

## Eight Discipline Report (8D Report)

To: **ODM** 8D report No.: **CPG0709**  
 From: **Chicony Power Technology** RMA claim No.: **NA**  
 CC: CPT P/N: **W033R004H-GS01-X1**  
 Customer P/N: **W16-033N1A**  
 Submit date: **2016/7/22** Product description: **33W adapter**  
 Receive date: **2016/7/21** Defect D/C or Lot No.: **NA**  
**Subject : No output\*1 ( 零件/ Diode, schottky diode D51 damaged)**

**D1.) 問題解決成員: Use Team Approach**

主持者 (Team Leader) : **Cf\_Liu**

內部成員 (Internal Team Members):

**QA: CM Wu/Roy Tsai/Mary He/Nono\_Cheng/Candy Zhu**

**PE: Jason Huang/Yong Liu**

**NPI: Jewel\_Chen/Xiaohui\_Du**

**RD: Aaron\_Chen/Walt\_Ni**

**PM: Vivi\_Hu/Suping\_Chang**

**Sales: Michael\_Ning**

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.)**

- 1. 2016/7/20 ODM feedback that 1pc adapter with no output was found in their site, defective phenomenon is as below:**

#	Test Item	Test Command	Ext. Name	Parameter	Next	P/F
1	Power Meter Setup	Auto Range				Pass
2	Load Setup	Von Setup				Pass
3	Static Load Test	Discharge				Pass
4	Load Setup	Von Setup				Pass
5	Turn On & Sequence Test	90V/47Hz Ton<4000ms				Fail
6	Combine Regulation Test	90V Min~Max~Nor Load				Fail
7	Combine Regulation Test	264V Min~Max~Nor Load				Fail
8	Over Load Protection Test	90V/47Hz OCP				Fail
9	Over Load Protection Test	264V/63HZ OCP				Fail
10	Overshoot Voltage Test	90V/47Hz Vos				Fail
11	Short Circuit Protection Test_2	90V SCP				Fail
12	Short Circuit Protection Test_2	264V SCP				Fail
13	Overshoot Voltage Test	264V/63Hz Vos				Fail
14	Average Efficiency Test	230V/50Hz Average EFF>83.3%				Fail
15	Average Efficiency Test	115V/60Hz Average EFF>83.5%				Fail
16	Power Meter Setup	Auto Range				Pass
17	Hold Up & Sequence Test	115V/60Hz Thd				Fail
18	Static Load Test	Discharge				Pass

**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.)

**Highlight the issue to all related department. No stock in Chicony Power factory at present**

**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.)

**Analyses and findings:**

1. Traced by the S/N number, we found this defect unit is without repair.(Record as below)

**Travel Card**

Serial Number: FTG2300400423 Query Export Batch Exp

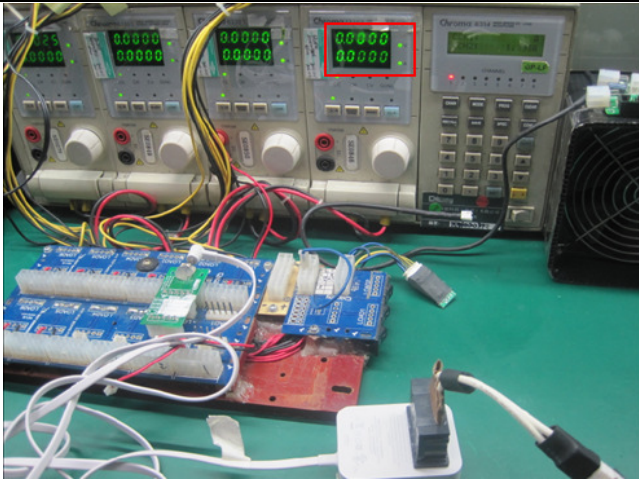
Work Order	T1623004	Serial Number	FTG2300400423
Part No	W033R004HGS01X1	Customer SN	F185081624000771
Version	N/A	QC LotNo	N/A
SPEC1		Pallet No	PTG2300400001
WIP Process	QC	Carton No	CTG2300400005
Assign Process		Box No	N/A

Travel | Repair | Quality Control | KeyParts | Rework | Work Order | Current | Burn In

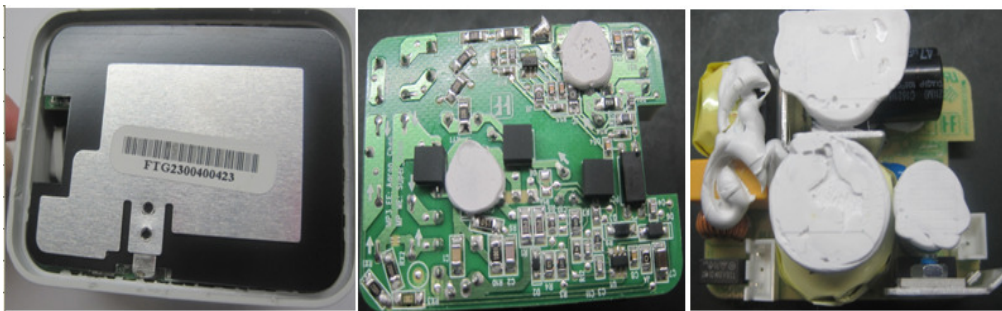
	Customer SN2	Version	Route Name	PDLine Name	Stage Name	Process Name	Terminal Name	Assign Process	Current Status
▶	N/A	N/A	R-noT/OICC→AUTO_L01	FINAL ASSEM	ACT		ACT01		Normal
	N/A	N/A	R-noT/OICC→AUTO_L01	FINAL ASSEM	ASSY		ASSY01		Normal
	N/A	N/A	R-noT/OICC→AUTO_L01	FINAL ASSEM	PRE-ATE		PRE-ATE01		Normal
	N/A	N/A	R-noT/OICC→AUTO_L03	PACKING	SN CHECK		SN CHECK01		Normal
	N/A	N/A	R-noT/OICC→AUTO_L03	PACKING	HIPOT/GROUN		HIPOT/GROUN		Normal
	N/A	N/A	R-noT/OICC→AUTO_L03	PACKING	FINAL-ATE1		FINAL-ATE101		Normal
	N/A	N/A	R-noT/OICC→AUTO_L03	PACKING	FINAL-ATE2		FINAL-ATE201		Normal
	N/A	N/A	R-noT/OICC→HSZ_L21	PACKING	PACKING		PACKING02		Normal

2. Observe the returned unit, no any cosmetic issue was found.

3. Power on the returned unit, we can see the unit no output which is same as customer feedback.



4. Then we open the case and observe PCBA by visual, Both SMD component side and insertion component side are good.



5. Measure the key components of the circuit on PCBA, we only found D51 fail, remove D51 from the PCBA and measure it again, we see it is still fail.

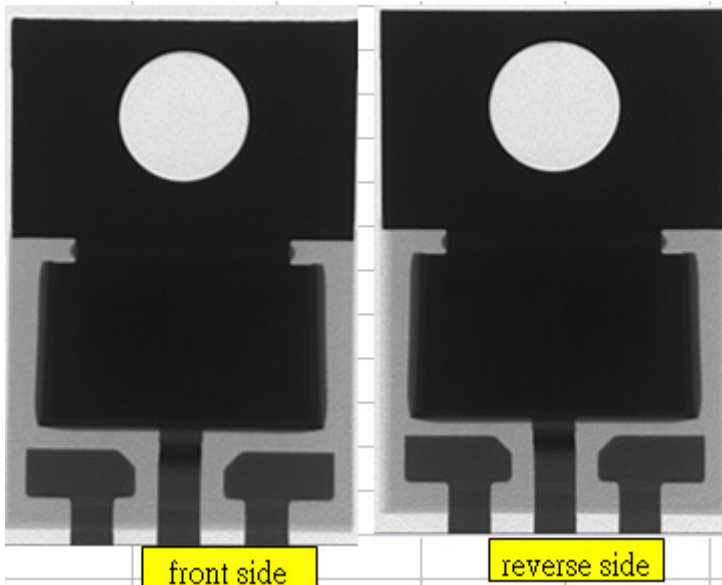


**NG**

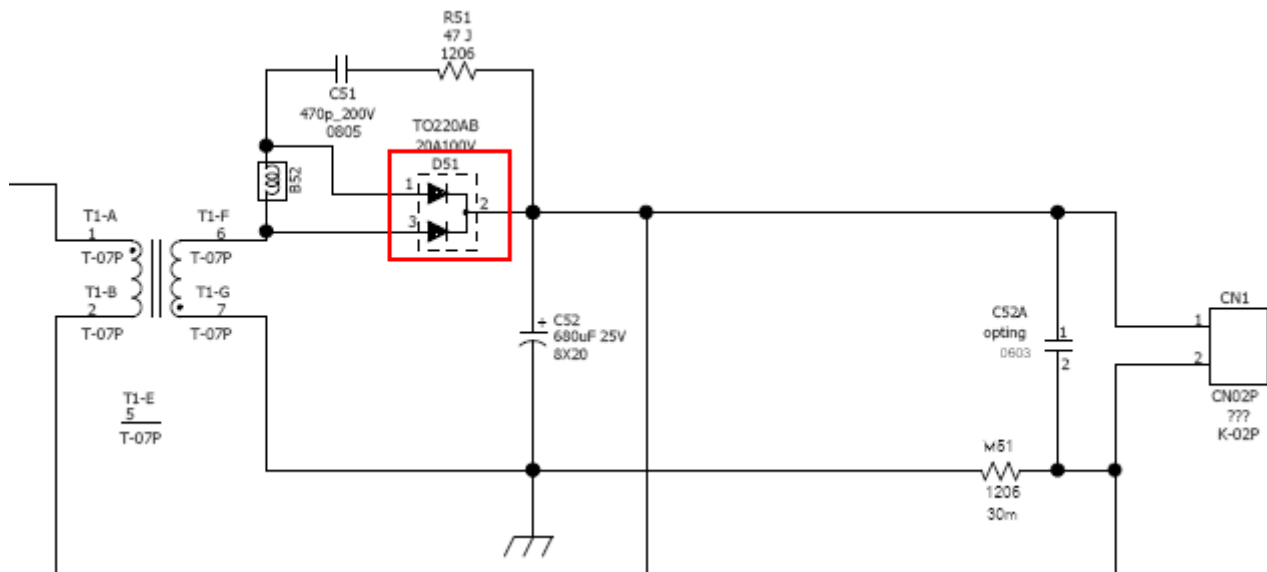


**Normal**

6. After doing the X-RAY for the defective D51, we don't find abnormality.

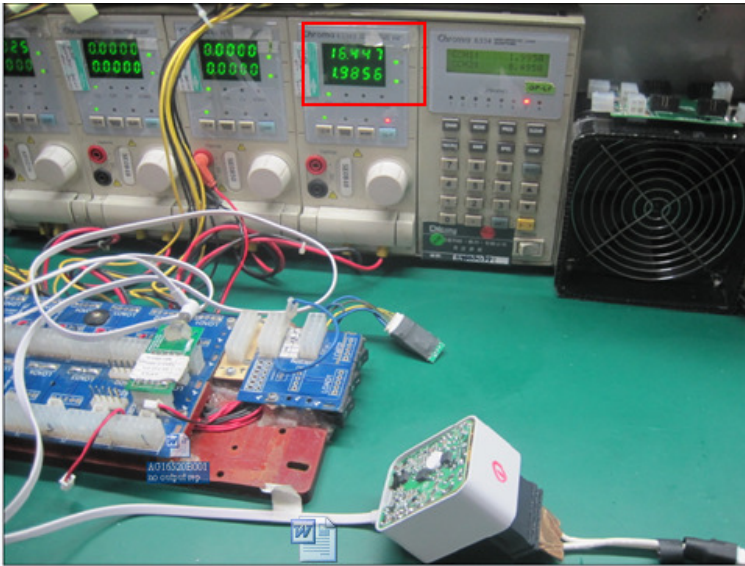


**7. Analysis of our design schematic, we found if D51 fail the product will be no output.**

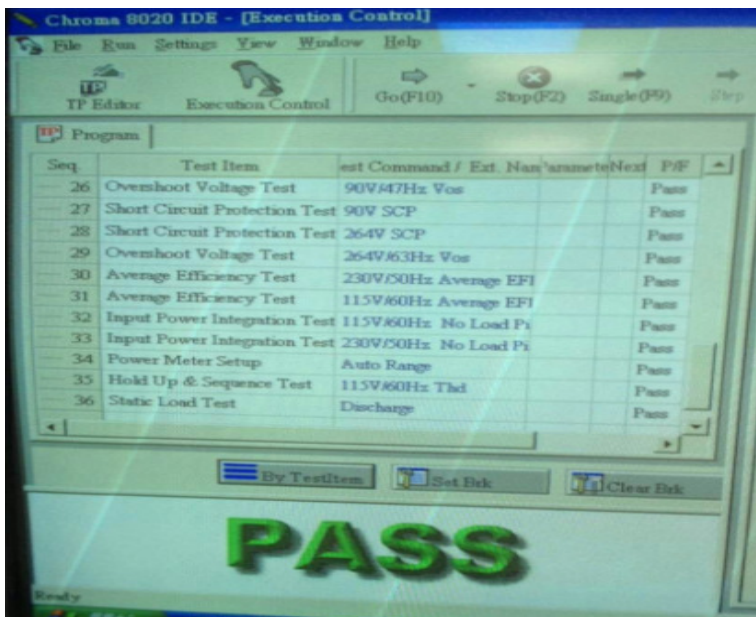


**8. After soldering a good D51 to the returned unit, then turn on it with full load, it becomes normal.**





8-1. After repaired the return unit, we check all function with ATE and test result is all pass as below.



9. To verify whether there is other factors to destroy the schottky Diode or not, we have done below tests:

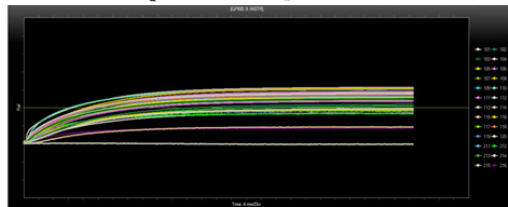
9-1. test D51 stress with input voltage 90V/47HZ, 264V/63HZ, we see they are all in spec.

Component Description		Component Specifications					Worse Case Stress In Application				Calculated Stress Factors			Stress Ratio Spec.			Stress
Location	Part No.	V <sub>R</sub> (V)	I <sub>P</sub> Avg(A)	V <sub>F</sub> (V)	R <sub>DS</sub>	T <sub>J</sub> Rated	V <sub>R</sub> (V)	I <sub>P</sub> Avg(A)	Power(W)	T <sub>C</sub> (°C)	V <sub>R</sub> Ratio	I <sub>P</sub> Avg Ratio	T <sub>J</sub> (°C)	V <sub>R</sub>	I <sub>P</sub> Avg	Temp.	OK?
D51	LITE ON(G20100CTW)	100	20	0.79	1	150	43.84	2.027	1.601	95	0.44	0.1	96.6	0.9	0.9	135	YES

Component Description		Component Specifications					Worse Case Stress In Application				Calculated Stress Factors			Stress Ratio Spec.			Stress
Location	Part No.	V <sub>R</sub> (V)	I <sub>P</sub> Avg(A)	V <sub>F</sub> (V)	R <sub>DS</sub>	T <sub>J</sub> Rated	V <sub>R</sub> (V)	I <sub>P</sub> Avg(A)	Power(W)	T <sub>C</sub> (°C)	V <sub>R</sub> Ratio	I <sub>P</sub> Avg Ratio	T <sub>J</sub> (°C)	V <sub>R</sub>	I <sub>P</sub> Avg	Temp.	OK?
D51	LITE ON(G20100CTW)	100	20	0.79	1	150	86.7	2.025	1.6	93.7	0.87	0.1	95.3	0.9	0.9	135	YES

9-2. We checked thermal performance with the condition of 90V/47HZ/40℃, 90V/47HZ/25℃, 264V/63HZ/40℃, 264V/63HZ/25℃, we see the result are all pass

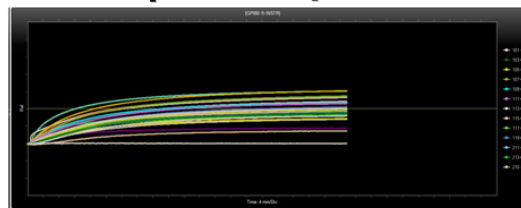
Input 90V/47Hz 40℃



Channel	Temp	Temp T	Temp T Ref	Current Data
1	LPI	75.3	100.0	PASS
2	CPU	84.1	100.0	PASS
3	L2	90.1	100.0	PASS
4	DDR1	76.3	100.0	PASS
5	CPU	75.7	100.0	PASS
6	Q1	76.1	100.0	PASS
7	F1 case	86.1	100.0	PASS
8	F1 case	86.1	100.0	PASS
9	CPU	75.3	100.0	PASS
10	D51	87.9	100.0	PASS
11	CPU	84.1	100.0	PASS
12	D1	75.3	100.0	PASS
13	D2	75.3	100.0	PASS
14	D3	75.3	100.0	PASS
15	D4	75.3	100.0	PASS
16	D5	75.3	100.0	PASS
17	D6	75.3	100.0	PASS
18	D7	75.3	100.0	PASS
19	D8	75.3	100.0	PASS
20	AMB	39.7	100.0	PASS

Case Temp	Temp	Spec
21 Top	76.6	89.7 PASS
22 Left	73.5	89.7 PASS
23 Bottom	82	89.7 PASS
24 Right	74.2	89.7 PASS
25 Front	58.8	89.7 PASS
26 Back	57.6	89.7 PASS
AMB	39.7	

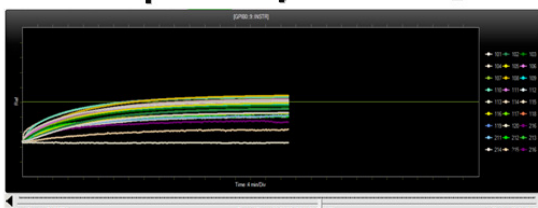
Input 264V/63Hz 40℃



Channel	Temp	Temp T	Temp T Ref	Current Data
1	LPI	72.9	100.0	PASS
2	CPU	72.2	100.0	PASS
3	L2	72.6	100.0	PASS
4	DDR1	53.7	100.0	PASS
5	CPU	58.3	100.0	PASS
6	Q1	58.1	100.0	PASS
7	F1 case	66.2	100.0	PASS
8	F1 case	66.2	100.0	PASS
9	CPU	58.3	100.0	PASS
10	D51	61.6	100.0	PASS
11	CPU	72.9	100.0	PASS
12	D1	72.9	100.0	PASS
13	D2	72.9	100.0	PASS
14	D3	72.9	100.0	PASS
15	D4	72.9	100.0	PASS
16	D5	72.9	100.0	PASS
17	D6	72.9	100.0	PASS
18	D7	72.9	100.0	PASS
19	D8	72.9	100.0	PASS
20	AMB	39.6	100.0	PASS

Case Temp	Temp	Spec
21 Top	77.7	89.6 PASS
22 Left	74	89.6 PASS
23 Bottom	79.4	89.6 PASS
24 Right	68.9	89.6 PASS
25 Front	54.9	89.6 PASS
26 Back	57.9	89.6 PASS
AMB	39.6	

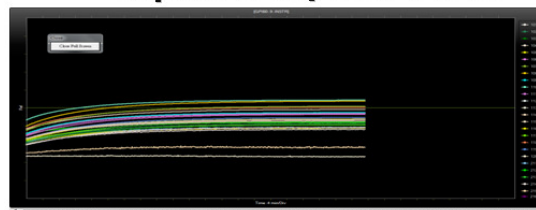
Input 90V/47Hz 25℃



Channel	Temp	Temp T	Temp T Ref	Current Data
1	LPI	67.2	100.0	PASS
2	CPU	72	100.0	PASS
3	L2	75.8	100.0	PASS
4	DDR1	54.4	100.0	PASS
5	CPU	75.7	100.0	PASS
6	Q1	75.7	100.0	PASS
7	F1 case	86.1	100.0	PASS
8	F1 case	86.1	100.0	PASS
9	CPU	67.2	100.0	PASS
10	D51	87.9	100.0	PASS
11	CPU	72	100.0	PASS
12	D1	72	100.0	PASS
13	D2	72	100.0	PASS
14	D3	72	100.0	PASS
15	D4	72	100.0	PASS
16	D5	72	100.0	PASS
17	D6	72	100.0	PASS
18	D7	72	100.0	PASS
19	D8	72	100.0	PASS
20	AMB	39.7	100.0	PASS

Case Temp	Temp	Spec
21 Top	65.1	73.8 PASS
22 Left	61	73.8 PASS
23 Bottom	72.7	73.8 PASS
24 Right	61.4	73.8 PASS
25 Front	45.5	73.8 PASS
26 Back	53.8	73.8 PASS
AMB	39.8	

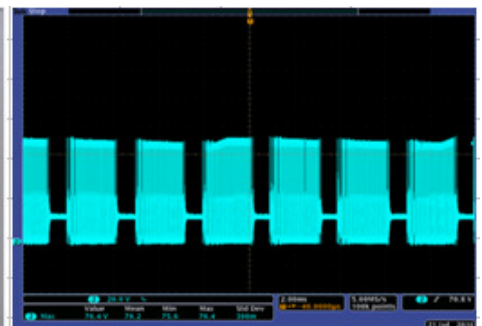
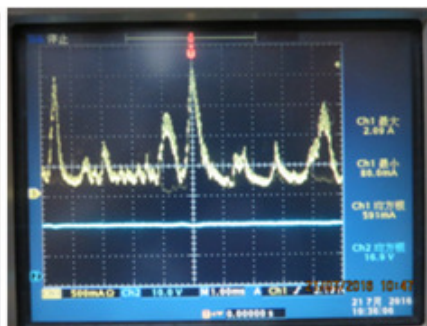
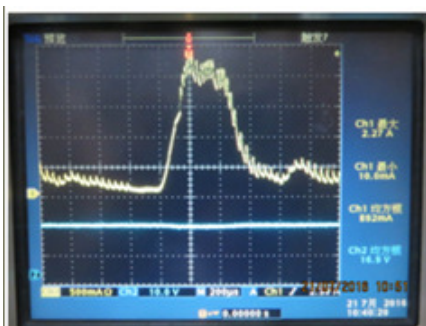
Input 264V/63Hz 25℃



Channel	Temp	Temp T	Temp T Ref	Current Data
1	LPI	58.1	100.0	PASS
2	CPU	63.1	100.0	PASS
3	L2	61.2	100.0	PASS
4	DDR1	67.2	100.0	PASS
5	CPU	67.2	100.0	PASS
6	Q1	67.2	100.0	PASS
7	F1 case	84.4	100.0	PASS
8	F1 case	84.4	100.0	PASS
9	CPU	58.1	100.0	PASS
10	D51	84.4	100.0	PASS
11	CPU	63.1	100.0	PASS
12	D1	63.1	100.0	PASS
13	D2	63.1	100.0	PASS
14	D3	63.1	100.0	PASS
15	D4	63.1	100.0	PASS
16	D5	63.1	100.0	PASS
17	D6	63.1	100.0	PASS
18	D7	63.1	100.0	PASS
19	D8	63.1	100.0	PASS
20	AMB	26.6	100.0	PASS

Case Temp	Temp	Spec
21 Top	59	76.6 PASS
22 Left	64.7	76.6 PASS
23 Bottom	65.5	76.6 PASS
24 Right	56.7	76.6 PASS
25 Front	37.4	76.6 PASS
26 Back	46	76.6 PASS
AMB	26.6	

9-3. We simulate the peak load condition of QCMC and conduct thermal test on D51. the test result is 65℃pass the thermal derating.



chirp output waveform by QCMC

D51 peak load waveform

Conclusion for Root cause:



- 1) D51 fail caused adapter no output.
- 2) From above analysis, the defect unit schottky Diode is not damaged by any abnormal control signal.
- 3) CPT will send the defective component to vendor (Lite-on) for further analysis, expect to get analysis report before 2016.7.30

**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)

1. Sent the defective D51 to vendor (Lite-on) for further analysis.
2. CPT will make the related action base on vendor's analysis.
3. CPT will hold LiteON diode for next builds until they have completed their FA with quality ensured, the replacement will be VISHAY 20A100V, Please refer to below attached Vishay's spec.



D51-vishay.pdf

**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)

**Due date: 2016.7.25**

**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.)

**CPT will make the related action base on vendor's analysis**

**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 ! ! !**

**QA: CM Wu/Roy Tsai/Mary He/Nono\_Cheng/Candy Zhu    PE: Jason Huang/Yong Liu**

**NPI: Jewel\_Chen/Xiaohui\_Du      RD: Aaron\_Chen/Walt\_Ni      PM: Vivi\_Hu/Suping\_Chang**

**Sales: Michael\_Ning/Borg\_Pan**



**Signature**

**Team Leader:**

**Cf\_Liu**

---

Name – Title

**Signature by Approver:**

**Roy\_Tsai**

---

Name-Title