FCC TEST REPORT

(PART 27)

REPORT NO.:	RF110705C18C-5 R1
MODEL NO.:	PH98100
FCC ID:	NM8PH98100
RECEIVED:	Aug. 23, 2011
TESTED:	Sep. 06 ~ Oct. 12, 2011
ISSUED:	Oct. 12, 2011

APPLICANT:	HTC Corporation
ADDRESS:	23, Xinghua Rd., Taoyuan 330, Taiwan, R.O.C.

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Sep. 15, 2011
RF110705C18C-5 R1	Add wireless charging mode	Oct. 12, 2011

1 CERTIFICATION

PRODUCT:	Smartphone
Model No.:	PH98100
BRAND:	HTC
APPLICANT:	HTC Corporation
TEST SAMPLE:	Production Unit
TESTED:	Sep. 06 ~ Oct. 12, 2011
TEST STANDARDS :	**FCC Part 27**
	FCC Part 2
	ANSI C63.4-2003

This report is issued as a supplementary report of **RF110705C18-6** for a new inductive cover. This report shall be used combining with its original report.

PREPARED BY	: Pettie Chen / Specialist	**, DATE :**	Oct. 12, 2011
APPROVED BY	: Gary Chang / Technical Manager	**, DATE :**	Oct. 12, 2011

NOTE: The emission tests and e.r.p peak power were performed for the addendum. Refer to original report for the other test data.

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

OPERATING BAND			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
2.1046 27.50(b)(10)	Maximum Peak Output Power Limit: max. 3 watts e.r.p peak power	PASS	Meet the requirement of limit. Minimum passing margin is 17.4dBm at 782.0MHz.
2.1055 27.54	Frequency Stability	NA	Refer to Note
2.1049	Occupied Bandwidth	NA	Refer to Note
27.50(d)(5)	Peak to average ratio	NA	Refer to Note
27.53(c)(2)	Band Edge Measurements	NA	Refer to Note
2.1051 27.53(c)(2)	Conducted Spurious Emissions	NA	Refer to Note
2.1051 27.53(c)(4)	Emission in the 736–775 MHz and 793–805 MHz band	NA	Refer to Note
2.1053 27.53(c)(2)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -24.1dB at 63.05MHz.
2.1053 27.53(f)	Emissions in the band 1559–1610 MHz	PASS	Meet the requirement of limit. Minimum passing margin is -6.3dB at 1564.0MHz.

NOTE: The emission tests and e.r.p peak power were performed for the addendum. Refer to original report for the other test data.

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Smartphone
MODEL NO.	PH98100
FCC ID	NM8PH98100
NOMINAL VOLTAGE	3.8Vdc (Li-ion battery) 3.7Vdc (Li-ion battery) 5Vdc (Adapter & host equipment)
MODULATION TECHNOLOGY	QPSK, 16QAM
MULTIPLE ACCESS METHOD	FDD
DUPLEX METHOD	FDD
FREQUENCY RANGE	777-787MHz
CHANNEL BANDWIDTH	10MHz
MAX. ERP POWER	17.4dBm (55mW)
ANTENNA TYPE	Fixed internal antenna with -1dBi gain
OPERATION TEMPERATURE RANGE	-30°C ~ 50°C
I/O PORTS	Refer to user's manual
DATA CABLE	Refer to note as below
ACCESSORY DEVICES	Refer to note as below

NOTE:

1. This is a supplementary report of RF110705C18-6. This report shall be combined together with its original report.
2. This report is prepared for FCC class II permissive change. Difference compared with the original report is adding inductive cover, BR C700; therefore, re-tested emission tests and e.r.p peak power and presented in the test report.
3. The Test Mode B of The section 4.2.7 is tested under wireless charging mode, which is compliant to WPC v1.0 standard. Because technologic confidential issue, please see the wireless charging back cover operational description.
4. The EUT's accessories list refers to Ext Pho_ NM8PH98100.pdf.
   *Item 1, 3, 5, 6, 8 were used for the test.

5. After pretest of output power and spurious emission under below configurations, QPSK with 1RB at upper edge was found to be worst case and was selected for the final test.

MODULATION	RB SETTING
QPSK	1 RB allocated at the lower edge
QPSK	1 RB allocated at the upper edge
QPSK	50% RB allocation centered
QPSK	100% RB allocation
16QAM	1 RB allocated at the lower edge
16QAM	1 RB allocated at the upper edge
16QAM	50% RB allocation centered
16QAM	100% RB allocation

6. The above EUT information is declared by manufacturer and for more detailed feature description, please refer to the manufacturer's specifications or User's Manual.

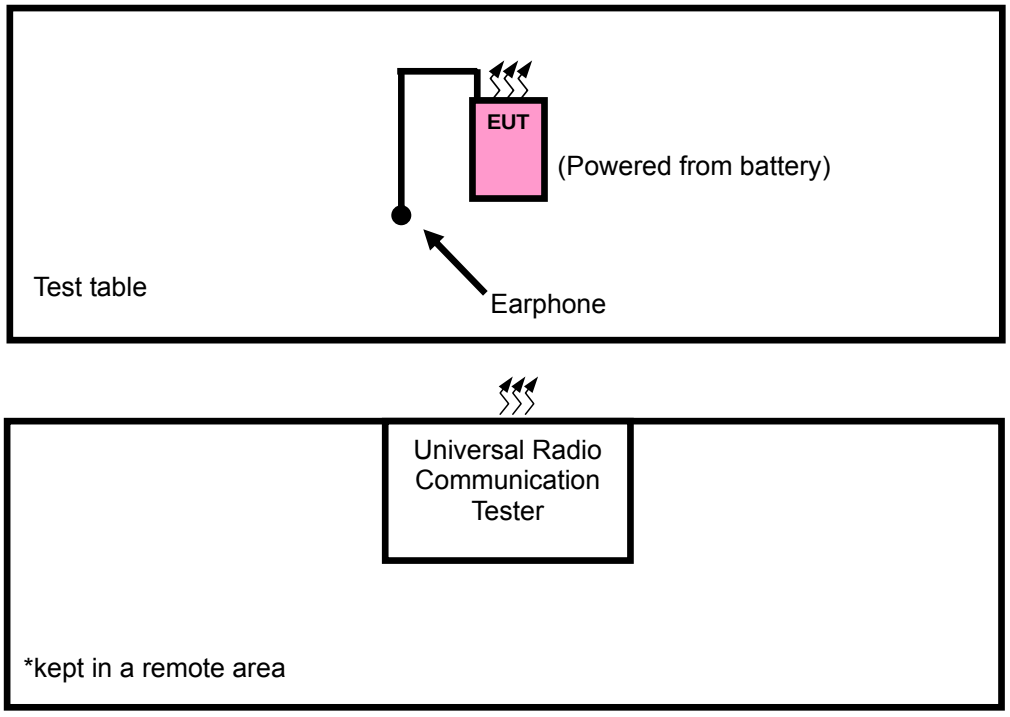
3.2 DESCRIPTION OF TEST MODES

One channel had been tested.

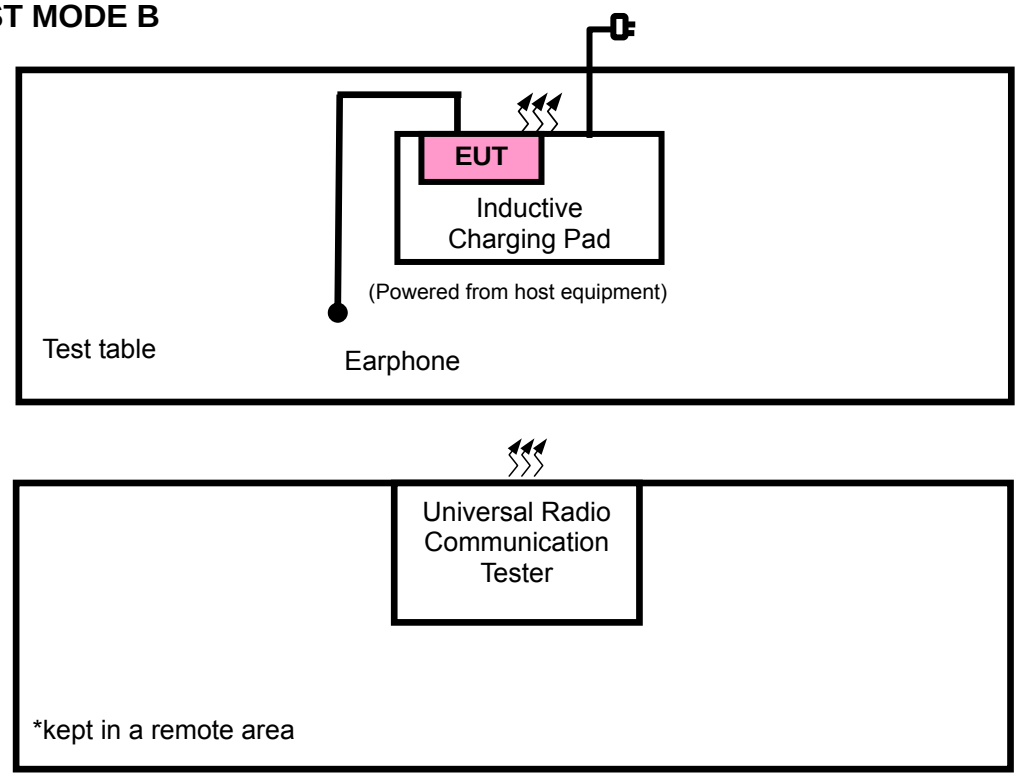
CHANNEL BANDWIDTH	10MHz
CHANNEL	23230
FREQUENCY (MHz)	782.0

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

TEST MODE A



TEST MODE B



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	OP	RE<1G	RE≥1G	
A	V	V	V	EUT Standalone
B	-	V	V	Wireless charging mode

Where **OP:** Output power **RE<1G:** Radiated emission below 1GHz
RE≥1G: Radiated emission above 1GHz **NOTE:** "-": Means no effect.

OUTPUT POWER MEASUREMENT:

☒ 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.

EUT CONFIGURE MODE	OPERATING BAND	FREQUENCY BAND (MHz)	TESTED FREQUENCY (MHz)	MODULATION TECHNOLOGY	AXIS
A	LTE	777-787	782.0	QPSK, 16QAM	X

RADIATED EMISSION MEASUREMENT (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.

EUT CONFIGURE MODE	OPERATING BAND	FREQUENCY BAND (MHz)	TESTED FREQUENCY (MHz)	MODULATION TECHNOLOGY	AXIS
A	LTE	777-787	782.0	QPSK	X
B	LTE	777-787	782.0	QPSK	-

RADIATED EMISSION MEASUREMENT (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.

EUT CONFIGURE MODE	OPERATING BAND	FREQUENCY BAND (MHz)	TESTED FREQUENCY (MHz)	MODULATION TECHNOLOGY	AXIS
A	LTE	777-787	782.0	QPSK	X
B	LTE	777-787	782.0	QPSK	-

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
OP	26deg. C, 65%RH	120Vac, 60Hz	Sam Chen
RE < 1G (Test Mode A)	25deg. C, 65%RH	120Vac, 60Hz	Sam Chen
RE < 1G (Test Mode B)	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
RE ≥ 1G (Test Mode A)	25deg. C, 65%RH	120Vac, 60Hz	Sam Chen
RE ≥ 1G (Test Mode B)	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI C63.4-2003

ANSI/TIA/EIA-603-C 2004

NOTE: 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	Universal Radio Communication Tester	Anritsu	MT8820C	NA	NA
2	Inductive Charging Pad	Energizer	IC2B	NA	NA
3	Inductive Charging Pad Adapter	Energizer	APS-A02409023W-G	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	NA

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 acted as a communication partner to transfer data.
3. Item 2, 3 were provided by client.

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Portable stations (hand-held devices) operating in the 776-793 MHz band are limited to 3 watts ERP

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 02, 2011	Aug. 01, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP 40	100041	Jul. 21, 2011	Jul. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 13, 2011	Apr. 12, 2012
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2011	Aug. 24, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295014/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	Aug. 19, 2011	Aug. 18, 2012
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 TEST PROCEDURES

ERP MEASUREMENT:

a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Angilent Spectrum Analyzer. All measurements were done at specific channel. RWB and VBW is 5MHz for LTE.

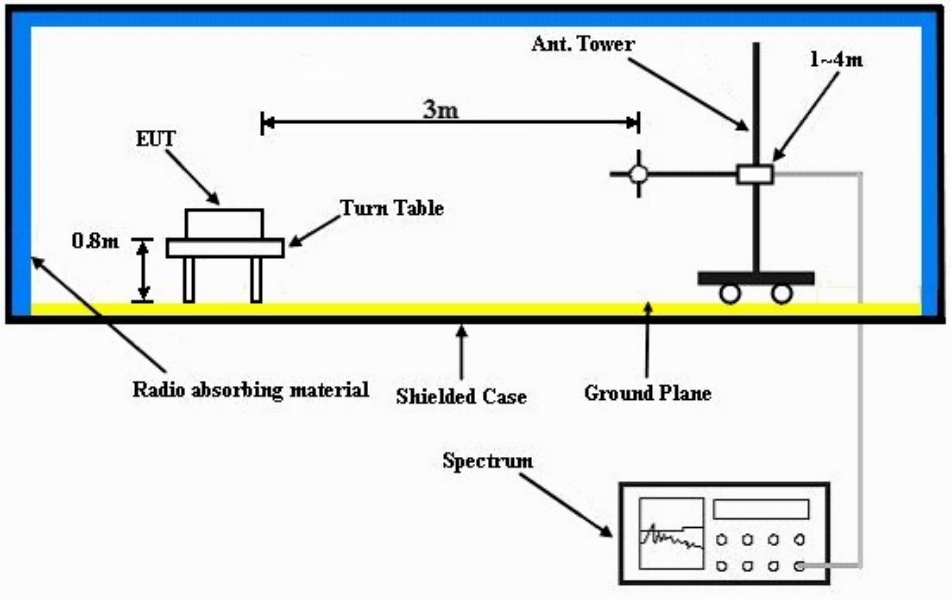
b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn

e. E.R.P = E.I.R.P- 2.15 dB

4.1.4 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.5 EUT OPERATING CONDITIONS

a. The EUT makes a call to the communication simulator.

b. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

4.1.6 TEST RESULTS

ERP

ERP POWER (QPSK 1 RB ALLOCATED AT THE UPPER EDGE)					
CHANNEL NO.	FREQUENCY (MHz)	S.G LEVEL (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
23230	782.0	25.7	-8.3	17.4	55.0

REMARKS: 1. Output Power (dBm) = S.G Level (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Gain of Substitution horn + TX cable loss.
3. The value in bold is the worst.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

4.2.2 TEST INSTRUMENTS

Same as 4.1.2.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.

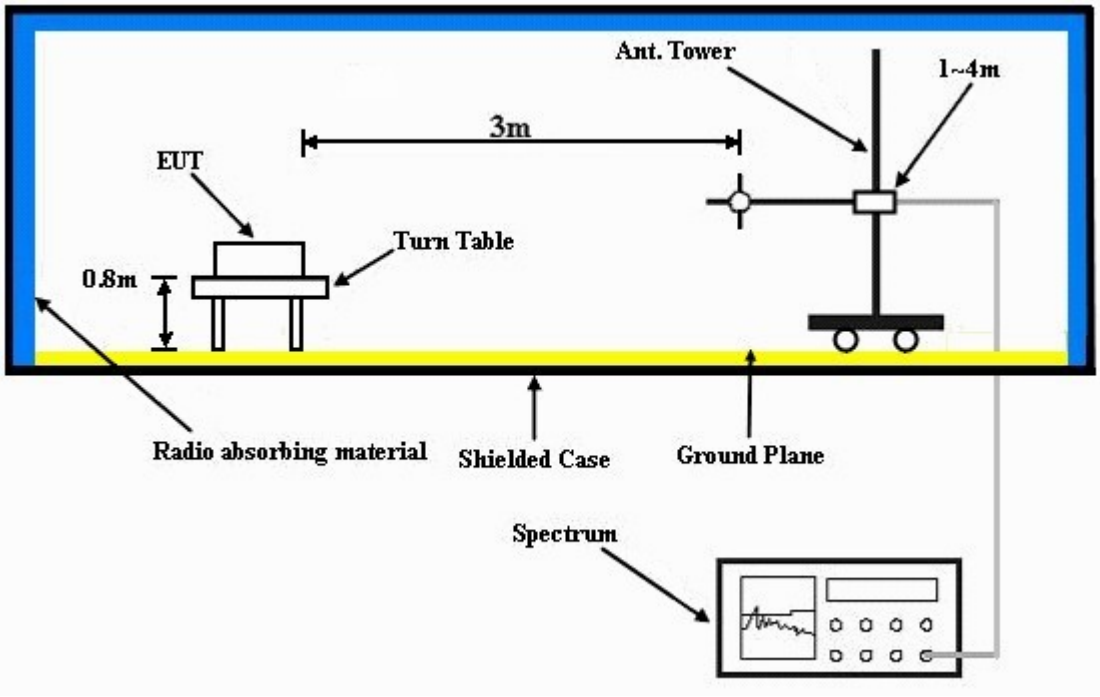
b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.

c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.

d. Repeat step a ~ c for horizontal polarization.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.7 TEST RESULTS

FOR OUTBAND EMISSION

WORST AT QPSK, 1RB ALLOCATED AT THE UPPER EDGE

BELOW 1GHz DATA:

TEST MODE A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	45.55	46.9	-13.0	-41.5	-7.7	-49.2
2	90.26	48.7	-13.0	-40.1	-7.7	-47.8
3	133.03	47.9	-13.0	-37.8	-7.7	-45.5
4	181.62	46.2	-13.0	-40.1	-7.7	-47.8
5	304.09	38.3	-13.0	-47.7	-7.8	-55.5
6	531.52	34.4	-13.0	-50.4	-7.8	-58.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	39.72	54.8	-13.0	-30.5	-7.7	-38.2
2	86.37	47.8	-13.0	-41.5	-7.7	-49.2
3	138.86	41.0	-13.0	-45.1	-7.7	-52.8
4	173.85	40.5	-13.0	-45.5	-7.7	-53.2
5	366.29	37.4	-13.0	-51.7	-7.8	-59.5
6	535.41	36.6	-13.0	-49.3	-7.8	-57.1

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

TEST MODE B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	64.99	52.3	-13.0	-34.3	-7.7	-42.0
2	156.35	46.5	-13.0	-40.3	-7.7	-48.0
3	238.00	38.5	-13.0	-47.9	-7.7	-55.6
4	346.85	40.0	-13.0	-47.0	-7.8	-54.8
5	438.22	37.3	-13.0	-49.2	-7.8	-57.0
6	576.23	36.0	-13.0	-50.5	-7.8	-58.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	43.61	49.7	-13.0	-36.8	-7.7	-44.5
2	**63.05**	**57.5**	**-13.0**	**-29.4**	**-7.7**	**-37.1**
3	90.26	44.1	-13.0	-42.8	-7.7	-50.5
4	158.30	35.4	-13.0	-51.2	-7.7	-58.9
5	181.62	34.2	-13.0	-52.9	-7.7	-60.6
6	321.58	35.8	-13.0	-50.8	-7.8	-58.6

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

ABOVE 1GHz DATA:

TEST MODE A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	2346.0	41.7	-13.0	-61.2	8.3	-52.9
2	3128.0	39.6	-13.0	-64.2	9.4	-54.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	2346.0	43.1	-13.0	-59.8	8.3	-51.5
2	3128.0	39.9	-13.0	-63.9	9.4	-54.5

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

TEST MODE B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	2346.0	42.7	-13.0	-60.2	8.3	-51.9
2	3128.0	41.5	-13.0	-62.3	9.4	-52.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	2346.0	43.1	-13.0	-59.8	8.3	-51.5
2	3128.0	43.4	-13.0	-60.4	9.4	-51.0

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

Emissions in the band 1559–1610 MHz

FOR GPS BAND EMISSION

WORST AT QPSK, 1RB ALLOCATED AT THE UPPER EDGE

TEST MODE A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1564.0	42.0	-40.0	-59.7	7.0	-52.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1564.0	43.9	-40.0	-57.8	7.0	-50.8

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

TEST MODE B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	**1564.0**	**48.1**	**-40.0**	**-53.3**	**7.0**	**-46.3**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	1564.0	45.3	-40.0	-56.3	7.0	-49.3

NOTE: ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
Correction Factor = gain of substitution antenna + cable loss

5 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 and authorization 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
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Hwa Ya EMC/RF/Safety/Telecom Lab:
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Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

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

6 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---