

Eight Discipline Report (8D Report)

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| To: Dell | 8D report No.: xxxxxx |
| From: : Chicony Power Technology | RMA claim No.: N/A |
| CC : | Chicony Power P/N: |
| | Customer P/N: |
| Submit date: 2023/10/23 | Product description: PD 130W |
| Receive date: 2023/10/27 | |

Subject : After the AC power is turned off, abnormal operation of the blocking MOS causes voltage bouncing on the output voltage;輸出電壓彈跳；輸出電壓異常；輸出突波；輸出 spike;關機輸出電壓異常

D1.) 問題解決成員:Use Team Approach

主持者 (Team Leader) : **Benson_Chen**

內部成員 (Internal Team Members):

RD: Kerr_Chen

外部成員 (External Team Member):

Supplier: OB

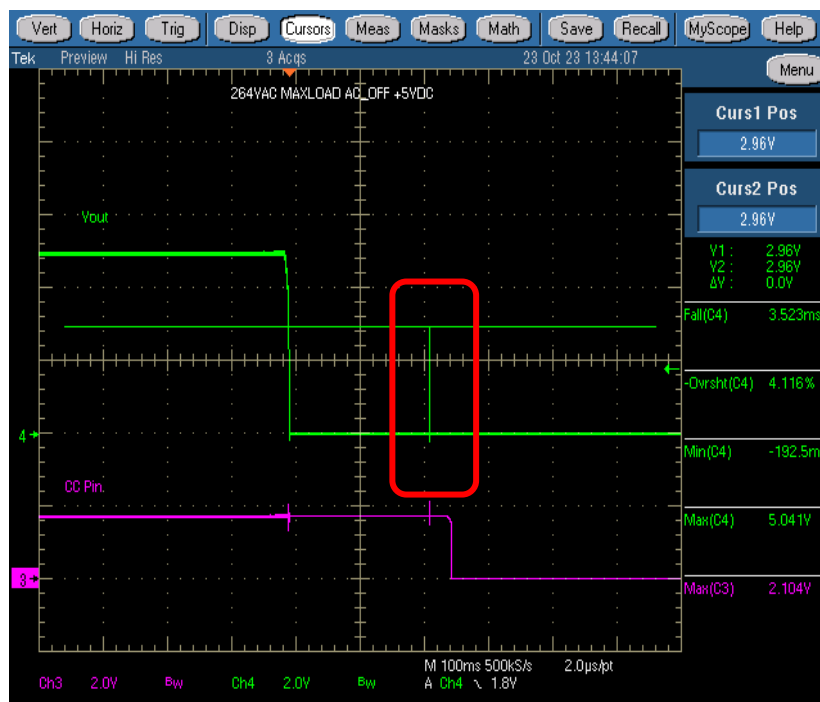
D2.)問題說明:Problem Description:

(Note: Use **who, what, when, where, why, how, how many** to specify the Customer's problem.)

Time: 2023/10/23

Location: Shanghai 3rd party lab on 2023/10/23.

- **Third party has provided feedback that a bouncing phenomenon occurs on the output voltage after AC OFF, under the condition of a 264VAC full-load.**



CH1:CC pin CH2:Vout

D3.)內部或客戶的暫時解決辦法及實施日期:Implement and Verify Containment Action:

(**Note:** Internal / external containment action effectiveness and date.)

- **3rd party return this sample for further analysis.**

Date:2023/10/27

D4.)不良原因確認: Define and Verify Root Causes:

(**Note:** Identify and verify all suspect causes, which needs explain why the problem occurred.)

- **Reconfirm this adapter, and ensure consistency with the problem description provided by the third party under the same testing condition.**
- **We found that after each AC power-off, the output voltage is turned off, and when the output voltage is open again, the time is 213ms. We suspect that the SCP process is being incorrect triggered.**



- When the SCP protection is triggered, the output voltage drops to 3.8V, the Blocking MOS is turned off, and the PD starts to discharge V_{Co} voltage (V_{Co}). After 210ms, if $V_{Co} > 3.8V$ the Blocking MOS is turned on. Then the V_o short is not removed, the output voltage will drop to 3.8V again, SCP process is being triggered. After looping 15 times, the PD enters the latch state.

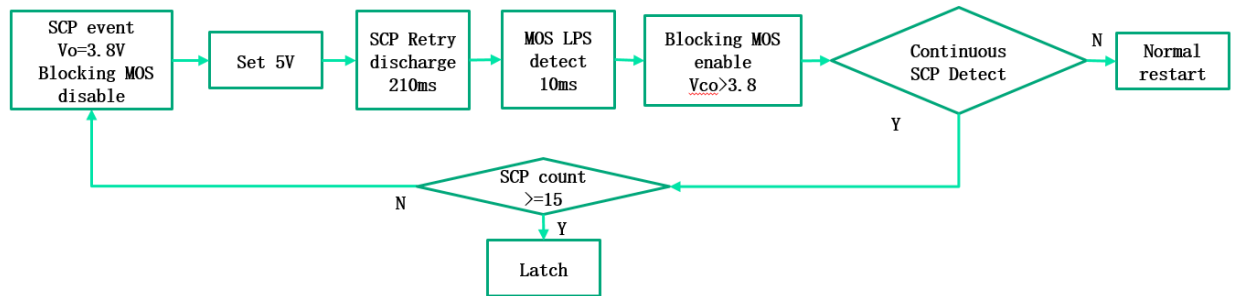
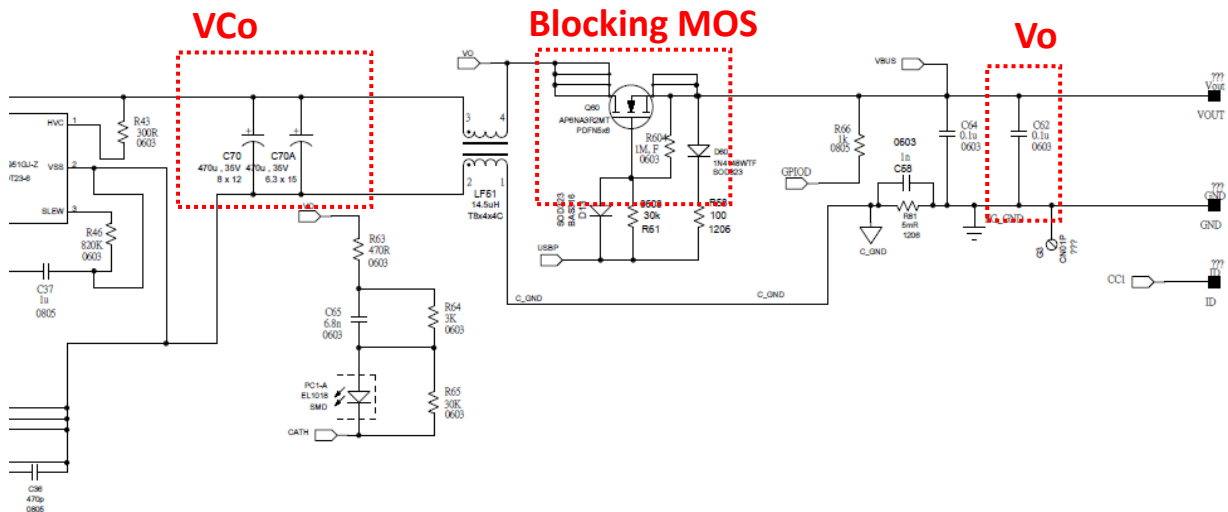
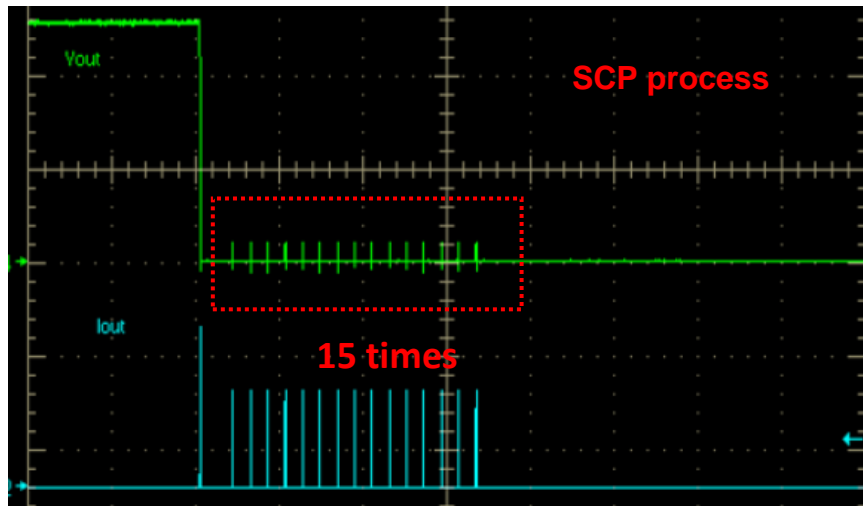
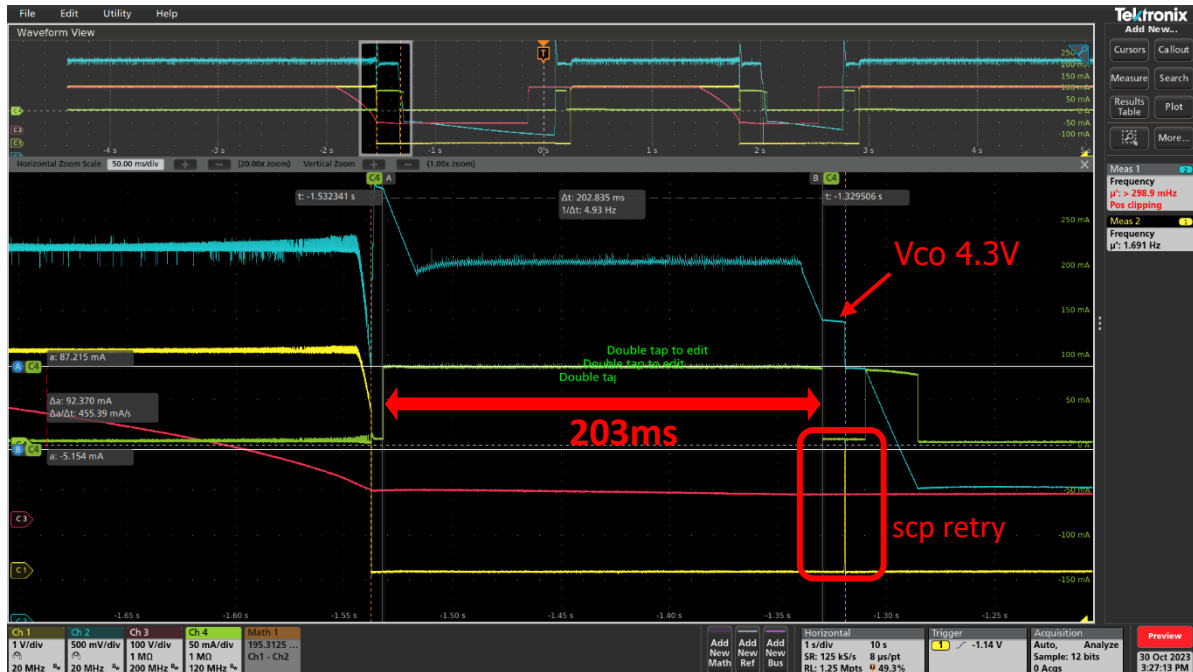


Figure 1. SCP Flow Chart

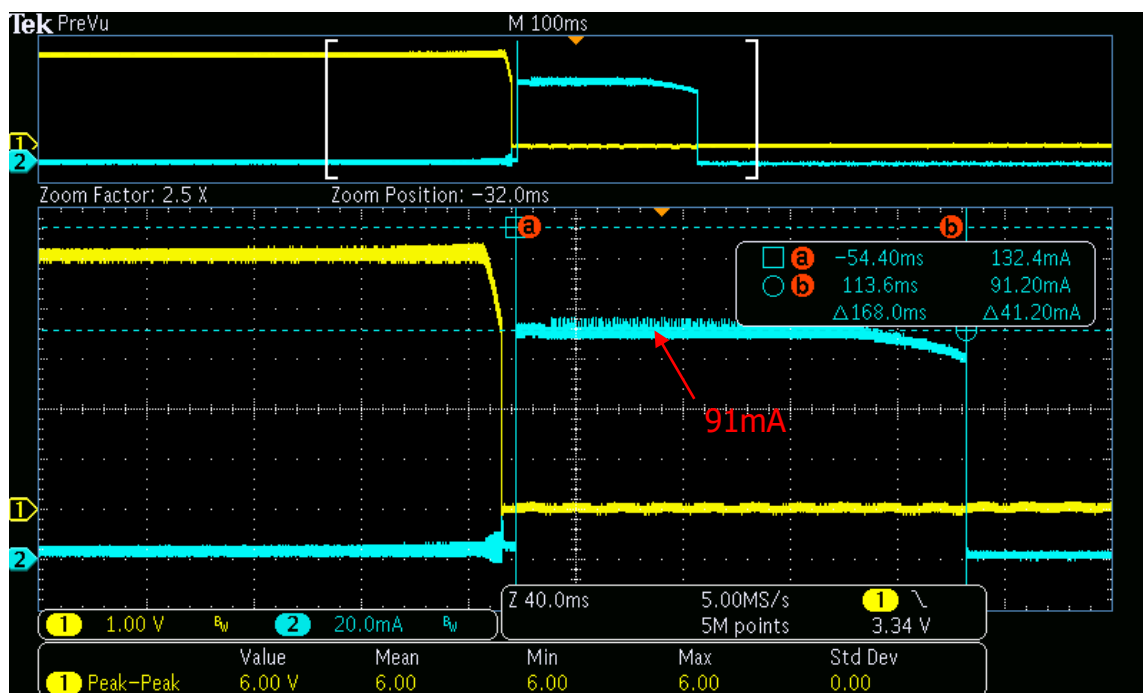


- Sample analysis when AC is turned off, Vco drops below the threshold of 3.8V , the blocking MOS is turned off. Following a discharge of 203ms, the Vco voltage is higher than the 3.8V threshold. Then, the system enters the SCP process , and the blocking MOS is turned on.



CH1: Vo CH2 : Vco Ch3: Vbulk CH4: discharge current

- The root cause is the insufficient discharge capability of the PD IC, causing the Vco voltage to exceed 3.8V, triggering the SCP process, and the blocking MOS turned on again.
- Considering the IC discharge tolerance, the measured lower limit for IC discharge current is 91mA, ensuring that the test does not trigger SCP retry.



CH1: Vo CH2: discharge current

➤ **Conclusion:**

To prevent triggering SCP retry, ensure that the IC discharge current capability is at least 91mA.

D5.)改善措施:Corrective Action Verification:

(Note: Be make sure the corrective actions is effective in process as well as able to fix the customer complaint problem)

OB suppliers will also implement sorting specifications on the provided IC to avoid the recurrence of the same issue.

Date:2023/11/03

D6.)改善措施實施日期:Implement Permanent Corrective Actions:

(Note: Be provide the phase-in date or lot# of corrective actions **implementation** in process)

immediately

D7.)預防再發生措施:Prevent Recurrence:

(Note: Modified the management, operating systems, practices, and procedures to prevent recurrence for the problems as well as lessons learned cases.)

Dell 機種由於 scp 保護機制，需要注意當 AC OFF 後，PD 對輸出電容放電需要降至 3.8V 以下，以免觸發 SCP 機制使 Blocking MOS 再次開啟，造成輸出電壓產生。

D8.)確認並感謝問題解決成員:Check and Congratulate the Team:

(Note: Recognize the collective efforts of the team.)

Thanks to you all ! ! !

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| Signature | Benson_Chen |
| Team Leader: | |
| | Name – Title |
| Signature by Approver: | Hunter_Peng |
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