


# SUNON

## SPECIFICATION FOR APPROVAL

**CUSTOMER** :

**MOTOR TYPE** : 

**MODEL NO** : LM310-001A99DN

**DESCRIPTION** : LED Cooling Module

**DIMENSIONS** : 121×92.3×66.0 mm

**SUNON SPEC. NO.** : C04004570G-00

**CUSTOMER APPROVAL NO.** :

**APPROVED BY CUSTOMER** :

(AUTHORIZED)

<b>DRAWN</b>  Ruby  06/06	<b>CHECKED</b>  Terry	<b>APPROVED</b>  Jacky	<b>SPEC. NO</b>	C04004570G-00
			<b>ISSUED DATE</b>	12. 27. 2012
			<b>EDITION</b>	1
			<b>REVISION DATE</b>	06. 06. 2013

建準電機工業股份有限公司

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## SPECIFICATION FOR APPROVAL

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**1.SCOPE**

**This compact LED cooling module (including Sunon's patented fan) is designed for heat dissipation of LED lamp. The following specification outlines the performance of this module for LED lighting system**

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建準電機工業(股)公司  
研發部  
發行章

**MODEL : LM310-001A99DN****2.SPECIFICATIONS**

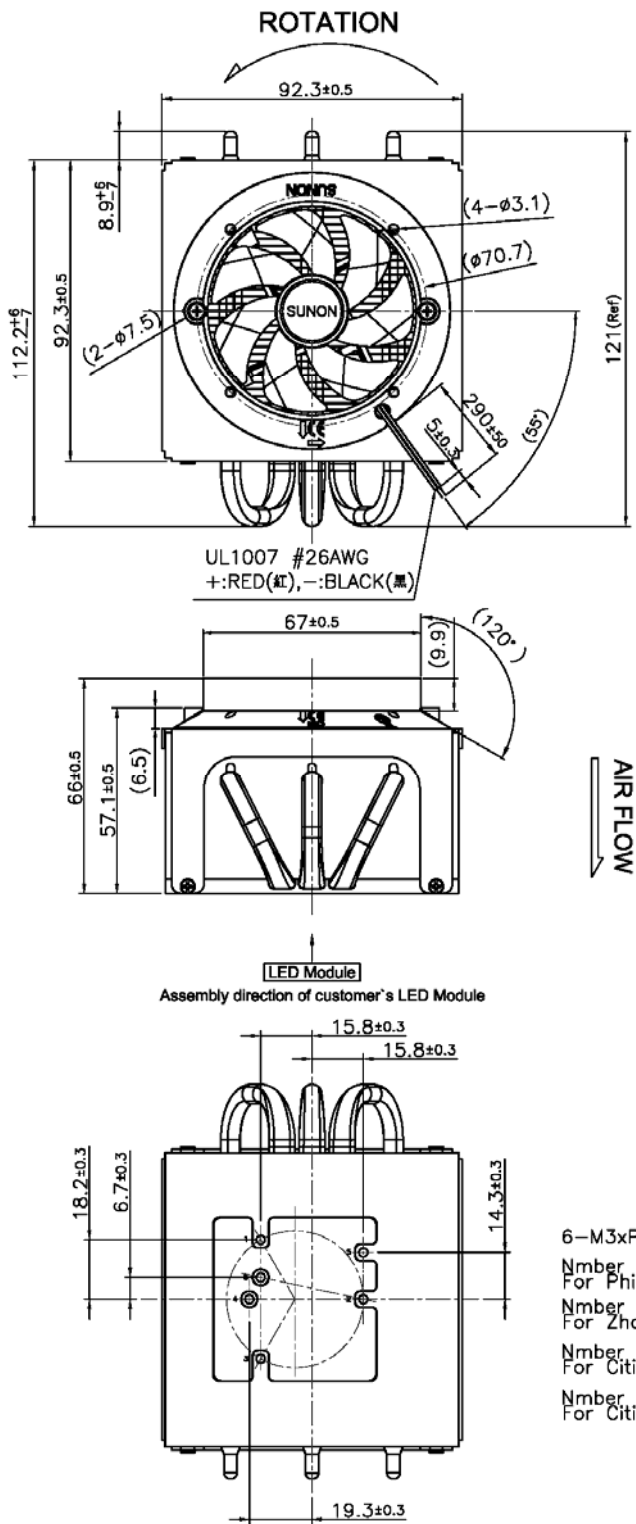
1. Module Dimension	§ 121×92.3×66.0 mm
2. Heat Sink Material	ADC10(Base) + AL1050(Fin) + C1100(Heat Pipe & Base)
3. Cooling Method	Fan
4. Fan Speed (with Heat Sink)	2200RPM ±10%
5. Rated Voltage	12 VDC
6. Rated Current	28 mA
7. Power Consumption	0.34 Watts
8. Fan Bearing System	Vapo
9. Cooling Module Noise @ 1M	17.8 dB(A)
10. Operating Voltage Range	6 ~13.8 VDC
11. Operating Temperature	-10 to + 70 deg. C
12. Storage Temperature	-40 to + 70 deg. C
13. Weight	352 g
14. Thermal resistance	0.33 °C /Watts (Based on CLL050)
15. Tolerance	±20% on rated power and current.
16. Safety	UL/CUR/TUV/CE Approvals
17. Life Expectancy (MTTF)	70,000 Hours at 60 deg. C, 65% humidity, 90% CL .

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**3.DIMENSION**



- 6-M3xP0.5
- Nmber 1, 2 & 3  
For Philips LED Module Assembly
- Nmber 2 & 4  
For Zhaga LED Module Assembly
- Nmber 2 & 6  
For Citizen CCL040 LED Module Assembly
- Nmber 3 & 5  
For Citizen CCL050 LED Module Assembly

UNIT:mm

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# Notes

## I .SAFETY

1. **DO NOT use or operate this module in excess of the limitations set forth in this specification. SUNON is not 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 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.**

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# Notes

## 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 SUNON 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, H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, or Cl<sub>2</sub>.
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.

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## Notes

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.

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## Declaration of RoHS

### Control declaration of environment-related substances/materials

1. In accordance with the Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, 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	Plastic (Frame, Impeller, wire harness, etc.)	<100ppm
	Solder	<1000ppm
	Steel alloy	<3500ppm
	Aluminium alloy	<4000ppm
	Copper alloy	<4wt%
4	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 $\geq$ 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
17	Hexabromocyclododecane (HBCDD)	<1000ppm
18	Di-butyl Phthalate (DBP)	<1000ppm
19	Benzyl butyl Phthalate (BBP)	<1000ppm
20	Di-ethylhexyl Phthalate (DEHP)	<1000ppm
21	Di-isobutyl Phthalate (DIBP)	<1000ppm

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