

# 承认书

## SPEC

客户

Customer:

客户编号

Customer's Part No:

本厂编号

FAN-4020-PWM-5V

ZFQ 's part No:

物品

DC FAN

Article:

发行日期

2021年03月10日

Issued Date:

文件编号

K-2103-003

File No:

客户规格确认证明

Customer's Confirmation for Specification

客户批准 Customer approval	批准签名 Authorized signatures

本厂规格确认证明

ZFQ's Confirmation for Specification

批准 Approval	审核 Check	QA

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# 规格说明书

## SPECIFICATION

物品 Article	4020 FAN	料号 Part No.	FAN-4020-PWM-5V	页数 Page	1 of 6	主题 Object	Engineering Data
样品需求类型(Samples Requirement):				<input checked="" type="checkbox"/> 工程样品(Engineering Samples)			
				<input type="checkbox"/> 投产前样品(Pre-production Samples)			
				<input type="checkbox"/> 现产线样品(Production Sample)			
马达保护类型(Motor Protection)				<input checked="" type="checkbox"/> 极性保护(Polarity Protection)			
				<input checked="" type="checkbox"/> 自动启动,锁定保护(Auto Restart)			
接头类型(Connection Lead Type)				<input type="checkbox"/> 线接(Wire) <input checked="" type="checkbox"/> 端接(Connector)			
轴承类型(Bearing Type)				<input checked="" type="checkbox"/> 2 BALL			
材质类型(Material Type)				<input checked="" type="checkbox"/> PBT			
<b>规格详述 (Specification):</b>							
<b>规格类型(Item)</b>				<b>规格参数值(Specification/Conditions)</b>			
外观尺寸(Measurement)				40*40*20 <i>mm</i>			
额定电压(Rated Voltage)				5 <i>DCV</i>			
操纵电压(Operating Voltage)				4.5~6.5 <i>DCV</i>			
启动电压(Starting Voltage)				Max:3.5 <i>DCV (on/off)</i>			
额定电流(Rated Current)				0.27±0.02 <i>Amp</i>			
额定功率(Input Power)				1.35 <i>Watts</i>			
额定转速(Rated Speed)				7500 <i>RPM±10% (after running 3~5minutes)</i>			
噪音值(Noise Level)				32.7 <i>dB(A)</i>			
最大风量(Max. Air Flow)				7.9 <i>CFM</i>			
最大静压值(Max. static Pressure)				5.78 <i>mmAq</i>			
预计寿命(Life Expectancy)				50000 <i>Hours (at 25 °C 65%R.H.)</i>			
工作温度(Operating Temperature)				-10~+70 <i>°C(66%RH)</i>			
储存温度(Storage Temperature)				-40~+70 <i>°C(66%RH)</i>			
重量(Weight)				26 <i>Gram</i>			

# 规格说明书

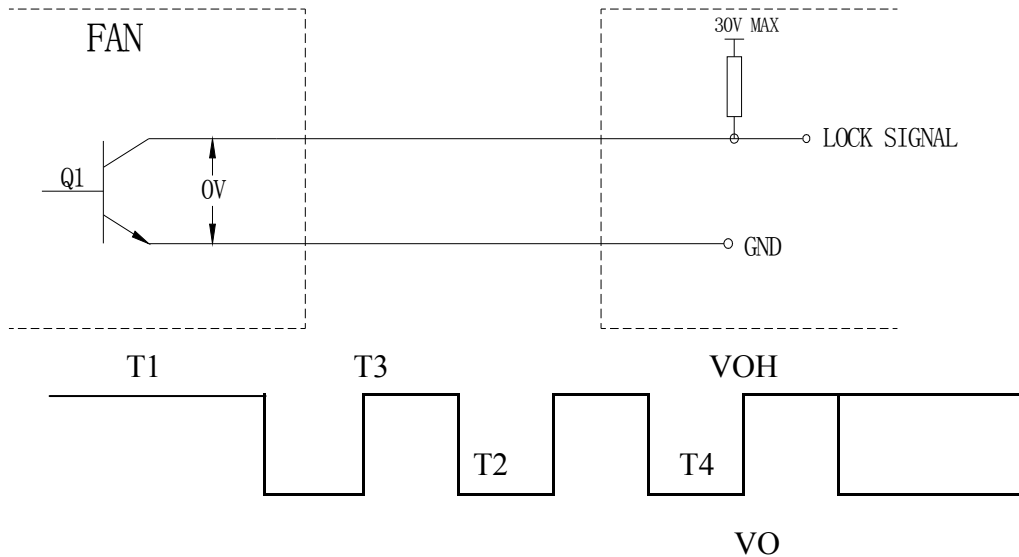
## SPECIFICATION

物品 Article	4020 FAN	料号 Part No.	FAN-4020-PWM-5V	页数 Page	2 of 6	主题 Object	Material List
序号 No	主要元件 MAJOR COMPONENTS		材质或型式 MATERIAL OR TYPE	等级 GRADE	号码 UL No		
1	扇 框 FAN HOUSING		PBT 85%+FIBER15%				
2	扇 叶 FAN BLADE		PBT 85%+FIBER15%				
3	绝缘架 INSULATOR FRAME		PBT 100%				
4	轴 芯 SHAFT		不锈钢 STAINLESS STEEL				
5	轴 承 BEARING		滚珠轴承 BALL				
6	橡胶磁铁 PLASTIC MAGNET		铁锆粉末化合物 STRONTIUM FERRITE				
7	漆包线 ENAMELED WIRE		2 UEW				
8	硅钢片 SILICON STEEL STRIP		H50				
9	印刷线路板 P.C.B		单层印刷线路板				
10	积体电路 HALL IC		29851				
11	引 导 线 LEAD WIRES		1571 28AWG 框外 L-150mm				
12	端 子 TERMINAL		2510 端 4PIN				
13	铜套 Copper sleeve		无				
14	扣具 BUTTON		无				
15	弹 簧 SPRING COIL		STTL				

# 规格说明书 SPECIFICATION

物品 Article	4020 FAN	料号 Part No.	FAN-4020-PWM-5V	页数 Page	3 of 6	主题 Object	Output locked signal
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FG 转速检测 FG RPM detection :



$$T = T1 + T2 + T3 + T4$$

<说明>

1. 输出波形：方波  
Output waveform: square wave
2. 当电压值愈高（Voltage Y 值），则输出波形愈高  
When the voltage value is higher (Voltage Y) the output waveform is higher.
3. 当风扇不转，则输出波形为一水平线  
When the fan is shutdown then output waveform is a horizontal line
4. 循环距离愈长（Timer X 值），则转速愈慢  
The cyclic distance is longer then the RPM is slower.
5. 转速计算公式如下：  
RPM formula as follows:

$$RPM = \frac{60000}{X(ns)}$$

<例>Example

$$X = 20.68ns$$

$$Ls = 1000ns$$

$$Lmin = 60000ns$$

$$RPM = \frac{60000}{20.68} = 3000$$

# 规格说明书 SPECIFICATION

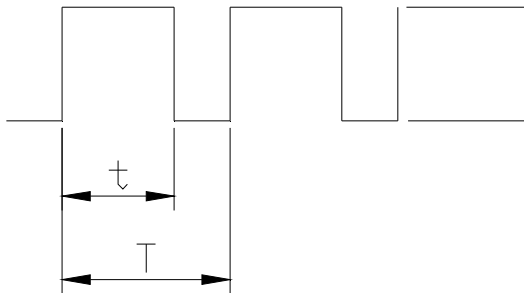
物品 Article	4020 FAN	料号 Part No.	DF-4020M05B	页数 Page	4of 6	主题 Object	Output locked signal
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脉宽调制控制信号

PWM CONTROL SIGNAL:

信号电压范围

SIGNAL VOLTAGE RANGE: 5 VDC



高信号: 3.3-5V DC

HIGH SIGNAL: 1-5VDC MIN .

低信号: 0.2V DC

LOW SIGNAL: 0.2VDC MAX

占空比

$$\text{DUTY CYCLE} = \frac{t}{T} * 100(\%)$$

风扇能接受的控制信号频率为 12KHz ~ 50kHz

- 1、 THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BEABLE TO ACCEPT A 12KHZ~50KHZ

风扇的首选频率为 25KHz

- 2、 THE PREFERRED OPERATING POINT FOR THE FAN IS 25KHZ.

占空比为 100%时风扇为最大转速运转

- 3、 AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED .

占空比为 0%时风扇停止转动

- 4、 AT 0% DUTY CYCLE THE ROTOR WILL STOP.

控制信号导线断开，风扇将以最大速度旋转

- 5、 WITH CONTROL SIGNAL LEAD DISCONNECTED THE FAN WILL SPIN AT MAXIMUM SPEED

.当风扇停止时,启动风扇频率占空比为 10%以上

- 6、 WHEN THE ROTOR IS HALTED IT WILL SPIN BY MORE THAN 10%DUTY CYCLE.

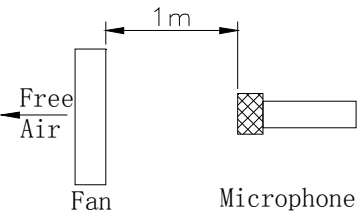
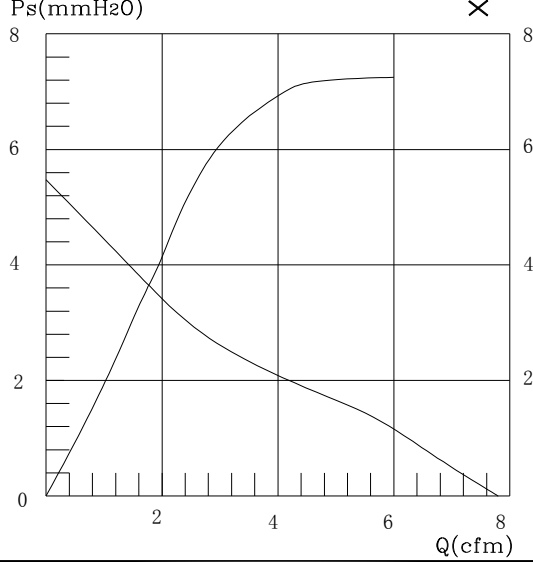
转速与 PWM 控制信号 (PWM 输入 5V, 频率 25kHz)

**SPEED VS PWM CONTROL SIGNAL:(PWM INPUT 5V FREQUENCY:25KHZ)**

DUTY CYCLE (%) 占空比	SPEED R.P.M (REF) 转速	CURRENT (A) 电流
100	7500	0.27
75	5600	TBD
50	3700	TBD
25	1800	TBD
0	0	TBD

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## SPECIFICATION

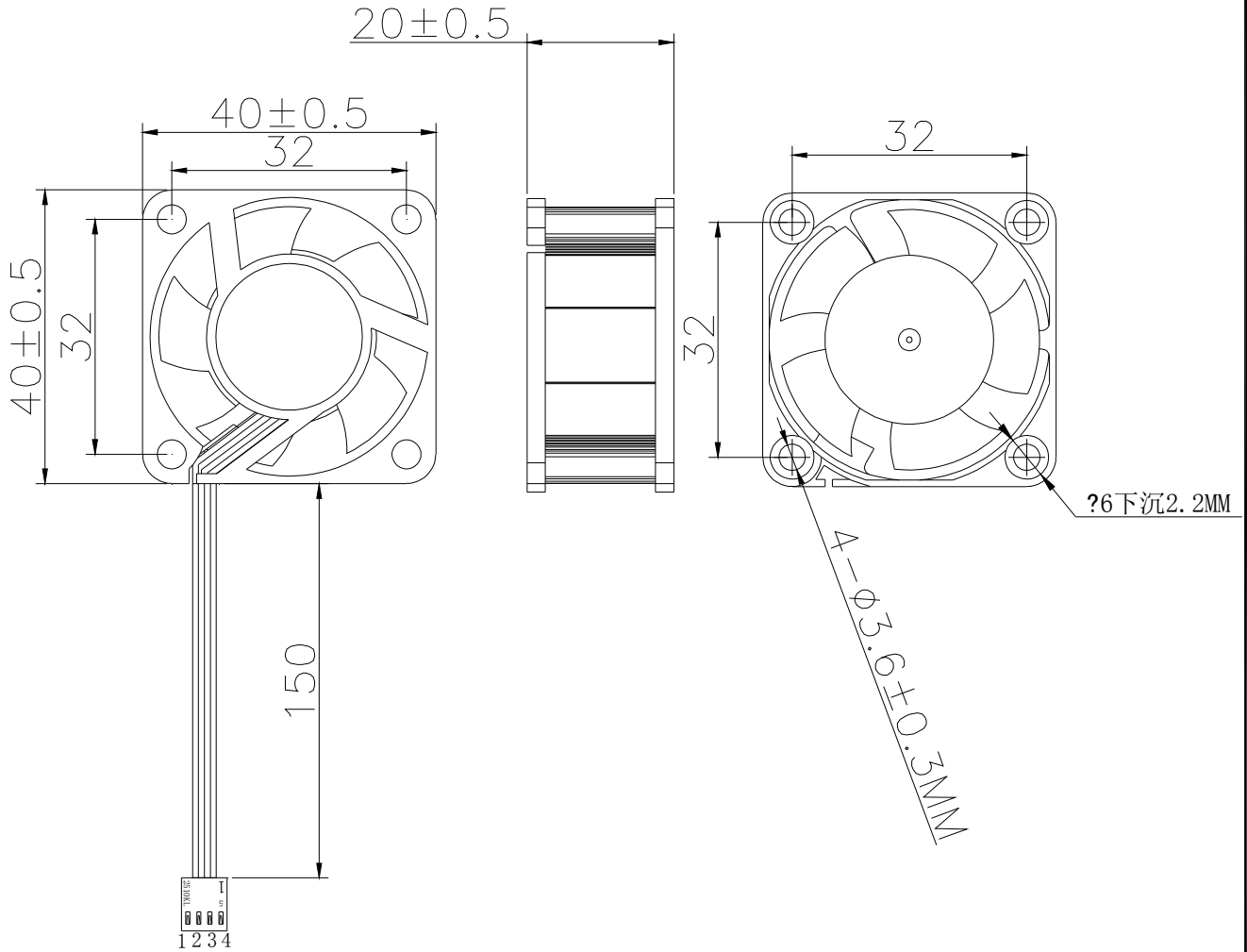
物品 Article	4020 Fan	料号 Part No.	FAN-4020-PWM-5V	页数 Page	5 of 6	主题 Object	Special Character
噪音测试 (Noise Test)	图示 Exhibit		测试条件 Condition		测试结果 Result		
			Under the standard environmental conditions and rated condition, shall be measured in a sound isolated room of background noise 15dB(A) or less, in a distance of 1 M from intake side direction.		Max 32.7 dB(A) characteristic average		
预期寿命 (Life Expectancy)	测试依据 Basis of test	环境温度 Ambient Temperature		预期寿命 Expectance			
	MIL-HDBK-217D Test Standard	At 25° C Relative Humidity 45-85%		50000 Hours			
风量风压特性 (Air Flow-Air pressure Characteristic)	相对条件 Relative Condition		项目 Item				
	Air pressure =0		Min. Air Flow=7.9cfm				
	Air Flow =0		Min. Air Pressure=5.78mmH <sub>2</sub> O				
Air Flow & Air pressure's Characteristic		As Performance Curves					
							
绝缘阻抗强度 (Insulation Resistance)		可承受在主体与两条导线间加500V直流电压, 绝缘阻值达10MΩ以上。 Can withstand 500 VDC between housing and both lead wires, The insulation resistance is at least 10MΩ .					
绝缘耐压强度 (Dielectric resistance)		可承受在主体与两条导线间加每分钟5mA1500v交流电压。 Can withstand 1500 VAC 1minute 5mA between housing and both lead wires.					
抗冲击强度 (Pound resistance)		可承受三维方向上每 11mS 两次的 60g 的冲击力。 Can withstand the shock from all three axis by 60g and two times per 11mS.					
抗震动强度 (Vibration resistance)		可承受三维方向上从5-30Hz, 0.04g到30-500Hz, 2g的阻尼震荡达5分钟。 Can withstand the vibration from 5-30Hz, 0.04g to 30-500Hz, 2g peak to peak amplitude for 5 minutes to all three axis.					
风扇锁定测试 (Lock Test)		风扇以额定电压锁定72小时, 当解除锁定之后均仍然正常运转。 Locked for at least72hrs at rated voltage, the fans run normally after lock released.					
反向电压测试 (Reversal Voltage Test)		风扇以额定电压作反向导电测试2~3分钟均不转动, 但正向导电后即可正常转动。 Test with reversal working voltage for 2~3minutes, all remain still, but all fans run normally after corrected voltage.					

# 规格说明书

## SPECIFICATION

物品 Article	4020 FAN	料号 Part No.	FAN-4020-PWM-5V	页数 Page	6 of 6	主题 Object	Drawing
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Drawing



框 叶	4020
单 位	mm
比 例	1:1
时 间	2021. 03. 10

NOTE:

- LEAD WIRE 1571 28AWG  
 RED WIRE ----- (+) (3)  
 BLACK WIRE ----- (-) (4)  
 YELLOW WIRE ----- (FG) (2)  
 BLUE WIRE----- (PWM) (1)
- 导线框外线长: 150mm