

FCC DECLARATION OF CONFORMITY

Certificate No : EMC-2014/039
Type of equipment : BlueTooth Anti-Loss Device
Model Name : KI POP

It's herewith confirmed to comply with the requirements of FCC Part 15 Rules. (Class B)

Operating 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

The equipment was tested by EMC compliance. Ltd. for compliance with the requirements Set forth in the FCC Rules and Regulation Part 15 and the measurement procedure according to ANSI C63.4. The test was carried out from the submitted samples.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

The following importer/ manufacturer is responsible for this declaration

Applicant : KOREA IMAGINEERING
1603, Gasandong STXV-Tower 128, Gasan
digital 1-ro, Geumcheon-gu, Seoul, Korea

Manufacturer : KOREA IMAGINEERING
1603, Gasandong STXV-Tower 128, Gasan
digital 1-ro, Geumcheon-gu, Seoul, Korea

MANUFACTURER/IMPORTER



(Name)'F wenLp. 'Ngg

(Date)'Lw{ '53. '4236

TESTING LABORATORY



(Name) Jeong-Soo, Beak

(Date) July 31, 2014

FCC COMPLIANCE REPORT

Test report No : EMC-2014/039
Type of Equipment : BlueTooth Anti-Loss Device
Model Name : KI POP
Applicant : KOREA IMAGINEERING
1603, Gasandong STXV-Tower 128,
Gasandigital 1-ro, Geumcheon-gu, Seoul, Korea
Manufacturer : KOREA IMAGINEERING
1603, Gasandong STXV-Tower 128,
Gasandigital 1-ro, Geumcheon-gu, Seoul, Korea
Test standards : FCC part 15 subpart B, Class B
FCC ID : 2ACMPKIPOP
Classification : DoC
Test Procedure and Items
- Radiated Emissions Measurement : ANSI C63.4-2009
Testing Laboratory : EMC Compliance Ltd.
Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Date of receipt: 2014. 05. 21

Date of testing: 2014. 06. 11

Issued date: 2014. 07. 31

Tested by:



SUNG, KI-MUN

Approved by:



BEAK, JEONG-SOO

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1. Applicant information

Applicant: KOREA IMAGINEERING
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E-mail: duckjini72@gmail.com
Contact name: **Lee Duck Jin**

Manufacturer: KOREA IMAGINEERING
Address: 1603, Gasandong STXV-Tower 128,
Gasandong digital 1-ro, Geumcheon-gu, Seoul, Korea
Telephone: +82-2-811-3668
Fax: +82-2-811-3669
E-mail: duckjini72@gmail.com
Contact name: **Lee Duck Jin**

2. Laboratory information

Address

EMC compliance Ltd.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-390, Korea

Telephone Number: 82 31 336 9919

Facsimile Number: 82 505 299 8311

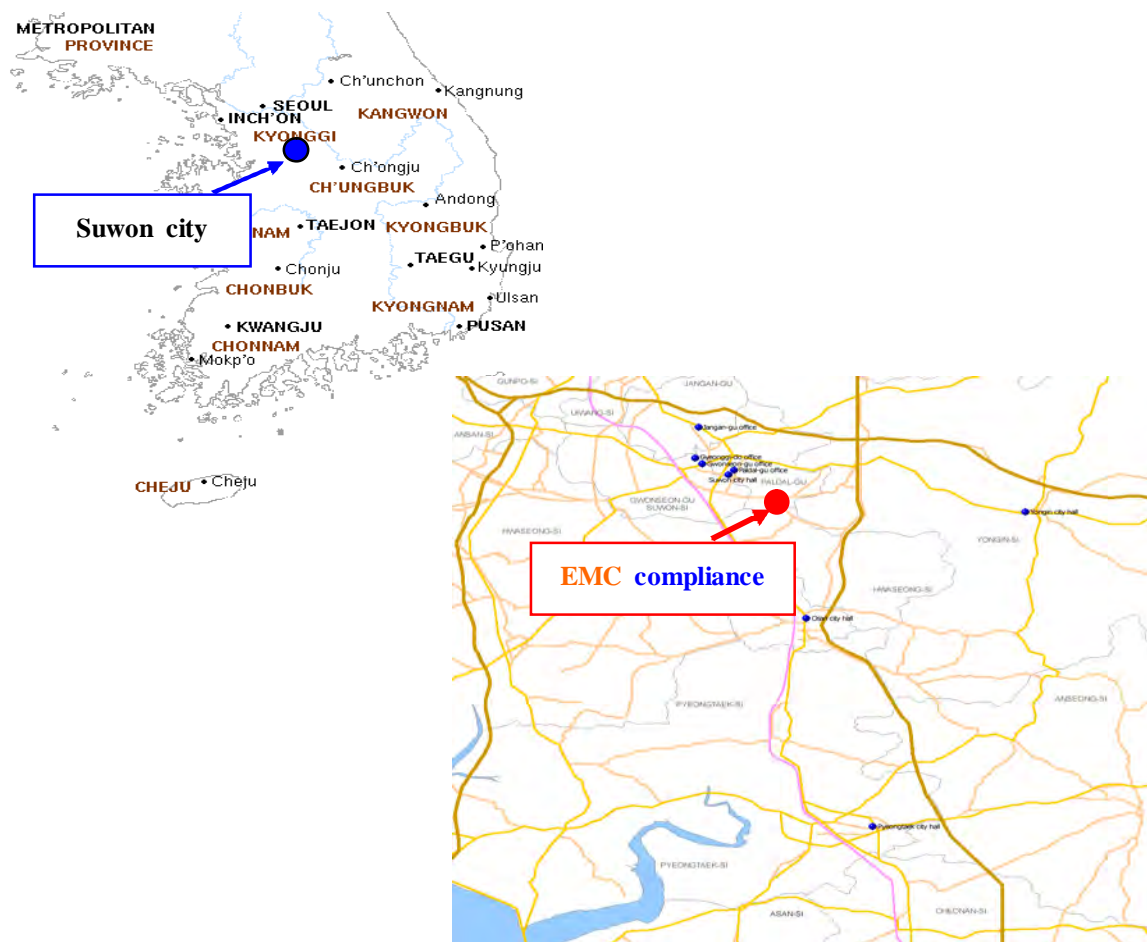
FCC CAB.: KR0040

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No.: 8035A

KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m)	: 20.3 °C	53.2 % R.H.	-

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Conducted emission measurement (C.L: Approx 95 %, k = 2)		
Shielded Room (CE#1)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#3)	9 kHz ~ 150 kHz: ± 4.00 dB 150 kHz ~ 30 MHz: ± 3.63 dB	
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 MHz ~ 300 MHz	3 m: + 4.56 dB, - 4.58 dB 10 m: + 4.56 dB, - 4.56 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.84 dB, - 4.85 dB 10 m: + 4.71 dB, - 4.72 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB
10 m Chamber (#F2)	30 MHz ~ 300 MHz	3 m: + 4.86 dB, - 4.88 dB 10 m: + 4.86 dB, - 4.86 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.98 dB, - 4.99 dB 10 m: + 4.85 dB, - 4.87 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB

4. Description of E.U.T.

4.1 General information

Bluetooth Version	BT 4.0 LE
Frequency Range	2.402~2.480 MHZ
RF Output Power	0dBm
Battery	CR2025 coin bat 3.3V
Battery Life	up to 1 year

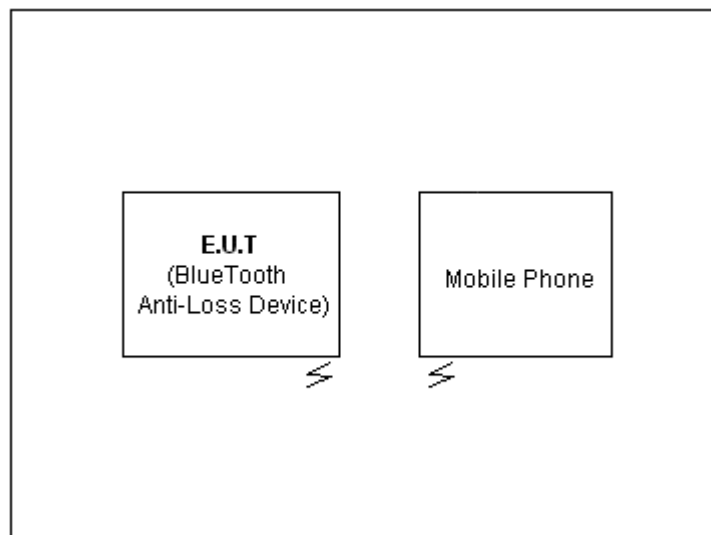
4.2 Product description

Type of product	BlueTooth Anti-Loss Device
Model name (Basic)	KI POP
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 3 V
Product rating	DC 3 V
Internal clock frequency	Above 108 Mhz
Note	-

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Mobile Phone	SHV-E330S	-	SAMSUNG

4.4 Test configuration



Note	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
-	EUT (BlueTooth Anti-Loss Device)	-	-	-	-	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	EUT and mobile phone connect to the Bluetooth. (Application: KIPOP)

5. Summary of test results

In the above configuration tested, The EUT complied with the requirement of the specification

5.1 Summary of EMI emission test results

FCC Part 15 Subpart B (Class B)

ANSI C63.4 – 2009

Applied	Test items	Test method	Result
<input type="checkbox"/>	Conducted Emission	ANSI C63.4 – 2009	N/A
<input checked="" type="checkbox"/>	Radiated Emission	ANSI C63.4 – 2009	Complied

6. Test results

6.1 Radiated Emission

Test specification	FCC Part 15, Section 15.109(g), Class B		
Testing voltage	DC 3 V		
Test facility	10 m Chamber (#F4)		
Test distance	3 m		
Date	2014. 06. 11		
Temperature (°C)	20.3 °C	Humidity (% R.H.)	53.2 % R.H.
Remarks	Complied		

6.1.1 Limits of radiated emission measurement

Frequency [MHz]	Class A (dB(μV/m)) @ 10 m	Class B (dB(μV/m)) @ 3 m
30-88	39	40
88-216	43.5	43.5
216-960	46.4	46
Above 960	49.5	54

* Note- Alternative standard: CISPR, Pub. 22 *

6.1.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.

Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.1.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2015.01.27	<input checked="" type="checkbox"/>
Test Receiver	ESCI	100001	R&S	2014.07.25	<input type="checkbox"/>
Test Receiver	ESCI	100710	R&S	2014.10.28	<input type="checkbox"/>
Test Receiver	ESR	101078	R&S	2015.02.24	<input type="checkbox"/>
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	2015.10.16	<input checked="" type="checkbox"/>
Amplifier	310	186280	SONOMA INSTRUMENT	2015.01.27	<input checked="" type="checkbox"/>
3 dB Attenuator	8491A	16861	HP	2014.07.08	<input checked="" type="checkbox"/>
Antenna Mast	AM4.0	079/3440509	MATURO	-	<input checked="" type="checkbox"/>
Turn Table	CO2000-SOFT	-	MATURO	-	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A01802	AGILENT	2014.09.03	<input checked="" type="checkbox"/>
Horn ANT	3115	00086706	ETS	2014.09.05	<input checked="" type="checkbox"/>
Horn ANT	3117	00155787	ETS	2015.02.26	<input checked="" type="checkbox"/>
Spectrum Analyzer	E4407B	US39010142	AGILENT	2014.10.21	<input checked="" type="checkbox"/>
Spectrum Analyzer	FSP7	100289	R&S	2014.11.25	<input type="checkbox"/>

6.1.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 3 \text{ dB Att} - \text{A.G})$$

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G = Amplifier Gain

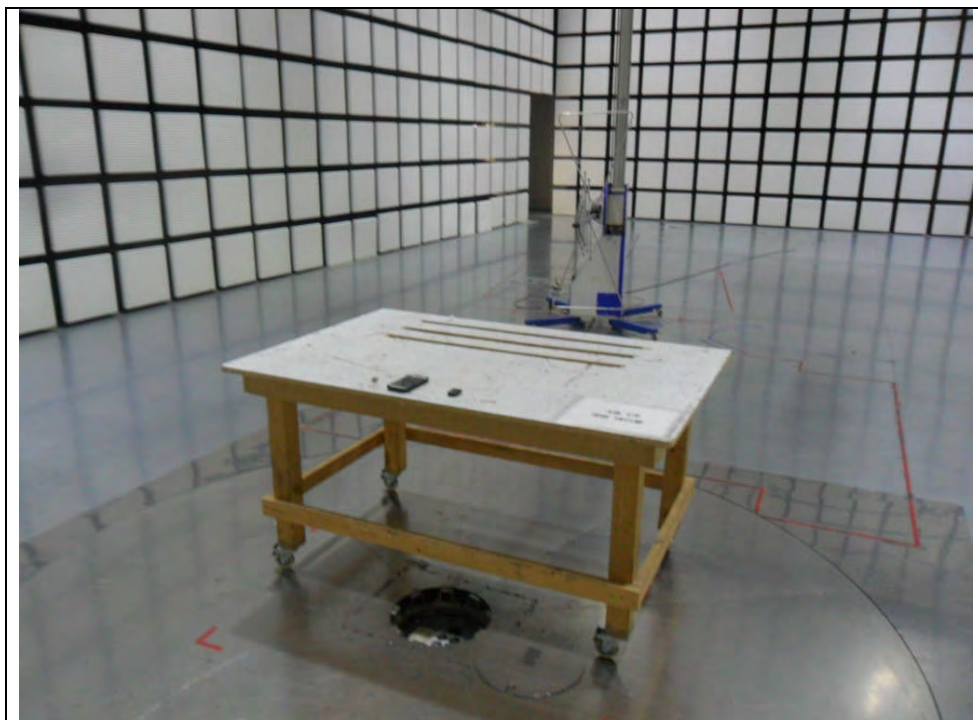
3 dB Att = 3 dB Attenuator

If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

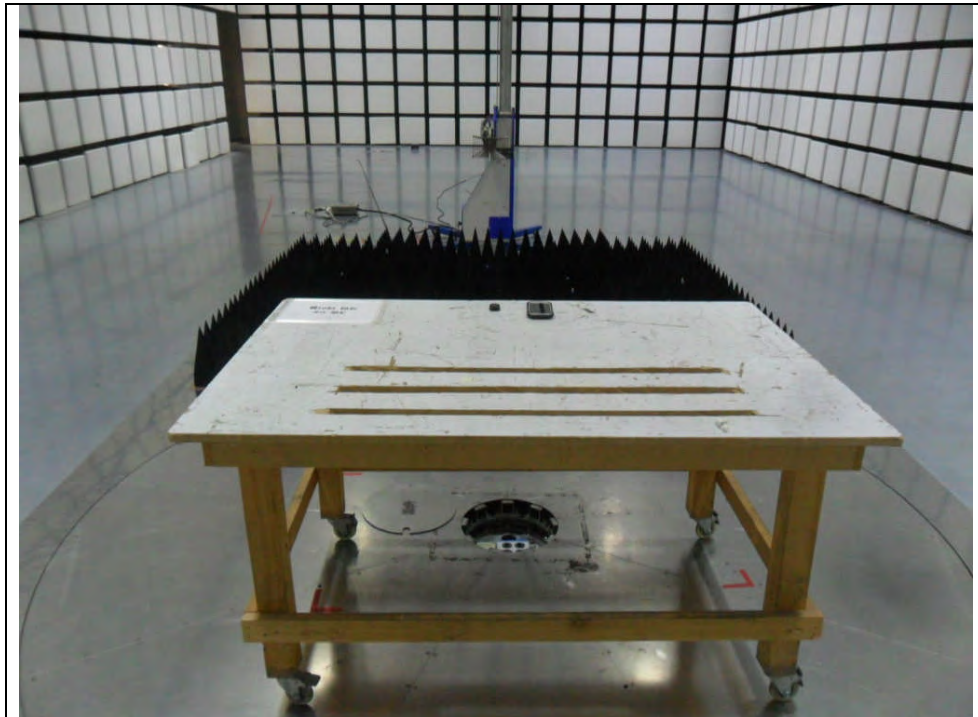
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



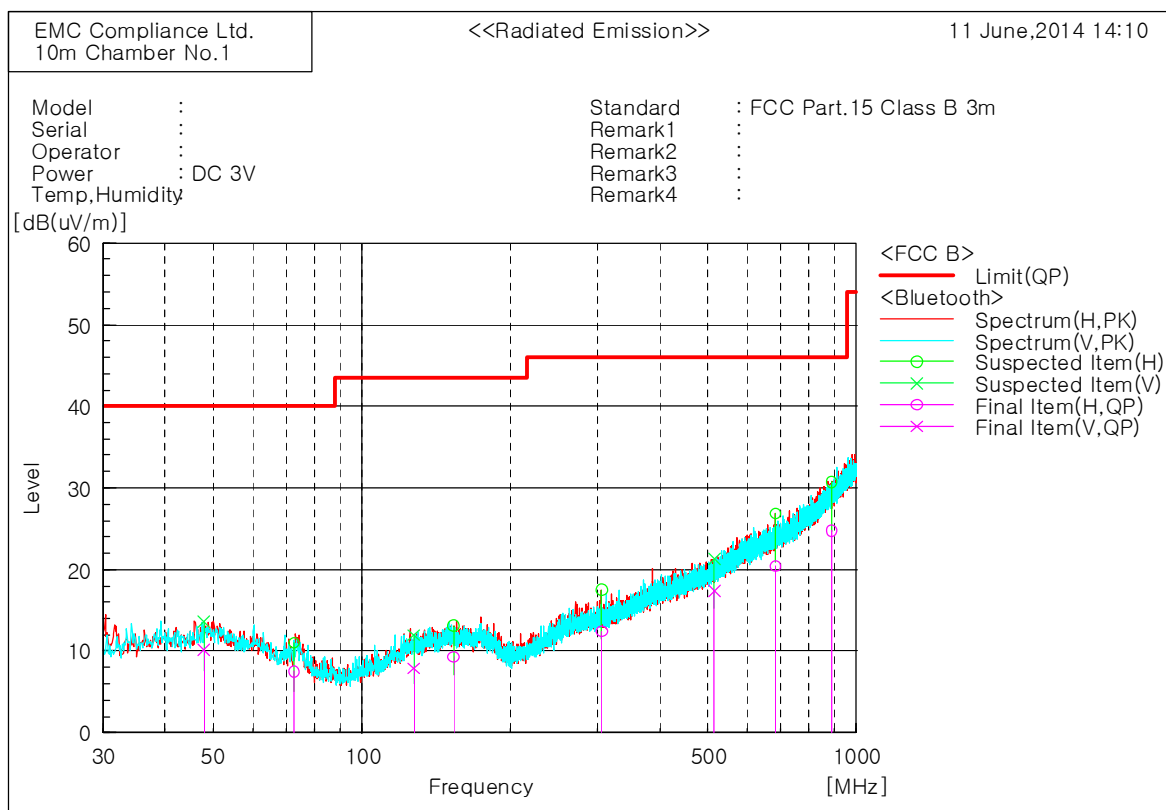
*1 GHz ~ 12 GHz



6.1.6 Radiated emission measurement result

* Graph and Data

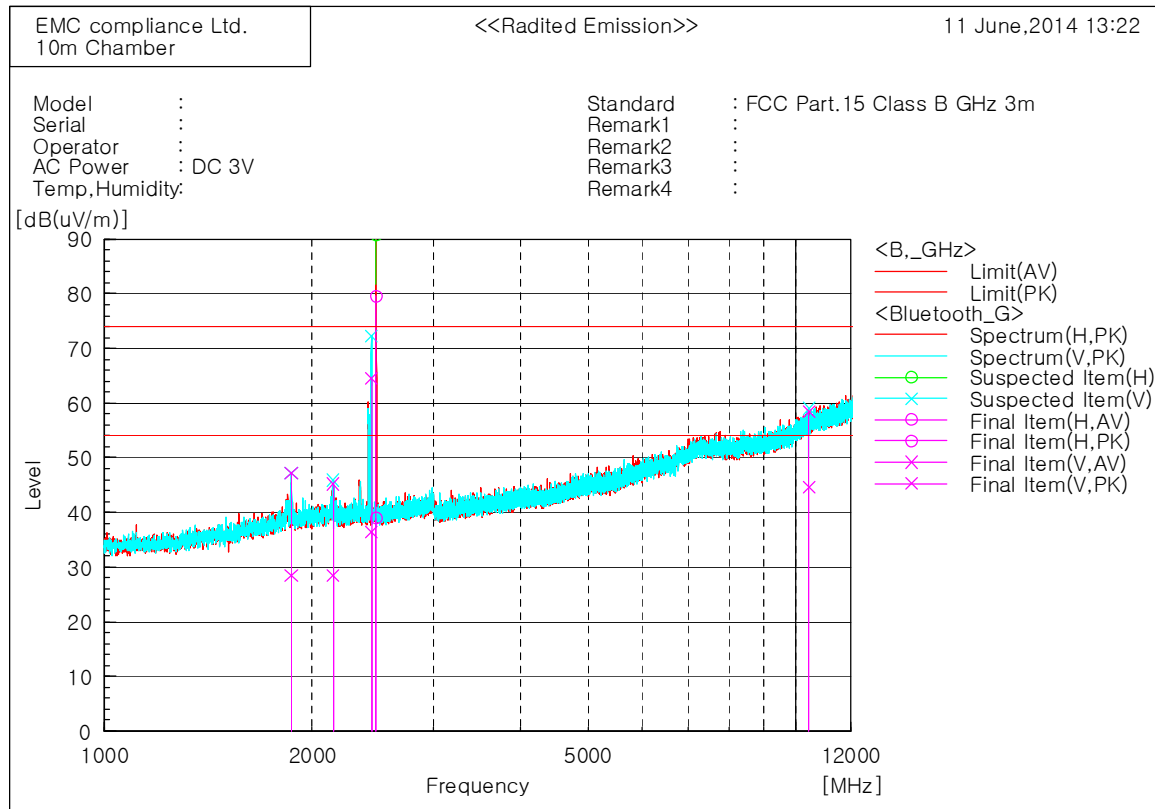
* 30 MHz ~ 1 GHz (KI POP)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	47.824	V	23.8	-13.6	10.2	40.0	29.8	199.0	148.9
2	72.801	H	23.8	-16.3	7.5	40.0	32.5	100.0	35.6
3	127.364	V	22.2	-14.3	7.9	43.5	35.6	298.0	199.0
4	153.190	H	22.3	-13.0	9.3	43.5	34.2	202.0	45.0
5	305.723	H	22.4	-10.0	12.4	46.0	33.6	302.0	5.9
6	515.121	V	21.4	-4.0	17.4	46.0	28.6	298.0	34.4
7	685.720	H	20.5	-0.1	20.4	46.0	25.6	400.0	343.2
8	891.239	H	20.2	4.6	24.8	46.0	21.2	302.0	347.7

* 1 GHz ~ 12 GHz (KI POP)



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c. f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1862.500	V	33.5	52.3	-5.0	28.5	47.3	54.0	74.0	25.5	26.7	100.0	245.4
2	2141.875	V	32.5	49.2	-4.0	28.5	45.2	54.0	74.0	25.5	28.8	100.0	10.1
3	2434.375	V	40.2	68.2	-3.7	36.5	64.5	54.0	74.0	17.5	9.5	100.0	337.1
4	2473.750	H	42.5	83.2	-3.6	38.9	79.6	54.0	74.0	15.1	-5.6	100.0	339.3
5	10444.500	V	28.9	42.8	15.7	44.6	58.5	54.0	74.0	9.4	15.5	100.0	319.3

* Fundamental frequency: 2473.750 MHz

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



Bottom View



Label



FCC Label Location



BlueTooth Anti-Loss Device
KI POP

Inside



Main Board

