



## Eight Discipline Report (8D Report)

To: 8D report No.: CPCQ20220801  
From: Chicony Power Technology RMA claim No.: N/A  
CC : N/A Chicony P/N: A111AP01P-HW01-0A  
Customer P/N:  
Submit date: 2022/08/04 updated Product description: 110W adapter  
Receive date: 2022/08/01 Defect D/C or Lot No.: 2022/02  
Subject : Adapter failed\*2pcs

Diode, regulation

D1.) 問題解決成員 :Use Team Approach

主持者 (Team Leader) : Henry\_Zhang

內部成員 (Internal Team Members):

CQS	Sunny_Dang
MFG	Ice_Liu
IPQC/QE	BL_Zhang
PE	XP_Zhao
IE	Hunter_Liao
RD	Frankly_Chen
RD	Lance_Lu

外部成員 (External Team Member):

N/A

D2.) 問題說明:Problem Description:

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

2022/07/29, H feedback 110W adapter failed\*2pcs.

CPT P/N: A111AP01P-HW01-0A

Sample1 SN: WLSYB0AGCGB0RZ

Sample2 SN: WLSYB0AGCGB0HC

Defect D/C: 2022/02

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.)

Send failed adapter to Chicony Power(Suzhou) for further analysis.

Date: 2022.07.29

#### 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. SFCS record

根據退回產品 S/N,查詢廠內 SFCS 記錄正常.

According to the defect adapter S/N, query SFCS record. - no abnormality was found.

Sample1:WLSYB0AGCGB0RZ

Sample2:WLSYB0AGCGB0HC

出貨序號	WLSYB0AGCGB0RZ	欄寬自動調整					
生產條碼	MBM08C1400950	客戶名稱					
工單	MBM08C14	途程名稱	AutoLine_PATE_A_100W				
工單類型		生產線別	CPCQ_L10				
料號	A111AP01PHW010A	規格					
機種		狀態	PASS complete				
版本	N/A	下道工序					
客戶序號1	WLSYB0AGCGB0RZ	客戶序號2	N/A				
包裝作業資訊				出貨作業資訊			
彩盒號	N/A	客戶		保固期			
箱號	CMM08C1400026			出貨地			
棧板號	PMW08C1400002						
流程	維修 抽驗 重工 物料 錫膏 鋼板 刮刀 組裝物料						
生產條碼	工單	料號	客戶	生產線	制程	狀態	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	ICT	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	ACT	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	ASSY	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	PRE-ATE-A	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	PRE-ATE-B	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	SN CHECK	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	HIPOT/GROUNDING	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE1	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE2	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE3	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	PACKING	OK	
MBM08C1400950	MBM08C14	A111AP01PHW010A		CPCQ...	QC	OK	

出貨序號	WLSYB0AGCGB0HC	欄寬自動調整					
生產條碼	MBM08C1401085	客戶名稱					
工單	MBM08C14	途程名稱	AutoLine_PATE_A_100W				
工單類型		生產線別	CPCQ_L10				
料號	A111AP01PHW010A	規格					
機種		狀態	PASS complete				
版本	N/A	下道工序					
客戶序號1	WLSYB0AGCGB0HC	客戶序號2	N/A				
包裝作業資訊				出貨作業資訊			
彩盒號	N/A	客戶		保固期			
箱號	CMM08C1400004			出貨地			
棧板號	PMW08C1400002						
流程	維修 抽驗 重工 物料 錫膏 鋼板 刮刀 組裝物料						
生產條碼	工單	料號	客戶	生產線	制程	狀態	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	ICT	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	ACT	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	ASSY	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	PRE-ATE-A	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	PRE-ATE-B	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	SN CHECK	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	HIPOT/GROUNDING	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE1	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE2	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE3	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	FINAL-ATE	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	PACKING	OK	
MBM08C1401085	MBM08C14	A111AP01PHW010A		CPCQ...	QC	OK	

##### 2. Power on test

檢查 adapter 外觀無異常,通電測試,230V full loading 無法工作.

The appearance of adapter is normal. Power on test confirms adapter failed to work on 230V full loading.



Chicony Power Technology Co., Ltd. 群光電能科技股份有限公司

Address: 29F, No. 69, Sec. 2, Guangfu Rd., Sanchong Dist., New Taipei City 241, Taiwan

新北市三重區光復路二段 69 號 29 樓

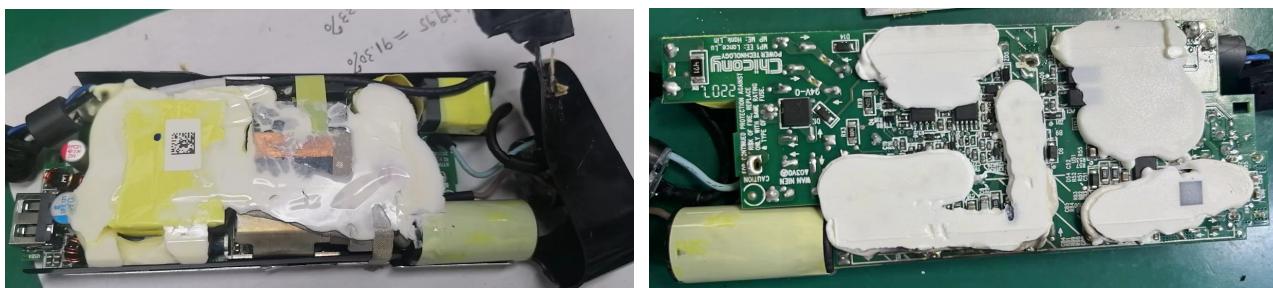
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### 3. Failure analysis

3.1. 開殼檢查確認零件面及錫面.(如下圖).

Open the case to check the parts surface and tin surface.



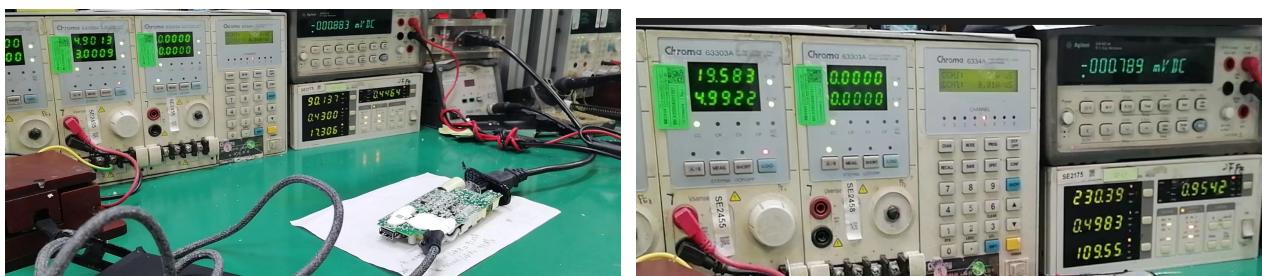
3.2. 清理錫面白膠,觀察到一次側 ground 銅箔燒毀痕跡.逐次量測錫面各個零件,發現 D4 fail(如下).

After cleaning the glue on the tin surface of the adapter, primary side ground copper foil has burn mark. PE measure each part of the tin surface one by one and found that D4 failed.



3.3. 更換 D4 零件,修復一次側 ground 銅箔.通電測試,輸出無異常.

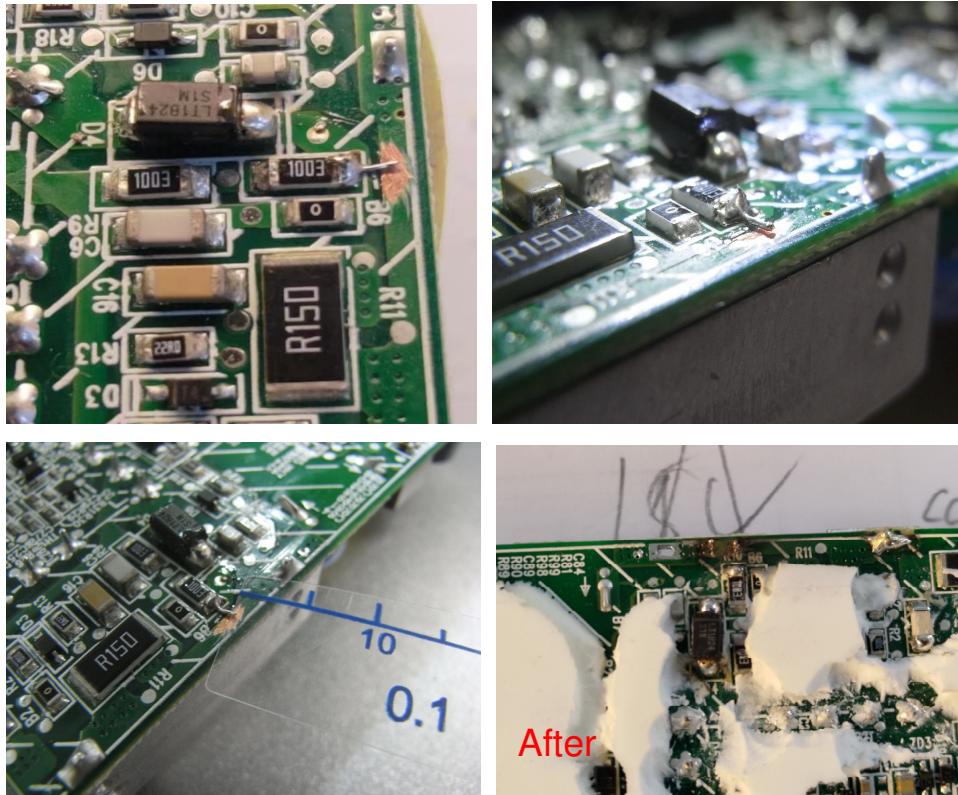
Replace the adapter with a good D4 and repair the ground copper foil of primary side. The output of the adapter is normal.





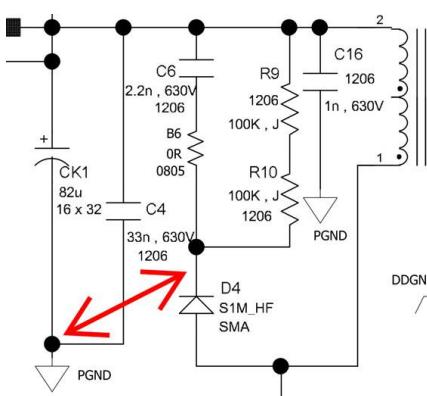
3.4.取產品進行模擬測試,將 R10 處(D4 負極)增加錫絲,使其到一次側 ground 銅箔距離 0.1mm.AC 輸入 220V(市電),觀察到 D4 fail.

Take the adapter for simulation test. Add tin wire to R10(D4 negative)to make the distance from it to the ground copper foil on the primary side is 0.1mm. AC input 220V, it is observed that the D4 fail.



3.5. Arcing area 如下電路圖.Snubber diode R10 處銅箔(D4 負端)與一次側 GND 銅箔 0.4mm.

The arcing area is shown in the schematic below. The min clearance (mm) on this node to GND on current PCB is 0.4mm.





綜合分析:外部異常高電壓造成 Snubber diode D4 負端銅箔與一次側 GND 銅箔 arcing,導致 D4 damage,以致於產品無輸出.

Conclusion: The external abnormally high voltage caused the negative end copper foil of Snubber Diode D4 and the primary side GND copper foil arcing, resulting in D4 damage, so that the adapter has no output.

Material: 451S1MXXXXX0JYLF    Vendor: DIODES-LITE ON

蘇州工廠將不良品及不良 D4,寄給我司台北 RD,協同廠商進一步分析.

Chicony Power(Suzhou) sent failed units and D4 to RD in Taipei for further analysis with the vendor.

#### 4. Risk assessment:

4.1. 取庫存良品 200pcs,至 OOOA 測試 ATE(試產程式),均 PASS.

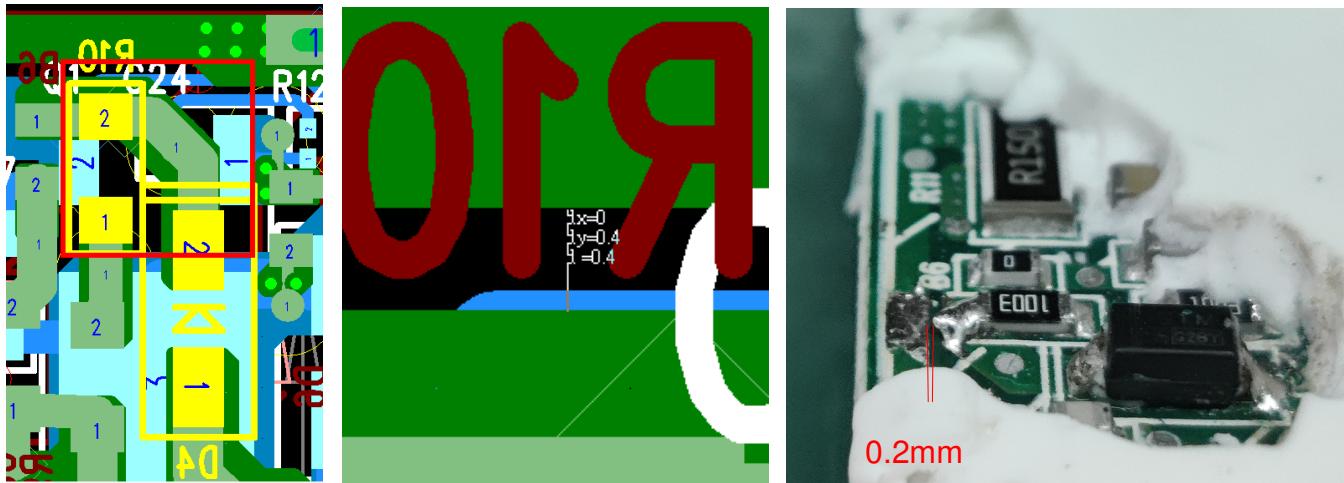
Take adapter 200pcs, test ATE(trial production program), all PASS.

4.2. 取庫存成品 10pcs,自 230V 升至 300V(AC SOURCE MAX OUTPUT:300V),均無異常.

Take adapter 10pcs and increase them from 230V to 300V without abnormal.

4.3.取產品進行模擬測試,將 R10 處銅箔(D4 負極)增加焊錫,使其到一次側 ground 銅箔距離為 0.2mm (SPEC:0.4mm). AC SOURCE 輸入 264V,無異常.

Take the adapter for simulation test. Add solder to the R10(D4 negative) to make the distance from it to the ground copper foil on the primary side be 0.2mm(SPEC:0.4mm). Input 264V with AC SOURCE, without abnormal.





D5.) 改善措施: improvement measure:

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

Short-term solution:

1. 驗證增加高壓絕緣膠來提升此兩 trace 的耐壓強度.

Verify that adding high voltage insulating glue improves the withstand voltage of the two traces.

- a. 取 PCB 板從 HS2 的腳焊線出來,用 ESD 測試儀接觸 D4 負極 Pad 進行測試.

Test the voltage withstand for w/ glue and w/o glue. Take the PCB board, and solder leads from and HS2 pin. Perform ESD contact test on D4 negative pad.

Test1: Without isolation glue.

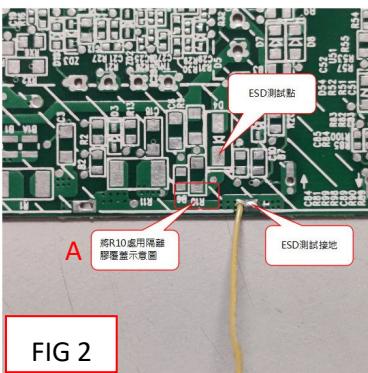
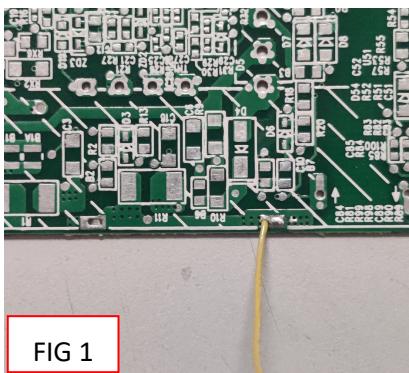
Test result: ESD contact test at 4.2KV, arcing occurs at the area of the negative end copper foil of Snubber Diode D4 and the primary side GND copper foil.

Test2: Following test1. Cover the arcing area with isolation glue.(Refer to “A” in FIG 2)

Test result: ESD contact test at 5.5kV, arcing occurs at the same area.

Test3: Take a new PCB board. Cover the same area as Test2.

Test result: ESD contact test at 8KV, arcing occurs.



2. 立即導入點高壓絕緣膠的措施.

Implement isolation glue immediately.

Due date:2022/8/4

Long-term solution:

RD 修改 layout,增加兩 trace 之間距離.Before: 0.4mm → After: 0.9mm. Gerber 對比如下:

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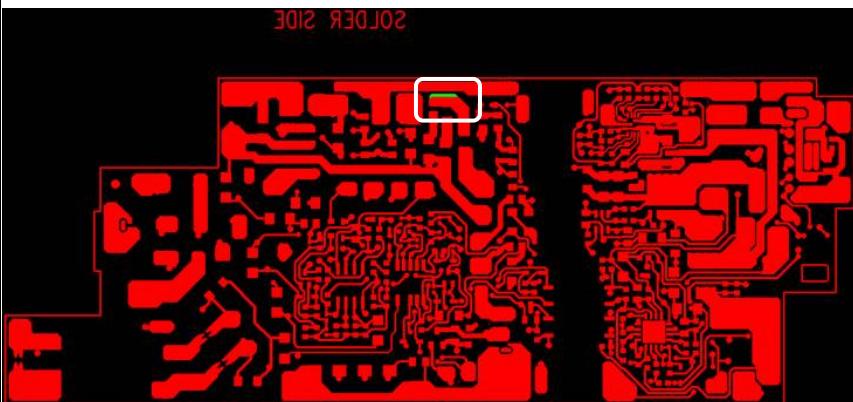
Address: 29F, No. 69, Sec. 2, Guangfu Rd., Sanchong Dist., New Taipei City 241, Taiwan

新北市三重區光復路二段 69 號 29 樓

TEL:+886-2-6626 0678



RD Changes PCB layout to increase the distance between two traces. Before 0.4mm to After 0.9mm.  
PCB layout update as below, green is current, red is long term solution.



Due date: 2022/8/5

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)

Implement isolation glue immediately. Cut in date: 2022/8/4

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.)

QIT members and IPQC will continue trace this issue day by day.

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 all QIT members.

Signature Team Leader: Henry\_Zhang

Name - Title

Signature by Approver: Roy\_Tsai

Name-Title