

Eight Discipline Report (8D Report)

To: ODM	8D report No.: CPE0601
From: : Chicony Power Technology	RMA claim No.: N/A
CC :	Chicony Power P/N: A048R001L-DR01-0E
	Customer P/N: EPS44R3-15
Submit date: 2015/07/23	Product description: 48W
Receive date: 2015/06/01	Defect D/C or Lot No.: CL44E1513C2116, CL44E1513C2122
Subject : No power*2pcs (EMC / Surge , surge failure, D52 shorted)	

D1.) 問題解決成員: Use Team Approach

主持者 (Team Leader) : **CF_Liu**

內部成員 (Internal Team Members):

CQS: Power_Zhang RD: Gary_Chen

RD Leader: Walt_Ni

外部成員 (External Team Member):

D2.) 問題說明: Problem Description:

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

1. In June 01 2015, CPT received 2 pcs 48W failed adapters from ODM. It failed during ODM surge test with HR54 system. Please see customer's detailed complaint as below:

Ring Wave 90 Degrees		DUT#1	DUT#1	DUT#1
Test #	TEST DESCRIPTION	S01	S02	S03
1	Line to Neutral: Ring. Wave (100kHz, 0.5us 12 Ohms)	Pass	Pass	Fail
2	Line to Ground: Ring. Wave (100kHz, 0.5us 12 Ohms)	Pass	Pass	NA
3	Neutral to Ground: Comb. Wave (100kHz, 0.5us 12 Ohms)	Pass	Pass	NA

Ring Wave 0 Degrees		DUT#1	DUT#1	DUT#1
Test #	TEST DESCRIPTION	S04	S05	S06
1	Line to Neutral: Ring. Wave (100kHz, 0.5us 12 Ohms)	Pass	N/A	N/A
2	Line to Ground: Ring. Wave (100kHz, 0.5us 12 Ohms)	Fail	N/A	N/A
3	Neutral to Ground: Ring. Wave (100kHz, 0.5us 12 Ohms)	N/A	N/A	N/A

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

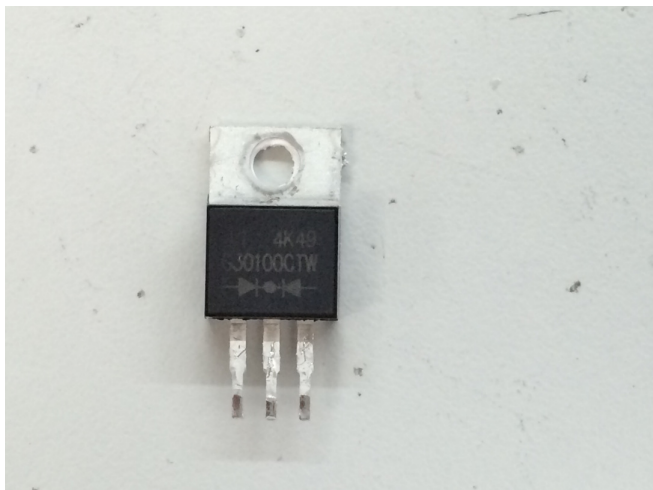
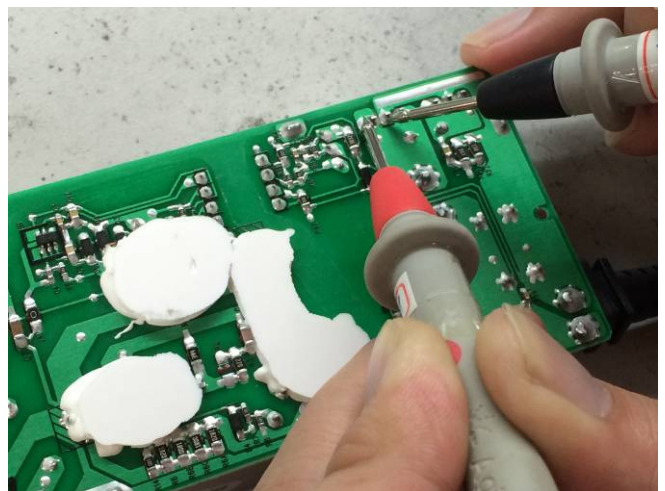
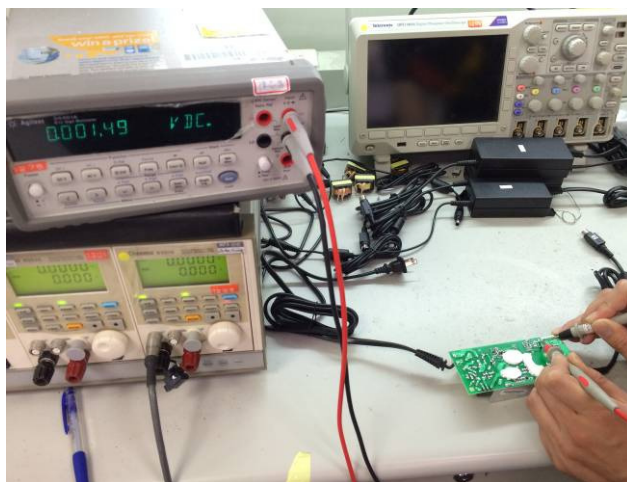
(Note: Internal / external containment action effectiveness and date.)

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

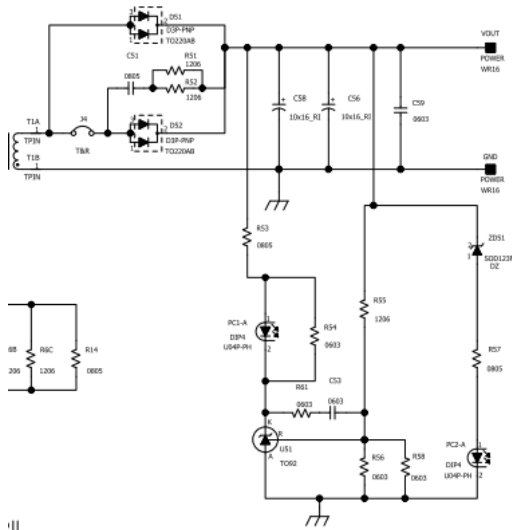
(Note: Identify and verify all suspect causes, which needs explain why the problem occurred.)

1. Turned on the PSU - noted the adapter has no power output which matches the customer's feedback.
2. When we open the case and examined the PCBA, we see found that the exterior is OK for both the SMD component side and the through hole component side.
3. Measure the key components of the circuit and found that both adapter's component D52 are NG.

Location	Symptom	Description
D52	Short between Anode to Cathode Pin at right side	Schottky Diode



4. Continue to analyze the circuit of the defect adapter, we found if the D52's Anode Pin short to Cathode Pin, the voltage and current can not be rectified then the adapter will exhibit a no power condition.



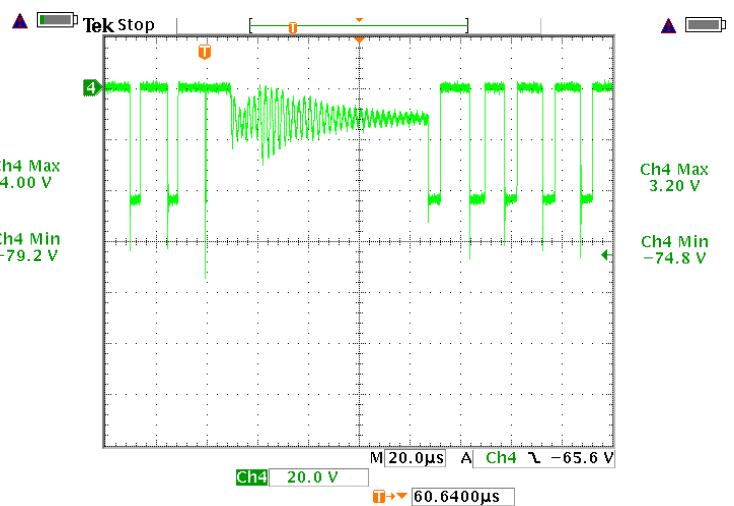
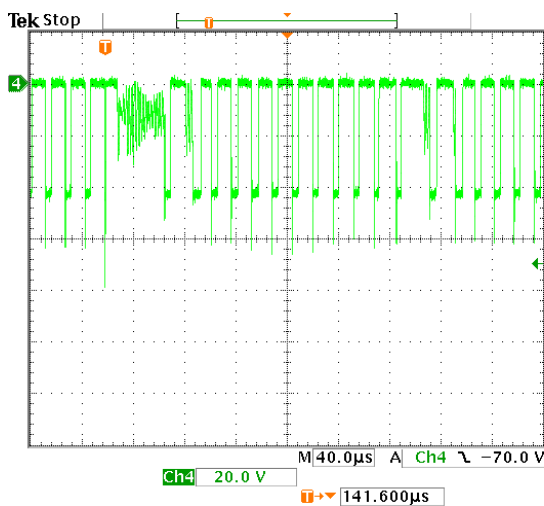
5. After replacing D52 the unit functioned normally.

6. We sent the failure component to supplier to do further analysis. Please refer to supplier's FA report as attached.

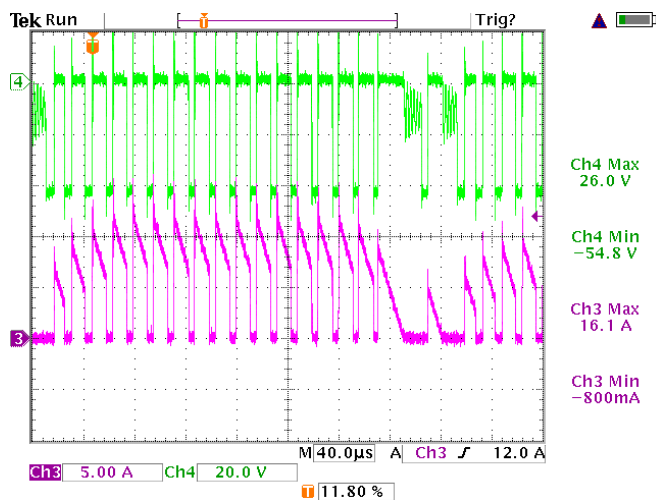


G30100CTW 6KV
lighting failure FA Re

7. Measured the voltage waveform of D52 during surge testing, it did not over D52's reverse voltage spec. (100V), please refer to the waveform below.



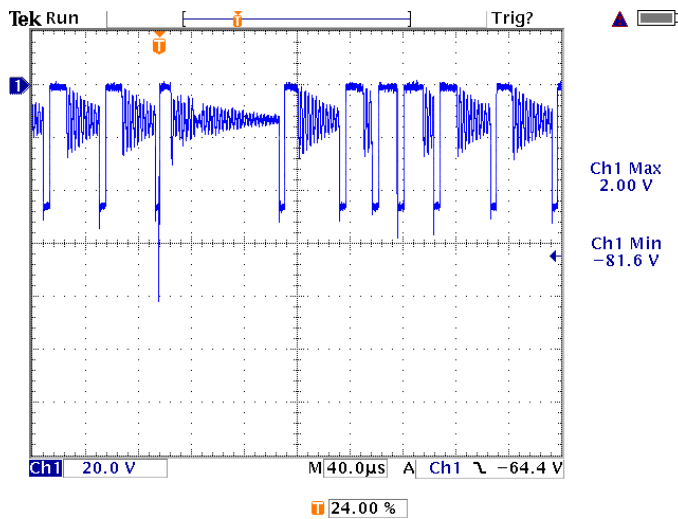
8. We arranged a co-test with LiteOn engineer for surge including voltage and current, but from waveform observation below, it showed no over stress on D52. We asked LiteON to assess which parameter is related to surge. Below is the waveform of voltage and current on D52 during surge 6KV test.



9. We went to ODM to witness the surge test, they prepared a HR54 STB but did not include the TV simulator. We compared the stress on D52, it showed no obvious difference when we used resistive load or HR54 STB during testing.

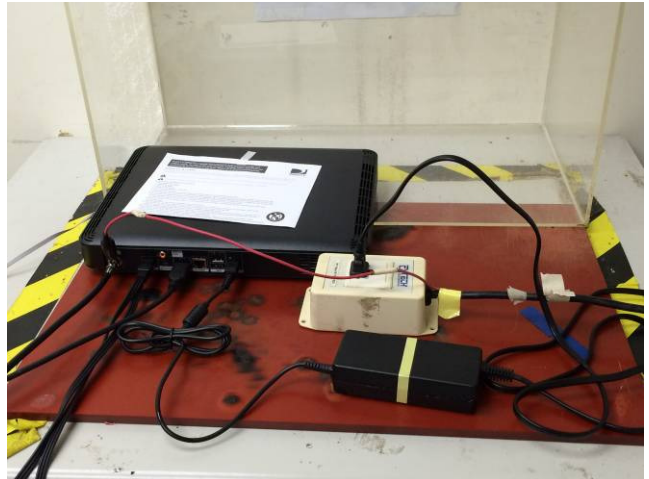


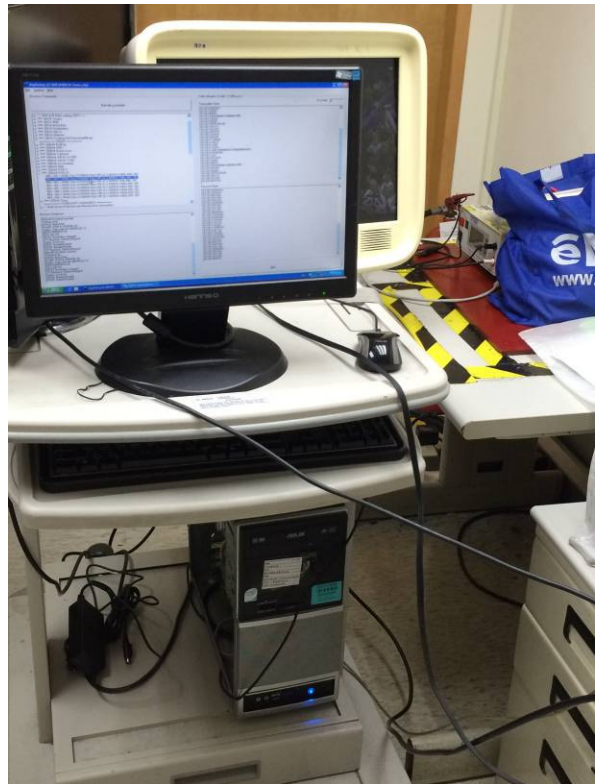
Below is the voltage waveform on D52 when tested with HR54 system.



10. We added a 2500uF capacitor at output to simulate capacitor load when paired with system, but can not see obvious difference on stress of D52.

11. We went to ODM to witness the surge test again. They prepared a full setup for test including HR54 STB, PC, TV, and monitor, but still not included TV simulator.



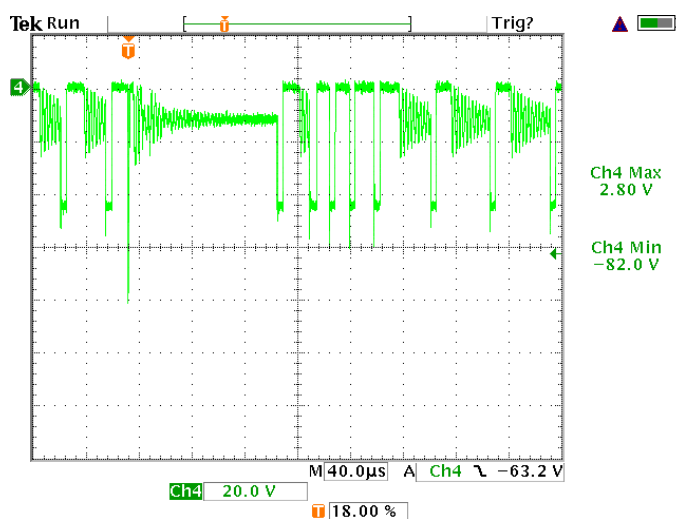


Our findings are :

(a) Adapter passed the full system surge at this setup.

(b) We measured the stress on D52 during this setup, it showed no obvious difference on stress of D52 compared to PSU stand alone.

Below is the voltage waveform on D52 when tested with full system at ODM.



12. From FA report from supplier, output schottky was damaged by reverse energy. We

discussed this issue with supplier and came out that from component level the reverse surge current (IRSM) should be the factor to affect surge performance, so our investigation is focused on IRSM capability of the device. We measured IRSM data and found that Vishay is better than LITEON on IRSM capability (see IRSM test method and data attached), that means Vishay's wafer is more robust than LITEON's.



Reverse current test
method



IRSM
data(Vishay,Liteon)

We verified EMI and efficiency using Vishay device (V30100C), and the result looks OK, see EMI and efficiency data attached.



Efficiency test
(Vishay,Liteon)



CE
report(Vishay,Liteon)



RE
report(Vishay,Liteon)

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)

Change output schottky from LITEON G30100CTW to Vishay V30100C to enhance surge capability.

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)

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.)

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 ! ! !

CQS: Power_Zhang RD: Gary_Chen RD Leader: Walt_Ni

Signature

CF_Liu

Team Leader:	
	Name – Title
Signature by Approver:	Roy_Tsai
	Name-Title

附錄：

Vendor	Vendor P/N	IRSM(A)@TP(us)	
		Irsm(A)	Tp(us)
Vishay	V30100C	50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	10
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15
		50	15

		50	15
		50	15
		50	10
		50	15
LITEON	G30100CTW	35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		25	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5
		35	5