

TESTING CERTIFICATE



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
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Certificate No.:
CTK-2015-00900
Page (1) / (54) Pages

1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do,
443-742 Republic of Korea
- Date of Receipt : 2015-03-18



2. Manufacturer

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do,
443-742 Republic of Korea

3. Use of Report : For FCC certification and IC certification

4. Test Sample / Model: WLAN Access Point / WEA463e

5. Date of Test : 2015-04-09 to 2015-06-18

6. Test Standard(method) used : FCC Part 15 Subpart B
ICES-003, Issue 5

7. Testing Environment: refer to 12 pages to 34 pages

8. Test Results : refer to 13 pages to 35 pages

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.

Affirmation	Tested by 	Approved by 
	Park Sangkyun: (Signature) EMC Test Engineer	Park Young-joon: (Signature) Technical Manager

2015-07-01

Republic of KOREA **CTK Co., Ltd.**



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REPORT REVISION HISTORY

Date	Revision	Page No
2015-07-01	Issued (CTK-2015-00900)	All

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1.0 General Product Description

No.	ITEM	APPLICATION
1	Test Sample	WLAN Access Point
2	Model	WEA463e
3	Variant Model	-
4	Dimensions (W x L x H)	260 mm × 185 mm × 45 mm
5	Mobility	☒ Table-top ☐ Floor-standing ☐ Built-in ☐ Portable
6	Maximum Clock Frequency	1 GHz
7	Electrical Ratings	AC/DC Adapter
		Input:
		AC 100 V – AC 240 V, 50 Hz / 60 Hz
		Output:
7	Electrical Ratings	PoE
		Input:
		DC 48 V, 0.5 A
		Output:
8	Test Voltage / Frequency	Voltage:
		AC 120 V
8	Test Voltage / Frequency	Frequency:
		60 Hz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

[AC/DC ADAPTER Mode]

Device	Model No.	Serial No.	Manufacturer
Antenna (Dipole Or Patch)	-	-	Samsung Electronics Co., Ltd.
SMPS	SB-S410K	-	Weihai Sunlin Electronics Co., Ltd.
Notebook Computer1	NT550P5C	JATQ91ID500086A	Samsung Electronics Co., Ltd.
AC/DC ADAPTER1	AD-9019S	CNBA4400215ADON831T0B2Z	Chicony Power Technology Co., Ltd.
Notebook Computer2	NT-R60Y	Z9GJ93GS302109B	Samsung Electronics Co., Ltd.
AC/DC ADAPTER2	AD-6019	CNBA4400238AD2VH93E1986	LI SHIN INTERNATIONAL ENTERPRISE CORP.
Notebook Computer3	PP20L	CN-0KD882-48643-69I-0039	Dell Asia Pacific Sdn.
AC/DC ADAPTER3	PA-1650-05DK	CN-0D1100-71615-4A3-0178	Dongguang Lite Power 2nd Plant

[PoE Mode]

Device	Model No.	Serial No.	Manufacturer
Antenna (Dipole Or Patch)	-	-	Samsung Electronics Co., Ltd.
PoE Switch	GS110TP	200CC8412556	NETGEAR INC
AC/DC ADAPTER1	AD8190LF	-	BAO HUI SCIENCE & TECHNOLOGY CO., LTD.
Notebook Computer1	NT550P5C	JATQ91ID500086A	Samsung Electronics Co., Ltd.
AC/DC ADAPTER2	AD-9019S	CNBA4400215ADON831T0B2Z	Chicony Power Technology Co., Ltd.
Notebook Computer2	NT-R60Y	Z9GJ93GS302109B	Samsung Electronics Co., Ltd.
AC/DC ADAPTER3	AD-6019	CNBA4400238AD2VH93E1986	LI SHIN INTERNATIONAL ENTERPRISE CORP.
Notebook Computer3	PP20L	CN-0KD882-48643-69I-0039	Dell Asia Pacific Sdn.
AC/DC ADAPTER4	PA-1650-05DK	CN-0D1100-71615-4A3-0178	Dongguang Lite Power 2nd Plant

☒ Cable Description

[AC/DC ADAPTER Mode]

No.	From		To		Type of Cable		
	Device	I/O Port	Device	I/O Port	Length (m)	Shielded or Unshielded	Ferrite Core [Y/N]
1	EUT	Antenna	Antenna	-	-	-	-
2		ETHERNET(PoE)	Notebook Computer1	LAN	3.0	U	N
3		ETHERNET	Cable	-	3.0	U	N
4		DC Input	SMPS	DC Output	1.5	U	Y
5	SMPS	AC Power	AC Mains	-	2.0	U	N
6	Notebook Computer1	DC Input	AC/DC ADAPTER1	DC Output	1.5	U	Y
7	AC/DC ADAPTER1	AC Power	AC Mains	-	1.8	U	N
8	Notebook Computer2	DC Input	AC/DC ADAPTER2	DC Output	1.5	U	Y
9	AC/DC ADAPTER2	AC Power	AC Mains	-	1.8	U	N
10	Notebook Computer3	DC Input	AC/DC ADAPTER3	DC Output	1.5	U	Y
11	AC/DC ADAPTER3	AC Power	AC Mains	-	1.8	U	N
12	EUT	GND	-	GND	1.5	U	N
13	SMPS	GND	-	GND	1.5	U	N

[PoE Mode]

No.	From		To		Type of Cable		
	Device	I/O Port	Device	I/O Port	Length (m)	Shielded or Unshielded	Ferrite Core [Y/N]
1	EUT	Antenna	Antenna	-	-	-	-
2		ETHERNET(PoE)	PoE Switch	LAN1	3.0	U	N
3		ETHERNET	Cable	-	3.0	U	N
4	PoE Switch	LAN2	Notebook Computer1	LAN	3.0	U	N
5		DC Input	AC/DC ADAPTER1	DC Output	1.5	U	Y
6	AC/DC ADAPTER1	AC Power	AC Mains	-	1.8	U	N
7	Notebook Computer1	DC Input	AC/DC ADAPTER2	DC Output	1.5	U	Y
8	AC/DC ADAPTER2	AC Power	AC Mains	-	1.8	U	N
9	Notebook Computer2	DC Input	AC/DC ADAPTER3	DC Output	1.5	U	Y
10	AC/DC ADAPTER3	AC Power	AC Mains	-	1.8	U	N
11	Notebook Computer3	DC Input	AC/DC ADAPTER4	DC Output	1.5	U	Y
12	AC/DC ADAPTER4	AC Power	AC Mains	-	1.8	U	N
13	EUT	GND	-	GND	1.5	U	N

* Shielded or Unshielded : Unshielded=U, Shielded=S

1.4 Test Software

- ☐ EMC Test V 1.0
- ☐ Display Test Patterns - V1.5
- ☒ Ping.exe
- ☐ Not applicable

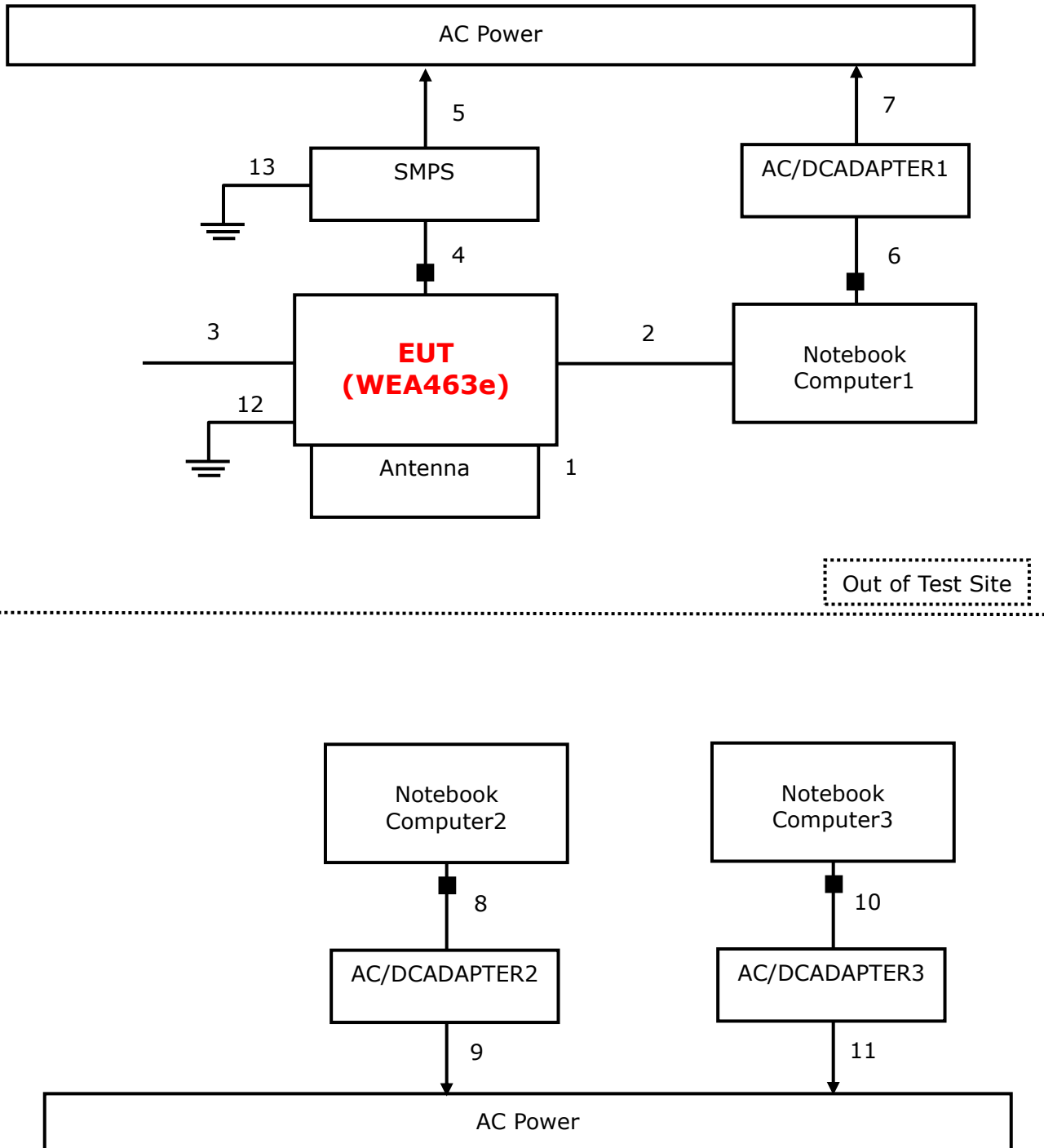
1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

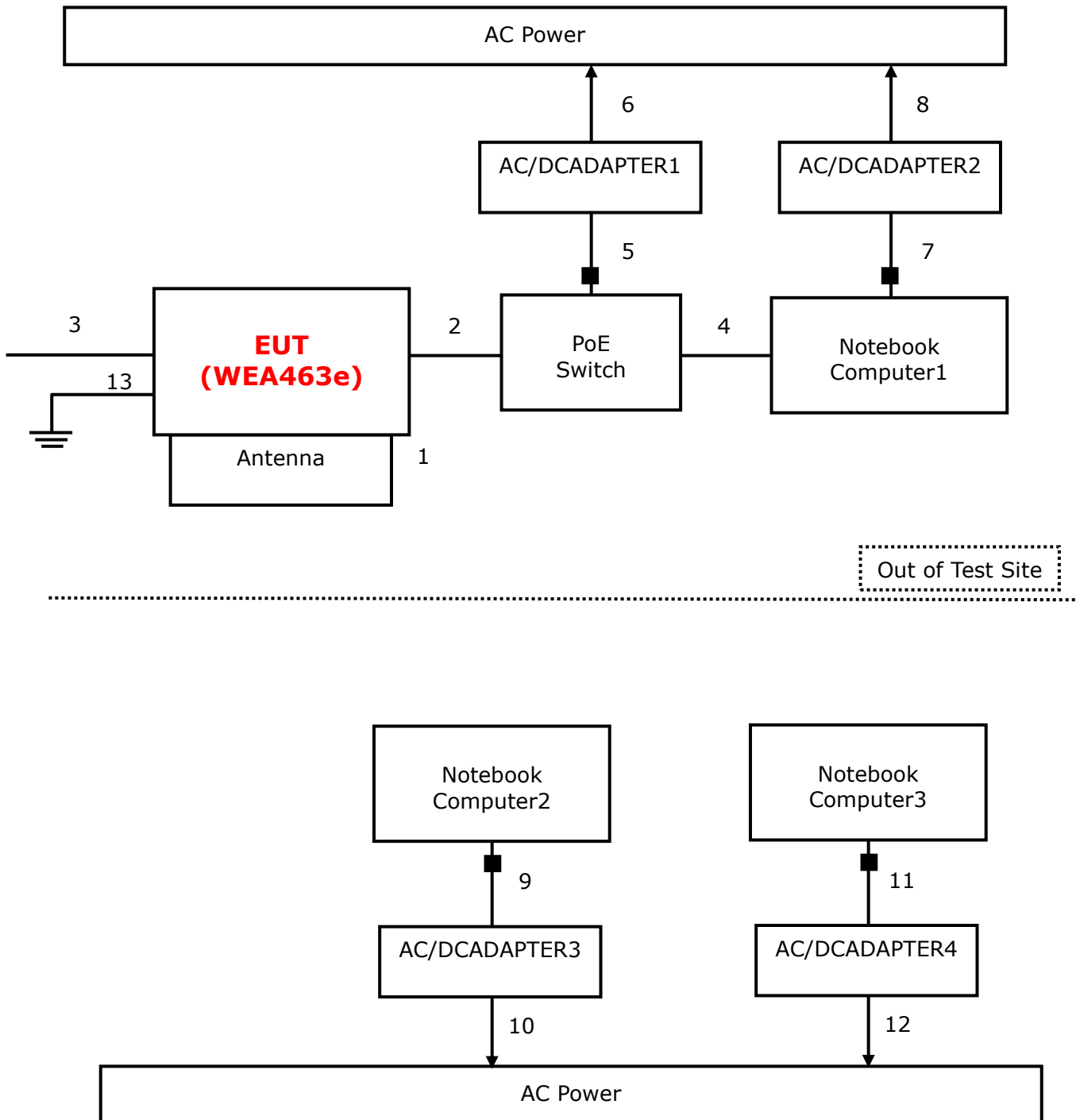
- | | |
|---|--|
| ☐ Standby | ☐ Scrolling 'H' |
| ☐ Color Bar Display | ☐ Data Read/Write |
| ☐ USB PLAY | ☐ DVD Play |
| ☐ USB Data Communication | ☐ Serial Data Communication |
| ☐ AUX IN | ☐ Receipt Printing Mode |
| ☐ DLNA | ☒ Ping Test |

1.6 Configuration

1) AC/DC ADAPTER Mode



2) PoE Mode



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1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.8 Test Facility

The measurement facility is located at (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.9 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.

Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed Semi-Anechoic Chamber or anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Semi-Anechoic Chamber.

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-2009 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2

Note #1: Comparing this test result and FCC Part 18 limits, the emission of this product can also meet the FCC Part 18.305 Field Strength Limits and 18.307 Conduction Limits.

Note #2: These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

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1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Registration Number	Logo
USA	FCC	FCC Part 15 & 18 EMI (Electromagnetic Interference / Emission)	805871	
JAPAN	VCCI	VCCI V-3 EMI (Electromagnetic Interference / Emission)	C-986 T-1843 R-3627 G-387	
KOREA	MSIP	EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity)	KR0025	
CANADA	IC	ICES-003, Issue 5 EMI (Electromagnetic Interference / Emission)	8737A-2	

1.11 Measurement Uncertainty

Compliance of the product is based on the measured value.

However, the measurement uncertainty is included for information purposes.

The measurement uncertainties given below are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Measurement Type	Frequency Range	Expanded Uncertainty
Conducted Emission	9 kHz to 150 kHz	2.78 dB (C.L.: Approx. 95 %, $k=2$)
Conducted Emission	150 kHz to 30 MHz	2.70 dB (C.L.: Approx. 95 %, $k=2$)
Disturbance Power	30 MHz to 300 MHz	3.74 dB (C.L.: Approx. 95 %, $k=2$)
Radiated Emission	30 MHz to 1000 MHz	3.66 dB (C.L.: Approx. 95 %, $k=2$)
Radiated Emission	1 GHz Above	4.16 dB (C.L.: Approx. 95 %, $k=2$)

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2.0 EMC Test Regulations/Standards

The tests were performed according to following regulations:

Applied standard	Title	Applied	Test Result
FCC Part 15 Subpart B ICES-003, Issue 5 ☐ Class A ☒ Class B	Conducted Voltage Emissions	☒	☒ MET ☐ NOT MET
	Radiated Electric Field Emissions	☒	☒ MET ☐ NOT MET

3.0 Results of Individual Test

3.1 Conducted Voltage Emissions of Mains ports

Test Date

2015-06-16

Test Location

Shielded Room

Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI3	Rohde & Schwarz	100032	2016-02-02	☐
LISN	ENV216	Rohde & Schwarz	101235	2016-05-14	☐
LISN	ENV216	Rohde & Schwarz	101236	2016-05-14	☐
EMI Test Receiver	ESR7	Rohde & Schwarz	101088	2016-06-12	☒
LISN	ENV216	Rohde & Schwarz	101151	2015-11-07	☒
LISN	ESH3-Z5	Rohde & Schwarz	100207	2015-11-07	☒
EMI Test Receiver	ESCI7	Rohde & Schwarz	100816	2015-12-05	☐
LISN	ENV216	Rohde & Schwarz	101760	2016-02-02	☐
LISN	NNLK 8121	SCHWARZBECK	8121-644	2016-05-15	☐
Pulse Limiter	VTSD 9561-F	SCHWARZBECK	9561-F064	2016-05-15	☐
LISN	ENV216	Rohde & Schwarz	101150	2016-02-02	☐

Test Software

ESCI7, ESCI3 : EMC32 Ver. 8.50.0

ESR7 : EMC32 Ver. 8.53.0

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Setting

IF Band Width: 9 kHz

Climate Condition

Temperature: (22 ± 1) °C

Relative Humidity: (42 ± 1) %

Atmospheric Pressure: 99 kPa

Test Result

The requirements are: ☒ MET ☐ NOT MET

[AC/DC ADAPTER Mode_Antenna1]

Frequency (MHz)	Measured Data (dBμV)	Margin (dB)	Remark
1.077 000	31.1	14.9	CAverage

[AC/DC ADAPTER Mode_Antenna2]

Frequency (MHz)	Measured Data (dBμV)	Margin (dB)	Remark
1.387 500	30.9	15.1	CAverage

[AC/DC ADAPTER Mode_Antenna3]

Frequency (MHz)	Measured Data (dBμV)	Margin (dB)	Remark
1.081 500	31.2	14.8	CAverage

The Result is calculated by using the following formula;

* Result = Limit – Margin (Result included the correction factor)

* Correction factor = Cable Loss + Insertion loss of LISN

Test Data

[AC/DC ADAPTER Mode_Antenna1] [Line: L1]

EMI Auto Test(5)

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Test Report

Common Information

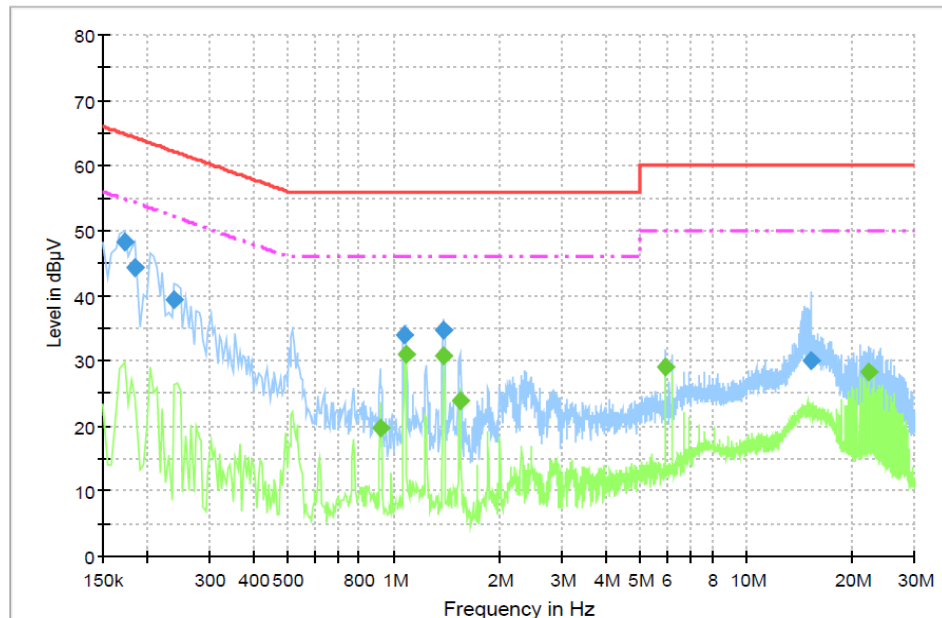
Test Model Name: WEA463e
Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz

Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_L1



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EMI Auto Test(5)

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.172500	48.3	1000.0	9.000	On	L1	9.8	16.5	64.8
0.186000	44.3	1000.0	9.000	On	L1	9.9	19.9	64.2
0.240000	39.4	1000.0	9.000	On	L1	9.7	22.7	62.1
1.077000	33.9	1000.0	9.000	On	L1	9.7	22.1	56.0
1.383000	34.8	1000.0	9.000	On	L1	9.7	21.2	56.0
15.207000	30.1	1000.0	9.000	On	L1	9.9	29.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.919500	19.7	1000.0	9.000	On	L1	9.7	26.3	46.0
1.081500	31.1	1000.0	9.000	On	L1	9.7	14.9	46.0
1.387500	30.7	1000.0	9.000	On	L1	9.7	15.3	46.0
1.545000	24.0	1000.0	9.000	On	L1	9.7	22.0	46.0
5.914500	28.9	1000.0	9.000	On	L1	9.8	21.1	50.0
22.182000	28.2	1000.0	9.000	On	L1	10.1	21.8	50.0

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[AC/DC ADAPTER Mode_Antenna1] [Line: Neutral]

EMI Auto Test(5)

1 / 2

Test Report

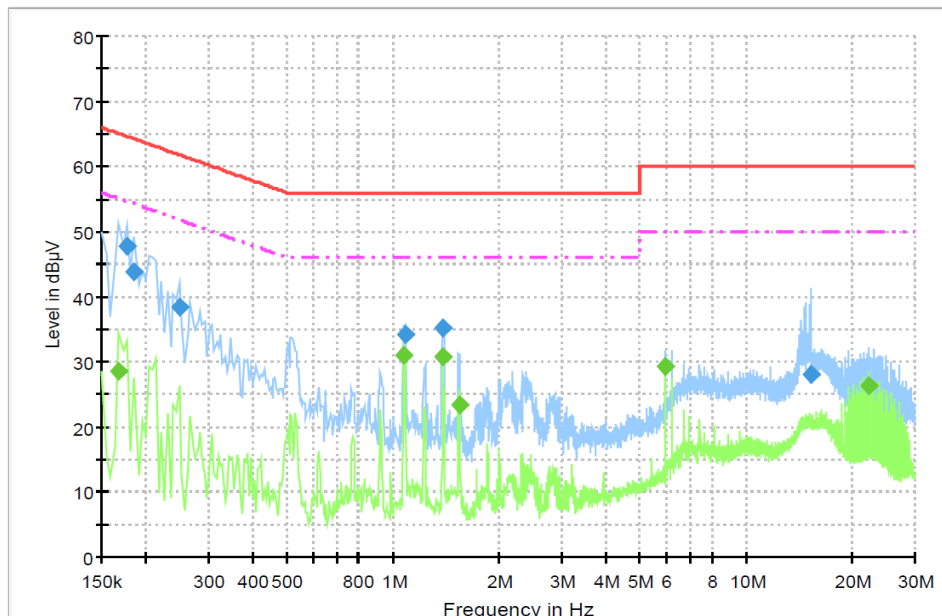
Common Information

Test Model Name: WEA463e
Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_N



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EMI Auto Test(5)

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	47.7	1000.0	9.000	On	N	9.8	16.9	64.6
0.186000	43.7	1000.0	9.000	On	N	9.9	20.5	64.2
0.249000	38.5	1000.0	9.000	On	N	9.6	23.3	61.8
1.081500	34.3	1000.0	9.000	On	N	9.7	21.7	56.0
1.387500	35.1	1000.0	9.000	On	N	9.7	20.9	56.0
15.207000	28.1	1000.0	9.000	On	N	10.0	31.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	28.6	1000.0	9.000	On	N	9.8	26.5	55.1
1.077000	31.1	1000.0	9.000	On	N	9.7	14.9	46.0
1.387500	30.8	1000.0	9.000	On	N	9.7	15.2	46.0
1.545000	23.5	1000.0	9.000	On	N	9.7	22.5	46.0
5.919000	29.2	1000.0	9.000	On	N	9.7	20.8	50.0
22.191000	26.4	1000.0	9.000	On	N	10.0	23.6	50.0

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[AC/DC ADAPTER Mode_Antenna2] [Line: L1]

EMI Auto Test(5)

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Test Report

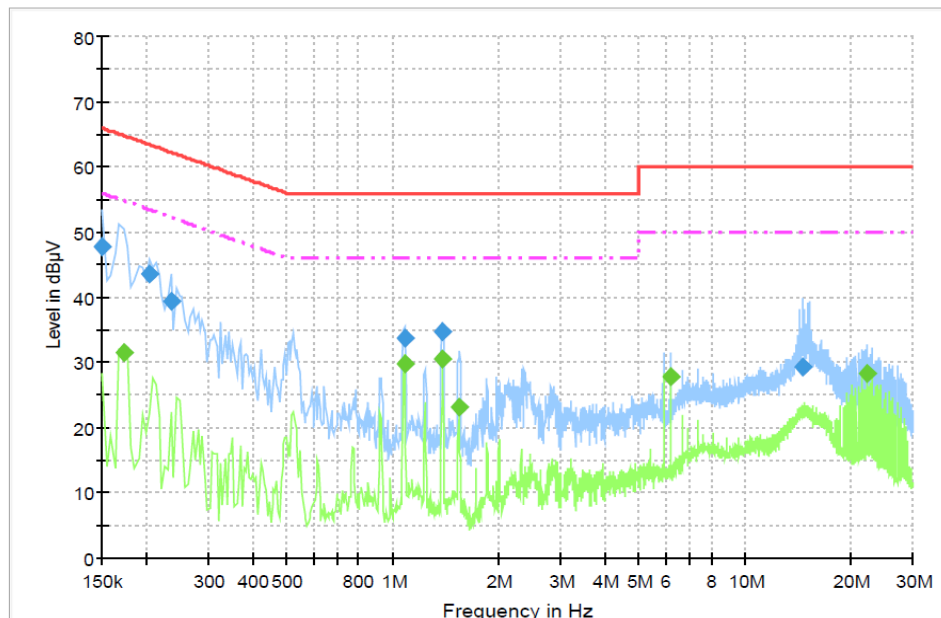
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Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_L1



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EMI Auto Test(5)

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	47.7	1000.0	9.000	On	L1	9.8	18.3	66.0
0.204000	43.6	1000.0	9.000	On	L1	9.9	19.9	63.4
0.235500	39.4	1000.0	9.000	On	L1	9.7	22.8	62.3
1.081500	33.6	1000.0	9.000	On	L1	9.7	22.4	56.0
1.378500	34.7	1000.0	9.000	On	L1	9.7	21.3	56.0
14.662500	29.3	1000.0	9.000	On	L1	9.9	30.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.172500	31.4	1000.0	9.000	On	L1	9.8	23.4	54.8
1.081500	29.7	1000.0	9.000	On	L1	9.7	16.3	46.0
1.383000	30.5	1000.0	9.000	On	L1	9.7	15.5	46.0
1.545000	23.3	1000.0	9.000	On	L1	9.7	22.7	46.0
6.162000	27.9	1000.0	9.000	On	L1	9.8	22.1	50.0
22.186500	28.2	1000.0	9.000	On	L1	10.1	21.8	50.0

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[AC/DC ADAPTER Mode_Antenna2] [Line: Neutral]

EMI Auto Test(5)

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Test Report

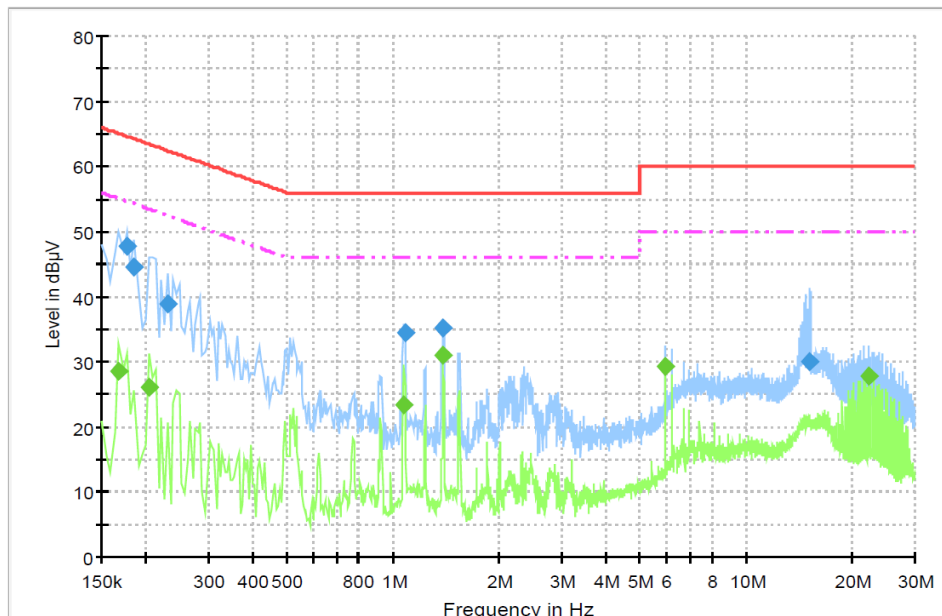
Common Information

Test Model Name: WEA463e
Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_N



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EMI Auto Test(5)

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	47.7	1000.0	9.000	On	N	9.8	16.9	64.6
0.186000	44.5	1000.0	9.000	On	N	9.9	19.7	64.2
0.231000	38.8	1000.0	9.000	On	N	9.7	23.6	62.4
1.081500	34.6	1000.0	9.000	On	N	9.7	21.4	56.0
1.387500	35.1	1000.0	9.000	On	N	9.7	20.9	56.0
15.180000	30.1	1000.0	9.000	On	N	10.0	29.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	28.6	1000.0	9.000	On	N	9.8	26.5	55.1
0.204000	26.0	1000.0	9.000	On	N	9.9	27.4	53.4
1.072500	23.3	1000.0	9.000	On	N	9.7	22.7	46.0
1.387500	30.9	1000.0	9.000	On	N	9.7	15.1	46.0
5.919000	29.2	1000.0	9.000	On	N	9.7	20.8	50.0
22.195500	27.8	1000.0	9.000	On	N	10.0	22.2	50.0

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[AC/DC ADAPTER Mode_Antenna3] [Line: L1]

EMI Auto Test(5)

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Test Report

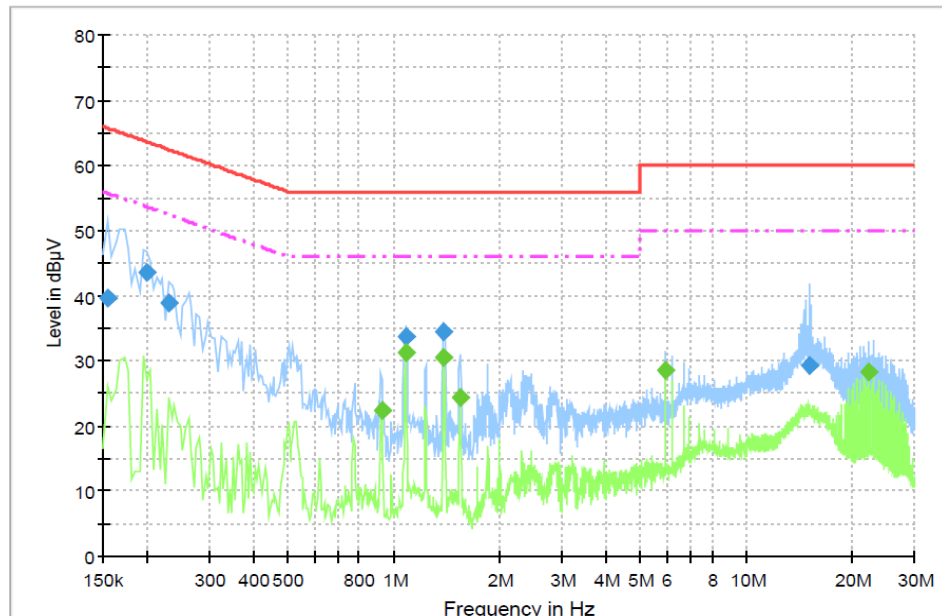
Common Information

Test Model Name: WEA463e
Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_L1



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EMI Auto Test(5)

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	39.7	1000.0	9.000	On	L1	9.8	26.1	65.8
0.199500	43.5	1000.0	9.000	On	L1	9.9	20.2	63.6
0.231000	38.8	1000.0	9.000	On	L1	9.7	23.6	62.4
1.086000	33.8	1000.0	9.000	On	L1	9.7	22.2	56.0
1.387500	34.6	1000.0	9.000	On	L1	9.7	21.4	56.0
15.157500	29.3	1000.0	9.000	On	L1	9.9	30.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.928500	22.3	1000.0	9.000	On	L1	9.7	23.7	46.0
1.081500	31.2	1000.0	9.000	On	L1	9.7	14.8	46.0
1.392000	30.6	1000.0	9.000	On	L1	9.7	15.4	46.0
1.545000	24.5	1000.0	9.000	On	L1	9.7	21.5	46.0
5.919000	28.4	1000.0	9.000	On	L1	9.8	21.6	50.0
22.191000	28.3	1000.0	9.000	On	L1	10.1	21.7	50.0

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[AC/DC ADAPTER Mode_Antenna3] [Line: Neutral]

EMI Auto Test(5)

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Test Report

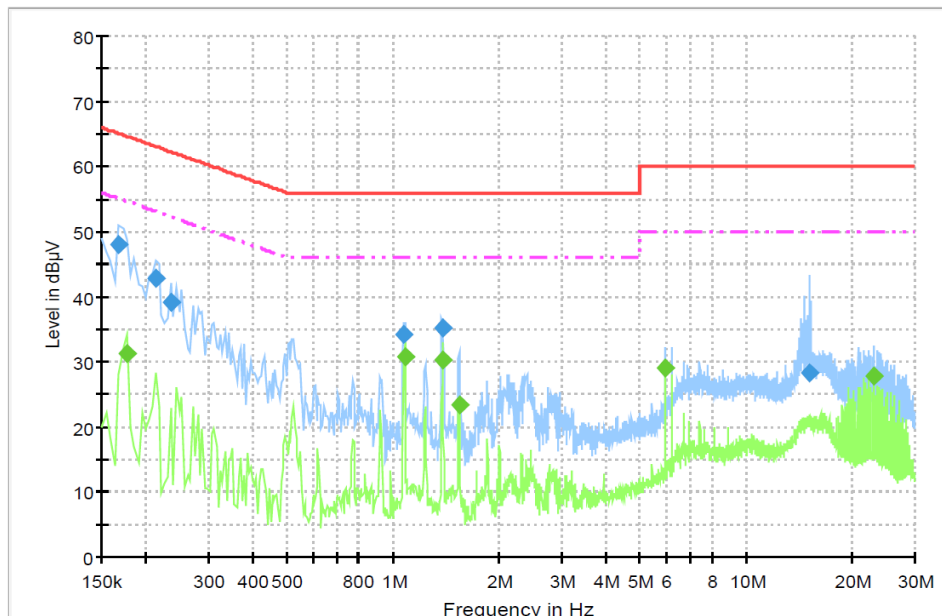
Common Information

Test Model Name: WEA463e
Test Mode: Operating Mode
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101151) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESR 7 [ESR 7]
@ GPIB0 (ADR 23), SN 1316.3003K07/101088, FW 2.26
Signal Path: ESR 7-ENV216 FO(101151)
FW 1.0
Correction Table: 2CE Cable Loss
LISN: ENV216 FO(101151)
Correction Table (Line 0): ENV216_FO_N(101151)
Correction Table (Line 1): ENV216_FO_L1(101151)

CISPR 22 Class B_N



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EMI Auto Test(5)

2 / 2

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	48.1	1000.0	9.000	On	N	9.8	17.0	65.1
0.213000	42.9	1000.0	9.000	On	N	9.8	20.2	63.1
0.235500	39.2	1000.0	9.000	On	N	9.7	23.0	62.3
1.077000	34.2	1000.0	9.000	On	N	9.7	21.8	56.0
1.383000	35.3	1000.0	9.000	On	N	9.7	20.7	56.0
15.103500	28.3	1000.0	9.000	On	N	10.0	31.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	31.3	1000.0	9.000	On	N	9.8	23.3	54.6
1.081500	30.7	1000.0	9.000	On	N	9.7	15.3	46.0
1.383000	30.3	1000.0	9.000	On	N	9.7	15.7	46.0
1.545000	23.5	1000.0	9.000	On	N	9.7	22.5	46.0
5.919000	29.1	1000.0	9.000	On	N	9.7	20.9	50.0
22.938000	27.9	1000.0	9.000	On	N	10.0	22.1	50.0

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3.2 Radiated Electric Field Emissions (Below 1 GHz)

Test Date

2015-04-09, 2015-06-17

Test Location

10 m SAC (test distance : ☐ 10 m, ☒ 3 m)

Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI7	Rohde & Schwarz	100814	2015-12-05	☒
Bilog Antenna	CBL6111C	Schaffner	2551	2017-04-24	☒
6dB Attenuator	DNF	Rohde & Schwarz	272.4110.50-2	2015-11-07	☒
Amplifier	310	Sonoma Instrument Co.	291721	2016-02-02	☒

Test Software

TOYO EMI software Ver. 5.1.0

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Setting

IF Band Width: 120 kHz

Climate Condition

	2015-04-09	2015-06-17
Temperature:	(22 ± 1) °C	(23 ± 1) °C
Relative Humidity:	(40 ± 1) %	(38 ± 1) %
Atmospheric Pressure:	99 kPa	99 kPa

Test Result

The requirements are: ☒ MET ☐ NOT MET

[AC/DC ADAPTER Mode_Antenna1]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
54.129	37.0	3.0	Quasi-peak

[AC/DC ADAPTER Mode_Antenna2]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
48.551	36.7	3.3	Quasi-peak

[AC/DC ADAPTER Mode_Antenna3]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
47.218	36.7	3.3	Quasi-peak

[PoE ADAPTER Mode_Antenna1]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
55.948	34.3	5.7	Quasi-peak

[PoE ADAPTER Mode_Antenna2]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
49.400	35.6	4.4	Quasi-peak

[PoE ADAPTER Mode_Antenna3]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
44.793	36.2	3.8	Quasi-peak

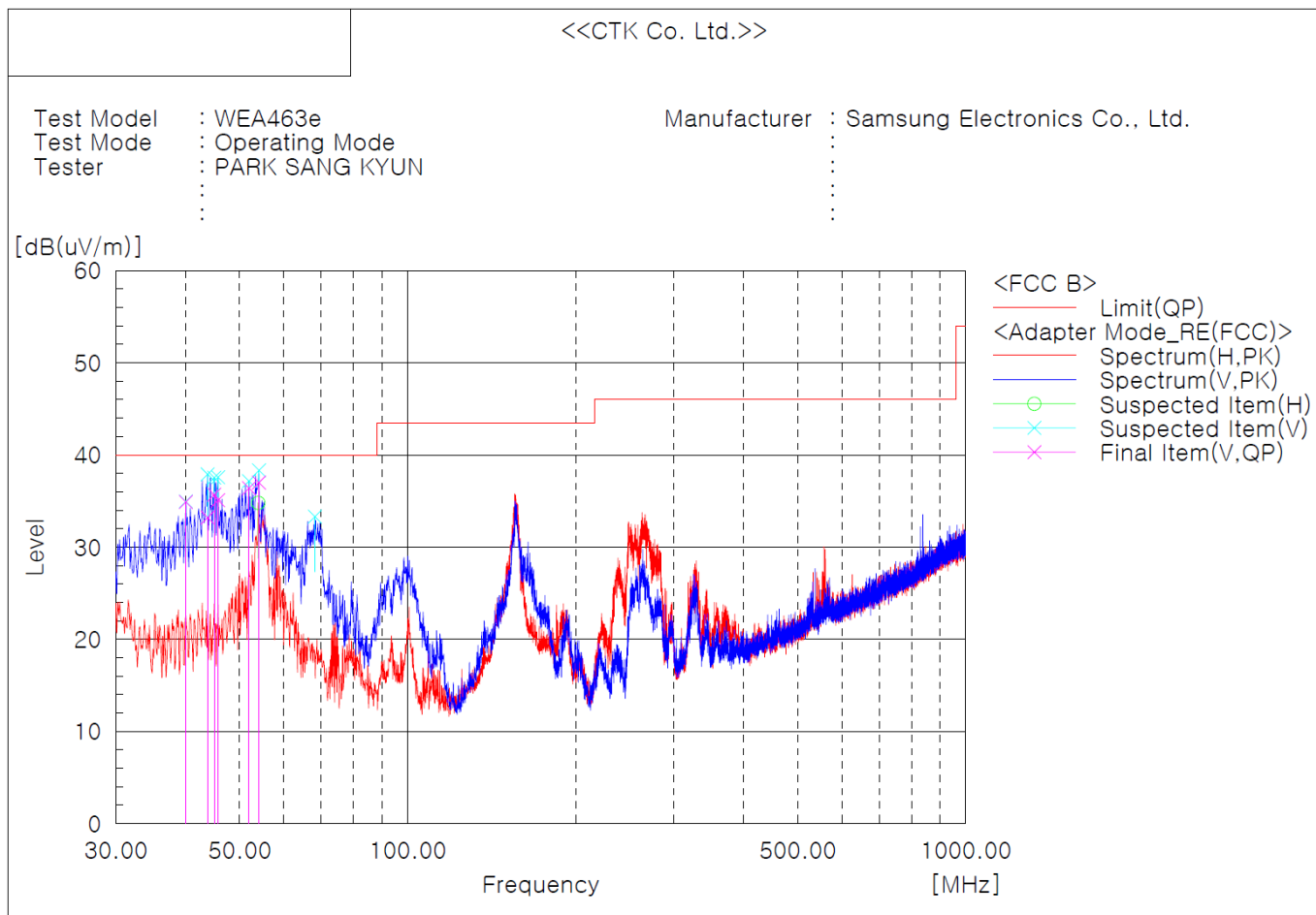
The Result is calculated by using the following formula;

* Result = Reading + Correction factor

* Correction factor = Antenna Factor + Cable Loss + 6 dB attenuator – Amp Gain

Test Data

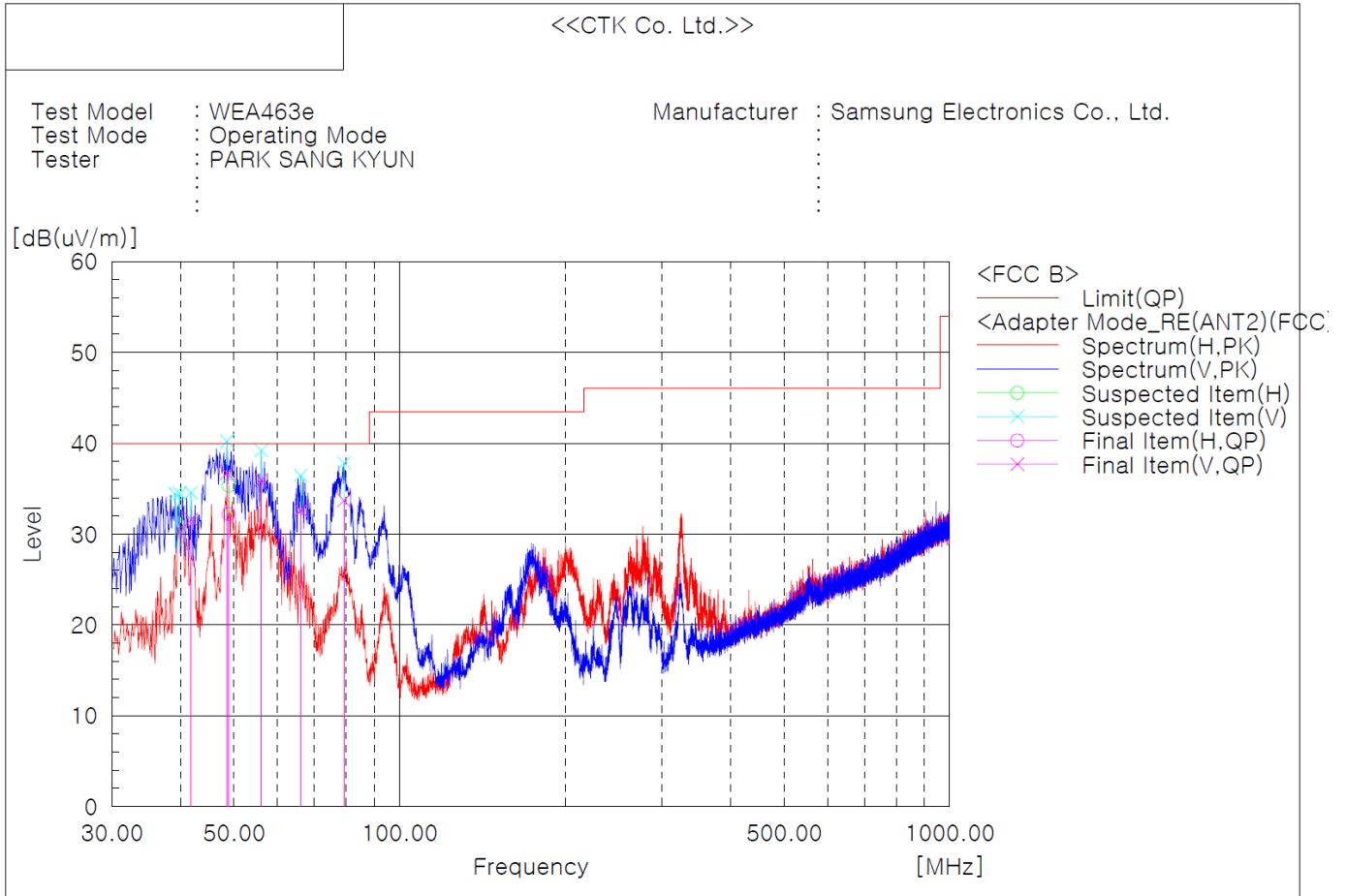
[AC/DC ADAPTER Mode_Antenna1]



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	40.064	V	47.0	-12.1	34.9	40.0	5.1	100.0	198.0
2	43.823	V	45.3	-12.1	33.2	40.0	6.8	100.0	49.0
3	45.035	V	47.8	-12.1	35.7	40.0	4.3	100.0	49.0
4	45.763	V	47.3	-12.2	35.1	40.0	4.9	100.0	0.0
5	51.946	V	49.0	-12.6	36.4	40.0	3.6	100.0	198.0
6	54.129	V	49.6	-12.6	37.0	40.0	3.0	100.0	198.0

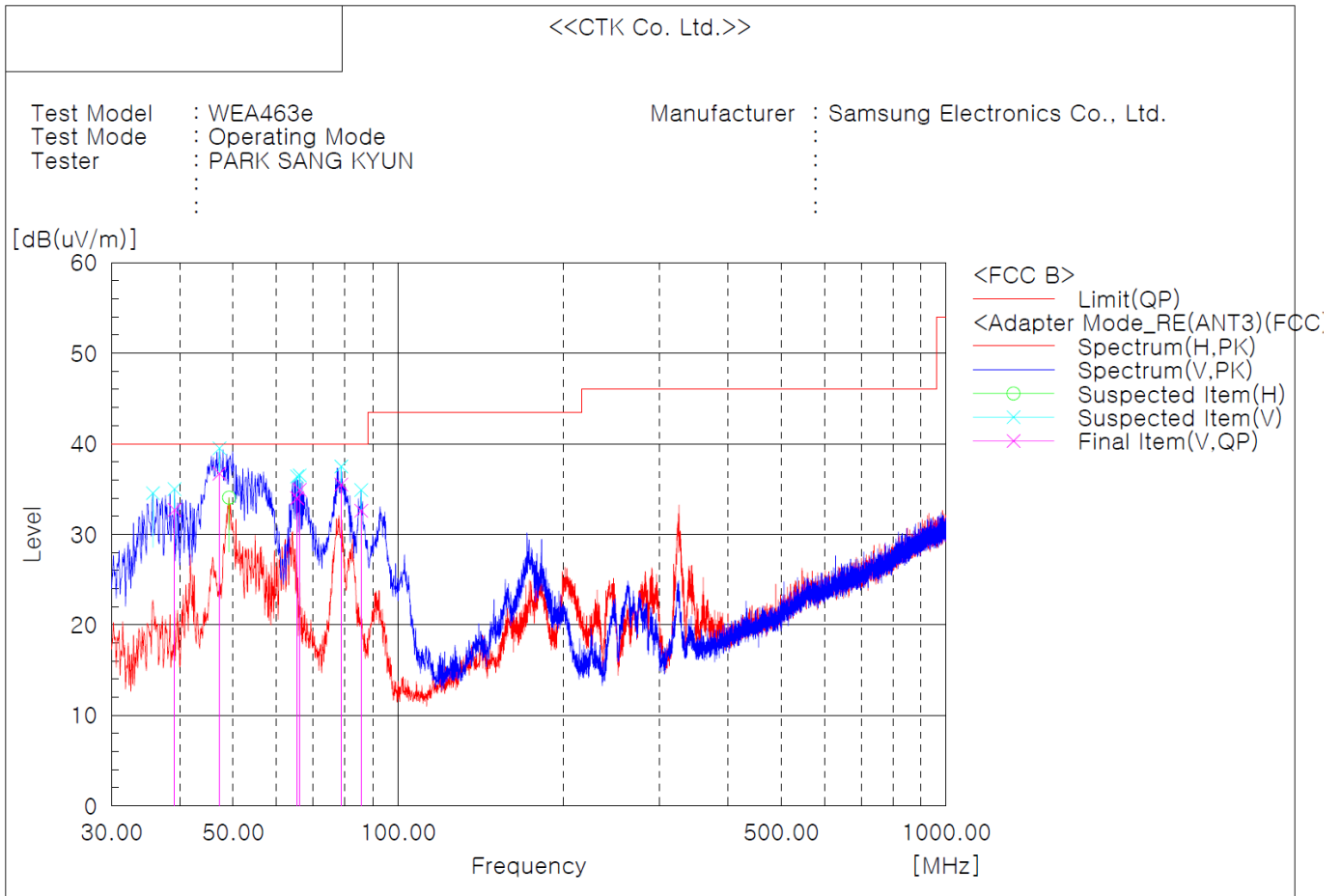
[AC/DC ADAPTER Mode_Antenna2]



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	41.761	V	44.2	-12.6	31.6	40.0	8.4	100.0	125.0
2	48.551	V	49.4	-12.7	36.7	40.0	3.3	100.0	125.0
3	48.915	H	44.9	-12.7	32.2	40.0	7.8	309.0	310.0
4	56.069	V	49.2	-13.2	36.0	40.0	4.0	100.0	237.0
5	66.133	V	46.7	-14.1	32.6	40.0	7.4	100.0	13.0
6	79.228	V	49.6	-15.9	33.7	40.0	6.3	100.0	51.0

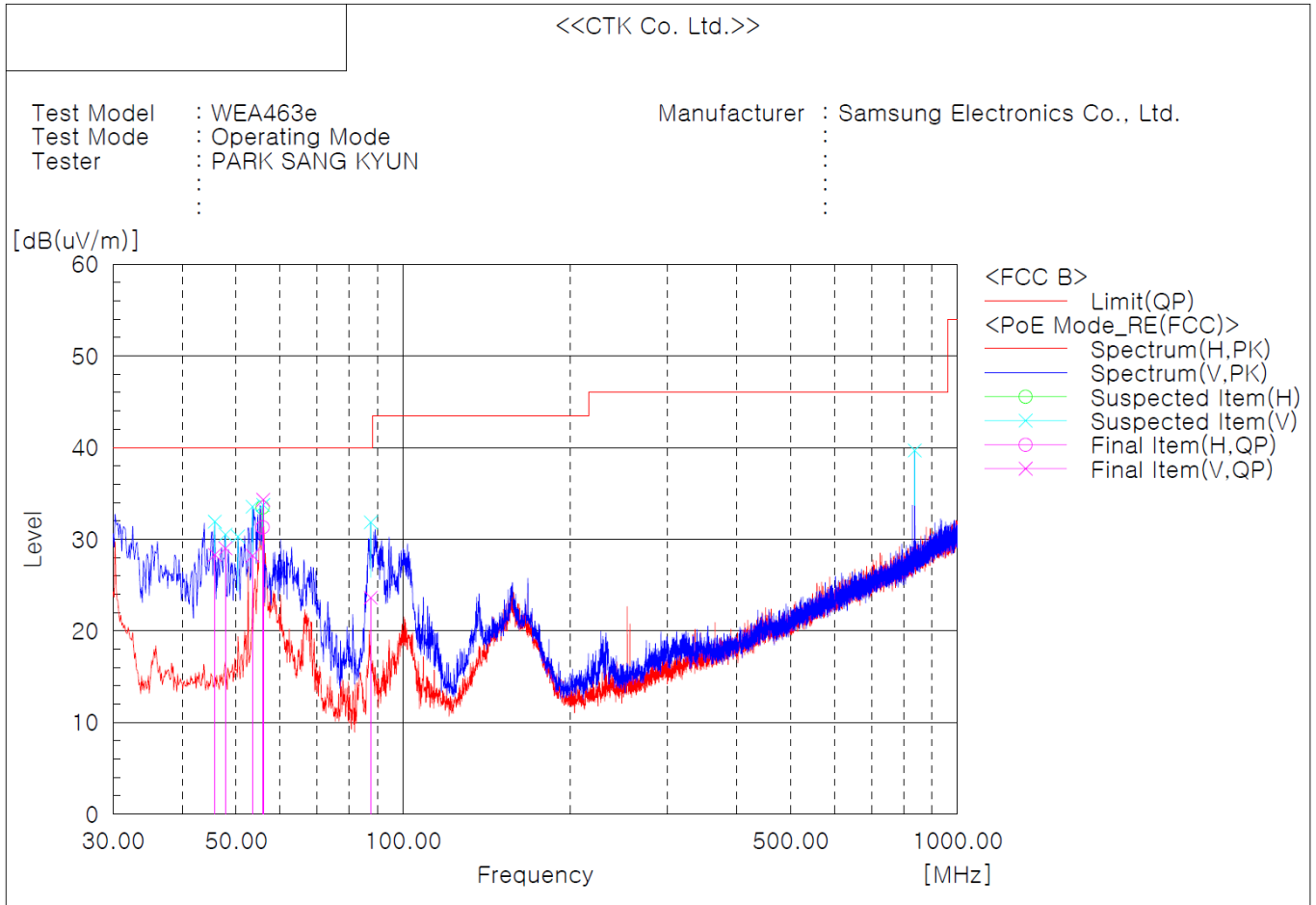
[AC/DC ADAPTER Mode_Antenna3]



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	39.094	V	45.4	-12.7	32.7	40.0	7.3	100.0	270.0
2	47.218	V	49.4	-12.7	36.7	40.0	3.3	100.0	233.0
3	65.405	V	48.0	-14.0	34.0	40.0	6.0	100.0	46.0
4	66.133	V	49.0	-14.1	34.9	40.0	5.1	100.0	9.0
5	78.743	V	51.4	-15.9	35.5	40.0	4.5	100.0	195.0
6	85.654	V	49.0	-16.4	32.6	40.0	7.4	100.0	307.0

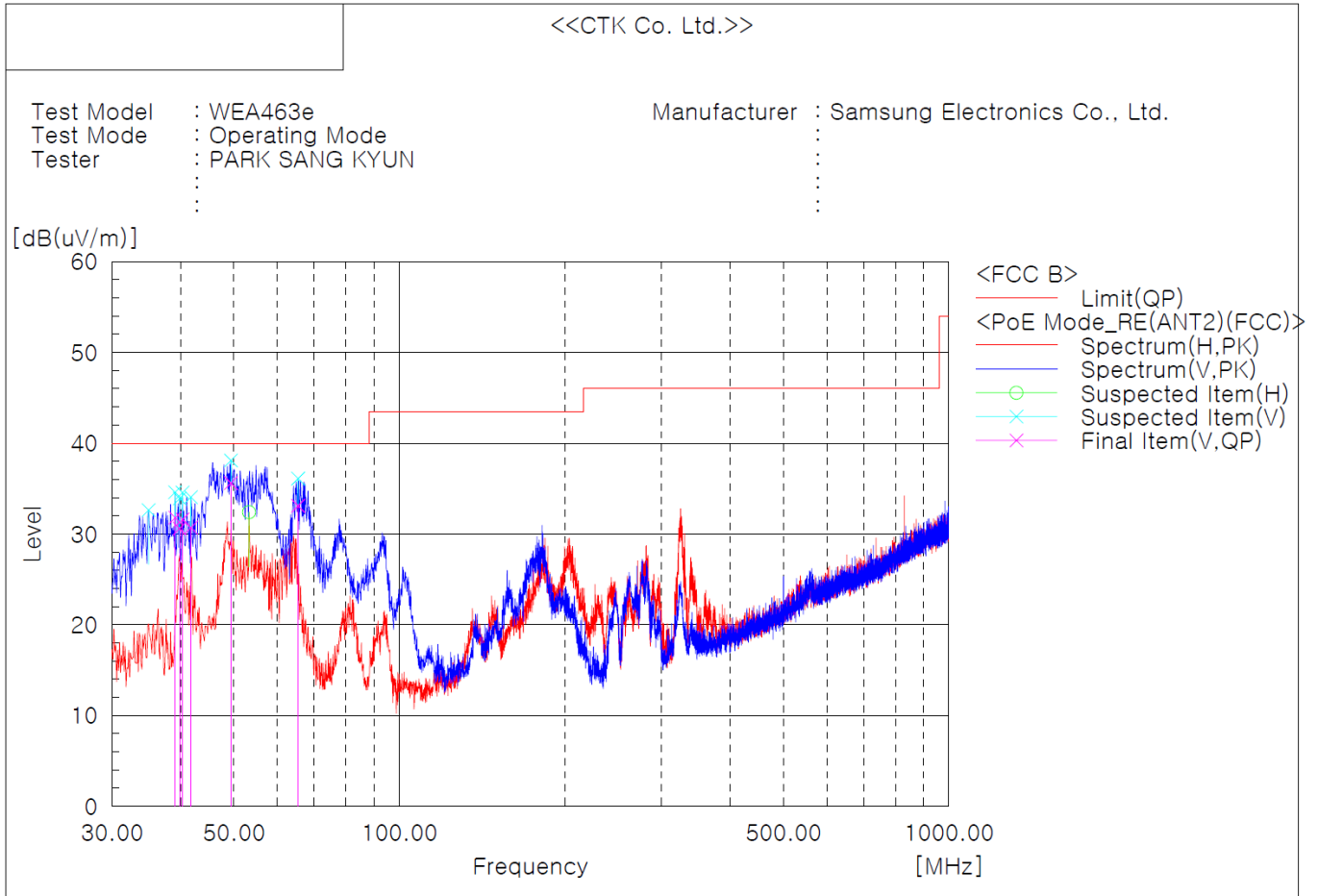
[PoE Mode_Antenna1]



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	45.763	V	40.5	-12.2	28.3	40.0	11.7	100.0	86.0
2	47.824	V	41.4	-12.4	29.0	40.0	11.0	100.0	49.0
3	53.523	V	40.8	-12.6	28.2	40.0	11.8	205.0	0.0
4	55.826	H	43.9	-12.6	31.3	40.0	8.7	295.0	311.0
5	55.948	V	46.9	-12.6	34.3	40.0	5.7	305.0	347.0
6	87.473	V	40.0	-16.4	23.6	40.0	16.4	205.0	0.0

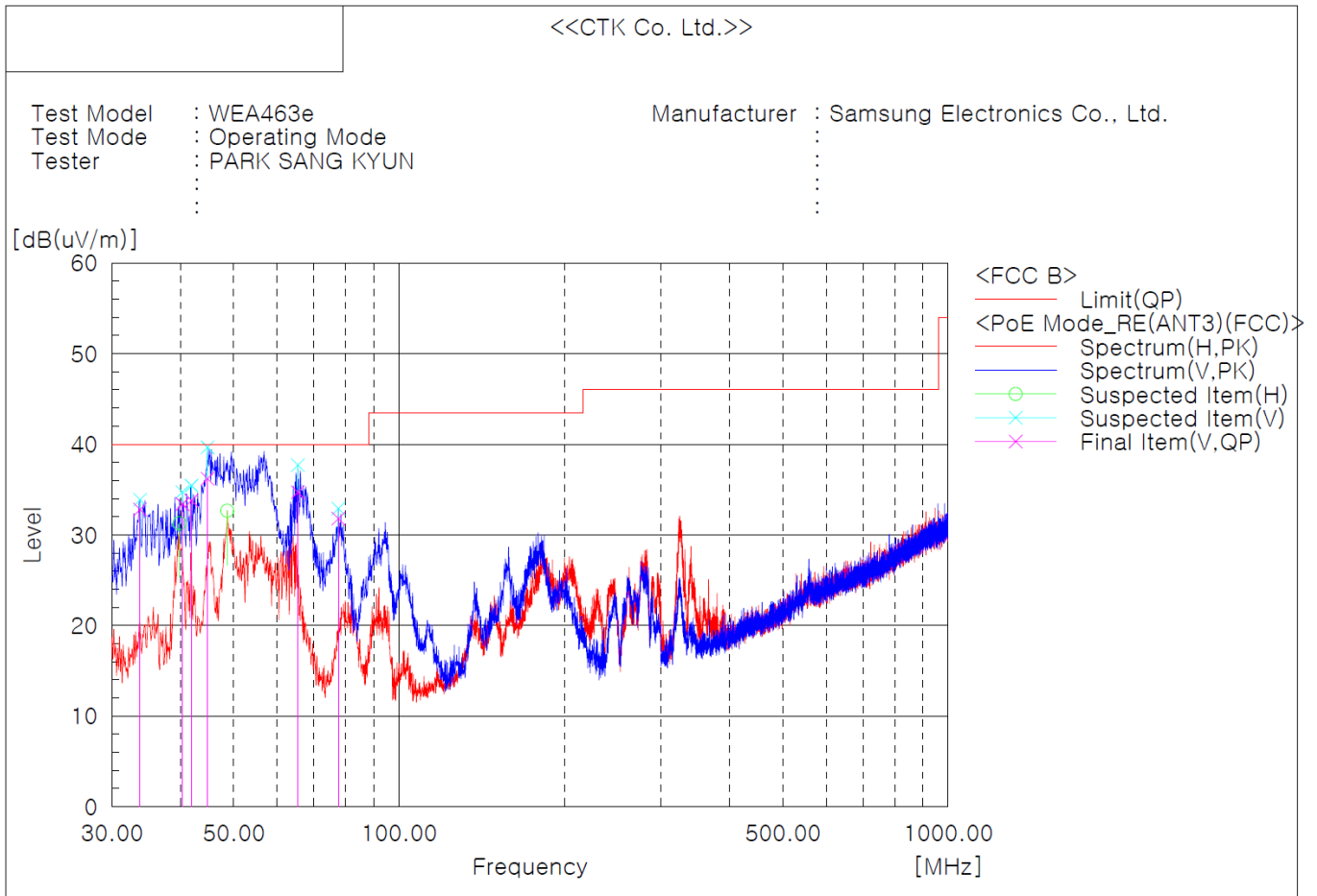
[PoE Mode_Antenna2]



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	39.094	V	44.5	-12.7	31.8	40.0	8.2	100.0	165.0
2	39.821	V	43.2	-12.6	30.6	40.0	9.4	100.0	202.0
3	40.306	V	44.2	-12.6	31.6	40.0	8.4	100.0	165.0
4	41.761	V	43.3	-12.6	30.7	40.0	9.3	100.0	53.0
5	49.400	V	48.3	-12.7	35.6	40.0	4.4	100.0	314.0
6	65.405	V	47.1	-14.0	33.1	40.0	6.9	100.0	53.0

[PoE Mode_Antenna3]



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	33.759	V	46.4	-13.6	32.8	40.0	7.2	100.0	351.0
2	40.306	V	46.0	-12.6	33.4	40.0	6.6	100.0	90.0
3	41.883	V	46.4	-12.6	33.8	40.0	6.2	100.0	53.0
4	44.793	V	48.8	-12.6	36.2	40.0	3.8	100.0	314.0
5	65.405	V	48.7	-14.0	34.7	40.0	5.3	100.0	90.0
6	77.530	V	47.5	-15.7	31.8	40.0	8.2	100.0	165.0

3.3 Radiated Electric Field Emissions (Above 1 GHz)

Test Date

2015-06-18

Test Location

3 m SAC

Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI7	Rohde & Schwarz	100816	2015-12-05	☒
Double Ridged Guide Antenna	3117	ETS-Lindgren	154525	2015-07-03	☒
Preamplifier	8449B	Agilent	3008A02307	2015-12-26	☒
Band Reject Filter	WRCSV 2400/2483-2375/2505-50/10EE	Wainwright Instruments GmbH	2	2016-05-14	☒
Band Reject Filter	WRCTV 5725/5825-5895/5855-50/12SS	Wainwright Instruments GmbH	1	2016-02-02	☒

Test Software

TOYO EMI software Ver. 5.1.0

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Setting

IF Band Width: 1 MHz

Climate Condition

Temperature: (22 ± 1) °C

Relative Humidity: (39 ± 1) %

Atmospheric Pressure: 99 kPa

Test Result

The requirements are: ☒ MET ☐ NOT MET

[AC/DC ADAPTER Mode_Antenna1]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 508.125	37.7	16.3	Average

[AC/DC ADAPTER Mode_Antenna2]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 541.250	36.7	17.3	Average

[AC/DC ADAPTER Mode_Antenna3]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
2 893.125	33.4	20.6	Average

[PoE ADAPTER Mode_Antenna1]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 689.375	40.0	14.0	Average

[PoE ADAPTER Mode_Antenna2]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
2 893.125	33.9	20.1	Average

[PoE ADAPTER Mode_Antenna3]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 530.625	38.2	15.8	Average

The Result is calculated by using the following formula;

* Result = Reading + Correction factor

* Correction factor = Antenna Factor + Cable Loss- Amp Gain

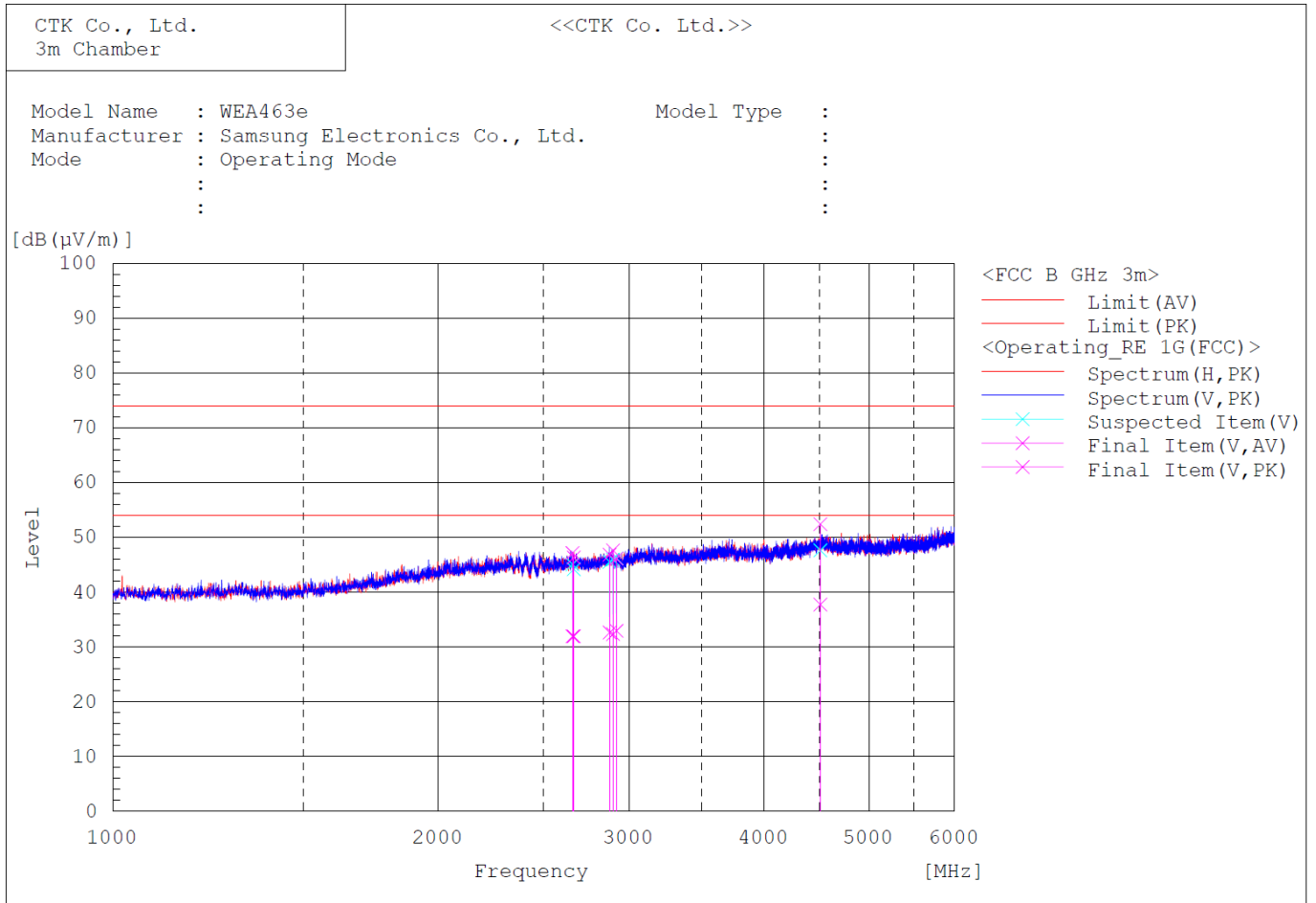


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CTK-2015-00900
Page (36) / (54) Pages

Test Data

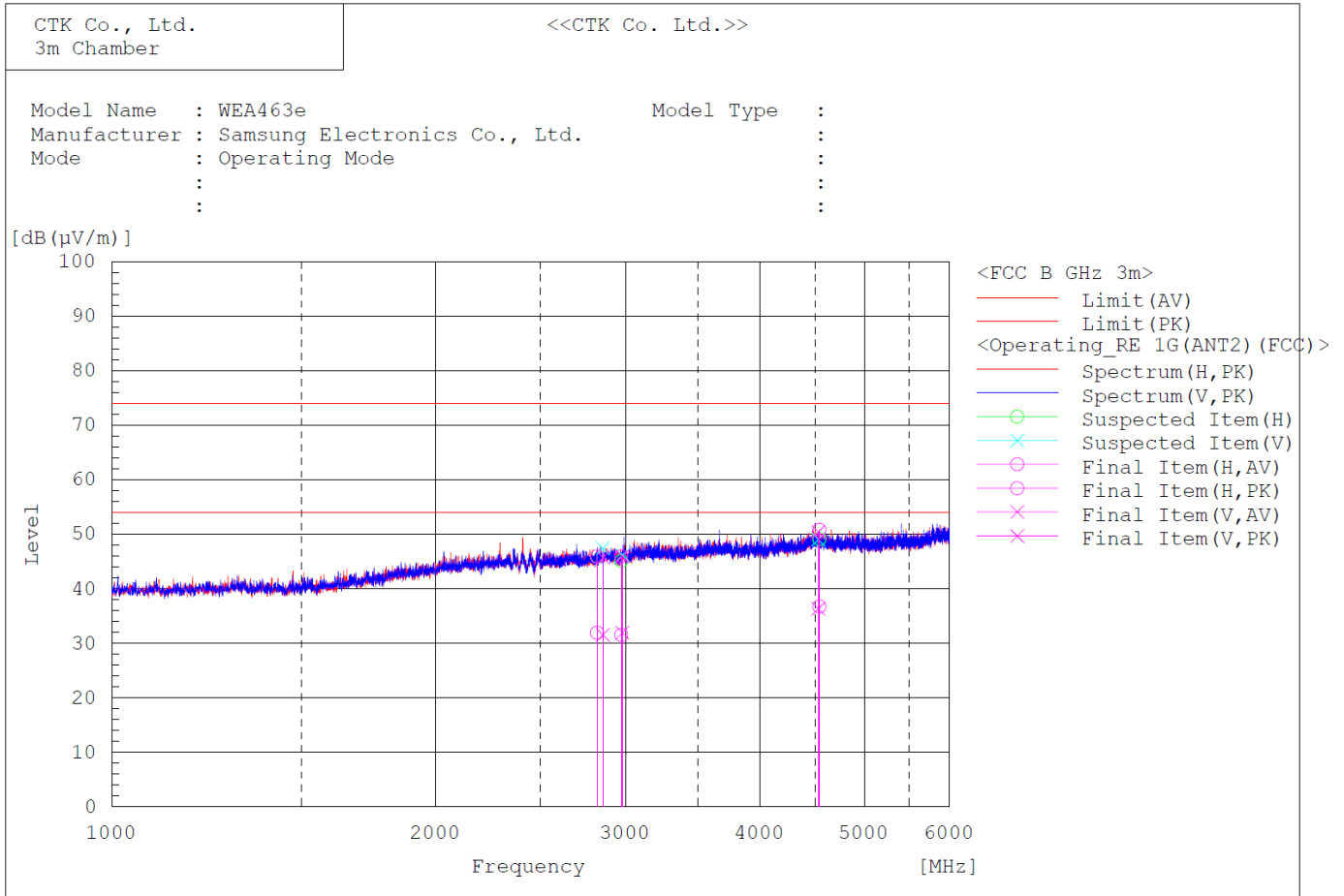
[AC/DC ADAPTER Mode_Antenna1]



Final Result

No.	Frequency (P)	Reading AV	Reading PK	c.f	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle
	[MHz]	[dB (μV)]	[dB (μV)]	[dB (1/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB]	[dB]	[cm]	[°]
1	2660.000	V 23.8	39.0	8.1	31.9	47.1	54.0	74.0	22.1	26.9	100.0	289.0
2	2666.875	V 23.8	38.2	8.1	31.9	46.3	54.0	74.0	22.1	27.7	100.0	345.0
3	2878.750	V 23.9	38.1	8.7	32.6	46.8	54.0	74.0	21.4	27.2	100.0	308.0
4	2900.000	V 23.5	38.8	8.8	32.3	47.6	54.0	74.0	21.7	26.4	100.0	27.0
5	2921.250	V 24.0	37.2	8.9	32.9	46.1	54.0	74.0	21.1	27.9	100.0	27.0
6	4508.125	V 24.0	38.7	13.7	37.7	52.4	54.0	74.0	16.3	21.6	100.0	270.0

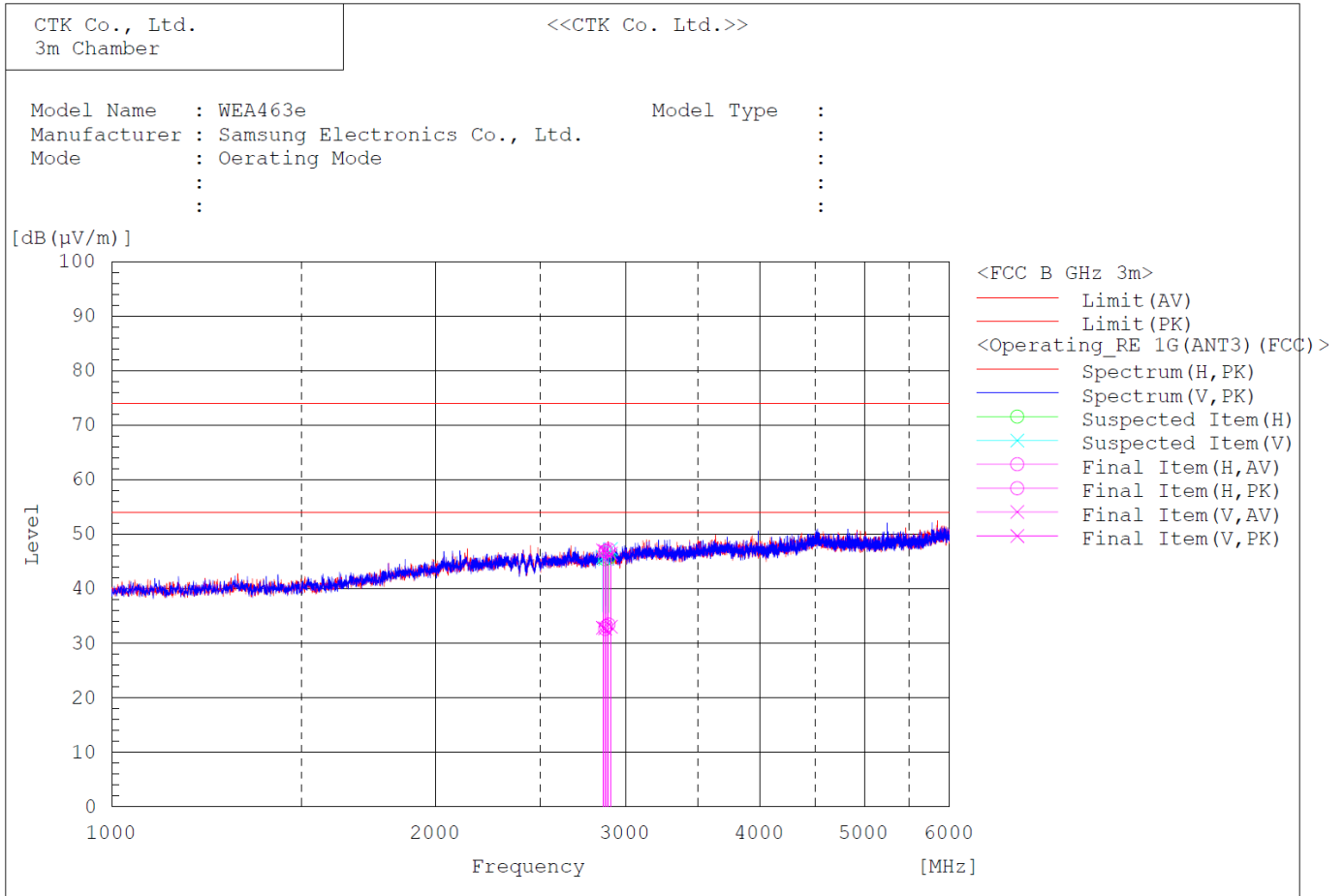
[AC/DC ADAPTER Mode_Antenna2]



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	2822.500	H	23.4	37.4	8.5	31.9	45.9	54.0	74.0	22.1	28.1	100.0	0.0
2	2857.500	V	22.9	37.1	8.6	31.5	45.7	54.0	74.0	22.5	28.3	100.0	65.0
3	2972.500	H	22.5	36.9	9.0	31.5	45.9	54.0	74.0	22.5	28.1	100.0	65.0
4	2979.375	V	22.9	36.9	9.0	31.9	45.9	54.0	74.0	22.1	28.1	100.0	0.0
5	4530.625	V	22.5	36.6	13.8	36.3	50.4	54.0	74.0	17.7	23.6	100.0	308.0
6	4541.250	H	22.9	37.0	13.8	36.7	50.8	54.0	74.0	17.3	23.2	100.0	196.0

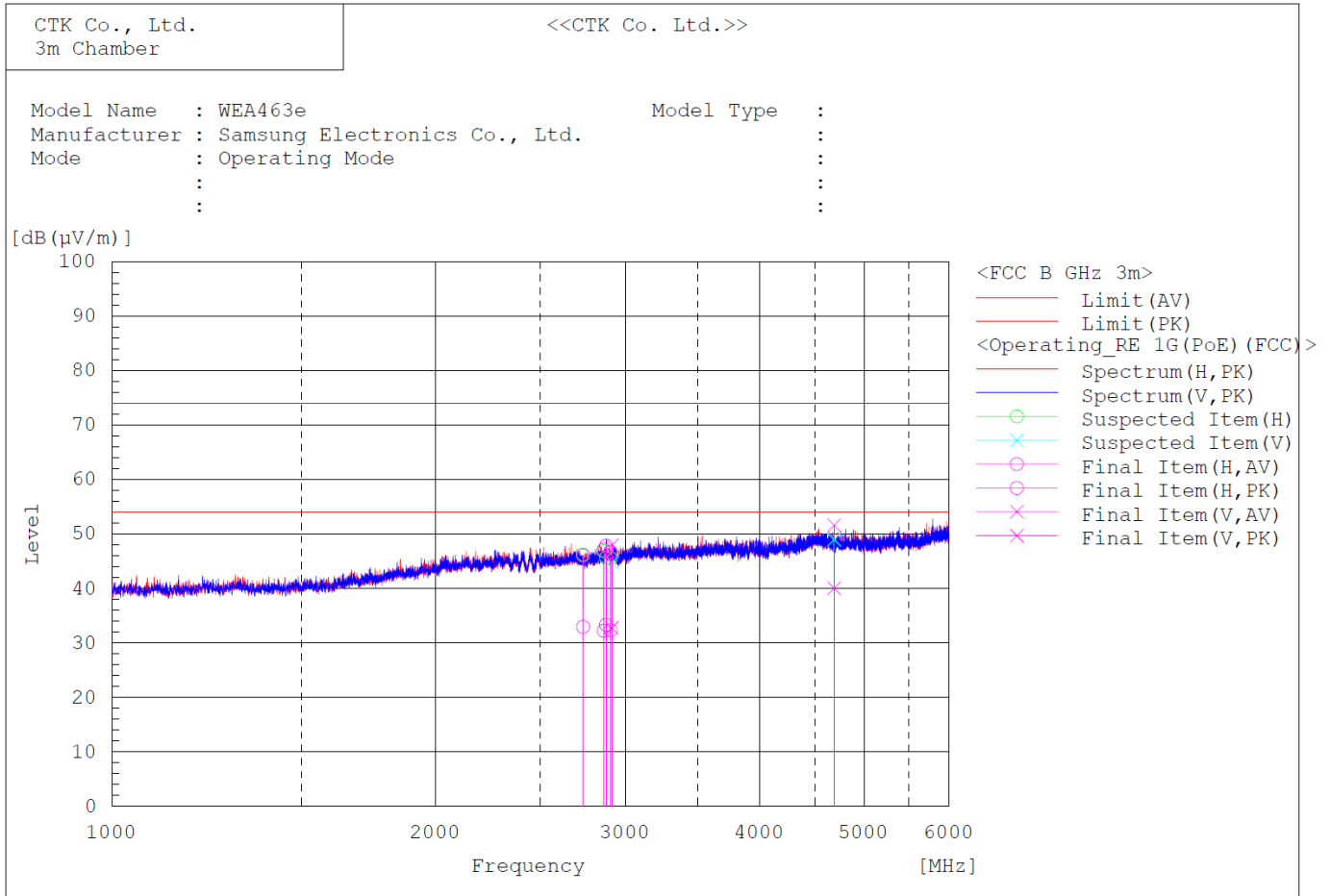
[AC/DC ADAPTER Mode_Antenna3]



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	2857.500	V	24.2	38.4	8.6	32.8	47.0	54.0	74.0	21.2	27.0	100.0	325.0
2	2871.250	H	23.9	38.1	8.7	32.6	46.8	54.0	74.0	21.4	27.2	100.0	250.0
3	2871.250	V	24.0	38.2	8.7	32.7	46.9	54.0	74.0	21.3	27.1	100.0	250.0
4	2878.750	H	24.4	38.2	8.7	33.1	46.9	54.0	74.0	20.9	27.1	100.0	26.0
5	2893.125	H	24.6	38.4	8.8	33.4	47.2	54.0	74.0	20.6	26.8	100.0	250.0
6	2906.875	V	24.2	37.6	8.8	33.0	46.4	54.0	74.0	21.0	27.6	100.0	359.0

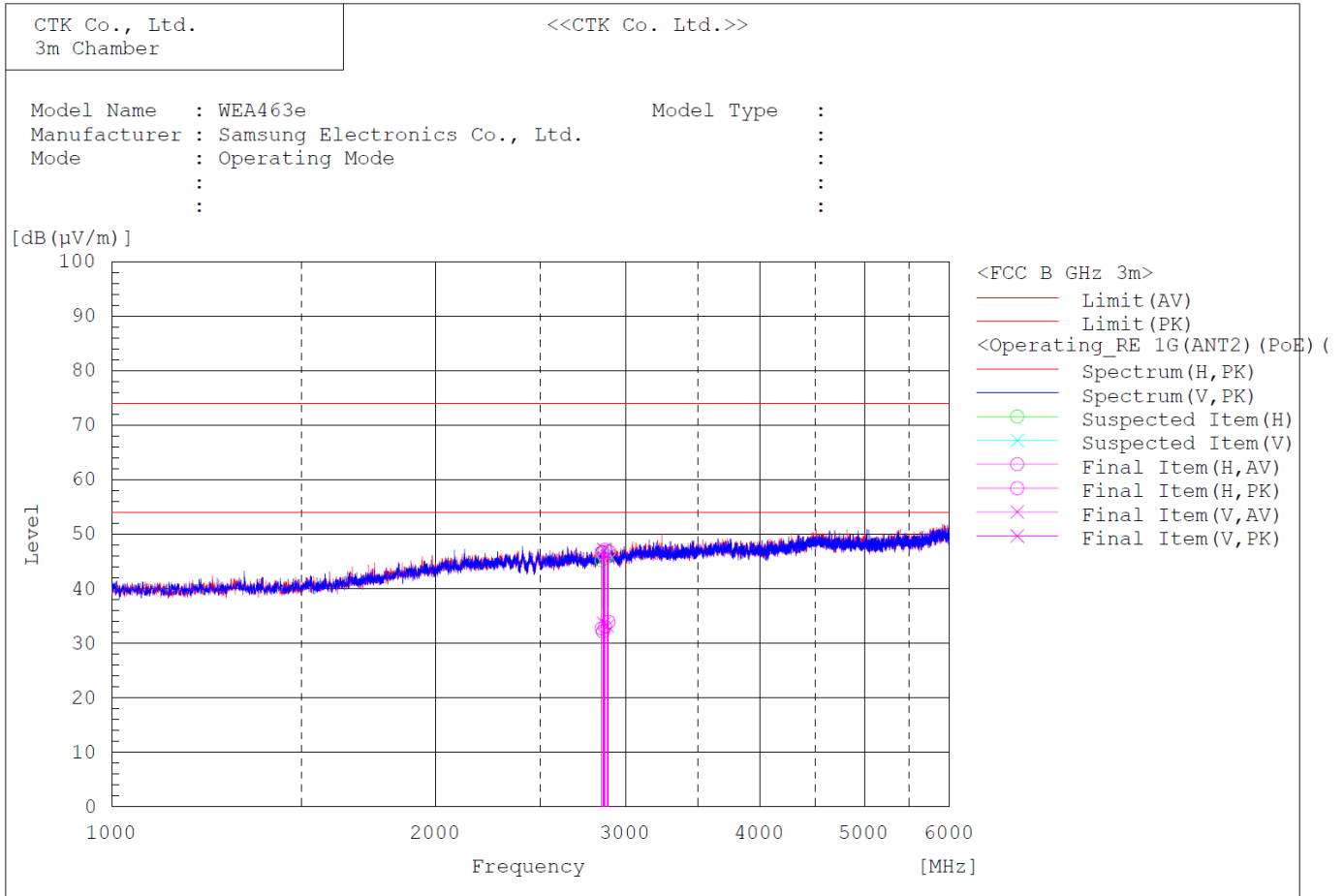
[PoE Mode_Antenna1]



Final Result

No.	Frequency (P)	Reading AV	Reading PK	c.f	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle
	[MHz]	[dB (μV)]	[dB (μV)]	[dB (1/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB]	[dB]	[cm]	[°]
1	2740.000	H 24.6	37.7	8.3	32.9	46.0	54.0	74.0	21.1	28.0	100.0	28.0
2	2864.375	H 23.5	38.4	8.7	32.2	47.1	54.0	74.0	21.8	26.9	100.0	345.0
3	2878.750	H 24.6	39.1	8.7	33.3	47.8	54.0	74.0	20.7	26.2	100.0	84.0
4	2906.875	H 23.5	37.9	8.8	32.3	46.7	54.0	74.0	21.7	27.3	100.0	233.0
5	2914.375	V 23.9	39.1	8.8	32.7	47.9	54.0	74.0	21.3	26.1	100.0	28.0
6	4689.375	V 26.1	37.7	13.9	40.0	51.6	54.0	74.0	14.0	22.4	100.0	28.0

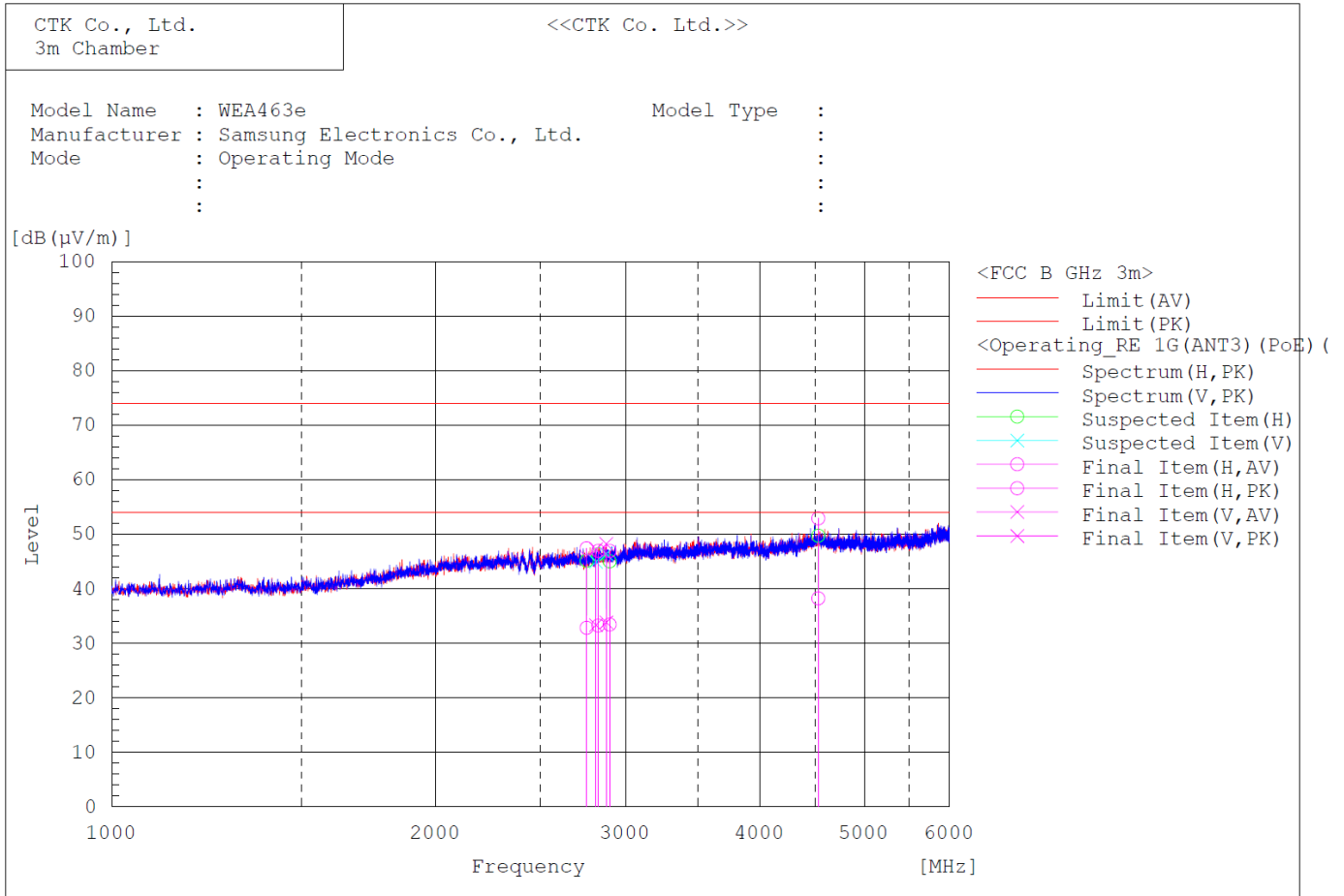
[PoE Mode_Antenna2]



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	2850.625	H	24.1	38.0	8.6	32.7	46.6	54.0	74.0	21.3	27.4	100.0	34.0
2	2857.500	H	23.5	38.1	8.6	32.1	46.7	54.0	74.0	21.9	27.3	100.0	221.0
3	2864.375	V	24.9	38.4	8.7	33.6	47.1	54.0	74.0	20.4	26.9	100.0	90.0
4	2871.250	H	24.3	38.4	8.7	33.0	47.1	54.0	74.0	21.0	26.9	100.0	109.0
5	2885.625	V	24.4	37.3	8.7	33.1	46.0	54.0	74.0	20.9	28.0	100.0	109.0
6	2893.125	H	25.1	38.0	8.8	33.9	46.8	54.0	74.0	20.1	27.2	100.0	72.0

[PoE Mode_Antenna3]



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	2760.625	H	24.5	39.1	8.3	32.8	47.4	54.0	74.0	21.2	26.6	100.0	0.0
2	2815.625	V	24.8	38.7	8.5	33.3	47.2	54.0	74.0	20.7	26.8	100.0	233.0
3	2829.375	H	24.7	38.4	8.5	33.2	46.9	54.0	74.0	20.8	27.1	100.0	65.0
4	2878.750	V	25.1	39.5	8.7	33.8	48.2	54.0	74.0	20.2	25.8	100.0	27.0
5	2900.000	H	24.6	38.1	8.8	33.4	46.9	54.0	74.0	20.6	27.1	100.0	0.0
6	4530.625	H	24.4	39.1	13.8	38.2	52.9	54.0	74.0	15.8	21.1	100.0	270.0

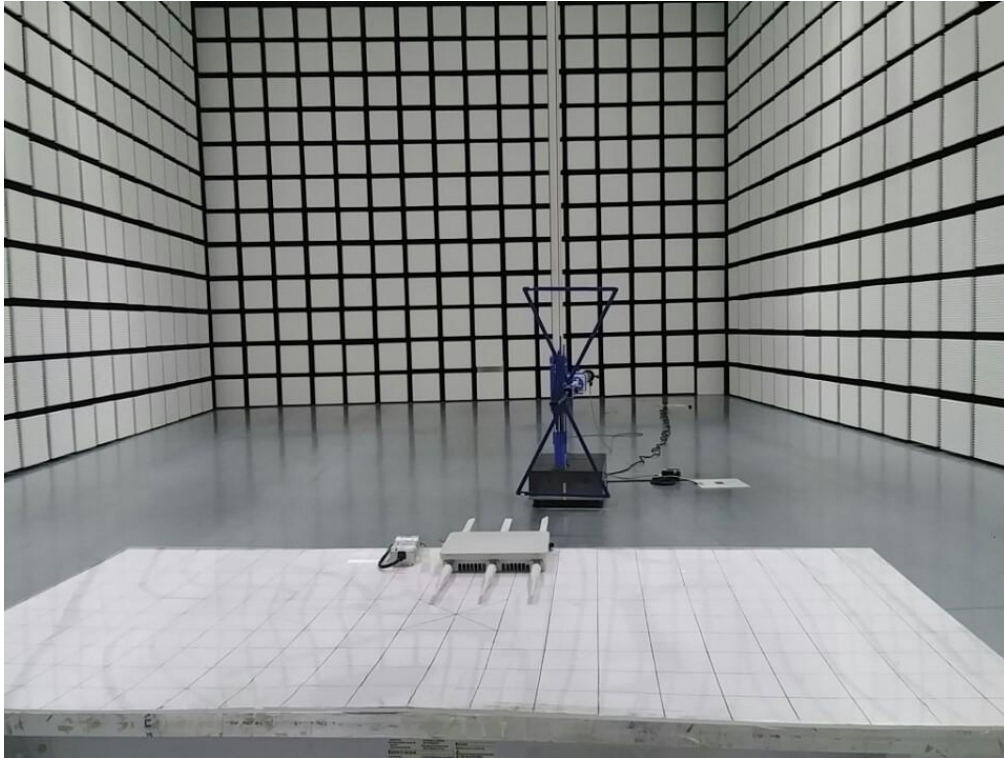
	CTK Co., Ltd. (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501	Certificate No.: CTK-2015-00900 Page (42) / (54) Pages	
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APPENDIX A - Test Setup Photos and Configuration

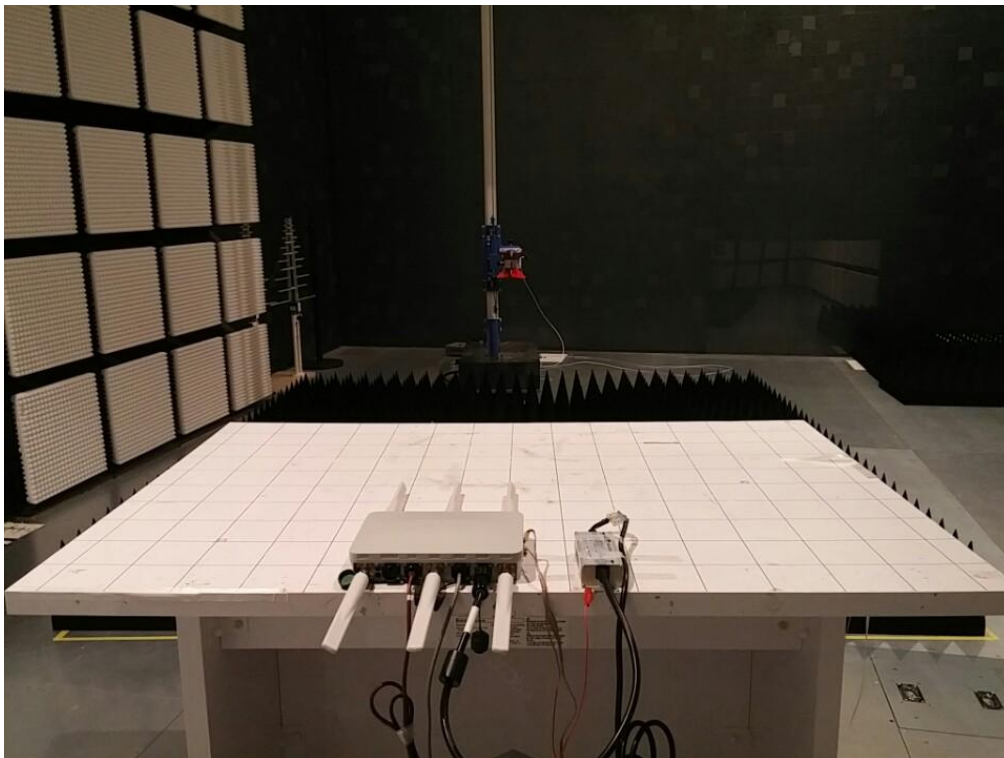
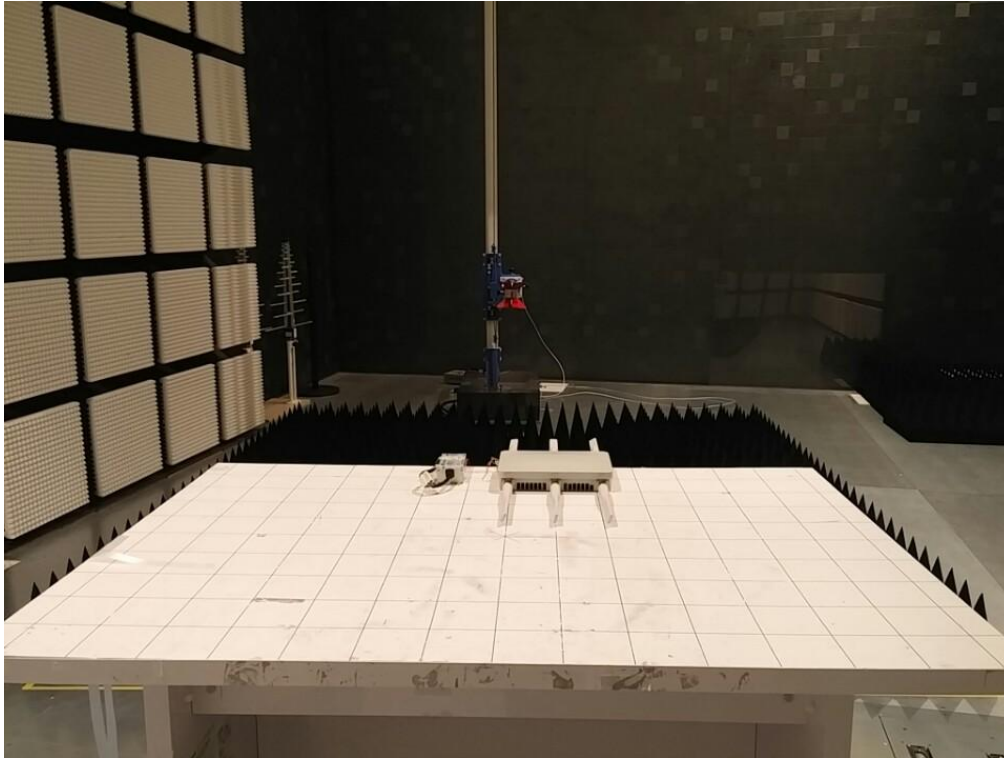
Conducted Voltage Emissions of Mains Ports



Radiated Electric Field Emissions (Below 1 GHz)



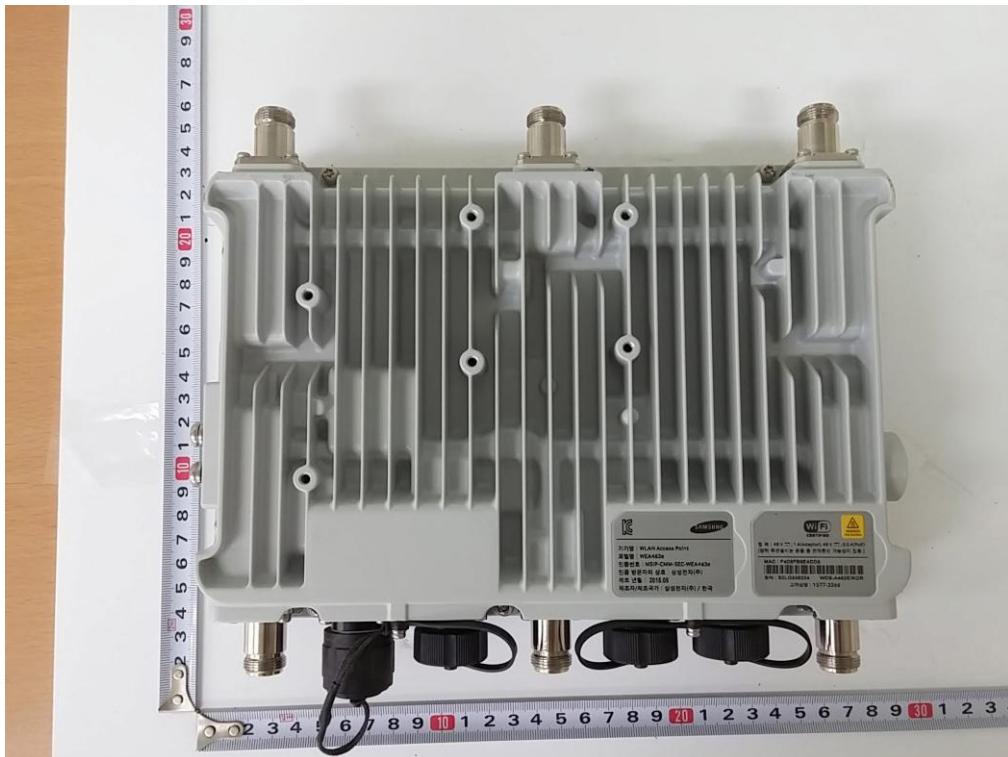
Radiated Electric Field Emissions (Above 1 GHz)



	CTK Co., Ltd. (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501	Certificate No.: CTK-2015-00900 Page (46) / (54) Pages	
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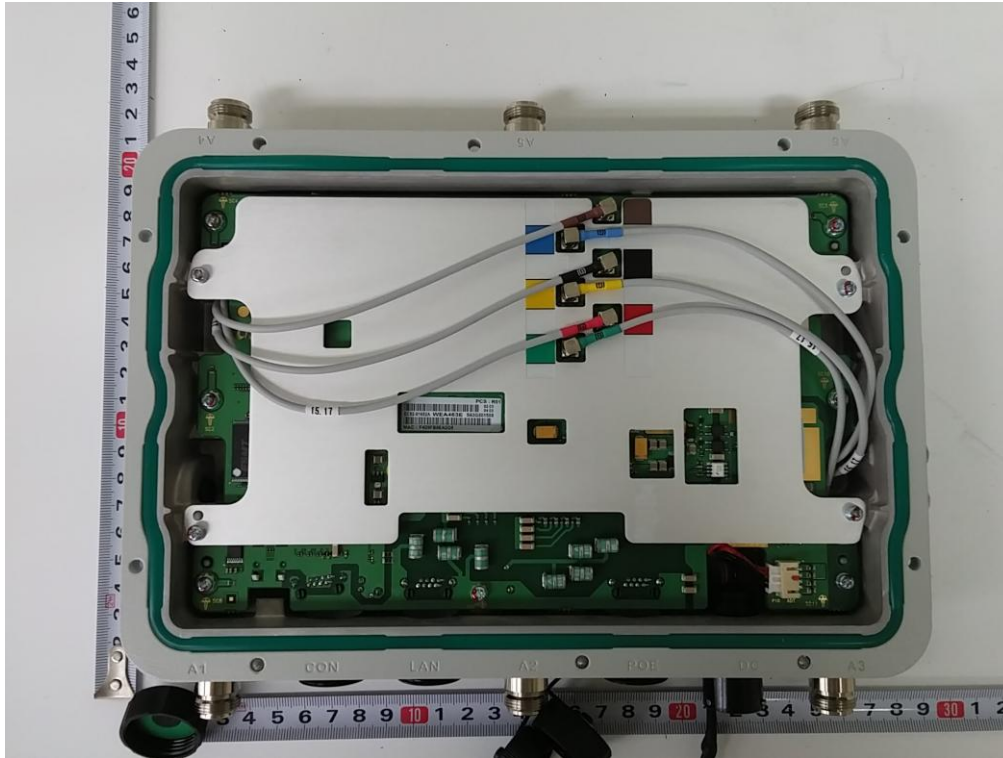
APPENDIX B – EUT Photographs

EUT External Photographs

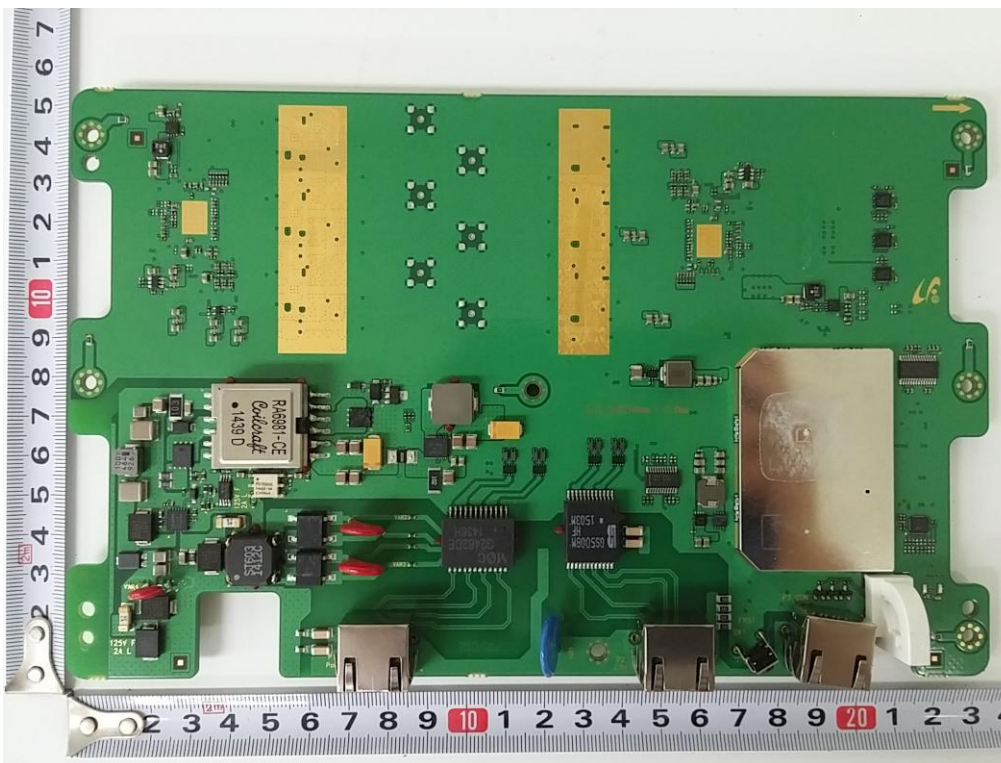
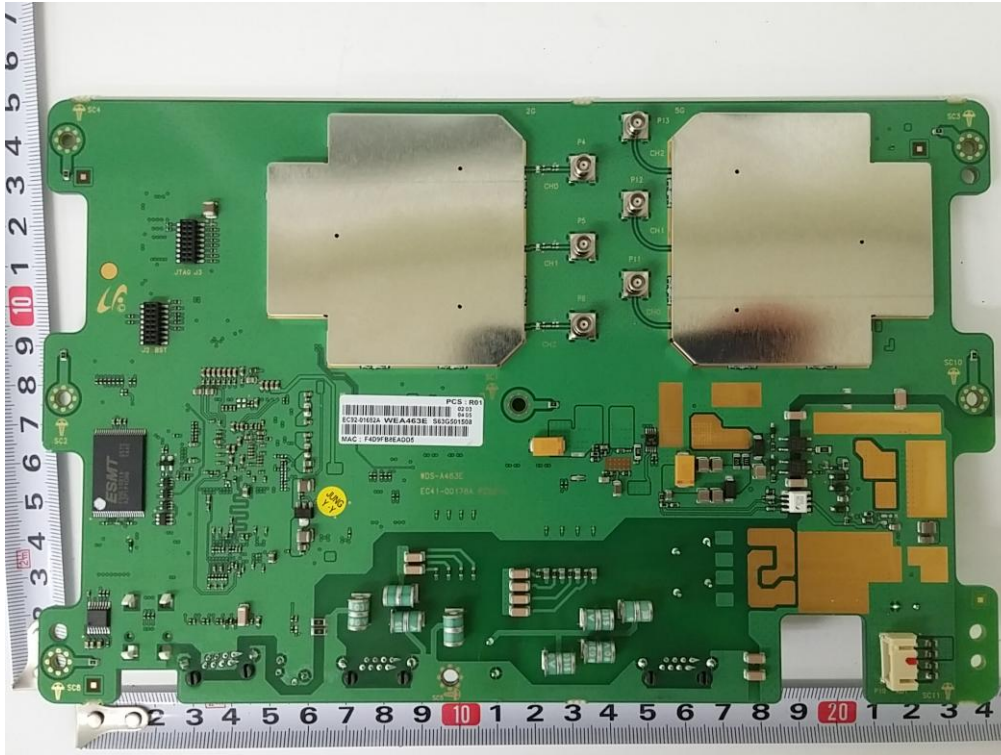




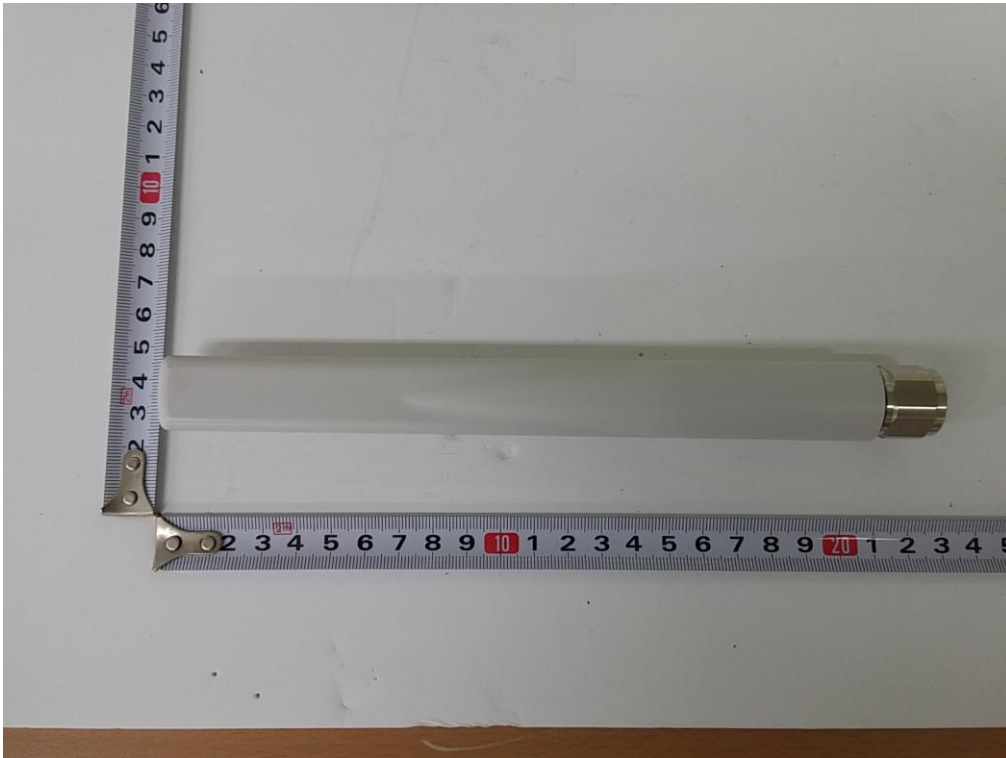
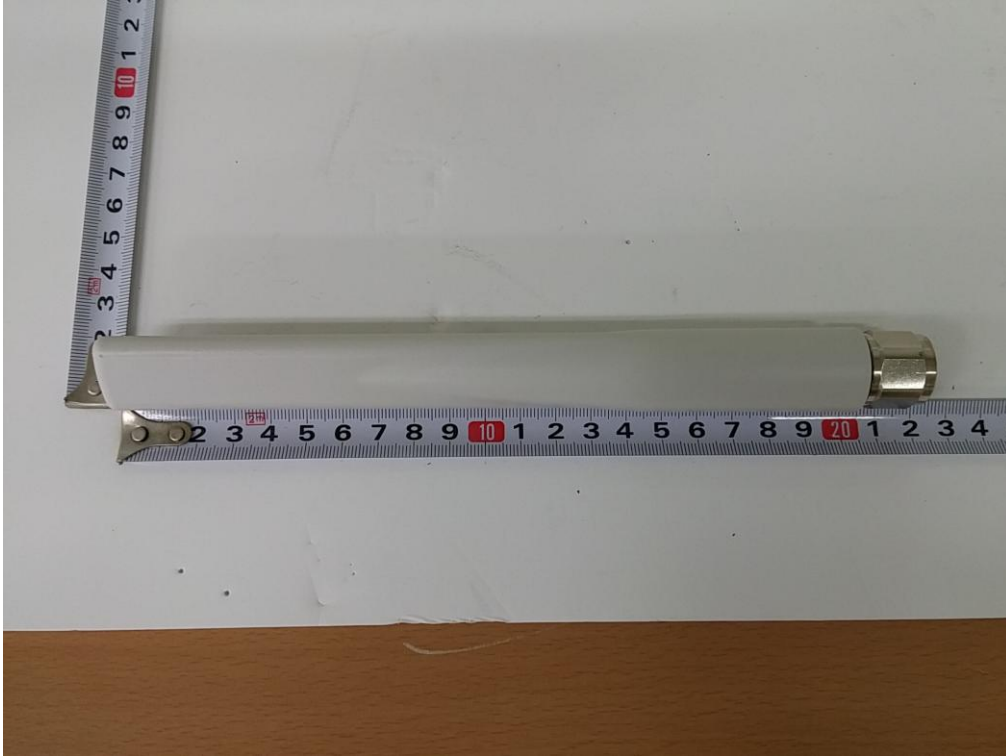
EUT Internal Photographs



PCB



Antenna1



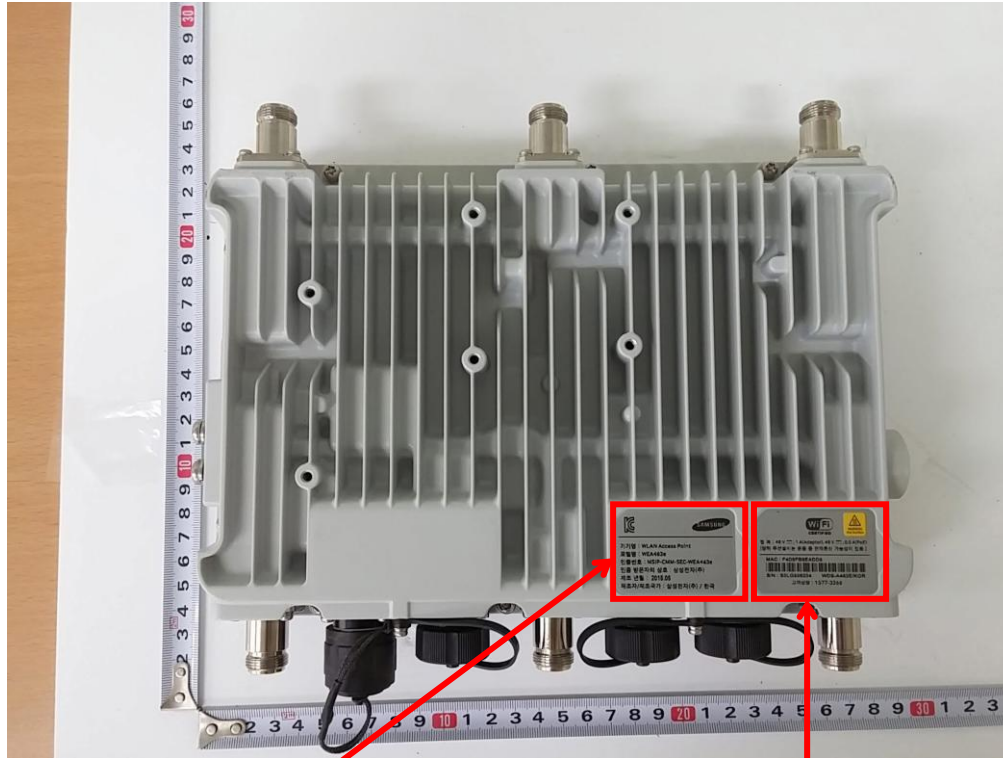
Antenna2



Antenna3



Label and Label Location



**WiFi
CERTIFIED**

Product : WLAN Access Point
Model : WEA463e
Manufactured :
MADE IN KOREA

FCC ID : A3LWEA463E IC : 649E-WEA463E

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.

UL
LISTED

E149091
I.T.E.

CE 2280

**WARNING
Hot Surface**

Samsung, Yateley, GU46 6GG, UK
Ratings : 48 V ; 1 A(Adaptor), 48 V ; 0.54 A(PoE)
SAMSUNG ELECTRONICS Co.,Ltd.
#244, 1gongdan-ro, Gumi-si, Gyeongsangbuk-do, Korea