ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**FORE100**
Brand Name:	**N/A**
Model Name:	**FORE100**
Model Differences:	**N/A**
FCC ID:	**NM8FORE**
Report No.:	**ER/2006/70002**
Issue Date:	**Jul. 27, 2006**
FCC Rule Part:	**§15.247**
Prepared for	**High Tech Computer Corp.** **No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan**
Prepared by:	**SGS Taiwan Ltd.** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

VERIFICATION OF COMPLIANCE

Applicant:	High Tech Computer Corp. No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan
Equipment Under Test:	FORE100
Brand Name:	N/A
FCC ID Number:	NM8FORE
Model No.:	FORE100
Model Difference:	N/A
File Number:	ER/2006/70002
Date of test:	Jul. 10, 2006 ~ Jul. 24, 2006
Date of EUT Received:	Jul. 10, 2006

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Alex Hsieh	***Date***	Jul. 27, 2006
	Alex Hsieh		
Prepared By:	Elisa Chen	***Date***	Jul. 27, 2006
	Elisa Chen		
Approved By	Vincent Su	***Date***	Jul. 27, 2006
	Vincent Su		

Version

Version No.	Date
00	Jul. 27, 2006

Table of Contents

1. GENERAL INFORMATION

1.1. Product Description

Product Name	FORE100
Model Name	FORE100
Model Difference:	N/A
Trade Name	N/A
Power Supply	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter
AC Adaptor	ADP-5FH B, Supplier: DELTA
Battery	Model No.: ST26B, ST26A, ST26C
Simple Hands-Free (SHF)	Mode No.: EMC-220-004-01, Supplier: MERRY
Data lead (USB)	Mode No.: N/A, Supplier: MEC
Cigar Lighter Adaptor (CLA)	No.

GSM:

Frequency Range and Power	TX: 824.2 MHz – 848.8 MHz	33 dBm
	TX: 1850.2MHz –1909.8MHz	30 dBm
Type of Emission	300KGXW	
Software Version	N/A	
Hardware Version	N/A	
IMEI	356854000016409	
Antenna Designation	PIFA Antenna, 850MHz, 0dBi(peak); 1900MHz, 0dBi(peak)	

Bluetooth:

Frequency Range	2402 – 2480MHz
Channel number	79 channels
Rated Power	3.41 dBm
Modulation type	Frequency Hopping Spread Spectrum (FHSS)(GFSK)
Antenna Designation	Trace Antenna, 0 dBi, Non-User Replaceable (Fixed)

The EUT compliances with Bluetooth Standard.

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: NM8FORE** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a Doc procedure.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements. Site No. 1(3 &10 meters) Registration Number: 94644, Both OATS and Anechoic chamber (3 meters) was accredited by CNLA (0513).

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

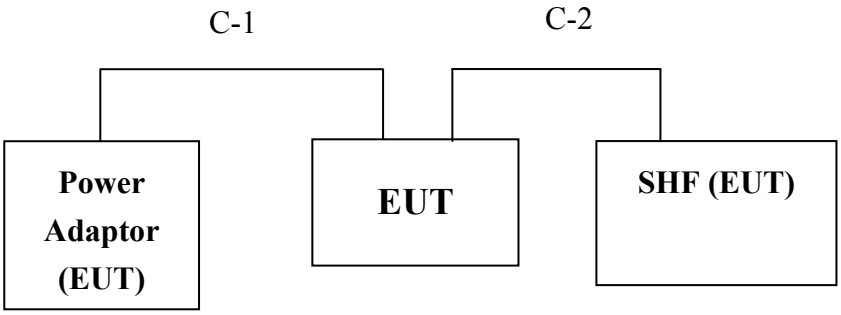


Fig. 2-2 Configuration (Remote Side, on the corner)

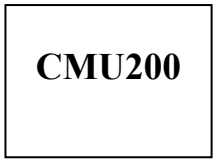


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Test Software	Foreseer	Foreseer_BTtestmode_20060324	N/A	N/A	N/A

Table 2-2 Support Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	N/A	Un-shielded

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(a)	20dB Bandwidth	Compliant
§15.247(c)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.209(a) (f)	Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	Time of Occupancy	Compliant
§15.247	Peak Power Density	Compliant
§15.203, §15.247(b)(4)(i)	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth Transmitter for channel Low, Mid and High the worst case E2 mode was reported.

The field strength of co-located spurious radiation emission was measured as worst case of EUT at E2 position at Bluetooth channel highest with GSM 850 at channel high mode was reported.

5. CONDUCTED EMISSION TEST

5.1. Standard Applicable

According to §15.207. frequency within 150KHz to 30MHz shall not exceed the limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

5.2. EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
2. The EUT was plug-in the AC/DC Power adapter. The host system was placed on the center of the back edge on the test table. The peripherals was placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The spacing between the peripherals was 10 centimeters.
4. External I/O cables were draped along the edge of the test table and bundle when necessary.
5. The host system was connected with 110Vac/60Hz power source.

5.3. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.4. Measurement Equipment Used:

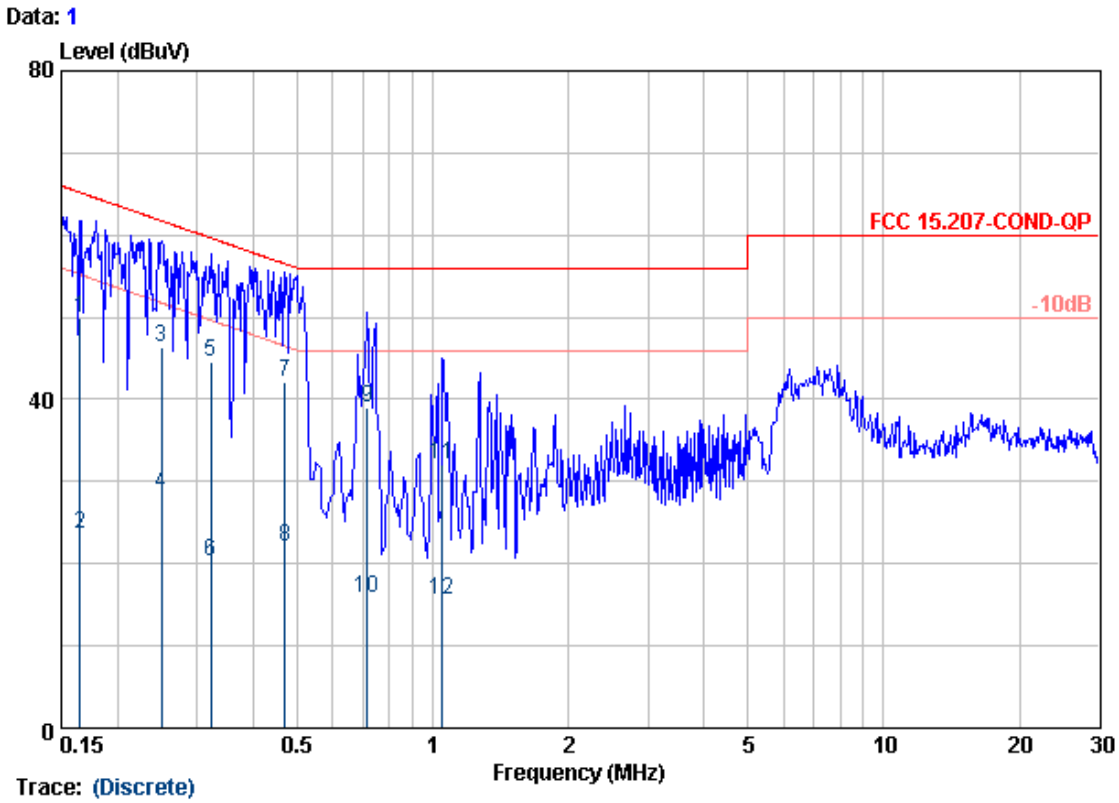
Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMC Analyzer	HP	8594EM	3624A00203	09/02/2005	09/03/2006
EMI Test Receiver	R&S	ESCS30	828985/004	06/09/2006	06/10/2007
Transient Limiter	HP	11947A	3107A02062	09/02/2005	09/03/2006
LISN	Rolf-Heine	NNB-2/16Z	99012	12/31/2005	12/30/2006
LISN	Rolf-Heine	NNB-2/16Z	99013	12/24/2005	12/23/2006
Coaxial Cables	N/A	No. 3, 4	N/A	12/01/2005	12/01/2206

5.5. Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

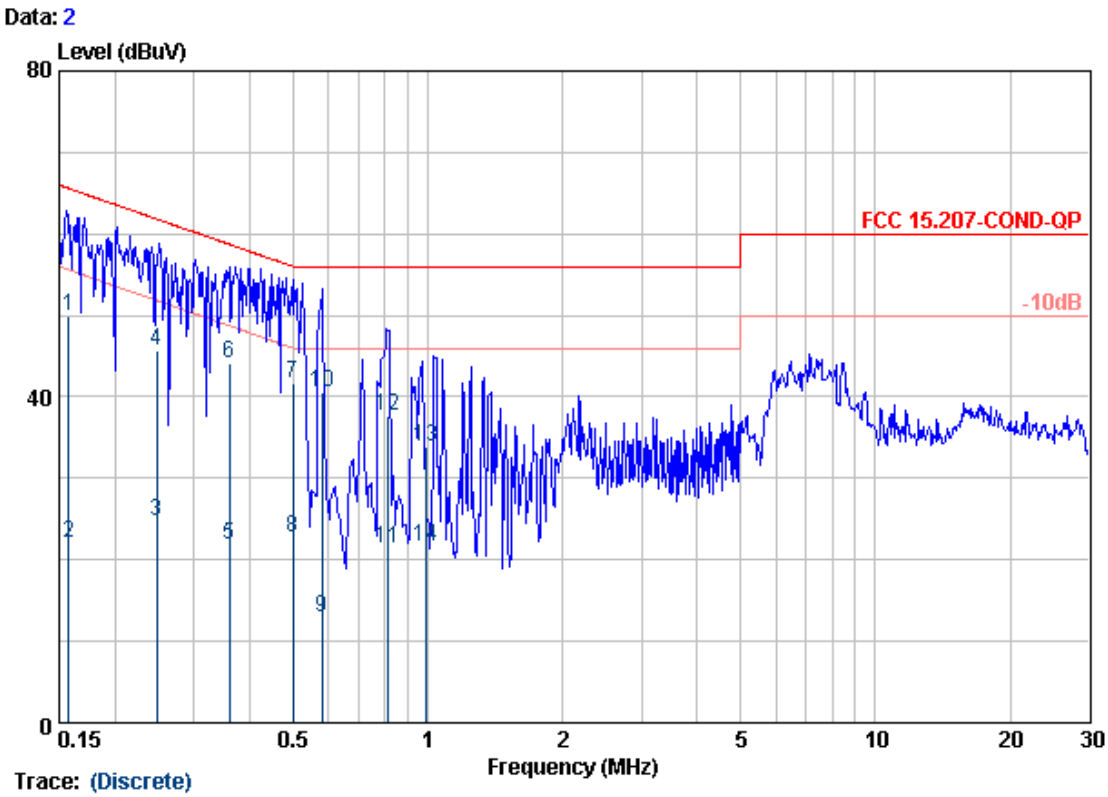
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	GSM850 link+BT on (AC Adaptor)			Test Date:	Jul. 15, 2006
Temperature:	25 ℃	Humidity:	65 %	Test By:	Alex



Site : RF Site
Condition : FCC 15.207-COND-QP NNB-2/16Z(99012) LINE
Project No. : ER/2006/70002~03
Applicant : 宏達
EUT Description : FORE100
EUT Model : FORE100
Test Mode : GSM850 link + BT ON (AC ADAPTER)
Temp./Humid. : 25/65
Operator : Alex

	Freq	Pol/Phase	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz		dBuV	dB	dBuV	dBuV	dB	
1	0.17	LINE	49.80	0.20	50.00	65.21	-15.21	QP
2	0.17	LINE	23.35	0.20	23.55	65.21	-41.66	AVERAGE
3	0.25	LINE	46.26	0.20	46.46	61.73	-15.27	QP
4	0.25	LINE	28.22	0.20	28.42	61.73	-33.31	AVERAGE
5	0.32	LINE	44.44	0.20	44.64	59.66	-15.02	QP
6	0.32	LINE	20.06	0.20	20.26	59.66	-39.40	AVERAGE
7	0.47	LINE	41.90	0.20	42.10	56.49	-14.39	QP
8	0.47	LINE	21.87	0.20	22.07	56.49	-34.42	AVERAGE
9	0.72	LINE	38.71	0.21	38.92	56.00	-17.08	QP
10	0.72	LINE	15.51	0.21	15.72	56.00	-40.28	AVERAGE
11	1.05	LINE	31.90	0.21	32.11	56.00	-23.89	QP
12	1.05	LINE	15.34	0.21	15.55	56.00	-40.45	AVERAGE

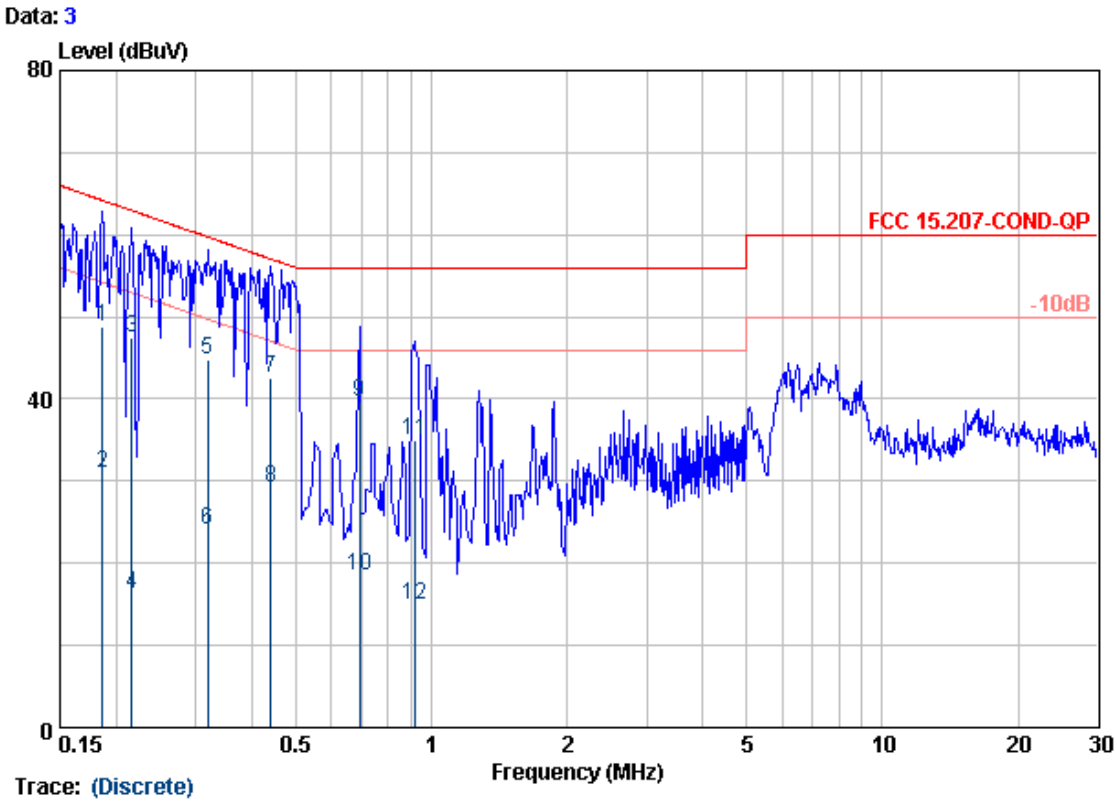


Site : RF Site
Condition : FCC 15.207-COND-QP NNB-2/16Z(99012) NEUTRAL
Project No. : ER/2006/70002-03
Applicant : 宏達
EUT Description : FORE100
EUT Model : FORE100
Test Mode : GSM850 link + BT ON (AC ADAPTER)
Temp./Humid. : 25/65
Operator : Alex

	Freq	Pol/Phase	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz		dBuV	dB	dBuV	dBuV	dB	
1	0.16	NEUTRAL	49.80	0.20	50.00	65.60	-15.60	QP
2	0.16	NEUTRAL	21.80	0.20	22.00	65.60	-43.60	AVERAGE
3	0.25	NEUTRAL	24.47	0.20	24.67	61.83	-37.16	AVERAGE
4	0.25	NEUTRAL	45.50	0.20	45.70	61.83	-16.13	QP
5	0.36	NEUTRAL	21.64	0.20	21.84	58.71	-36.87	AVERAGE
6	0.36	NEUTRAL	43.94	0.20	44.14	58.71	-14.57	QP
7	0.50	NEUTRAL	41.36	0.20	41.56	56.02	-14.46	QP
8	0.50	NEUTRAL	22.56	0.20	22.76	56.02	-33.26	AVERAGE
9	0.58	NEUTRAL	12.81	0.20	13.01	56.00	-42.99	AVERAGE
10	0.58	NEUTRAL	40.43	0.20	40.63	56.00	-15.37	QP
11	0.81	NEUTRAL	21.26	0.21	21.47	56.00	-34.53	AVERAGE
12	0.81	NEUTRAL	37.46	0.21	37.67	56.00	-18.33	QP
13	0.99	NEUTRAL	33.72	0.21	33.93	56.00	-22.07	QP
14	0.99	NEUTRAL	21.49	0.21	21.70	56.00	-34.30	AVERAGE

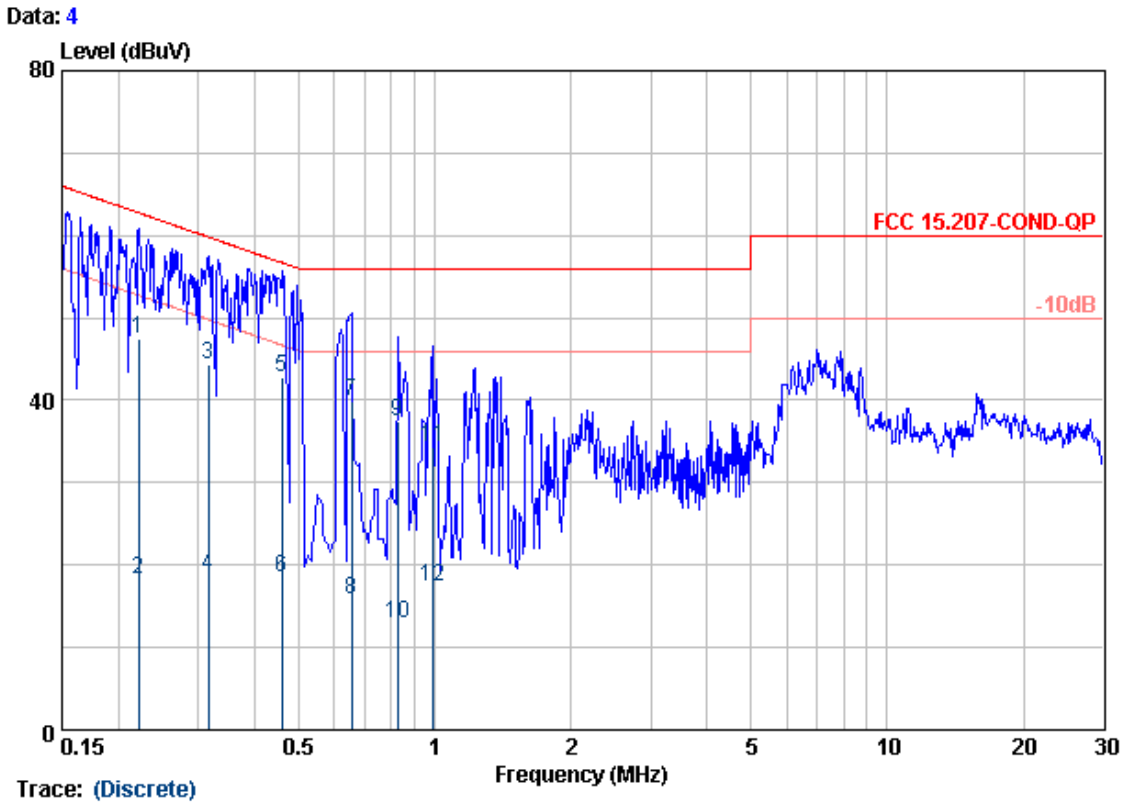
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	GSM1900 link+BT on (AC Adaptor)			Test Date:	Jul. 15, 2006
Temperature:	25 ℃	Humidity:	65 %	25 ℃	Humidity:



Site	: RF Site
Condition	: FCC 15.207-COND-QP NNB-2/16Z(99012) LINE
Project No.	: ER/2006/70002~03
Applicant	: 宏達
EUT Description	: FORE100
EUT Model	: FORE100
Test Mode	: GSM1900 link + BT ON (AC ADAPTER)
Temp./Humid.	: 25/65
Operator	: Alex

	Freq	Pol/Phase	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz		dBuV	dB	dBuV	dBuV	dB	
1	0.19	LINE	48.67	0.20	48.87	64.20	-15.33	QP
2	0.19	LINE	30.84	0.20	31.04	64.20	-33.16	AVERAGE
3	0.22	LINE	47.37	0.20	47.57	62.96	-15.39	QP
4	0.22	LINE	16.09	0.20	16.29	62.96	-46.67	AVERAGE
5	0.32	LINE	44.69	0.20	44.89	59.75	-14.86	QP
6	0.32	LINE	23.76	0.20	23.96	59.75	-35.79	AVERAGE
7	0.44	LINE	42.40	0.20	42.60	57.07	-14.47	QP
8	0.44	LINE	28.98	0.20	29.18	57.07	-27.89	AVERAGE
9	0.69	LINE	39.37	0.21	39.58	56.00	-16.42	QP
10	0.69	LINE	18.31	0.21	18.52	56.00	-37.48	AVERAGE
11	0.92	LINE	34.70	0.21	34.91	56.00	-21.09	QP
12	0.92	LINE	14.68	0.21	14.89	56.00	-41.11	AVERAGE



Site	: RF Site
Condition	: FCC 15.207-COND-QP NNB-2/16Z(99012) NEUTRAL
Project No.	: ER/2006/70002-03
Applicant	: 宏達
EUT Description	: FORE100
EUT Model	: FORE100
Test Mode	: GSM1900 link + BT ON (AC ADAPTER)
Temp./Humid.	: 25/65
Operator	: Alex

	Freq	Pol/Phase	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz		dBuV	dB	dBuV	dBuV	dB	
1	0.22	NEUTRAL	47.36	0.20	47.56	62.74	-15.18	QP
2	0.22	NEUTRAL	18.02	0.20	18.22	62.74	-44.52	AVERAGE
3	0.32	NEUTRAL	44.05	0.20	44.25	59.80	-15.55	QP
4	0.32	NEUTRAL	18.51	0.20	18.71	59.80	-41.09	AVERAGE
5	0.46	NEUTRAL	42.53	0.20	42.73	56.71	-13.98	QP
6	0.46	NEUTRAL	18.22	0.20	18.42	56.71	-38.29	AVERAGE
7	0.65	NEUTRAL	39.70	0.21	39.91	56.00	-16.09	QP
8	0.65	NEUTRAL	15.70	0.21	15.91	56.00	-40.09	AVERAGE
9	0.83	NEUTRAL	37.13	0.21	37.34	56.00	-18.66	QP
10	0.83	NEUTRAL	12.64	0.21	12.85	56.00	-43.15	AVERAGE
11	0.99	NEUTRAL	34.18	0.21	34.39	56.00	-21.61	QP
12	0.99	NEUTRAL	17.11	0.21	17.32	56.00	-38.68	AVERAGE

6. PEAK OUTPUT POWER MEASUREMENT

6.1. Standard Applicable

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: 0.125 Watts.

6.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

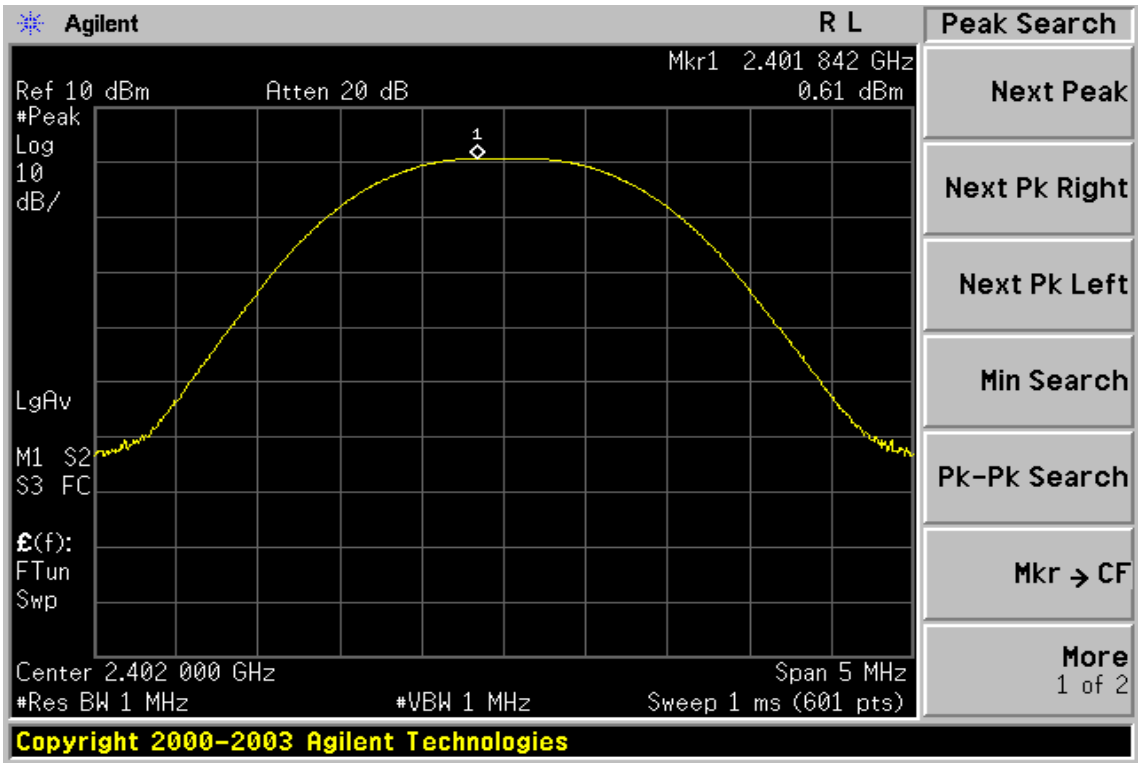
6.3. Measurement Result

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	0.61	0.10	0.71	0.00118	1
2441.00	1.05	0.10	1.15	0.00130	1
2480.00	0.77	0.10	0.87	0.00122	1

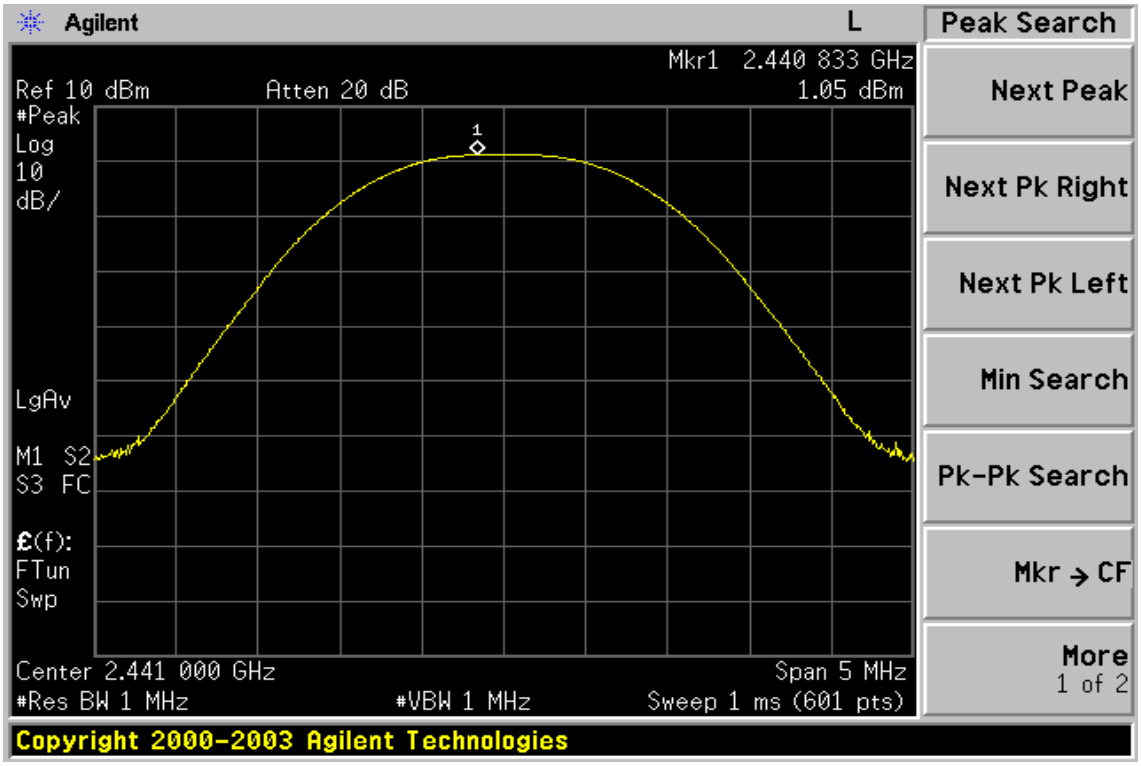
6.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circuit	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

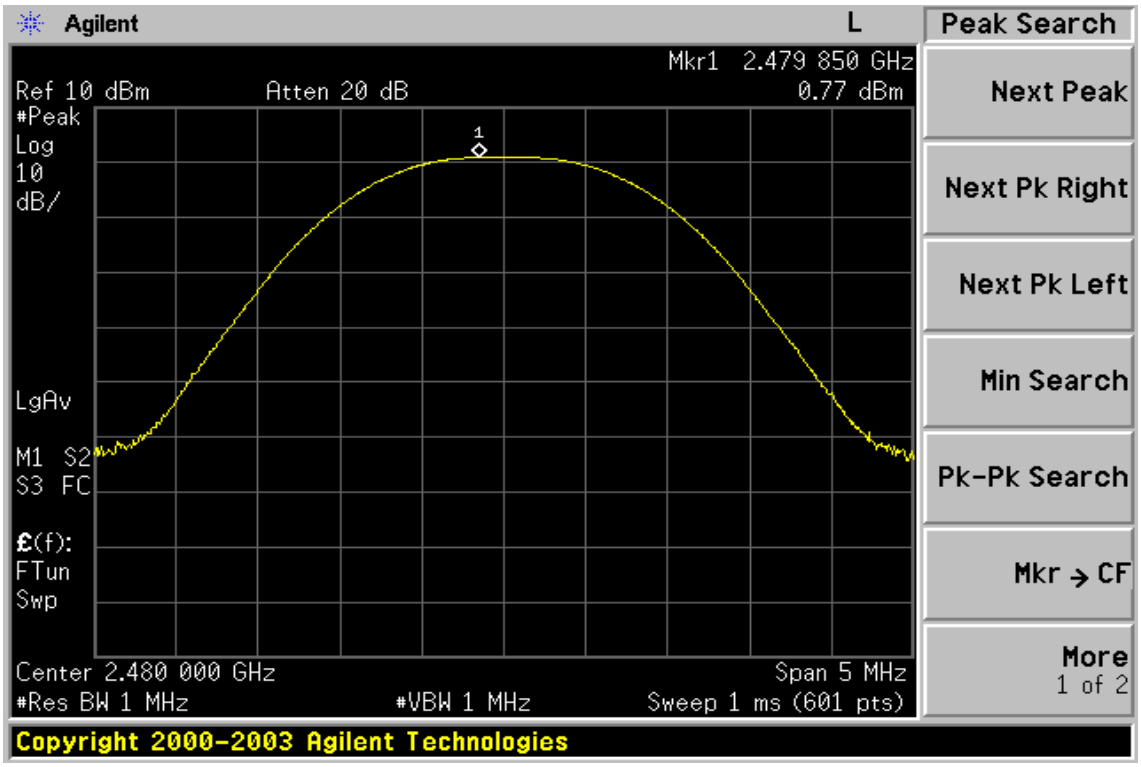
Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)



Peak Power Output Data Plot (CH High)



7. 20dB BAND WIDTH

7.1. Standard Applicable

For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

7.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10KHz (1 % of Bandwidth.), VBW=3*RBW, Span= 3MHz, Sweep=auto
4. Mark the peak frequency and –20dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

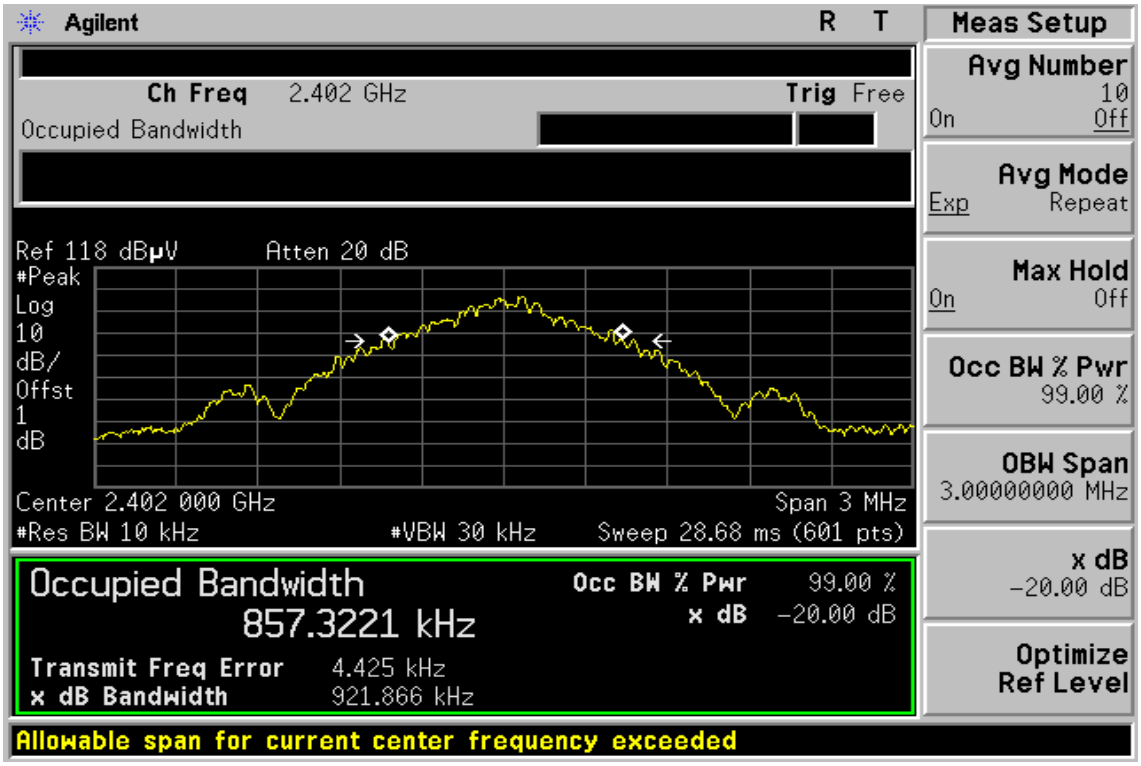
7.3. Measurement Result

CH	Bandwidth
	(MHz)
Lower	0.921
Mid	0.930
Higher	0.930

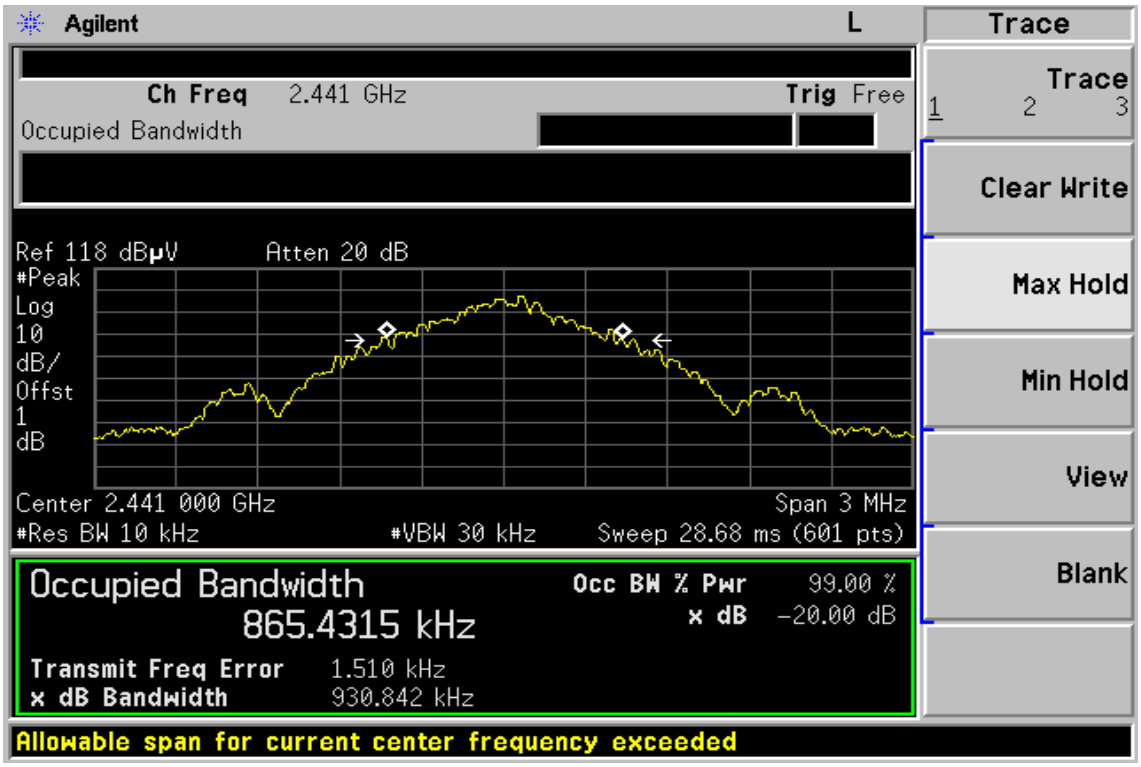
7.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

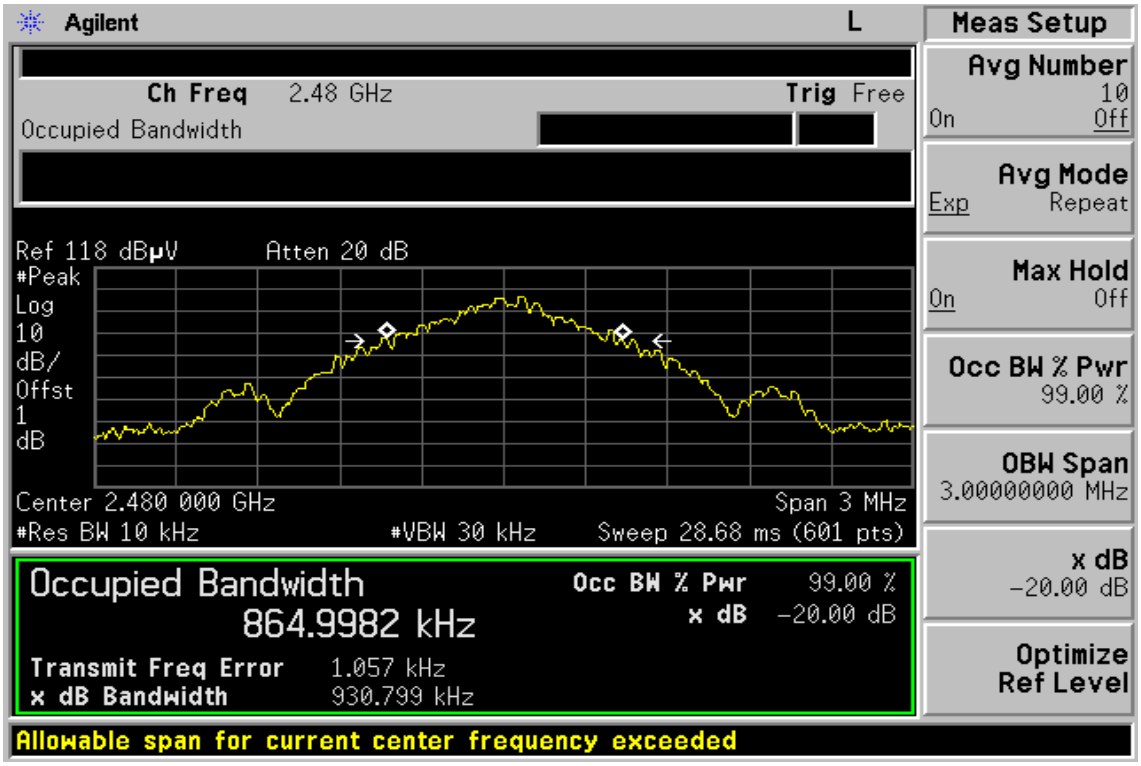
20dB Band Width Test Data CH-Low



20dB Band Width Test Data CH-Mid



20dB Band Width Test Data CH-High



8. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1. Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

8.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.
7. Radiated Emission refer to section 9.

8.3. Measurement Result

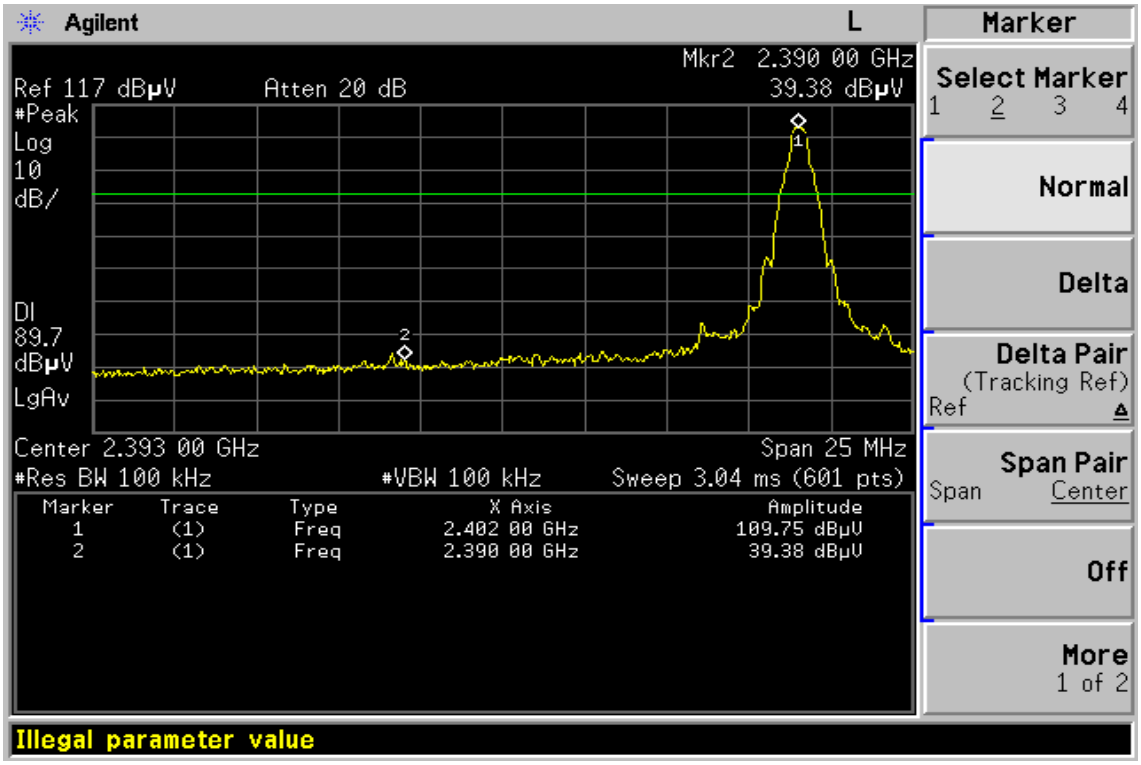
Refer to attach spectrum analyzer data chart.

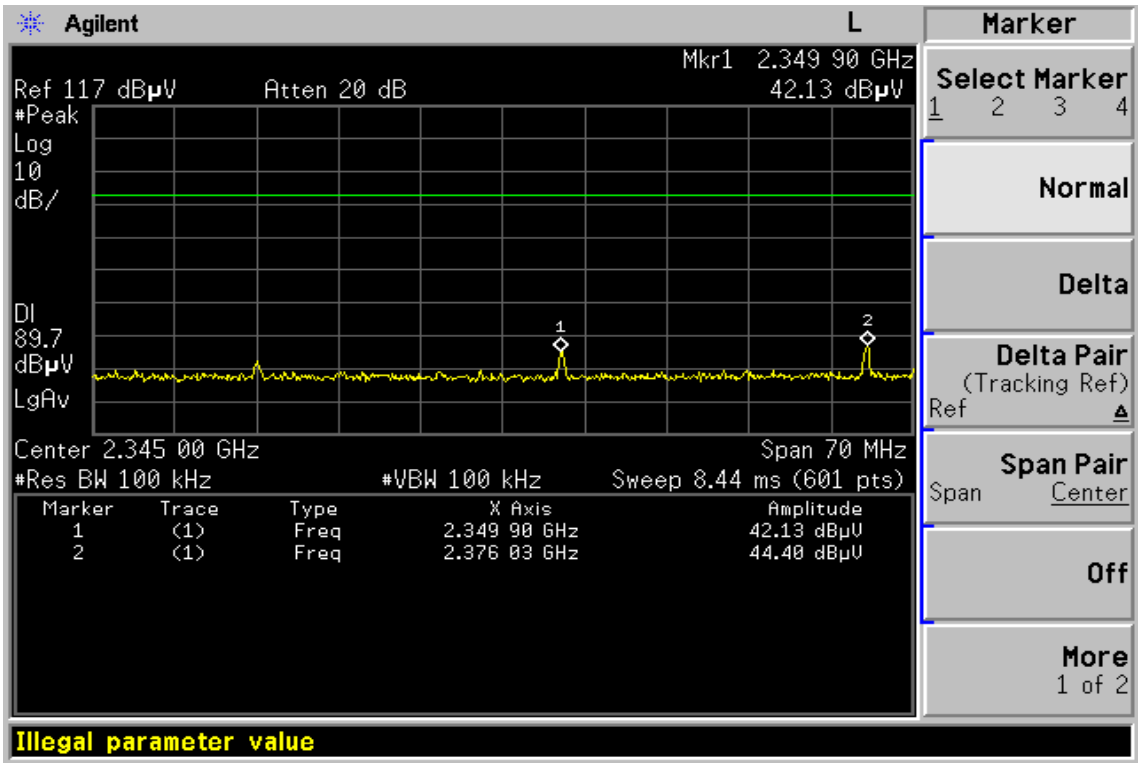
8.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

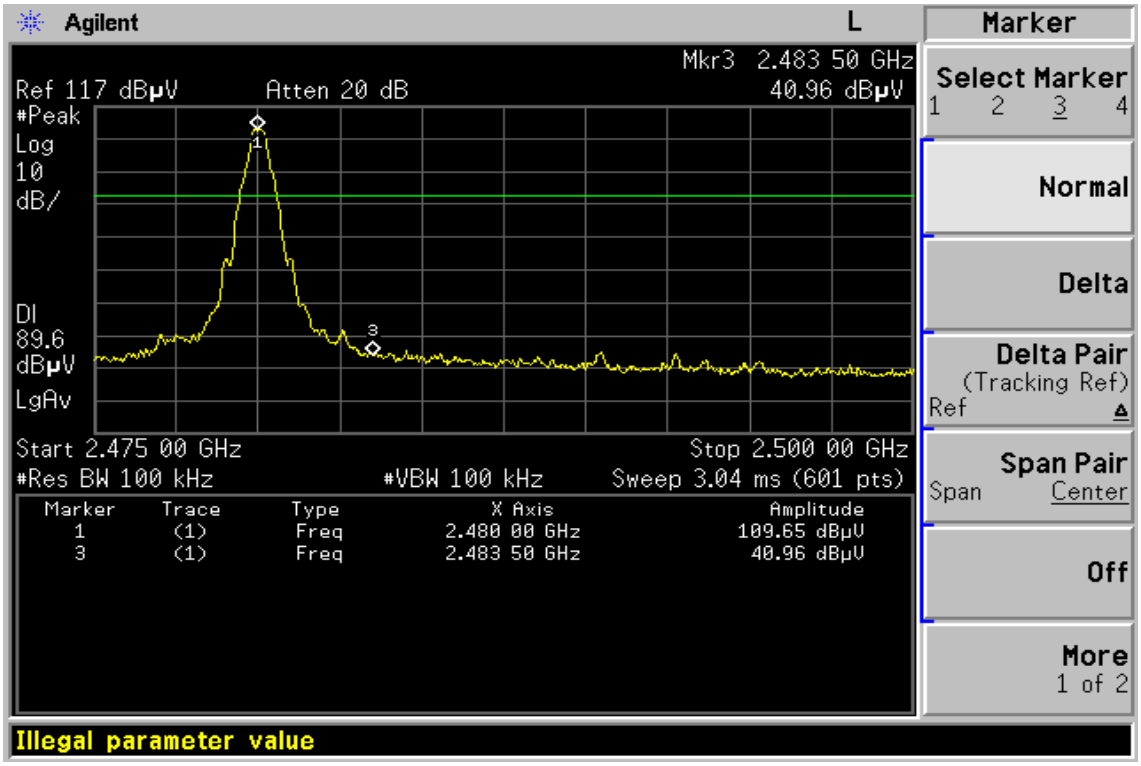
Note: Measurement Equipment for radiated emission refers to section 9.

Conducted Emission: Test Data CH-Low





Conducted Emission: Test Data CH-High



Radiated Emission:

Operation Mode	TX CH Low	Test Date	Jul. 11, 2006
Fundamental Frequency	2402 MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2349.90	---					74.00	54.00		Peak
2376.03	---					74.00	54.00		Peak
2390.00	32.73	---	0.00	32.73	---	74.00	54.00	-21.27	Peak

Operation Mode	TX CH Low	Test Date	Jul. 11, 2006
Fundamental Frequency	2402 MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2349.90	---					74.00	54.00		Peak
2376.03	---					74.00	54.00		Peak
2390.00	34.22	---	0.00	34.22	---	74.00	54.00	-19.78	Peak

Remark：

(1) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission:

Operation Mode	TX CH High	Test Date	Jul. 11, 2006
Fundamental Frequency	2480 MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	---		---	---		74.00	54.00	---	Peak

Operation Mode	TX CH High	Test Date	Jul. 11, 2006
Fundamental Frequency	2480 MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	---		---	---		74.00	54.00	---	Peak

Remark：

(1) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission: Co-Location

Operation Mode	TX CH Low / GSM 850 High	Test Date	Jul. 16, 2006
Fundamental Frequency	2402 MHz / 848.80MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2349.90	---					74.00	54.00		Peak
2376.03	---					74.00	54.00		Peak
2390.00	33.10	---	0.00	33.10	---	74.00	54.00	-20.90	Peak

Operation Mode	TX CH Low / GSM 850 High	Test Date	Jul. 16, 2006
Fundamental Frequency	2402 MHz / 848.80MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2349.90	---					74.00	54.00		Peak
2376.03	---					74.00	54.00		Peak
2390.00	34.70	---	0.00	34.70	---	74.00	54.00	-19.30	Peak

Remark：

(1) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission:Co-Location

Operation Mode	TX CH High/ GSM 850 High	Test Date	Jul. 16, 2006
Fundamental Frequency	2480 MHz / 848.80MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	---		---	---		74.00	54.00	---	Peak

Operation Mode	TX CH High/ GSM 850 High	Test Date	Jul. 16, 2006
Fundamental Frequency	2480 MHz / 848.80MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	---		---	---		74.00	54.00	---	Peak

Remark：

(1) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

9. SPURIOUS RADIATED EMISSION TEST

9.1. Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

9.2. EUT Setup

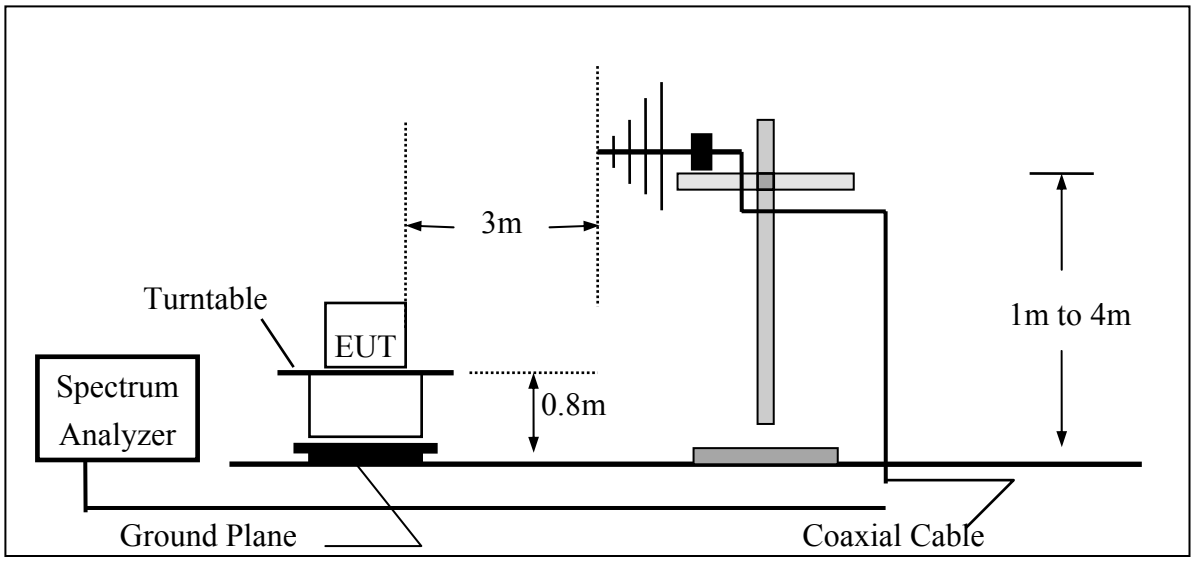
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2003.
2. The EUT was put in the front of the test table. The peripherals was placed on the side of the host system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The spacing between the peripherals was 10 centimeters.
4. External I/O cables were draped along the edge of the test table and bundle when necessary.
5. The host PC system was connected with 110Vac/60Hz power source.

9.3. Measurement Procedure

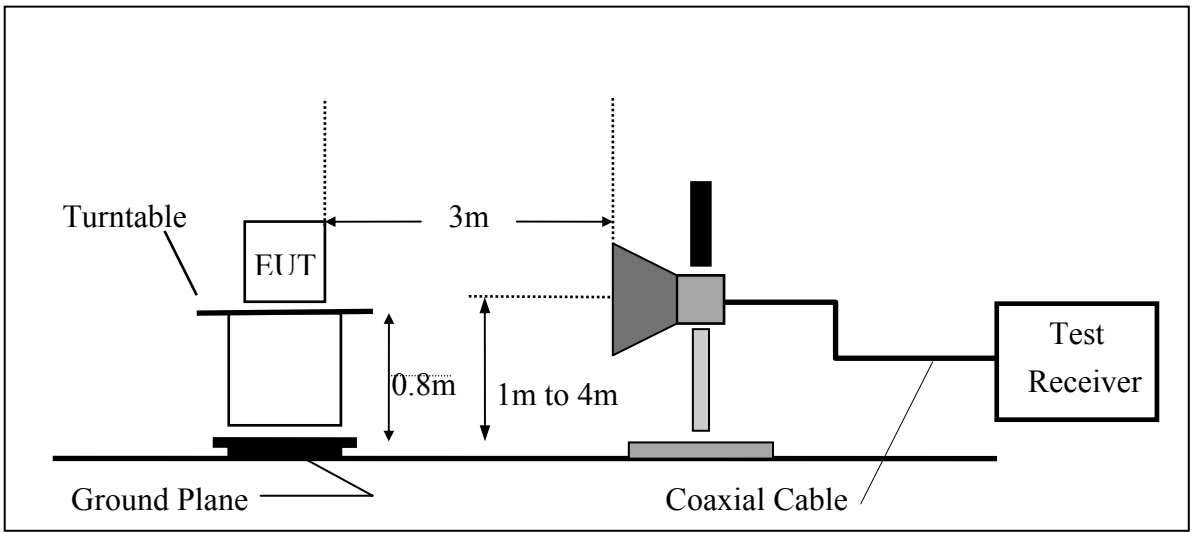
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

9.4. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1GHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



9.5. Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	05/27/2006	05/26/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2005	08/26/2006
Bilog Antenna	SCHWAZBECK	VULB9163	152	06/03/2006	06/02/2007
Horn antenna	Schwarzbeck	BBHA 9120D	309/320	08/16/2005	08/15/2006
Horn antenna	Schwarzbeck	BBHA 9170	184/185	07/04/2006	07/03/2007
Pre-Amplifier	HP	8447D	2944A09469	07/19/2006	07/18/2007
Pre-Amplifier	HP	8494B	3008A00578	02/26/2006	02/25/2007
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	10/09/2005	10/08/2006
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2005	10/08/2006
Site NSA	SGS	966 chamber	N/A	11/17/2005	11/16/2006

9.6. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

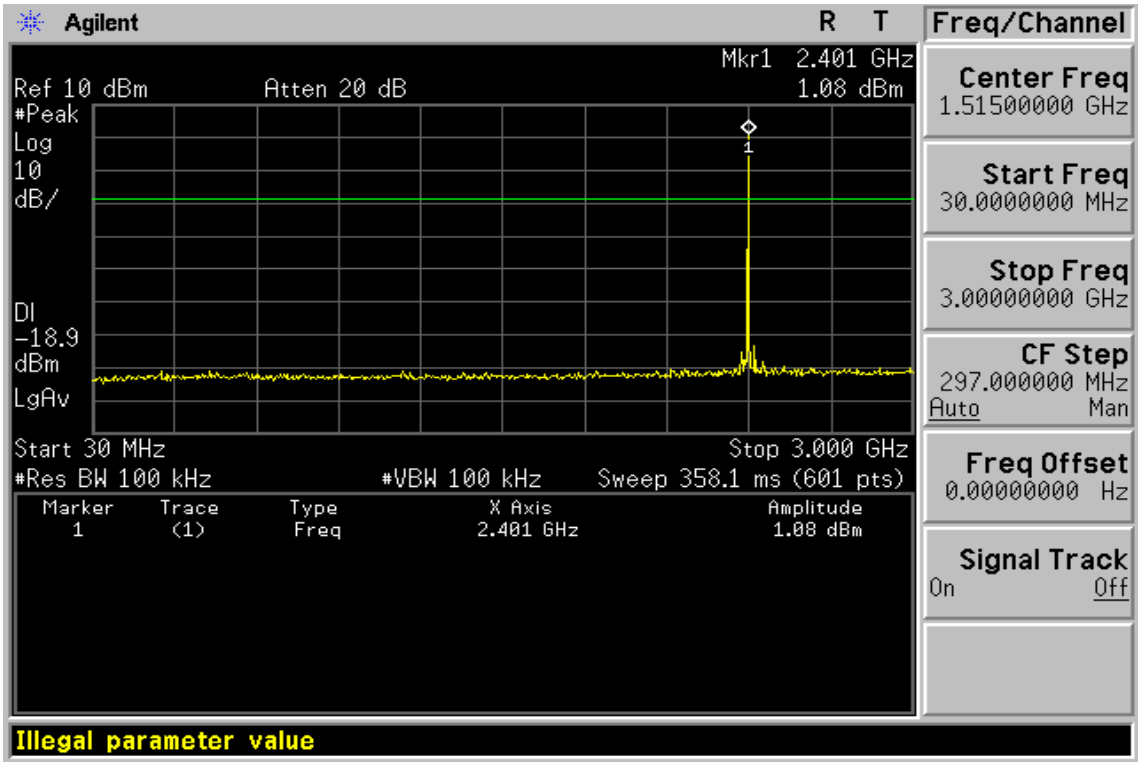
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

9.7. Measurement Result

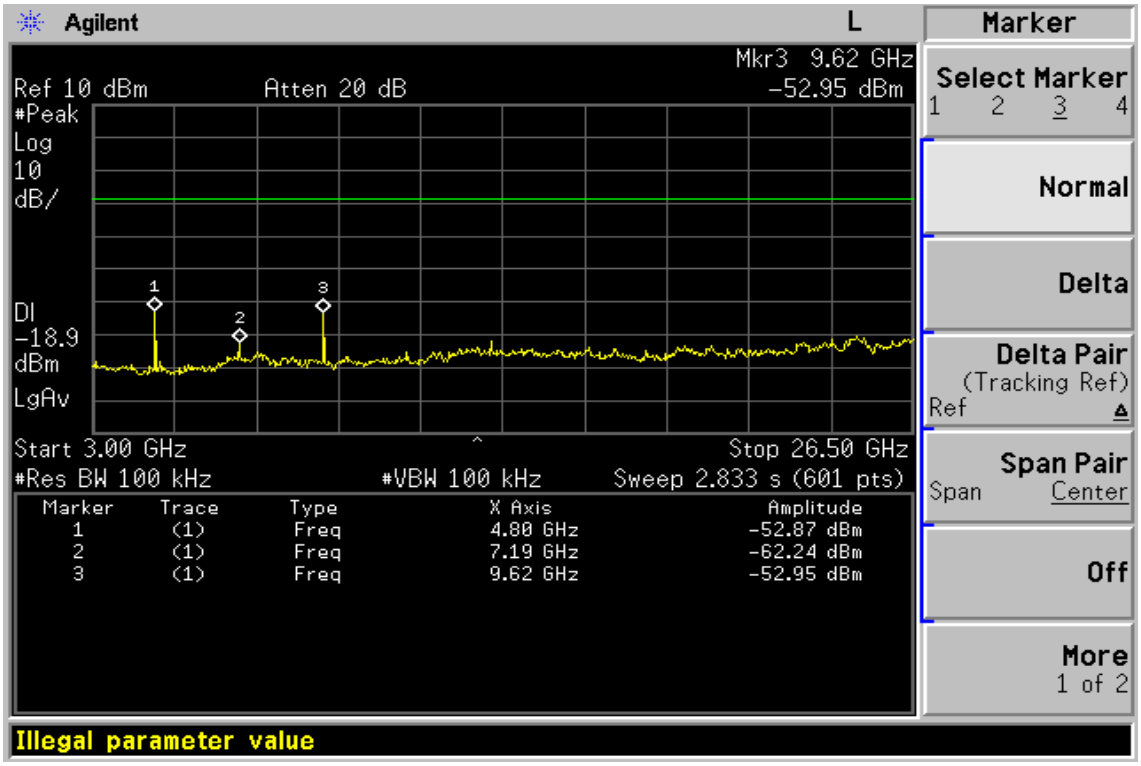
Refer to attach tabular data sheets.

Conducted Spurious Emission Measurement Result

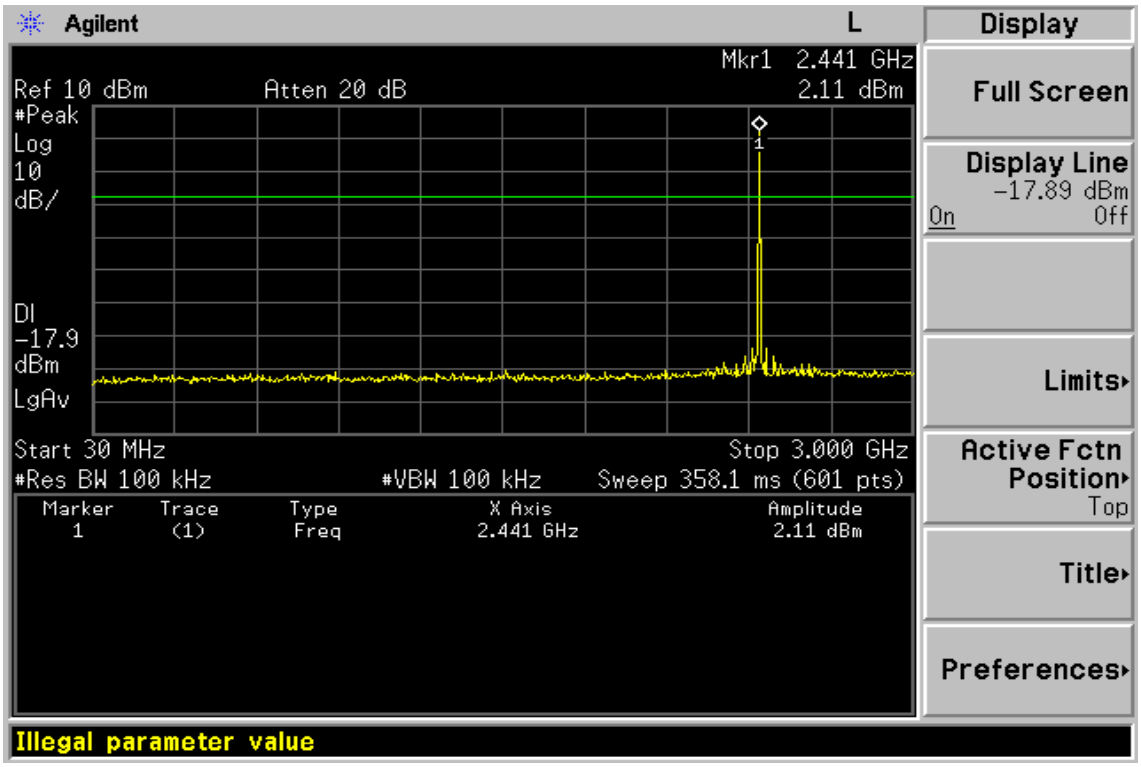
Ch Low 30MHz – 3GHz



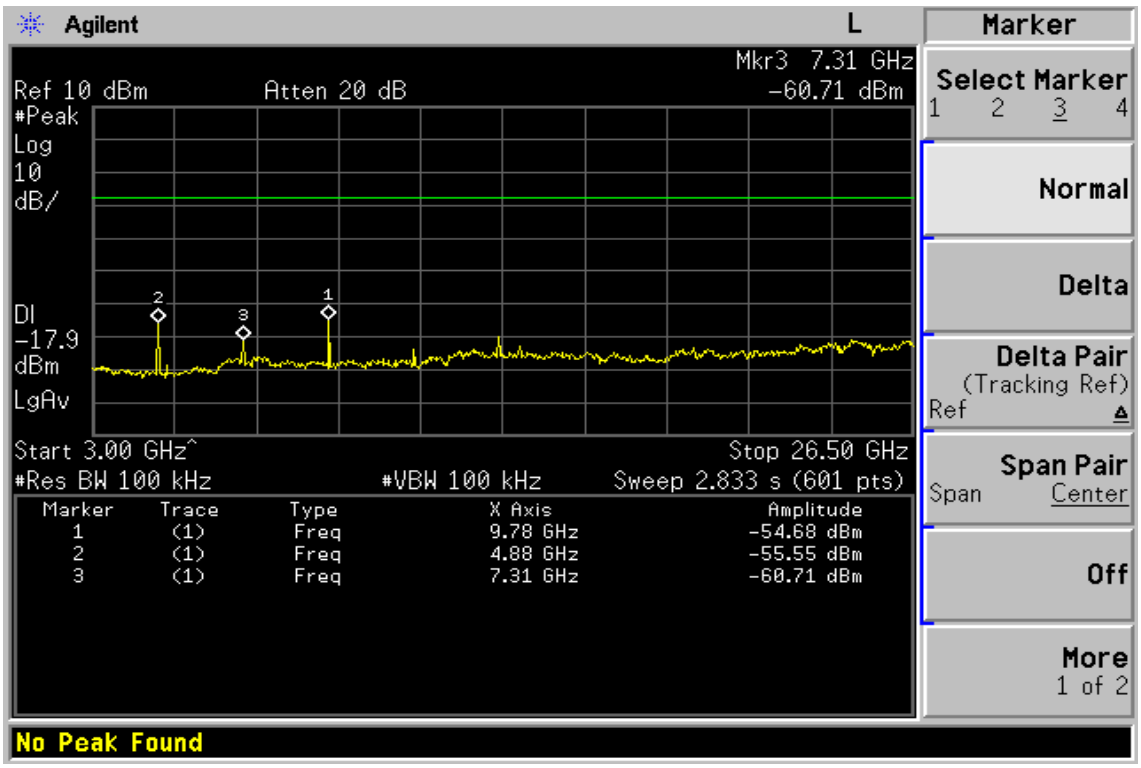
Ch Low 3GHz – 26.5GHz



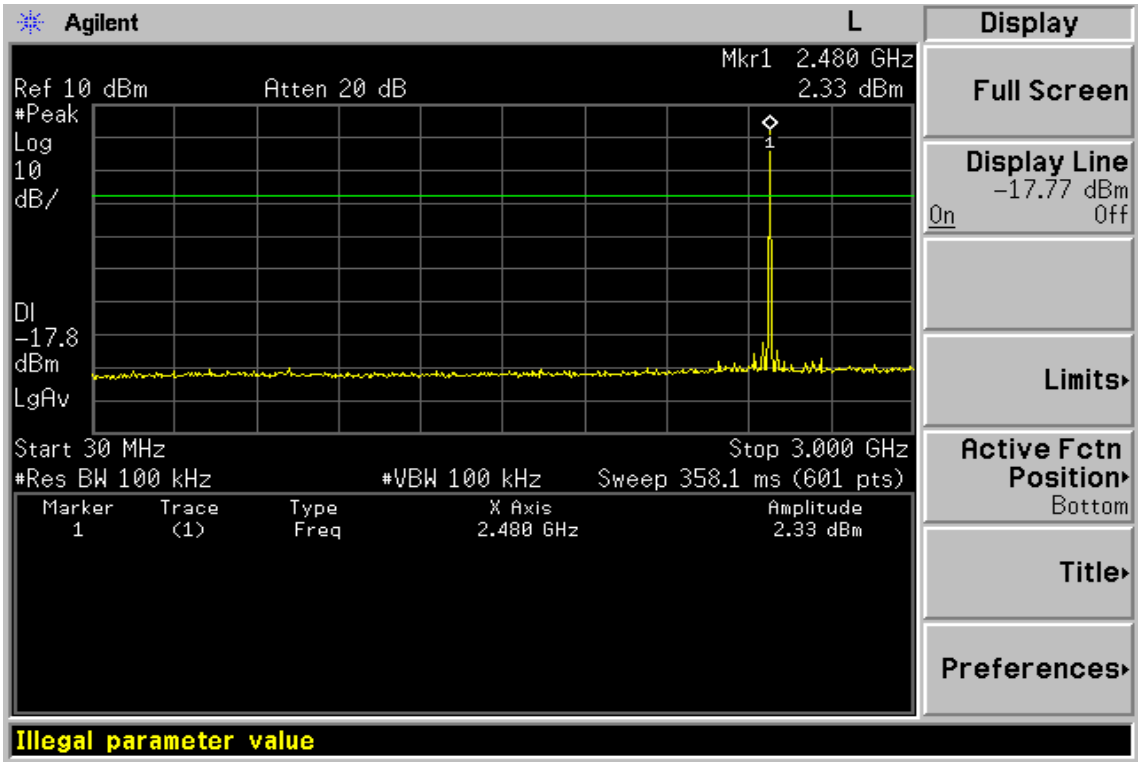
Ch Mid 30MHz – 3GHz



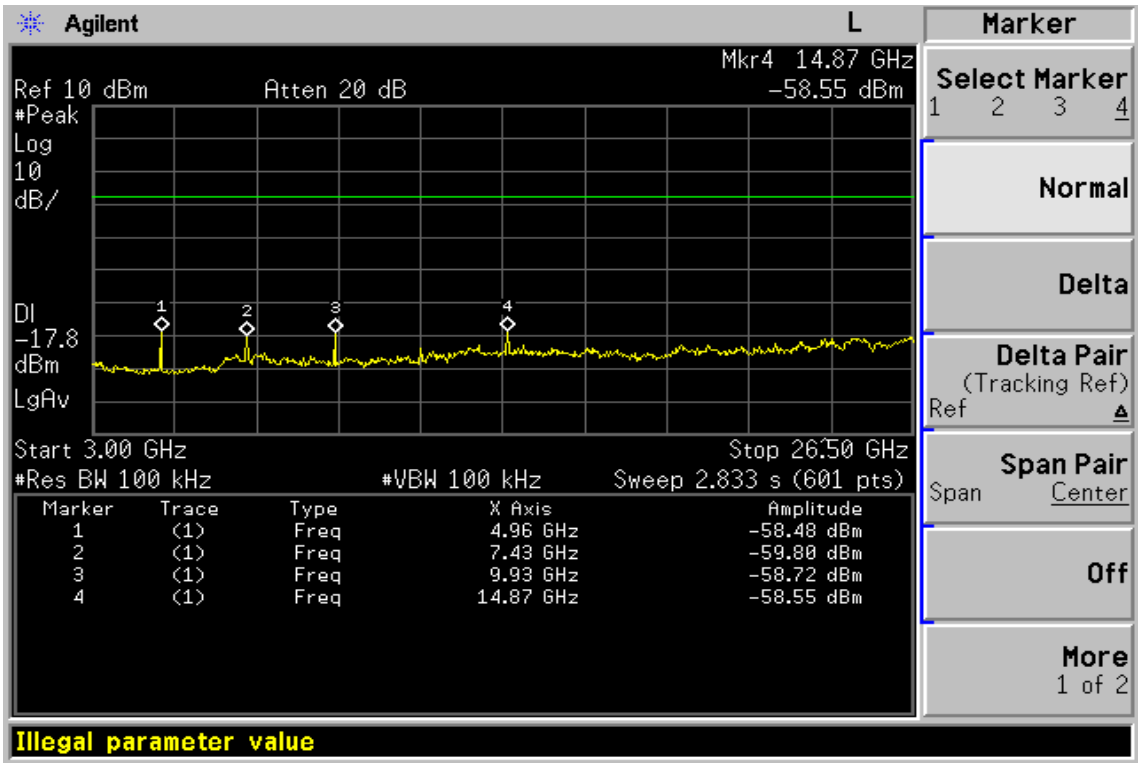
Ch Mid 3GHz – 26.5GHz



Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Low (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2402MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver./Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
37.76	V	Peak	43.29	-14.85	28.44	40.00	-11.56
54.25	V	Peak	42.09	-14.95	27.14	40.00	-12.86
123.12	V	Peak	37.55	-15.27	22.28	43.50	-21.22
152.22	V	Peak	36.00	-13.58	22.42	43.50	-21.08
180.35	V	Peak	34.55	-15.20	19.35	43.50	-24.15
522.76	V	Peak	29.75	-8.91	20.84	46.00	-25.16
42.61	H	Peak	44.66	-14.65	30.01	40.00	-9.99
54.25	H	Peak	41.96	-14.95	27.01	40.00	-12.99
149.31	H	Peak	34.69	-13.45	21.24	43.50	-22.26
180.35	H	Peak	34.63	-15.20	19.43	43.50	-24.07
388.90	H	Peak	30.44	-10.90	19.54	46.00	-26.46
709.00	H	Peak	27.34	-5.21	22.13	46.00	-23.87

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2441MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver./Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
30.00	V	Peak	46.89	-15.29	31.60	40.00	-8.40
39.70	V	Peak	41.67	-14.70	26.97	40.00	-13.03
123.12	V	Peak	37.77	-15.27	22.50	43.50	-21.00
152.22	V	Peak	36.55	-13.58	22.97	43.50	-20.53
314.21	V	Peak	30.35	-12.97	17.38	46.00	-28.62
808.91	V	Peak	27.46	-3.39	24.07	46.00	-21.93
42.61	H	Peak	43.83	-14.65	29.18	40.00	-10.82
54.25	H	Peak	40.99	-14.95	26.04	40.00	-13.96
139.61	H	Peak	33.53	-13.92	19.61	43.50	-23.89
181.32	H	Peak	33.83	-15.28	18.55	43.50	-24.95
312.27	H	Peak	34.78	-13.02	21.76	46.00	-24.24
709.00	H	Peak	27.55	-5.21	22.34	46.00	-23.66

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2480MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver./Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
41.64	V	Peak	41.74	-14.67	27.07	40.00	-12.93
54.25	V	Peak	41.41	-14.95	26.46	40.00	-13.54
123.12	V	Peak	36.47	-15.27	21.20	43.50	-22.30
152.22	V	Peak	36.22	-13.58	22.64	43.50	-20.86
428.67	V	Peak	29.39	-10.09	19.30	46.00	-26.70
522.76	V	Peak	30.71	-8.91	21.80	46.00	-24.20
38.73	H	Peak	43.07	-14.77	28.30	40.00	-11.70
54.25	H	Peak	41.43	-14.95	26.48	40.00	-13.52
139.61	H	Peak	33.57	-13.92	19.65	43.50	-23.85
180.35	H	Peak	33.21	-15.20	18.01	43.50	-25.49
258.92	H	Peak	32.77	-14.99	17.78	46.00	-28.22
311.30	H	Peak	30.01	-13.07	16.94	46.00	-29.06

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2402 MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4804.0	----					74.00	54.00	
7206.0	----					74.00	54.00	
9608.0	----					74.00	54.00	
12010.0	----					74.00	54.00	
14412.0	----					74.00	54.00	
16814.0	----					74.00	54.00	
19216.0	----					74.00	54.00	
21618.0	----					74.00	54.00	
24020.0	----					74.00	54.00	

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2402 MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4804.0	----					74.00	54.00	
7206.0	----					74.00	54.00	
9608.0	----					74.00	54.00	
12010.0	----					74.00	54.00	
14412.0	----					74.00	54.00	
16814.0	----					74.00	54.00	
19216.0	----					74.00	54.00	
21618.0	----					74.00	54.00	
24020.0	----					74.00	54.00	

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2441 MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4882.0	----					74.00	54.00	
7323.0	----					74.00	54.00	
9764.0	----					74.00	54.00	
12205.0	----					74.00	54.00	
14646.0	----					74.00	54.00	
17087.0	----					74.00	54.00	
19528.0	----					74.00	54.00	
21969.0	----					74.00	54.00	
24410.0	----					74.00	54.00	

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2441 MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor .
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4882.0	----					74.00	54.00	
7323.0	----					74.00	54.00	
9764.0	----					74.00	54.00	
12205.0	----					74.00	54.00	
14646.0	----					74.00	54.00	
17087.0	----					74.00	54.00	
19528.0	----					74.00	54.00	
21969.0	----					74.00	54.00	
24410.0	----					74.00	54.00	

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2480 MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4960.0	----					74.00	54.00	
7440.0	----					74.00	54.00	
9920.0	----					74.00	54.00	
12400.0	----					74.00	54.00	
14880.0	----					74.00	54.00	
17360.0	----					74.00	54.00	
19840.0	----					74.00	54.00	
22320.0	----					74.00	54.00	
24800.0	----					74.00	54.00	

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High (E2 Position)	Test Date	Jul. 16, 2006
Fundamental Frequency	2480 MHz	Test By	Alex
Temperature	25 ℃	Pol	Hor.
Humidity	65 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	
4960.0	36.43	----	3.40	39.83	----	74.00	54.00	-14.17	Peak
7440.0	----					74.00	54.00		
9920.0	----					74.00	54.00		
12400.0	----					74.00	54.00		
14880.0	----					74.00	54.00		
17360.0	----					74.00	54.00		
19840.0	----					74.00	54.00		
22320.0	----					74.00	54.00		
24800.0	----					74.00	54.00		

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (below 1GHz) (Co-Location mode)

Operation Mode	BT E2 TX Hihg / GSM 850 High	Test Date	Jul. 16, 2006
Fundamental Frequency	2480MHz / 848.80MHz	Test By	Alex
Temperature	25 ℃	Pol	Ver./Hor.
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
37.76	V	Peak	43.35	-14.85	28.50	40.00	-11.50
57.16	V	Peak	40.31	-14.89	25.42	40.00	-14.58
127.00	V	Peak	46.34	-14.95	31.39	43.50	-12.11
154.16	V	Peak	47.87	-13.77	34.10	43.50	-9.40
246.31	V	Peak	37.13	-15.43	21.70	46.00	-24.30
260.86	V	Peak	36.72	-14.91	21.81	46.00	-24.19
42.61	H	Peak	43.67	-14.65	29.02	40.00	-10.98
57.16	H	Peak	42.15	-14.89	27.26	40.00	-12.74
93.05	H	Peak	40.05	-17.72	22.33	43.50	-21.17
125.06	H	Peak	41.13	-15.10	26.03	43.50	-17.47
154.16	H	Peak	41.26	-13.77	27.49	43.50	-16.01
181.32	H	Peak	36.25	-15.28	20.97	43.50	-22.53

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (above 1GHz) (Co-Location)

Operation Mode	BT E2 TX High / GSM 850 High	Test Date	Jul. 16, 20006
Fundamental Frequency	2480MHz / 848.80MHz	Test By	Alex
Temperature	25℃	Pol	Ver.
Humidity	65%		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Note
4960.0	---					74.00	54.00		
7440.0	---					74.00	54.00		
9920.0	---					74.00	54.00		
12400.0	---					74.00	54.00		
14880.0	---					74.00	54.00		
17360.0	---					74.00	54.00		
19840.0	---					74.00	54.00		
22320.0	---					74.00	54.00		
24800.0	---					74.00	54.00		
1697.6	50.30	---	-6.39	43.91	---	74.00	54.00	-30.09	Peak
2546.4	51.66	---	-2.85	48.81	---	74.00	54.00	-25.19	Peak
3395.2	---					74.00	54.00		
4244.0	40.71	---	1.40	42.11	---	74.00	54.00	-31.89	Peak

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (Co-Location)

Operation Mode	BT E2 TX High / GSM 850 High	Test Date	Jul. 16, 20006
Fundamental Frequency	2480MHz / 848.80MHz	Test By	Alex
Temperature	25℃	Pol	Hor
Humidity	65%		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Note
4960.0	---					74.00	54.00		
7440.0	---					74.00	54.00		
9920.0	---					74.00	54.00		
12400.0	---					74.00	54.00		
14880.0	---					74.00	54.00		
17360.0	---					74.00	54.00		
19840.0	---					74.00	54.00		
22320.0	---					74.00	54.00		
24800.0	---					74.00	54.00		
1697.6	53.16	---	-6.39	46.77	---	74.00	54.00	-27.23	Peak
2546.4	59.33	---	-2.85	56.48	---	74.00	54.00	-17.52	Peak
3395.2	---					74.00	54.00		
4244.0	43.81	---	1.40	45.21	---	74.00	54.00	-28.79	Peak

Remark：

(1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency。

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(4) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.

(5) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

10. FREQUENCY SEPARATION

10.1. Standard Applicable

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

10.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel .
4. Set the spectrum analyzer as RBW,VBW=100KHz, Adjust Span to 5 MHz, Sweep = auto.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

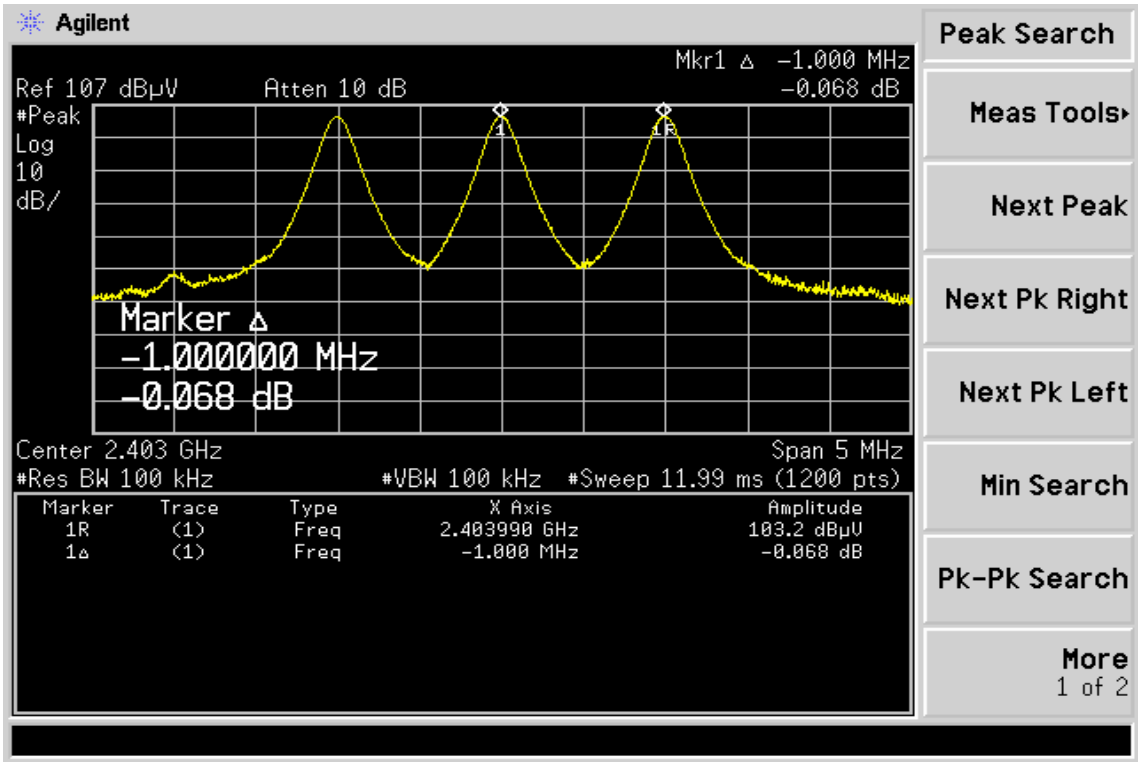
10.3. Measurement Result

Channel separation	Limit	Result
MHz	kHz	
1	>=25KHz or 2/3* 20 dB bandwidth	PASS

10.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circuit	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

Frequency Separation Test Data



11. NUMBER OF HOPPING FREQUENCY

11.1. Standard Applicable

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

11.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW,VBW=100KHz,
5. Max hold, view and count how many channel in the band.

11.3. Measurement Result

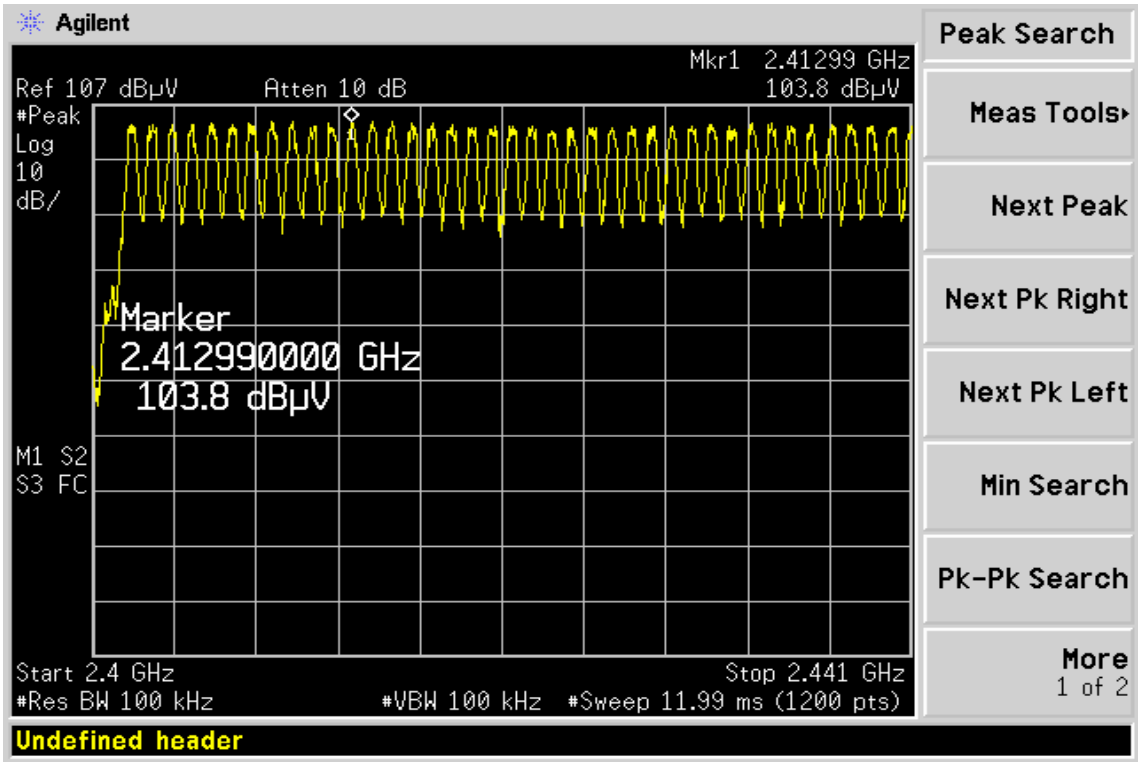
	Limit (CH)	Measurement result (CH)	Result
Total No of hopping channel	15	79	Pass

11.4. Measurement Equipment Used:

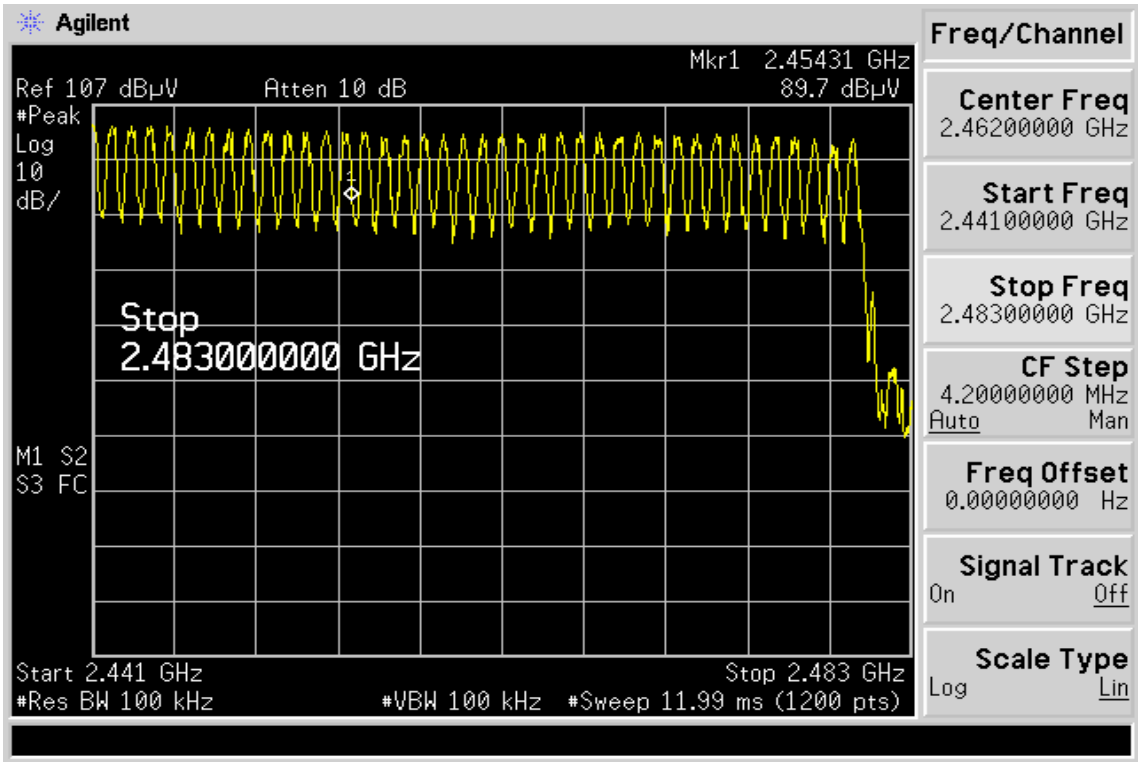
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

Channel Number

2.4 GHz – 2.441GHz



2.441 GHz – 2.4835GHz



12. TIME OF OCCUPANCY (DWELL TIME)

12.1. Standard Applicable

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

12.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW,VBW=100KHz, Span = 0Hz , Adjust Sweep = 30s.
5. Repeat above procedures until all frequency measured were complete.

12.3. Measurement Result

A period time = 0.4 (ms) * 79 = 31.6 (s)

CH Low: DH1 time slot = 0.405 (ms) * (1600/(1*79)) * 31.6 = 259.1 (ms)

DH3 time slot = 1.675 (ms) * (1600/(3*79)) * 31.6 = 357.2 (ms)

DH5 time slot = 2.925 (ms) * (1600/(5*79)) * 31.6 = 374.3 (ms)

CH Mid: DH1 time slot = 0.405 (ms) * (1600/(1*79)) * 31.6 = 259.1 (ms)

DH3 time slot = 1.675 (ms) * (1600/(3*79)) * 31.6 = 357.2 (ms)

DH5 time slot = 2.906 (ms) * (1600/(5*79)) * 31.6 = 371.9 (ms)

CH High: DH1 time slot = 0.416 (ms) * (1600/(1*79)) * 31.6 = 266.1 (ms)

DH3 time slot = 1.662 (ms) * (1600/(3*79)) * 31.6 = 354.5 (ms)

DH5 time slot = 2.906 (ms) * (1600/(5*79)) * 31.6 = 371.9 (ms)

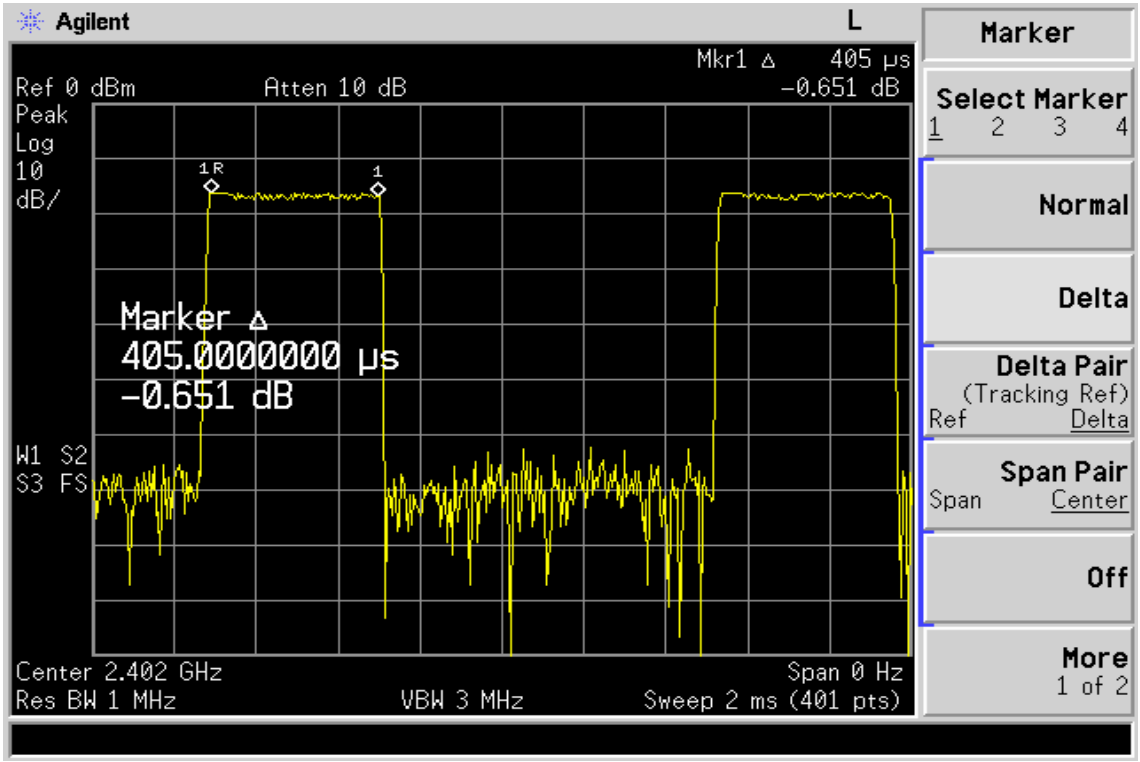
12.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2005	06/29/2006
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circuit	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

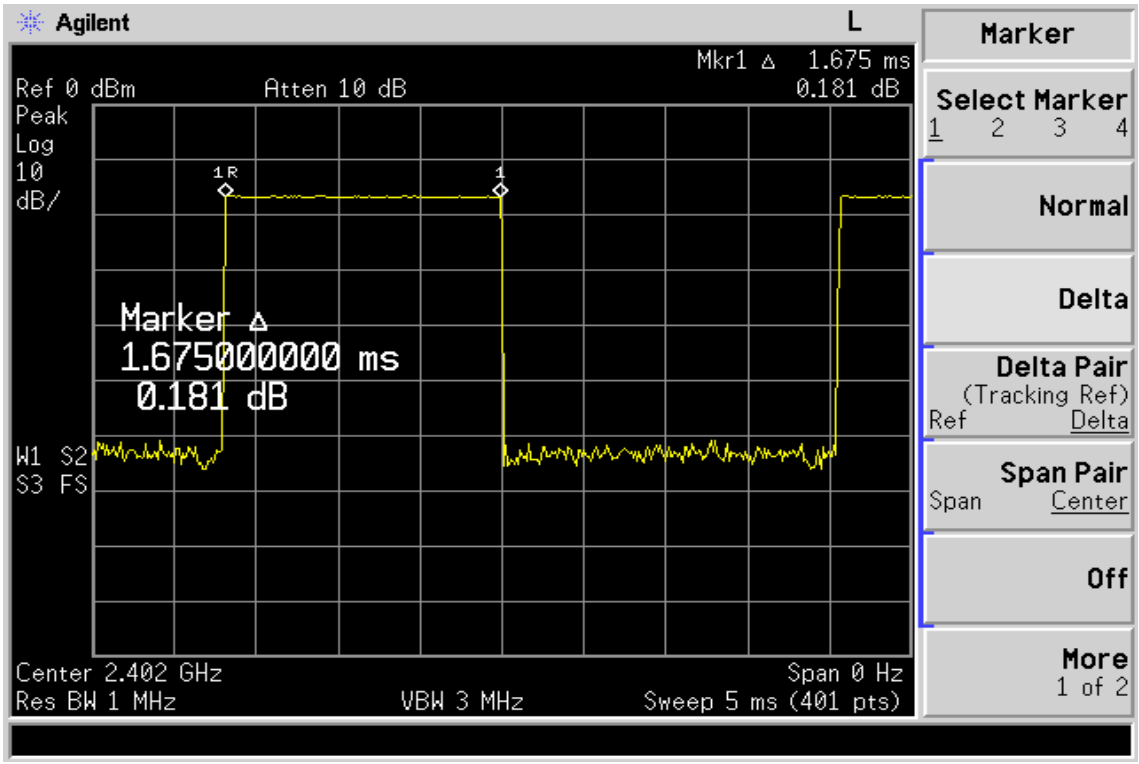
Dwell Time Test Data

CH-Low

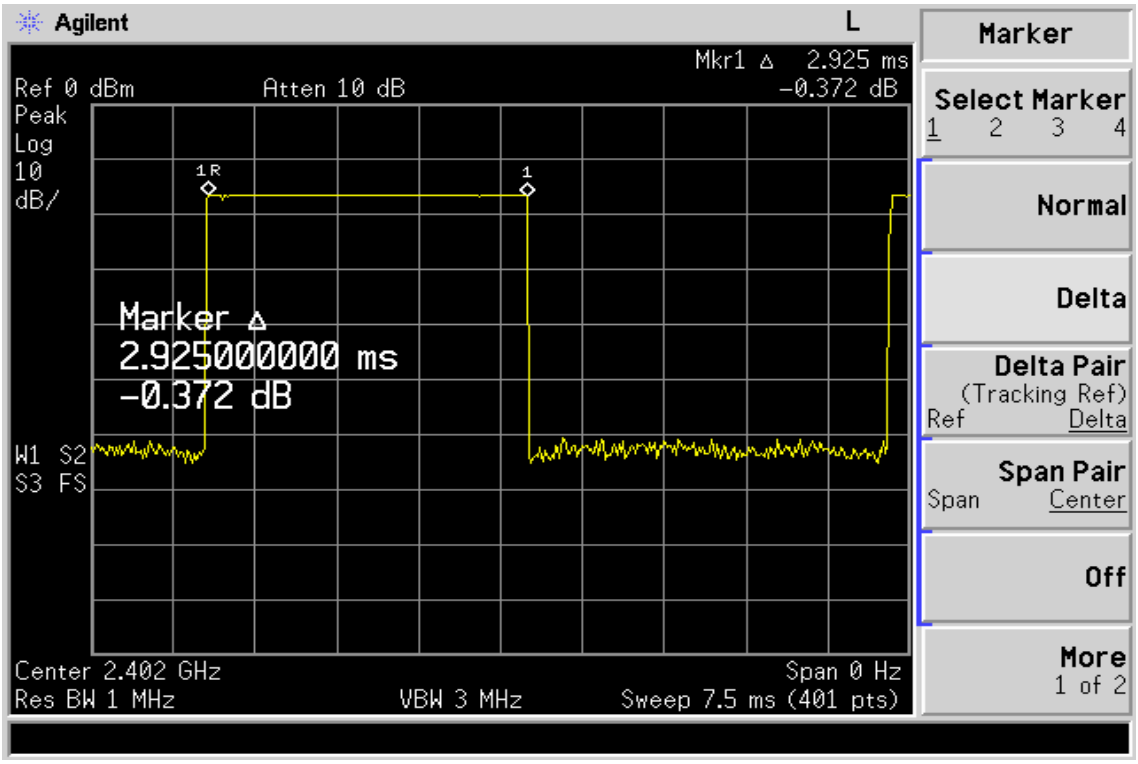
DH1



DH3

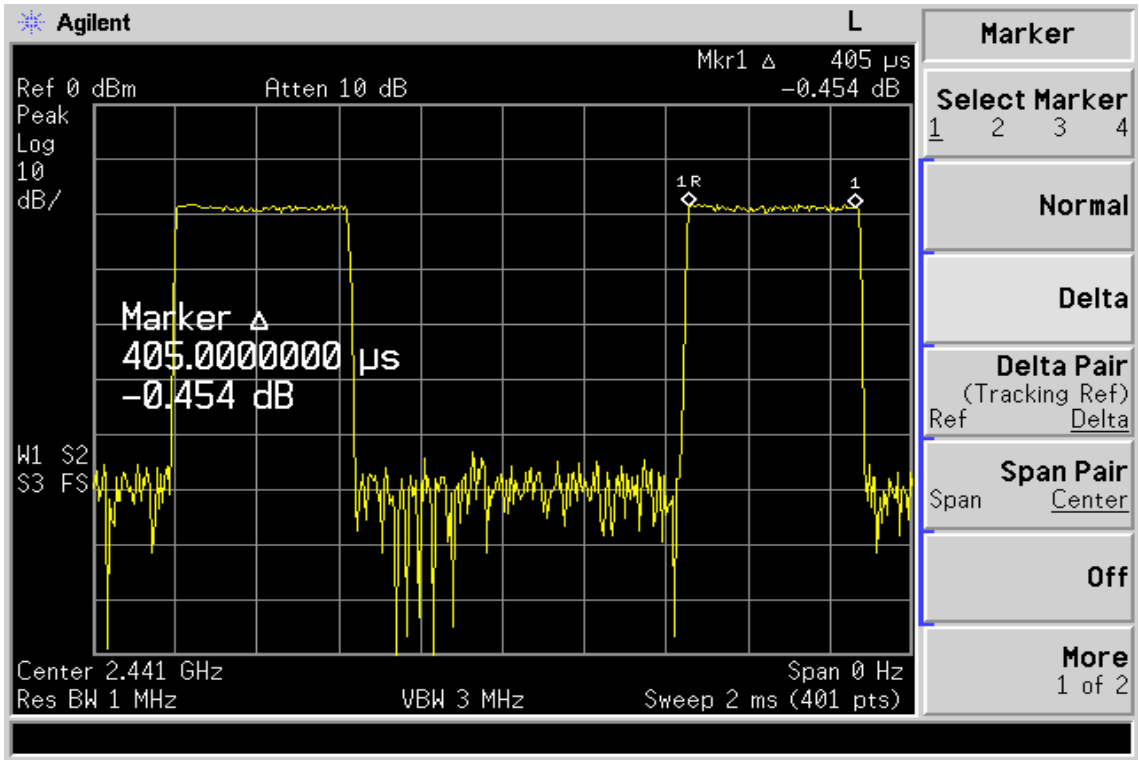


DH5

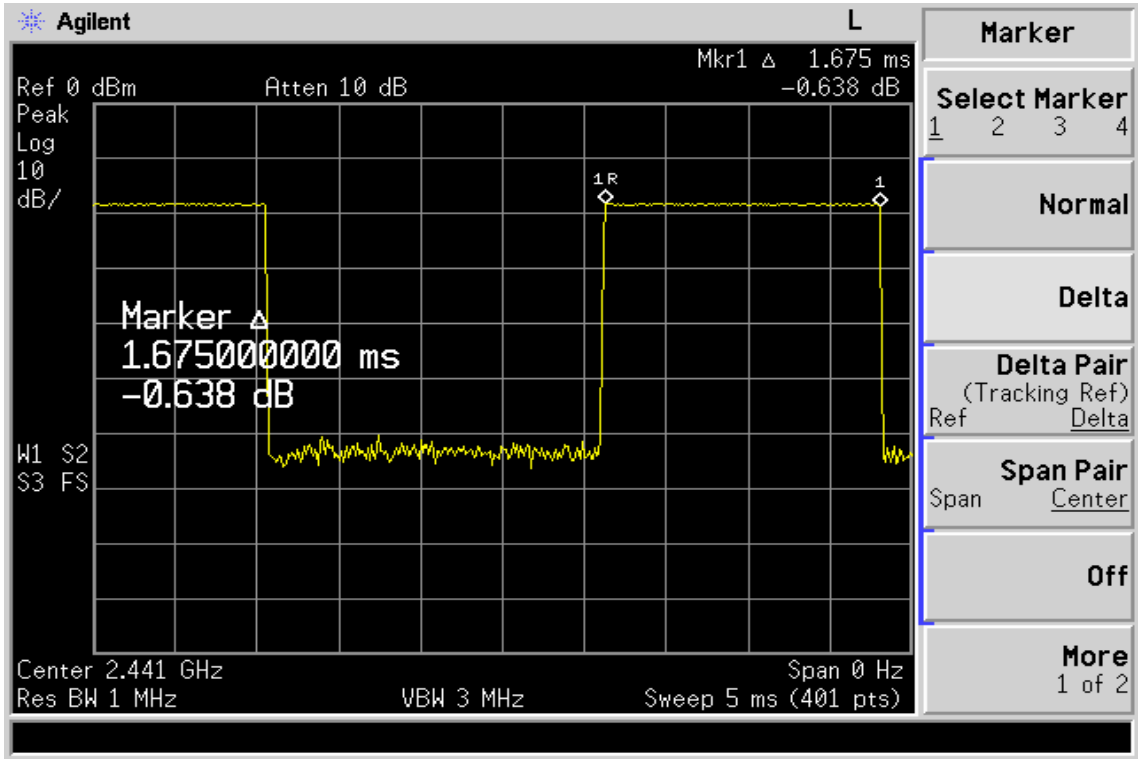


CH-Mid

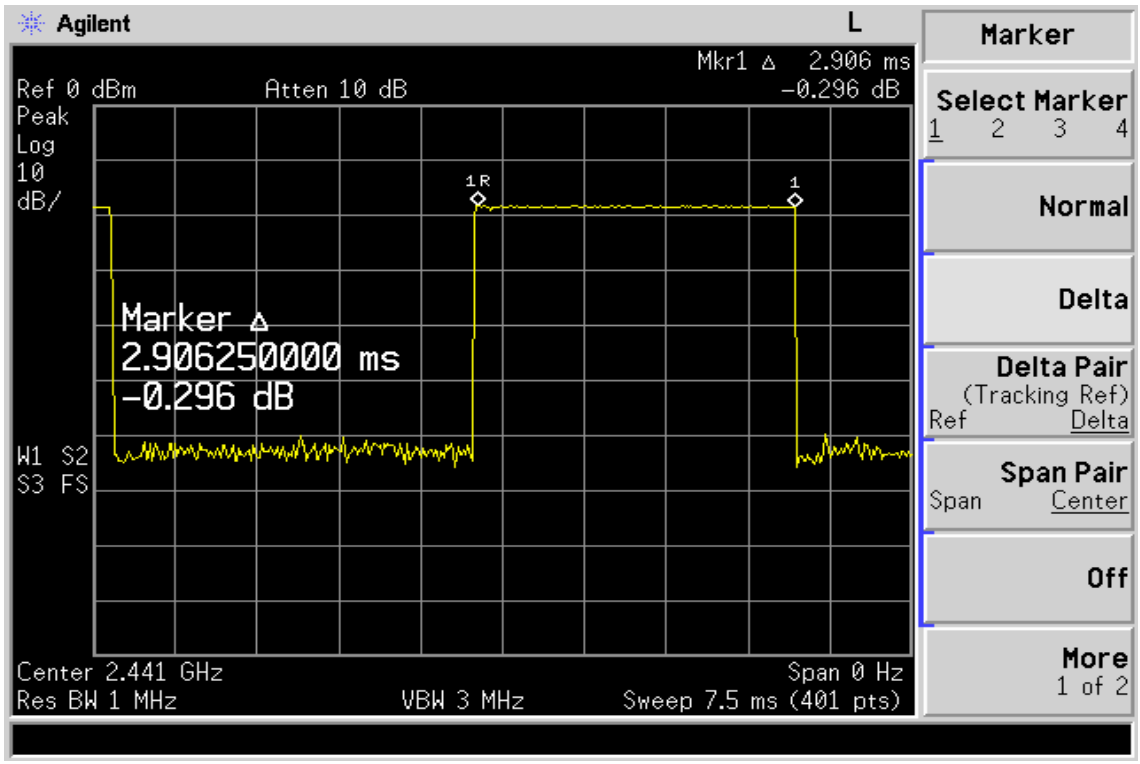
DH1



DH3

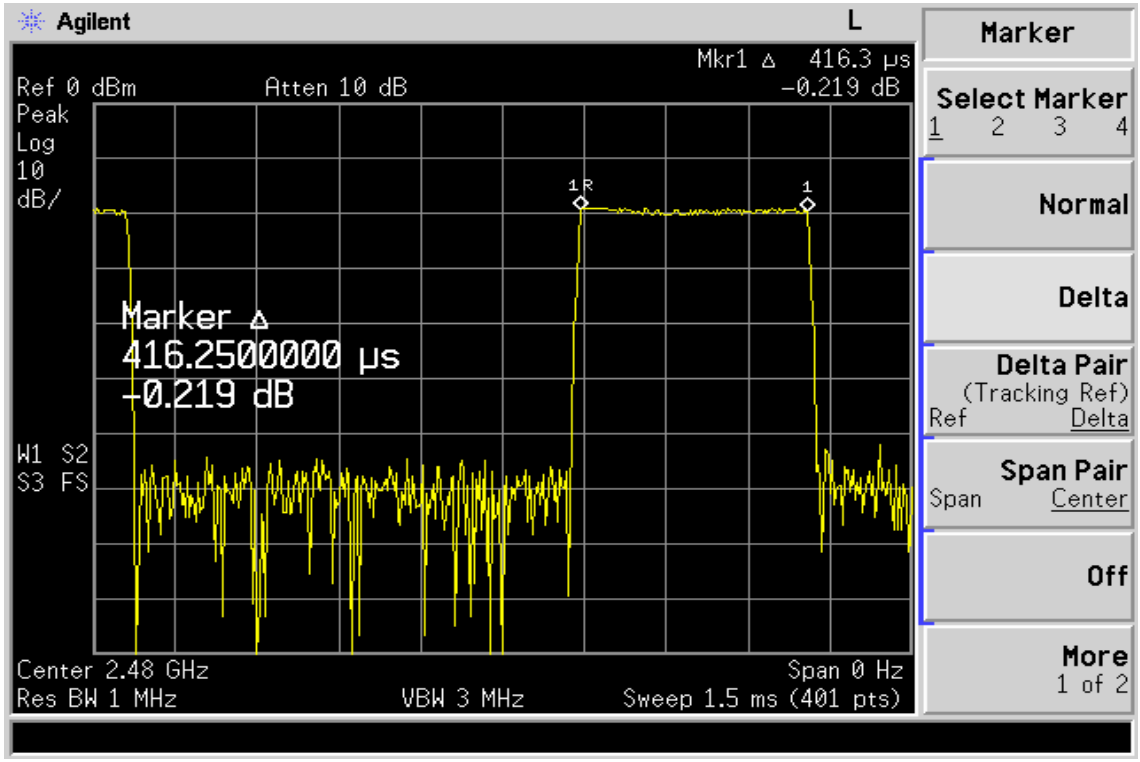


DH5

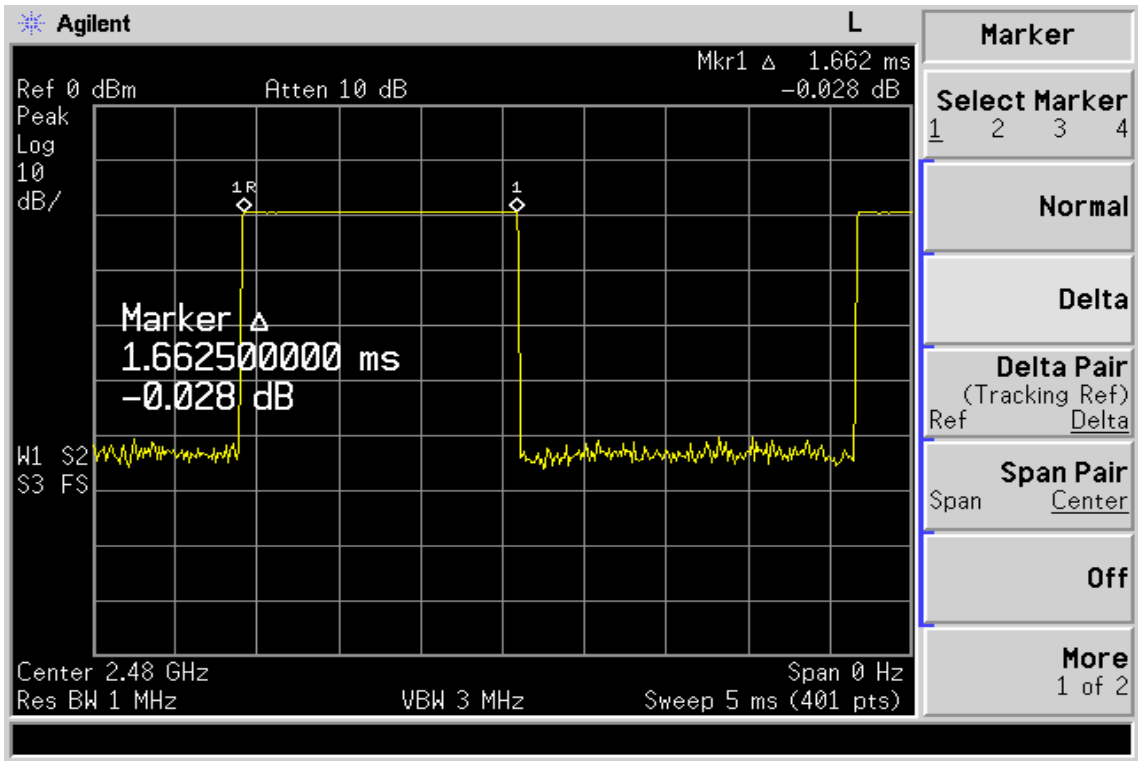


CH-High

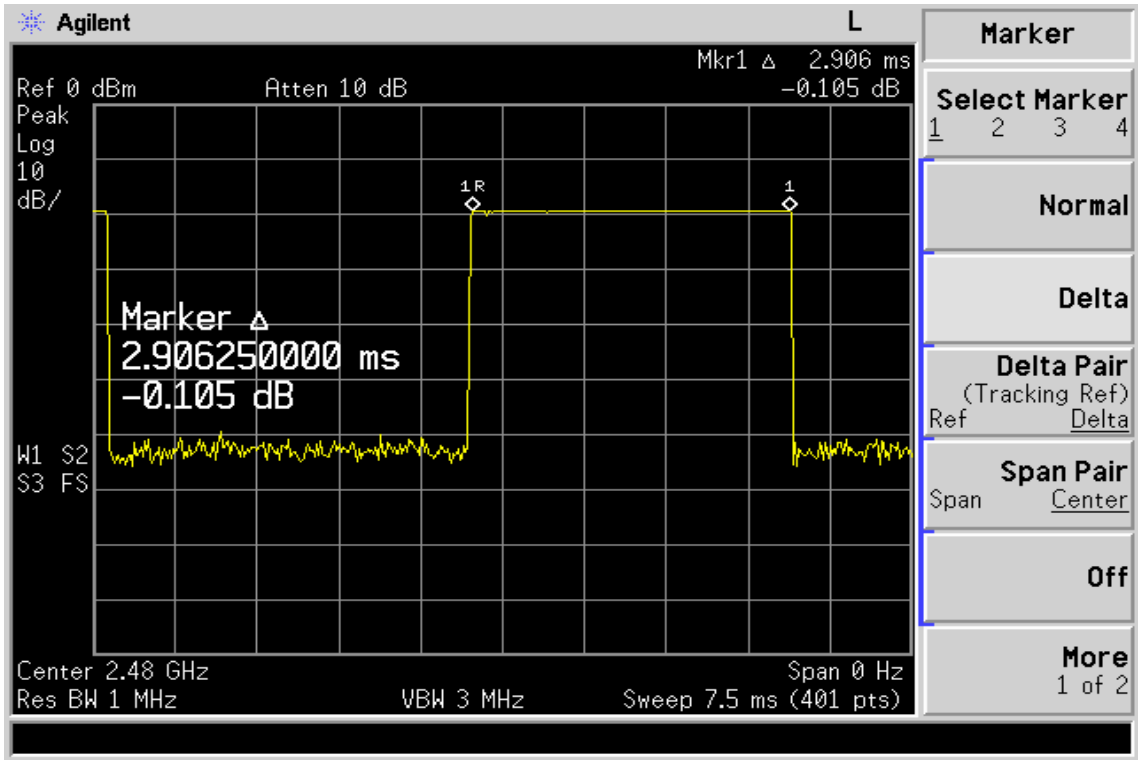
DH1



DH3



DH5



13. Peak Power Spectral Density

13.1. Standard Applicable

According to §15.247(d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3kHz band during any time interval of continuous transmission.

13.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

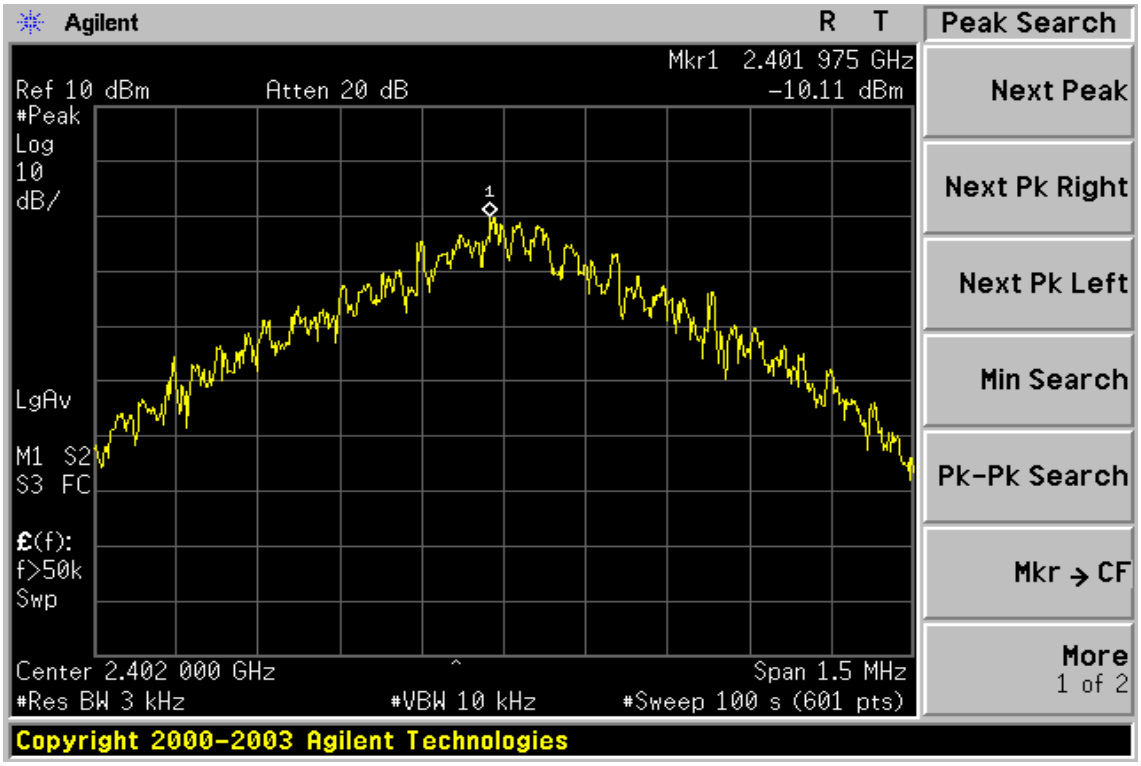
13.3. Measurement Result

CH	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
Low	-10.11	0.10	-10.01	8
Mid	-9.67	0.10	-9.57	8
High	-8.72	0.10	-8.62	8

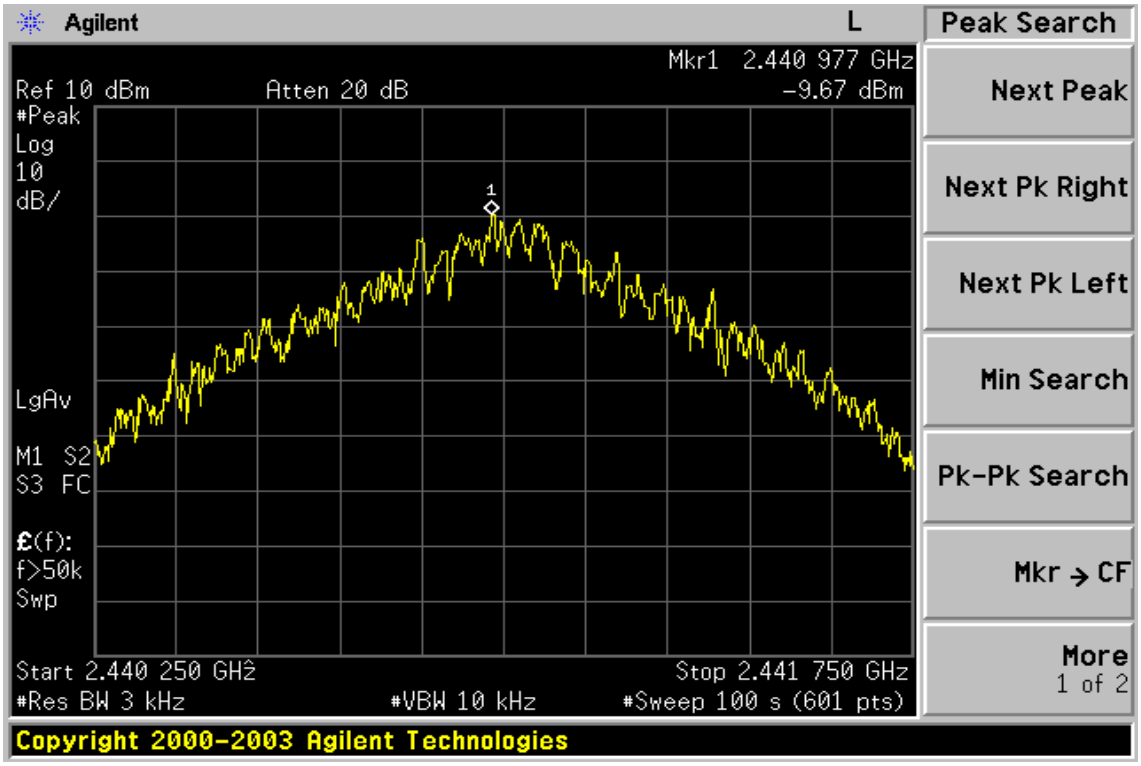
13.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2006	03/28/2007
Spectrum Analyzer	Agilent	7405A	US41160416	06/28/2006	06/29/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S10W5	N/A	10/07/2005	10/06/2006
Attenuator	Mini-Circuit	BW-S6W5	N/A	10/07/2005	10/06/2006
Splitter	Agilent	11636B	51818	01/05/2006	01/04/2007

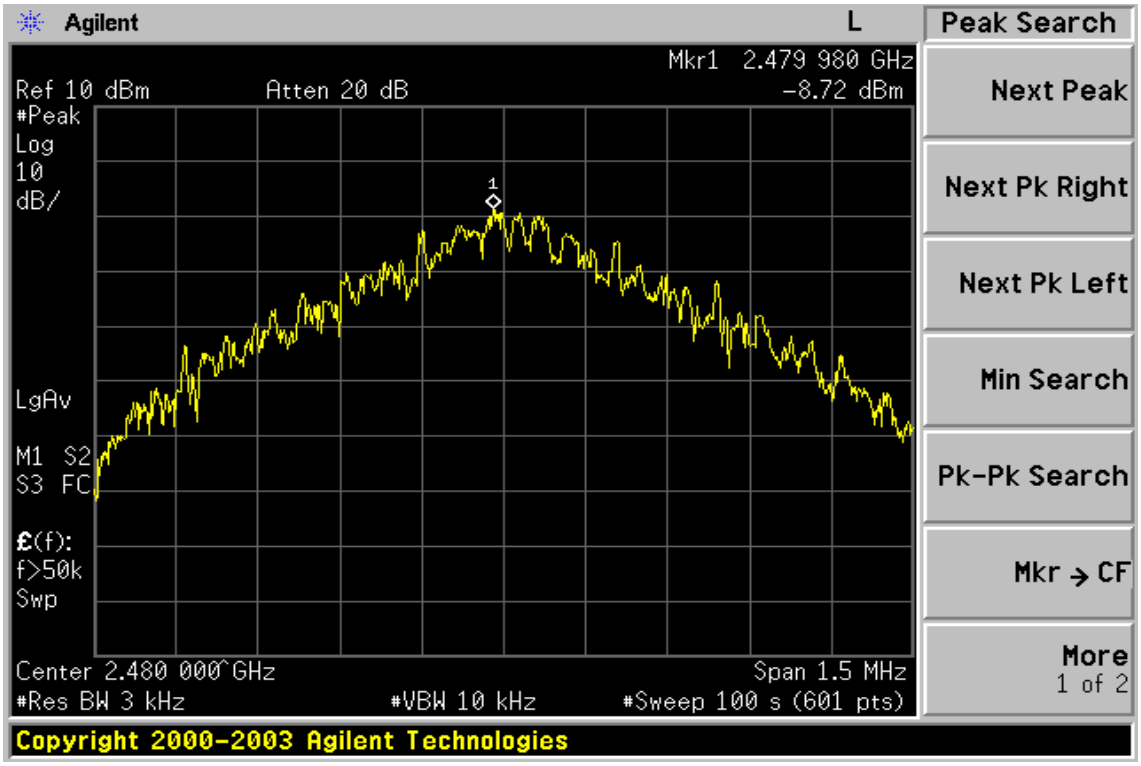
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



14. ANTENNA REQUIREMENT

14.1. Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

14.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 0dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.