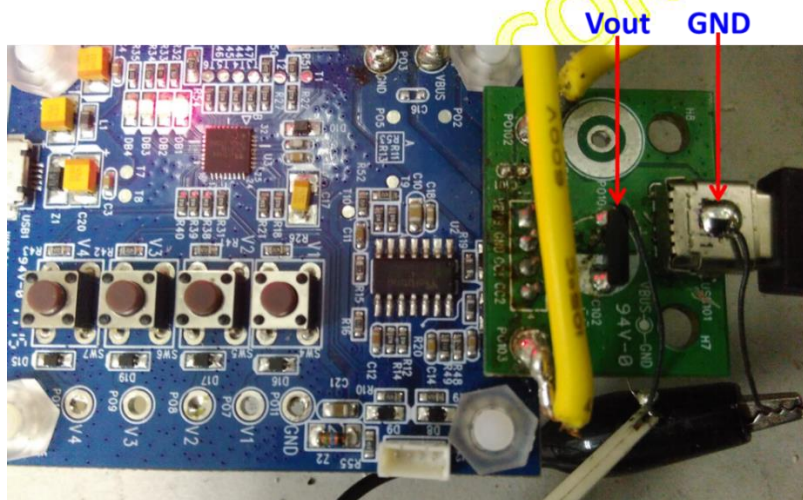


ADP-100EW Series

1. 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.
2. 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** 需按抽樣標準做抽樣測試。
The production line shall perform all or worst test items/conditions, and QC shall follow the sampling plan to perform the sampling test.
3. 測試注意事項：
 - a. 功能測試時,電子負載需設定 Von 點為 3V.
 - b. 所有 ATS 測試時，須偵測 CONNECTOR 端之電壓.
 - c. ATE 測試治具板:Weltrend P/N:WPD002,F/W Rev:2.0
 - d. 在測試 regulation&ripple 時，治具上各組輸出須接有 0.1uF 電容和 10uF 鉭電容.
 - e. ESD 測試時，使用的治具版本為 V1.02 版，同時上電后要把治具小板移除后再測 ESD。測條件為接觸±8kV，空氣±15kV.
 - f. 測試 AVE EFF 和與輸出電壓 Regulation 有關 item 時,治具的電壓採樣點離 cable 末端距離要盡量短，可參考如下圖所示的電壓採樣點來測試.
 - g. CC pin pulse width 測試請參考附件一.



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4. 燒錄 IC :

- a. 預燒錄 IC 之 Location Name= IC131 。
- b. 燒錄注意事項: IC 內建
- c. 所使用之特殊燒錄器形式及特殊 Socket 之規格:TBD
- d. 燒錄程式名稱& Check SUM: TBD

5. 小板(小板名稱)動態測試 : TDC-1511

6. 手調測試站 :

- a. **Full Load Test:**
檢查滿載輸出是否符合規格
- b. **Min. Load Test:**
檢查輕載輸出是否符合規格
- h. **OTP Test :**
Load Condition :5V/3A,9V/3A,15V/3A,20V/5A
敘述測試方法,例如: 短路 NTC131,檢查輸出電壓是否 shutdown and Latch off.
- c. **OVP Test :**
Load Condition : 5V/3A,9V/3A,15V/3A,20V/5A
敘述測試方法,例如: 短路光耦 IC51 的 pin1&pin2, 檢查輸出電壓是否滿足以下要求:
<7.5V(5V/3A)
<11.7V(9V/3A)
<19.5V(15V/3A)
<26V(20V/A)
OVP 動作模式為 Latch off.
- d. **LED 狀態:**
N/A
- e. **AC On/Off:**
Power supply 連續開關機 On= 1 秒, Off= 1 秒, 5 次後, 必須無損壞情形。
For bench AC ON/OFF test:判定規格為 no damage



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7. Function test (ATS) procedure : (20VDC)

Input Specification Table:

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	90 VAC	137 VAC	100~127VAC
HIGH RANGE	180V AC	265V AC	200~240VAC

Output Specification Table:

OUTPUT	MINIMUM	MAXIMUM	NOMINAL(RATED)
Voltage (Vdc)	19	21	20
Loading (Amp)	0A	5A	5A

Test Item	Vin	Load	Spec	Remark
Line Regulation	90/265V 47/63Hz	0A	19.0V~21.0V	
Line Regulation	90/265V 47/63Hz	5A	19.0V~21.0V	
Load/Combine Regulation	90V/265V 47/63Hz	0A,2.5A, 5A	19.0V~21.0V	
Ripple & Noise	90Vac-265Vac 47-63Hz	5A	Vp-p<350mV	Bandwidth:1MHz, A high frequency 0.1uF capacitor and10uF tantalum capacitor,temperature at 25degC
Dynamic Load	100Vac / 240Vac	0.10A~5A 0.20A ~ 1.50A 1.00A ~ 3A 1.00A ~ 5A	18.0V~22.0V (+/-10%)	S/R: 2.5A/us, Load On/off= 4ms/6ms Load On/off=50mS/50mS
Dynamic Load (Peak power)	90Vac-99Vac 241Vac-265Vac	1.5* Rate power	18.0V~22.0V (+/-10%)	S/R: 2.5A/us, On/off=5m/1000ms
Dynamic Load (Peak power)	90Vac-99Vac	120W→100W 130W	18.0V~22.0V (+/-10%)	Repeated mode On/off=2s/ 8s 120W→100W Repeated. Non-Repeated mode On =4s 130W Not be repeated.
Line Voltage Surge	240V to 288V for 2sec.	5A	18.0V~22.0V	客戶無要求
Line Voltage Sag	100V to 75V for 2sec.	5A	18.0V~22.0V	客戶無要求
Short Circuit Protection	90V/47Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Short Circuit Protection	265V/63Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Over Current Protection	90/265Vac	5A	OCP<=7.5A Auto-recovery (Vo>=4.75V)	Meet the peak power requirement and no damage
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>87%	Cold For 產線測試
Full load Efficiency	90V/60Hz	100%	>85%	Cold For 產線測試
Hold up time	115Vac/60Hz	5A	>10ms	



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8. Function test (ATS) procedure : (15VDC)

Input Specification Table:

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	90 VAC	137 VAC	100~127VAC
HIGH RANGE	180V AC	265V AC	200~240VAC

Output Specification Table:

OUTPUT	MINIMUM	MAXIMUM	NOMINAL(RATED)
Voltage (Vdc)	14.25	15.75	15
Loading (Amp)	0A	3A	3A

Test Item	Vin	Load	Spec	Remark
Line Regulation	90/265V 47/63Hz	0A	14.25V~15.75V	
Line Regulation	90/265V 47/63Hz	3A	14.25V~15.75V	
Load/Combine Regulation	90V/265V 47/63Hz	0.A,1.5 A, 3.0A	14.25V~15.75V	
Ripple & Noise	90Vac-265Vac 47-63Hz	3A	Vp-p<350mV	Bandwidth:1MHz, A high frequency 0.1uF capacitor and10uF tantalum capacitor, temperature at 25degC
Dynamic Load	100Vac / 240Vac	0%~90%, 10%~100%	13.5V~16.5V(+/-10%)	S/R: 2.5A/us, On/Off=4ms/6ms, 50ms/50ms(1Hz~5kHz)
Dynamic Load (Peak power)	90Vac-99Vac 241Vac-265Vac	45W-68W	13.5V~16.5V(+/-10%)	S/R: 2.5A/us, On/off=1m/999ms
Line Voltage Surge	240V to 288V for 2sec.	3A	13.5V~16.5V(+/-10%)	客戶無要求
Line Voltage Sag	100V to 75V for 2sec.	3A	13.5V~16.5V(+/-10%)	客戶無要求
Short Circuit Protection	90V/47Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Short Circuit Protection	265V/63Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Over Current Protection	90/265Vac	3A	OCP<=4.5A Auto-recovery (Vo>=4.75V)	Meet the peak power requirement and no damage
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>85%	Cold For 產線測試
Full load Efficiency	90V/60Hz	100%	>84%	Cold For 產線測試



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9. Function test (ATS) procedure : (9VDC)

Input Specification Table:

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	90 VAC	137 VAC	100~127VAC
HIGH RANGE	180V AC	265V AC	200~240VAC

Output Specification Table:

OUTPUT	MINIMUM	MAXIMUM	NOMINAL(RATED)
Voltage (Vdc)	8.55	9.45	9
Loading (Amp)	0A	3A	3A

Test Item	Vin	Load	Spec	Remark
Line Regulation	90/265V 47/63Hz	0A	8.55V~9.45V	
Line Regulation	90/265V 47/63Hz	3A	8.55V~9.45V	
Load/Combine Regulation	90V/265V 47/63Hz	0.A,1.5 A, 3.0A	8.55V~9.45V	
Ripple & Noise	90Vac-265Vac 47-63Hz	3A	Vp-p<350mV	Bandwidth:1MHz, A high frequency 0.1uF capacitor and10uF tantalum capacitor, temperature at 25degC
Dynamic Load (IEC requirement)	100Vac / 240Vac	10%~50%, 50%~100%	8.1V~9.9V	S/R: 2.5A/us, On/Off=4ms/6ms, 50ms/50ms(1Hz~5kHz)
Line Voltage Surge	240V to 288V for 2sec.	3A	8.1V~9.9V	客戶無要求
Line Voltage Sag	100V to 75V for 2sec.	3A	8.1V~9.9V	客戶無要求
Short Circuit Protection	90V/47Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Short Circuit Protection	265V/63Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Over Current Protection	90/265Vac	3A	OCP<=4.5A Auto-recovery (Vo>=4.75V)	Meet the peak power requirement and no damage
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>83.5%	Cold For 產線測試
Full load Efficiency	90V/60Hz	100%	>82.5%	Cold For 產線測試



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10. Function test (ATS) procedure : (5VDC)

Input Specification Table:

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	90 VAC	137 VAC	100~127VAC
HIGH RANGE	180V AC	265V AC	200~240VAC

Output Specification Table:

OUTPUT	MINIMUM	MAXIMUM	NOMINAL(RATED)
Voltage (Vdc)	4.75	5.25	5
Loading (Amp)	0A	3A	3A

Test Item	Vin	Load	Spec	Remark
Inrush Current	265V/50Hz;	3A	No component damage	Cold start
Line Regulation	90/265V 47/63Hz	0A	4.75V~5.25V	
Line Regulation	90/265V 47/63Hz	3A	4.75V~5.25V	
Load/Combine Regulation	90V/265V 47/63Hz	0A, 1.5 A, 3.0A	4.75V~5.25V	
Ripple & Noise	90Vac-265Vac 47-63Hz	3A	Vp-p<350mV	Bandwidth:1MHz, A high frequency 0.1uF capacitor and 10uF tantalum capacitor, temperature at 25degC
Dynamic Load (IEC requirement)	100Vac / 240Vac	10%~50% 50%~100%	4.1V~5.5V	S/R: 2.5A/us, On/Off=4ms/6ms, 50ms/50ms(1Hz~5kHz)
Dynamic Load (Peak power)	90Vac-99Vac 241Vac-265Vac	15W-22.5W	4.1V~5.5V	S/R: 2.5A/us, On/off=1m/999ms
Line Voltage Surge	240V to 288V for 2sec.	3A	4.1V~5.5V	客戶無要求
Line Voltage Sag	100V to 75V for 2sec.	3A	4.1V~5.5V	客戶無要求
Short Circuit Protection	90V/47Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Short Circuit Protection	265V/63Hz	Min. and Max.Load Turn on then short	Auto-recovery (Vo>=4.75V)	
Over Current Protection	90/265Vac	3A	OCP<=4.5A Auto-recovery (Vo>=4.75V)	Meet the peak power requirement and no damage
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>78.5%	Cold For 產線測試
Full load Efficiency	90V/60Hz	100%	>77.5%	Cold For 產線測試



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Test Item	Vin	Load	Spec	Remark
Pin at No Load	115V/60Hz 230V/50Hz	No Load	<0.15W	輸出端不可接到負載
Pin at standby Load	115V/60Hz 230V/50Hz	0.25W 0.5W	<0.5W <1.0W	measured after 15 minutes of warm-up, test at 5V and 115Vac/230Vac
Capacitive Load	90V/47Hz	3A	4.1V~5.5V	Parallel 100uF Cap at output
Capacitive Load	265V/63Hz	3A	4.1V~5.5V	Parallel 100uF Cap at output
Start up delay time	90V/47Hz 265V/63Hz	3A	<5s	
Output rise time	90V/50Hz	0-500mA	<10mS	

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.

11. Safety

11.1 Hi-POT test :

PRIMARY to SECONDARY use DC 4242 V test , (上昇時間: DC=1Se) . Test time=1sec.

Arcing sense = Level5 (EVT1:10mA · EVT2/DVT:10mA · PVT/MP:10mA).

Hi-Limit current=50μA. Lo-Limit current = 0.01uA.

11.2 Insulation Resistance (IR)test :

PRIMARY to SECONDARY use 500Vdc test ; Insulation resistance limit:>100M ohm °

12. Burn-in 測試作業規範

P/R 階段 B/I 32 小時,B/I 電壓和時間分別如下:

5V 8 小時

9V 8 小時

15V 8 小時

20V 8 小時

MP 階段根據品質穩定狀況調整 B/I 時間

13. I2C 測試作業規範: NA

14. FRU DataBarcode Read/Write 測試作業規範: NA



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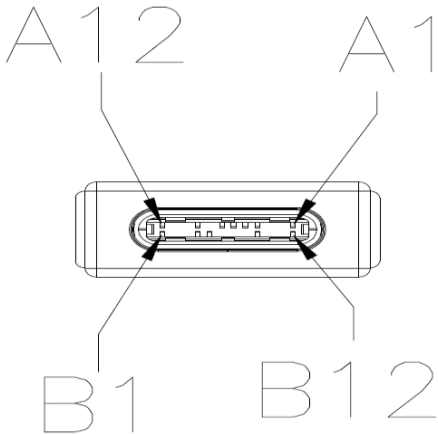
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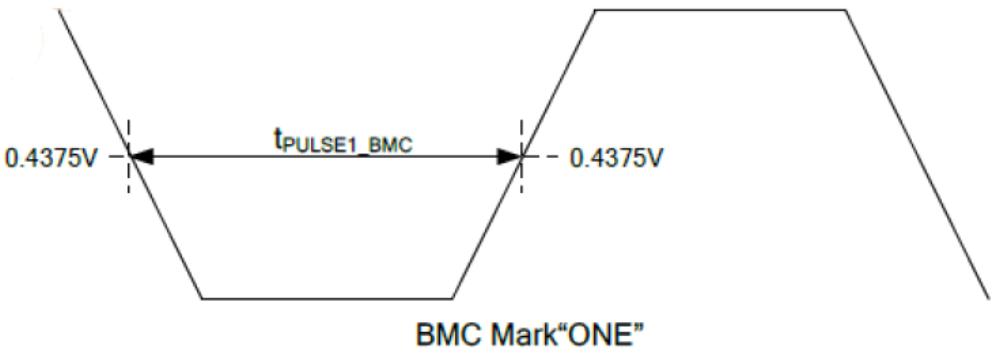
15. DC Cable Connector pin define and related test request.

- A. Power cord 之 24pin connector,每 PIN 皆需做短路导通测试。
- B. 各 PIN 功能如下，其他皆为空 PIN:

VDD			
USB PD CONTROLLER			
GPIO	CC	USB PIN	
		A4,A9,B4,B9	VBUS
		A1,A12,B1,B12	GND
		A5	CC
		A6,A7,B6,B7	D+/D-
GND			



附件一
此 t_{PULSE1_BMC} 於電壓 0.4375V level 時需符合 1.0 μ S~2.0 μ S 範圍內。
(1)pulse width of transmitted BMC "ONE" signal



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16. Noise 測試方法:

- A. 測試 5V noise 時用 220Vac 5V/3A 熱機 20min
- B. Load 調節以每次 0.1A 為最小單位進行調節 (Lenovo 測試規範)。
- C. The adapter shall not make any acoustical noise. The noise level is less than 25 dB at 100 mm distance. And less than 10dB at 8k/10k/12.5kHz band at 300 mm distance. Measure with well warm up, and with setting adapter both position of "its label down and up".
- D. Need test and consider Lenovo PA noise standard.
- E. **ORT 測試要求**
測試前@220V~5A 熱機 20 分鐘 · Load 調節以每次 0.1A 為最小單位進行調節。
@110V&220V~20V/0~5A, 10CM 高度噪音小於 25dB · 8K/10K/12.5K · 30cm 高度小於 10dB。
@110V&220V~5V, 9V, 15V~0~3A, 10CM 高度噪音小於 28dB · 8K/10K/12.5K · 30cm 高度小於 13dB。

17. 客戶規格 CASE 溫升測試:

測試條件: all case's temperature $\leq 50^{\circ}\text{C}$ when 90Vac or 265Vac input

all case's temperature $\leq 45^{\circ}\text{C}$ when 115Vac or 230Vac input

all case's temperature $\leq 40^{\circ}\text{C}$ when 220V

Ambient temperature: 40°C

測試方法: Wall mount 機種溫度測試須以以下 (立式) 擺放方式測試

ORT 測試要求:

all case's temperature $\leq 50^{\circ}\text{C}$ when 100Vac or 265Vac input

all case's temperature $\leq 45^{\circ}\text{C}$ when 115Vac or 230Vac input

all case's temperature $\leq 40^{\circ}\text{C}$ when 220V

Ambient temperature: 40°C



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18. 包裝測試

參考包裝運輸測試規範 10000-0089

19. ESD 測試標準

AIR 15kV/CONTACT 8kV, Criteria B

20. 5V/9V/15V EMC 測試標準

5V/9V/15V EMC 項目 (EMI/ISN/RFI 等) · 按 2dB Margin 判定。

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