FCC PART 15, CLASS B

TEST REPORT

For

Collage Investments LLC.

11437 NW 34 STREET, DORAL, FLORIDA 33178 U.S.A

FCC ID: GAO-MAX40

Report Type:	**Product Type:**
Original Report	3G smartphone

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Report Number:	RKS1501060001-00A
Report Date:	2015-1-8
Reviewed By:	Jesse huang EMC Manager
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Collage Investments LLC.'s product, model number: MAX4.0 (FCC ID: GAO-MAX40) or the "EUT" in this report was a 3G smartphone, which was measured approximately: 120.65 mm (L) x63.5 mm (W) x 11.4 mm (H), rated with input voltage: DC 3.7 V rechargeable Li-ion battery. The highest operating frequency is 1.2GHz.

**All measurement and test data in this report was gathered from production sample serial number: 000008 (Assigned by the BACL, (Kunshan). The EUT supplied by the applicant was received on 2014-12-26*

Objective

This test report is prepared on behalf of Collage Investments LLC. in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

Related Submittal(s)/Grant(s)

Part 15.247 DSS and DTS, Part 22H/24E PCE submissions with ID: GAO-MAX40.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the Chenghu Luke Road, Kunshan Development Zone No.248, Kunshan, Jiangsu, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode 1: Downloading
EUT operation mode 2: Charging

EUT Exercise Software

"BurnIn test v5.3" exercise software was used.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

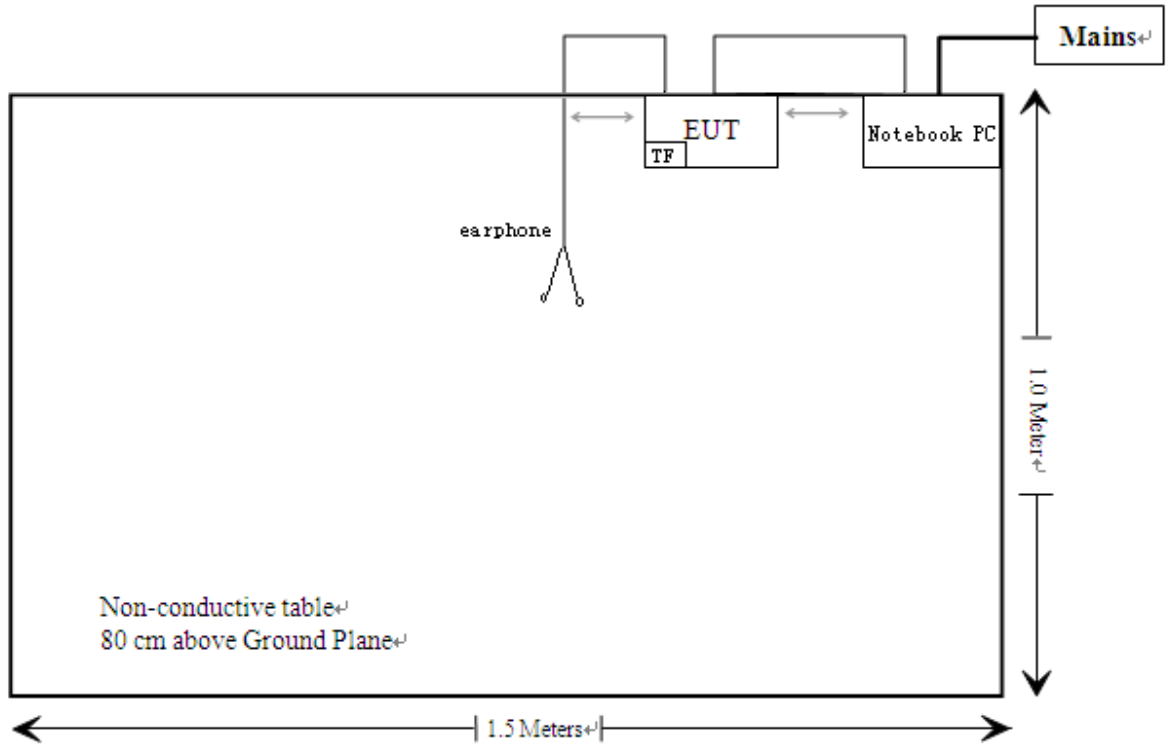
Manufacturer	Description	Model	Serial Number
LENOVO	Notebook PC	T400	127BP2X
TF Card	sandisk	4G	N.A
AC/DC ADAPTER	N.A	ODL-28850100	N.A
Earphone	N.A	N.A	N.A

External I/O Cable

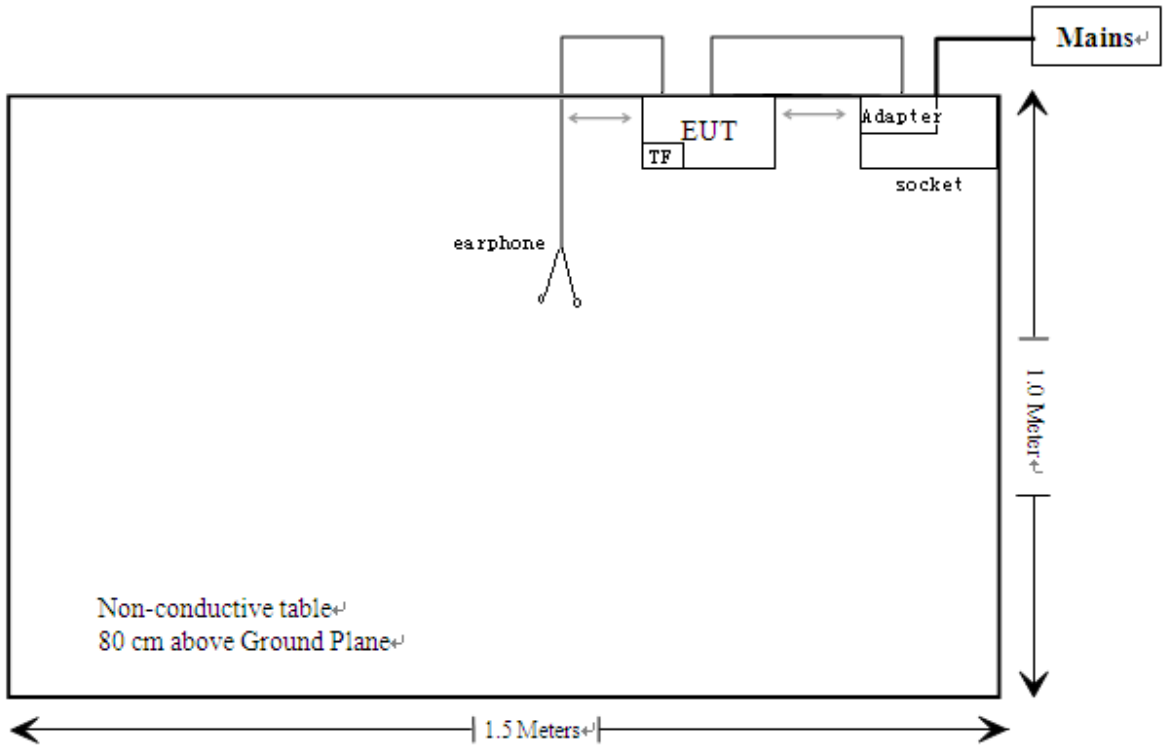
Cable Description	Length (m)	From/Port	To
Unshielding Detachable USB Cable	1.0	EUT	PC
Unshielding Detachable USB Cable	1.0	EUT	ADAPTER

Block Diagram of Test Setup

EUT operation mode 1: Downloading



EUT operation mode 2: Charging



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Spurious Emissions	Compliance

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.107

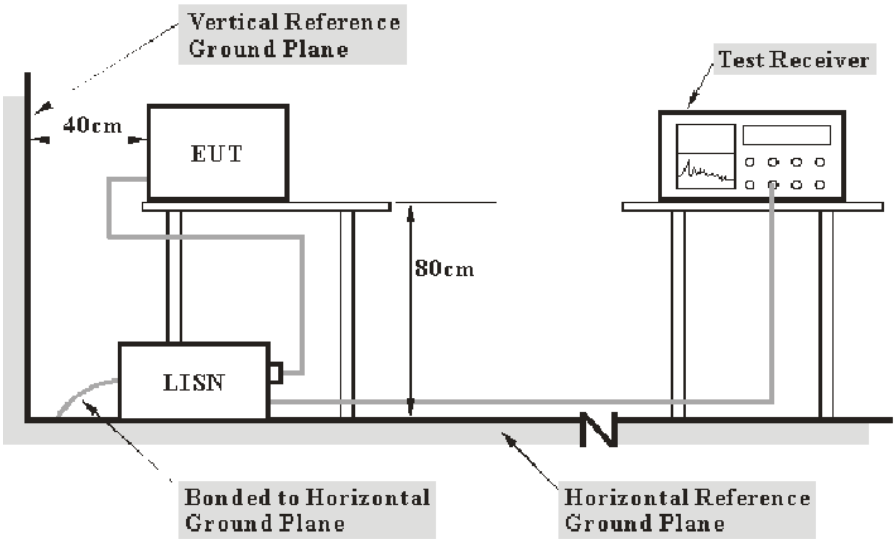
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Kunshan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with per ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the host PC/Adapter was connected to the first LISN and the other relevant equipments were conncected to the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	831294/005	2014-09-16	2015-09-16
Rohde & Schwarz	LISN	ESH3-Z5	12005	2014-09-16	2015-09-16
Rohde & Schwarz	LISN	ESH3-Z5	12008	2014-09-16	2015-09-16
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	--	--

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –(QuasiPeak &Average)

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

10.83 dB at 0.186000 MHz in the **Line** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL., $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

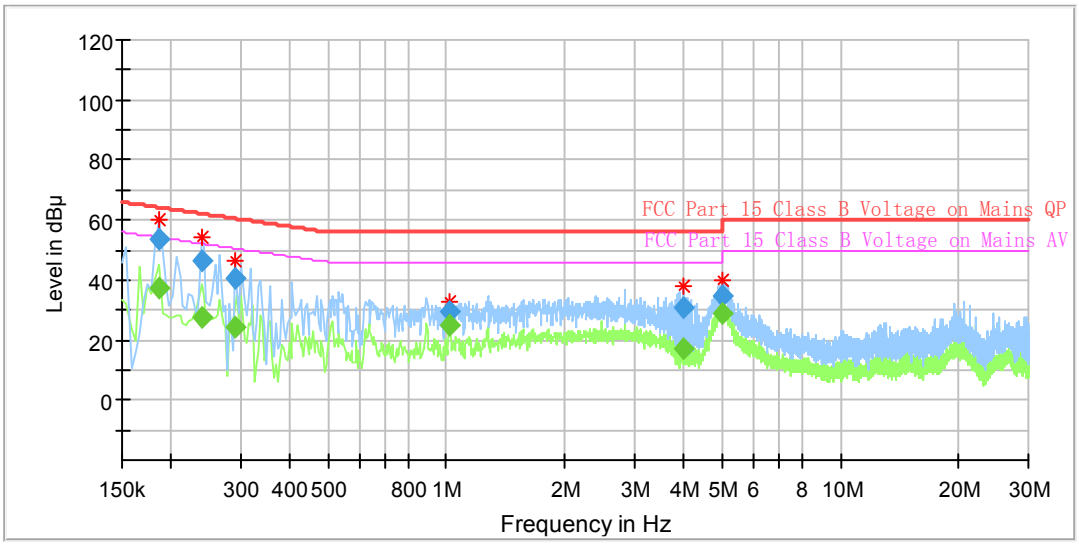
Environmental Conditions

Temperature:	27℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen.tian on 2015-1-5

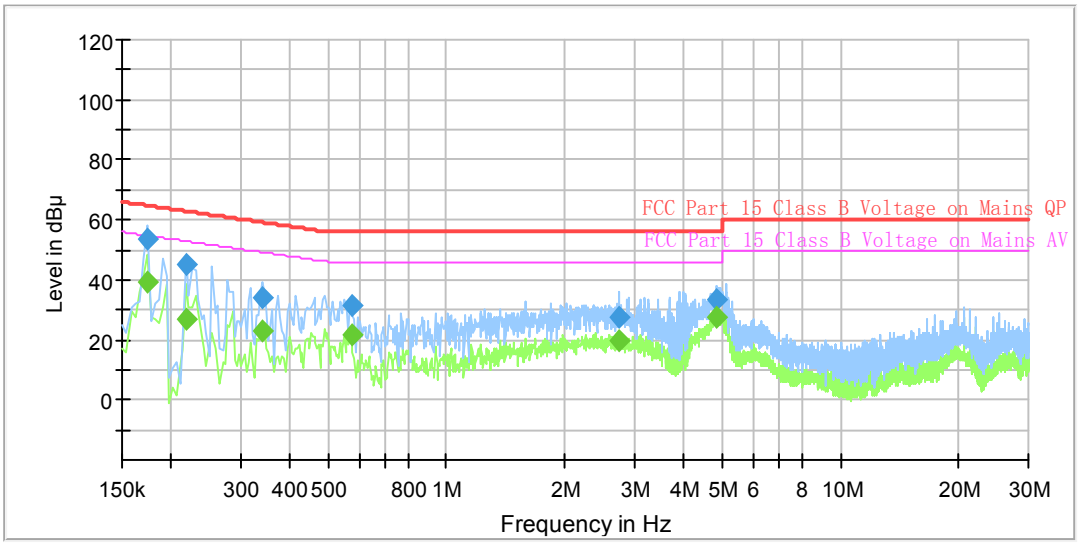
EUT Operation Mode: Downloading

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corrected Factor. (dB)
0.186000	---	37.59	54.21	16.62	9.000	L1
0.186000	53.38	---	64.21	10.83	9.000	L1
0.238000	---	27.49	52.17	24.68	9.000	L1
0.238000	46.54	---	62.17	15.63	9.000	L1
0.290000	---	24.11	50.52	26.41	9.000	L1
0.290000	40.42	---	60.52	20.10	9.000	L1
1.018000	---	25.00	46.00	21.00	9.000	L1
1.018000	29.57	---	56.00	26.43	9.000	L1
4.002000	---	17.28	46.00	28.72	9.000	L1
4.002000	30.65	---	56.00	25.35	9.000	L1
4.994000	---	28.82	46.00	17.18	9.000	L1
4.994000	34.63	---	56.00	21.37	9.000	L1

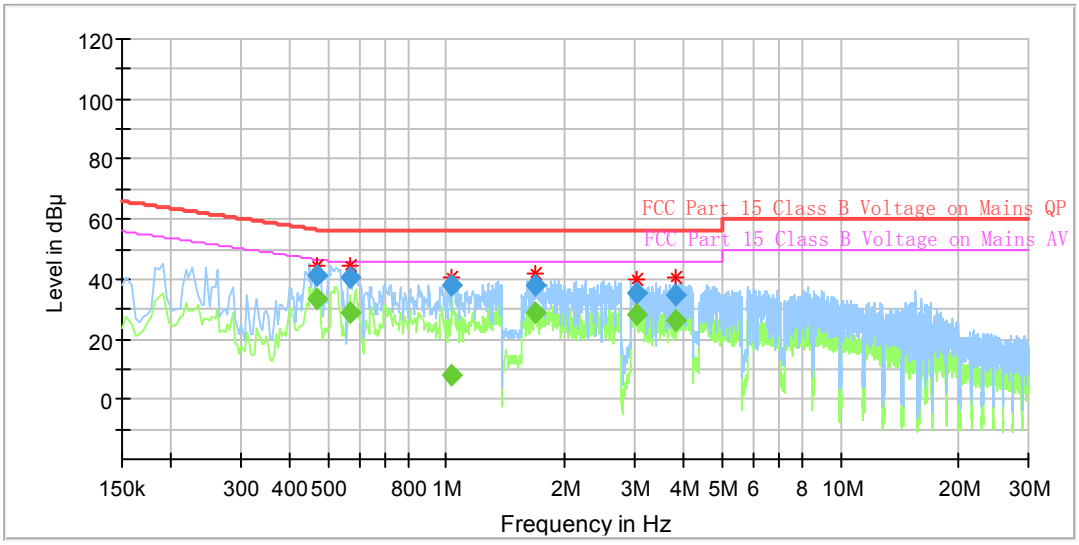
AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Correction Factor. (dB)
0.174000	---	38.99	54.77	15.78	N	1.0
0.174000	53.32	---	64.77	11.45	N	1.0
0.218000	---	27.08	52.89	25.81	N	1.0
0.218000	45.02	---	62.89	17.87	N	1.0
0.342000	---	23.16	49.15	25.99	N	1.0
0.342000	34.19	---	59.15	24.96	N	1.0
0.574000	---	21.76	46.00	24.24	N	1.0
0.574000	31.47	---	56.00	24.53	N	1.0
2.746000	---	19.87	46.00	26.13	N	1.3
2.746000	27.56	---	56.00	28.44	N	1.3
4.846000	---	27.69	46.00	18.31	N	1.4
4.846000	33.45	---	56.00	22.55	N	1.4

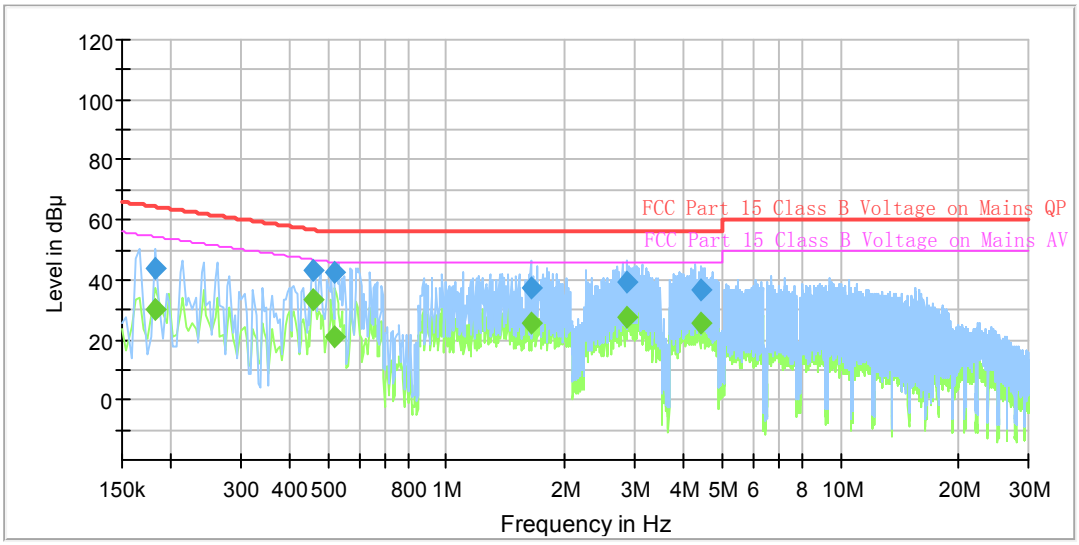
EUT Operation Mode: Charging

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corrected Factor. (dB)
0.470000	---	33.62	46.51	12.89	L1	1.0
0.470000	41.21	---	56.51	15.30	L1	1.0
0.566000	---	28.92	46.00	17.08	L1	1.0
0.566000	40.75	---	56.00	15.25	L1	1.0
1.034000	---	7.79	46.00	38.21	L1	1.1
1.034000	37.71	---	56.00	18.29	L1	1.1
1.670000	---	28.78	46.00	17.22	L1	1.1
1.670000	38.23	---	56.00	17.77	L1	1.1
3.022000	---	28.44	46.00	17.56	L1	1.2
3.022000	35.18	---	56.00	20.82	L1	1.2
3.810000	---	26.11	46.00	19.89	L1	1.3
3.810000	34.94	---	56.00	21.06	L1	1.3

AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Correction Factor. (dB)
0.182000	---	30.21	54.39	24.18	N	1.0
0.182000	43.70	---	64.39	20.69	N	1.0
0.458000	---	33.19	46.73	13.54	N	1.0
0.458000	42.96	---	56.73	13.77	N	1.0
0.522000	---	21.29	46.00	24.71	N	1.0
0.522000	42.50	---	56.00	13.50	N	1.0
1.634000	---	25.52	46.00	20.48	N	1.2
1.634000	37.45	---	56.00	18.55	N	1.2
2.866000	---	27.39	46.00	18.61	N	1.3
2.866000	39.08	---	56.00	16.92	N	1.3
4.422000	---	25.49	46.00	20.51	N	1.3
4.422000	36.92	---	56.00	19.08	N	1.3

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss
The corrected factor has been input into the transducer of the test software.
2) Margin = Limit –(QuasiPeak&Average)

FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §15.109

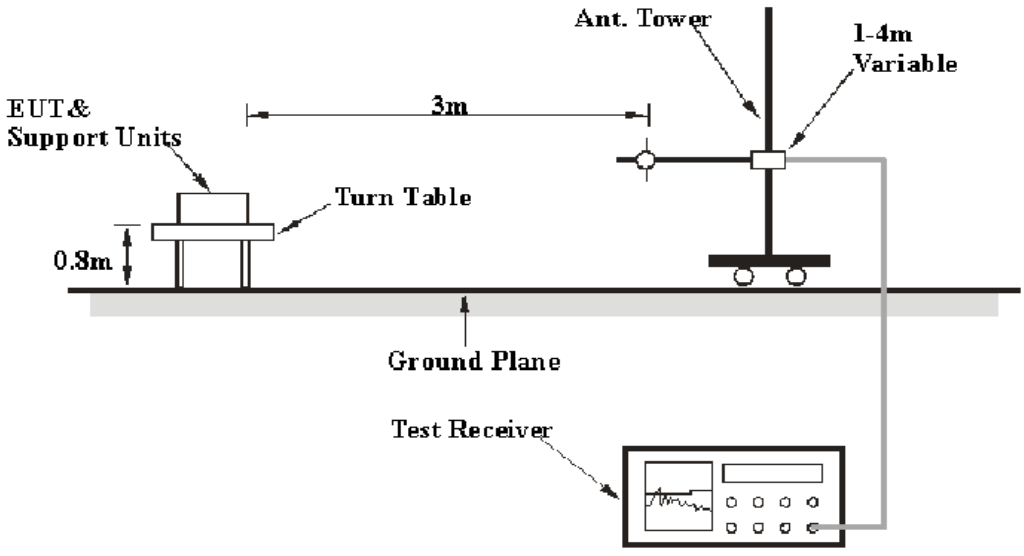
Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Kunshan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal/Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal/Vertical	4.92 dB (k=2, 95% level of confidence)

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The host PC/Adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrunent	Amplifier	330	171377	2014-09-16	2015-09-16
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2014-09-16	2015-09-16
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2014.09.12	2015-09-12
ETS	Horn Antenna	3115	6229	2014.09.12	2015-09-12
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2014.09.16	2015-09-16
Mini	Pre-amplifier	ZVA-183-S+	857001418	2014-09-16	2015-09-16
champrotek	Chamber	Chamber A	1#	2014-09-17	2015-09-17
R&S	Auto test Software	EMC32	V 09.10.0	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Correction Factor & Margin Calculation

The Correction Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

10.9 dB at 890.026250 MHz in the **Vertical** polarization mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen Tian on 2015-1-5

EUT Operation Mode: Downloading

30MHz ~ 6GHz

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (deg)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)	Remark
44.913750	21.12	100.0	V	221.0	-13.3	40.00	18.88	QP
85.896250	25.78	201.0	H	318.0	-17.1	40.00	14.22	QP
158.403750	20.01	100.0	V	159.0	-12.3	43.50	23.49	QP
166.527500	27.92	200.0	V	13.0	-12.1	43.50	15.58	QP
286.807500	21.22	100.0	V	281.0	-10.5	46.00	24.78	QP
890.026250	35.01	200.0	V	195.0	-0.7	46.00	10.99	QP
1715.183367	39.03	128.0	H	174.0	0.5	73.90	34.87	PK
1715.183367	25.06	128.0	H	174.0	0.5	53.90	28.84	Ave.
2874.023046	42.08	100.0	H	287.0	5.6	73.90	31.82	PK
2874.023046	29.03	100.0	H	287.0	5.6	53.90	24.87	Ave.

EUT Operation Mode: Charging

30MHz ~ 6GHz

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (deg)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)	Remark
30.363750	14.84	200.0	V	221.0	-5.2	40.00	25.16	QP
84.198750	8.61	100.0	V	318.0	-17.1	40.00	31.39	QP
185.200000	10.71	201.0	H	159.0	-11.8	43.50	32.79	QP
327.305000	19.71	100.0	H	13.0	-9.7	46.00	26.29	QP
725.611250	17.84	100.0	H	281.0	-2.0	46.00	28.16	QP
935.737500	19.03	100.0	H	195.0	-0.2	46.00	26.97	QP
2601.612225	40.61	121.0	H	324.0	3.9	73.90	33.29	PK.
2601.612225	27.27	121.0	H	324.0	3.9	53.90	26.63	Ave.
4440.624249	45.86	129.0	V	284.0	11.0	73.90	28.04	PK
4440.624249	32.33	129.0	V	284.0	11.0	53.90	21.57	Ave.

Note:
1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
2) Margin = Limit - Limit – Corrected Amplitude

******* END OF REPORT *******