

# 深圳市承高达电子科技有限公司

SHENZHEN CHENGGAODA ELECTRONIC TECHNOLOGY CO.,LTD

## 承认书

### SPECIFICATION FOR APPROVAL

品 名 (DESCRIPTION) : DC FAN  
承认书编号 (REPORT NO) : 250826-5K  
客 户 (CUSTOMER) :  
产品型号 Par NO : CGD4020M12B-A  
类别 Category: : ☒Fan ☐Blower☐ Centrifugal☐support  
环保类型 (GP TYPE) : ☒RoHS ☐REACH  
认证 (CERTIFICATION) : ☒CE ☐UL/CUL ☐TUV  
样品数 Quantity : 1PCS

| 客户承认栏 (Customer Approved) |                 |               |
|---------------------------|-----------------|---------------|
| 承认章 (Recognition Chapter) | 接受 (Acceptance) | 批准 (Approval) |
|                           |                 |               |

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### 版本记录 / REVIESD RECORD

| 版本 (Rev.) | 变更说明 (Revision Description) | 日期 (Date) |
|-----------|-----------------------------|-----------|
| A0        | 初次发行                        | 2025.8.26 |
|           |                             |           |
|           |                             |           |
|           |                             |           |

| 批准 (Approval) | 审核 (Checked) | 制作 (Editor) | 版本 (Rev.) |
|---------------|--------------|-------------|-----------|
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| 详细说明 (Specifications)          |                                    |                |  |                         |                      |
|--------------------------------|------------------------------------|----------------|--|-------------------------|----------------------|
| *****                          |                                    |                |  |                         |                      |
| Item 项目                        |                                    | Unit 单位        |  | Specification 参数        | Condition 条件         |
| 風扇 尺寸 Dimension of fan         |                                    | Mm 毫米          |  | 40*40*20MM              | LxWxThickness 长宽高    |
| Bearing System 轴承类型            |                                    | ----           |  | Ball Bearin             | ----                 |
| Rated Voltage 额定电压             |                                    | VDC            |  | 12V                     | ----                 |
| Operating Voltage Range 操作电压范围 |                                    | VDC            |  | 7~13V                   | At 25℃               |
| highest bearing voltage 最高承受电压 |                                    | VDC            |  | 13V                     | At 25℃               |
| Start-up Voltage 启动电压          |                                    | VDC            |  | 7V                      | At 25℃               |
| Rated Current 额定电流             |                                    | Amp 安培         |  | 0.05A                   | At Rated 在额定电压下      |
| Lock Rotor Current 锁定电流        |                                    | Amp 安培         |  | 0.02A(MAX)              | Locked 锁死            |
| Rated Power 额定功耗               |                                    | Watt 瓦特        |  | 0.6W±15%                | At Rated 在额定电压下      |
| Rated Speed 额定转速               |                                    | RPM 圈/分钟       |  | 6500±10%                | AT Rated Voltage 30℃ |
| Air Flow 风量                    |                                    | CFM            |  | 7.0                     | In Free Air 无风阻条件    |
| Static Air Pressure 静压         |                                    | mmH2O          |  | 4.4                     | When Air Flow=0      |
| Noise Level 噪音                 |                                    | dBA            |  | 30.6                    | At Rated Speed 额定速   |
| Other Spec.                    | Polarity protection 反向保护           |                |  | YES                     |                      |
|                                | Tachometer Output 转速反馈             |                |  | NO                      |                      |
|                                | Soft-restart function 软启动          |                |  | NO                      |                      |
|                                | Lock Protection 锁定保护               |                |  | YES                     |                      |
|                                | Lock Rotor Alarm 锁定报警              |                |  | NO                      |                      |
|                                | PWM Control 速度控制                   |                |  | NO                      |                      |
|                                | Thermal Control 过热保护               |                |  | NO                      |                      |
|                                | Over voltage protection 过压保护       |                |  | NO                      |                      |
|                                | Over current protection 过流保护       |                |  | NO                      |                      |
|                                | fixed constant speed Function 恒速功能 |                |  | NO                      |                      |
| Connection Lead Type<br>连接方式   |                                    | Lead Wire 导线型号 |  | UL 1007 24# 300MM<br>黑红 | See drawings 见图纸     |
|                                |                                    | Connector 端子   |  | NO                      | See drawings 见图纸     |
| 防护等级 (IP RATING)               |                                    |                |  | NO                      |                      |
| 备注:                            |                                    |                |  |                         |                      |

### 1.0 适用范围 (Scope) :

此文件说明 CGD4020M12B-A 风扇特性 (Fan characteristic of CGD4020M12B-A)

### 2.0 原料 (MATERIAL)

2.1 外框 (Housing) : PBT OF UL 94V-0

2.2 扇叶 (Fan Blade) : PBT OF UL 94V-0

2.3 轴承类型 (Bearing Sys) : ☒ 滚珠 (Ball Bearing)  
☐ 含油 (Sleeve Bearing)  
☐ 液压 (Hydro Bearing)

### 3.0 尺寸与结构 (DIMENSIONS & CONSTRUCTION)

所有尺寸、旋转方向和气流按照所附图纸上说明 (All dimensions, direction of rotation and air flow were specified as per drawing attached.)

### 4.0 特性和说明 (CHARACTERISTICS & DEFINITION)

4.1 所有比率特性均按随附数据单上说明 (All rated characteristics were specified as per data sheet enclosed)。

4.2 电流: 电流在持续旋转 3 分钟后测量 (Rated Current: Rated Current shall be measured after 3 minutes of continuous rotation at rated voltage。)

4.3 转速: 速率在持续旋转 3 分钟后测量 (Rated Speed: Rated Speed shall be measured after 3 minutes of continuous rotation at rated voltage)。

4.4 起动电压: 打开开关“ON”后, 能够起动风扇运作的电压 (Start Voltage: The voltage which is able to start the fan to operate by suddenly switching “ON”)。

4.5 输入功率: 输入功率在持续旋转 3 分钟后测量 (Input Power: Input Power shall be measured after 3 minutes of continuous rotation at rated voltage。)

4.6 锁定电流: 可以锁机的风扇, 锁定电流在清新空气中锁机 3 分钟测定 (The fan can be locked, Locked Rotor Current: Locked Current shall be measured within one minute of rotor Locked after 3 minutes of continuous at rated voltage in clean air)。

4.7 空气流量数据及压力数据测定根据“AMCA 标准”或者 DIN24163 规则, 该数据测定在双压力仓进行, 并需测定压力仓各边所承受的压力数据 (Air Flow & Static Pressure: The air flow data and static pressures should be determined in accordance with AMCA standard or DIN24163 specification in a double chamber testing with intake side measurement)。

4.8 噪音标准: 噪音标准测试参照 ISO3745 标准, 测量在隔音室内进行, 将麦克风置于风扇一米处 (Noise Level: The measurement of noise level is carried out with reference to ISO3745 in an anechoic chamber with the microphone positioned 1 meter from the air intake. Testing fan shall be hung in clean air。)

## 5.0 机械力检测 (MECHANICAL INSPECTION)

### 5.1 旋转方向 (Rotation Direction)

从扇叶面看风扇, 扇叶 逆时针 方向旋转, 按外框一边的箭号指示相同方向 (The blade is count anticlockwise viewing from the blade. The same direction also indicated by an arrow mark on one side of the housing)

### 5.2 保护试验 (Protection)

几个风扇扇叶连在一起固定限制其旋转, 如果风扇及电子组件不会损坏, 限制旋转的组件被解松则风扇可自动重新启动旋转。 (All fans have integrated protection against locked rotor condition so that there will be no damage to winding or any electronic component. Restarting is automatic as soon as any constraint component to rotation has been released.)

风扇放置在垂直位置, 打开开关 “ON” 或 “OFF” 风扇旋转或停止, 运转正常则说明风扇是合格品 (As fan placed at dead angle position, and the switch of FAN was changed from off to on, Restarting was automatic normal as soon as and proved that this fan is good fan)

### 5.3 转体锁定保护 (Locked Rotor Protection)

5.3.1 小电流或者带 Auto start 功能的风扇, 在通电旋转状态将风扇扇叶锁定, 持续 72 小时之后, 松开被锁定扇叶, 风扇立即自动重转, 证明风扇无异常。

5.3.2 (No damage shall be found after 72 hours continuously at condition of rotation locked, Restarting is automatic as soon as constraint to running has been released)。

5.3.3 大电流或不带 Auto start 功能的风扇, 不可长时间锁定, 否则风扇会过热损坏。 (The fan can't be locked or the fan will overheat and be damaged)

### 5.4 极性保护 (Polarity Protection)

电压正常条件下, 如果反接电源对风扇通电 15 分钟, 断电后重新按正常两极连接, 所有功能将正常 (No damage shall be found with reverse connection 15 minute at rated voltage. After returning to normal polarity, all function shall be normal.)

### 5.5 自由跌落 (Free Drop shock)

单体由 600mm 高空跌到 30mm 厚的木板上, 风扇 6 个表面中的任何一面和一角均经得起跌落试验, 并确认无损伤. (The product drops from the bight of 600mm to the wood board of 30mm. Any one of the 6 faces and any one of the corners could withstand the pressure, and also no damage will be found.)

电力测定 (ELECTRICAL INSPECTION)

### 5.6 绝缘阻抗 (Insulation Resistance)

在 500V 直流电条件下, 外框与导线正极电阻不少于 10M $\Omega$  (Not less than 10M ohm between housing and positive end of lead wire(red) at 500V DC)。

### 5.7 绝缘强度 (Dielectric Strength)

在 5mA 漏电流, AC500V 条件下持续 60 秒, 风扇外框与导线无异常, 证明绝缘良好 (No damage should at 500 VAC for 60 sec, measured with 5mA trip current between housing and positive end of lead wire)

6.0 平均寿命 (Life Expectancy)

在指定恒温下持续工作后，经检验，90%能正常运转即可估算其平均使用寿命 (The continuous duty life at given temperature after which, 90% of testing units shall still be running)。

| Bearing System | Temperature | Life Expectancy |
|----------------|-------------|-----------------|
| Ball Bearing   | 25℃         | 50000hrs        |

7.0 工作环境 (ENVIRONMENTAL)

7.1 运行温度 (Operating Temperature)

在-40℃ ~+80℃为正常工作温度 ( -40℃ to +80℃ at normal humidity)

7.2 贮存温度 (Storage Temperature)

在-40℃ ~85℃温度下贮存 500 小时后，经过在室内温度下 24 小时恢复期后，所有功能正常运作 (All function shall be normal after 500 hours storage at -40℃ to +85℃ at normal humidity with a 24 hour recovery period at room temperature)。

7.3 湿度 (Humidity)

95%RH . 40+/-2℃per MiL-STD-202F 标准 103B 湿度检测 96 小时, 绝缘电阻和绝缘强度测量数据符合 8.0 说明。(After 96 hours 95%RH 40+/-2℃per MiL-STD-202F, method 103B humidity test, the measured data on insulation resistance and dielectric strength shall meet the specification. REMARKS)

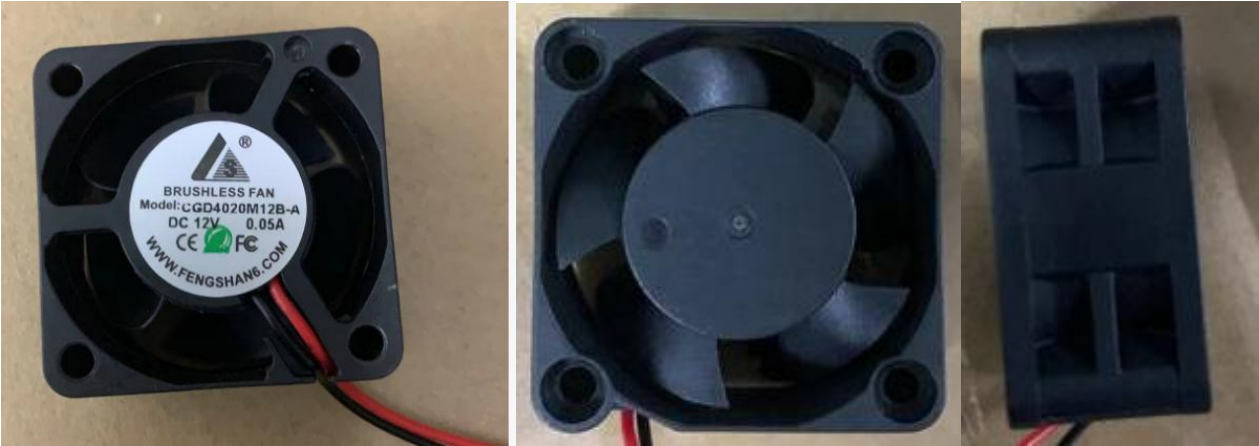
8.0 说明 (REMARKS)

8.1 材料和结构的改变将另附说明 (Matetial and construction are subject to change without advance. The changes should be within specification)

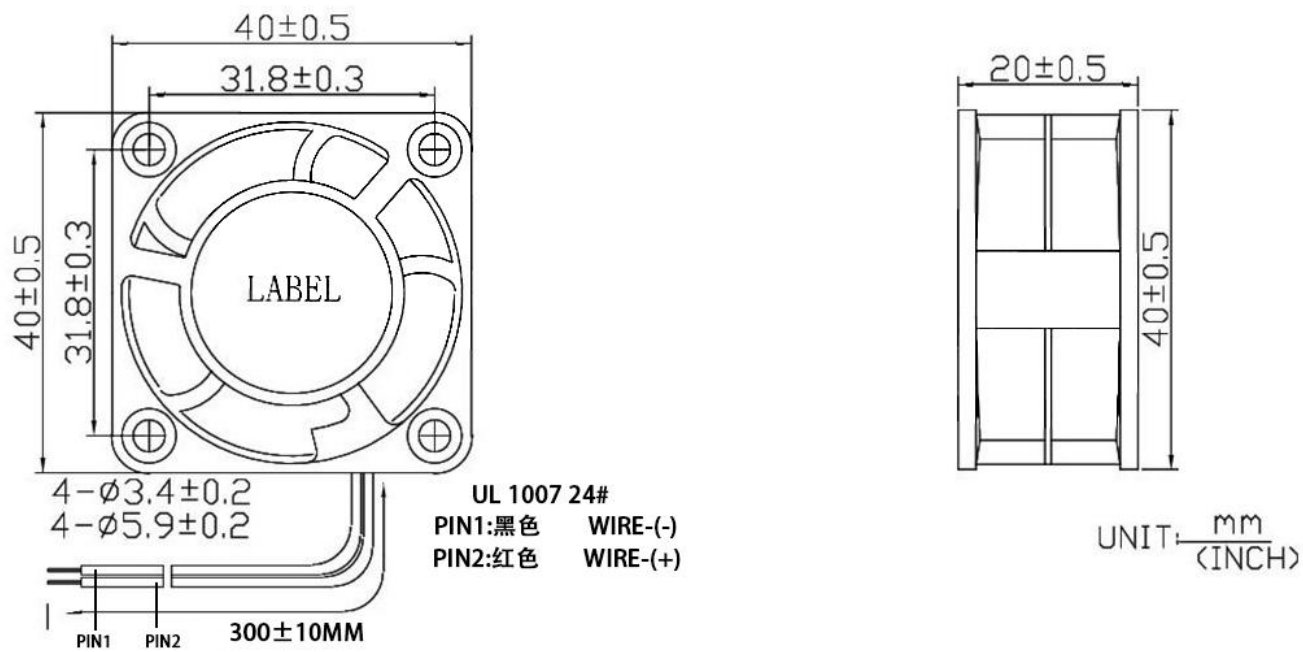
8.2 风扇的检验标准为 MIL-STD-105E II 标准。(All fans shall meet the quality inspection under sampling plan MIL-STD-105E II as follow)

|     |          |      |
|-----|----------|------|
| 致命的 | Critical | 0    |
| 严重的 | Major    | 0.40 |
| 轻微的 | Minor    | 0.65 |

9.0 产品图形



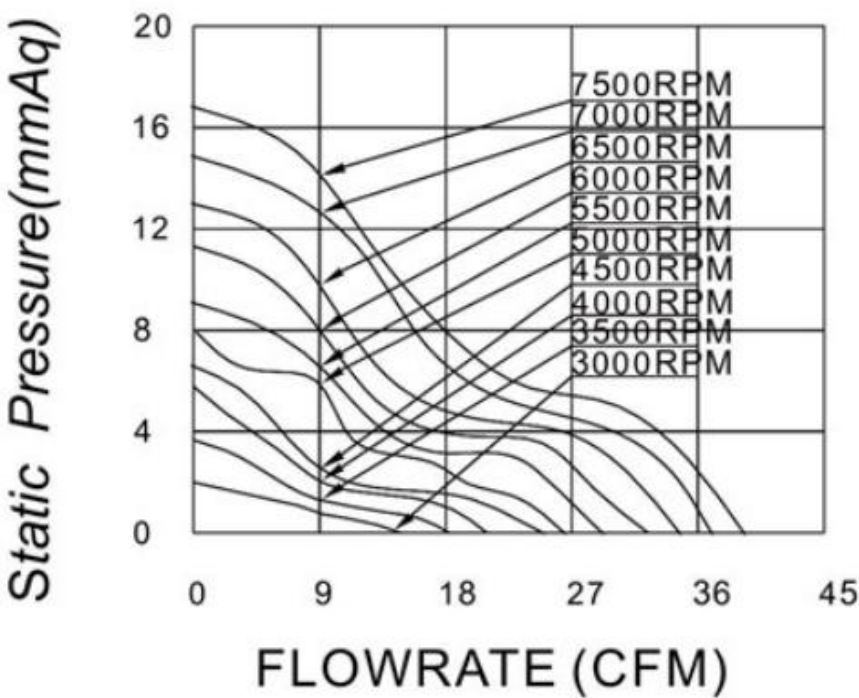
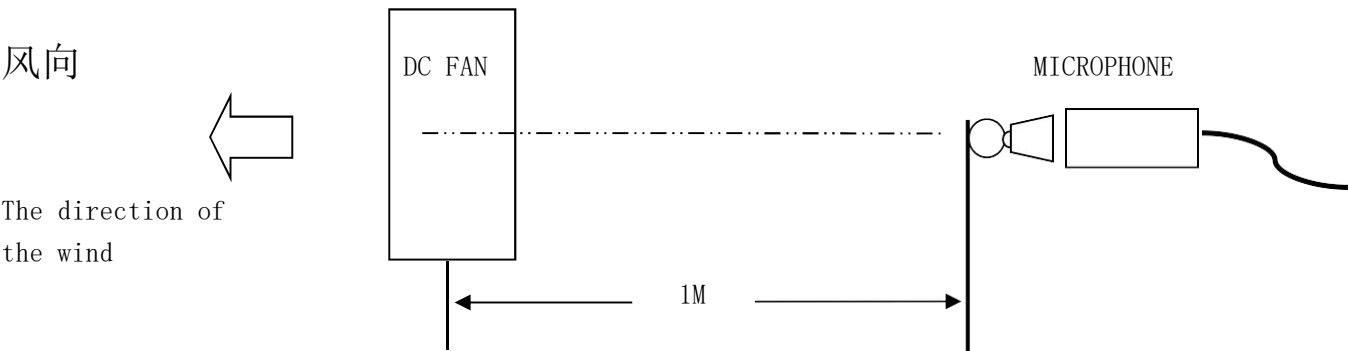
10.0 单位：毫米（Unit:mm）



11.1. 噪音测试 Noise Test

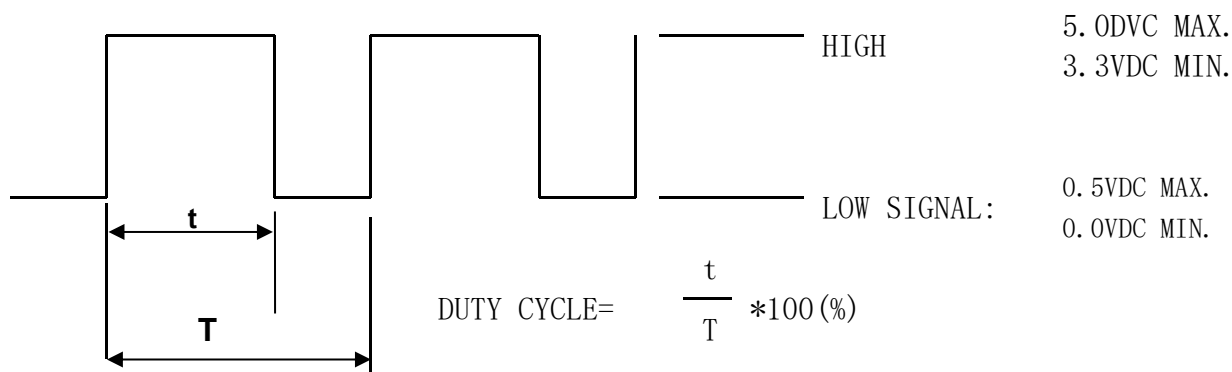
| 测试条件 Test Condition                                                                                              | 测试方法 Test Method                                            |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1. 温度 Temperature: 26 °C                                                                                         | 1. 测试位置 Test Postion: 180°                                  |
| 2. 湿度 Humidity : 52 %RH                                                                                          | 2. 测试距离 Test Distance: 1.0M From the fan intake             |
| 3. 在额定电压下 At Rated Voltage                                                                                       | 3. 背景噪音 Background Noise: 14.8dB(A)                         |
| 4. 在额定转速下 At Rated Speed                                                                                         | 4. 测试依照标准 ISO3745 执行 This test executes to ISO3745 standard |
| 测试设备 Test Equipment:<br>AWA6228+ 型多功能声级计（噪音分析仪） AWA6228+ Type. Multi-function sound level meter (noise analyzer) |                                                             |
| 测试结果 Test Result: 噪音 Leq: NOdB(A)                                                                                |                                                             |

11.2. 噪音测试方法示意图 Schematic diagram of noise test method:



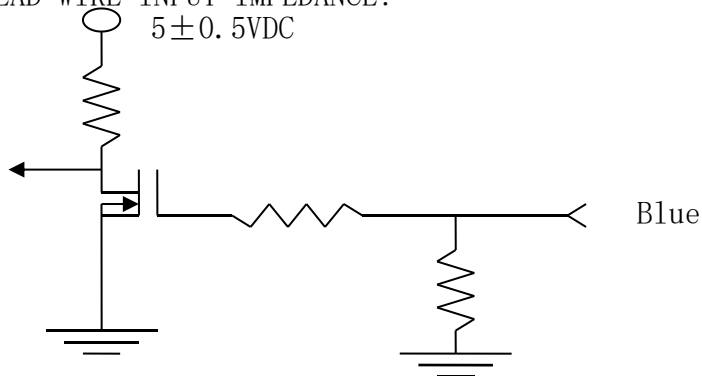
12.0 功能描述  
Functional description

## 12. 1. PWM CONTROL SIGNAL PWM 控制信号:



- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT 16K~32 KHZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE, THE ROTOR WILL STOP.
- WHEN CONTROL SIGNAL LEAD DISCONNECTED, THE FAN WILL MAXIMUM SPEED.
- AT 25K 25% DUTY CYCLE, THE FAN WILL BE ABLE TO START FROM A DEAD STOP.

## 12. 2. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



1. THE FAN SPEED WILL DEFAULT TO MAXIMUM WHEN THE SPEED CONTROL INPUT IS LEFT UNCON

风扇特性曲线 PWM 测试报告

The Fan Property Curve PWM test report



1.测试数据:

| 序号 | 百分比      | 转速 | 单位 Unit |
|----|----------|----|---------|
| 1  | 10%(启动)  |    | RPM     |
| 2  | 25%      |    | RPM     |
| 3  | 50%      |    | RPM     |
| 4  | 75%      |    | RPM     |
| 5  | 100%(全速) |    | RPM     |

2 .PWM 数据及曲线 PWM data and curves

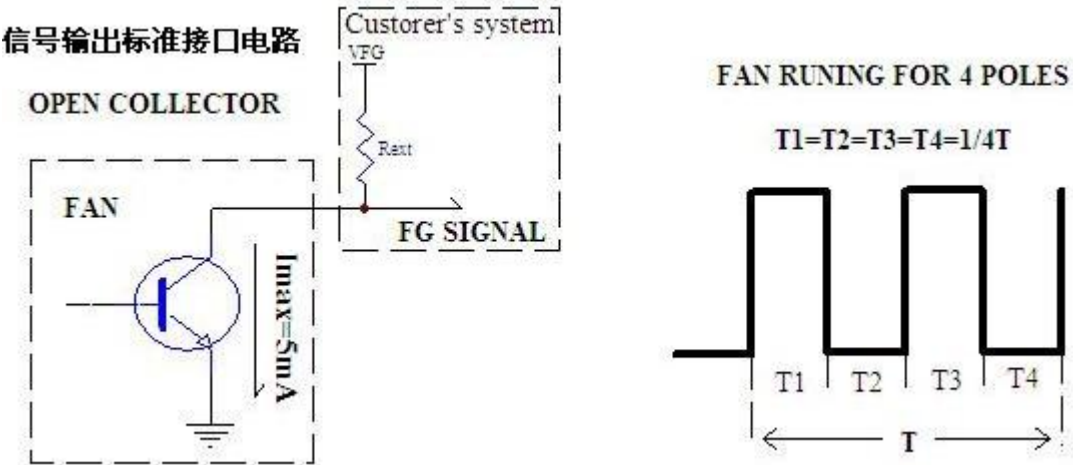
13. 0. 频率发生器 (FG) 信号 (FREQUENCY GENERATOR (FG) SIGNAL) :

FG: 风扇运转时, 转子的 N, S 极切换会产生高低电平变化, 转速越快, 电平变化也就越快, 从而可以通过变化的频率来侦测风扇的转速。

FG: When fan is running, the switch of rotor N, S can make exchange of high and low level. And speed faster, the frequency of level exchange faster. So we can sense fan's rotation speed via the signal of variational frequency.

13. 1. FG 输出电路为集电极开路模式 (FG OUTPUT CIRCUIT---OPEN COLLECT MODE)

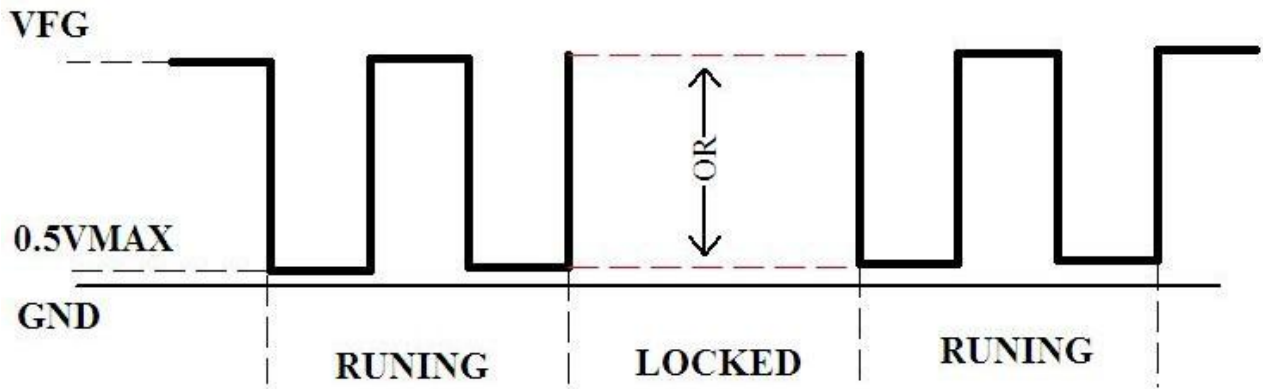
13. 2. 规格条件 (SPECIFICATION) :



$VFG= 5-24 V_{max}$     $R_{ext} (min) =VFG/I_{max}$     $I_{max}=5mA$     $V_{ce}=0. 5V_{max}$

13. 3.  $N=RPM$     $T=60/N (SEC)$     $T1=T2=T3=T4=1/4T$

### 13.4. 频率发生器波形 (FREQUENCY GENERATOR WAVEFORM):



Note:

13.5.FG 信号导线不能接触“+”和“-”引线引线

FG signal wire can not contact with the "+" and "-" lead wire

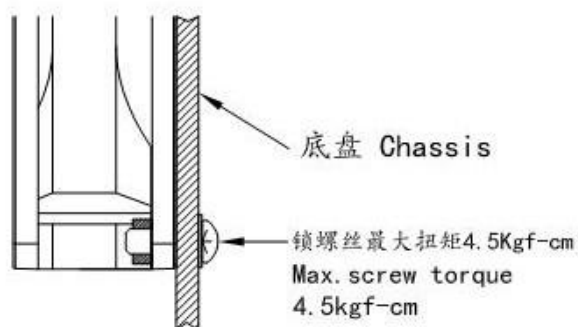
13.6. 当风扇锁住时, FG 信号的输出电压可能是 VFG 或 0V (0.5V<sub>max</sub>)

When Fan is locking , the FG signal output voltage may be VFG or 0V (0.5Vmax)

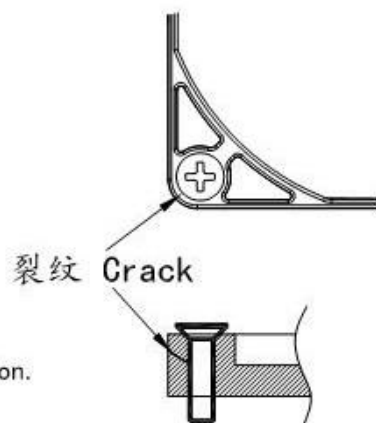
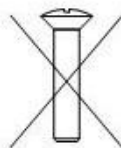
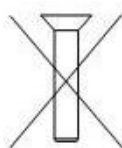
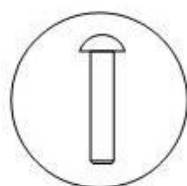
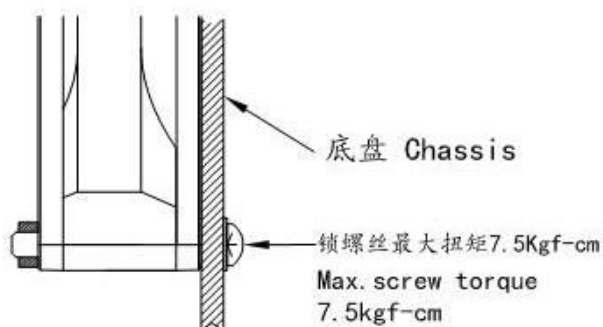
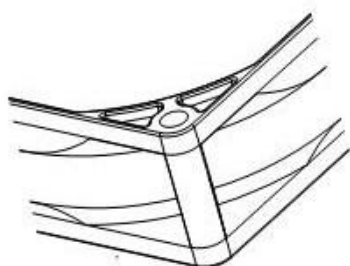
## 14.0 风扇安装方式及螺丝扭矩建议

## Suggestions for fan installation and screw torque

\* 法兰框架 Flange Frame



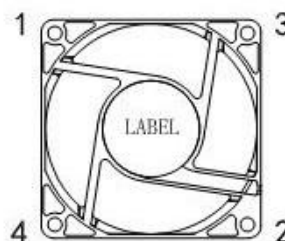
\* 肋骨框架 Rib Frame



\* 考虑到车架裂纹，禁止使用锥度螺钉。  
Taper screw is prohibited for frame crack consideration.

\* 螺丝锁紧使用交叉、分步紧固方式，一般分两次紧固，第一次使用规定扭矩的30%，如图依次紧固1→2→3→4四颗螺栓，确定风扇锁平后，第二次使用规定扭矩100%锁紧螺栓。

Screw locking adopts cross and step-by-step tightening method, which is generally tightened in two times; 30% of the specified torque is used for the first time, and four bolts 1 → 2 → 3 → 4 are tightened successively as shown in the figure. After the fan is locked flat, 100% of the specified torque is used for the second time.



**★注意事项 Note:**

1. 使用时请勿超出本规格所规定之极限，否则我们不保证此产品。

We will not guarantee the products if the application of our products are exceeded the limitation which is specified on this specification.

2. 倘若要变更此份文件的任何规格，请务必事先提出需求。

In case of changes of the specification specified on this document. A written notice is requested in advance.

3. 请勿触压着叶片以及电源线缠绕着风扇或用力拉扯电源线，如此轴心与电源线将会被损毁。

Please do not touch the impeller with the pressure and never bring the fan with lead wire. The bearing and lead wire may be damaged.

4. 本产品不保证因粉尘、水滴、小虫进入，而影响寿命与不良品产生。

No guarantee on the products against the safety problem or failure caused by powder dust, drop of water or insect.

5. 如有任何资料及文件与此份资料不同，将以此份资料为主要参考。

If there is any data or related documentation different from this data sheet. This data sheet is the principle reference.

6. 请勿在可燃性气体与任何有害环境中使用。

Please do not use the fan in the environment of corrosive gas or liquid or any detrimental gas.

7. 组装风扇时，请特别注意，因共振或振动产生的噪音。

During the installation of the fan, please pay substantial attention to possible notice caused by resonance vibration and shock.

8. 当搬运或作业中，风扇如从 60cm 的高度落下，将会对叶片的平衡产生若干影响，特别是滚珠轴承避免掉落。

It is very important to notify that avoid to drop from 60cm height when in any movement or operation, it will impact the balance of blade. Especially ball bearing structure is avoided to drop down.

9. 当风扇在运转时，请不要触摸叶片，这样非常危险，容易伤害到您的手指。

Please don't touch the blade when the fan at full speed running, be careful your fingers!