

EMC EMISSION - TEST REPORT

Report Number : 708881569801-00-Part 1 Date of Issue: June 15, 2015

Model : XYZ (X stands for 1, 2, 3; Y stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; Z stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
Models list refer to Appendix B

Product Type : Flashlight

Applicant : Ningbo Strong Optoelectric Co., Ltd.

Manufacturer : Ningbo Strong Optoelectric Co., Ltd.

License holder : Ningbo Strong Optoelectric Co., Ltd.

Address : No.1, EAST YONGXING ROAD,

: EAST SUBURBS INDUSTRIAL ZONE

: 315499 YUYAO, ZHEJIANG, PEOPLE'S REPUBLIC OF CHINA

Test Result : Positive Negative



Total pages including Appendices 28

TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch issued reports.

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D I R E C T O R Y - E M I S S I O N S

	Pages
A) Documentation	
Test Report	<u>1 - 12</u>
Directory	<u>2</u>
Test Regulations	<u>3</u>
General Remarks and Summary	<u>12</u>
Test Setups (Photographs)	<u>13 - 16</u>
B) Test Data	
Conducted Emissions 9/150 kHz - 30 MHz	<u>5, 11</u>
Radiated Emissions 9 kHz - 30 MHz	<u>6, 11</u>
Radiated Emissions 30 MHz – 300/1000/6000 MHz	<u>7, 11</u>
Interference Power 30 MHz - 300 MHz	<u>8, 11</u>
Harmonic Current Emissions and Voltage Fluctuations and Flicker 2nd through 40th Harmonics	<u>9, 11</u>
C) Appendix A	
Test Data Sheets	<u>A2 – A6</u>
D) Appendix B	
Constructional Data Form and Product Information Form(s)	<u>B1 – B3</u>
E) Appendix C	
Constructional Photographs	<u>C1 – C3</u>

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

■ - EMC - Directive 2004/108/EC

- EN 61000-6-3:2007/A1:2011

- EN 61000-6-4:2007/A1:2011

- EN 61326-1:2006

- Class A

- Class B

- EN 55011:2009/A1:2010

- Group 1

- Group 2

- EN 55012:2007/A1:2009

- Class A

- Class B

- EN 55013:2013

- EN 55014-1:2006/A1:2009/A2:2011

- Household appliances and similar

- Electric tools

- Others_____.

■ - EN 55015:2013

- EN 55022: 2010

- Class A

- Class B

- EN 61000-3-2:2006/A1:2009/A2:2009

- EN 61000-3-3:2008

- EN 61000-3-11:2000

Environmental Conditions In The Laboratory:

	<u>Actual</u>
Temperature:	: 20°C
Relative Humidity:	: 50%
Atmospheric Pressure:	: 1005mBar

Power Supply Utilized:

Power supply system : 4.2V DC

Statement of Measurement Uncertainty:

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Emission	0.15MHz to 30MHz	3.21 dB
Radiated Emission (Electric field)	30MHz to 1GHz	3.46 dB (Horizontal)
		3.79 dB (Vertical)
Radiated Emission (Electric field)	1GHz to 18GHz	3.33 dB (Horizontal)
		3.58 dB (Vertical)
Radiated Emission (Magnetic field)	9KHz to 30MHz	3.03dB
Disturbance power	30MHz to 300MHz	2.99 dB
Harmonic	50Hz to 2KHz	6.21%
Flicker	dc	0.624%
	dmax	0.654%
	dt	4.729%
	Pst/Plt	4.73%

Symbol Definitions:

- - Applicable
- - Not Applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

- Test not applicable

- Test Area –

Test Equipment Used :

	Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/>	DIA1512D	Schaffner	Discontinuous Interference Analyser	487/750206(No.E50)
<input type="checkbox"/>	- ESHS30	Rohde & Schwarz	EMI Test Receiver	70-7/63-97-01
<input type="checkbox"/>	-	TÜV PS	Artificial Hand	95-01
<input type="checkbox"/>	NSLK 8127	Schwarzbeck	LISN	48-7/60-02-15
<input type="checkbox"/>	- ESH3-Z5	Rohde & Schwarz	LISN	70-7/60-96-03
<input type="checkbox"/>	- ENV4200	Rohde & Schwarz	LISN	48-7/60-99-13
<input type="checkbox"/>	- NNB42	Schaffner	LISN	487/601121
<input type="checkbox"/>	- TK 9420	Schwarzbeck	High-Voltage-Probe, 1.5kOhm	487/430204
<input type="checkbox"/>	- EN55015/B7	M&E	energy saving lamp active	707/609702

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

- Test not applicable

■ - Test Area-A

Testing was performed at a test distance of :

- - 3 meters
- 30 meters

Test Equipment Used :

	Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/>	ESHS30	Rohde & Schwarz	EMI Test Receiver	70-7/63-97-01
■	ESCI 3	Rohde & Schwarz	EMI Test Receiver	48-7/63-11-10
■	HM020	Rohde & Schwarz	Triple-loop Antenna	48-7/62-99-11

-

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-300/1000/6000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Test not applicable

■ - Test Area - A

Testing was performed at a test distance of :

■ - 3 meters

- 10 meters

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - ESIB7	Rohde & Schwarz	EMI Test Receiver (20Hz~7GHz)	487/630408
■ - ESU 8	Rohde & Schwarz	EMI Test Receiver	487/630909
■ - VULB9168	Schwarzbeck	Broadband Antenna	487/621027
<input type="checkbox"/> - 10m	TDK	Semi-anechoic Chamber	487/770201
■ - 3m	Jinlida	Anechoic Chamber	

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

- Test not applicable

- Test Area –

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - MDS-21	Rohde & Schwarz	Absorbing Clamp	70-7/60-95-02
<input type="checkbox"/> - ESVS 30	Rhode & Schwarz	EMI Test Receiver	70-7/63-95-02

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: CONDUCTED EMISSIONS (Harmonics and Flicker)

The *Harmonic Current Emissions and Voltage Fluctuations and Flicker* measurements were performed at the following test location :

■ - Test not applicable

- Test Area –

Test Equipment Used :

	Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> -	PM 6000	Voltech	Universal Power Analyzer	48-7/74-07-41
<input type="checkbox"/> -	IEC Standard 555	Voltech	Reference Impedance Network	70-7/57-95-01
<input type="checkbox"/> -	C15003ix-400/3-CTS	California Instruments	AC Power Supply Testing System	487/68-99-10
<input type="checkbox"/> -	MX45-3PI	California Instruments	AC Power Supply Testing System	487/681243

Remarks: Test equipment used is calibrated on a regular basis.

Equipment Under Test (EUT) Test Operation Mode - Emissions Tests:

The equipment under test was operated under the following conditions during emissions testing:

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Normal Operating Mode

- Light on.

- _____
- _____

Configuration of the equipment under test:

- See Constructional Data Form in Appendix B
- See Product Information Form(s) in Appendix B

The following peripheral devices and interface cables were connected during the testing:

- | | |
|----------------------------------|--------------|
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |

- unshielded power cable
- unshielded cables
- shielded cables
- customer specific cables

TUVPS.No.: _____

- _____
- _____

Emissions Test Results:

Conducted Emissions, 9/150 kHz - 30 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ dB At _____ MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Radiated Emissions (Magnetic Field), 9 kHz - 30 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ >6 dB At 0.009-30 MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Interference Power at the Mains and Interface Cables, 30 MHz - 300 MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ dB At _____ MHz

Maximum limit exceeding _____ -- dB At _____ -- MHz

Comply with the limits reduces by Table 2b of EN 55014-1? - YES - NO - N/A

Remarks: _____

Radiated Emissions (Electric Field), - 30 MHz – 300 MHz, - 30MHz – 1000MHz

- PASS - FAIL - NOT APPLICABLE

Minimum limit margin _____ >6 dB At 30-300 MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Harmonic Current Emissions and Voltage Fluctuations and Flicker

- PASS - FAIL - NOT APPLICABLE

Harmonic measurement exceeding limit _____ Above At _____ Harmonic

Flicker measurement exceeding limit _____ Above The _____ Requirement

Remarks: _____



Product Service

GENERAL REMARKS:

According to client's declaration, all the models have the same electric structure except for their different mechanical structure.

So model 182 was chosen to perform all the tests.

SUMMARY:

All tests according to the regulations cited on page 3 were

■ - Performed

□ - **Not** Performed

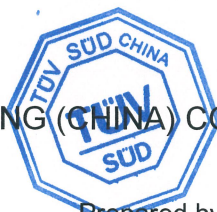
The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.

□ - **Does not** fulfill the general approval requirements cited on page 3.

Testing Start Date: May 22, 2015

Testing End Date: May 22, 2015



- TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH-

Reviewed by:

Prepared by:

Liping Xue 6-15, 2015
Liping XUE
Review Engineer

Yongqing Zheng 6-15, 2015
Yongqing ZHENG
Project Engineer



Product Service

Photograph of Test Setup:
Conducted Emissions : 9/150 kHz - 30 MHz

■ - Test not applicable

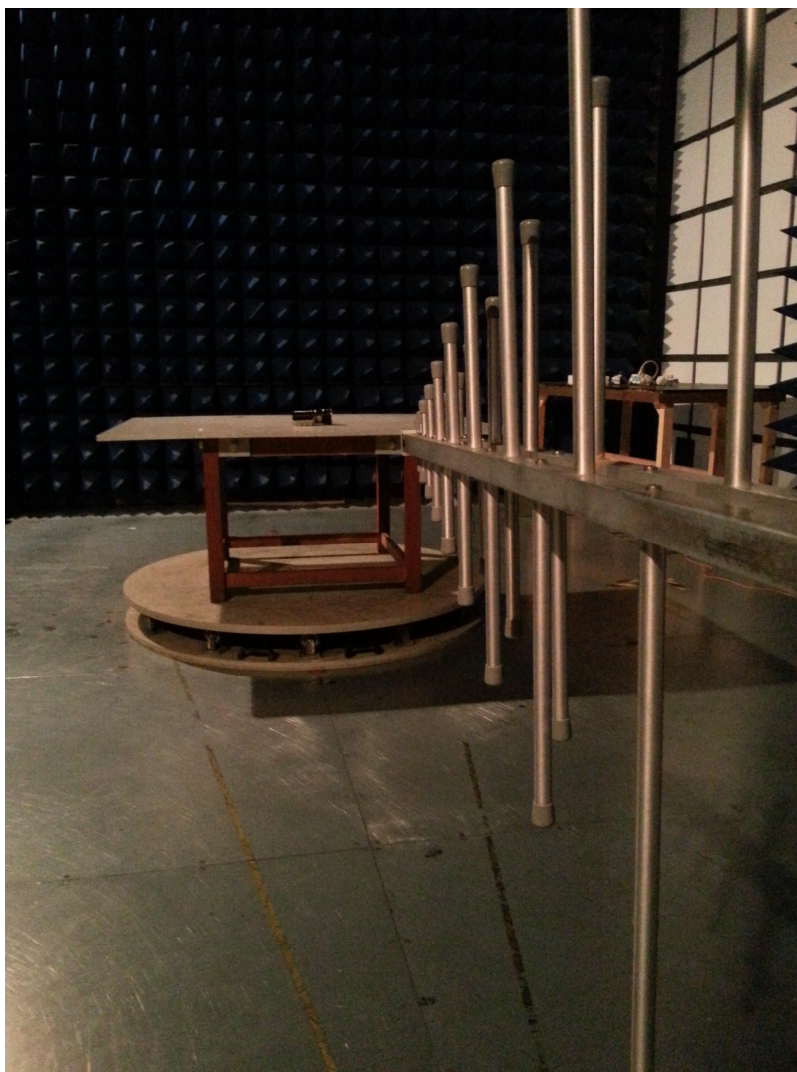
Photograph of Test Setup:
Radiated Emissions 0.009MHz – 30MHz

- Test not applicable



Photograph of Test Setup:
Radiated Emissions 30 MHz – 300MHz

- Test not applicable





Product Service

Photograph of Test Setup:
Harmonic Current/Voltage Fluctuations and Flicker

■ - Test not applicable



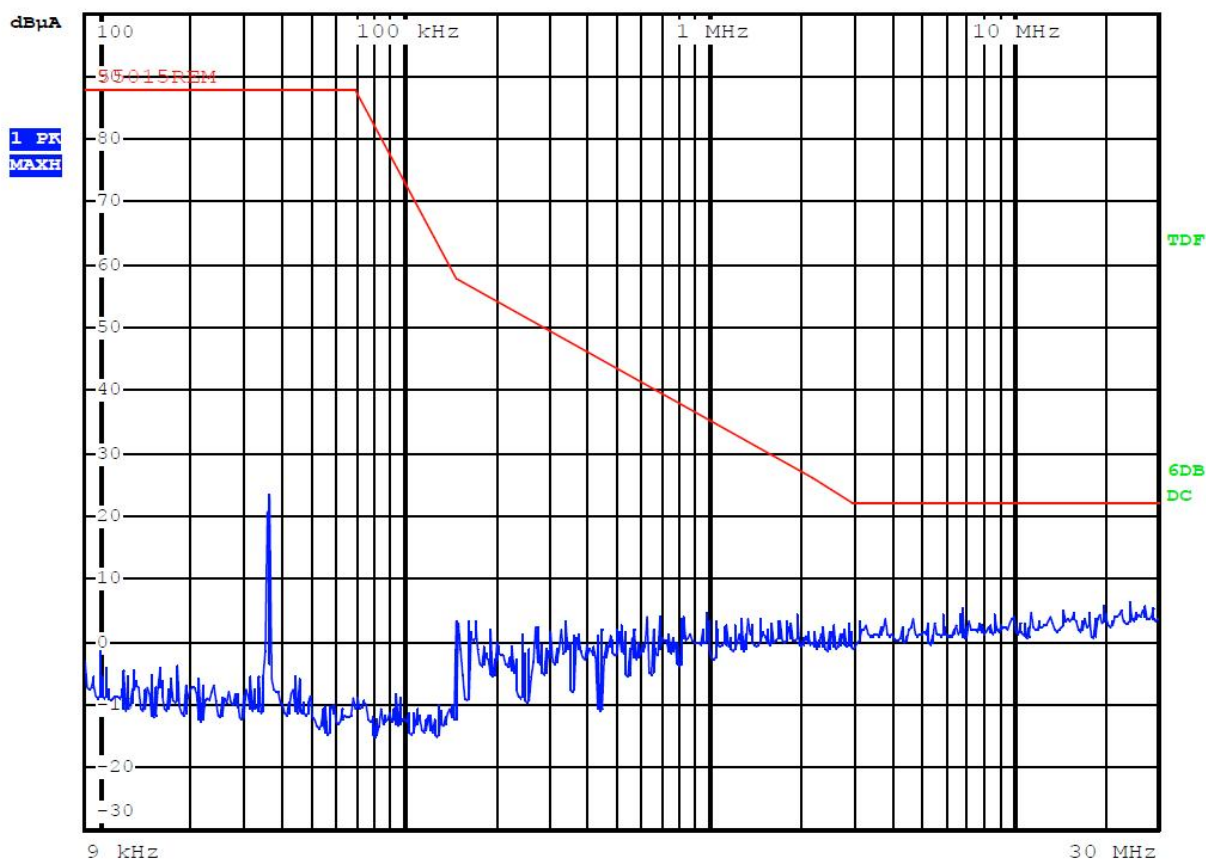
Appendix A

Test Data Sheets

9k-30MHz Radiated Emission Test

182

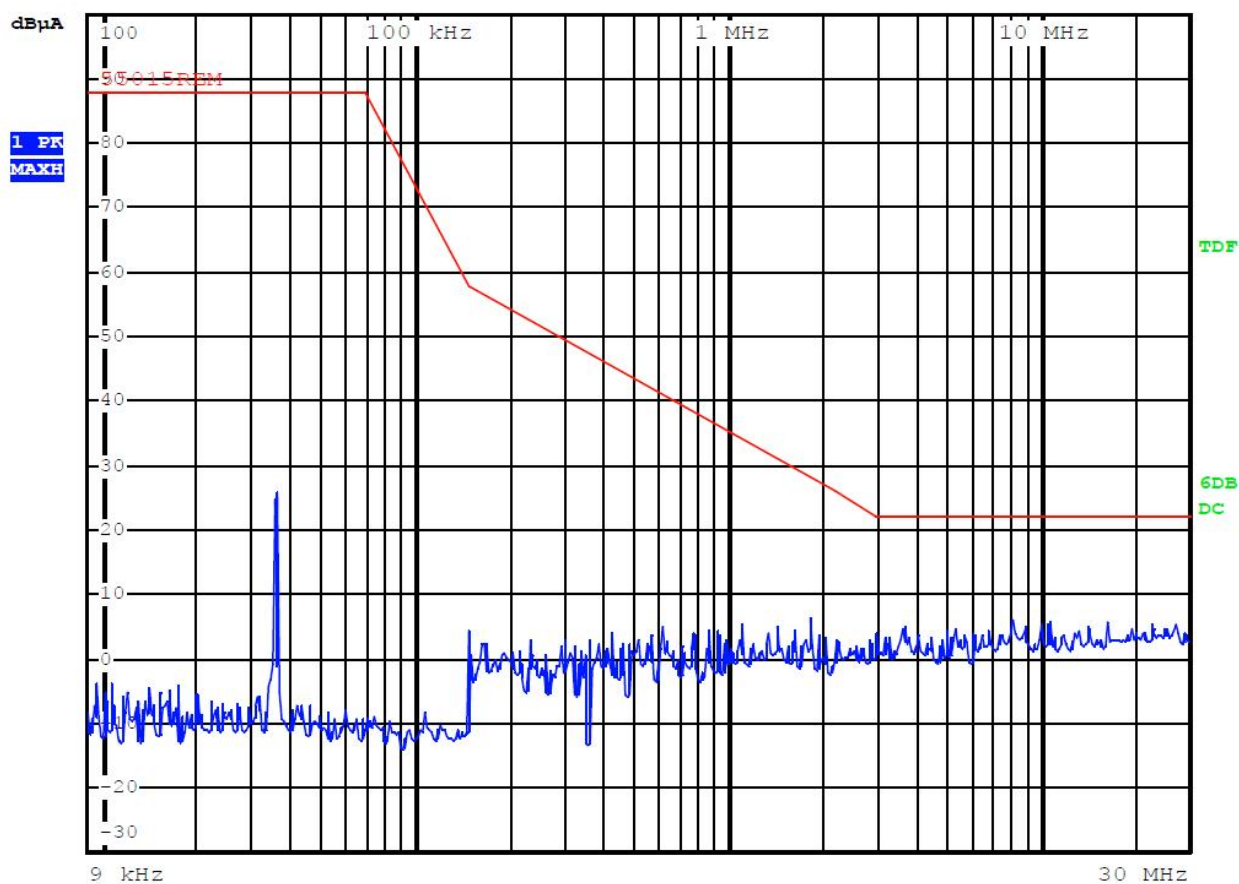
EUT: Flashlight
 Manuf: Ningbo Strong Optoelectric Co., Ltd.
 Op Cond: Light on
 Operator: Xiaoli Su
 Test Spec: EN55015
 Sample No.: 171184-1
 Comment: A1



9k-30MHz Radiated Emission Test

182

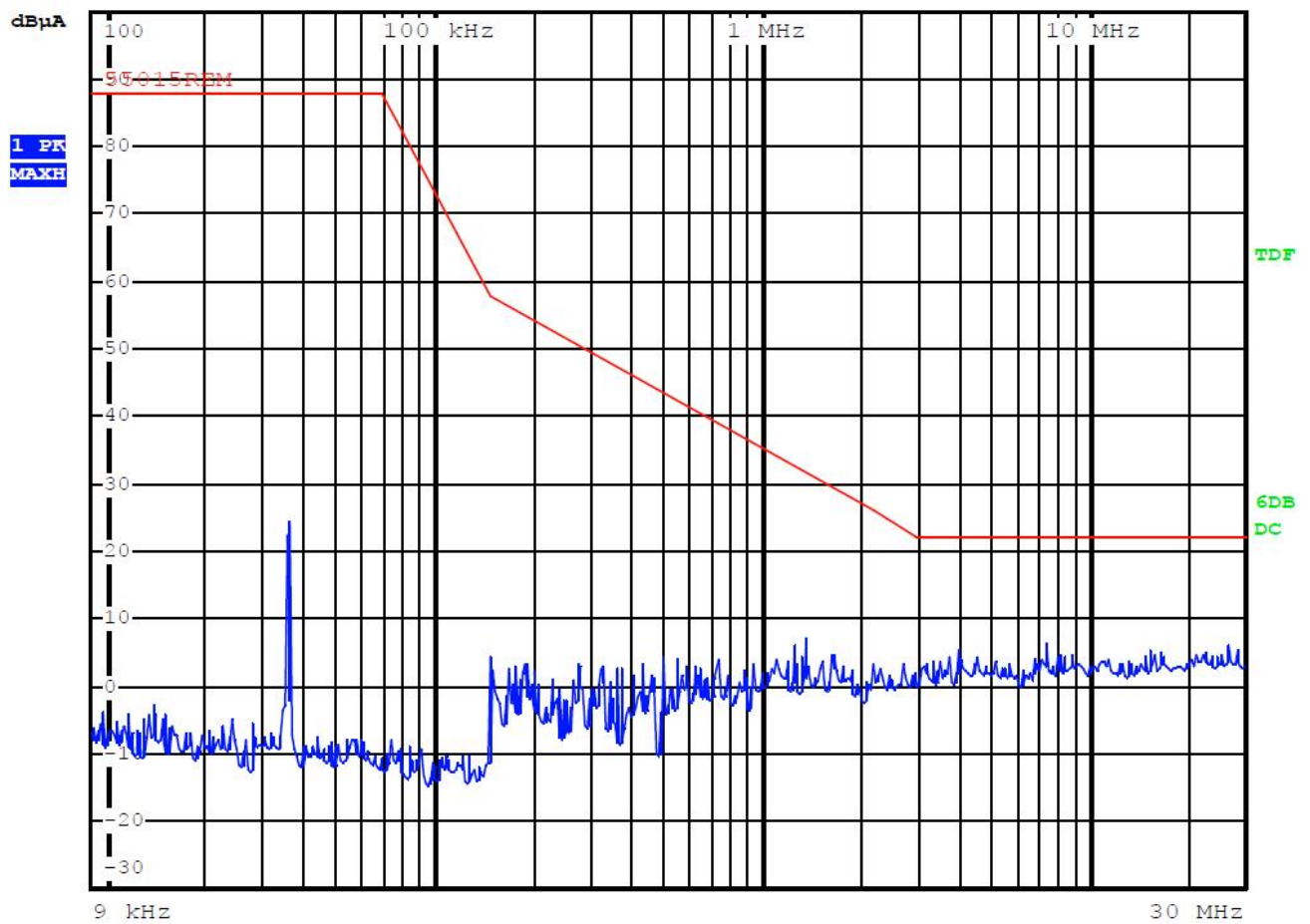
EUT: Flashlight
 Manuf: Ningbo Strong Optoelectric Co., Ltd.
 Op Cond: Light on
 Operator: Xiaoli Su
 Test Spec: EN55015
 Sample No.: 171184-1
 Comment: A2



9k-30MHz Radiated Emission Test

182

EUT: Flashlight
 Manuf: Ningbo Strong Optoelectric Co., Ltd.
 Op Cond: Light on
 Operator: Xiaoli Su
 Test Spec: EN55015
 Sample No.: 171184-1
 Comment: A3



EMC32 Report

Common Information

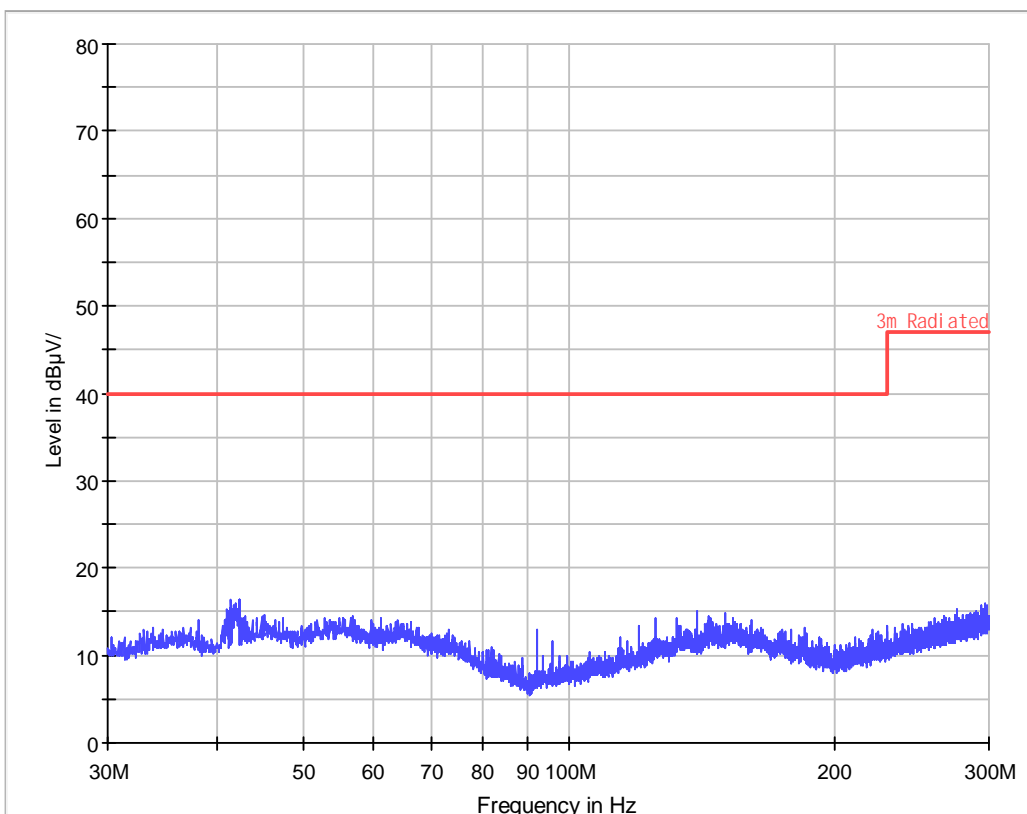
Test Description: 30-300MHz Radiated Emission test
 EUT: Flashlight; 182
 Manufacturer: Ningbo Strong Optoelectric Co.,Ltd.
 Operating Conditions: Light on
 Operator Name: Xiaoli Su
 Specification: EN 55015
 Comment: Vertical
 Sample No.: 171184-1

Automotive Setup: 3m 966 radiation(Scan) [EMI radiated]

Device Mode: Scan Mode

Subrange Name	Subrange	Step Size	Detectors	IF BW	Meas. Time
CISPR 15	30 MHz - 300 MHz	40 kHz	PK+	120 kHz	0.005 s

CISPR 15



EMC32 Report

Common Information

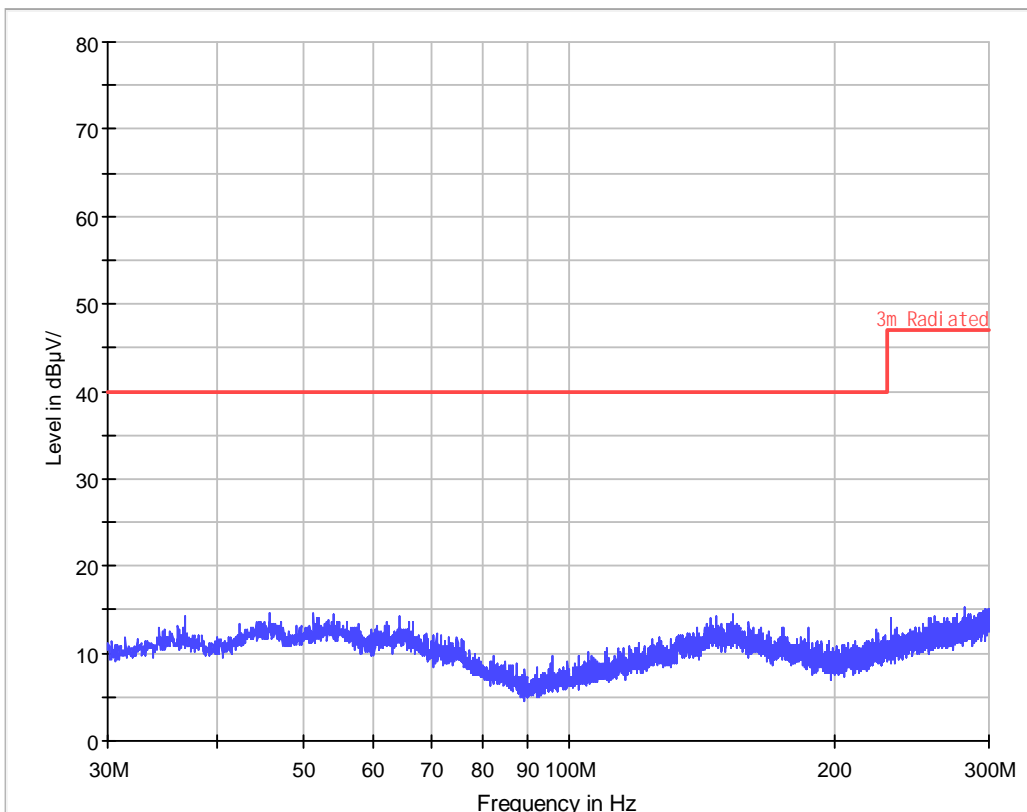
Test Description: 30-300MHz Radiated Emission test
 EUT: Flashlight; 182
 Manufacturer: Ningbo Strong Optoelectric Co.,Ltd.
 Operating Conditions: Power on
 Operator Name: Xiaoli Su
 Specification: EN 55015
 Comment: Horizontal
 Sample No.: 171184-1

Automotive Setup: 3m 966 radiation(Scan) [EMI radiated]

Device Mode: Scan Mode

Subrange Name	Subrange	Step Size	Detectors	IF BW	Meas. Time
CISPR 15	30 MHz - 300 MHz	40 kHz	PK+	120 kHz	0.005 s

CISPR 15





Product Service

Appendix B

Data form for electrical equipment and machinery

Applicant : Ningbo Strong Optoelectric Co., Ltd.
Address : No.1, EAST YONGXING ROAD, EAST SUBURBS INDUSTRIAL ZONE ,
315499 YUYAO, ZHEJIANG, PEOPLE'S REPUBLIC OF CHINA
Factory : Same as above
Address : Same as above
Type : Flashlight
Model : XYZ (X stands for 1, 2, 3; Y stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; Z stands
for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
Rated voltage : 4.2V DC
Rated power : 7.56W
Protection class : III

Configuration of equipment:

LED, Switch, PCB Board

Short description of the EUT (Purpose of system, area of use, Function of the system):

Light equipment

Sources of Interference:

Internal frequencies:

Noise suppression components:

Measures for electromagnetic shielding:

O If applicable, if necessary complete overlea

Component List

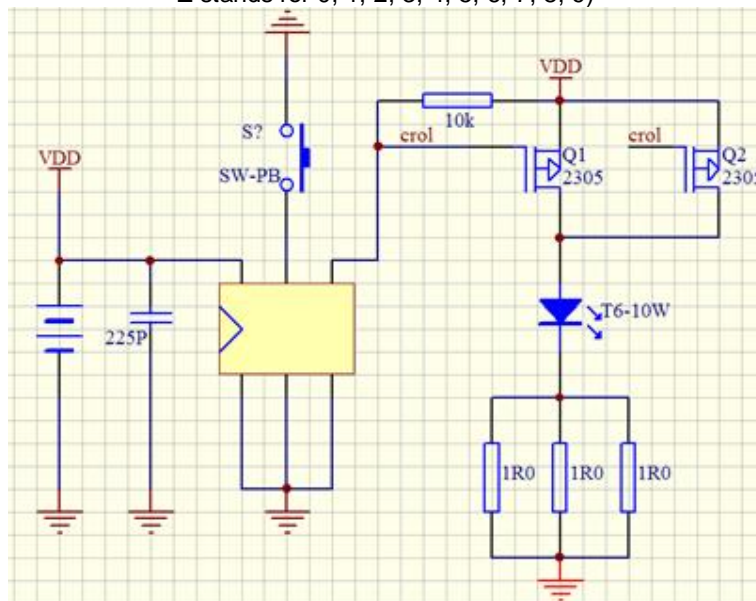
Part No.	Information	No.
PCB	FR-4	
Resistor	10K, 5%, 0603	R1
Resistor	0.1Ω	R2, R3, R4
Diode	肖特基二极管, 500mA, 40V, SOD-123封装	S4
Capacitor	10UF, 10%, 0805	C1
IC	AT8PB513B, MCU, SOP8封装	U1
Triode	230, N 沟道 MOS 管, 4A, 20V, SOT23封装	Q1,Q2

Models List

101	201	301	121	221	141	161	181
102	202	302	122	222	142	162	182
103	203	303	123	223	143	163	183
104	204	304	124	224	144	164	184
105	205	305	125	225	145	165	185
106	206	306	126	226	146	166	186
107	207	307	127	227	147	167	187
108	208	308	128	228	148	168	188
109	209	309	129	229	149	169	189
110	210	310	130	230	150	170	190
111	211	311	131	231	151	171	191
112	212	312	132	232	152	172	192
113	213	313	133	233	153	173	193
114	214	314	134	234	154	174	194
115	215	315	135	235	155	175	195
116	216	316	136	236	156	176	196
117	217	317	137	237	157	177	197
118	218	318	138	238	158	178	198
119	219	319	139	239	159	179	199
120	220	320	140	240	160	180	200

Circuit Diagram

XYZ (X stands for 1, 2, 3; Y stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9;
Z stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9)

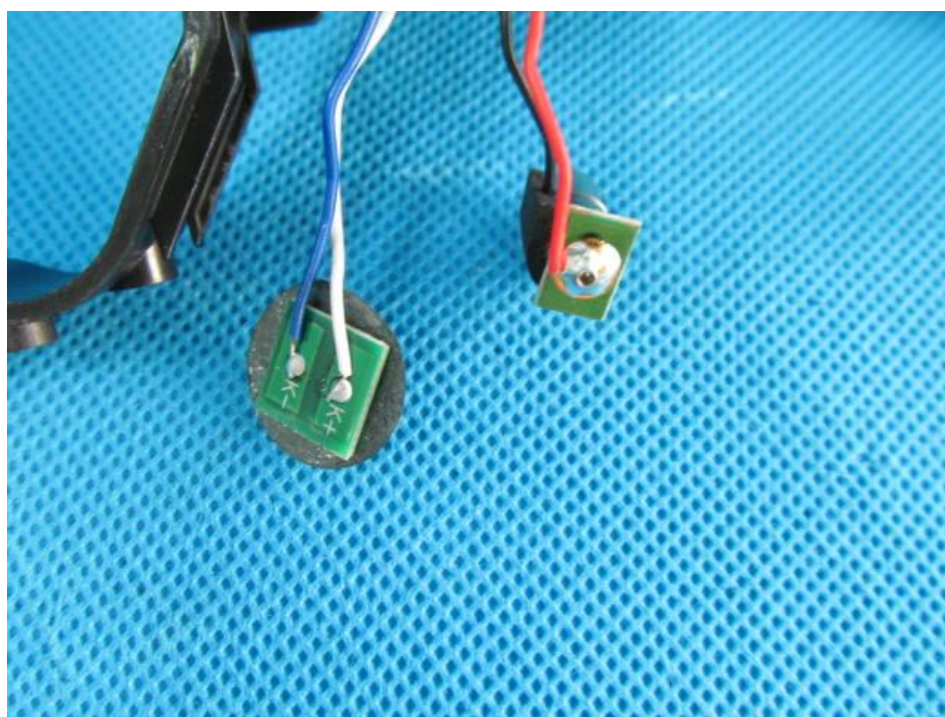


Appendix C

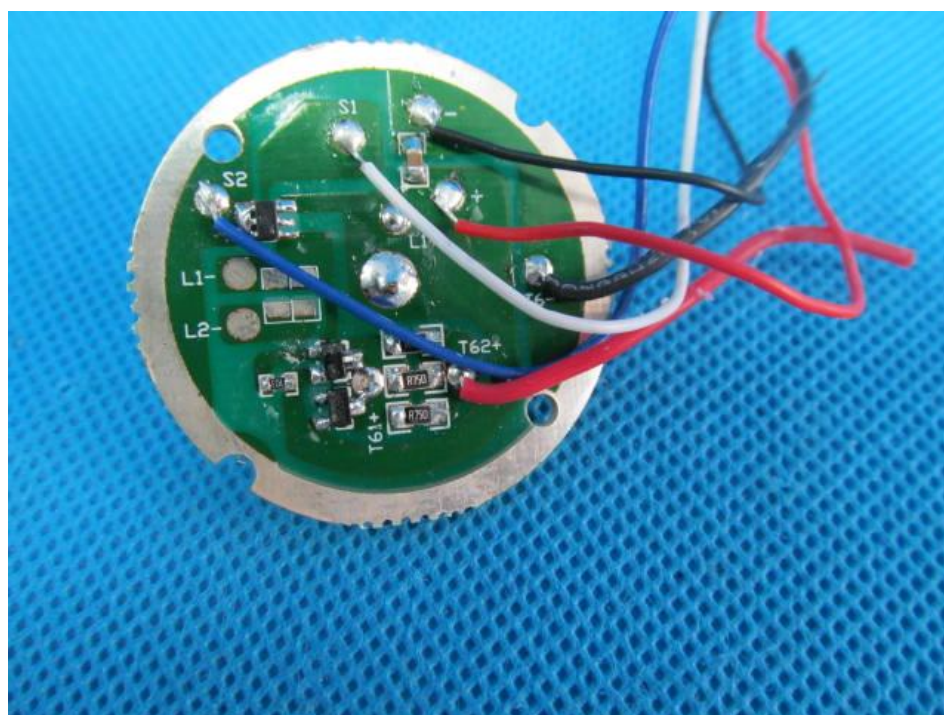
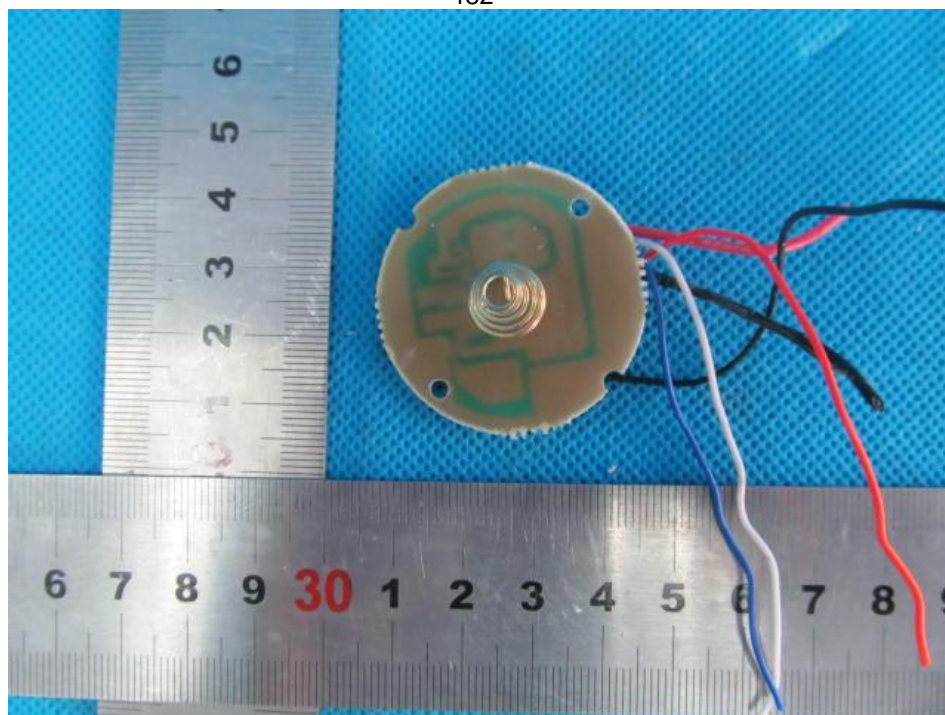
Constructional Photographs 182



Constructional Photographs
182



Constructional Photographs
182





Product Service

EMC IMMUNITY TEST REPORT

Report Number : 708881569801-00-Part 2 Date of Issue: June 15, 2015

Model : XYZ (X stands for 1, 2, 3; Y stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; Z stands for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9) Models list refer to Appendix B of 708881569801-00-Part 1

Product Type : Flashlight

Applicant : Ningbo Strong Optoelectric Co., Ltd.

Manufacturer : Ningbo Strong Optoelectric Co., Ltd.

License holder : Ningbo Strong Optoelectric Co., Ltd.

Address : No.1, EAST YONGXING ROAD,

EAST SUBURBS INDUSTRIAL ZONE

315499 YUYAO, ZHEJIANG, PEOPLE'S REPUBLIC OF CHINA

Test Result : Positive Negative

Total pages including Appendices

24



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D I R E C T O R Y - I M M U N I T Y

	Pages
A) Documentation	
Test Report	1 –16
Directory	2
Test Regulations	3
General Remarks and Summary	16
Test Setups (Photographs)	17-22
B) Test data: Immunity against	
Electrostatic Discharge	5
Radiated Electromagnetic Fields	6
Fast Transients (Burst)	7-8
Surge Transients	9-10
Conducted Disturbance	11-12
RF Frequency Magnetic Fields	13
Voltage Dips, Interruptions & Variations	14
C) Appendix A	
Constructional Data Form and Product Information Forms	A1
D) Appendix B	
Photo documents of EUT	B1

IMMUNITY TEST REGULATIONS :

The immunity tests were performed according to the following regulations :

■ - EMC - Directive 2004/108/EC

-
- EN 61000-6-1: 2007
 - EN 61000-6-2: 2005
 - EN 55014-2: 1997+A1: 2001+A2: 2008
 - EN 55020: 2007+A11: 2011
 - EN 55024: 2010
 - EN 61326-1: 2013
 - - EN 61547: 2009

-
- - IEC 61000-4-2: 2008
 - - IEC 61000-4-3: 2006+A1:2007
 - IEC 61000-4-4: 2004
 - IEC 61000-4-5: 2005
 - IEC 61000-4-6: 2008
 - IEC 61000-4-8: 2003
 - IEC 61000-4-11: 2004

Symbol Definitions:

- - Applicable
- Not Applicable

Note: For undated references, the latest edition of the publication at the time of testing (including amendments) was applied.



Product Service

Environmental Conditions In The Laboratory:

	<u>Actual</u>
Temperature:	: 20 °C
Relative Humidity:	: 50 %
Atmospheric Pressure:	: 1005 mBar

Power Supply Utilized:

Power supply system : 4.2VDC

Symbol Definitions:

- - Applicable
- - Not Applicable

Immunity Test Conditions: ELECTROSTATIC DISCHARGE (ESD)

The immunity against *ELECTROSTATIC DISCHARGE (ESD)* events was performed in the following location:

- Test not applicable

■ - Test Area -A

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
■ - NSG435	TESEQ	ESD Generator	487/751016
■ - ---	TÜV Product Service	Horizontal Coupling Plane	---
■ - ---	TÜV Product Service	Vertical Coupling Plane	---
<input type="checkbox"/> - ONYX30	Haefely	ESD Simulator System	487/751520
<input type="checkbox"/> - PESD 3010	Haefely	ESD Simulator System	487/750508
<input type="checkbox"/> - ---	---	---	---

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Discharge Voltage (Air): - 2 kV - 8 kV - 6 kV
 - 4 kV - 15 kV - _ kV

Discharge Voltage (Contact): - 2 kV - 6 kV - _ kV
 - 4 kV - 8 kV

Discharge Impedance: - 330 Ω / 150 pF - 150 Ω / 150 pF

Discharge Repetition Rate: - ≥ 1 sec.

Number of Discharges: - ≥ 10 at all locations

Kind of Discharges: - Air discharge - Conducted discharge (relay)
 - Direct - Indirect

Polarity: - Positive - Negative

Location of Discharge: - See Data Record(s) in Appendix A
 - Each location on the surface touchable by hand
 - See drawing in Appendix A
 - HCP, VCP

Result :

■ - No degradation of function - Met Criterion A
 - Distortion of function - Met Criterion B
 - Error of function - Met Criterion C
 - Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: RADIATED ELECTROMAGNETIC FIELDS

The immunity against *RADIATED ELECTROMAGNETIC FIELDS* exposure was performed in the following location:

- Test not applicable

■ - Test Area -A

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
■ - STLP 9128Ds	Schwarzbeck	Antenna	487/621432
■ - SMB-100A	Rohde & Schwarz	Signal Generator	487/391120
<input type="checkbox"/> - CBA3G-100	Amplifier Research	Power Amplifier	487/400909
■ - NRP-2	Rohde & Schwarz	Power Meter	487/741156
■ - CBA1G-500	Amplifier Research	Power Amplifier	487/400908
<input type="checkbox"/> - DC7144M1	Amplifier Research	Coupler	487/570202
■ - DC6080A	Amplifier Research	Coupler	487/571116
<input type="checkbox"/> - AT1080	Amplifier Research	Log-periodic Antenna	487/620519
<input type="checkbox"/> - BBHA9120D	Schwarzbeck	Horn Antenna	487/620213
<input type="checkbox"/> - SML03	ROHDE&SCHWARZ	Signal Generator	487/390304
<input type="checkbox"/> - AT4002A	Amplifier Research	Horn Antenna	487/620621
<input type="checkbox"/> - TS9980	ROHDE & SCHWARZ	EMS Test System	
<input type="checkbox"/> - TS 998JC	ROHDE & SCHWARZ	Stripline	487/620315

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Frequency Range:

- 27 MHz - 500 MHz - 26 MHz - 1000 MHz
 - 9 kHz - 27 MHz ■ - 80 MHz - 1000 MHz

Field Strength:

- 1 V/m ■ - 3 V/m
 - 10 V/m - _ V/m

Distance Antenna - EUT:

- 1 m ■ - 3 m

Modulation:

- - AM : 80 % 1 kHz
 - FM : ___ kHz dev. ___ kHz
 ■ - sine wave:
 - unmodulated
 - Pulse ON/OFF Duty Cycle: ___ %

Step:

- - 1%

Polarization of Antenna:

- - Horizontal ■ - Vertical

Result :

- - No degradation of function - Met Criterion A
 - Distortion of function - Met Criterion B
 - Error of function - Met Criterion C
 - Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: FAST TRANSIENTS (BURST)

The immunity against *FAST TRANSIENTS (BURST)* events was performed in the following test location:

- Test not applicable

- Test Area -

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - UCS 500N5E	EM Test	EFT/Burst Generator	487/751219
<input type="checkbox"/> - CDN125	Schaffner	Capacitive Coupling Clamp	48-7/60-99-08
<input type="checkbox"/> - CNI 503	EM Test	3-phase coupling network	487/609909
<input type="checkbox"/> - NSG2050	Schaffner	EFT/Burst Generator	487/390203
<input type="checkbox"/> - PNW2225	Schaffner	Fast Transient/Burst Plug-in	487/610205

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

<u>Pulse Amplitude - AC Power Port:</u>	<input type="checkbox"/> - 1,0 kV	<input type="checkbox"/> - 2,0 kV	
	<input type="checkbox"/> - 4,0 kV	<input type="checkbox"/> - ___ kV	
<u>Pulse Amplitude - DC Power Port:</u>	<input type="checkbox"/> - 1,0 kV	<input type="checkbox"/> - 2,0 kV	
	<input type="checkbox"/> - 4,0 kV	<input type="checkbox"/> - ___ kV	
<u>Pulse Amplitude - Signal/Data Non control Port:</u>	<input type="checkbox"/> - 0,5 kV	<input type="checkbox"/> - 1,0 kV	
	<input type="checkbox"/> - 2,0 kV	<input type="checkbox"/> - ___ kV	
<u>Pulse Amplitude - Process: Measurement & Control Port:</u>	<input type="checkbox"/> - 0,5 kV	<input type="checkbox"/> - 1,0 kV	
	<input type="checkbox"/> - 2,0 kV	<input type="checkbox"/> - ___ kV	
<u>Burst Frequency:</u>	<input type="checkbox"/> - 2,5 kHz	<input type="checkbox"/> - 5,0 kHz	<input type="checkbox"/> - ___ kHz
<u>Time of Coupling:</u>	<input type="checkbox"/> - 60 seconds	<input type="checkbox"/> - 120 seconds	
<u>Coupling Method:</u>	<input type="checkbox"/> - Coupling/decoupling network	<input type="checkbox"/> - Coupling clamp	
<u>Polarity:</u>	<input type="checkbox"/> - Positive	<input type="checkbox"/> - Negative	

Immunity Test Conditions: FAST TRANSIENTS (BURST), continued

Location of Coupling:

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: SURGE TRANSIENTS

The immunity against *SURGE TRANSIENTS* events was performed in the following test location:

- Test not applicable

- Test Area -

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - UCS 500N5V	EM Test	Surge Generator	487/751218
<input type="checkbox"/> - CNI 503	EM Test	3-phase coupling network	487/609909

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Pulse Amplitude - AC Power Port:

<input type="checkbox"/> - 1,0 kV (phase and phase) (phase and neutral)	<input type="checkbox"/> - 2,0 kV (phase and protective earth) (neutral and protective earth)
<input type="checkbox"/> - 4,0 kV	<input type="checkbox"/> - 0,5 kV

Pulse Amplitude - DC Power Port:

<input type="checkbox"/> - 1,0 kV	<input type="checkbox"/> - 2,0 kV
<input type="checkbox"/> - 4,0 kV	<input type="checkbox"/> - ___ kV

Pulse Amplitude - Signal/Data Non control Port:

<input type="checkbox"/> - 0,5 kV	<input type="checkbox"/> - 1,0 kV
<input type="checkbox"/> - 2,0 kV	<input type="checkbox"/> - ___ kV

Pulse Amplitude - Process: Measurement & Control Port

<input type="checkbox"/> - 0,5 kV	<input type="checkbox"/> - 1,0 kV
<input type="checkbox"/> - 2,0 kV	<input type="checkbox"/> - ___ kV

Source Impedance:

<input type="checkbox"/> - 2 Ω + 18 μF (phase and phase) (phase and neutral)	<input type="checkbox"/> - 12 Ω + 9 μF (phase and protective earth) (neutral and protective earth)
<input type="checkbox"/> - 42 Ω + 0,1 μF	<input type="checkbox"/> - 42 Ω + 0,5 μF

Number of Surges:

<input type="checkbox"/> - 10 surges/angle	<input type="checkbox"/> - __ surges /angle
--	---

Angle:

<input type="checkbox"/> - 0 °	<input type="checkbox"/> - 90 °
<input type="checkbox"/> - 270 °	

Repetition Rate:

<input type="checkbox"/> - 60 sec.	<input type="checkbox"/> - ___ sec.
------------------------------------	-------------------------------------

Polarity:

<input type="checkbox"/> - Positive	<input type="checkbox"/> - Negative
-------------------------------------	-------------------------------------

Immunity Test Conditions: SURGE TRANSIENTS, continued

Location of Coupling:

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

Result:

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: CONDUCTED DISTURBANCE

The immunity against *CONDUCTED DISTURBANCE* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area -

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - NSG 2070	Schaffner	RF-Generator	48-7/75-99-01
<input type="checkbox"/> - CDN725	Schaffner	EM Clamp	48-7/60-99-02
<input type="checkbox"/> - INA726	Schaffner	De-coupling Clamp	48-7/60-99-03
<input type="checkbox"/> - CDN M2	Schaffner	Coupling/decoupling Network	48-7/60-99-05
<input type="checkbox"/> - CDN M3	Schaffner	Coupling/decoupling Network	48-7/60-99-06
<input type="checkbox"/> - MD720	Schaffner	Monitoring Probe	48-7/60-99-07

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Frequency Range: - 0,15 MHz - 230 MHz - 0,15 MHz - 80 MHz

Voltage Level (EMF): - 1 V - 3 V
 - 10 V - ___ V

Modulation: - AM : 80 % 1 kHz
 - FM : ___ kHz dev. ___ kHz
 - sine wave:
 - unmodulated
 - Pulse ON/OFF Duty Cycle: ___ %

Step: - 1%

Immunity Test Conditions: CONDUCTED DISTURBANCE, continued

Location of Coupling:

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

name of lines: _____
 type of lines: - shielded - unshielded
 status of lines: - passive - active
 kind of transmission: - analog - digital
 length of lines: _____

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: POWER FREQUENCY MAGNETIC FIELD

The immunity against *POWER FREQUENCY MAGNETIC FIELD* exposure, induced by power frequency magnetic fields, was performed in the following test location:

- Test not applicable

- Test Area -

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - INA702	Schaffner	Magnetic Field Coil	487/440201
<input type="checkbox"/> - INA2141	Schaffner	Induction Coil Interface	487/440202
<input type="checkbox"/> - 4500L	California Instrument	Power Source	707/689501

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

- Frequency Range: - 50 Hz - 60 Hz - 400 Hz
- Field level (EMF): - 1 A/m - 3 A/m - 10 A/m
- 30 A/m - 100 A/m - ___ A/m
- Short Field (1-3 sec): - 300 A/m - 1000 A/m - ___ A/m
- Duration: - ___ seconds
- Axis of Orientation: - X-axis - Y-axis - Z-axis

Result :

- No degradation of function - Met Criterion A
- Distortion of function - Met Criterion B
- Error of function - Met Criterion C
- Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS

The immunity against *VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area -

Test Equipment Used :

Model Number	Manufacturer	Description	TUV PS Number
<input type="checkbox"/> - NSG1003	Schaffner	Drop-out and Variation Simulator	70-7/75-96-04
<input type="checkbox"/> - UCS500N5-PFS	EM test	Voltage Drop Generator	487/751117
<input type="checkbox"/> - C15003ix-400/3-CTS	California Instruments	AC Power Supply Testing System	487/68-99-10

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Nominal Mains Voltage (U_T): - 230 Vac - ___ Vac - ___ Vdc

Level of Reduction (dip): - 1000 ms voltage dips in 30% of U_T
 - 200 ms voltage dips in 60% of U_T
 - 200 ms voltage dips in 30% of U_T

Duration of Interruption ($>.95*U_T$): - 5000 ms - 10 ms

Voltage Fluctuation: - $U_T + 10\%$ - $U_T - 10\%$

Result :

- No degradation of function - Met Criterion A
 - Distortion of function - Met Criterion B
 - Error of function - Met Criterion C
 - Loss of function - Unrecoverable Failure

Remarks: _____

Equipment Under Test (EUT) Test Operation Mode - Immunity Tests:

The equipment under test was operated under the following conditions during immunity testing:

- Standby
- Test Program (H - Pattern)
- Test Program (Color Bar)
- Test Program (Customer Specified)
- Normal Operating Mode
- Light on.

Configuration of the equipment under test:

- See Constructional Data Form in Appendix A
- See Product Information Form(s) in Appendix A

The following peripheral devices and interface cables were connected during the testing:

<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - _____	Type : _____
<input type="checkbox"/> - unshielded power cable	
<input type="checkbox"/> - unshielded cables	
<input type="checkbox"/> - shielded cables	TÜVPS. No.: _____
<input type="checkbox"/> - customer specific cables	
<input type="checkbox"/> - _____	
<input type="checkbox"/> - _____	



Product Service

GENERAL REMARKS:

According to client's declaration, all the models have the same electric structure except for their different mechanical structure.

So model 182 was chosen to perform all the tests.

SUMMARY:

All tests according to the regulations cited on page 3 were

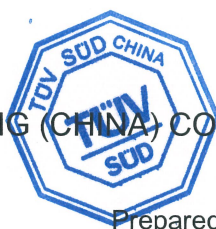
- Performed
- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements cited on page 3.
- **Does not** fulfill the general approval requirements cited on page 3.

Testing Start Date: May 22, 2015

Testing End Date: May 22, 2015



- TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH-

Reviewed by:

Prepared by:

Liping Xue 6-15, 2015
 Liping XUE
 Review Engineer

Yongqingzheng 6-15, 2015
 YongqingZHENG
 Project Engineer

Photograph of Test Setup:
Electrostatic Discharge (ESD)

- Test not applicable

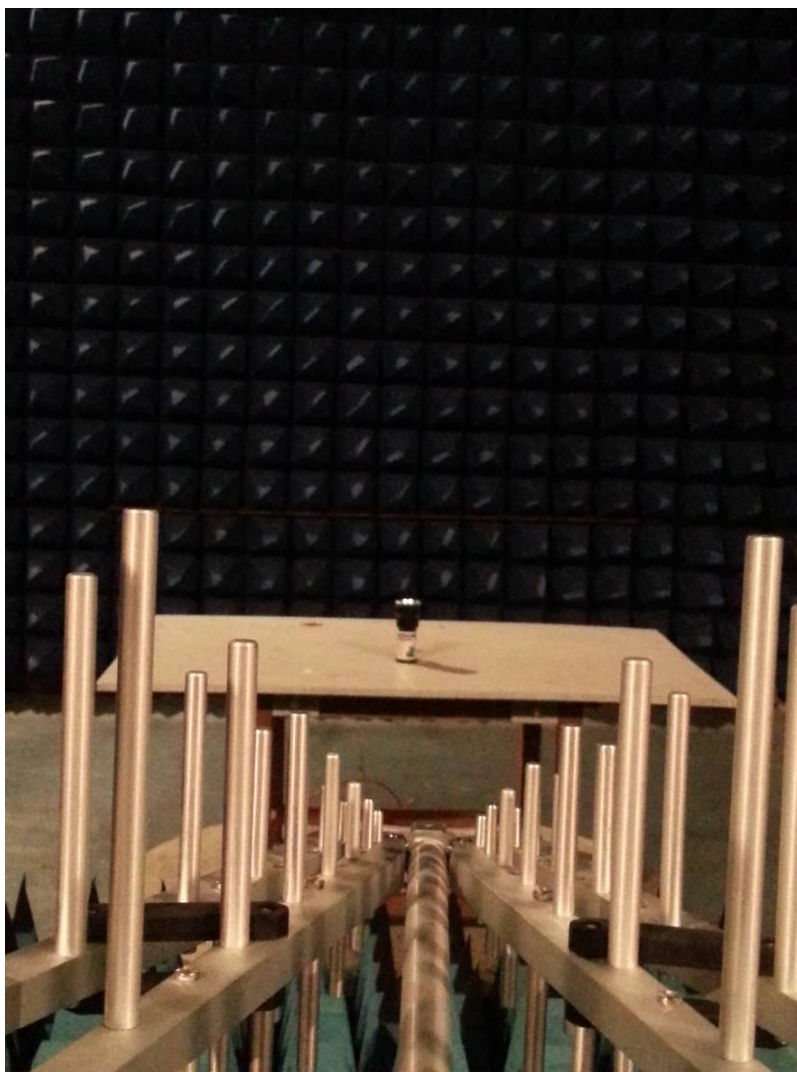
IEC 61000-4-2
EN 61000-4-2



Photograph of Test Setup:
Radiated Electromagnetic Field

- Test not applicable

IEC 61000-4-3
EN 61000-4-3





Product Service

Photograph of Test Setup:
Fast transients (BURST)

■ - Test not applicable

IEC 61000-4-4
EN 61000-4-4



Product Service

Photograph of Test Setup:
SURGE transients

■ - Test not applicable

IEC 61000-4-5
EN 61000-4-5



Product Service

Photograph of Test Setup:
Conducted disturbance

■ - Test not applicable

IEC 61000-4-6
EN 61000-4-6



Product Service

Photograph of Test Setup:
Voltage Dips, Interruptions & Variations

■ - Test not applicable

IEC 61000-4-11
EN 61000-4-11

Appendix A

Constructional Data Form

and

Product Information Form(s)

Please refer to EMC EMISSION-TEST REPORT Appendix B

Appendix B

Photo documents
of
Equipment Under Test (EUT)

Please refer to EMC EMISSION-TEST REPORT Appendix C