



A Test Lab Techno Corp.

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P22 & P24 Test Report



Test Report No.	: 0809FR15
Applicant	: Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Manufacturer	: TOSHIBA CORPORATION
Model Name	: Mobile Phone
Trade Mark	: TOSHIBA
Model Number	: 830T, CL4-J01
FCC ID	: SP2-CL4-J01
Dates of Test	: Sep. 19 ~ Sep. 24, 2008
Test Specification	: 47 CFR Part 22H, 24E & and 24, ANSI/TIA-603-C-2004
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full.

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Measurement Center Manager

John Cheng 20081027
Testing Engineer



Contents

1. General Information	3
2. Test Configuration of Equipment under Test	4
2.1 Test Manner.....	4
2.2 Test Mode.....	4
2.3 Connection Diagram of Test System.....	6
2.4 Ancillary Equipment List.....	6
3. General Information of Test Site.....	7
3.1 Test Voltage.....	7
3.2 Test in Compliance with.....	7
3.3 Frequency Range Investigated	7
3.4 Test Distance.....	7
4. Test Data and Test Result.....	8
4.1 List of Measurements and Examinations	8
4.2 RF Output Power.....	9
4.3 ERP / EIRP Measurement.....	11
4.4 Occupied Bandwidth and Band Edge Measurement.....	16
4.5 Conducted Emission	25
4.6 Field Strength of Spurious Radiation.....	28
4.7 Frequency Stability (Temperature Variation)	36
4.8 Frequency Stability (Voltage Variation).....	38
4.9 AC Power Conducted Emissions Requirements	40
5. List of Measurement Equipments.....	44
6. Uncertainty Evaluation	45



1. General Information

Applicant : **Toshiba Information Systems (UK) Ltd, Mobile Communications Division**
Delta House, The Crescent, Southwood Business Park, Farnborough,
GU14 0NL, Hampshire UK

Manufacturer	: TOSHIBA CORPORATION 1-1, Asahigaoka 3-Chome, Hino-Shi, Tokyo 191-8555, Japan
Product Name	: Mobile Phone
Trade Mark	: TOSHIBA
Model Number	: 830T, CL4-J01
FCC ID	: SP2-CL4-J01
TX Frequency	: 1850 - 1910 MHz (PCS 1900)
RX Frequency	: 1930 - 1990 MHz (PCS 1900)
Antenna Type	: Internal Antenna
Antenna Gain	: -0.4 dBi
Hardware Version	: CS-1
Software Version	: 21.0012
Maximum Output Power to Antenna (Conducted)	: 29.11 dBm
Max. ERP/EIRP Power	: 0.798 W / 29.02 dBm EIRP
Type of Emission	: 247KGXW
Power Rating (DC , Voltage and Current of RF element or PA)	: 3.7V / 0.8 A
Digital Modulation Emission	: GMSK(GSM 850 / PCS1900) QPSK(WCDMA Band V / WCDMA Band II)
DUT Stage	: Production Unit



2. Test Configuration of Equipment under Test

2.1 Test Manner

1. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
2. During all testing, EUT is in link mode with base station emulator at maximum power level. (PCL=5 for GSM 850 or PCL=0 for PCS 1900)
3. Frequency range investigated: radiated emission 30 MHz to 9000 MHz for GSM850; 30MHz to 19000 MHz for PCS 1900.

2.2 Test Mode

Preliminary tests were performed in different data mode to find the worst case. The data mode shown in the table below is the worst-case rate (Blue color). Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Output power (Peak Power)				
Channel		Frequency (MHz)	Conducted Power (dBm)	Worst Case
PCS1900	Lowest - 512	1850.2	28.87	<input type="checkbox"/>
	Middle - 661	1880.0	29.04	<input type="checkbox"/>
	Highest - 810	1909.8	29.11	<input checked="" type="checkbox"/>
GPRS 1900	3Down2Up	Lowest - 512	27.80	<input checked="" type="checkbox"/>
		Middle - 661	27.60	<input type="checkbox"/>
		Highest - 810	27.70	<input type="checkbox"/>
	3Down1Up	Lowest - 512	27.68	<input type="checkbox"/>
		Middle - 661	27.41	<input type="checkbox"/>
		Highest - 810	27.75	<input type="checkbox"/>

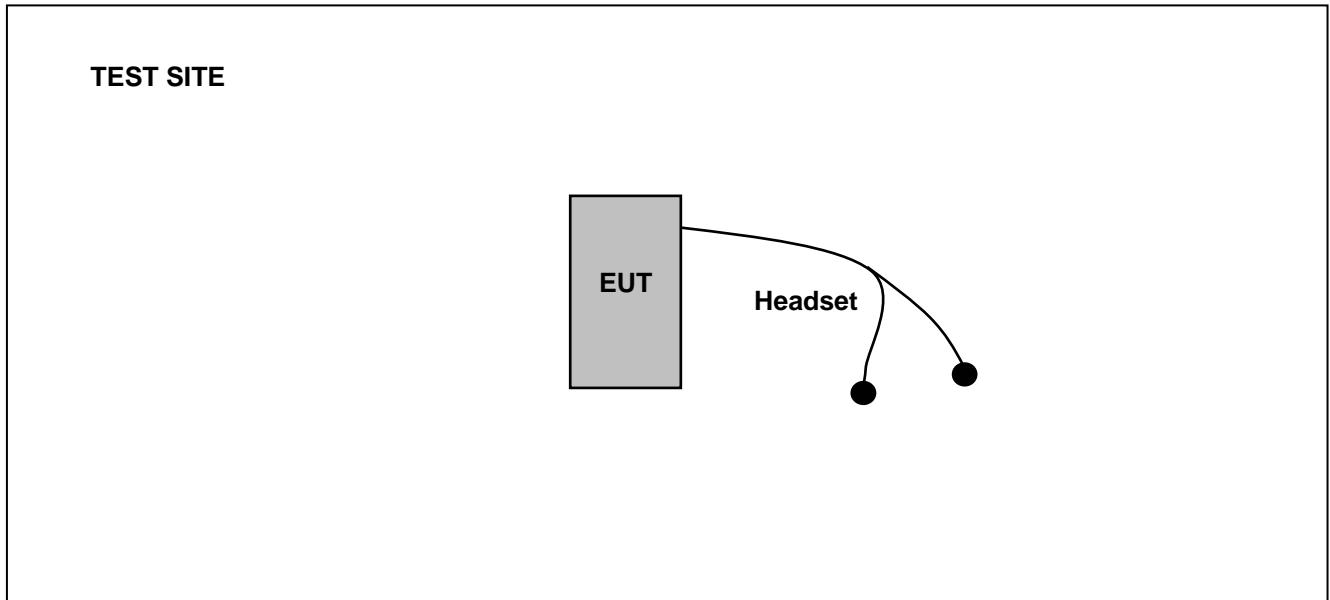


Test Mode List				
Section	DESCRIPTION OF TEST	PCS 1900	GPRS 1900	
			3Down1Up	3Down2Up
4.2	RF Output Power	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4.3	ERP / EIRP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.4	Occupied Bandwidth & Band Edge Measurement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.5	Conducted Spurious Emission	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Field Strength of Spurious Radiation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Frequency Stability vs. Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Frequency Stability vs. Voltage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	AC Power Conducted Emissions Requirements	N/A	N/A	N/A

Comment:

1. The PCS 1900's RF Output Power value was more high than GPRS 1900(3Down1up) and GPRS1900 (3Down2up) condition. The PCS 1900 be testing all items.
2. The GPRS 1900(3Down2up)'s RF Output Power value was more high than GPRS1900 (3Down1up) condition. The GPRS 1900(3Down2up) be testing section 4.2, 4.3 and 4.4.

2.3 Connection Diagram of Test System



During EMI testing (LINK) the EUT (Mobile Phone)'s ear port connected to headset.

2.4 Ancillary Equipment List

1. Base Station(R&S) CMU200 106656
2. Power Supply (GW) 12P3A H281001



3. General Information of Test Site

Test Site Location: No. 140 -1, Changan Street, Bade City, Taoyuan County, Taiwan R.O.C.

TEL: 886-3-271-0188 FAX: 886-3-271-0190

Registration Number : 854525

Designation Number : TW1330

The chamber meets the characteristics of ANSI C63.4-2006. This site is on file with the FCC.

3.1 Test Voltage

DC 3.7V / 0.8 A (Li-ion Battery)

3.2 Test in Compliance with

47 CFR Part 22H, 24E and Part 2. and 24, ANSI/TIA-603-C-2004

3.3 Frequency Range Investigated

1. Radiation: from 30 MHz to 9000 MHz for GSM 850.
2. Radiation: from 30 MHz to 19000 MHz for PCS 1900.
3. Radiation: from 30 MHz to 9000 MHz for WCDMA Band V.
4. Radiation: from 30 MHz to 19000 MHz for WCDMA Band II.

3.4 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.



4. **Test Data and Test Result**

4.1 List of Measurements and Examinations

FCC Rule	DESCRIPTION OF TEST	Result	Section
§ 2.1046	RF Output Power	Passed	4.2
§ 22.913 § 24.232	ERP / EIRP	Passed	4.3
§ 2.1049 § 22.917 § 24.238(b)	Occupied Bandwidth & Band Edge Measurement	Passed	4.4
§ 2.1051	Conducted Spurious Emission	Passed	4.5
§ 2.1053	Field Strength of Spurious Radiation	Passed	4.6
§ 2.1055 § 22.355 § 24.235	Frequency Stability vs. Temperature	Passed	4.7
§ 2.1055 § 22.355 § 24.235	Frequency Stability vs. Voltage	Passed	4.8
§ 15.207	AC Power Conducted Emissions Requirements	N/A Customer Request	4.9

4.2 RF Output Power

4.2.1 Measurement Instruments :

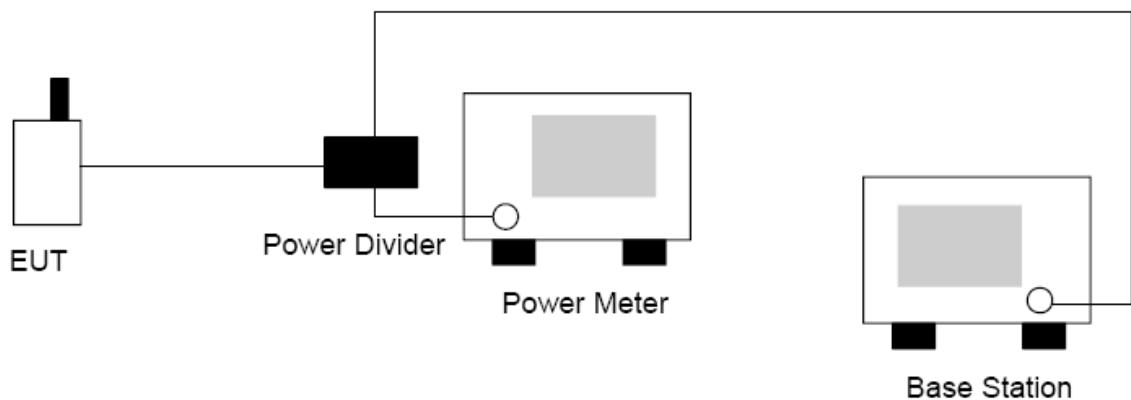
As described in chapter 5 of this test report.

4.2.2 Test Procedure :

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

1. The transmitter output was connected to power meter and base station through power divider.
2. Set base station for EUT at GSM 850: PCL=5 and PCS 1900: PCL=0.
3. Set base station for EUT at WCDMA Band V and WCDMA Band II, power level was set to maximum.
4. Select lowest, middle, and highest channels for each band.

4.2.3 Test Setup Layout :





4.2.4 Test Result :

Max. RF Output Power					
Bands	Channel	Frequency (MHz)		Conducted Power (dBm)	Conducted Power (Watts)
PCS 1900	512	Low	1850.2	28.87	0.771
	661	Mid	1880.0	29.04	0.802
	810	High	1909.8	29.11	0.815

Note: The testing result was used peak detector.

Max. RF Output Power					
Bands	Channel	Frequency (MHz)		Conducted Power (dBm)	Conducted Power (Watts)
GPRS 1900 3Down2Up	512	Low	1850.2	27.80	0.603
	661	Mid	1880.0	27.60	0.575
	810	High	1909.8	27.70	0.589

Note: The testing result was used peak detector.

Max. RF Output Power					
Bands	Channel	Frequency (MHz)		Conducted Power (dBm)	Conducted Power (Watts)
GPRS 1900 3Down1Up	512	Low	1850.2	27.68	0.586
	661	Mid	1880.0	27.41	0.551
	810	High	1909.8	27.75	0.596

Note: The testing result was used peak detector.



4.3 ERP / EIRP Measurement

Equivalent isotropic radiated power measurements by substitution method according to ANSI / TIA / EIA-603-B-2002.

4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

4.3.2 Test Procedure

The phone was tested in an anechoic chamber with a 3-axis position system that permits taking complete spherical scans of the EUT's 3-axis radiation patterns. For all tests, the phone was supported in a free space type environment, vertically oriented in the chamber. Tests were done for GSM 850 three frequencies (824.2, 836.6 and 848.8 MHz) and GSM 1900 three frequencies (1850.2, 1880.00, and 1909.80 MHz).

GSM measurements were made with the phone placed in a call using the CMU200 mobile station test set. The phone was weakly coupled to the test set and configured to transmit in full data rate mode.

The radiated power was measured using ETS-LINDGREN OTA Chamber in "Peak" mode. From these measurements, the software calculates the angle at which maximum radiated power occurs for each case, and the radiated power at this angle was extracted from the data.

Each individual data point in a radiated power or sensitivity measurement is referred to as the effective isotropic radiated power or effective isotropic sensitivity. That is, the desired information is how the measured quantity relates to the same quantity from an isotropic radiator. Thus, the reference measurement must relate the power received or transmitted at the EUT test equipment (spectrum analyzer or communication tester) back to the power transmitted or received at a theoretical isotropic radiator. The total path loss then, is just the difference in dB between the power transmitted or received at the isotropic radiator and that seen at the test equipment (see follow Figure 1).

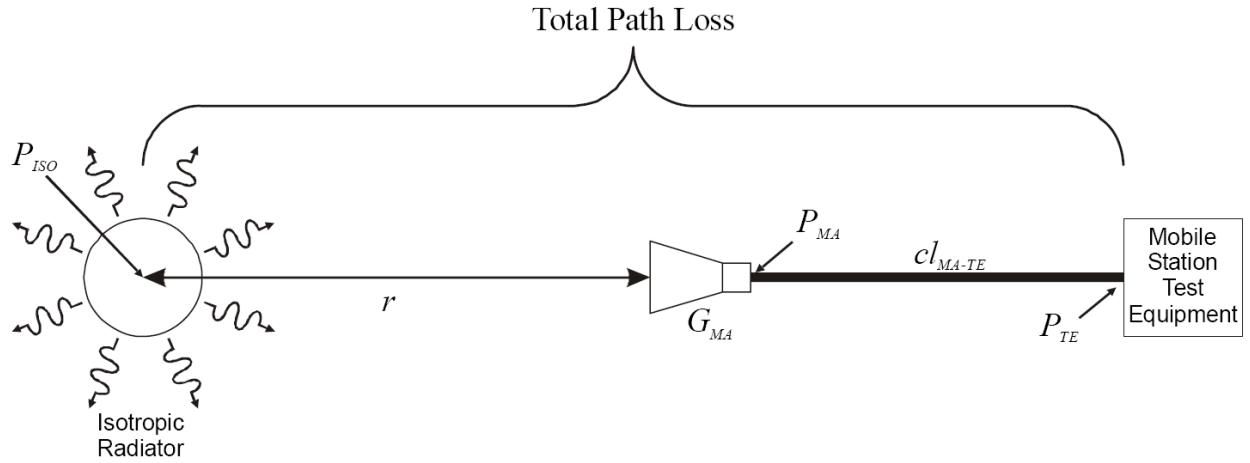


Figure 1. THEORETICAL CASE FOR DETERMINING PATH LOSS

In equation form, this becomes:

Equation 1

$$PL = P_{ISO} - P_{TE},$$

where PL is the total path loss, P_{ISO} is the power radiated by the theoretical isotropic radiator, and P_{TE} is the power received at the test equipment port. As can be seen in Figure 1, this quantity includes the range path loss due to the range length r , the gain of the measurement antenna, and any loss terms associated with the cabling, connections, amplifiers, splitters, etc. between the measurement antenna and the test equipment port.

Figure 2 shows a typical real world configuration for measuring the path loss. In this case, a reference antenna with known gain is used in place of the theoretical isotropic source. The path loss may then be determined from the power into the reference antenna by adding the gain of the reference antenna.

That is:

Equation 2

$$P_{ISO} = P_{RA} + G_{RA},$$

where P_{RA} is the power radiated by reference antenna, and G_{RA} is the gain of the reference antenna, so that:

Equation 3

$$PL = P_{RA} + G_{RA} - P_{TE},$$

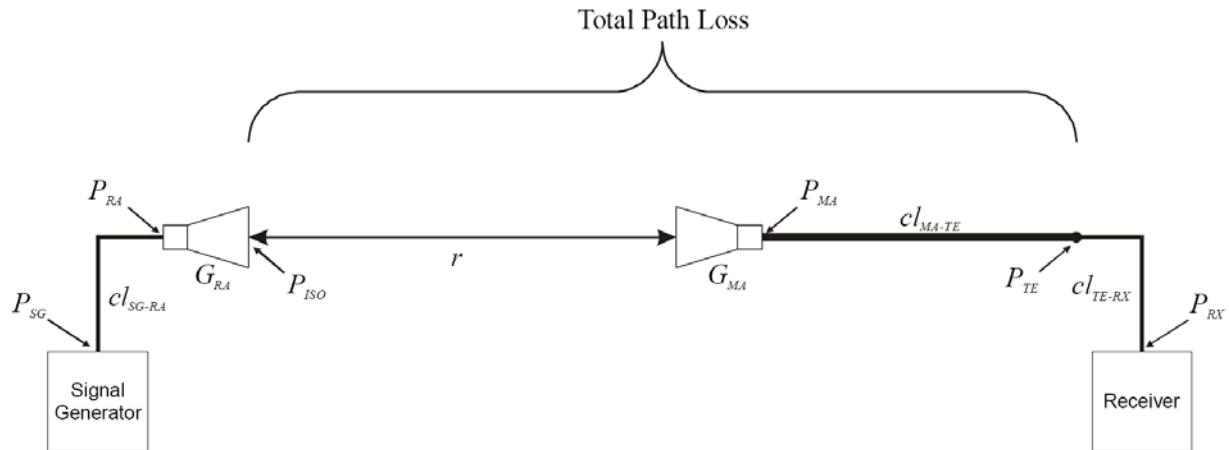


Figure 2. TYPICAL CONFIGURATION FOR MEASURING PATH LOSS

In order to determine P_{RA} , it is necessary to perform a cable reference measurement to remove the effects of the cable loss between signal generator and reference antenna, and between the test equipment port and the receiver. This establishes a reference point at the input to the reference antenna. Figure 3 illustrates the cable reference measurement configuration. Assuming the power level at the signal generator is fixed, it is easy to show that the difference between P_{RA} and P_{TE} in Figure 2 is given by:

Equation 4

$$P_{RA} - P_{TE} = P_{RX}' - P_{RX},$$

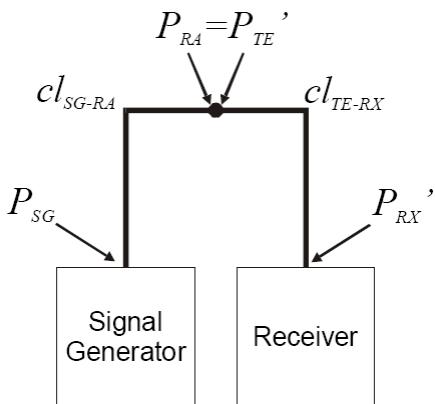


Figure 3. CABLE REFERENCE CALIBRATION CONFIGURATION

Where $P_{RX'}$ is the power measured at the receiver during the cable reference test, and P_{RX} is the power measured at the receiver during the range path loss measurement in Figure 2. Thus, the path loss is then just given by:

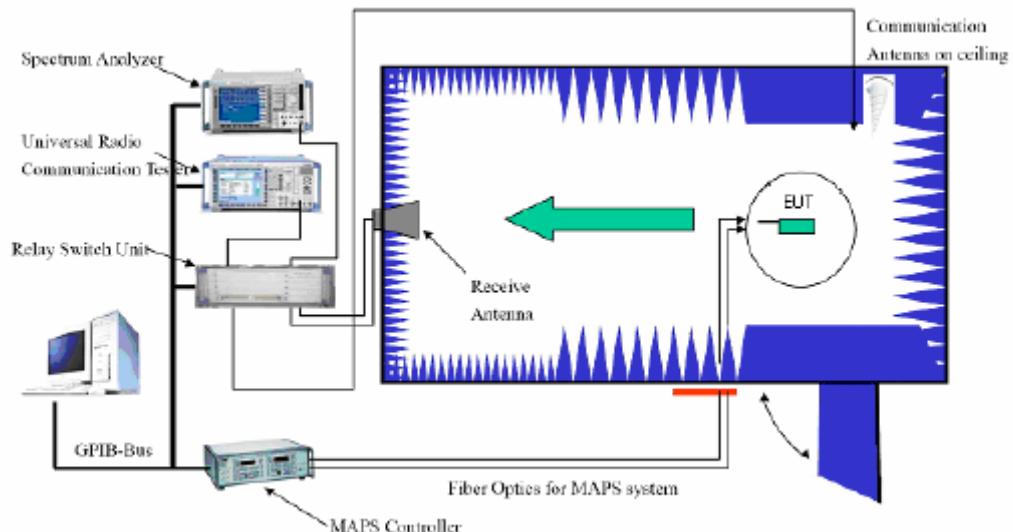
Equation 5

$$PL = G_{RA} + P_{RX'} - P_{RX}$$

$$EIRP = P_t + P_L$$

Pt = Often referred to as antenna output power

4.3.3 Test Setup Layout of ERP/EIRP





4.3.4 Test Result

PCS 1900 Max. Radiated Power EIRP				
Maximum Output Power				
Frequency (MHz)	Read Level (dBm)	Correction factor (dBm)	EIRP (dBm)	EIRP (W)
1850.20	83.86	-55.40	28.46	0.702
1880.00	83.99	-55.60	28.39	0.691

GPRS 1900 (3Down2Up) Max. Radiated Power EIRP				
Maximum Output Power				
Frequency (MHz)	Read Level (dBm)	Correction factor (dBm)	EIRP (dBm)	EIRP (W)
1850.20	83.73	-55.40	28.33	0.682
1880.00	83.87	-55.60	28.27	0.671
1909.80	84.59	-55.70	28.89	0.775

Note:

1. ERP/EIRP = Read Level + Correction factor.
2. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz.
3. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.
4. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

4.4 Occupied Bandwidth and Band Edge Measurement

4.4.1 Measurement Instruments

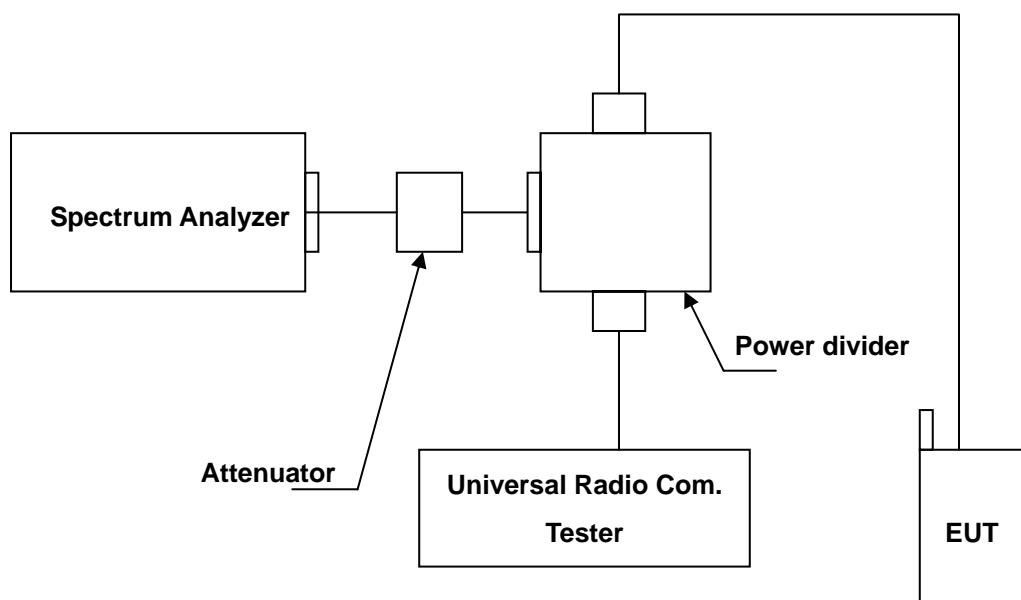
As described in chapter 5 of this test report.

4.4.2 Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.
3. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
4. The band edge setting:
 - a. RB=3 kHz; VB=3 kHz for GSM 850 and PCS 1900.
 - b. RB=100 kHz; VB=100 kHz for WCDMA Band V and WCDMA Band II.

4.4.3 Test Setup Layout

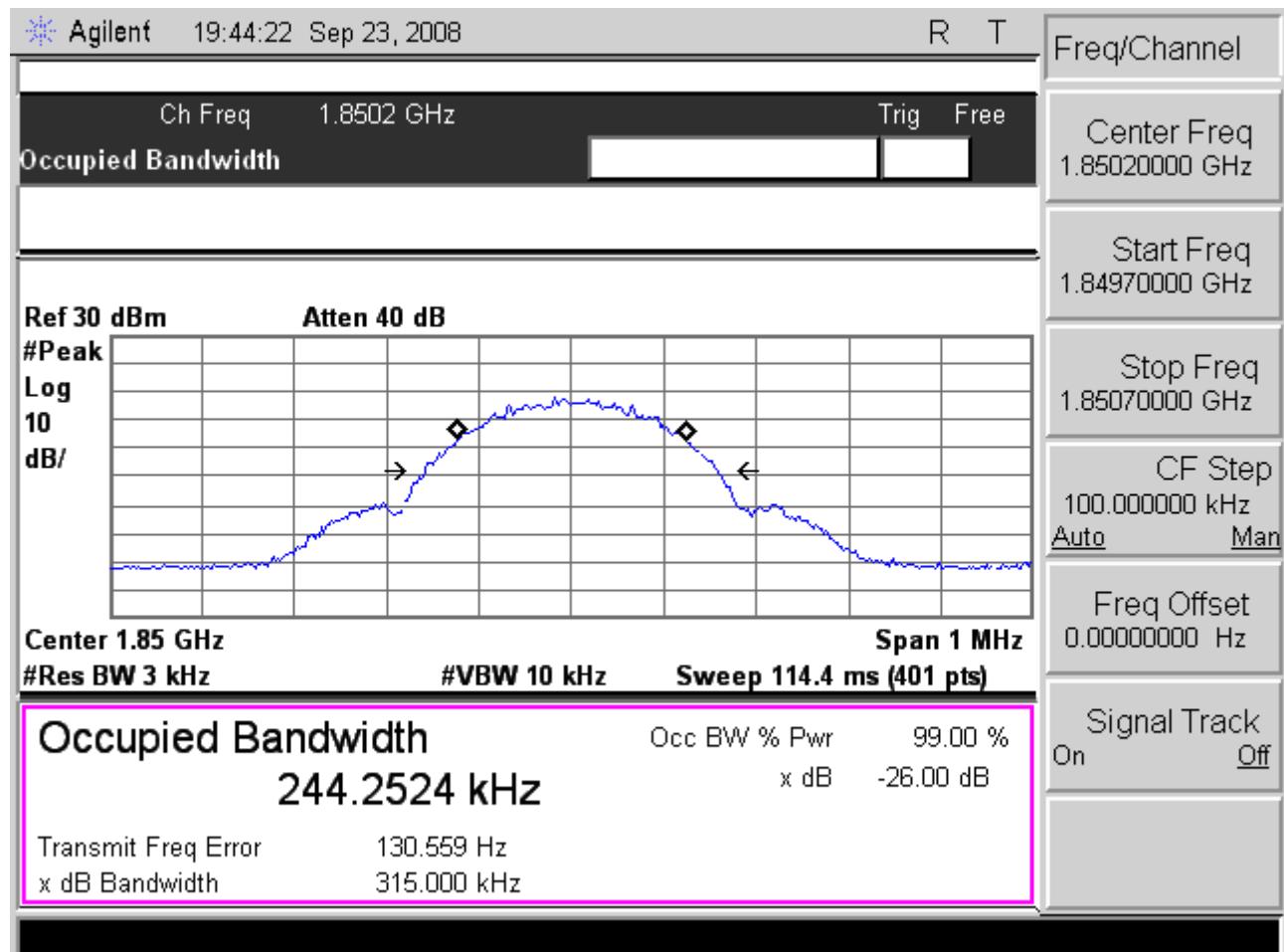


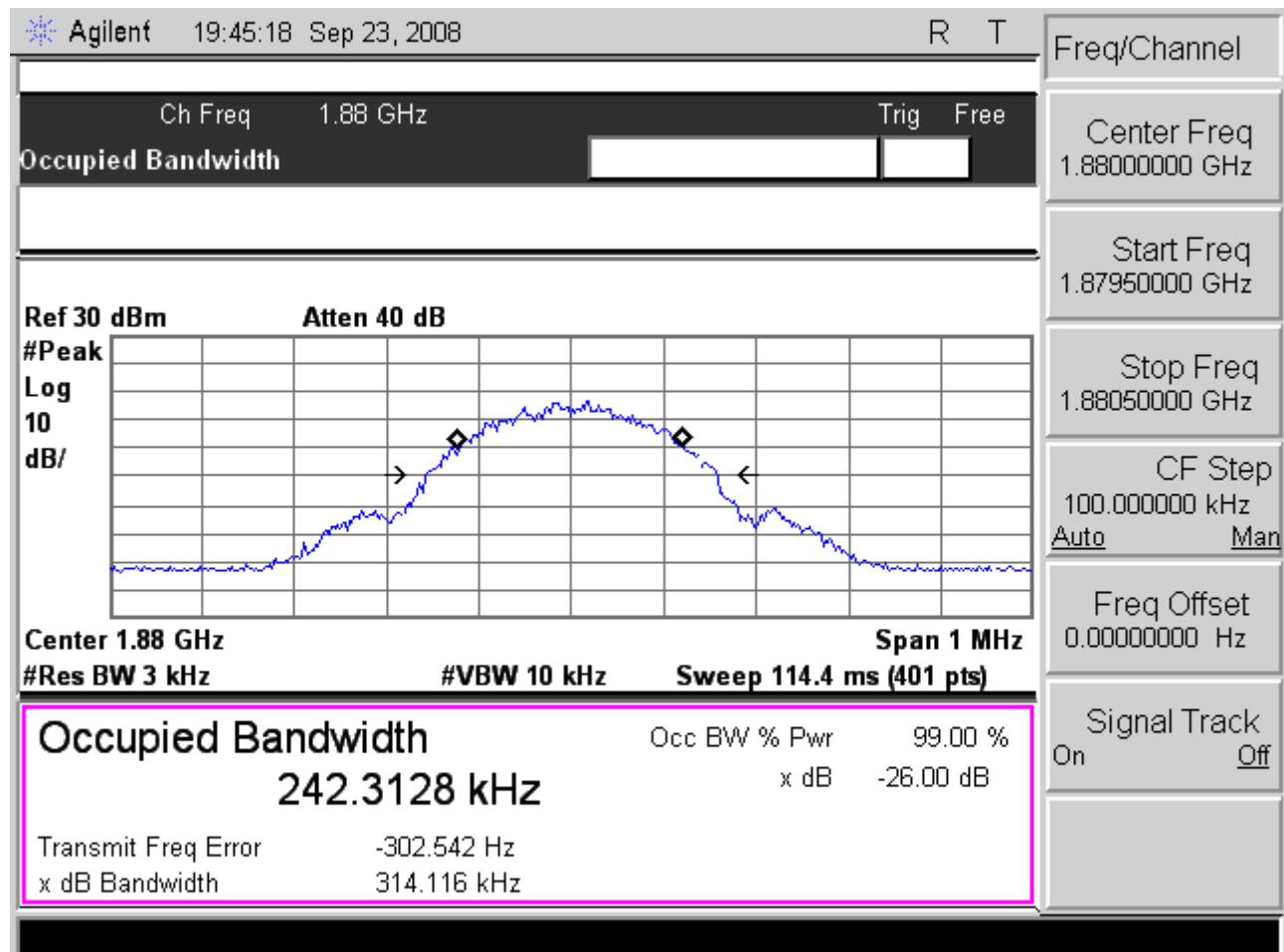


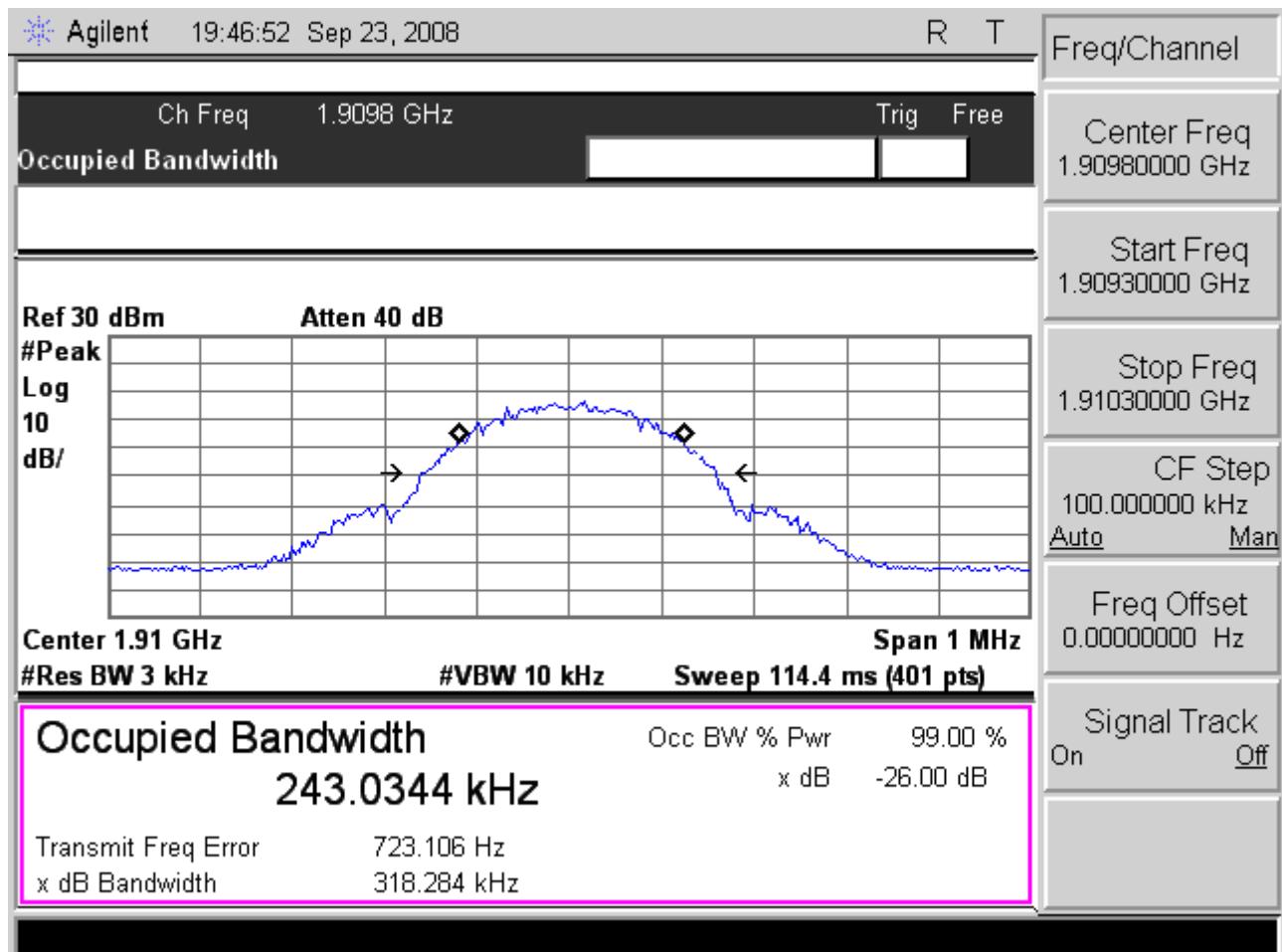
4.4.4 Occupied Bandwidth Test Result

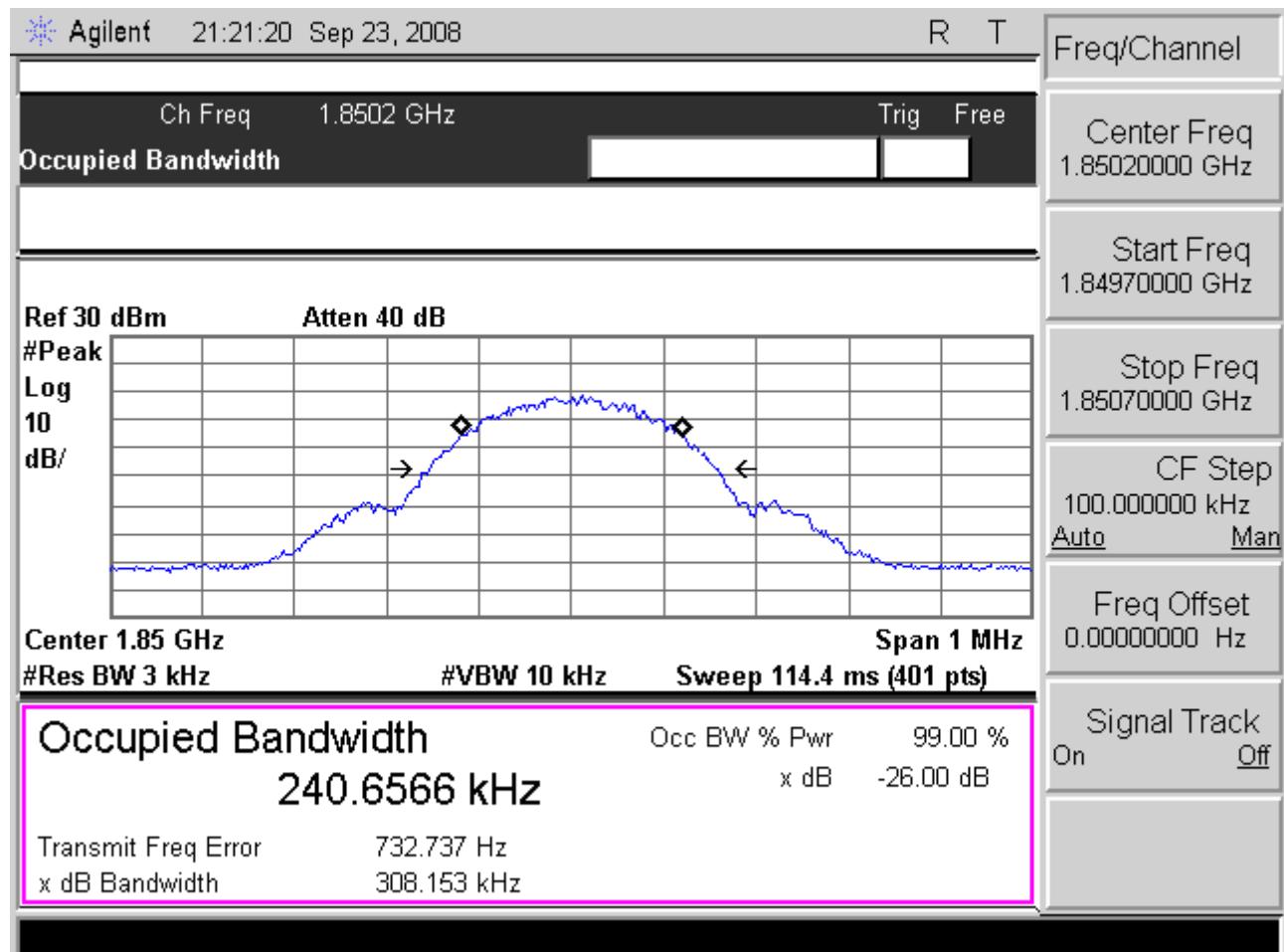
PCS 1900		
Channel	Frequency (MHz)	Output Power - 26 dBc Bandwidth (kHz)
512	1850.2	244.2524
661	1880.0	242.3128
810	1909.8	243.0344
RB:3KHz , VBW:10KHz		

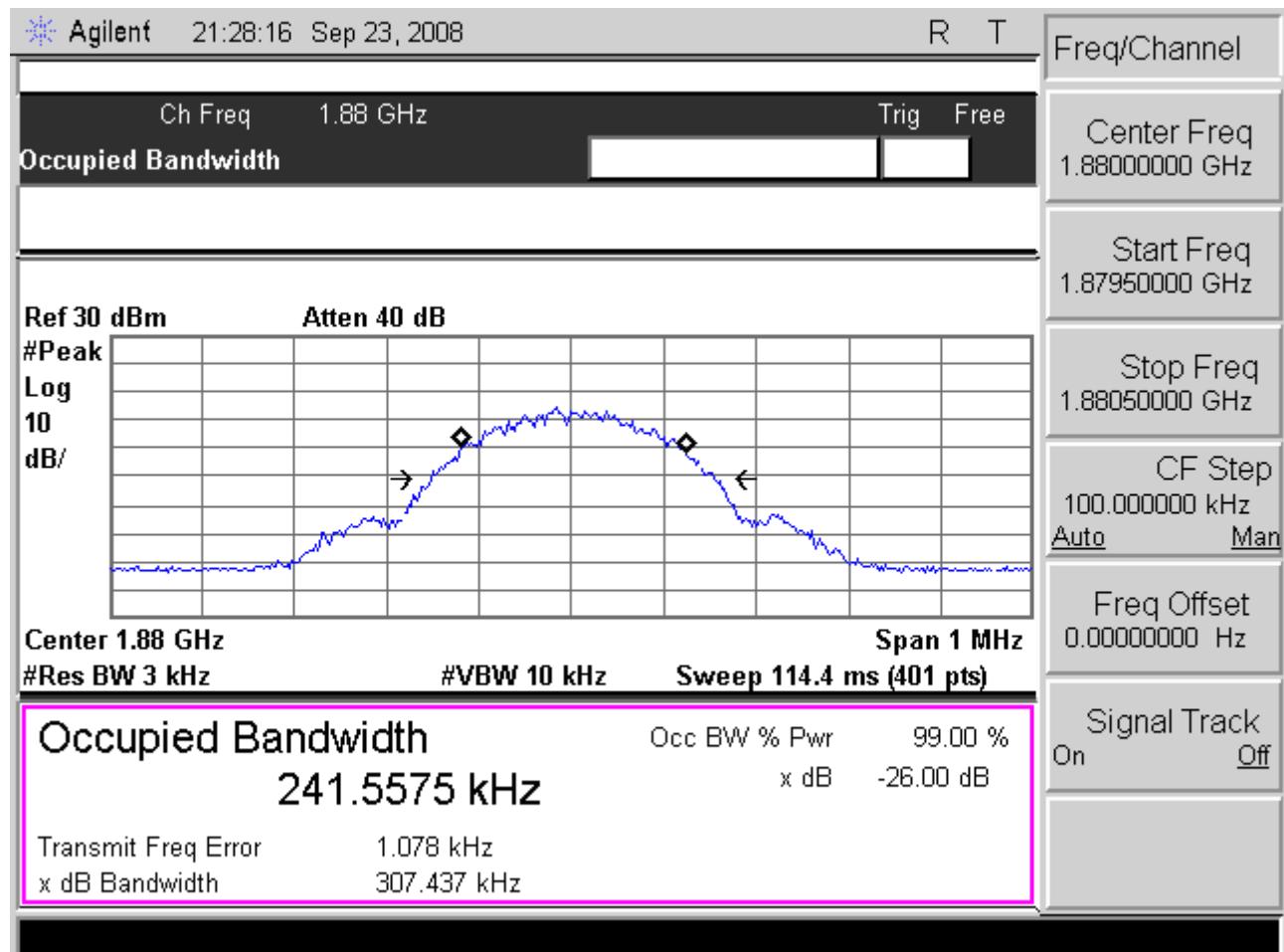
GPRS 1900 (3Down2Up)		
Channel	Frequency (MHz)	Output Power - 26 dBc Bandwidth (kHz)
512	1850.2	240.6566
661	1880.0	241.5575
810	1909.8	247.7009
RB:3KHz , VBW:10KHz		

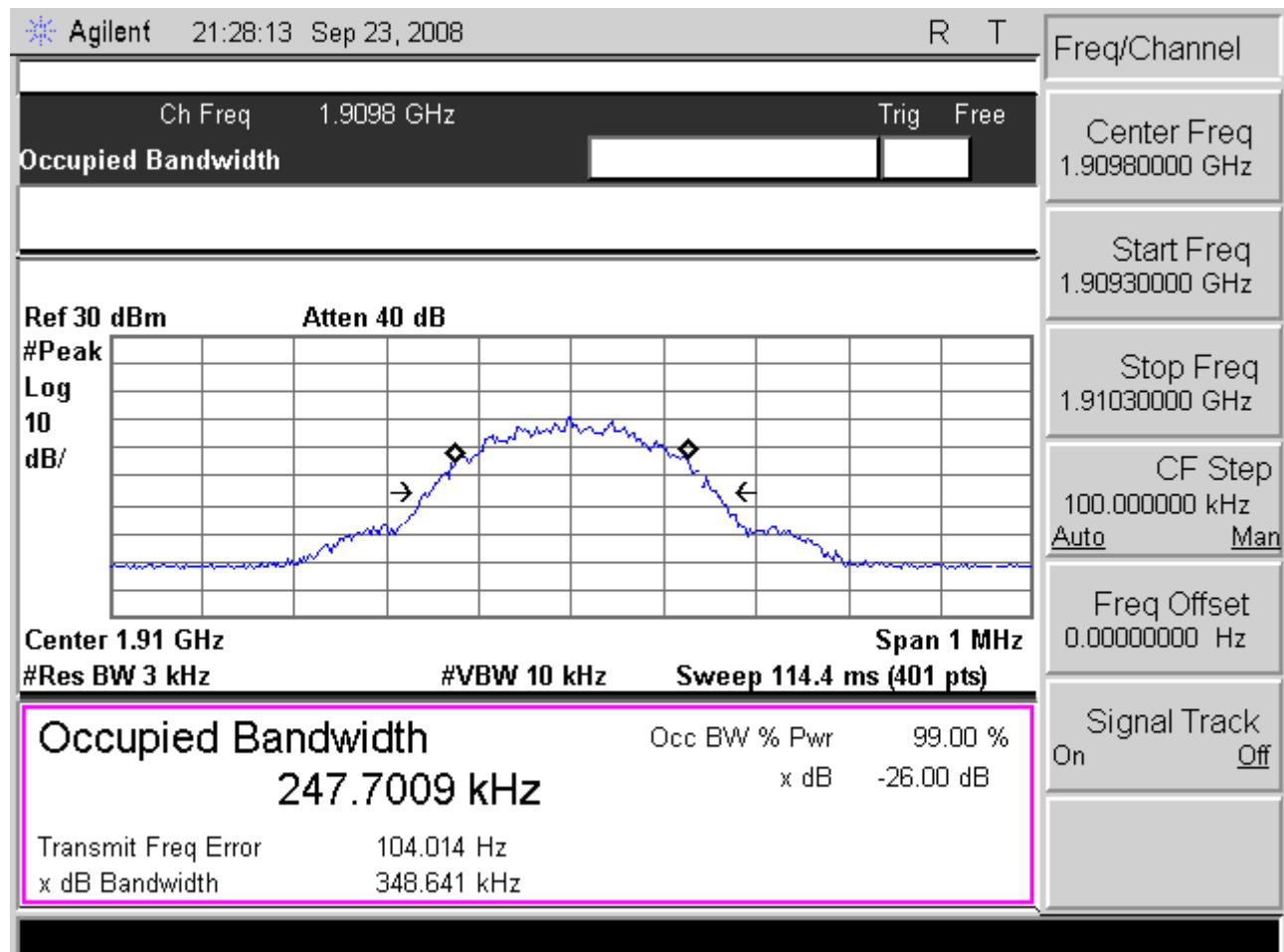
Test Mode: PCS 1900 CH512 99% Occupied Bandwidth


Test Mode: PCS 1900 CH661 99% Occupied Bandwidth


Test Mode: PCS 1900 CH810 99% Occupied Bandwidth


Test Mode: GPRS 1900 (3Down2Up) CH512 99% Occupied Bandwidth


Test Mode: GPRS 1900 (3Down2Up) CH661 99% Occupied Bandwidth


Test Mode: GPRS 1900 (3Down2Up) CH810 99% Occupied Bandwidth




4.4.5 Band Edge Test Result

PCS 1900				
Band	Channel	Frequency (MHz)	Bandwidth (dBm)	Limit (dBm)
Lower	512	1849.980	-16.41	-13
Higher	810	1910.020	-15.20	-13

Please refer to next pager of detail testing data.

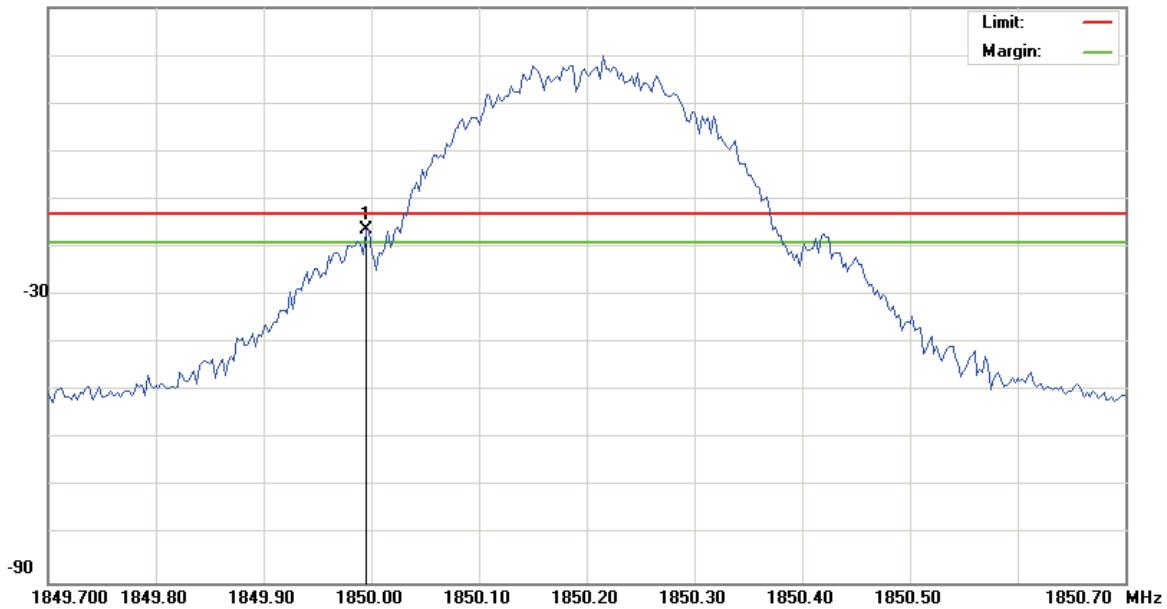
File :Julia(CH512)

Data :#1

Date: 2008/9/23

Time: 下午 09:22:23

30.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1784.8MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	1849.995	-20.66	4.25	-16.41	-13.00	-3.41	peak		Comment

*:Maximum data x:Over limit !:over margin

●Reference Only

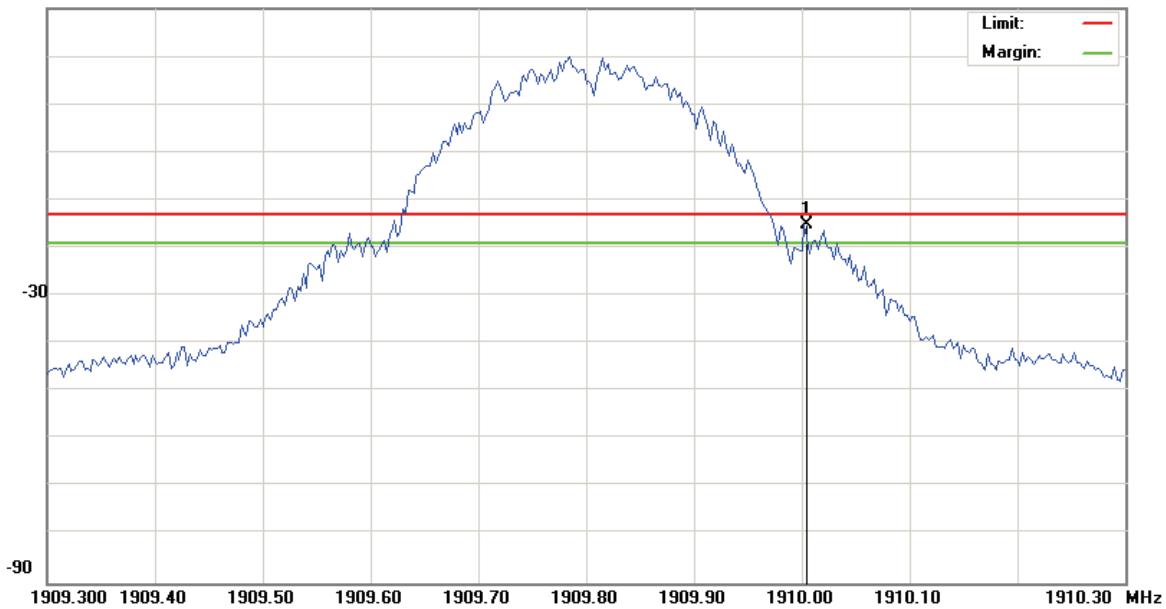
File :Julia(CH810)

Data :#1

Date: 2008/9/23

Time: 下午 09:23:58

30.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	1910.003	-20.90	5.70	-15.20	-13.00	-2.20	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

4.5 Conducted Spurious Emission

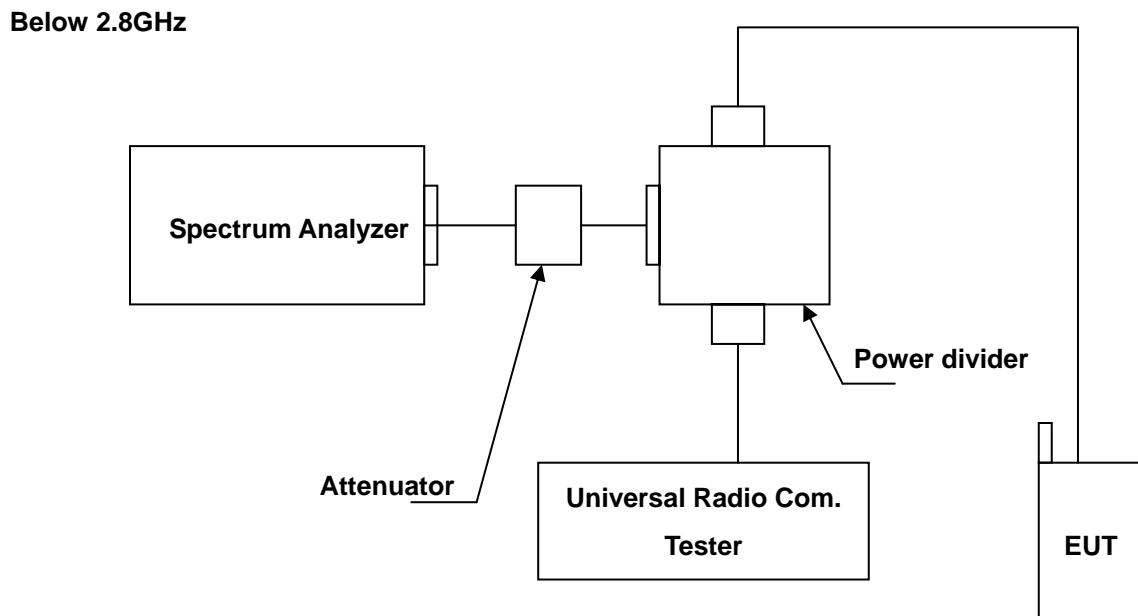
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

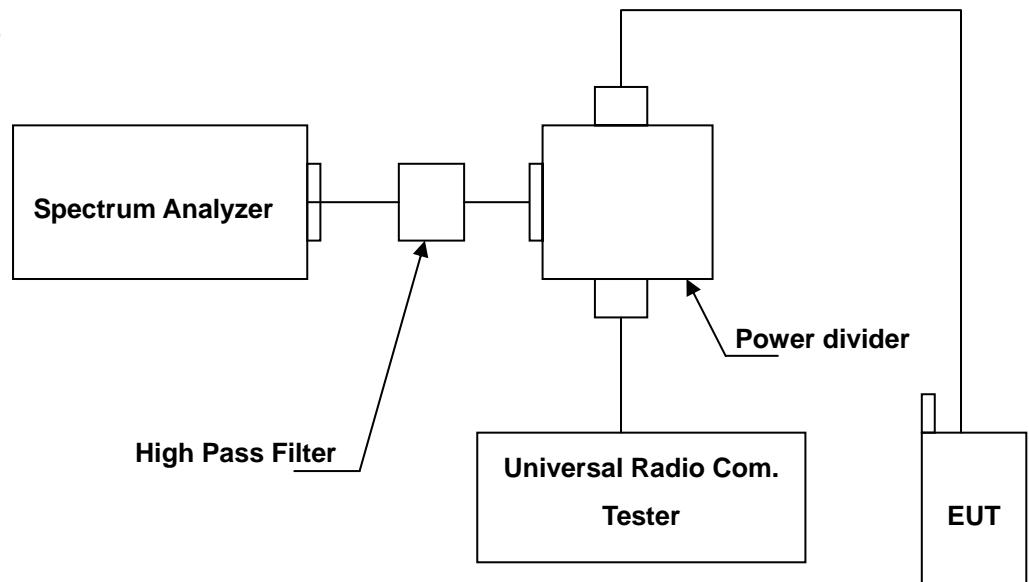
4.5.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.
4. Test setting at GSM 850 RB>100 kHz, VB>100 kHz; PCS 1900 RB>1MHz, VB>1MHz.

4.5.3 Test Setup Layout



Above 2.8GHz





4.5.4 Test Result

Applicant : Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Model No : 830T
EUT : Mobile Phone
Test Mode : PCS 1900 (Low CH512 / Middle CH661 / High CH 810)
Test Date : 09/23/2008

Please refer to next pager of detail testing data.

Note: Amplitude= Reading Amplitude + Factor (Cable loss + Filter Amplitude= Insertion loss)

(Auto calculate in spectrum analyzer)

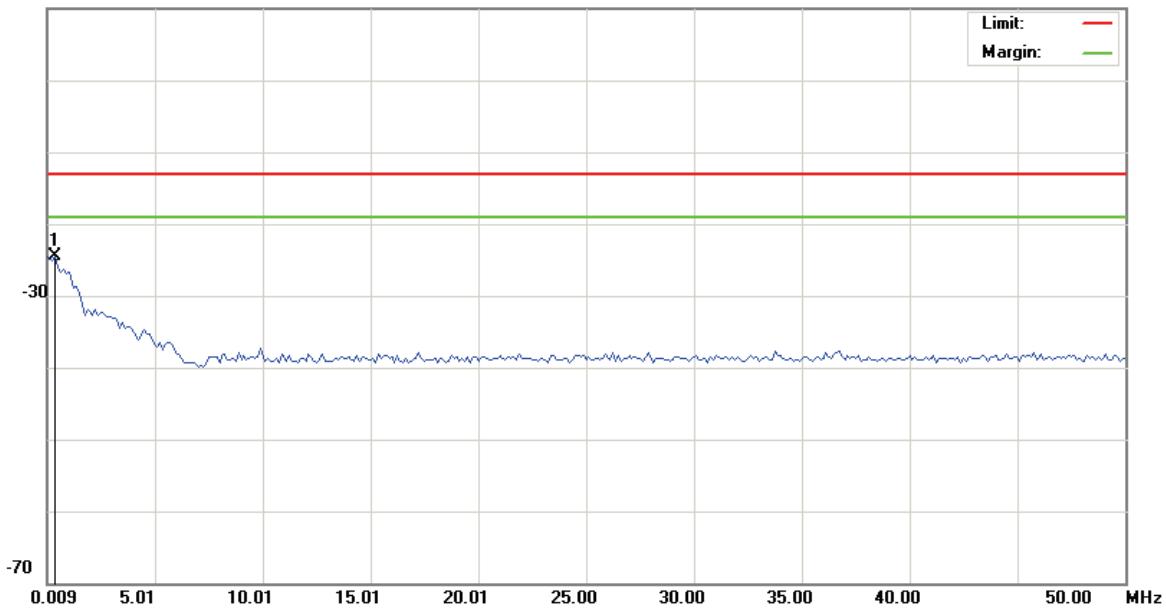
File :SB6(CH512)

Data :#1

Date: 2008/9/23

Time: 下午 08:53:46

10.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1850.2MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table		
			Level	Factor	ment						
			MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	0.3839	-37.26	12.78	-24.48	-13.00	-11.48	peak			

*:Maximum data x:Over limit !:over margin

●Reference Only

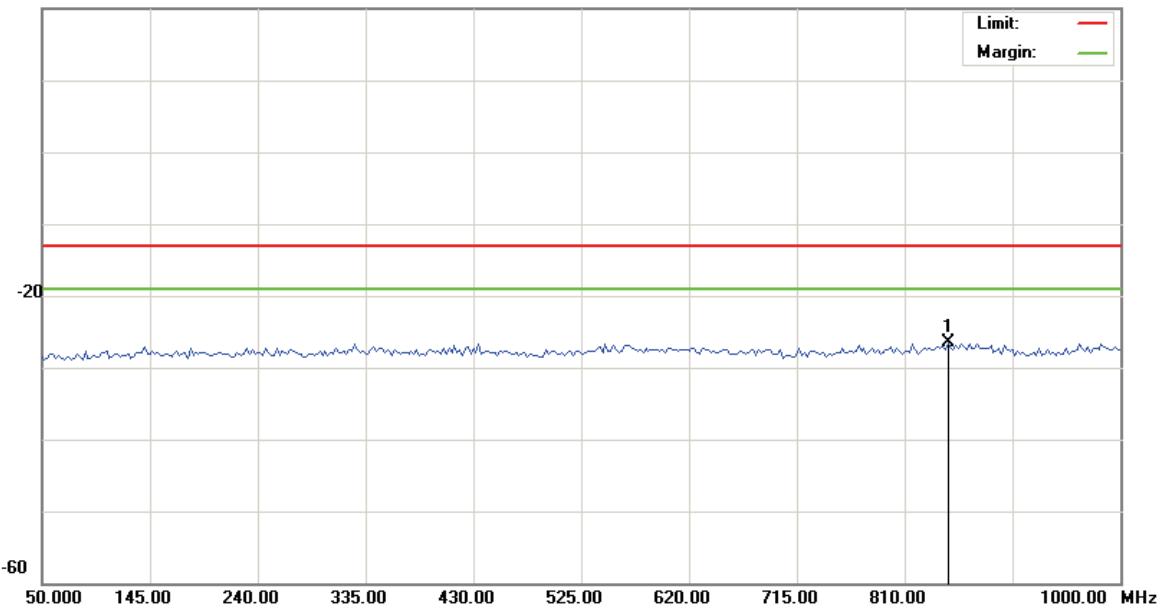
File :SB6(CH512)

Data :#2

Date: 2008/9/23

Time: 下午 08:54:08

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1850.2MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	848.0000	-39.78	13.24	-26.54	-13.00	-13.54	peak		Comment

*:Maximum data x:Over limit !:over margin

●Reference Only

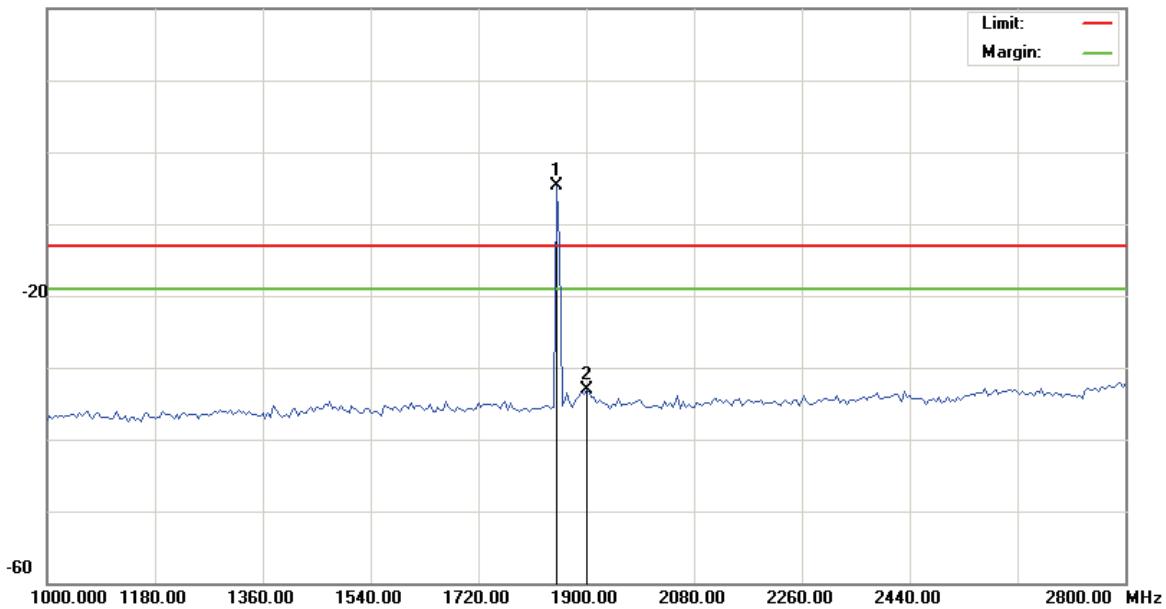
File :SB6(CH512)

Data :#3

Date: 2008/9/23

Time: 下午 09:09:32

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1850.2MHz)

加Notch(5TNF-1700)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment				Height	Degree
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree
1	*	1850.500	-8.87	4.26	-4.61	-13.00	8.39	peak		Main Frequency
2		1900.000	-39.65	6.63	-33.02	-13.00	-20.02	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

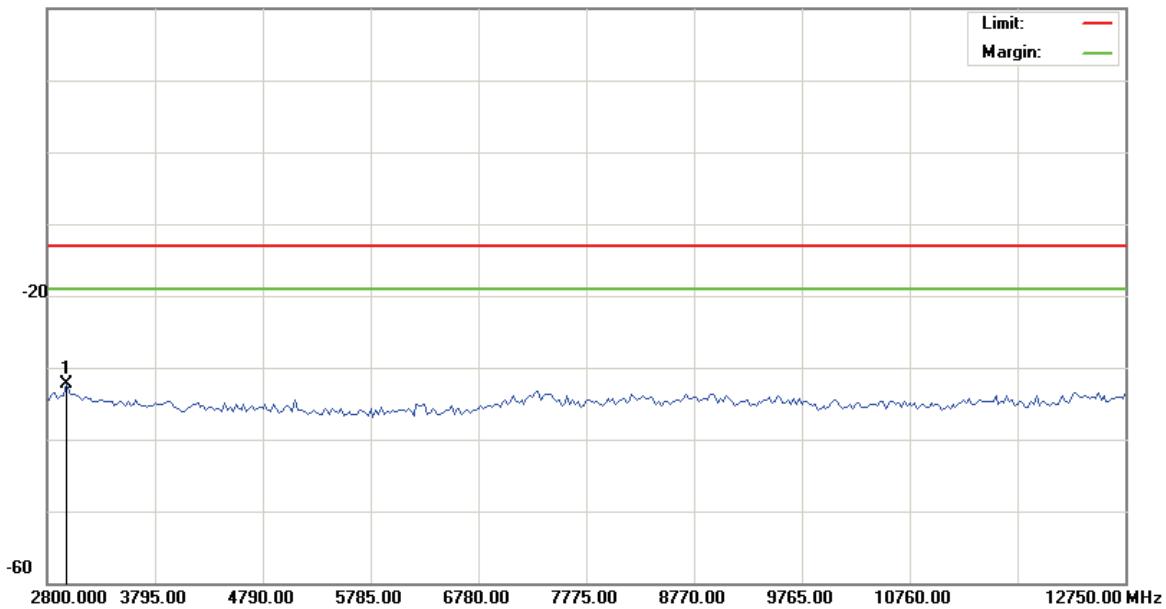
File :SB6(CH512)

Data :#4

Date: 2008/9/23

Time: 下午 09:40:02

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1850.2MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	2974.125	-37.95	5.56	-32.39	-13.00	-19.39	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

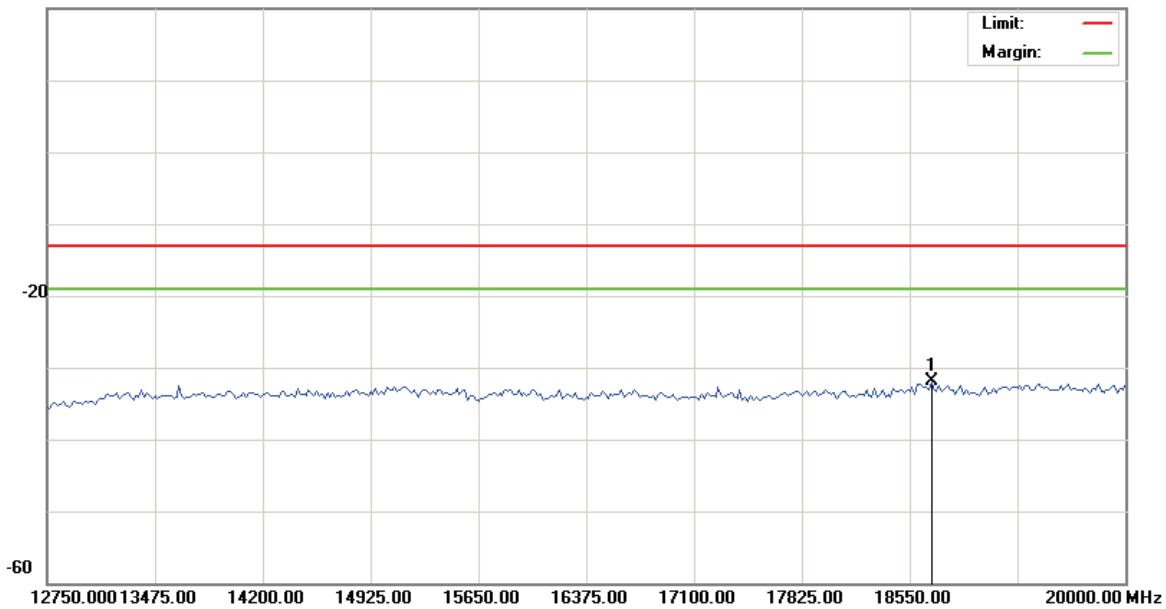
File :SB6(CH512)

Data :#5

Date: 2008/9/23

Time: 下午 09:40:23

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH512(1850.2MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	18695.00	-39.05	7.07	-31.98	-13.00	-18.98	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

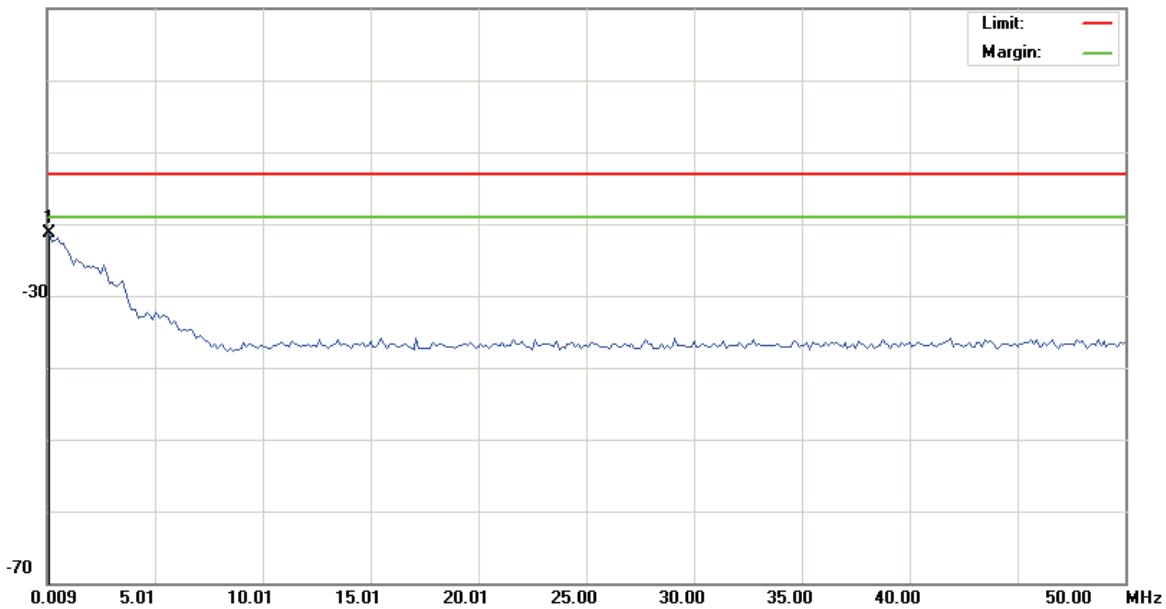
File :SB6(CH661)

Data :#1

Date: 2008/9/23

Time: 下午 08:56:52

10.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH661(1880MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	0.1340	-33.76	12.48	-21.28	-13.00	-8.28	peak		Comment

*:Maximum data x:Over limit !:over margin

●Reference Only

File :SB6(CH661)

Data :#2

Date: 2008/9/23

Time: 下午 08:57:13

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH661(1880MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	634.2500	-38.85	13.14	-25.71	-13.00	-12.71	peak		Comment

*:Maximum data x:Over limit !:over margin

●Reference Only

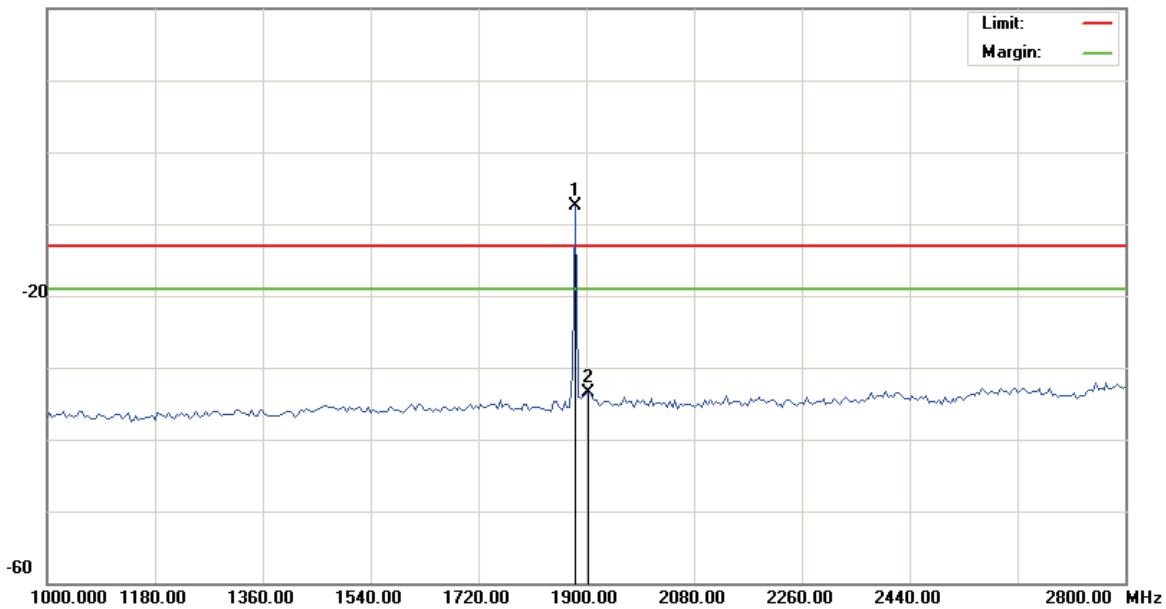
File :SB6(CH661)

Data :#3

Date: 2008/9/23

Time: 下午 09:11:38

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH661(1880MHz)

加Notch(5TNF-1700)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment				Height	Degree
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	1882.000	-12.36	4.83	-7.53	-13.00	5.47	peak		Main Frequency
2		1904.500	-39.75	6.21	-33.54	-13.00	-20.54	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only



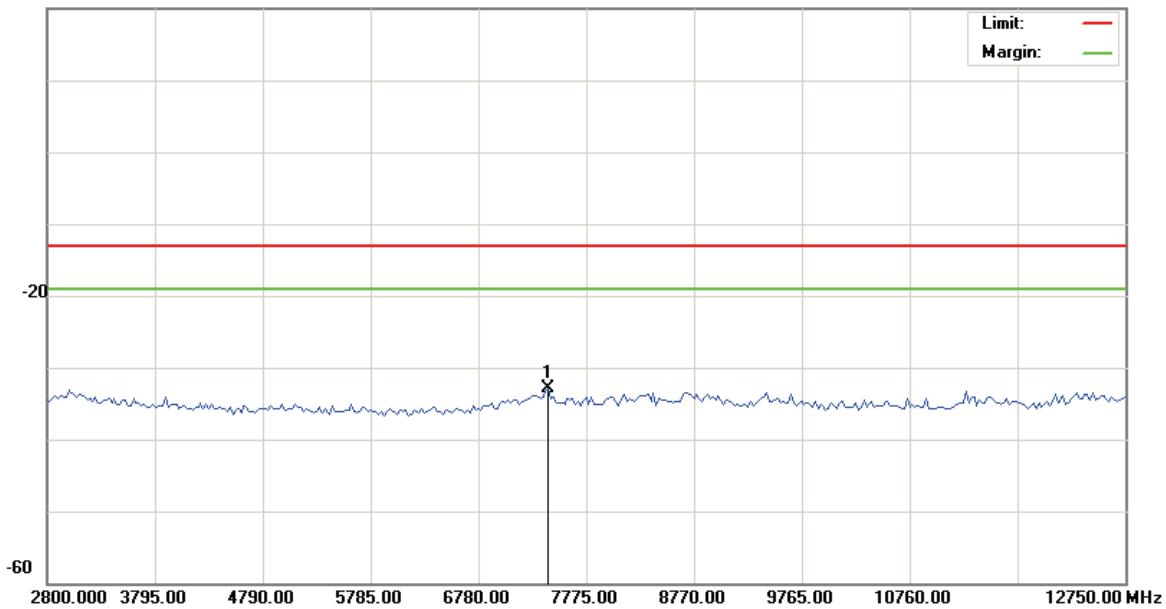
File :SB6(CH661)

Data :#4

Date: 2008/9/23

Time: 下午 09:41:46

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH661(1880MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	7426.750	-38.01	5.15	-32.86	-13.00	-19.86	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only



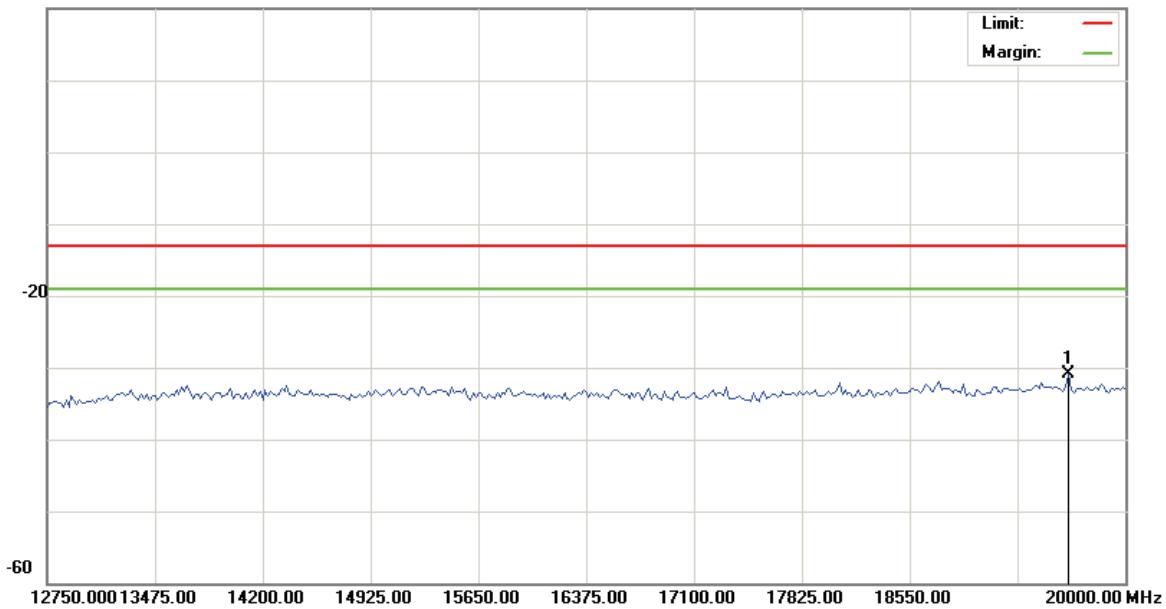
File :SB6(CH661)

Data :#5

Date: 2008/9/23

Time: 下午 09:42:07

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH661(1880MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	19619.37	-38.19	7.33	-30.86	-13.00	-17.86	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

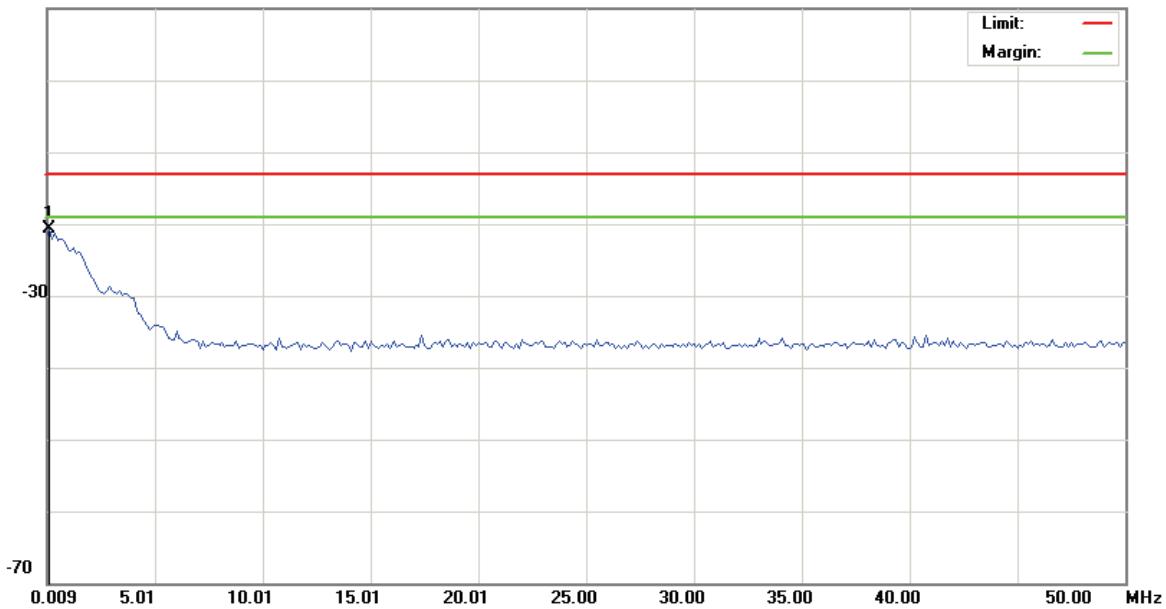
File :SB6(CH885)

Data :#1

Date: 2008/9/23

Time: 下午 08:59:33

10.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table		
			Level	Factor	ment						
			MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	0.1340	-33.26	12.48	-20.78	-13.00	-7.78	peak			

*:Maximum data x:Over limit !:over margin

●Reference Only

File :SB6(CH885)

Data :#2

Date: 2008/9/23

Time: 下午 08:59:54

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

加10db衰減器

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
			MHz	dBm	dB	dBm	dB	Detector	cm	degree
1	*	596.2500	-38.69	13.18	-25.51	-13.00	-12.51	peak		Comment

*:Maximum data x:Over limit !:over margin

●Reference Only

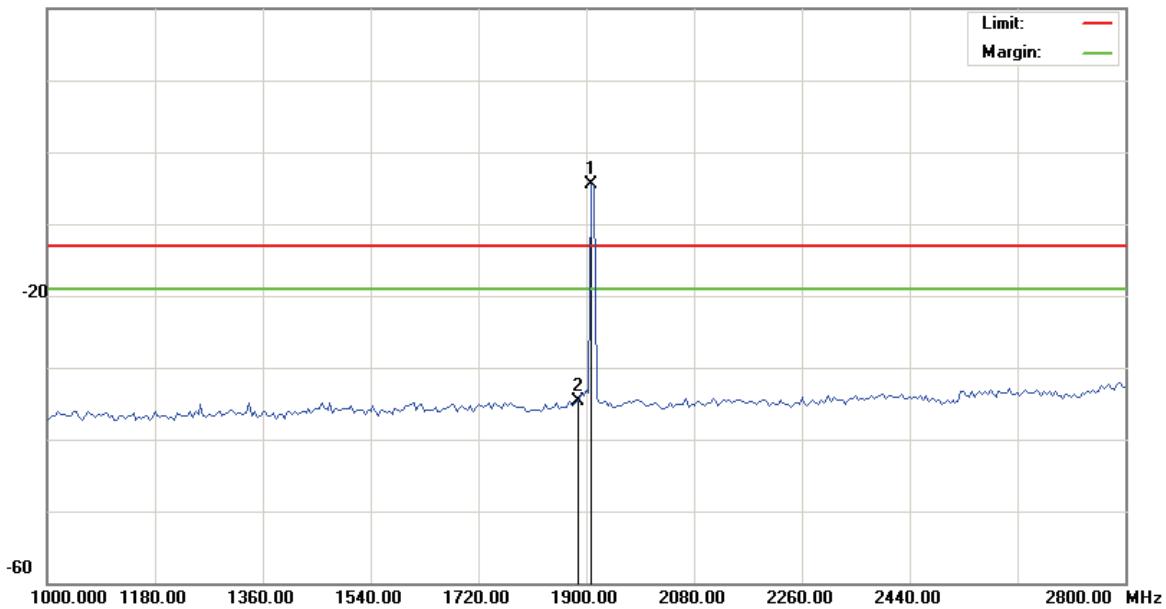
File :SB6(CH885)

Data :#3

Date: 2008/9/23

Time: 下午 09:13:31

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

加Notch(5TNF-1700)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	1909.000	-10.38	5.80	-4.58	-13.00	8.42	peak		Main Frequency
2		1886.500	-39.90	5.28	-34.62	-13.00	-21.62	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

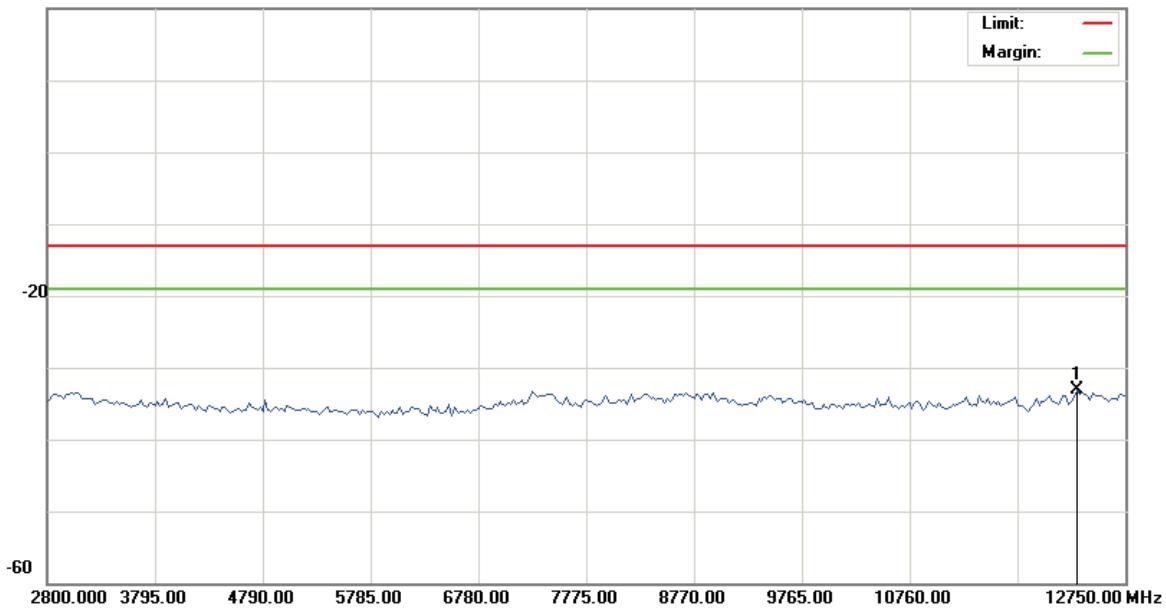
File :SB6(CH885)

Data :#4

Date: 2008/9/23

Time: 下午 09:42:51

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	12302.25	-38.37	5.19	-33.18	-13.00	-20.18	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only

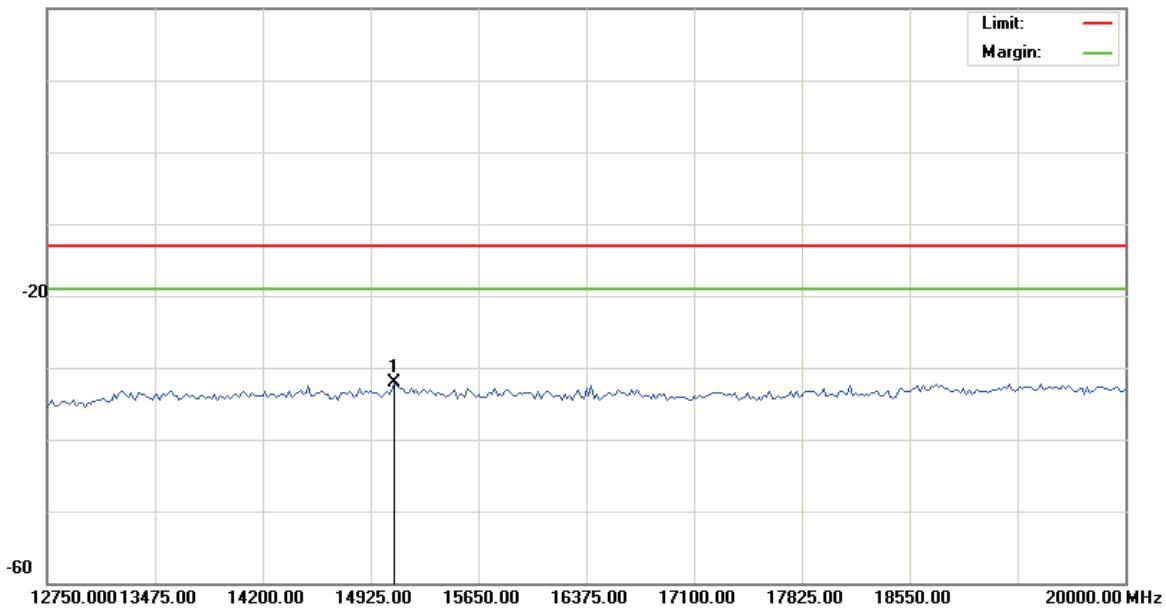
File :SB6(CH885)

Data :#5

Date: 2008/9/23

Time: 下午 09:43:12

20.0 dBm



Site site#1

Polarization: **Conducted po**

Temperature: 26 °C

Limit: FCC Part 24 conducted(9k-12.75G)

Power: AC 110V/60Hz

Humidity: 55 %

EUT:

Distance:

M/N: 08-0221-SEO

Mode: PCS1900

Note: CH810(1909.8MHz)

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
			Level	Factor	ment					
		MHz	dBm	dB	dBm	dB	Detector	cm	degree	Comment
1	*	15088.12	-38.09	6.04	-32.05	-13.00	-19.05	peak		

*:Maximum data x:Over limit !:over margin

●Reference Only



4.6 Field Strength of Spurious Radiation

Equivalent isotropic radiated Power Measurements by substitution method according to ANSI/TIA/EIA-603-A .

4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

4.6.2 Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

The equipment under test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

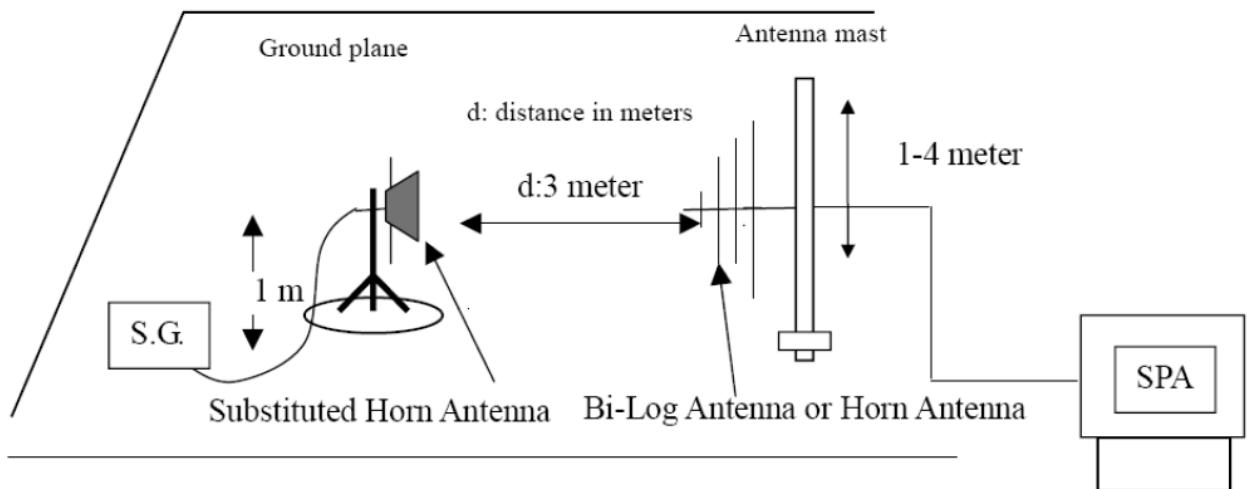
The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole. A fully charged battery was used for the supply voltage.

The settings of the receiver were as follows:

Units	dBm
Resolution Bandwidth	1 MHz
Video Bandwidth	Auto
Sweep Time	Auto

4.6.3 Test Setup Layout

Substituted Method Test Set-up





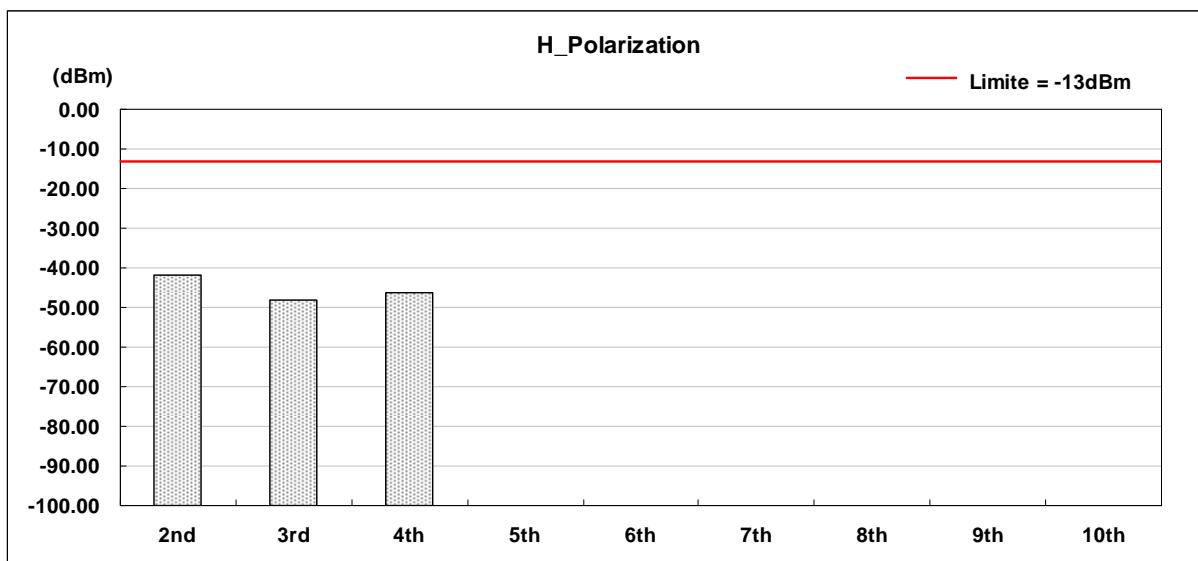
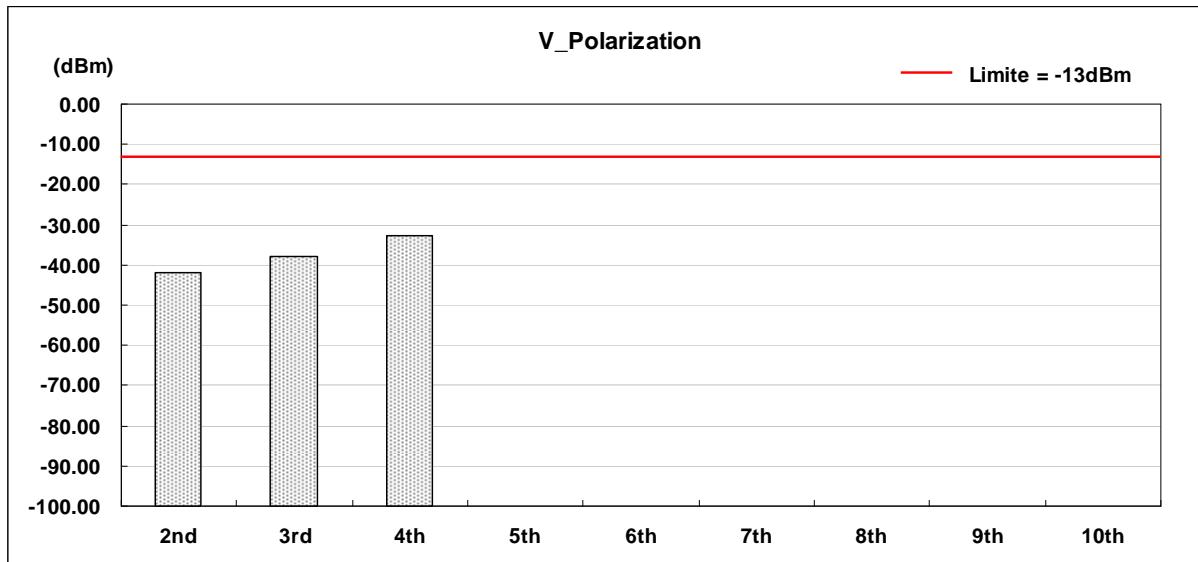
4.6.4 Test Result

Applicant : Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Model No : 830T
EUT : Mobile Phone
Test Mode : PCS 1900 (Low CH512)
Test Date : 09/19/2008

Harmonic	Frequency (MHz)	Polarization	FCC Max. Limit	S.G Power	Substitution Antenna Gain	Cable Loss	Peak Output Power
			(dBm)	(dBm)	(dBi)	(dBm)	(dBm)
2nd	3700.4	V	-13	-52.24	10.72	0.56	-42.08
3rd	5550.6	V	-13	-48.02	10.66	0.62	-37.98
4th	7400.8	V	-13	-42.73	10.78	0.74	-32.69
5th	9251.0	V	-13	*	*	*	*
6th	11101.2	V	-13	*	*	*	*
7th	12951.4	V	-13	*	*	*	*
8th	14801.6	V	-13	*	*	*	*
9th	16651.8	V	-13	*	*	*	*
10th	18502.0	V	-13	*	*	*	*
2nd	3700.4	H	-13	-52.18	10.72	0.56	-42.02
3rd	5550.6	H	-13	-58.22	10.66	0.62	-48.18
4th	7400.8	H	-13	-56.33	10.78	0.74	-46.29
5th	9251.0	H	-13	*	*	*	*
6th	11101.2	H	-13	*	*	*	*
7th	12951.4	H	-13	*	*	*	*
8th	14801.6	H	-13	*	*	*	*
9th	16651.8	H	-13	*	*	*	*
10th	18502.0	H	-13	*	*	*	*

Notes:

- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBd) - Cable\ Loss\ (dB)$
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBi) - Cable\ Loss\ (dB)$



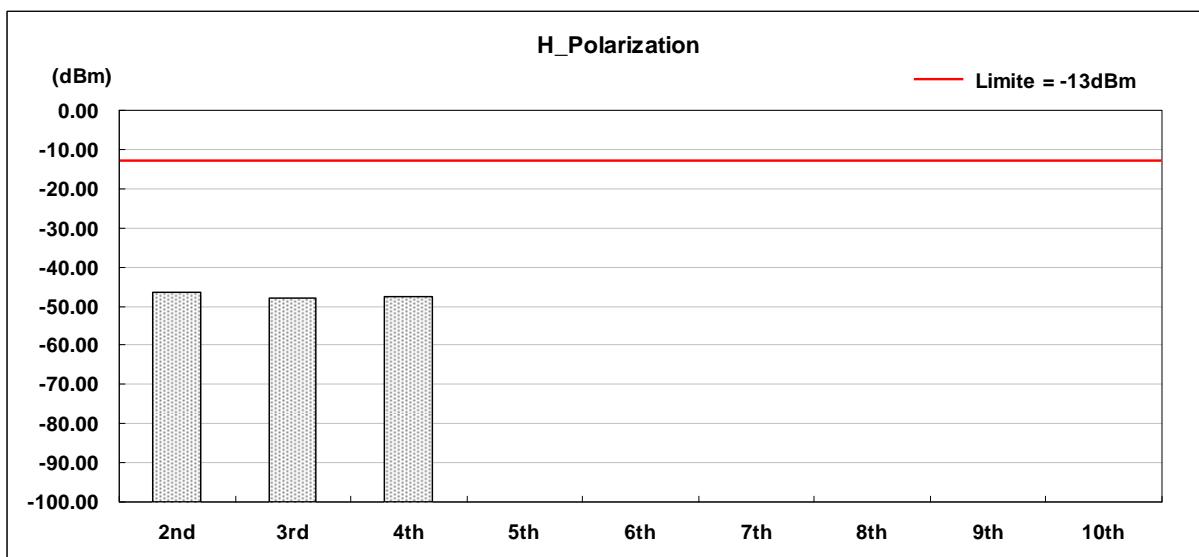
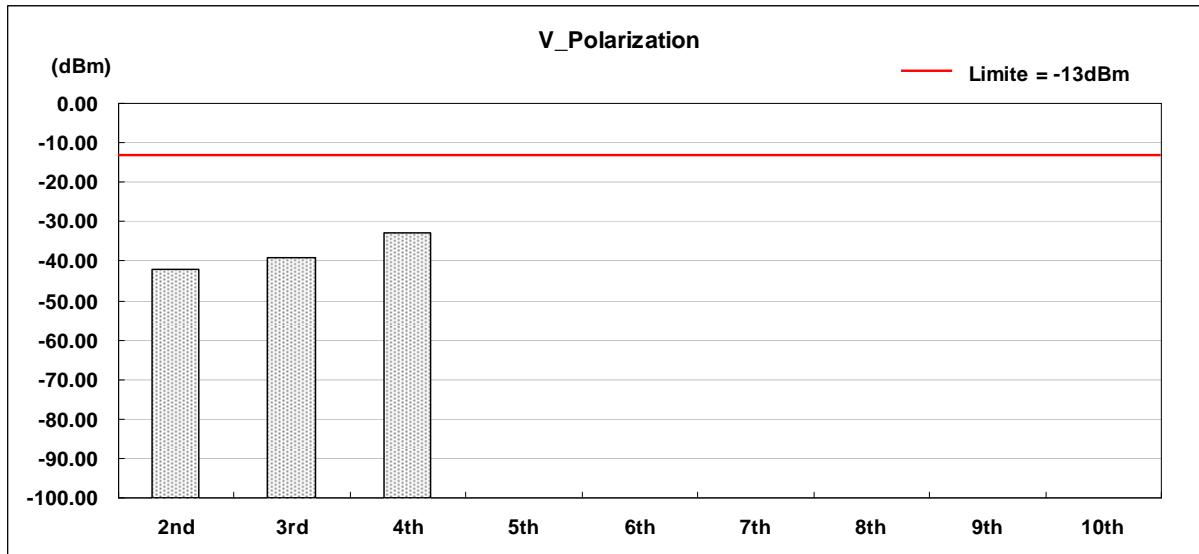


Applicant : Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Model No : 830T
EUT : Mobile Phone
Test Mode : PCS 1900 (Middle CH661)
Test Date : 09/19/2008

Harmonic	Frequency (MHz)	Polarization	FCC Max. Limit	S.G Power	Substitution Antenna Gain	Cable Loss	Peak Output Power
			(dBm)	(dBm)	(dBi)	(dBm)	(dBm)
2nd	3760.0	V	-13	-52.36	10.72	0.56	-42.20
3rd	5640.0	V	-13	-49.00	10.66	0.62	-38.96
4th	7520.0	V	-13	-42.85	10.78	0.74	-32.81
5th	9400.0	V	-13	*	*	*	*
6th	11280.0	V	-13	*	*	*	*
7th	13160.0	V	-13	*	*	*	*
8th	15040.0	V	-13	*	*	*	*
9th	16920.0	V	-13	*	*	*	*
10th	18800.0	V	-13	*	*	*	*
2nd	3760.0	H	-13	-56.50	10.72	0.56	-46.34
3rd	5640.0	H	-13	-58.05	10.66	0.62	-48.01
4th	7520.0	H	-13	-57.46	10.78	0.74	-47.42
5th	9400.0	H	-13	*	*	*	*
6th	11280.0	H	-13	*	*	*	*
7th	13160.0	H	-13	*	*	*	*
8th	15040.0	H	-13	*	*	*	*
9th	16920.0	H	-13	*	*	*	*
10th	18800.0	H	-13	*	*	*	*

Notes:

- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBi) - Cable\ Loss\ (dB)$
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBi) - Cable\ Loss\ (dB)$



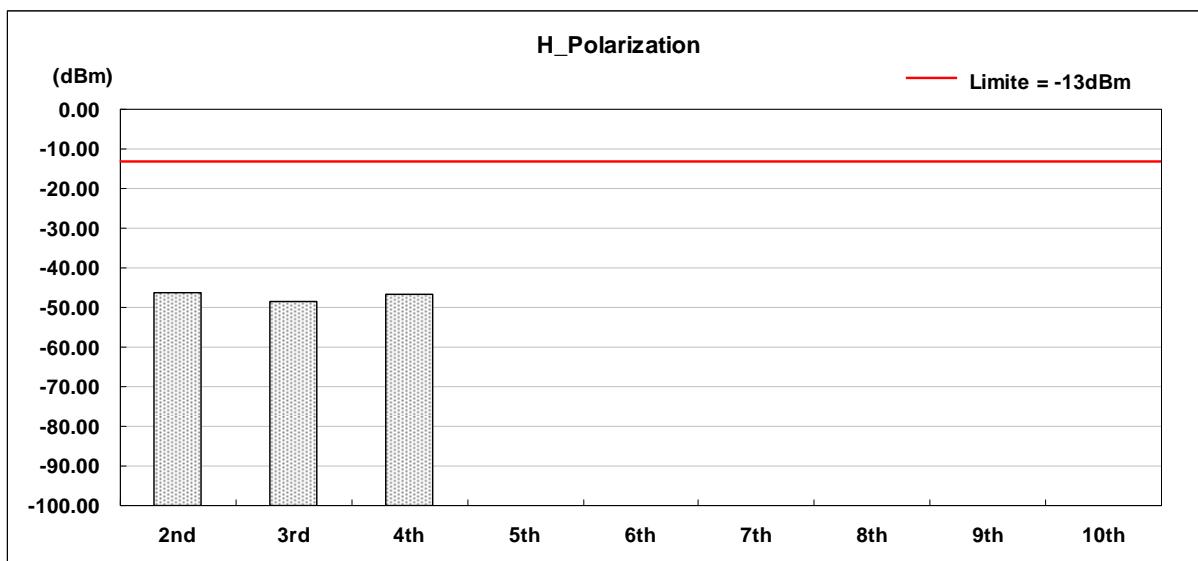
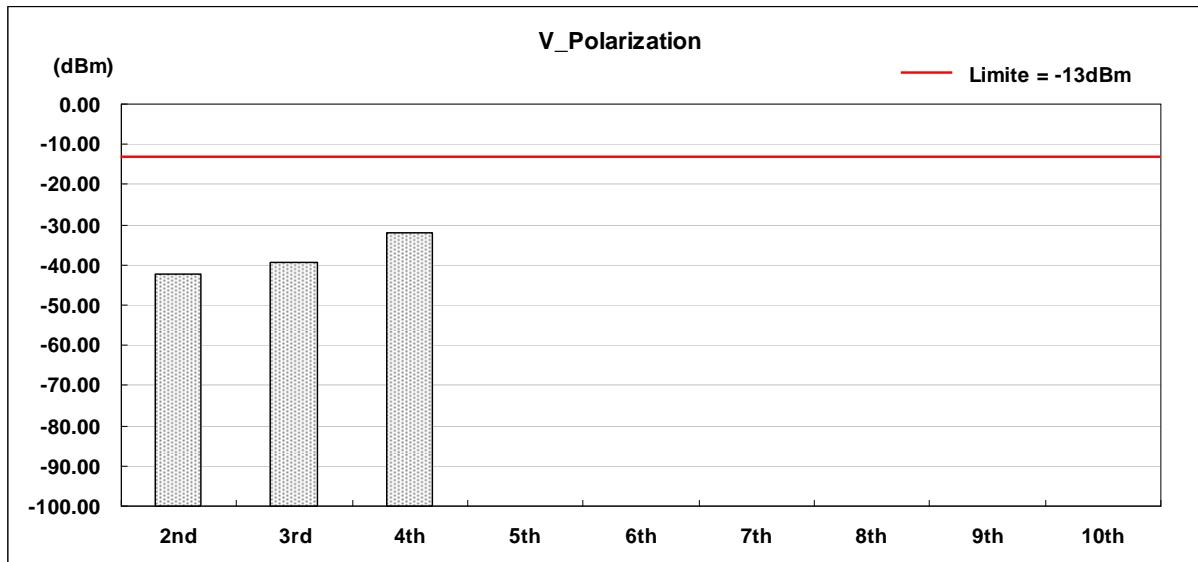


Applicant : Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Model No : 830T
EUT : Mobile Phone
Test Mode : PCS 1900 (High CH 810)
Test Date : 09/19/2008

Harmonic	Frequency (MHz)	Polarization	FCC Max. Limit	S.G Power	Substitution Antenna Gain	Cable Loss	Peak Output Power
			(dBm)	(dBm)	(dBi)	(dBm)	(dBm)
2nd	3819.6	V	-13	-52.36	10.72	0.56	-42.20
3rd	5729.4	V	-13	-49.45	10.66	0.62	-39.41
4th	7639.2	V	-13	-42.08	10.78	0.74	-32.04
5th	9549.0	V	-13	*	*	*	*
6th	11458.8	V	-13	*	*	*	*
7th	13368.6	V	-13	*	*	*	*
8th	15278.4	V	-13	*	*	*	*
9th	17188.2	V	-13	*	*	*	*
10th	19098.0	V	-13	*	*	*	*
2nd	3819.6	H	-13	-56.54	10.72	0.56	-46.38
3rd	5729.4	H	-13	-58.65	10.66	0.62	-48.61
4th	7639.2	H	-13	-56.61	10.78	0.74	-46.57
5th	9549.0	H	-13	*	*	*	*
6th	11458.8	H	-13	*	*	*	*
7th	13368.6	H	-13	*	*	*	*
8th	15278.4	H	-13	*	*	*	*
9th	17188.2	H	-13	*	*	*	*
10th	19098.0	H	-13	*	*	*	*

Notes:

- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBi) - Cable\ Loss\ (dB)$
- $ERP = S.G\ Power\ (dBm) + Substitution\ Antenna\ Gain\ (dBi) - Cable\ Loss\ (dB)$



4.7 Frequency Stability (Temperature Variation)

4.7.1 Measurement Instrument

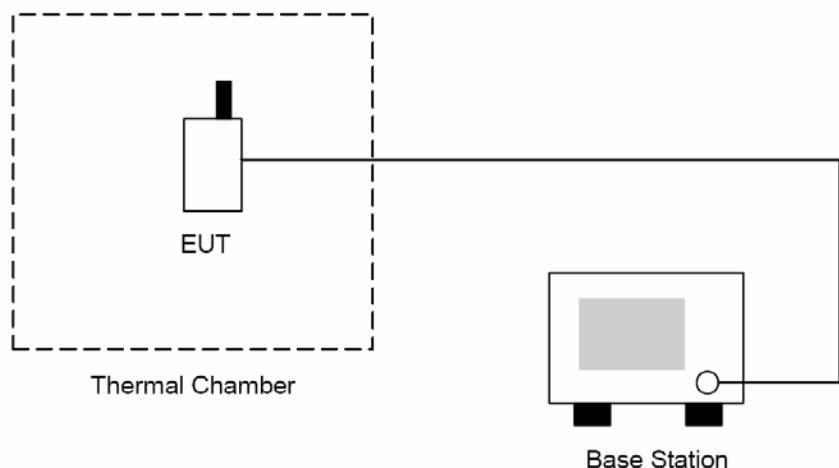
As described in chapter 5 of this test report.

4.7.2 Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The temperature tests were performed for the worst case.
5. Test data was recorded.

4.7.3 Test Setup Layout





4.7.4 Test Result

Test Mode: PCS 1900 CH661

Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)
-30	26.78	0.014	1
-20	28.66	0.015	1
-10	25.47	0.014	1
0	26.32	0.014	1
10	24.74	0.013	1
20	25.83	0.014	1
30	29.39	0.016	1
40	34.61	0.018	1
50	32.71	0.017	1

4.8 Frequency Stability (Voltage Variation)

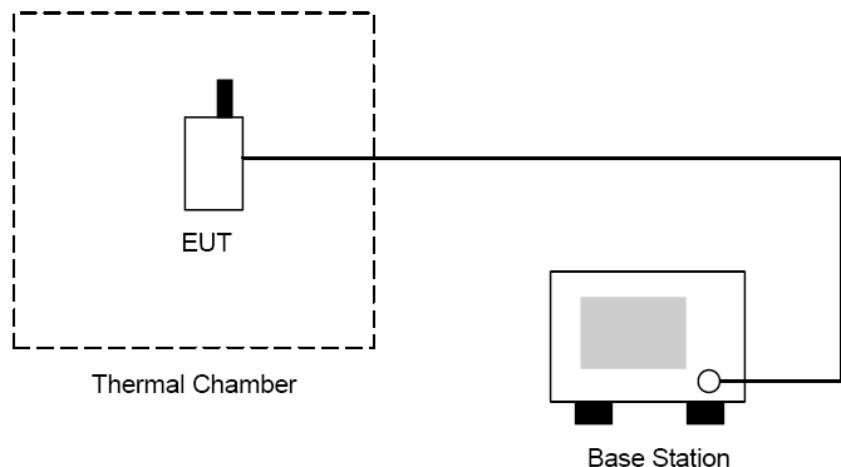
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

1. The EUT was placed in a temperature chamber at 25 ± 5 °C and connected as the following section.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

4.8.3 Test Setup Layout





4.8.4 Test Result

Test Mode: PCS 1900 CH661

Level	Voltage [V]	Deviation [Hz]	Deviation [ppm]	Limit [ppm]
Battery full point	4.20	29.75	0.016	1
Normal	3.70	40.82	0.022	1
Battery cut-off point	3.45	35.98	0.019	1



4.9 AC Power Conducted Emissions Requirements

4.9.1 Measurement Instrument

As described in chapter 5 of this test report.

4.9.2 Test Procedure

The measurement is made according to FCC rules15.207:

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.6.



4.9.3 Test Configuration:

N/A



4.9.4 Test condition:

EUT tested in accordance with the specifications given by the Manufacturer, and exercised in the most unfavorable manner.

4.9.5 Conducted Emissions Limits:

Frequency range (MHz)	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50



4.9.6 Test Result

Applicant : Toshiba Information Systems (UK) Ltd, Mobile Communications Division
Model No : 830T
EUT : Mobile Phone (with Charger)
Test Mode : N/A
Test Date : N/A



5. List of Measurement Equipments

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
Agilent	Spectrum analyzer	E4408B	MY45107753	Jun. 05, 2008	Jun. 05, 2009
R&S	Receiver	ESCI	100367	Jun. 05, 2008	Jun. 05, 2009
SCHWARZBECK	Trilog Broadband Antenna	VULB 9163	9163-270	Jun. 26, 2008	Jun. 26, 2009
SCHWARZBECK	Broadband Horn Antenna	BBHA 9120D	9120D-550	Jun. 26, 2008	Jun. 26, 2009
SCHWARZBECK	Broadband Horn Antenna	BBHA 9170	9170-320	Jun. 09, 2008	Aug. 07, 2009
Agilent	Amplifier	8447D	2944A10961	Jun. 10, 2008	Jun. 10, 2009
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	112387	Oct. 24, 2007	Oct. 24, 2008
Spectrum Analyzer	Agilent	E4445A	MY45300744	Nov. 29, 2007	Nov. 29, 2008
Loop Dipole	ETS-Lindgren	3127-1880	00052640	Jul. 02, 2008	Jul. 02, 2009
Loop Dipole	ETS-Lindgren	3127-836	00055272	Jun. 29, 2008	Jun. 29, 2009
Sleeve Dipole	ETS-Lindgren	3126-1845	00056670	Jun. 29, 2008	Jun. 29, 2009
Sleeve Dipole	ETS-Lindgren	3126-880	00052705	Jun. 29, 2008	Jun. 29, 2009
Anechoic Chamber	ETS-Lindgren	AMS 8500	S/N 102165	NA	
High Pass Filter	MICRO-TRONICS	HPM50108	020	NA	
High Pass Filter	MICRO-TRONICS	HPM50111	021	NA	
Circularly Polarized Communication Antennas	EMCO	3102	00051714	NA	
Pattern Measurement Software	ETS-Lindgren	EMQuest™ EMQ-100	NA	NA	
Desktop Computer with Windows XP		Dell Computers	NA	NA	
Antenna Positioner Controller	EMCO	2090	00052447	NA	
MAPS Positioner	EMCO	2010/2015	NA	NA	
Filter	K&L	5TNF-1700/2000-0.1N/N	166	NA	
Filter	K&L	3TNF-800/1000-0.2N/N	274	NA	
Attenuator	RADIALL	R41572000	0603033073	NA	
Splitter	Powercom	SGR-GFQ-2-D	41106609	NA	
Power divider	Agilent	87302C	3239A00760	NA	

6. Uncertainty Evaluation

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of χ_i		$U(\chi_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty $U_c(y)$	1.27		
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	2.54		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of χ_i		$U(\chi_i)$	C_i	$C_i * U(\chi_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\sqrt{1} = 0.197$ Antenna VSWR $\sqrt{2} = 0.194$ Uncertainty=20log(1- $\sqrt{1} * \sqrt{2} * \sqrt{3}$)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	4.72				