



# FCC/IC TEST REPORT

**Job No.** : GPWE2105000091EH  
**Applicant Name** : FCC: LG Electronics USA  
 IC: LG Electronics Inc.  
**Equipment Under Test (EUT) :**  
 Product Name : Bluetooth Module  
 Model Name : LCB-003  
**FCC Authorization Type** : Certification  
**FCC ID** : BEJ-LCB003  
**IC Certification** : 2703N-LCB003  
**Applied Standards** : FCC Part 15 Subpart B, Class B  
 ANSI C63.4a:2017  
 ICES-003 Issue 7:2020  
**Date of Receipt** : May 18, 2021  
**Date of Test** : May 26, 2021 ~ May 31, 2021  
**Date of Issue** : June 14, 2021  
**Test Results** : Complied

<b>Tested by</b>	<b>:</b>	 <hr style="border-top: 1px dashed black;"/> <b>Lucas Ku</b>
<b>Reviewed by</b>	<b>:</b>	 <hr style="border-top: 1px dashed black;"/> <b>Julia Choi</b>

**This test report does not assure KOLAS accreditation.**

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

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 The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full

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## Revision History

Revision	Report number	Description
0	F690501-RF-EMH001381	Initial
1	F690501-RF-EMH001381_1	Change 1.1 Client Information
2	F690501-RF-EMH001381_2	Add FCC ID and IC Certification Information

## 1. General Information

### 1.1 Client Information

FCC Applicant	LG Electronics USA
FCC Applicant Address	111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632
IC Applicant	LG Electronics Inc.
IC Applicant Address	170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea (Republic Of), 51533
Manufacturer 1	LG Electronics Inc.
Manufacturer 1 Address	84, Wanam-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, 51554, Republic of Korea
Manufacturer 2	OHSUNG ELECTRONICS CO.LTD.
Manufacturer 2 Address	335-4, Sanho-daero, Gumi-si, Gyeongsangbuk-do, Republic of Korea, 39269
Manufacturer 3	OHSUNG ELECTRONICS(SUZHOU) CO., LTD.
Manufacturer 3 Address	NO.188 TUNPU SOUTH ROAD,TUNCUN,TONGLI,WUJIANG,JIANGSU PROVINCE,CHINA

### 1.2 Test Laboratory

Name and Address	SGS Korea Co., Ltd.
- Giheung 1 Laboratory	35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Giheung 2 Laboratory	23, Giheungdanji-ro 24beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
FCC Registration No.	KR0150
IC Registration No.	7837B
Phone	+ 82 31 548 0710
Fax	+ 82 31 548 0719
e-mail	<a href="mailto:julia.choi@sgs.com">julia.choi@sgs.com</a>

### 1.3 General Information of E.U.T.

Classification	Specification
Product Name	Bluetooth Module
Model Name	LCB-003
Serial No.	None
EMI Classification	Class B
Test Power	DC 3.3V, DC 5.0V
Rated Power	DC 3.3 V, DC 5.0V
RF operating freq. range	(2 402 -2 480) MHz
Tx Power	4 dB m
Antenna	PCB Pattern Antenna
Port	DC IN(3.3 V), Audio
Function	Bluetooth Speaker Module

### 1.4 Operating Modes and Conditions

Operating mode	Operating Condition
1) Bluetooth Communication	The EUT is tested on Bluetooth communication with mobile phone

### 1.5 Peripheral Equipments

Description	Model	Serial No.	Manufacturer
Mobile Phone	SM-N916S	-	Samsung Electronics
DC POWER SUPPLY1	IT6720	-	ITECH
DC POWER SUPPLY2	IT6720	-	ITECH

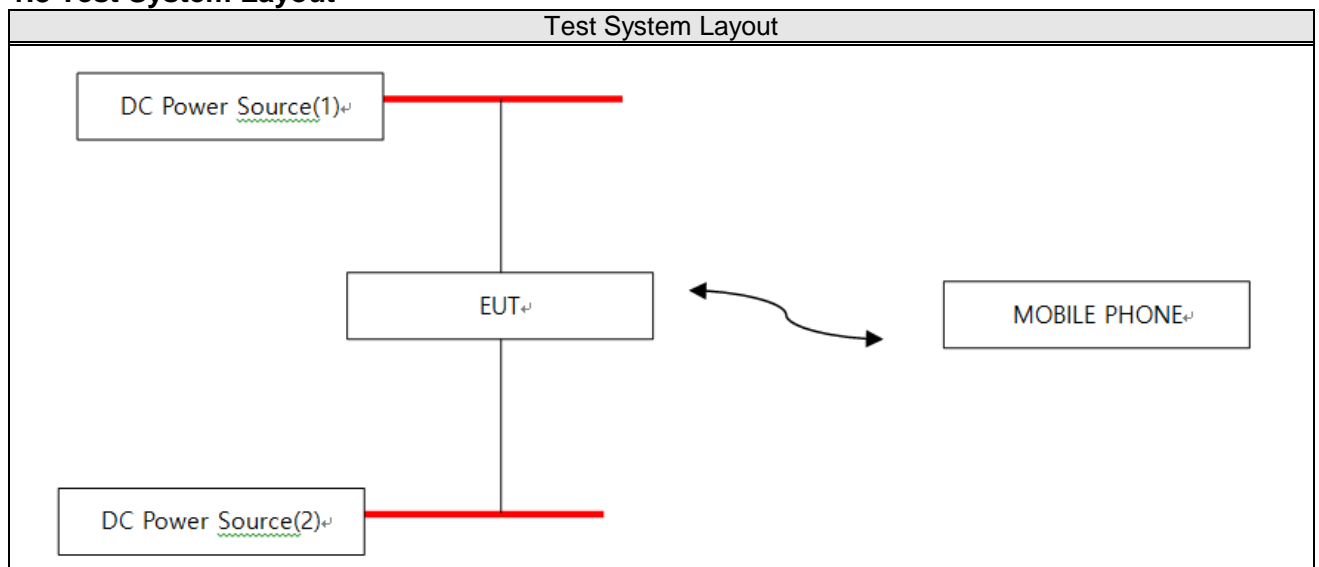
### 1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
EUT	DC IN	DC POWER SOURCE(1)	DC OUT	1.2	Unshield	No
	Audio	DC POWER SOURCE(2)	DC OUT	1.2	Unshield	No
	-	MOBILE PHONE	-	-	-	-

### 1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note
-	-	-	-	-

### 1.8 Test System Layout



### 1.9 Modifications

- There was no modified item during the test.

### 1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 : Subpart B ICES-003 Issue 7:2020	Applicable	No Deviation

### 1.11 Summary of Test Results

Test Item	Standards	Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 Issue 7:2020	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020	Complied

Note : Test methods of all test items are performed according to the basic standards in this table.

# EMISSION

## 2.1 Test Results

Test Items	Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 Issue 7:2020	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020	Complied

## 2.2 Test Method and Limits

### 2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 MHz ~ 30 MHz	9 kHz	-
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m & 3 m
	Above 1 GHz	1 MHz	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 MHz ~ 1 GHz. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 MHz ~ 1 GHz and Class A and Class B equipment above 1 GHz.

### 2.2.2 Test Limits

#### -Conducted Emission Limits

Frequency Range	Limits(dB $\mu$ V)		Class
	Quasi-peak	Average	
0.15 MHz ~ 0.5 MHz	79	66	Class A
0.5 MHz ~ 30 MHz	73	60	
0.15 MHz ~ 0.5 MHz	66 to 56	56 to 46	Class B
0.5 MHz ~ 5 MHz	56	46	
5 MHz ~ 30 MHz	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

#### -Radiated Emission Limits below 1 GHz

[ FCC Part 15 Subpart B ]

Frequency Range	Limits(dB $\mu$ V/m)	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.0	Class A (10 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40.0	Class B (3 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

[ ICES-003 Issue 7 : 2020 ]

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Quasi-peak		
30 MHz ~ 88 MHz	40.0		Class A (10 m method)
88 MHz ~ 216 MHz	43.5		
216 MHz ~ 230 MHz	46.4		
230 MHz ~ 960 MHz	47.0		
960 MHz ~ 1 GHz	49.5		
30 MHz ~ 88 MHz	50.0		Class A (3 m method)
88 MHz ~ 216 MHz	54.0		
216 MHz ~ 230 MHz	56.9		
230 MHz ~ 960 MHz	57.0		
960 MHz ~ 1 GHz	60.0		
30 MHz ~ 88 MHz	30.0		Class B (10 m method)
88 MHz ~ 216 MHz	33.1		
216 MHz ~ 230 MHz	35.6		
230 MHz ~ 960 MHz	37.0		
960 MHz ~ 1 GHz	43.5		
30 MHz ~ 88 MHz	40.0		Class B (3 m method)
88 MHz ~ 216 MHz	43.5		
216 MHz ~ 230 MHz	46.0		
230 MHz ~ 960 MHz	47.0		
960 MHz ~ 1 GHz	54.0		

**-Radiated Emission Limits above 1 GHz (3 m method)**

[ FCC Part 15 Subpart B ]

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54.0	74.0	Class B

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

[ ICES-003 Issue 7 : 2020 ]

Frequency Range	Limits(dB $\mu$ V/m)		Class
	Average	Peak	
Above 1 GHz	60.0	80.0	Class A
Above 1 GHz	54.0	74.0	Class B

### 2.3 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range (30 MHz to 1 GHz) using a max hold mode incorporating a Peak detector by using the EMI measuring software. The final test data was measured using a Quasi-Peak detector below 1 GHz, Peak and CISPR-Average detector above 1 GHz.

Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

Note. Measuring software

-Giheung 1Lab. : EMC32(V9.26.01) from R&S

-Giheung 2Lab. : EMC32(V10.40.10) from R&S

#### 2.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
EMI TEST RECEIVER	ESU40	R&S	100075	2021.08.18
Hybrid ANTENNA	VULB 9163	SCHWARZBECK	9163-390	2022.02.15
Double Ridged Horn Antenna	HF907	R&S	102578	2022.04.15
AMPLIFIER	8447D	HP	2727A05297	2021.07.10
Microwave Preamplifier	PAM-118A	Com-Power	551074	2021.10.13

#### 2.3.2 Test Site

3m SEMI-ANECHOIC CHAMBER in Giheung 2 Laboratory

#### 2.3.3 Environment Conditions

##### ① Below 1 GHz

Temperature	(Minimum 19.0, Maximum 20.0) °C
Humidity	(Minimum 43.0, Maximum 44.0) %R.H..
Atmospheric Pressure	(Minimum 100.2, Maximum 100.2)kPa
Test Date	May 26, 2021

##### ② Above 1 GHz

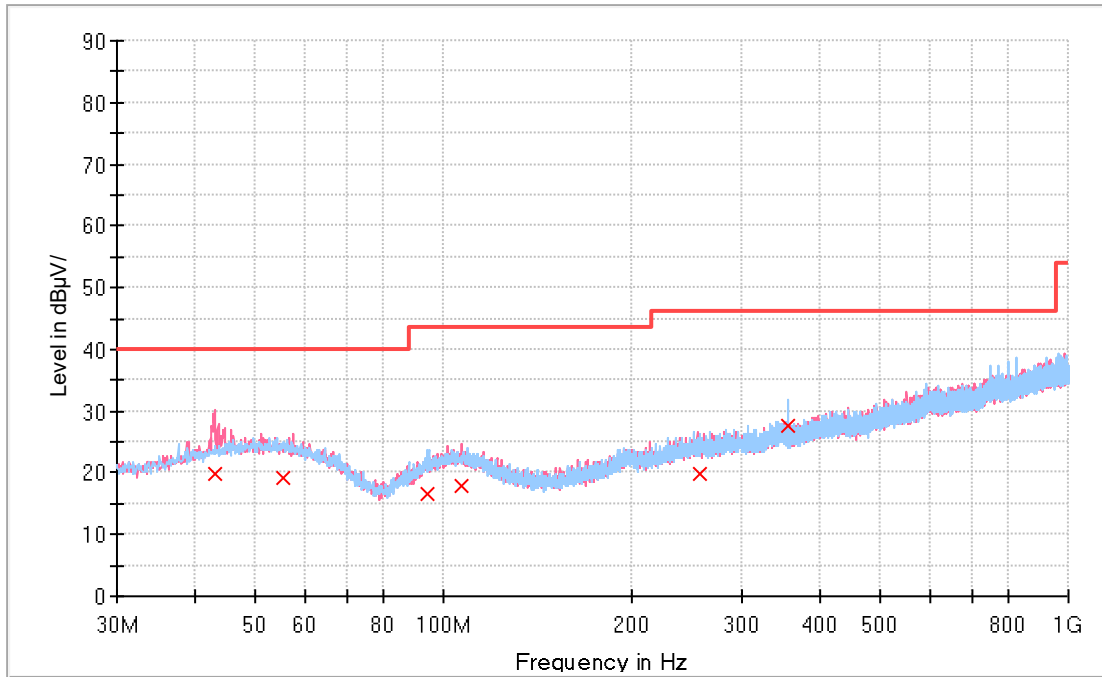
Temperature	(Minimum 20.8, Maximum 20.9) °C
Humidity	(Minimum 37.0, Maximum 38.0) %R.H..
Atmospheric Pressure	(Minimum 99.7, Maximum 99.7)kPa
Test Date	May 31, 2021



### 2.3.4 Test Results

① Below 1 GHz (3 m method)

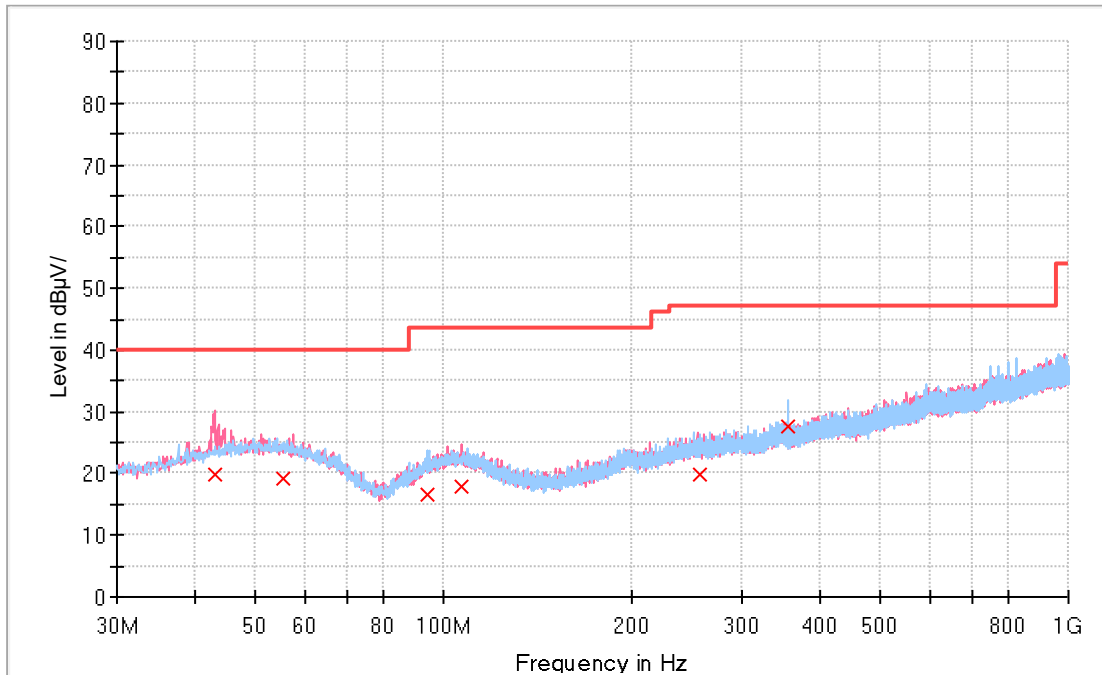
[ FCC Part 15 Subpart B ]



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.998	19.78	40.00	20.22	15 000.0	120.000	132.0	V	69.0	-2.5
55.317	19.33	40.00	20.67	15 000.0	120.000	358.0	H	340.0	-2.0
94.214	16.68	43.50	26.82	15 000.0	120.000	220.0	H	272.0	-4.5
106.630	17.90	43.50	25.60	15 000.0	120.000	330.0	V	165.0	-3.3
257.562	19.88	46.00	26.12	15 000.0	120.000	400.0	H	44.0	-1.2
356.308	27.52	46.00	18.48	15 000.0	120.000	110.0	H	358.0	0.4

[ ICES-003 Issue 7 : 2020 ]


**Final Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	PoI	Azimuth (deg)	Corr. (dB)
42.998	19.78	40.00	20.22	15 000.0	120.000	132.0	V	69.0	-2.5
55.317	19.33	40.00	20.67	15 000.0	120.000	358.0	H	340.0	-2.0
94.214	16.68	43.50	26.82	15 000.0	120.000	220.0	H	272.0	-4.5
106.630	17.90	43.50	25.60	15 000.0	120.000	330.0	V	165.0	-3.3
257.562	19.88	47.00	27.12	15 000.0	120.000	400.0	H	44.0	-1.2
356.308	27.52	47.00	19.48	15 000.0	120.000	110.0	H	358.0	0.4

Measurement Uncertainty : See Appendix A

Note : • POL H = Horizontal

• Margin = Limit – Quasi Peak

• POL V = Vertical

• Corr. = Antenna Factor + Cable loss – Amplifier Gain

Ex) In case

Freq ; 100 MHz, level ; 30 dB(µV/m), AF ; 10 dB/m, CL ; 4 dB, Amp ; 25 dB

Result = Level + AF + CL – Amp

$$= 30 + 10 + 4 - 25$$

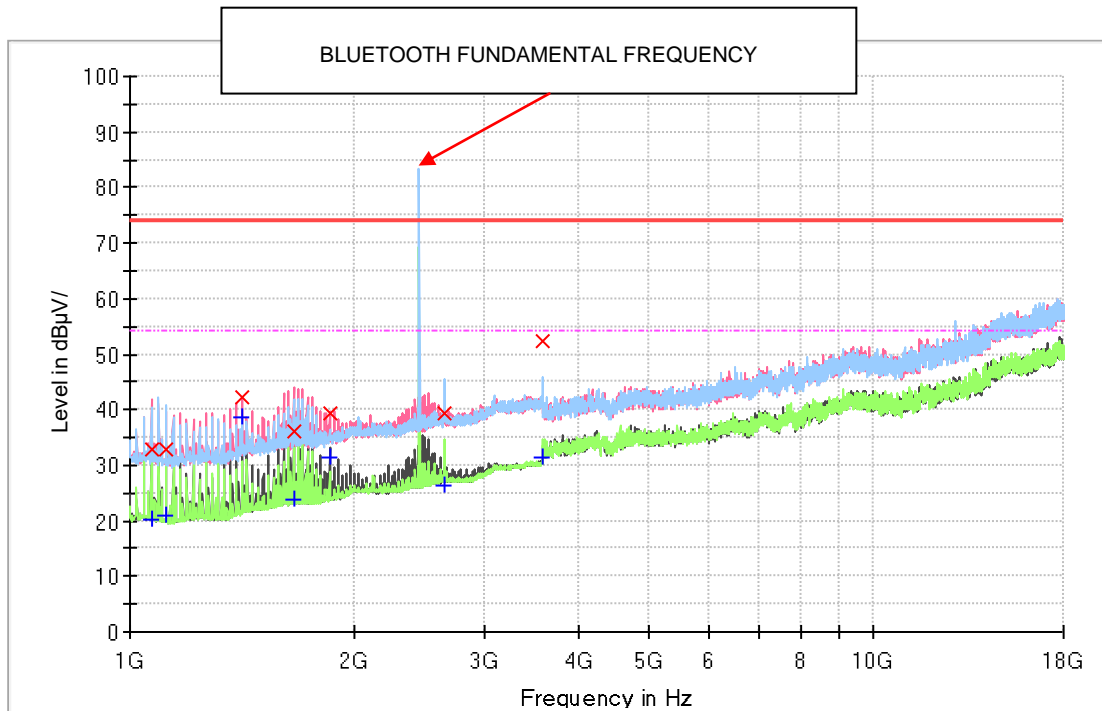
$$= 19$$

Margin = Limit – Result

$$= 43.5 - 19$$

$$= 24.5$$

② Above 1 GHz (3 m method)



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 068.000	32.75	---	74.00	41.25	15 000.0	1 000.000	100.0	V	0.0	-13.7
1 068.000	---	20.22	54.00	33.78	15 000.0	1 000.000	100.0	V	0.0	-13.7
1 117.300	---	21.04	54.00	32.96	15 000.0	1 000.000	100.0	H	188.0	-14.1
1 117.300	32.72	---	74.00	41.28	15 000.0	1 000.000	100.0	H	188.0	-14.1
1 413.100	---	38.75	54.00	15.25	15 000.0	1 000.000	100.0	V	169.0	-12.9
1 413.100	42.29	---	74.00	31.71	15 000.0	1 000.000	100.0	V	169.0	-12.9
1 657.900	35.99	---	74.00	38.01	15 000.0	1 000.000	100.0	V	64.0	-11.3
1 657.900	---	23.88	54.00	30.12	15 000.0	1 000.000	100.0	V	64.0	-11.3
1 855.100	39.40	---	74.00	34.60	15 000.0	1 000.000	100.0	V	135.0	-10.7
1 855.100	---	31.31	54.00	22.69	15 000.0	1 000.000	100.0	V	135.0	-10.7
2 643.900	39.50	---	74.00	34.50	15 000.0	1 000.000	200.0	H	142.0	-7.8
2 643.900	---	26.49	54.00	27.51	15 000.0	1 000.000	200.0	H	142.0	-7.8
3 597.600	---	31.26	54.00	22.74	15 000.0	1 000.000	100.0	H	21.0	-4.8
3 597.600	52.22	---	74.00	21.78	15 000.0	1 000.000	100.0	H	21.0	-4.8

Measurement Uncertainty : See Appendix A

Note :

- AF = Antenna Factor
- POL H = Horizontal
- H = Height
- Margin = Limit – Result
- CL = Cable Loss
- POL V = Vertical
- Distance = Distance Correction Factor
- Result = Level + AF + CL – AMP + Distance
- AMP = Amplifier Gain
- A = Angle

## Appendix A : Measurement Uncertainty

### - Giheung 1 Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.70 dB (The confidential level is 95 %, $k=2$ )
		ESH2-Z5	3.58 dB (The confidential level is 95 %, $k=2$ )
		ESH3-Z6	3.54 dB (The confidential level is 95 %, $k=2$ )
Conducted Emission - Signal		ISN T800	5.12 dB (The confidential level is 95 %, $k=2$ )
		ISNT8-Cat6	5.14 dB (The confidential level is 95 %, $k=2$ )
		ISN S751	5.20 dB (The confidential level is 95 %, $k=2$ )
Radiated Emission	9 kHz ~30 MHz (3m chamber)	Horizontal	3.64 dB (The confidential level is 95 %, $k=2$ )
		Vertical	3.64 dB (The confidential level is 95 %, $k=2$ )
	30 MHz ~ 1 000 MHz (10m chamber)	Horizontal	4.26 dB (The confidential level is 95 %, $k=2$ )
		Vertical	4.39 dB (The confidential level is 95 %, $k=2$ )
	1 GHz ~ 18 GHz (3m chamber)	Horizontal	3.59 dB (The confidential level is 95 %, $k=2$ )
		Vertical	3.59 dB (The confidential level is 95 %, $k=2$ )
Radiated Immunity Test		0.86 dB (The confidential level is 95 %, $k=2$ )	
Conducted Immunity Test		2.23 dB (The confidential level is 95 %, $k=2$ )	
Magnetic Field		5.78 dB (The confidential level is 95 %, $k=2$ )	

### - Giheung 2 Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.54 dB (The confidential level is 95 %, $k=2$ )
		ESH2-Z5	3.53 dB (The confidential level is 95 %, $k=2$ )
		ESH3-Z6	3.49 dB (The confidential level is 95 %, $k=2$ )
Conducted Emission - Signal		ISN T800	5.03 dB (The confidential level is 95 %, $k=2$ )
		ISNT8-Cat6	5.15 dB (The confidential level is 95 %, $k=2$ )
		ISN S751	5.15 dB (The confidential level is 95 %, $k=2$ )
Discontinuous		3.02 dB (The confidential level is 95 %, $k=2$ )	
Disturbance Power		3.66 dB (The confidential level is 95 %, $k=2$ )	
Radiated Emission	9 kHz ~30 MHz (3m chamber)	Horizontal	3.84 dB (The confidential level is 95 %, $k=2$ )
		Vertical	3.84 dB (The confidential level is 95 %, $k=2$ )
	30 MHz ~ 1 000 MHz (10m chamber)	Horizontal	5.18 dB (The confidential level is 95 %, $k=2$ )
		Vertical	5.32 dB (The confidential level is 95 %, $k=2$ )
	1 GHz ~ 18 GHz (3m chamber)	Horizontal	3.62 dB (The confidential level is 95 %, $k=2$ )
		Vertical	3.67 dB (The confidential level is 95 %, $k=2$ )
Radiated Immunity Test		1.47 dB (The confidential level is 95 %, $k=2$ )	
Conducted Immunity Test		2.23 dB (The confidential level is 95 %, $k=2$ )	
Magnetic Field		5.78 dB (The confidential level is 95 %, $k=2$ )	

- End of Test Report -