Certificate – Сертификат – 證明書 – Certificat – 증명서 – شهادة

Shenzhen ZKT Technology Co., Ltd.
1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue,
Fuhai Street, Bao'an District, Shenzhen, China

Certificate of Compliance

Certificate Number: ZKT-2020071126C

Certificate's Holder	:	**ShenZhen Weiyin Technology Co., Ltd 2/F, Building E, Hengchangrong Industrial Park, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China**
Manufacturer	:	**ShenZhen Weiyin Technology Co., Ltd 2/F, Building E, Hengchangrong Industrial Park, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China**
Trade Mark	:	ADLIS WEIYIN®
Product	:	**Smart Furniture**
Model(s)	:	**WYC1802** **Additional models see annex**

Test Standard	:	**Art.3.1(a)**	**Safety**	**EN 62368-1:2014+A11:2017**
		Art.3.1(a)	**Health**	**EN 62479:2010**
		Art.3.1(b)	**EMC**	**EN 301 489-1 V2.2.3 (2019-11)** **EN 301 489-17 V3.2.2 (2019-12)**
		Art.3.2	**Radio**	**EN 300 328 V2.2.2 (2019-07)** **EN 303 417 V1.1.1 (2017-06)**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Radio Equipment Directive (RED) 2014/53/EU. The essential requirement are fulfilled accordingly based on the technical specifications applicable at the time of issuance.

CE

Shenzhen ZKT Technology Co., Ltd
Approved
Manager
Jul. 30, 2020

This Certificate of Conformity is based on single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the whole product and relevant . Directives to be observed.

Certificate – Сертификат – 證明書 – Certificat – 증명서 – شهادة

Shenzhen ZKT Technology Co., Ltd.
1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue,
Fuhai Street, Bao'an District, Shenzhen, China

Certificate of Compliance

Certificate Accessories

Certificate's Holder : **ShenZhen Weiyin Technology Co., Ltd**
2/F, Building E, Hengchangrong Industrial Park, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China

Manufacturer : **ShenZhen Weiyin Technology Co., Ltd**
2/F, Building E, Hengchangrong Industrial Park, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China

Additional Model Accessories: WYC1802C, WYC1805, WYC1914, WYC1904, WYC1807, WYC1808, WYC1808A, WYC1814, WYC1809, WYC1810, WYC1815, WYC1815A, WYC1901, WYC1902, WYC1916, WYC1917, WYC1921, WYC1922, WYC1903, WYC1903B, WYC1816, WYC1816A, WYC1829, WYC1820, WYC1919, WYC1920, WYC1822, WYC1823, WYC2056, WYC1824, WYC1825, WYC1826, WYC1827, WYC1828, WYC1811, WYC1811A, WYC1812, WYC1821, WYC1801, WYC1801A, WYC1803, WYC1804, WYC1907, WYC1908, WYC1909, WYC1921, WYC1922, WYC2003, WYC1926, WYC1926B, WYC1910, WYC2010, WYC1818, WYC1817, WYC2002, WYC2004, WYC1911, WYC1912, WYC1913, WYC1923, WYC1925, WYC1806, WYC1831, WYC1832, WYC1833, WYC1834, WYC1835, WYC1836, WYC1836A, WYC1837, WYC1838, WYC1839, WYC1840, WYC1841, WYC1842, WYB2003, WYB2004, WYB2005, WYB2006, WYC1819, WYC1843, WYC1844, WYC1845, WYC1846, WYC1847, WYC1848, WYC1849, WYC1850, WYC1851, WYS1802, WYS1803, WYS1807, WYS1816, WYS1817, WYC1818, WYC2405, WYC2406, WYC2407, WYC2408, WYC2409, WYC2410, WYC2411, WYC2412, WYC2413, WYC2414, WYC2415, WYC2416, WYC2417, WYC2418, WYC2419, WYC2420, WYC2421, WYC2422, WYC2423, WYC2424, WYC2425, WYC2426, WYC2427, WYC2428, WYC2429, WYC2430, WYC2431, WYC2432, WYC1926, WYC1927, WYC1928, WYC1929, WYC1930, WYC1931, WYC1932, WYC1933

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Radio Equipment Directive (RED) 2014/53/EU. The essential requirement are fulfilled accordingly based on the technical specifications applicable at the time of issuance

CE

Shenzhen ZKT Technology Co., Ltd. Approved
Manager
Jul. 30, 2020

This Certificate of Conformity is based on single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the whole product and relevant . Directives to be observed.

ISO 9001

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificate No.: 46622Q1011400R0S

This is to certify that management system of

Shenzhen Weiyin Technology Co.,Ltd subsidiary of Adlis/Weiyin Corporation

Unified social credit code: 91440300MA5DNLH174

Registered Address: Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Business Address: Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Management system in line with:

GB/T19001-2016 /ISO9001:2015

Scope of certification:

R & D and sales of outdoor smart furniture and solar products (solar bus stops, solar trash bins, solar charging stations, solar lights / light boxes and solar kiosks)

Date of issue: January 24, 2022

Date of expire : January 23, 2025

It is valid for use within the scope of administrative and qualification permission and the period of validity stipulated by the state. The certificated organization shall be subject to supervision and audit on schedule within the period of validity of the certificate. It is valid for use after passing the supervision and audit. The information of this certificate can be found on the official website of the national certification and Accreditation Administration （ www.cnca.gov.cn ） Inquiry。

深圳市中鑫认证 SHENZHEN ZHONGXIN CCQC CERTIFICATION

General manager:

深圳市中鑫认证检测有限公司 4403041342294

Shenzhen Zhongxin certification testing Co., Ltd

Address: 401-b-5a, Xianke electromechanical building, baguasi Road, Futian District, Shenzhen

Website: www.szccqc.cn Telephone: 0755-86568634

ISO 14001

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificate No.: 46622E1011401R0S

This is to certify that management system of

Shenzhen Weiyin Technology Co.,Ltd subsidiary of Adlis/Weiyin Corporation

Unified social credit code: 91440300MA5DNLH174

Registered Address: Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Business Address: Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Management system in line with:

GB/T24001-2016 /ISO14001:2015

Scope of certification:

R & D and sales of outdoor smart furniture and solar products (solar bus stops, solar trash bins, solar charging stations, solar lights / light boxes and solar kiosks)

Date of issue: January 24, 2022

Date of expire : January 23, 2025

It is valid for use within the scope of administrative and qualification permission and the period of validity stipulated by the state. The certificated organization shall be subject to supervision and audit on schedule within the period of validity of the certificate. It is valid for use after passing the supervision and audit. The information of this certificate can be found on the official website of the national certification and Accreditation Administration （ www.cnca.gov.cn ） Inquiry。

深圳市中鑫认证 SHENZHEN ZHONGXIN CCQC CERTIFICATION

General manager:

深圳市中鑫认证检测有限公司 4403041342294

Shenzhen Zhongxin certification testing Co., Ltd

Address: 401-b-5a, Xianke electromechanical building, baguasi Road, Futian District, Shenzhen

Website: www.szccqc.cn Telephone: 0755-86568634

Certificate of Conformity

Certificate Number: DL-20220408014C

Applicant: **Shenzhen Weiyin Technology Co., Ltd subsidiary of Adlis/Weiyin Corporation**

Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Manufacturer: **Shenzhen Weiyin Technology Co., Ltd subsidiary of Adlis/Weiyin Corporation**

Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Product: **Smart Furniture**

Model Number: **WYC1802**
WYC1801, WYC1805, WYC1806, WYC1808, WYC1811, WYC1812, WYC1821, WYC1902, WYC1908, WYC1911, WYC1912, WYC1913, WYC1916, WYC1917, WYC2021, WYB2001, WYB2005, WYB2006, WYR1804, WYS1817

Test Standard: **EN60529:1991+A1:2000+A2:2013**

The EUT described above has been tested by us with the listed standards and found in compliance with the council LVD directive 2014/35/EU. It is possible to use IP marking to demonstrate the compliance with this LVD Directive. It is only valid in connection with the test report number: DL-20220408014S.

Shenzhen DL Testing Technology Co., Ltd. Approved

Manager

Apr. 13, 2022

IP65

Shenzhen DL Testing Technology Co., Ltd.
101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone,Baolong Street, Longgang District, Shenzhen, Guangdong, China
Web: www.dl-cert.com E-mail: Service@dl-cert.com Tel: 400-688-3552

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L11121)

Inspection Center of Hebei Allgrand Power Source Co., Ltd.

(Legal Entity: Hebei Allgrand Power Source Co., Ltd.)

Aoguan Street, Xiazhuang Development Zone, Gucheng, Hengshui, Hebei, China

is accredited in accordance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake the service described in the schedule attached to this certificate.

The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule forms an integral part of this certificate.

Effective Date：2019-06-14

Expiry Date：2024-06-24

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is a signatory of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) and the Asia Pacific Laboratory Accreditation Cooperation Mutual Recognition Arrangement (APLAC MRA).

The validity of the certificate can be checked on CNAS website at http://www.cnas.org.cn/english/findanaccreditedbody/index.shtml

5、欧盟 CE 认证

ISTITUTO SERVIZI
EUROPEI TECNOLOGICI

ISET S.r.l.

Sede Legale e Uffici
Via Donatori di sangue, 9 - 46024 Moglia (MN)
Tel. e fax +39 (0)376 598963
iset@iset-italia.com www.iset-italia.eu

Cap. soc. i.v. € 10.200,00
Cod. Fisc. e P.IVA 02 332 750 369
Reg. Imprese 02 332 750 369
REA MN 0221098

CERTIFICATE OF COMPLIANCE

Certificado de Conformidade - Сертификат соответствия - Konformitätserklärung

1) APPLICANT:
Shandong ALLGRAND New Energy Technology Co., Ltd
West of High-speed Railway Station, North of
Dongfanghong Road, East of Jingqi Road,
South of Weiliu Road, Dezhou Economic Development
Zone, Dezhou City, Shandong Province, P.R. China

2) CERTIFICATE NO.:
IT0909AG27031805

TEST REPORT(S) NO.:
Report No. 180301068
Shenzhen Rongbiao Testing Services Co., Ltd

3) STANDARDS APPLIED:
IEC 62133-2-2017

4) CERTIFICATION ISET MARK:

ISTITUTO SERVIZI
EUROPEI TECNOLOGICI

5) PRODUCT CHARACTERISTICS: Portable Power Supply

MODEL(S): AG-500W

REMARK: ***The verification has been carried out on a voluntary basis. We attest that a TCF is in place. The product(s) satisfies the requirements of the Certification Mark of ISET, in reference to the above list standard(s). The above compliance mark can be fixed on the product(s) according to the ISET regulation about its release. This verification doesn't imply assessment of the production and the product(s).***

CE

Notice of the CE marking: The label of the CE marking: Not less than 5mm height. Before putting the product(s) into market, CE marking and EC declaration are duties of the manufacturer. The manufacturer is responsible to start the CE marking certification procedure and to perform all the activities according to the regulation.

6) DATE OF ISSUE: 27/03/2018 ***DATE OF EXPIRE:*** 26/03/2023

CERTIFICATION MANAGER:

ISTITUTO SERVIZI EUROPEI TECNOLOGICI
ISET S.R.L

CERTIFICATE

Environmental Management Systems Certificate

Certificate Number: 00220E30177R3M

CQM hereby certifies that

Hebei Aoguan Power Source Co., Ltd.

United Social Credit Code:91131126715860426W

Domicile:East Side of the South End of Aoguan Street, Gucheng County Economic Development Zone, Hengshui City, Hebei, P.R.China

Certification Add.:East Side of the South End of Aoguan Street, Gucheng County Economic Development Zone, Hengshui City, Hebei, P.R.China(253800)

has implemented and maintains a Environmental Management System which fulfils the requirements of the following standards

GB/T 24001-2016/ISO 14001:2015

Environmental management systems-Requirements with guidance for use

This certificate is valid to the following product(s)/service:

Design and manufacture of maintenance-free VRLA and relevant management activities

Issued on: 2020-01-13

Effective date: 2020-01-13

Validity Date: 2023-01-12

Registration Number: CQM-13-2000-0897-0002

The validity of the certificate can be checked on www.cnca.gov.cn, *Certificate Confirmation* and CQM website

GB/T 24001

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C002-M

CHINA QUALITY MARK CERTIFICATION GROUP

Address: No.33, Zengguang Road, Haidian District, Beijing, 100048, P.R. China

http://www.cqm.com.cn

CQM is a partner of:

EY 0019296

CERTIFICATE

Occupational Health and Safety Management Systems Certificate

Certificate Number: 00220S20158R3M

CQM hereby certifies that

Hebei Aoguan Power Source Co., Ltd.

United Social Credit Code:91131126715860426W
Domicile:East Side of the South Head of Aoguan Street, Economic Development Zone, Gucheng County, Hengshui City, Hebei, P.R.China
Certification Add.:East Side of the South Head of Aoguan Street, Economic Development Zone, Gucheng County, Hengshui City, Hebei, P.R.China(253800)

has implemented and maintains a Occupational Health and Safety Management System which fulfils the requirements of the following standards

GB/T 45001-2020/ISO 45001:2018

Occupational health and safety management systems -- Requirements with guidance for use

This certificate is valid to the following product(s)/service:

Design and manufacture of VRLA gel batteries and relevant management activities

Reissue date: 2021-02-01

Effective date: 2020-01-13

Validity date: 2023-01-12

Registration Number: CQM-13-2000-0897-0003

The validity of the certificate can be checked on www.cnca.gov.cn, Certificate *Confirmation* and CQM website

JiXiaoDong

GB/T 45001

中国认可
管理体系
MANAGEMENT SYSTEM
CNAS C002-M

CHINA QUALITY MARK CERTIFICATION GROUP

Address: No.33, Zengguang Road, Haidian District, Beijing, 100048, P.R. China
http://www.cqm.com.cn

CQM is a partner of:

C 0028702

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

Hebei Aoguan Power Source Co., Ltd.

Certification Add.:East Side of the South Head of Aoguan Street, Economic Development Zone, Gucheng County, Hengshui City, Hebei, P.R.China

Post code: 253800

for the following scope:

Design and manufacture of VRLA gel batteries and relevant management activities

has implemented and maintains a

Occupational health and safety Management System

which fulfils the requirements of the following standard:

ISO 45001:2018

Issued on:2021-02-01
First issued on:2020-01-13
Expires on: 2023-01-12

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document

Registration Number: CN-00220S20158R3M

Alex Stoichitoiu
President of IQNet

Ji XiaoDong
General Manager of CQM

IQNet Partners*:
AENOR *Spain* AFNOR Certification *France* APCER *Portugal* CCC *Cyprus* CISQ *Italy*
CQC *China* CQM *China* CQS *Czech Republic* Cro Cert *Croatia* DQS Holding GmbH *Germany* EAGLE Certification Group *USA*
FCAV *Brazil* FONDONORMA *Venezuela* ICONTEC *Colombia* Inspecta Sertifiointi Oy *Finland* INTECO *Costa Rica*
IRAM *Argentina* JQA *Japan* KFQ *Korea* MIRTEC *Greece* MSZT *Hungary* Nemko AS *Norway* NSAI *Ireland*
NYCE-SIGE *México* PCBC *Poland* Quality Austria *Austria* RR *Russia* SII *Israel* SIQ *Slovenia*
SIRIM QAS International *Malaysia* SQS *Switzerland* SRAC *Romania* TEST St Petersburg *Russia* TSE *Turkey* YUQS *Serbia*

* The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

CERTIFICATE

Quality Management Systems Certificate

Certificate Number: 00219Q20441R2M

CQM hereby certifies that

Hebei Aoguan Power Source Co.,Ltd.

United Social Credit Code: 91131126715860426W
Domicile:East Side of the South End of Aoguan Street, Gucheng County Economic Development Zone, Hengshui City, Hebei, P.R.China
Certification Add.:East Side of the South End of Aoguan Street, Gucheng County Economic Development Zone, Hengshui City, Hebei, P.R.China(253800)

has implemented and maintains a Quality Management System which fulfils the requirements of the following standards

GB/T 19001-2016/ISO 9001:2015

Quality management systems---Requirements

This certificate is valid to the following product(s)/service:

Design and manufacture of VRLA maintenance free batteries

Reissue date: 2020-03-23

Effective date: 2019-01-21

Validity date: 2022-01-11

Registration Number: CQM-13-2000-0897-0001

The validity of the certificate can be checked on www.cnca.gov.cn, *Certificate Confirmation* and CQM website

JiXiaoDong

GB/T 19001

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C002-M

CHINA QUALITY MARK CERTIFICATION GROUP

Address: No.33, Zengguang Road, Haidian District, Beijing, 100048, P.R. China

http://www.cqm.com.cn

CQM is a partner of:

QY 0028844

CERTIFICATE

Energy Management Systems Certificate

Certificate Number: 00221EN0038R0M

CQM hereby certifies that

Hebei Aoguan Power Source Co., Ltd.

United Social Credit Code: 91131126715860426W

Domicile:East Side of the South Head of Aoguan Street, Economic Development Zone, Gucheng County, Hengshui City, Hebei, P.R.China

Certification Add.:East Side of the South Head of Aoguan Street, Economic Development Zone, Gucheng County, Hengshui City, Hebei, P.R.China(253800)

has implemented and maintains a Energy Management Systems which fulfils the requirements of the following standards

ISO 50001:2018 ***Energy management systems -- Requirements with guidance for use*** **and RB/T 119-2015** ***Energy management systems-Certification requirements for machinery enterprise***

This certificate is valid to the following product(s)/service:

Energy management activities involved in the production of lead-acid batteries (power class, floating charge, energy storage)

For the accounting boundary for comprehensive energy consumption for unit output value of the products within the above certification scope to the attachment, This certificate is effective only using with attachment

Issued on: 2021-02-01

Effective date: 2021-02-01

Validity Date: 2024-01-31

Registration Number: CQM-13-2000-0897-0004

The validity of the certificate can be checked on www.cnca.gov.cn, Certificate *Confirmation* and CQM website; the validity of the certificate keeping by surveillance, surveillance results can be found in attachment

JiXiaoDong

GB/T 23331

中国认可
管理体系
MANAGEMENT SYSTEM
CNAS C002-M

CHINA QUALITY MARK CERTIFICATION GROUP

Address: No.33, Zengguang Road, Haidian District, Beijing, 100048, P.R. China

http://www.cqm.com.cn

CQM is a partner of:

C 0028707

CERTIFICATE

Energy Management Systems Certificate

Attachment (Page 1)

Certificate Number: 00221EN0038R0M

Products(services)/Processes	Comprehensive energy consumption for per unit output of product/for per unit output value	Report Period	Accounting boundary for energy consumption
Lead acid battery (floating charge)	2.48kgce/KVAH	2020.6.1-2020.11.30	Production report period:188 thousand KVAHProduction system: Lead, sulfuric acid and clapboard were used as raw materials, production includes the process of cast plate, coated plate (including grinding powder), reparing of plywood, assembling, change, packing, etc.;Auxiliary production system: Power supply, water supply, steam supply, gas supply, machine maintenance, safety and environmental protection facilities, etc.Subsidiary production system: Work(including air conditioning and lighting), check test, dining room, dormitory, etc.
Lead acid battery (power class)	3.84kgce/KVAH	2020.6.1-2020.11.30	Production report period: 54 thousand KVAHProduction system: Lead, sulfuric acid and clapboard were used as raw materials, production includes the process of cast plate, coated plate (including grinding powder), reparing of plywood, assembling, change, packing, etc.;Auxiliary production system: Power supply, water supply, steam supply, gas supply, machine maintenance, safety and environmental protection facilities, etc.Subsidiary production system: Work(including air conditioning and lighting), check test, dining room, dormitory, etc.
Lead acid battery (energy storage)	6.33kgce/KVAH	2020.6.1-2020.11.30	Production report period: 45 thousand KVAHProduction system: Lead, sulfuric acid and clapboard were used as raw materials, production includes the process of cast plate, coated plate (including grinding powder), reparing of plywood, assembling, change, packing, etc.;Auxiliary production system: Power supply, water supply, steam supply, gas supply, machine maintenance, safety and environmental protection facilities, etc.Subsidiary production system: Work(including air conditioning and lighting), check test, dining room, dormitory, etc.

Issued on:2021-02-01

Effective date:2021-02-01

Validity Date:2024-01-31

Registration Number:CQM-13-2000-0897-0004

(The attachment is effective only using with home page)

GB/T 23331

中国认可
管理体系
MANAGEMENT SYSTEM
CNAS C002-M

CHINA QUALITY MARK CERTIFICATION GROUP

Address: No.33, Zengguang Road, Haidian District, Beijing, 100048, P.R. China

http://www.cqm.com.cn

CQM is a partner of:

C 0028706

Certificate of Conformity

Certificate Number: B-R14065751
RoHS Directive 2011/65/EU

Beide
Compliance Laboratory

Holder.....:	Ningbo Yinzhou Hexiang Automotive Parts Co., Ltd.
Address.....:	N0.207, QianShuiWan Road, QiuGa Town, Yinzhou District, NingBo City, Zhejiang Province, China
Manufacturer....:	Same As Hclder
Product.....:	MOTORCYCLE POWER SOCKET
Model No.....:	C832 C833 C833A C8332 C5018 C5032

The submitted products have been tesled by us and found to be in compliance with the listed European Directives.

The test results apply only to the particular sample tested and to the specific tests carried out. Technical Report and documentation a·e at the Holder's disposal.

This certificate applies specifically to the sample investigated in our test reference number only. The CE markings as shown below can be affixed on the product after preparation of necessary technical documentation. Other relevant Directives have to be observed.

CE

Certification Manager
Date: Jul. 1, 2014

BEIDE (UK) PRODUCT SERVICE LIMITED COMMON SEAL

Company No 07113834

Beide (UK) Product Service Limited

U.K.: Flat 107, 25 Indescon Square, London, United Kingdom
China: 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen, China
Http://www.szbeide.com E-mail: admin@szbeide.com

ATTESTATION OF CONFORMITY

Attestation Number :	AOC R2BJ170516050-03 -01
Date of Issue:	2017-09-19
Product:	Solar Charge Controller
Model(s):	Tracer7810BP Tracer2606BP, Tracer3906BP, Tracer5206BP, Tracer2610BP, Tracer3910BP, Tracer5210BP
Brand:	EPEVER
Applicant Name & Address:	BEIJING EPSOLAR TECHNOLOGY CO., LTD. NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO. 3 STREET, SHANGDI XINXI CHANYE JIDI,HAIDIAN DISTRICT, BEIJING,CHINA

Bay Area Compliance Laboratories Corp. (Dongguan) hereby declares that the submitted sample(s) of the above equipment has been tested for CE-marking and in accordance with the following European Directives and Standards:

Low Voltage Directive 2014/35/EU

Harmonized Standards	Test Report Number
EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013	R2BJ170516050-03

CE Mark is permitted only after all applicable requirements are met in accordance with the European Union Rules, including the manufacturer's issuance of a "Declaration of Conformity. The Declaration of Conformity is issued under sole responsibility of manufacturer. This attestation is specific to the standard(s) stated above and compliance with additional standards and/or European directives are applicable.

Attestation by:

Boyce Yang

Lab Manager

Signature

ATTESTATION OF CONFORMITY

Attestation Number :	AOC R2BJ170516051-03 -01
Date of Issue:	2017-09-19
Product:	Solar Charge Controller
Model(s):	Tracer7810BP Tracer2606BP, Tracer3906BP, Tracer5206BP, Tracer2610BP, Tracer3910BP, Tracer5210BP
Brand:	EPEVER
Applicant Name & Address:	BEIJING EPSOLAR TECHNOLOGY CO., LTD. NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO. 3 STREET, SHANGDI XINXI CHANYE JIDI,HAIDIAN DISTRICT, BEIJING,CHINA

Bay Area Compliance Laboratories Corp. (Dongguan) hereby declares that the submitted sample(s) of the above equipment has been tested for CE-marking and in accordance with the following European Directives and Standards:

Low Voltage Directive 2014/35/EU

Harmonized Standards	Test Report Number
IEC 60950-1:2005 (Second Edition) + A1: 2009 + A2: 2013	R2BJ170516051-03

CE Mark is permitted only after all applicable requirements are met in accordance with the European Union Rules, including the manufacturer's issuance of a "Declaration of Conformity. The Declaration of Conformity is issued under sole responsibility of manufacturer. This attestation is specific to the standard(s) stated above and compliance with additional standards and/or European directives are applicable.

Attestation by:

Boyce Yang

Lab Manager

Signature

Bay Area Compliance Laboratories Corp. (Dongguan)
No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China
Phone: +86-769-86858888 Fax: +86-769-86858891
www.baclcorp.com.cn

ATTESTATION OF CONFORMITY

Attestation Number:	AOC RBJ170516050-02
Date of Issue:	2017-06-20
Product:	Solar Charge Controller
Model(s):	Tracer7810BP,Tracer2606BP,Tracer3906BP,Tracer5206BP Tracer2610BP,Tracer3910BP,Tracer5210BP
Brand:	N/A
ApplicantName& Address:	BEIJING EPSOLAR TECHNOLOGY CO.,LTD. NO.228,BLOCK A,2ND FLOOR,BLDG 1,NO.3 STREET,SHANGDI XINXI CHANYE JIDI,HAIDIAN DISTRICT,BEIJING,CHINA

Bay Area Compliance Laboratories Corp. (Dongguan)hereby declares that the submitted sample(s) of the above equipment has been tested for CE-markingand in accordance with the following European Directives and Standards:

EMC Directive 2014/30/EU

Harmonized Standards	Test Report Number
EN 61000-6-4:2007+A1:2011 EN 61000-6-2:2005	RBJ170516050-01

CE Mark is permitted only after all applicable requirements are met in accordance with the European Union Rules, including the manufacturer's issuance of a "Declaration of Conformity. The Declaration of Conformity is issued under sole responsibility of manufacturer. This attestation is specific to the standard(s) stated above and compliance with additional standards and/or European directives are applicable.

Attestation by: **Jerry Zhang**
Lab Manager

Jerry Zhang
Signature

中国认可
检测
TESTING
CNAS L5662

IEC 60529:1989+A1:1999+A2:2013
EN 60529:1991+A1:2000+A2:2013

Measurement and Test Report

For

BEIJING EPSOLAR TECHNOLOGY CO., LTD.

NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO. 3 STREET, S NGDI XINXI HANYE JIDI, HAIDIAN DISTRICT, BEIJING, CHINA

Tested Model: Tracer7810BP

Multiple Models: Tracer2606BP, Tracer3906BP, Tracer5206BP, Tracer2610BP, Tracer3910BP, Trac 210BP

This Report Concerns:	Equipment Type:
☒ Origin Report	Solar charge controller

Test Eng e	Will Wang Will Wang
Test Date:	017-04-10 to 2017-04-13
Reviewed By:	Robin He Robin He
Prepared By:	**Bay Area Compliance Laboratories Corp. (Dongguan)** No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China

TABLE OF CONTENTS

1 - GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The BEIJING EPSOLAR TECHNOLOGY CO., LTD.'s product, "EUT" as referred to in this report is a Solar charge controller. The test model is Tracer7810BP, and the multiple models are Tracer2606BP、Tracer3906BP、 Tracer5206BP、Tracer2610BP、Tracer3910BP、Tracer5210BP. DECLARATION OF SIMILARITY see page 9.

1.2 Objective

The following Declaration of Conformity of a device is prepared on behalf of the BEIJING EPSOLAR TECHNOLOGY CO., LTD. in accordance with EN 60529:1991+A1:2000+A2:2013 and IEC 60529:1989+A1:1999+A2:2013, Degrees of protection provided by enclosures (IP code). The objective of the manufacturer is to demonstrate compliance with EN 60529:1991+A1:2000+A2:2013 and IEC 60529:1989+A1:1999+A2:2013.Currently, EN 60529:1991+A1:2000+ A2:2013 and IEC 60529:1989+A1:1999+A2:2013 tests to be performed. They are as follows:

- Test for protection against object probe and for protection against solid foreign objects (IP6X) (CLAUSE 12.2+12.3 and CLAUSE 13.4+13.6);
- Test for secondary characteristic numeral 6, protection against continuous immersion subject to agreement (IPX8) (CLAUSE 14.2.8)

Data has been collected, reduced, and analyzed within this report in accordance with EN 60529: 1991+A1:2000+A2:2013 and IEC 60529:1989+A1:1999+A2:2013.In order to demonstrate compliance, the manufacturer or a contracted laboratory makes measurements and takes the necessary steps to ensure that the equipment complies with the appropriate technical standards.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report were conducted with EN 60529:1991+A1:2000+A2:2013 and IEC 60529:1989+A1:1999+A2:2013, Degrees of protection provided by enclosures (IP code).

All measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

1.5 Test Equipment List

S/N	Manufacturer and Model	Instrument Type	Instrument I.D	Cal. Last Date	Cal. Due Date
1	FTR-3301B	Dust proof test chamber	201008	2016-03-04	2019-03-04
2	IPX8	Water tight caisson	201003	2015-03-26	2018-03-25
3	1500mm	Ruler	2010009	2015-01-27	2018-01-26
4	BND-D	IP6X Test Probe	BN20140425-02	2017-03-04	2018-03-04
5	PWS280	Hygrothermograph	1#	2017-03-20	2018-03-20

1.6 Equipment Under Test (EUT)

Manufacturer	Description	Model	Brand Name	Cert.
BEIJING EPSOLAR TECHNOLOGY CO., LTD	Solar charge controller	**Tested Model:** Tracer7810BP **Multiple Model:** Tracer2606BP, Tracer3906BP, Tracer5206BP, Tracer2610BP, Tracer3910BP, Tracer5210BP	EPEVER	---
Manufacturer address	NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO. 3 STREET, SHANGDI XINXI CHANYE JIDI,HAIDIAN DISTRICT, BEIJING,CHINA			

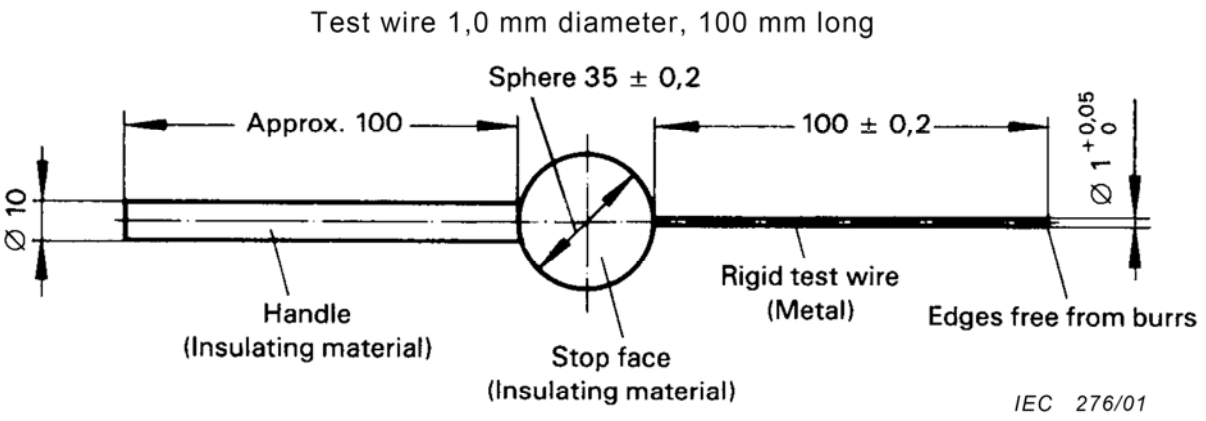
2- Test for first characteristics numerals 6 (IP6X) (CLAUSE 12.2+12.3 and CLAUSE 13.4+13.6)

2.1Tests for protection against access to hazardous parts indicated by the first characteristic numeral (CLAUSE 12.2+12.3)

2.1.1 Method

Access probes to test the protection of persons against access to hazardous parts are given in follow figure.

1) The test is made using a test wire of 1,0 mm inserted through any openings of the enclosure;
2) The test with the force 1±0.1N;
3) For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected between the probe and the hazardous parts inside the enclosure. Hazardous live parts covered only with varnish or paint, or protected by oxidation or by a similar process, are covered by a metal foil electrically connected to those parts which are normally live in operation. The signal-circuit method should also be applied to the hazardous moving parts of high-voltage equipment;
4) Internal moving parts may be operated slowly, wher[illegible] possible.



2.1.2 Results

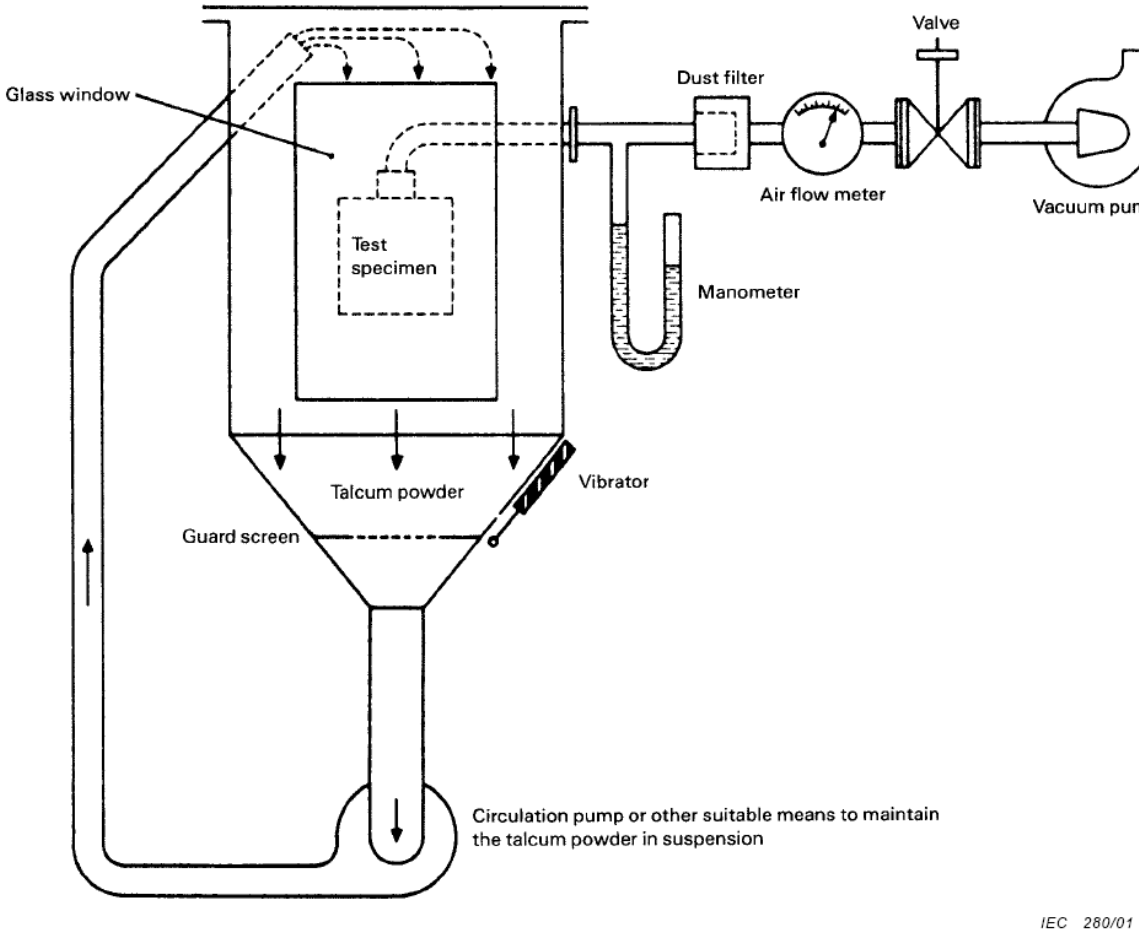
(x) The access probe not touch hazardous live parts. (IP6X) (CLAUSE 12.2+12.3).
Pass

2.2Tests for protection against solid foreign objects indicated by the first characteristic numeral (CLAUSE 13.4+13.6)

2.2.1 Method

Test device to verify protection against solid foreign objects like the follow figure.

1) The test is made using a dust chamber incorporating the basic principle shown in the following figure;
2) The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump. The suction connection shall be made to a hole specially provided for this test. See the EUT photograph 4.3;
3) The extraction rate is about 40 times volumes of the sample enclosure and the depression of the manometer is less than 2kPa;
4) The test duration is 2 hours.



2.2.2 Results

(x) No deposit of dust was observable inside the enclosure at the end of the test. (IP6X) (CLAUSE 13.4+13.6).
Pass

3-Test for protection against water characteristics numerals 8(IPX8) (CLAUSE 14.2.8)

3.1 Method

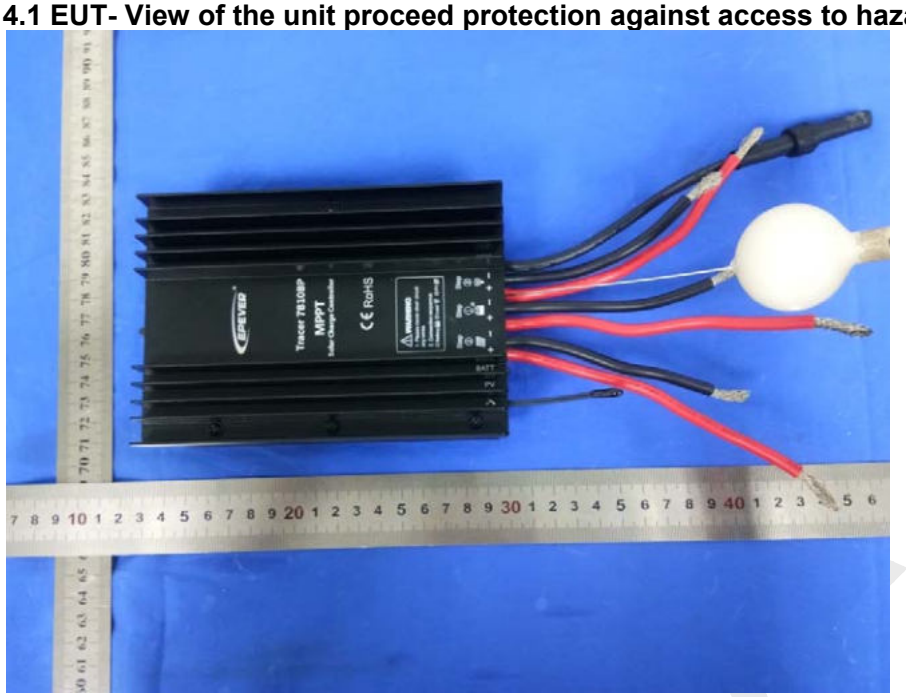
Unless there is a relevant product standard, the test conditions are subject to agreement between manufacturer and user, but they shall be more severe than those prescribed in 14.2.7 and they shall take account of the condition that the enclosure will be continuously immersed in actual use.
According to customer requirements, the test methods are as follows:
1) The lowest point of enclosures with a height less than 850mm is located **1500**mm below the surface of the water;
2) The highest point of enclosures with a height equal to or greater than 850mm is located 650mm below the surface of the water; (N/A)
3) The duration of the test is 72 hours;
4) The water temperature does not differ from that of the equipment by more than 5K.However, a modified requirement may be specified in the relevant product standard if the tests are to be made when the equipment is energized and/or its parts in motion.

3.2 Results

(1) There is no water accumulated inside the enclosure.
(2) The EUT complies with the requirement for protection against water characteristics numerals 8 (IPX8) (CLAUSE14.2.8)
Pass.

4– EUT PHOTOGRAPHS

4.1 EUT- View of the unit proceed protection against access to hazardous parts test



4.2 EUT- Function of unit

5- DECLARATION OF SIMILARITY

BEIJING EPSOLAR TECHNOLOGY CO., LTD
NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO 3 STREET, SHANGDIXINXI
CHANYEJIDI, HAIDIAN, BEIJING, CHINA
Tel: 010-82894856

DECLARATION OF SIMILARITY

Date: 2017-04-12

Dear Sir or Madam:
We, BEIJING EPSOLAR TECHNOLOGY CO.,LTD. hereby declare that our product solar charge controller, Model Number: Tracer7810BP,Tracer2606BP,Tracer3906BP,Tracer5206BP,Tracer2610BP, Tracer3910BP ,Tracer5210BP are the same construction, electrical parameters, schematics and PCB layout, material and tooling technologies. are identical with the same circuit principle. are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics.

Their differences are as following:

Model	Battery	Charge current	Rated charge power	Max. PV open circuit voltage	MPP voltage range	Max. output current	Working environment temperature
Tracer7810BP	12/24V	30A	390W/12V;780W/24V	100V	(Max. battery voltage+2V)~72V	30A	-40℃~+50℃
Tracer2606BP	12/24V	10A	130W/12V,260W/24V	60V	(Max. battery voltage+2V)~36V	10A	-40℃~+60℃
Tracer3906BP	12/24V	15A	195W/12V;390W/24V	60V	(Max. battery voltage+2V)~36V	15A	-40℃~+60℃
Tracer5206BP	12/24V	20A	260W/12V;520W/24V	60V	(Max. battery voltage+2V)~36V	20A	-40℃~+60℃
Tracer2610BP	12/24V	10A	130W/12V;260W/24V	100V	(Max. battery voltage+2V)~72V	10A	-40℃~+60℃
Tracer3910BP	12/24V	15A	195W/12V;390W/24V	100V	(Max. battery voltage+2V)~72V	15A	-40℃~+60℃
Tracer5210BP	12/24V	20A	260W/12V;520W/24V	100V	(Max. battery voltage+2V)~72V	20A	-40℃~+60℃

Please contact me if you have any question.

Signature: Xu Zhongwang 2017.4.12

Print Name: Xu zhong wang

Title: Manager

*****End of report *****

TEST REPORT

REPORT No.: R2BJ181212F0829E Date: March 1, 2019 Page 1 of 15

BEIJING EPSOLAR TECHNOLOGY CO.,LTD.
NO.228, BLOCK A, 2ND FLOOR, BLDG 1, NO.3 STREET, SHANGDI XINXI CHANYE JIDI, HAIDIAN DISTRICT, BEIJING, CHINA

Report on the submitted samples said to be:

Sample Name	:	MPPT Solar Charge Controller
Tested Style/ Items No.①	:	Tracer7810BP
Additional Styles/ Items No.②	:	Tracer2606BP, Tracer3906BP, Tracer5206BP, Tracer2610BP, Tracer3910BP, Tracer5210BP
Sample Receiving Date	:	December 12, 2018
Testing Period	:	From December 12, 2018 to March 1, 2019
Results	:	Please refer to next page(s).
Remark	:	①The tested Style/ Item No. is tested by the lab. ②The Additional Styles/ Items No. declared in the applicant's declaration are not tested, their materials are the same as the tested parts and the result of the test report is only responsible for the test sample.

****

Summary of Test Results:

TEST REQUEST		**CONCLUSION**
A	RoHS Directive 2011/65/EU and its amendment directives	
	XRF screening test and Wet Chemical Testing (Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs & PBDEs content)	**Pass**
	Phthalates(DBP、BBP、DEHP、DIBP)content	**Pass**

****

Signed for and on behalf of BACL

Checked by: _____ Approved by: _____

Jane Xu
Technical Supervisor

Bensen Huang
Laboratory Manager

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TEST REPORT

Results:

A、RoHS Directive 2011/65/EU and its amendment directives

XRF screening test

Test method: With reference to IEC62321-3-1:2013 screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	Silvery metal with black/white coating(shell, Charge Controller)	BL	BL	BL	BL	---
2	Lt green soft silicone(radiator, Charge Controller)	BL	BL	BL	BL	BL
3*	Silvery metal with black coating(screw, Charge Controller)	BL	BL	BL	IN	---
4	Black soft plastic with white printing(wire jacket, PCB, Charge Controller)	BL	BL	BL	BL	BL
5	Red soft plastic with black printing(wire jacket, PCB, Charge Controller)	BL	BL	BL	BL	BL
6	Coppery metal with silvery plating(wire, PCB, Charge Controller)	BL	BL	BL	BL	---
7	Translucent soft glue(cover, PCB, Charge Controller)	BL	BL	BL	BL	BL
8	Black plastic(fixer, inner, Charge Controller)	BL	BL	BL	BL	BL
9	Black soft plastic(cable jacket, PCB)	BL	BL	BL	BL	BL
10	Black soft plastic(wire jacket, cable, PCB)	BL	BL	BL	BL	BL
11	Red soft plastic(wire jacket, cable, PCB)	BL	BL	BL	BL	BL
12	Yellow soft plastic(wire jacket, cable, PCB)	BL	BL	BL	BL	BL
13	White soft plastic(wire jacket, cable, PCB)	BL	BL	BL	BL	BL
14	Coppery metal(wire, cable, PCB)	BL	BL	BL	BL	---
15	Black soft plastic(waterproof cap, waterproof port, cable, PCB)	BL	BL	BL	BL	BL
16*	Black plastic(shell, waterproof port, cable)	BL	BL	BL	BL	IN
17*	Black plastic(nut, waterproof port, cable)	BL	BL	BL	BL	IN
18	Red soft silicone(gasket, waterproof port, cable)	BL	BL	BL	BL	BL
19*	Black plastic(connector holder, waterproof port, cable)	BL	BL	BL	BL	IN
20*[2]	Golden metal(connector, waterproof port, cable))	OL	BL	BL	BL	---

TEST REPORT

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
21	Silvery solder(connector, waterproof port, cable))	BL	BL	BL	BL	---
22*	Black soft plastic(wire jacket, temperature sensor, PCB)	BL	BL	BL	BL	IN
23	Coppery metal with silvery plating(wire, temperature sensor, PCB)	BL	BL	BL	BL	---
24	Black body(temperature sensor, PCB)	BL	BL	BL	BL	BL
25	Yellow adhesive plastic(tape, inductor"L11", PCB)	BL	BL	BL	BL	BL
26	Transparent adhesive plastic(tape, inductor"L11", PCB)	BL	BL	BL	BL	BL
27	White adhesive paper with black printing(label, inductor"L11", PCB)	BL	BL	BL	BL	BL
28	Black soft plastic(sleeve, inductor"L11", PCB)	BL	BL	BL	BL	BL
29	Coppery metal with red coating(coil, inductor"L11", PCB)	BL	BL	BL	BL	---
30	Black magnet(core, inductor"L11", PCB)	BL	BL	BL	BL	BL
31	Black body(triode"Q5", PCB)	BL	BL	BL	BL	BL
32*	Green body(LED"D25", PCB)	BL	BL	BL	BL	IN
33*	Translucent body(LED"D26", PCB)	BL	BL	BL	BL	IN
34	Blue plastic with white printing(sleeve, capacitor"E3", PCB)	BL	BL	BL	BL	BL
35	Silvery metal(shell, capacitor"E3")	BL	BL	BL	BL	---
36	Black rubber(base, capacitor"E3")	BL	BL	BL	BL	BL
37	Transparent soft plastic(film, capacitor"E3")	BL	BL	BL	BL	BL
38	Brown paper with liquid(film, capacitor"E3")	BL	BL	BL	BL	BL
39	Silvery metal(foil, capacitor"E3")	BL	BL	BL	BL	---
40	Dull silvery metal(foil, capacitor"E3")	BL	BL	BL	BL	---
41	Silvery metal(connector, capacitor"E3")	BL	BL	BL	BL	---
42	Silvery metal(pin, capacitor"E3")	BL	BL	BL	BL	---
43*[1]	Red body(diode"D35", PCB)	OL	BL	BL	BL	BL
44	Black body with grey printing(diode"D21", PCB)	BL	BL	BL	BL	BL
45	Black body(diode"D24", PCB)	BL	BL	BL	BL	BL

TEST REPORT

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
46	Brown body(capacitor"C61", PCB)	BL	BL	BL	BL	BL
47	Black body with white printing(resistor"28", PCB)	BL	BL	BL	BL	BL
48	Black body(IC"U5", PCB)	BL	BL	BL	BL	BL
49	Black body(triode"Q15", PCB)	BL	BL	BL	BL	BL
50	Silvery body(crystal"Y1", PCB)	BL	BL	BL	BL	BL
51	Dull grey body(inductor"L1", PCB)	BL	BL	BL	BL	BL
52*	Green PCB(Charge Controller)	BL	BL	BL	BL	IN
53	Silvery solder(PCB, Charge Controller)	BL	BL	BL	BL	---
54	Black glue(sealing, Charge Controller)	BL	BL	BL	BL	BL

- The test results of samples (15), (18), (21) are shown retest result, and the retest samples were provided by client January 2, 2019.
- The test result of sample (4) is shown retest result, and the retest sample was provided by client on February 27, 2019.

Remark:
(1)

--- = Not Conducted

* = Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(Ⅵ)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC62321-3-1:2013.

Element	Unit	Polymers	Metal	Composite Material
Cd	mg/kg	BL≤70-3σ< X <130+3σ≤OL	BL≤70-3σ< X <130+3σ≤OL	LOD < X <150+3σ≤OL
Pb	mg/kg	BL≤700-3σ< X <1300+3σ≤OL	BL≤700-3σ< X <1300+3σ≤ OL	BL≤500-3σ< X <1500+3σ≤OL
Hg	mg/kg	BL≤700-3σ< X <1300+3σ≤OL	BL≤700-3σ< X <1300+3σ≤OL	BL≤500-3σ< X <1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ< X	BL≤700-3σ< X	BL≤500-3σ< X
Br	mg/kg	BL≤300-3σ< X	---	BL≤250-3σ< X

BL = Below Limit

OL = Over Limit

IN = Inconclusive

LOD = Limit of Detection

*1 = As claimed by the material declaration submitted by the client, the materials of the sample No.43 is glass. And according to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.

*2 = As claimed by the material declaration submitted by the client, the material of the sample No. 20 is copper alloy. And according to RoHS directive2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.

(2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

(3) The maximum permissible limit is quoted from RoHS directive 2011/65/EU:

RoHS Restricted Substances	**Maximum Concentration Value (mg/kg) (by weight in homogenous materials)**
Cadmium(Cd)	100
Lead(Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(Ⅵ))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominate ddiphenylethers (PBDEs)	1000

(4) As requested by applicant, only components shown in this report were screened by XRF spectroscopy for 2011/65/EU and its amendment directives, other components were not screened included in this report.

(5) Photo appendix is included.

Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

****

Wet Chemical Testing：

Test method:

Lead Content:
With reference to IEC62321-5:2013, by acid digestion and analysis was performed by Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES) or Atomic Absorption Spectrometry (AAS).

Hexavalent Chromium Content (For metal material):
With reference to IEC 62321-7-1:2015, by boiling-water-extraction and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:
With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Pb

Item	Unit	MDL	Results
			20
Lead (Pb) Content	mg/kg	10	24890

2) The test results of Cr (Ⅵ)

Item	Unit	MDL	Results	Limit
			3	
Hexavalent Chromium (Cr(Ⅵ))	μg/cm^2	0.10	N.D.	**
Conclusion	/	/	**Pass**	/

Note:

- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- mg/kg = ppm
- ** =

  a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13μg/cm^2. The sample coating is considered to contain CrVI
  b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10μg/cm^2). The coating is considered a non-CrVI based coating
  c. The result between 0.10μg/cm^2 and 0.13μg/cm^2 is considered to be inconclusive -unavoidable coating variations may influence the determination

  For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

****

3) The test results of PBBs & PBDEs

Item	Unit	MDL	Results				Limit
			16	17	19	22	
Polybrominated Biphenyls							
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000
Polybrominated Diphenylethers							
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000
Conclusion	**/**	**/**	**Pass**	**Pass**	**Pass**	**Pass**	**/**

****

TEST REPORT

Item	Unit	MDL	Results			Limit
			32	33	52	
Polybrominated Biphenyls						
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	1000
Polybrominated Diphenylethers						
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	1000
Conclusion	/	/	**Pass**	**Pass**	**Pass**	/

Note:

- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- The results less than MDL are not taken into account while calculating the sum contents.
- mg/kg = ppm
- Photo is included.

Phthalates(DBP、BBP、DEHP、DIBP)content

Test method: With reference to IEC 62321-8:2017, by gas chromatographic-mass spectrometer (GC-MS)

Item	Unit	MDL	Results				Limit
			2+7	4	5	8+9+16	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	0.077	0.054	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	0.006	0.013	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	0.017	0.014	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	**Pass**	/

Item	Unit	MDL	Results				Limit
			10+11	12+13	15	17+19	
Dibutyl Phthalate (DBP)	%	0.003	0.029	0.038	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	0.006	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	**Pass**	/

Item	Unit	MDL	Results				Limit
			18	22	24+31+32	25	
Dibutyl Phthalate (DBP)	%	0.003	0.014	N.D.	N.D.	0.005	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	**Pass**	/

Item	Unit	MDL	Results				Limit
			26+34	27+38	28	30	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	0.005	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	**Pass**	/

TEST REPORT

Item	Unit	MDL	Results				Limit
			33+43+44	36+37	45+46+47	48+49+50	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	**Pass**	/

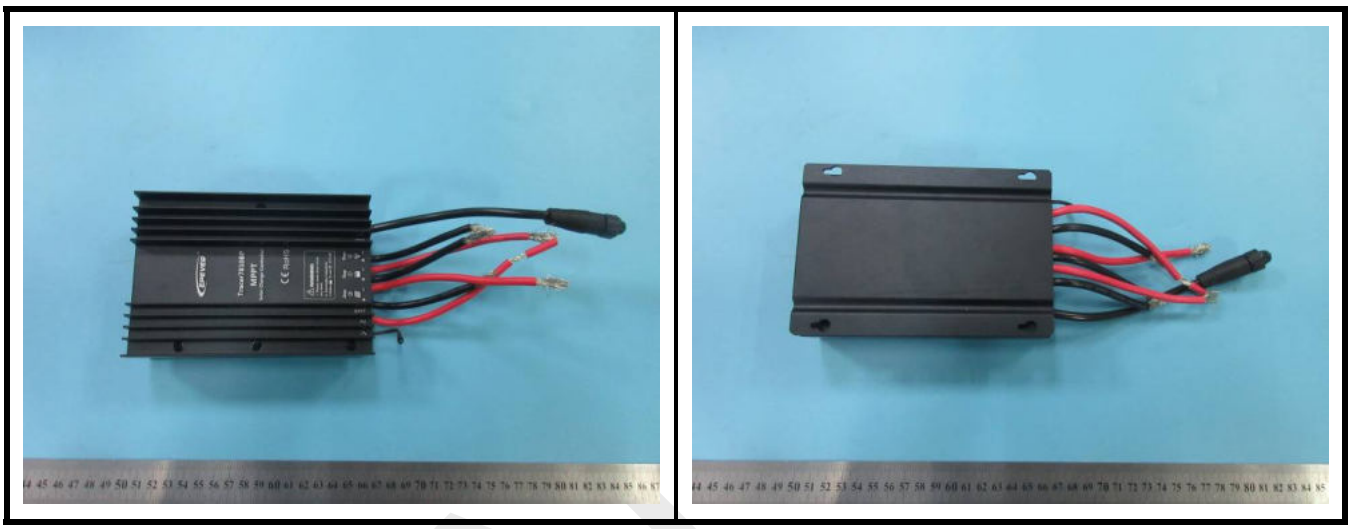
Item	Unit	MDL	Results			Limit
			51	52	54	
Dibutyl Phthalate (DBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Benzylbutyl Phthalate (BBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	N.D.	N.D.	N.D.	0.1
Diisobutyl Phthalate(DIBP)	%	0.003	N.D.	N.D.	N.D.	0.1
Conclusion	/	/	**Pass**	**Pass**	**Pass**	/

Note:

- The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- mg/kg = ppm
- The test results of samples (15), (18) are shown retest result, and the retest samples were provided by client January 2, 2019.
- The test result of sample (4) is shown retest result, and the retest sample was provided by client on February 27, 2019.
- "+"= Mixed, The admixture of specimen is tested as a whole(part) which according to the applicant's request, the result of report as average value because of the whole specimen is regarded as constituting from the homogeneous material. If the testing of specimen may have the obvious difference, and the result may exceed the number in this report. The applicant will undertake all differences and risk.
- Photo is included.

TEST REPORT

Photograph of Sample



BACL authenticate the photo on original report only

*** End of Report ***

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中国认可
国际互认
检测
TESTING
CNAS L6910

国家强制性产品认证
试验报告

■新申请 □变更 □监督 □复审 □其他:

申请编号： A2019CCC1302-3208880

产品名称： 建筑用钢化玻璃

型　　号： 公称厚度 6mm < D ≤ 12mm

检测机构： 中国质量认证中心华中实验室

安全型式试验报告

试样规格：（1400×400×8.0）mm　　最大拱高：110mm

使用仪器：计数框、钢直尺、钢卷尺、千分尺

试验环境温度：/　　试验环境相对湿度：/

检验项目	碎片状态		
标准要求	每块试样在（50×50）mm 的区域内的最少碎片数必须满足下表。且允许有少量长条碎片，其长度不超过 75mm。		
	玻璃品种	公称厚度（mm）	最少碎片数/片
	平面钢化玻璃	3	30
		4–12	40
		≥15	30
	曲面钢化玻璃	≥4	30

试验结果

试样编号	试样厚度（mm）	（50×50）mm 的区域内碎片数	有无长度超过 75mm 的碎片
C3208880-15	7.73	68	无
C3208880-16	7.75	61	无
C3208880-17	7.74	54	无
C3208880-18	7.74	59	无
单项结论	合格		
备　注			

检验：杨鹏　　审核：马素波　　日期：2019 年 08 月 05 日

本报告涂改无效

样品名称：建筑用钢化玻璃 型　　号：6mm＜D≤12mm 商　　标：/ 样品数量：试样　22 块 收样完成：2019 年 07 月 09 日 检测完成：2019 年 08 月 05 日 样品来源：初始送样	委托人：深圳市兴安玻璃有限公司 委托人地址：深圳市龙岗区坪地街道六联石碧村红岭工业区 11B 生产者：深圳市兴安玻璃有限公司 生产者地址：深圳市龙岗区坪地街道六联石碧村红岭工业区 11B 生产企业：深圳市兴安玻璃有限公司 生产企业地址：深圳市龙岗区坪地街道六联石碧村红岭工业区 11B

试验依据标准：GB 15763.2-2005《建筑用安全玻璃　第 2 部分：钢化玻璃》

试验结论：合格

本申请单元所覆盖的产品型号规格及相关情况说明：

本单元覆盖了该企业生产的公称厚度为 6mm＜D≤12mm 认证单元（公称厚度 8.0mm、10.0mm、12.0mm 最大展开面积 9.20m²，最小邻边夹角 30°，最大拱高 110mm）的建筑用钢化玻璃。

主检：杨　鹏　　签名：杨鹏 日期：2019 年 08 月 05 日	
审核：冯素波　　签名：冯素波 日期：2019 年 08 月 05 日	
签发人：蔡　青　　签名：蔡青 日期：2019 年 08 月 05 日	中国质量认证中心华中实验室 2019 年 08 月 05 日

备注：检验项目执行《强制性产品认证实施规则　安全玻璃》及相关文件规定。

报 告 的 组 成

内容	有无	页数	编号
封面	✓	1	/
首页	✓	1	/
报告的组成	✓	1	/
样品描述及说明	✓	1	/
安全型式试验报告	✓	5	/
试验仪器设备清单	✓	1	/
封底	✓	1	/

本报告由表中划✓的所有内容组成

样品描述及说明

一、样品尺寸及数量：

试样：1800mm × 1000mm × 8.0mm（最大展开面积 9.20m² 用 4 块尺寸 1800mm × 1000mm 样品，摆放于最大展开面积四角外缘在炉中一次加工而成） 4 块

1000mm × 577mm × 8.0mm（最小邻边夹角 30° ） 4 块

1400mm × 400mm × 8.0mm（最大拱高） 4 块

610mm × 610mm × 8.0mm 6 块

1930mm × 864mm × 8.0mm 4 块

二、样品覆盖型号及说明：

样品覆盖了该企业生产的公称厚度 6mm < D ≤ 12mm 认证单元（公称厚度 8.0mm、10.0mm、12.0mm 最大展开面积 9.20m²，最小邻边夹角 30° ，最大拱高 110mm ）的建筑用钢化玻璃。

三、检验说明：

依据 GB 15763.2-2005《建筑用安全玻璃 第 2 部分：钢化玻璃》标准，本实验室对深圳市兴安玻璃有限公司生产的建筑用钢化玻璃（公称厚度 D－8.0mm）进行了碎片状态（最大展开面积、最小邻边夹角、最大拱高）、抗冲击性、霰弹袋冲击性能试验，其结果均符合标准要求。

安全型式试验报告

试样规格：（610×610×8.0）mm

使用仪器：落球冲击试验机、钢卷尺、千分尺

试验环境温度：/ 试验环境相对湿度：/

检验项目	抗冲击性
标准要求	质量为 1040g±10g 钢球（直径 63.5mm），落下高度 1000mm，冲击后，试样破坏数不超过 1 块为合格。

试验结果

试样编号	试样厚度（mm）	冲击后试样状态
C3208880-1	7.72	未破坏
C3208880-2	7.74	未破坏
C3208880-3	7.73	未破坏
C3208880-4	7.74	未破坏
C3208880-5	7.74	未破坏
C3208880-6	7.74	未破坏
单项结论	合格	
备注	TMP 方式检测	

检验：杨鹏 审核：冯素波 日期：2019 年 08 月 05 日

本报告涂改无效

安全型式试验报告

试样规格：（1800×1000×8.0）mm　　最大展开面积：9.20m²

使用仪器：计数框、钢直尺、钢卷尺、千分尺

试验环境温度：/　　试验环境相对湿度：/

检验项目	碎片状态		
标准要求	每块试样在（50×50）mm 的区域内的最少碎片数必须满足下表。且允许有少量长条碎片，其长度不超过 75mm。		
	玻璃品种	公称厚度（mm）	最少碎片数/片
	平面钢化玻璃	3	30
		4~12	40
		≥15	30
	曲面钢化玻璃	≥4	30

试验结果

试样编号	试样厚度（mm）	（50×50）mm 的区域内碎片数	有无长度超过 75mm 的碎片
C3208880-7	7.73	62	无
C3208880-8	7.73	58	无
C3208880-9	7.74	60	无
C3208880-10	7.75	66	无
单项结论	合格		
备注	最大展开面积由 4 块（1800×1000×8.0）mm 的样品拼成 9.20m²，摆放于最大展开面积四角外缘在炉中一次加工而成。		

检验：杨鹏　　审核：冯秦波　　日期：2019 年 08 月 05 日

本报告涂改无效

安全型式试验报告

试样规格：（1000×577×8.0）mm　　最小邻边夹角：30°

使用仪器：计数框、钢直尺、钢卷尺、千分尺

试验环境温度：/　　试验环境相对湿度：/

检验项目	碎片状态		
标准要求	每块试样在（50×50）mm 的区域内的最少碎片数必须满足下表，且允许有少量长条碎片，其长度不超过 75mm。		
	玻璃品种	公称厚度（mm）	最少碎片数/片
	平面钢化玻璃	3	30
		4~12	40
		≥15	30
	曲面钢化玻璃	≥4	30

试验结果

试样编号	试样厚度（mm）	（50×50）mm 的区域内碎片数	有无长度超过 75mm 的碎片
C3208880-11	7.74	84	无
C3208880-12	7.74	87	无
C3208880-13	7.73	87	无
C3208880-14	7.73	89	无
单项结论	合格		
备　注			

检验：杨鹏　　审核：马素波　　日期：2019 年 08 月 05 日

本报告涂改无效

安全型式试验报告

试样规格：（1930×864×8.0）mm

使用仪器：霰弹冲击试验机、千分尺、钢卷尺

试验环境温度：/　　试验环境相对湿度：/

检验项目	霰弹袋冲击性能
标准要求	质量为 45±0.1kg 霰弹袋，落下高度（300、750、1200）mm，冲击后，试样不破坏；或试样破坏，并且每块试样的最大 10 块碎片的总和不得超过相当于试样的 65cm² 面积的质量，保留在框内的任何无贯穿裂纹的玻璃碎片长度不超过 120mm。

试验结果

试样编号	试样厚度（mm）	最大冲击高度（mm）	冲击后状态	最大 10 块碎片的总质量（g）	框内有无长度大于 120mm 碎片
C3208880-19	7.72	1200	未破坏	/	/
C3208880-20	7.73	1200	未破坏	/	/
C3208880-21	7.73	1200	未破坏	/	/
C3208880-22	7.72	1200	未破坏	/	/
单项结论	合格				
备注	TMP 方式检测				

检验：杨鹏　　审核：冯素波　　日期：2019 年 08 月 05 日

本报告涂改无效

试验仪器设备清单

序号	名称	型号	编号	计量有效期至	本次使用
1	霰弹冲击试验机	/	/	/	✓
2	霰弹袋	45kg	/	2019 年 05 月 29 日（校准日期）	✓
3	落球冲击试验机	/	/	/	✓
4	钢球	1040g	/	2019 年 05 月 29 日（校准日期）	✓
5	千分尺	0-25mm	CQCBL100	2020 年 04 月 24 日	✓
6	钢卷尺	5m	CQCBL101	2020 年 04 月 24 日	✓
7	钢直尺	150mm	CQCBL102	2020 年 04 月 24 日	✓
8	计数框	（50 × 50）mm	/	/	✓

声　明

本报告试验结果仅对受试样品有效；

未经许可本报告不得部分复制；

对本报告如有异议，请于收到报告之日起十五天内提出。

检测单位：中国质量认证中心华中实验室

地　　址 1：湖北省武汉市东湖开发区高新大道 999 号

地　　址 2：湖北省武汉市东湖开发区九龙湖街 51 号

邮政编码：430000

电　　话：027-87908588

传　　真：027-87908026

Certificate

CertificateNumber: UNIA21030401EC-01

Product:	SMD Light Strip
Applicant:	Shenzhen Louita Lighting Co., Ltd. North, 5F, Building B, Sanhe Industrial Park, Yongxin Street, Yingrenshi Community, Shiyan Street, Bao'an District, Shenzhen
Manufacturer:	Shenzhen Louita Lighting Co., Ltd. North, 5F, Building B, Sanhe Industrial Park, Yongxin Street, Yingrenshi Community, Shiyan Street, Bao'an District, Shenzhen
Model No.:	SMD5050, SMD2835, SMD2811, SMD1903, SMD5630, SMD3014, SMD16703, SMD5054, SMD3528, SMD5730
Trade Name:	N/A
Test Methods:	EN IEC 55015:2019/A11:2020, EN 61547:2009 EN IEC61000-3-2:2019, EN 61000-3-3:2013/A1:2019

The laboratory tested the product provided by the applicant according to the above test methods. According to the test results, the product conforms to EMC Directive (2014/30/EU) issued by the European Commission. It is possible to use CE marking to demonstrate the compliance with EMC Directive.

The certificate applies to the tested sample above mentioned only and shall not imply an assessment of the whole production. It is only valid in connection with the test report number: UNIA21030401ER-01.

Mar. 15,2021
Issue Date

Hoffer Lau

CE

Shenzhen United Testing Technology Co., Ltd.

Shenzhen:2/F.,Annex Building,Jiahuangyuan Tech Park, No.365, Baotian 1st Road, Fiegang, Xixiang Street, Bao'anDistrict, Shenzhen, Guangdong, China/518050

Guangzhou:No.47-3, Industrial Road, Zhushan, Dalong Street, Panyu District, Guangzhou, Guangdong, China/511450

Tel:+86-755-86180996/+86-020-39277769 Fax:+86- 0755-86180156

Web.Site: www.uni-lab.hk/ E-mail:hofferlau@uni-lab.hk

Certificate of Compliance

Certificate

Certificate Number: UNIB21030909HC-01

Product:	SMD Light Strip
Applicant:	Shenzhen Louita Lighting Co., Ltd. North, 5F, Building B, Sanhe Industrial Park, Yongxin Street, Yingrenshi Community, Shiyan Street, Bao'an District, Shenzhen
Manufacturer:	Shenzhen Louita Lighting Co., Ltd. North, 5F, Building B, Sanhe Industrial Park, Yongxin Street, Yingrenshi Community, Shiyan Street, Bao'an District, Shenzhen
Model No.:	SMD5050, SMD2835, SMD2811, SMD1903, SMD5630, SMD3014, SMD16703, SMD5054, SMD3528, SMD5730
Trade Name:	N/A
Test Methods:	IEC 62321-2:2013, IEC 62321-3-1:2013, IEC 62321-8:2017

The laboratory tested the product provided by the applicant according to the above test methods. According to the test results, the product conforms to RoHS Directive [(2011/65/EU and Amendment (EU) 2015/863)] issued by the European Commission. It is possible to use CE marking to demonstrate the compliance with RoHS Directive.

The certificate applies to the tested sample above mentioned only and shall not imply an assessment of the whole production. It is only valid in connection with the test report number: UNIB21030909HR-01.

Note: According to the requirements of the applicant for testing, details are shown in the test report.

RoHS

Mar. 15,2021
Issue Date

Hoffer Lau

CE

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Certificate of Compliance

Certificate of Compliance

Certificate No.: FQII-DZ-19009-1/2

Certificate Holder: Xiamen Qiangli Jucai Opto-Electronic Technology Co.,Ltd.

Address: No.8065, West Xiangan Road, Xiamen Torch High-Tech industrial Zone,Xiamen 361100,Fujian,China

Product Description: Full color LED display

Model Reference: Q2.5、Q1.29、Q1.33、Q1.34、Q1.37、Q1.40、Q1.42、Q1.53、Q1.58、Q1.66、Q1.75、Q1.81、Q1.83、Q1.86、Q1.92、Q1.97、Q2.0、Q2.84、Q3、Q3.3、Q3.9、Q4.8、Q5、Q5.9、Q6、Q6.2、Q6.6、Q8、Q10、Q16

Brand Name:

Report No.: (2019)DZI0011

Standard/Directive:

EC Electromagnetic Compatibility Directive 2014/30/EU
EN 55032: 2015,EN 55035: 2017,
EN 61000-3-2: 2014,EN 61000-3-3: 2013

This certificate applies specifically to the sample investigated in our test report number only. The test results apply only to the particular sample tested and to the specific tests carried out.

The CE marking can be affixed on the product after preparation of necessary conformity documentation.

CE

Authorized Signatory

Valid from: Apr.09,2019 Valid Until: Apr.09,2021

FUJIAN INSPECTION AND RESEARCHINSTITUTE FOR PRODUCT QUALITY

No.:121 Shantoujiao, West Yangqiao Road, Fuzhou, Fujian, P.R.China

Certificate of Compliance

Certificate No.: FQII-DZ-19009-2/2

Certificate Holder: Xiamen Qiangli Jucai Opto-Electronic Technology Co.,Ltd.

Address: No.8065, West Xiangan Road, Xiamen Torch High-Tech industrial Zone,Xiamen 361100,Fujian,China

Product Description: Full color LED display

Model Reference: S1.25、S1.29、S1.33、S1.34、S1.37、S1.40、S1.42、S1.53、S1.58、S1.66、S1.75、S1.81、S1.83、S1.86、S1.92、S1.97、S2.0、S2.5、S2.8、S3、S3.0、S3.3、S3.9、S4、S4.8、S5、S5.9、S6、S6.2、S6.6、S8、S10

Brand Name:

Report No.: (2019)DZI0011

Standard/Directive:

EC Electromagnetic Compatibility Directive 2014/30/EU
EN 55032: 2015,EN 55035: 2017,
EN 61000-3-2: 2014,EN 61000-3-3: 2013

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Valid from: Apr.09,2019 Valid Until: Apr.09,2021

FUJIAN INSPECTION AND RESEARCHINSTITUTE FOR PRODUCT QUALITY

No.:121 Shantoujiao, West Yangqiao Road, Fuzhou, Fujian, P.R.China

Certificate of Compliance

Certificate No.: FQII-DZ-19010-1/2

Certificate Holder: Xiamen Qiangli Jucai Opto-Electronic Technology Co.,Ltd.

Address: No.8065, West Xiangan Road, Xiamen Torch High-Tech industrial Zone,Xiamen 361100,Fujian,China

Product Description: Full color LED display

Model Reference: Q2.5、Q1.29、Q1.33、Q1.34、Q1.37、Q1.40、Q1.42、Q1.53、Q1.58、Q1.66、Q1.75、Q1.81、Q1.83、Q1.86、Q1.92、Q1.97、Q2.0、Q2.84、Q3、Q3.3、Q3.9、Q4.8、Q5、Q5.9、Q6、Q6.2、Q6.6、Q8、Q10、Q16

Brand Name:

Report No.: (2019)DZ10012

Standard/Directive:

EC Low Voltage Directive 2014/35/EU
EN 60950-1:2006+A11:2009+A1:2010+A12: 2011+A2: 2013

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The CE marking can be affixed on the product after preparation of necessary conformity documentation.

Authorized Signatory

Valid from: Apr.09,2019 Valid Until: Apr.09,2021

FUJIAN INSPECTION AND RESEARCHINSTITUTE FOR PRODUCT QUALITY

No.:121 Shantoujiao, West Yangqiao Road, Fuzhou, Fujian, P.R.China

Certificate of Compliance

Certificate No.: FQII-DZ-19010-2/2

Certificate Holder: Xiamen Qiangli Jucai Opto-Electronic Technology Co.,Ltd.

Address: No.8065, West Xiangan Road, Xiamen Torch High-Tech industrial Zone,Xiamen 361100,Fujian,China

Product Description: Full color LED display

Model Reference: S1.25、S1.29、S1.33、S1.34、S1.37、S1.40、S1.42、S1.53、S1.58、S1.66、S1.75、S1.81、S1.83、S1.86、S1.92、S1.97、S2.0、S2.5、S2.8、S3、S3.0、S3.3、S3.9、S4、S4.8、S5、S5.9、S6、S6.2、S6.6、S8、S10

Brand Name:

Report No.: (2019)DZI0012

Standard/Directive:

EC Low Voltage Directive 2014/35/EU
EN 60950-1:2006+A11:2009+A1:2010+A12: 2011+A2: 2013

This certificate applies specifically to the sample investigated in our test report number only. The test results apply only to the particular sample tested and to the specific tests carried out.

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Authorized Signatory

Valid from: Apr.09,2019 Valid Until: Apr.09,2021

FUJIAN INSPECTION AND RESEARCHINSTITUTE FOR PRODUCT QUALITY

No.:121 Shantoujiao, West Yangqiao Road, Fuzhou, Fujian, P.R.China

中国合格评定国家认可委员会

实验室认可证书

（注册号：CNAS L10574）

兹证明：

深圳市北科检测科技有限公司

深圳市龙岗区南湾街道

上李朗社区洲腾工业园三栋6楼中，518116

符合 ISO/IEC 17025：2005《检测和校准实验室能力的通用要求》（CNAS-CL01《检测和校准实验室能力认可准则》）的要求，具备承担本证书附件所列服务能力，予以认可。

获认可的能力范围见标有相同认可注册号的证书附件，证书附件是本证书组成部分。

签发日期：2017-12-25

有效期至：2023-12-24

初次认可：2017-12-25

中国合格评定国家认可委员会授权人

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CNAS是国际实验室认可合作组织（ILAC）和亚太实验室认可合作组织（APLAC）的互认协议成员。
本证书的有效性可登陆www.cnas.org.cn获认可的机构名录查询。

深圳市北科检测科技有限公司
检验报告

产品名称	户外全彩LED显示屏	商标	强力巨彩
制造商单位	厦门强力巨彩光电科技有限公司		
制造商地址	厦门火炬高新区（翔安）产业区翔安西路E6幢8065号		
委托单位	厦门强力巨彩光电科技有限公司		
委托方地址	厦门火炬高新区（翔安）产业区翔安西路E6幢8065号		
送样数量	1台	送样日期	2020年09月11日
型号/规格	Q6-E		
检验类别	委托检验		
检验地点	深圳市北科检测科技有限公司		
检验环境	温度：25℃　　湿度：55%RH　　大气压：101kPa		
检验说明	整机性能测试。		
检验依据	委托方要求以及企业技术条件 GB 4943.1-2011信息技术设备 安全 第1部分：通用要求 SJ/T 11141-2017《LED显示屏通用规范》 SJ/T 11281-2017《发光二极管（LED）显示屏测试方法》 CQC3158-2016 LED显示单元节能认证技术规范 SJ/T 11590-2016 LED显示屏图像主观质量评价方法 CESI TS008-2016 HDR显示认证技术规范 CESI-TS 006—2015 超高清显示认证 CESI TS009-2018 LED显示屏绿色健康分级认证技术规范 EN 62471：2008 灯和灯系统的光生物安全性 GB/T 2423.22-2012 电工电子产品环境试验 第2部分试验方法 试验N 温度变化 GB/T 4208-2017 外壳防护等级（IP 代码） GB/T 5080.7-1986 设备可靠性试验 恒定失效率假设下的失效率与平均无故障时间的验证试验方案		

	GB/T 18313-2001 声学信息技术设备和通信设备空气噪声的测量 IEC TR62778:2014 LED蓝光危害评估 IEC 62471 灯与灯系统的光生物安全
检验结果	见本报告
检验结论	其所测项目见数据页。
主 检: 郭双庆	郭双庆
审 核: 王文斌	王文斌
批 准: 廖晓琴	廖晓琴
日 期:	2020年09月29日

深圳市北科检测科技有限公司

深圳市北科检测科技有限公司 检测专用章

GB 4943.1-2011			
条款	标准要求	结果	判定
4.2	机械强度		合格
4.2.1	基本要求	结构设计合理，具有足够的机械强度	合格
4.2.4	250N的恒定作用力试验	250N的力施加在外部外壳上，无危险	合格
4.2.5	冲击试验：用一个直径约50mm、质量500g±25g的光滑的实心钢球，使其从距样品垂直距离(H)为1.3米处自由落到样品上。	试验后无损伤	合格
4.3	结构设计		合格
4.3.1	棱缘和拐角	棱缘和拐角均充分倒圆和磨光	合格

检验结果

序号	检验项目	单位	技术要求	检验结果	结论
1	像素点间距	mm	6±0.1	符合	合格
2	结构	/	LED显示屏显示部分结构可采用钢、铝、镀锌方管、塑料等材料，结构安全坚固。	符合	合格
3	外观	/	LED显示屏的外表面无明显划痕。	符合	合格
			LED显示屏模组安装应一致，无松动无破裂。	符合	合格
4	工作电压	/	在4.2×(1±10%) VDC范围内能正常工作	符合	合格
5	自动校正	/	数据采集自动共享到网上，客户可自行下载校正数据，进行校正和优化。	符合	合格
6	工作环境	/	-20℃~50℃条件下能正常工作。	符合	合格
7	材质	/	箱体采用镁合金/压铸铝/铁材质	符合	合格
		/	套件采用采用聚碳酸酯和玻璃纤维材质	符合	合格
8	系统调节功能	/	可通过系统调节参数影响显示效果	符合	合格
9	像素密度	点/单元	单元大小为192mm×192mm的像素密度。	1024	合格
10	动态扫描	/	采用行驱动芯片	符合	合格
11	像素组成	/	1R、1G、1B	符合	合格
12	支持亮度调节	/	支持亮度调节功能	符合	合格
13	亮度/色度校正	/	支持亮度校正、色度校正	符合	合格
14	驱动芯片功能	/	具有列下消隐功能、倍频刷新率提升、低灰偏色改善	符合	合格
15	调节软件设置项	/	支持鬼影消除、暗亮线消除、慢速开启、十字架消除、毛毛虫消除、亮度缓慢变亮功能	符合	合格
16	功能	/	显示单元均可独立控制，单点故障不影响整屏使用，单元支持带电热插拔。	符合	合格
			单元板前、后维护	符合	合格
			系统、电源前、后维护	符合	合格

检验结果					
序号	检验项目	单位	技术要求	检验结果	结论
17	防伪功能	/	具备强力巨彩logo、产品型号	符合	合格
18	一键调试	/	支持联网一键下载程序文件和调试	符合	合格
19	拼缝调节	/	支持亮暗线拼缝调节	符合	合格
20	整屏平整度	mm	≤0.2	0.13	合格
21	模组平整度	mm	≤0.1	0.06	合格
22	拼接缝	mm	≤0.1	0.07	合格
23	最大亮度	cd/m^2	≥4200	5621	合格
24	最高对比度	/	≥5000:1	8410:1	合格
25	水平视角	°	≥140	167	合格
26	垂直视角	°	≥130	166	合格
27	亮度均匀性	%	≥95	97.1	合格
28	刷新率	/	960/1920	符合	合格
29	最大功耗	W/m^2	≤883	512	合格
30	像素中心距精确度	%	≤3%	符合	合格
31	像素失控率	%	<0.01	0	合格
32	灰度级数（信号处理深度）	/	采用14bit技术	符合	合格
33	色温	/	3000K~18000K可调	符合	合格
34	色度均匀性	/	±0.002Cx、Cy内	符合	合格
35	低亮高灰	/	亮度为20%时信号处理深度（灰度级数）达到14bit	符合	合格
36	恒流设计	/	采用恒流设计	符合	合格
37	换帧频率	Hz	60	60	合格
38	宽色域	%	测试NTSC色域	108.5	合格
39	平均功耗	W/m^2	≤295	173	合格
40	色度均匀性	/	-0.003<Cx<0.003, -0.003<Cy<0.003（校正后）	符合	合格
41	反光率	%	反光率≤1.5%	符合	合格

检验结果					
序号	检验项目	单位	技术要求	检验结果	结论
42	画面延时（纳秒级）	ns	≤500ns	符合	合格
43	衰减率	%	≤10%（工作3年）	符合	合格
44	图像质量		LED显示屏图像质量主观评价优	符合	合格
45	防护性能	/	具有防静电、防电磁干扰、喷三防漆防潮、防腐蚀、防虫、抗震动、抗雷击等功能；具有电源过压、过流、断电保护、分布上电措施、防护等级达到IP65	符合	合格
46	连续工作时间	h	连续工作时间：≥7×24hrs，支持连续不间断显示	符合	合格
47	使用寿命	h	≥100000	符合	合格
48	平均无故障时间	h	MTBF平均无故障时间≥20000h; MTTR平均修复时间≤20分钟	符合	合格
49	屏幕温升	k	最高亮度（白平衡）持续工作4小时，模组表面温升小于20K	符合	合格
50	高温负荷工作	/	样品状态：通电工作 试验温度：80℃ 试验时间：12h	试验结束后，产品正常工作	合格
51	低温负荷工作	/	样品状态：通电工作 试验温度：-40℃ 试验时间：12h	试验结束后，产品正常工作	合格
52	高温存储	/	样品放入试验箱中，试验箱内温度80℃，存放48h，无异常	符合	合格
53	低温存储	/	样品放入试验箱中，试验箱内温度-40℃，存放48h，无异常	符合	合格
54	恒定湿热	/	样品状态：通电工作 试验温度：85℃ 相对湿度：85% 试验时间：168h	试验结束后，产品正常工作	合格
55	湿热负载	/	LED显示屏最高工作环境温度下，相对湿度87%-93%，通电工作12h	试验结束后，产品正常工作	合格

检验结果

序号	检验项目	单位	技术要求	检验结果	结论
56	光生物安全检测	/	无危害类：8h（30000s）曝辐中不造成光化学紫外危害（ES），并在16min（1000s）内不造成近紫外危害（EUVA），并在2.8h（10000s）内不造成对视网膜蓝光危害（LB）并在10s内不造成对视网膜热危害（LR），且在1000s内不造成对眼睛的红外辐射危害（EIR）	符合	合格
57	盐雾	/	盐雾10级 试验溶液盐溶液：采用氯化钠和蒸馏水配制，其浓度为（5±0.1）%盐雾工作试验空间内温度：35℃ PH值：6.5～7.2 盐雾工作试验空间内放置时间：48h 试验前样品干净，无油污，无临时性的保护层和其他弊病，样品放置试验样品表面与垂直方向成倾斜角，相互不重叠，接触试验结束后，清洗样品表面盐沉积物，然后在标准的大气条件下恢复1-2h	试验结束后，产品正常工作	合格
58	阻燃	/	PCB板、防火保护外壳达到V-0等级	符合	合格
59	振动试验	/	频率循环范围：（5～55～5）Hz 振幅值：0.19mm 扫频速率：5min/次 方向：互相垂直的两个方向 循环次数：二次	试验结束后，产品正常工作	合格
60	冷热冲击	/	低温：-40℃ 时间：0.5h 高温：100℃ 时间：0.5h 转换时间：（3-5分钟）min 试验周期：上述试验为1个循环，试验进行200循环 样品状态：非工作状态	试验结束后，产品正常工作	合格

检验结果

序号	检验项目	单位	技术要求	检验结果			结论
61	点对点电阻 A面	/	$1x10^5$～$1x10^9$ Ω	1	$2.19x10^8$		合格
				2	$2.31x10^8$		
				3	$2.36x10^8$		
62	点对点电阻 B面	/	$1x10^5$～$1x10^9$ Ω	1	$2.47x10^8$		合格
				2	$2.48x10^8$		
				3	$2.09x10^8$		
63	静电电压衰减期	/	（±1000-±100V） ≤2S		+V	-V	合格
				1	0.21S	0.27S	
				2	0.32S	0.25S	
				3	0.24S	0.31S	
64	高低温循环	/	低温：-40℃ 时间：0.5h 高温：80℃ 时间：0.5h 转换时间：（3-5分钟）min 试验周期：上述试验为1个循环，试验进行200循环 样品状态：工作状态	试验结束后，产品正常工作			合格
65	电磁兼容/干扰	/	符合Class B标准	符合			合格
66	抗紫外线UV	/	暴露周期8h干燥、4h凝露 使用UVA340灯，辐照度0.76W/M2 干燥时，黑标温度：60℃，8h 凝露时，黑标温度：50℃，4h	样品表面无明显变化			合格

检验结果

序号	检验项目	单位	技术要求	检验结果	结论
67	噪声	/	1m范围内，测试4个位置（前后左右）噪音不大于2dB	符合	合格
68	抗电强度	/	在电源插头与金属外壳之间以施加试验电压1.5kV/50Hz，保持1min，不应出现飞弧和击穿现象。 在电源插头与屏正面之间以施加试验电压3kV/50Hz，保持1min，不应出现飞弧和击穿现象。	试验结束后，产品正常工作	合格
69	对地漏电流	mA	≤3.5	符合	合格
70	抗干扰	/	符合IEC801规定	符合	合格
71	安全性	/	符合GB4793规定	符合	合格
72	一键点屏	/	支持一键点屏技术，开机后自动识别系统连接，无需重置系统配置	符合	符合
73	防碰撞	/	具备防碰撞焊盘技术	符合	合格
74	SELV电路	/	具备SELV电路	符合	合格
75	箱体防护等级	/	IK10	符合	合格
76	人眼视觉舒适度	/	VICO指数≤1	符合视觉舒适度1级，基本无疲劳感	合格
77	PCB层数	/	PCB采用2层、4层、6层、8层、10层设计	符合	合格
78	PCB板材	/	采用玻璃化温度≥150℃的覆铜板	符合	合格
79	失真效果检测	/	显示画面无几何畸变、扭曲、比例失调情况，无亮度、色温非线性失真。	符合	合格
80	能耗对比	/	对LED显示屏进行节能对比，达到能效一级标准	符合	合格
备注	无				

----结束----

Certificate – Сертификат – 證明書 – Certificat – 증명서 – شهادة

Shenzhen ZKT Technology Co., Ltd.
1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Certificate of Compliance

Certificate Number: ZKT-2111156113C

Certificate's Holder : **Shenzhen Weiyin Technology Co.,Ltd**
Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Manufacturer : **Shenzhen Weiyin Technology Co.,Ltd**
Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen

Trade Mark : ADLIS WEIYIN

Product : **Solar Panel**

Model(s) : **WYC1802-SP**
WYC1805-SP, WYC1808-SP, WYC1813-SP, WYC1815-SP, WYC1817-SP, WYC1828-SP, WYC1901-SP, WYC1904-SP, WYC1916-SP, WYC1917-SP, WYC2021-SP, WYC1811-SP, WYC1812-SP, WYC1821-SP, WYC1908-SP WYS1801-SP, WYS1802-SP, WYS1803-SP, WYS1804-SP, WYS1805-SP, WYS1807-SP, WYS1816-SP, WYS1817-SP, WYS1818-SP, WYB2001-SP, WYB2005-SP, WYB2006-SP, WYB2007-SP, WYB2008-SP, WYB2011-SP, WYC1902-SP, WYC1920-SP, WYC1903-SP, WYC1829-SP, WYC1820-SP, WYC1822-SP, WYC1823-SP, WYC1835-SP, WYC1826-SP, WYC1928-SP.

Test Standard : **EN 61215-1:2016**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirement are fulfilled accordingly based on the technical specifications applicable at the time of issuance. See also notes overleaf. It is only valid in connection with the test report number: ZKT-2111156113S.

CE

Manager
Nov 19, 2021

This Certificate of Conformity is based on single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the whole product and relevant . Directives to be observed.

TEST REPORT
EN 61215-1
Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements

Report Number.....:	ZKT-2111156113S
Date of issue.....:	Nov 19, 2021
Tota lnumber of pages.....:	54
Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address.....:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name.....:	**Shenzhen Weiyin Technology Co.,Ltd**
Address.....:	Room 201, Building E, No.1, Xinyuan Industrial Zone, Xinmu Community, Pinghu Street, Longgang District, Shenzhen
Test specification	
Standard.....:	EN 61215-1:2016
Test procedure .....:	CE-LVD
Non-standard test method .....:	N/A

This test report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent of ZKT Test.

Test item description.....:	Solar Panel
Trademark.....:	ADLIS WEIYIN
Manufacturer.....:	Same as applicant
Model/Type reference.....:	WYC1802-SP WYC1805-SP, WYC1808-SP, WYC1813-SP, WYC1815-SP, WYC1817-SP, WYC1828-SP, WYC1901-SP, WYC1904-SP, WYC1916-SP, WYC1917-SP, WYC2021-SP, WYC1811-SP, WYC1812-SP, WYC1821-SP, WYC1908-SP WYS1801-SP, WYS1802-SP, WYS1803-SP, WYS1804-SP, WYS1805-SP, WYS1807-SP, WYS1816-SP, WYS1817-SP, WYS1818-SP, WYB2001-SP, WYB2005-SP, WYB2006-SP, WYB2007-SP, WYB2008-SP, WYB2011-SP, WYC1902-SP, WYC1920-SP, WYC1903-SP, WYC1829-SP, WYC1820-SP, WYC1822-SP, WYC1823-SP, WYC1835-SP, WYC1826-SP, WYC1928-SP.
Ratings .....:	See the following marking plate.

Testing procedure and testing location:

Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address.....:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District Shenzhen, China
Date of Test.....:	Nov 13, 2021 - Nov 19, 2021
Tested by (name + signature).....:	Peter Huang
Reviewed by (name + signature).....:	Simon Gong
Approved by (name + signature).....:	Awen He

List of Attachments (including a total number of pages in each attachment):

-- Attachment : 2 pages for Photo documentation.

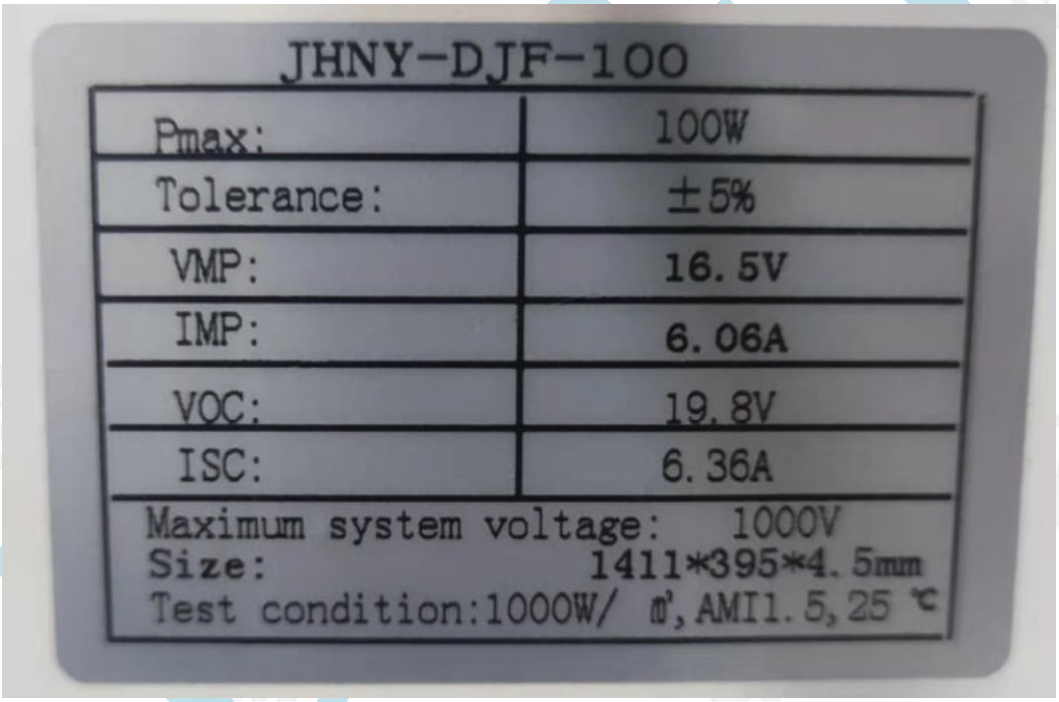
Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
-- EN 61215-1:2016; The submitted samples were found to comply with the requirements of above specification.	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

(Additional requirements for markings.)



Remark on above marking:

1, The height of CE symbols is more than 5 mm;

2, The height of WEEE symbols is more than 7 mm;

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
4	Marking		P
	Each module shall carry the following clear and indelible markings		P
	– name, monogram or symbol of manufacturer		P
	– type or model number	See Copy of marking plate	P
	– serial number		P
	– polarity of terminals or leads (colour coding is permissible)	constructional design	P
	– maximum system voltage for which the module is suitable		P
	The date and place of manufacture shall be marked on the module or be traceable from the serial number	2019/CHINA	P
5	Testing		P
	Before beginning the testing, all modules, including the control, shall be exposed to sunlight (either real or simulated) to an irradiation level of 5kWh· m^{-2} to 5.5kWh· m^{-2} while open-circuited		P
	The modules shall be divided into groups and subjected to the qualification test sequences in Figure 1, carried out in the order laid down. Each box refers to the corresponding subclause in this standard. Test procedures and severities, including initial and final measurements where necessary, are detailed in Clause 10	See clause 10	P
	In carrying out the tests, the tester shall strictly observe the manufacturer's handling, mounting and connection instructions. Tests given in 10.4, 10.5, 10.6 and 10.7 may be omitted if future IEC 61853 has been or is scheduled to be run on this module type		P
	Test conditions are summarized in Table 1	See table 1	P
6	Pass criteria		P
	A module design shall be judged to have passed the qualification tests, and therefore to be IEC type approved, if each test sample meets all the following criteria		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	a) the degradation of maximum output power does not exceed the prescribed limit after each test nor 8 % after each test sequence	≦8% of stated value	P
	b) no sample has exhibited any open circuit during the tests	No open circuit	P
	c) there is no visual evidence of a major defect, as defined in Clause 7	No defect	P
	d) the insulation test requirements are met after the tests	Refer to the insulation clause	P
	e) the wet leakage current test requirements are met at the beginning and the end of each sequence and after the damp heat test	tested	P
	f) specific requirements of the individual tests are met	tested	P
	If two or more modules do not meet these test criteria, the design shall be deemed not to have met the qualification requirements. Should one module fail any test, another two modules meeting the requirements of Clause 3 shall be subjected to the whole of the relevant test sequence from the beginning. If one or both of these modules also fail, the design shall be deemed not to have met the qualification requirements. If, however, both modules pass the test sequence, the design shall be judged to have met the qualification requirements	All testing samples met the identify requests	P

7	Major visual defects		P
	For the purposes of design qualification and type approval, the following are considered to be major visual defects:		P
	a) broken, cracked, or torn external surfaces, including superstrates, substrates, frames and junction boxes;	No such defects	P
	b) bent or misaligned external surfaces, including superstrates, substrates, frames and junction boxes to the extent that the installation and/or operation of the module would be impaired.	Not be impaired	P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	c) a crack in a cell the propagation of which could remove more than 10 % of that cell's area from the electrical circuit of the module;	No crack in cell	P
	d) bubbles or delaminations forming a continuous path between any part of the electrical circuit and the edge of the module;	No such defects	P
	e) loss of mechanical integrity, to the extent that the installation and/or operation of the module would be impaired.	No such defects	P
8	Report		P
	Following type approval, a certified report of the qualification tests, with measured performance characteristics and details of any failures and re-test, shall be prepared by the test agency in accordance with ISO/IEC 17025. The report shall contain the detail specification for the module. Each certificate or test report shall include at least the following information:		P
	a) a title;		P
	b) name and address of the test laboratory and location where the tests were carried out;		P
	c) unique identification of the certification or report and of each page;		P
	d) name and address of client, where appropriate;		P
	e) description and identification of the item tested;		P
	f) characterization and condition of the test item;		P
	g) date of receipt of test item and date(s) of test, where appropriate;		P
	h) identification of test method used;		P
	i) reference to sampling procedure, where relevant;		P
	j) any deviations from, additions to or exclusions from the test method, and any other information relevant to a specific tests, such as environmental conditions;		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	k) measurements, examinations and derived results supported by tables, graphs, sketches and photographs as appropriate including temperature coefficients of short-circuit current, open-circuit voltage and peak power, NOCT, power at NOCT, STC and low irradiance, spectrum of the lamp used for the UV pre-screening test, maximum power loss observed after all of the tests, and any failures observed;		P
	l) a statement of the estimated uncertainty of the test results (where relevant);		P
	m) a signature and title, or equivalent identification of the person(s) accepting responsibility for the content of the certificate or report, and the date of issue;		P
	n) where relevant, a statement to the effect that the results relate only to the items tested;		P
	o) a statement that the certificate or report shall not be reproduced except in full, without the written approval of the laboratory.		P
	A copy of this report shall be kept by the manufacturer for reference purposes.		P

9	Modifications		N
	Any change in the design, materials, components or processing of the module may require A repetition of some or all of the qualification tests to maintain type approval.	The same design, materials, components	N

10	Test procedures		P
10.1	Visual inspection		P
	To detect any visual defects in the module.		P
10.1.2	Procedure	Tested	P
	Carefully inspect each module under an illumination of not less than 1 000 lux for the following conditions:		P
	– cracked, bent, misaligned or torn external surfaces;		P
	– broken cells;		P
	– cracked cells;		P
	– faulty interconnections or joints;		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	– cells touching one another or the frame;		P
	– failure of adhesive bonds;		P
	– bubbles or delaminations forming a continuous path between a cell and the edge of the module;		P
	– tacky surfaces of plastic materials;		P
	– faulty terminations, exposed live electrical parts;		P
	– any other conditions which may affect performance.		P
	Make note of and/or photograph the nature and position of any cracks, bubbles or delaminations, etc. which may worsen and adversely affect the module performance in subsequent tests. After above tests, no such	defects	P
10.1.3	Requirements		P
	Visual conditions other than the major visual defects listed in Clause 7 are acceptable for the purposes of type approval.		P
10.2	Maximum power determination	WYC1802	P
10.2.1	Purpose		P
	To determine the maximum power of the module before and after the various environmental tests. Repeatability of the test is the most important factor.		P
10.2.2	Apparatus		P
	a) A radiant source (natural sunlight or a solar simulator class B or better in accordance with IEC 60904-9).	Solar simulator B	P
	b) A PV reference device in accordance with IEC 60904-2 or IEC 60904-6. If a class B simulator is used the reference device shall be a reference module of the same size with the same cell technology (to match spectral response) as the test specimen.		P
	c) A suitable mount for supporting the test specimen and the reference device in a plane normal to the radiant beam		P
	d) A means for monitoring the temperature of the test specimen and the reference device to an accuracy of ±1 °C and repeatability of ±0,5 °C.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	e) Equipment for measuring the current of the test specimen and reference device to an accuracy of ±0,2 % of the reading;		P
	f) Equipment for measuring the voltage of the test specimen and reference device to an accuracy of ±0,2 % of the reading		P
10.2.3	Procedure		P
	Visual conditions other than the major visual defects listed in Clause 7 are acceptable for the purposes of type approval.		P
10.2	Maximum power determination	WYC1802	P
10.2.1	Purpose		P
	To determine the maximum power of the module before and after the various environmental tests. Repeatability of the test is the most important factor.		P
10.2.2	Apparatus		P
	a) A radiant source (natural sunlight or a solar simulator class B or better in accordance with IEC 60904-9).	Solar simulator B	P
	b) A PV reference device in accordance with IEC 60904-2 or IEC 60904-6. If a class B simulator is used the reference device shall be a reference module of the same size with the same cell technology (to match spectral response) as the test specimen.		P
	c) A suitable mount for supporting the test specimen and the reference device in a plane normal to the radiant beam		P
	d) A means for monitoring the temperature of the test specimen and the reference device to an accuracy of ±1 °C and repeatability of ±0,5 °C.		P
	e) Equipment for measuring the current of the test specimen and reference device to an accuracy of ±0,2 % of the reading;		P
	f) Equipment for measuring the voltage of the test specimen and reference device to an accuracy of ±0,2 % of the reading		P
10.2.3	Procedure		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	Determine the current-voltage characteristic of the module in accordance with IEC 60904-1 at a specific set of irradiance and temperature conditions (a recommended range is a cell temperature between 25 °C and 50 °C and an irradiance between 700 $W \cdot m^{-2}$ and 1 100 $W \cdot m^{-2}$) using natural sunlight or a class B or better simulator conforming to the requirements of IEC 60904-9. In special circumstances when modules are designed for operation under a different range of conditions, the current-voltage characteristics can be measured using temperature and irradiance levels similar to the expected operating conditions. Temperature and irradiance corrections can be made in accordance with IEC 60891 in order to compare sets of measurements made on the same module before and after environmental tests. However, every effort should be made to assure that peak power measurements are made under similar operating conditions, that is minimize the magnitude of the correction by making all peak power measurements on a particular module at approximately the same temperature and irradiance. Repeatability of the maximum power measurement must be better than ±1 %.		P
10.3	Insulation test		P
10.3.1	Purpose		P
10.3.2	Apparatus		P
	a) DC voltage source, with current limitation, capable of applying 500 V or 1 000 V plus twice the maximum system voltage of the module according to 10.3.4 c).		P
	b) An instrument to measure the insulation resistance.		P
10.3.3	Test conditions		P
	The test shall be made on modules at ambient temperature of the surrounding atmosphere (see IEC 60068-1) and in a relative humidity not exceeding 75 %.	(20~22)℃, 68%	P
10.3.4	Procedure	Tested	P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	a) Connect the shorted output terminals of the module to the positive terminal of a d.c. insulation tester with a current limitation.		P
	Determine the current-voltage characteristic of the module in accordance with IEC 60904-1 at a specific set of irradiance and temperature conditions (a recommended range is a cell temperature between 25 °C and 50 °C and an irradiance between 700 $W \cdot m^{-2}$ and 1 100 $W \cdot m^{-2}$) using natural sunlight or a class B or better simulator conforming to the requirements of IEC 60904-9. In special circumstances when modules are designed for operation under a different range of conditions, the current-voltage characteristics can be measured using temperature and irradiance levels similar to the expected operating conditions. Temperature and irradiance corrections can be made in accordance with IEC 60891 in order to compare sets of measurements made on the same module before and after environmental tests. However, every effort should be made to assure that peak power measurements are made under similar operating conditions, that is minimize the magnitude of the correction by making all peak power measurements on a particular module at approximately the same temperature and irradiance. Repeatability of the maximum power measurement must be better than ±1 %.		P
10.3	Insulation test		P
10.3.1	Purpose		P
10.3.2	Apparatus		P
	a) DC voltage source, with current limitation, capable of applying 500 V or 1 000 V plus twice the maximum system voltage of the module according to 10.3.4 c).		P
	b) An instrument to measure the insulation resistance.		P
10.3.3	Test conditions		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	The test shall be made on modules at ambient temperature of the surrounding atmosphere (see IEC 60068-1) and in a relative humidity not exceeding 75 %.	(20~22)℃, 68%	P
10.3.4	Procedure	Tested	P
	a) Connect the shorted output terminals of the module to the positive terminal of a d.c. insulation tester with a current limitation.		P
	Determine the current-voltage characteristic of the module in accordance with IEC 60904-1 at a specific set of irradiance and temperature conditions (a recommended range is a cell temperature between 25 °C and 50 °C and an irradiance between 700 $W \cdot m^{-2}$ and 1 100 $W \cdot m^{-2}$) using natural sunlight or a class B or better simulator conforming to the requirements of IEC 60904-9. In special circumstances when modules are designed for operation under a different range of conditions, the current-voltage characteristics can be measured using temperature and irradiance levels similar to the expected operating conditions. Temperature and irradiance corrections can be made in accordance with IEC 60891 in order to compare sets of measurements made on the same module before and after environmental tests. However, every effort should be made to assure that peak power measurements are made under similar operating conditions, that is minimize the magnitude of the correction by making all peak power measurements on a particular module at approximately the same temperature and irradiance. Repeatability of the maximum power measurement must be better than ±1 %.		P
10.3	Insulation test		P
10.3.1	Purpose		P
10.3.2	Apparatus		P
	a) DC voltage source, with current limitation, capable of applying 500 V or 1 000 V plus twice the maximum system voltage of the module according to 10.3.4 c).		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) An instrument to measure the insulation resistance.		P
10.3.3	Test conditions		P
	The test shall be made on modules at ambient temperature of the surrounding atmosphere (see IEC 60068-1) and in a relative humidity not exceeding 75 %.	(20~22)℃, 68%	P
10.3.4	Procedure	Tested	P
	a) Connect the shorted output terminals of the module to the positive terminal of a d.c. insulation tester with a current limitation.		P
	b)Connect the exposed metal parts of the module to the negative terminal of the tester. If the module has no frame or if the frame is a poor electrical conductor, wrap a conductive foil around the edges and over the back of the module. Connect the foil to the negative terminal of the tester.		P
	c) a PV reference device having a known shortcircuit current versus irradiance characteristic determined by calibrating against an absolute radiometer in accordance with IEC 60904-2 or IEC60904-6;		P
	d) any equipment necessary to change the temperature of the test specimen over the range of interest;		P
	e) a suitable mount for supporting the test specimen and the reference device in the same plane normal to the radiant beam;		P
	f) a means for monitoring the temperature of the test specimen and reference device to an accuracy of ±1 °C, and repeatability of ±0,5 °C;		P
	g) equipment for measuring the current of the test specimen and reference device to an accuracy of ±0,2 % of the reading;		P
	h) equipment for measuring the voltage of the test specimen and reference device to an accuracy of ±0,2 % of the reading;		P
10.4	Measure of temperature coefficient		P
10.4.2	Equipment		P
10.4.3	Procedure		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	There are two acceptable procedures for measuring the temperature coefficients.		N
10.4.3.1	Procedure in natural sunlight		N
	a) Measurement in natural sunlight shall only be made when:		N
	– the total irradiance is at least as high as the upper limit of the range of interest		N
	– the irradiance variation caused by short-term oscillations (clouds, haze, or smoke) is less than ±2 % of the total irradiance as measured by the reference device;		N
	– the wind speed is less than 2 $m \cdot s^{-1}$		N
	b) Mount the reference device co-planar with the test module so that both are normal to the direct solar beam within ±5°C. Connect to the necessary instrumentation.		N
	c) If the test module and reference device are equipped with temperature controls, set the controls at the desired level.		N
	d) If temperature controls are not used, shade the specimen and the reference device from the sun and wind until its temperature is uniform within ±1 °C of the ambient air temperature, or allow the test specimen to equilibrate to its stabilized temperature, or cool the test specimen to a point below the required test temperature and then let the module warm up naturally. The reference device should also stabilize within ±1 °C of its equilibrium temperature before proceeding		N
	e) Record the current-voltage characteristic and temperature of the specimen concurrently with recording the short-circuit current and temperature of the reference device at the desired temperatures. If necessary, make the measurements immediately after removing the shade.		N

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	f) The irradiance Go shall be calculated in accordance with IEC 60891 from the measured current (Isc) of the PV reference device, and its calibration value at STC (Irc). A correction should be applied to account for the temperature of the reference device Tm using the specified temperature coefficient of the reference device αrc.		N
	g) Adjust the temperature by means of a controller or alternately exposing and shading the test module as required to achieve and maintain the desired temperature. Alternately, the test module may be allowed to warm-up naturally with the data recording procedure of item d) performed periodically during the warm-up.		N
	h) Ensure that the test module and reference device temperature are stabilized and remain constant within ±1 °C and that the irradiance as measured by the reference device remains constant within ±1 % during the recording period for each data set. All data must be taken at 1 000 W· m–2 or be translated to that irradiance level.		N
	i) Repeat steps d) through h). Module temperatures shall be such that the range of interest is at least 30 °C and that it is spanned in at least four approximately equal increments. A minimum of three measurements shall be made at each of the test conditions.		N
	Procedure with a solar simulator		P
	a) Determine the short-circuit current of the module at the desired irradiance at room temperature, in accordance with IEC 60904-1.		P
	b) Mount the test module in the equipment used to change the temperature. Mount the PV reference device within the simulator beam. Connect to the instrumentation.		P
	c) Set the irradiance so that the test module produces the short-circuit current determined in item a). Use the PV reference device to maintain this irradiance setting throughout the test.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	d) Heat or cool the module to a temperature of interest. Once the module has reached the desired temperature, measure Isc, Voc and peak power. Change the module temperature in steps of approximately 5 °C over a range of interest of at least 30 °C and repeat the measurements of Isc, Voc and peak power.		P
10.4.3.3	Calculation of temperature coefficients		P
	a) Plot the values of Isc, Voc and Pmax as functions of temperature and construct a least-squares-fit curve through each set of data		P
	b) From the slopes of the least squares fit straight lines for current, voltage and Pmax, calculate α, the temperature coefficient of short circuit current, β, the temperature coefficient of open-circuit voltage, and δ, the temperature coefficient of Pmax, for the module.	α=0.005	P
10.5	Measurement of nominal operating cell temperature (NOCT)		P
10.5.1	Purpose		P
	To determine the NOCT of the module.		P
10.5.2	Introduction		P
	NOCT is defined as the equilibrium mean solar cell junction temperature within an open- rack mounted module in the following standard reference environment (SRE):		P
	– tilt angle:		P
	– total irradiance:	1000w/m^2	P
	– ambient temperature:	25°C	P
	– wind speed:	60m/s	P
	– electrical load:	Opened circuit	N

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	NOCT can be used by the system designer as a guide to the temperature at which a module will operate in the field and it is therefore a useful parameter when comparing the performance of different module designs. However, the actual operating temperature at any particular time is affected by the mounting structure, irradiance, wind speed, ambient temperature, sky temperature and reflections and emissions from the ground and nearby objects. For accurate performance predictions, these factors shall be taken into account.		P
	Two methods for determining NOCT are described.		P
	The first, called "the primary method", is universally applicable to all PV modules. In the case of modules not designed for open-rack mounting, the primary method may be used to determine the equilibrium mean solar cell junction temperature in the SRE, with the module mounted as recommended by the manufacturer.		P
	The second, called "the reference-plate method", is faster but is applicable only to PV modules of the type which respond to changes of ambient temperature (within restricted ranges of wind speed and irradiance) in the same way as the reference plates used in the measurement. Crystalline silicon modules with a glass front and plastic back are in this category. The reference plates are calibrated using the same procedure as in the primary method.		P
10.5.3	Primary method		P
10.5.3.1	Principle		P
	This method is based on gathering actual measured cell temperature data under a range of environmental conditions including the SRE. The data are presented in a way that allows accurate and repeatable interpolation of the NOCT.		P
	– total irradiance:	1000w/m^2	P
	– ambient temperature:	25°C	P
	– wind speed:	60m/s	P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	– electrical load:	Opened circuit	N
	NOCT can be used by the system designer as a guide to the temperature at which a module will operate in the field and it is therefore a useful parameter when comparing the performance of different module designs. However, the actual operating temperature at any particular time is affected by the mounting structure, irradiance, wind speed, ambient temperature, sky temperature and reflections and emissions from the ground and nearby objects. For accurate performance predictions, these factors shall be taken into account.		P
	Two methods for determining NOCT are described.		P
	The first, called "the primary method", is universally applicable to all PV modules. In the case of modules not designed for open-rack mounting, the primary method may be used to determine the equilibrium mean solar cell junction temperature in the SRE, with the module mounted as recommended by the manufacturer.		P
	The second, called "the reference-plate method", is faster but is applicable only to PV modules of the type which respond to changes of ambient temperature (within restricted ranges of wind speed and irradiance) in the same way as the reference plates used in the measurement. Crystalline silicon modules with a glass front and plastic back are in this category. The reference plates are calibrated using the same procedure as in the primary method.		P
10.5.3	Primary method		P
10.5.3.1	Principle		P
	This method is based on gathering actual measured cell temperature data under a range of environmental conditions including the SRE. The data are presented in a way that allows accurate and repeatable interpolation of the NOCT.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	The temperature of the solar cell junction (TJ) is primarily a function of the ambient temperature (Tamb), the average wind speed (V) and the total solar irradiance (G) incident on the active surface of the module. The temperature difference (TJ – Tamb) is largely independent of the ambient temperature and is essentially linearly proportional to the irradiance at levels above 400 W.m–2. The procedure calls for plotting (TJ – Tamb) against G		P
	or a period when wind conditions are favorable. A preliminary NOCT value is then determined by adding 20 °C to the value of (TJ – Tamb) interpolated at the SRE irradiance of 800 $W \cdot m^{-2}$. Finally, a correction factor, dependent on the average temperature and wind speed during the test period, is added to the preliminary NOCT to correct it to 20 °C and 1 $m \cdot s^{-1}$.		P
10.5.3.2	Apparatus		P
	The following apparatus is required:		P
	a) an open rack to support the test module(s) and pyranometer in the specified manner (see 10.5.3.3). The rack shall be designed to minimize heat conduction from the modules and to interfere as little as possible with the free radiation of heat from their front and back surfaces;		P
	b) a pyranometer, mounted in the plane of the module(s) and within 0,3 m of the test array;		P
	c) instruments to measure wind speed down to 0,25 $m \cdot s^{-1}$ and wind direction, installed approximately 0,7 m above the top of the module(s) and 1,2 m to the east or west;		P
	d) an ambient temperature sensor, with a time constant equal to or less than that of the module(s), installed in a shaded enclosure with good ventilation near the wind sensors;		P
	e) cell temperature sensors, attached by solder or thermally conductive adhesive to the backs of two solar cells near the middle of each test module, or other equipment necessary for IEC-approved measurement of cell temperature;		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	f) a data acquisition system with temperature measurement accuracy of ±1 °C to record the following parameters within an interval of no more than 5 s:		P
	– irradiance,		P
	– ambient temperature,		P
	– cell temperature,		P
	– wind speed,		P
	– wind direction.		P
10.5.3.3	Test module mounting		P
	Tilt angle: the test module(s) shall be positioned so that it (they) is (are) tilted at 45° ± 5° to the horizontal with the front side pointed toward the equator.	45°	P
	Height: the bottom edge of the test module(s) shall be 0,6 m or more above the local horizontal plane or ground level.	1m	P
	Configuration: to simulate the thermal boundary conditions of modules installed in an array, the test module(s) shall be mounted within a planar surface that extends at least 0,6 m beyond the module(s) in all directions. For modules designed for free-standing, open-back installations, black aluminum plates or other modules of the same design shall be used to fill out the remaining open area of the planar surface.		P
	Surrounding area: there shall be no obstructions to prevent full irradiance of the test module(s) during the period from 4 h before local solar noon to 4 h after local solar noon. The ground surrounding the module(s) shall not have an abnormally high solar reflectance and shall be flat and level or sloping away from the test fixture in all directions. Grass, other types of vegetation, black asphalt or dirt are acceptable for the local surrounding area.		P
10.5.3.4	Procedure Tested		P
	a) Set up the apparatus with the test module(s), as described in 10.5.3.3. Ensure that the test module(s) are open-circuited.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) On a suitable, clear, sunny day with little wind, record, as a function of time, the cell temperature, the ambient temperature, the irradiance, wind speed and wind direction.		P
	c) Reject all data taken during the following conditions		P
	– irradiance below 400 $W \cdot m^{-2}$;		P
	– in a 10-min interval after the irradiance varies by more than 10 % from the maximum value to the minimum value recorded during that 10 min period;		P
	– wind speeds outside the range 1 $m \cdot s^{-1}$ ± 0,75 $m \cdot s^{-1}$;		P
	– ambient temperatures outside the range 20 °C ± 15 °C or varying by more than 5 °C from the maximum to the minimum value recorded during one data collection run;		P
	– in a 10-min interval after a wind gust of more than 4 $m \cdot s^{-1}$;		P
	– wind direction within ±20° of east or west.		P
	d) From a minimum of 10 acceptable data points covering an irradiance range of at least 300 $W \cdot m^{-2}$, making sure that data points are from both before and after solar noon, plot (TJ – Tamb) as a function of irradiance. Use regression analysis to fit the data points.		P
	e) Determine the value of (TJ – Tamb) at 800 $W \cdot m^{-2}$ and add 20 °C to give the preliminary value of NOCT		P
	f) Calculate the average ambient temperature, Tamb, and the average wind speed, V, associated with the acceptable data points and determine the appropriate correction factor from Figure 2.		P
	g) Add the correction factor to the preliminary NOCT to correct it to 20 °C and 1 $m \cdot s^{-1}$. This sum is the NOCT of the module.		P
	h) Repeat the entire procedure on two additional days and average the three values of NOCT for each test module.		P
10.5.4	Reference-plate method		P
10.5.4.1	Principle		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	This method is based on the principle of comparing the temperature of the test module(s) with that of standard reference plates under the same conditions of irradiance, ambient temperature and wind speed. The steady-state temperature of the reference plate in the SRE is determined using the primary method described in 10.5.3.		P
	– wind speeds outside the range 1 $m \cdot s^{-1}$ ± 0,75 $m \cdot s^{-1}$;		P
	– ambient temperatures outside the range 20 °C ± 15 °C or varying by more than 5 °C from the maximum to the minimum value recorded during one data collection run;		P
	– in a 10-min interval after a wind gust of more than 4 $m \cdot s^{-1}$;		P
	– wind direction within ±20° of east or west.		P
	d) From a minimum of 10 acceptable data points covering an irradiance range of at least 300 $W \cdot m^{-2}$, making sure that data points are from both before and after solar noon, plot (TJ – Tamb) as afunction of irradiance. Use regression analysis to fit the data points.		P
	e) Determine the value of (TJ – Tamb) at 800 $W \cdot m^{-2}$ and add 20 °C to give the preliminary value of NOCT		P
	f) Calculate the average ambient temperature, Tamb, and the average wind speed, V, associated with the acceptable data points and determine the appropriate correction factor from Figure 2.		P
	g) Add the correction factor to the preliminary NOCT to correct it to 20 °C and 1 $m \cdot s^{-1}$. This sum is the NOCT of the module.		P
	h) Repeat the entire procedure on two additional days and average the three values of NOCT for each test module.		P
10.5.4	Reference-plate method		P
10.5.4.1	Principle		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	This method is based on the principle of comparing the temperature of the test module(s) with that of standard reference plates under the same conditions of irradiance, ambient temperature and wind speed. The steady-state temperature of the reference plate in the SRE is determined using the primary method described in 10.5.3.		P
	The NOCT of the test module is obtained by correcting the temperature difference between the test module and the reference plates to the SRE and adding this value to the mean steady-state temperature of the reference plates in the SRE. It has been established that the measured temperature difference is insensitive to fluctuations in irradiance and to small changes in ambient temperature and wind speed.		P
10.5.4.2	Reference plate Performed		P
	aluminum alloy to the dimensions shown in Figure 3. The front surface shall be painted matte black and the back surface gloss white. Means shall be provided for measuring the temperature of the reference plates to the required accuracy. One method employing two thermocouples is shown in Figure 3. One thermocouple is cemented into each branch of the milled groove with thermally conductive and electrically insulating adhesive, after removing any insulation for a distance of 25 mm from the junction. The remainder of the thermocouple wires are finally cemented into the groove with conductive putty.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	At least three reference plates shall be made and calibrated, using the primary method described in 10.5.3. The steady-state temperatures so determined shall be within the range 46 °C to 50 °C and shall differ by no more than 1 °C. One of the reference plates shall be kept unused as a control. Before making a NOCT measurement, the steady-state temperatures of the reference plates shall be checked against that of the control plate under the acceptable conditions indicated in item c) of 10.5.3.4 to detect any change in their thermal properties. If the measured temperatures of the reference plates differ by more than 1 °C, the reason for this shall be investigated and necessary corrective action taken before proceeding with the test		P
10.5.4.3	Test site		P
	Select a flat test site with negligible wind disturbance from buildings, trees and topographical features. Non-uniform reflections from the ground and objects behind the test plane shall be avoided.		P
10.5.4.4	Apparatus		P
	The following apparatus is required (see Figure 4).		P
	The NOCT of the test module is obtained by correcting the temperature difference between the test module and the reference plates to the SRE and adding this value to the mean steady-state temperature of the reference plates in the SRE. It has been established that the measured temperature difference is insensitive to fluctuations in irradiance and to small changes in ambient temperature and wind speed.		P
10.5.4.2	Reference plate Performed		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	aluminum alloy to the dimensions shown in Figure 3. The front surface shall be painted matte black and the back surface gloss white. Means shall be provided for measuring the temperature of the reference plates to the required accuracy. One method employing two thermocouples is shown in Figure 3. One thermocouple is cemented into each branch of the milled groove with thermally conductive and electrically insulating adhesive, after removing any insulation for a distance of 25 mm from the junction. The remainder of the thermocouple wires are finally cemented into the groove with conductive putty.		P
	At least three reference plates shall be made and calibrated, using the primary method described in 10.5.3. The steady-state temperatures so determined shall be within the range 46 °C to 50 °C and shall differ by no more than 1 °C. One of the reference plates shall be kept unused as a control. Before making a NOCT measurement, the steady-state temperatures of the reference plates shall be checked against that of the control plate under the acceptable conditions indicated in item c) of 10.5.3.4 to detect any change in their thermal properties. If the measured temperatures of the reference plates differ by more than 1 °C, the reason for this shall be investigated and necessary corrective action taken before proceeding with the test		P
10.5.4.3	Test site		P
	Select a flat test site with negligible wind disturbance from buildings, trees and topographical features. Non-uniform reflections from the ground and objects behind the test plane shall be avoided.		P
10.5.4.4	Apparatus		P
	The following apparatus is required (see Figure 4).		P
	a) A number of reference plates, as described in 10.5.4.2 (one more than the number of modules to be tested simultaneously).		P
	b) A pyranometer or a PV reference device.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	c) An open rack to support the test module(s), reference plates and pyranometer tilted at 45° ± 5° to the horizontal with the front side toward the equator. Each module shall be closely flanked by two reference plates with the lower edge of the module(s) approximately 1 m above the ground. The rack shall be designed to minimize heat conduction from the module(s) and plates and to interfere as little as possible with the free radiation of heat from their front and back surfaces.		P
	d) Instruments to measure wind speed down to 0,25 $m \cdot s^{-1}$ and wind direction, installed approximately 0,7 m above the top of the module(s) and 1,2 m to the east or west, as shown in Figure 4.		P
	e) An ambient temperature sensor with a time constant equal to or less than that of the modules, installed in a shaded enclosure with good ventilation near the wind sensors. f) Cell temperature sensors, attached by solder or thermally conductive adhesive to the backs of two solar cells near the middle of each module, or other equipment necessary for IEC-approved measurement of cell temperature.		P
	g) A data acquisition system with temperature measurement accuracy of ±1 °C to record the following parameters within an interval of no more than 5 s:		P
	– irradiance;		P
	– ambient temperature;		P
	– cell temperature;		P
	– wind speed;		P
	– wind direction;		P
	– reference-plate temperatures.		P
10.5.4.5	Procedure		P
	a) Set up the apparatus with the test module(s) and reference plates as shown in Figure 4. Ensure that the test module(s) are open-circuited.		P
	a) A number of reference plates, as described in 10.5.4.2 (one more than the number of modules to be tested simultaneously).		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) A pyranometer or a PV reference device.		P
	c) An open rack to support the test module(s), reference plates and pyranometer tilted at 45° ± 5° to the horizontal with the front side toward the equator. Each module shall be closely flanked by two reference plates with the lower edge of the module(s) approximately 1 m above the ground. The rack shall be designed to minimize heat conduction from the module(s) and plates and to interfere as little as possible with the free radiation of heat from their front and back surfaces.		P
	d) Instruments to measure wind speed down to 0,25 $m \cdot s^{-1}$ and wind direction, installed approximately 0,7 m above the top of the module(s) and 1,2 m to the east or west, as shown in Figure 4.		P
	e) An ambient temperature sensor with a time constant equal to or less than that of the modules, installed in a shaded enclosure with good ventilation near the wind sensors. f) Cell temperature sensors, attached by solder or thermally conductive adhesive to the backs of two solar cells near the middle of each module, or other equipment necessary for IEC-approved measurement of cell temperature.		P
	g) A data acquisition system with temperature measurement accuracy of ±1 °C to record the following parameters within an interval of no more than 5 s:		P
	– irradiance;		P
	– ambient temperature;		P
	– cell temperature;		P
	– wind speed;		P
	– wind direction;		P
	– reference-plate temperatures.		P
10.5.4.5	Procedure		P
	a) Set up the apparatus with the test module(s) and reference plates as shown in Figure 4. Ensure that the test module(s) are open-circuited.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) On a suitable, clear, sunny day with little wind, record, as a function of time, the cell temperature(s) of the test module(s), the reference-plate temperature, irradiance, ambient temperature, wind speed and wind direction.		P
	c) Reject all data taken during, or for 15 min after, the following conditions:		P
	– irradiance below 750 $W \cdot m^{-2}$ or above 850 $W \cdot m^{-2}$;		P
	– irradiance varying by more than ± 40 $W \cdot m^{-2}$ during one data collection run;		P
	– wind speeds above 2 $m \cdot s^{-1}$ that continue for more than 30 s;		P
	– wind speeds below 0,5 $m \cdot s^{-1}$;		P
	– wind direction within ±20° of east or west;		P
	– differences between temperatures of the reference plates greater than 1 °C.		P
	d) For each data point in the selected period, take the mean temperature TP of all the reference plates.		P
	e) For each data point in the selected period and for each test module:		P
10.6	Performance at STC and NOCT		P
10.6.1	Purpose		P
	To determine how the electrical performance of the module varies with load at STC (1 000 $W \cdot m^{-2}$, 25 °C cell temperature, with the IEC 60904-3 reference solar spectral irradiance distribution) and at NOCT and an irradiance of 800 $W \cdot m^{-2}$, with the IEC 60904-3 reference solar spectral irradiance distribution		P
10.6.2	Apparatus		P
	a) A radiant source (natural sunlight or a solar simulator class B or better) in accordance with IEC 60904-9.		P
	b) A PV reference device in accordance with IEC 60904-2 or IEC 60904-6. If a class B simulator is used, the reference device shall be a reference module of the same size with the same cell technology to match spectral response.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	c) A suitable mount for supporting the test specimen and the reference device in a plane normal to the radiant beam.		P
	d) A means for monitoring the temperature of the test specimen and the reference device to an accuracy of ±1 °C and repeatability of ±0,5 °C.		P
	e) Equipment for measuring the current of the test specimen and reference device to an accuracy of ±0,2 % of the reading.		P
	f) Equipment for measuring the voltage of the test specimen and reference device to an accuracy of ±0,2 % of the reading.		P
	g) Equipment necessary to change the temperature of the test specimen to the NOCT temperature measured in 10.5.		P
10.6.3	Procedure		P
10.6.3.1	STC		P
	Maintain the module at 25 °C and trace its currentvoltage characteristic at an irradiance of 1 000 $W \cdot m^{-2}$ (as measured by a suitable reference device), in accordance with IEC 60904-1, using natural sunlight or a class B or better simulator conforming to the requirements of IEC 60904-9.		P
10.6.3.2	NOCT		P
	Heat the module uniformly to NOCT and trace its current-voltage characteristic at an irradiance of 800 $W \cdot m^{-2}$ (as measured by a suitable reference device), in accordance with IEC 60904-1, using natural sunlight or a class B or better simulator conforming to the requirements of the IEC 60904-9.		P
	If the reference device is not spectrally matched to the test module, use IEC 60904-7 to calculate the spectral mismatch correction.		P
10.7	Performance at low irradiance		P
10.7.1	Purpose		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	To determine how the electrical performance of the module varies with load at 25 °C and an irradiance of 200 W·m^{-2} (as measured by A suitable reference device), in accordance with IEC 60904-1 using natural sunlight or a simulator class B or better conforming to the requirements of IEC 60904-9.		P
10.7.2	Apparatus		P
	a) A radiant source (natural sunlight or a solar simulator class B or better) in accordance with IEC 60904-9.		P
	b) Equipment necessary to change the irradiance to 200 W·m^{-2} without affecting the relative spectral irradiance distribution and the spatial uniformity in accordance with IEC 60904-10.		P
	c) A PV reference device in accordance with IEC 60904-2 or IEC 60904-6.		P
	d) A suitable mount for supporting the test specimen and the reference device in a plane normal to the radiant beam.		P
	e) A means for monitoring the temperature of the test specimen and the reference device to an accuracy of ±1 °C and repeatability of ±0,5 °C.		P
	f) Equipment for measuring the current of the test specimen and reference device to an accuracy of ±0,2 % of the reading.		P
	g) Equipment for measuring the voltage of the test specimen and reference device to an accuracy of ±0,2 % of the reading.		P
10.7.3	Procedure		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	Determine the current-voltage characteristic of the module at 25 °C ± 2 °C and an irradiance of 200 W·m^{-2} (as measured by a suitable reference device), in accordance with IEC 60904-1 using natural sunlight or a class B or better simulator conforming to the requirements of IEC 60904-9. The irradiance shall be reduced to the specified level by using neutral filters or some other technique, which does not affect the spectral irradiance distribution. (See IEC 60904-10 for guidance on reducing the irradiance without changing the spectral irradiance distribution.)		P
10.8	Outdoor exposure test		P
10.8.1	Purpose		P
	To make a preliminary assessment of the ability of the module to withstand exposure to outdoor conditions and to reveal any synergistic degradation effects which may not be detected by laboratory tests.		P
10.8.2	Apparatus		P
	a) A device capable of measuring solar irradiation, with an uncertainty of less than ±5 %.		P
	b) Means to mount the module, as recommended by the manufacturer, co-planar with the irradiation measuring device.		P
	c) A load sized such that at STC the module will operate near the maximum power point.		P
10.8.3	Procedure		P
	a) Attach the resistive load to the module and mount it outdoors, as recommended by the manufacturer, co-planar with the irradiation monitor. Any hot-spot protective devices recommended by the manufacturer shall be installed before the module is tested.		P
	b) Subject the module to an irradiation totalling 60 k Wh·m^{-2}, as measured by the monitor, under conditions conforming to general open-air climates, as defined in IEC 60721-2-1.		P
10.8.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P
10.8.5	Requirements		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	The requirements are as follows:		P
	– no evidence of major visual defects, as defined in Clause 7;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.9	Hot-spot endurance test		P
10.9.1	Purpose		P
10.9.2	Hot-spot effect		P
	Hot-spot heating occurs in a module when its operating current exceeds the reduced shortcircuit current of a shadowed or faulty cell or group of cells within it. When such a condition occurs, the affected cell or group of cells is forced into reverse bias and must dissipate power, which can cause overheating.		P
	Figure 6 illustrates the hot-spot effect in a module of a series string of cells, one of which, cell Y, is partially shadowed. The amount of power dissipated in Y is equal to the product of the module current and the reverse voltage developed across Y. For any irradiance level, maximum power is dissipated in the short-circuit current condition, when the reverse voltage across Y is equal to the voltage generated by the remaining (s – 1) cells in the module. This is shown in Figure 6 by the hatched rectangle constructed at the intersection of the reverse I-V characteristic of Y with the image of the forward I-V characteristic of the (s^{-1}) cells.		P
	Because the reverse characteristics can vary considerably from cell to cell, it is necessary to classify cells as voltage limited (type A) or current limited (type B), according to how the reverse characteristic intersects the “test limit zone” shown in Figure 7.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	Figure 6 applies to type A cells. It illustrates that the maximum dissipation in a faulty or shadowed type A cell occurs when the reverse characteristic intersects the image of the (s^{-1}) characteristic at its maximum power point.		P
	In contrast, Figure 8 shows that the maximum dissipation in a type B cell occurs when it is fully shadowed. But it should be noted that, in this case, the dissipated power may be only a fraction of the total power available from the module.		P
10.9.3	Classification of cell interconnection		P
	Solar cells in a PV module are connected in one of the following ways:		P
	Case SP: series-parallel connection, i.e. a parallel connection of p strings, each with s cells in series; see Figure 9;		P
	Case SPS: Series-parallel-series connection, i.e. a series connection of b blocks, where each block consists of a parallel connection of p strings, each with s cells in series. See Figure 10.		N
	By-pass diodes, if present, limit the reverse voltage of the enclosed cells and therefore define the part of the circuit to be tested. The maximum internal power dissipation occurs with the module short-circuited.		N
10.9.4	Apparatus		P
	a) Radiant source 1. Steady-state solar simulator or natural sunlight capable of an irradiance of not less than 700 $W \cdot m^{-2}$ with a non-uniformity of not more than ±2 % and a temporal stability within ±5 %.		P
	b) Radiant source 2. Class C steady-state solar simulator (or better) or natural sunlight with an irradiance of 1 000 $W \cdot m^{-2}$ ± 10 %.		N
	c) Module I-V curve tracer.		P
	d) Set of opaque covers for test cell shadowing in 5 % increments.		P
	e) An appropriate temperature detector, if required.		N
10.9.5	Procedure		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	Any hot-spot protective devices recommended by the manufacturer shall be installed before the module is tested.		P
10.9.5.1	Case S	Not case S	N
	a) Expose the unshadowed module to radiant source 1 at an irradiance of not less than 700 $W \cdot m^{-2}$. Measure the I-V characteristic and determine the current at maximum power, IMP		N
	b) Short-circuit the module and select a cell by one of the following methods:		N
	1) With the module exposed to radiant source 1 at a stable irradiance of not less than 700 $W \cdot m^{-2}$, determine the hottest cell using an appropriate temperature detector. (An infrared (IR) camera is recommended).		N
	2) Under the irradiance specified for step a), completely shadow each cell in turn and select the cell or one of the cells which gives the biggest decrease in short-circuit current when shadowed. During this process, the irradiance shall not change by more than ± 5 %.		N
	c) Under the same irradiance (within ±3 %) as used in step a), completely shadow the selected cell and check that the short circuit current (ISC) of the module is less than the peak power current (IMP) of the module, as determined in step a). If this condition does not occur, the condition of maximum power dissipation within a single cell cannot be set. In this case, proceed with the selected cell completely shadowed, omitting step		N
	d) Gradually decrease the shadowed area of the selected cell until ISC of the module coincides as closely as possible with IMP. In this condition, the maximum power is dissipated within the selected cell.		N
	e) Expose the module to radiant source 2. Note the value of ISC and keep the module in the condition of maximum power dissipation, readjusting the shadow, if necessary, to maintain ISC at the specified level. Under these conditions the module temperature should be 50 °C ± 10 °C.		N

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	f) Maintain this condition for a total exposure time of 5 h.		N
10.9.5.2	Case SP		P
	a) Expose the unshadowed module to radiant source 1 at an irradiance of not less than 700 $W \cdot m^{-2}$. Measure the I-V characteristic and determine ISC (*), the short-circuit current corresponding to the condition of maximum hot spot power dissipation, from the following equation, assuming that all strings generate the same current:	ISC=9.08A	P
	b) Short-circuit the module and select a cell by one of the following methods:		P
	1) with the module exposed to radiant source 1 at a stable irradiance of not less than 700 $W \cdot m^{-2}$, determine the hottest cell using an appropriate temperature detector;		P
	2) under the irradiance specified in step a), completely shadow each cell in turn and find the cell which gives the biggest decrease in shortcircuit current when shadowed. During this process, the irradiance shall not change by more than ±5 %.		P
	c) Under the same irradiance as in step a) (within ±3 %), check that, with the selected cell fully shadowed, ISC of the module is less than ISC (*), as determined in step a). If this condition does not occur, the condition of maximum power dissipation within a single cell cannot be set. In this case, proceed with the selected cell fully shadowed, omitting step d).		P
	d) Gradually decrease the shadowed area of the selected cell until ISC of the module coincides as closely as possible with ISC (*). In this condition, the maximum power is dissipated within the selected cell.		P
	e) Expose the module to radiant source 2. Note the value of ISC and keep the module in the condition of maximum power dissipation, readjusting the shadow, if necessary, to maintain ISC at the specified level. Under these conditions the module temperature should be 50 °C± 10 °C.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	f) Maintain this condition for a total exposure time of 5 h.		P
10.9.5.3	Case SPS		N
	a) Short-circuit the unshadowed module and expose it to radiant source 1 at a stable irradiance of not less than 700 $W \cdot m^{-2}$. Take at random at least 30 % of the cells in the module, fully shadow each cell in turn and measure the temperature at which it stabilizes, using thermal imaging equipment or other appropriate means.		N
	b) Fully shadow the hottest cell found in step a).		N
	c) While continuing to monitor its temperature, gradually decrease the shadowed area and determine the condition in which maximum temperature is achieved.		N
	d) Expose the module to radiant source 2 and keep it in the shadowed condition established in step c). Under these conditions the module temperature should be 50 °C ± 10 °C.		N
	e) Maintain this condition for a total exposure time of 5 h.		N
10.9.6	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P
10.9.7	Requirements		P
	The requirements are as follows:		P
	– no evidence of major visual defects, as defined in Clause 7. If there is evidence of serious damage that does not qualify as a major visual defect, repeat the test on 2 additional cells. If there is no visual damage around either of these two cells the module type passes the hot spot test;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;	< 5%	P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.10	UV preconditioning test		P
10.10.1	Purpose		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	To precondition the module with ultra-violet (UV) radiation before the thermal cycle/ humidity freeze tests to identify those materials and adhesive bonds that are susceptible to UV degradation.		P
10.10.2	Apparatus		P
	a) Equipment to control the temperature of the module while it is irradiated by UV light. The equipment must be capable of maintaining the module temperature at 60 °C ± 5 °C.	58 °C-62 °C	P
	b) Means for measuring and recording the temperature of the module(s) to an accuracy of ±2 °C. The temperature sensors shall be attached to the front or back surface of the module near the middle. If more than one module is tested simultaneously, it will suffice to monitor the temperature of one representative sample.		P
	c) Instrumentation capable of measuring the irradiation of the UV light produced by the UV light source at the test plane of the module(s), within the wavelength ranges of 280 nm to 320 nm and 320 nm to 385 nm with an uncertainly of ±15 %.		P
	d) A UV light source capable of producing UV irradiation with an irradiance uniformity of ±15 % over the test plane of the module(s) with no appreciable irradiance at wavelengths below 280 nm and capable of providing the necessary irradiation in the different spectral regions of interest as defined in 10.10.3.		P
10.10.3	Procedure		P
	a) Using the calibrated radiometer measure the irradiance at the proposed module test plane and assure that at wavelengths between 280 nm and 385 nm it does not exceed 250 $W \cdot m^{-2}$ (i.e. about five times the natural sunlight level) and that it has a uniformity of ±15 % over the test plane.		P
	b) Mount an open-circuited module in the test plane at the location selected in a), normal to the UV irradiance beam. Make sure that the module temperature is 60 °C ± 5 °C.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	c) Subject the module(s) to a total UV irradiation of 15 kWh·m^{-2} in the wavelength range between 280 nm and 385 nm, with at least 5 kWh·m^{-2} in the wavelength band between 280 nm and 320 nm, while maintaining the module temperature within the prescribed range.	Performed	P
	d) Means for applying a current equal to the STC peak power current of the module(s) under test.		P
	e) Means for monitoring the flow of current through each module during the test.		P
10.11.3	Procedure		P
	a) Install the module(s) at room temperature in the chamber.		P
	b) Connect the temperature monitoring equipment to the temperature sensor(s). Connect each module to the appropriate current supply by connecting the positive terminal of the module to the positive terminal of the power supply and the second terminal accordingly. During the 200 thermal cycle test set the current flow to the measured STC peak power current within ±2 %. Current flow shall only be maintained when the module temperature is above 25 °C. During the 50 thermal cycle test no current flow is required.		P
	c) Close the chamber and subject the module(s) to cycling between module temperatures of –40 °C ± 2 °C and +85 °C ± 2 °C, in accordance with the profile in Figure 11. The rate of change of temperature between the low and high extremes shall not exceed 100 °C/h and the module temperature shall remain stable at each extreme for a period of at least 10 min. The cycle time shall not exceed 6 h unless the module has such a high heat capacity that a longer cycle is required. The number of cycles shall be as shown in the relevant blocks in Figure 1.		P
	d) Throughout the test, record the module temperature and monitor the current flow through the module(s).		P
10.11.4	Final measurements		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	After a minimum recovery time of 1 h, repeat the tests of 10.1, 10.2 and 10.3.	Retested	P
10.11.5	Requirements		P
	The requirements are as follows:	No below defects	P
	– no interruption of current flow during the test;		P
	– no evidence of major visual defects, as defined in Clause 7;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.12	Humidity-freeze test		P
	e) Means for monitoring the flow of current through each module during the test.		P
10.11.3	Procedure		P
10.12.1	Purpose		P
	The purpose of this test is to determine the ability of the module to withstand the effects of high temperature and humidity followed by sub-zero temperatures. This is not a thermal shock test		P
10.12.2	Apparatus		P
	a) A climatic chamber with automatic temperature and humidity control, capable of subjecting one or more modules to the humidity-freeze cycle specified in Figure 12.	85%RH, 20h, no RH, 4h, total 10C	P
	b) Means for mounting or supporting the module(s) in the chamber, so as to allow free circulation of the surrounding air. The thermal conduction of the mount or support shall be low, so that, for practical purposes, the module(s) is (are) thermally isolated.		P
	c) Means for measuring and recording the module temperature to an accuracy of ±1 °C. (It is sufficient to monitor the temperature of one representative sample, if more than one module is being tested.)	One module to test	P
10.12.3	Procedure		P
	a) Attach a suitable temperature sensor to the front or back surface of the module(s) near the middle.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) Install the module(s) at room temperature in the climatic chamber.		P
	c) Connect the temperature monitoring equipment to the temperature sensor(s).		P
	d) After closing the chamber, subject the module(s) to 10 complete cycles in accordance with the profile in Figure 12. The maximum and minimum temperatures shall be within ±2 °C of the specified levels and the relative humidity shall be maintained within ±5 % of the specified value at all temperatures above room temperature. Performed P e) Throughout the test, record the module temperature.		P
10.12.4	Final measurements		P
	After a recovery time between 2 h and 4 h, repeat the test of 10.3. Repeat the tests of 10.1 and 10.2.	Retested	P
10.12.5	Requirements		P
	The requirements are as follows:		P
	– no evidence of major visual defects, as defined in Clause 7;	No defects Complied with Clause 7	P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.13	Damp-heat test		P
10.13.1	Purpose		P
	To determine the ability of the module to withstand the effects of long-term penetration of humidity.		P
10.13.2	Procedure		P
	The test shall be carried out in accordance with IEC 60068-2-78 with the following provisions:		P
	a) Preconditioning		P
	The module(s), being at room temperature, shall be introduced into the chamber without preconditioning.		P
	The module(s), being at room temperature, shall be introduced into the chamber without preconditioning.		P
	b) Severities		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	The following severities are applied:		P
	Test temperature: 85 °C ± 2 °C	84 °C	P
	Relative humidity: 85 % ± 5 %	87 %	P
	Test duration: 1 000 h	1000h	P
10.13.3	Final measurements		P
	After a recovery time between 2 h and 4 h, repeat the tests of 10.3 and 10.15. Repeat the tests of 10.1 and 10.2.		P
10.13.4	Repeat the tests of 10.1 and 10.2.		P
	The requirements are as follows:	Comply with below requirements	P
	– no evidence of major visual defects, as defined in Clause 7;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– the insulation test and the wet leakage current test shall meet the same requirements as for the initial measurements.		P
10.14	Robustness of terminations test		P
10.14.1	Purpose		P
	To determine that the terminations and the attachment of the terminations to the body of the module will withstand such stresses as are likely to be applied during normal assembly or handling operations.		P
	To determine that the terminations and the attachment of the terminations to the body of the module will withstand such stresses as are likely to be applied during normal assembly or handling operations.		P
10.14.2	Types of terminations		P
	Three types of module terminations are considered:		P
	– type A: wire or flying lead		N
	– type B: tags, threaded studs, screws, etc.;		P
	– type C: connector.		N
10.14.3	Procedure		P
	Preconditioning: 1 h at standard atmospheric conditions for measurement and test.		P
10.14.3.1	Type A terminations		N

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	Tensile test: as described in IEC 60068-2-21, test Ua, with the following provisions:		N
	– all terminations shall be tested;		N
	– tensile force shall never exceed the module weight.		N
	Bending test: as described in IEC 60068-2-21, test Ub, with the following provisions:		N
	– all terminations shall be tested;		N
	– method 1-10 cycles (1 cycle is 1 bend in each opposite direction).		N
10.14.3.2	Type B terminations		P
	Tensile and bending tests:	Performed	P
	a) for modules with exposed terminals, each termination shall be tested as for type A terminations;		N
	b) if the terminations are enclosed in a protective box, the following procedure shall be applied:	Use protective box	P
	– a cable of the size and type recommended by the module manufacturer, cut to a suitable length, shall be connected to the terminations inside the box using the manufacturer's recommended procedures. The cable shall be taken through the hole of the cable gland, taking care to utilize any cable clamp arrangement provided. The lid of the box shall be securely replaced. The module shall then be tested as for type A terminations.		P
	Torque test: as described in IEC 60068-2-21, test Ud with the following provisions:		P
	– all terminations shall be tested;		P
	– severity		P
	The nuts or screws should be capable of being loosened afterwards unless they are specifically designed for permanent attachment.		P
10.14.3.3	Type C terminations		N
	A cable of the size and type recommended by the module manufacturer, cut to a suitable length, shall be connected to the output end of the connector and the tests for type A terminations shall be carried out.		N
10.14.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
10.14.5	Requirements		P
	The requirements are as follows:	Comply with below requirements	P
	– no evidence of mechanical damage;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.15	Wet leakage current test		P
10.15.1	Purpose		P
	To evaluate the insulation of the module under wet operating conditions and verify that moisture from rain, fog, dew or melted snow does not enter the active parts of the module circuitry, where it might cause corrosion, a ground fault or a safety hazard.		P
10.15.2	Apparatus		P
	a) A shallow trough or tank of sufficient size to enable the module with frame to be placed in the solution in a flat, horizontal position. It shall contain a water/wetting agent solution meeting the following requirements:		P
	Resistivity: 3 500 Ω·cm or less	≦3 500 Ω·cm	P
	Surface tension: 0,03 $N \cdot m^{-1}$ or less	≦0,03 $N \cdot m^{-1}$	P
	Temperature: 22 °C ± 3 °C	(21~23) °C	P
	The depth of the solution shall be sufficient to cover all surfaces except junction box entries not designed for immersion.		P
	b) Spray equipment containing the same solution.		P
	c) DC voltage source, with current limitation, capable of applying 500 V or the maximum rated system voltage of the module, whichever is more.	1000V	P
	d) Instrument to measure insulation resistance.	Insulation Resistance Meter	P
10.15.3	Procedure		P
	All connections shall be representative of the recommended field wiring installation and precautions shall be taken to ensure that leakage currents do not originate from the instrumentation wiring attached to the module.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	a) Immerse the module in the tank of the required solution to a depth sufficient to cover all surfaces except junction box entries not designed for immersion. The cable entries shall be thoroughly sprayed with solution. If the module is provided with a mating connector, the connector should be immersed during the test.		P
	b) Connect the shorted output terminals of the module to the positive terminal of the test equipment. Connect the liquid test solution to the negative terminal of the test equipment using a suitable metallic conductor.		P
	c) Increase the voltage applied by the test equipment at a rate not to exceed 500 V · s–1 to 500 V or the maximum system voltage for the module, whichever is greater. Maintain the voltage at this level for 2 min. Then determine the insulation resistance.	1000V	P
	d) Reduce the applied voltage to zero and shortcircuit the terminals of the test equipment to discharge the voltage build-up on the module.		P
10.15.4	Requirements		P
	The requirements are as follows:		P
	– For modules with an area of less than 0,1 m^2 the insulation resistance shall be not less than 400 MΩ.		P
	– For modules with an area larger than 0,1 m^2 the measured insulation resistance times the area of the module shall be not less than 40 MΩ · m^2.	> 100 MΩ · m^2	P
10.16	Mechanical load test		P
10.16.1	Purpose		P
	The purpose of this test is to determine the ability of the module to withstand wind, snow, static or ice loads.		P
10.16.2	Apparatus		P
	a) A rigid test base which enables the modules to be mounted front-side up or front-side down. The test base shall enable the module to deflect freely during the load application.		P
	b) Instrumentation to monitor the electrical continuity of the module during the test.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	c) Suitable weights or pressure means that enable the load to be applied in a gradual, uniform manner.		P
10.16.3	Procedure		P
	a) Equip the module so that the electrical continuity of the internal circuit can be monitored continuously during the test.	Installed According to product manual	P
	b) Mount the module on a rigid structure using the method prescribed by the manufacturer. (If there are different possibilities, use the worst one, where the distance between the fixing points is at maximum.)		P
	c) On the front surface, apply gradually a load corresponding to 2 400 Pa, spread uniformly. (This load may be applied pneumatically or by means of weights covering the entire surface. In the latter case, the module shall be mounted horizontally.) Maintain this load for 1 h.	Performed	P
	d) Apply the same procedure on the back surface of the module.		P
	e) Repeat steps c) and d) for a total of three cycles.		P
10.16.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P
10.16.5	Requirements		P
	a) Equip the module so that the electrical continuity of the internal circuit can be monitored continuously during the test.	Installed According to product manual	P
	b) Mount the module on a rigid structure using the method prescribed by the manufacturer. (If there are different possibilities, use the worst one, where the distance between the fixing points is at maximum.)		P
	c) On the front surface, apply gradually a load corresponding to 2 400 Pa, spread uniformly. (This load may be applied pneumatically or by means of weights covering the entire surface. In the latter case, the module shall be mounted horizontally.) Maintain this load for 1 h.	Performed	P
	d) Apply the same procedure on the back surface of the module.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	e) Repeat steps c) and d) for a total of three cycles.		P
10.16.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P
10.16.5	Requirements		P
	The requirements are as follows	Comply with below Requirements	P
	-no intermittent open-circuit fault detected during the test		P
	-no evidence of major visual defects, as defined in Clause 7;		P
	-the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.17	Hail test		P
10.17.1	Purpose		P
	To verify that the module is capable of withstanding the impact of hailstones.	Performed	P
10.17.2	Apparatus		P
	a) Moulds of suitable material for casting spherical ice balls of the required diameter. The standard diameter shall be 25 mm but any of the other diameters listed in Table 2 may be specified for special environments.		P
	b) A freezer, controlled at –10 °C ± 5 °C. P		P
	c) A storage container for storing the ice balls at a temperature of –4 °C ± 2 °C		P
	d) A launcher capable of propelling an ice ball at the specified velocity, within ±5 %, so as to hit the module within the specified impact location. The path of the ice ball from the launcher to the module may be horizontal, vertical or at any intermediate angle, so long as the test requirements are met.		P
	e) A rigid mount for supporting the test module by the method prescribed by the manufacturer, with the impact surface normal to the path of the projected ice ball.		P
	f) A balance for determining the mass of an ice ball to an accuracy of ±2 %.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	g) Un instrument pour mesurer la vitesse de la bille de glace avec une précision de ±2 %. Le capteur de vitesse doit être placé à moins de 1 m de la surface du module en essai.		P
	An instrument for measuring the velocity of the ice ball to an accuracy of ±2 %. The velocity sensor shall be no more than 1 m from the surface of the test module.		P
	As an example, Figure 13 shows in schematic form a suitable apparatus comprising a horizontal pneumatic launcher, a vertical module mount and a velocity meter which measures electronically the time it takes the ice ball to traverse the distance between two light beams. This is only one example as other types of apparatus including slingshots and spring driven testers have been successfully utilized.		P
10.17.3	Procedure		P
	a) Using the moulds and the freezer, make sufficient ice balls of the required size for the test,including some for the preliminary adjustment of the launcher.		P
	b) Examine each one for cracks, size and mass. An acceptable ball shall meet the following criteria:		P
	– no cracks visible to the unaided eye		P
	– diameter within ±5 % of that required;		P
	– mass within ±5 % of the appropriate nominal value in Table 2.		P
	c) Place the balls in the storage container and leave them there for at least 1 h before use.		P
	d) Ensure that all surfaces of the launcher likely to be in contact with the ice balls are near room temperature.		P
	e) Fire a number of trial shots at a simulated target in accordance with step g) below and adjust the launcher until the velocity of the ice ball, as measured with the velocity sensor in the prescribed position, is within ±5 % of the appropriate hailstone test velocity in Table 2.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	f) Install the module at room temperature in the prescribed mount, with the impact surface normal to the path of the ice ball.		P
	g) Take an ice ball from the storage container and place it in the launcher. Take aim at the first impact location specified in Table 3 and fire. The time between the removal of the ice ball from the container and impact on the module shall not exceed 60 s.		P
	h) Inspect the module in the impact area for signs of damage and make a note of any visual effects of the shot. Errors of up to 10 mm from the specified location are acceptable.		P
	i) If the module is undamaged, repeat steps g) and h) for all the other impact locations in Table 3,as illustrated in Figure 14.		P
10.17.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P
10.17.5	Requirements		P
	The requirements are as follows:		P
	– no evidence of major visual defects, as defined in Clause 7;		P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements.		P
10.18	Bypass diode thermal test		P
10.18.1	Purpose		P
	To assess the adequacy of the thermal design and relative long-term reliability of the by-pass diodes used to limit the detrimental effects of module hotspot susceptibility.	Performed	P
10.18.2	Apparatus		P
	a) Means for heating the module to a temperature of 75 °C ± 5 °C.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
	b) Means for measuring and recording the temperature of the module(s) to an accuracy of ±1°C		P
	c) Means for measuring the temperature of any bypass diodes provided with the module. Care should be taken to minimize any alteration of the properties of the diode or its heat transfer path.		P
	d) Means for applying a current equal to 1,25 times the STC short-circuit current of the module under test and means for monitoring the flow of current through the module, throughout the test.		P
10.18.3	Procedure		P
	a) Electrically short any blocking diodes incorporated in the module.		P
	b) Determine the rated STC short-circuit current of the module from its label or instruction sheet.		P
	c) Prepare to measure the temperature of the bypass diodes during the test.		P
	d) Connect wires of the manufacturer's minimum recommended wire gauge to the output terminals of the module. Follow the manufacturer's recommendations for wire entry into the wiring compartment and replace the wire compartment cover.		P
	e) Heat the module to 75 °C ± 5 °C. Apply a current to the module equal to the short circuit current of the module as measured at STC ± 2 %. After 1 h measure the temperature of each bypass diode. Using the information provided by the diode manufacturer calculate the junction temperature from the measured case temperature and the power dissipated in the diode using the following formula.	75 °C	P
	f) Increase the applied current to 1,25 times the short-circuit current of the module as measured at STC while maintaining the module temperature at 75 °C ± 5 °C. Maintain the current flow for 1 h.		P
	g) Verify that the diode is still operational.		P
10.18.4	Final measurements		P
	Repeat the tests of 10.1, 10.2 and 10.3.		P

EN 61215			
Clause	Requirement Test	Result - Remark	Verdict
10.18.5	Requirements		P
	The requirements are as follows:	Comply with below requirements	P
	– the diode junction temperature as determined in 10.18.3.e) shall not exceed the diode manufacturer's maximum junction temperature rating;		P
	– no evidence of major visual defects, as defined in Clause 7;	Performed	P
	– the degradation of maximum output power shall not exceed 5 % of the value measured before the test;		P
	– insulation resistance shall meet the same requirements as for the initial measurements;		P
	– the diode shall still function as a diode after the conclusion of the test.		P

Tables

Table 1-Testing condition

Test	Item	condition
10.1	Visual inspection	See 10.1.2
10.2	Maximum power determination	Comply with IEC 60904-1
10.3	Insulation test	800V;time:1m';insulated resistance:≥50MΩ
10.4	Temperature modulus	Comply with IEC 60904-10
10.5	Measurement of nominal operating cell temperature (NOCT)	Total irradiance: 800W/m^2 Testing temperature: 20℃ Wind speed: 50m/s
10.6	Performance at STC and NOCT	Cell temperature: 25℃and NOCT Irradiance:1000 and 800W/m^2
10.7	Performance at low irradiance	Cell temperature: 25℃
10.8	Outdoor exposure test	Irradiance: 200 W/m^2
10.9	Hot-spot endurance test	Total irradiance: 60kW/m^2
10.10	UV preconditioning test	UV: 280nm～385nm Total rradiance: 15kW/m^2
10.11	Hot-circle test	-40℃ to +85℃ 50 and 200 times repeat
10.12	Humidity-freeze test	Humidity: 85%+85℃ to -40℃10 times repeat
10.13	Damp-heat test	+85℃; 85% humidity; 1000h
10.14	Robustness of terminations test	Comply IEC 60068-2-21
10.15	Wet leakage current test	See 10.14
10.16	Mechanical load test	2400Pa load; 1h; 2 times repeat
10.17	Hail test	25mm; 23m/s; 11 times strike
10.18	Bypass diode thermal test	75℃ and Isc; 1h 75℃ and 1.25Isc; 1h

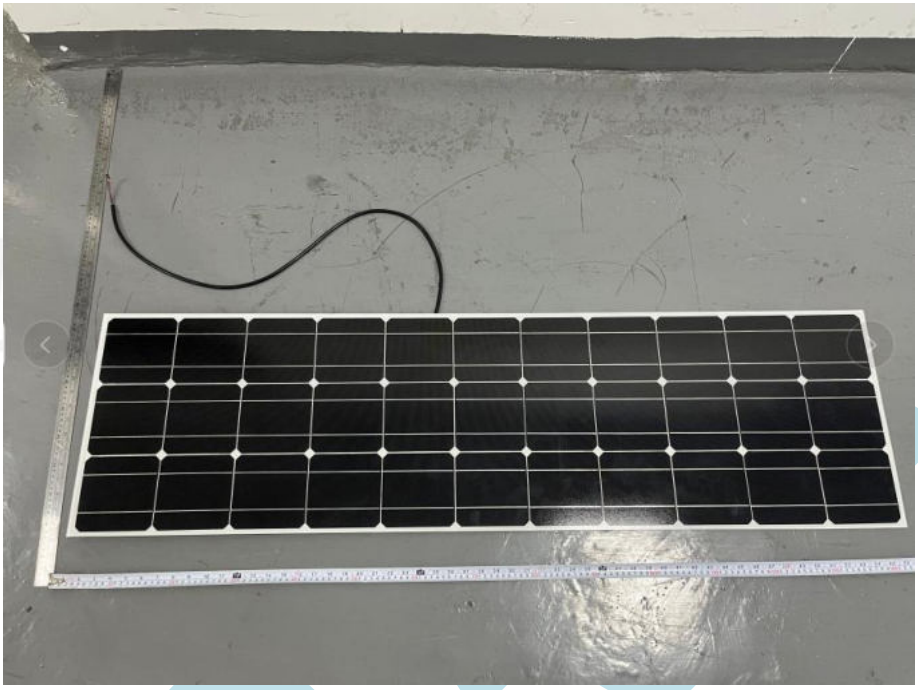
Table 2 - Solar Panel

Type / Silicon / Parameters		WYC1802
		Polycrystalline
Maximum Power Watt		100
Production Tolerance		±5%
Maximum Power voltage	V	16.5
Maximum Power current	A	6.06
Open circuit voltage	V	19.8
Short circuit current	A	6.36
size of module(wide and high)		1411*395*4.5mm
Surface		Low iron tempered glass
frame (type, material and thickness)		Anodized Aluminium frame
Weight Kg		5.0Kg
type of junction box		PV junction box
cable type and length, connector type		PV cable, 800mm Special connector
NOCT (Nominal operating cell temperature)		25℃
Dielectric Isolation		1000VDC max
Storage temperature		+5℃ - +25℃
Wind Bearing		60m/s(200kg/sq.m)
Impact Resistance Hail Impact Test		227g steel ball fall down from 1m height
Quality warranty		10 years 90% and 25 years 80% of power output

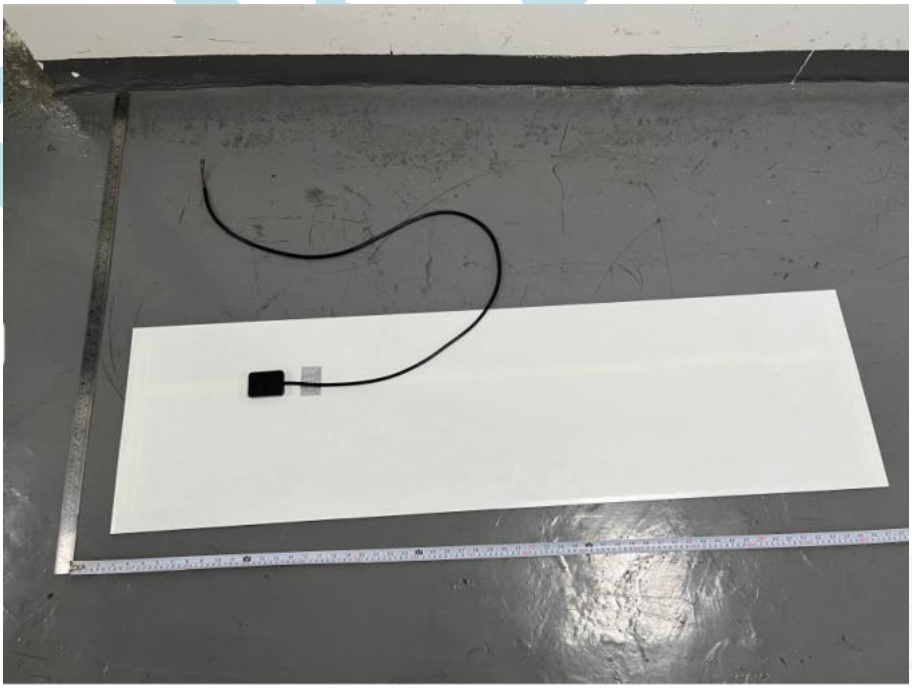
ANNEX A:

Photo-documentation

EUT Photo 1



EUT Photo 2



EUT Photo 3

※※※※※ END OF REPORT ※※※※※

福建宏旺实业有限公司

Fujian Hongwang Industrial Co.,Ltd.

产品质量证明书

PRODUCT QUALITY CERTIFICATE

地址：中国 福建 福安市湾坞镇上洋村

Add：Shangyang, Fu'an, Fujian, China

电话/Tel:+86-593-6296610

网址/URL：www.cnhwjt.com

传真/Fax:+86-593-6600196

客户 Customer：

产品名称 Product：冷轧不锈钢钢带 COLD ROLLED STAINLESS STEEL COIL

证书号/Certificate No：202003310011

表面品级 Surface Finish：No.2B　　钢种 Steel Grade： J2　　标准 Standard：Q/FJHW 1-2019

产品编号 Product ID	炉号 Heat No.	尺寸（mm） Dimension	重量（kg） Weight	化学成分 Chemical Composition （%）								拉伸试验 Tensile Test			硬度试验 Hardness Test	
				C	Si	Mn	P	S	Cr	Ni	Cu	屈服强度 0.2% Y.S (Mpa)	抗拉强度 T.S(Mpa)	延伸率 EL(%)	硬度 HRB	硬度 HV
			Min. Max.	0.200	0.80	7.50 11.00	0.060	0.030	12.00 16.00	0.80 2.00	1.00	300	750	40	102	270
FG20030849AY2C	N200301AQ021-01	1.05*1240	9735	0.154	0.40	9.13	0.046	0.003	13.03	1.24	0.35	447	994	50		265
FG20011683AY1C	N200105AQ112-01	1.15*1240	9608	0.132	0.39	8.54	0.041	0.003	14.36	1.20	0.35	448	996	49		265
FG20031323AY2C	N200303AT092-03	1.18*1240	9397	0.128	0.35	8.66	0.053	0.001	14.49	1.22	0.37	448	995	49		265
FG20031697AY1C	N200307AQ071-02	1.25*1240	9733	0.135	0.41	8.79	0.046	0.002	14.31	1.19	0.37	448	995	47		265
FG20030495AY2C	N200227AR032-05	1.65*1240	9617	0.132	0.44	8.63	0.044	0.001	14.31	1.24	0.35	445	989	48		266
BG20030247AY1C	N200315AR091-01	1.95*1240	9383	0.135	0.40	8.61	0.049	0.003	14.32	1.16	0.35	444	986	48		266
FG20032917AY1C	N200315AT101-05	2.15*1240	9714	0.128	0.40	8.77	0.045	0.002	14.25	1.31	0.35	444	986	46		266
FG20030993AY1C	N200302AQ041-03	2.45*1240	9846	0.134	0.40	8.69	0.040	0.002	14.21	1.35	0.34	443	984	47		265
FG20020479AY1C	N200130AQ041-04	2.65*1240	9687	0.134	0.33	8.64	0.043	0.002	14.47	1.13	0.38	438	973	47		267
FG20032711AY1C	N200313PA041-03	2.95*1240	9699	0.139	0.38	8.54	0.040	0.003	14.42	1.20	0.37	440	978	45		267
合计 Total			96419	◆尺寸公差 Size tolerance ： 合格 Acceptable								◆表面质量 Surface quality ： 一级 Class 1				

附注 Remarks:

1.兹证明所列产品经检验均符合企业标准要求。

The material listed above has been tested and complies with the terms of the contract and enterprise standard .

2.本证明书盖品质证明专用章后生效。

This certificate is valid with the orginal stamp of the quality assurance department.

3.如有质量异议，请来电或来函说明情况，并告知质量证明书编号。

If any quality query, please clarify via phone call or fax,indicating the certificate number.

编制： Typed by	郑晓凤
批准： Ratifying	李佼
日期： Date	20200331

福建宏旺实业有限公司 品质保证部 Fujian Hongwang Industrial Co.,Ltd. Quality Assurance Department

质量检验章

Quality inspection seal

EU-TYPE EXAMINATION (MODULE B) CERTIFICATE

Radio Equipment Directive (RED) 2014/53/EU

PHOENIX TESTLAB

Notified Body Number 0700

Recognised by Bundesnetzagentur

BNetzA-bS-02/51-55

This is to certify that:
PHOENIX TESTLAB did undertake the relevant type examination procedures for the radio equipment identified below which was found to be in compliance with the essential requirements of Radio Equipment Directive (RED) 2014/53/EU subject to any conditions in the annex attached hereto.

Certificate No.	17-213314
Manufacturer	Shenzhen Libtor Technology Co., Ltd
Address	Room 608, Building A, Hongshengyuan Industrial Zone, No.339 Bulong Road, Bantian Street Office, Longgang District, Shenzhen, Guangdong, China
Product Description	Industrial 4g router; with GSM, WCDMA, LTE, WIFI
Brand Name / Model Name	Linble / T260S, T270, T280, T300, D500, D520, D550, D560, M400, M450

The radio equipment meets the following essential requirements

Article 3.1 a): Health and Safety	**Conform**
Article 3.1 b): Electromagnetic Compatibility	**Conform**
Article 3.2: Effective and Efficient Use of Radio Spectrum	**Conform**
Additional Essential Requirements:	**Not applicable**

Date of issue	**2017-10-26**	Expiry date:	**2022-10-25**

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached annex are complied with. The conditions for the validity of this certificate are listed in the Annex.

The attached Annex forms part of this certificate. This certificate consists of 3 pages.

Seal

Signed by Alan Lane
Notified Body

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notifiedbody@phoenix-testlab.de

PHOENIX TESTLAB GmbH
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Annex

Technical description

Frequency Range	GSM 850/900/1800/1900 UTRA FDD Band I/II/V/VIII E-UTRA FDD Band 1/2/3/5/7/8/20 WiFi (20 MHz): 2412 - 2472 MHz WiFi (40 MHz): 2422 - 2462 MHz
Transmit Power	Max. 2W / Max. 1W UTRA FDD: 24 dBm E-UTRA FDD: 23 dBm WiFi: 11b: 13.64 dBm EIRP 11g: 12.34 dBm EIRP 11n HT20: 10.52 dBm EIRP 11n HT40: 9.48 dBm EIRP
Hardware Version	T260S_V16
Software Version	2.2.1.3

System Components

2.4G sucker antenna	SMA Antenna (SHENZHEN ZHONGTIANHAO COMMUNICATION EQUIPMENT CO.,LTD TECHNOLOGY DEPARTMENT)
3G/4G sucker antenna	SMA Antenna (SHENZHEN ZHONGTIANHAO COMMUNICATION EQUIPMENT CO.,LTD TECHNOLOGY DEPARTMENT)

Optional Components

Adapter	KZ1201000V (Shenzhen Kezhen Electronic Co., Ltd) Specification: Input: 100-240V~,50/60Hz, 0.3A Max. Output: DC12V, 1.0A

Approval documentation

External / Internal Photos	Provided, 4 / 4 pages
User Manual	User Manual, 24 pages
Block Diagram	Provided, 1 page
Circuit Diagram	Provided, 37 pages
Operational Description	Operation Description, 2 pages
PCB Layout	Included in Placement
Parts Placement	Provided, 16 pages
Parts List	Provided, 9 pages
EU Declaration of Conformity	2 pages, August 28, 2017
Explanation of compliance Article 10(2) and Article 10(10)	Description in the User Manual
Further Documents	Risk Assessment, 4 pages, August 28, 2017 Differences Declaration, 1 page, August 28, 2017

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Applied Standards and Test Reports

Specification	Laboratory	Test Report Number / Version
EN 60950-1:2006+A11:2009+ A1:2010+A12:2011+A2:2013	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731S009
EN 62311:2008	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E022
Draft ETSI EN 301 489-1 V2.2.0 Draft ETSI EN 301 489-17 V3.2.0 Draft ETSI EN 301 489-52 V1.1.0	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E021
ETSI EN 301 511 V12.5.1	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E016
ETSI EN 301 908-1 V11.1.1 ETSI EN 301 908-2 V11.1.1	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E017
ETSI EN 301 908-1 V11.1.1 ETSI EN 301 908-13 V11.1.1	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E020
ETSI EN 300 328 V2.1.1	Shenzhen TCT Testing Technology Co., Ltd.	TCT170731E015

Limitations / Restrictions

Operating Temperature range -20 ~ 40 degree Celsius

This device also contains frequency bands that are not operational in EU member states. Only the frequency bands used in European Union have been assessed for this EU-TYPE EXAMINATION (MODULE B) CERTIFICATE.

Body Separation distance is 45cm by using the procedure of MPE calculation.

Notes

1. This certificate will not be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with PHOENIX TESTLAB.

2. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/them being placed on the market.

3. The manufacturer shall take all measures necessary so that the manufacturing process and its monitoring ensure conformity of the manufactured radio equipment with the approved type described in the EU-type examination certificate and with the requirements of Directive 2014/53/EU that apply to it.

4. CE The manufacturer shall affix the CE marking to each item of radio equipment that is in conformity with the type described in the EU-type examination certificate and satisfies the applicable requirements of the Directive.

5. The manufacturer shall draw up a written EU declaration of conformity for each radio equipment type and keep it at the disposal of the national authorities for 10 years after the radio equipment has been placed on the market. The EU declaration of conformity shall identify the radio equipment type for which it has been drawn up. A copy of the EU declaration of conformity shall be made available to the relevant authorities upon request.

BENANNTE STELLE PHOENIX TESTLAB NOTIFIED BODY

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