Eight Discipline Report (8D Report)

To:	8D report No.:
From:：**Chicony Power Technology**	RMA claim No.: **N/A**
CC：	Chicony Power P/N: ***A20-100P1A***
	Customer P/N:
Submit date: ***4/25***	Product description: ***100W PD***
Receive date: ***4/26***	Defect D/C or Lot No.:
Subject：客戶反映 100W RMA 2pcs 回收 adapter 後確認輸出異常 **(Regulation, 電容)**	

D1.) 問題解決成員:Use Team Approach

主持者 (Team Leader)：**Mark Meng**

內部成員 (Internal Team Members):

RD: Edward Ho

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.)

2022/4/25 客戶告知:

CPT P/N: A20-100P1A

不良情況 ：輸出異常，造成系統無法充電



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.**)**

1. 從客戶端拿到了樣機並做進一步分析

Date:2022/4/25

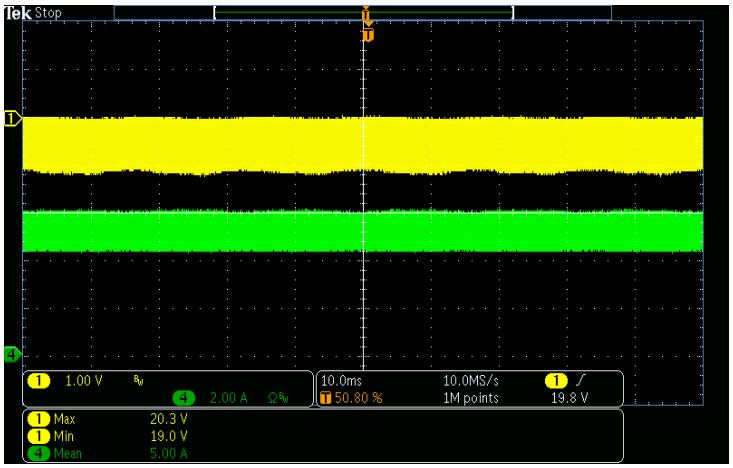
D4.)不良原因確認: Define and Verify Root Causes:

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

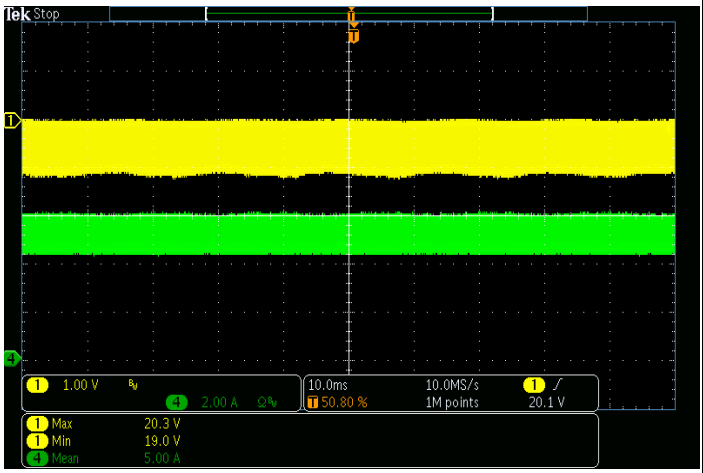
1. 開機測試_sample1

I. 複判確認20V加載後輸出電壓符合規格

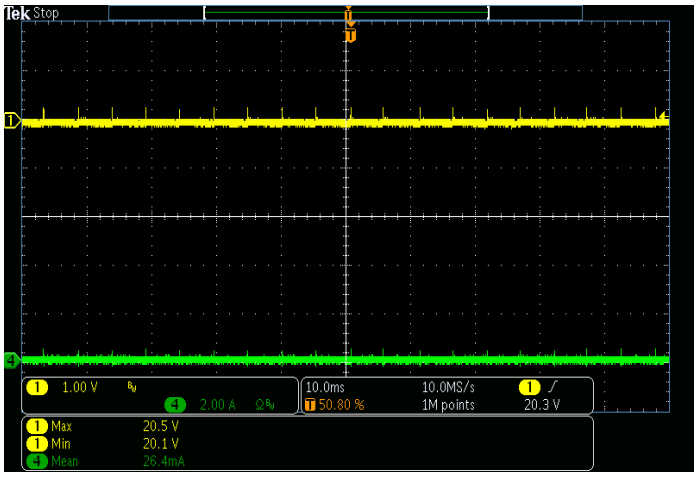
Input : 90Vac/47Hz ; Output : 20V Full Load



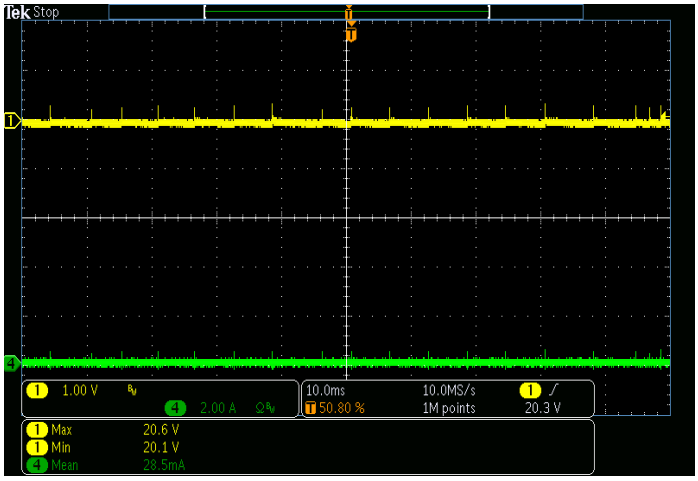
Input : 264Vac/63Hz ; Output : 20V Full Load



Input : 90Vac/47Hz ; Output : 20V No Load

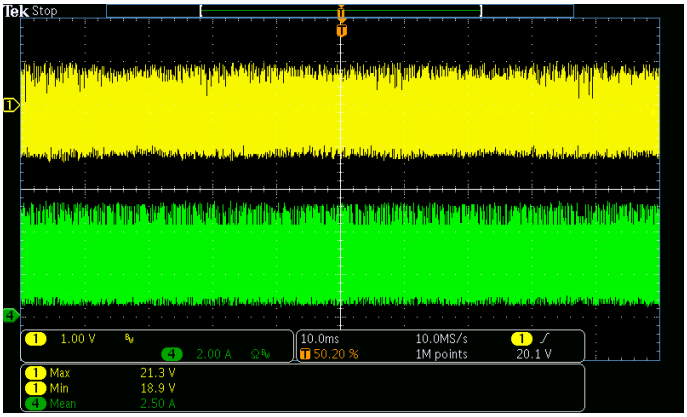


Input : 264Vac/63Hz ; Output : 20V No Load

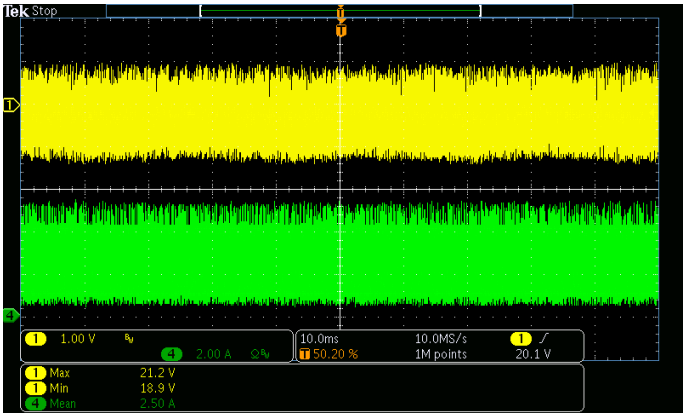


II. 複判確認20V 動態負載，輸出電壓超出規格下限

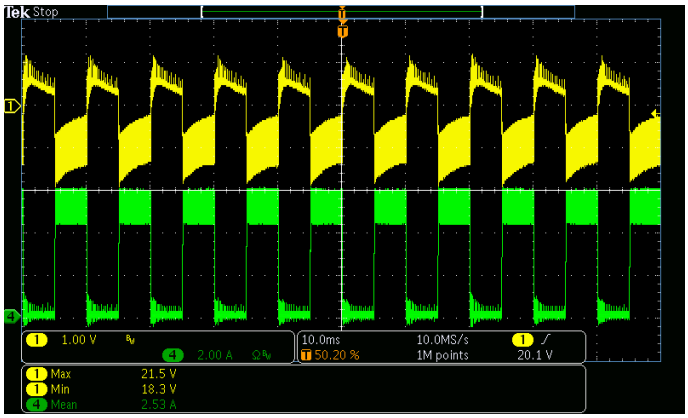
Input : 90Vac/47Hz ;
Output : 20V Dynamic Load ; F:100KHz



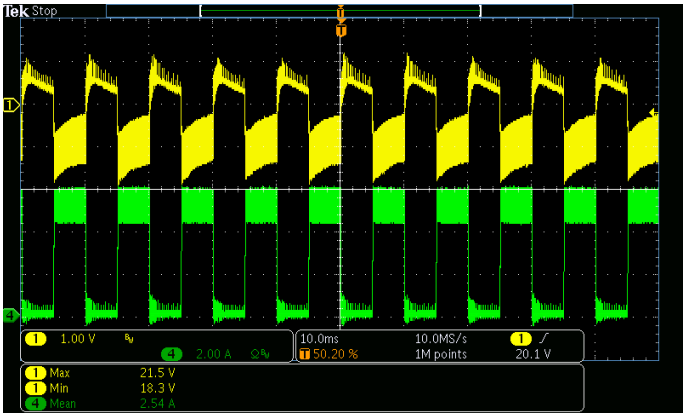
Input : 264Vac/63Hz ;
Output : 20V Dynamic Load ; F:100KHz



Input : 90Vac/47Hz ;
Output : 20V Dynamic Load ; F:100Hz

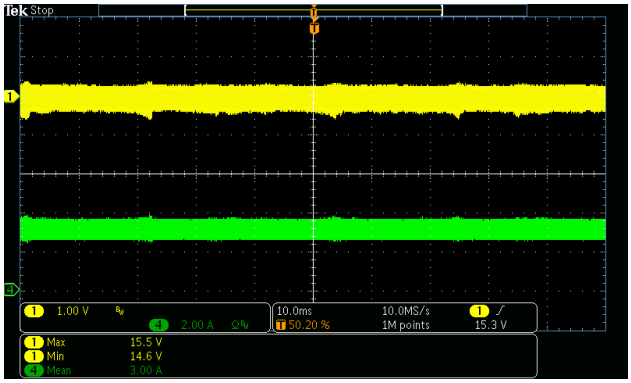


Input : 264Vac/63Hz ;
Output : 20V Dynamic Load ; F:100Hz

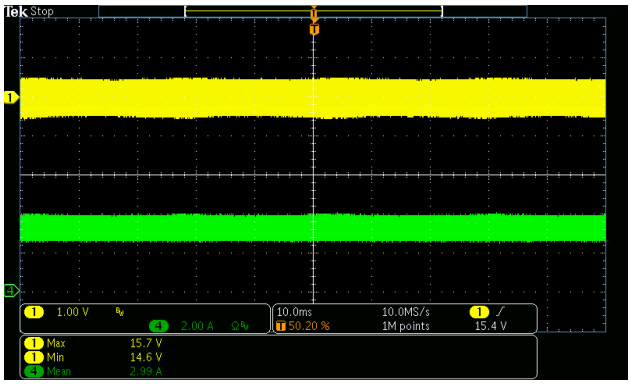


III. 複判確認15V加載後輸出電壓符合規格。

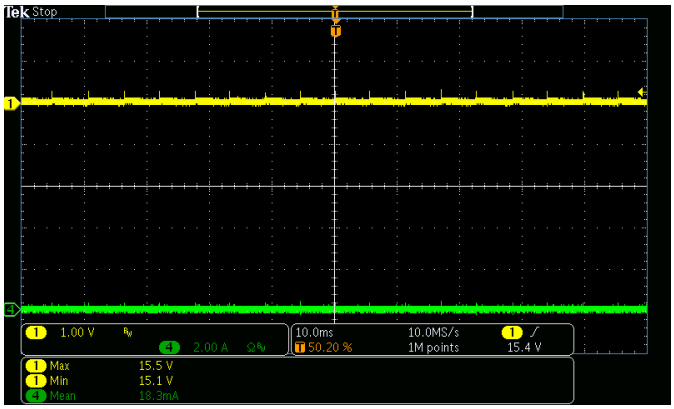
Input : 90Vac/47Hz ; Output : 15V Full Load



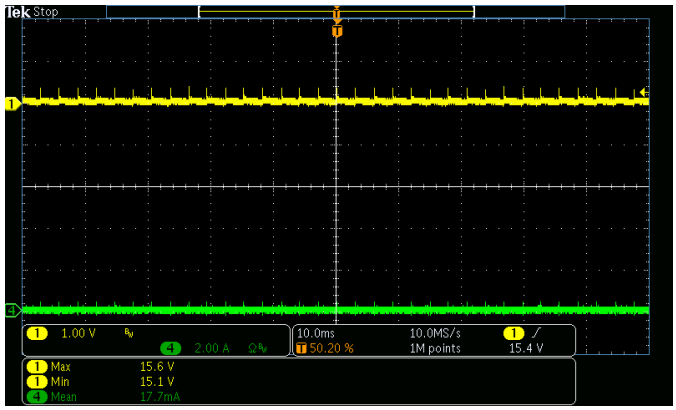
Input : 264Vac/63Hz ; Output : 15V Full Load



Input : 90Vac/47Hz ; Output : 15V No Load

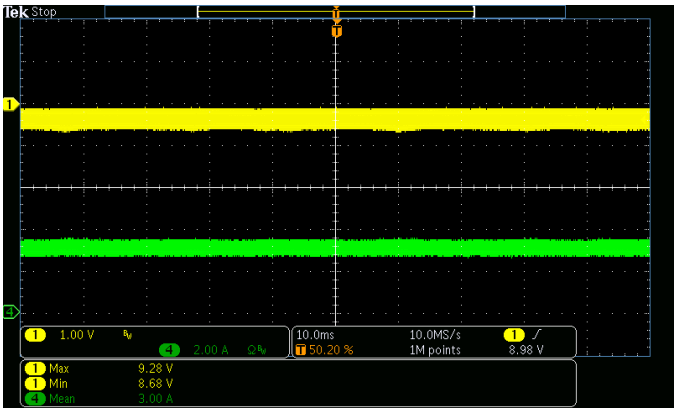


Input : 264Vac/63Hz ; Output : 15V No Load

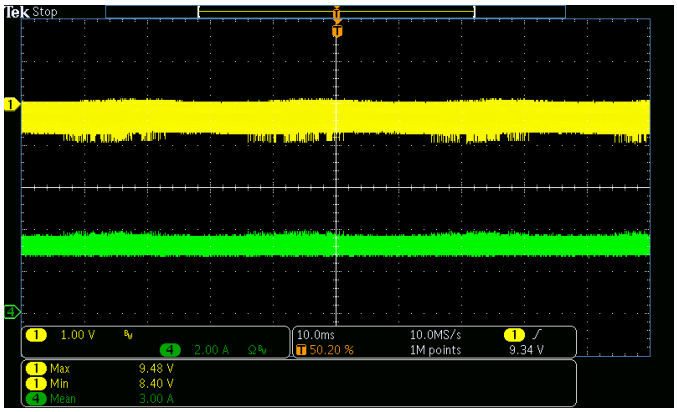


IV. 複判確認9V加載後輸出電壓超出規格下限 (264Vac / Full Load)

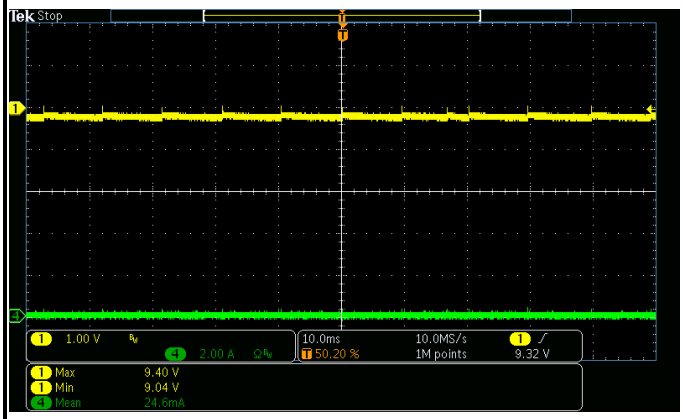
Input : 90Vac/47Hz ; Output : 9V Full Load



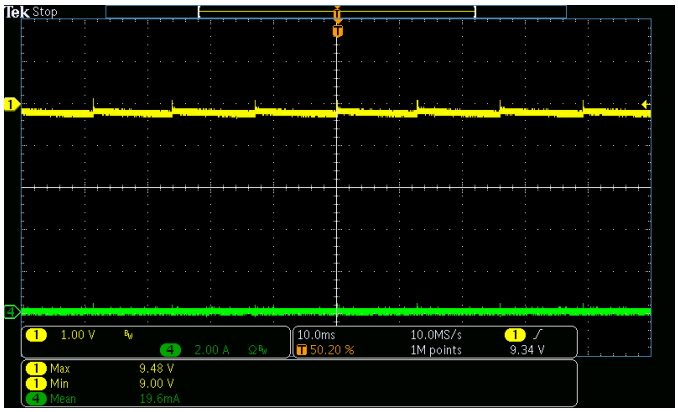
Input : 264Vac/63Hz ; Output : 9V Full Load



Input : 90Vac/47Hz ; Output : 9V No Load

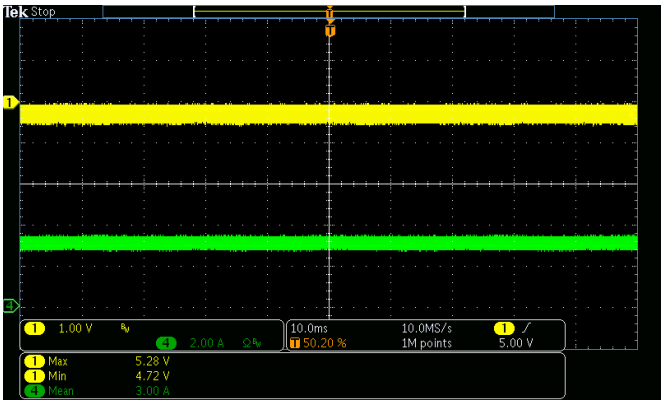


Input : 264Vac/63Hz ; Output : 9V No Load

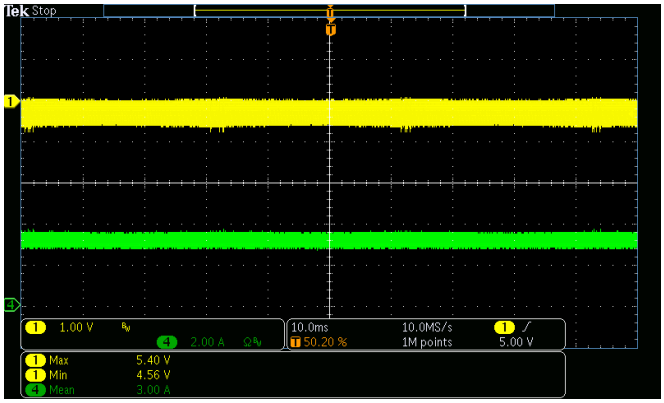


V. 複判確認5V加載後輸出電壓超出規格下限 (90Vac and 264Vac/ 5V Full Load)

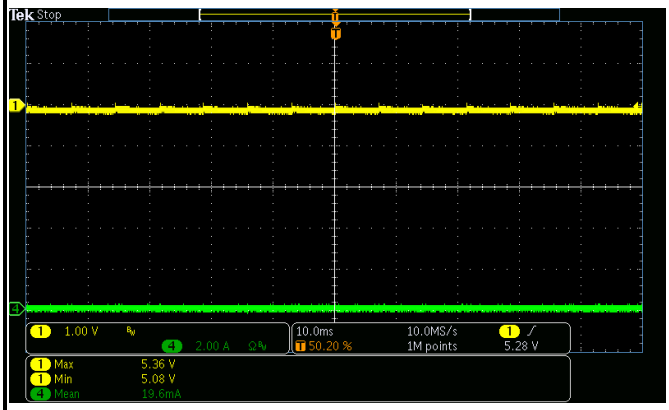
Input : 90Vac/47Hz ; Output : 5V Full Load



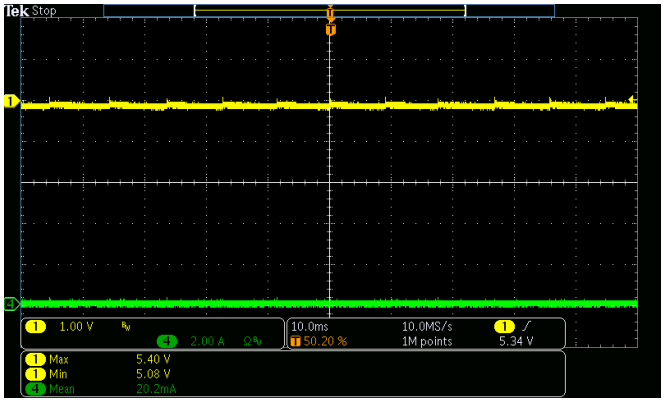
Input : 264Vac/63Hz ; Output : 5V Full Load



Input : 90Vac/47Hz ; Output : 5V No Load

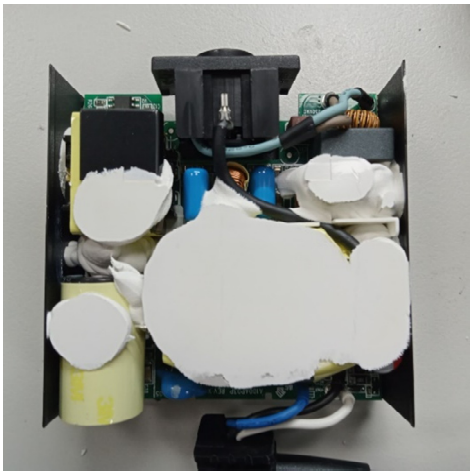


Input : 264Vac/63Hz ; Output : 5V No Load



1. Open case

I. ADP開蓋錫面零件面正常



II. ADP開蓋後發現C55零件電器特性NG

Component Specification

Table 5 Standard ratings

WV/Vdc (SV)	Cap (μF)	Size Code	Leakage Current (μA)	tanδ	ESR (mΩmax/20℃, 100k to 300kHz)	Rated Ripple Current (mArms/ 105℃ /100kHz)	Part No.
25 (28.8)	680	0816	850	0.14	18	5,000	250ARME681M0816PFBT

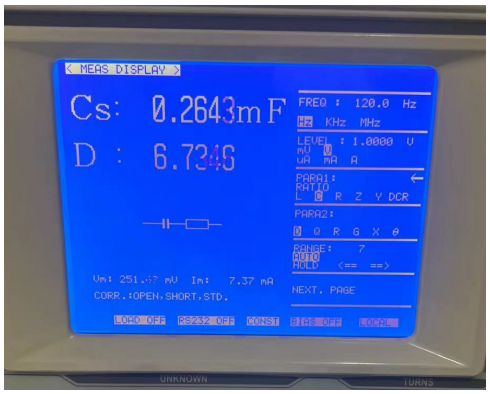
Table 3 Capacitance tolerance

Cap tolerance code	Cap tolerance
M	±20%

816uF ~ 544uF

C55 680uF/25V 靜態測試

1. 電容容值測試 ：Fail **2. 電容 DF 測試 ：Fail**



3. 電容 ESR 測試 ：Fail

III. ADP開蓋後發現C57 零件電器特性NG

Table 5 Standard ratings

WV/Vdc (SV)	Cap (μF)	Size Code	Leakage Current (μA)	tanδ	ESR (mΩmax/20℃, 100k to 300kHz)	Rated Ripple Current (mArms/ 105℃/100kHz)	Part No.
25 (28.8)	560	06A6	700	0.14	20	3,900	250ARME561M06A6T

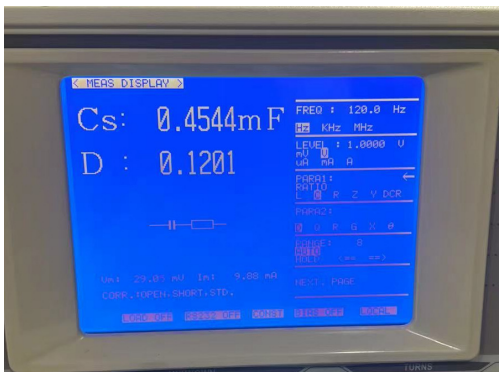
Table 3 Capacitance tolerance

Cap tolerance code	Cap tolerance
M	±20%

672uF ~448uF

C57 560uF/25V 靜態測試

1. 電容容值測試 ：Pass **2. 電容 DF 測試 ：Pass** **3. 電容 ESR 測試 ：Fail**



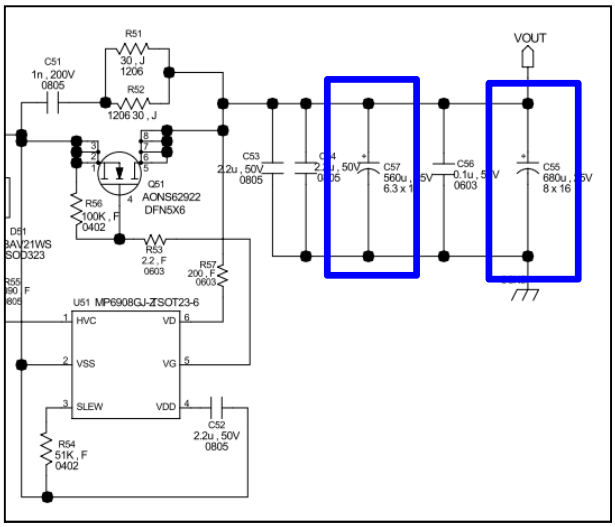
2. Verification

I. 更換C55和C57 後，複驗5V, 9V, 15V, 20V 輸出，均符合規格。

Specification

Item	Content	Specification			
Vendor ID		ASUS (0x0b05)			
Safety Rating		5V/3A , 9V/3A , 15V/3A , 20V/5A			
PD Mode	PDO	5V Fixed	9V Fixed	15V Fixed	20V Fixed
	Output Voltage Range	4.85~5.5V	8.55V~9.45V	14.25~15.75V	19~21V
	Output Voltage Ripple	180mV	200mV	300mV	300mV
	Output Current Range	0~3A	0~3A	0~3A	0~5A
	Output Current Ripple	100mA	N/A	N/A	N/A

Schematic

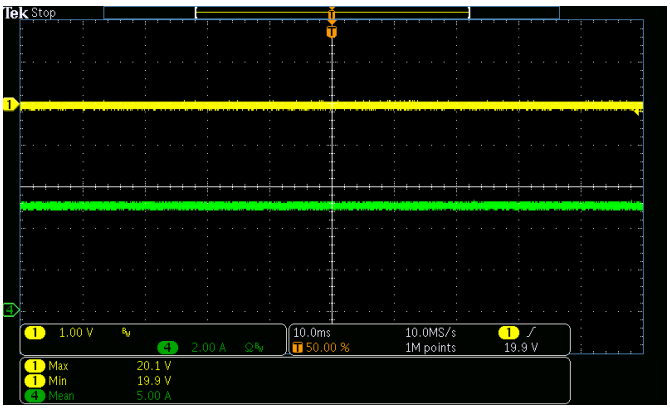


Test Result :

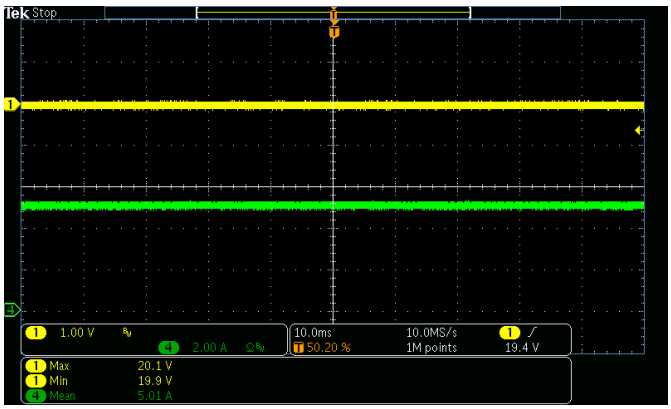
Output \ Input		90V/47Hz	264Vac / 63Hz
20V No Load	Max	20.3V	20.4V
	Min	20.1V	20.1V
20V Full Load	Max	20.1V	20.1V
	Min	19.9V	19.9V
15V No Load	Max	15.4V	15.4V
	Min	15.1V	15.1V
15V Full Load	Max	15.2V	15.2V
	Min	15V	15V
9V No Load	Max	9.28V	9.28V
	Min	9.04V	9.04V
9V Full Load	Max	9.16V	9.16V
	Min	8.92V	8.88V
5V No Load	Max	5.34V	5.34V
	Min	5.1V	5.1V
5V Full Load	Max	5.18V	5.18V
	Min	4.94V	4.94V

II. 更換C55和C57 後，複驗20V輸出，均符合規格。

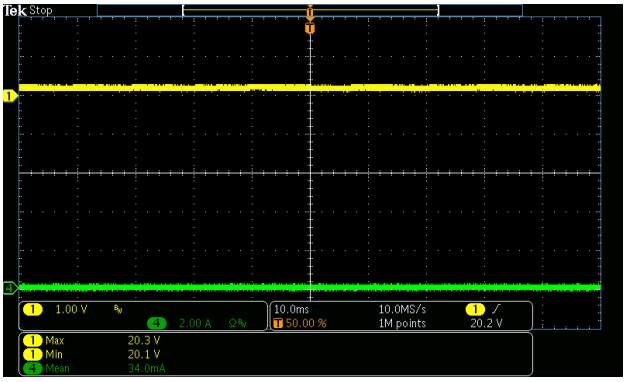
Input : 90Vac/47Hz ; Output : 20V Full Load



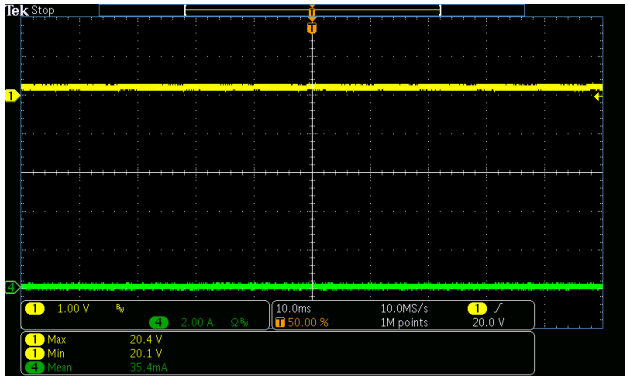
Input : 264Vac/63Hz ; Output : 20V Full Load



Input : 90Vac/47Hz ; Output : 20V No Load

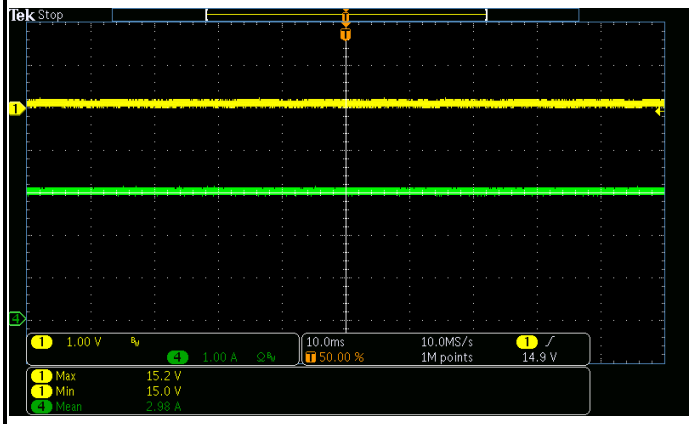


Input : 264Vac/63Hz ; Output : 20V No Load

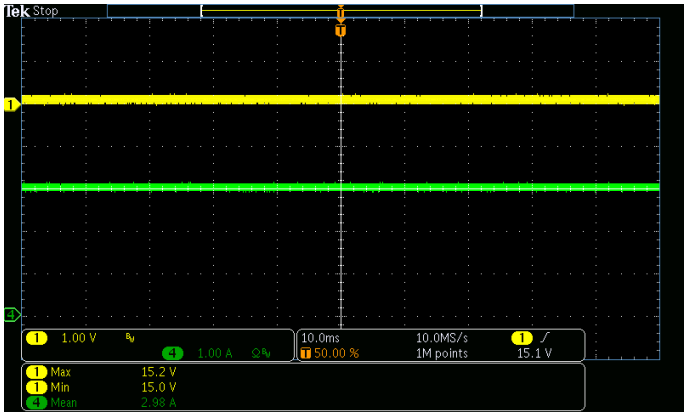


III. 更換C55和C57 後，複驗15V輸出，均符合規格。

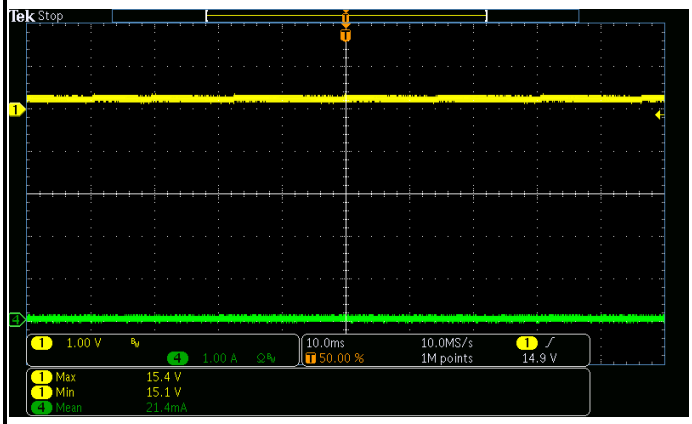
Input : 90Vac/47Hz ; Output : 15V Full Load



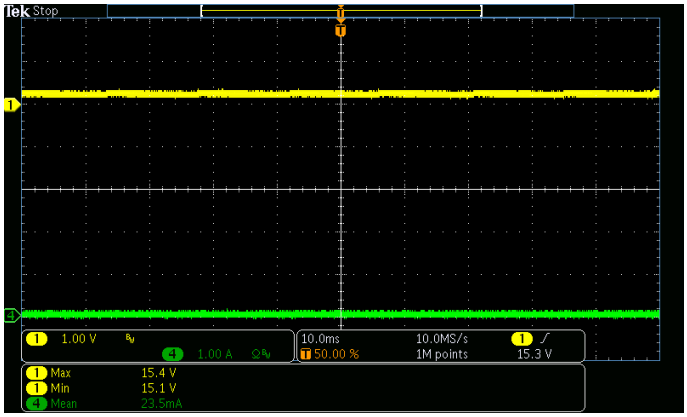
Input : 264Vac/63Hz ; Output : 15V Full Load



Input : 90Vac/47Hz ; Output : 15V No Load

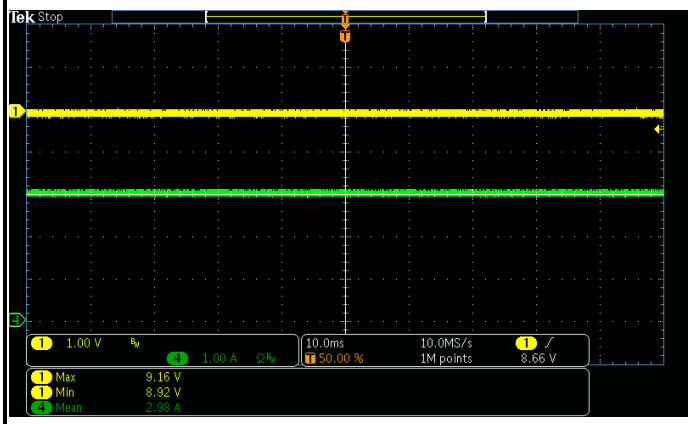


Input : 264Vac/63Hz ; Output : 15V No Load

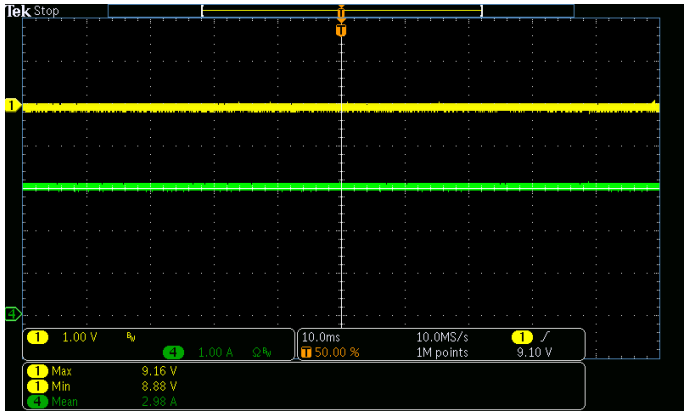


IV. 更換C55和C57 後，複驗9V輸出，均符合規格。

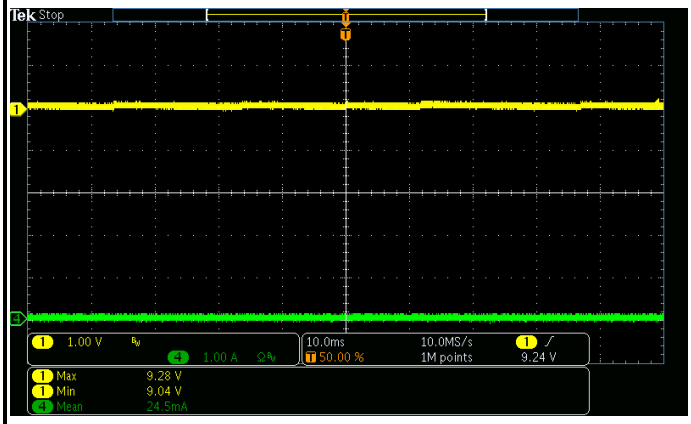
Input : 90Vac/47Hz ; Output : 9V Full Load



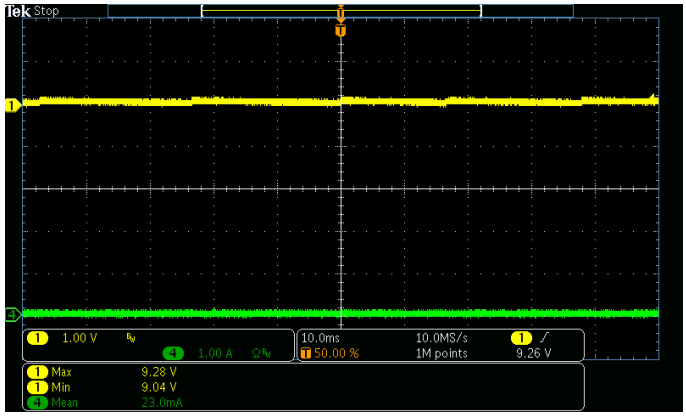
Input : 264Vac/63Hz ; Output : 9V Full Load



Input : 90Vac/47Hz ; Output : 9V No Load

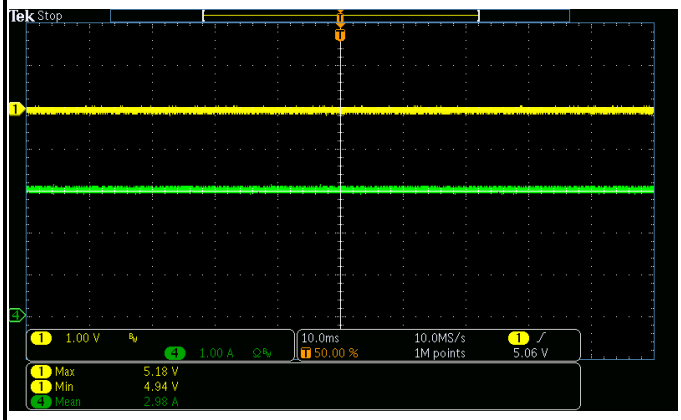


Input : 264Vac/63Hz ; Output : 9V No Load

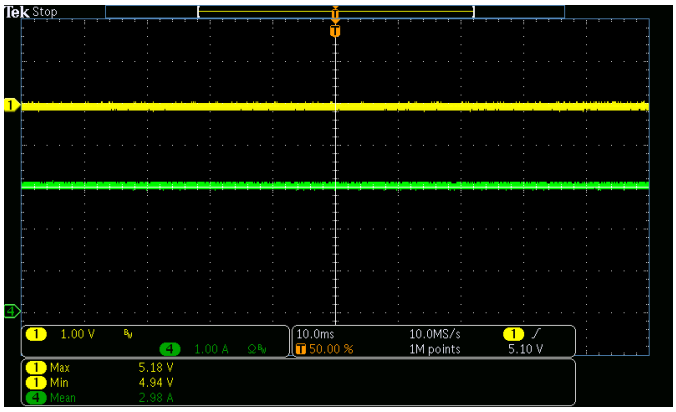


V. 更換C55和C57 後，複驗5V輸出，均符合規格。

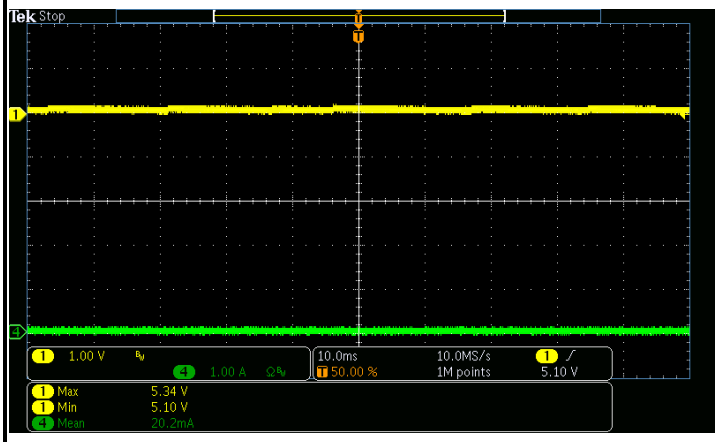
Input : 90Vac/47Hz ; Output : 5V Full Load



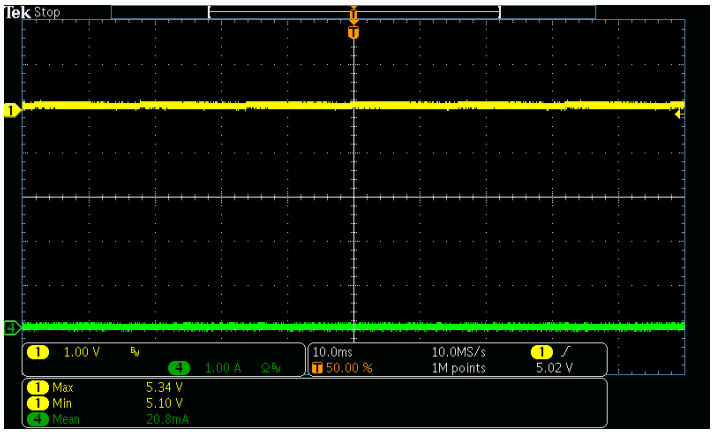
Input : 264Vac/63Hz ; Output : 5V Full Load



Input : 90Vac/47Hz ; Output : 5V No Load



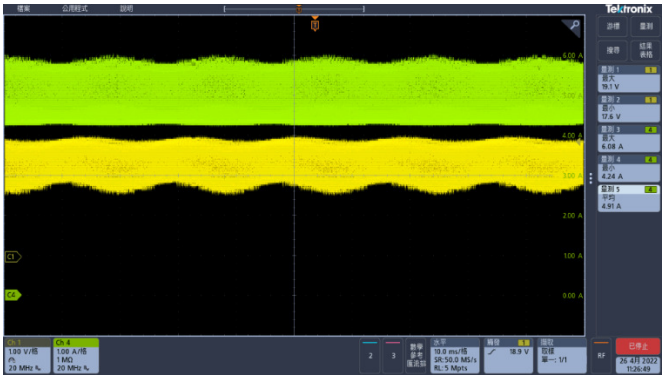
Input : 264Vac/63Hz ; Output : 5V No Load



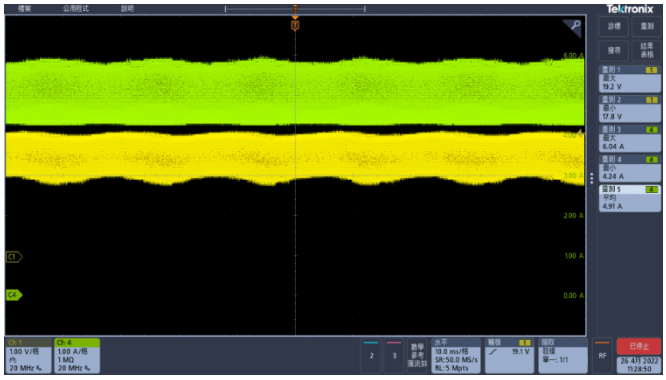
1. 開機測試_sample2

I. 複判確認20V加載後輸出電壓超出規格下限。(90Vac&264Vac / Full Load)

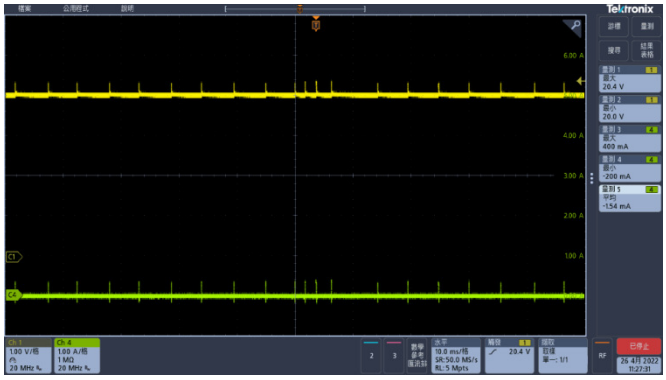
Input : 90Vac/47Hz ; Output : 20V Full Load



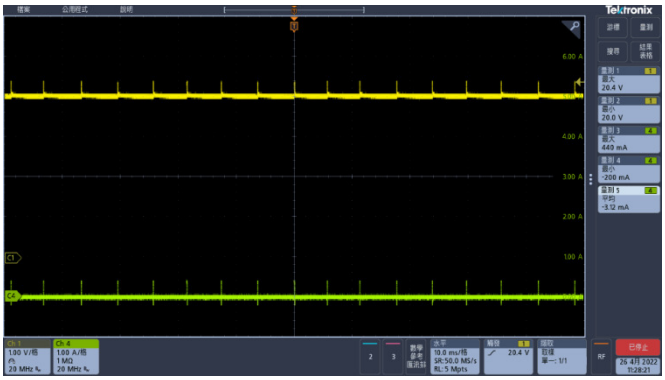
Input : 264Vac/63Hz ; Output : 20V Full Load



Input : 90Vac/47Hz ; Output : 20V No Load

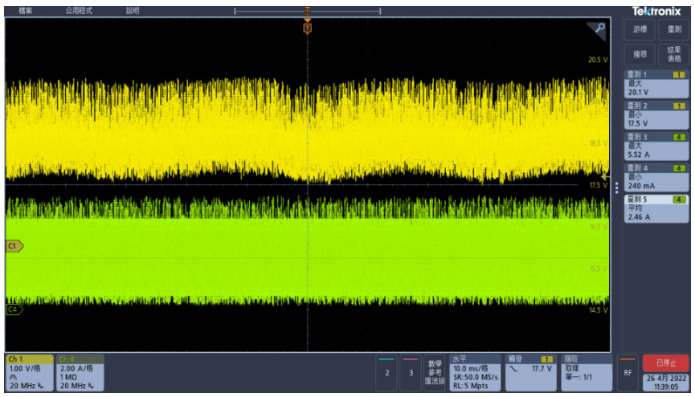


Input : 264Vac/63Hz ; Output : 20V No Load

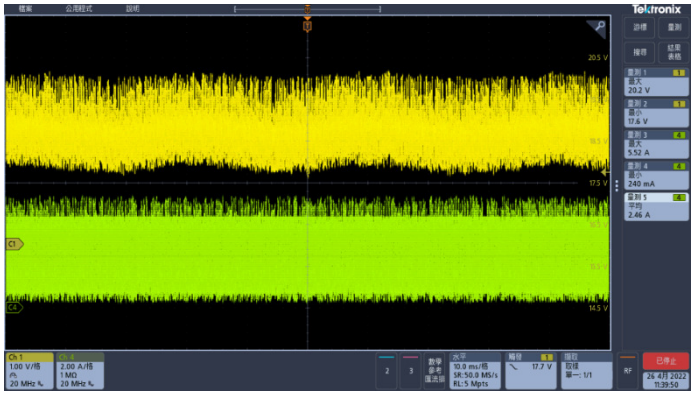


II. 複判確認20V 動態負載，輸出電壓超出規格下限

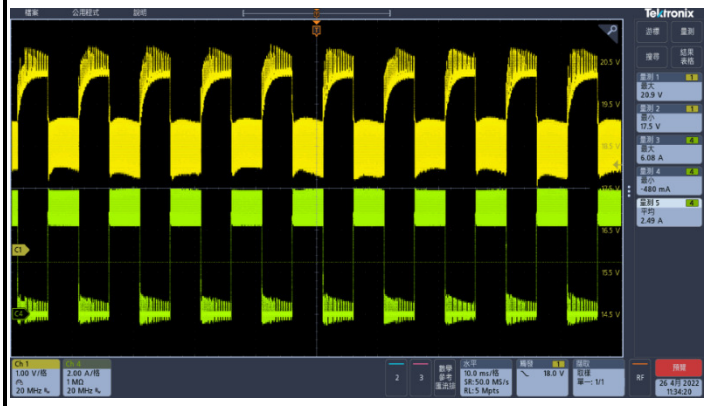
Input : 90Vac/47Hz ;
Output : 20V Dynamic Load ; F:100KHz



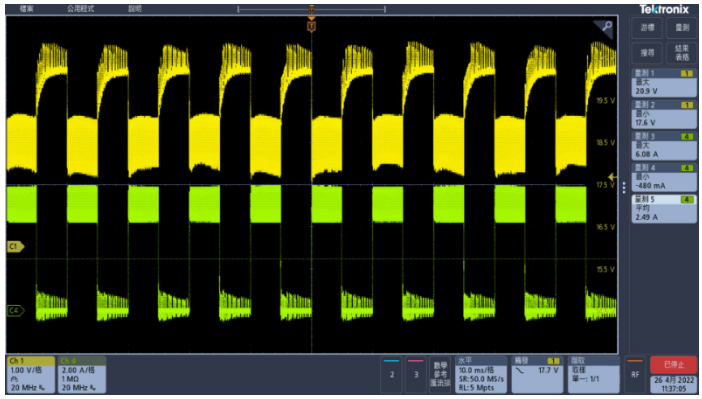
Input : 264Vac/63Hz ;
Output : 20V Dynamic Load ; F:100KHz



Input : 90Vac/47Hz ;
Output : 20V Dynamic Load ; F:100Hz

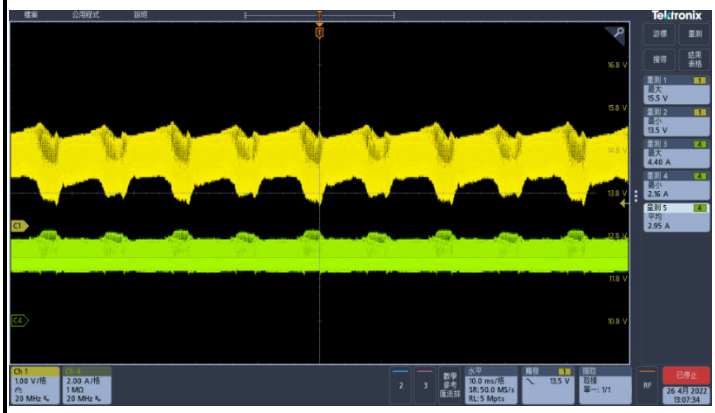


Input : 264Vac/63Hz ;
Output : 20V Dynamic Load ; F:100Hz

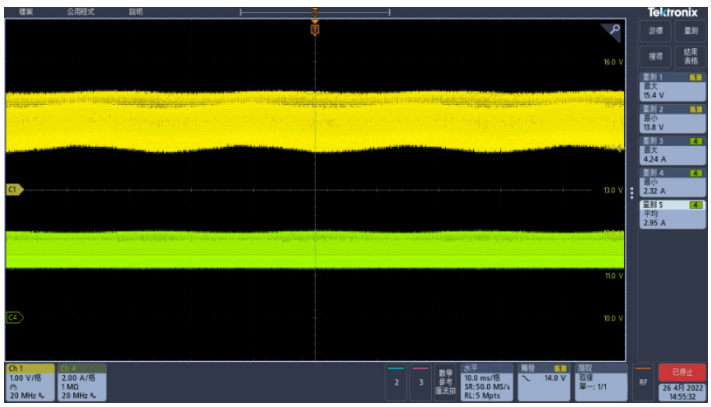


III. 複判確認15V加載後輸出電壓超出規格下限。(90Vac&264Vac / Full Load)

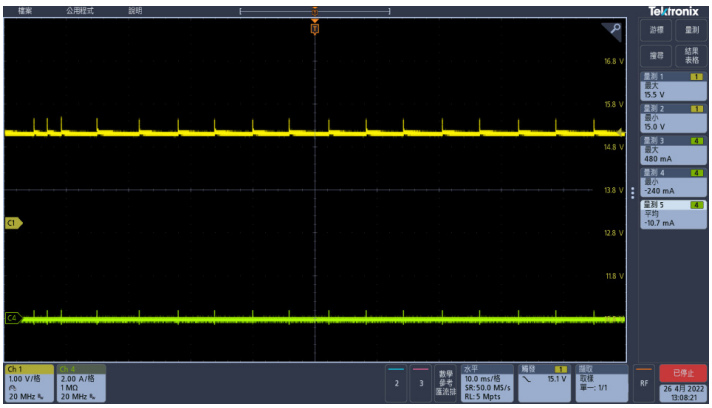
Input : 90Vac/47Hz ; Output : 15V Full Load



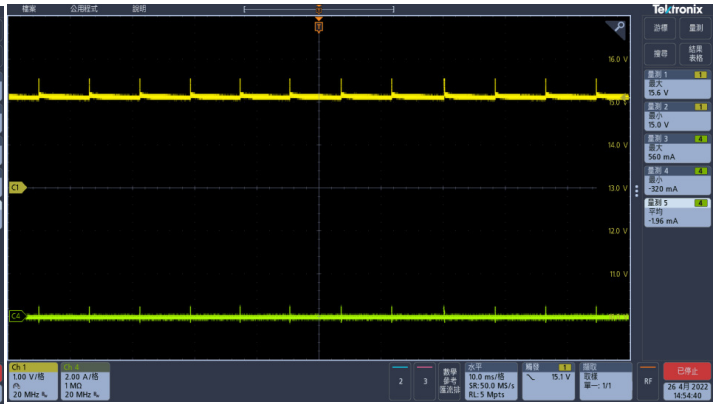
Input : 264Vac/63Hz ; Output : 15V Full Load



Input : 90Vac/47Hz ; Output : 15V No Load

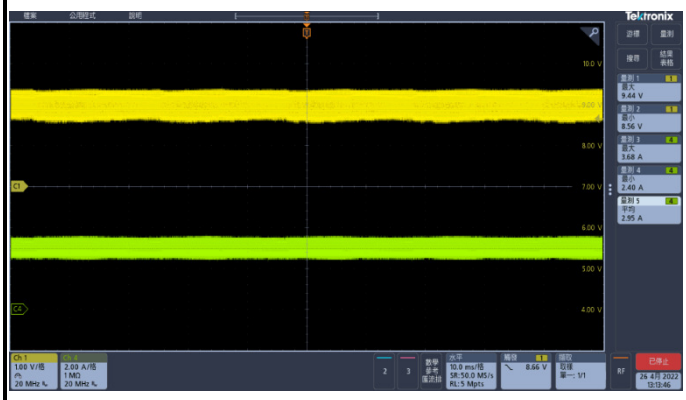


Input : 264Vac/63Hz ; Output : 15V No Load

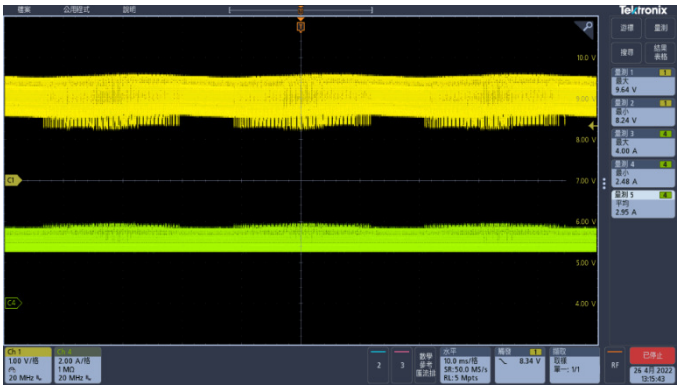


IV. 複判確認9V加載後輸出電壓超出規格上下限 (264Vac / Full Load)

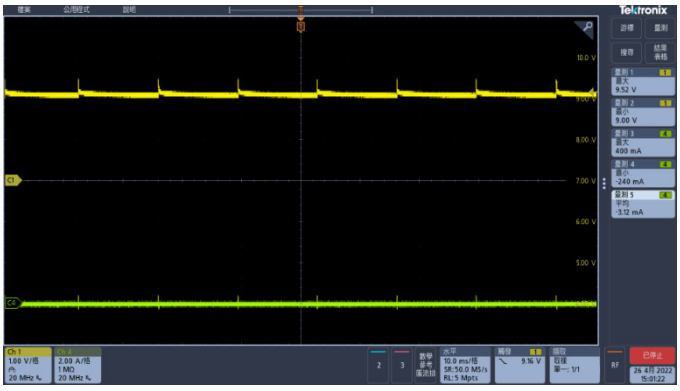
Input : 90Vac/47Hz ; Output : 9V Full Load



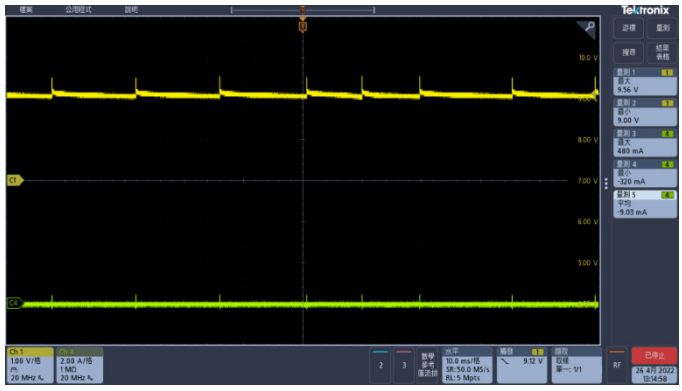
Input : 264Vac/63Hz ; Output : 9V Full Load



Input : 90Vac/47Hz ; Output : 9V No Load

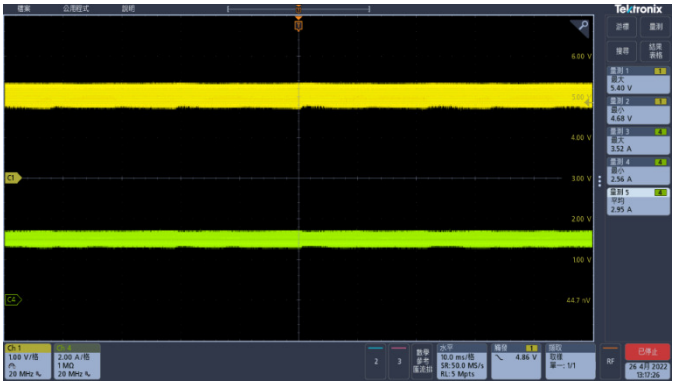


Input : 264Vac/63Hz ; Output : 9V No Load

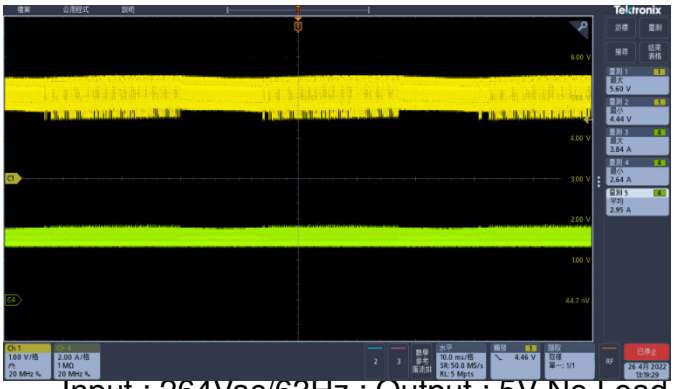


V. 複判確認5V加載後輸出電壓超出規格上下限 (90Vac&264Vac/ Full Load)

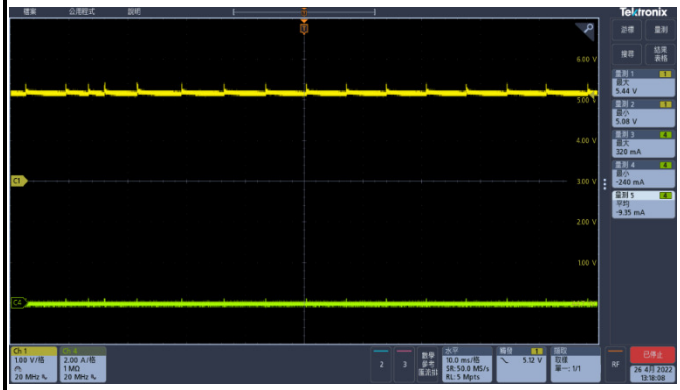
Input : 90Vac/47Hz ; Output : 5V Full Load



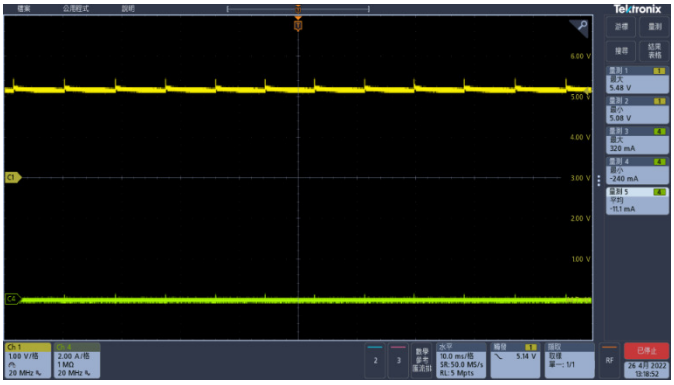
Input : 264Vac/63Hz ; Output : 5V Full Load



Input : 90Vac/47Hz ; Output : 5V No Load

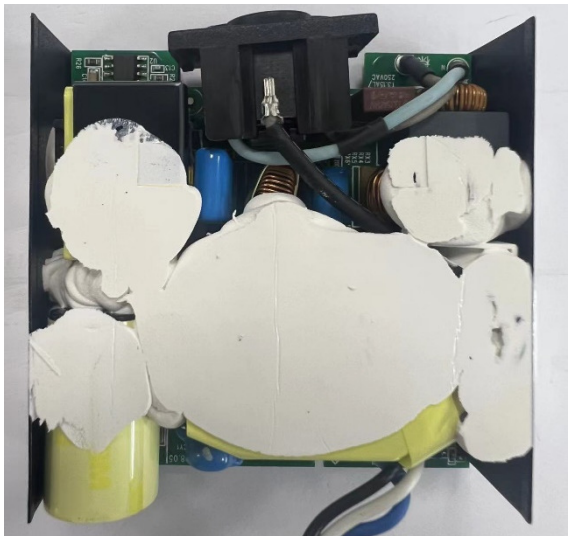


Input : 264Vac/63Hz ; Output : 5V No Load



2. Open case

I. ADP開蓋錫面零件面正常



II. ADP開蓋後發現C55零件電器特性NG

Component Specification

Table 5 Standard ratings

WV/Vdc (SV)	Cap (μF)	Size Code	Leakage Current (μA)	tanδ	ESR (mΩmax/20℃, 100k to 300kHz)	Rated Ripple Current (mArms/ 105℃ /100kHz)	Part No.
25 (28.8)	680	0816	850	0.14	18	5,000	250ARME681M0816PFBT

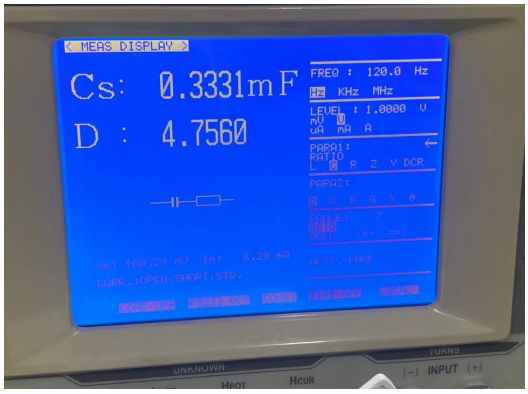
Table 3 Capacitance tolerance

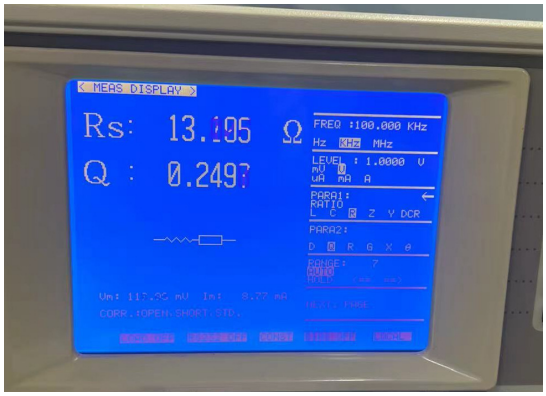
Cap tolerance code	Cap tolerance
M	±20%

816uF ~ 544uF

C55 680uF/25V 靜態測試

1. 電容容值測試 ：Fail **2. 電容 DF 測試 ：Fail** **3. 電容 ESR 測試 ：Fail**





III. ADP開蓋後發現C57 零件電器特性NG

Component Specification

Table 5 Standard ratings

WV/Vdc (SV)	Cap (μF)	Size Code	Leakage Current (μA)	tanδ	ESR (mΩmax/20℃, 100k to 300kHz)	Rated Ripple Current (mArms/ 105℃/100kHz)	Part No.
25 (28.8)	560	06A6	700	0.14	20	3,900	250ARME561M06A6T

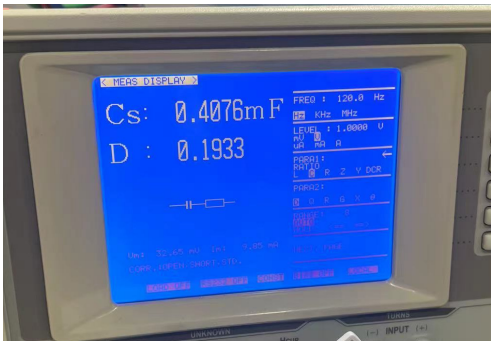
Table 3 Capacitance tolerance

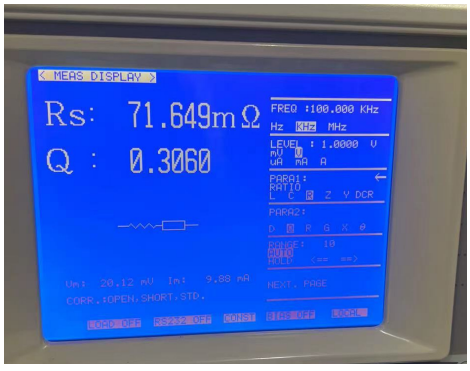
Cap tolerance code	Cap tolerance
M	±20%

672uF ~448uF

C57 560uF/25V 靜態測試

1. 電容容值測試 ：Fail **2. 電容 DF 測試 ：Fail** **3. 電容 ESR 測試 ：Fail**





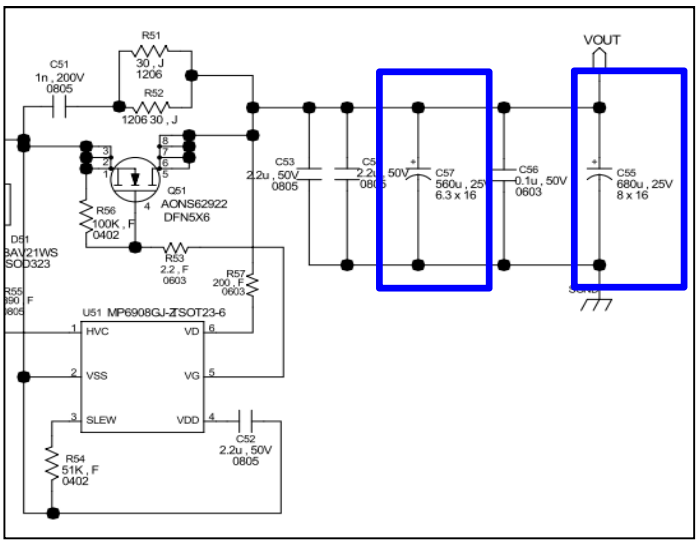
3. Verification

I. 更換C55和C57 後，複驗5V, 9V, 15V, 20V 輸出，均符合規格。

Specification

Item	Content	Specification			
Vendor ID		ASUS (0x0b05)			
Safety Rating		5V/3A , 9V/3A , 15V/3A , 20V/5A			
PD Mode	PDO	5V Fixed	9V Fixed	15V Fixed	20V Fixed
	Output Voltage Range	4.85~5.5V	8.55V~9.45V	14.25~15.75V	19~21V
	Output Voltage Ripple	180mV	200mV	300mV	300mV
	Output Current Range	0~3A	0~3A	0~3A	0~5A
	Output Current Ripple	100mA	N/A	N/A	N/A

Schematic

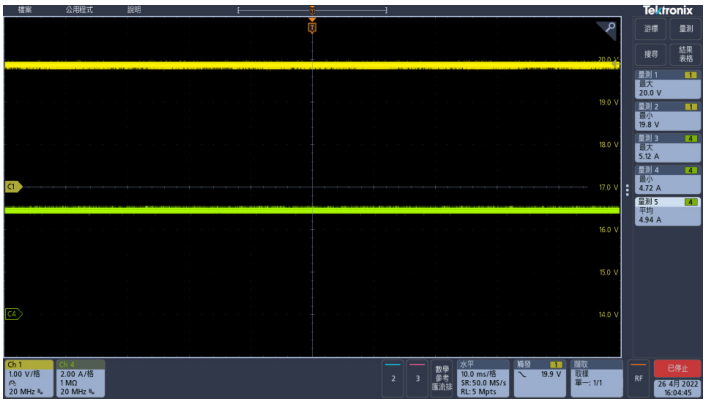


Test Result :

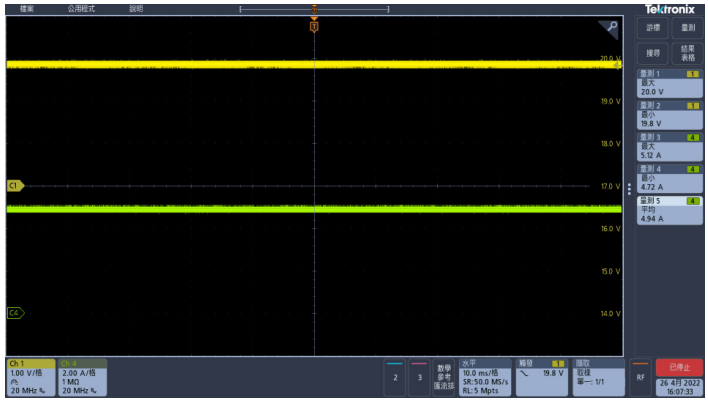
Output \ Input		90V/47Hz	264Vac / 63Hz
20V No Load	Max	20.2V	20.2V
	Min	20.0V	20.0V
20V Full Load	Max	20.0V	20.0V
	Min	19.8V	19.8V
15V No Load	Max	15.2V	15.2V
	Min	15.0V	15.0V
15V Full Load	Max	15.1V	15.2V
	Min	14.9V	14.9V
9V No Load	Max	9.2V	9.2V
	Min	9.0V	9.0V
9V Full Load	Max	9.12V	9.12V
	Min	8.92V	8.92V
5V No Load	Max	5.2V	5.2V
	Min	5.0V	5.0V
5V Full Load	Max	5.28V	5.28V
	Min	5.12V	5.12V

II. 更換C55和C57 後，複驗20V輸出，均符合規格。

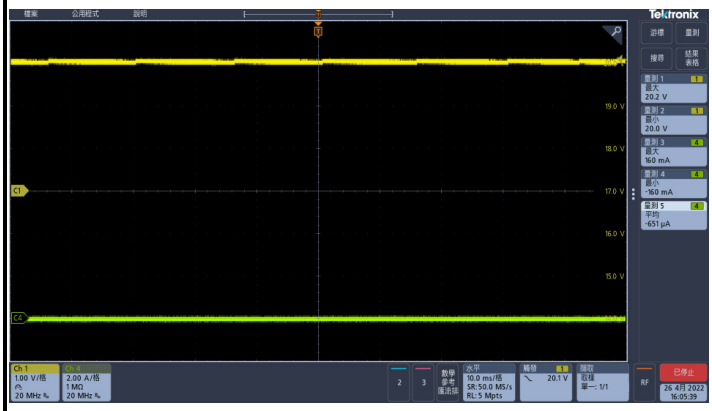
Input : 90Vac/47Hz ; Output : 20V Full Load



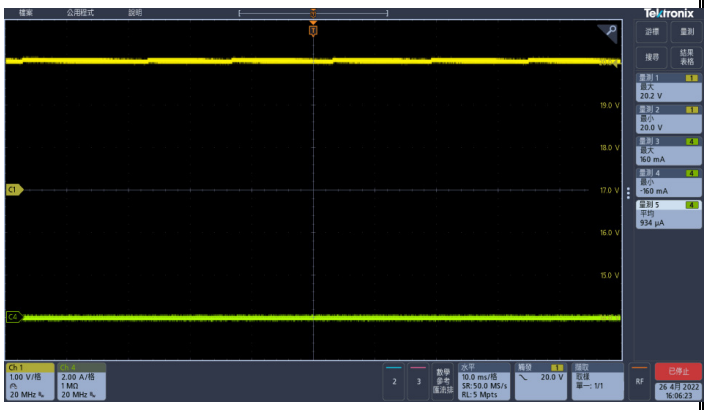
Input : 264Vac/63Hz ; Output : 20V Full Load



Input : 90Vac/47Hz ; Output : 20V No Load

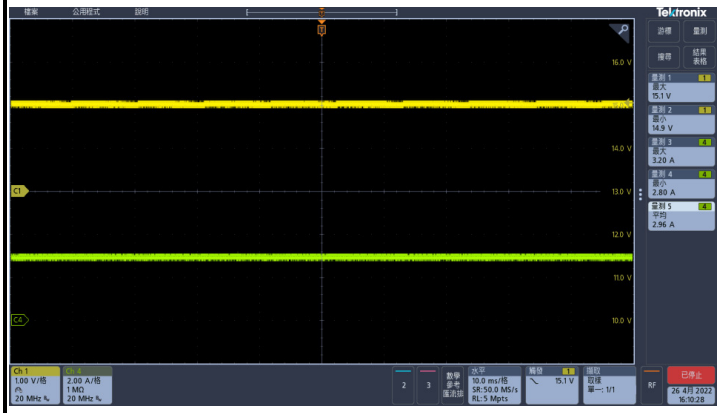


Input : 264Vac/63Hz ; Output : 20V No Load

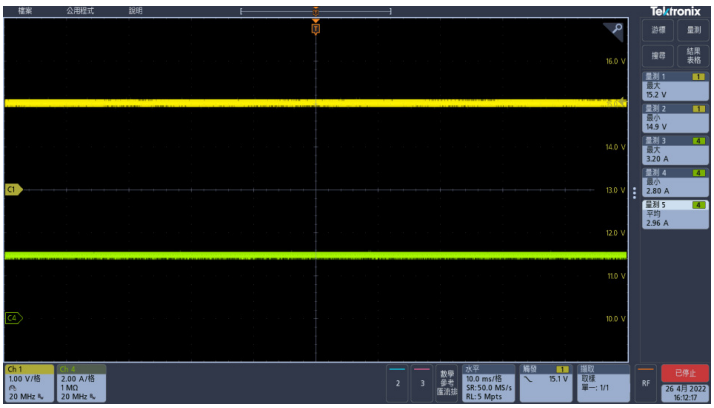


III. 更換C55和C57 後，複驗15V輸出，均符合規格。

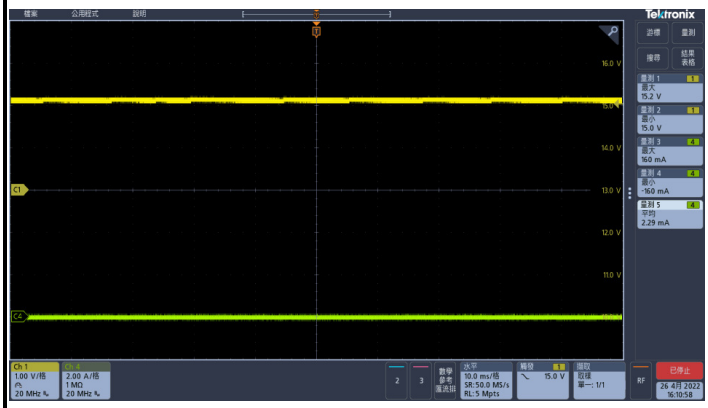
Input : 90Vac/47Hz ; Output : 15V Full Load



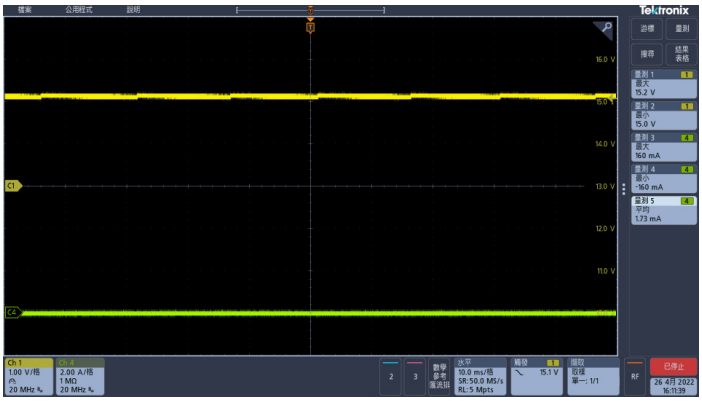
Input : 264Vac/63Hz ; Output : 15V Full Load



Input : 90Vac/47Hz ; Output : 15V No Load

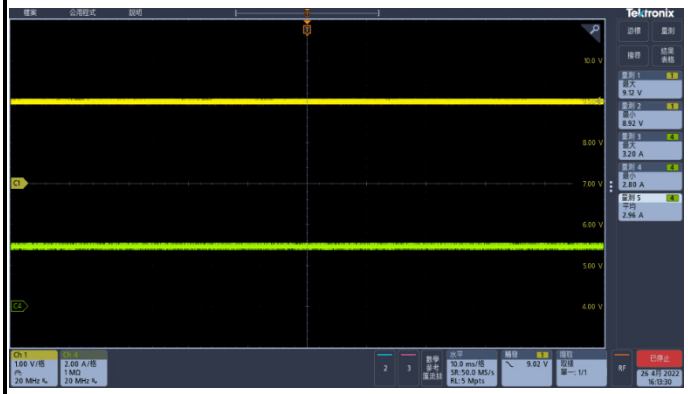


Input : 264Vac/63Hz ; Output : 15V No Load

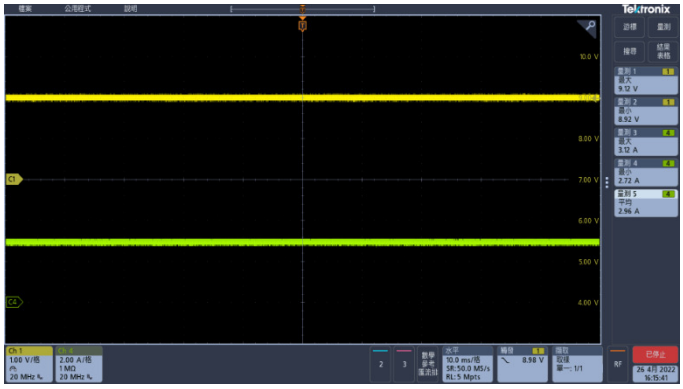


IV. 更換C55和C57 後，複驗9V輸出，均符合規格。

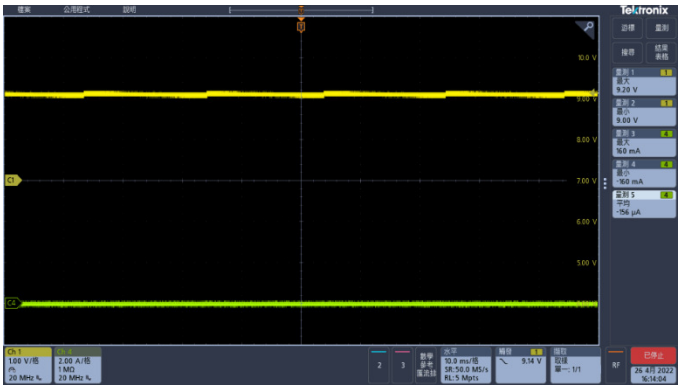
Input : 90Vac/47Hz ; Output : 9V Full Load



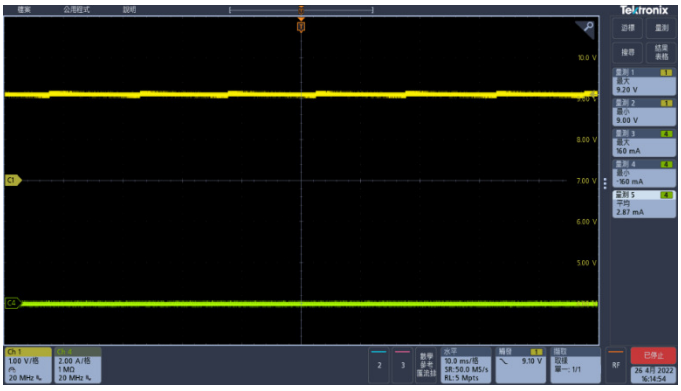
Input : 264Vac/63Hz ; Output : 9V Full Load



Input : 90Vac/47Hz ; Output : 9V No Load

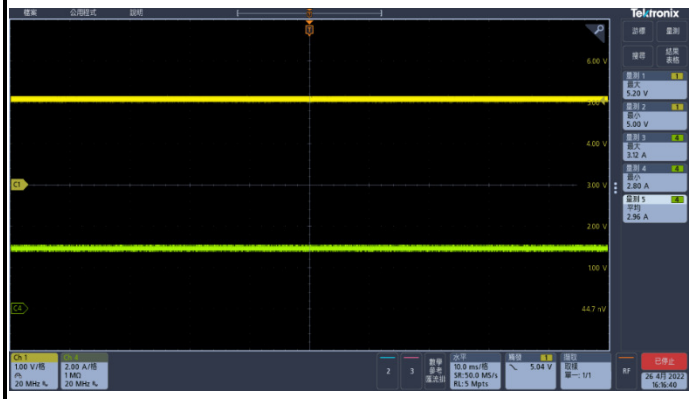


Input : 264Vac/63Hz ; Output : 9V No Load

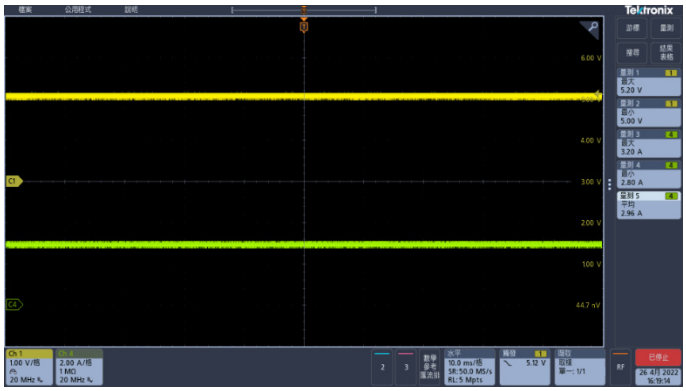


V. 更換C55和C57 後，複驗5V輸出，均符合規格。

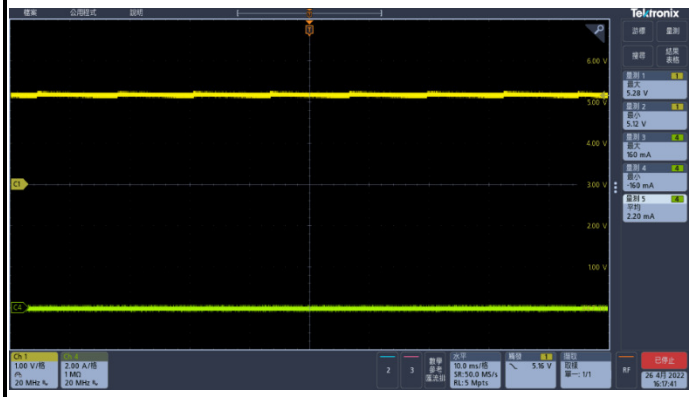
Input : 90Vac/47Hz ; Output : 5V Full Load



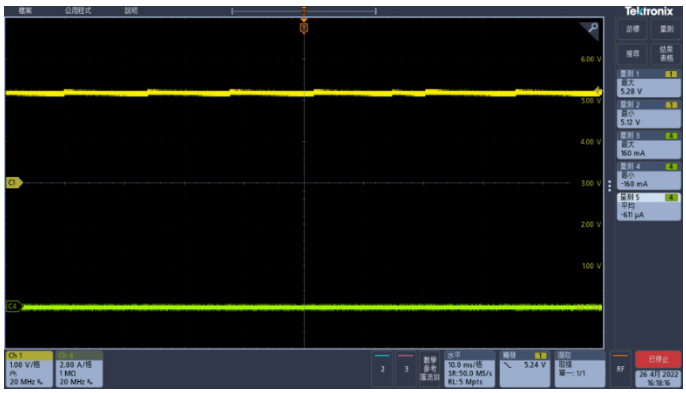
Input : 264Vac/63Hz ; Output : 5V Full Load



Input : 90Vac/47Hz ; Output : 5V No Load



Input : 264Vac/63Hz ; Output : 5V No Load



結論:

- 失效單體分析，發現 C57, C55 零件失效，導致單體輸出異常。
- 不良零件 C57 送廠商分析，廠商: APAQ P/N: 250ARME561M06A6T
- 不良零件 C55 送廠商分析，廠商: APAQ P/N: 250ARME681M0816PFBT
- 在 X03 版本後(含 X03)，C55 和 C57 這兩個位置已經刪除 APAQ 這家供應商，所以從量產以來均無使用 APAQ 這家廠商的物料。

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**)**
■ **在 X03 版本後(含 X03)，C55 和 C57 這兩個位置已經刪除 APAQ 這家供應商，所以從量產以來均無使用 APAQ 這家廠商的物料。** **Date:2022/04/26**
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**.)**
Same as D5
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！！！ **Sales: Jennie Chiang , RD: Edward Ho**

Signature **Team Leader**:	**Mark Meng**
	Name – Title
Signature by Approver:	**Mark Meng**
	Name-Title