Certificate

Issue Date: December 25, 2019
Ref. Report No. ISL-19LE853FA

Product Name	:	Mother Board
Model(s)	:	MAPLKAS
Applicant	:	GIGA-BYTE TECHNOLOGY CO., LTD.
Address	:	No.6, Baoqiang Rd., Xindian Dist., New Taipei City 231, Taiwan

We, **International Standards Laboratory Corp.**, hereby certify that:

The sample ISL received which bearing the trade name and model specified above has shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance). And Our laboratories is the accredited laboratories and are approved according to ISO/IEC 17025.

Standards:

FCC CFR Title 47 Part 15 Subpart B: Section 15.107 and 15.109
ANSI C63.4-2014
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 6: 2016
Class A

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.
The determination of the test results is determined by customer agreement, regulations or standard document specifications.
The Laboratory evaluates measurement inaccuracies based on regulatory or standard document specifications and is listed in the report for reference. The quantitative project part judges the conformity of the test results based on the evaluation results of the standard cited uncertainty, and the qualitative project does not temporarily evaluate the measurement uncertainty.

Angus Chu

Angus Chu / Director

International Standards Laboratory Corp.
☐ **LT LAB:**
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan
Tel: 886-3-407-1718; Fax: 886-3-407-1738

Supplier's Declaration of Conformity

This device complies with Part 15 of the FCC Rules. The test result has been shown in the ISL test report with number ISL-19LE853FA. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Product Name:	Mother Board
Model(s):	MAPLKAS
Name of Responsible Party:	GIGA-BYTE TECHNOLOGY CO., LTD.
Address of Responsible Party:	No.6, Baoqiang Rd., Xindian Dist., New Taipei City 231, Taiwan
Contact Person:	Alan Wu
Phone No.:	+886-2-8912-4888
Fax No.:	+886-2-8912-6322

We, GIGA-BYTE TECHNOLOGY CO., LTD., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable FCC Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the Commissions requirements.

Alan Wu
GIGA-BYTE TECHNOLOGY CO., LTD.
Issue Date: December 25, 2019

Remarks: 1) The responsible party for Supplier's Declaration of Conformity must be located within the United States, 2) The above is a sample of SDoC, one should modify it to meet remark 1 requirement.

FCC TEST REPORT

of

CFR 47 Part 15 Subpart B Class A

Application Type: Supplier's Declaration of Conformity

Product : **Mother Board**

Model(s): **MAPLKAS**

Applicant: **GIGA-BYTE TECHNOLOGY CO., LTD.**

Address: **No.6, Baoqiang Rd., Xindian Dist.,**
New Taipei City 231, Taiwan

TESTING
NVLAP LAB CODE 200234-0

Test Performed by:

International Standards Laboratory Corp.
<LT LAB>
*Address:
No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel: 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-19LE853FA**
Issue Date : **December 25, 2019**

This report totally contains 29 pages including this cover page and contents page.

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.
A test report bearing the term and/or symbol shall include a statement that the report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	FCC CFR Title 47 Part 15 Subpart B: Section 15.107 and 15.109 ANSI C63.4-2014 Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 6: 2016 Class A
Equipment Tested:	Mother Board
Model:	MAPLKAS
Applicant:	GIGA-BYTE TECHNOLOGY CO., LTD.
Sample received Date:	December 11, 2019
Final test Date:	refer to the date of test data
Test Site:	Chamber 12; Chamber 14; Conduction 04
Test Distance:	10M; 3M (above1GHz)
Temperature:	refer to each site test data
Humidity:	refer to each site test data
Input power:	Conduction input power: AC 120 V / 60 Hz Radiation input power: AC 120 V / 60 Hz
Test Result:	**PASS**
Report Engineer:	Alice Chiu
Test Engineer:	James Kuo
Approved By:	Benson Chen / Associate Director

1.2 Description of EUT

EUT

Description	Mother Board
Model	MAPLKAS
Condition	Pre-Production
Serial Number	N/A
Maximum display resolution	3840*2160 60Hz
Highest working frequency	1.60GHz

The devices can be supported with the EUT are listed below:

Component	Vendor	Description
CPU	INTEL	E3940 (1.60GHz 4 core)
		E3930 (1.30GHz 2 core)
Mother Board	GIGABYTE	MAPLKAS
Adapter	FSP	FSP065-REBN2 (65W)
	APD	DA-65C19 (65W)

Support unit:

Component	Vendor	Description
RAM		DDR3L 1600 (8GB)
HDD(SATA)	WD	WD5000BPKT (500GB)

The I/O ports of EUT are listed below:
For Industrial Embedded System Kit:

I/O Port Type	Quantity
D-SUB Port	One
LAN Port(10M/100M/1Gbps)	Two
HDMI Port	One
Audio In Port	One
USB 3.0 Port	Two
USB 2.0 Port	Two
COM port	Four
DC INPUT Port	One

All the devices listed below are chosen by the applicant to be the representative configuration for testing in this report.

Test Configuration:

Configuration	1
CPU	INTEL E3940 (1.60GHz 4 core)
Mother Board	Gigabyte (Model: MAPLKAS)
Memory	DDR3L 1600 8GB*2
HDD	WD (Model: WD5000BPKT) (500GB)
Power Supplier	APD (Model: DA-65C19) (65W)
Resolution	1920*1080 60Hz (D-SUB & HDMI port)

EMI Noise Source:

Crystal	Point
32.768kHz	X1
19.2MHz	X3
25MHz	X12
25MHz	X13
27MHz	LVX1

EMI Solution:
Please refer to the technical documents.

1.3 Description of Support Equipment

No	Unit	Model / Serial No.	Brand	Power Cord	FCC ID
1	LCD Monitor	P2416D S/N: N/A	DELL	Non-shielded	FCC DOC
2	LCD Monitor	P2416D S/N: N/A	DELL	Non-shielded	FCC DOC
3	USB Mouse	MOCZUL S/N: N/A	DELL	N/A	FCC DOC
4	USB Keyboard	SK-8175 S/N: N/A	DELL	N/A	FCC DOC
5	Hard disk case	HD-PNTU3 S/N: N/A	BUFFALD	N/A	FCC DOC
6	Hard disk case	HD-PNTU3 S/N: N/A	BUFFALD	N/A	FCC DOC
7	Speaker/ microphone	RC-E160 S/N: N/A	HTC	N/A	FCC DOC
8	Modem	DM1414 S/N: N/A	Aceex	Non-shielded	FCC DOC
9	Modem	DM1414 S/N: N/A	Aceex	Non-shielded	FCC DOC
10	Modem	DM1414 S/N: N/A	Aceex	Non-shielded	FCC DOC
11	Modem	DM1414 S/N: N/A	Aceex	Non-shielded	FCC DOC
12	Personal Computer	3212-BK1 S/N: NA	LENOVO	Non-shielded	FCC DOC

1.4 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

1. Send H pattern to the LCD Monitor through EUT USB D-SUB Port.
2. Send H pattern to the LCD Monitor through EUT USB HDMI Port.
3. Read and write data through HDD(SATA).
4. Read and write Hard disk casethrough EUT USB 3.0 Port.
5. Receive audio signal from Speaker/Microphone(microphone) through EUT Audio in port.
6. Send signal to the Modem through EUT Com Port.
7. Receive and transmit packet of EUT to the Personal Computer through LAN port.
8. Repeat the above steps.

	File	Issue Date
LCD Monitor	BurnIn 8.1	01/10/2017
HDD	BurnIn 8.1	01/10/2017
Hard Disk Case	BurnIn 8.1	01/10/2017
Modem	BurnIn 8.1	01/10/2017
Speaker/Microphone	BurnIn 8.1	01/10/2017
LAN	Ping	

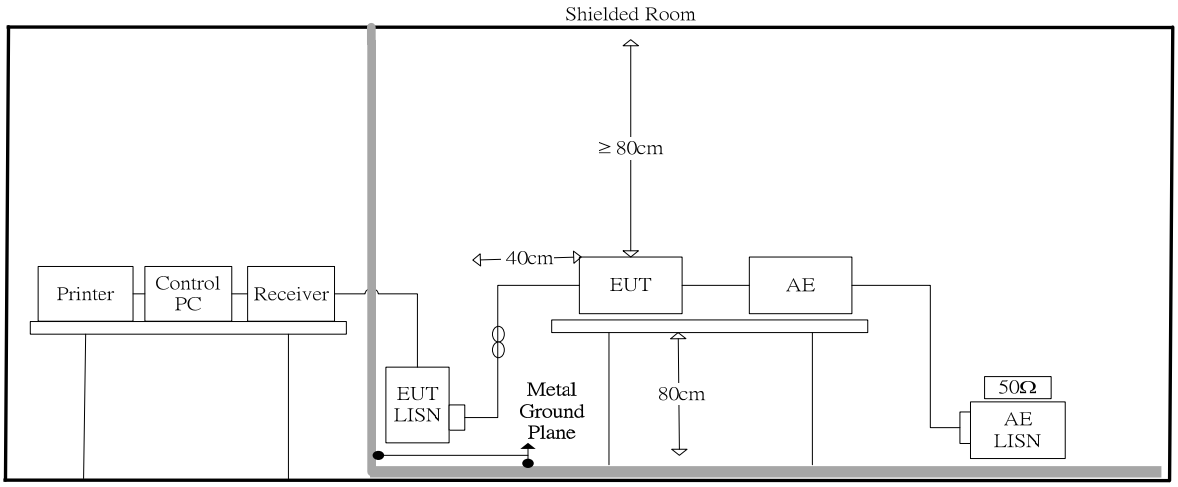
1.5 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Core	Remark
AC Power Cable	120V to PC SPS	1.8m	Non-shielded	No	
USB Mouse Data Cable	USB Mouse to EUT USB Port	1.8m	Shielded	No	
USB Keyboard Data Cable	USB Keyboard to EUT USB Port	1.8m	Shielded	No	
D-SUB Data Cable	LCD Monitor to EUT D-SUB Port	1.8m	Shielded	Yes	
HDMI Data Cable	LCD Monitor to EUT HDMI Port	1.8m	Shielded	No	
USB data cable*2	Hard disk case to EUT USB 3.0 Port	1.0m	Shielded	No	
Audio data cable	Speaker/Microphone to EUT Audio In Port	1.4m	Shielded	No	
Modem Data Cable*4	Modem to EUT Com Port	1.8m	Shielded	No	
LAN data cable*2	Personal Computer LAN port to EUT LAN port	10m	Non-shielded	No	Cat5e

2. Power Line Conducted Emissions

2.1 Test Setup and Procedure

2.1.1 Test Setup



2.1.2 Test Procedure

The measurements are performed in a shielded room test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to ANSI C63.4 requirements.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150kHz~30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9kHz

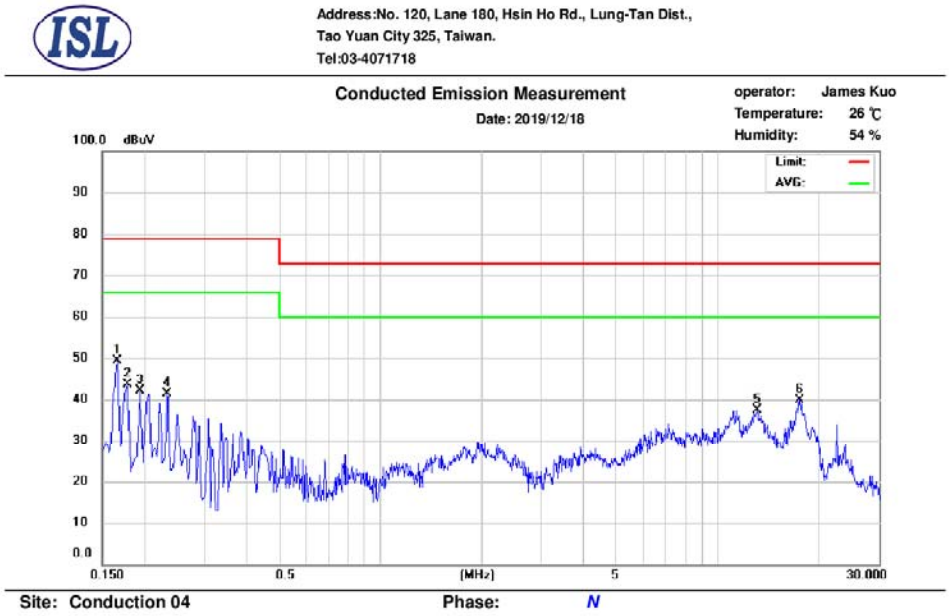
2.2 Conduction Test Data: Configuration 1

- Line

No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.154	38.39	19.94	9.68	48.07	79.00	-30.93	29.62	66.00	-36.38
2	0.166	36.97	20.25	9.68	46.65	79.00	-32.35	29.93	66.00	-36.07
3	0.194	32.49	15.89	9.68	42.17	79.00	-36.83	25.57	66.00	-40.43
4	0.214	29.23	13.84	9.68	38.91	79.00	-40.09	23.52	66.00	-42.48
5	13.142	23.13	17.44	9.99	33.12	73.00	-39.88	27.43	60.00	-32.57
6	17.410	23.19	15.11	10.02	33.21	73.00	-39.79	25.13	60.00	-34.87

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in “QP/AVG Correct” column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

- Neutral



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.166	37.22	19.68	9.64	46.86	79.00	-32.14	29.32	66.00	-36.68
2	0.178	34.57	15.99	9.63	44.20	79.00	-34.80	25.62	66.00	-40.38
3	0.194	31.97	13.25	9.63	41.60	79.00	-37.40	22.88	66.00	-43.12
4	0.234	27.40	12.91	9.63	37.03	79.00	-41.97	22.54	66.00	-43.46
5	13.114	23.19	17.56	10.00	33.19	73.00	-39.81	27.56	60.00	-32.44
6	17.506	24.08	13.76	10.10	34.18	73.00	-38.82	23.86	60.00	-36.14

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = QP_R/AVG_R + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in “QP/AVG Correct” column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

2.3 Test Setup Photo

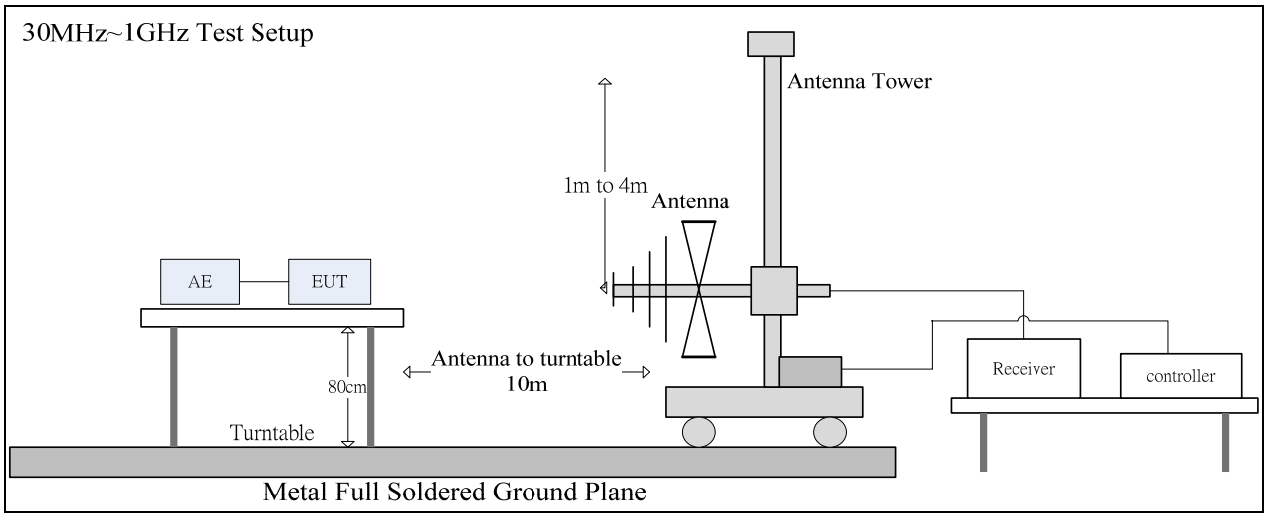
Front View

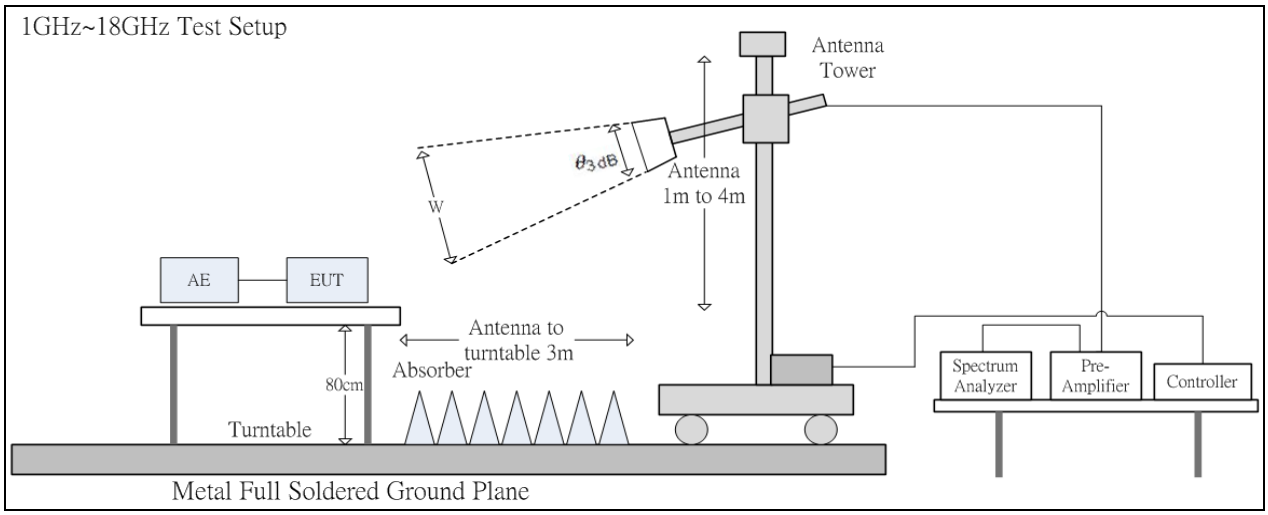
Back View

3. Radiated Emissions

3.1 Test Setup and Procedure

3.1.1 Test Setup





The 3dB beam width of the horn antenna used for the test is as shown in the table below.

1GHz~18GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$ (min)	d= 3 m
				w (m)
1	88°	147°	88°	5.79
2	68°	119°	68°	4.04
3	73°	92°	73°	4.44
4	70°	89°	70°	4.20
5	55°	60°	55°	3.12
6	63°	62°	62°	3.60
7	48°	49°	48°	2.67
8	39°	46°	39°	2.12
9	32°	42°	32°	1.72
10	30°	39	30°	1.61

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$ (min)	d= 3 m
				w (m)
11	32°	35°	32°	1.72
12	35°	32°	35°	1.89
13	34°	31°	31°	1.66
14	32°	27°	27°	1.44
15	36°	26°	26°	1.39
16	40°	28°	28°	1.50
17	43°	26°	26°	1.39
18	41°	22°	22°	1.17

18 GHz~26.5 GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$ (min)	d= 1 m	d= 3 m
				w (m)	w (m)
18	11.4°	12.7°	11.4°	0.199	0.598
19	10.9°	12.4°	10.9°	0.190	0.572
20	10.8°	12.4°	10.8°	0.189	0.567
21	9.8°	12°	9.8°	0.171	0.514
22	9.7°	11°	9.7°	0.169	0.509
23	10°	11.8°	10°	0.174	0.524
24	9°	11°	9°	0.157	0.472
25	10°	12.3°	10°	0.174	0.524
26	9.9°	11.1°	9.9°	0.173	0.519
26.5	9.4°	11.3°	9.4°	0.164	0.493

26 GHz~40 GHz

Frequency GHz	E-plane	H-plane	$\theta_{3\,dB}$ (min)	d= 1 m	d= 3 m
				w (m)	w (m)
26	12°	12.2°	12°	0.210	0.631
27	13°	10.5°	10.5°	0.184	0.551
28	13.2°	12.3°	12.3°	0.216	0.647
29	11.5°	12.8°	11.5°	0.201	0.604
30	12°	8°	8°	0.140	0.420
31	11.5°	10.1°	10.1°	0.177	0.530
32	11.8°	10°	10°	0.175	0.525
33	11.8°	9.5°	9.5°	0.166	0.499
34	11.6°	10°	10°	0.175	0.525
35	10.9°	9.8°	9.8°	0.171	0.514
36	11.8°	8.6°	8.6°	0.150	0.451
37	12.9°	10.5°	10.5°	0.184	0.551
38	12°	10.3°	10.3°	0.180	0.541
39	11.8°	9.8°	9.8°	0.171	0.514
40	12.5°	11.2°	11.2°	0.196	0.588

3.1.2 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites or 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 40 GHz were analyzed in details by operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the cone of radiation from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to ANSI C63.4 requirements.

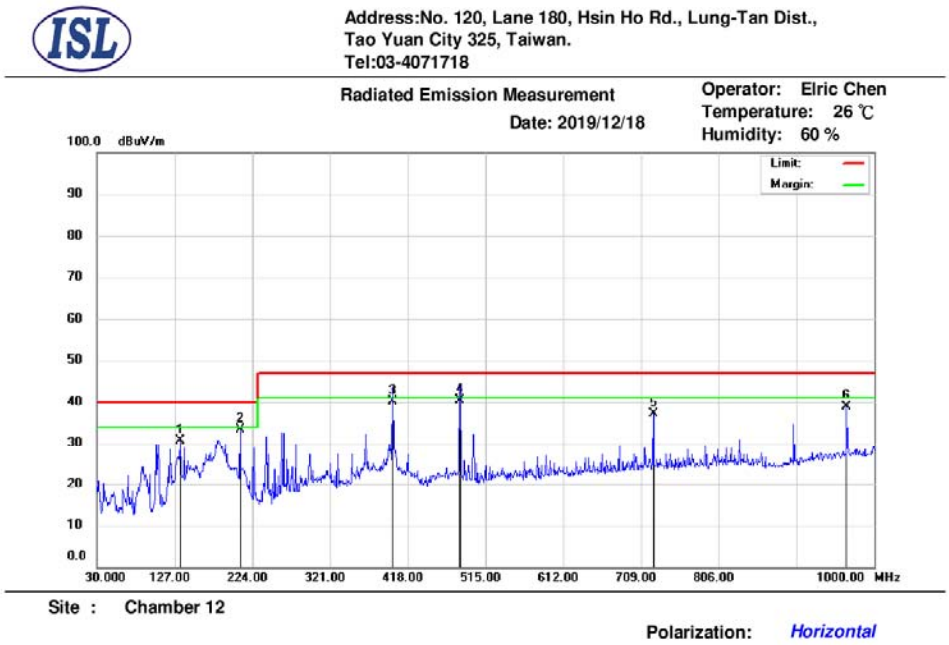
The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less. Spectrum Analyzer Configuration (for the frequencies tested).

3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	30MHz--1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120kHz

Frequency Range:	Above 1000MHz
Detector Function:	Peak/Average Mode
Resolution Bandwidth:	1MHz

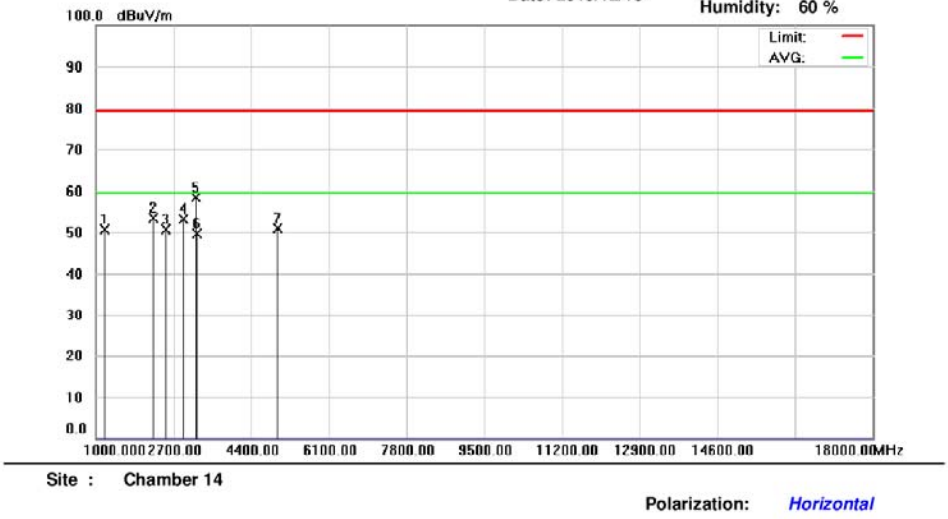
3.2 Radiation Test Data: Configuration 1
- Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	133.79	47.59	-16.94	30.65	40.00	-9.35	400	142	peak
2	208.48	52.09	-18.64	33.45	40.00	-6.55	400	112	peak
3	399.03	51.99	-11.97	40.02	47.00	-6.98	248	165	QP
4	483.00	50.50	-10.02	40.48	47.00	-6.52	200	106	QP
5	724.52	42.68	-5.55	37.13	47.00	-9.87	100	81	peak
6	966.05	41.14	-2.34	38.80	47.00	-8.20	200	302	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1187.00	66.87	-16.14	50.73	79.50	-28.77	250	198	peak
2	2258.00	66.41	-12.94	53.47	79.50	-26.03	350	259	peak
3	2530.00	62.46	-11.87	50.59	79.50	-28.91	250	232	peak
4	2904.00	64.60	-11.50	53.10	79.50	-26.40	199	74	peak
5	3193.00	68.93	-10.66	58.27	79.50	-21.23	300	239	peak
6	3199.85	60.25	-10.66	49.59	59.50	-9.91	150	224	AVG
7	4978.00	60.29	-9.30	50.99	79.50	-28.51	250	81	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 3 meters
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road,Lung-Tan
Tao Yuan Conty,Taiwan R.O.C.
Tel:03-4071718

Radiated Emission Measurement

Operator: James Kuo
Temperature: 26 ℃
Humidity: 60 %

Date: 2019/12/13

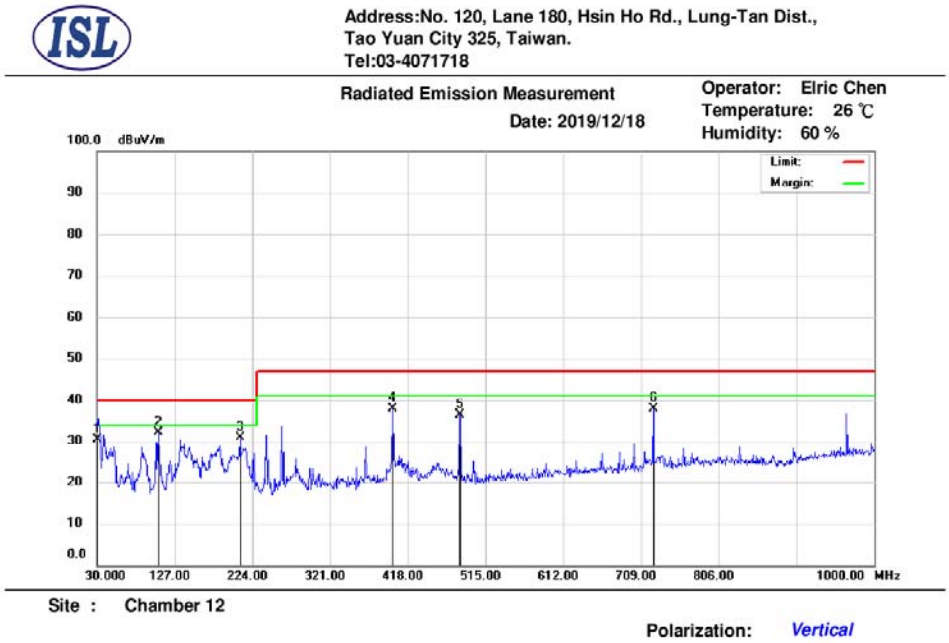
Site : Chamber 14

Polarization: *Horizontal*

Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	29990.00	42.23	14.75	56.98	89.00	-32.02	1189	123	peak
2	30562.00	42.46	14.92	57.38	89.00	-31.62	119	258	peak
3	36084.00	42.48	16.12	58.60	89.00	-30.40	100	252	peak
4	37580.00	42.10	16.20	58.30	89.00	-30.70	100	128	peak
5	38768.00	43.35	16.25	59.60	89.00	-29.40	107	259	peak
6	39846.00	40.96	19.49	60.45	89.00	-28.55	189	322	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 3 meters
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

-Radiated Emissions (Vertical)



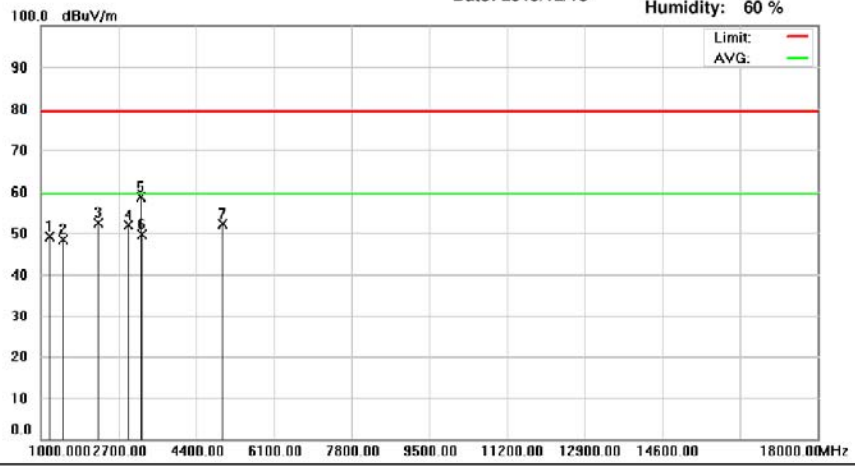
Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	30.73	49.29	-18.90	30.39	40.00	-9.61	100	335	QP
2	106.63	52.01	-19.78	32.23	40.00	-7.77	150	292	peak
3	208.48	49.60	-18.64	30.96	40.00	-9.04	100	326	peak
4	399.57	49.87	-11.95	37.92	47.00	-9.08	350	117	peak
5	482.99	46.39	-10.02	36.37	47.00	-10.63	350	174	peak
6	724.52	43.45	-5.55	37.90	47.00	-9.10	331	0	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718

Radiated Emission Measurement
Date: 2019/12/13

Operator: James Kuo
Temperature: 26 ℃
Humidity: 60 %



Site : Chamber 14

Polarization: *Vertical*

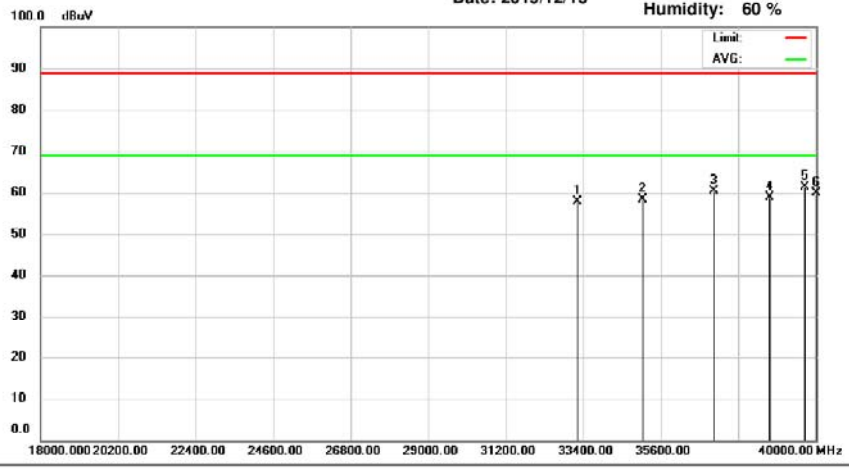
Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1187.00	65.27	-16.14	49.13	79.50	-30.37	132	0	peak
2	1493.00	65.22	-16.86	48.36	79.50	-31.14	100	20	peak
3	2258.00	65.28	-12.94	52.34	79.50	-27.16	100	129	peak
4	2921.00	63.27	-11.45	51.82	79.50	-27.68	250	84	peak
5	3193.00	69.20	-10.66	58.54	79.50	-20.96	150	227	peak
6	3199.74	60.18	-10.66	49.52	59.50	-9.98	149	230	AVG
7	4978.00	61.44	-9.30	52.14	79.50	-27.36	200	26	peak

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 3 meters
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road,Lung-Tan
Tao Yuan Conty,Taiwan R.O.C.
Tel:03-4071718

Radiated Emission Measurement
Date: 2019/12/13

Operator: James Kuo
Temperature: 26 ℃
Humidity: 60 %



Site : Chamber 14

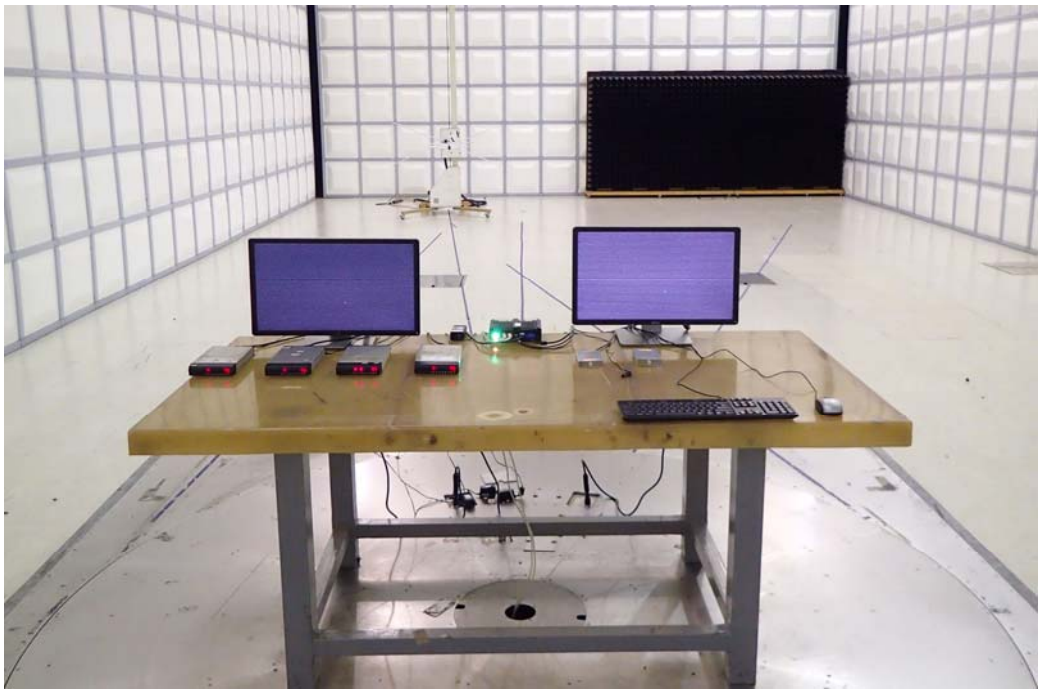
Polarization: *Vertical*

Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB)	Emission (dBuV)	Limit (dBuV)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	33224.00	42.06	15.78	57.84	89.00	-31.16	156	331	peak
2	35094.00	42.28	16.00	58.28	89.00	-30.72	100	191	peak
3	37118.00	44.03	16.37	60.40	89.00	-28.60	129	74	peak
4	38702.00	42.57	16.21	58.78	89.00	-30.22	111	207	peak
5	39692.00	42.68	18.79	61.47	89.00	-27.53	100	352	peak
6	40000.00	39.70	20.21	59.91	89.00	-29.09	100	109	peak

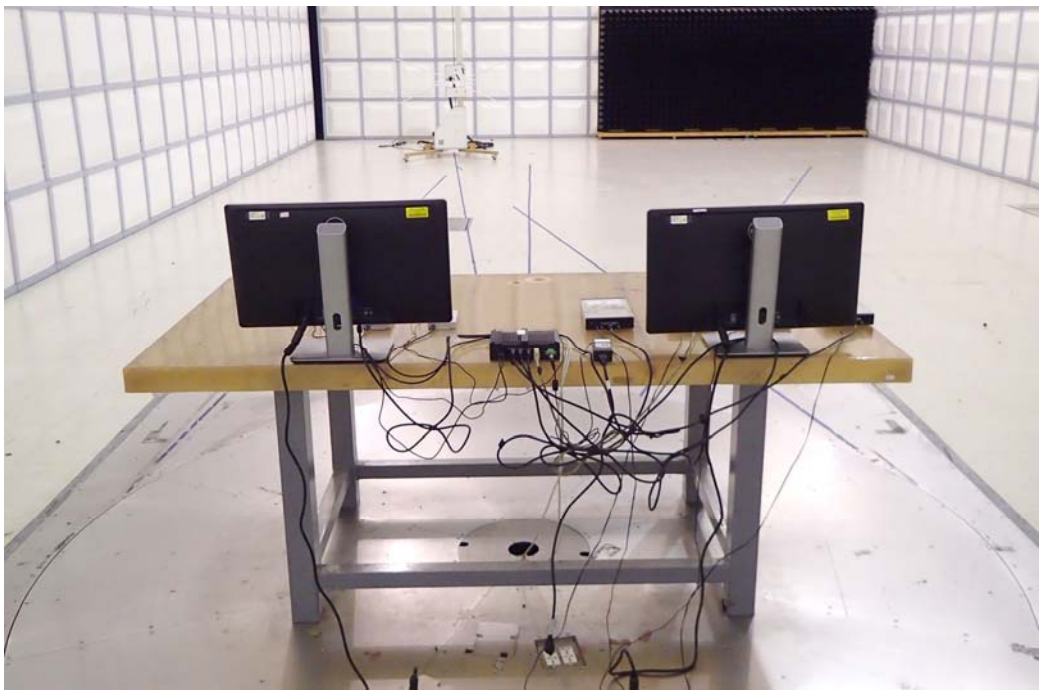
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Antenna Distance: 3 meters
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

3.3 Test Setup Photo

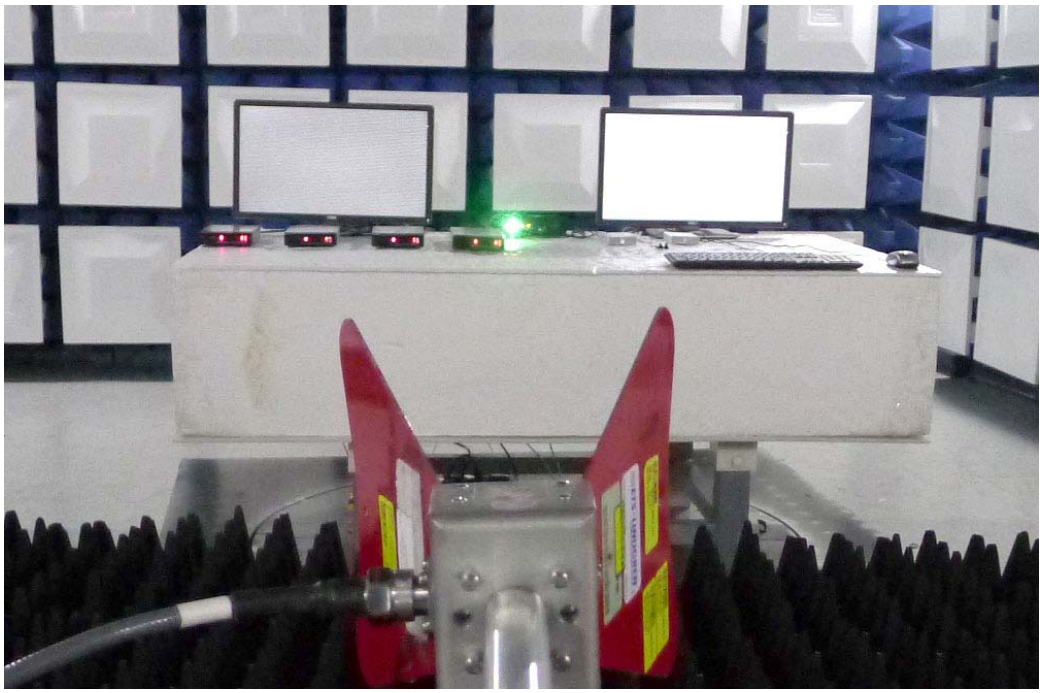
Front View (30MHz~1GHz)



Back View (30MHz~1GHz)



Front View (above 1GHz)



Back View (above 1GHz)

4. Appendix

4.1 Appendix A: Warning Labels

Label Requirements

A Class A digital device subject to authorization under Supplier's Declaration of Conformity of FCC shall carry a label which includes the following statement:

*** * * W A R N I N G * * ***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Devices subject to authorization under Supplier's Declaration of Conformity may be labeled with FCC logo on a voluntary basis as a visual indication that the product complies with the applicable FCC requirements

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

When the device is so small or for such use that it is impracticable to label it with the statement specified under (§15.19 Labeling requirements) paragraph (a) of this section in a font that is four-point or larger, and the device does not have a display that can show electronic labeling, then the information required by this paragraph shall be placed in the user manual and must also either be placed on the device packaging or on a removable label attached to the device.

4.2 Appendix B: Warning Statement

Statement Requirements

The operators' manual for a Class A digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communications Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

* * * * * * * * *

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

4.3 Appendix C: Test Equipment

4.3.1 Test Equipment List

Location Con04	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 04	LISN 18	ROHDE & SCHWARZ	ENV216	101424	07/09/2019	07/09/2020
Conduction 04	LISN 03	ROHDE & SCHWARZ	ESH3-Z5	828874/010	07/22/2019	07/22/2020
Conduction 04	Conduction 04-3 Cable	WOKEN	CFD 300-NL	conduction 04-3	08/29/2019	08/29/2020
Conduction 04	EMI Receiver 18	ROHDE&SCHWARZ	ESCI	101392	06/14/2019	06/14/2020

Location Chmb12	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber12)	BILOG Antenna 18	Schwarzbeck	Schwarzbeck VULB 9168+EMCI-N-6-05	646	01/29/2019	01/29/2020
Radiation (Chamber12)	Preamplifier 26	EMCI	EMC9135	980297	01/23/2019	01/23/2020
Radiation (Chamber12)	Coaxial Cable Chmb 12-10M-01	PEWC	CFD400-NL	Chmb 12-10M-01	09/16/2019	09/16/2020
Radiation (Chamber12)	EMI Receiver 18	ROHDE & SCHWARZ	ESCI	101392	06/14/2019	06/14/2020

Location Chmb14	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Rad. Above 1GHz	Spectrum Analyzer 25	R&S	FSV 40	101499	11/01/2019	11/01/2020
Rad. Above 1GHz	Spectrum Analyzer 24	Agilent	N9010A	MY49060537	11/12/2019	11/12/2020
Rad. Above 1GHz	Horn Antenna 12 (18G~40G)	ETS-Lindgren	3116C-PA	00164816	12/11/2019	12/11/2020
Rad. Above 1GHz	Horn Antenna 13	ETS-Lindgren	3117	0161229	09/09/2019	09/09/2020
Rad. Above 1GHz	Preamplifier 20	EMC INSTRUMENT	EMC051845/EMCI-S-18-06	980084/AT-S 18001	03/21/2019	03/21/2020
Rad. Above 1GHz	Microwave Cable 04 (18G~40G)	HUBER SUHNER	SUCOFLEX 102	37270/2	12/13/2018	12/13/2019
Rad. Above 1GHz	Microwave Cable 35	WOKEN	WCBA-WCA04NM.SM6	Chamber 14-1	01/31/2019	01/31/2020
Rad. Above 1GHz	Microwave Cable 36	WOKEN	WCBA-WCA04NM.SM0.8	Chamber 14-2	01/31/2019	01/31/2020

4.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

Site	Filename	Version	Issue Date
Conduction/Radiation	EZ EMC	ISL-03A2	3/6/2013

4.4 Appendix D: Uncertainty of Measurement

The laboratory measurement uncertainty accordance with refers to CISPR 16-4-2. If Ulab is less than or equal to Ucispr in Table 1, then the test report may either state the value of Ulab or state that Ulab is less than Ucispr.
The coverage factor k = 2 yields approximately a 95 % level of confidence.

<Conduction 04>
AMN: ±2.90dB

<Chamber 12 (10M)>
Horizontal
30MHz~200MHz: ±4.14dB
200MHz~1000MHz: ±4.12dB
Vertical
30MHz~200MHz: ±4.30dB
200MHz~1000MHz: ±4.45dB

<Chamber 14 (3M)>
1GHz~6GHz: ±4.93dB
1GHz~18GHz: ±4.48dB
18GHz~26.5GHz: ±4.40dB
26.5GHz~40GHz: ±4.40dB

4.5 Appendix E: Photographs of EUT

Please refer to the File of **ISL-*19LE853*P**