
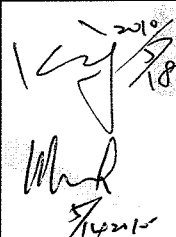



SUNON

SPECIFICATION FOR APPROVAL

CUSTOMER :
MOTOR TYPE : 
MODEL NO : TA001-09012
DESCRIPTION : LED Cooling Module
DIMENSIONS : $\phi 59 \times 20.53$ mm
SUNON SPEC. NO. : D05047670G-00
CUSTOMER APPROVAL NO. :
APPROVED BY CUSTOMER :
 (AUTHORIZED)

DRAWN	Nancy 05/14	CHECKED		APPROVED		SPEC.NO	D05047670G-00
						ISSUE DATE	05. 14. 2010
						EDITION	0
						REVISION DATE	
						E.SPEC	E10900548

建準電機工業股份有限公司

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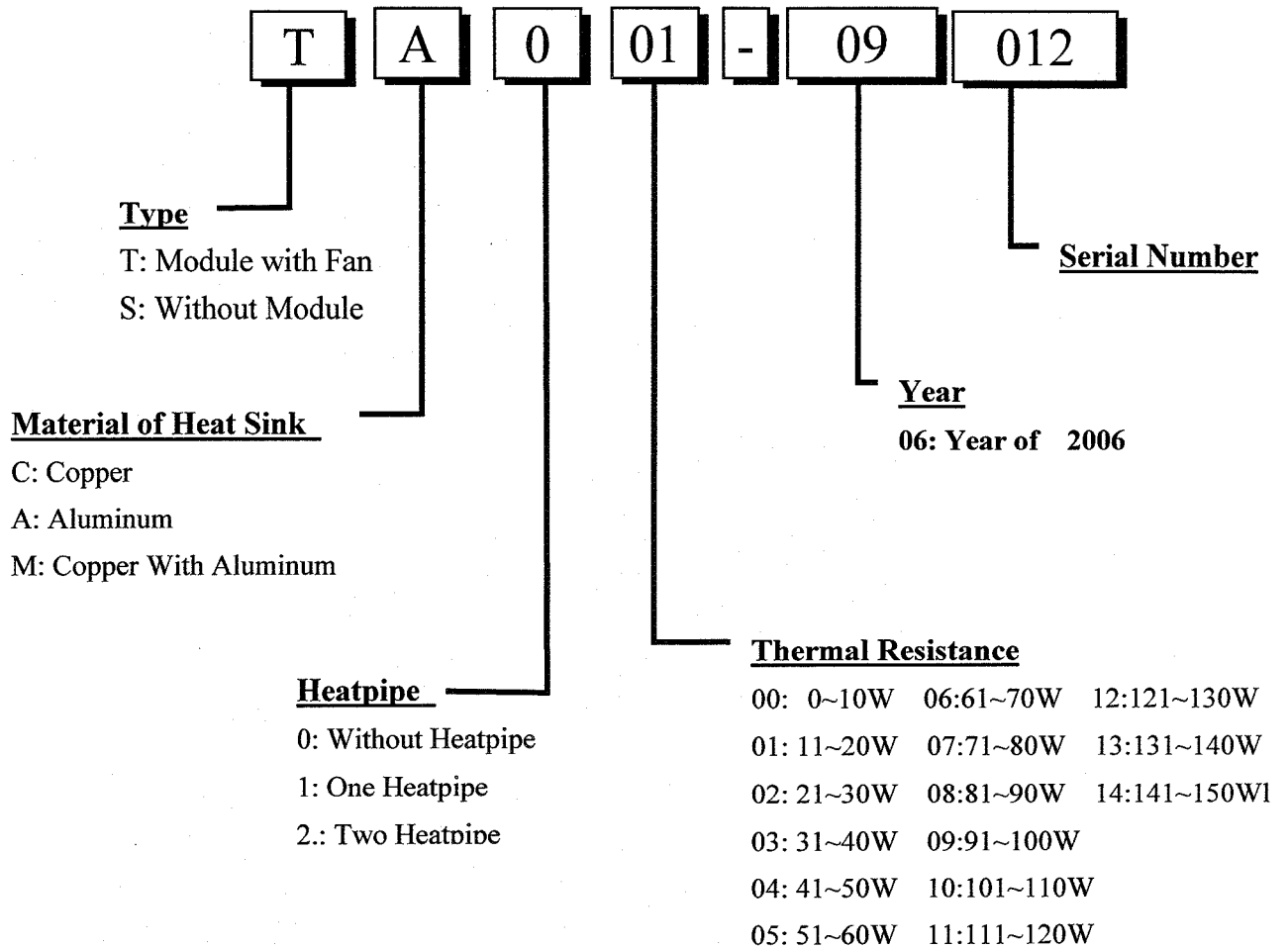
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I. MODEL NUMBERING SYSTEM

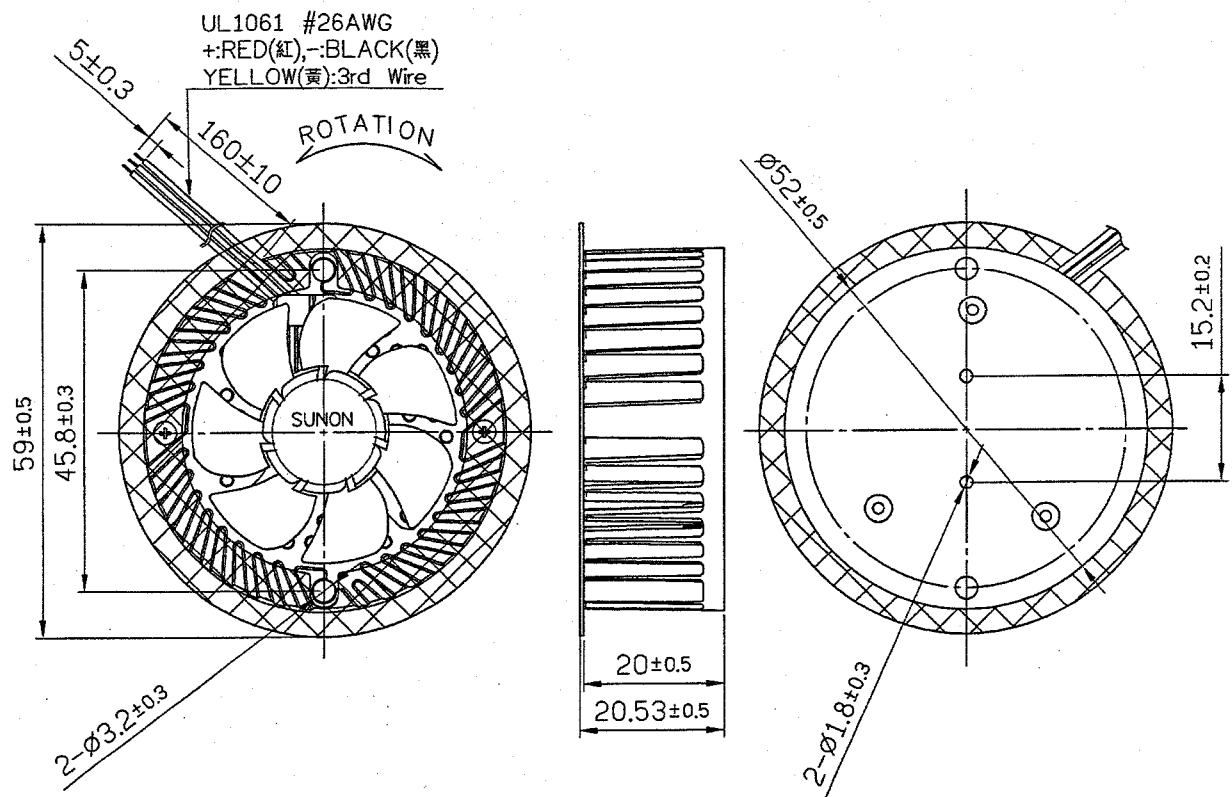


II. SPECIFICATION

1. Application	LED lamp
2. Heat Sink Dimension	φ 52 × 20 mm
3. Cooling Method	Fan
4. Material of Heat Sink	ADC12
5. Material of Fan blade	Thermoplastic PBT of UL 94V-0
6. Material of Frame	Thermoplastic PBT of UL 94V-0
7. Fan Dimension	φ 38 × 15.6 mm
8. Fan Speed (with Heat Sink)	3800 RPM ± 10%
9. Fan Rating Voltage	5 V
10. Fan Rating Current(with Heat Sink)	42 mA
11. Fan Power Consumption (with Heat Sink)	0.21 Watts
12. Motor Design	3 phases, 4-poles Brushless DC motor
13. Fan Bearing Type	VAPO Bearing System
14. Direction Of Rotation	Clockwise (CW) viewed from front of fan blade, after power on 30 seconds, Counter- Clockwise(CCW) viewed from front of fan blade.
15. Cooling Module Noise @ 1M	16.8 dB(A) +2 dB(A)
16. Operating Voltage Range	4~5.5 VDC
17. Starting Voltage	4 VDC
18. Operating Temperature	-10 to + 70 deg. C
19. Storage Temperature	-40 to + 70 deg. C
20. Weight	48 ± 2 g
21. Thermal resistance	1.2 °C/Watts
22. Life Expectance (MTTF)	50,000 Hours at 60 deg. C, 65% humidity, 90% CL.
23. Tolerance	±20% on rated power and current.
24. Special Features	<input checked="" type="checkbox"/> Self -Cleaning <input checked="" type="checkbox"/> Over Temperature Protection <input checked="" type="checkbox"/> Fan Speed Alarm

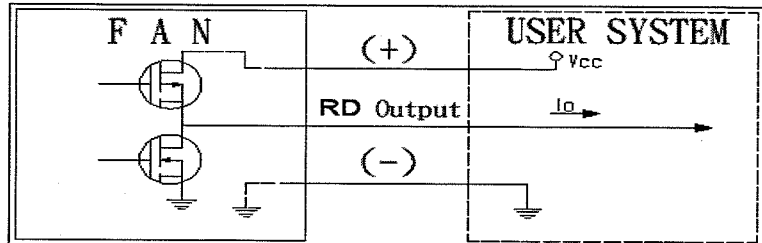


DIMENSIONS

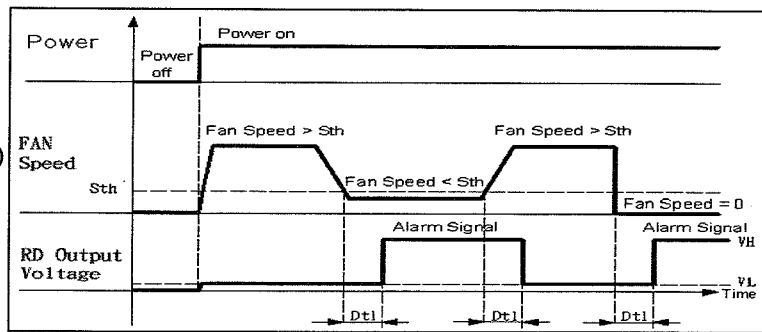


RD TYPE WITH TEMPERATURE AND SPEED ALARM

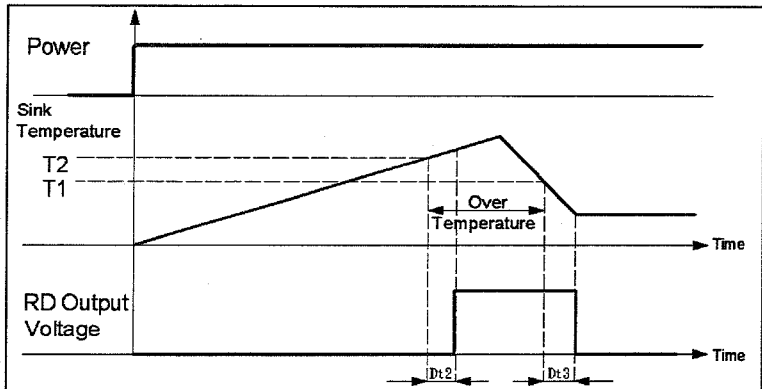
● R Type (Rotation Detector)



Condition 1
(Under Threshold Speed)



Condition 2
(Over Temperature)



★Electrical Characteristics : (at $T_a = 25^\circ\text{C}$, $V_{cc} = 5\text{VDC}$)

Parameter	Ratings			Unit
	min	typ.	max	
RD Output Current (I_o)	-	3	5	mA
RD Output Voltage (V_H)	3	4.5	5	Voltage
RD Output Voltage (V_L)	-	0.4	0.6	Voltage
RD Output Delay Time ($Dt1$)	-	0.5	1	Second
RD Output Delay Time ($Dt2$)	-	1	3	Second
RD Output Delay Time ($Dt3$)	-	1	3	Second
Release Temperature ($T1$)	47	50	53	$^\circ\text{C}$
Alarm Temperature ($T2$)	67	70	73	$^\circ\text{C}$
Threshold Speed (Sth)	800	1000	1200	RPM



III. OTHER SPECIFIED TESTING

The following is a general description of certain tests that are performed on representative Sunon fans. Nothing in this document is intended to suggest that these tests are performed on every model of Sunon fan. Moreover, the descriptions that follow each test are meant only to provide a general explanation of each test. If you would like a more detailed explanation as to any test identified in this Section, Sunon can provide such an explanation upon request.

1. DROP PROOF TEST

Fans are packaged in a standard size shipping box and are dropped to the ground from certain heights and angles depending on the weight of the particular box.

2. HUMIDITY PROOF TEST

The fan is operated for 96 continuous hours in an environment with humidity of 90% to 95% RH at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

3. VIBRATION PROOF TEST

Vibration with an amplitude 2mm and a frequency of 5-55-5hz is applied in all 3 directions (X,Y,Z), in cycles of 1 hour each, for a total vibration time of 3hours.

4. THERMAL CYCLING TEST

The fan is operated in a testing chamber for 50 cycles. In each cycle, the temperature is gradually increased from -10°C to 70°C for 90 minutes, and subsequently operated at 70°C for 120 minutes. The temperature is then gradually decreased from 70°C to -10°C for 90 minutes, and subsequently operated at -10°C for 120 minutes.

5. SHOCK PROOF TEST

100G of force is applied in the 3 directions (X,Y, and Z) for 2 milliseconds each.

6. LIFE EXPECTANCY

The "Life Expectancy" of SUNON fans is determined in SUNON's reliability test laboratory by using temperature chambers. The "Life Expectancy" of this fan has not been evaluated for use in combination with any end application. Therefore, the Life Expectancy Test Reports (L10 and MTTF Report) that relate to this fan are only for reference.

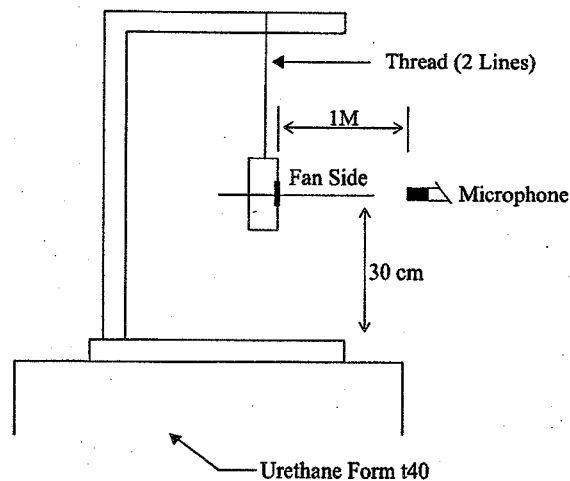


IV. CHARACTERISTIC DEFINITION

The following is a general description of certain tests that are performed on representative Sunon fans in order to determine the specifications of the fan. Nothing in this document is intended to suggest that these tests are performed on every model of Sunon fan. Moreover, the descriptions that follow each test are meant only to provide a general explanation of each test. If you would like a more detailed explanation as to any test identified in this Section, Sunon can provide such an explanation upon request.

1. ACOUSTICAL NOISE

Measured in a semi-anechoic chamber with background noise level below 15dB(A).



1 METER FROM MICROPHONE TO FAN INTAKE

The fan is running in free air under shaft horizontal condition with the microphone at distance of one meter from the fan intake.

2. INPUT POWER

Measured after continuous 10 minute operation at rated voltage in clean air (STATIC PRESSURE=0), and at ambient temperature of 25 degrees C under shaft horizontal condition.

3. RATED CURRENT

Measured after continuous 10 minute operation at rated voltage in clean air (STATIC PRESSURE=0), and at ambient temperature of 25 degrees C under shaft horizontal condition.

4. RATED SPEED

Measured after continuous 10 minute operation at rated voltage in clean air (STATIC PRESSURE=0), and at ambient temperature of 25 degrees C under shaft horizontal condition.

5. STARTING VOLTAGE

Measured the voltage which enables to start the fan in the clean air (static pressure = 0) by switching on at the voltage under shaft horizontal condition. It is not at continuously increasing voltage adjustment.

6. LOCKED ROTOR CURRENT

Measured immediately after the fan blade is locked.

7. AIR FLOW AND STATIC PRESSURE

The performance specification of air flow and static pressure shown in this specification for approval is measured using the exhaust method. A double chamber is used in accordance with AMCA 210 standard or DIN 24163 specification . The values are recorded when the fan speed has stabilized at rated voltage.

8. INSULATION RESISTANCE

1. PLASTIC HOUSING:

- (1) Measured between internal stator and lead wire(+).
- (2) Measured between housing and lead wire(+).

2. ALUMINIUM HOUSING:

Measured between internal stator and lead wire(+).

9. DIELECTRIC STRENGTH

Measure between housing and lead wire(+).



V. NOTE

I .SAFETY

1. DO NOT use or operate this module in excess of the limitations set forth in this specification. SUNON is not be responsible for the non-performance of this module and/or any damages resulting from its use, if it is not used or operated in accordance with the specifications.
2. SUNON recommends adding a protection circuit to the product or application in which this module is installed, such as a thermo-fuse, or current-fuse or thermo-protector. The failure to use such a device may result in smoke, fire, electric shock by insulation degradation in cases of motor lock, motor lead short circuit, overload, or over voltage, and/or other failure.
3. SUNON recommends installing a protection device to the product or application in which this module is installed if there is a possibility of reverse-connection between VDC (+) and GND (-). The failure to install such a device may result in smoke, fire, and/or destruction, although these conditions may not manifest immediately.
4. This module must be installed and used in compliance with all applicable safety standards and regulations.
5. Use proper care when handling and/or installing this module. Improper handling or installation of this module may cause damage that could result in unsafe conditions.
6. Use proper care during installation and/or wiring. Failure to use proper care may cause damage to certain components of the module including, but not limited to, the coil and lead wires, which could result in smoke and/or fire.
7. DO NOT use power or ground PWM to control the fan speed. If the fan speed needs to be adjusted, please contact Sunon to customize the product design for your application.
8. For critical or extreme environments, including non stop operation, please contact Sunon and we will gladly provide assistance with your product selection to ensure an appropriate cooling product for your application.



II. SPECIFICATION MODIFICATION

1. SUNON offers engineering assistance on module installation and cooling system design.
2. All changes, modifications and/or revisions to the specifications, if any, are incorporated in the attached specifications.
3. No changes, modifications and/or revisions to these specifications are effective absent agreement, by both Sunon and the customer, in writing.
4. This module will be shipped in accordance with the attached specification unless SYNON and the customer have agreed otherwise, in writing, as specified in Paragraph 3, above.

III. OTHER

1. When building your device, please examine thoroughly any variation of EMC, temperature rise, life data, quality, etc. of this product by shock/drop/vibration testing, etc. If there are any problems or accidents in connection with this product, it should be mutually discussed and examined.
2. Use proper care when handling this module. Components such as module holders or bearings may be damaged, if touched with fingers or other objects. Additionally, static electricity (ESD) may damage the internal circuits of the module.
3. DO NOT operate this module in proximity to hazardous materials such as organic silicon, cyanogens, formalin, phenol, or corrosive gas environments including, but not limited to, H₂S, SO₂, NO₂, or Cl₂.
4. SUNON recommends that you protect this module from exposure to outside elements such as dust, condensation, humidity or insects. Exposure of this module to outside elements such as dust, condensation, humidity or insects may affect its performance and may cause safety hazards. SUNON does not warrant against damage to the product caused by outside elements.
5. This module must be installed properly and securely. Improper mounting may cause harsh resonance, vibration, and noise.



6. Fan guards may prevent injury during handling or installation of the module and are available for sale with this module.
7. Unless otherwise noted, all testing of this module is conducted at 25°C ambient temperature and sixty-five percent (65%) relative humidity.
8. DO NOT store this module in an environment with high humidity. This module must be stored in accordance with the attached specifications regarding storage temperature. If this module is stored for more than 6 months, SUNON recommends functional testing before using.
9. SUNON reserves the right to use components from multiple sources at its discretion. The use of components from other sources will not affect the specifications as described herein.
10. The “Life Expectancy” of this module has not been evaluated for use in combination with any end application. Therefore, the Life Expectancy Test Reports (L10 and MTTF Report) that relate to this module are only for reference.

VI. WARRANTY

This module is warranted against all defects which are proved to be fault in our workmanship and material for one year from the date of our delivery. The sole responsibility under the warranty shall be limited to the repair of the module or the replacement thereof, at SUNON’s sole discretion. SUNON will not be responsible for the failures of its modules due to improper handling, misuse or the failure to follow specifications or instructions for use. In the event of warranty claim, the customer shall immediately notify SUNON for verification. SUNON will not be responsible for any consequential damage to the customer’s equipment as a result of any modules proven to be defective.



Declaration of RoHS

Control declaration of environment-related substances/materials

1. In accordance with the Restriction of Hazardous Substances (RoHS) Directive, Sunon product have complied with law and discipline not to employ the forbidden substances, and restrict the allowable concentration of some limited substances deliberately in our components.

No	Substance	Criteria	
1	CFCs & HCFCs (ozone depleting substances)	Forbidden	
2	Chlorinated Organic Solvent	Forbidden	
3	Lead and its compounds	Plastic (Frame, Impeller, wire harness, etc.)	<100ppm
		Solder	<1000ppm
		Steel alloy	<3500ppm
		Aluminium alloy	<4000ppm
		Copper alloy	<4wt%
4	Cadmium and its compounds	Solder	<20ppm
		Parts composed of metals containing zinc (e.g. brass, zinc for die casting)	<100ppm
		Plastic	<5ppm
5	PBBs and PBDEs	Forbidden	
6	PCB and PCT	Forbidden	
7	CP, Short-chain Chlorinated paraffins C10-13, Cl ₂ ≥48 wt%	Forbidden	
8	Mirex	Forbidden	
9	PCN	Forbidden	
10	Hexavalent Chromium compounds	<100ppm	
11	Mercury and its compounds	Forbidden	
12	Asbestos	Forbidden	
13	Organic Tin compounds	Forbidden	
14	Azo compounds	Forbidden	
15	TBBP-A in external case plastic parts of products (PCB is exempted)	<1000ppm	
16	Nickel in external case parts, which are likely to result in prolonged skin exposure	<1000ppm	

