

TESTING CERTIFICATE



CTK Co., Ltd.
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Certificate No.:
CTK-2015-00694
Page (1) / (46) 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

4. Test Sample / Model: WLAN Access Point / WEA403e

5. Date of Test : 2015-04-09 to 2015-06-13

6. Test Standard(method) used : FCC Part 15 Subpart B

7. Testing Environment: refer to 12 pages to 28 pages

8. Test Results : refer to 12 pages to 28 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 Sang Kyun: (Signature) EMC Test Engineer	Park Young-joon: (Signature) Technical Manager

2015-06-15

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

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REPORT REVISION HISTORY

Date	Revision	Page No
2015-06-15	Issued (CTK-2015-00694)	All

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1.0 General Product Description

No.	ITEM		APPLICATION	
1	Test Sample		WLAN Access Point	
2	Model		WEA403e	
3	Variant Model		-	
4	Dimensions (W x L x H)		200 mm X 200 mm X 43 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
			Output:	DC 48 V, 0.75 A
		PoE	Input:	DC 48 V, 0.54 A
			Output:	-
8	Test Voltage / Frequency		Voltage:	AC 120 V
			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

1) AC/DC ADAPTER Mode

Device	Model No.	Serial No.	Manufacturer
Antenna (Dipole Or Patch)	-	-	Samsung Electronics Co., Ltd.
AC/DC ADAPTER1	AP36-48	-	ACT CO., LTD.
Notebook Computer1	Satellite A100	-	INVENTEC CORPORATION
AC/DC ADAPTER2	SADP-75PB B	6032B0006901-0639-01825	DELTA ELECTRONICS(JIANG SU), 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-OKD882-48643-69I-0039	Dell Asia Pacific Sdn.
AC/DC ADAPTER4	PA-1650-05DK	CN-0D1100-71615-4A3-0178	Dongguang Lite Power 2nd Plant

2) 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	Satellite A100	-	INVENTEC CORPORATION
AC/DC ADAPTER2	SADP-75PB B	6032B0006901-0639-01825	DELTA ELECTRONICS(JIANG SU), 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-OKD882-48643-69I-0039	Dell Asia Pacific Sdn.
AC/DC ADAPTER4	PA-1650-05DK	CN-0D1100-71615-4A3-0178	Dongguang Lite Power 2nd Plant

☒ Cable Description

1) 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 (Dipole Or Patch)	-	-	-	-
2		ETHERNET(PoE)	Notebook Computer1	LAN	3.0	Unshielded	N
3		ETHERNET	Cable	-	3.0	Unshielded	N
4		DC Input	AC/DC ADAPTER1	DC Output	1.5	Unshielded	Y
5		2.4 GHz communication	Notebook Computer2	2.4 GHz communication	-	-	-
6		5 GHz communication	Notebook Computer3	5 GHz communication	-	-	-
7	AC/DC ADAPTER1	AC Power	AC Mains	-	1.8	Unshielded	N
8	Notebook Computer1	DC Input	AC/DC ADAPTER2	DC Output	1.5	Unshielded	Y
9	AC/DC ADAPTER2	AC Power	AC Mains	-	1.8	Unshielded	N
10	Notebook Computer2	DC Input	AC/DC ADAPTER3	DC Output	1.5	Unshielded	Y
11	AC/DC ADAPTER3	AC Power	AC Mains	-	1.8	Unshielded	N
12	Notebook Computer3	DC Input	AC/DC ADAPTER4	DC Output	1.5	Unshielded	Y
13	AC/DC ADAPTER4	AC Power	AC Mains	-	1.8	Unshielded	N

2) 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 (Dipole Or Patch)	-	-	-	-
2		ETHERNET(PoE)	PoE Switch	LAN1	3.0	Unshielded	N
3		ETHERNET	Cable	-	3.0	Unshielded	N
4		2.4 GHz communication	Notebook Computer2	2.4 GHz communication	-	-	-
5		5 GHz communication	Notebook Computer3	5 GHz communication	-	-	-
6	PoE Switch	LAN2	Notebook Computer1	LAN	3.0	Unshielded	N
7		DC Input	AC/DC ADAPTER1	DC Output	1.5	Unshielded	Y
8	AC/DC ADAPTER1	AC Power	AC Mains	-	1.8	Unshielded	N
9	Notebook Computer1	DC Input	AC/DC ADAPTER2	DC Output	1.5	Unshielded	Y
10	AC/DC ADAPTER2	AC Power	AC Mains	-	1.8	Unshielded	N
11	Notebook Computer2	DC Input	AC/DC ADAPTER3	DC Output	1.5	Unshielded	Y
12	AC/DC ADAPTER3	AC Power	AC Mains	-	1.8	Unshielded	N
13	Notebook Computer3	DC Input	AC/DC ADAPTER4	DC Output	1.5	Unshielded	Y
14	AC/DC ADAPTER4	AC Power	AC Mains	-	1.8	Unshielded	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

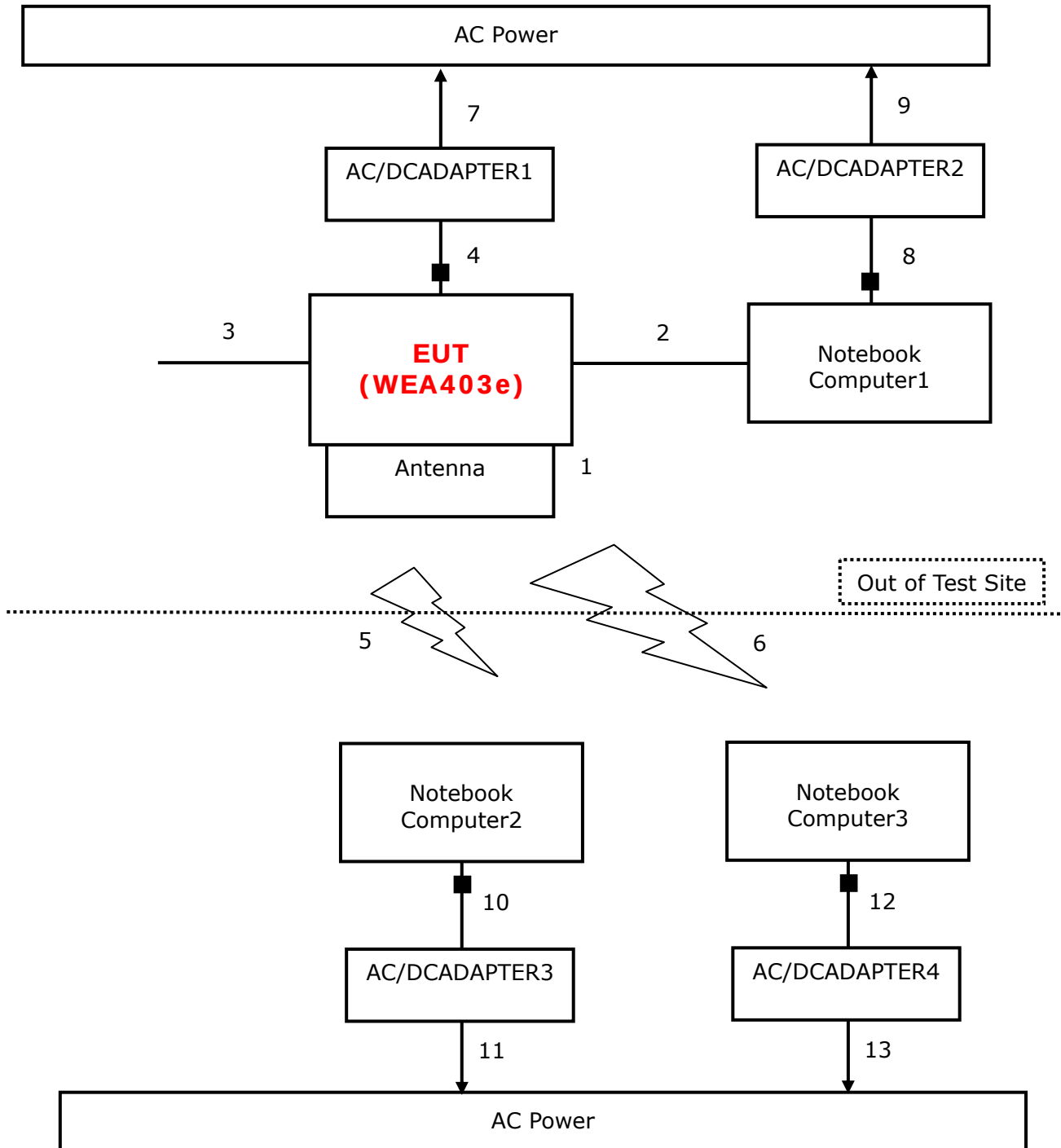
1.5 EUT Operating Mode(s)

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

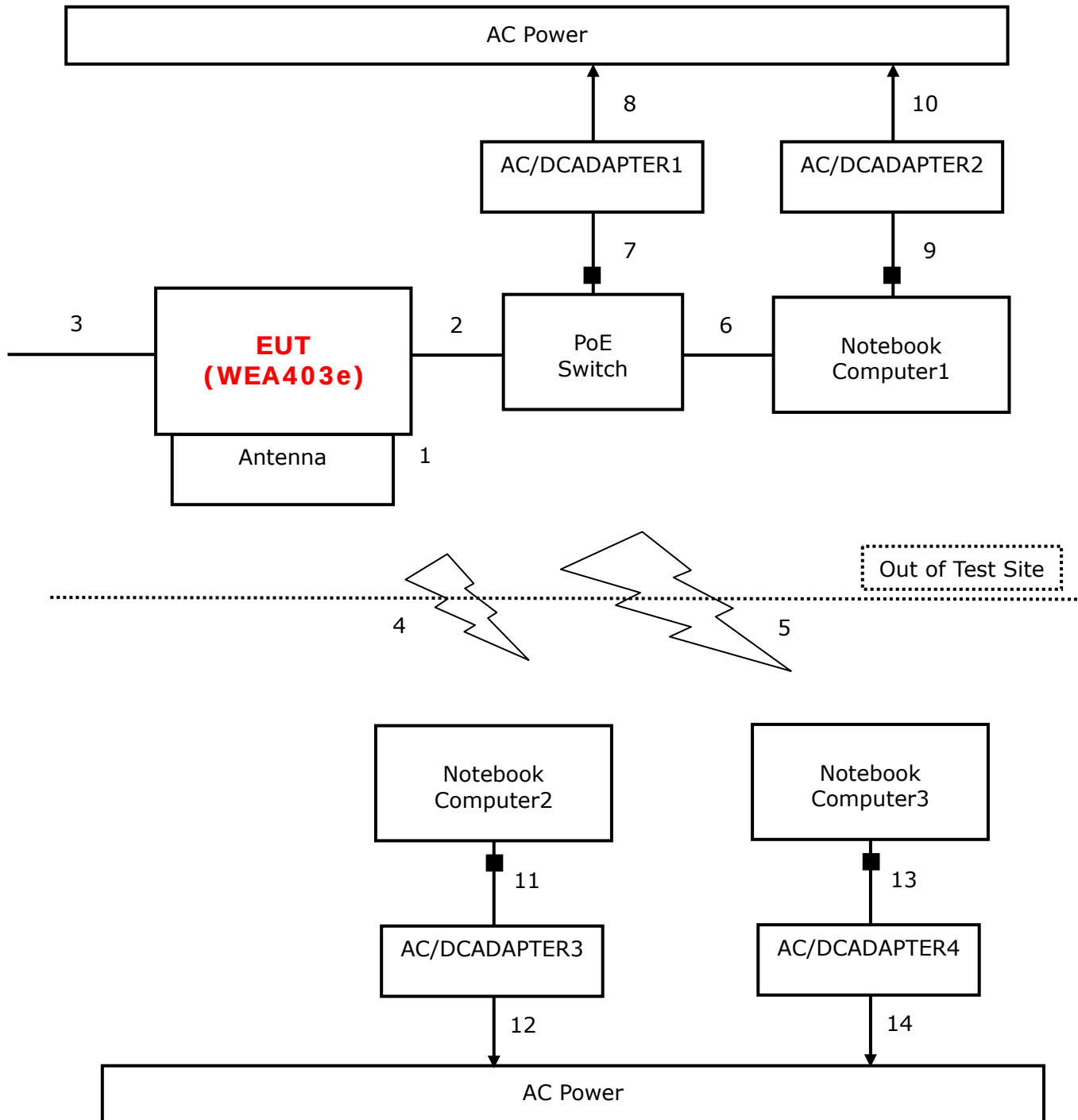
- | | |
|---|--|
| ☐ Standby | ☐ Scrolling 'H' |
| ☐ Color Bar Display | ☐ Data Read/Write |
| ☐ USB PLAY | ☐ DVD Play |
| ☐ USB Data Communication | ☐ Serial Data Communication |
| ☐ AUX IN | ☐ Receipt Printing Mode |
| ☐ DLNA | ☒ Ping test |

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: 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	

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 ☐ 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

2015-04-09

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	2015-07-29	☐
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

[Dipole Antenna]

Frequency (MHz)	Measured Data (dBμV)	Margin (dB)	Remark
0.492 000	41.1	5.0	CAverage



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[Patch Antenna]

Frequency (MHz)	Measured Data (dB μ V)	Margin (dB)	Remark
0.492 000	41.1	5.0	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

[Dipole Antenna] - [Line: L1]

Test

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Test Report

Common Information

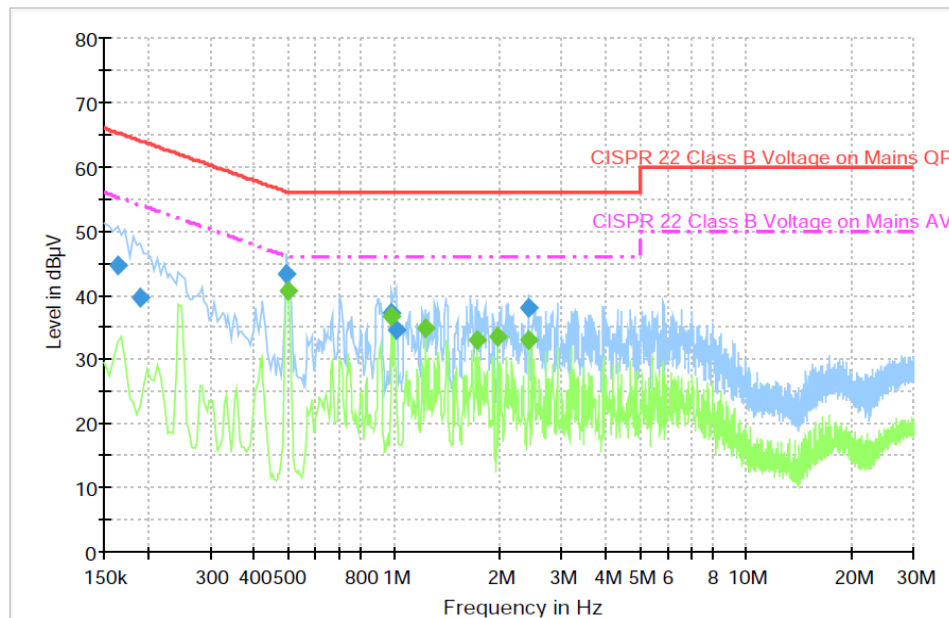
Test Model Name: WEA403e
Test Mode: Operating
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101235) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz

Receiver: ESCI 3 [ESCI 3]
@ GPIB0 (ADR 23), SN 100032/003, FW 4.42
Signal Path: ESCI 3-ENV216 FO(101235)
FW 1.0
Correction Table: 3CE Cable Loss
LISN: ENV216 FO(101235)
Correction Table (Line 0): ENV216_FO_N(101235)
Correction Table (Line 1): ENV216_FO_L1(101235)

3CE_CISPR 22 Class B_L1



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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	44.7	1000.0	9.000	On	L1	9.8	20.6	65.3
0.190500	39.5	1000.0	9.000	On	L1	9.8	24.5	64.0
0.496500	43.2	1000.0	9.000	On	L1	9.9	12.9	56.1
0.987000	37.1	1000.0	9.000	On	L1	9.8	18.9	56.0
1.014000	34.6	1000.0	9.000	On	L1	9.8	21.4	56.0
2.413500	38.0	1000.0	9.000	On	L1	9.8	18.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.501000	40.7	1000.0	9.000	On	L1	9.9	5.3	46.0
0.987000	36.8	1000.0	9.000	On	L1	9.8	9.2	46.0
1.230000	34.8	1000.0	9.000	On	L1	9.7	11.2	46.0
1.725000	33.1	1000.0	9.000	On	L1	9.7	12.9	46.0
1.968000	33.4	1000.0	9.000	On	L1	9.7	12.6	46.0
2.418000	33.1	1000.0	9.000	On	L1	9.8	12.9	46.0

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[Dipole Antenna] - [Line : Neutral]

Test

1 / 2

Test Report

Common Information

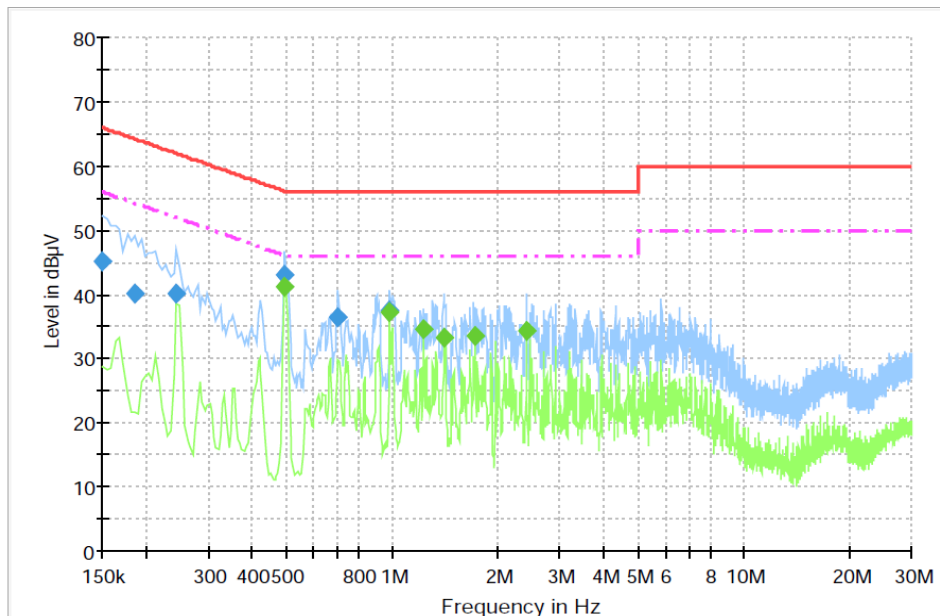
Test Model Name: WEA403e
Test Mode: Operating
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101235) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz

Receiver: ESCI 3 [ESCI 3]
@ GPIB0 (ADR 23), SN 100032/003, FW 4.42
Signal Path: ESCI 3-ENV216 FO(101235)
FW 1.0
Correction Table: 3CE Cable Loss
LISN: ENV216 FO(101235)
Correction Table (Line 0): ENV216_FO_N(101235)
Correction Table (Line 1): ENV216_FO_L1(101235)

3CE_CISPR 22 Class B_N



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Test

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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	45.0	1000.0	9.000	On	N	9.7	21.0	66.0
0.186000	40.2	1000.0	9.000	On	N	9.8	24.0	64.2
0.244500	40.2	1000.0	9.000	On	N	9.6	21.7	61.9
0.496500	43.0	1000.0	9.000	On	N	9.9	13.1	56.1
0.703500	36.5	1000.0	9.000	On	N	9.8	19.5	56.0
0.987000	37.6	1000.0	9.000	On	N	9.7	18.4	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.492000	41.1	1000.0	9.000	On	N	9.9	5.0	46.1
0.987000	37.1	1000.0	9.000	On	N	9.7	8.9	46.0
1.230000	34.7	1000.0	9.000	On	N	9.7	11.3	46.0
1.414500	33.2	1000.0	9.000	On	N	9.7	12.8	46.0
1.725000	33.5	1000.0	9.000	On	N	9.7	12.5	46.0
2.413500	34.3	1000.0	9.000	On	N	9.7	11.7	46.0

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[Patch Antenna] - [Line: L1]

Test

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Test Report

Common Information

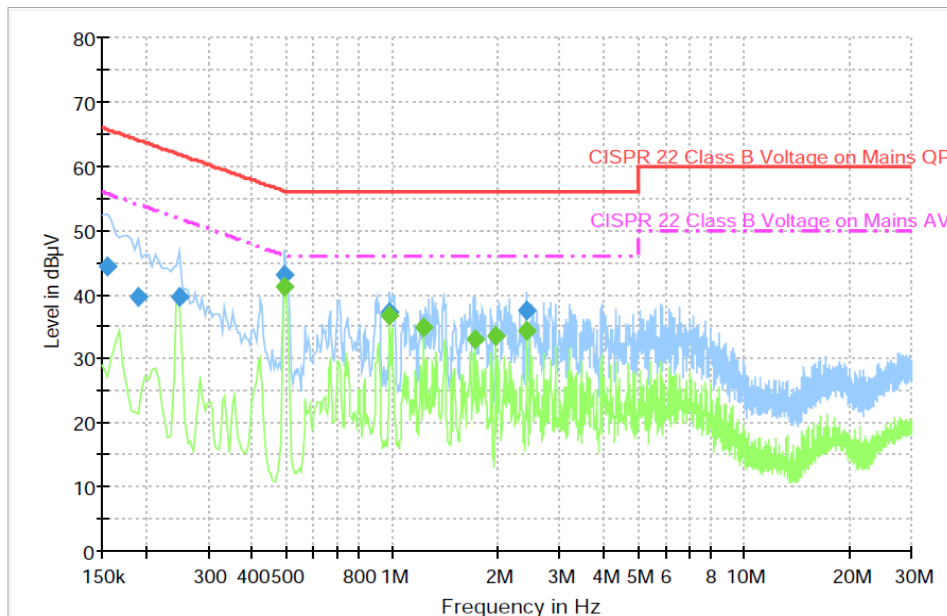
Test Model Name: WEA403e
Test Mode: Operating
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Hardware Setup: EMI conducted\Voltage with ENV216_FO(101235) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz

Receiver: ESCI 3 [ESCI 3]
@ GPIB0 (ADR 23), SN 100032/003, FW 4.42
Signal Path: ESCI 3-ENV216 FO(101235)
FW 1.0
Correction Table: 3CE Cable Loss
LISN: ENV216 FO(101235)
Correction Table (Line 0): ENV216_FO_N(101235)
Correction Table (Line 1): ENV216_FO_L1(101235)

3CE_CISPR 22 Class B_L1



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Test

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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	44.3	1000.0	9.000	On	L1	9.7	21.4	65.8
0.190500	39.7	1000.0	9.000	On	L1	9.8	24.3	64.0
0.249000	39.6	1000.0	9.000	On	L1	9.6	22.2	61.8
0.496500	43.1	1000.0	9.000	On	L1	9.9	13.0	56.1
0.987000	37.4	1000.0	9.000	On	L1	9.8	18.6	56.0
2.409000	37.5	1000.0	9.000	On	L1	9.8	18.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.492000	41.1	1000.0	9.000	On	L1	9.9	5.0	46.1
0.987000	36.8	1000.0	9.000	On	L1	9.8	9.2	46.0
1.230000	34.9	1000.0	9.000	On	L1	9.7	11.1	46.0
1.725000	32.9	1000.0	9.000	On	L1	9.7	13.1	46.0
1.968000	33.6	1000.0	9.000	On	L1	9.7	12.4	46.0
2.413500	34.3	1000.0	9.000	On	L1	9.8	11.7	46.0

4/9/2015

5:42:42

[Patch Antenna] - [Line : Neutral]

Test

1 / 2

Test Report

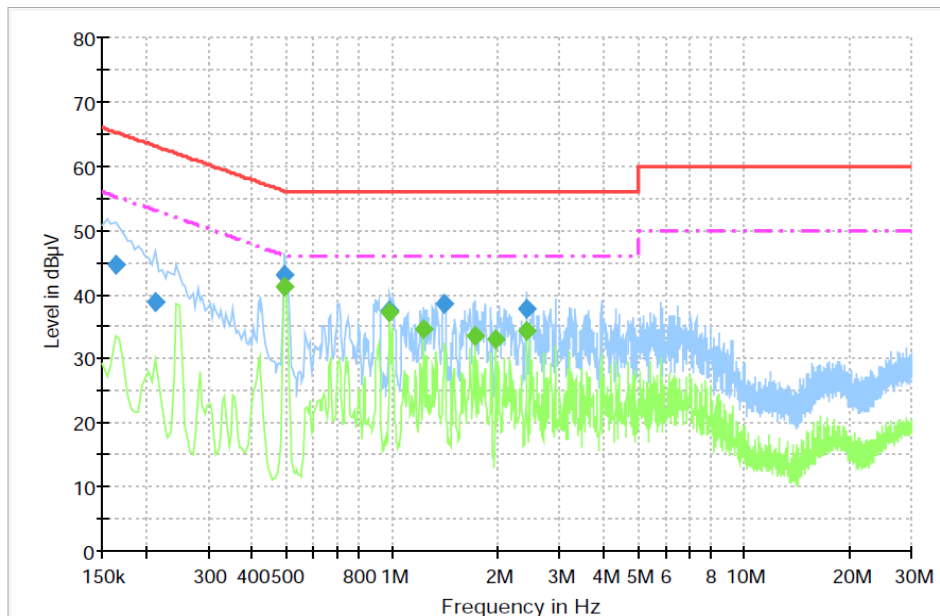
Common Information

Test Model Name: WEA403e
Test Mode: Operating
Manufacturer: Samsung Electronics Co., Ltd.
Tester: PARK SANG KYUN

Hardware Setup: EMI conducted\Voltage with ENV216_FO(101235) - [EMI conducted]

Subrange 1
Frequency Range: 150 kHz - 30 MHz
Receiver: ESCI 3 [ESCI 3]
@ GPIB0 (ADR 23), SN 100032/003, FW 4.42
Signal Path: ESCI 3-ENV216 FO(101235)
FW 1.0
Correction Table: 3CE Cable Loss
LISN: ENV216 FO(101235)
Correction Table (Line 0): ENV216_FO_N(101235)
Correction Table (Line 1): ENV216_FO_L1(101235)

3CE_CISPR 22 Class B_N



4/9/2015

5:48:01



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Test

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Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	44.5	1000.0	9.000	On	N	9.7	20.8	65.3
0.213000	38.9	1000.0	9.000	On	N	9.8	24.2	63.1
0.496500	43.2	1000.0	9.000	On	N	9.9	12.9	56.1
0.987000	37.6	1000.0	9.000	On	N	9.7	18.4	56.0
1.405500	38.5	1000.0	9.000	On	N	9.7	17.5	56.0
2.409000	37.7	1000.0	9.000	On	N	9.7	18.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.492000	41.1	1000.0	9.000	On	N	9.9	5.0	46.1
0.987000	37.1	1000.0	9.000	On	N	9.7	8.9	46.0
1.230000	34.6	1000.0	9.000	On	N	9.7	11.4	46.0
1.725000	33.5	1000.0	9.000	On	N	9.7	12.5	46.0
1.968000	33.0	1000.0	9.000	On	N	9.6	13.0	46.0
2.413500	34.3	1000.0	9.000	On	N	9.7	11.7	46.0

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3.2 Radiated Electric Field Emissions (Below 1 GHz)

Test Date

2015-06-07

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

Temperature: (23 ± 1) °C

Relative Humidity: (40 ± 1) %

Atmospheric Pressure: 99 kPa

Test Result

The requirements are: ☒ MET ☐ NOT MET

[AC/DC Adapter Mode] - [Dipole Antenna]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
55.826	34.8	5.2	Quasi-peak

[AC/DC Adapter Mode] - [Patch Antenna]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
234.428	40.7	5.3	Quasi-peak

[PoE Mode] - [Dipole Antenna]

Frequency (MHz)	Measured Data (dB μ V/m)	Margin (dB)	Remark
234.670	40.6	5.4	Quasi-peak

[PoE Mode] - [Patch Antenna]

Frequency (MHz)	Measured Data (dB μ V/m)	Margin (dB)	Remark
55.948	34.8	5.2	Quasi-peak

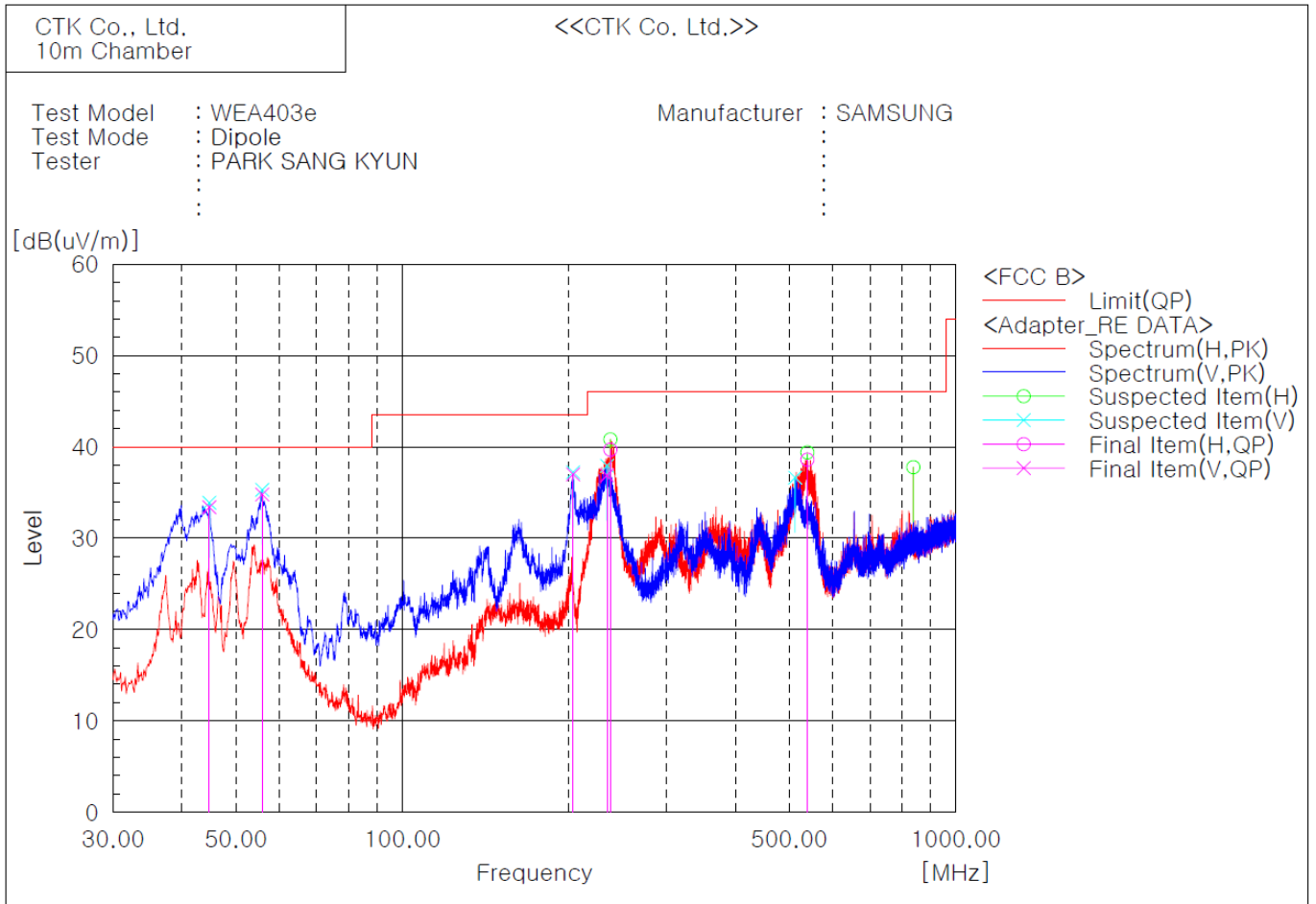
The Result is calculated by using the following formula;

* Result = Reading + Correction factor

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

Test Data

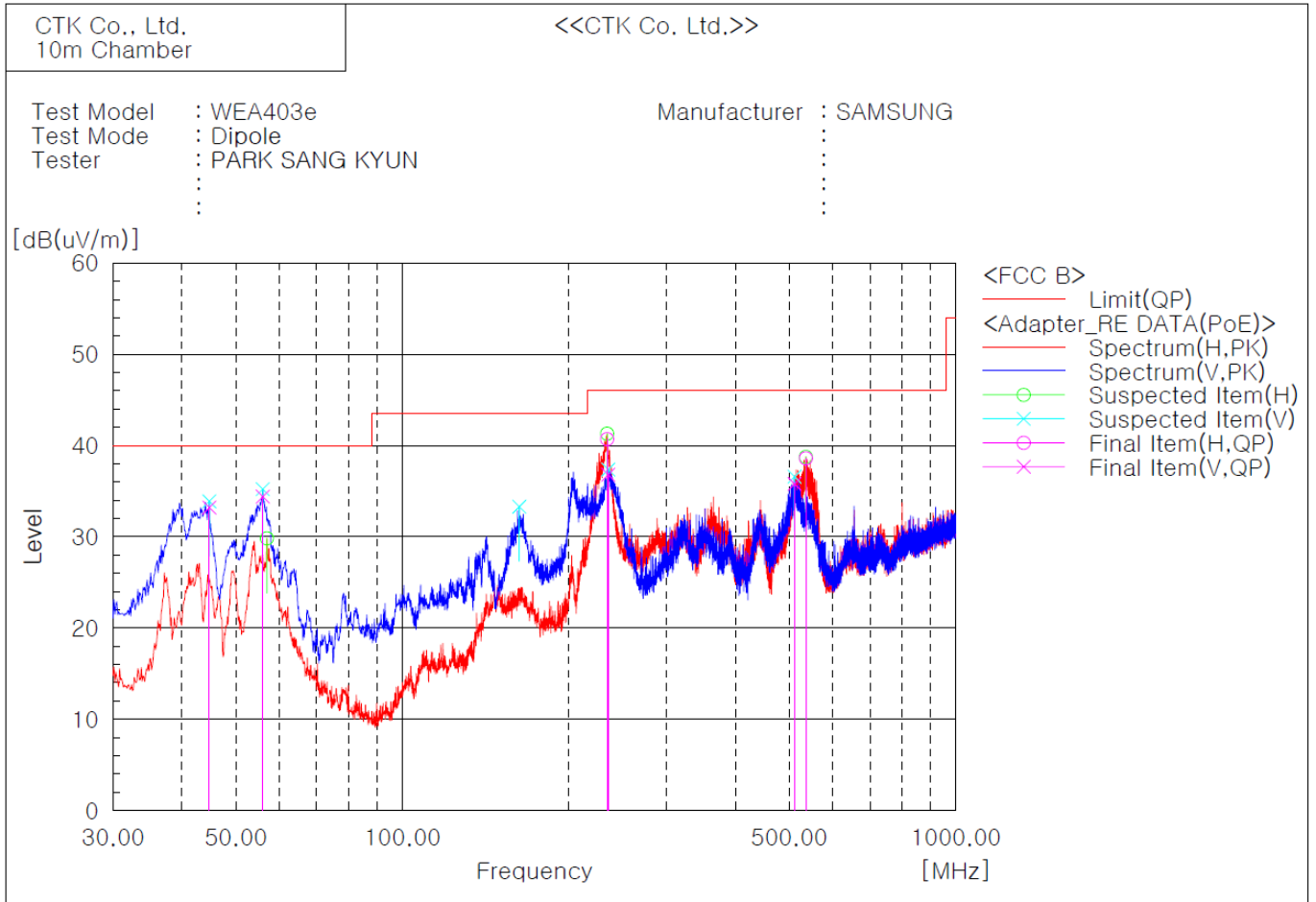
[AC/DC Adapter Mode] - [Dipole Antenna]



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	44.793	V	46.0	-12.6	33.4	40.0	6.6	100.0	349.0
2	55.826	V	47.9	-13.1	34.8	40.0	5.2	100.0	125.0
3	203.509	V	50.5	-13.5	37.0	43.5	6.5	100.0	237.0
4	234.306	V	48.5	-11.6	36.9	46.0	9.1	100.0	349.0
5	237.701	H	51.0	-11.3	39.7	46.0	6.3	100.0	234.0
6	539.371	H	39.9	-1.3	38.6	46.0	7.4	205.0	124.0

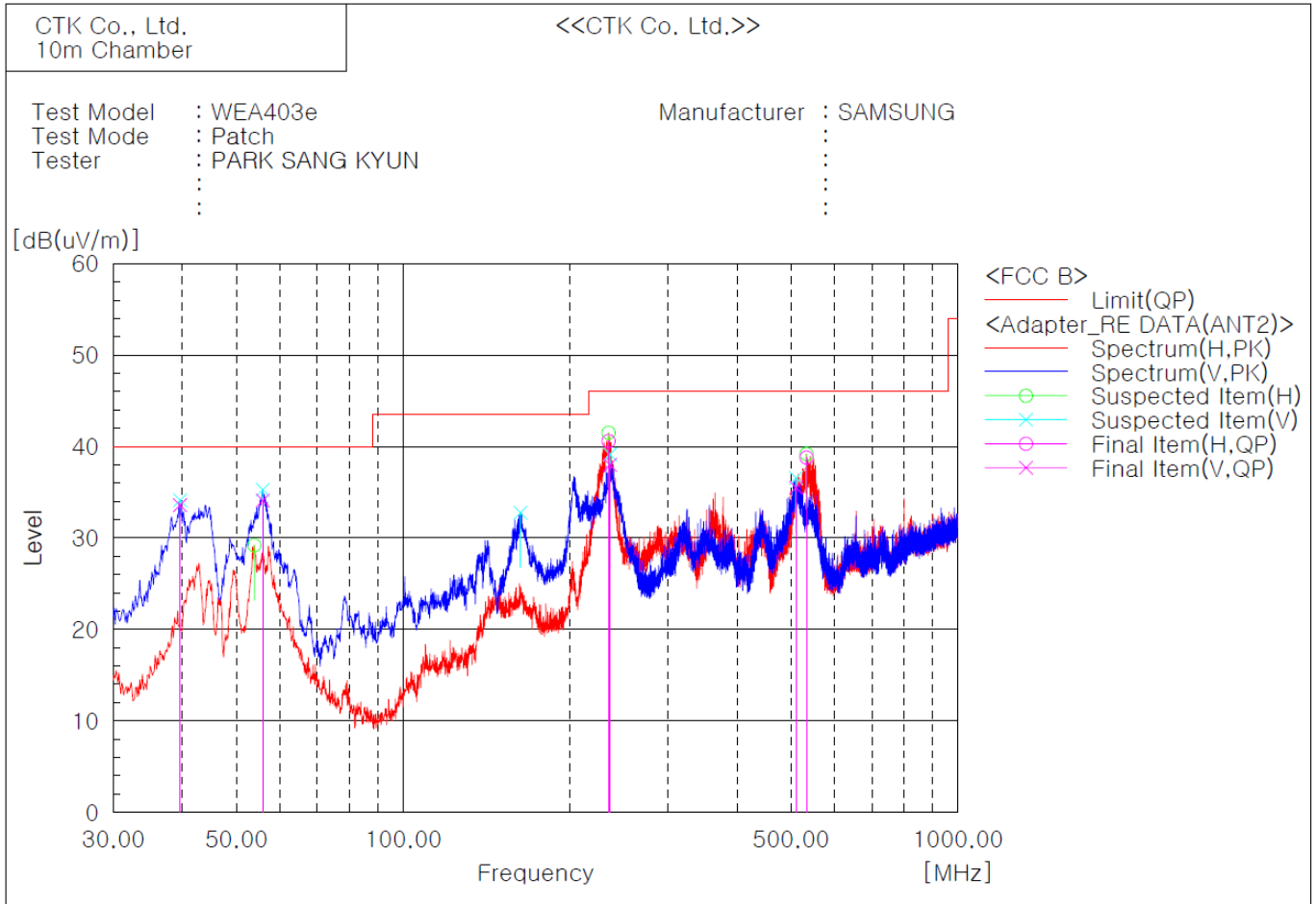
[AC/DC Adapter Mode] - [Patch Antenna]



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	44.793	V	45.8	-12.6	33.2	40.0	6.8	100.0	51.0
2	55.948	V	47.5	-13.1	34.4	40.0	5.6	100.0	51.0
3	234.428	H	52.2	-11.5	40.7	46.0	5.3	100.0	48.0
4	235.519	V	48.3	-11.5	36.8	46.0	9.2	195.0	11.0
5	511.362	V	37.9	-2.1	35.8	46.0	10.2	100.0	238.0
6	535.976	H	40.0	-1.4	38.6	46.0	7.4	205.0	126.0

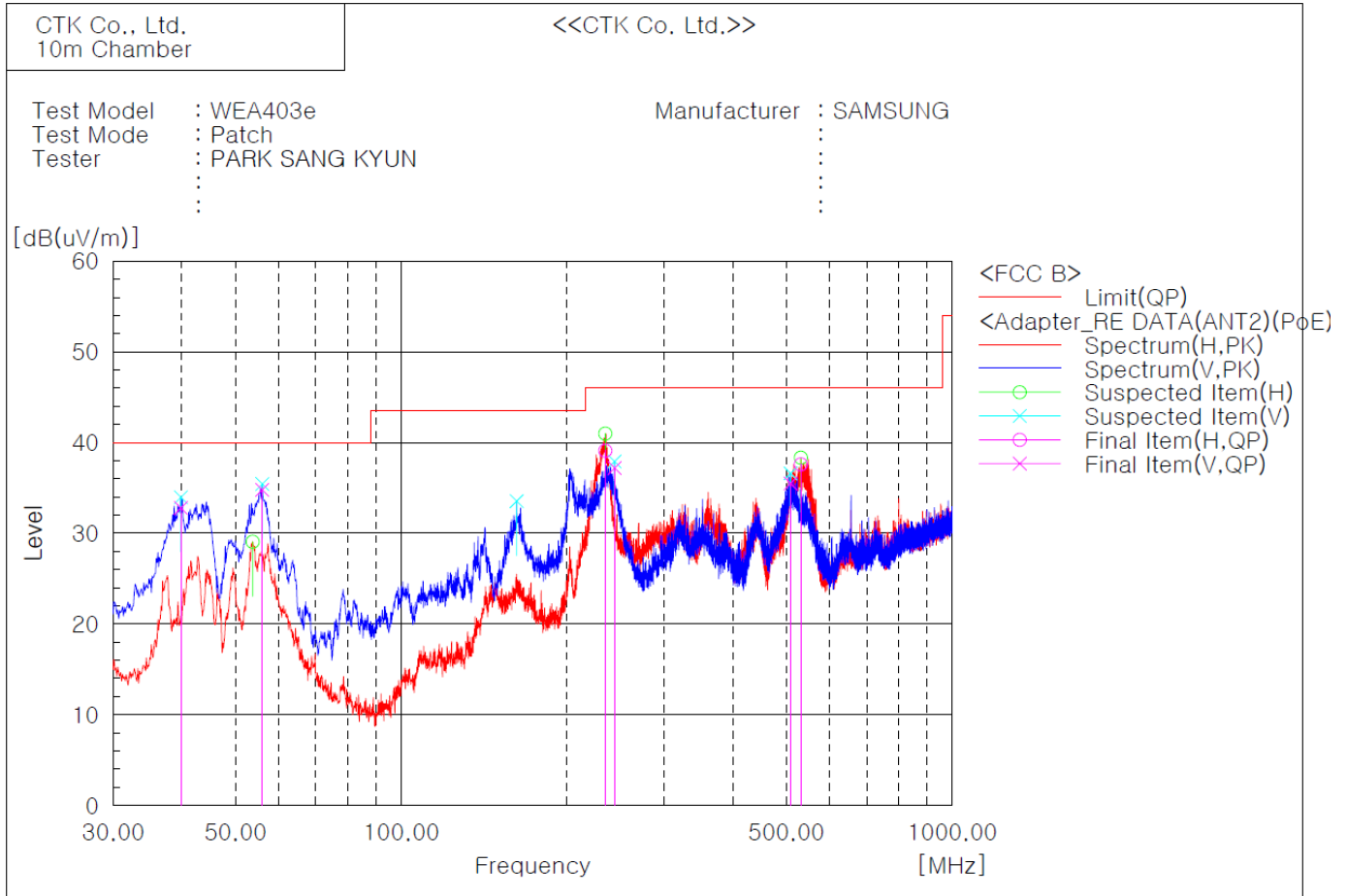
[PoE Mode] - [Dipole Antenna]



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	39.579	V	46.2	-12.6	33.6	40.0	6.4	100.0	349.0
2	55.826	V	47.2	-13.1	34.1	40.0	5.9	100.0	51.0
3	234.670	H	52.1	-11.5	40.6	46.0	5.4	100.0	48.0
4	236.004	V	49.4	-11.4	38.0	46.0	8.0	100.0	0.0
5	510.635	V	37.6	-2.1	35.5	46.0	10.5	100.0	163.0
6	533.673	H	40.3	-1.5	38.8	46.0	7.2	205.0	126.0

[PoE Mode] - [Patch Antenna]



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	39.821	V	45.4	-12.6	32.8	40.0	7.2	100.0	349.0
2	55.948	V	47.9	-13.1	34.8	40.0	5.2	100.0	51.0
3	234.791	H	50.6	-11.5	39.1	46.0	6.9	100.0	48.0
4	244.006	V	48.0	-10.8	37.2	46.0	8.8	100.0	274.0
5	508.937	V	37.7	-2.2	35.5	46.0	10.5	100.0	237.0
6	531.490	H	39.1	-1.5	37.6	46.0	8.4	205.0	125.0

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3.3 Radiated Electric Field Emissions (Above 1 GHz)

Test Date

2015-06-13

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 Technologies	3008A02011	2015-12-26	☒
Band Reject Filter	WRCSV 2400/2403-2375/2505-50/10EE	Wainwright Instruments GmbH	2	2016-05-14	☒
Band Reject Filter	WRCSV 5725/5025-5685/5065-50/12SS	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: (38 ± 1) %

Atmospheric Pressure: 99 kPa

Test Result

The requirements are: ☒ MET ☐ NOT MET

[AC/DC Adapter Mode] - [Dipole Antenna]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 196.875	35.4	18.6	Average

[AC/DC Adapter Mode] - [Patch Antenna]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
3 646.875	38.2	15.8	Average

[PoE Mode] - [Dipole Antenna]

Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
3 812.500	36.4	17.6	Average

[PoE Mode] - [Patch Antenna]

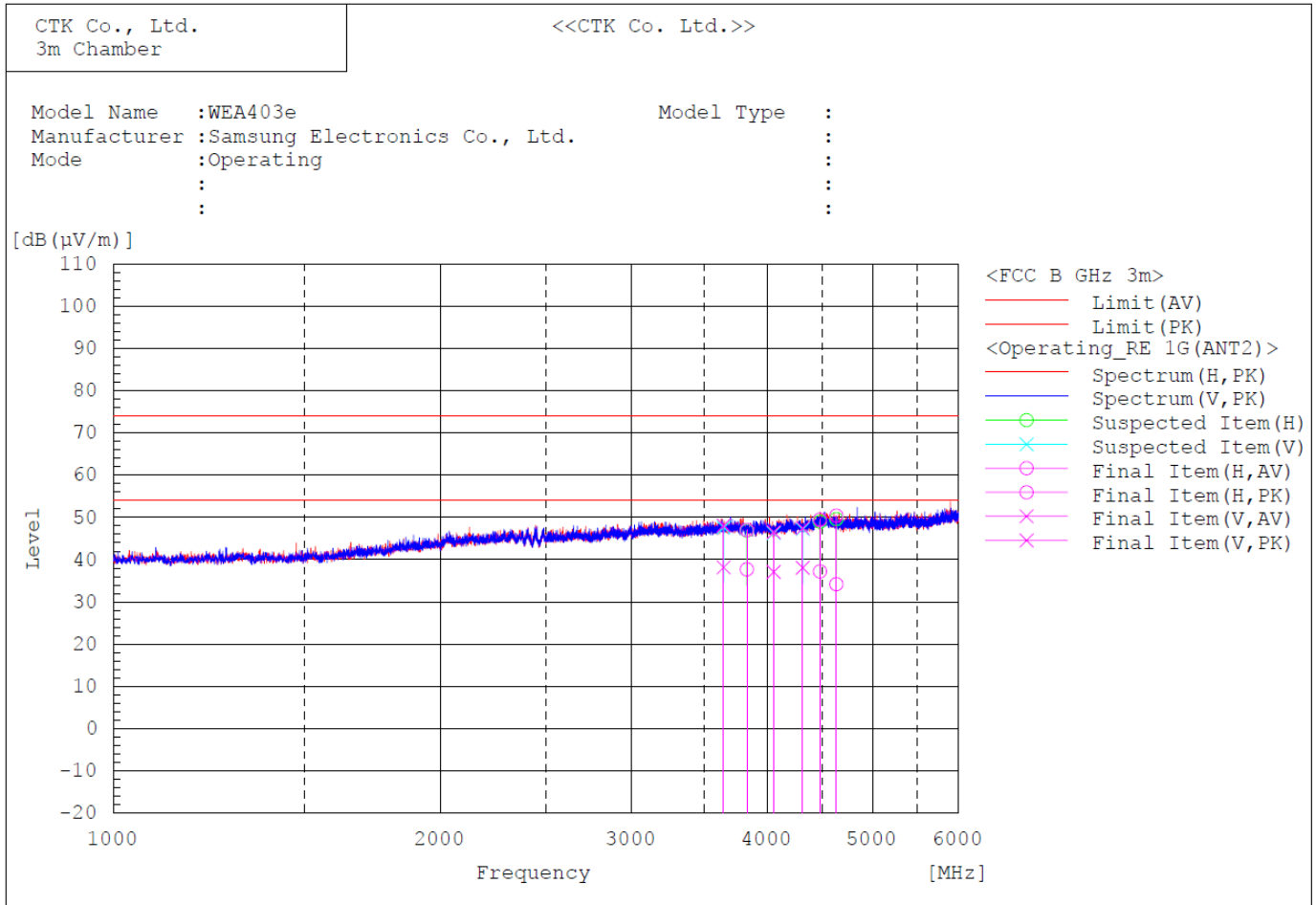
Frequency (MHz)	Measured Data (dBμV/m)	Margin (dB)	Remark
4 249.375	36.2	17.8	Average

The Result is calculated by using the following formula;

* Result = Reading + Correction factor

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

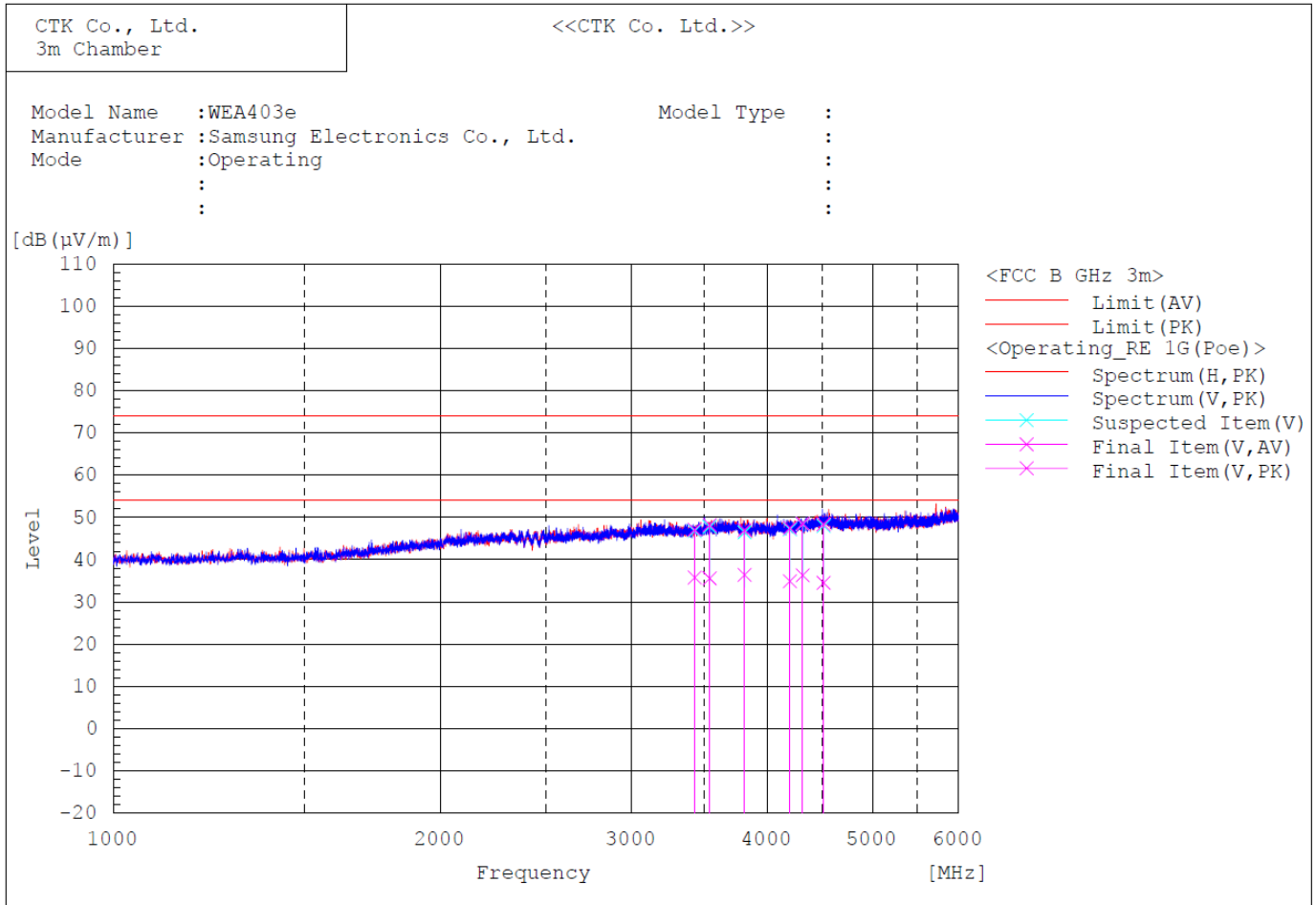
[AC/DC Adapter Mode] - [Patch Antenna]



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	3646.875	V	27.3	37.2	10.9	38.2	48.1	54.0	74.0	15.8	25.9	100.0	346.0
2	3831.250	H	26.2	35.5	11.5	37.7	47.0	54.0	74.0	16.3	27.0	100.0	332.0
3	4055.000	V	25.2	34.6	11.9	37.1	46.5	54.0	74.0	16.9	27.5	100.0	309.0
4	4312.500	V	25.3	34.7	12.8	38.1	47.5	54.0	74.0	15.9	26.5	100.0	290.0
5	4473.750	H	23.6	35.9	13.6	37.2	49.5	54.0	74.0	16.8	24.5	100.0	164.0
6	4631.875	H	20.3	36.5	13.9	34.2	50.4	54.0	74.0	19.8	23.6	100.0	332.0

[PoE Mode] - [Dipole Antenna]



Final Result

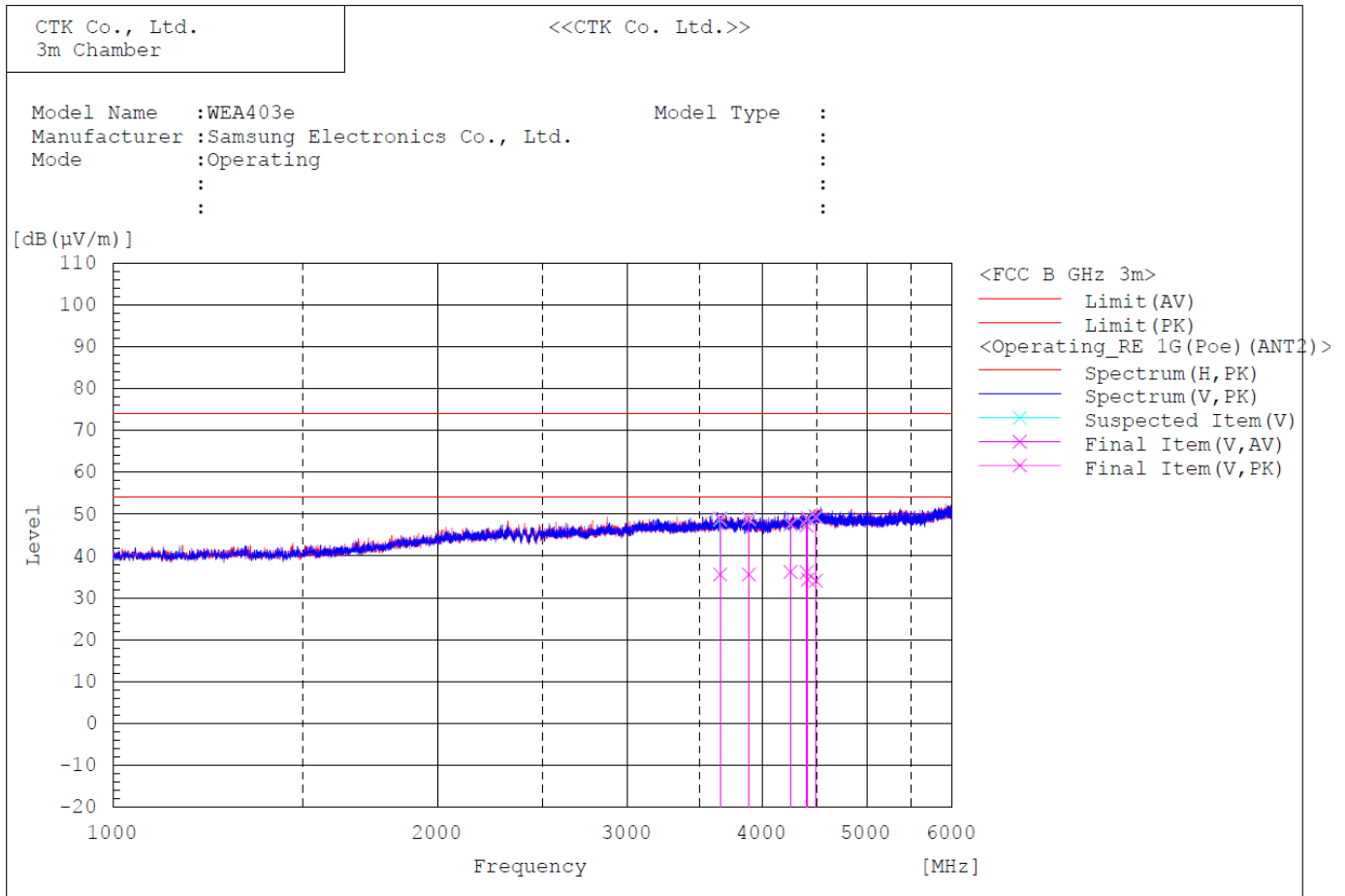
No.	Frequency [MHz]	(P)	Reading AV [dB (μV)]	Reading PK [dB (μV)]	c.f [dB (1/m)]	Result AV [dB (μV/m)]	Result PK [dB (μV/m)]	Limit AV [dB (μV/m)]	Limit PK [dB (μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	3429.375	V	25.6	36.9	10.2	35.8	47.1	54.0	74.0	18.2	26.9	100.0	291.0
2	3540.625	V	25.0	37.6	10.6	35.6	48.2	54.0	74.0	18.4	25.8	100.0	86.0
3	3812.500	V	24.9	35.5	11.5	36.4	47.0	54.0	74.0	17.6	27.0	100.0	67.0
4	4196.875	V	22.4	35.0	12.5	34.9	47.5	54.0	74.0	19.1	26.5	100.0	28.0
5	4312.500	V	23.5	35.7	12.8	36.3	48.5	54.0	74.0	17.7	25.5	100.0	28.0
6	4508.125	V	20.8	34.7	13.7	34.5	48.4	54.0	74.0	19.5	25.6	100.0	105.0



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[PoE Mode] - [Patch Antenna]



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	3656.250	V	24.7	38.1	10.9	35.6	49.0	54.0	74.0	18.4	25.0	100.0	101.0
2	3888.125	V	24.0	37.4	11.6	35.6	49.0	54.0	74.0	18.4	25.0	100.0	195.0
3	4249.375	V	23.6	35.1	12.6	36.2	47.7	54.0	74.0	17.8	26.3	100.0	213.0
4	4398.125	V	22.9	34.1	13.2	36.1	47.3	54.0	74.0	17.9	26.7	100.0	213.0
5	4409.375	V	21.1	35.8	13.3	34.4	49.1	54.0	74.0	19.6	24.9	100.0	63.0
6	4485.625	V	20.4	35.8	13.7	34.1	49.5	54.0	74.0	19.9	24.5	100.0	176.0

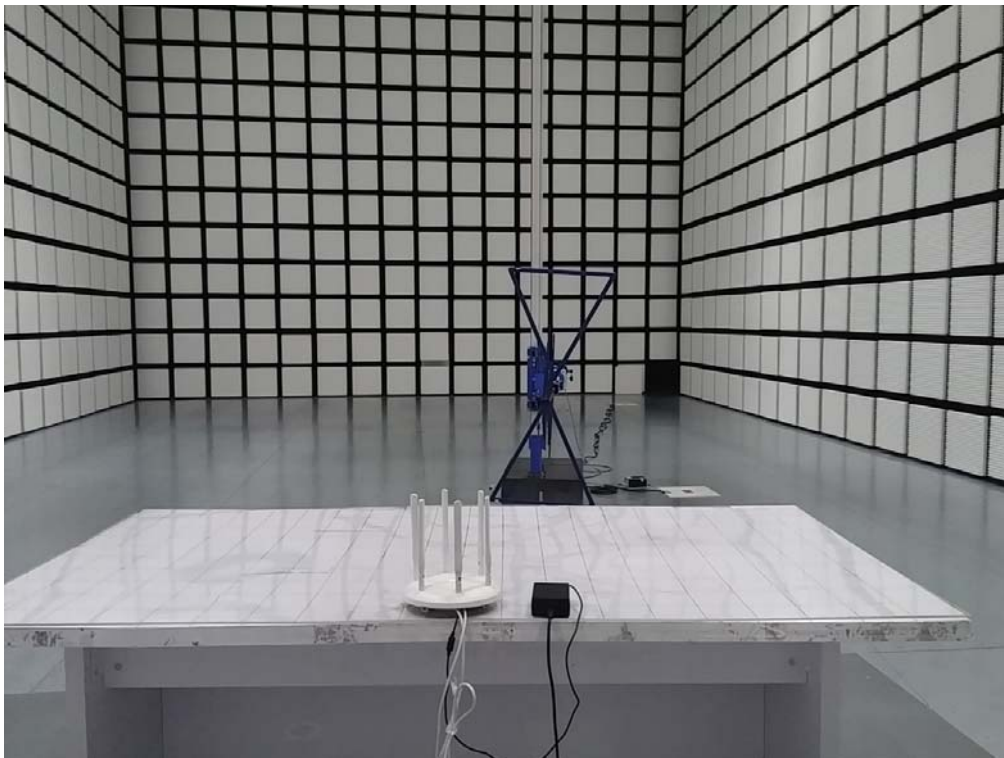
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APPENDIX A - Test Setup Photos and Configuration

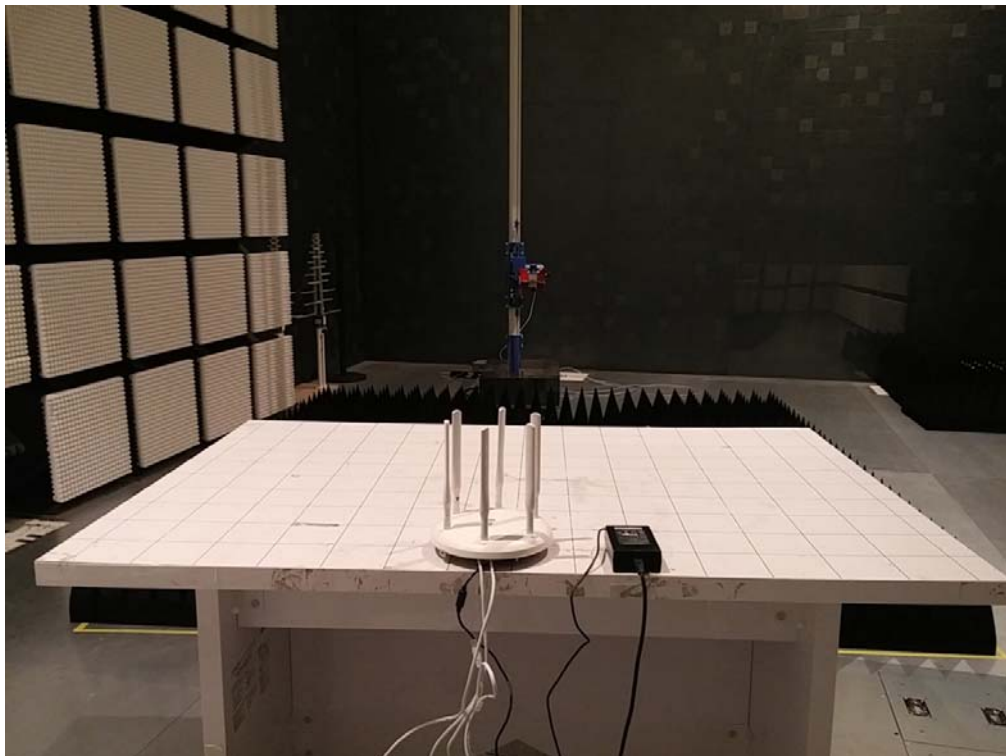
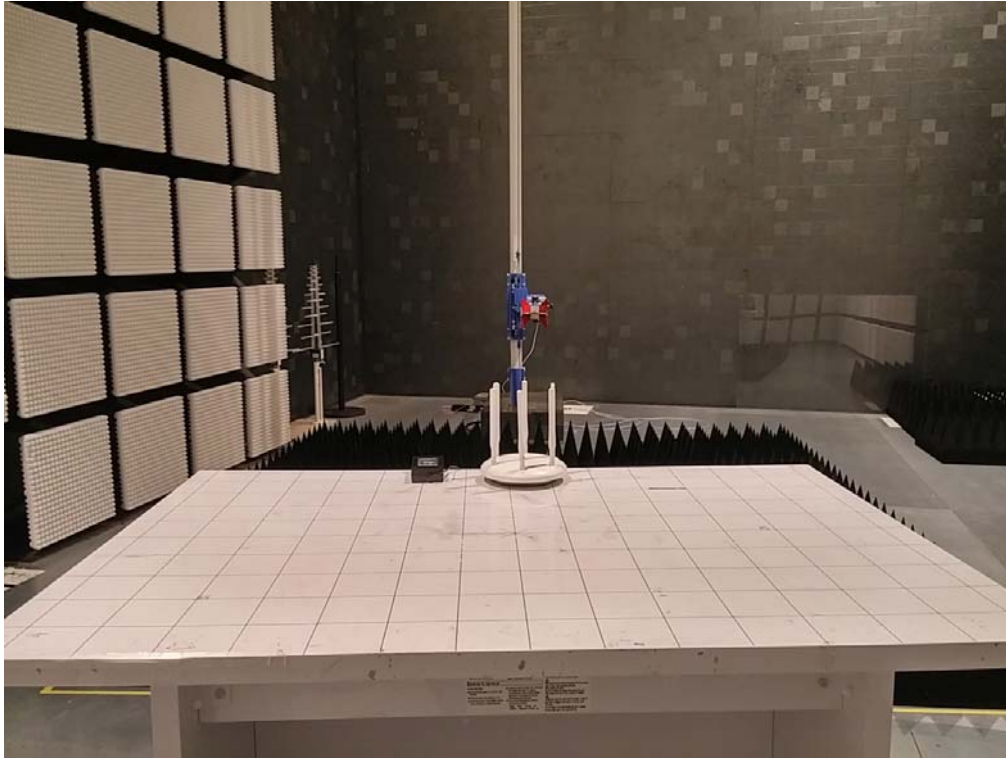
Conducted Voltage Emissions of Mains Ports



Radiated Electric Field Emissions (Below 1 GHz)

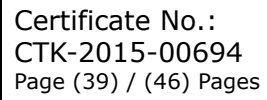


Radiated Electric Field Emissions (Above 1 GHz)



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APPENDIX B – EUT Photographs





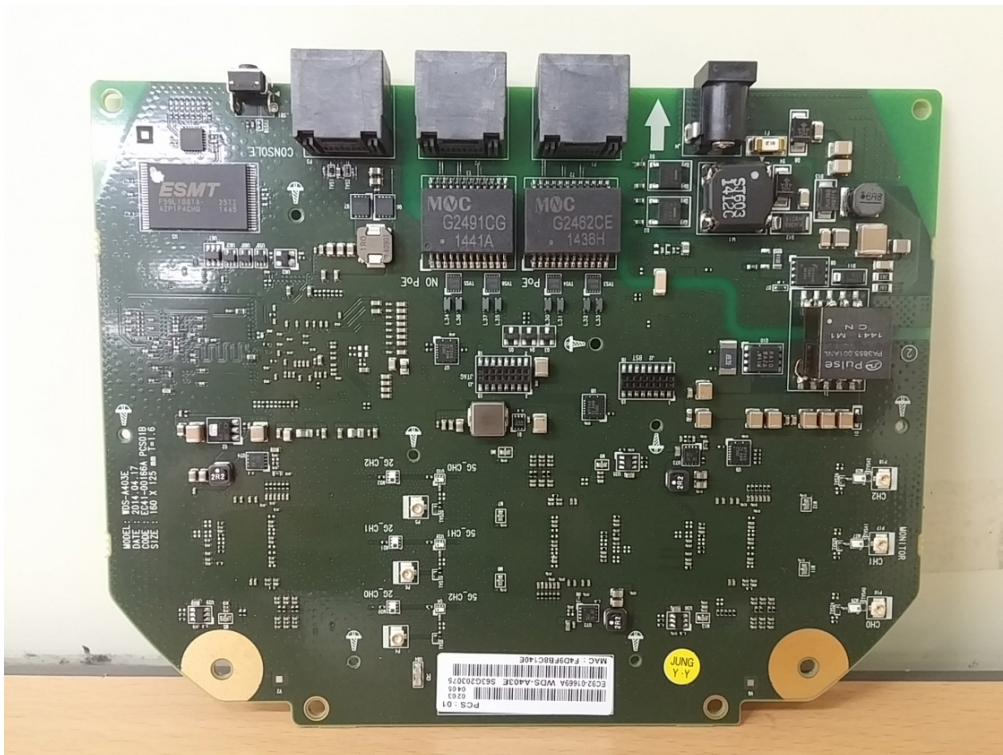
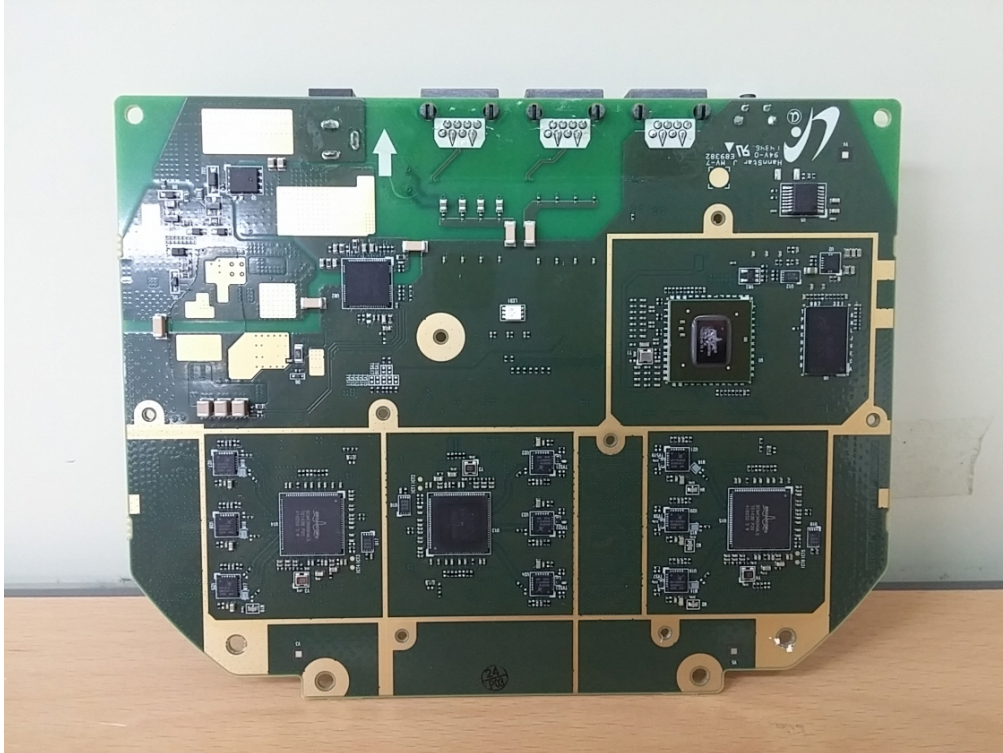
EUT Internal Photographs



AC/DC Adapter



PCB



ANT(Dipole)



ANT(Patch)



Label and Location

