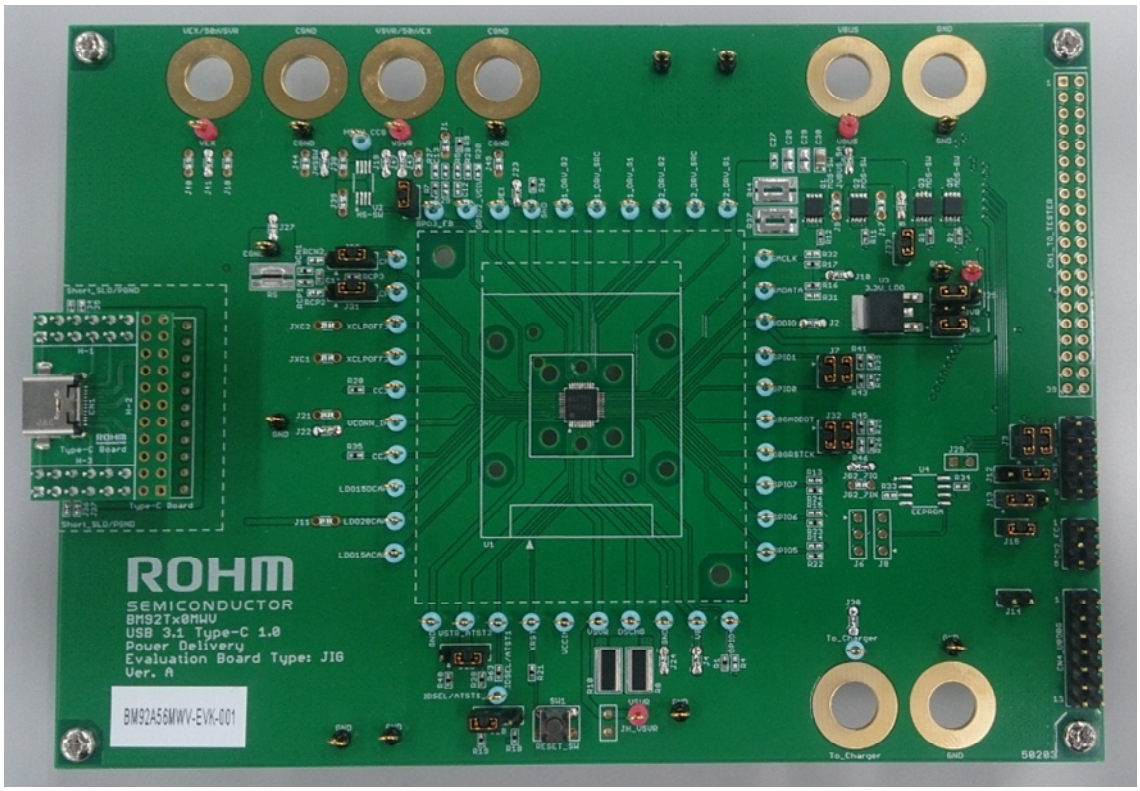


Figure1. Evaluation Board Photo

Evaluation Board Circuit and Pin Explanation

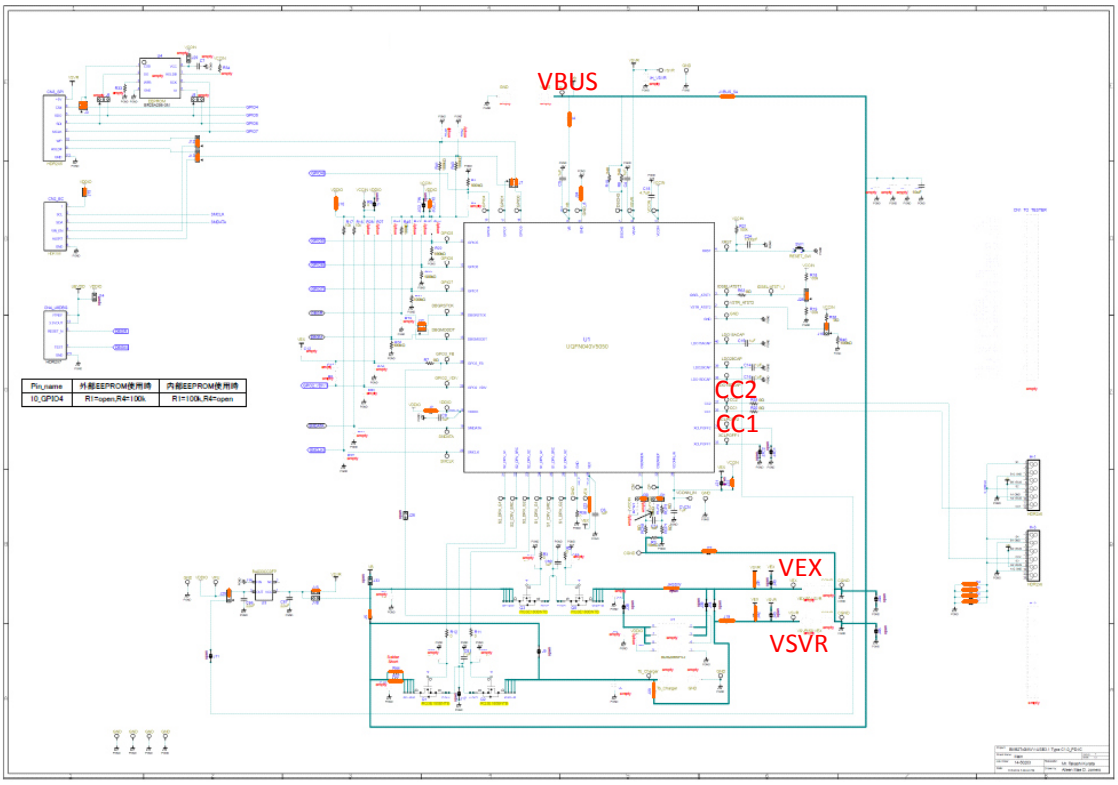


Figure2. Evaluation Board Circuit

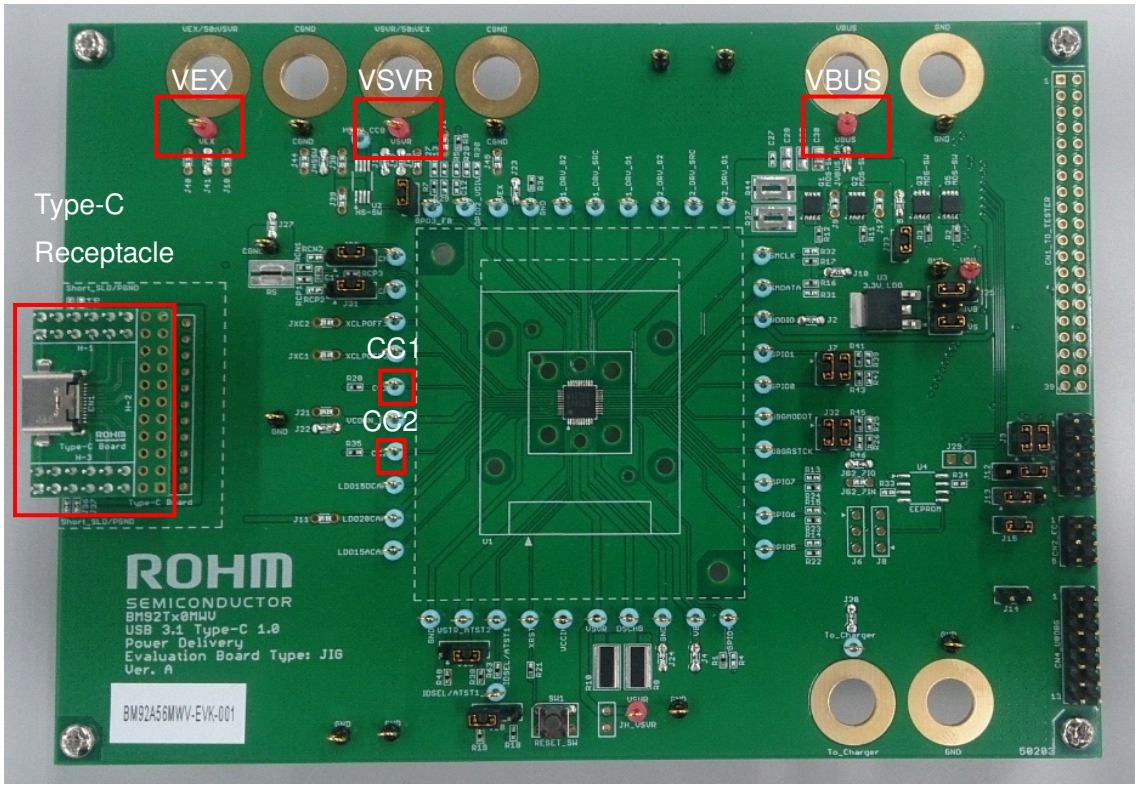


Figure3. Evaluation Board Photo

・VEX pin：5V voltage input pin. Although it is named VEX pin on the board, it is connected to the VSVR pin of the PDIC.

・VSVR pin：5V or 9V or 12V or 15V or 20V voltage input pin. Although it is named VSVR pin on the board, it is connected to the VEX pin of the PDIC.

・CC1,CC2 pin：You can monitor the communication waveform (BMC waveform) with USB Power Delivery.

・VBUS pin：It is connected to VB pin of PDIC and VBUS pin of Type-C Receptacle. You can monitor the VBUS voltage to power the Sink side.

How to use and evaluate

1. Please input 5V to VEX pin and 5V or 9V or 12V or 15V or 20V to VSVR pin of this board.

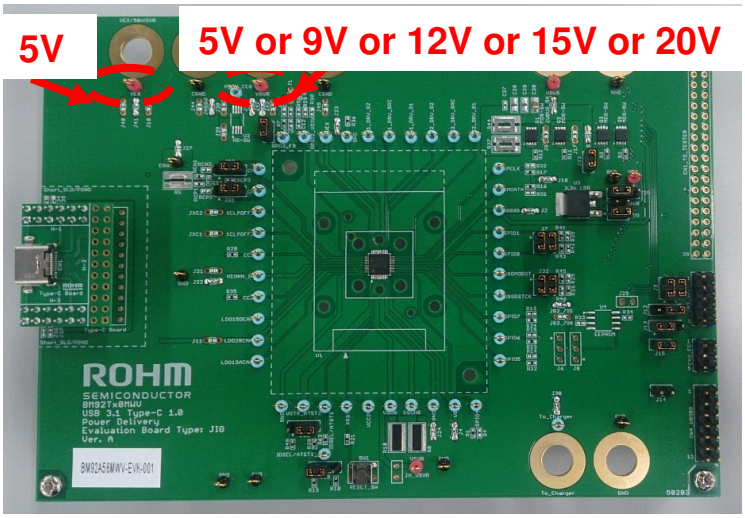


Figure4. Evaluation Board Photo

2. Please connect to capable of receiving power USB Type-C Power Delivery device with Type-C dedicated cable.
   The following is a picture connected to the selling separately BM92A15MWV-EVK-001.

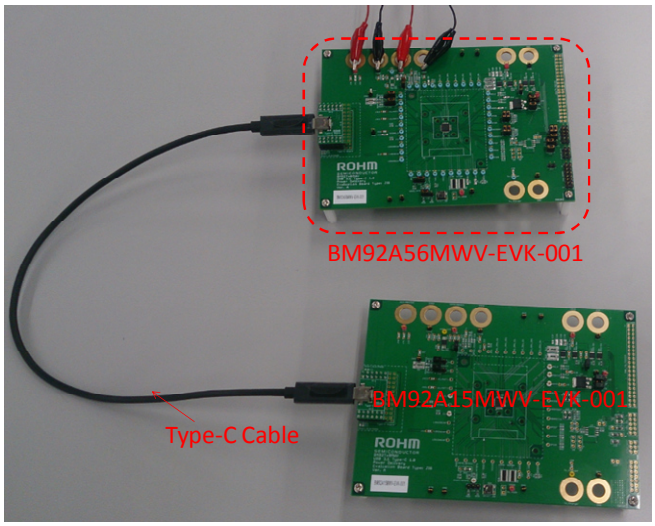


Figure5. Device connection photo using Type-C cable

Power Delivery Operating Waveform

When connecting this board (Source side) and power receiving device (Sink 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 （Board VSVR voltage:20V）

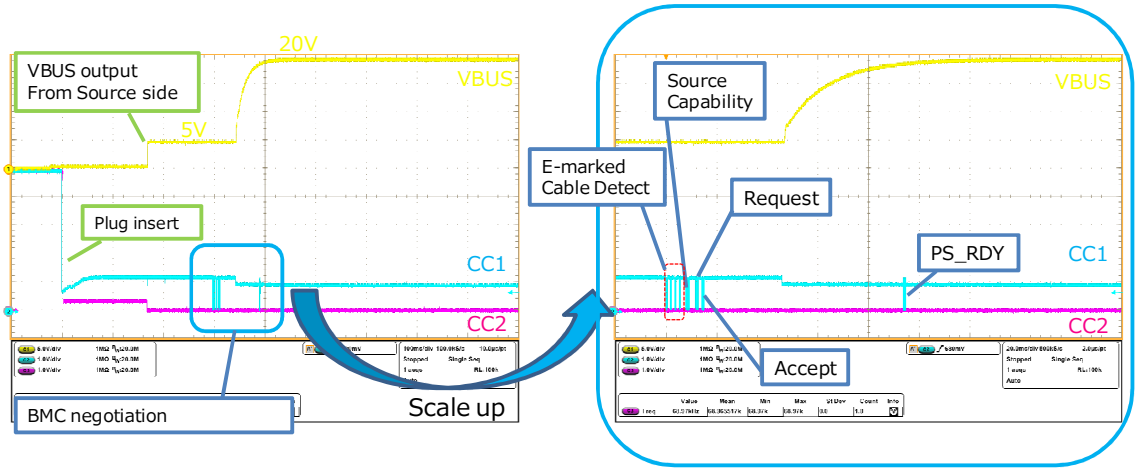


Figure6. Power Delivery negotiation waveform

Evaluation Board Layout

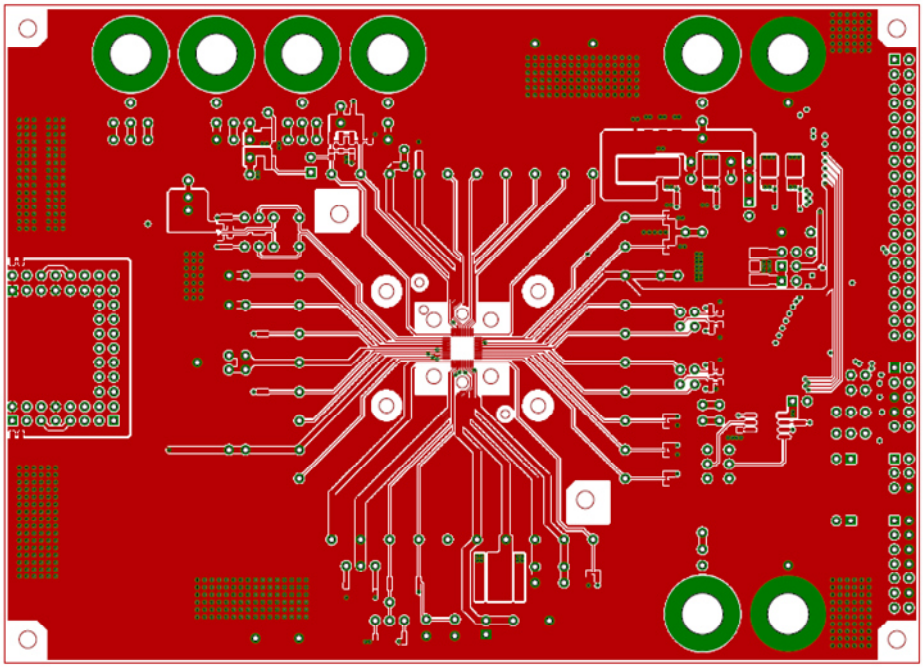


Figure7. Top Layer Layout

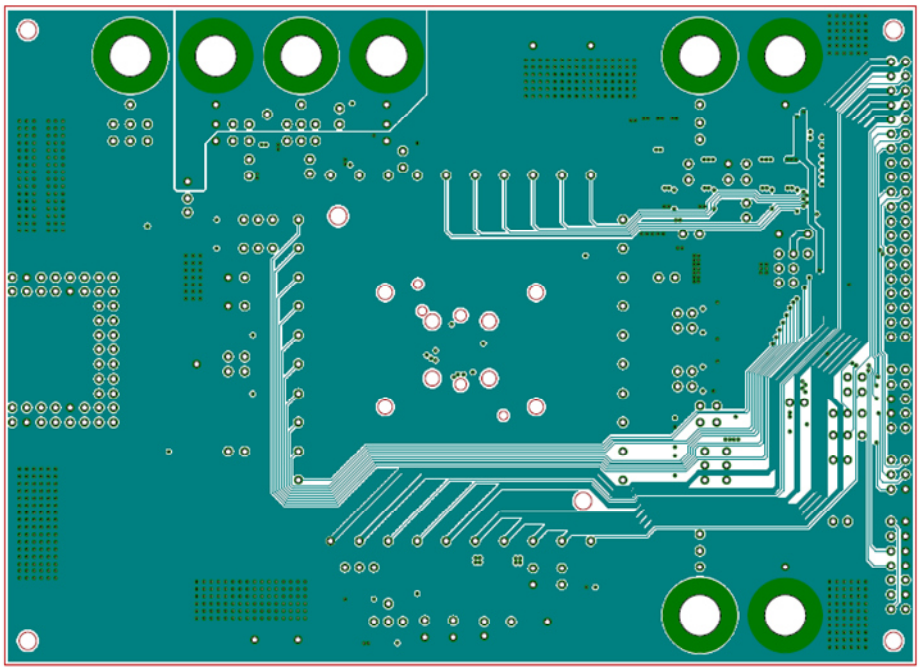


Figure8. Second Layer Layout

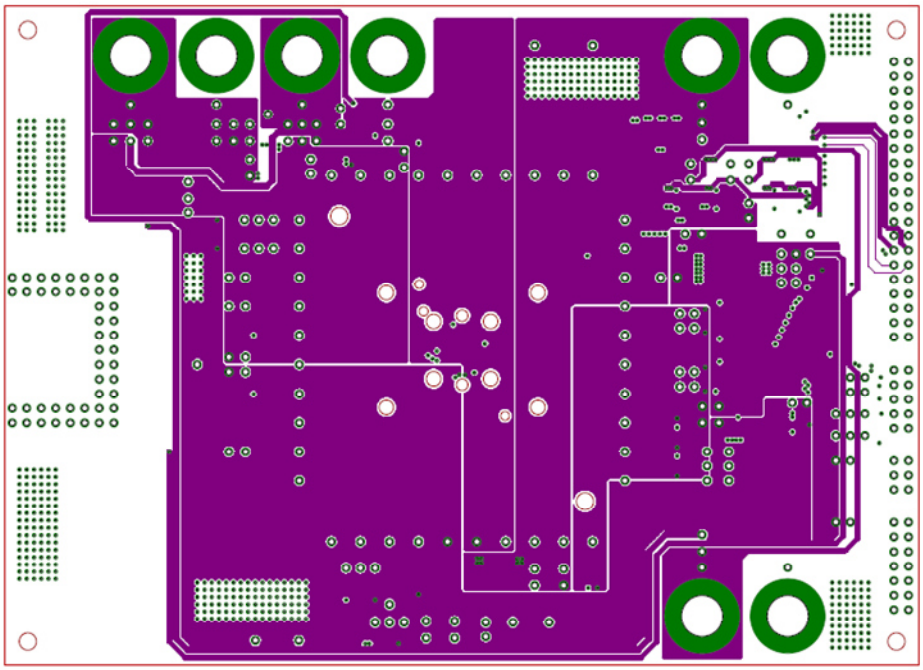


Figure9. Third Layer Layout

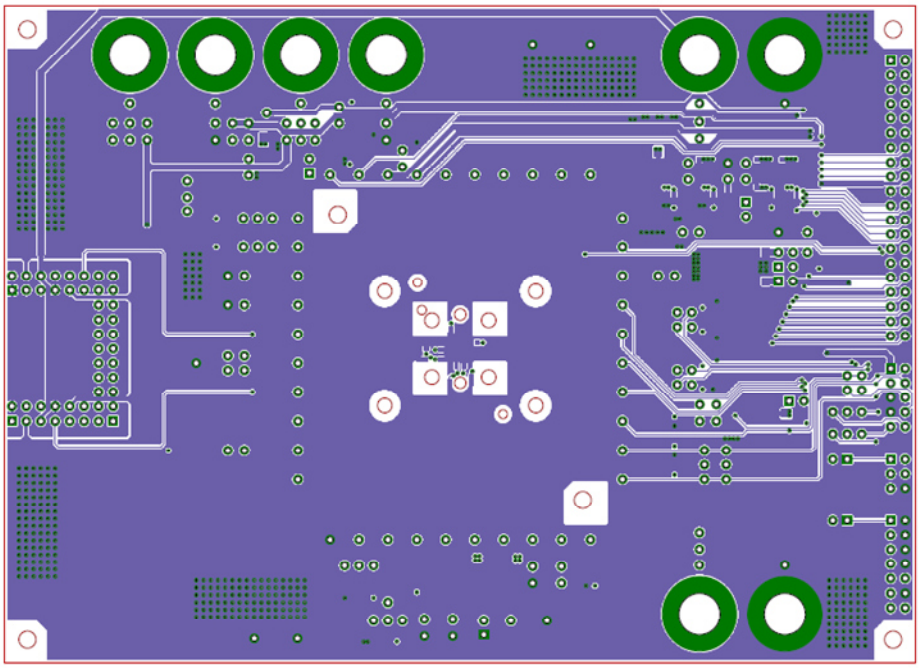


Figure10. Bottom Layer Layout

Notes

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3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
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4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

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