

SUNON®

Ultra Micro Cooling Device

让手机·系统不发烧发烫
让智慧·行动无后顾之忧



Smart Phone



Pad



Ultrabook



Ionic Air Purifier



Pico Projector



*可接受客制化·厚度3mm以下更薄的风扇产品。

www.sunon.com.cn

Date : 2013.05.27(192-C)
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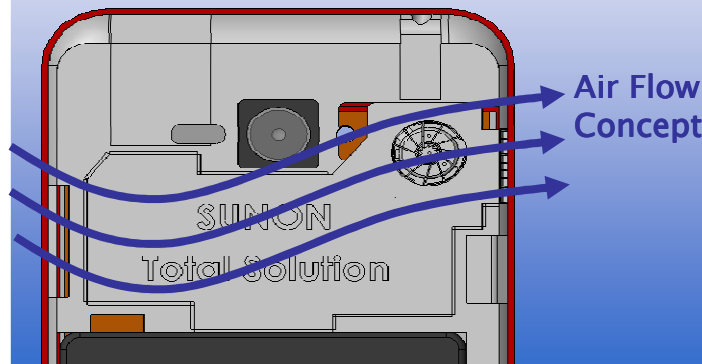


HD 超高画质分辨率屏幕、大量影像内容处理、多核心高运算速度、4G LTE 芯片、摄录像功能提升、超薄精致外型、效能更提升，使用的电子组件越来越多，内部功耗也越增加...

多涂点防热胶、加装散热片，贴石墨材料、甚至采用全铝合金外壳等被动散热组件处理方法，已无法解决系统热的难题。

全方位散热解决方案

毫米科技风扇 + 微型散热鳍片 + 防尘、防水 + 防止EMC/EMI 及自动控制设计，
让气流通过主要热源区进行有效驱热



主动式散热比被动式散热

更有效降低CPU 温度25 °C 以上。

更有效降低手机表面温度15 °C 以上。

SunonUltra Micro Cooling Device 产品特色

1 行动装置量身打造 最佳散热解决方案

Sunon 散热设计具备小型化、薄型化、低震动等特性，迎合系统内部空间与高度受限并兼顾手持式手感要求。

2 高效率散热

主动式散热设计比被动式散热更有效降低 CPU 温度 25 °C 以上；同步降低手机表面温度 15 °C 以上。

3 超省电、极静音

采用磁浮系统设计，省电 50%，PQ 加倍，静音低于 20 Phon，符合行动装置长效电池续航与声音质量的要求。

4 防尘、防水 防磁波

具备 EMC / EMI 电磁波防护设计，同时通过 IP58 防尘防水等级第三方验证。(视实际机型)

5 智能型自控设计

为避免干扰手机通讯质量，在通话状态下，风扇会停止或低速运转，当温度过热时会自动散热。让手机散热得到解决，同时可免除噪音的困扰。

6 环保材质 高可靠度

符合无卤 RoHS2.0，并采用 UL 94 V-0 防火塑料、耐高温环境、耐化学侵蚀，并通过 1 公尺落下验证。

Sunon毫米系列(轴流风扇)



8x8x3mm



8x8x5mm



10x10x3mm



12x12x3mm



15x15x3mm



17x17x3mm

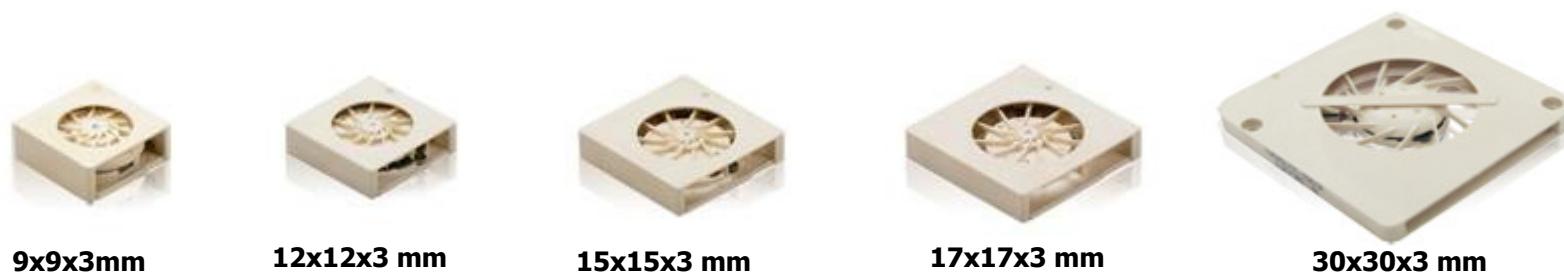
Size (mm)	Model	Volt. (V)	OV (V)	Current (mA)	Consumption (Watts)	Speed (RPM)	Q (l/min)	P (Pa)	Noise dB(A)
8x8x3	UF383-100	3	2.1-3.5	93	0.30	13500	0.17	1.56	14.1/5 cm
8x8x5	UF385-100	3	2.0-3.5	49	0.10	17000	0.61	2.98	17.1/30 cm
10x10x3	UF3A3-500 UF3A3-700	3	2.0-3.5	96	0.29	17000	3.43	10.44	27.3/10cm
12x12x3	UF3C3-500 UF3C3-700	3	2.0-3.5	97	0.30	16500	5.95	18.91	28.3/20cm
15x15x3	UF3F3-500 UF3F3-700	3	2.0-3.5	36	0.10	14500	8.75	20.36	30.0/30cm
17x17x3	UF3H3-500 UF3H3-700	3	2.0-3.5	37	0.10	13000	16.27	21.21	32.0/30cm

UFxxx-500 :3 wires (3rd F type)

UFxxx-700: 2 wires

噪音量测距离一般风扇标准的噪音量测距离为100cm，由于毫米科技风扇在100cm距离无法测得噪音值(低于背景噪音)，因此毫米科技风扇噪音值之量测距离为30cm以下。

Sunon毫米系列(鼓风机)



Size	Model	Volt.	OV	Current	Consumption	Speed	Q	P	Noise
		(V)	(V)	(mA)	(Watts)	(RPM)	(l/min)	(Pa)	dB(A)
9x9x3	UB393-500 UB393-700	3	2.0-3.5	92	0.28	17400	1.17	16.17	25.0/30cm
12x12x3	UB3C3-500 UB3C3-700	3	2.0-3.5	36	0.10	15500	2.67	22.96	26.0/30cm
15x15x3	UB3F3-500 UB3F3-700	3	2.0-3.5	38	0.10	14000	4.53	33.85	30.0/30cm
17x17x3	UB3H3-500 UB3H3-700	3	2.0-3.5	37	0.10	12500	6.50	40.34	32.0/30cm
30x30x3	UB5U3-500 UB5U3-700	5	2.0-6.0	72	0.36	9500	18.0	88.18	36.0/30cm

UBxxx-500 :3 wires (3rd F type)

UBxxx-700: 2 wires

噪音量测距离 一般风扇标准的噪音量测距离为100cm，由于毫米科技风扇在100cm距离无法测得噪音值(低于背景噪音)，因此毫米科技风扇噪音值之量测距离为30cm以下。

Sunon超薄系列(大尺寸鼓风机)-适用于Ultrabook、PAD



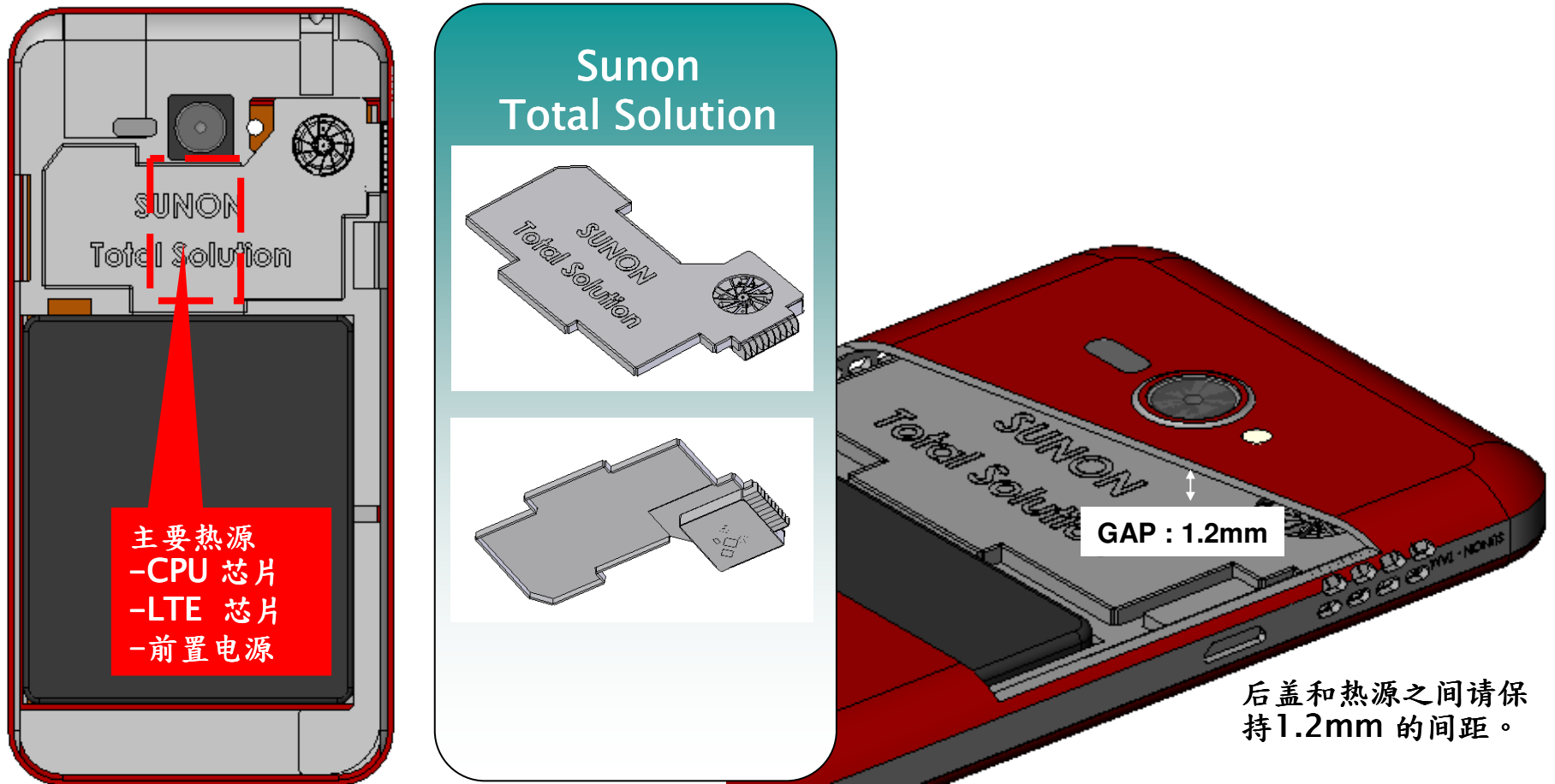
Size (mm)	Specifications				
	Rated Voltage (VDC)	Speed (RPM)	Air Flow (CFM)	Static Pressure (In-H2O)	Noise (dB(A))
30x30x4	5	14000	1.5	0.55	40/50cm
40x40x4	5	9000	1.7	0.70	41/50cm
50x49x4	5	4300	1.7	0.30	27/50cm
65x50x4	5	4300	2.0	0.37	32/50cm
65x60x4	5	4800	2.5	0.40	37/50cm

*可接受客制化更薄的风扇产品，上述规格仅供参考。

*系统距离风扇入风口需预留至少1.2mm的进风空间。

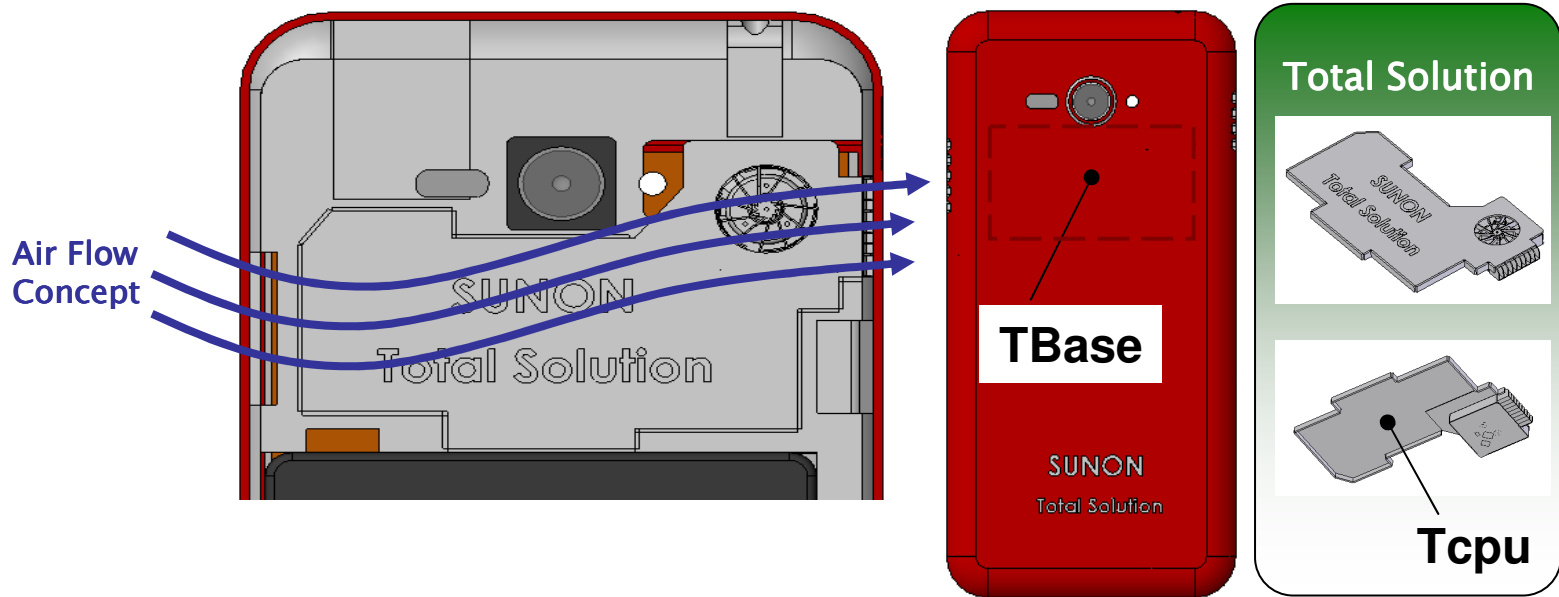
智能型行动系统散热解决方案(适用于手机、PAD...)

手机、PAD 是属于高密度的电子系统装置，Sunon 提供全方位散热解决方案，以风扇散热模块结合最佳化热流规划、声音质量分析、与防止EMC/EMI电磁波干扰隔间设计，并兼具有IP58 防尘防水设计，让系统无后顾之忧。



智能型行动系统散热解决方案(适用于手机、PAD...)

Sunon 全方位散热解决方案让气流通过主要热源区进行有效散热。



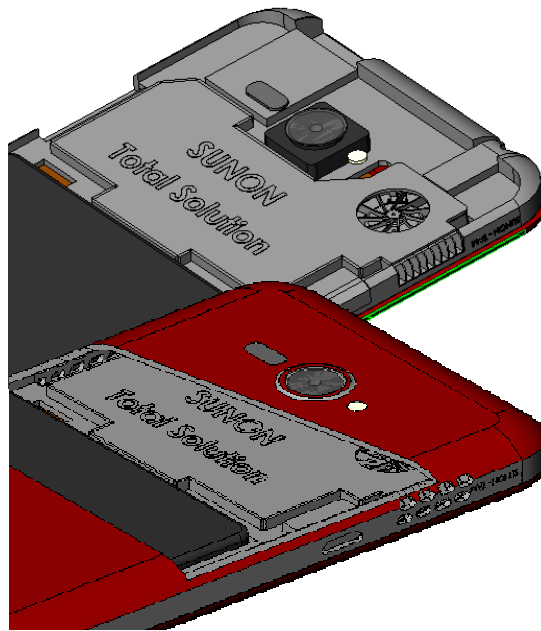
Type	Power Dissipation (W)	Ta (°C)	CPU 温度 Tcpu (°C)	手机表面温度 Tbase (°C)	SPL @0.35m dB(A)
Passive	5.0	25.0	109.9	69.5	-
Active (+Fan)	5.0	25.0	83.4	54.3	35.0

相同体积条件下测试结果

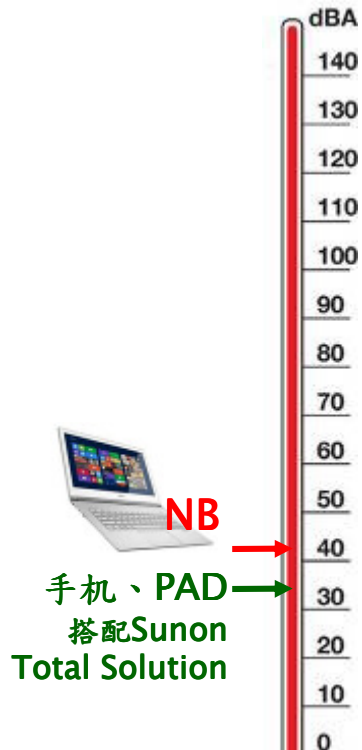
主动式散热比被动式散热更有效降低CPU 温度26.5 °C。

主动式散热比被动式散热更有效降低手机表面温度15.2 °C。

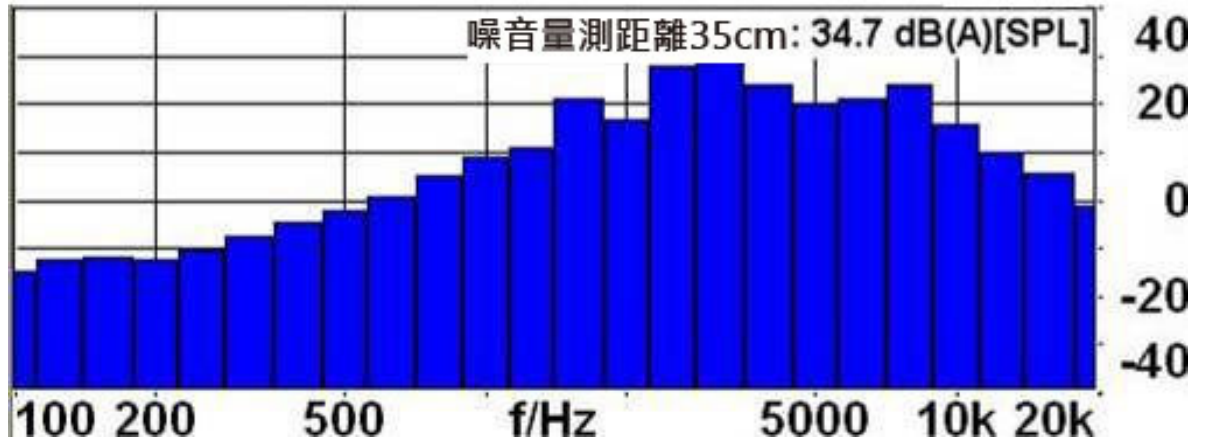
智能型行动系统散热解决方案(适用于手机、PAD...)



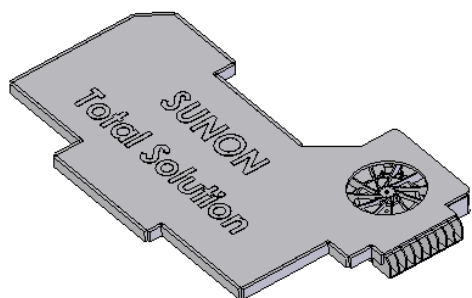
智能型行动装置
手机、PAD+Sunon 风扇模块
噪音值33dBA
(换算量测距离50cm)



(噪音量测距离50cm)

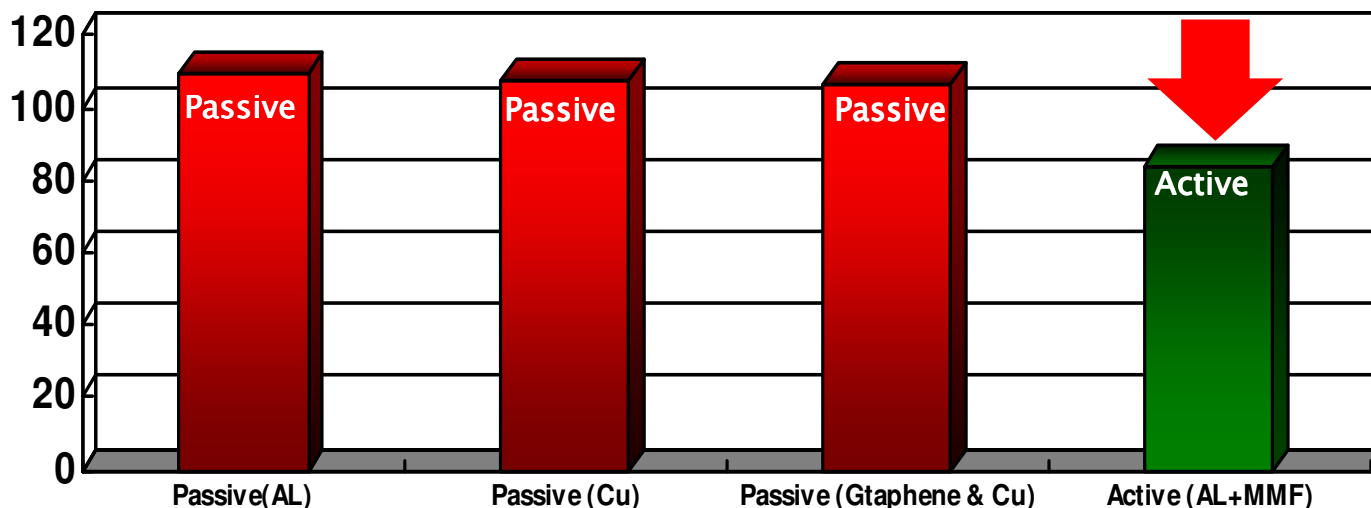


不同材质散热效果比较



Item	Type	Power Dissipation (W)	Ta (°C)	Tcpu (°C)
AL (铝)	Passive	5.0	25.0	109.9
Cu (铜)	Passive			107.3
Graphene + Cu (石墨烯+铜)	Passive			106.5
AL + MMB (铝+毫米风扇)	Active			83.4

主动式散热比被动式散热更有效降低CPU 温度 **23~26 °C**



IP 58 防尘、防水测试报告(第三认证单位验证)

风扇测试机型-UF3H3 (17x17x3mm)

ETC ELECTRONICS TESTING CENTER, TAIWAN
 ADDRESS: NO. 5 HONG HSI 3 RD, SUN INDUSTRIAL PARK,
 TAINAN, TAINAN
 TEL: 82-6-2025762 FAX: 82-6-2000262
 http://www.etc.com.tw

TAF
 Testing Laboratory
 TAF

Ind. Ser. No. : 13-03-NEF-031
 Issue Date : 2013/05/19

TEST REPORT

Ind. Ser. No. : 13-03-NEF-031
 Applicant : Sunonwealth Electric Machine Industry CO., Ltd
 Address : No. 30, Ln. 296, Xinyu Rd., Qianzhen Dist., Kaohsiung
 City 806, Taiwan
 Products : DC Fan
 Model : UF3H3
 Quantity : 6 set
 Date of Receipt : 2013/03/12
 Date of Testing : 2013/03/12~2013/03/19
 Test specification : IEC60529 - Edition 2.1 2.001-02
 Inspection Site : Electronics Testing Center, Taiwan - Southern Taiwan
 Industry Service Department
 (TAF Certification No: 1161)
 Ambient Environment : IP5X Temp. 24 ± 1 °C, R.H. 55 ± 2 %
 : IPX8 Temp. 25 ± 1 °C, R.H. 60 ± 2 %
 Testing Item : IP58
 Test condition : See the following sheets
 Test result : PASS

The test results relate only to the items tested.
 This report shall not be reproduced except in full, without the written approval of Electronics Testing Center,
 Taiwan.
 These inspection has carried out to the best of our knowledge and ability, and our responsibility is limited to
 the exercise of reasonable care; this certification is not intended to relieve the client from their contractual
 obligations.

Tested by: Ken Lung Tai Approved by: Yi-Hong Liao
 Ken Lung Tai Southern Taiwan Industry
 Service Department Yi-Hong Liao
 Southern Taiwan Industry
 Service Department

Page: 1 of 6 Pages
 Page: 1 of 6 Pages

Pass

ETC TEST REPORT Ind. Ser. No. : 13-03-NEF-031

Testing Item: IP58

Testing Conditions :

IP5X :
 (1) The enclosure under test is supported in its normal operating
 position inside the test chamber.
 (2) The test shall be continued for a period of 8h.

IPX8 :
 (1) Put the testing sample under water 1.1 m.
 (2) The duration of the test is 1 hours.

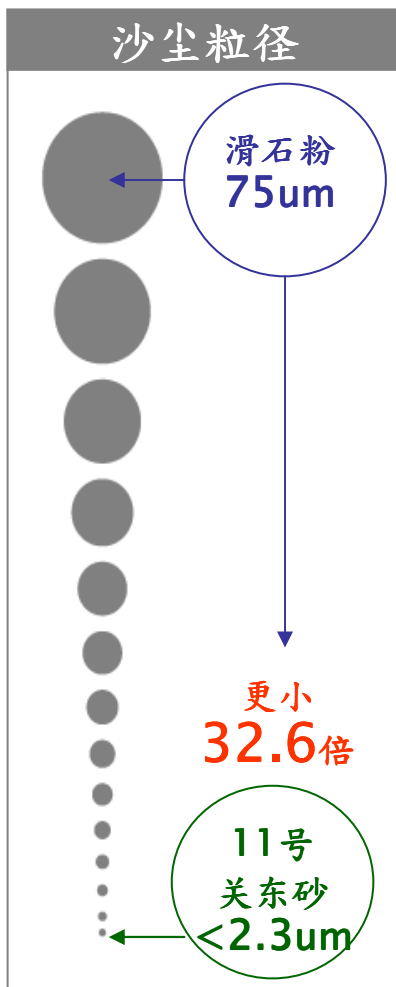
Testing Result :

Request/Experiment	Results	Remark
Accordance with IEC60529 13.1,13.4 and 13.5 test. The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.	There is no trace of dust inside.	IP5X
After testing in accordance with appropriate requirements of IEC60529 14.1,14.2.8 and 14.3	No ingress of water was found inside.	IPX8

Page: 2 of 6 Pages

关东砂防尘测试报告 (第三认证单位验证)

风扇测试机型-UB3C3 (12x12x3mm)



Report No. : HB120020007A-2
Version : A

DUST TEST REPORT

Company : Sunonwealth Electric Machine Industry Co., Ltd.
Address : No. 30, Lane 298, Sinyua Road, Cianjhen District, Kaohsiung City 806, Taiwan, R.O.C.
Model Name : UB3C3 500
Date Received : SEP 19, 2012
Date Tested : SEP 19, 2012

TESTING LABORATORY IS ACCREDITED BY:

IEC/IECQ 17025 certificate of independent test laboratory approval
Certificate No. : T1091
ISO 17025 accredited in respect of laboratory is approved by TAF
Certificate No. : L0835-090819
ISO 9001 certificate is approved by TUV CERT certification body of TUV NORD Cert GmbH

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

	Name	Signature	Date
Test Engineer	Ethan Chen	<i>Ethan Chen</i>	Sep 20, 2012
Manager	General Lee	<i>General Lee</i>	Sep 20, 2012

NOTE :

- This report will be invalid if reproduced in part or altered in any way.
- This report refers only to the specimen(s) submitted to test, and is void if used otherwise.
- This report is ONLY valid with the examination seal and signature of the testing laboratory.
- The tested specimen(s) will only be preserved for thirty days from the date issued, not collected by the applicant.

Page: 1 of 5 Pages

Integrated Service Technology Inc.
Reliability & Failure Analysis Engineering Group
1F, No. 19, Pu-ding Rd., Hsin-chu City, Taiwan, R.O.C.
Tel: 886-3-578-2286, Fax: 886-3-610-0599
<http://www.istgroup.com>

Report No. : HB120020007A-2
Page 3 of 4

2. DUST TEST

2.1 TEST EQUIPMENT

Model	Serial Number	Calibration Date
ESPEC EDC27	405519	NA

2.2 LABORATORY AMBIENCE CONDITION

Temperature : 23±3°C
Relative humidity : 55%±3% (RH)

2.3 REFERENCE DOCUMENT

The test is refers to SAE575A Dust test specification.

2.4 TEST CONDITION

Units are operating.
Dust material : Kanto sand (100% dry fine)

Particulate size	Amount (%)
<1 µm (Diameter)	30.2%±5
1 µm (Diameter)	21%±5
2 µm (Diameter)	29.6%±5
4 µm (Diameter)	10.2%±3
6 µm (Diameter)	3.4%±3
8 µm (Diameter)	5.7%±3

Dust density : 3 g/cm³
Amount of kanto sand : 2 kg/m³ (chamber volume)
Blow sand time : 2 seconds on, 15 minutes off
Dust injection direction : Upward, then let fall freely
Test time : 8 hours

2.5 SUMMARY OF TEST

After testing, visual inspection showed no physical defect or functional degradation of units.

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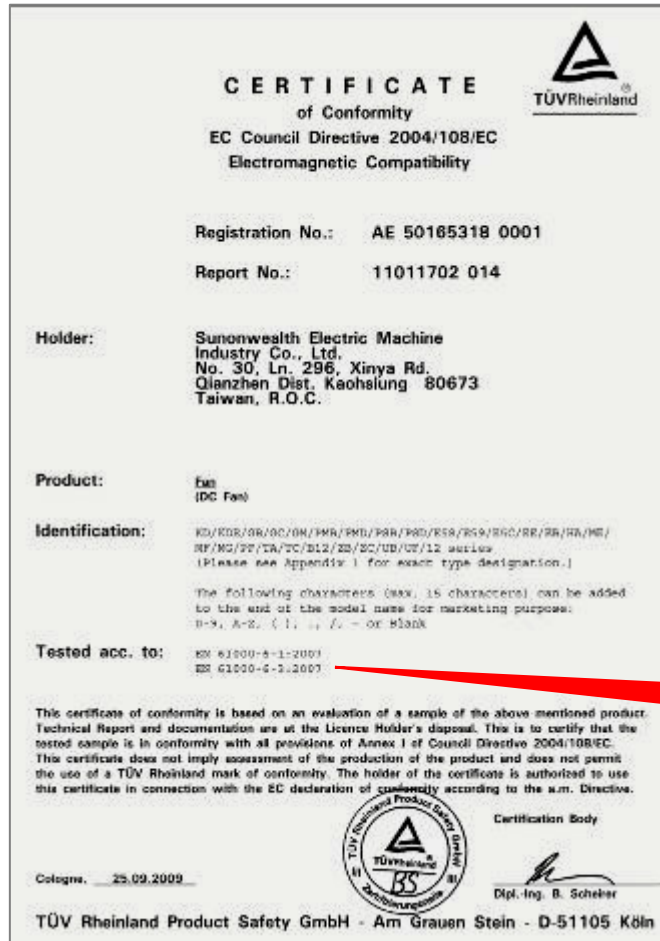


沙尘验证经过8小时后，风扇外观与功能正常。

Pass

其它测试报告(第三认证单位验证)

EMC / EMI 测试报告 第三认证单位测试报告 (TUV)



CERTIFICATE of Conformity
EC Council Directive 2004/108/EC
Electromagnetic Compatibility

Registration No.: AE 50165318 0001
Report No.: 11011702 014

Holder: Sunonwealth Electric Machine Industry Co., Ltd.
No. 30, Ln. 296, Xinya Rd.
Qianzhen Dist, Kaohsiung 80673
Taiwan, R.O.C.

Product: Fan (DC Fan)

Identification: ED/EDR/ER/EC/EN/EMR/EMD/ER/ERD/ESR/ESD/ESC/ESR/ER/EM/RF/RC/TC/TC/BI2/SD/SC/UD/US/12 series
(Please see Appendix I for exact type designation.)

The following characters (max. 15 characters) can be added to the end of the model name for marketing purposes:
0-9, A-Z, (), /, - or blank

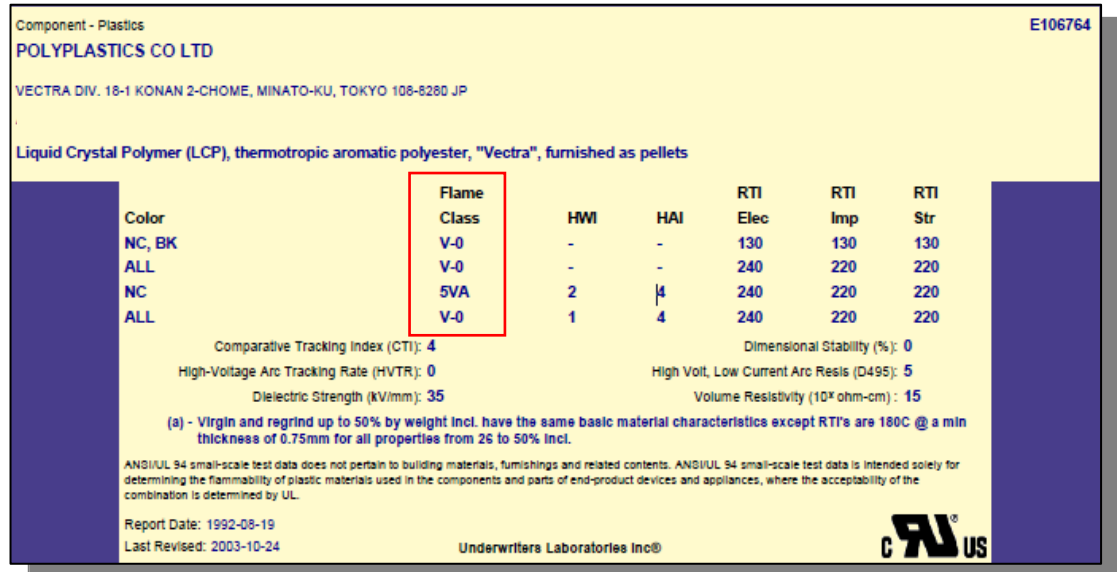
Tested acc. to: EN 61000-6-1:2007
EN 61000-6-3:2007

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2004/108/EC. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.

Certification Body: TÜV Rheinland Product Safety GmbH
Dipl.-Ing. B. Scheiter

Cologne, 25.09.2009
TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

LCP塑料防火等级94V-0 证明 第三认证单位测试报告 (UL)



Component - Plastics
POLYPLASTICS CO LTD
VECTRA DIV. 16-1 KONAN 2-CHOME, MINATO-KU, TOKYO 106-8280 JP

Liquid Crystal Polymer (LCP), thermotropic aromatic polyester, "Vectra", furnished as pellets

Color	Flame Class	HMI	HAI	RTI	
				Elec	Imp Str
NC, BK	V-0	-	-	130	130
ALL	V-0	-	-	240	220
NC	5VA	2	4	240	220
ALL	V-0	1	4	240	220

Comparative Tracking Index (CTI): 4
High-Voltage Arc Tracking Rate (HVTR): 0
Dielectric Strength (kV/mm): 35

Dimensional Stability (%): 0
High Volt, Low Current Arc Resis (D495): 5
Volume Resistivity (10¹⁴ ohm-cm): 15

(a) - Virgin and regrind up to 50% by weight incl. have the same basic material characteristics except RTI's are 180C @ a min thickness of 0.75mm for all properties from 26 to 50% incl.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1992-08-19
Last Revised: 2003-10-24
Underwriters Laboratories Inc®

EN 61000-6-1:2007
EN 61000-6-3:2007

落下验证(1M)



产品型号: UB5U3-500 (30x30x3mm)

测试项目: 单体落下测试。

测试条件: 自由落体, 高度100cm

产品规格: 电流 $72 \pm 15\%$ mA, 转速: 9500 ± 1900 RPM

Item	Current(AMP)			Speed(RPM)			Noisy by ear	Judgement
Criteria	Amp over 10% of original			RPM under 10% of original			Not noisy	
NO	Before	After	Var.	Before	After	Var.	Result	
1	0.074	0.073	1.4%	10039	10074	0.3%	OK	OK
2	0.076	0.075	1.7%	9843	9907	0.7%	OK	OK
3	0.074	0.072	2.7%	9836	9783	0.5%	OK	OK
4	0.076	0.075	1.3%	10087	10078	0.1%	OK	OK
5	0.073	0.071	2.7%	9856	9849	0.1%	OK	OK
AVG	0.075	0.073	2.0%	9932	9938	0.3%		
MIN	0.073	0.071	1.3%	9836	9783	0.1%		
MAX	0.076	0.075	2.7%	10087	10078	0.7%		

随机震动验证



产品型号: UB5U3-500 (30x30x3mm)

测试项目: 随机震动测试

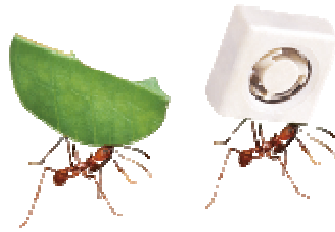
测试条件: 输入电压 5V

频率范围: 20~500Hz

PSD:1.0G(OP)

产品规格: 电流 $72 \pm 15\%$ mA, 转速: 9500 ± 1900 RPM

Item	Current (mA)			Speed (RPM)			Noise @ 1M dB(A)			Noisy by ear	Judgement
Criteria	Amp over 10% of original			RPM under 10% of original			Noise over 3 dB(A) of original			Not noisy	
NO	Before	After	Var.	Before	After	Var.	Before	After	Var.	Result	
1	0.078	0.077	1.3%	9888	9782	1.1%	31.2	31.5	0.3	OK	OK
2	0.075	0.074	1.3%	10052	10046	0.1%	33.3	33.0	0.3	OK	OK
3	0.075	0.073	2.7%	10009	9847	1.6%	31.5	32.3	0.5	OK	OK
4	0.073	0.072	1.4%	9889	9788	1.0%	32.9	31.9	1.0	OK	OK
5	0.078	0.076	2.6%	9831	9764	0.7%	33.4	32.6	0.8	OK	OK
AVG	0.078	0.074	1.8%	9934	9845	0.9%	32.5	32.3	0.6	OK	OK
MIN	0.073	0.072	1.3%	9831	9764	0.1%	31.2	31.5	0.3		
MAX	0.078	0.077	2.7%	10052	10046	1.6%	33.4	33.0	1.0		



SUNON®

For more information
please contact your local Sunon sales office
or visit sunon website:
www.sunon.com

Thanks for Your Attention!!