

# Specification for Brushless DC Vibration Motor

Model: NFP-BLDCY825A



Prepared by	Checked by	Approved by
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**Customer Name:** \_\_\_\_\_

**Customer Model:** \_\_\_\_\_

**Customer Comment:** \_\_\_\_\_

**Customer Approval / Date:** \_\_\_\_\_

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# 規格書 SPECIFICATIONS

## 1. 前言/ Preface

### ◆ CTF (Critical to Factor / Function)

#### ■ 電機特性 (or光學特性) / Electrical Characteristics (or Optical Characteristics)

項目/ Item	Spec	CPK	备注/ Remark
额定转数 Spin Speed	16,000±2,500RPM	1.39	全数检查实施 Total inspection
额定损耗电流 Operating Consumption Current	≤80mA	1.62	全数检查实施 Total inspection
启动电压 Starting Voltage	≤DC 2.5V	2.35	全数检查实施 Total inspection

#### ■ 形合部尺寸/ Shape Measurements

項目/ Item	Spec	CPK	备注/ Remark
完成品高度 Product Height	2.5±0.1mm	1.95	
完成品直径 Product Diameter	Ø8±0.05mm	2.17	

#### ■ 外观/ Appearance

- CASE 無變形及生銹現象 / Case: No dent and rust
- F-PCB 無變形及位置扭曲現象 / F-PCB: No dent and twist
- 

### ◆ 開發階段重要 ISSUE 事項 / Major Issues in Development Stage

- 开发阶段issue事项 / Major issues in development stage
- 
- 
- 初度量產時, 必須確認的邀請事項
- Request list of essential confirmation for the first mass production

## 2. 产品说明/ Product Specification

### 2-1 适用范围 / Application Scope

本式樣書適用於Ø8\*2.5mm無刷振動馬達。

This specification is applied to the Ø8\*2.5mm BLDC vibration motors.

### 2-2 测试环境条件 / Environment and Conditions for Measuring

No.	项目/ Item	规格/ Standard
2-2-1	溫度 / Temperature	25±3℃
2-2-2	濕度 / Humidity	65±20%RH
2-2-3	氣壓 / Atmospheric Pressure	1,013±40 hpa

### 2-3 使用環境 / Environment for Operation

No.	项目/ Item	规格/ Standard
2-3-1	使用電壓範圍 Range of Working Voltage	2.7 ~ 3.3V
2-3-2	保管溫度範圍 Temperature Range of Storage	-30℃ ~ +85℃, no moisture condensation.
2-3-3	使用溫度範圍 Temperature Range of Operation	-20℃ ~ +60℃, no moisture condensation.

### 2-4 实验误差范围 / Ranges of Deviation in Tests


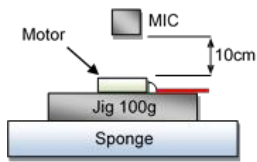
No.	项目/ Item	规格/ Standard
2-4-1	常溫常濕 Room Temperature and Humidity	20±15℃, 65±20%RH
2-4-2	恒溫組溫度 Temperature in Thermostat	Designated Level ±3℃
2-4-3	電壓 Voltage	Designated Level ±0.15V

### 3. 产品特性/ Product Features

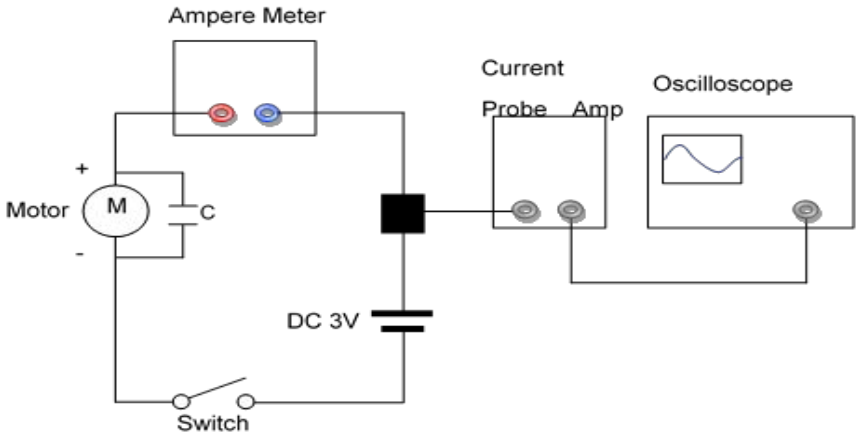

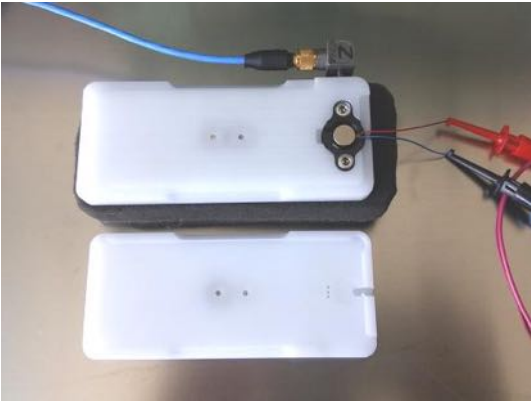
#### 3-1. 电机特性 / Electrical Features

No.	项目/ Item	条件/ Condition	规格/ Standard
3-1-1	額定電壓 Operation Voltage		3.0V DC
3-1-2	轉數方向 Direction of rotation	Lead Wire Red(+), Blue(-)連接基準 Based on connecting lead wire Red(+), Black(-)	CW
3-1-3	額定轉數 Operating RPM	遵從4項標準測定條件 Based on No, 4 standard measurement condition	16,000±2,500rpm
3-1-4	額定損耗電流 Operating Current	遵從4項標準測定條件 Based on No, 4 standard measurement condition	≤80mA
3-1-5	啟動電流 Starting Current	在額定電壓下把旋轉子固定, 此時消耗的電流測定 Measuring the consumption current when the rotor starts at operating voltage	≤175mA
3-1-6	启动电压 Starting Voltage	使馬達能夠啟動的最小電壓(ON, OFF 試驗) (ON, OFF 实验) The minimum current that can start the motor(ON, OFF test)	≤2.5V DC
3-1-7	绝缘电阻 Insulation Resistance	Case和 Lead wire 端子间 DC 100V施加 100V DC input, between case and F-PCB	≥10MΩ

#### 3-2. 机械特性 / Mechanical Features

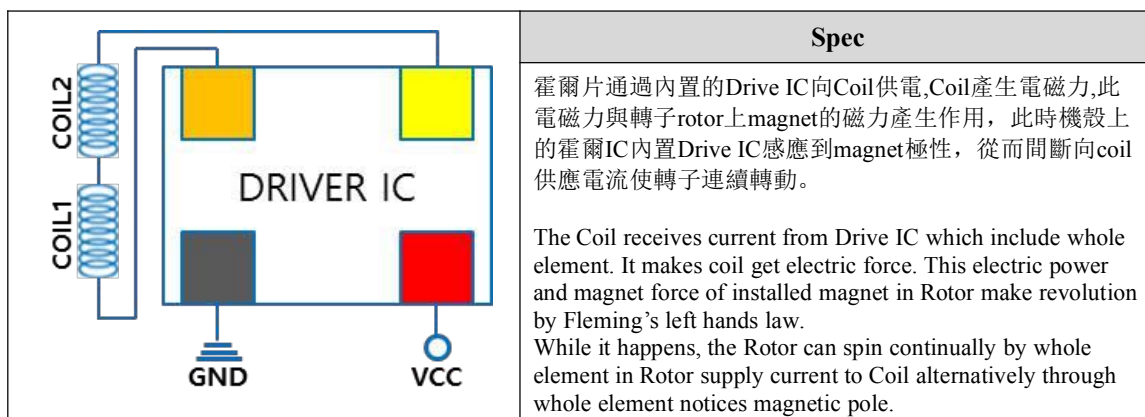
No.	项目/ Item	条件/ Condition	规格/ Standard
3-2-1	振動量 Vibration Force	 <ul style="list-style-type: none"> <li>- 电压voltage: DC3.0V</li> <li>- Jig weight: 100g</li> <li>- JIG放置在 Sponge 上測定</li> <li>- 马达用两面tape固定在jig中</li> </ul>	≥1.0G(rms)
3-2-2	机械噪音 Mechanical Noise	 <ul style="list-style-type: none"> <li>- Background noise below 28dB</li> <li>- Standard voltage : DC 3.0V</li> <li>- To install jig on the sponge</li> <li>- Measuring after attaching the motor with double-sided tape</li> </ul>	≤50dB
3-2-3	重量 Weight	Measuring with the electronic scale	0.75g±10%
3-2-4	耐压力 Weight Loading	電機正面承壓, 不破壞電機性能和結構 No malfunction to the motor with the pressure on the top side.	≤3.0kgf

#### 4. 测定方法/ Measuring Method

No.	项目	Spec
4-1	温度 Temperature	25±3℃
4-2	湿度 Humidity	65±20%RH
4-3	额定电压 Operating Voltage	3.0V DC
4-4	测定方法 Measuring Method	<div style="text-align: center;">  <p>检查回路图 / Testing Circuit Diagram</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>- Install jig on the sponge pad - Fix the motor inner side of jig</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>标准测定状态 The Condition of Standard Measurement</p> </div> </div> <div style="text-align: center;">  <p>- Jig weight: 100g - Material: POM</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>马达安插状态 The Condition of Motor Settlement</p> </div> </div> </div>

## 5. 回路图及料單/ Circuit Diagram and Part List

### 5-1 回路图 / Circuit Diagram

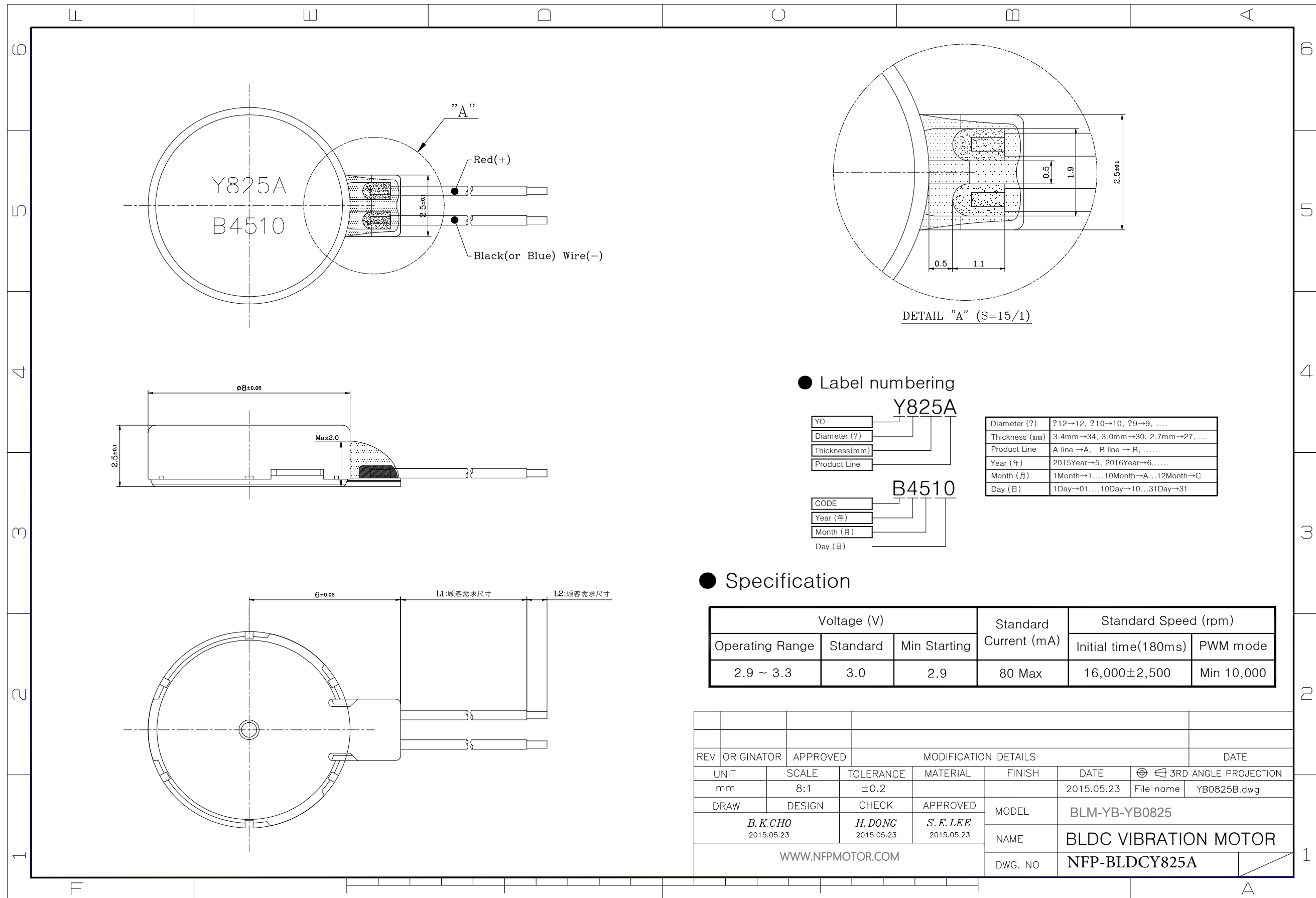


### 5-2 Part List

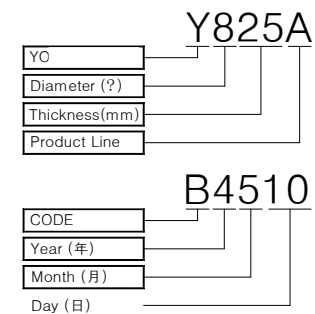
No.	部品名/ Parts	原材料/ Materials
1	BRACKET	SUS304
2	WEIGHT	W
3	Driver IC	Si
4	DOUBLE-SIDE TAPE	#4972 (0.05t)
5	METAL BEARING	Cu-Fe-other
6	SHAFT	DSR7B
7	WASHER	PEEK
8	COIL Ass'y	COIL
9	Capacitor	Si (0603)
10	MAGNET	Nd-Fe-B
		Nd-Fe-B
11	BACK YOKE	SPCC
12	CASE	SUS304
13	F-PCB	EPOXY,FR-4(0.1t)



6. 图面 / Drawing



● Label numbering



Diameter (?)	?12→12, ?10→10, ?9→9, ...
Thickness (mm)	3.4mm→34, 3.0mm→30, 2.7mm→27, ...
Product Line	A line →A, B line → B, ...
Year (年)	2015Year→5, 2016Year→6, ...
Month (月)	1Month→1...10Month→A...12Month→C
Day (日)	1Day→01...10Day→10...31Day→31

● Specification

Operating Range	Voltage (V)		Standard Current (mA)	Standard Speed (rpm)	
	Standard	Min Starting		Initial time(180ms)	PWM mode
2.9 ~ 3.3	3.0	2.9	80 Max	16,000±2,500	Min 10,000

REV	ORIGINATOR	APPROVED	MODIFICATION DETAILS				DATE
UNIT	SCALE	TOLERANCE	MATERIAL	FINISH	DATE	3RD ANGLE PROJECTION	
mm	8:1	±0.2			2015.05.23	File name	YB0825B.dwg
DRAW	DESIGN	CHECK	APPROVED	MODEL	BLM-YB-YB0825		
B.K.CHO 2015.05.23			H.DONG 2015.05.23	S.E.LEE 2015.05.23	NAME	BLDC VIBRATION MOTOR	
WWW.NFPMOTOR.COM				DWG. NO	NFP-BLDCY825A		

## 7. 包装式様 / Packaging Specification

### 7-1. 適用範圍 / The arrange of application

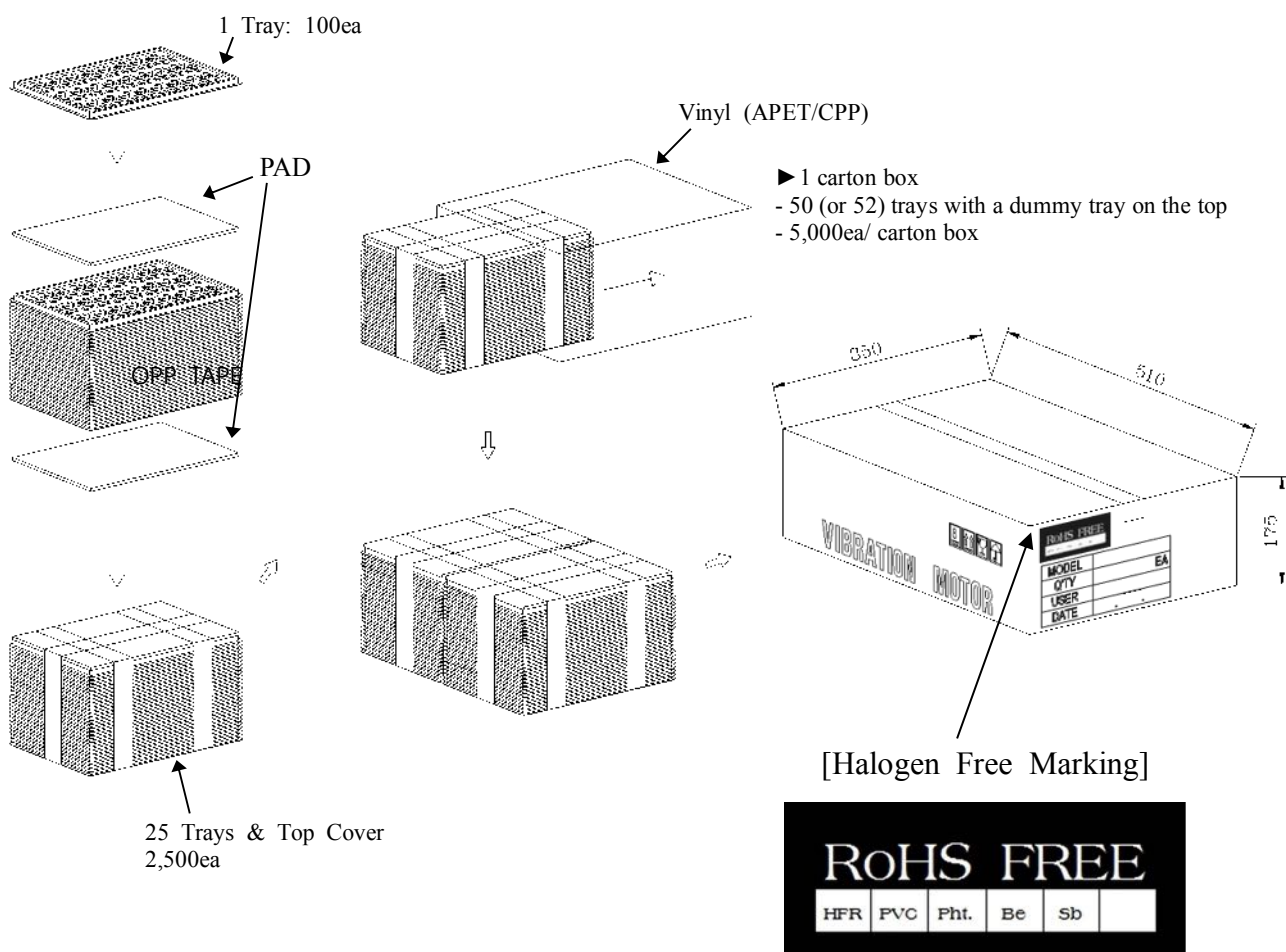
本包装式樣書適用於Ø8\*2.5mm BLDC型振動馬達

This packing specification is applied to Ø8\*2.5mm BLDC vibration motor.

### 7-2. 内外包装规格 / The Packing Standards

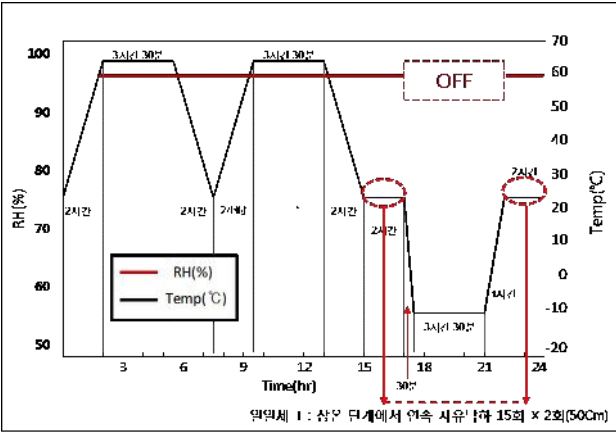
項目/Item	Spec			
	Material	Size (mm)	包装数量 / Packing Qty	包装后重量 Weight after packing
Tray 包装	PET	328(L)×240(W)×9.5(H)	100ea Max	≈ 121g
Out box 包装	DW-1	510(L)×350(W)×175(H)	5,000ea Max	≈ 7.6Kg

### 7-3. 包装图 / Packaging Drawing



## 8. 信赖性实验规格/ Reliability Tests

No.	项目/Item	测定条件/Test Conditions	评价基准/Judgment																
8-1	耐久壽命 Life Test	<p>-施加电压 DC 3.3V, 以2秒 On 1秒 Off为 1 cycle进行 500,000次后, 在常温常湿下放置2小时后测定.</p> <table border="1"> <thead> <tr> <th>电压</th> <th>温度</th> <th>湿度</th> <th>寿命</th> </tr> </thead> <tbody> <tr> <td>3.3V DC</td> <td>20±15℃</td> <td>65±20% RH</td> <td>500,000</td> </tr> </tbody> </table> <p>Operating the motors 2s On/ 1s Off as 1 cycle for 500,000 cycles by applied Voltage 3.3V DC, then 2 hours later test them in room temperature and humidity.</p> <table border="1"> <thead> <tr> <th>Voltage</th> <th>Temperature</th> <th>Humidity</th> <th>Life Cycles</th> </tr> </thead> <tbody> <tr> <td>3.3V DC</td> <td>20±15℃</td> <td>65±20% RH</td> <td>500,000</td> </tr> </tbody> </table>	电压	温度	湿度	寿命	3.3V DC	20±15℃	65±20% RH	500,000	Voltage	Temperature	Humidity	Life Cycles	3.3V DC	20±15℃	65±20% RH	500,000	<p>-額定轉數: 初期值+40%,-20%以內 -其他電機特性: 要滿足3-1項.</p> <p>Rated Spin Number :Should be in ±40%, -20% from initial value - Other electronic features : Should meet clause 3-1</p>
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3.3V DC	20±15℃	65±20% RH	500,000																
8-2	高溫高濕 動作實驗 High Temperature & High Humidity Life Test	<p>- 1 Cycle: 90 sec On, 30 sec Off 1440 Cycles</p> <table border="1"> <thead> <tr> <th>电压</th> <th>温度</th> <th>湿度</th> <th>时间</th> </tr> </thead> <tbody> <tr> <td>DC 3.3V</td> <td>50℃</td> <td>95% RH</td> <td>48Hr</td> </tr> </tbody> </table> <p>-在常温常湿下放置2小時後測定.</p> <p>3.3V 90s on/30s off, 1440 Cycles +50℃, 95%RH, 48Hr test In Room temperature 2 hours later.</p> <table border="1"> <thead> <tr> <th>Voltage</th> <th>Temperature</th> <th>Humidity</th> <th>Test time</th> </tr> </thead> <tbody> <tr> <td>DC 3.3V</td> <td>50℃</td> <td>95% RH</td> <td>48Hr</td> </tr> </tbody> </table>	电压	温度	湿度	时间	DC 3.3V	50℃	95% RH	48Hr	Voltage	Temperature	Humidity	Test time	DC 3.3V	50℃	95% RH	48Hr	<p>Rated Spin Number :Should be in ±40%, -20% from initial value - Other electronic features : Should meet clause 3-1</p>
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8-3	低溫保管實驗 Storage Test at Low Temperature	<p>-20℃條件下,保存2小時, 常温常湿条件下放置2小時候測定</p> <p>Store at -20℃ for 2hrs Test after 2hrs in Room Temperature.</p>	<p>-額定轉數: 初期值±20% 以內. -其他電機特性: 要滿足3-1項</p>																
8-4	高溫高濕實驗 High Temperature & High Humidity Test	<p>在+50℃, 95%RH條件下,放置120小時, 常温常湿条件下放置2小時候測定</p> <p>Store at +50℃ and 95% RH for 120hrs. Test after 2hrs in Room Temperature and Humidity</p>	<p>-Rated Spin Number :Should be in ±20% from initial value - Other electronic features : Should meet clause 3-1</p>																
8-5	熱衝擊實驗 Thermal Shock Test	<p>-40℃和 +85℃,各2小時,一共20cycles構成 常温常湿条件下放置2小時候測定</p> <p>Operating at - 40℃ for 60min and +85℃ for 60min (20cycles) test after 2 hrs in room temperature.</p>	<p>-額定轉數: 初期值±20% 以內. -其他電機特性: 要滿足3-1項</p> <p>-Rated Spin Number :Should be in ±20% from initial value - Other electronic features : Should meet clause 3-1</p>																
8-6	落下實驗 Drop Test	<p>在大约300g Dummy SET上安裝MOTOR后, 从152cm 高度,正面/反面各20次,侧面各10次 总80次落下后測定</p> <p>After installing motor in 300g Dummy set, drop the dummy from 152cm height. Test after drop total 80 times (Front: 20 times/ Back: 20 times/ 4 Sides: 10times for each side)</p>	<p>-額定轉數: 初期值±25% 以內 -其他電機特性: 要滿足3-1項.</p> <p>-無外觀構造的變形,裂開,部品 無脫離現象. -無TOUCH聲音發生現象.</p> <p>-Rated Spin Number : Should be in ±25% from initial value. - Other electronic features : Should meet clause 3-1 -Should not have transformations, cracks and part deviations. Should not make the touch sound</p>																

No.	項目/Item	測定条件/Test Conditions	评价基準/Judgment																
8-7	連續落下實驗 Continuous Drop Test	<p>在大约300g Dummy SET上安裝MOTOR后, 從100cm高度100次, 從50cm 高度200次落下後測定</p> <p>After installing motor in 300g Dummy set, 100cm 100cycles, 50cm 200cycles</p>	<p>-Rated Spin Number : Should be in <math>\pm 25\%</math> from initial value.</p> <p>- Other electronic features : Should meet clause 3-1</p> <p>-Should not have transformations, cracks and part deviations.</p> <p>Should not make the touch sound</p>																
8-8	高溫-低溫動作實驗 High-Low Temperature Movement Test	<p>--高溫動作: +25 ~ 70°C, 5°C單位別測定. -低溫動作: -20 ~ -30°C, 5°C單位別測定.</p> <table border="1" data-bbox="395 607 962 725"> <thead> <tr> <th>状态</th> <th>电压</th> <th>測定項目</th> <th>固定方法</th> </tr> </thead> <tbody> <tr> <td>水平</td> <td>3.0V DC</td> <td>转数 震動量</td> <td>STEEL JIG Double side TAPE</td> </tr> </tbody> </table> <p>- High Temperature: +25 ~ 70°C, Test at every 5°C. - Low Temperature: -20 ~ -30°C, Test at every 5°C</p> <table border="1" data-bbox="395 815 962 943"> <thead> <tr> <th>Position</th> <th>Voltage</th> <th>Test Item</th> <th>Fixing Method</th> </tr> </thead> <tbody> <tr> <td>Horizontal</td> <td>3.0V DC</td> <td>RPM</td> <td>STEEL JIG Double side TAPE</td> </tr> </tbody> </table>	状态	电压	測定項目	固定方法	水平	3.0V DC	转数 震動量	STEEL JIG Double side TAPE	Position	Voltage	Test Item	Fixing Method	Horizontal	3.0V DC	RPM	STEEL JIG Double side TAPE	<p>各溫度單位別 RPM 變化值測定.(參照用) Measuring alteration of RPM at each degree (For Reference)</p>
状态	电压	測定項目	固定方法																
水平	3.0V DC	转数 震動量	STEEL JIG Double side TAPE																
Position	Voltage	Test Item	Fixing Method																
Horizontal	3.0V DC	RPM	STEEL JIG Double side TAPE																
8-9	加速壽命實驗 Accelerated Life Test	<p>DC3.3V, 90秒 ON / 30分 OFF, 10日(468 cycle 进行) 每日常温 2point 在300g Dummy SET上安裝MOTOR后, 在50cm高度, 每次连续自由落下15次, 一共进行30次.</p> <p>3.3V, 90s ON/ 30m OFF -10~65°C, 0~93%RH, 10 cycles</p>  <p>在常溫常濕在放置2小時後測定.</p>	<p>-額定轉數: 初期值+40%,-20%以內</p> <p>-其他電機特性: 要滿足3-1項.</p> <p>-無外觀構造的變形,裂開,部品無脫離現象.</p> <p>-無TOUCH聲音發生現象</p> <p>Rated Spin Number :Should be in <math>\pm 40\%</math>, -20% from initial value</p> <p>- Other electronic features : Should meet clause 3-1</p> <p>-Should not have transformations, cracks and part deviations.</p> <p>Should not make the touch sound.</p>																
8-10	高溫動作試驗 High Temperature Life Test	<p>在+40°C 2 sec on/ 1sec off 24Hr进行后, 常溫常濕2小时 放置后 測定.</p> <p>+40°C 3.3V 2sON/1sOFF 24Hr</p>	<p>-額定轉數: 初期值<math>\pm 20\%</math> 以內.</p> <p>-其他電機特性: 要滿足3-1項.</p> <p>-Rated Spin Number :Should be in <math>\pm 20\%</math> from initial value</p> <p>- Other electronic features : Should meet clause 3-1</p>																

## 9. 安裝建議及注意事項 Recommendation and Cautions in Use

9-1

與規格不同使用的情況下,性能和壽命會發生問題.希望注意電壓使用範圍.

You might encounter functional and life problems if you use it different from the standard.

Please be careful of the range of use, like voltage etc.

9-2

MOTOR使用时,一定要把图纸上的lead wire (+)端子连接在 (+), (-) 端子连接在(-)后使用.

Please connect red lead wire to (+) socket, and blue/black lead wire to (-) socket when you use the motor.

9-3

在有害GAS及高溫高濕的場所保管對馬達造成不良因素所以請注意保管.

Please note the storage in high temperature and high humidity and toxic gas might cause damage to motors.

9-4

為了減少馬達旋轉時因檢查失誤電源端子短路時 導致 Drive IC 損傷。

為了防止損傷 Drive IC 電源端子間 (+, -) 把 2 $\mu$ F 以上的電容器並列鏈接 在 Motor 後實施檢查是安全措施.

Drive IC can be damaged by power plug short due to careless test. To prevent damage to Driver IC, please connect

2 $\mu$ F condenser to motor in a row (parallel connection) with power plug (+/-).

9-5

拿取馬達時,盡可能的輕拿Case部分.

Please hold the case part lightly as much as you can when you use motors.

9-6

为保护Drive IC, 请不要施加DC 4.5V以上.

Please do not use above DC 4.5V for preventing Driver IC.

9-7

馬達接近磁性物質或接觸時會降低馬達性能, 因此避免接近強磁場.

Please avoid being near and contacting magnetic materials like magnet which might encounter functional problems.

9-8

能夠自我吸附的物質 (鐵, 粉末) 及灰塵等與馬達混放時會出現轉動不良, 異常音等, 會使馬達的性能下降及信賴性受影響,因此取用及作業時應注意環境清潔.

If motors were placed together with some materials as metal or powder or dust, it might decline it features such as unstable rotation and abnormal noise. Please keep clean the working environment and carefully operate the motors.

9-9

注意請不要浸泡在液態物質如: 水或酒精中.

Please be careful of not soaking in liquid like water or alcohol.

9-10

包裝方法: (參照包裝圖) 只有在客戶要求下變更可能.

Packing method: Refer to packaging drawing. But, it could be changed on user's demand.

9-11

無法保證滿足本式樣範圍以外使用的情況.

It can't guarantee if the motors are used out of the range of fulfilling this specification.

9-12

本式樣書內容的變更及追加是在雙方協議下實施.

Any further conditions or change of this specification take effect by mutual consent between the users and us.