C E R T I F I C A T E

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

TÜVRheinland®

Registration No.: AE 50231637 0001

Report No.: 17026164 001

Holder:
Rishang Optoelectronics Co., Ltd.
FL3-5, Block 2, Hongfa Jiateli hi-Tech Park, Tangtou Ave, Shiyan, Bao'an
Shenzhen, Guangdong 518108
P.R. China

Product:
Electronic Control Unit
(Flex LED Strip)

Identification:

Type Designation:	R0060AA	R80C0BA	R8060AQ	R0XXXXA
	R0XXXXQ	R1XXXXA	R1XXXXQ	R2XXXXA
	R2XXXXQ	R3XXXXA	R3XXXXQ	R6XXXXA
	R6XXXXQ	R8XXXXA	R8XXXXQ	

Serial No. : n.a.
Remark: Refer to test report 17026164 001 for details.

Tested acc. to:
EN 55015:2006+A1+A2
EN 61000-3-2:2006+A1+A2
EN 61000-3-3:2008
EN 61547:2009

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

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

Certification Body

Date 26.06.2012

Johnny Lau

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group

TÜVRheinland®
Precisely Right.

Rishang Optoelectronics Co., Ltd.
Ms. Ivy
-
FL3-5, Block 2, Hongfa Jiateli
hi-Tech
Park, Tangtou Ave, Shiyan, Bao'an
Shenzhen, Guangdong 518108
P.R. China

Date : 26.06.2012
Our ref. : SUTIG 02
Your ref.:

Ref : AE Certificate of Conformity EMC

Type of Equipment : Flex LED Strip
Model Designation : See Certificate
Certificate No. : AE 50231637 0001
Report No. : 17026164 001

Dear Ms. Ivy,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body

Johnny Lau

Enclosure

TÜV Rheinland (China) Ltd.
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TÜVRheinland®

Produkte
Products

Prüfbericht - Nr.: 17026164 001 *Test Report No.:*		**Seite 1 von 29** *Page 1 of 29*
Auftraggeber: *Client:*	**Rishang Optoelectronics Co., Ltd.** **FL3-5, Block 2, Hongfa Jiateli hi-Tech Park, Tangtou Ave, Shiyan, Bao'an, Shenzhen, Guangdong 518108, P.R. China**	
Gegenstand der Prüfung: *Test item:*	**Flex LED Strip**	
Bezeichnung: *Identification:*	**Details refer to clause 3.1**	**Serien-Nr.:** *Serial No.:* **N/A**
Wareneingangs-Nr.: *Receipt No.:*	**163093519**	**Eingangsdatum:** *Date of receipt:* **2012-05-25**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test samples received are sufficient for testing and not damaged.	
Prüfort: *Testing location:*	**Accurate Technology Co., Ltd.** **and** **Shenzhen Academy of Metrology and Quality Inspection** **(Detailed address refer to clause 2.1)**	
Prüfgrundlage: *Test specification:*	**EN 55015:2006+A1+A2** **EN 61547:2009** **EN 61000-3-2:2006+A1+A2** **EN 61000-3-3:2008**	
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*	
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland (Shenzhen) Co., Ltd.**	

geprüft/ *tested by:*			**kontrolliert/** *reviewed by:*		
2012-06-26	Tiger Su Project Engineer		2012-06-26	Johnny Lau Technical Certifier	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges/ *Other Aspects:*

Abkürzungen:				*Abbreviations:*			
	P(ass)	=	*entspricht Prüfgrundlage*		*P(ass)*	=	*passed*
	F(ail)	=	*entspricht nicht Prüfgrundlage*		*F(ail)*	=	*failed*
	N/A	=	*nicht anwendbar*		*N/A*	=	*not applicable*
	N/T	=	*nicht getestet*		*N/T*	=	*not tested*

TEST SUMMARY

5.1.1 HARMONICS ON AC MAINS
RESULT: Passed

5.1.2 VOLTAGE FLUCTUATIONS ON AC MAINS
RESULT: Passed

5.1.3 TERMINAL CONTINUOUS DISTURBANCE VOLTAGE AT
RESULT: Passed

5.1.4 RADIATED ELECTROMAGNETIC DISTURBANCES
RESULT: Passed

5.2.1 RADIATED ELECTROMAGNETIC DISTURBANCES
RESULT: Passed

6.2.1 RADIO-FREQUENCY ELECTROMAGNETIC FIELD (RS)
RESULT: Passed

6.2.2 INJECTED CURRENTS / CONDUCTED SUSCEPTIBILITY (CS)
RESULT: Passed

6.3.1 ELECTRICAL FAST TRANSIENTS (EFT)
RESULT: Passed

6.3.2 SURGE
RESULT: Passed

6.3.3 ELECTROSTATIC DISCHARGES (ESD)
RESULT: Passed

6.4.1 VOLTAGE DIP AND INTERRUPTION
RESULT: Passed

Contents

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

Appendix 2: Measurement Uncertainties

2. Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.
F1, Bldg. A, Changyuan New Material Port, Keyuan Road, Science & Industry Park, Nanshan 518057 Shenzhen, P.R. China

and

Shenzhen Academy of Metrology and Quality Inspection
Bldg. of Academy of Metrology and Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, P.R. China

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Disturbance Voltage				
Test Receiver	R&S	ESCS30	100307	2013-01-06
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	2013-01-06
50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283936	2013-01-06
RF Coaxial Cable	SUHNER	N-2m	No.2	2013-01-06
Radiated Electromagnetic Disturbance(9k-30MHz) (SMQ)				
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	2013-01-20
Triple Loop Antenna	Schwarzbeck	HXYZ9170	9124	2013-01-20
Radiated Electromagnetic Disturbance(30M-300MHz)				
Spectrum Analyzer	Agilent	E7405A	MY45115511	2013-01-06
Test Receiver	Rohde & Schwarz	ESCS30	100307	2013-01-06
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	2013-01-06
50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	2013-01-06
RF Coaxial Cable	Schwarzbeck	N-5m	No.1	2013-01-06
RF Coaxial Cable	Schwarzbeck	N-1m	No.6	2013-01-06
Harmonic Current / Flicker				
AC Power Source	California Instruments	5001iX-400	55689	2013-01-06
Test analyzer	California Instruments	PACS-1	72254	2013-01-06
Electrostatic Discharge				
ESD Tester	HAEFELY	PESD1610	H4001552	2013-01-10
Radio-Frequency Electromagnetic Field Amplitude Modulated (SMQ)				
Signal Generator	Rohde&Schwarz	SMT03	100059	2013-01-16
Voltage Probe	Rohde&Schwarz	URV5-Z2	100012	2013-01-20
Voltage Probe	Rohde&Schwarz	URV5-Z2	100013	2013-01-20
Field Probe	ETS	HI-6005	121578	2013-05-18
Power Amplifier	AR	250W1000A	335304	2012-11-28
Power Amplifier	MILMEGA	AS0860-75/45	1040084	2012-11-24
Power Meter	Rohde & Schwarz	NRVD	100041	2013-01-20
Antenna	AR	AT1080	28568	N/A
Horn Antenna	AR	AT4002A	305754	N/A
Injected Current				
Conducted Immunity Test System	FRANKONIA	CIT-10	126B1121	2013-01-06
CDN	FRANKONIA	CDN-M2/3	A3027020	2013-01-06

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
6dB Attenuator	Weinschel	WA59-6-33	A329	2013-01-06
150/50 ohms Adaptor	Frankonia	N/A	025	2013-01-06
EM Injection Clamp	FCC	F-203I-23mm	091824	2013-01-06
EFT, Surge and Voltage Dips				
ULTRA COMPACT SIMULATOR	EM TEST	UCS 500 N5	V0928104968	2013-01-06
Transformer	EM TEST	V4780S2	0109-44	2013-01-06
CAPACITIVE CLAMP	EM TEST	HFK	0509-34	2013-01-06

3. General Product Information

3.1 Product Function and Intended Use

The EUTs are Flex LED Strips for illumination purpose. The models R0060AA, R80C0BA, R0XXXXA, R1XXXXA, R2XXXXA, R3XXXXA, R6XXXXA and R8XXXXA have two types of circuit design, one was indicated with model R0060AA, and another one was indicated with model R80C0BA. The models R8060AQ, R0XXXXQ, R1XXXXQ, R2XXXXQ, R3XXXXQ, R6XXXXQ and R8XXXXQ have the same circuit design, and which should be matched with RGB controller for use. Refer to below table 2 for details:

Table 2: Model list & classification table

Model No.	Rated Voltage (V)	Rated Power	LED quant. (pcs)
R0060AA	DC 12V	12W/per meter	60/per meter
R80C0BA	DC 12V	9W/per meter	120/per meter
R8060AQ	DC 12V	14.4W/per meter	60/per meter
R0XXXXA	DC 12V	≤12W/per meter	-
R0XXXXQ	DC 12V	≤14.4W/per meter	-
R1XXXXA	DC 12V	≤12W/per meter	-
R1XXXXQ	DC 12V	≤14.4W/per meter	-
R2XXXXA	DC 12V	≤12W/per meter	-
R2XXXXQ	DC 12V	≤14.4W/per meter	-
R3XXXXA	DC 12V	≤12W/per meter	-
R3XXXXQ	DC 12V	≤14.4W/per meter	-
R6XXXXA	DC 12V	≤12W/per meter	-
R6XXXXQ	DC 12V	≤14.4W/per meter	-
R8XXXXA	DC 12V	≤12W/per meter	-
R8XXXXQ	DC 12V	≤14.4W/per meter	-

The first “X”= 0~9 or A~Z indicates product size or shape.The second and the third “XX”=01~99 or when the second”X”=A~Z, the third “X”=1~9, these digits or letters indicate LED quantity. The fourth”X”= A~Z or XB, indicates LED encapsulation types.

For more information refer to the circuit diagram & manufacturer’s instruction manual.

3.2 Ratings and System Details

System input voltage:	DC 12V	AC 100-240V (LED driver input for model R8060AQ) (LED driver is employed as input source for testing)
Frequency:	--	50/60Hz
Rated power:	See above Table 2	80W Max.
Protection class:	III	I

3.3 Independent Operation Modes

The basic operation modes are:

A. On.
B. Off.

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Schematic Diagram.

3.5 Submitted Documents

- Rating label
- BOM
- User Manual
- PCB layout
- Schematic diagram

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5 & 6. According to models' difference indicated in Clause 3.1, all tests were carried out on models R0060AA, R80C0BA and R8060AQ. Although the models R0060AA and R80C0BA are intended for using together with AC power supply, but they have no electronic circuitry, only have LEDs and resistances, according to the characteristic, which unlikely to produce significant conducted disturbance and radiated disturbance, they are deemed to comply with all EMI test requirements without testing.

4.3 Special Accessories and Auxiliary Equipment

The model R8060AQ was tested together with the following accessories:

Item	Manufacturer	Model	S/N
AC/DC power supply	mobitronic	NSA80ED-120667	N/A
RGB controller	Rishang	KC3P000ZV1	N/A

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

5. Test Results EMISSION

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Harmonics on AC Mains

RESULT: **Passed**

Date of testing	:	2012-06-26
Test procedure	:	EN 61000-3-2:2006+A1+A2
Class	:	C
Limit	:	Table 2
Measuredharmonics	:	1 – 40

Test setup

Input Voltage	:	AC 230V±2%, 50Hz
Operation Condition	:	According to Annex C.5
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.
Remark: According to clause 4.2, test was carried out on model R8060AQ only, models R0060AA and R80C0BA are deemed to comply with the test requirement without testing.

5.1.2 Voltage Fluctuations on AC Mains

RESULT: **Passed**

Test procedure	:	EN 61000-3-3:2008
Limit	:	Clause 5
Frequency range	:	0 - 2kHz

The max.rated input power of the EUTs is 14.4W/per meter only (test sample <=72W), which unlikely to produce significant voltage fluctuation. Therefore no test was applied.

See clause 6.1***

*** EN 61000-3-3:2008, clause 6.1:" ... Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker. ..."

5.1.3 Terminal Continuous Disturbance Voltage at AC Mains

RESULT: **Passed**

Date of testing	:	2012-06-12
Test standard	:	EN 55015:2006+A1+A2
Frequency range	:	0.009 - 30MHz
Limits	:	Table 2a
Kind of test site	:	Shielded room

Test setup

Input Voltage	:	AC 230V, 50Hz
Operation Condition	:	According to Clause 6 & 8.2
Operation mode	:	A
Earthing	:	Connected

Detailed test data refer to attached Appendix 1.

Remark: According to clause 4.2, test was carried out on model R8060AQ only, models R0060AA and R80C0BA are deemed to comply with the test requirement without testing.

5.1.4 Radiated Electromagnetic Disturbances

RESULT: **Passed**

Date of testing	:	2012-06-12
Test standard	:	EN 55015:2006+A1+A2
Frequency range	:	0.009 – 30MHz
Limits	:	Table 3a
Kind of test site	:	Shielded room

Test setup

Input Voltage	:	AC 230V, 50Hz
Operation Condition	:	According to Clause 6 & 9.3
Operation mode	:	A
Earthing	:	Connected

Detailed test data refer to attached Appendix 1.
Remark: According to clause 4.2, test was carried out on model R8060AQ only, models R0060AA and R80C0BA are deemed to comply with the test requirement without testing.

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Radiated Electromagnetic Disturbances

RESULT: **Passed**

Date of testing	:	2012-06-12
Test standard	:	EN 55015:2006+A1+A2
Basic standard	:	CISPR 22:2005
Frequency range	:	30 – 300MHz
Limits	:	Table 3b of EN 55015:2006+A1+A2
Kind of test site	:	3m semi-anechoic chamber

Test setup:

Input Voltage	:	AC 230V, 50Hz
Operation Condition	:	According to Clause 6 & 9.3
Operation mode	:	A
Earthing	:	Connected

Detailed test data refer to attached Appendix 1.
Remark: According to clause 4.2, test was carried out on model R8060AQ only, models R0060AA and R80C0BA are deemed to comply with the test requirement without testing.

6. Test Results IMMUNITY

6.1 Classification of apparatus

According to EN 61547:2009, the EUTs belong to indoor/outdoor luminaires, and shall be tested in accordance with clause 5 and comply with the performance criterion of table 15.

Continuous Disturbance

Radio-Frequency Electromagnetic Fields (RS)	**Criterion A**
Injected Currents(CS)	**Criterion A**
Power Frequency Magnetic Fields *	**Criterion A**

Transient Disturbance

Fast Transient (EFT)	**Criterion B**
Surge	**Criterion C**
Electrostatic Discharges (ESD)	**Criterion B**

Power supply Alterations

Voltage Dips and Interruptions 30% Voltage Reduction, 10 Periods	**Criterion C**
100% Voltage Reduction, 0.5 Periods	**Criterion B**

Remark:
1. * -Power Frequency Magnetic Fields is not applicable, since the EUTs do not contain any components susceptible to magnetic fields.

2. For models R0060AA and R80C0BA, the input voltage of the system under test is DC 12V, these tests including EFT, surge, injected currents and voltage dips on AC power port were not applicable, but the injected currents and EFT tests on DC power port were applicable.

6.2 Continuous Disturbances

6.2.1 Radio-Frequency Electromagnetic Field (RS)

RESULT: **Passed**

Date of Testing	:	2012-06-12
Test Specification	:	EN 61547:2009 Table 2
Basic Standard	:	IEC 61000-4-3:2006
Criterion	:	A
Frequency Range	:	80 – 1,000MHz
Test Level	:	3V/m (Unmodulated, rms)
Modulation	:	80% AM, 1kHz

Test setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ) DC 12V(for models R0060AA and R80C0BA)
Operation Mode	:	A
Earthing	:	Not connected(for models R0060AA and R80C0BA) Connected (for model R8060AQ)
Ambient Temperature	:	See Appendix 1
Relative Humidity	:	See Appendix 1
Atmospheric Pressure	:	See Appendix 1

Refer to attached Appendix 1

6.2.2 Injected Currents / Conducted Susceptibility (CS)

RESULT: **Passed**

Date of testing	:	2012-06-12
Test Specification	:	EN 61547:2009, Table 9
Basic Standard	:	IEC 61000-4-6:2006
Criterion	:	A
Frequency range	:	0.15 – 80MHz
Source impedance	:	150Ω
Test level	:	Level 2 (3V) (unmodulated, rms.)
Modulation	:	AM 80%, 1kHz sine-wave
Sweep mode	:	automatic
Sweep rate	:	< 1.5×10^{-3} decade / sec.

Test setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ) DC 12V(for models R0060AA and R80C0BA)
Operation Mode	:	A
Earthing	:	Not connected(for models R0060AA and R80C0BA) Connected (for model R8060AQ)
Ambient temperature	:	See Appendix 1
Relative humidity	:	See Appendix 1
Atmospheric pressure	:	See Appendix 1

Refer to attached Appendix 1

6.3 Transient Disturbances

6.3.1 Electrical Fast Transients (EFT)

RESULT: **Passed**

Date of testing	:	2012-06-12
Test Specification	:	EN 61547:2009, Table 6
Basic Standard	:	IEC 61000-4-4:2004
Criterion	:	B
Test level	:	±0.5kV, ±1kV
Test duration	:	≥60sec
Rise time	:	5/50ns
Repetition frequency	:	5 kHz

Test setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ) DC 12V(for models R0060AA and R80C0BA)
Operation Mode	:	A
Earthing	:	Not connected(for models R0060AA and R80C0BA) Connected (for model R8060AQ)
Ambient temperature	:	See Appendix 1
Relative humidity	:	See Appendix 1
Atmospheric pressure	:	See Appendix 1

Refer to attached Appendix 1

6.3.2 Surge

RESULT: **Passed**

Date of testing	:	2012-06-12
Test Specification	:	EN 61547:2009, Table 10
Basic Standard	:	IEC 61000-4-5:2005
Criterion	:	C
Source impedance	:	2Ω,12Ω
Test level	:	±1kV, ±2kV
Coupling phases	:	π/2, 3π/2
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	Max. 1/min

Test Setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ)
Operation Mode	:	A
Earthing	:	Connected
Ambient temperature	:	See Appendix 1
Relative humidity	:	See Appendix 1
Atmospheric pressure	:	See Appendix 1

Refer to attached Appendix 1

6.3.3 Electrostatic Discharges (ESD)

RESULT: **Passed**

Date of testing	:	2012-06-12
Test Specification	:	EN 61547:2009, Table 1
Basic Standard	:	IEC 61000-4-2:2001
Criterion	:	B
Charge voltage	:	Level 3 (±8kV) (air discharge) Level 2 (±4kV) (contact discharge)
Number of discharges	:	>10

Test Setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ) DC 12V(for models R0060AA and R80C0BA)
Operation Mode	:	A
Earthing	:	Not connected(for models R0060AA and R80C0BA) Connected (for model R8060AQ)
Ambient temperature	:	See Appendix 1
Relative humidity	:	See Appendix 1
Atmospheric pressure	:	See Appendix 1

Refer to attached Appendix 1

Remark: For the precautionary measure and the propositional installation of the model R0060AA, it should be installed into the slot and the slot's surface should be covered the non-metallic materials, so it is a kind of built-in installation, those direct discharge tests are unpractical, they are not applicable.

6.4 Power Supply Alterations

6.4.1 Voltage Dip and Interruption

RESULT: **Passed**

Date of testing	:	2012-06-12
Test Specification	:	EN 61547:2009, Table 11 & 12
Basic Standard	:	IEC 61000-4-11:2004
Criterion	:	C - table 11 B - table 12

Test Setup

Input Voltage	:	AC 230V, 50Hz (for model R8060AQ)
Operation Mode	:	A
Earthing	:	Connected (for model R8060AQ)
Ambient temperature	:	See Appendix 1
Relative humidity	:	See Appendix 1
Atmospheric pressure	:	See Appendix 1

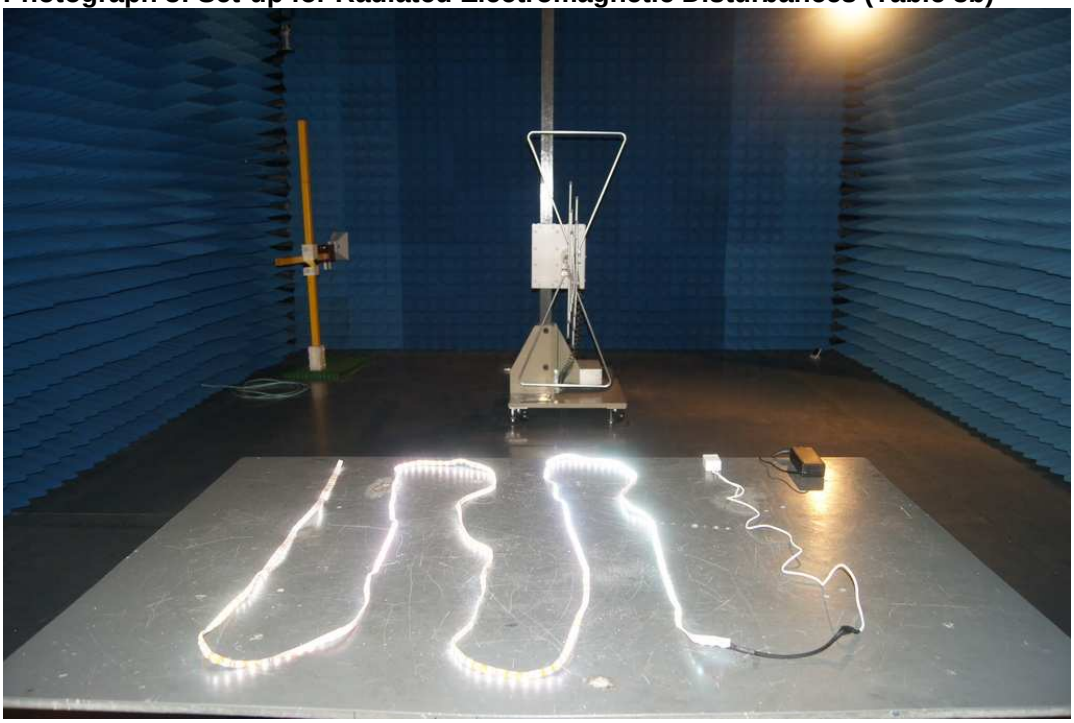
Refer to attached Appendix 1

7. Photographs of the Test Set-Up

Photograph 1: Set-up for Disturbance Voltage

Photograph 2: Set-up for Radiated Electromagnetic Disturbances (Table 3a)

Photograph 3: Set-up for Radiated Electromagnetic Disturbances (Table 3b)



Photograph 4: Set-up for Injected Currents on AC Mains, DC Power Port & Controller Line (CS)

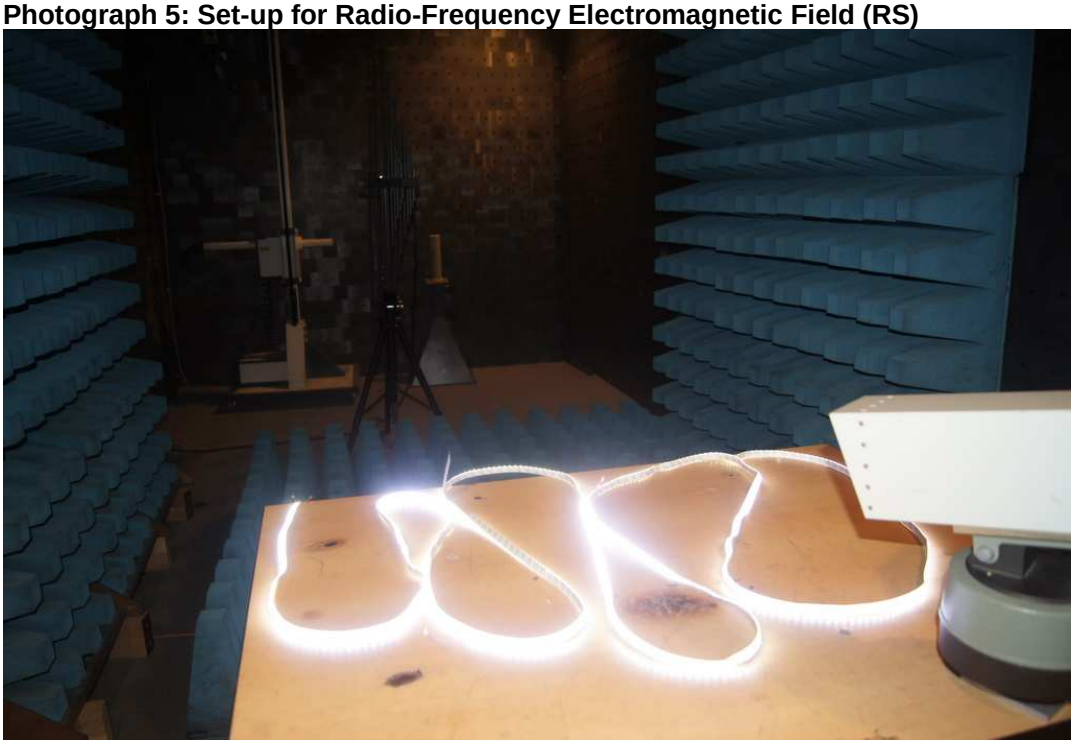
(DC Power Input Directly)

(AC Mians)

(Controller Output Line)

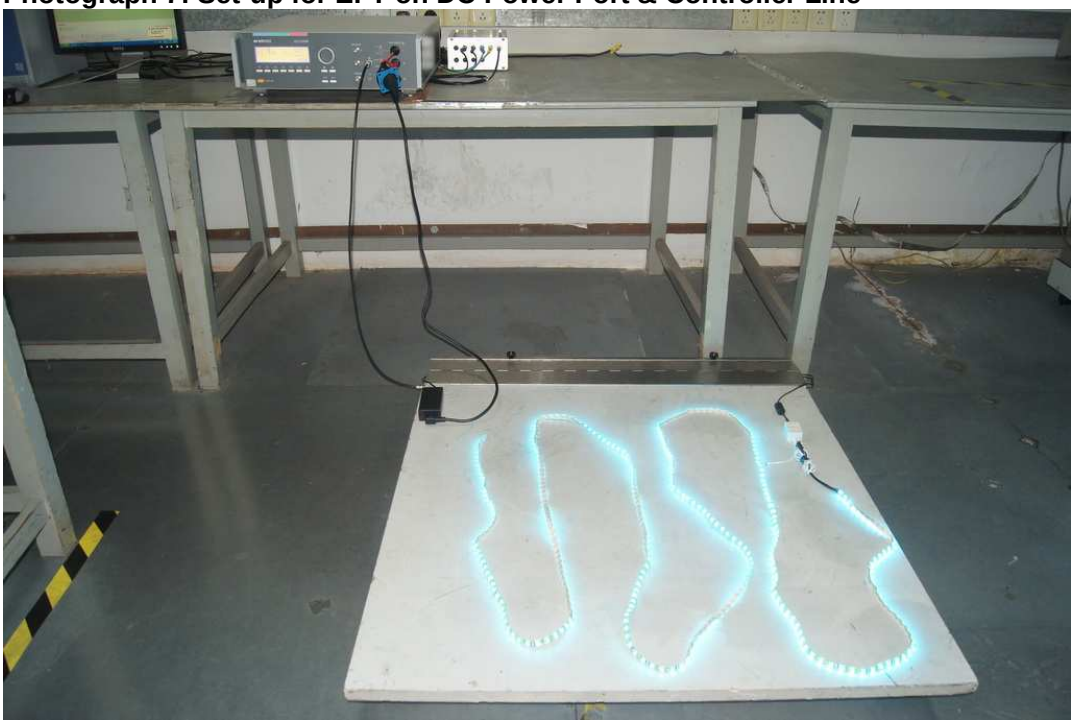
(Controller Input Line)

Photograph 5: Set-up for Radio-Frequency Electromagnetic Field (RS)

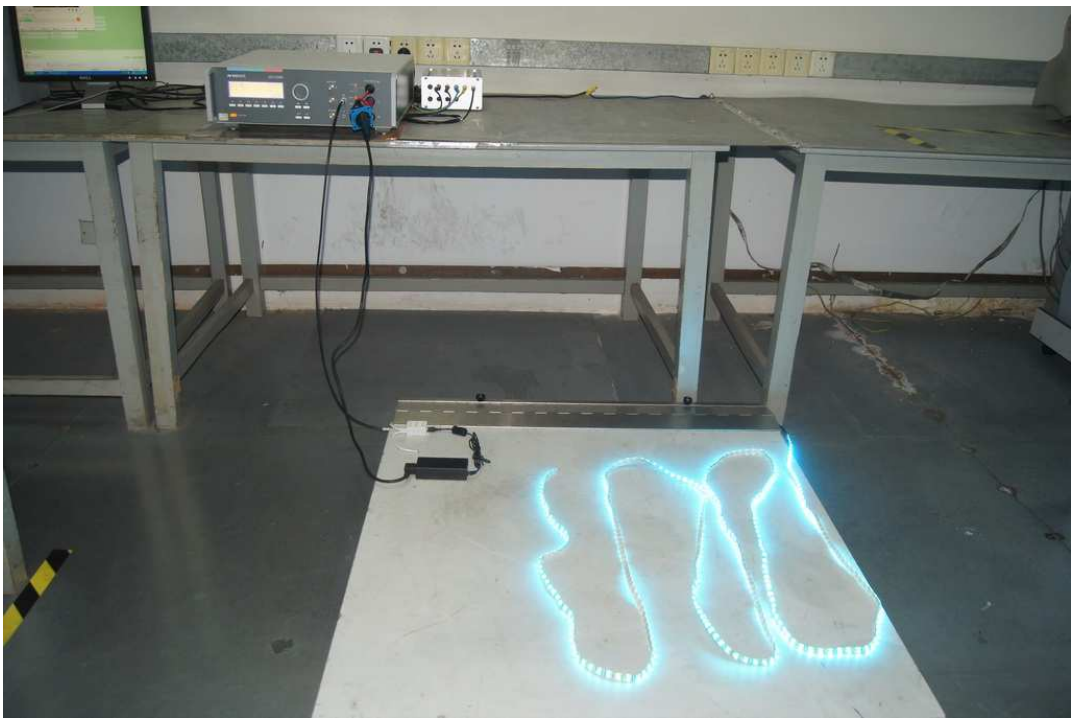


Photograph 6: Set-up for EFT, Surge & Voltage Dips on AC Mains

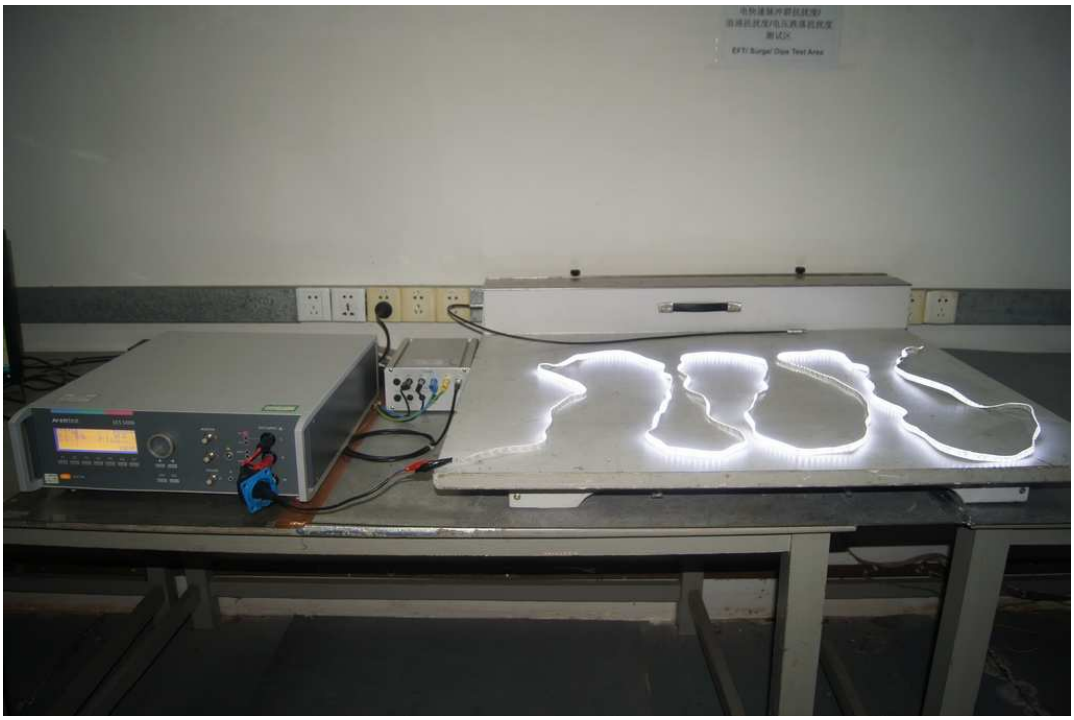
Photograph 7: Set-up for EFT on DC Power Port & Controller Line



(Controller Input Line)



(Controller Output Line)



DC Power Input Directly

Photograph 8: Set-up for Electrostatic Discharges (ESD)

8. List of Tables

9. List of Photographs

California Instruments
San Diego, California

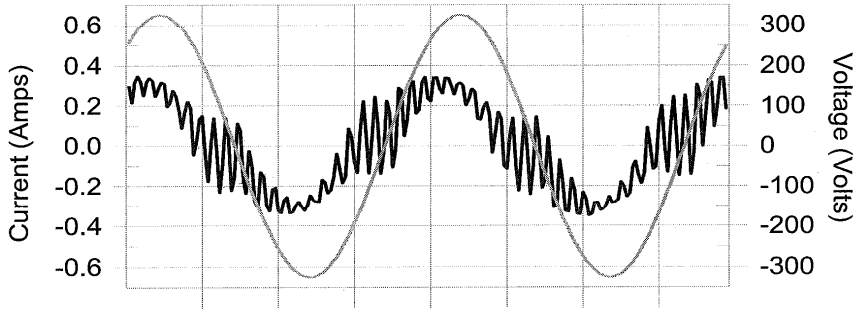
6/26/2012
11:22 AM

Harmonics – Class-C per Ed. 3.0 (2006)(Run time)

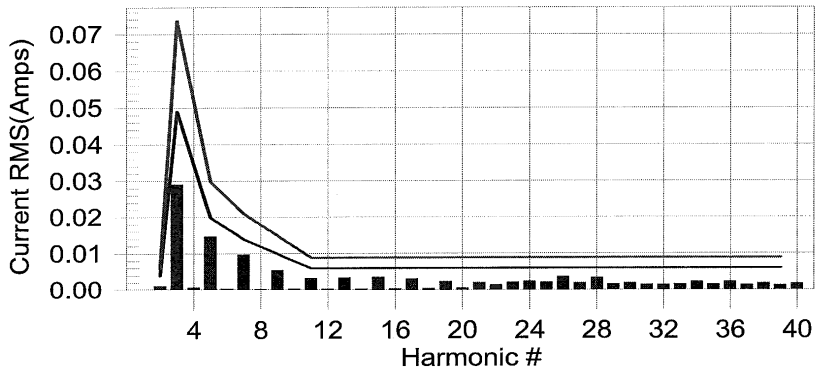
EUT: Flex LED Strip M/N:R8060AQ **Tested by: PEI**
Test category: Class-C per Ed. 3.0 (2006) (European limits) **Test Margin: 100**
Test date: 2012-6-26 **Start time: 10:11:47** **End time: 10:14:37**
Test duration (min): 2.5 **Data file name: H-000050.cts_data**
Comment: On
Customer: Rishang

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class C limit line **European Limits**



Test result: Pass **Worst harmonics H5-73.71% of 100% limit, H5-50.24% of 150% limit.**

California Instruments
San Diego, California

6/26/2012
11:22 AM

Current Test Result Summary (Run time)

EUT: Flex LED Strip M/N:R8060AQ **Tested by: PEI**
Test category: Class-C per Ed. 3.0 (2006) (European limits) **Test Margin: 100**
Test date: 2012-6-26 **Start time: 10:11:47** **End time: 10:14:37**
Test duration (min): 2.5 **Data file name: H-000050.cts_data**
Comment: On
Customer: Rishang

Test Result: Pass **Source qualification: Normal**
THC(A): 0.03 **I-THD(%): 17.34** **POHC(A): 0.000** **POHC Limit(A): 0.019**
Highest parameter values during test:

V_RMS (Volts):	229.84	Frequency(Hz):	50.00
I_Peak (Amps):	0.388	I_RMS (Amps):	0.222
I_Fund (Amps):	0.199	Crest Factor:	1.751
Power (Watts):	41.9	Power Factor:	0.823

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.004	0.0	0.001	0.006	0.00	Pass
3	0.029	0.049	59.1	0.031	0.074	41.44	Pass
4	0.001						
5	0.015	0.020	73.7	0.015	0.030	50.24	Pass
6	0.000						
7	0.010	0.014	70.1	0.010	0.021	47.71	Pass
8	0.000						
9	0.005	0.010	54.0	0.005	0.015	36.94	Pass
10	0.000						
11	0.003	0.006	0.0	0.003	0.009	0.00	Pass
12	0.000						
13	0.003	0.006	0.0	0.003	0.009	0.00	Pass
14	0.000						
15	0.003	0.006	0.0	0.004	0.009	0.00	Pass
16	0.000						
17	0.003	0.006	0.0	0.003	0.009	0.00	Pass
18	0.000						
19	0.002	0.006	0.0	0.002	0.009	0.00	Pass
20	0.000						
21	0.002	0.006	0.0	0.002	0.009	0.00	Pass
22	0.001						
23	0.002	0.006	0.0	0.002	0.009	0.00	Pass
24	0.002						
25	0.002	0.006	0.0	0.002	0.009	0.00	Pass
26	0.004						
27	0.002	0.006	0.0	0.002	0.009	0.00	Pass
28	0.003						
29	0.002	0.006	0.0	0.002	0.009	0.00	Pass
30	0.002						
31	0.001	0.006	0.0	0.001	0.009	0.00	Pass
32	0.001						
33	0.002	0.006	0.0	0.002	0.009	0.00	Pass
34	0.002						
35	0.001	0.006	0.0	0.002	0.009	0.00	Pass
36	0.002						
37	0.001	0.006	0.0	0.001	0.009	0.00	Pass
38	0.002						
39	0.001	0.006	0.0	0.001	0.009	0.00	Pass
40	0.002						

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

California Instruments
San Diego, California

6/26/2012
11:22 AM

Voltage Source Verification Data (Run time)

EUT: Flex LED Strip M/N:R8060AQ **Tested by: PEI**
Test category: Class-C per Ed. 3.0 (2006) (European limits) **Test Margin: 100**
Test date: 2012-6-26 **Start time: 10:11:47** **End time: 10:14:37**
Test duration (min): 2.5 **Data file name: H-000050.cts_data**
Comment: On
Customer: RIshang

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	229.84	Frequency(Hz):	50.00
I_Peak (Amps):	0.388	I_RMS (Amps):	0.222
I_Fund (Amps):	0.199	Crest Factor:	1.751
Power (Watts):	41.9	Power Factor:	0.823

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.150	0.460	32.60	OK
3	0.784	2.068	37.93	OK
4	0.067	0.460	14.50	OK
5	0.204	0.919	22.17	OK
6	0.042	0.460	9.10	OK
7	0.031	0.690	4.50	OK
8	0.028	0.460	5.99	OK
9	0.026	0.460	5.63	OK
10	0.017	0.460	3.63	OK
11	0.022	0.230	9.37	OK
12	0.021	0.230	9.26	OK
13	0.018	0.230	8.03	OK
14	0.009	0.230	4.02	OK
15	0.016	0.230	6.85	OK
16	0.011	0.230	4.66	OK
17	0.018	0.230	7.80	OK
18	0.021	0.230	8.97	OK
19	0.010	0.230	4.46	OK
20	0.014	0.230	6.08	OK
21	0.007	0.230	2.86	OK
22	0.012	0.230	5.11	OK
23	0.007	0.230	3.18	OK
24	0.010	0.230	4.39	OK
25	0.009	0.230	3.74	OK
26	0.011	0.230	4.73	OK
27	0.007	0.230	3.08	OK
28	0.011	0.230	4.60	OK
29	0.007	0.230	3.03	OK
30	0.009	0.230	3.87	OK
31	0.007	0.230	3.12	OK
32	0.006	0.230	2.57	OK
33	0.008	0.230	3.46	OK
34	0.005	0.230	2.02	OK
35	0.005	0.230	2.30	OK
36	0.005	0.230	2.01	OK
37	0.006	0.230	2.45	OK
38	0.004	0.230	1.77	OK
39	0.004	0.230	1.70	OK
40	0.006	0.230	2.60	OK

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Emission	**Continuous Disturbance** Freq. 9kHz to 30MHz	☒ EN 55015
Port:	**AC input** **Live**	Total: **PASS** / ~~FAIL~~
Input Voltage:	**AC 230V, 50Hz**	per test
Ambient	25 °C, 50 % RH,	101 kPa
Artificial hand:	Not applied	

Operation Mode: A

Pre-test in different load & find out the worst case for final test.

Emission spectrum see page:
If the result of the measurement with the Quasi Peak detector is below the Average limit the measurement with Average Detector has been omitted.

Model: R8060AQ

Frequency (MHz)	Quasi Peak (dBuV) Level / Limit	Average (dBuV) Level / Limit
Please see the data page.		
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	/	/

Date: 2012-06-12
Inspector:

Signature:

ACCURATE TECHNOLOGY CO.,LTD

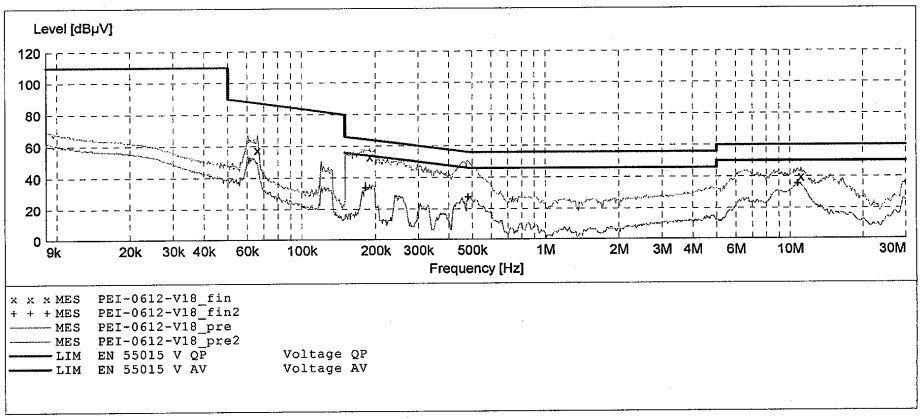
CONDUCTED EMISSION STANDARD EN 55015

EUT: Flex LED Strip M/N:R8060AQ
Manufacturer: Rishang
Operating Condition: A
Test Site: 1#Shielding Room
Operator: PEI
Test Specification: L 230V/50Hz
Comment:
Start of Test: 6/12/2012 / 10:36:55PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "PEI-0612-V18_fin"

6/12/2012 10:39PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.065974	57.80	11.0	88	29.7	QP	L1	GND
0.188993	53.10	11.2	64	11.0	QP	L1	GND
11.086095	39.80	11.2	60	20.2	QP	L1	GND

MEASUREMENT RESULT: "PEI-0612-V18_fin2"

6/12/2012 10:39PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181612	33.80	11.2	54	20.6	AV	L1	GND
0.480097	27.50	12.0	46	18.8	AV	L1	GND
10.738323	35.60	11.3	50	14.4	AV	L1	GND

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Emission	**Continuous Disturbance** Freq. 9kHz to 30MHz	☒ EN 55015
Port:	**AC input** **Neutral**	Total: **PASS / ~~FAIL~~**
Input Voltage:	**AC 230V, 50Hz**	per test
Ambient	25 °C, 50 % RH,	101 kPa
Artificial hand:	Not applied	

Operation Mode: A

Pre-test in different load & find out the worst case for final test.

Emission spectrum see page:
If the result of the measurement with the Quasi Peak detector is below the Average limit the measurement with Average Detector has been omitted.

Model: R8060AQ

Frequency (MHz)	Quasi Peak (dBuV) Level / Limit	Average (dBuV) Level / Limit
Please see the data page.		
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Date: 2012-06-12
Inspector:

Signature:

ACCURATE TECHNOLOGY CO.,LTD

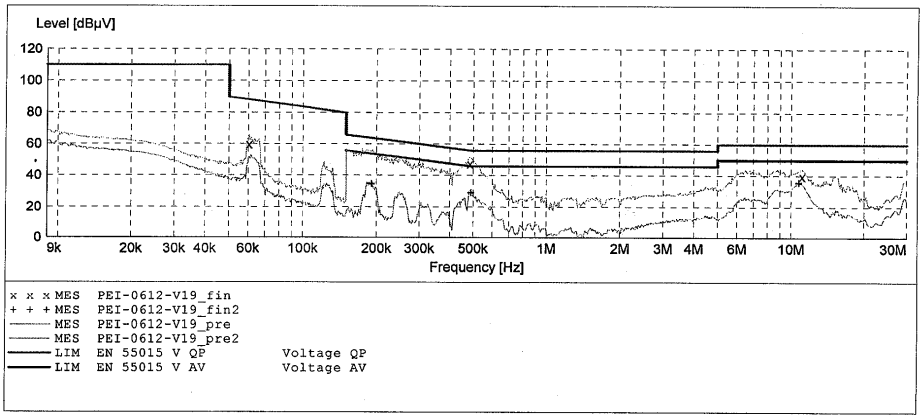
CONDUCTED EMISSION STANDARD EN 55015

EUT: Flex LED Strip M/N:R8060AQ
Manufacturer: Rishang
Operating Condition: A
Test Site: 1#Shielding Room
Operator: PEI
Test Specification: N 230V/50Hz
Comment:
Start of Test: 6/12/2012 / 10:40:41PM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "PEI-0612-V19_fin"

6/12/2012 10:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.060438	59.80	11.0	88	28.5	QP	N	GND
0.483938	47.50	12.0	56	8.8	QP	N	GND
11.086095	39.80	11.2	60	20.2	QP	N	GND

MEASUREMENT RESULT: "PEI-0612-V19_fin2"

6/12/2012 10:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.190505	34.60	11.2	54	19.4	AV	N	GND
0.487809	29.10	12.0	46	17.1	AV	N	GND
10.738323	35.80	11.3	50	14.2	AV	N	GND

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Emission	**Radiated Emission** Freq. 9kHz to 30MHz	☒ **EN 55015**
Port:	**Enclosure**	Total: **PASS / ~~FAIL~~**
Input Voltage:	**AC 230V, 50Hz**	per test
Ambient	25 °C, 50 % RH,	101 kPa
Artificial hand:	Not applied	

Operation Mode: A

Pre-test in different load & find out the worst case for final test.

Emission spectrum see page:
If the result of the measurement with the Quasi Peak detector is below the Average limit the measurement with Average Detector has been omitted.

Model: R8060AQ

Frame 1:X		Frame 2:Y		Frame 3:Z	
Frequency/ MHz	Level/dBµA QP	Frequency/ MHz	Level/dBµA QP	Frequency/ MHz	Level/dBµA QP
Please see the data page.		Please see the data page.		Please see the data page.	

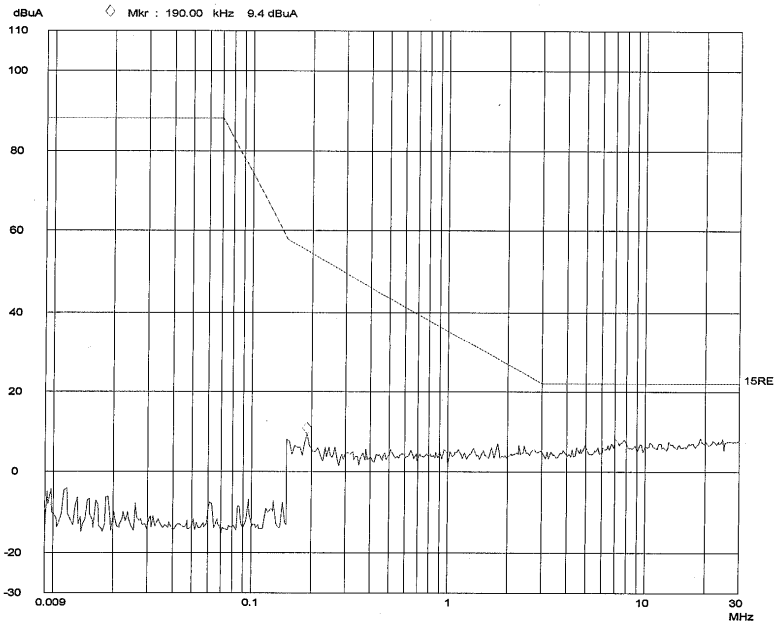
Operation Mode:

Frame 1:		Frame 2:		Frame 3:	
Frequency/ MHz	Level/dBµA QP	Frequency/ MHz	Level/dBµA QP	Frequency/ MHz	Level/dBµA QP

Date: 2012-06-12
Inspector: _____ Signature: _____

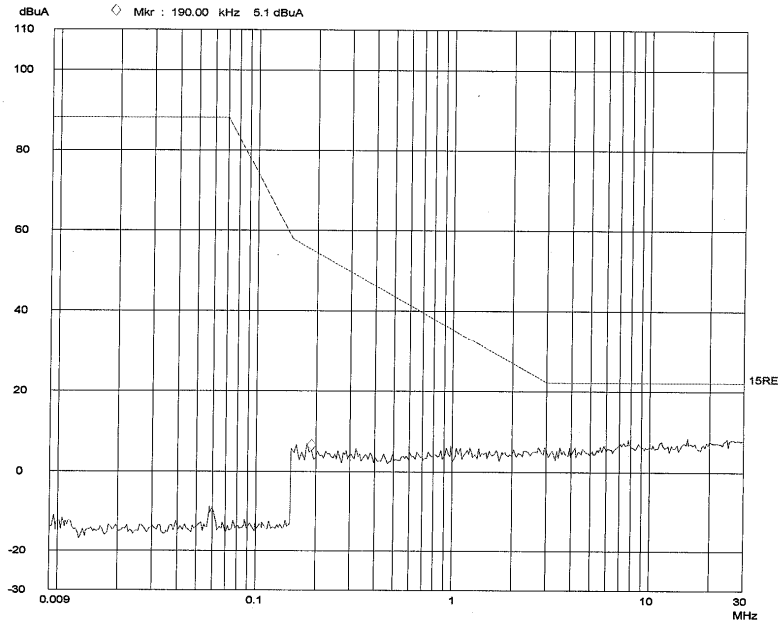
Radiated Electromagnetic Disturbance

EUT:	Flex LED Strip M/N:R8060AQ
Op Cond:	On
Manufacturer:	Rishang
Comment:	X 230V/50Hz



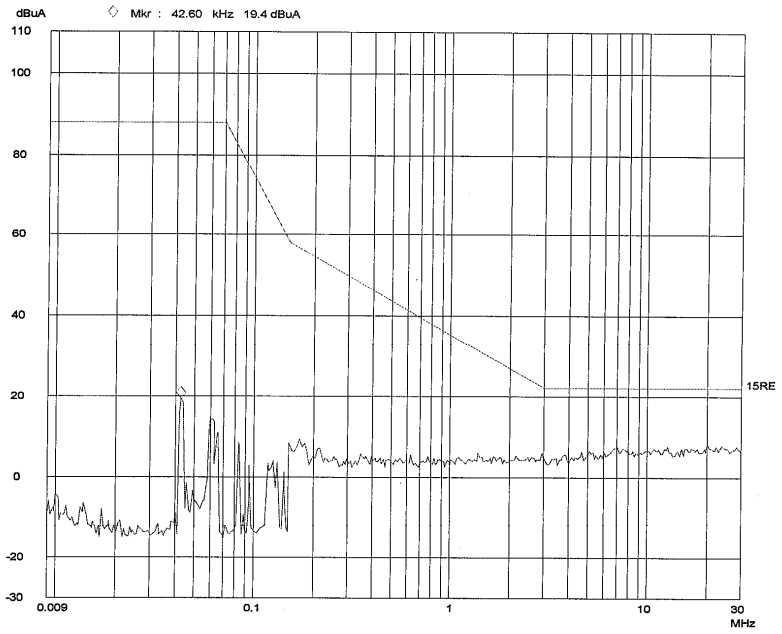
Radiated Electromagnetic Disturbance

EUT:	Flex LED Strip M/N:R8060AQ
Op Cond:	On
Manufacturer:	Rishang
Comment:	Y 230V/50Hz



Radiated Electromagnetic Disturbance

EUT:	Flex LED Strip M/N:R8060AQ
Op Cond:	On
Manufacturer:	Rishang
Comment:	Z 230V/50Hz



EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Emission	**Radiated Emission** Freq. 30MHz to 300MHz	☒ EN 55015
Port:	**Enclosure**	Total: **PASS** / ~~**FAIL**~~
Input Voltage:	**AC 230V, 50Hz**	per test
Ambient	24 °C, 48 % RH,	101 kPa

Operation Mode: A

Pre-test in different load & find out the worst case for final test.

Emission spectrum see page:
If the result of the measurement with the Quasi Peak detector is below the Average limit the measurement with Average Detector has been omitted.

Model: R8060AQ

Frequency (MHz)	Quasi Peak (dBuV/m) Horizontal Level / Limit	Quasi Peak (dBuV/m) Vertical Level / Limit
Please see the data page.		
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	/	/

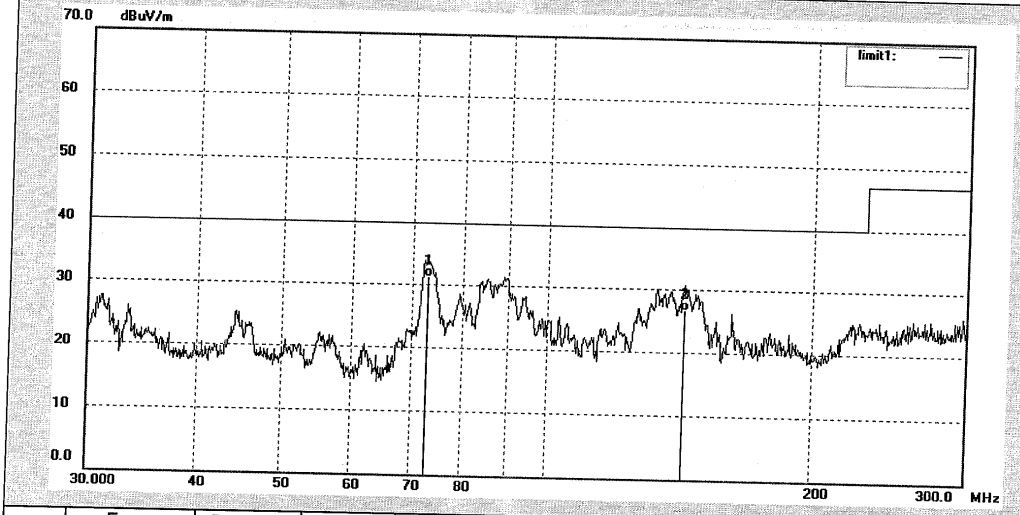
Date: 2012-06-12
Inspector: _____ Signature: _____

ATC®
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: pei #9085
Standard: EN 55015
Test item: Radiation Test
Temp.(C)/Hum.(%) 24 C / 48 %
EUT: Flex LED Strip
Mode: A
Model: R8060AQ
Manufacturer: Rishang

Polarization: Horizontal
Power Source: AC 230V/50Hz
Date: 2012/06/12
Time: 22:54:48
Engineer Signature: PEI
Distance: 3m

Note:



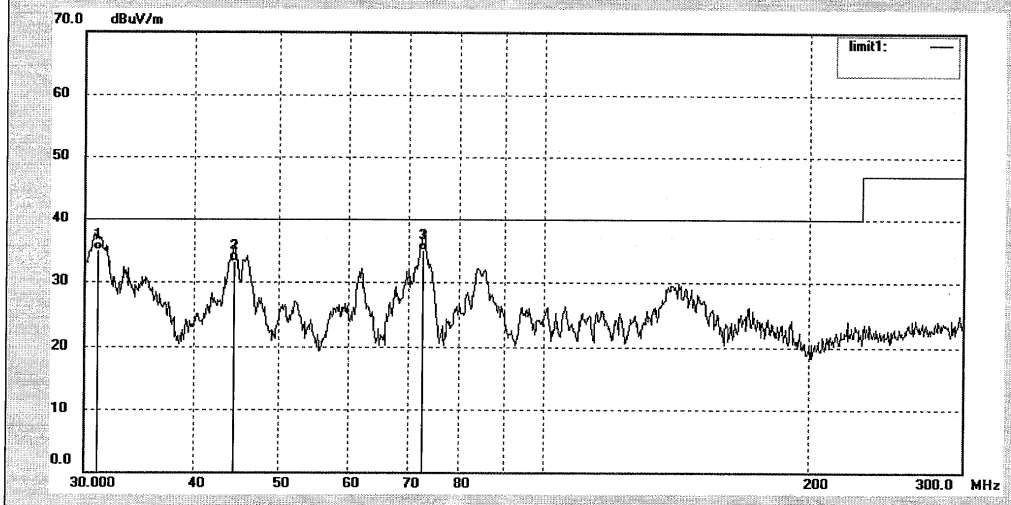
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	72.9157	20.21	11.08	31.29	40.00	-8.71	QP			
2	143.1768	15.18	11.48	26.66	40.00	-13.34	QP			

ATC®
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: pei #9084
Standard: EN 55015
Test item: Radiation Test
Temp.(C)/Hum.(%) 24 C / 48 %
EUT: Flex LED Strip
Mode: A
Model: R8060AQ
Manufacturer: Rishang

Polarization: Vertical
Power Source: AC 230V/50Hz
Date: 2012/06/12
Time: 22:45:49
Engineer Signature: PEI
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.0618	18.75	16.09	34.84	40.00	-5.16	QP			
2	44.4959	18.73	14.45	33.18	40.00	-6.82	QP			
3	72.7468	23.93	11.07	35.00	40.00	-5.00	QP			

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R0060AA	
Report:	

Immunity	**ESD** Electrostatic Discharge	☒ EN 61000-4-2
Air Discharge: ±8 kV	Criterion: B	Total: **PASS** / ~~FAIL~~
Contact: ±4 kV	# of discharges: 10	per test
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site:		
Operation Mode: A		
Model: R0060AA		

Location	**Kind** A=Air C=Cont	**Result**
HCP & VCP	C	Passed

For indirect discharge: HCP = Horizontal Coupling Plane, VCP = Vertical Coupling Plane

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R80C0BA	
Report:	

Immunity	**ESD** Electrostatic Discharge	☒ EN 61000-4-2
Air Discharge: ±8 kV	Criterion: B	Total: **PASS** / ~~FAIL~~
Contact: ±4 kV	# of discharges: 10	per test
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site:		
Operation Mode: A		
Model: R80C0BA		

Location	Kind A=Air C=Cont	Result
All non-conducted enclosure	A	Passed
All screws	C	Passed
HCP & VCP	C	Passed

For indirect discharge: HCP = Horizontal Coupling Plane, VCP = Vertical Coupling Plane

Date: 2012-06-12
Inspector: _____ Signature: _____

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity	**ESD** Electrostatic Discharge	☒ EN 61000-4-2
Air Discharge: ±8 kV	Criterion: B	Total: **PASS** / ~~FAIL~~
Contact: ±4 kV	# of discharges: 10	per test
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site:		
Operation Mode: A		
Model: R8060AQ		

Location	**Kind** A=Air C=Cont	**Result**
All non-conducted enclosure	A	Passed
All screws	C	Passed
HCP & VCP	C	Passed

For indirect discharge: HCP = Horizontal Coupling Plane, VCP = Vertical Coupling Plane

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity **Enclosure**	**RS** **Radiated Susceptibility**	☒ **EN 61000-4-3**
Field Strength: 3 V/m	Criterion: **A**	Total: **PASS / ~~FAIL~~**
Frequency Range: 80 MHz	to 1000 MHz	
Modulation: ☐ none ☒ AM	☐ Pulse 1 kHz,	80 %
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site: Anechoic Chamber		
Operation Mode: A		
Model: R8060AQ		

	Frequency Range 1: 80 – 1000 MHz		Frequency Range 2: MHz		Frequency Range 3: MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front	X	X				
Right	X	X				
Rear	X	X				
Left	X	X				

	Frequency Range 1: 80 - 1000 MHz		Frequency Range 2: - MHz		Frequency Range 3: - MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front						
Right						
Rear						
Left						

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R80C0BA	
Report:	

Immunity Enclosure	**RS** Radiated Susceptibility	☒ EN 61000-4-3
Field Strength: 3 V/m	Criterion: A	Total: **PASS** / ~~FAIL~~
Frequency Range: 80 MHz	to 1000 MHz	
Modulation: ☐ none ☒ AM	☐ Pulse 1 kHz,	80 %
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site: Anechoic Chamber		

Operation Mode: A

Model: R80C0BA

	Frequency Range 1: 80 – 1000 MHz		Frequency Range 2: MHz		Frequency Range 3: MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front	X	X				
Right	X	X				
Rear	X	X				
Left	X	X				

	Frequency Range 1: 80 - 1000 MHz		Frequency Range 2: - MHz		Frequency Range 3: - MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front						
Right						
Rear						
Left						

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R0060AA	
Report:	

Immunity Enclosure	**RS** Radiated Susceptibility	☒ EN 61000-4-3
Field Strength: 3 V/m	Criterion: A	Total: **PASS** / ~~FAIL~~
Frequency Range: 80 MHz	to 1000 MHz	
Modulation: ☐ none ☒ AM	☐ Pulse 1 kHz,	80 %
Ambient: 25 °C,	50 % RH,	101 kPa
Test Site: Anechoic Chamber		
Operation Mode: A		
Model: R0060AA		

	Frequency Range 1: 80 – 1000 MHz		Frequency Range 2: MHz		Frequency Range 3: MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front	X	X				
Right	X	X				
Rear	X	X				
Left	X	X				

	Frequency Range 1: 80 - 1000 MHz		Frequency Range 2: - MHz		Frequency Range 3: - MHz	
Steps	# / %		# / %		# / %	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Front						
Right						
Rear						
Left						

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R80C0BA	
Report:	

Immunity Conn. Lines	**EFTB** Fast Transient Burst	☐ IEC 61000-4-4 ☒ EN 61000-4-4
Level: **0.5kV**	Criterion: **B**	Total: **PASS** / ~~FAIL~~
Ambient: 25 °C,	50 % RH,	103 kPa
Test Site:		

Operation Mode: A

Model:

Line: ☐ AC Mains ☐ AC Output ☐ Signal
Coupling: ☐ Direct ☐ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
L	250V			500V		
	1Kv			2Kv		
N	250V			500V		
	1Kv			2Kv		
LN	250V			500V		
	1Kv			2Kv		
PE	250V			500V		
	1Kv			2Kv		
LPE	250V			500V		
	1Kv			2Kv		
NPE	250V			500V		
	1Kv			2Kv		
LNPE	250V			500V		
	1Kv			2Kv		

Model: R80C0BA

Line: ☐ AC Mains ☒ DC input ☐ Signal: Control Cable
Coupling: ☒ Direct ☐ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
DC input line	250V			500V	x	x
	1kV			2kV		

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R0060AA	
Report:	

Immunity Conn. Lines	**EFTB** Fast Transient Burst	☐ IEC 61000-4-4 ☒ EN 61000-4-4
Level: **0.5kV**	Criterion: **B**	Total: **PASS** / ~~FAIL~~
Ambient: 25 °C,	50 % RH,	103 kPa
Test Site:		

Operation Mode: A

Model:

Line: ☐ AC Mains ☐ AC Output ☐ Signal
Coupling: ☐ Direct ☐ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
L	250V			500V		
	1Kv			2Kv		
N	250V			500V		
	1Kv			2Kv		
LN	250V			500V		
	1Kv			2Kv		
PE	250V			500V		
	1Kv			2Kv		
LPE	250V			500V		
	1Kv			2Kv		
NPE	250V			500V		
	1Kv			2Kv		
LNPE	250V			500V		
	1Kv			2Kv		

Model: R0060AA

Line: ☐ AC Mains ☒ DC input ☐ Signal: Control Cable
Coupling: ☒ Direct ☐ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
DC input line	250V			500V	x	x
	1kV			2kV		

Date: 2012-06-12
Inspector: _____ Signature: _____

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity Conn. Lines	**EFTB** Fast Transient Burst	☐ IEC 61000-4-4 ☒ EN 61000-4-4
Level: **0.5 & 1kV** Criterion: **B**		Total: **PASS** / ~~FAIL~~
Ambient: 25 °C, 50 % RH, 103 kPa		
Test Site:		

Operation Mode: A

Model: R8060AQ

Line: ☒ AC Mains ☐ AC Output ☐ Signal
Coupling: ☒ Direct ☐ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
L	250V			500V		
	1Kv			2Kv		
N	250V			500V		
	1Kv			2Kv		
LN	250V			500V		
	1Kv			2Kv		
PE	250V			500V		
	1Kv			2Kv		
LPE	250V			500V		
	1Kv			2Kv		
NPE	250V			500V		
	1Kv			2Kv		
LNPE	250V			500V		
	1Kv	x	x	2Kv		

Operation Mode: R8060AQ

Line: ☐ AC Mains ☐ DC Input ☒ Signal: Control line
Coupling: ☐ Direct ☒ Capacitive Clamp

Conductor	Voltage	+	-	Voltage	+	-
Control input line	250V			500V	x	x
	1kV			2kV		

Conductor	Voltage	+	-	Voltage	+	-
Control output line	250V			500V	x	x
	1kV			2kV		

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity **Conn. Lines**	**Surge**	☐ IEC 61000-4-5 ☒ EN 61000-4-5
Level: **0.5&1&2kV*** Criterion: **C**		**Total: PASS / ~~FAIL~~**
Repetition: **5** Times per test Interval: **60** sec.		
Ambient: 25 °C, 50 % RH, 103 kPa		
Test Site:		

Operation Mode: A

Model: R8060AQ

Line: ☒ AC Mains ☐ AC Output ☐ Signal: Control Cable

Common Mode (Line – Ground)
Coupling: ☐ Cable Shielding, Grounding: ☐ 2 Sides ☐ 1 Side (+ 10Nf)
☐ CDN: C= µF, R=Ω, L= Mh

	Volt:	500V		1kV		2kV		3kV		4kV	
Conductor	**Phase**	+	-	+	-	+	-	+	-	+	-
L – N	0°										
	90°	x		x							
	180°										
	270°		x		x						
L - PE	0°										
	90°			x		x					
	180°										
	270°				x		x				
N - PE	0°										
	90°			x		x					
	180°										
	270°				x		x				

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity Conn. Lines	**Conducted disturbances induced by radio-frequency fields**	☐ IEC 61000-4-6 ☒ EN 61000-4-6

Voltage level 3 V Criterion: A — Total: **PASS** / ~~FAIL~~

Frequency Range: 150 kHz to 80 MHz

Modulation: ☐ None ☒ AM ☐ Pulse 1 kHz, 80 %

Ambient: 25 °C, 50 % RH, 103 kPa

Test Site:

Operation Mode: A

Model: R8060AQ

Line: ☒ AC Mains ☐ AC Output ☐ Signal : Control Cable

Common Mode (Line – Ground)

Coupling: ☐ Cable Shielding, Grounding: ☐ 2 Sides ☐ 1 Side (+ 10Nf)

☒ CDN: C= µF, R=Ω, L= Mh

Injected Port	Frequency Range (MHz)	Test Level (V)	Result
AC Input	0.15-80	3	PASSED

Model :

Line: ☐ AC Mains ☐ DC Input ☒ Signal : Control line

Common Mode (Line – Ground)

Coupling: ☒ EM Injection Clamp ☐ 2 Sides ☐ 1 Side (+ 10Nf)

☐ CDN: C= µF, R=Ω, L= Mh

Injected Port	Frequency Range (MHz)	Test Level (V)	Result
Control input line	0.15-80	3	PASSED
Control output line	0.15-80	3	PASSED

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R0060AA	
Report:	

Immunity Conn. Lines	**Conducted disturbances induced by radio-frequency fields**	☐ IEC 61000-4-6 ☒ EN 61000-4-6

Voltage level	3 V	Criterion:	A	Total: **PASS** / ~~FAIL~~	
Frequency Range:	150 kHz	to	80 MHz		
Modulation:	☐ None ☒ AM	☐ Pulse	1 kHz,	80 %	
Ambient:	25 °C,	50 % RH,		103 kPa	
Test Site:					

Operation Mode: A

Model:

Line: ☐ AC Mains ☐ DC Output ☐ Signal : Control Cable

Common Mode (Line – Ground)
Coupling: ☐ Capacitive Clamp: ☐ 2 Sides ☐ 1 Side (+ 10Nf)
☐ CDN: C= µF, R=Ω, L= Mh

Model : R0060AA

Line: ☐ AC Mains ☒ DC intput ☐ Signal

Common Mode (Line – Ground)
Coupling: ☐ Capacitive Clamp ☐ 2 Sides ☐ 1 Side (+ 10Nf)
☒ ~~EM Injection Clamp~~ CDN 刘伟华 2012.6.12

Injected Port	Frequency Range (MHz)	Test Level (V)	Result
DC input line	0.15-80	3	PASSED

Date: 2012-06-12
Inspector:

Signature:

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R80C0BA	
Report:	

Immunity **Conn. Lines**	**Conducted disturbances induced by radio-frequency fields**	☐ IEC 61000-4-6 ☒ EN 61000-4-6

Voltage level 3 V Criterion: A Total: **PASS** / ~~FAIL~~

Frequency Range: 150 kHz to 80 MHz

Modulation: ☐ None ☒ AM ☐ Pulse 1 kHz, 80 %

Ambient: 25 °C, 50 % RH, 103 kPa

Test Site:

Operation Mode: A

Model:

Line: ☐ AC Mains ☐ DC Output ☐ Signal : Control Cable

Common Mode (Line – Ground)

Coupling: ☐ Capacitive Clamp: ☐ 2 Sides ☐ 1 Side (+ 10Nf)

☐ CDN: C= µF, R=Ω, L= Mh

Model : R80C0BA

Line: ☐ AC Mains ☒ DC intput ☐ Signal

Common Mode (Line – Ground)

Coupling: ☐ Capacitive Clamp ☐ 2 Sides ☐ 1 Side (+ 10Nf)

☒ ~~EM Injection Clamp~~ CDN 2012.6.12

Injected Port	Frequency Range (MHz)	Test Level (V)	Result
DC input line	0.15-80	3	PASSED

Date: 2012-06-12

Inspector: _____ Signature: _____

EMC Test Protocol

TÜV Rheinland Group

Reference: Flex LED Strip R8060AQ	
Report:	

Immunity Conn. Lines	**Voltage dips, short interruptions and voltage variations**	☐ IEC 61000-4-11 ☒ EN 61000-4-11

Mains port Criterion: B , C Total: **PASS / ~~FAIL~~**

Ambient: 25 °C, 50 % RH, 103 kPa

Test Site:

Operation Mode: A

Model: R8060AQ

Voltage dips and short interruptions

Test level % U_T	Voltage dip and short interruptions % U_T	Duration (in period)	Criterion
0	100	0.5	B
70	30	10	C

Model

Voltage dips and short interruptions

Test level % U_T	Voltage dip and short interruptions % U_T	Duration (in period)	Criterion

Date: 2012-06-12
Inspector:

Signature:

Measurement Uncertainties

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Table 1: Measurement Uncertainty levels

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.23 dB ± 2.23 dB	± 4.0 dB ± 3.6 dB
Power disturbance	Level accuracy (30MHz to 300MHz)	± 2.92 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.50 dB	N/A
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.08 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 4.42 dB	± 5.2 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 4.06 dB	N/A
Mains Harmonic	Voltage	± 0.512%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.512%	N/A

As U_{lab} in all applicable tests listed above are less than U_{cispr} according to CISPR 16-4-2:2003,

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.