

恒德電機製品有限公司

(Hengde Motor Products Co., Ltd.)

產品規格書

Product Specifications

Customer name/客戶名稱：**HD-T146**

Customer model no./客戶型號：

Product model no./產品型號：**AF150SMV-23100-35.5**

Issuing date/發行日期：**2023 年 09 月 24 日**

Specification no./規格書編號：**AF150SMV-00005**

制 定 Drafter	審 核 Reviewer	批 准 Approver
张伟	伍锦明	譚喜旺

客戶確認 Customer confirmation

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Change Records of the Specifications

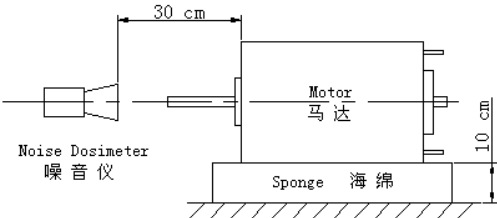
規格書編號 Specifications no.	發行日期 Issuing date	變更內容 Changed contents
AF150SMV-00005	2023 年 09 月 24 日	新发行

1、测定条件 1. Test conditions

	项 目 Items	规 格 Specification
1-1	额定电压 Rated voltage	(3.7) V DC 马达接线端子之间 Between the motor terminals
1-2	额定负载 Rated load	砝码: 20g.cm 模拟风叶: 61.0*10.1mm
1-3	马达方位 Motor orientation	轴伸出任意方向 Any direction of the shaft extension
1-4	环境温度、湿度 Ambient temperature and humidity	测试环境温度(10℃~30℃)、相对湿度 30%~95%。如对测试结果有疑问, 可在温度 20℃±2℃、湿度 65%±5%的条件下和电机初始运转 30 秒钟后再做判定。 Test ambient temperature: 10℃~30℃, Relative humidity: 30% ~ 95%. If you are in doubt with the test result, you can judge it again under the following conditions: temperature (20℃±2℃), humidity (65%±5%), and 30 seconds after the motor's initial running.

2. Characteristics

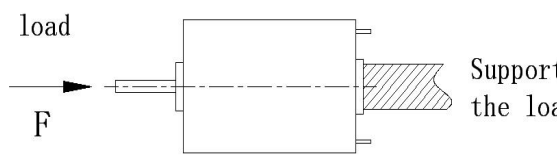
特性参数 Characteristics and parameters

	项 目 Items	测 试 条 件 Test conditions	规格 Specification
2-1	空载电流 No-load current	额定电压、无负载 Rated voltage, no load	≤ (120) mA
2-2	空载转速 No-load speed	额定电压、无负载 Rated voltage, no load	(7100) ± 300 rpm
2-3	空载起动电压 No-load starting voltage	无负载 No load	≤ (0.8) V
2-4	停转转矩 Stalling torque	额定电压 Rated voltage	≥ (100) g.cm
2-5	停转电流 Stalling current	额定电压(马达两端电压必须保持稳定 3.7V) Rated voltage (The voltage between the motor terminals must keep steady 3.7 V)	≥ (2400) mA
2-6	绝缘电阻 Insulation resistance	使用 DC100V 兆欧表, 测量电机接线端子与机壳之间的电阻 Use DC100V megger to measure the resistance between the motor terminals and the motor housing.	无特殊要求
2-7	电气噪音 Electrical noise		已装压敏电阻 The varistor has been installed.
2-8	机械杂音 Mechanical noise	额定电压、空载, 环境噪音: ≤32dB Rated voltage, no load, ambient noise: ≤32dB 	≤ (60) dB
2-9	电流波形 Current waveform	额定电压下, 无负载 Rated voltage, no load	无死点 No dead point.

3、标准工作条件 3. Standard working conditions

	项 目 Items	规 格 Specification
3-1	额定负载电流 Rated load current	$\leq (670) \text{ mA}$
3-2	额定负载转速 Rated load speed	$(6100) \text{ rpm} \pm 10\%$
3-3	旋 转 方 向 Rotation direction	(CCW)
3-4	接 地 极 性 Grounding polarity	无接地点 Without grounding point
3-5	电压使用范围 Operating voltage range	$(0.8) \sim (4.5) \text{ VDC}$
3-6	负 载 范 围 Load range	$(0) \sim (100) \text{ g} \cdot \text{cm}$

4、结构特性 4. Structural Characteristics

	项目 Items	测 试 条 件 Test conditions	规格 Specification
4-1	外 观 Appearance	目视 Visual inspection	无明显表面缺陷 Without obvious surface defects
4-2	外形尺寸 Dimensions	卡尺 Callipers	符合图纸要求 Conformity with the drawing requirements
4-3	重 量 Weight	天平 Scale	$\approx (28) \text{ g}$
4-4	轴向间隙 Shaft end play	百分表 Dial gage	$(0.05) \sim (0.5) \text{ mm}$
4-5	最大轴向受力 Maximum axial load	支撑点及受力如下图所示: The supporting point and load are shown in the following figure: 	$F \leq (18) \text{ kg}$

型号 Model：AF150SMV-23100-35.5			页码：3/4 Page:3/4																
5、可靠性、特殊试验 5. Reliability and special test																			
5-1	寿命测试 Life test	<p>如果满足下列项目中任何一项时，认为电机的寿命结束 。 If any one of the following items is met, the life of the motor is considered to end.</p> <p>1. 电机的负载转速、相对额定值超过±30% 。 The motor’s load speed and relative rated value are more than ±30%.</p> <p>2. 电机的负载电流、相对额定值超过±30% 。 The motor’s load current and relative rated value are more than ±30%.</p> <p>3. 确认电机不可使用 。 It’s confirmed that the motor cannot be used.</p> <p>4. 马达工作寿命大于 <u>待客户条件再测试</u> 小时(在正常温度和湿度，额定电压、额定负载下) The motor’s working life is more than <u>待客户条件再测试</u> hours (under normal temperature, humidity, rated voltage, and rated load)</p> <p>5. 工作周期，看下面示意图： The working cycle is shown in the following schematic diagram:</p> <div><div>3.7V</div><div><div></div><div></div></div><div>0 V</div><div>连续工作 Continuously operating</div></div>																	
5-2	跌落试验 Drop test	<p>将马达放进小包装中，在高度 200mm 处自然跌落在 10mm 厚的木板上 Put the motor into a small package, and drop it naturally at the height of 200mm down on a 10mm thick wood plank.</p>	<p>额定负载电流变化±30%。 The rated load current changes within ±30%.</p>																
5-3	存放试验 Storage test	<p>按下表各温度、湿度环境下放置试验后，在常温、常湿中放置 24 hrs 再测定参数。 After the shelf test in accordance with the temperature and humidity stipulated in the table, then put the motor for 24 hours under the room temperature and normal humidity, test its parameters.</p> <table><tr><td></td><td>Temperature 温度</td><td>Humidity 湿度</td><td>Time 时间</td></tr><tr><td>1</td><td>+70℃</td><td>30%</td><td>96h</td></tr><tr><td>2</td><td>+40℃</td><td>90%</td><td>96h</td></tr><tr><td>3</td><td>-20℃</td><td>/</td><td>96h</td></tr></table>		Temperature 温度	Humidity 湿度	Time 时间	1	+70℃	30%	96h	2	+40℃	90%	96h	3	-20℃	/	96h	<p>额定负载转速相对初始值变化：±30%。 The change of the rated load speed to the initial value is less than ±30%.</p> <p>额定负载电流相对初始值变化：±30%。 The change of the rated load current to the initial value is less than ±30%</p>
	Temperature 温度	Humidity 湿度	Time 时间																
1	+70℃	30%	96h																
2	+40℃	90%	96h																
3	-20℃	/	96h																

6、存放及使用环境 6. Storage and using environment

	项 目 Items	规 格 Specification
6-1	存放环境 Storing environment	<p>1. 请不要将马达存放于高温和湿度大的环境条件下,也不要放于产生腐蚀性气体的环境中,以免产生故障。 Please don't put the motor in the place of high temperature and humidity, nor put it in the environment with corrosive gases in order to avoid failure.</p> <p>2. 推荐环境: 温度+10℃~30℃, 相对湿度 30%~95%。 Recommended environment: temperature +10℃ ~ 30℃, relative humidity 30% ~ 95%.</p> <p>3. 当马达放于仓库内4个月或以上(而带油脂马达为3个月或以上),要特别注意起动性能的恶化,必须再用额定电压测试性能后,符合标准才可使用。 If the motor is stored in the warehouse for 4 months or more (the motor with grease is stored for 3 months or more), it is important to pay special attention to the deterioration of its starting performance. The motor must be tested its performance under rated voltage and conforms to the standard can it be put into use.</p>
6-2	使用环境 Using environment	<p>1. 不用说是腐蚀性之气体(H₂S、SO₂、NO₂、CL₂),其它有害的气体环境中以及能产生有害气体的物质(尤其是有机硅 Silicic, 含氰物质 Cyanic, 福尔马林 Formalin, 苯酚 Pheol 等系列物质)存在的场所,要避开在此场所的使用及保存。特别是在马达整机内部不能有上述物质的存在,这些都是马达故障,死机的原因。 Do not put the motor in the environment with corrosive gases (such as H₂S, SO₂, NO₂, CL₂) and other harmful gases, let alone putting it in the environment where there are substances that can produce harmful gases (especially the substances such as organic Silicon, Cyanide, Formalin, and phenol, etc.). Avoid such places when using and storing it. Especially the above substances are not allowed to exist inside the motor, for they are the causes to motor fault and crash.</p> <p>2. 如果含有低分子硅化合物材料附着在马达的换向器、电刷或其它部件上,在换向产生的电能的作用下,硅化合物材料就会分解成 SiO₂, SiC 和其它成分,这些成分会使换向器和电刷之间的电阻产生较快的增加,当硅化合物材料用在整机上时应非常注意。同时也要仔细检查所用粘合剂或密封材料不会产生有害气体,不管是用在马达安装上或客户整机产品的装配上,特别是使用含有氰化物和硫化物气体的粘合剂或密封材料时。 If there are low molecular silicon compounds attached to the motor's commutator, brush or other parts, under the action of electricity produced by reversing, these silicon compounds will broken down into SiO₂, SiC and other materials, which can make the resistance between the commutator and brush rapidly increase. Therefore, when the silicon compounds are used onto the motor, we must be very careful. At the same time check to ensure the adhesive or sealing materials used won't produce harmful gases, whether they are used on the motor or on the customer's assembly product, especially when using adhesives that contains cyanide and sulfur gases or sealing materials.</p> <p>3. 马达使用时周围的温度会影响性能和寿命,要特别注意高温、潮湿的环境,推荐环境为6-1项第2点。 Since the temperature around the motor will affect its performance and life, it is important to pay special attention to the high temperature and damp environment. The recommended environment should be point 2 of item 6-1.</p>

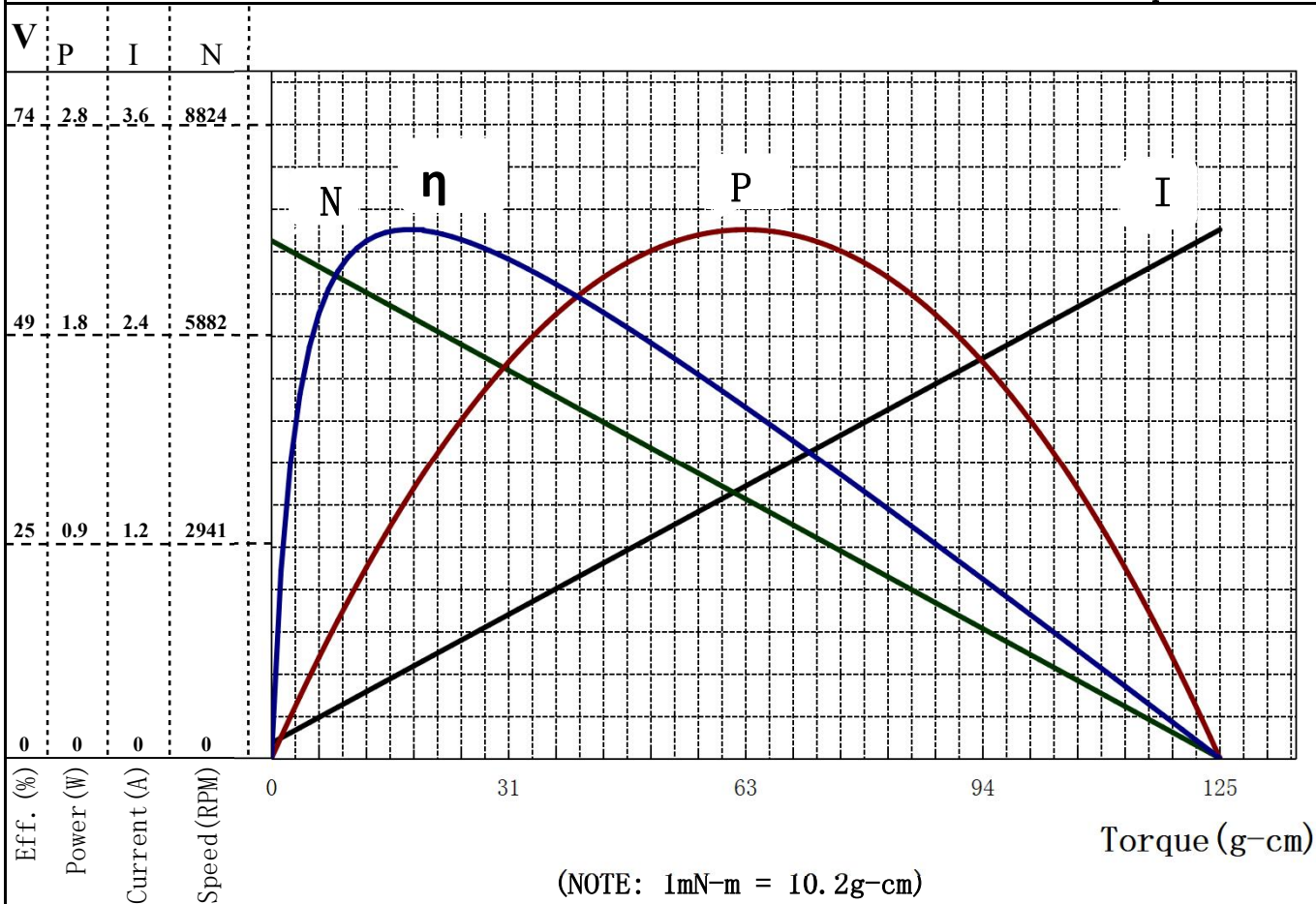
恒德電機製品有限公司

(Hengde Motor Products Co., Ltd.)

Sample No: AF150SMV-00005
Model: AF150SMV-23100-35.5

Customer _____ Date: 2023/9/24
Efficiency _____
Power output _____

NOTE: Performance (in an ambient temperature of 25–30°C)
Motor tested rapidly to prevent



Constant voltage : 3.7 Volts
Direction: CCW

At No Load

Speed: 7200 rpm
Current: 0.085 A

At stall (Extrapolated)

Torque: 125.0 g-cm
Current: 2.98 A

At maximum efficiency

Efficiency: 61.4 %
Torque: 20.0 g-cm
Speed: 6067 rpm
Current: 0.55 A
Output: 1.24 W

At maximum Power output

Output: 2.31 W
Torque: 62.5 g-cm
Speed: 3658 rpm
Current: 1.53 A

Issued by QA Reliability Testing Center

COMPUTER PRINT-OUT

NOMINAL MOTOR CURVES

Performance and characteristics are measured
based on limited motor samples only

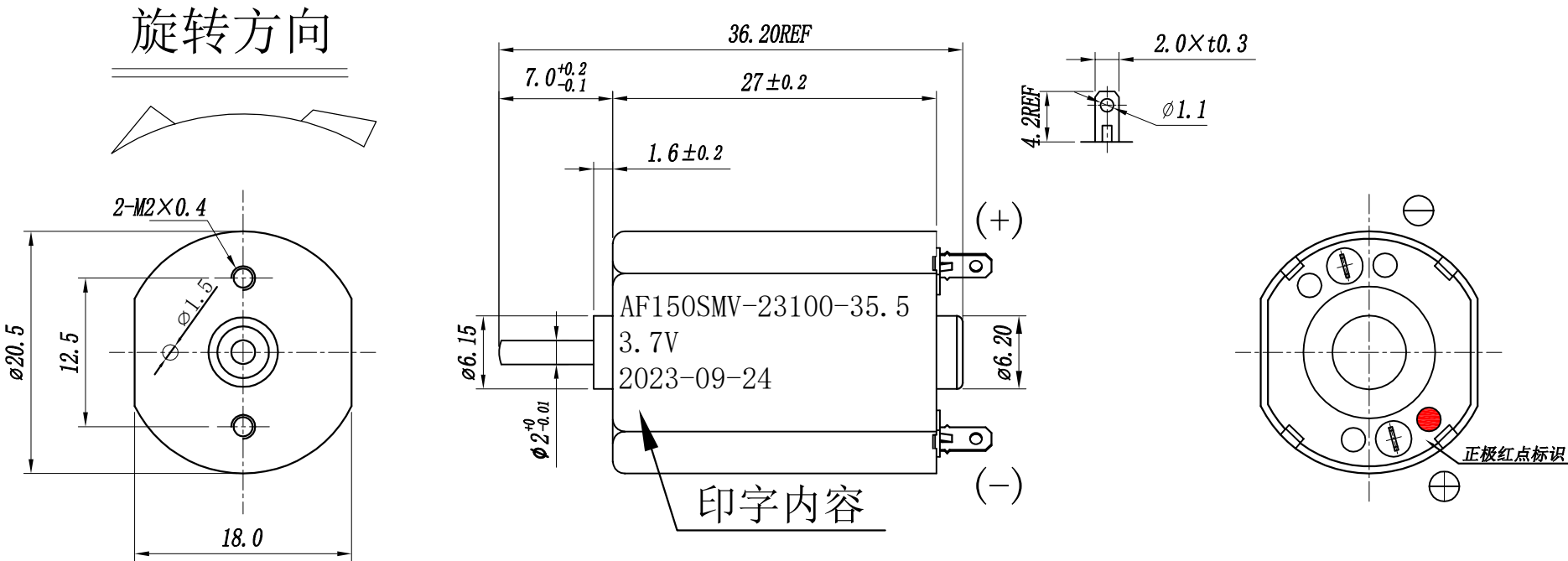
Prepared by: 张伟

Checked by: 伍锦明

Approved by: 谭喜旺

记号	年月日	记 事	联络书NO	记 印	检 印

轴长：35.5L



注记 (NOTES) :

- 7.0^{+0.2}_{-0.1}mm只有在马达轴针位于右端极限位置时应用。
7.0^{+0.2}_{-0.1}mmDIM APPLIES ONLY WHEN
MOTOR SHAFT IS IN EXTREME RIGHT POSITION.
- 轴向间隙范围：0.05-0.5mm.
END PLAY LIMITS OF SHAFT 0.05-0.5mm.
- 未标注尺寸公差：±0.2mm
TOLERANCES NOT SPECIFIED：±0.2mm
- 单位：毫米
UNITS:MILLIMETERS

		AF150SMV-23100-35.5					HD-T146				
编 号		部 品 名			材 料		数/台		备 考		
承 认		比 例	热 处 理	淬 火		HR-C	名 称	AF150 马达尺寸图			
检 图		谭喜旺	表面处理								
设 计		伍锦明		制图日	2023. 09. 24		图 号	90-D632			REV
制 图		张伟	恒德电机制品有限公司								A0

加工序	工程名
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整 站