ROHM USB Type-C Power Delivery Evaluation Board Manual

BM92A21MWV-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 and AC 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.

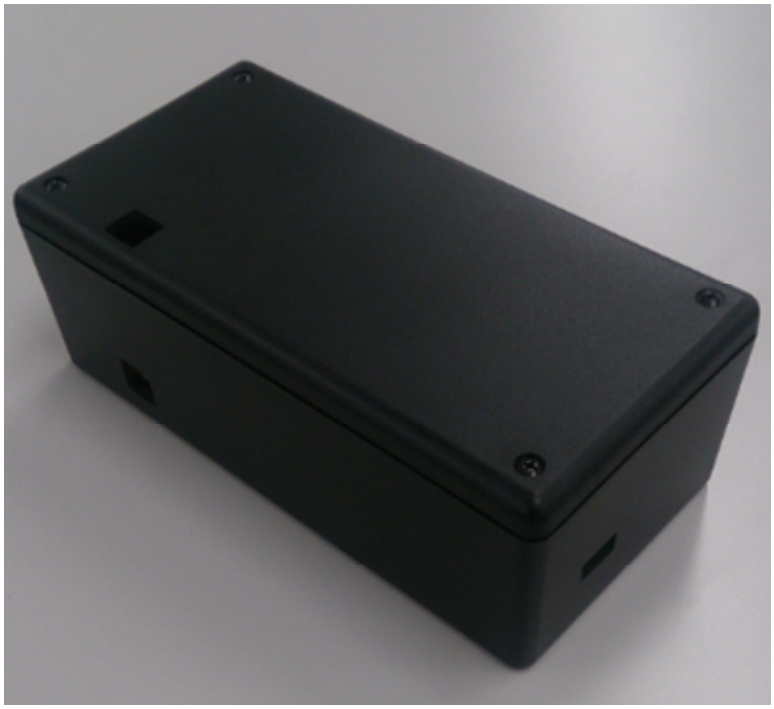

Figure1. Evaluation Board Photo

How to use and evaluate

1. As shown in the picture below, please insert the AC cable into this board.
   Please tighten the screw securely with the screwdriver from the top.

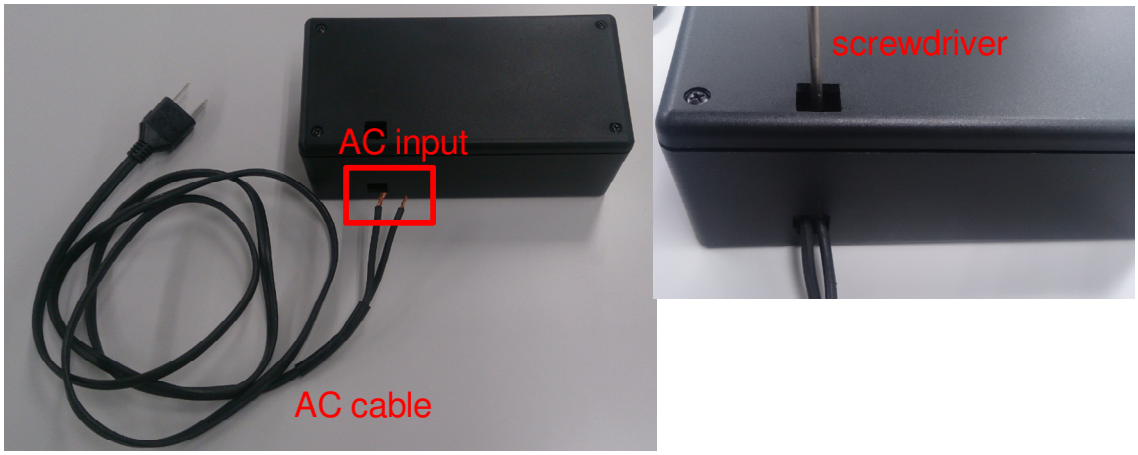

Figure2. AC cable connection

2. Please the AC cable into the power outlet.

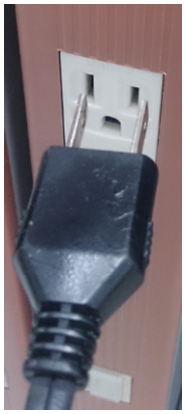

Figure3. Power outlet connection

3. 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 BM92A12MWV-EVK-001.

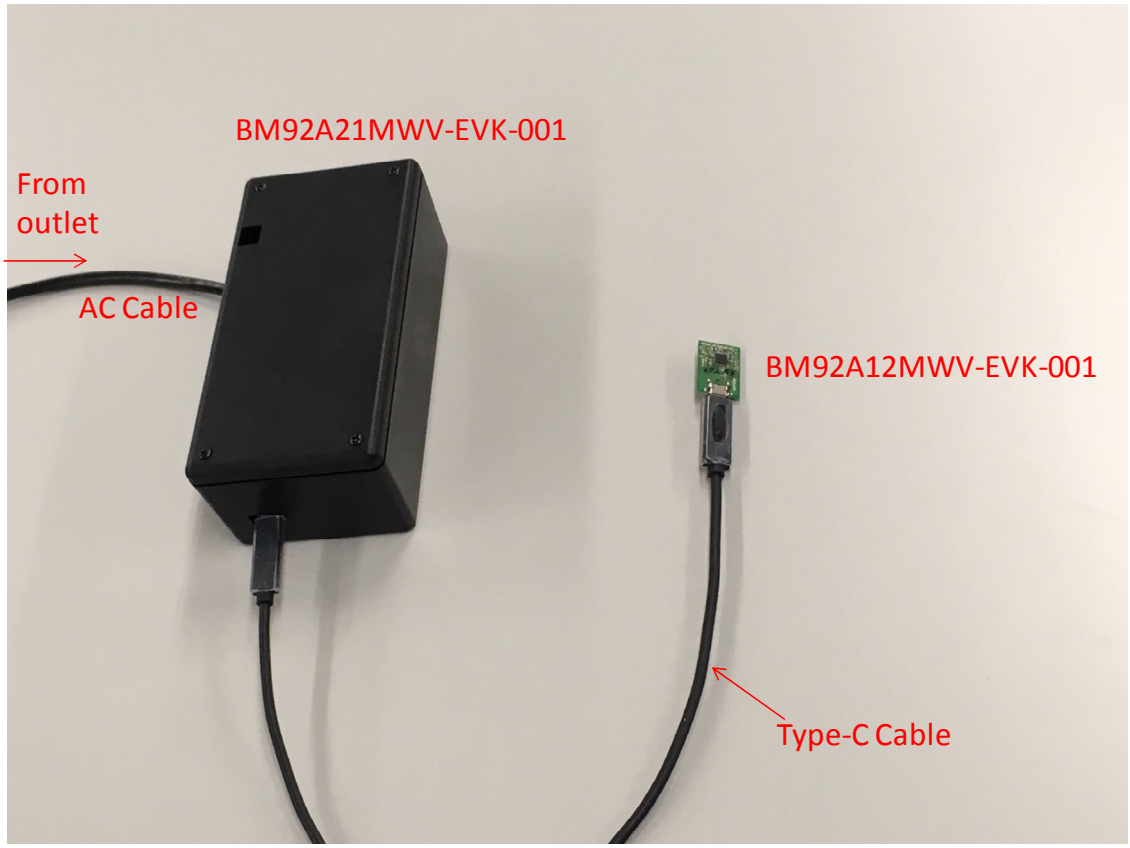

Figure4. Device connection photo using Type-C cable

There is no monitor pin for observing voltage on this board. If you want to observe voltage waveform, please use selling separately BM92A12MWV-EVK-001, BM92A13MWV-EVK-001, BM92A14MWV-EVK-001, BM92A15MWV-EVK-001 as the power receiving side board.

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

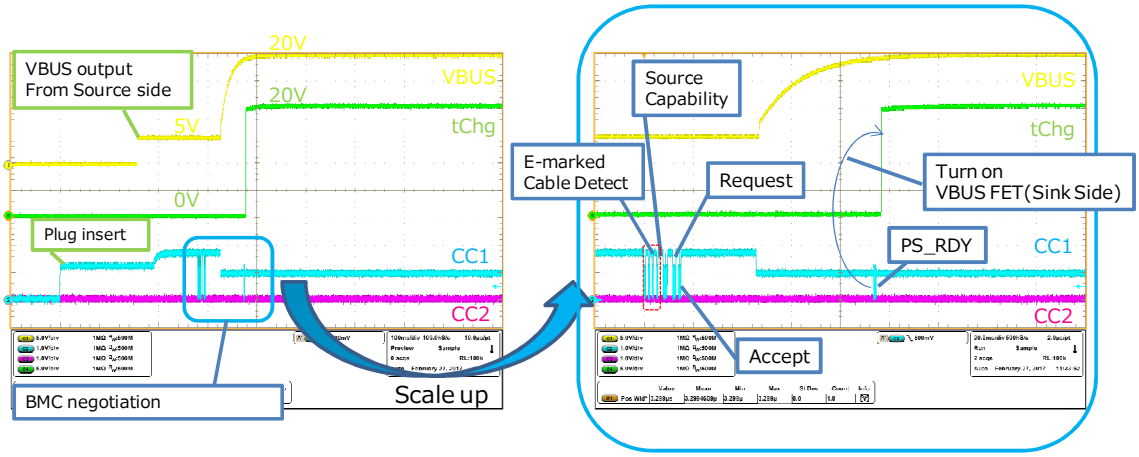

Figure5. Power Delivery negotiation waveform

The Specification and Caution of the BM92A21MWV-EVK-001

<Specification>

・PDO

PDO-1:5V 3A

PDO-2:9V 3A

PDO-3:12V 3A

PDO-4:15V 3A

PDO-5:20V 3A

・AC input voltage range:90Vac～270Vac

・AC input current limit:2A

・Output voltage range:5V～20V

・Output power:100W

・Output noise: Characteristic non-guarantee

・Output ripple voltage: non-guarantee

・Steep output load response: non-guarantee

・Rush current saving function: none

・Tolerance to ESD voltage: non-guarantee

・Tolerance to EMC/EMI: non-guarantee

・Sound ringing measure of a PWM controller :none

・Primary OVP function: mask(Secondary OVP function: negotiated voltage ×1.2)

・Primary OCP function:6A~10A(Secondary OCP function: negotiated voltage ×1.2)

・OVP,OCP detection: Auto-recovery

<Caution>

It can't be used for mass production because the power efficiency is bad with 75%

When a photo coupler short-circuited, safety has not been secured because there are no protection circuits.

It's for evaluation, so it doesn't correspond to the safe standard by which it's for UL, PSE.

Please use as a demonstration kit for USB-PD evaluation.

Mouser Electronics

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ROHM Semiconductor:

BM92A21MWV-EVK-001