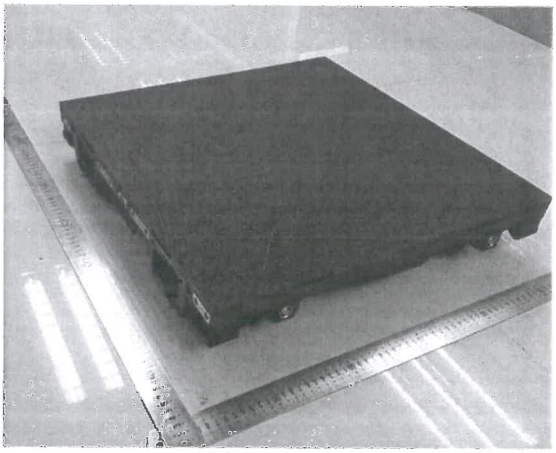
Prüfbericht-Nr.: *Test Report No.:*	**50052740 002**	**Auftrags-Nr.:** *Order No.:*	164076892	Seite 1 von 29 *Page 1 of 29*
Kunden-Referenz-Nr.: *Client Reference No.:*	481435	**Auftragsdatum:** *Order date.:*	25 Oct. 2016	
Auftraggeber: *Client:*	Shenzhen Absen Optoelectronic Co., Ltd. 18-20/F, Tower A, Building 3, Phase I,Tian An Cloud Park, NO.2018, Xuegang Rd, Bantian, Longgang District, Shenzhen, Guangdong, P.R. China			
Prüfgegenstand: *Test item:*	Full Color LED Display			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	M2.3, M3.4			
Auftrags-Inhalt: *Order content:*	TUV Rheinland - EMC service			
Prüfgrundlage: *Test specification:*	EN 55022:2010 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 55024:2010			
Wareneingangsdatum: *Date of receipt:*	25 October 2016			
Prüfmuster-Nr.: *Test sample No.:*	BL-SZ16A0139 #1 BL-SZ16A0139 #2			
Prüfzeitraum: *Testing period:*	Refer to test report			
Ort der Prüfung: *Place of testing:*	Refer to section 2.1			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			



geprüft von / *tested by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
28.11.2016	Felix Tao Senior Project Engineer	

kontrolliert von / *reviewed by:*

Datum *Date*	Name/Stellung *Name/Position*	Unterschrift *Signature*
28.11.2016	Tongle Lee Assistant Manager	

Sonstiges / *Other:*

This report is for approval of additional models M2.3, M3.4.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: Test item complete and undamaged

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhalt
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor
	P(ass) = passed a.m. test specifications(s)		F(ail) = failed a.m. test specifications(s)	N/A = not applicable	N/T = not tested

V04

TEST SUMMARY

5.1.1 HARMONICS ON AC MAINS
RESULT: Pass

5.1.2 VOLTAGE FLUCTUATIONS ON AC MAINS
RESULT: Pass

5.1.3 MAINS TERMINAL DISTURBANCE VOLTAGE
RESULT: Pass

5.2.1 RADIATED EMISSION
RESULT: Pass

6.2.1 RADIO-FREQUENCY ELECTROMAGNETIC FIELD AMPLITUDE MODULATED (RS)
RESULT: Pass

6.2.2 RADIO-FREQUENCY CONTINUOUS CONDUCTED (CS)
RESULT: Pass

6.3.1 FAST TRANSIENTS (EFT)
RESULT: Pass

6.3.2 SURGE
RESULT: Pass

6.3.3 ELECTROSTATIC DISCHARGES (ESD)
RESULT: Pass

6.4.1 VOLTAGE DIP AND INTERRUPTIONS
RESULT: Pass

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

Shenzhen BALUN Technology Co., Ltd.
Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road,
Nanshan District, Shenzhen, Guangdong Province, P. R. China

The tests at the test site 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
Conducted Emission (BALUN)				
EMI Test Receiver	Rohde & Schwarz	ESRP	101036	2017-07-04
L.I.S.N.	Schwarzbeck	NSLK 8127	8127-687	2017-07-04
Radiated Emission (3m Chamber) (BALUN)				
EMI Test Receiver	KEYSIGHT	N9038A	MY53220118	2017-09-09
Amplifier	Mini-Circuits	ZHL-42W(+)	M129211	2017-07-21
Amplifier	Mini-Circuits	ZVA-213+	M127054	2017-07-21
Bilog Antenna	Schwarzbeck	VULB9163	9163-624	2017-07-21
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1148	2017-07-21
Harmonics & Flicker, Voltage Dips and Interruptions (BALUN)				
AC Power Source	EVERFINE	DPS1030	Y120984CJ7 331115	2017-11-10
Harmonics & Flicker Power Analyser	HALL	AC2000A	377954	2017-11-07
Radio-Frequency Electromagnetic Field Amplitude Modulated (RS) (BALUN)				
Signal Generator	Rohde & Schwarz	SMB100A	177746	2017-07-12
Power Meter	Agilent	E4419B	GB40201833	2017-11-12
Directional Coupler	Werlantone	C5982-10	109275	N/A
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A
Field Strength Meter	Narda	EP601	511WX51129	2017-01-11
Power Amplifier	OPHIR RF	5225F	1037	2017-02-23
Power Amplifier	OPHIR RF	5225F	1016	2017-02-21
Log.-Per. Antenna	Schwarzbeck	VULB 9163	9163-624	2017-07-21
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1148	2017-07-21
ESD (BALUN)				
ESD Test System	SCHLODER	SESD 30000	607339	2017-07-04
Radio-Frequency Continuous Conducted (CS) (BALUN)				
Conducted Disturbances Test System	Schloder GmbH	CDG 6000	126B1286	2017-07-04
CDN-M2+3	Schloder GmbH	CDN M2+M3-16	A2210276	2017-07-04
EM Clamp	Schloder GmbH	CDN-EMCL 20	1456165	2017-07-04
EFT (BALUN)				
EFT Test System	HALL	HEFT 51	1331011	2017-07-04
Coupling Clamp	HALL	ECDN 51	150601	2017-07-04
Surge (BALUN)				

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Surge Generator (AC Ports)	HALL	HCWG 70	151601	2017-07-04
Surge Coupling Network (AC Ports)	HALL	SCDN303P7	151602	2017-07-04
Surge Generator (Telecom Ports)	HALL	HCOMB 70	143806	2017-07-04
Surge Coupling Network (Telecom Ports)	HALL	TCOMB-4	143807	2017-07-04

3. General Product Information

3.1 Product Function and Intended Use

The EUTs are LED display used for information technology equipment.

The EUT was tested according to class A limit.

Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

For more information refer to the Circuit Diagram & Instruction Manual.

3.2 Ratings and System Details

System input voltage:	AC 100-240V
Rated Frequency:	50/60Hz
Rated input current:	12A
Rated output:	AC 100-240V, 50/60Hz, 10.4A
Protection class:	I

3.3 Independent Operation Modes

The basic operation modes are:

A. On (Displaying white light / colored light or Running ‘H’ pattern)
B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- PCB Layout
- Rating Label

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.
Pre-test was carried out at all operation modes & different voltages to find out the worst case for compliance test.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested together with the following accessories:

Item	Manufacturer	M/N	S/N
Laptop	Lenovo	E31	R3026PU9
Sending card	LINSN	TS802	0089872

4.4 Countermeasures to achieve EMC Compliance

The test samples which have 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: **Pass**

Date of testing	:	2016-11-17 to 2016-11-19
Test procedure	:	EN 61000-3-2:2014
Class	:	A
Limit	:	Table 1
Measured harmonics	:	1 – 40

Test setup

Input Voltage	:	AC 230V±2%, 50Hz
Operation Condition	:	According to Annex C.10
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

5.1.2 Voltage Fluctuations on AC Mains

RESULT: **Pass**

Date of testing	:	2016-11-19
Test procedure	:	EN 61000-3-3:2013
Limit	:	Clause 5

Test setup

Input Voltage	:	AC 230V±2%, 50Hz
Operation Condition	:	According to Clause 6.6
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

5.1.3 Mains Terminal Disturbance Voltage

RESULT: **Pass**

Date of testing	:	2016-11-17
Test standard	:	EN 55022:2010
Frequency range	:	0.15 - 30MHz
Classification	:	Class A
Limits	:	Table 1 of EN 55022:2010
Kind of test site	:	Shielded room

Test setup

Input Voltage	:	AC 100-240V, 50/60Hz
Operation Condition	:	According to Clause 8 & 9 of EN 55022:2010
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Radiated Emission

RESULT: **Pass**

Date of testing	:	2016-11-17 to 2016-11-18
Test standard	:	EN 55022:2010
Frequency range	:	30 - 6000MHz
Classification	:	Class A
Limits	:	Table 5 & 7 of EN 55022:2010
Kind of test site	:	3m chamber

Test setup:

Input Voltage	:	AC 100-240V, 50/60Hz
Operation Condition	:	According to Clause 8 & 10 of EN 55022:2010
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

6. Test Results IMMUNITY

6.1 Classification of apparatus

According to EN 55024:2010, the EUTs shall be tested in accordance with clause 4, 6 & 10, and comply with the performance criterion in table 1, 2 & 4 of clause 10.

Continuous Disturbance

Radio-Frequency Electromagnetic Field Amplitude Modulated (RS)	**Criterion A**
Radio-Frequency Continuous Conducted (CS)	**Criterion A**
Power-Frequency Magnetic Fields *	**N/A**

Transient Disturbance

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

Power supply Alterations

Voltage Dips, >95% reduction, 0.5 period	**Criterion B**
30% reduction, 25 periods	**Criterion C**
Voltage Interruptions, >95% reduction, 250 periods	**Criterion C**

* The EUTs don't contain devices susceptible to magnetic field, therefore the Power-Frequency Magnetic Fields test is not necessary.

6.2 Continuous Disturbances

6.2.1 Radio-Frequency Electromagnetic Field Amplitude Modulated (RS)

RESULT: **Pass**

Date of Testing	:	2016-11-17
Test Specification	:	EN 55024:2010
Basic Standard	:	IEC 61000-4-3:2006+A1+A2
Criterion	:	A
Frequency Range	:	80 - 1000MHz
Test Level	:	3V/m (Unmodulated, r.m.s.)
Modulation	:	AM 80%, 1kHz sine-wave

Test setup

Input Voltage	:	AC 100-240V, 50/60Hz
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.

6.2.2 Radio-Frequency Continuous Conducted (CS)

RESULT: **Pass**

Date of testing	:	2016-11-17
Test Specification	:	EN 55024:2010
Basic Standard	:	IEC 61000-4-6:2008
Criterion	:	A
Frequency range	:	0.15 - 80 MHz
Source impedance	:	150Ω
Test level	:	3V (unmodulated, r.m.s.)
Modulation	:	AM 80%, 1kHz sine-wave
Sweep mode	:	automatic
Sweep rate	:	$< 1.5 \times 10^{-3}$ decade / sec.

Test setup

Input Voltage	:	AC 100-240V, 50/60Hz
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 Transient Disturbances

6.3.1 Fast Transients (EFT)

RESULT: **Pass**

Date of testing	:	2016-11-17
Test Specification	:	EN 55024:2010
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 100-240V, 50/60Hz
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.

6.3.2 Surge

RESULT: **Pass**

Date of testing	:	2016-11-17
Test Specification	:	EN 55024:2010
Basic Standard	:	IEC 61000-4-5:2005
Criterion	:	B & C
Source impedance	:	2Ω, 12Ω, 42Ω
Test level	:	±1kV & ±2kV
Coupling phases	:	0°, 90°, 180°, 270°
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	Max. 1/min

Test Setup

Input Voltage	:	AC 100-240V, 50/60Hz
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: **Pass**

Date of testing	:	2016-11-17
Test Specification	:	EN 55024:2010
Basic Standard	:	IEC 61000-4-2:2008
Criterion	:	B
Charge voltage	:	±2.0kV, ±4.0kV, ±8.0kV (air discharge) ±4.0kV (contact discharge)
Number of discharges	:	>10

Test Setup

Input Voltage	:	AC 100-240V, 50/60Hz
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.

6.4 Power Supply Alterations

6.4.1 Voltage Dip and Interruptions

RESULT: **Pass**

Date of testing	:	2016-11-17
Test Specification	:	EN 55024:2010
Basic Standard	:	IEC 61000-4-11:2004
Criterion	:	B & C

Test Setup

Input Voltage	:	AC 100-240V, 50/60Hz
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.

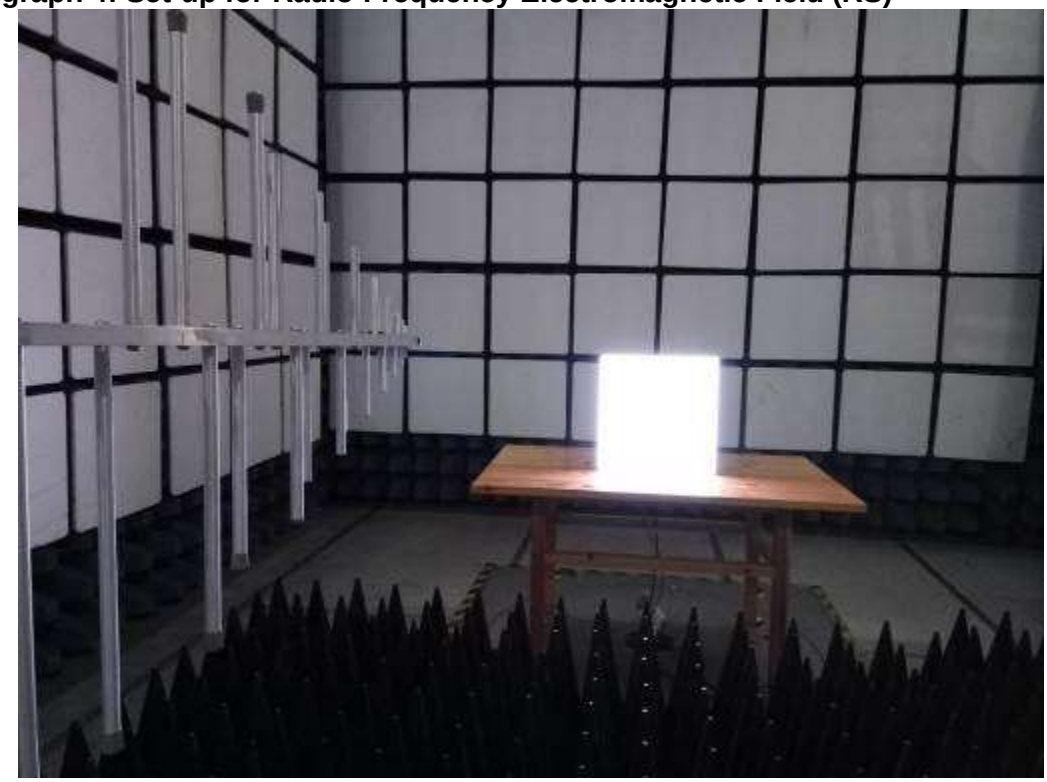
7. Photographs of the Test Set-Up

Photograph 1: Set-up for Harmonics and Voltage Fluctuations on AC Mains

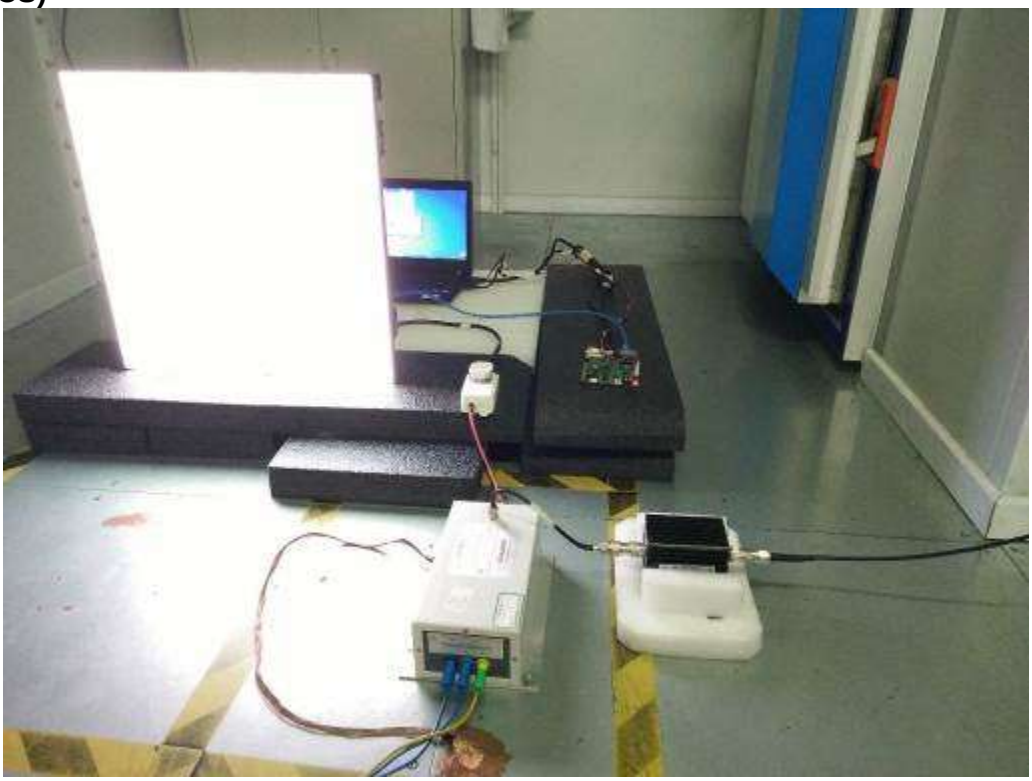
Photograph 2: Set-up for Mains Terminal Disturbance Voltage

Photograph 3: Set-up for Radiated Emission

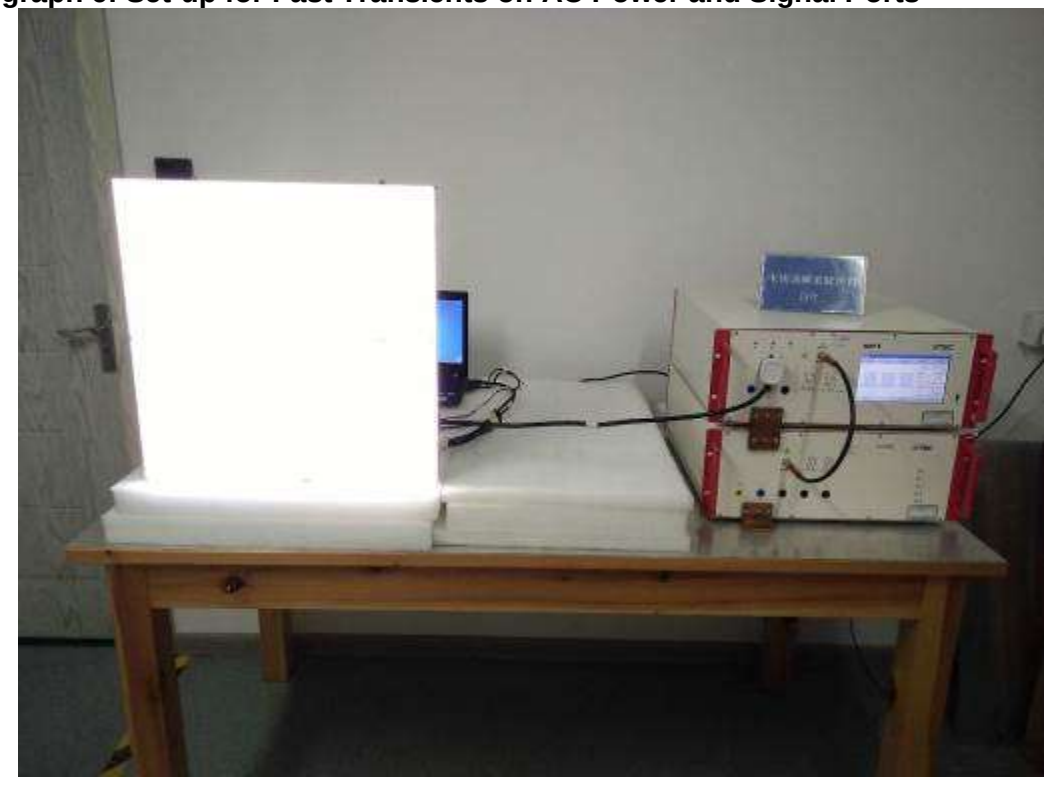
Photograph 4: Set-up for Radio-Frequency Electromagnetic Field (RS)



Photograph 5: Set-up for Conducted Susceptibility on AC Power and Signal Ports (CS)



Photograph 6: Set-up for Fast Transients on AC Power and Signal Ports



Photograph 7: Set-up for Electrostatic Discharges

Photograph 8: Set-up for Surge on AC Power and Signal Ports

Photograph 9: Set-up for Voltage Dips on AC Mains

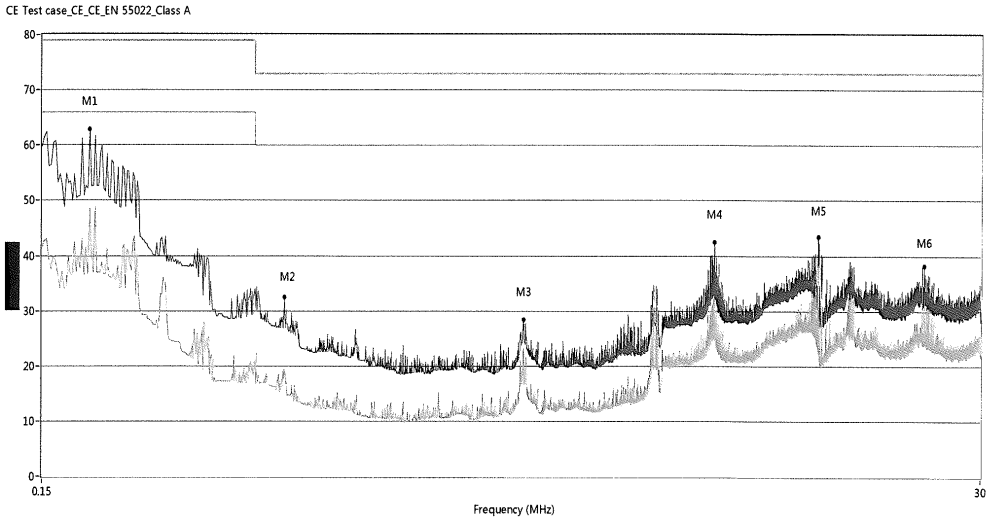
8. List of Tables

9. List of Photographs

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-17_11.55.58

EUT Name:	Full Color LED Display	Test Engineer:	Chelngliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

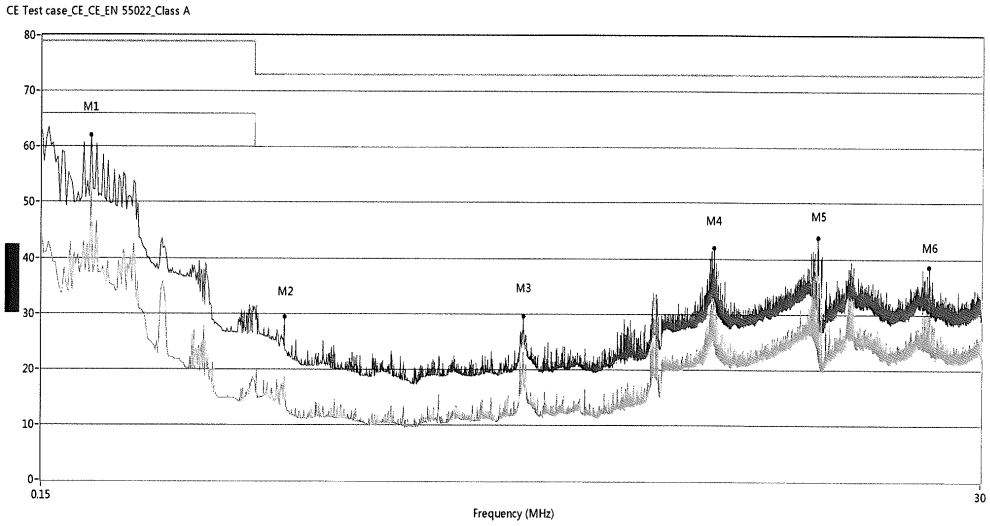


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.196	61.76	11.00	79.0	17.24	QP	L Line	Pass
1**	0.196	45.02	11.00	66.0	20.98	AV	L Line	Pass
2	0.592	32.4	11.00	73.0	40.60	QP	L Line	Pass
2**	0.592	19.5	11.00	60.0	40.50	AV	L Line	Pass
3	2.274	28.5	11.00	73.0	44.50	QP	L Line	Pass
3**	2.274	23.3	11.00	60.0	36.70	AV	L Line	Pass
4	6.718	42.5	11.00	73.0	30.50	QP	L Line	Pass
4**	6.718	29.6	11.00	60.0	30.40	AV	L Line	Pass
5	11.892	42.88	11.00	73.0	30.12	QP	L Line	Pass
5**	11.892	39.43	11.00	60.0	20.57	AV	L Line	Pass
6	21.906	38.3	11.00	73.0	34.70	QP	L Line	Pass
6**	21.906	31.8	11.00	60.0	28.20	AV	L Line	Pass

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-17_11.50.03

EUT Name:	Full Color LED Display	Test Engineer:	Chelngliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

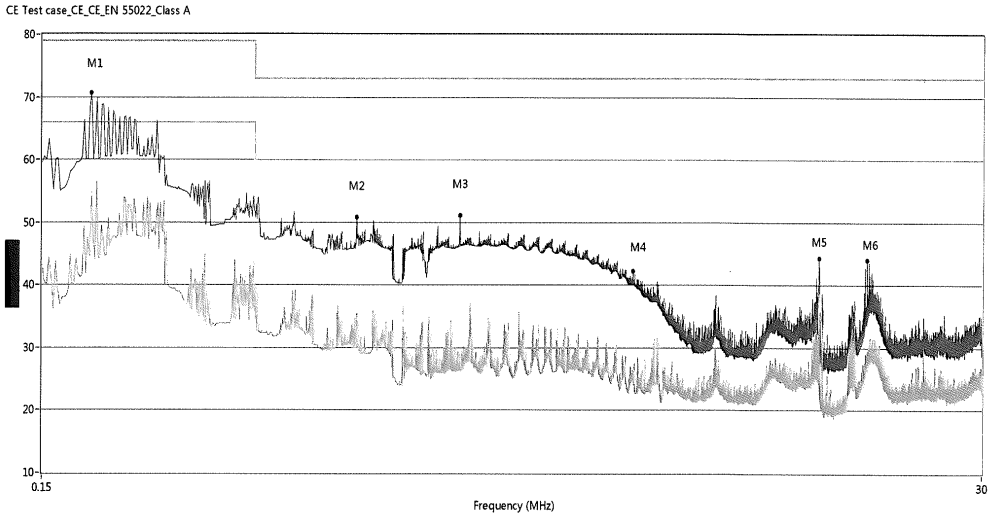


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.198	62.1	11.00	79.0	16.90	QP	N Line	Pass
1**	0.198	52.3	11.00	66.0	13.70	AV	N Line	Pass
2	0.594	29.4	11.00	73.0	43.60	QP	N Line	Pass
2**	0.594	18.5	11.00	60.0	41.50	AV	N Line	Pass
3	2.272	29.6	11.00	73.0	43.40	QP	N Line	Pass
3**	2.272	22.0	11.00	60.0	38.00	AV	N Line	Pass
4	6.734	41.9	11.00	73.0	31.10	QP	N Line	Pass
4**	6.734	32.5	11.00	60.0	27.50	AV	N Line	Pass
5	11.890	43.8	11.00	73.0	29.20	QP	N Line	Pass
5**	11.890	37.7	11.00	60.0	22.30	AV	N Line	Pass
6	22.456	38.6	11.00	73.0	34.40	QP	N Line	Pass
6**	22.456	33.2	11.00	60.0	26.80	AV	N Line	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-17_12.09.32

EUT Name:	Full Color LED Display	Test Engineer:	Chelngliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

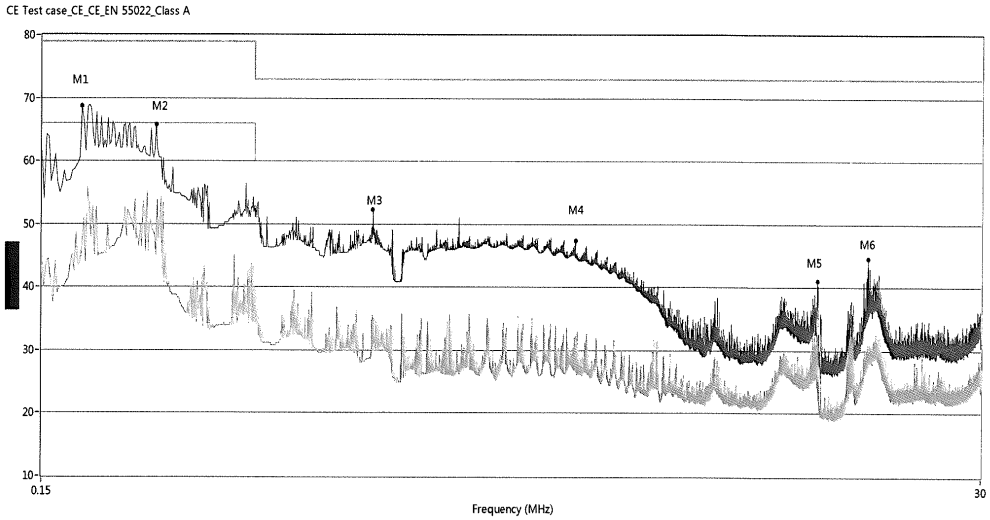


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.198	69.14	11.00	79.0	9.86	QP	L Line	Pass
1**	0.198	51.89	11.00	66.0	14.11	AV	L Line	Pass
2	0.888	50.8	11.00	73.0	22.20	QP	L Line	Pass
2**	0.888	35.6	11.00	60.0	24.40	AV	L Line	Pass
3	1.586	51.1	11.00	73.0	21.90	QP	L Line	Pass
3**	1.586	29.4	11.00	60.0	30.60	AV	L Line	Pass
4	4.226	42.2	11.00	73.0	30.80	QP	L Line	Pass
4**	4.226	25.4	11.00	60.0	34.60	AV	L Line	Pass
5	11.892	44.3	11.00	73.0	28.70	QP	L Line	Pass
5**	11.892	40.4	11.00	60.0	19.60	AV	L Line	Pass
6	15.710	44.1	11.00	73.0	28.90	QP	L Line	Pass
6**	15.710	29.4	11.00	60.0	30.60	AV	L Line	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-17_12.11.52

EUT Name:	Full Color LED Display	Test Engineer:	Chelngliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

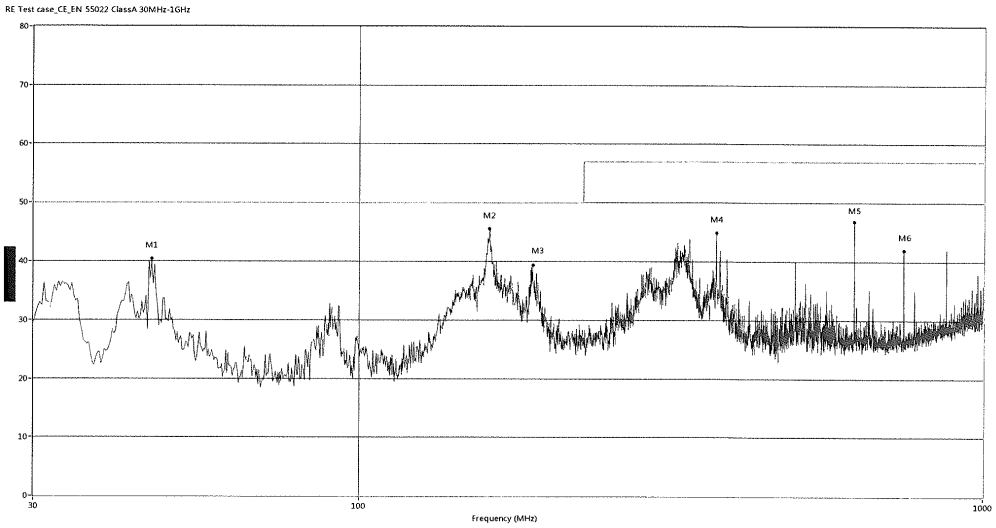


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.188	63.80	11.00	79.0	15.20	QP	N Line	Pass
1**	0.188	47.29	11.00	66.0	18.71	AV	N Line	Pass
2	0.286	62.15	11.00	79.0	16.85	QP	N Line	Pass
2**	0.286	49.79	11.00	66.0	16.21	AV	N Line	Pass
3	0.976	52.3	11.00	73.0	20.70	QP	N Line	Pass
3**	0.976	33.4	11.00	60.0	26.60	AV	N Line	Pass
4	3.070	47.5	11.00	73.0	25.50	QP	N Line	Pass
4**	3.070	32.3	11.00	60.0	27.70	AV	N Line	Pass
5	11.890	41.0	11.00	73.0	32.00	QP	N Line	Pass
5**	11.890	36.5	11.00	60.0	23.50	AV	N Line	Pass
6	15.936	44.6	11.00	73.0	28.40	QP	N Line	Pass
6**	15.936	30.3	11.00	60.0	29.70	AV	N Line	Pass

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-18_11.25.00

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

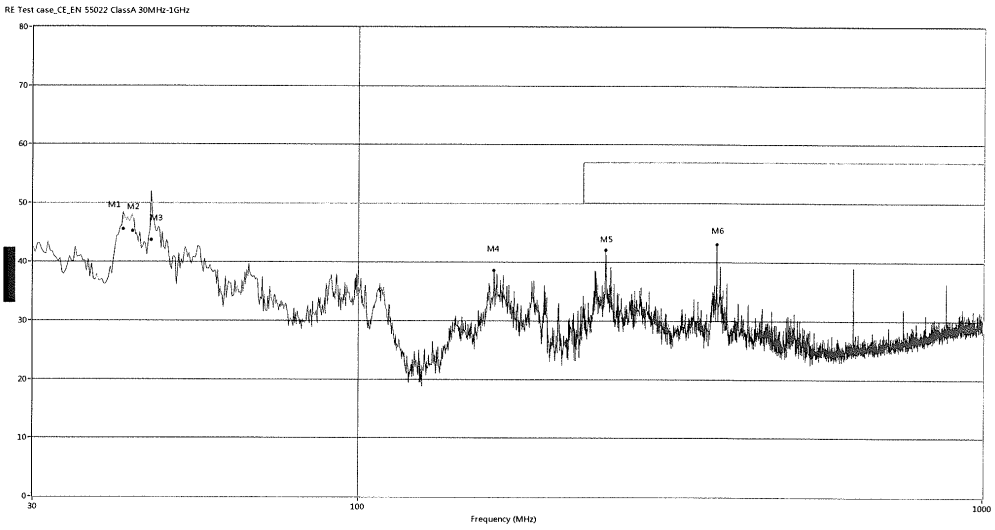


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	46.490	40.41	-19.59	50.0	9.59	QP	264.70	300	Horizontal	Pass
2	161.920	45.55	-24.18	50.0	4.45	QP	0.00	100	Horizontal	Pass
3	190.292	39.38	-22.26	50.0	10.62	QP	296.20	100	Horizontal	Pass
4	375.078	44.89	-17.24	57.0	12.11	QP	253.90	200	Horizontal	Pass
5	625.095	46.89	-11.93	57.0	10.11	QP	167.30	100	Horizontal	Pass
6	749.982	41.63	-10.06	57.0	15.37	QP	185.80	100	Horizontal	Pass

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-18_11.33.11

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

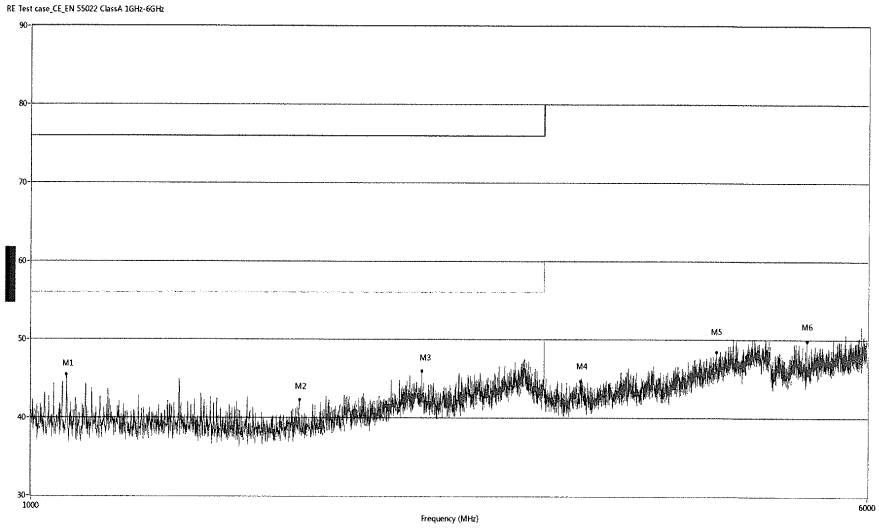


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	42.172	45.54	-19.90	50.0	4.46	QP	22.90	114	Vertical	Pass
2	42.918	45.24	-19.71	50.0	4.76	QP	208.70	114	Vertical	Pass
3	46.928	43.72	-19.59	50.0	6.28	QP	208.70	107	Vertical	Pass
4	165.072	38.55	-24.08	50.0	11.45	QP	0.00	100	Vertical	Pass
5	249.462	42.09	-20.31	57.0	14.91	QP	31.90	200	Vertical	Pass
6	375.078	43.01	-17.24	57.0	13.99	QP	5.00	200	Vertical	Pass

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-18_19.13.17

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

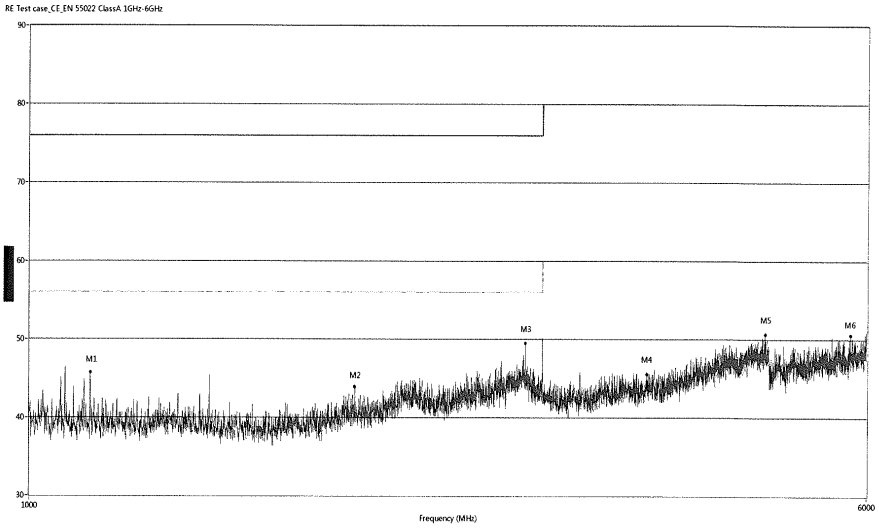


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1079.480	45.48	-3.78	76.0	30.52	Peak	125.20	100	Horizontal	Pass
1**	1079.480	32.15	-3.78	56.0	23.85	AV	125.20	100	Horizontal	Pass
2	1779.305	42.29	-1.45	76.0	33.71	Peak	146.70	100	Horizontal	Pass
3	2309.173	45.94	2.33	76.0	30.06	Peak	202.80	100	Horizontal	Pass
4	3245.939	44.69	9.01	80.0	35.31	Peak	137.10	100	Horizontal	Pass
5	4327.168	48.40	12.19	80.0	31.60	Peak	66.30	100	Horizontal	Pass
6	5265.184	49.86	14.61	80.0	30.14	Peak	1.70	100	Horizontal	Pass

Test result

Project Number: BL-SZ16A0139 #1
Test Time: 2016-11-18_19.14.58

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M2.3	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

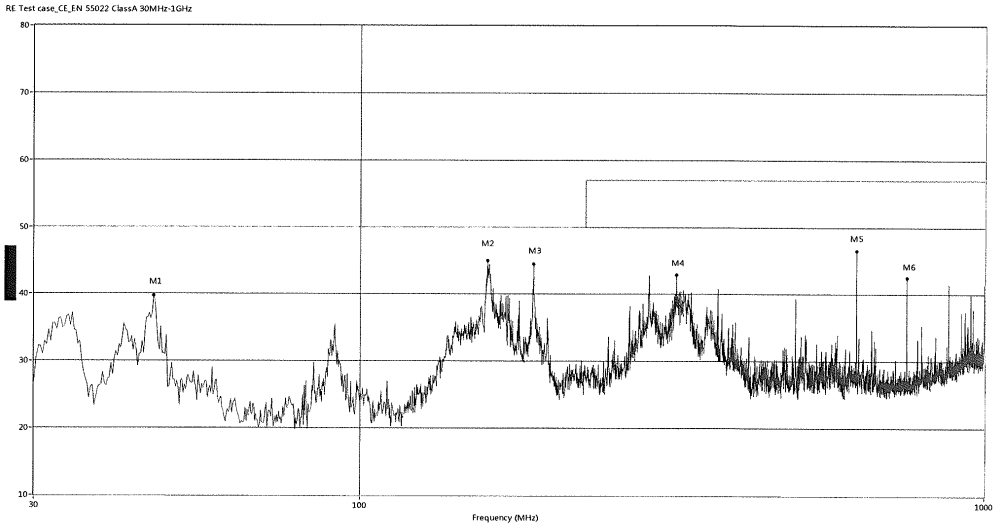


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1139.965	45.74	-4.13	76.0	30.26	Peak	105.40	100	Vertical	Pass
2	2008.248	43.87	0.12	76.0	32.13	Peak	356.70	100	Vertical	Pass
3	2893.027	49.47	5.77	76.0	26.53	Peak	30.10	100	Vertical	Pass
3**	2893.027	31.66	5.77	56.0	24.34	AV	30.10	100	Vertical	Pass
4	3743.064	45.57	10.74	80.0	34.43	Peak	0.50	100	Vertical	Pass
5	4818.295	50.66	13.90	80.0	29.34	Peak	217.10	100	Vertical	Pass
6	5800.550	50.60	15.43	80.0	29.40	Peak	250.00	100	Vertical	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-17_10.59.41

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

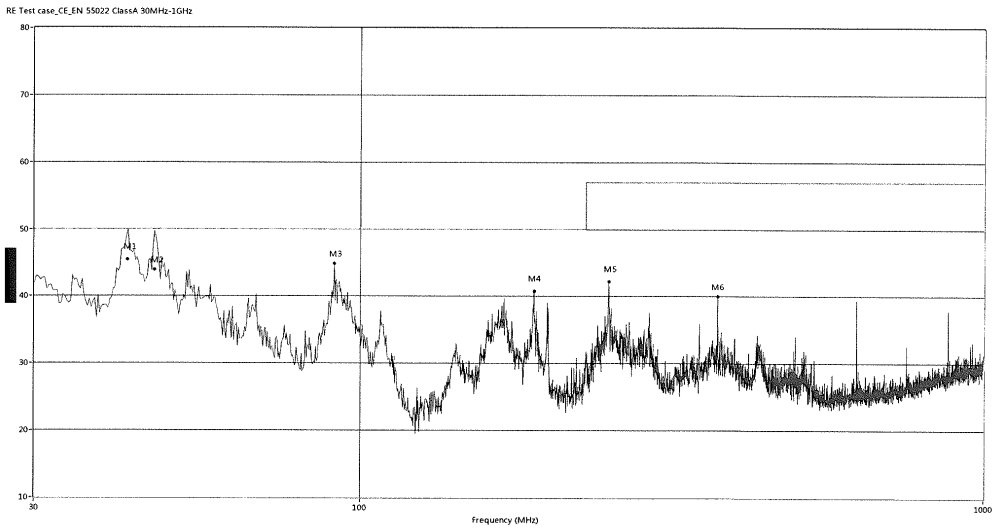


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	46.733	39.73	-19.58	50.0	10.27	QP	237.70	200	Horizontal	Pass
2	160.708	45.01	-24.24	50.0	4.99	QP	357.70	200	Horizontal	Pass
3	190.050	44.55	-22.29	50.0	5.45	QP	242.20	100	Horizontal	Pass
4	321.242	42.91	-18.52	57.0	14.09	QP	0.60	100	Horizontal	Pass
5	625.095	46.56	-11.93	57.0	10.44	QP	177.00	100	Horizontal	Pass
6	749.982	42.52	-10.06	57.0	14.48	QP	180.50	200	Horizontal	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-17_10.53.49

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

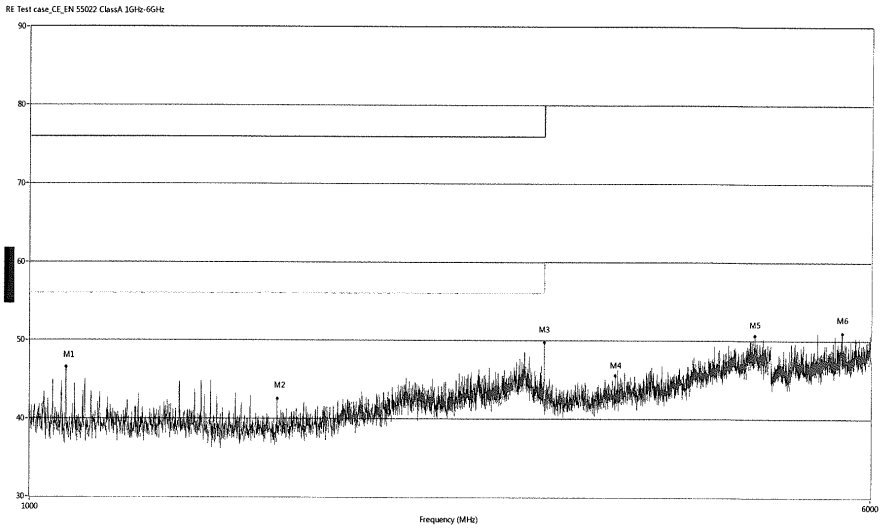


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	42.530	45.43	-19.82	50.0	4.57	QP	40.40	100	Vertical	Pass
2	46.890	43.94	-19.58	50.0	6.06	QP	198.50	112	Vertical	Pass
3	90.868	44.91	-22.79	50.0	5.09	QP	207.60	100	Vertical	Pass
4	190.292	40.78	-22.26	50.0	9.22	QP	359.10	200	Vertical	Pass
5	249.947	42.22	-20.31	57.0	14.78	QP	355.50	200	Vertical	Pass
6	375.078	40.00	-17.24	57.0	17.00	QP	0.00	200	Vertical	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-18_19.07.20

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON

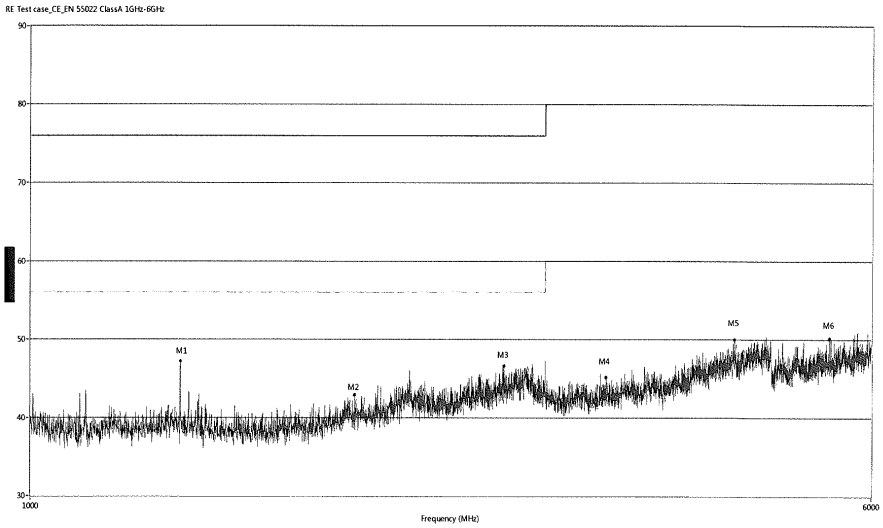


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1079.980	46.52	-3.87	76.0	29.48	Peak	119.20	100	Horizontal	Pass
2	1695.826	42.49	-1.63	76.0	33.51	Peak	300.70	100	Horizontal	Pass
3	3000.000	46.00	4.99	76.0	30.00	Peak	0.00	100	Horizontal	Pass
3**	3000.000	33.62	4.99	56.0	22.38	AV	0.00	100	Horizontal	Pass
4	3487.378	45.55	9.60	80.0	34.45	Peak	26.20	100	Horizontal	Pass
5	4699.825	50.69	13.28	80.0	29.31	Peak	5.50	100	Horizontal	Pass
6	5650.587	50.95	15.71	80.0	29.05	Peak	245.90	100	Horizontal	Pass

Test result

Project Number: BL-SZ16A0139 #2
Test Time: 2016-11-18_19.03.38

EUT Name:	Full Color LED Display	Test Engineer:	chengliang.luo
Manufacturer:	Shenzhen Absen Optoelectronic Co., Ltd	Test Standard:	EN55022
Model:	M3.4	Work Addition:	Normal
Temp.(oC):	25	Load:	AC 230/ 50Hz
Hum.:	55%	Mode:	ON



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1374.906	47.22	-2.55	76.0	28.78	Peak	200.70	100	Vertical	Pass
1**	1374.906	32.89	-2.55	56.0	23.11	AV	200.70	100	Vertical	Pass
2	1999.750	42.94	-0.23	76.0	33.06	Peak	139.90	100	Vertical	Pass
3	2749.063	46.59	4.49	76.0	29.41	Peak	205.10	100	Vertical	Pass
4	3414.646	45.18	9.25	80.0	34.82	Peak	359.60	100	Vertical	Pass
5	4504.874	49.97	12.67	80.0	30.03	Peak	170.70	100	Vertical	Pass
6	5493.127	49.44	15.09	80.0	30.56	Peak	343.80	100	Vertical	Pass

HA-PC Link Plus. Software v3.01. Firmware v3.02

Tested On : 19 Nov. 2016 16:03 for 150 Seconds.

Equipment Under Test : Full Color LED Display(M2.3)

Serial Number : BL-SZ16A0139 #1

Tested by : chengliang.luo

Supply Voltage : 229.3 to 230.3 Vrms 325.5 Vpk Frequency : 50.00 Hz

Supply Meets EN Requirements

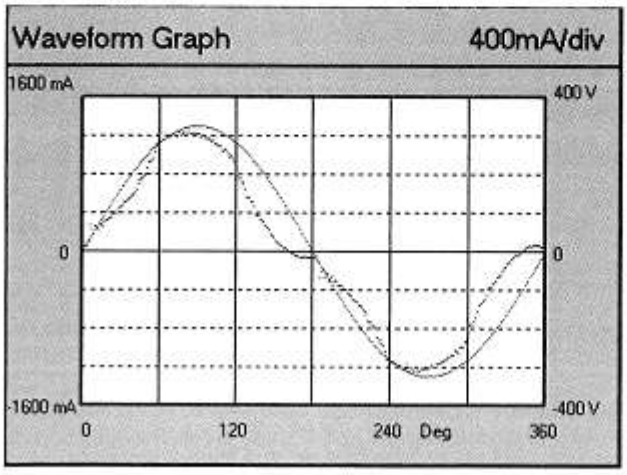
Load Power : 164.56 W 167.48 VA Power Factor 0.966

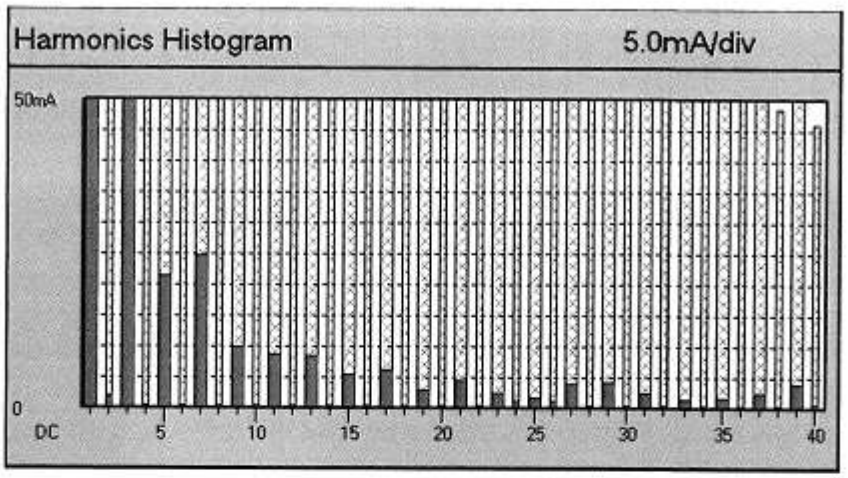
Load Current : 0.1 to 739.6 mArms 0.1 to 1151.0 mApk Crest Factor 1.567

I-THD(%) :20.7

THC(A) :0.147

Limits Applied : EN61000-3-2:2014 Class A Limits Apply.





Harmonic Number	Limit Current mA	Average (filtered) mA	% Limit	max. Value (Filtered) mA	% Limit	Assessment
Fundamental :		711.5				
2 :	1080.0	2.0	0.2	2.2	0.2	Pass
3 :	2300.0	142.4	6.2	142.6	6.2	Pass
4 :	430.0	0.5	0.1	0.5	0.1	Pass
5 :	1140.0	21.4	1.9	21.5	1.9	Pass
6 :	300.0	0.5	0.2	0.5	0.2	Pass
7 :	770.0	24.8	3.2	24.8	3.2	Pass
8 :	230.0	0.5	0.2	0.6	0.3	Pass
9 :	400.0	10.0	2.5	10.2	2.5	Pass
10 :	184.0	0.4	0.2	0.4	0.2	Pass
11 :	330.0	8.6	2.6	8.7	2.6	Pass

12 :	153.3	0.4	0.3	0.5	0.3	Pass
13 :	210.0	8.7	4.1	8.9	4.2	Pass
14 :	131.4	0.5	0.4	0.5	0.4	Pass
15 :	150.0	5.9	3.9	6.4	4.3	Pass
16 :	115.0	0.5	0.4	0.5	0.4	Pass
17 :	132.3	6.4	4.8	6.5	4.9	Pass
18 :	102.2	0.5	0.5	0.5	0.5	Pass
19 :	118.4	2.7	2.3	2.9	2.4	Pass
20 :	92.0	0.5	0.5	0.5	0.5	Pass
21 :	107.1	4.4	4.1	4.5	4.2	Pass
22 :	83.6	0.6	0.7	0.6	0.7	Pass
23 :	97.8	2.4	2.5	2.6	2.7	Pass
24 :	76.7	1.2	1.6	1.2	1.6	Pass
25 :	90.0	1.7	1.9	1.9	2.1	Pass
26 :	70.8	1.3	1.8	1.3	1.8	Pass
27 :	83.3	4.2	5.0	4.5	5.4	Pass
28 :	65.7	0.5	0.8	0.5	0.8	Pass
29 :	77.6	4.2	5.4	4.3	5.5	Pass
30 :	61.3	0.6	1.0	0.6	1.0	Pass
31 :	72.6	2.2	3.0	2.5	3.4	Pass
32 :	57.5	0.6	1.0	0.6	1.0	Pass
33 :	68.2	1.3	1.9	1.5	2.2	Pass

34 :		54.1	0.7	1.3	0.7	1.3	Pass
35 :		64.3	1.9	3.0	2.0	3.1	Pass
36 :		51.1	0.5	1.0	0.6	1.2	Pass
37 :		60.8	2.8	4.6	3.1	5.1	Pass
38 :		48.4	0.6	1.2	0.7	1.4	Pass
39 :		57.7	3.8	6.6	4.0	6.9	Pass
40 :		46.0	0.8	1.7	0.8	1.7	Pass
21 - 39	:	251.4	9.8	3.9	9.9	3.9	-

HA-PC Link Plus. Software v3.01. Firmware v3.02

Tested On : 17 Nov. 2016 10:21 for 150 Seconds.

Equipment Under Test : Full Color LED Display(M3.4)

Serial Number : BL-SZ16A0139 #2

Tested by : chengliang.luo

Supply Voltage : 230.0 Vrms @ 323.6 Vpk Frequency : 50.00 Hz

Supply Meets EN Requirements

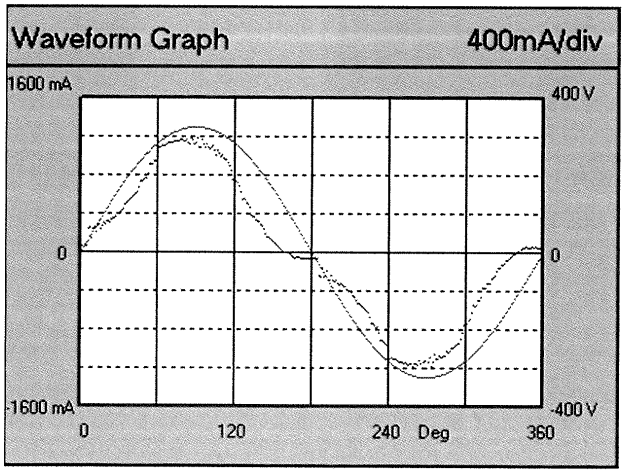
Load Power : 150.520 W 156.62 VA Power Factor 0.961

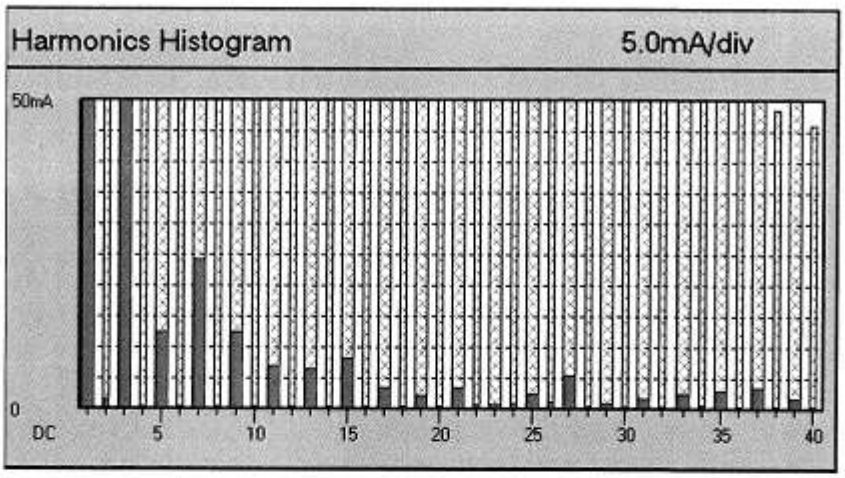
Load Current : 681.0 mArms 1055.2 to 1059.0 mApk Crest Factor 1.554

I-THD(%) :22.5

THC(A) :0.149

Limits Applied : EN61000-3-2:2014 Class A Limits Apply.





Harmonic Number	Limit Current mA	Average (filtered) mA	% Limit	max. Value (Filtered) mA	% Limit	Assessment
Fundamental :		663.9				
2 :	1080.0	1.5	0.1	1.6	0.1	Pass
3 :	2300.0	145.4	6.3	145.4	6.3	Pass
4 :	430.0	0.7	0.2	0.8	0.2	Pass
5 :	1140.0	13.5	1.2	13.7	1.2	Pass
6 :	300.0	0.6	0.2	0.7	0.2	Pass
7 :	770.0	24.5	3.2	24.6	3.2	Pass
8 :	230.0	0.8	0.3	0.9	0.4	Pass
9 :	400.0	12.7	3.2	12.8	3.2	Pass
10 :	184.0	0.7	0.4	0.7	0.4	Pass
11 :	330.0	6.8	2.1	6.9	2.1	Pass

12 :	153.3	0.5	0.3	0.6	0.4	Pass
13 :	210.0	6.8	3.2	6.9	3.3	Pass
14 :	131.4	0.5	0.4	0.6	0.5	Pass
15 :	150.0	8.1	5.4	8.1	5.4	Pass
16 :	115.0	0.7	0.6	0.7	0.6	Pass
17 :	132.3	3.9	2.9	3.9	2.9	Pass
18 :	102.2	0.6	0.6	0.8	0.8	Pass
19 :	118.4	2.3	1.9	2.3	1.9	Pass
20 :	92.0	0.5	0.5	0.6	0.7	Pass
21 :	107.1	3.5	3.3	3.6	3.4	Pass
22 :	83.6	0.6	0.7	0.7	0.8	Pass
23 :	97.8	0.9	0.9	0.9	0.9	Pass
24 :	76.7	1.2	1.6	1.2	1.6	Pass
25 :	90.0	2.0	2.2	2.1	2.3	Pass
26 :	70.8	1.3	1.8	1.4	2.0	Pass
27 :	83.3	6.1	7.3	6.2	7.4	Pass
28 :	65.7	0.8	1.2	0.8	1.2	Pass
29 :	77.6	0.6	0.8	0.6	0.8	Pass
30 :	61.3	0.7	1.1	0.7	1.1	Pass
31 :	72.6	1.9	2.6	2.0	2.8	Pass
32 :	57.5	0.6	1.0	0.6	1.0	Pass
33 :	68.2	2.3	3.4	2.5	3.7	Pass

34 :		54.1	0.5	0.9	0.5	0.9	Pass
35 :		64.3	2.9	4.5	3.1	4.8	Pass
36 :		51.1	0.7	1.4	0.8	1.6	Pass
37 :		60.8	3.8	6.3	4.0	6.6	Pass
38 :		48.4	0.6	1.2	0.8	1.7	Pass
39 :		57.7	1.1	1.9	1.3	2.3	Pass
40 :		46.0	0.8	1.7	0.8	1.7	Pass
21 - 39	:	251.4	9.4	3.7	9.5	3.8	-

Flicker
HA-PC Link Plus. Software v3.01. Firmware v3.02
Tested On : 19 Nov. 2016 18:34
Equipment Under Test : Full Color LED Display(M2.3)
Serial Number : BL-SZ16A0139 #1
Tested by : chengliang.luo

Supply Voltage : 229.3 to 230.3 Vrms 325.5 Vpk Frequency : 50.00 Hz
Load Power : 0.161 kW 0.168 kVA Power Factor 0.958
Load Current : 0.7 Arms 1.2 Apk Crest Factor 1.581

EN 61000-3-3:2013 - Voltage reduction is positive

Voltage Variations
Nominal Voltage: 230 Vrms
Highest Half-cycle level: -0.08%
Lowest Half-cycle level: +0.05%

d(max):	0.08%	Limit: 4%	PASS
t(max):	0.00seconds	Limit: 500ms	PASS

Steady State definition: >1000ms within +/- 0.2%
Largest d(c) change down: 0.00%
Largest d(c) change up: +0.00%
Largest d(c) change: 0.00% Limit: 3.3% PASS

Flicker

Short Term Flicker Pst:	0.16	Limit: 1.00	PASS
Long Term Flicker Plt:	0.10	Limit: 0.65	PASS

Pst Classifier		Plt Calculation	
Duration	Flicker	Interval	Pst
0.7%	0.81	1:	0.76
1.0%	0.00	2:	0.00
1.5%	0.00	3:	0.00
2.2%	0.00	4:	0.00
3%	0.00	5:	0.00
4%	0.00	6:	0.00
6%	0.00	7:	0.00
8%	0.00	8:	0.00
10%	0.00	9:	0.00
13%	0.00	10:	0.00
17%	0.00	11:	0.00
30%	0.00	12:	0.00
30%	0.00		
50%	0.00	Plt =	0.10
80%	0.00		

Flicker

HA-PC Link Plus. Software v3.01. Firmware v3.02
Tested On : 19 Nov. 2016 15:42
Equipment Under Test :Full Color LED Display(M3.4)
Serial Number :BL-SZ16A0139 #2
Tested by : chengliang.luo

Supply Voltage : 230.0 Vrms @ 323.6 Vpk Frequency : 50.00 Hz
Load Power : 0.150 kW 0.155 kVA Power Factor 0.961
Load Current : 0.7 Arms 1.1 Apk Crest Factor 1.604

EN 61000-3-3:2013 - Voltage reduction is positive

Voltage Variations
Nominal Voltage: 230 Vrms
Highest Half-cycle level: -0.08%
Lowest Half-cycle level: +0.06%

d(max):	0.07%	Limit: 4%	PASS
t(max):	0.00seconds	Limit: 500ms	PASS

Steady State definition: >1000ms within +/- 0.2%
Largest d(c) change down: 0.00%
Largest d(c) change up: +0.00%
Largest d(c) change: 0.00% Limit: 3.3% PASS

Flicker

Short Term Flicker Pst:	0.15	Limit: 1.00	PASS
Long Term Flicker Plt:	0.11	Limit: 0.65	PASS

Pst Classifier		Plt Calculation	
Duration	Flicker	Interval	Pst
0.7%	0.73	1:	0.69
1.0%	0.00	2:	0.00
1.5%	0.00	3:	0.00
2.2%	0.00	4:	0.00
3%	0.00	5:	0.00
4%	0.00	6:	0.00
6%	0.00	7:	0.00
8%	0.00	8:	0.00
10%	0.00	9:	0.00
13%	0.00	10:	0.00
17%	0.00	11:	0.00
30%	0.00	12:	0.00
30%	0.00		
50%	0.00	Plt =	0.11
80%	0.00		

	Electrostatic discharge Immunity	No:	TR4-5
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information

Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd	EUT Name: Full Color LED Display
Model Name: M2.3, M3.4	Temperature: 25 (15-35℃)
Test Standard: EN 55024	Humidity: 55 (30-60%RH)
Rating: AC 230/ 50Hz	Pressure: 102 (86-106kPa)
Operation Mode: ON	Test time: 2016.11.17

Level

air discharge: ☒±2kV ☒±4kV ☐±6kV ☒±8kV ☐± kV	Criterion	☐A; ☒B; ☐C;
Con discharge: ☒±2kV ☒±4kV ☐±6kV ☐±8kV ☐± kV		

Result

Test Point	Discharge Level kV	Discharge Mode	Number of Discharge	Performance	Verdict
Power Port	±2,4,8	☒Air, ☐Contact	50	normal	A
LED Light	±2,4,8	☒Air, ☐Contact	50	normal	A
Gap	±2,4,8	☒Air, ☐Contact	50	normal	A
Shell	±2,4,8	☒Air, ☐Contact	50	normal	A
Button	±2,4,8	☒Air, ☐Contact	50	normal	A
Indicator Panel	±2,4,8	☒Air, ☐Contact	50	normal	A
Screw & Metal	±2,4	☐Air, ☒Contact	50	normal	A
VCP	±2,4	☐Air, ☒Contact	50	normal	A
HCP	±2,4	☐Air, ☒Contact	50	normal	A

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo Data: 2016.11.17

	Radiated, Radio Frequency Electromagnetic Field Immunity	No:	TR4-7
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information			
Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd		EUT Name: Full Color LED Display	
Model Name: M2.3, M3.4		Temperature: 25 (15-35℃)	
Test Standard: EN 55024		Humidity: 55 (30-60%RH)	
Rating: AC 230/ 50Hz		Pressure: 102 (86-106kPa)	
Operation Mode: ON		Test time: 2016.11.17	
Level			
Radiated Field: ☐1V/m ☒3V/m ☐10V/m ☐30V/m		Criterion	☒A; ☐B; ☐C; ☐D

Result					
Frequency Range (MHz)	Antenna Polarity	Position	Level (V/m)	Performance	Verdict
80 - 1000	☒ Horizontal ☒ Vertical	☒ Front ☒ Right ☒ Rear ☒ Left	3	normal	A

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo Data:2016.11.17

	Electrical Fast Transient/Burst Immunity	No:	TR4-4
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information

Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd	EUT Name: Full Color LED Display
Model Name: M2.3, M3.4	Temperature: 25 (15-35℃)
Test Standard: EN 55024	Humidity: 55 (30-60%RH)
Rating: AC 230/ 50Hz	Pressure: 102 (86-106kPa)
Operation Mode: ON	Test time: 2016.11.17

Level

☒Power port: ☒±0.5kV☒±1kV ☐±2kV ☐± kV	Criterion	☐A; ☒B; ☐C
☒Signal ports and telecommunication ports: ☒±0.5kV☐±1kV ☐±2kV ☐± kV		

Parameters

Pulse: ☒5/50ns; ☐Other _____;	Frequency: ☒5kHz, ☐0.25kHz, ☐Other _____;
Duration: ☒15ms, ☐Other _____;	Interval: ☒300ms, ☐Other _____;
Test time: ☒120s	

Result

Test Mode	Level / kV	Performance	Verdict
L	±0.5, 1	normal	A
N	±0.5, 1	normal	A
PE	±0.5, 1	normal	A
L.N	±0.5, 1	normal	A
L.PE	±0.5, 1	normal	A
N.PE	±0.5, 1	normal	A
L.N.PE	±0.5, 1	normal	A
Signal port	±0.5	normal	A

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo Data :2016.11.17

	Surge Immunity	No:	TR4-8
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information			
Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd		EUT Name: Full Color LED Display	
Model Name: M2.3, M3.4		Temperature: 25 (15-35℃)	
Test Standard: EN 55024		Humidity: 55 (30-60%RH)	
Rating: AC 230/ 50Hz		Pressure: 102 (86-106kPa)	
Operation Mode: ON		Test time: 2016.11.17	
Level			
☒AC power port: ☒±0.5kV☒±1kV ☒±2kV ☐± kV	Criterion	☐A; ☒B; ☒C	
☐DC power port: ☐±0.5kV☐±1kV ☐±2kV ☐± kV			
☒Signal and TEL: ☒±0.5kV☒±1kV ☐±2kV ☐± kV			
Parameters			
Waveform: ☒1.2/50μs; ☒10/700μs;		Phase position(AC power port): ☒0°☒90°☒180°☒270°;;	
Number: Negative/Positive 5 times		Duration: ☒60s	

Result

Test Mode	Level / kV	Performance	Verdict
L-N	±0.5, 1	normal	A
L-PE	±0.5, 1,2	normal	A
N-PE	±0.5, 1,2	normal	A
Signal port	±0.5,1	normal	A

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo	Data: 2016.11.17

	Conducted Disturbances Immunity	No:	TR4-2
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information	
Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd	EUT Name: Full Color LED Display
Model Name: M2.3, M3.4	Temperature: 25 (15-35℃)
Test Standard: EN 55024	Humidity: 55 (30-60%RH)
Rating: AC 230/ 50Hz	Pressure: 102 (86-106kPa)
Operation Mode: ON	Test time: 2016.11.17

Level		
Radiated Field: ☐1V rms ☒3V rms ☐10V rms	Criterion	☒A; ☐B; ☐C

Result

TEST MODE	Frequency Range(MHz)	Level (V rms)	Performance
AC Mains	0.15-80	3	normal
Signal port	0.15-80	3	normal

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo Data : 2016.11.17

	Voltage Dips, Short Interruptions and Voltage Variations Immunity	No:	TR4-3
		Version:	V1.0
		Item:	BL-SZ16A0139

Basic information	
Manufacturer: Shenzhen Absen Optoelectronic Co., Ltd	EUT Name: Full Color LED Display
Model Name: M2.3, M3.4	Temperature: 25 (15-35℃)
Test Standard: EN 55024	Humidity: 55 (30-60%RH)
Rating: AC 230/ 50Hz	Pressure: 102 (86-106kPa)
Operation Mode: ON	Test time: 2016.11.17

Level		
☒EN 55024 ITE	☐EN 301489-1 R&TTE	☐else
Drop >95%U_T,0.5T, Class B Drop >30%U_T,25T, Class C Drop >95%U_T,250T, Class C	Drop>100%U_T,0.5T, Class B Drop >100%U_T,1T, Class B Drop >30%U_T,25T, Class B Drop >95%U_T,250T, Class B	

Result

Test Mode	Voltage Drop	Duration(ms)	Performance	Verdict
Voltage Dips	100	10	normal	A
	30	500	normal	A
Short Interruptions	100	5000	reboot	C

General Performance Criteria

The dwell time at each frequency is according to the standard being applied and the basic standard.

A: Normal performance within the specification limits

B: Temporary degradation or loss of function or performance which is self-recoverable

C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Test Verdict: ☒Pass;	Test engineer: chengliang.luo	Data: 2016.11.17

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)	± 3.23 dB ± 3.23 dB	± 4.0 dB ± 3.6 dB
Power disturbance	Level accuracy (30MHz to 300MHz)	± 2.80 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.97 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz, Horizontal) (30MHz to 1000MHz, Vertical)	± 4.30 dB ± 4.30 dB	± 5.2 dB
Radiated Emission	Level accuracy (above 1000MHz, Horizontal) (above 1000MHz, Vertical)	± 4.81 dB ± 4.81 dB	N/A
Mains Harmonic	Voltage	± 0.1%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.8%	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.