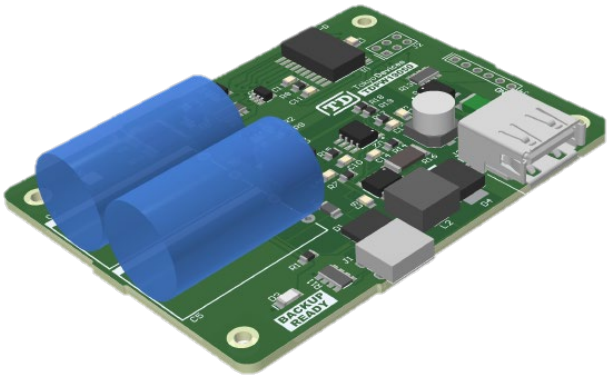
TOKYO DEVICES

TDPW19050

USB Backup Power, UPS, Protection for 5V Power Flicker/Interruption

Revision 1.0



TDPW19050 is a small UPS for devices that operate on USB power. In the event of a momentary interruption in the USB power supply, it temporarily provides backup power from the built-in energy storage device in the module. It provides approximately 20 seconds of backup at a 500mA load and 10 seconds at 1A load.

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1. Specifications

Name	Value	Note
Energy Storage	Electric Double-Layer Capacitor, 12.5F at 5V	
Output Voltage (V_{OUT})	USB 5.2V typ.	
Backup Time	60sec @100mA 20sec @500mA 10sec @1A	approximate values. It is recommended to perform experiments with your actual load devices for precise results.
Rated Maximum Output (I_{MAX})	1A	
Peak Output (I_{peak})	1.5A	Do not connect a load that exceeds the peak output. It can cause abnormal heating and malfunction.
Input Power	USB Type-C 15W or higher	It is recommended to use a USB Type-C power supply that can provide 5V 3A.
BKUP Pin Abs. Max. Current	±4mA max.	
BKUP Pin V_{OH}	V_{OUT}-0.3V min.	
BKUP PIN V_{OL}	0.3V max	
Output Connector	USB Type A	
Input Connector	USB Type C	
Weight	TBD	
Operating Temp. Range	0-50°C	no condensation
Dimensions	TBD	

2. Board Layout and Interface

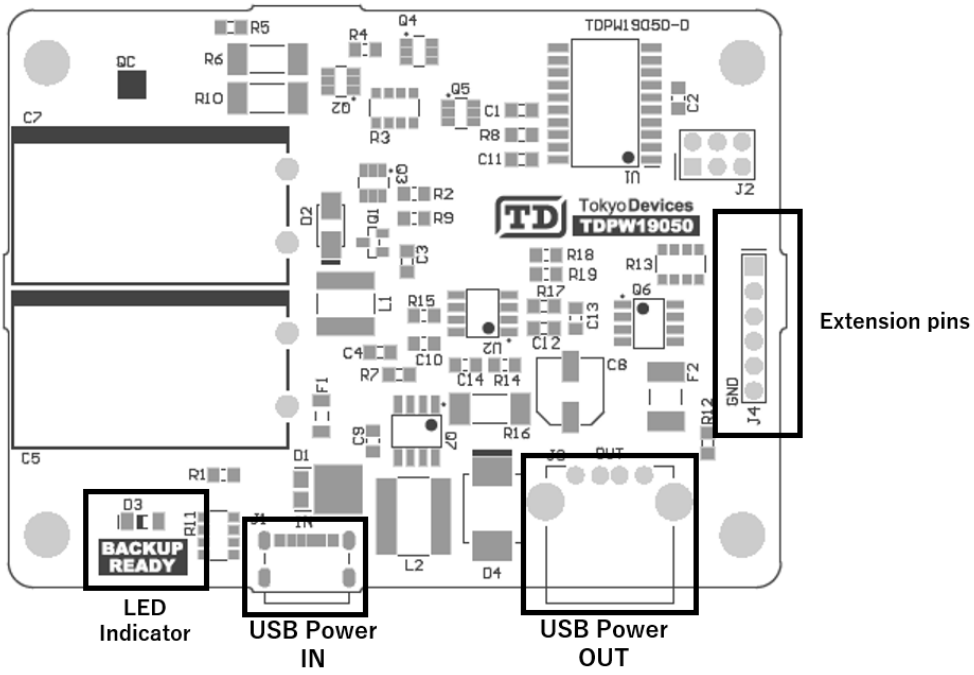

Figure 1 Board Layout

Table 1 Interface Specifications

Symbol	Name	Description
D3	LED Indicator	**- With power input:** - On: Backup ready (battery capacity 80% or more) - Off: Backup in progress (battery capacity less than 80%) **- Without power input:** - Flashing: Backup in progress (discharging) - Off: Backup stopped (discharge completed)
J1	USB Power IN	Connect a USB power source.
J3	USB Power OUT	Connect a USB device.
J4	Extension Pins	The side with printed lines on the board is considered pin 1. The pin assignment is as follows: 1, 3, 4 = OPEN, 2 = TEST, 5 = BKUP, 6 = GND.

3. How to Use

- Connect a standard USB power source, such as a USB charger, to the USB Power IN connector.
- Connect the USB-powered load device to the USB Power OUT connector.
- Wait for approximately 15 minutes until the energy storage is complete. The LED indicator will illuminate.
- To test a power outage scenario, intentionally disconnect the power source from the USB Power IN connector.
  - ➢ The backup power supply from the energy storage device will take over.

- During backup mode, if the energy storage device discharges significantly, the LED will start flashing.
- When the energy storage device is depleted, the USB Power OUT will turn off.

・ If you reconnect the USB Power IN connector while in backup mode, the backup will automatically end, and the recharging of the energy storage device will begin again.

4. Extension Pins

J4 is an extended pin for interfacing with external devices. When it enters backup mode, an 'H' signal is output from the BKUP pin. By detecting the rising edge of the BKUP signal, you can take measures such as saving data or shutting down within the grace period.

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