

# FCC TEST REPORT (PART 24)

**REPORT NO.:** RF950109L04G

**MODEL NO.:** HERM100

**RECEIVED:** Sep. 01, 2006

**TESTED:** Sep. 02, 2006

**ISSUED:** Sep. 06, 2006

**APPLICANT:** High Tech Computer Corp.

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R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

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## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

### FOR PCS FUNCTION:

APPLIED STANDARD: FCC Part 24 & Part 2 / IC RSS-133			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -43.42dB at 863.93MHz.

### FOR WCDMA FUNCTION:

APPLIED STANDARD: FCC Part 24 & Part 2 / IC RSS-133			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -39.14dB at 399.34MHz.

## 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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~ 1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 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

<b>PRODUCT</b>	Pocket PC Phone
<b>MODEL NO.</b>	HERM100
<b>FCC ID</b>	NM8HERM100
<b>POWER SUPPLY</b>	3.7Vdc from rechargeable lithium battery 5.0Vdc from power adapter 5.0Vdc from host equipment
<b>MODULATION TYPE</b>	PCS: GMSK / 8PSK WCDMA: QPSK / BPSK
<b>FREQUENCY RANGE</b>	Tx frequency: 1850.2MHz ~ 1909.8MHz Rx frequency: 1930.2MHz ~ 1989.8MHz
<b>NUMBER OF CHANNEL</b>	PCS: 299 WCDMA: 277
<b>MAX. CONDUCTED PEAK OUTPUT POWER</b>	29.46dBm (0.88308Watts)
<b>MAX. ERP POWER</b>	29.30dBm (0.85114Watts)
<b>ANTENNA TYPE</b>	Monopole antenna with -1dBi gain
<b>DATA CABLE</b>	1.2m USB shielded cable without core 1.7m non-shielded cable for earphone
<b>I/O PORTS</b>	Refer to user's manual
<b>ASSOCIATED DEVICES</b>	Earphone
<b>EUT EXTREME VOL. RANGE</b>	3.7Vdc to 4.2Vdc

**NOTE:**

1. This report is issued as a supplementary report of RF950109L04. This report shall be combined together with its original report.
2. RF output power is the same as the original test report.
3. This report is prepared for FCC class II permissive change. Difference compared with the original report is listed as below, therefore radiated emission measurements has been re-tested.

ITEM	ORIGINAL DESCRIPTION	ITEM	CLASS II CHANGE DESCRIPTION
1	with Video telephone, with CCD camera	1	with Video telephone, without CCD camera
2	without Video telephone, without CCD camera	2	without Video telephone, with CCD camera

4. The EUT is a GSM850/PCS1900/ WCDMA850/WCDMA1900 Pocket PC Phone with wireless LAN and bluetooth functions. This report is only covered the functions of PCS1900/ WCDMA1900. The wireless LAN and bluetooth functions are covered in another test report, which standard used is FCC Part 15. And the GSM850/WCDMA850 mobile phone function is covered in another test report, which standard used is FCC Part 22.

5. The communicated functions of EUT listed as below:

		GSM850MHz	PCS1900MHz	WCDMA850MHz	WCDMA1900MHz	With 802.11b/g & bluetooth
2G	GPRS	√	√			
	Edge	√	√			
3G	HSDPA			√	√	

6. The EUT was operated with following power adapters:

ADAPTER 1:	
<b>BRAND:</b>	TPT
<b>MODEL:</b>	JHA050100UU05
<b>INPUT:</b>	100-240Vac ~ 50-60Hz, 0.3A,
<b>OUTPUT:</b>	5.0Vdc, 1A
<b>POWER LINE:</b>	DC 1.8m non-shielded cable without core

ADAPTER 2:	
<b>BRAND:</b>	PHIHONG
<b>MODEL:</b>	PSAA05A-050
<b>INPUT:</b>	100~240Vac, 0.2A, 50-60Hz
<b>OUTPUT:</b>	5.0Vdc, 1A
<b>POWER LINE:</b>	DC 1.8m non-shielded cable without core

ADAPTER 3:	
<b>BRAND:</b>	Delta
<b>MODEL:</b>	ADP-5FH B
<b>INPUT:</b>	100-240Vdc ~ 0.2A, 50-60Hz
<b>OUTPUT:</b>	5.0Vdc, 1A
<b>POWER LINE:</b>	DC 1.8m non-shielded cable without core

7. The EUT have lithium battery listed as below:

STANDARD BATTERY:	
<b>MODEL:</b>	PA16A
<b>RATING:</b>	3.7Vdc, 1350mAh

8. IMEI code: 35771900\*\*\*\*\*.

9. Software version: 0.90.00.

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



### 3.2 DESCRIPTION OF TEST MODES

299 channels are provided to this EUT in the PCS1900 band. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
<b>LOW</b>	512	1850.2 MHz	GSM, GPRS, E-GPRS
<b>MIDDLE</b>	661	1880.0 MHz	GSM, GPRS, E-GPRS
<b>HIGH</b>	810	1909.8 MHz	GSM, GPRS, E-GPRS

- NOTE:**
1. Below 1 GHz, the channel 512, 661, and 810 were pre-tested in chamber. The channel 512 was chosen for final test.
  2. The worst case for final test is chosen when the power control level set 0.
  3. The channel space is 0.2MHz.
  4. Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane. Therefore only the test data of this Y-plane was used for radiated emission measurement test.
  5. For spurious emissions tests, GSM mode has been chosen for the worst case to do the final test and record.

277 channels are provided to this EUT in the WCDMA1900 band. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
<b>LOW</b>	9262	1852.4 MHz	WCDMA, HSDPA
<b>MIDDLE</b>	9400	1880.0 MHz	WCDMA, HSDPA
<b>HIGH</b>	9538	1907.6 MHz	WCDMA, HSDPA

- NOTE:**
1. Below 1 GHz, the channel 9262, 9400 and 9538 were pre-tested in chamber. The channel 9262 was chosen for final test.
  2. The worst case for final test is chosen when the power control level set maximum.
  3. The channel space is 0.2MHz.
  4. Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane. Therefore only the test data of this Y-plane was used for radiated emission measurement test.
  5. For spurious emissions tests, WCDMA mode has been chosen for the worst case to do the final test and record.

### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

The tested channel of each test item is selected from the worst case of original report.

#### FOR PCS FUNCTION:

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE<1G	RE≥1G	
-	√	√	The EUT without video telephone, with CCD camera

Where **RE<1G**: Radiated Emission below 1GHz      **RE≥1G**: Radiated Emission above 1GHz

**Note:** The EUT without video telephone, with CCD camera mode was found the worst case. Therefore only recorded the test data in the test report.

#### **RADIATED EMISSION TEST (BELOW 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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 TECHNOLOGY	AXIS
512 to 810	512	GSM	Y

#### **RADIATED EMISSION TEST (ABOVE 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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 TECHNOLOGY	AXIS
512 to 810	810	GSM	Y

**FOR WCDMA FUNCTION:**

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE<1G	RE≥1G	
-	√	√	The EUT without video telephone, with CCD camera

Where **RE<1G**: Radiated Emission below 1GHz      **RE≥1G**: Radiated Emission above 1GHz

**Note:** The EUT without video telephone, with CCD camera mode was found the worst case. Therefore only recorded the test data in the test report.

**RADIATED EMISSION TEST (BELOW 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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 TECHNOLOGY	AXIS
9262 to 9538	9262	WCDMA	Y

**RADIATED EMISSION TEST (ABOVE 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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 TECHNOLOGY	AXIS
9262 to 9538	9538	WCDMA	Y

### 3.2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Pocket PC Phone. 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 24**

**IC RSS-133**

**ANSI C63.4-2003**

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

### 3.2.3 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.	CAL. DATE
1	Universal Radio Communication Tester	R&S	CMU200	104958	Apr. 11, 2007
2	NJZ-2000 (GSM+WCDMA simulator)	JRC	NJZ-2000	ET00054	Sep. 05, 2007

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

**NOTE:** All power cords of the above support units are non shielded (1.8m).

## 4 TEST TYPES AND RESULTS (FOR PCS FUNCTION)

### 4.1 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the emission of limit equal to  $-13\text{dBm}$ . So the limit of emission is the same absolute specified line.

LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

**NOTE:** The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts.}$$

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 20, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 27, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 15, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 22, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 26, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01961	Oct. 23, 2006
Preamplifier Agilent	8447D	2944A10629	Oct. 27, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	214380/4	Jan. 16, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	219266/4	Jan. 16, 2007
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA
Signal Generator Agilent	E8257C	MY43320668	Dec. 07, 2006

- 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 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.

#### 4.1.3 TEST PROCEDURES

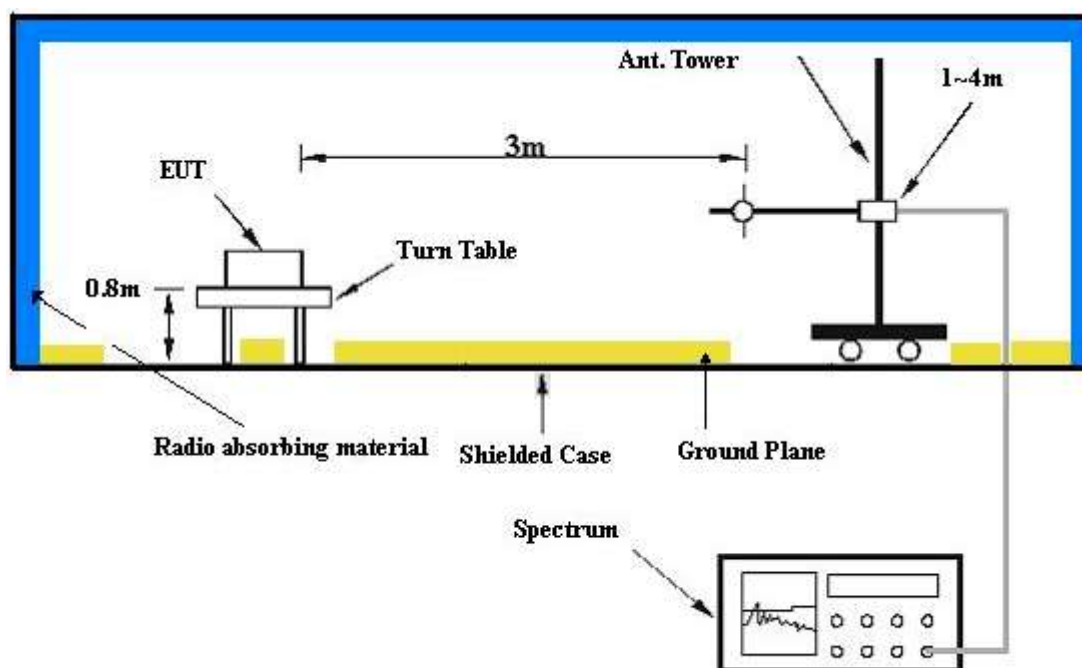
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the 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 1MHz and the video bandwidth is 1MHz.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

- The EUT makes a phone call to the communication simulator.
- The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.



#### 4.1.7 TEST RESULTS

##### FOR PCS MODE (UP-LINK WITH 1 TIME SLOT)

<b>MODE</b>	TX channel 512	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>FREQUENCY RANGE</b>	Below 1000 MHz	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 66%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

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	70.82	24.54 QP	82.22	-57.68	1.50 H	10	12.83	11.71
2	113.59	30.35 QP	82.22	-51.87	2.00 H	280	20.13	10.23
3	129.14	28.39 QP	82.22	-53.83	2.00 H	10	16.37	12.01
4	169.96	27.65 QP	82.22	-54.57	1.50 H	10	14.86	12.79
5	412.95	32.27 QP	82.22	-49.95	2.00 H	271	14.07	18.20
6	731.74	33.76 QP	82.22	-48.46	2.00 H	292	8.58	25.18
7	<b>863.93</b>	<b>38.80 QP</b>	<b>82.22</b>	<b>-43.42</b>	<b>2.00 H</b>	<b>280</b>	<b>12.01</b>	<b>26.79</b>
8	930.02	36.70 QP	82.22	-45.52	1.50 H	115	8.21	28.48

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	55.27	29.83 QP	82.22	-52.39	1.00 V	268	15.90	13.93
2	70.82	33.09 QP	82.22	-49.13	1.00 V	19	21.39	11.71
3	115.53	35.47 QP	82.22	-46.75	1.00 V	25	25.07	10.40
4	397.39	31.89 QP	82.22	-50.33	1.00 V	154	14.03	17.85
5	449.88	32.44 QP	82.22	-49.78	1.00 V	67	13.49	18.95
6	731.74	35.10 QP	82.22	-47.12	1.00 V	130	9.92	25.18
7	865.87	38.45 QP	82.22	-43.77	1.00 V	25	11.65	26.80
8	931.96	31.83 QP	82.22	-50.39	1.00 V	67	3.26	28.57

- 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. This is valid for all 3 channels.

## 4.2 EFFECTIVE RADIATED POWER MEASUREMENT (ABOVE 1GHz)

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 47.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the emission of limit equal to  $-13\text{dBm}$ .

#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 20, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 27, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 15, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 22, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 26, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01961	Oct. 23, 2006
Preamplifier Agilent	8447D	2944A10629	Oct. 27, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	214380/4	Jan. 16, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	219266/4	Jan. 16, 2007
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA
Signal Generator Agilent	E8257C	MY43320668	Dec. 07, 2006

- 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 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.

#### 4.2.3 TEST PROCEDURES

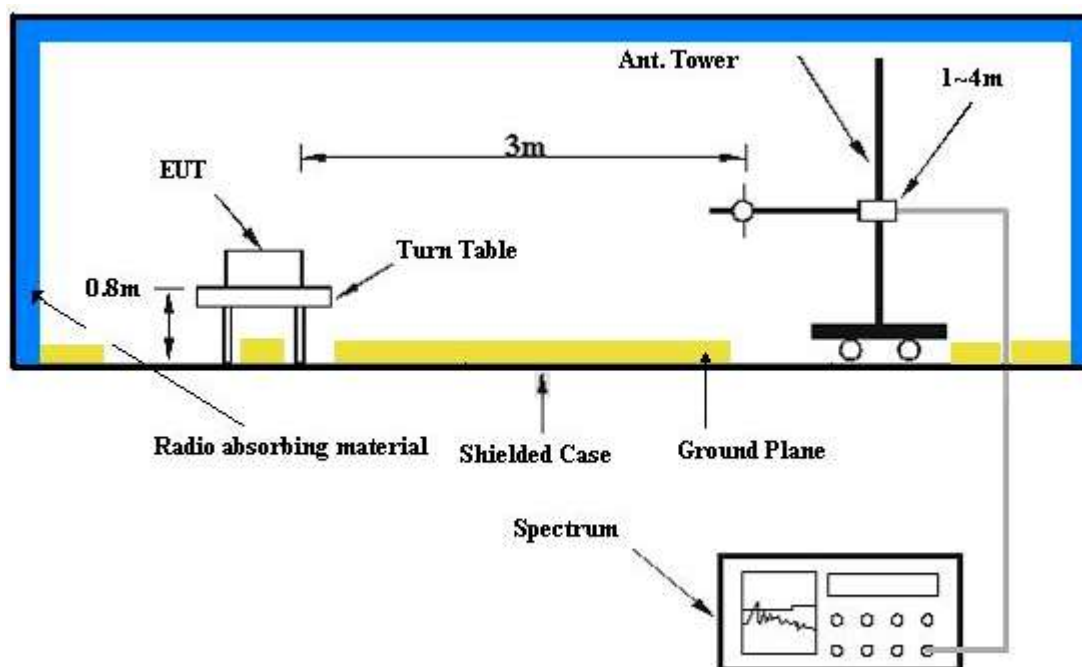
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the 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. The EUT is replaced by a substituted antenna connected to a signal generator tuned to the frequency of emission.
- e. The signal generator level has to be adjusted to have the same emission nature.
- f. The radiated power can be calculated via the factor and antenna gain.
- g. Repeat step a ~ f for horizontal polarization.

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

#### 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. The EUT makes a phone call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

## 4.2.7 TEST RESULTS

### FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

<b>MODE</b>	TX channel 810	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 66%RH, 991hPa
<b>TESTED BY</b>	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	3819.00	64.64	-13.00	-44.25	13.66	-30.59
2	5729.00	61.23	-13.00	-48.39	14.39	-34.00
3	7639.00	60.33	-13.00	-48.05	13.15	-34.90
4	9549.00	55.20	-13.00	-53.89	13.86	-40.03

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	3819.00	62.27	-13.00	-46.62	13.66	-32.96
2	5729.00	60.32	-13.00	-49.30	14.39	-34.91
3	7639.00	59.63	-13.00	-48.75	13.15	-35.60
4	9549.00	57.50	-13.00	-51.59	13.86	-37.73

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

## 5 TEST TYPES AND RESULTS (FOR WCDMA FUNCTION)

### 5.1 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

#### 5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the limit of emission equal to  $-13$ dBm. So the limit of emission is the same absolute specified line.

LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

**NOTE:** The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts.}$$

## 5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 20, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 27, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 15, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 22, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 26, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01961	Oct. 23, 2006
Preamplifier Agilent	8447D	2944A10629	Oct. 27, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	214380/4	Jan. 16, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	219266/4	Jan. 16, 2007
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA
Signal Generator Agilent	E8257C	MY43320668	Dec. 07, 2006

- 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 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.



### 5.1.3 TEST PROCEDURES

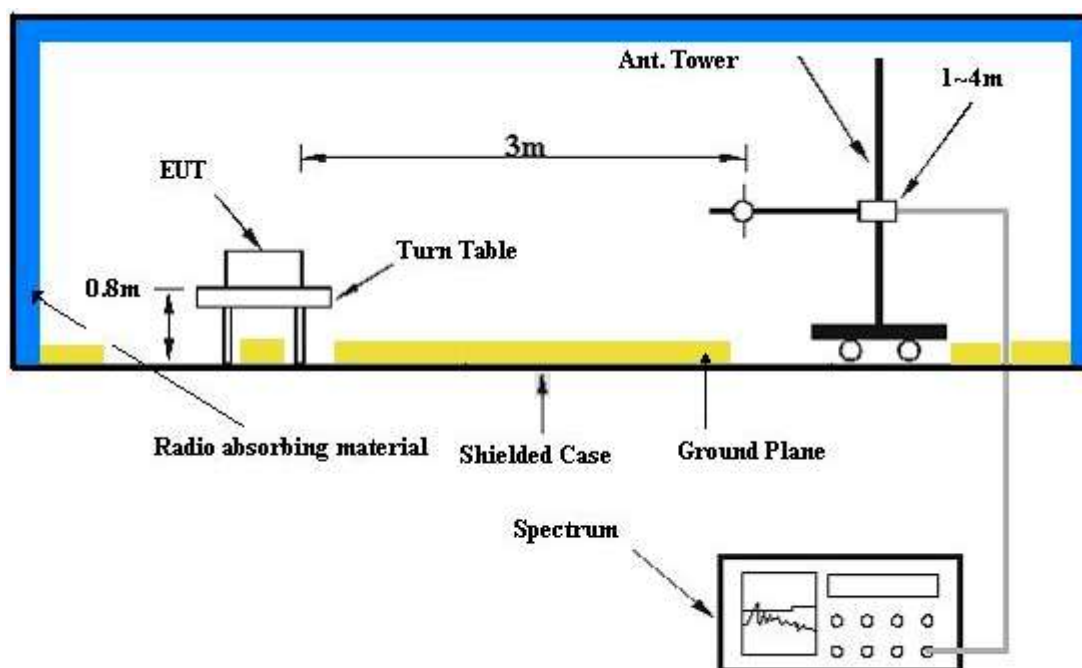
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the 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 1MHz and the video bandwidth is 1MHz.

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.1.5 TEST SETUP



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

### 5.1.6 EUT OPERATING CONDITIONS

- a. The EUT makes a phone call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

### 5.1.7 TEST RESULTS

<b>MODE</b>	TX channel 9262	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>FREQUENCY RANGE</b>	Below 1000 MHz	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 66%RH, 991hPa	<b>TESTED BY</b>	Match Tsui

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	70.82	24.26 QP	82.22	-57.96	1.50 H	355	12.56	11.71
2	113.59	31.09 QP	82.22	-51.13	2.00 H	268	20.86	10.23
3	131.08	29.50 QP	82.22	-52.72	1.50 H	10	17.23	12.27
4	168.02	27.70 QP	82.22	-54.52	1.00 H	259	14.79	12.91
5	206.89	29.02 QP	82.22	-53.20	1.00 H	319	17.96	11.06
<b>6</b>	<b>399.34</b>	<b>43.08 QP</b>	<b>82.22</b>	<b>-39.14</b>	<b>1.00 H</b>	<b>259</b>	<b>25.16</b>	<b>17.92</b>
7	729.80	33.61 QP	82.22	-48.61	1.50 H	355	8.50	25.12
8	865.87	40.86 QP	82.22	-41.36	1.00 H	289	14.05	26.80
9	931.96	33.92 QP	82.22	-48.30	1.50 H	193	5.35	28.57

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	57.21	30.68 QP	82.22	-51.54	1.50 V	247	16.91	13.77
2	70.82	33.34 QP	82.22	-48.88	2.00 V	271	21.64	11.71
3	115.53	33.28 QP	82.22	-48.94	1.00 V	304	22.88	10.40
4	397.39	32.31 QP	82.22	-49.91	2.00 V	4	14.46	17.85
5	455.71	31.32 QP	82.22	-50.9	1.00 V	205	12.24	19.08
6	597.62	30.09 QP	82.22	-52.13	2.00 V	316	7.67	22.42
7	663.71	30.05 QP	82.22	-52.17	2.00 V	316	6.71	23.33
8	729.80	34.59 QP	82.22	-47.63	2.00 V	271	9.47	25.12
9	863.93	34.61 QP	82.22	-47.61	2.00 V	94	7.83	26.79
10	930.02	35.26 QP	82.22	-46.96	1.00 V	280	6.78	28.48
11	949.46	30.48 QP	82.22	-51.74	1.50 V	202	1.08	29.39

- 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. This is valid for all 3 channels.

## 5.2 EFFECTIVE RADIATED POWER MEASUREMENT (ABOVE 1GHz)

### 5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the limit of emission equal to  $-13\text{dBm}$ .

## 5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 20, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 27, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 15, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 22, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 26, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01961	Oct. 23, 2006
Preamplifier Agilent	8447D	2944A10629	Oct. 27, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	214380/4	Jan. 16, 2007
RF signal cable HUBER+SUHNER	SUCOFLEX 104	219266/4	Jan. 16, 2007
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA
Signal Generator Agilent	E8257C	MY43320668	Dec. 07, 2006

- 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 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.

### 5.2.3 TEST PROCEDURES

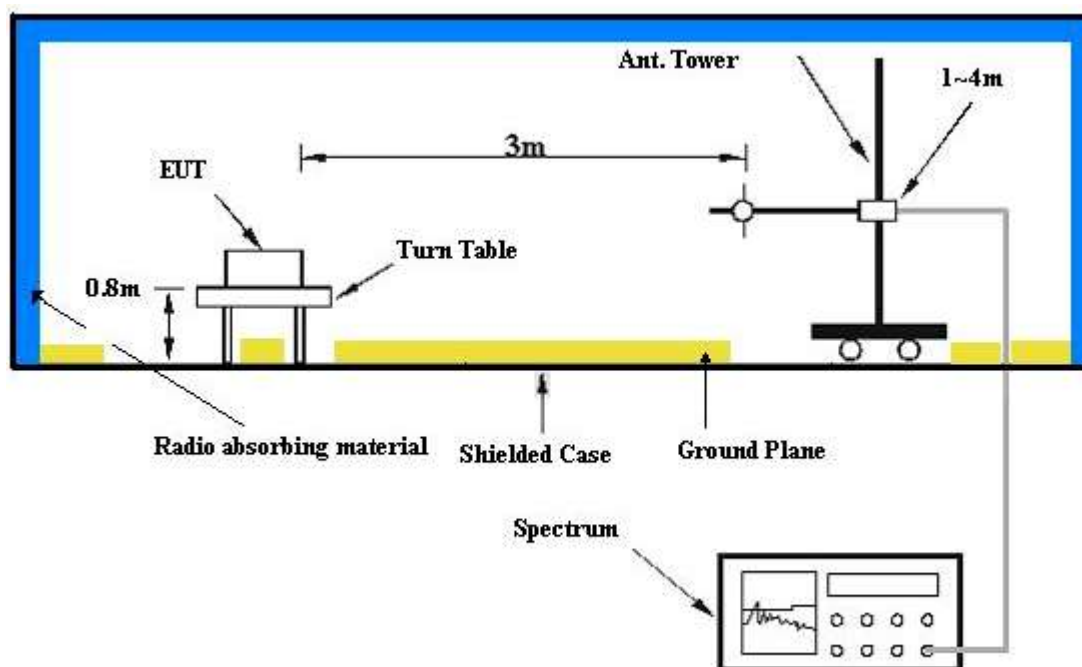
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the 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. The EUT is replaced by a substituted antenna connected to a signal generator tuned to the frequency of emission.
- e. The signal generator level has to be adjusted to have the same emission nature.
- f. The radiated power can be calculated via the factor and antenna gain.
- g. Repeat step a ~ f for horizontal polarization.

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

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 5.2.5 TEST SETUP



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

## 5.2.6 EUT OPERATING CONDITIONS

- a. The EUT makes a phone call to the communication simulator.
- b. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

## 5.2.7 TEST RESULTS

<b>MODE</b>	TX channel 9538	<b>FREQUENCY RANGE</b>	Above 1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 66%RH, 991hPa
<b>TESTED BY</b>	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	3819.00	57.69	-13.00	-51.20	13.66	-37.54
2	5729.00	52.25	-13.00	-57.37	14.39	-42.98
3	7639.00	56.69	-13.00	-51.69	13.15	-38.54

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	3819.00	59.91	-13.00	-48.98	13.66	-35.32
2	5729.00	54.01	-13.00	-55.61	14.39	-41.22
3	7639.00	57.44	-13.00	-50.94	13.15	-37.79

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).



## 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

<b>USA</b>	FCC, UL, A2LA
<b>GERMANY</b>	TUV Rheinland
<b>JAPAN</b>	VCCI
<b>NORWAY</b>	NEMKO
<b>CANADA</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	CNLA, BSMI, DGT
<b>NETHERLANDS</b>	Telefication
<b>SINGAPORE</b>	PSB , GOST-ASIA (MOU)
<b>RUSSIA</b>	CERTIS (MOU)

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](http://www.adt.com.tw/index.5/phtml).  
If you have any comments, please feel free to contact us at the following:

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**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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

## **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