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TYPE-C BASED BACKUP POWER SOLUTION FOR DESKTOP PC

HP INC

Type-C based Backup Power Solution for Desktop PC

ABSTRACT

Power Failure is one of serious fault event which would cause system unexpected shutdown and customer important data loss.

The possibility of Power Failure may cause by:

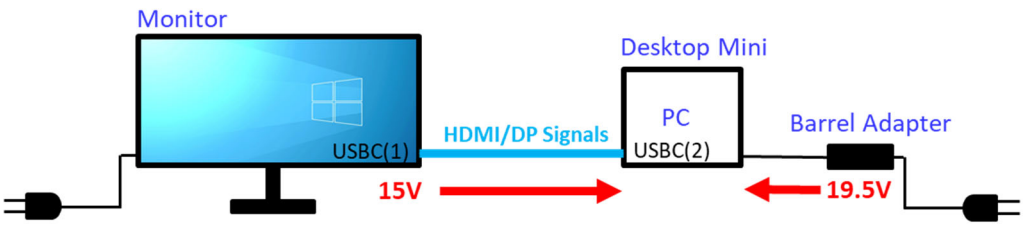
- PC system abnormal operation (Triggering PSU/Adapter over current protection)
- AC Line fault (Power quality, noise or voltage regulation fail…etc.)

The invention is to provide a simple and no cost-adder solution which use Type-C power delivery as a backup power to support Desktop PC while Power Failure event.

With Type-C as backup power, system can store running data and entering S3 Sleep mode safely without data loss.

DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a typical block diagram for the invention.



At Normal State:

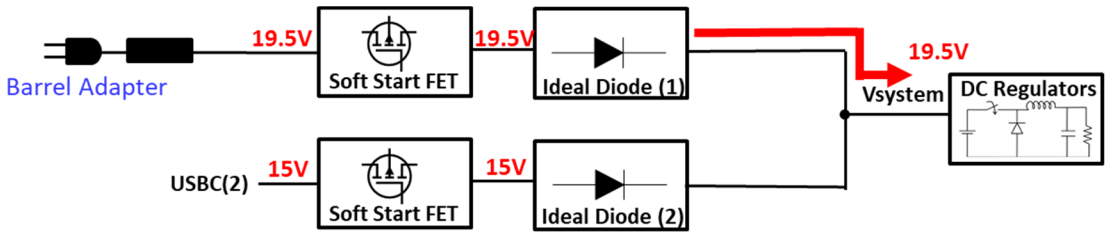
- PC ask "Power Role Swap" to monitor over USBC.
- USBC(1) configurated as output power port with 15V standby power on Vbus.
- PC have two power sources (19.5V from barrel adapter and 15V from monitor).
- PC system is powered by 19.5V barrel adapter.

At Power Failure State:

- When "Power Failure" occurs, The 15V delivered by USBC(1) act as backup power to keep PC alive and prevent data loss.

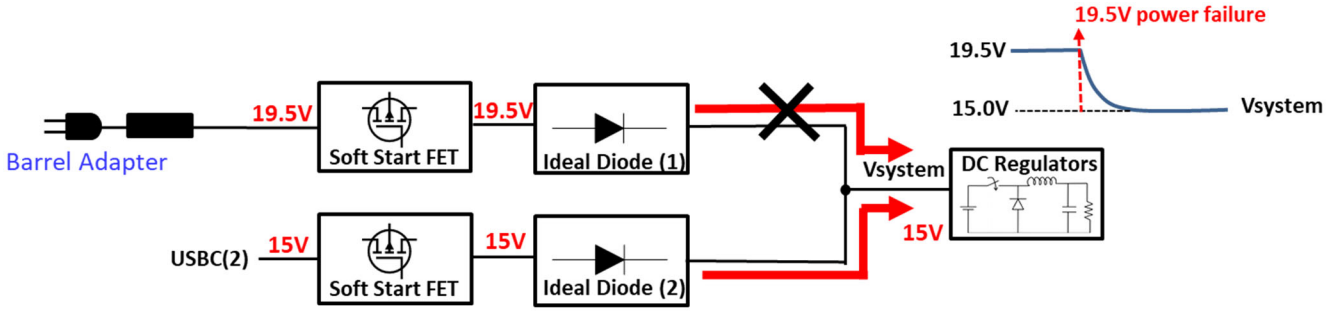
Fig. 2-1 and 2-2 illustrates a "power flow" use case for the invention.

At Normal State:



- 15V power is always standby at Ideal Diode (2) Input.
- 19.5V power priority is higher than 15V standby power.

At Power Failure State:



- When 19.5V falls by power failure, 15V will catch up system power “seamlessly”.

Fig. 3 illustrates a “PD Controller“ flow chart of the invention proposal.

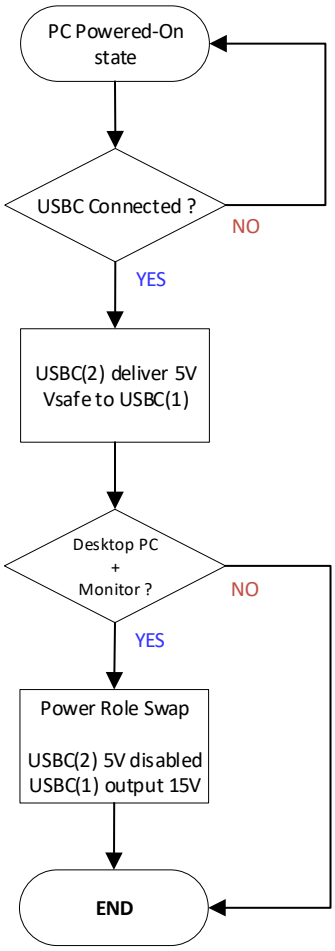
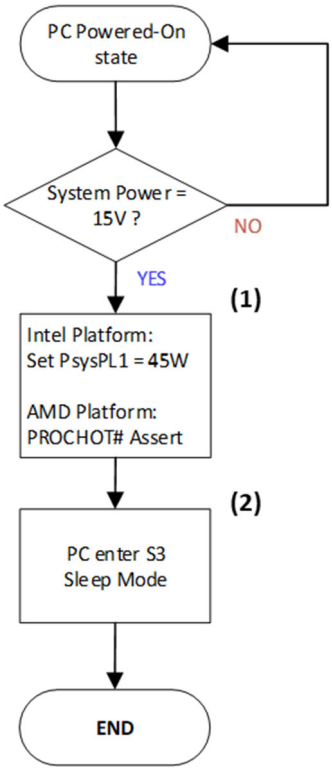


Fig. 4 illustrates a “SIO/EC “flow chart of the invention proposal.



Note:

(1) Set PsysPL1 or PROCHOT# assertion is to limit PC max power draw and protect monitor power delivery

(2) OS can notice user after wake from S3:
There was a power failure event, PC is now powered by monitor (backup power).

Disclosed by Angus, Liu, HP Inc.