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FCC TEST REPORT

REPORT NO.: RF990202A02-1

MODEL NO.: CK-200

VERSION: Proto: B4.0D, HW: 1.0, BT SW: 0.69C,
RCU SW: 0.5B, MV: 1.0

RECEIVED: Feb. 2, 2010

TESTED: Feb. 2, 2010

ISSUED: March 10, 2010

APPLICANT: Nokia Corporation

ADDRESS: Joensuunkatu 7E P.O. Box 86 Salo, FIN-24100,
Finland

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou
Hsiang, Taipei Hsien 244, Taiwan

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1. CERTIFICATION

PRODUCT: Nokia Car Kit CK-200
BRAND NAME: NOKIA
MODEL NO.: CK-200
APPLICANT: Nokia Corporation
TESTED: Feb. 2, 2010
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: FCC Part 15, Subpart C (Section 15.249),
ANSI C63.4-2003

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Jessica Cheng , **DATE:** March 10, 2010
(Jessica Cheng / Specialist)

**TECHNICAL
ACCEPTANCE** : Jamison Chan , **DATE:** March 10, 2010
Responsible for RF
(Jamison Chan / Supervisor)

APPROVED BY : Ken Liu , **DATE:** March 10, 2010
(Ken Liu / Assistant Manager)



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2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	Conducted Emission Test	N/A	The EUT power from battery
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 12.209	PASS	Minimum passing margin is -2.2dB at 2475.00MHz

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz~1GHz	3.86 dB
	Above 1GHz	2.89 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Nokia Car Kit CK-200
MODEL NO.	CK-200
FCC ID	PYACK-200
POWER SUPPLY	12Vdc
MODULATION TYPE	GFSK
OPERATING FREQUENCY	2475MHz
NUMBER OF CHANNEL	1
OUTPUT POWER	2.8mW
ANTENNA TYPE	F Type Antenna with 1.51dBi gain
ANTENNA CONNECTOR	N/A
I/O PORTS	Refer to user's manual
DATA CABLE	N/A
ASSOCIATED DEVICES	Refer to note below

NOTE:

1. The EUT is a Nokia Car Kit CK-200, the functions of EUT listed as below:

FUNCTION	TEST STANDARD	REFERENCE REPORT
Bluetooth	FCC Part 15, Subpart C (Section 15.247)	RF990202A02
GFSK	FCC Part 15, Subpart C (Section 15.249)	RF990202A02-1

2. And the EUT equipped the following accessories:

ITEM	Brand /Model / spec.
Remote	NOKIA,CU-13R VERSION: Proto: B4.0F, HW: 1.0, RCU SW: 0.5B, MV: 1.0
Speaker	NOKIA, SP-3
Junction Box	NOKIA, RX-73 VERSION: Proto: B4.0D, HW: 1.0, MV: 1.0
Relay Box	NOKIA, CA-160 VERSION: Proto: B4.0A, HW: 1.0, MV: 1.0
Microphone	NOKIA, MP-2
Data cable	NOKIA, CA-165; NOKIA, CA-134
Tel. Line	NOKIA, CA-161

3. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.



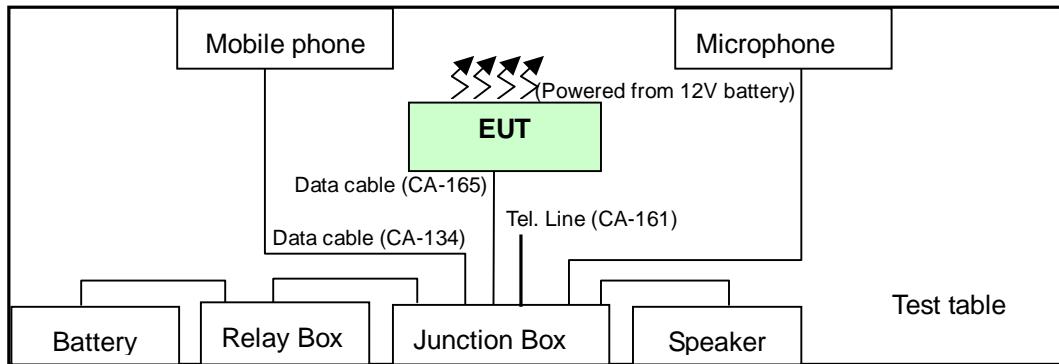
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3.2 DESCRIPTION OF TEST MODES

1 channel is provided to the EUT.

CHANNEL	FREQUENCY (MHz)
0	2475MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE \geq 1G	APCM	
-	Note	✓	✓	✓	-

Where PLC: Power Line Conducted Emission

RE<1G RE: Radiated Emission below 1GHz

RE \geq 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

Note: No need to concern of Conducted Emission due to the EUT is powered by batteries.

RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
1	0	GFSK	X

RADIATED EMISSION TEST (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
1	0	GFSK	X

BANDEdge MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
1	0	GFSK	X

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	18deg. C, 78% RH, 1015hPa	12Vdc	Nick Chen
RE<1G	18deg. C, 78% RH, 1015hPa	12Vdc	Nick Chen
APCM	20deg. C, 63% RH, 1014hPa	12Vdc	Chad Lee



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3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.249)

ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Mobile phone	NOKIA	6212	N/A	N/A
2	Microphone	NOKIA	MP-2	N/A	N/A
3	Speaker	NOKIA	SP-3	N/A	N/A
4	Junction Box	NOKIA	RX-73	N/A	N/A
5	Relay Box	NOKIA	CA-160	N/A	N/A
6	Battery	GLOBAL	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5 m data cable (Model: CA-134).
2	3 m audio cable
3	1.6 m audio cable
4	N/A
5	1.6 m data cable
6	N/A

NOTE: (1) The support units 1~ 5 which was provided by client.

(2) One Tel. Line 1.2 m (Model: CA-161) was connected to Tel. Line port of Junction Box to form an open loop cable.

(3) One data cable 1.8 m (Model: CA-165) was connected from EUT to support unit 4.



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4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

N/A

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209, 15.249 as following:

15.209 Limit		
Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

15.249 Limit		
Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB_{UV}/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 04, 2009	May 03, 2010
HP Preamplifier	8449B	3008A01924	Aug. 31, 2009	Aug. 30, 2010
HP Preamplifier	8449B	3008A01292	Aug. 10, 2009	Aug. 09, 2010
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 06, 2009	Jun. 05, 2010
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2009	Apr. 28, 2010
Schwarzbeck Antenna	VHBA 9123	480	Apr. 21, 2009	Apr. 20, 2010
EMCO Horn Antenna	3115	6714	Oct. 26, 2009	Oct. 25, 2010
EMCO Horn Antenna	3115	9312-4192	Apr. 17, 2009	Apr. 16, 2010
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF104-26.5	CABLE-CH6-17m -01	Aug. 20, 2009	Aug. 19, 2010
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

NOTE:

1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.



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4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

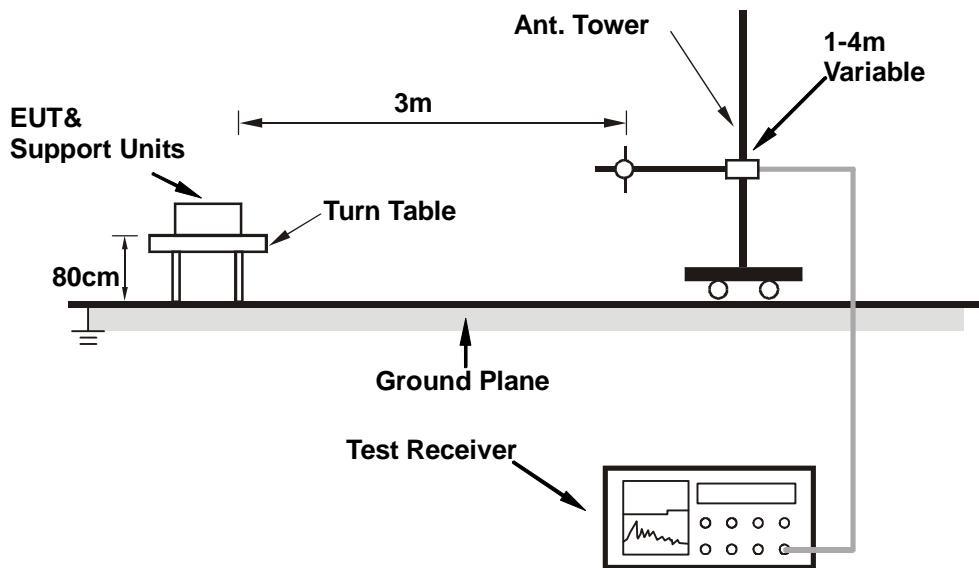
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

- a. Connected the EUT with Junction Box placed on testing table.
- b. EUT ran a test program (provided by manufacturer) to enable it under transmitting condition at specific channel continuously.
- c. Checked if the EUT and the Remote Controller were set at the same channel.
- d. Repeated c-d



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4.2.7 TEST RESULTS

ABOVE 1GHz DATA

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 0		FREQUENCY RANGE 1 ~ 25GHz
INPUT POWER		12Vdc		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		18deg. C, 78%RH 1015 hPa		TESTED BY Nick Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)
1	2390.00	57.6 PK	74.0	-16.4	1.08 H	183	26.06
2	2390.00	45.9 AV	54.0	-8.1	1.08 H	183	14.36
3	*2475.00	92.6 PK	114.0	-21.4	1.08 H	183	60.75
4	*2475.00	91.8 AV	94.0	-2.2	1.08 H	183	59.92
5	2483.50	59.2 PK	74.0	-14.8	1.08 H	183	27.26
6	2483.50	47.2 AV	54.0	-6.8	1.08 H	183	15.32
7	4950.00	47.7 PK	74.0	-26.3	1.05 H	28	9.65
8	4950.00	34.5 AV	54.0	-19.5	1.05 H	28	-3.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)
1	2390.00	57.2 PK	74.0	-16.8	1.08 V	286	25.65
2	2390.00	46.1 AV	54.0	-7.9	1.08 V	286	14.59
3	*2475.00	89.2 PK	114.0	-24.8	1.08 V	286	57.29
4	*2475.00	88.3 AV	94.0	-5.7	1.08 V	286	56.39
5	2483.50	59.2 PK	74.0	-14.8	1.08 V	286	27.29
6	2483.50	47.5 AV	54.0	-6.5	1.08 V	286	15.59
7	4950.00	48.2 PK	74.0	-25.8	1.05 V	338	10.12
8	4950.00	38.2 AV	54.0	-15.8	1.05 V	338	0.12

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*”: Fundamental frequency.



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BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 0		FREQUENCY RANGE Below 1000MHz
INPUT POWER		12Vdc		DETECTOR FUNCTION Quasi-Peak
ENVIRONMENTAL CONDITIONS		18deg. C, 78%RH 1015 hPa		TESTED BY Nick Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.33	20.5 QP	40.0	-19.5	1.24 H	16	7.30	13.22
2	527.44	27.6 QP	46.0	-18.5	1.11 H	37	5.85	21.70
3	875.64	27.3 QP	46.0	-18.7	1.23 H	67	-0.44	27.73
4	888.08	26.8 QP	46.0	-19.2	1.24 H	124	-1.10	27.89
5	923.83	27.4 QP	46.0	-18.6	1.35 H	202	-0.92	28.30
6	942.48	27.7 QP	46.0	-18.3	1.03 H	262	-0.78	28.51

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.66	24.0 QP	40.0	-16.0	1.27 V	115	11.72	12.31
2	87.52	25.8 QP	40.0	-14.2	1.27 V	94	17.30	8.51
3	117.05	29.4 QP	43.5	-14.2	1.02 V	4	18.35	11.00
4	140.37	26.2 QP	43.5	-17.3	1.32 V	289	12.68	13.56
5	193.22	26.9 QP	43.5	-16.6	1.02 V	142	15.28	11.65
6	870.98	26.7 QP	46.0	-19.3	1.04 V	322	-0.96	27.67
7	916.06	26.9 QP	46.0	-19.1	1.01 V	97	-1.35	28.22

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.



4.3 BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Below –50dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots are attached on the following pages.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 EUT OPERATING CONDITION

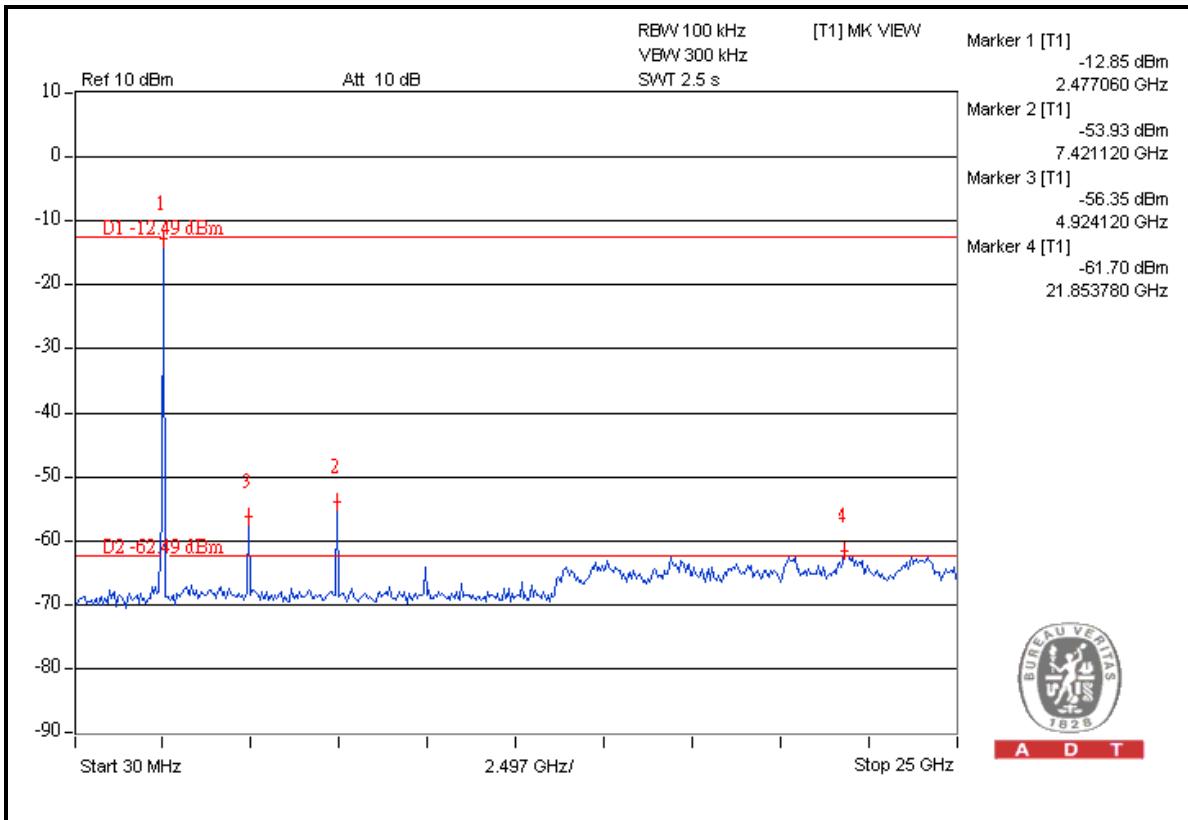
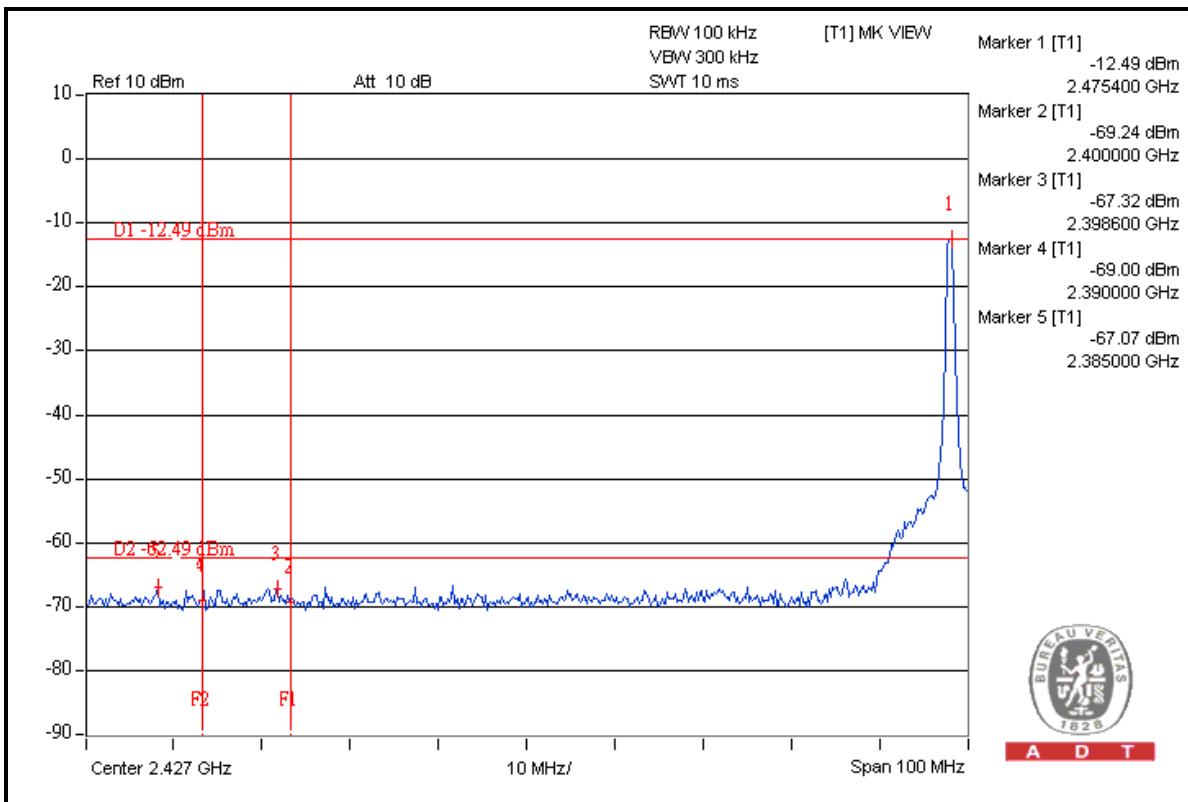
Same as Item 4.2.6

4.3.6 TEST RESULTS

The spectrum plots are attached on the following 4 images. D1 line indicates the highest level, and D2 line indicates the 50dB offset below D1. It shows compliance with the requirement in part 15.249(d).

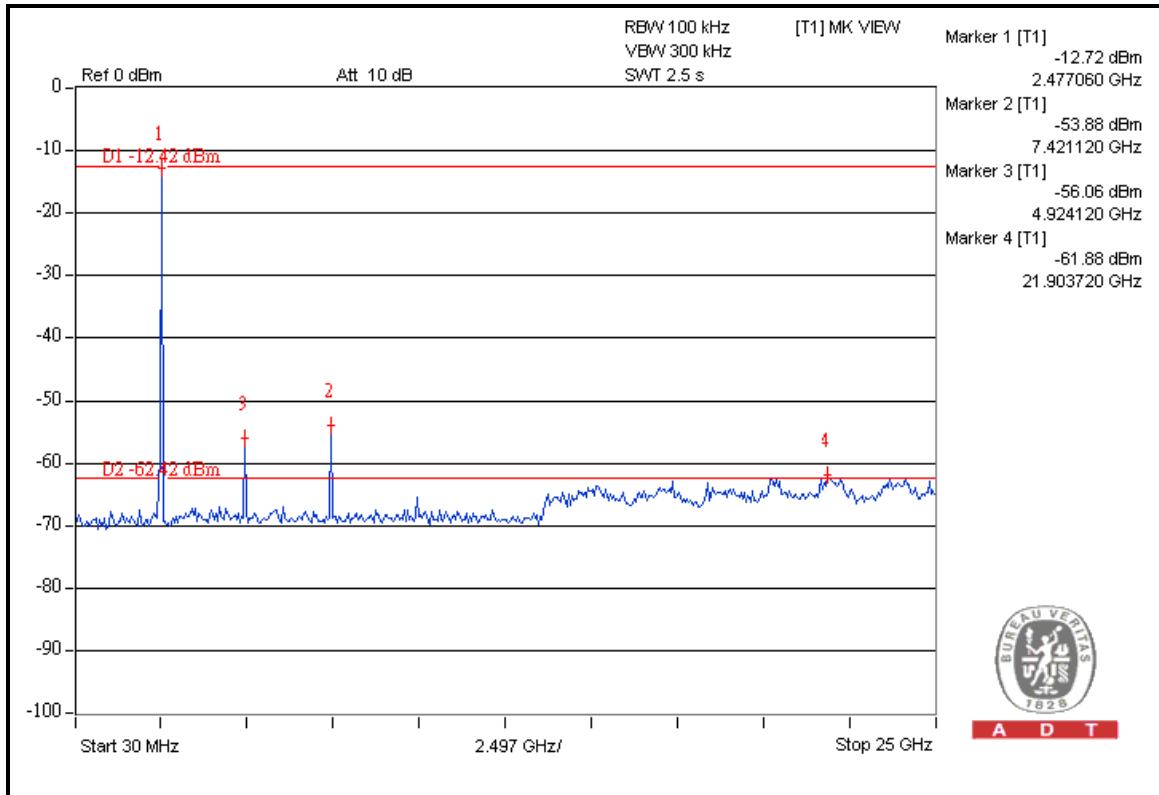
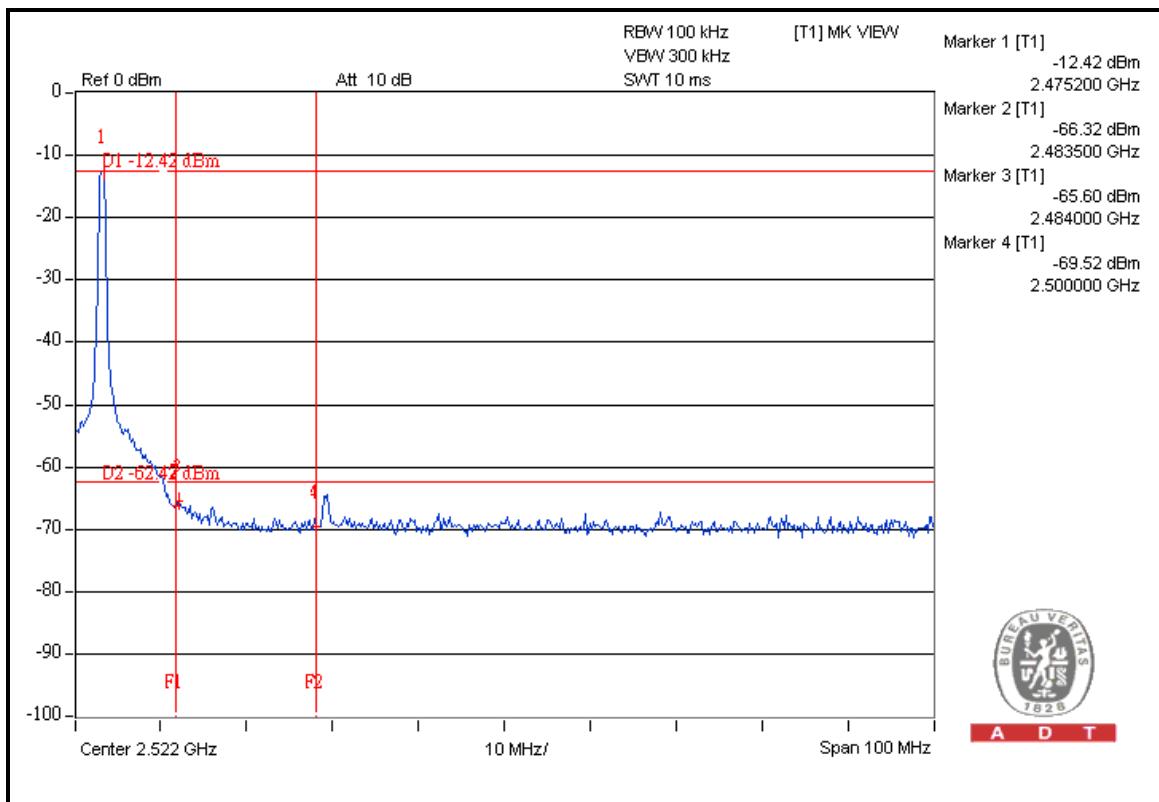


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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also



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7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---