

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 1 of 21

Applicant : Shanghai Goodview Electronics Technology Co., Ltd.
Address of Applicant : Room 866, NO.888, West Huanhu 2 Road,
NanhuiXincheng Town, Pudong, Shanghai, China

Product Name : Double-sided digital poster installation/Ultrathin Digital Poster
Model No. : D*****,
(*=A to Z, 0 to 9,blank,just difference in appearance color,sales area customer code ,and software version)
Sample No. : E20010035-01#01
FCC ID : 2AVB8YLDH
Standards : FCC CFR47 Part 15, Subpart C

Date of Receipt : 2020-1-06
Date of Test : 2020-1-06 ~ 2020-4-18
Date of Issue : 2020-4-18

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 2 of 21

Revision Record			
Version	Date	Revisions	Revised By
1.0	2019-12-10	Original	shi
2.0	2020-4-10	Update form	jesse

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 3 of 21

Contents

1	GENERAL INFORMATION	4
1.1	TESTING LABORATORY	4
1.2	DETAILS OF APPLICATION	4
1.3	DETAILS OF EUT	4
1.4	TEST METHODOLOGY.....	5
2	TEST CONDITION	6
2.1	ENVIRONMENTAL CONDITIONS	6
2.2	EQUIPMENT LIST	6
2.3	MEASUREMENT UNCERTAINTY.....	6
3	TEST SET-UP AND OPERATION MODES	7
3.1	DETAILS OF TEST MODE	7
3.2	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	7
3.3	SUPPORT SOFTWARE.....	7
3.4	TEST SETUP DIAGRAM	8
4	TEST RESULTS	10
4.1	TRANSMITTER REQUIREMENT & TEST SUITES	10
4.1.1	<i>Antenna Requirement</i>	<i>10</i>
4.1.2	<i>Maximum Conducted Output Power</i>	<i>11</i>
4.1.3	<i>20dB Bandwidth and 99% Bandwidth.....</i>	<i>12</i>
4.1.4	<i>Conducted Spurious Emission & Authorized-band band-edge.....</i>	<i>13</i>
4.1.5	<i>Spurious Emission</i>	<i>14</i>
4.1.6	<i>Band Edge (Restricted-band band-edge)</i>	<i>15</i>
4.1.7	<i>Hopping Frequency Separation</i>	<i>16</i>
4.1.8	<i>Number of Hopping Frequency.....</i>	<i>17</i>
4.1.9	<i>Time of Occupancy.....</i>	<i>18</i>
4.2	MAINS EMISSIONS	19
4.2.1	<i>Conducted Emission on AC Mains.....</i>	<i>19</i>

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 4 of 21

1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Services (Shanghai) Co., Ltd.
Address	155 Pingbei Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Company Name	Shanghai Goodview Electronics Technology Co., Ltd.
Address	Room 866, NO.888, West Huanhu 2 Road, NanhuiXincheng Town, Pudong, Shanghai, China
Contact Person	Hongyue Xu
Telephone	15618060409
Email	xuhongyue@goodview.com

1.3 Details of EUT

Product Name	Double-sided digital poster installation/Ultrathin Digital Poster
Brand Name	GOODVIEW
Model No.	D****, (*=A to Z, 0 to 9,blank,just difference in appearance color,sales area customer code ,and software version)
FCC ID	2AVB8YLDH
Mode of Operation	Bluetooth BR/EDR
Frequency Range	2400MHz ~ 2483.5MHz
Number of Channels	79 (at intervals of 1 MHz)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type	External Antenna
Antenna Gain	3 dBi
Extreme Temperature Range	10℃~ +40℃
Test Voltage	AC 100~240V

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 5 of 21

1.4 Test Methodology

47 CFR Part 15, Subpart C (10-1-16 Edition)	Miscellaneous Wireless Communications Services
KDB Publication 558074 D01 v05r02	15.247 Meas Guidance.
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 6 of 21

2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Due Date
Spectrum Analyzer	Keysight	N9020B	MY59260184	2020-07-28
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2020-06-24
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2020-06-19
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2020-06-19
V-network	SCHWARZBECK	NSLK 8127	8127-902	2020-02-20
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	100687	2020-08-22
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2020-06-06
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2020-06-06
Loop Antenna	SCHWARZBECK	FMZB 1513	N/A	2021-03-19
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2020-07-26
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2020-06-26
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2020-08-28
Test Software	BL	BL410_E	N/A	N/A

2.3 Measurement Uncertainty

Parameter	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	30 MHz – 1 GHz	± 3 dB
	> 1GHz	± 3 dB

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 7 of 21

3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel(CH0)	2402MHz
The middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz

The basic operation modes are:

- A. On
 - 1. BR/EDR mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - iv. Hopping mode
 - b. Receiving
 - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	TP00083A	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	/	RF Test Tool

TEST REPORT

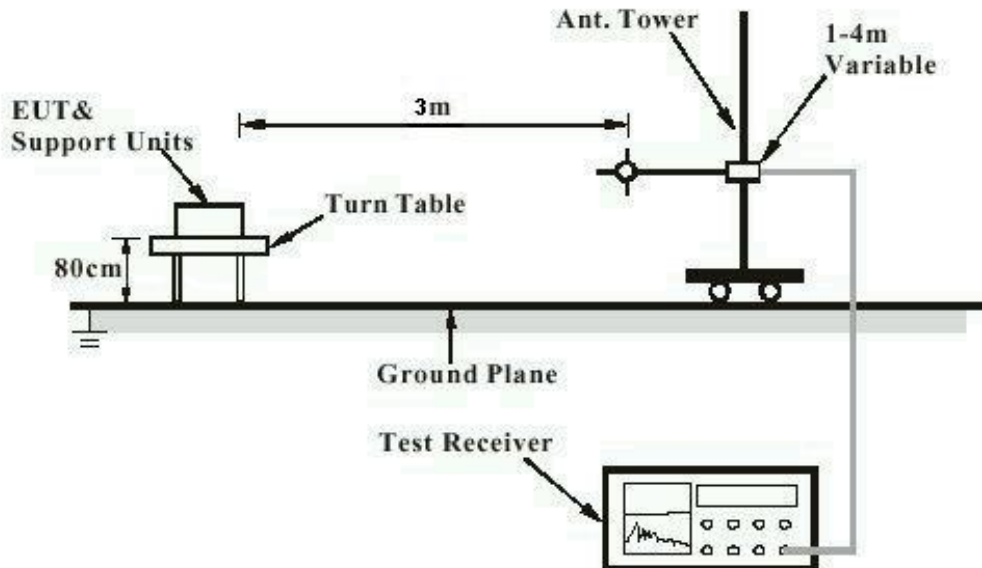
Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 8 of 21

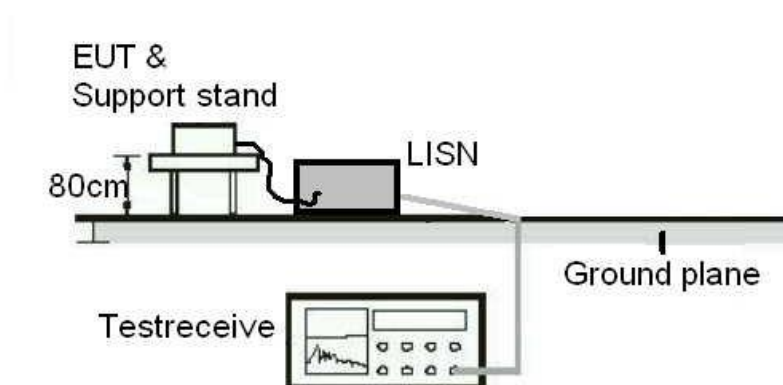
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Conduction Measurement



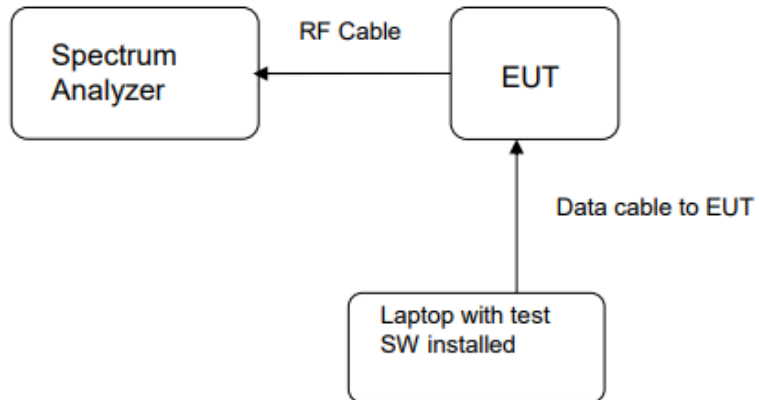
TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 9 of 21

Diagram of Measurement Equipment Configuration for Transmitter Measurement



TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 10 of 21

4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard	: FCC Part 15.247(b)(4), Part 15.203
Requirement	: The use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 3 dBi. The antenna is with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 11 of 21

4.1.2 Maximum Conducted Output Power

RESULT:

PASS

Test standard : FCC Part 15.247(b)(1)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 1: Maximum Conducted Output Power

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(mW)	
GFSK	2402	7.04	5.06	< 1
	2441	6.68	4.66	
	2480	6.06	4.04	
$\pi/4$ -DQPSK	2402	8.70	7.41	< 0.125
	2441	8.35	6.84	
	2480	7.87	6.12	
8-DPSK	2402	8.78	7.55	< 0.125
	2441	8.20	6.61	
	2480	8.05	6.38	

Note :

1. Test plots please refer to the annex document "Annex A. Peak Output Power of SHE20010035-01BE" total 14 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 12 of 21

4.1.3 20dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 2: 20dB Bandwidth and 99% Bandwidth

Test Mode	Test Channel (MHz)	99% Bandwidth (MHz)	20dB Bandwidth (MHz)
GFSK	2402	0.8116	0.5686
	2441	0.8111	0.5685
	2480	0.8088	0.5686
8-DPSK	2402	1.0361	1.0208
	2441	1.0368	1.0231
	2480	1.0378	1.0237

Note :

1. Test plots please refer to the annex document "Annex A. 20db and 99% bandwidth of SHE20010035-01BE" total 8 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 13 of 21

4.1.4 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard	: FCC Part 15.247(d)
Requirement	: ANSI C63.10-2013
Kind of test site	: Shielded room

Test setup

Test Channel	: Low/Middle/High for spurious, Low/High for Band Edge
Operation Mode	: A.1.a
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

Note :

- 1.Test plots please refer to the annex document "Annex A. Conducted Spurious Emissions of SHE20010035-01BE" total 29 page
- 2.Test plots please refer to the annex document "Annex A. Conducted Spurious Emissions(hopping) of SHE20010035-01BE" total 11 page
- 3.Test plots please refer to the annex document "Annex A. Bandedge(H)--CSE of SHE20010035-01BE" total 10 page
- 4.Test plots please refer to the annex document "Annex A. Bandedge(L)--CSE of SHE20010035-01BE" total 10 page
- 5.Test plots please refer to the annex document "Annex A. Bandedge(hopping)--CSE of SHE20010035-01BE" total 6 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 14 of 21

4.1.5 Spurious Emission

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A
Ambient temperature	: 25°C
Relative humidity	: 52%

Notes:

1. Test plots please refer to the annex document "Annex A RADIATED SPURIOUS EMISSION DATA of SHE20010035-01BE". total 52 page
2. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
3. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
4. The EUT is working in the Normal link mode below 1 GHz.

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 15 of 21

4.1.6 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1
Ambient temperature	: 25°C
Relative humidity	: 52%

Note:

1. Test plots please refer to the annex document "Annex A RADIATED SPURIOUS EMISSION DATA of SHE20010035-01BE". total 52 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 16 of 21

4.1.7 Hopping Frequency Separation

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)
RSS-247 5.1(2)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 25°C
Relative humidity : 52%

Table 3: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	0.998	≥ 25kHz or two-thirds of 20dB bandwidth
8-DPSK	2441	1	

Note:

1. Test plots please refer to the annex document “Annex A. Hopping Frequency Separation of SHE20010035-01BE”.
total 4 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 17 of 21

4.1.8 Number of Hopping Frequency

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 25°C
Relative humidity : 52%

Table 4: Number of Hopping Frequency

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

Note:

1. Test plots please refer to the annex document “Annex A. Number of Hopping Frequency of SHE20010035-01BE”.
total 6 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 18 of 21

4.1.9 Time of Occupancy

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii)
RSS-247 5.1(4)
Requirement : ANSI C63.10-2013
Kind of test site : Shielded room

Test setup

Test Channel : Middle
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 52%

Table 5: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell (ms)	Limit (s)
GFSK	DH1	0.413	132.16	0.4
	DH3	1.667	266.72	0.4
	DH5	2.913	310.72	0.4
8-DPSK	DH1	0.413	132.16	0.4
	DH3	1.673	267.68	0.4
	DH5	2.920	311.47	0.4

Note:

For DH1 package type:

Total of Dwell = Pulse Time*(1600/2)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH3 package type:

Total of Dwell = Pulse Time*(1600/4)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH5 package type:

Total of Dwell = Pulse Time*(1600/6)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

1. Test plots please refer to the annex document "Annex A. Time of Occupancy of SHE20010035-01BE". total 8 page

TEST REPORT

Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 19 of 21

4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a) RSS-Gen 8.8
Requirement	: ANSI C63.10-2013
Kind of test site	: Shielded room

Test setup

Input Voltage	: AC 120V, 60Hz; AC 240V, 50Hz
Operation Mode	: A.1.a
Earthing	: Not Connected
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

TEST REPORT

Report No.: SHE20010035-01BE

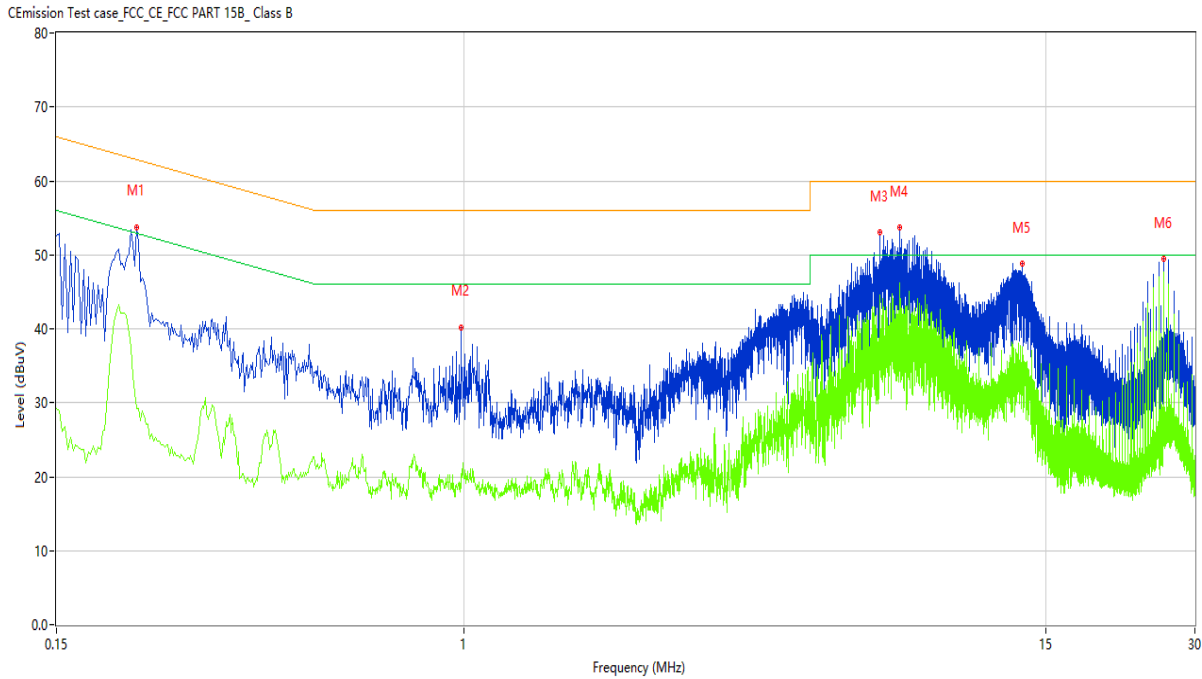
Date: 2020-4-18

Page 20 of 21

Note:

The all configurations were tested respectively, but only the worst configuration shown here.

Figure 1: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.218	53.85	10.14	62.89	-9.04	Peak	L	Pass
1*	0.218	47.13	10.14	62.89	-15.76	QP	L	Pass
1**	0.218	29.19	10.14	52.89	-23.70	AV	L	Pass
2	0.986	40.42	10.15	56.00	-15.58	Peak	L	Pass
2*	0.986	27.97	10.15	56.00	-28.03	QP	L	Pass
2**	0.986	20.38	10.15	46.00	-25.62	AV	L	Pass
3	6.918	52.68	10.31	60.00	-7.32	Peak	L	Pass
3*	6.918	47.21	10.31	60.00	-12.79	QP	L	Pass
3**	6.918	43.68	10.31	50.00	-6.32	AV	L	Pass
4	7.592	53.09	10.32	60.00	-6.91	Peak	L	Pass
4*	7.592	48.49	10.32	60.00	-11.51	QP	L	Pass
4**	7.592	46.19	10.32	50.00	-3.81	AV	L	Pass
5	13.438	47.70	10.45	60.00	-12.30	Peak	L	Pass
5*	13.438	43.67	10.45	60.00	-16.33	QP	L	Pass
5**	13.438	37.00	10.45	50.00	-13.00	AV	L	Pass
6	25.970	50.64	10.52	60.00	-9.36	Peak	L	Pass
6*	25.970	48.32	10.52	60.00	-11.68	QP	L	Pass
6**	25.970	47.29	10.52	50.00	-2.71	AV	L	Pass

TEST REPORT

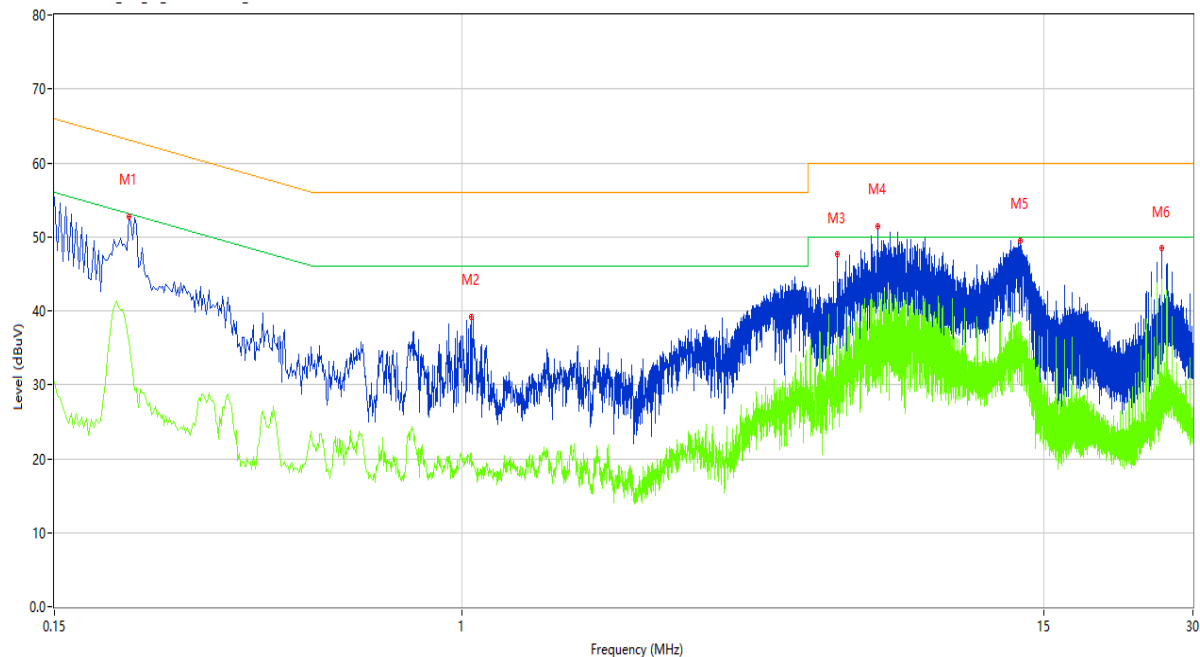
Report No.: SHE20010035-01BE

Date: 2020-4-18

Page 21 of 21

Figure 2: Conducted Emission on AC Mains, N Phase

CEmission Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.212	54.04	10.14	63.13	-9.09	Peak	N	Pass
1*	0.212	47.69	10.14	63.13	-15.44	QP	N	Pass
1**	0.212	35.99	10.14	53.13	-17.14	AV	N	Pass
2	1.046	41.45	10.15	56.00	-14.55	Peak	N	Pass
2*	1.046	30.52	10.15	56.00	-25.48	QP	N	Pass
2**	1.046	20.26	10.15	46.00	-25.74	AV	N	Pass
3	5.734	47.22	10.27	60.00	-12.78	Peak	N	Pass
3*	5.734	41.91	10.27	60.00	-18.09	QP	N	Pass
3**	5.734	38.82	10.27	50.00	-11.18	AV	N	Pass
4	6.912	51.02	10.31	60.00	-8.98	Peak	N	Pass
4*	6.912	44.32	10.31	60.00	-15.68	QP	N	Pass
4**	6.912	40.31	10.31	50.00	-9.69	AV	N	Pass
5	13.442	49.71	10.45	60.00	-10.29	Peak	N	Pass
5*	13.442	45.29	10.45	60.00	-14.71	QP	N	Pass
5**	13.442	36.93	10.45	50.00	-13.07	AV	N	Pass
6	25.978	49.47	10.52	60.00	-10.53	Peak	N	Pass
6*	25.978	46.46	10.52	60.00	-13.54	QP	N	Pass
6**	25.978	44.24	10.52	50.00	-5.76	AV	N	Pass

End of the report