

EMC TEST REPORT

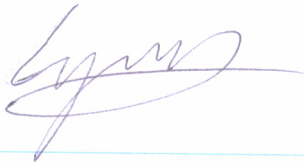
Project No.	LBE20145850	Issue No.	0
Applicant	Name of organization	Samsung Electronics Co., Ltd.	
	Address	(Maetan dong) 129, Samsung-ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742 Korea	
	Date of application	2014-12-29	
EUT	Kind of product	WLAN Access Point	
	Type of device	Class B personal computers and peripherals	
	Equipment authorization	☐ Declaration of Conformity ☒ Certification ☐ Verification	
	FCC ID	A3LWEA453E	
	Model No.	WEA453e	
		Variant Model No.	-
	Manufacturer	Samsung Electronics Co., Ltd. #244, 1Gongdan-ro, Gumi-Si, Gyeongsangbuk-Do, 730-030, Korea	
Applied Standards	47 CFR Part 15, Subpart B / ANSI C63.4-2009 ICES-003 Issue 5		
Test Period	2015-01-12 ~ 2015-01-13		
Issue date	2015-01-22		
Test result : Complied The equipment under test has found to be compliant with the applied standards. The result is not applied the uncertainty concept.			
Tested by : Su Young Son 		Reviewed by : Min Gon Kim 	
The test results in this report only apply to the tested sample. This report must not be reproduced, except in full, without written permission from CS & Environment center.			
 Samsung Electronics Co Ltd, CS & Environment Center (Maetan dong) 129, Samsung-ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742, Korea			

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1. Report information

1.1 Revision history

No.	Revised detailed information
Issue 0	There are no revisions and this version is basic test report.

1.2 Sample calculation

1.2.1 Conducted disturbance (at 10 MHz)

- Limit = 60 dB μ V (Quasi-peak limit)
- Level (50 dB μ V) = Meter Reading (40.2 dB μ V) + Factor (9.8 dB = AMN factor 9.7 dB + Cable loss 0.1 dB)
- Margin (10 dB) = Limit (60 dB μ V) - Level (50 dB μ V) = 10 dB below limit

1.2.2 Radiated disturbance (at 100 MHz)

- Limit = 30 dB μ V/m at 10 m
- Level (20 dB μ V/m)
= Meter Reading (40 dB μ V) + Factor (- 20 dB (1/m) = antenna factor + cable loss – amplifier gain)
- Margin (10 dB) = Limit (30 dB μ V/m) - Level (20 dB μ V/m) = 10 dB below limit

2. Summary of test results

2.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result
☒	Conducted Disturbance (Mains Port)	47 CFR Part 15, Subpart B / ANSI C63.4-2009 (Class B)	Complied
☒	Radiated Disturbance		Complied

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

3. General Information

3.1 Test facility

The CS & Environment center is located on Samsung Electronics Co., Ltd. at (Maetan dong) 129, Samsung-ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do 443-742 Korea. All testing are performed in Semi-anechoic chambers conforming to the site attenuation Characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The CS & Environment Centre is operated as EMC testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

4. Test Setup configuration

4.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Seq	Description	Model No.	Serial No.	Manufacturer	Fcc ID / DoC
A	WLAN Access Point	WEA453e	-	Samsung	A3LWEA453E
B	AC Adapter	SB-S410K	RD201408090017	Samsung	-
C	PoE Switch	WS-C2960S-24PD-L	FOC1727W077	CISCO	Verification
D	Note PC	NT-200B5B	HRW891CC900047W	Samsung	DoC
E	Note PC	NT-200B5B	HRW891CC900380D	Samsung	DoC
F	Note PC	NT-200B5B	HRW891JC90089P	Samsung	DoC

4.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1 (Test mode)	Networking (Ethernet & WLAN) using Dipole Antenna & AC Adapter
Operating Mode 2 (Test mode)	Networking (Ethernet & WLAN) using Patch Antenna & AC Adapter
Operating Mode 3 (Test mode)	Networking (Ethernet & WLAN) using Dipole Antenna & PoE power
Operating Mode 4 (Test mode)	Networking (Ethernet & WLAN) using Patch Antenna & PoE power

4.3 Details of Sampling

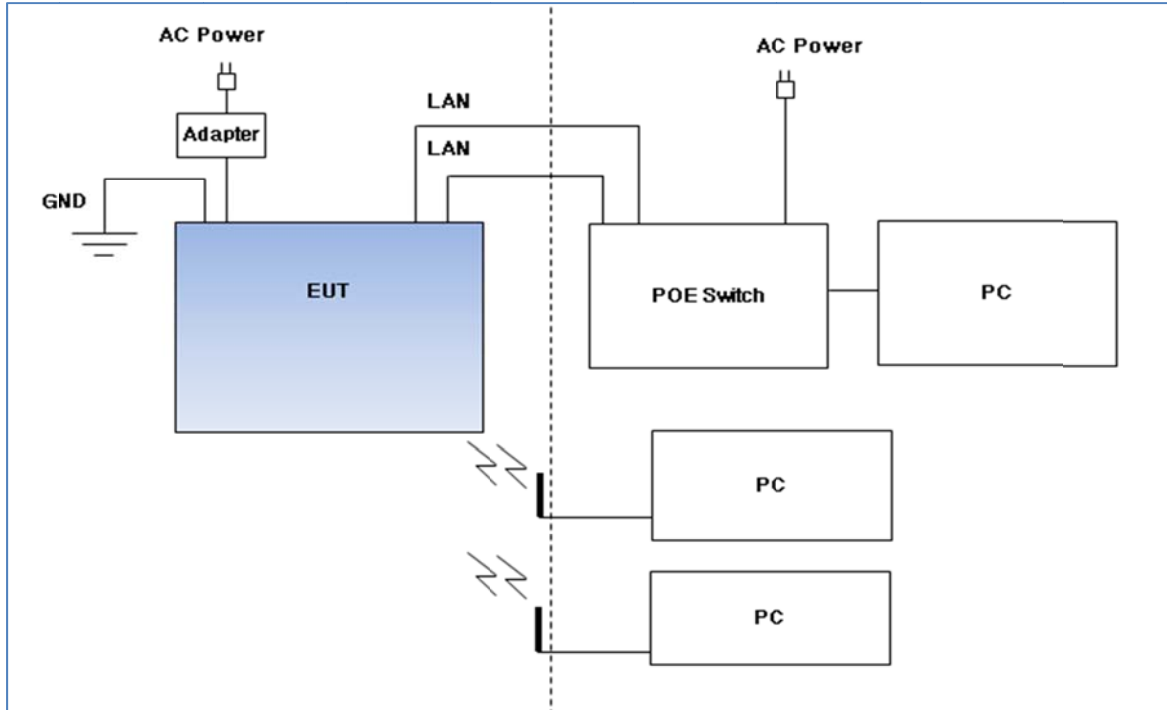
Customer selected, single unit.

4.4 Used cable description

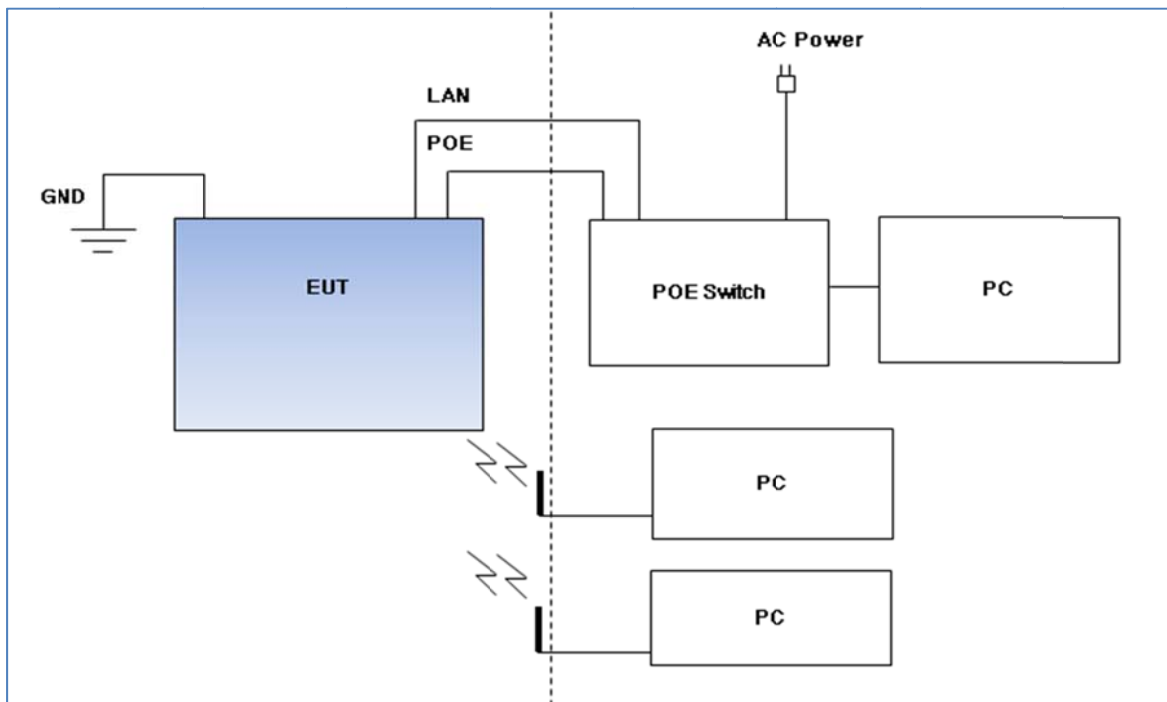
The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected;

No.	Connected cable	Length [m]	Shielded [Y/N]	Note
1	Power	0.8	N	For EUT
2	Power	1.8	N	For Adpater
3	LAN	2.0	Y	From PoE Switch to EUT
4	LAN	2.0	Y	From PoE Switch to EUT
5	Power	1.8	N	For Adpater
6	LAN	2.0	Y	From PoE Switch to PC

4.5 Test arrangement



[Mode 1,2]



[Mode 3,4]

4.6 EUT Description

The following features describe EUT represented by this report:

Item		
Wireless	Standard	802.11a/b/g/n/ac
	# of radio	Dual Concurrent Radio
	Frequency	2.4 GHz, 5 GHz
	Antennas	External Type (Dipole, Patch)
	MIMO	3 X 3 MIMO, 3 Spatial Streams
	PHY Rate	1.3 Gbps
H/W	Network I/F	2 GE (RJ45), 1 Console (RJ45)
	PoE	802.3at
	Environment Class	Outdoor
Dimension	Width x Length x Height	267 x 184 x 57.5 mm
	Weight	2.6 kg
Security	Standard	802.11i, WPA/WPA2
	Multi SSID	Maximum 16
	# of Multi VLAN over SSID	Maximum 1,024
	Encryption	DTLS
QoS	Standard	802.11e
	WMM	Yes
Management	Operation	Controller Based
Certification	WiFi Certified	WPA/WPA2, WMM, WMM-PS

4.7 Clock Frequencies

Kind of Clocks	Frequency[MHz]	Kind of Clocks	Frequency[MHz]
CPU Speed	1 000	DDR3	800

4.8 Test configuration and condition

The interface cables were connected to one of each type of functional interface port on the EUT, the system was configured for testing in a typical fashion that a customer would normally use.

The EUT was connected to a PoE Switch through the Ethernet port with shielded Twisted Pair Ethernet cable. Ethernet testing was performed at 1 000 Mbps, 100 Mbps, 10 Mbps operation.

Also, the EUT was connected to a PC through IEEE802.11 a/b/g/n/ac function.

Additionally, the EUT tested when supplied of power using PoE Switch.

- **Testing Voltage : AC 120 V, 60 Hz**

4.9 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

4.9.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance	Main terminal	3.12 dB
Radiated Disturbance (30 MHz ~ 1 GHz)	Horizontal	4.90 dB
	Vertical	4.65 dB
Radiated Disturbance (Above 1 GHz)	Horizontal	5.45 dB
	Vertical	5.43 dB

5. Results of individual test

5.1 Conducted disturbance

Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports

Frequency range Limits(MHz)	Resolution Bandwidth(kHz)	Limits of Class A, dB(μV)		Limits of Class B, dB(μV)	
		Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.50	9	79	66	66 ~ 56	56 ~ 46
0.50 ~ 5	9	73	60	56	46
5 ~ 30	9			60	50
NOTE 1 The lower limit shall apply at the transition frequency					
NOTE 2 The Class B limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.					

If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 seconds at each measurement frequency, the highest reading shall be recorded, with the exception of any brief isolated high reading (which shall be ignored).

5.1.1 Test instrumentation

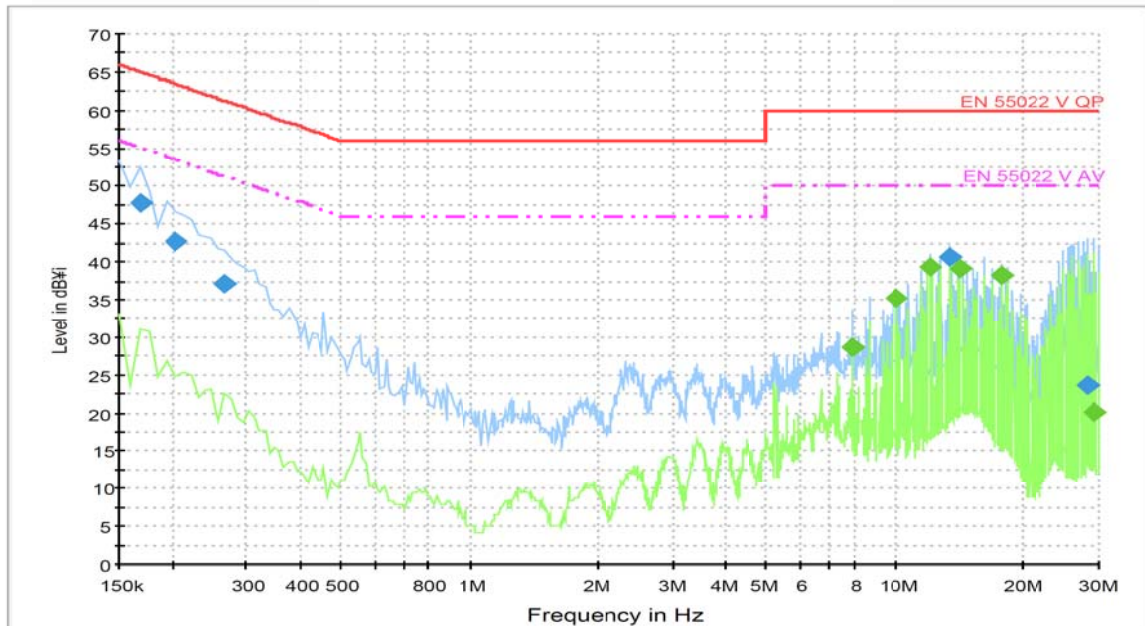
Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
EMI Test Receiver	ESIB-26	R&S	100291	2014-12-08	12
Two-Line V-Network	ENV216	R&S	101369	2014-11-17	12
Two-Line V-Network	ENV216	R&S	101366	2014-07-24	12

5.1.2 Temperature and humidity condition

Test date	2015-01-13	Test engineer		Su Young Son	
Climate condition	Ambient temperature	22.3 ℃	Relative humidity		45 %
	Atmospheric pressure	100.9 kPa			
Test place	Shielded Room #8				

5.1.3 Test results (mains port)

- Operating Mode : 1



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163000	47.7	5000.0	9.000	L1	9.9	17.30	65.10
0.204000	42.8	5000.0	9.000	N	10.0	20.70	63.40
0.267000	37.2	5000.0	9.000	L1	9.7	24.00	61.20
13.479000	40.8	5000.0	9.000	L1	9.9	19.20	60.00
14.154000	39.2	5000.0	9.000	L1	9.9	20.80	60.00
28.423000	23.5	5000.0	9.000	N	10.0	36.50	60.00

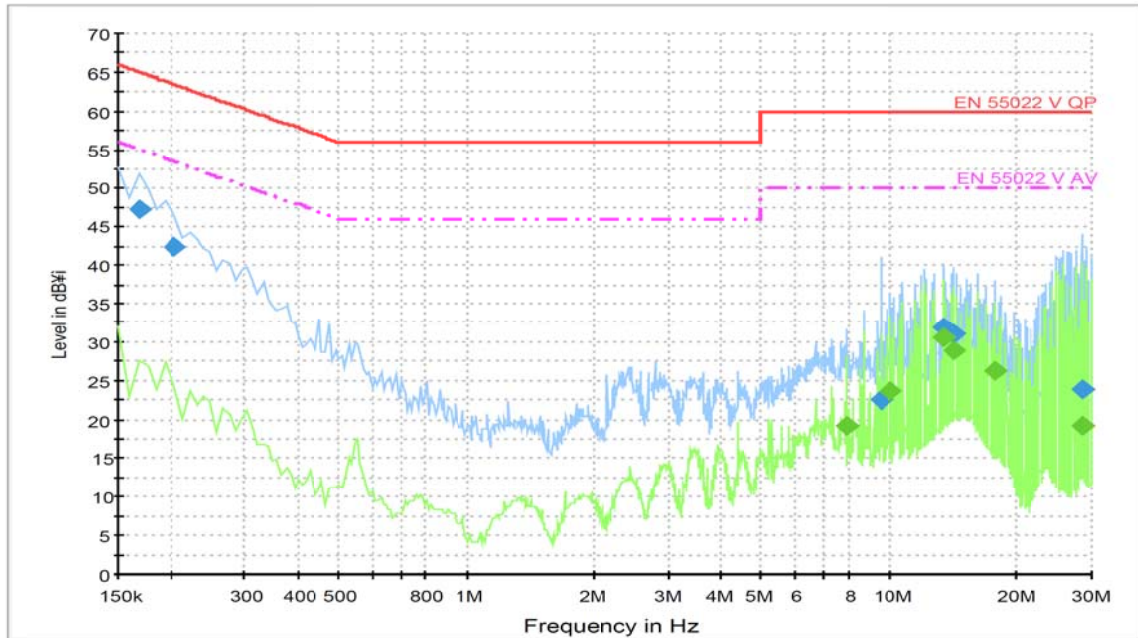
Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.926000	28.6	5000.0	9.000	L1	9.8	21.40	50.00
10.059000	35.1	5000.0	9.000	L1	9.8	14.90	50.00
12.133000	39.4	5000.0	9.000	L1	9.8	10.60	50.00
14.154000	39.1	5000.0	9.000	L1	9.8	10.90	50.00
17.691000	38.3	5000.0	9.000	N	9.9	11.70	50.00
29.166000	20.1	5000.0	9.000	L1	9.8	29.90	50.00

- Note1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph. 'Final Result 1' is Quasi-peak final measurement results table and 'Final Result 2' is CAverage final measurement results table.
- Note2) Level (Quasi-Peak and/or CAverage) = Meter Reading + Factor(Corr.)
- Note3) Line = Polarity of input power (Live or Neutral)
N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity
- Note4) Corr. = Factor = ISN Insertion Loss + Cable Loss
- Note5) Margin = Limit – Level (Quasi-Peak and/or CAverage)
- Note6) CAverage = CISPR-Average

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- Operating Mode : 2



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	47.4	5000.0	9.000	L1	9.9	17.70	65.10
0.204000	42.4	5000.0	9.000	L1	10.0	21.00	63.40
9.546000	22.5	5000.0	9.000	N	9.8	37.50	60.00
13.479000	31.9	5000.0	9.000	L1	9.9	28.10	60.00
14.154000	31.0	5000.0	9.000	L1	9.9	29.00	60.00
28.473000	23.8	5000.0	9.000	N	10.0	36.20	60.00

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
7.926000	19.2	5000.0	9.000	N	9.8	30.80	50.00
10.059000	23.6	5000.0	9.000	N	9.8	26.40	50.00
13.479000	30.6	5000.0	9.000	L1	9.9	19.40	50.00
14.154000	29.0	5000.0	9.000	L1	9.9	21.00	50.00
17.691000	26.3	5000.0	9.000	N	9.9	23.70	50.00
28.473000	19.4	5000.0	9.000	L1	9.8	30.60	50.00

- Note1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.
'Final Result 1' is Quasi-peak final measurement results table and 'Final Result 2' is CAverage final measurement results table.
- Note2) Level (Quasi-Peak and/or CAverage) = Meter Reading + Factor(Corr.)
- Note3) Line = Polarity of input power (Live or Neutral)
N : Abbreviation of Neutral Polarity, L1 : Abbreviation of Live Polarity
- Note4) Corr. = Factor = ISN Insertion Loss + Cable Loss
- Note5) Margin = Limit – Level (Quasi-Peak and/or CAverage)
- Note6) CAverage = CISPR-Average

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5.2 Radiated disturbance

Of those disturbances above ($L - 20$ dB), where L is the limit level in logarithmic units, record at least the disturbance levels and the frequencies of the six highest disturbances.

The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin. All measurements were taken utilizing quasi-peak detection unless stated otherwise.

Measurements were performed at an antenna to EUT distance of 10 meters and elevated between 1 and 4 meters. Both vertical and horizontal antenna polarizations were measured.

Limits for radiated disturbance of ITE at a measuring distance of 10 m

Frequency range Limits (MHz)	Resolution Bandwidth(kHz)	Quasi-peak Limits, dB(μV/m)	
		Class A	Class B
30 ~ 230	120	40	30
230 ~ 1 000	120	47	37
NOTE 1 The lower limit shall apply at the transition frequency			
NOTE 2 Additional provisions may be required for cases where interference occurs.			

Peak measurements were made over the changeable frequency range 1 GHz to 40 GHz in accordance with internal maximum operating frequency at a measurement distance of 3 m for the following antenna and turntable arrangements:

Antenna Height (cm)	Antenna Polarisation	Turntable position (degrees)
100 ~ 400	Horizontal, Vertical	Continuous

Limits for Class B equipment at a measurement distance of 3 m

Frequency range Limits GHz	Peak Limits dB μ V/m	Average Limits dB μ V/m
Above 1 GHz	74	54
NOTE The lower limit shall apply at the transition frequency		

Measurements within 20 dB of the limit were then maximized by adjusting turntable position. Final measurements were made using a average detector.

Results checked manually; and points close to the limit line were re-measured.

5.2.1 Test instrumentation

Test instrumentation	Model name	Manufacturer	Serial or Firmware (No./Ver.)	Calibration	
				Date	Interval (Month)
Antenna Mast	AM 4.0	Maturo	AM4.0/061/2410908	-	-
Antenna Mast	AM 4.0	Maturo	AM4.0/060/2410908	-	-
Controller	MCU	Maturo	MCU/100/2410908	-	-
Controller	HD100	HD	100/723	-	-
Preamplifier	317	SONOMA	312701	2014-03-24	12
Preamplifier	317	SONOMA	312702	2014-03-24	12
Preamplifier	ESV-Z3	R&S	815111	2014-04-10	12
BILOG Antenna	CBL6112D	TESEQ	36997	2013-11-06	24
BILOG Antenna	CBL6112B	Schaffner	2804	2014-05-14	24
Double-Ridged Waveguide Horn Antenna	HF906	R&S	100027	2013-05-31	24
EMI Test Receiver	ESU-26	R&S	100364	2014-05-15	12
EMI Test Receiver	ESU	R&S	100482	2014-06-16	12
EMI Test Receiver	ESIB-26	R&S	100355	2014-02-17	12

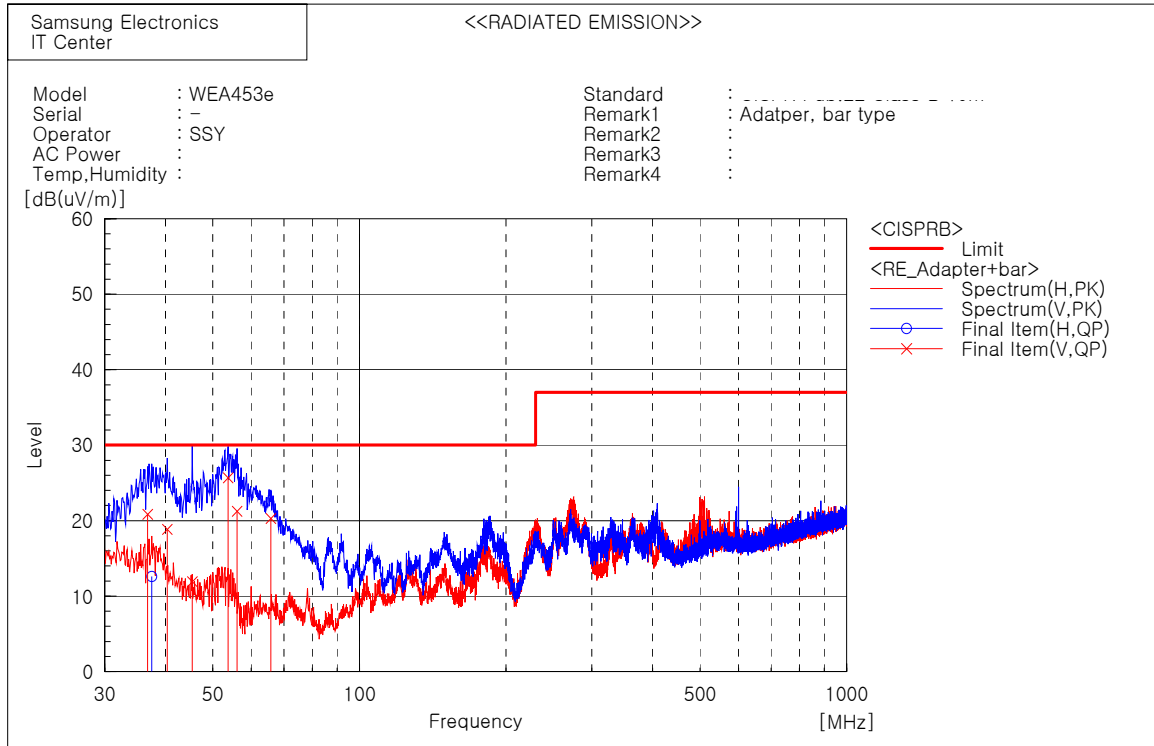
5.2.2 Temperature and humidity condition

Test date	2015-01-12	Test engineer		Su Young Son	
Climate condition	Ambient temperature	23.3 ℃	Relative humidity		44 %
	Atmospheric pressure	101.0 kPa			
Test place	10 m #1 Semi-Anechoic Chamber				

5.2.3.1 Below 1 GHz results

- Operating Mode : 1

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Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	System
	[MHz]		QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	36.772	V	43.5	-22.7	20.8	30.0	9.2	106.0	72.0	2
2	37.518	H	35.0	-22.4	12.6	30.0	17.4	298.0	168.0	1
3	40.306	V	43.2	-24.3	18.9	30.0	11.1	100.0	114.0	2
4	45.399	V	38.6	-26.7	11.9	30.0	18.1	100.0	126.0	2
5	53.765	V	56.1	-30.4	25.7	30.0	4.3	400.0	47.0	2
6	56.069	V	52.4	-31.1	21.3	30.0	8.7	400.0	30.0	2
7	65.769	V	51.7	-31.4	20.3	30.0	9.7	400.0	49.0	2

Note1) (P) : Abbreviation of Antenna Polarity

Note2) Reading QP : Received raw Quasi-peak signal

Note3) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

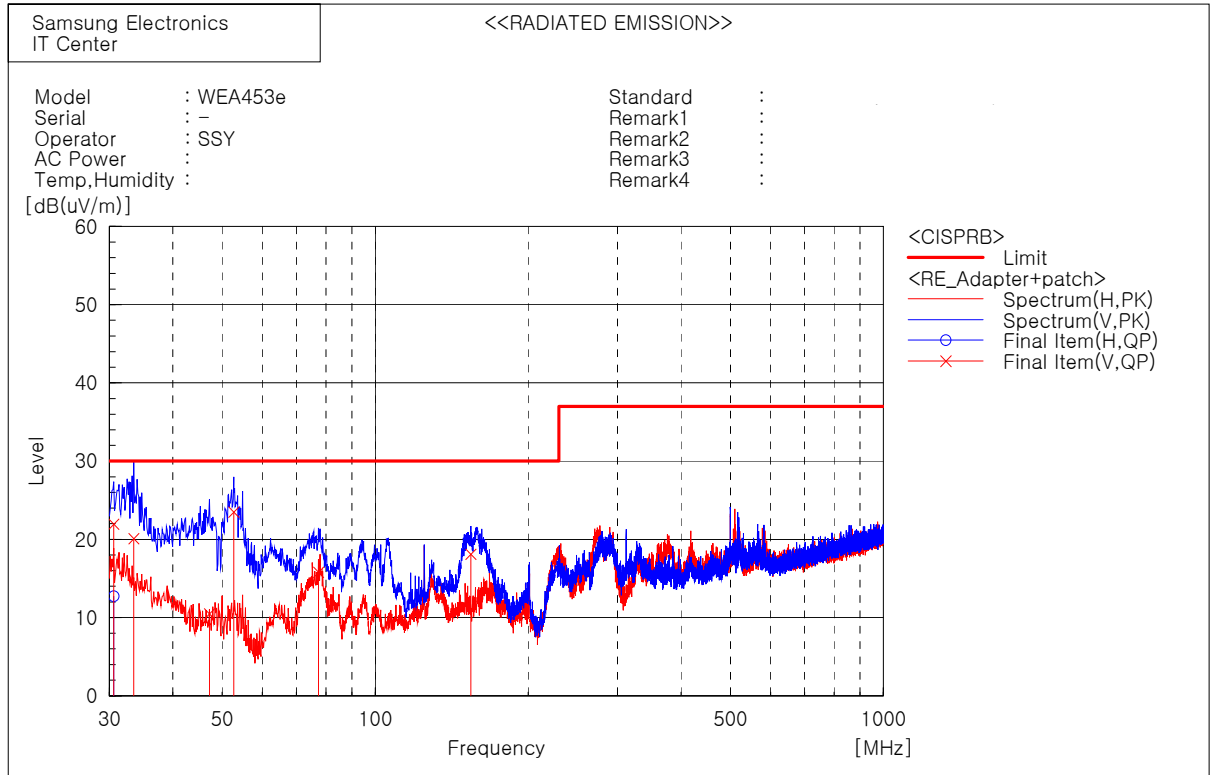
Note4) Result QP = Level QP = Reading QP + Factor, Real signal Quasi-peak level

Note5) Margin QP = Limit - Level QP

Note6) QP : Abbreviation of Quasi-peak

- **Operating Mode : 2**

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Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	System
1	30.606	H	32.0	-19.3	12.7	30.0	17.3	202.0	179.0	1
2	30.606	V	41.6	-19.6	22.0	30.0	8.0	102.0	209.0	2
3	33.516	V	41.2	-21.1	20.1	30.0	9.9	100.0	129.0	2
4	47.218	V	38.1	-27.6	10.5	30.0	19.5	299.0	185.0	2
5	52.674	V	53.4	-29.9	23.5	30.0	6.5	100.0	214.0	2
6	77.409	V	45.8	-30.0	15.8	30.0	14.2	299.0	313.0	2
7	154.281	V	43.9	-25.8	18.1	30.0	11.9	101.0	251.0	2

Note1) (P) : Abbreviation of Antenna Polarity

Note2) Reading QP : Received raw Quasi-peak signal

Note3) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note4) Result QP = Level QP = Reading QP + Factor, Real signal Quasi-peak level

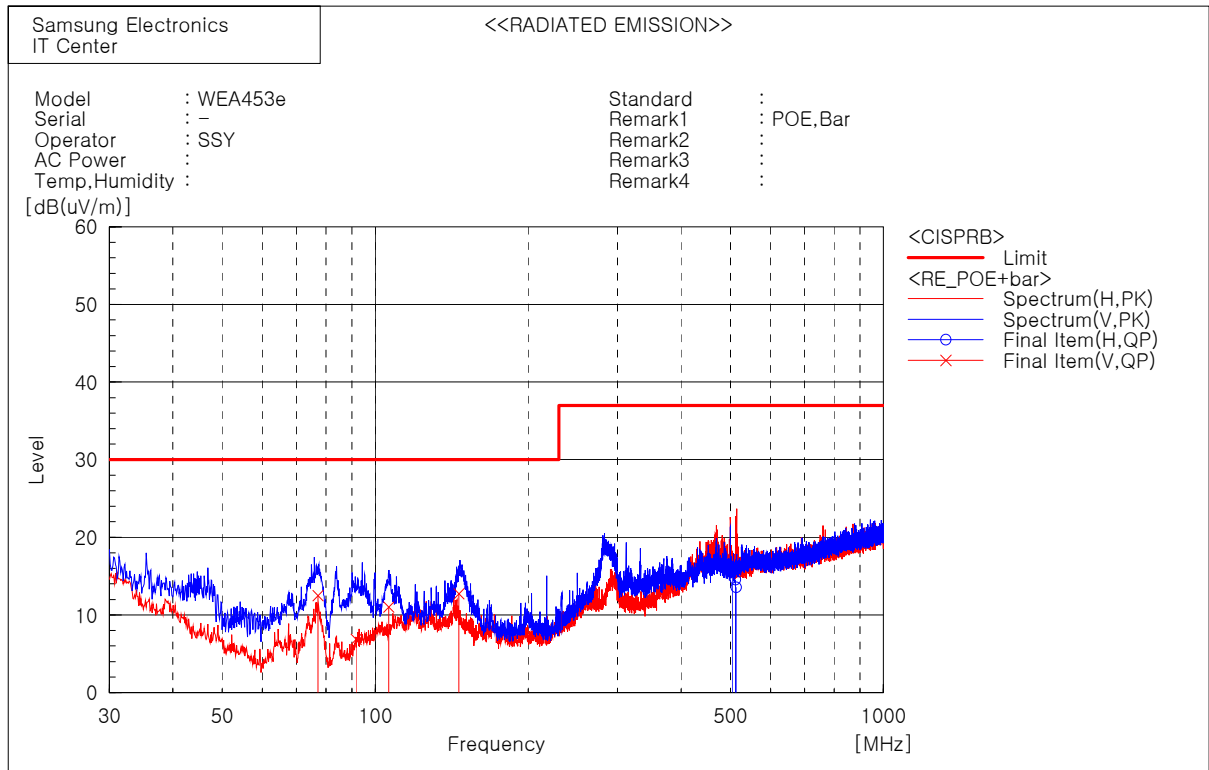
Note5) Margin QP = Limit - Level QP

Note6) QP : Abbreviation of Quasi-peak

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- **Operating Mode : 3**

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Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	System
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	77.175	V	42.5	-30.0	12.5	30.0	17.5	168.0	165.0	2
2	91.719	V	33.9	-27.0	6.9	30.0	23.1	105.0	2.0	2
3	106.383	V	36.0	-25.0	11.0	30.0	19.0	133.0	155.0	2
4	146.196	V	38.0	-25.2	12.8	30.0	17.2	108.0	203.0	2
5	504.312	H	30.7	-15.0	15.7	37.0	21.3	160.0	80.0	1
6	511.515	H	29.5	-14.9	14.6	37.0	22.4	183.0	76.0	1
7	513.196	H	28.5	-14.9	13.6	37.0	23.4	218.0	88.0	1

Note1) (P) : Abbreviation of Antenna Polarity

Note2) Reading QP : Received raw Quasi-peak signal

Note3) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note4) Result QP = Level QP = Reading QP + Factor, Real signal Quasi-peak level

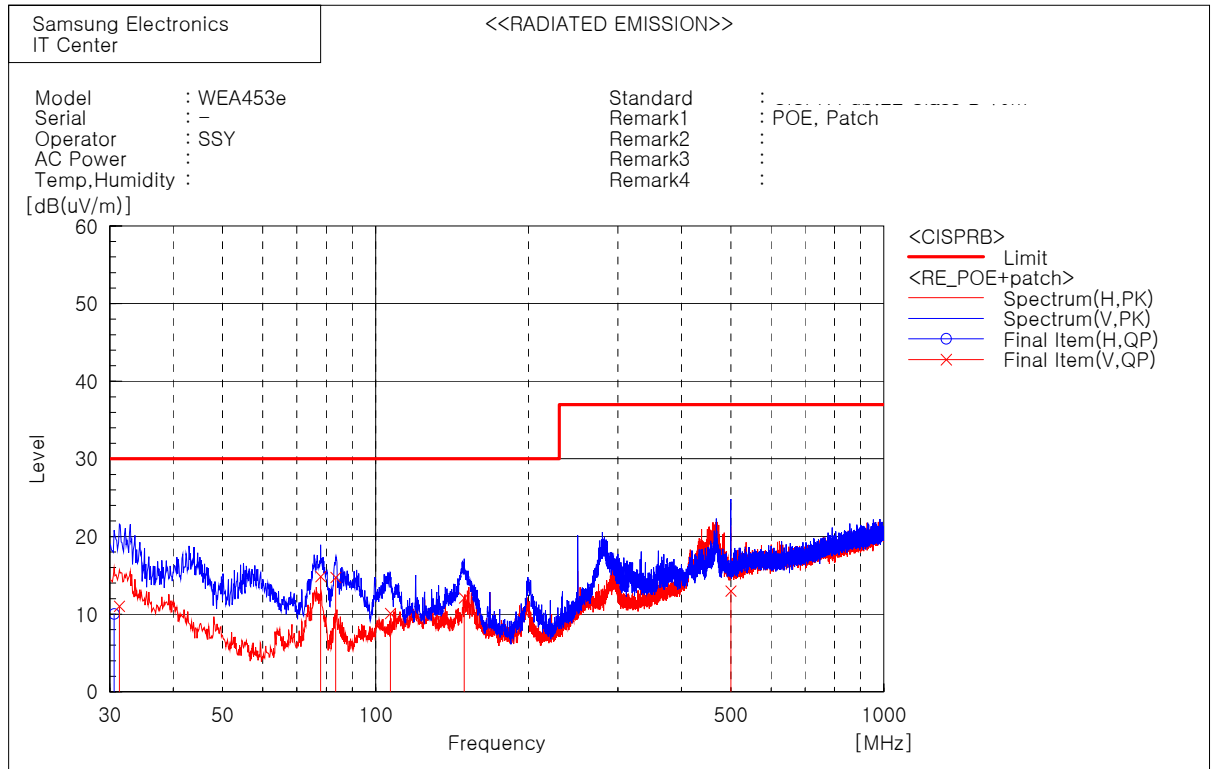
Note5) Margin QP = Limit - Level QP

Note6) QP : Abbreviation of Quasi-peak

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- Operating Mode : 4

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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]	System
1	30.606	H	29.3	-19.3	10.0	30.0	20.0	400.0	96.0	1
2	31.334	V	31.0	-20.0	11.0	30.0	19.0	197.0	17.0	2
3	78.015	V	44.7	-29.9	14.8	30.0	15.2	197.0	11.0	2
4	83.471	V	43.4	-28.7	14.7	30.0	15.3	197.0	172.0	2
5	106.994	V	35.1	-25.0	10.1	30.0	19.9	100.0	145.0	2
6	149.431	V	37.6	-25.5	12.1	30.0	17.9	197.0	352.0	2
7	500.086	V	29.5	-16.5	13.0	37.0	24.0	100.0	33.0	2

Note1) (P) : Abbreviation of Antenna Polarity

Note2) Reading QP : Received raw Quasi-peak signal

Note3) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note4) Result QP = Level QP = Reading QP + Factor, Real signal Quasi-peak level

Note5) Margin QP = Limit - Level QP

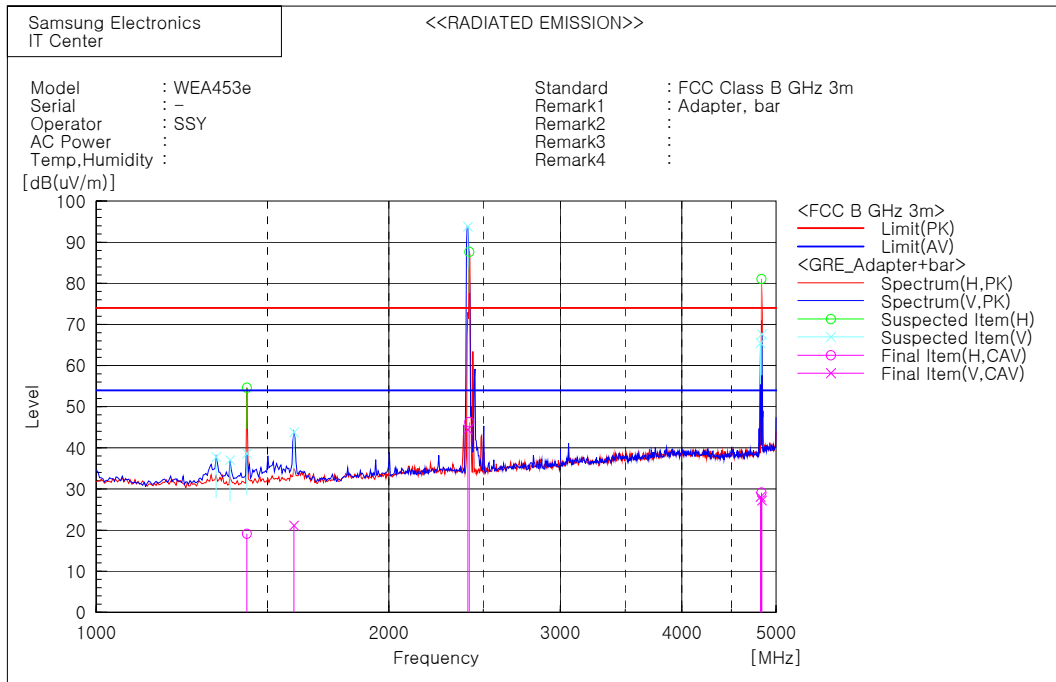
Note6) QP : Abbreviation of Quasi-peak

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5.2.3.2 Above 1 GHz results (1 ~ 6 GHz)

- Operating Mode : 1

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Final Result

No.	Frequency [MHz]	(P)	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result CAV [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin CAV [dB]	Height [cm]	Angle [deg]
1	1428.858	H	30.4	-11.3	19.1	54.0	34.9	101.0	261.0
2	1597.194	V	31.7	-10.6	21.1	54.0	32.9	101.0	153.0
3	2410.822	V	52.3	-7.8	44.5	54.0	9.5	101.0	354.0
4	2418.838	H	54.0	-7.8	46.2	54.0	7.8	101.0	50.0
5	4819.640	V	30.8	-2.7	28.1	54.0	25.9	101.0	352.0
6	4831.664	H	31.8	-2.6	29.2	54.0	24.8	101.0	250.0
7	4835.672	V	29.8	-2.6	27.2	54.0	26.8	101.0	356.0

Note1) Radiated emissions (Tx / Rx frequency and Harmonics) from the transceiver shall be ignored.

- Wi-Fi b/g/n : Operating frequencies (2 402 ~ 2 482) MHz / Harmonics (4 804 ~ 4 964) MHz

- Wi-Fi a/n/ac : Operating frequencies (5 170 ~ 5 710) MHz

Note2) (P) : Abbreviation of Antenna Polarity

Note3) Reading PK : Received raw Peak signal, Reading C/AV : Received raw CISPR-Average signal

Note4) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note5) Result (PK and/or C/AV) = Reading (PK and/or C/AV) + Factor, Real signal (PK and/or C/AV) level

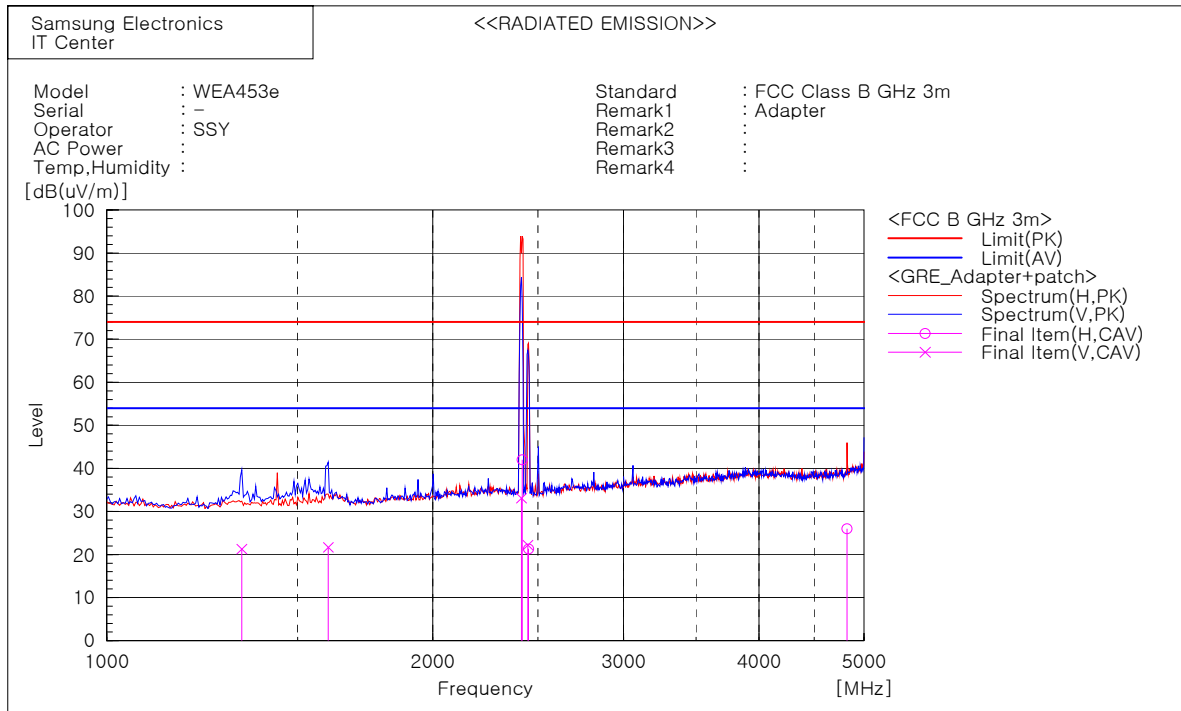
Note6) Margin (PK and/or C/AV) = Limit - Level (PK and/or C/AV)

Note7) QP : Abbreviation of Peak, C/AV : Abbreviation of CISPR-Average

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- **Operating Mode : 2**

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Final Result

No.	Frequency [MHz]	(P)	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result CAV [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin CAV [dB]	Height [cm]	Angle [deg]
1	1332.665	V	32.9	-11.6	21.3	54.0	32.7	101.0	119.0
2	1601.202	V	32.2	-10.5	21.7	54.0	32.3	101.0	230.0
3	2414.830	V	40.9	-7.8	33.1	54.0	20.9	101.0	353.0
4	2418.838	H	49.8	-7.8	42.0	54.0	12.0	101.0	120.0
5	2446.894	V	30.0	-7.8	22.2	54.0	31.8	101.0	208.0
6	2450.902	H	29.1	-7.8	21.3	54.0	32.7	101.0	9.0
7	4823.649	H	28.7	-2.7	26.0	54.0	28.0	101.0	54.0

Note1) Radiated emissions (Tx / Rx frequency and Harmonics) from the transceiver shall be ignored.

- Wi-Fi b/g/n : Operating frequencies (2 402 ~ 2 482) MHz / Harmonics (4 804 ~ 4 964) MHz

- Wi-Fi a/n/ac : Operating frequencies (5 170 ~ 5 710) MHz

Note2) (P) : Abbreviation of Antenna Polarity

Note3) Reading PK : Received raw Peak signal, Reading C/AV : Received raw CISPR-Average signal

Note4) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note5) Result (PK and/or C/AV) = Reading (PK and/or C/AV) + Factor, Real signal (PK and/or C/AV) level

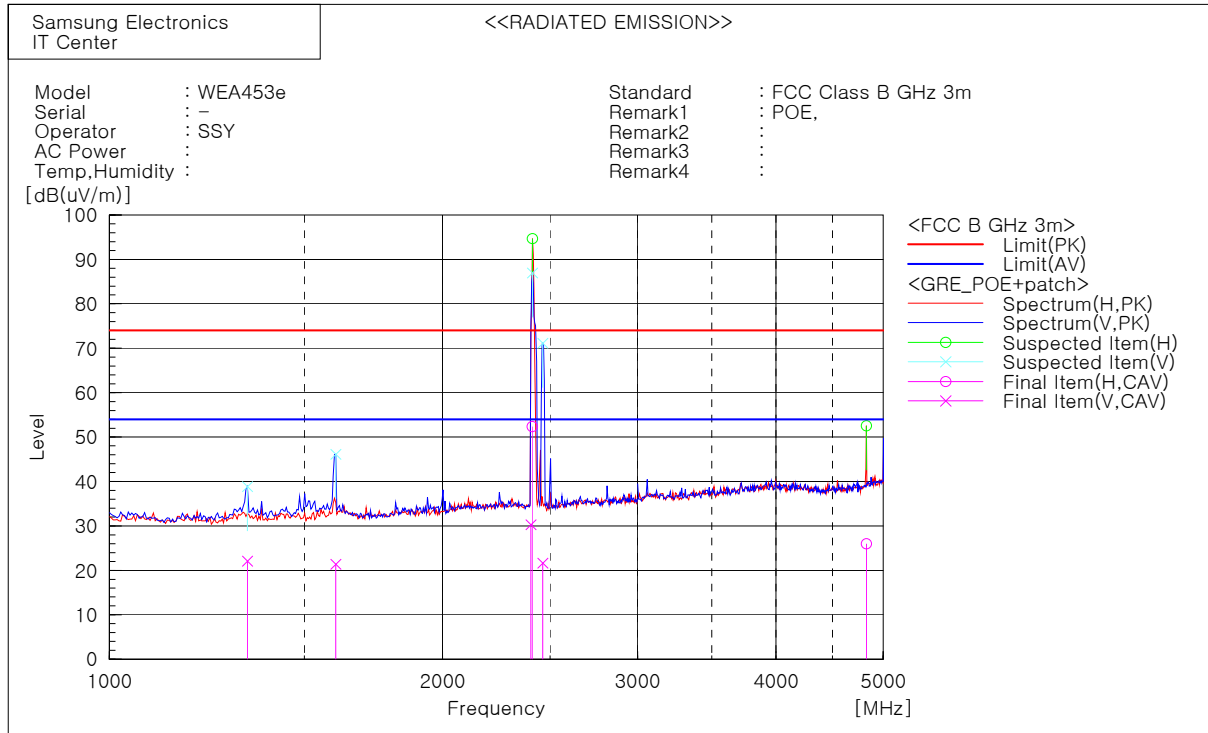
Note6) Margin (PK and/or C/AV) = Limit - Level (PK and/or C/AV)

Note7) QP : Abbreviation of Peak, C/AV : Abbreviation of CISPR-Average

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- Operating Mode : 3

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Final Result

No.	Frequency [MHz]	(P)	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result CAV [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin CAV [dB]	Height [cm]	Angle [deg]
1	1332.665	V	33.7	-11.6	22.1	54.0	31.9	101.0	87.0
2	1601.202	V	31.9	-10.5	21.4	54.0	32.6	101.0	338.0
3	2403.427	V	38.2	-7.9	30.3	54.0	23.7	117.0	120.0
4	2409.600	H	60.2	-7.8	52.4	54.0	1.6	116.0	118.0
5	2462.926	V	29.5	-7.8	21.7	54.0	32.3	101.0	87.0
6	4827.656	H	28.6	-2.6	26.0	54.0	28.0	101.0	71.0
7	5807.615	V	42.1	0.4	42.5	54.0	11.5	101.0	112.0
8	5807.615	H	43.7	0.4	44.1	54.0	9.9	101.0	151.0
9	5891.784	H	27.4	0.6	28.0	54.0	26.0	101.0	86.0

Note1) Radiated emissions (Tx / Rx frequency and Harmonics) from the transceiver shall be ignored.
- Wi-Fi b/g/n : Operating frequencies (2 402 ~ 2 482) MHz / Harmonics (4 804 ~ 4 964) MHz
- Wi-Fi a/n/ac : Operating frequencies (5 170 ~ 5 710) MHz

Note2) (P) : Abbreviation of Antenna Polarity

Note3) Reading PK : Received raw Peak signal, Reading C/AV : Received raw CISPR-Average signal

Note4) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note5) Result (PK and/or C/AV) = Reading (PK and/or C/AV) + Factor, Real signal (PK and/or C/AV) level

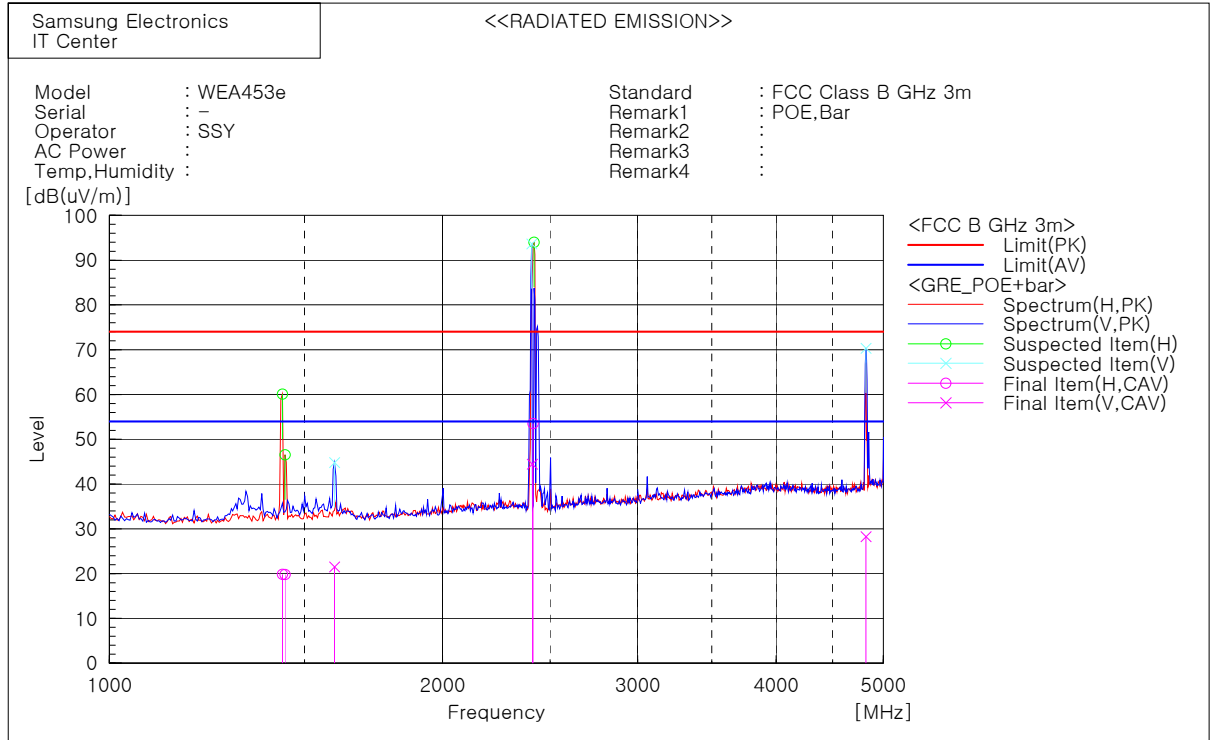
Note6) Margin (PK and/or C/AV) = Limit - Level (PK and/or C/AV)

Note7) QP : Abbreviation of Peak, C/AV : Abbreviation of CISPR-Average

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- Operating Mode : 4

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Final Result

No.	Frequency [MHz]	(P)	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result CAV [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin CAV [dB]	Height [cm]	Angle [deg]
1	1432.866	H	31.2	-11.3	19.9	54.0	34.1	100.0	105.0
2	1440.882	H	31.1	-11.3	19.8	54.0	34.2	100.0	254.0
3	1597.194	V	32.1	-10.6	21.5	54.0	32.5	100.0	355.0
4	2409.279	V	52.3	-7.8	44.5	54.0	9.5	117.0	5.0
5	2413.006	H	61.3	-7.8	53.5	54.0	0.5	116.0	263.0
6	4821.644	V	31.0	-2.7	28.3	54.0	25.7	100.0	355.0
7	5789.850	H	41.4	0.3	41.7	54.0	12.3	118.0	144.0

Note1) Radiated emissions (Tx / Rx frequency and Harmonics) from the transceiver shall be ignored.

- Wi-Fi b/g/n : Operating frequencies (2 402 ~ 2 482) MHz / Harmonics (4 804 ~ 4 964) MHz

- Wi-Fi a/n/ac : Operating frequencies (5 170 ~ 5 710) MHz

Note2) (P) : Abbreviation of Antenna Polarity

Note3) Reading PK : Received raw Peak signal, Reading C/AV : Received raw CISPR-Average signal

Note4) c.f = Factor = Antenna factor + Cable loss - Amplifier gain

Note5) Result (PK and/or C/AV) = Reading (PK and/or C/AV) + Factor, Real signal (PK and/or C/AV) level

Note6) Margin (PK and/or C/AV) = Limit - Level (PK and/or C/AV)

Note7) QP : Abbreviation of Peak, C/AV : Abbreviation of CISPR-Average

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Appendix – EUT photography



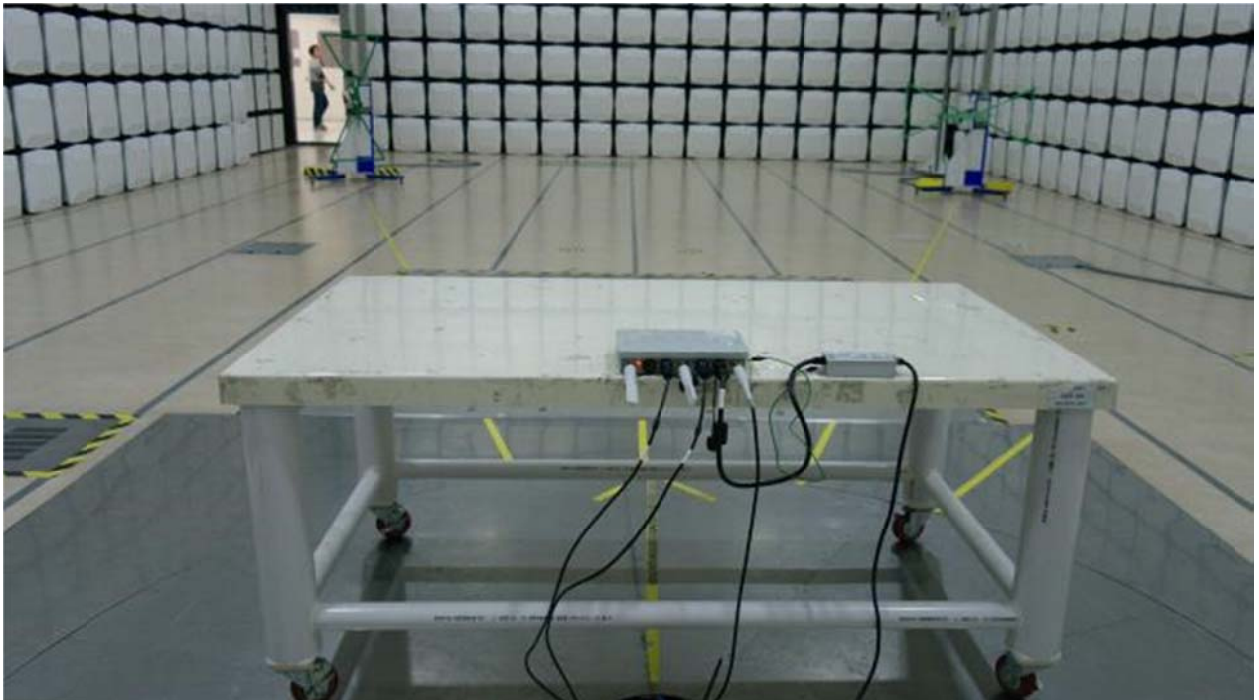
Conducted disturbance(Front)



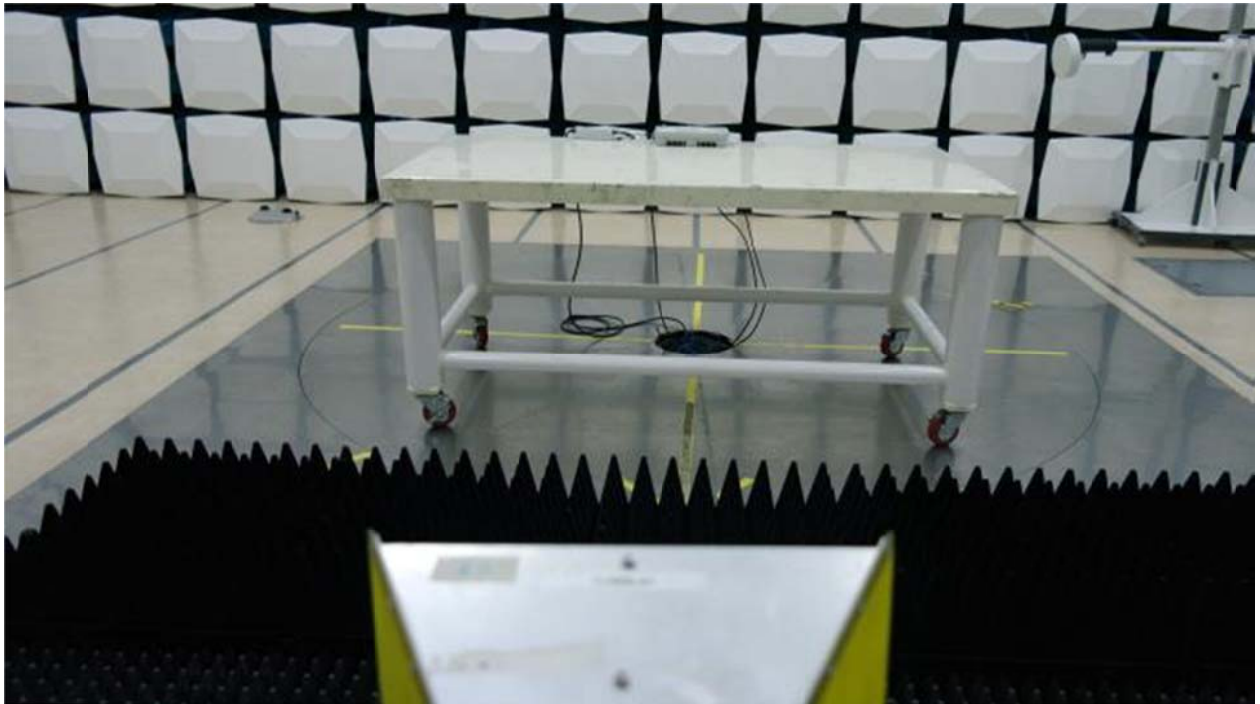
Conducted disturbance(Rear)



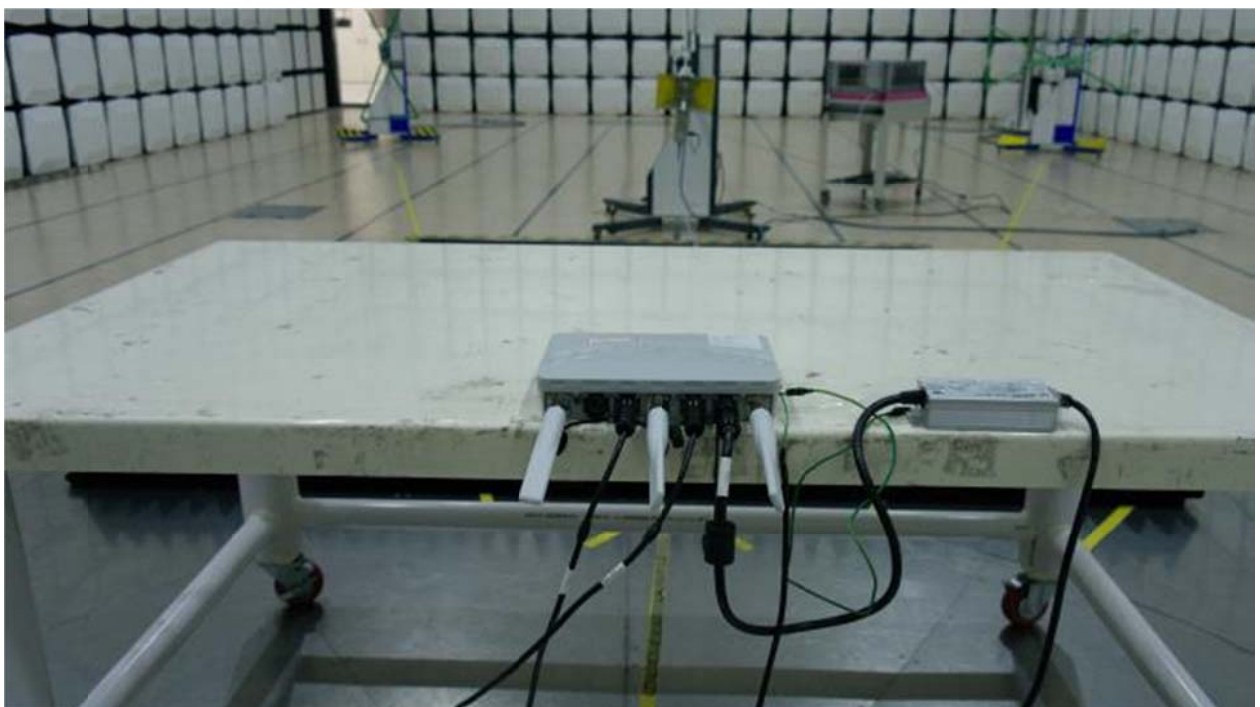
Radiated disturbance below 1GHz(Front)



Radiated disturbance below 1GHz(Rear)



Radiated disturbance above 1GHz(Front)



Radiated disturbance above 1GHz(Rear)



Front View (Dipole Antenna)



Rear View



Antenna Option (Patch)



Label Location



Label