REV.	Description		Date
00	SPEC ISSUE (NEW MODEL) ADP-400GR AAA		05/27'22
01	102A-226091 1. 修改 6.6 Acoustic noise test 測試圖片		06/20'22
02	102A-229063 1. Add 6.21 9V hold-up time 測試項目,ATS 100%測 function team 會做波形抓取並判定。	式,但是不做 CPK 判定,Bench	09/12'22
03	102A-229084 Add Model: ADP-400GR AAB, ADP-400GR AAC		09/19'22
04	102A-22C035 Add Model: ADP-400GR AAD		12/12'22
05	102A-22C106 Add Model: ADP-400GR AA		01/18'23
06	102A-232105 Add Model: ADP-400GR AAE, ADP-400GR AAF		02/15'23
07	102A-235049 Add Model: ADP-400GR AB, ADP-400GR ABA, ADP-	400GR ABB, ADP-400G <mark>R</mark> ABC	05/05'23
08	102A-235308 1. CR-BOX 測試時,測試電壓設定為 6KV,此測試電 試結果最相近,故以此電壓做測試(no function error 判定標準為 (can damage, no quality accident)。		05/31'23
09	102A-238047 Add Model: ADP-400GR AB88		08/04'23
10	102A-244263 Add Model: ADP-400GR AC		04/23°24
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Design (ME)

李昱緯

Drawn

李亭芳

Date

04/23'24

Design (EE)

楊曜廷

TS-400GR A SERIES

DOCUMENT NAME.:

REV.

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#### MODEL LIST

ADP-400GR AA	ADP-400GR AAA	ADP-400GR AAB	ADP-400GR AAC	ADP-400GR AAD
ADP-400GR AAE	ADP-400GR AAF	ADP-400GR AB	ADP-400GR ABA	ADP-400GR ABB
ADP-400GR ABC	ADP-400GR AB88	ADP-400GR AC		

## 測試注意事項內容,未經工程師許可,不可任意變更。

Test Notice contents shall not be changed or revised without engineer permission.

1 此測試規格用於主線測試,所有項目均需被測試,因設備或線速限制無法全數測試時, 需測試 worst case, QC 需按抽樣標準測試所有 Item 不可只測試主線測試項目.

The production line shall perform all or worst test items/conditions, and QC shall follow the sampling plan to perform all items/conditions not just the worst condition as production did.

- 2 測試注意事項:(以下為範例寫法請依據產品特性自行修正)
  - a. 功能測試時,12V 電子負載需設定 Von 點為 0V.
  - b. 所有 ATS 測試時,須偵測 CONNECTOR 端之電壓。
  - c. 在測試時,治具上各組輸出須有加濾波電容 22uF (Ceramic capacitor)
  - d. ATS 測試時須外加風扇,否則將造成 Power supply 過熱。
  - e. Case 未組裝前的各項測試,於測試完成後須對 BULK CAP 放電。
  - f. 12V 的 output peak load & 效率測試電壓量測需以測試板上為主。
  - g. Brown out: 判定標準為 no damage
  - h. Efficiency 12V 冷機規格為 NA 熱機(至少 5min)規格為 NA
- 3 手調測試站:(以下為範例寫法請依據產品特性自行修正)
  - a. Full Load Test: 檢查滿載輸出是否符合規格
  - b. Min. Load Test: 檢查輕載載輸出是否符合規格

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Output	Output Voltage			
-	Rated	Tolerance		
12V	12V	11.52V~12.6V		

#### c. OVP Test:

12V OVP:短路 IC53

#### d. AC On/Off:

Power supply 連續開關機 On=2秒,Off=2秒,5 次後,必須無損壞情形。

#### e. OTP Test:

NTC41 OTP : Short NTC41. NTC151 OTP : Short NTC151.

Input: 85Vac /276Vac, Output: 12V/31A

# 4 Function test (ATS) procedure:

### **Input Specification Table:**

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	85 VAC	132 VAC	100 VAC
HIGH RANGE	180V AC	276 AC	240V AC

# Output Specification Table:

Output	Output	Voltage
	Rated	Tolerance
12V	12V	11.52V~12.6V

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# 4.1 Input characteristics

	Item	Condition		Specification
1	Rated input voltage	-		100 ~ 240 Vac
2	Input voltage range	-		85 ~ 276Vac
3	Input current	12V/31A @ 10	0Vac	Less than 4.5A
4	Rated input frequency	-		50Hz / 60Hz
5	Input frequency	-		47 ~ 63 Hz
		85 ~ 276 Vac Rated load.	Ta= 25°C Cold start	Less than 140A
6	Input inrush current	(Test with 3KV AC Source).	Ta= 40°C Repeat AC ON<=>OFF (5VSB: 120mA load, 12V OFF)	Less than 180A/2msec

# 4.2 Output characteristics

2 Outpu	ıt characteristics	3			
utput Syst	em:				
utput Cha	racteristics:				
elow output	conneitance (amallact		- 4! - <b>6</b> !1		
below outpu	. capacitance (smallest	capacity) should be s	satisfied		
•	uF (Ceramic capacitor)	capacity) should be s	satisfied		
•		capacity) snould be s	satisfied		
12V : 22		. ,,	at Current		Ripple & Nioise (at rated load)
•	uF (Ceramic capacitor)	. ,,		Min.	Ripple & Nioise (at rated load)  Ta= -5~40°C
12V : 22	uF (Ceramic capacitor)  Output Voltage	Outpu	ut Current	Min. OA	

# full load(300ms)~peak load(30ms) >

Output	OCP	OVP
12V	50.25A~62.8A	15.6V,max

#### Other characteristics:

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	14	0 1111		
	Item		on and Specification	
1	No load operating	Input rai	nge: 85~ 276 Vac	
	, and the second	+		d output voltage should be within regulation.
2	Over / Undershoot	Input rai	nge: 85 ~ 276 Vac	
	0.00.7 0.000.000	Output v	oltage should be within +	10%~-10% of rated output voltage.
		OCP		
_	OVP		The 12V has been detected abnormal (12V	
3	Protective function	OTP		OC/OV/OT/UV), 12V output should be shut down immediately.
			on functional operation and power output)	
4	Recovery from protection	Remove		C OFF and within 3 minutes.
5	Transient response	Input range: 85 ~ 276 Vac  [ 12V load change ] Change range : 100%~ 70%~10% Change frequency : 10th Change rate : 1.0A/use		%~40%, 90%~30%, 80%~20%, Output voltage should be requlated within 12V +5% -4%.

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4.3 Common specifications

	Item			Condition	Specification
1	Switching frequency		V	100Vac input.	
			у	Rated load.	
2	Power factor			-	IEC61000-3-2.
3	Life			Rated input voltage. Ambient temperature, constant humidity.	70,000Hr or more with system. => 20,000Hr, 12V/rated load (FAN cooling). => 50,000Hr, 12V/3A (air convection).
				Rated input voltage, load (0A).	<0.17W
				Rated input voltage, load (0.01A).	37.8
				Rated input voltage, load (0.025A).	61.5
				Rated input voltage, load (0.05A).	66.4
		Light	load	Rated input voltage, load (0.1A).	72.4
		w/o F	an	Rated input voltage, load (0.2A).	76.7
4.	Efficiency			Rated input voltage, load (0.3A).	82.0
				Rated input voltage, load (0.4A).	83.0
				Rated input voltage, load (0.6A).	84.0
				Rated input voltage, load (1A).	85.0
		Normal load	Rated input voltage, load (10A).	89.0	
		With Fan		Rated input voltage, load (20A).	88.0
				Rated input voltage, load (31A).	85.5
5	5 Parts temperature			Rated input voltage. System ass'y. Ta=40°C	There is enough de-rating of temperature for all components.
6	t_dur1 t_dur1		t_dur1	Rated input voltage 12V: 20A	50Hz 1.5 cycle(=30ms).  Output voltage shall be satisfy electric characteristic.
7	Leakage current		-	Rated input voltage.	100uArms or less.
8	8 Input discharge time		e	Input 121V or less, from AC power OFF to 37% rated.	1 Sec or less.
				Input 122V or more, from AC power OFF to 45V.	1 sec or less.
9	Overvoltage apply test		test	400Vac input / 2sec.	No safety hazard.
9	Overvoltage apply test		test	Input 122V or more, from AC power OFF to 45V.  400Vac input / 2sec.	

Note 1: After completes required DVT test matrix, identifies and selects the worst case condition for the Production MTR. It is not required that all test conditions be tested. Example: If worst case condition for Output Ripple is minimum input voltage and maximum dc load, then that is the test condition to be used.

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# 4.4 Power ON/OFF (Sequential control & Timing)

Item	Condition	Specification
t_on	AC ON to 12V turn on time	output voltage can be regulated to 12V+5%, -4% within 2S.
t_off	12V output voltage from 100% to 10%.	12V output voltage from 100% to 10%.
Tur t_r	0V to 12V rise time	12V output voltage from 5% to 95% within 2~20msec. Load 0A:不判定
t_9V_keep	When AC off , 9V keep time.	12V/1A , 9V keep time 1s (min)

# 5. Safety

# **Hi-POT test**:

1	HI-POT	Input between primary and secondary. Primary 是 L,N, Second 是 12V & GND PG1 & PG2 需連接在一起. QA (sampling): 3.0kVac 50/60Hz 60sec	IEC60950-1 item 5.2  Sense current: 10mA or less. Arcing current: EVT1: 5mA, EVT2,3/DVT: 8mA, PVT/MP:10mA Without damage to parts.
2	Insulation resistance	500 Vdc input between primary and secondary.	10 Mohm or more.
3	ESD	ESD 僅針對二次側 GND 測試 for 客戶要求	
4	RFI	AC 線需垂直於地面	

# 6. Other

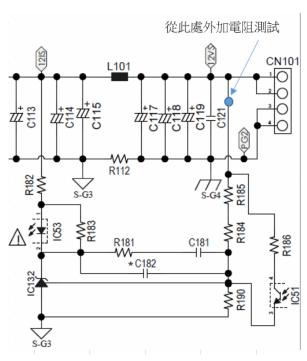
6.1 12V 測試 dynamic load 的時候需按照客戶規格切換做測試,不做 0%到 100% load 切換.

6.2 Common mode noise:客戶暫無規格不須測試.

6.3 Loop gain (12V)

擾動電壓:產品不當機即可.

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FIDENTIAL 6.4 Ripple voltage (低溫) 需 power 穩定後才能讀值.

6.5 ESD:每打一次 ESD,就需對治具放電一次.

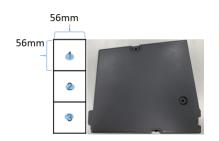
6.6 Acoustic noise test

測試3個點,藍點為麥克風位置.

Input: 100Vac,240Vac

Output: 0~2A, 0.015A, 0.25A

Spec : < 50dB(A)



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**DESCRIPTION:** 

測試注意事項 (Test Specification )

MODEL NO.:

**ADP-400GR A SERIES** 

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6.7 OCP test: 當 OCP 測試時,每測試一次 OCP 後,需空載 Burn in 1min,再測下一個 OCP,避免過熱影響準確性.

#### 6.8 CN101

Pin_1	Output (+)	CN101
Pin_2	Output (+)	10
Pin_3	Output (-)	30
Pin_4	Output (-)	

- 6.9 OCP,測試 OCP 時的 ATS 須修正輸出電流附載的上升斜率 4A/1sec → 12A/sec.
- 6.10 效率測試時在 Io=0.025A 時需要再 0.025A 等 3 分鐘之後再積分 1 分鐘做測試.
- 6.11 在測試 0A Pin 的時候, 須先 12V/0A 等 5 分鐘後在開始測
- 6.12 零件點溫做 OCP burn in 時,需要先滿載 burn in 2 小時之後,再測 95% OCP, 若輸出 latch, 需先再滿載 burn in 3 分鐘之後,再測 90% OCP,以此類推做測試。避免誤測.
- 6.13 Peak load burn in test condition : full load(5S)~peak load(30ms) •
- 6.14 OTP 測試

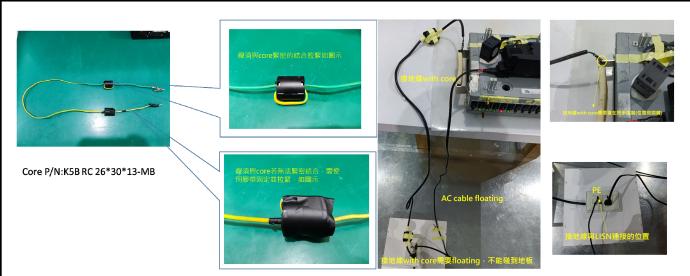
Fan voltage=12V(8.5CFM), Fan voltage=11.5V(8.5\*0.8=6.8CFM),所以測試時 Fan voltage 用 11.5V 做測試..

- 6.15 EMI/RFI 測試時使用與客人一樣的負載做測試 Io=20.3A.
- 6.16 變更產線 ATS ripple noise 測試條件 12V/0A → 12V/1A for 客戶要求
- 6.17 產線 ATS 滿載冷機效率測試條件 100VAC~240Vac;12V/31A > 84.0% for 客戶要求
- 6.18 EMI/RFI 測試時使用與客人一樣的接地線設置,需在接地線兩端纏繞夾 core
- 6.19 變更低溫測試條件 12V/滿載開機改成系統負載開機 20.3A。
- 6.20 增加接地線設置輔助說明。

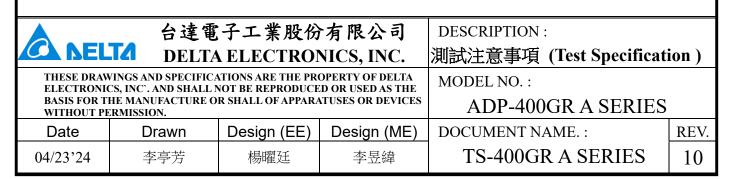
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- 6.21 9V hold-up time 測試項目,ATS 100%測試,但是不做 CPK 判定,Bench function team 會做波形 抓取並判定。
- 6.22 CR-BOX 測試時,測試電壓設定為 6KV,此測試電壓測試結果與 SIE 系統搭配測試結果最相近,故以此電壓做測試(no function error, no latch off, no damage.)。8KV 判定標準為 (can damage, no quality accident)。



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