TESTING CERTIFICATE

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-2014-00674

1. Client

◦ Name : Carman International Co., Ltd.

◦ Address : #1212, 12th Floor, Hoseo Univ. Venture Tower, 70,
Gasan digital 1-ro, Geumcheon-gu, Seoul, 153-711, Korea

◦ Date of Receipt : 2014-04-14

2. Manufacturer

◦ Name : Carman International Co., Ltd.

◦ Address : #1212, 12th Floor, Hoseo Univ. Venture Tower, 70,
Gasan digital 1-ro, Geumcheon-gu, Seoul, 153-711, Korea

3. Use of Report : For FCC certification

4. Test Sample / Model: Bluetooth USB Dongle / CMIT-BT200

5. Date of Test : 2014-05-15

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

7. Testing Environment: refer to 10 pages to 15 pages

8. Test Results : refer to 10 pages to 15 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 Park Sang Kyun: (Signature)	Technical Manager Lee Eun-Won: (Signature)

2014-06-11

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

CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
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REPORT REVISION HISTORY

Date	Revision	Page No
2014-06-11	Issued (CTK-2014-00674)	All

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CTK Co., Ltd.
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1.0 General Product Description

No.	ITEM	APPLICATION	
1	Test Sample	Bluetooth USB Dongle	
2	Model	CMIT-BT200	
3	Variant Model	-	
4	Dimensions (㎜)	67 (W) x 24 (L) x 14 (H)	
5	Mobility	☐ Table-top ☐ Floor-standing ☒ Built-in ☐ Portable	
6	Maximum Clock Frequency	26 ㎒	
7	Electrical Ratings	Input:	DC 5 V , 0.5 A (Notebook USB Mains)
		Output:	-
8	Test Voltage / Frequency	Voltage:	AC 120 V
		Frequency:	60 ㎐

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

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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

Device	Model No.	Serial No.	Manufacturer
Notebook Computer	NT-R60Y	Z9GJ93GS302109B	Samsung Electronics Co., Ltd.
AC/DC Adapter	LSE9901B1970	A30444068806	Suzhou Fordgood Electronic Co., Ltd.
Radio Communication Tester	CMU200	106765	R&S
Antenna	-	-	-

☒ Cable Description

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	2.4 GHz Wireless Communication	Radio Communication Tester	2.4 GHz Wireless Communication	-	-	-
2		USB	Notebook Computer	USB	-	-	-
3	Notebook Computer	DC Input	AC/DC Adapter	DC Output	1.5	U	Y
4	AC/DC Adapter	AC Power	AC Mains	-	1.8	U	N
5	Radio Communication Tester	AC Power	AC Mains	-	1.8	U	N
6		ANT	Antenna	-	-	-	-

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

1.4 Test Software

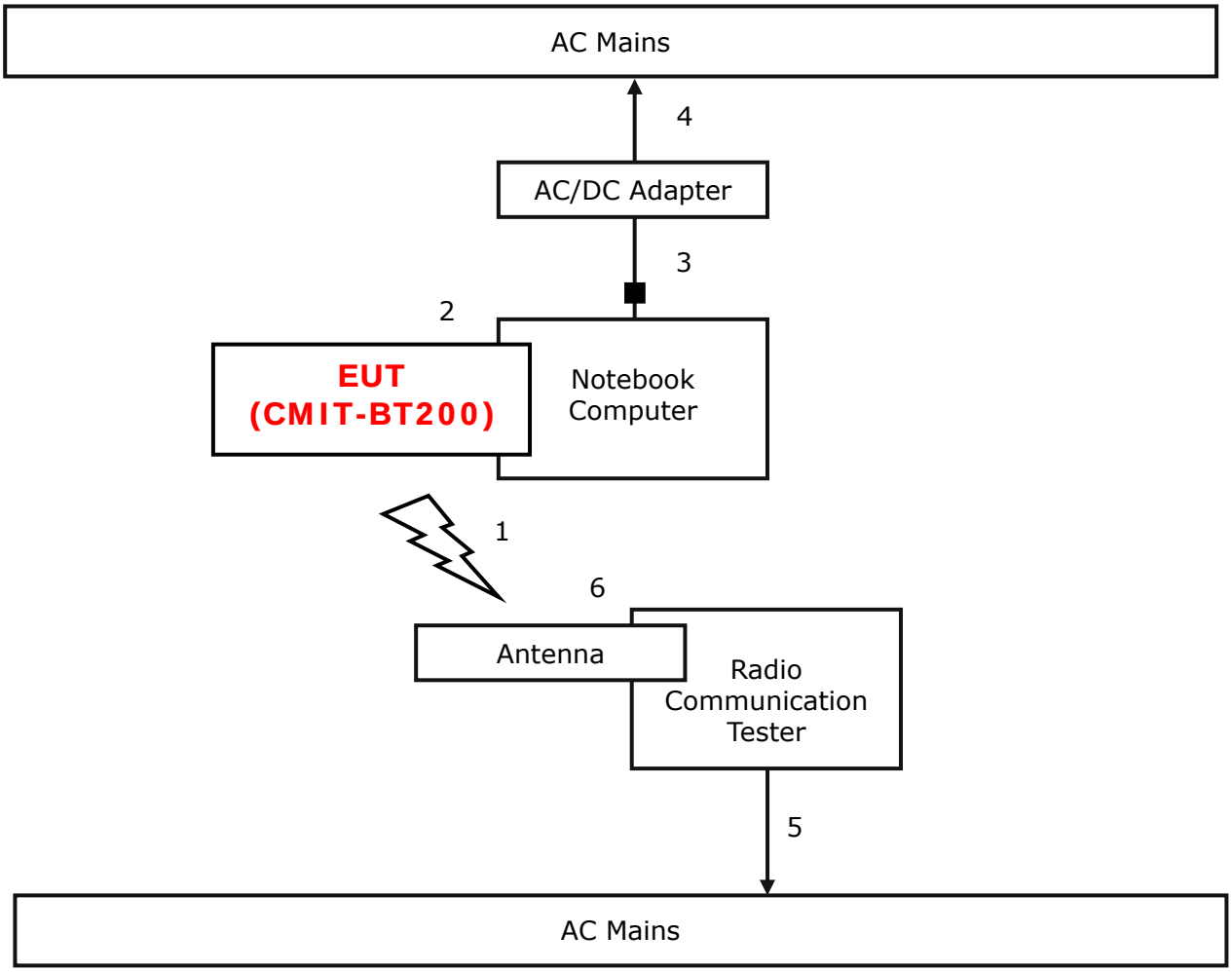
☐ EMC Test V 1.0
☐ Display Test Patterns – V1.5
☐ Ping.exe
☒ Not applicable

1.5 EUT Operating Mode(s)

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

☒ Bluetooth mode

1.6 Configuration



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

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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	150 ㎑ to 30 ㎒	2.66 ㏈ (C.L.: Approx. 95 %, k=2)
Radiated Emission	30 ㎒ to 1000 ㎒	3.66 ㏈ (C.L.: Approx. 95 %, k=2)
Radiated Emission	1 ㎓ Above	4.16 ㏈ (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

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3.0 Results of Individual Test

3.1 Conducted Voltage Emissions of Mains ports

Test Date
2014-05-15

Test Location
Shielded Room

Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI3	Rohde & Schwarz	100032	2015-02-04	☒
LISN	ENV216	Rohde & Schwarz	101235	2014-08-02	☒
LISN	ENV216	Rohde & Schwarz	101236	2014-08-02	☒
EMI Test Receiver	ESR7	Rohde & Schwarz	101088	2014-08-02	☐
LISN	ENV216	Rohde & Schwarz	101151	2014-11-08	☐
LISN	ESH3-Z5	Rohde & Schwarz	100207	2014-11-08	☐
EMI Test Receiver	ESCI7	Rohde & Schwarz	100816	2014-12-06	☐
LISN	ENV216	Rohde & Schwarz	101760	2015-02-03	☐
LISN	ENV4200	Rohde & Schwarz	100042	2015-02-05	☐
LISN	ENV216	Rohde & Schwarz	101150	2015-02-04	☐

Test Software
ESCI7, ESCI3 : EMC32 Ver. 8.50.0
ESR7 : EMC32 Ver. 8.53.0

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Setting
IF Band Width: 9 ㎑

Climate Condition
Temperature: (22 ± 1) ℃
Relative Humidity: (39 ± 1) %
Atmospheric Pressure: 99 ㎪

Test Result
The requirements are: ☒ MET ☐ NOT MET

Frequency (㎒)	Measured Data (dBμV)	Margin (dB)	Remark
2.773 500	34.8	11.2	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

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Test Data

[Line: L1]

Test 1 / 2

Test Report

Common Information

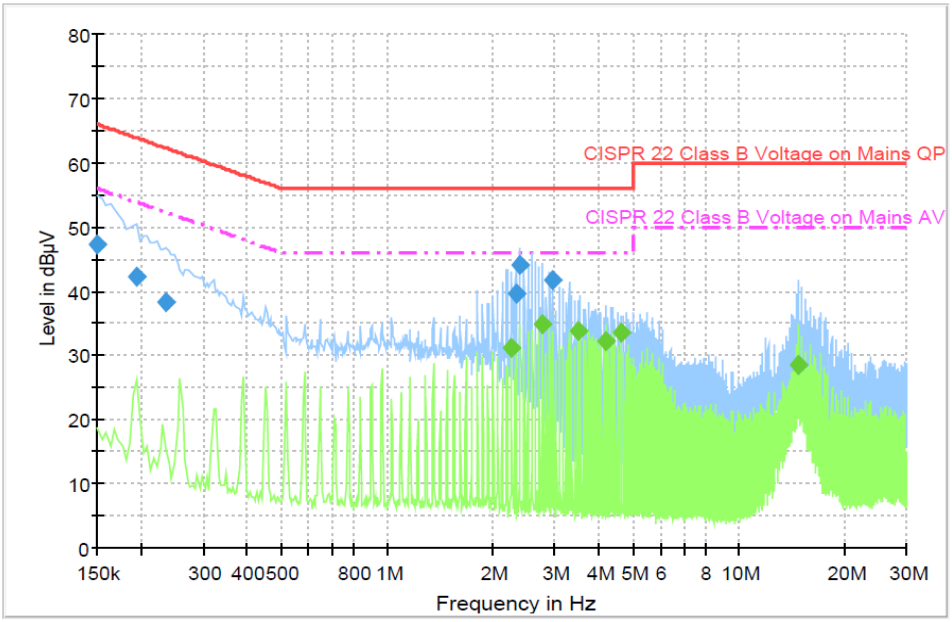
Test Model Name:	CMIT-BT200
Test Mode:	BT Mode
Manufacturer:	CARMAN
Tester:	PARK SANG KYUN

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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Test 2 / 2

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	47.3	1000.0	9.000	On	L1	9.9	18.7	66.0
0.195000	42.3	1000.0	9.000	On	L1	9.9	21.6	63.8
0.235500	38.2	1000.0	9.000	On	L1	9.8	24.0	62.3
2.323500	39.7	1000.0	9.000	On	L1	9.7	16.3	56.0
2.386500	44.1	1000.0	9.000	On	L1	9.8	11.9	56.0
2.967000	41.8	1000.0	9.000	On	L1	9.8	14.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.260500	31.2	1000.0	9.000	On	L1	9.7	14.8	46.0
2.773500	34.8	1000.0	9.000	On	L1	9.8	11.2	46.0
3.484500	33.9	1000.0	9.000	On	L1	9.7	12.1	46.0
4.195500	32.1	1000.0	9.000	On	L1	9.7	13.9	46.0
4.645500	33.4	1000.0	9.000	On	L1	9.7	12.6	46.0
14.842500	28.6	1000.0	9.000	On	L1	10.0	21.4	50.0

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[Line : Neutral]

Test 1 / 2

Test Report

Common Information

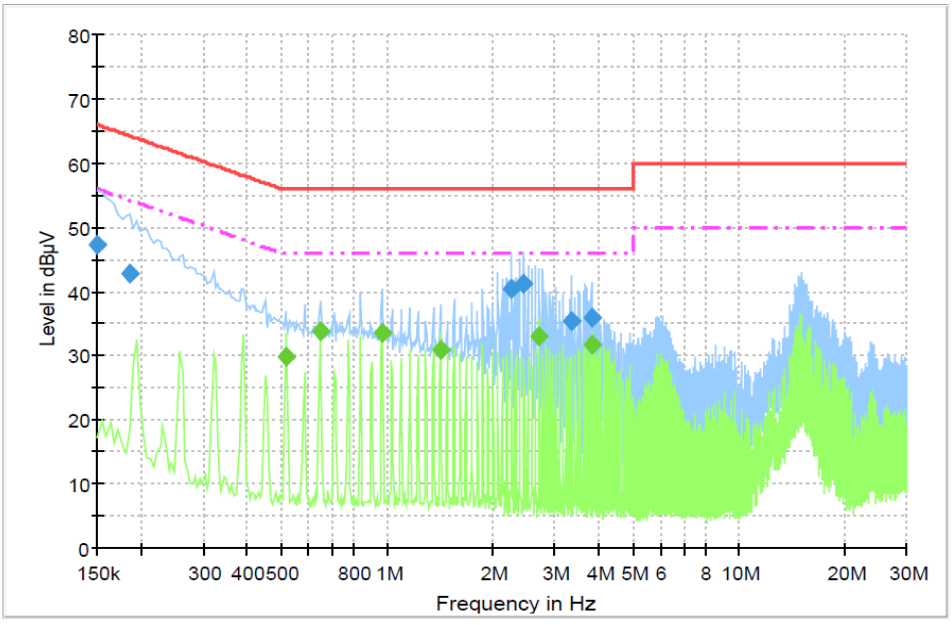
Test Model Name:	CMIT-BT200
Test Mode:	BT Mode
Manufacturer:	CARMAN
Tester:	PARK SANG KYUN

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 2 / 2

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	47.3	1000.0	9.000	On	N	9.9	18.7	66.0
0.186000	42.9	1000.0	9.000	On	N	9.9	21.4	64.2
2.260500	40.4	1000.0	9.000	On	N	9.7	15.6	56.0
2.454000	41.2	1000.0	9.000	On	N	9.8	14.8	56.0
3.358500	35.4	1000.0	9.000	On	N	9.7	20.6	56.0
3.808500	36.0	1000.0	9.000	On	N	9.7	20.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.519000	29.9	1000.0	9.000	On	N	10.1	16.1	46.0
0.645000	33.9	1000.0	9.000	On	N	10.0	12.1	46.0
0.969000	33.4	1000.0	9.000	On	N	9.9	12.6	46.0
1.419000	30.9	1000.0	9.000	On	N	9.8	15.1	46.0
2.710500	33.1	1000.0	9.000	On	N	9.8	12.9	46.0
3.808500	31.7	1000.0	9.000	On	N	9.7	14.3	46.0

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3.2 Radiated Electric Field Emissions (Below 1 ㎓)

Test Date
2014-05-15

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	2014-12-06	☒
Trilog Broadband Antenna	VULB 9161 SE	Schwarzbeck	9161-4133	2014-06-11	☒
6dB Attenuator	DNF	Rohde & Schwarz	272.4110.50-2	2014-11-12	☒
Amplifier	310	Sonoma Instrument Co.	291721	2015-02-06	☒

Test Software
TOYO EMI software Ver. 5.1.0

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Setting
IF Band Width: 120 ㎑

Climate Condition
Temperature: (22 ± 1) ℃
Relative Humidity: (42 ± 1) %
Atmospheric Pressure: 99 ㎪

Test Result
The requirements are: ☒ MET ☐ NOT MET

Frequency (㎒)	Measured Data (dBμV/m)	Margin (dB)	Remark
204.721	37.3	6.2	Quasi-Peak

The Result is calculated by using the following formula;
* Result = Reading + Correction factor
* Correction factor = Antenna Factor + Cable Loss + 6 ㏈ attenuator – Amp Gain

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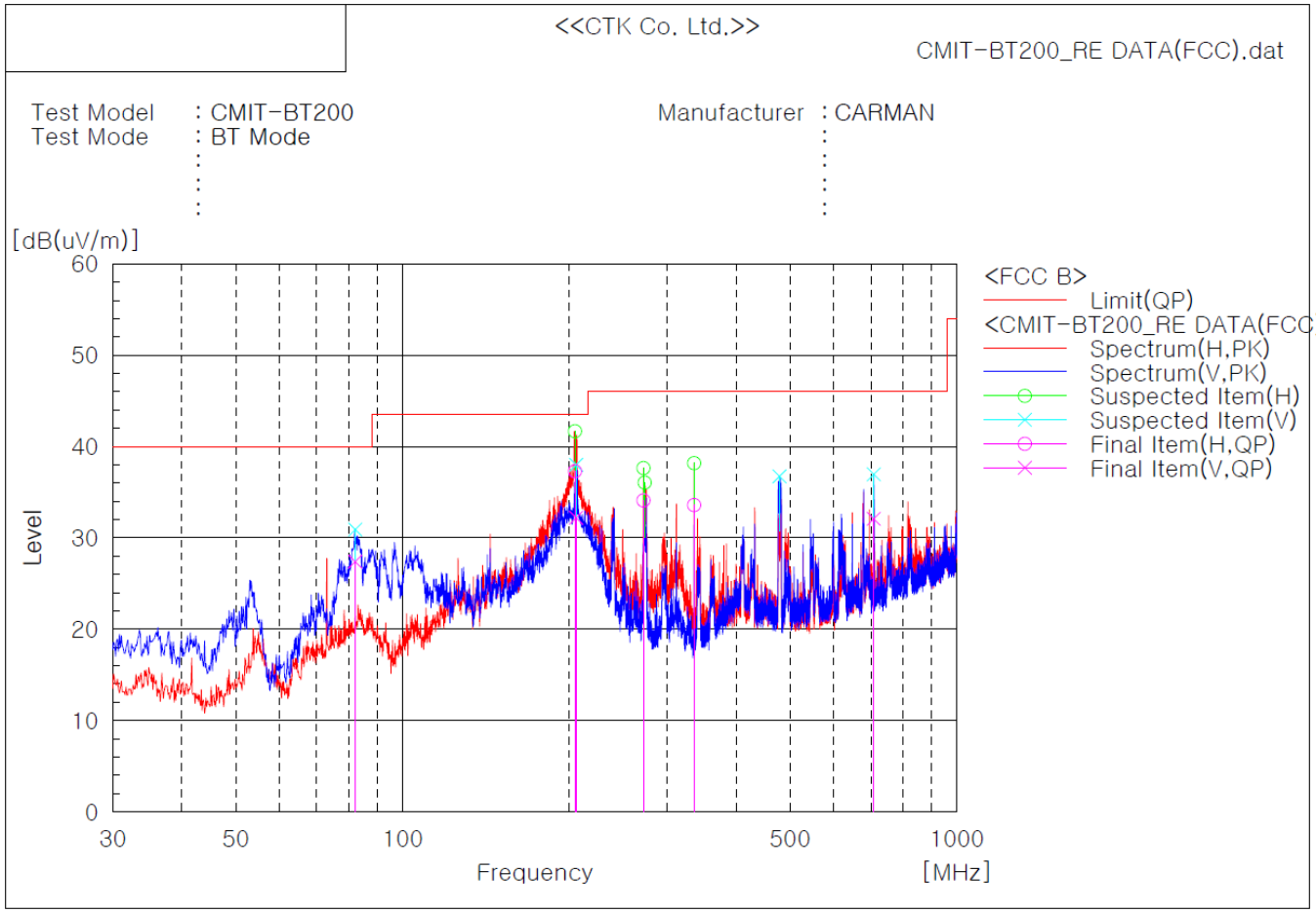
Test Data



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]	Remark
1	82.138	V	42.4	-15.0	27.4	40.0	12.6	100.0	258.0	
2	204.721	H	48.5	-11.2	37.3	43.5	6.2	100.0	230.0	
3	205.691	V	43.4	-11.2	32.2	43.5	11.3	100.0	183.0	
4	272.136	H	44.4	-10.3	34.1	46.0	11.9	100.0	43.0	
5	335.914	H	41.9	-8.3	33.6	46.0	12.4	100.0	155.0	
6	708.030	V	32.5	-0.4	32.1	46.0	13.9	191.0	29.0	

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3.3 Radiated Electric Field Emissions (Above 1 ㎓)

Test Date
Not Applicable

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	2014-12-06	☐
Double Ridged Guide Antenna	3117	ETS-Lindgren	154525	2015-07-03	☐
Preamplifier	8449B	Agilent Technologies	3008A02307	2014-11-08	☐

Test Software
TOYO EMI software Ver. 5.1.0

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Setting
IF Band Width: 1 ㎒

Climate Condition
Temperature:
Relative Humidity:
Atmospheric Pressure:

Test Result
The requirements are: ☐ MET ☐ NOT MET

Frequency (㎒)	Measured Data (dBμV/m)	Margin (dB)	Remark

The Result is calculated by using the following formula;

* Result = Reading + Correction factor

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

Test Data

APPENDIX A - Test Setup Photos and Configuration

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Conducted Voltage Emissions of Mains Ports

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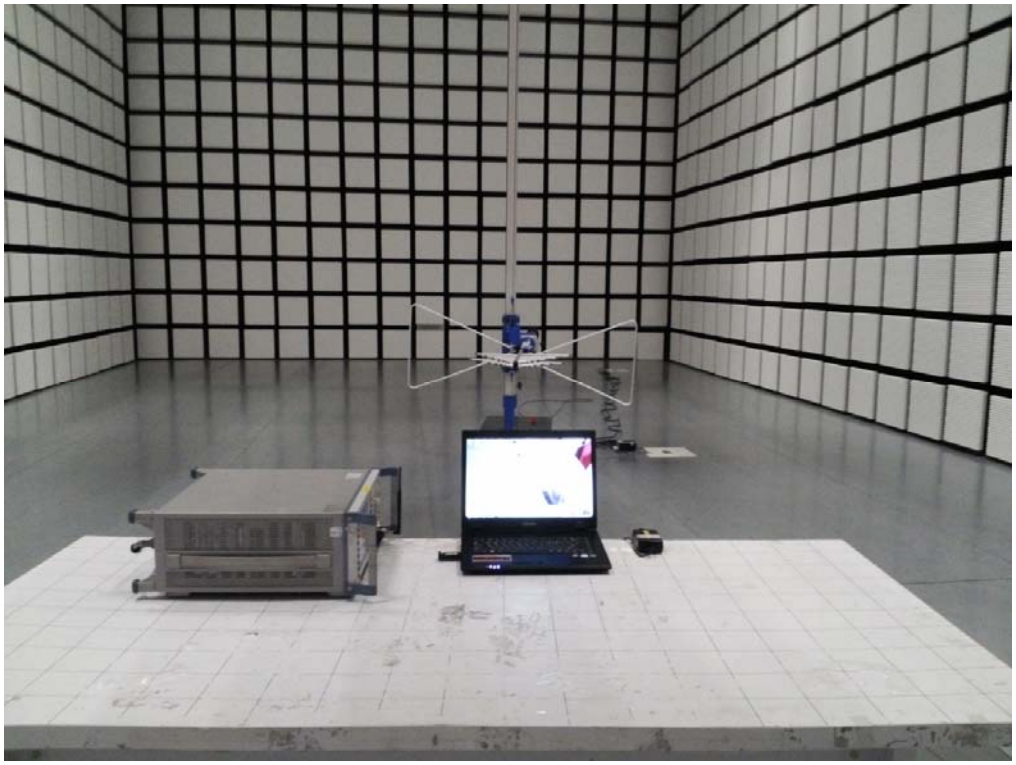
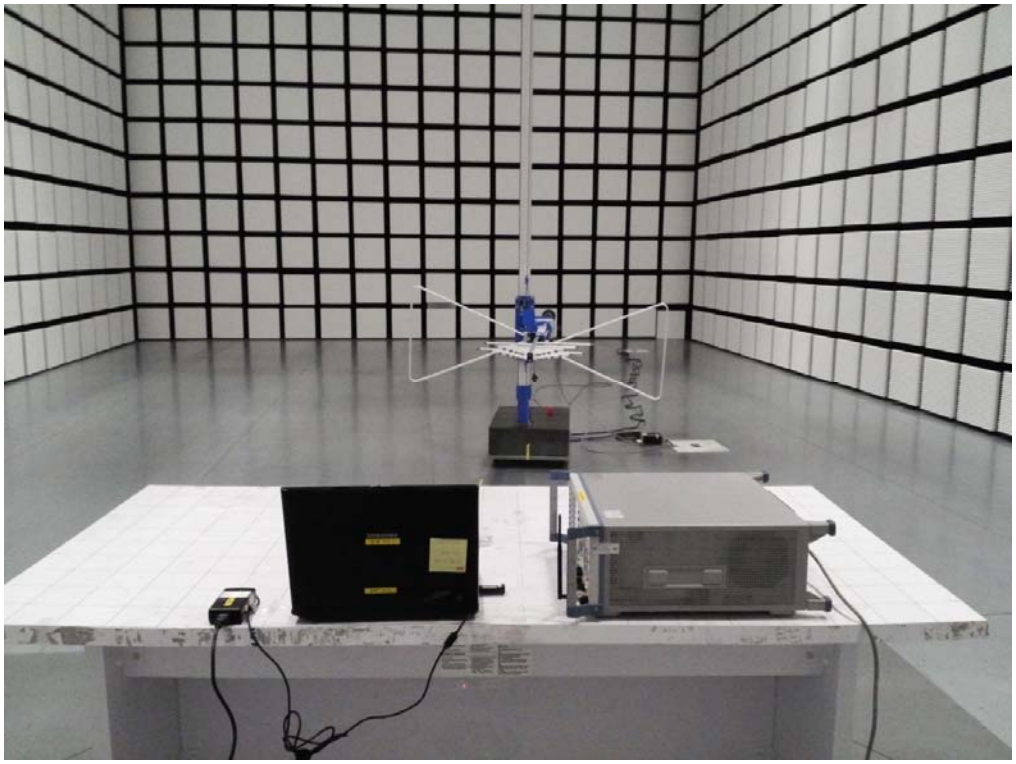
Radiated Electric Field Emissions (Below 1 ㎓)





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Radiated Electric Field Emissions (Above 1 ㎓)

Not Applicable

APPENDIX B – EUT Photographs

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EUT External Photographs

EUT Internal Photographs

PCB