


REV.	Description	Date
00	SPEC ISSUE NEW MODEL:ADP-330HB BA	05/11'23
01	102A-239282 Change TS. 7. Function Test : ID 轉態前電壓	10/04'23
02	102A-23C195 Change TS 7.Function test (ATS) procedure. Pin at standby Load 的 Remark add “需先通電 5min 後再積分測試”	12/21'23
03	102A-241022 ITEM 7. Test Item ,Capacitor Load ,System cap 從 1000uF 改為 2200uF	01/05'24
04	102A-241023 ADD MODEL: ADP-330HB BA88	01/09'24
05	102A-241074 ITEM 3. 測試注意事項 Change i. “(1000uF 日系電容)” to “(2200uF 日系電容)” Delete “1. Acoustic noise HP 規格需使用隔離變壓器測試” ITEM 7. Test Item, Dynamic and Peak Load, System cap 從 1000uF 改為 2200uF	01/11'24
06	102A-244256 1. 7.Function test (ATS) procedure add new peak load specification	04/25'24

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## MODEL LIST:ADP-330HB BA, ADP-330HB BA88

### 1 測試注意事項內容，未經工程師許可，不可任意變更。

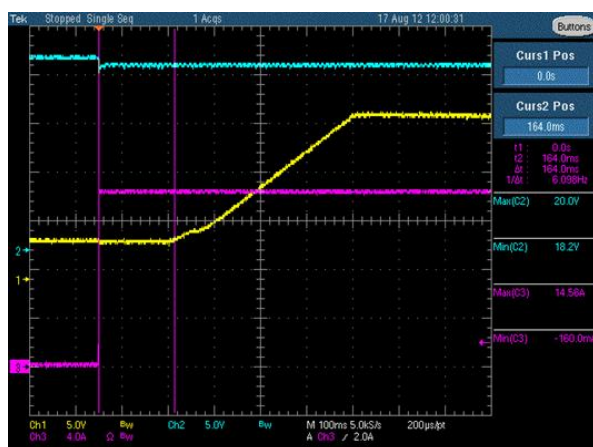
Test Notice contents shall not be changed or revised without engineer permission.

### 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：

- 所有 ATS 測試時，須偵測 CONNECTOR 端之電壓。
- Thermal 測試環境：用電木測試
- Acoustic noise 測試時須使用 AC source 6530
- ID PIN 轉態時間是指從負載電流變化到 ID PIN 開始轉態時須在 50ms~300ms 之間。  
負載電流由 0A 變到 20.3A  
測試波形如下(範例):



- 量測 ID PIN 電壓時,不可使用電子負載,須使用三用電表或是示波器.



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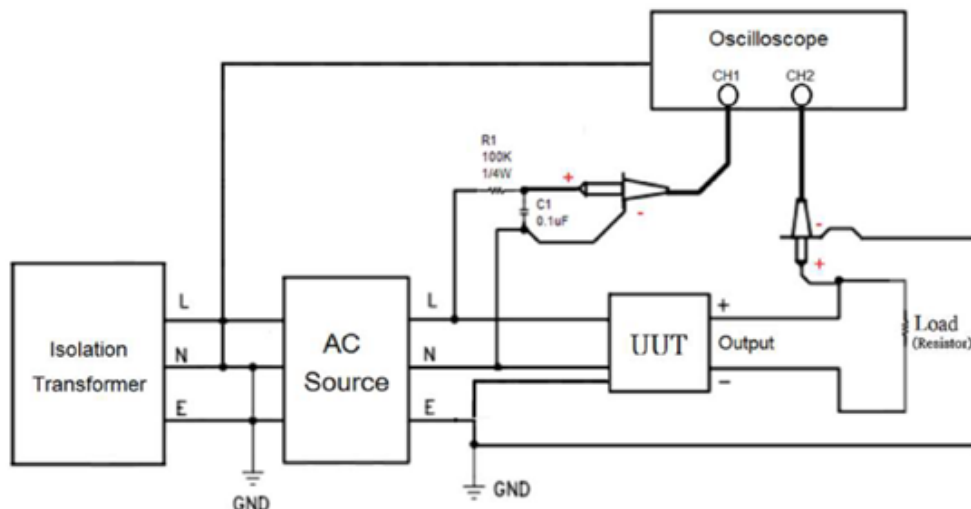
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- f. Common Mode Noise 只需滿足 HP 規格.

The common mode noise when measure in accordance with IEC 62684 shall not exceed below requirement

The peak to peak voltage measured in the frequency range of 10KHz to 400KHz shall not exceed 150mV.



- g. Power Saving 測試須使用積分的方式測試

- h. Hi-Pot 測試時 AC cable 須使用兩芯線

- i. 所有測試外掛系統電容(2200uF 日系電容)需直接加在治具端上,不可使用電容盒聯接

- j. AC on/off 測試必須設 Von 點為 15V

- k. EMI/RFI margin 6dB

- m. 測試效率/平均效率時, response 需使用 slow

- n. 測試表面溫升時, 使用#30 點溫線

#### 4 燒錄 IC :

無

#### 5 小板(小板名稱)動態測試 :

無

#### 6 手調測試站 :



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**a. ID function 調整測試如下:**

ID 測試條件定義為產品在輸出電流 16.5A~20.3A 之間, ID 電壓由 (4.92V~5.5V) 升高到 (16V~18V), 此產品為正常轉態.(測試治具 ID PIN 對地電阻為 19.1Kohm)

針對 ID 電壓在轉態時, 輸出電流不落在 16.2A~20.3A 時之異常處置:

1. 針對輸出電流小於 16.5A, ID 電壓應為 4.92V~5.5V
2. 針對輸出電流大於 20.3A, ID 電壓應為 16V~18V

**b. Full Load Test:** 檢查滿載輸出是否符合規格

**c. Min. Load Test:** 檢查輕載輸出是否符合規格

**d. OTP Test :**

Load Condition : 16.92A

敘述測試方法: NTC31 並聯 2Kohm, 檢查輸出電壓是否 shutdown and Latch off.


**e. OVP Test :**

Load Condition : 0A or 16.92A

敘述測試方法, 例如: 持續短路 R134 大於 5sec, 檢查輸出電壓是否小於 29V, OVP 動作模式為 Latch off.

**f. AC On/Off:**

Power supply 連續開關機 On= 3 秒, Off= 3 秒, 5 次後, 必須無損壞情形。

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## 7 Function test (ATS) procedure :

**Input Specification Table:**

INPUT VOLTAGE	MINIMUM	MAXIMUM	NOMINAL(RATED)
LOW RANGE	90 VAC	132 VAC	120 VAC
HIGH RANGE	180 VAC	264 VAC	240V AC

**Output Specification Table:**

OUTPUT	MINIMUM	MAXIMUM	NOMINAL(RATED)
Voltage (Vdc)	18.525	20.475	19.5
Loading (Amp)	0	16.92	8.25
ID (V) 轉態前	4.92	5.5	
ID (V) 轉態後	16	18	

Test Item	Vin	Load	Spec	Remark
Inrush Current	264V/63Hz; Phase 90°	16.92A	<220A	
Turn On Time	90V/47Hz	16.92A	<5Sec	CPK 以 Bench 為準
Hold up Time	115V/60Hz	13.6A	>10mS	
Rise Time	90V/47Hz 264V/63Hz	0A, 0.5A	<40mSec	
Overshoot	90V/47Hz 264V/63Hz	0A, 16.92A	<21.5V and 10msec	
Line Regulation	90/115/230/264V 47/63Hz	0A, 16.92A	18.525V ~ 20.475V	
Load/Combine Regulation	120V/60Hz	0A, 16.92A	18.525V ~ 20.475V	
ID Regulation	90V/47Hz 264V/63Hz	0A	5.78V~6.4V	不計 CPK
ID Regulation	90V/47Hz 264V/63Hz	20.3A	16~18V	不計 CPK
Capacitor Load	90V/47Hz 264V/63Hz	16.92A	Shall not cause the adapter to shut down	System cap=2200uF
Ripple & Noise	90V/47Hz 264V/63Hz	0A, 16.92A	<380mVp-p	1uF//10uF BW : 20MHz



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Sync Dynamic	90V/47Hz 115V/60Hz 230V/50Hz 264V/63Hz	0%~50% load, 50%~100%load, 0%~100% Load	18.525V ~ 20.475V	S/R: 1A/uS, 1Hz,100Hz,1KHz,5KHz 不計算 CPK System cap=2200uF
Peak Load	90Vac/47Hz	a) 16.9A~23A b) 16.9A~32A c) 16.9A~23A d) 0A~23A e) 8A~23A	>18V	a) L(900ms),H(100ms) b) L(990ms),H(10ms) c) L(500ms),H(490ms) d) L(700ms),H(300ms) e) L(700ms),H(300ms) S/R: 1A/uS,不計算 CPK System cap=2200uF
Short Circuit Protection	90V/47Hz 264V/63Hz	Min. Load Turn on then short		latch
Over Current Protection	90/115/230/264Vac	16.92A-Trip	<25A	latch
Input Current	90V/47Hz	16.92A	<4.2A	
Harmonic Current Power Factor	230V/50Hz	Pin = 75W 100% Load	EN-61000-3-2	
Power factor	100V/50Hz 240V/50Hz	100% Load	PF >0.9	
Power Consumption	90V/47Hz	16.92A	<370W	
Full Load Efficiency	90V/47Hz	16.92A	>89%	Cold
10% Load Efficiency	115V/60Hz 230V/50Hz	10% Load	81% 84%	Cold Hot
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>88%	Cold
Average Efficiency	115V/60Hz 230V/50Hz	25%, 50%, 75% & 100% Load	>89%	Hot
Pin at No Load	115V/60Hz 230V/50Hz	No Load	<0.15W	輸出端不可接到負載 請以積分測試, 該項 CPK 以 Bench 為準
Pin at standby Load	115V/60Hz 230V/50Hz	0.18W 0.3W 0.66W 1.241W 1.848W 3.9W 7.9W 16W 20.25W	<0.3W >60% <0.5W >60% <1.0W >66% <1.7W >73% <2.4W >77% <5W >78% <10W >79% <20W >80% <25W >81%	請以積分測試, 該項 CPK 以 Bench 為準  需先通電 5min 後再積分 測試

Note 1: After completes required DVT test matrix, identifies and selects the worst case condition for the

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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.

## 8. Safety

### 8.1 Hi-POT test :

- 8.1.1 PRIMARY to SECONDARY use 3000+10% Vac. (上昇時間: DC=1Sec, AC=0.1Sec) 。  
Test time=1sec 。 Arcing current=Level 8(EVT1: 5mA, EVT2, DVT: 8mA, PVT/MP: 10mA)  
Hi-Limit current=10mA 。 Lo-Limit current=0.01mA 。

### 8.2 Insulation Resistance (IR) test :

- 8.2.1 PRIMARY to SECONDARY use 500Vdc test ; Insulation resistance limit: >30M ohm 。

### 8.3 FG connection test

- 8.3.1 FG 與 Vo GND 之間直流阻抗必須在 0.9~1.1 Mohm 之間

### 8.4 Leakage current

- 8.4.1 Class I Equipment (Grounded Equipment)  
The total combined leakage current when measure in accordance with IEC 60950-1, 2<sup>nd</sup> Edition shall not exceed 40 microamperes when tested at 250 VAC, 50 Hz in a normal operating condition.

## 9. Burn-in 測試作業規範


Follow Delta Standard Burn-in Condition

## 10. I2C 測試作業規範

N.A.

## 11. FRU Data Barcode Read/Write 測試作業規範

N.A.

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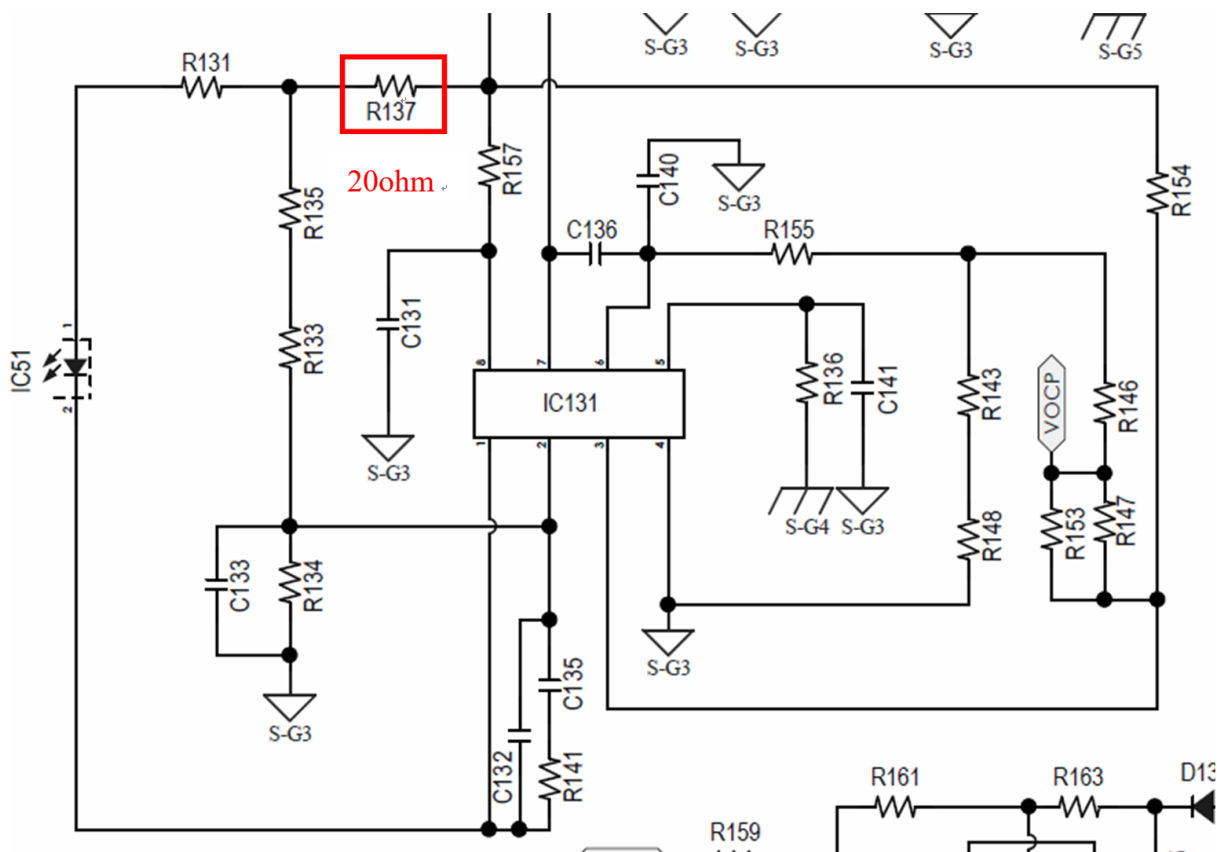


## 12. Loop/Gain 測試作業規範

Disturbance voltage setting 1.77V

將 R137 更換為 20ohm,由該 20ohm 電阻進行 loop gain 之量測

線路如下所示:



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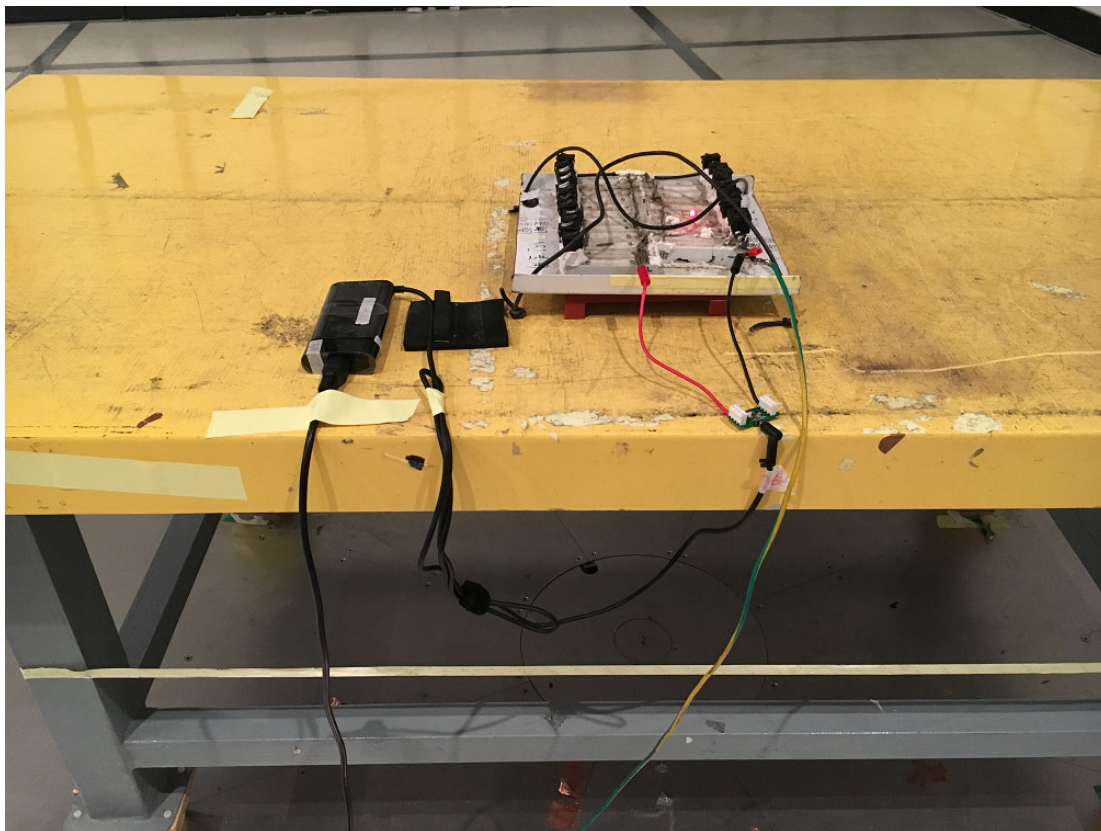
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### 13. EMI/RFI Setup

1. AC power cord 使用 1.8M 線
2. 樣品 DC cable 放在樣品與 dummy load 之間 (不能跨到 AC power cord 及接地線)
3. Dummy load 放桌內, 治具與桌面切齊



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#### 14. Mechanical 包裝測試條件: 請參照台達規範: 10000-0089

##### (1) Drop Test

###### a. 條件

Carton weight

~25kg, 高度 60cm

26~50, 高度 45cm

51~75, 高度 35cm

76~100, 高度 30cm

###### b. 紙箱測試順序

以紙箱之1個稜角/3個稜線/6個面，每次落下試驗可取任一稜角(傾斜角不得超過10度)

###### c. 試驗步驟如下

Step1. 垂直落下此角 (Corner 2-3-5)

Step2. 由此角引申之最小稜線 (Edge 3-5)

Step3. 由此角引申之次長稜線 (Edge 2-5)

Step4. 由此角引申之最長稜線 (Edge 2-3)

Step5. 最小的面 (Front 5)

Step6. 相對的最小面 (Rear 6)

Step7. 次小的面 (Right 2)

Step8. 相對的次小面 (Left 4)



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Step9. 最大的面 (Bottom 3)

Step10. 相對的最大面 (Top 1)

## (2) Vibration Test

### a. 條件

頻率 5 Hz, 振幅 20 mm, 時間 5 Min.

頻率 10 Hz, 振幅 5 mm, 時間 5 Min.

頻率 15 Hz, 振幅 2.2 mm, 時間 5 Min.

頻率 20 Hz, 振幅 1.25 mm, 時間 5 Min.

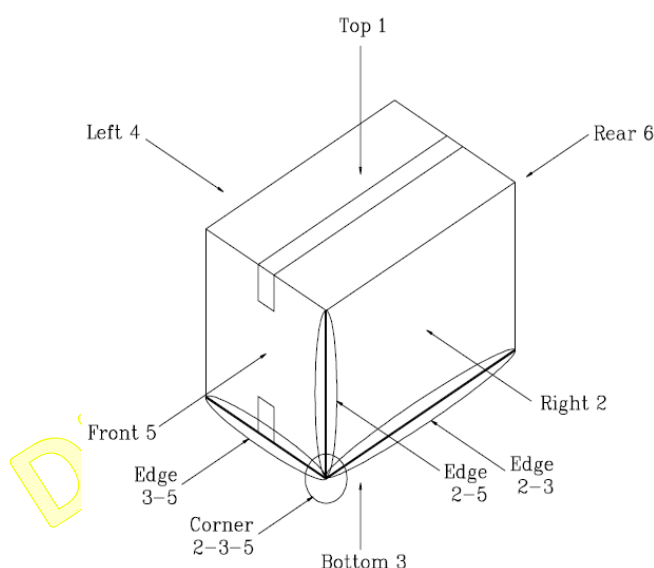
### \* 包裝測試後判定標準:

(1) Drop Test --- 產品 --- 外觀無損壞, 輸出正常, Hi-Pot 測試無不良.

--- 包材 --- 外箱可變形, 隔板潰縮移位不可大於同方向紙箱內尺寸之 4%,  
產品自身之單體包裝 (PE Bag, 彩盒, 吸塑盒.....) 不得有變形及破損.

(2) Vibration Test --- 產品 --- 外觀無損壞, 輸出正常, Hi-Pot 測試無不良, 包裝材料無損壞.

\* 如果參考機種已完成包裝測試, 則不需重新測試.



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# HP包裝測試條件:

Package Drop test

## Test conditions:

Following ISTA drop standard "1A" criteria.

Sample size: 2 boxes per test

### a. 條件

Depends on weight (see below Tab,)

Packaged-Product Weight				Drop Height Free Fall			
<=		<		1A		2A	
lbs	kg	lbs	kg	In.	mm	In.	mm
0	0	21	10	30	760	38	970
21	10	41	19	24	610	32	810
41	19	61	28	18	460	26	660
61	28	100	45	12	310	20	510
100	45	150	68	8	200	12	310

### b. 紙箱測試順序

以紙箱之 1 個稜角/3 個稜線/6 個面，每次落下試驗可取任一稜角(傾斜角不得超過 10 度)

### c. 試驗步驟如下

Step1. 垂直落下此角 (Corner 2-3-5)

Step2. 由此角引申之最小稜線 (Edge 3-5)

Step3. 由此角引申之次長稜線 (Edge 2-5)

Step4. 由此角引申之最長稜線 (Edge 2-3)

Step5. 最小的面 (Front 5)

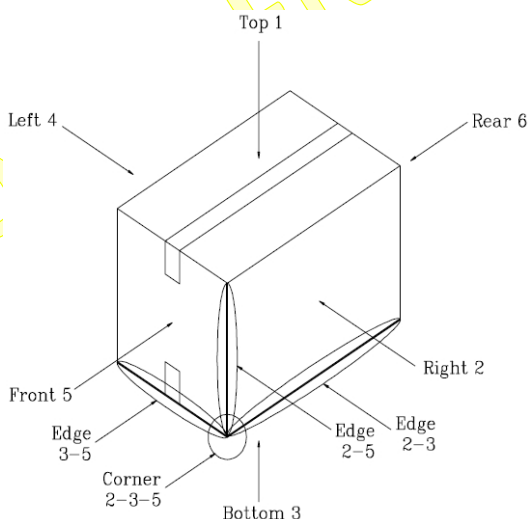
Step6. 相對的最小面 (Rear 6)

Step7. 次小的面 (Right 2)

Step8. 相對的次小面 (Left 4)

Step9. 最大的面 (Bottom 3)

Step10. 相對的最大面 (Top 1)



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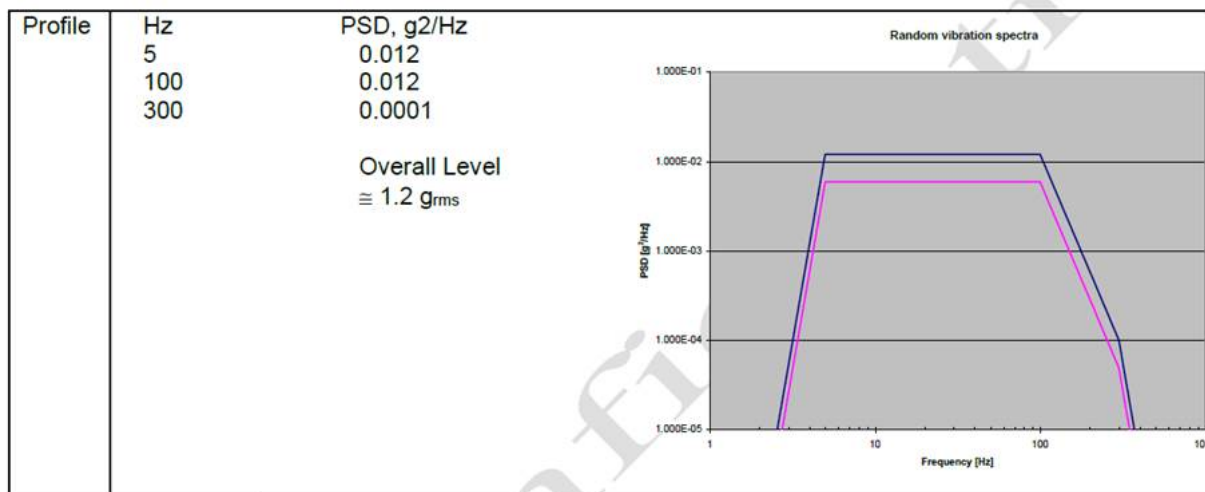
## Package Vibration test

### Test conditions:

Sample size: 2 boxes per test

- Deviation from the overall Grms level should not exceed + 5%. Test all three axis, 30 minutes.

Figure 3.1 random vibration scan



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