Testing Laboratory
1190

FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment	:	**GSM/GPRS with Bluetooth Cellular Phone**
Trade Name	:	**GPLUS**
Model No.	:	**GP810**
FCC ID	:	**VPV-GP810**
Filing Type	:	**Certification**
Applicant	:	**TOTAL LIGHT ENTERPRISE CO., LTD.** 5F, No.62, Zhouzi St., Neihu District, Taipei City 114, Taiwan (R.O.C)

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- The data shown in this test report were carried out on Oct. 24, 2007 at **Sporton International Inc. LAB.**
- Report No.: FR751505-03, Report Version: Rev. 01.

Jones Tsai
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Report Issue Date: Oct. 31, 2007

Report No.	Description

1. General Description of Equipment under Test

1.1 Applicant

TOTAL LIGHT ENTERPRISE CO., LTD.
5F, No.62, Zhouzi St., Neihu District, Taipei City 114, Taiwan (R.O.C)

1.2 Manufacturer

GPLUS TELECOM CO., LTD.
4F, POLARIS I BLDG., 15-3, JEONGJA-DONG BUNDANG-GU, SEONGNAM-SI, GYEONGGI-DO, KOREA 463-811

1.3 Basic Description of Equipment under Test

Equipment		GSM/GPRS with Bluetooth Cellular Phone
Trade Name		GPLUS
Model No.		GP810
FCC ID		VPV-GP810
AC Adapter	**Brand Name**	GPLUS
	Model Name	GT-TA-005-A3
	Power Rating	I/P: 100-240Vac, 50-60Hz, 0.2A; O/P: 5.2Vdc, 600mA
	AC Power Cord Type	1.55 meter non-shielded cable without ferrite non-core
Battery	**Brand Name**	GPLUS
	Model Name	GP800/810
	Rating	4.2V, 270mA
	Type	Li-ion
Earphone	**Brand Name**	GPLUS
	Model Name	GP800
	Signal line Type	1.65 meter non-shielded cable without ferrite non-core
USB Cable	**Brand Name**	GPLUS
	Model Name	GP800
	Signal line Type	1.5 meter non-shielded cable without ferrite non-core

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. Modulation Type/Data Rate	GFSK			
2. Frequency Range.	2400 MHz ~ 2483.5 MHz			
3. Number of Channels	79			
4. Carrier Frequency of each channel	2402 + n * 1 MHz, n = 0~78			
5. Channel Spacing	1 MHz			
6. Maximum Output Power to Antenna (Normal condition)	-1.62 dBm			
7. Type of Antenna Connector	N/A			
8. HW Version	RevA1			
9. SW Version	GP810_V043_CC052_TELCEL_20070817			
10. Antenna Type	Chip Antenna			
11. Antenna Gain	-9 dBi			
12. Function Type	Transmitter		Transceiver	V
13. DUT Stage	Production Unit			

2. Test Configuration of Equipment under Test

2.1 Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
b. For spurious emission below 1GHz, only one channel of each application was tested because it is not related to channel selection.
c. The EUT is programmed to transmit signal continuously for all tests.
d. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

2.2 Test Mode

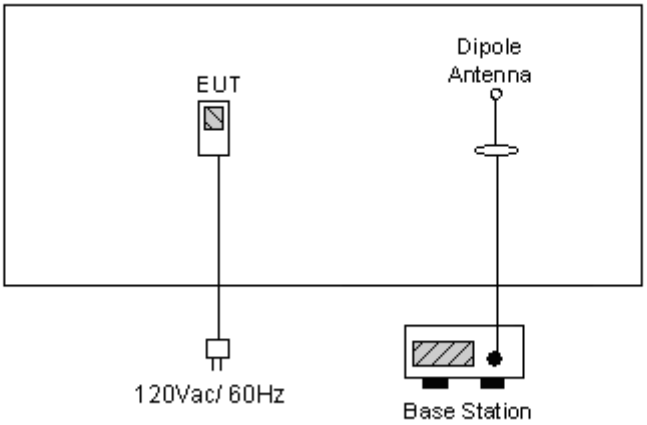
Application	Bluetooth
Radiated Emission	Mode 1: Tx_CH00_2402 MHz Mode 2: Tx_CH39_2441 MHz Mode 3: Tx_CH78_2480 MHz
Conducted Emission	Mode 1: GSM850 Idle Mode + BT Link + Camera + Adapter Mode 2: GSM850 Idle Mode + BT Link + MPEG4 + Adapter Mode 3: GSM850 Idle Mode + BT Link +Camera + USB Link Mode 4: PCS1900 Idle Mode + BT Link + Camera + Adapter

2.3 Ancillary Equipment List

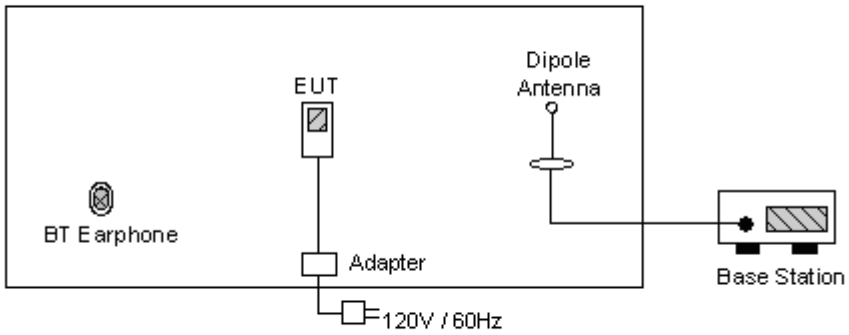
Item	Equipment	Trade Name	Model No.	FCC ID	Serial No.
1.	Base Station	R&S	CMU200	N/A	N/A

2.4 Connection Diagram of Test System

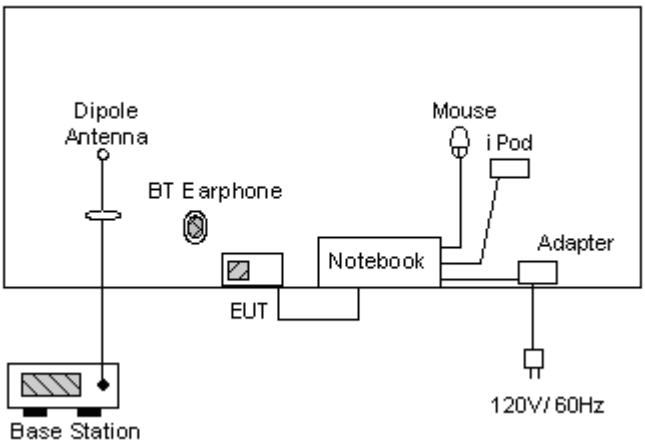
<Radiated Emission >



<Conducted Emission>
EUT with Adapter Mode



EUT with USB Link Mode



3. RF Utility

The EUT is in BT Link mode with mobile phone for conducted emission or in BT continuous Tx Mode controlled by base station simulator for radiation emission.

4. General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO04-HY, 03CH06-HY

4.1 Test Voltage

AC120V / 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test Compliance

47 CFR Part 15 Subpart C

4.4 Frequency Range

Conduction: from 150 kHz to 30 MHz
Radiation: from 30 MHz to 25000MHz

4.5 Test Distance

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

5. Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result	Section
15.247(a)(1)	Hopping Channel Separation	Pass	5.2
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Pass	5.3
15.247(a)(1)	Hopping Channel Bandwidth	Pass	5.4
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass	5.5
15.247(b)(1)	Output Power	Pass	5.6
15.247(c)	100kHz Bandwidth of Frequency Band Edges	Pass	5.7
15.207	Conducted Emission	Pass	5.8
15.209	Radiated Emission	Pass	5.9
15.203	Antenna Requirement	Pass	5.10

5.2 Hopping Channel Separation

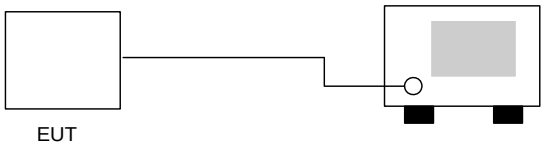
5.2.1. Measuring Instruments：

As described in chapter 6 of this test report.

5.2.2. Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 100kHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

5.2.3. Test Setup Layout：



5.2.4. Test Result：The spectrum analyzer plots are attached as below

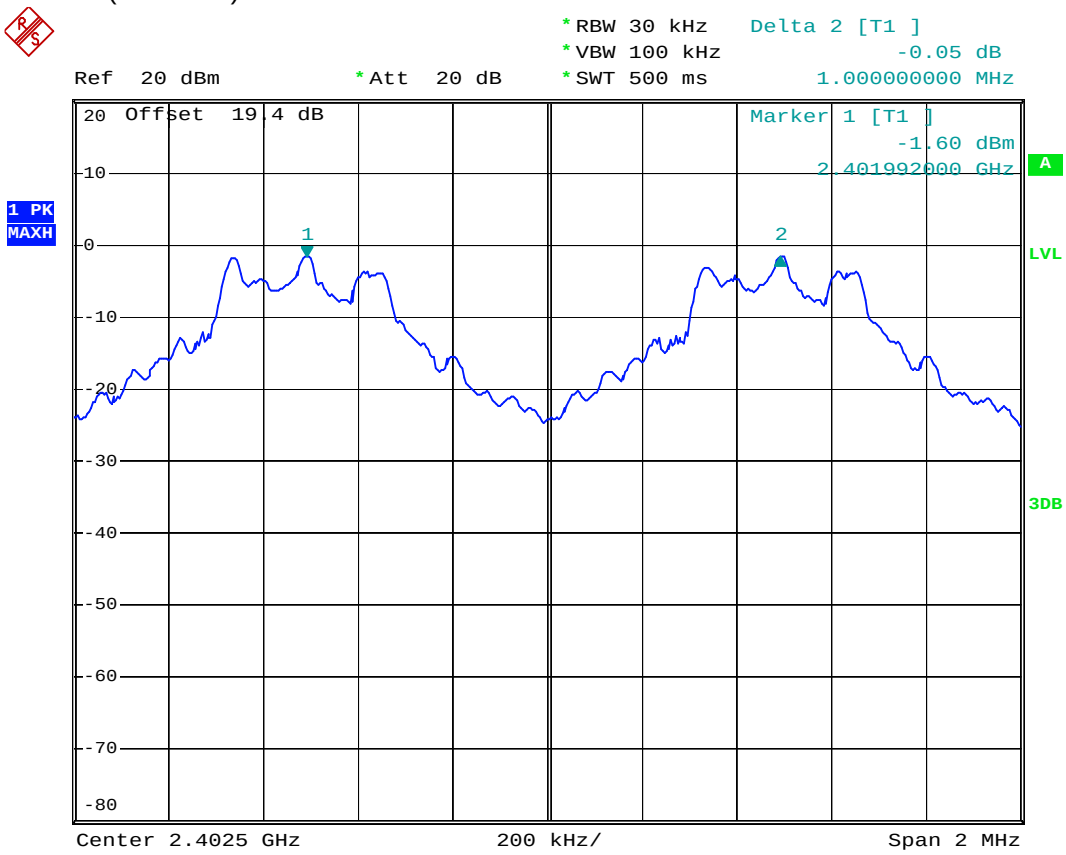
- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.587	Mode 1
39	2441	1.012	0.591	Mode 2
78	2480	1.000	0.583	Mode 3

Remark: Limit is the greater one of 25kHz or the 20dB bandwidth of the hopping channel.

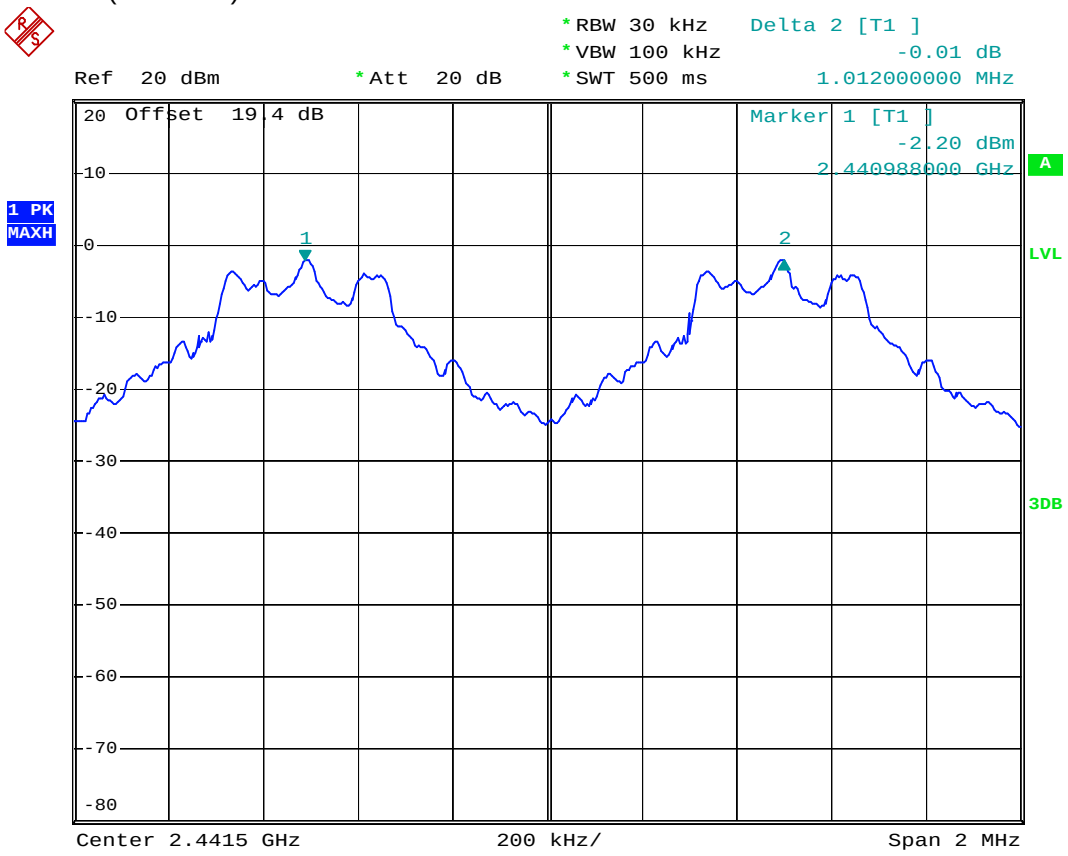
5.2.5. Hopping Channel Separation

Mode 1: CH00 (2402MHz)



Date: 17.OCT.2007 05:49:21

Mode 2: CH39 (2441MHz)



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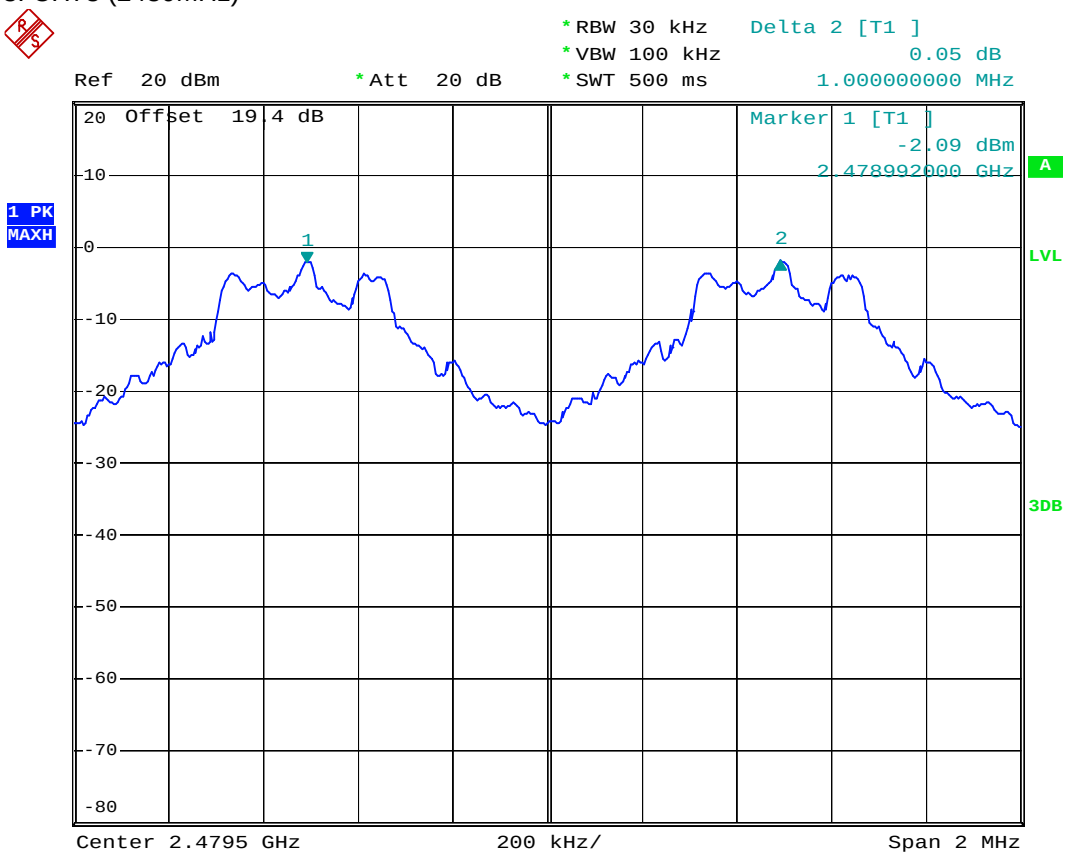
Mode 3: CH78 (2480MHz)



Date: 17.OCT.2007 05:55:14

5.3 Number of Hopping Frequency

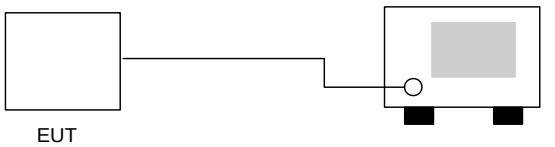
5.2.6. Measuring Instruments：

As described in chapter 6 of this test report.

5.2.7. Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The number of hopping frequency used is defined as the device has the numbers of total channel.

5.2.8. Test Setup Layout：

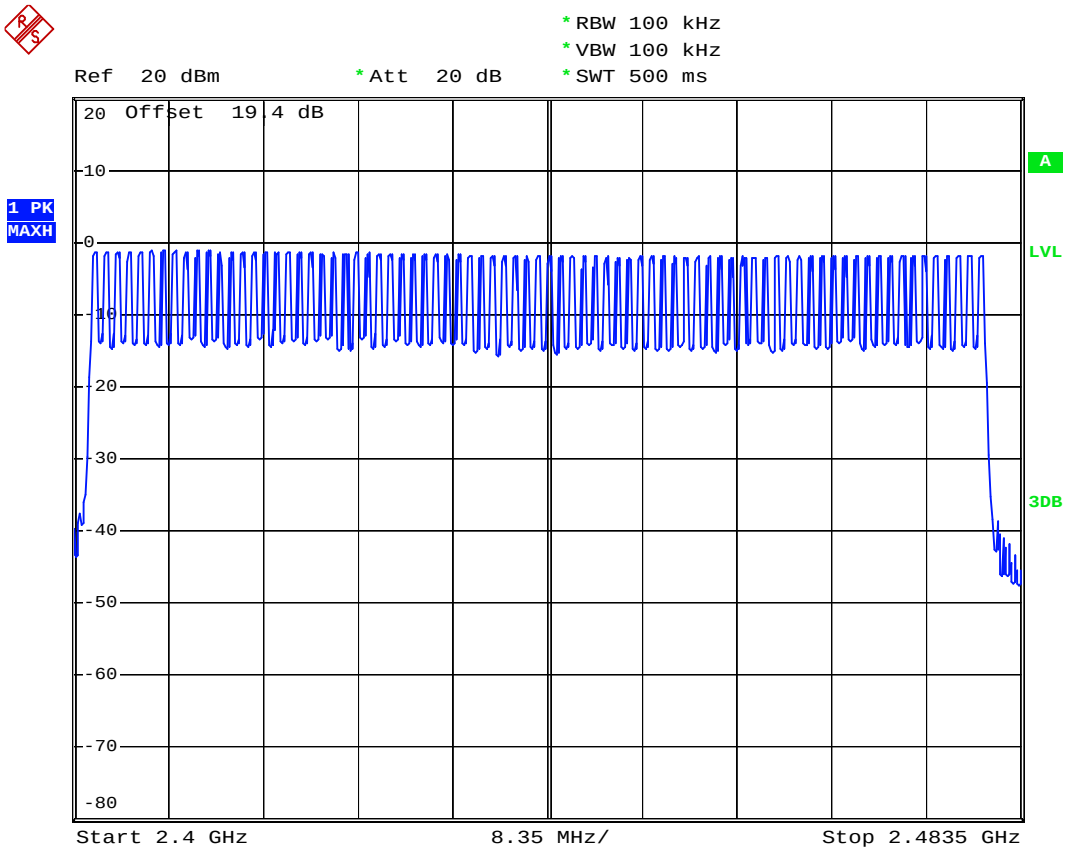


5.2.9. Test Result：See spectrum analyzer plots below

- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

Number of Hopping Frequency (Channel)	Limits (Channel)
79	15

5.2.10. Number of Hopping Frequency



Date: 17.OCT.2007 06:16:40

5.4 Hopping Channel Bandwidth

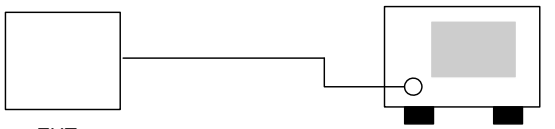
5.4.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.4.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 300kHz.
3. The Hopping Channel bandwidth is defined as the frequency range where the power is higher than peak power minus 20dB.

5.4.3 Test Setup Layout：



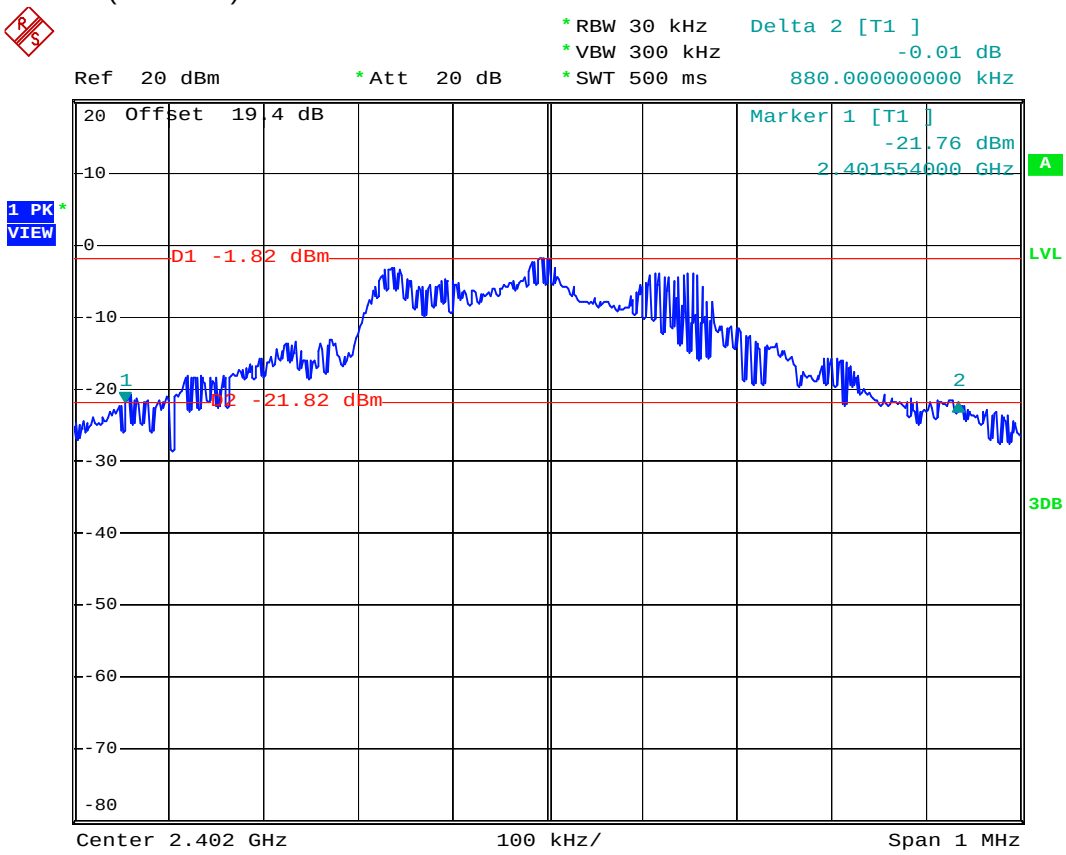
5.4.4 Test Result：See spectrum analyzer plots below

- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.880	1.0	Mode 1
39	2441	0.886	1.0	Mode 2
78	2480	0.874	1.0	Mode 3

5.4.5 Hopping Channel Bandwidth

Mode 1: CH00 (2402MHz)



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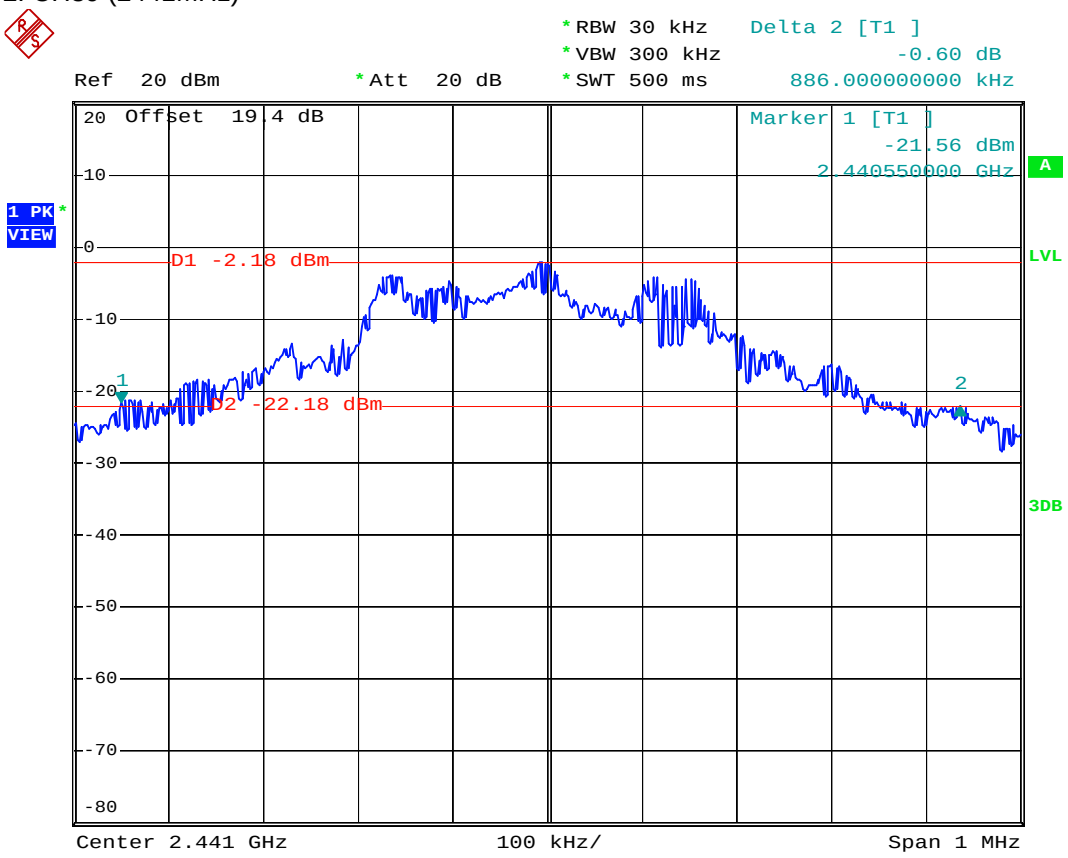
Mode 2: CH39 (2441MHz)



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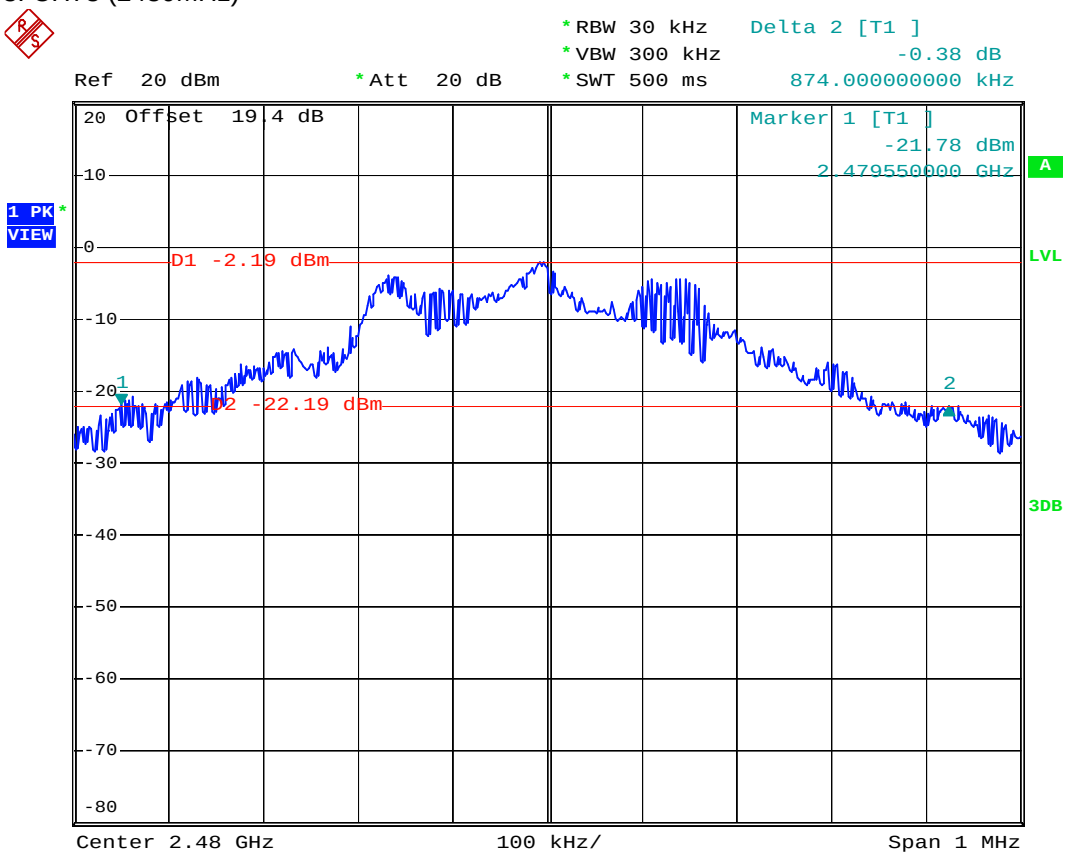
Mode 3: CH78 (2480MHz)



Date: 17.OCT.2007 05:43:06

5.5 Dwell Time of Each Frequency within a 30 Seconds Period

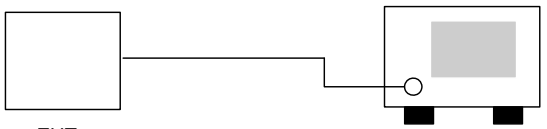
5.5.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.5.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Set the center frequency on any frequency would be measured and set the frequency span to zero span.
4. The equation = 30*(1600/79)*t (t = the time duration of one single pulse)

5.5.3 Test Setup Layout：



5.5.4 Test Result：See spectrum analyzer plots below

- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

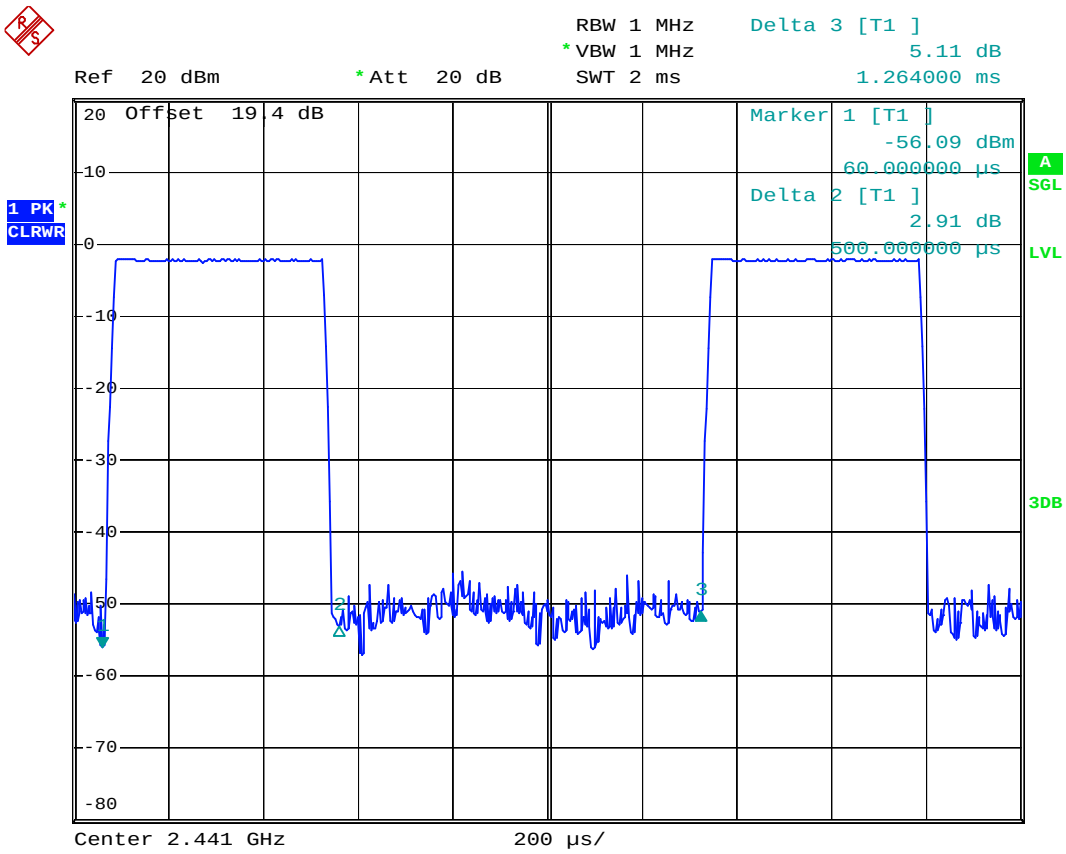
Ch39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.1	500	0.128	0.4
DH3	4	1770	0.224	0.4
DH5	2.9	3050	0.280	0.4

※ Remark:
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

5.5.5 Dwell Time

DH1 (CH39)



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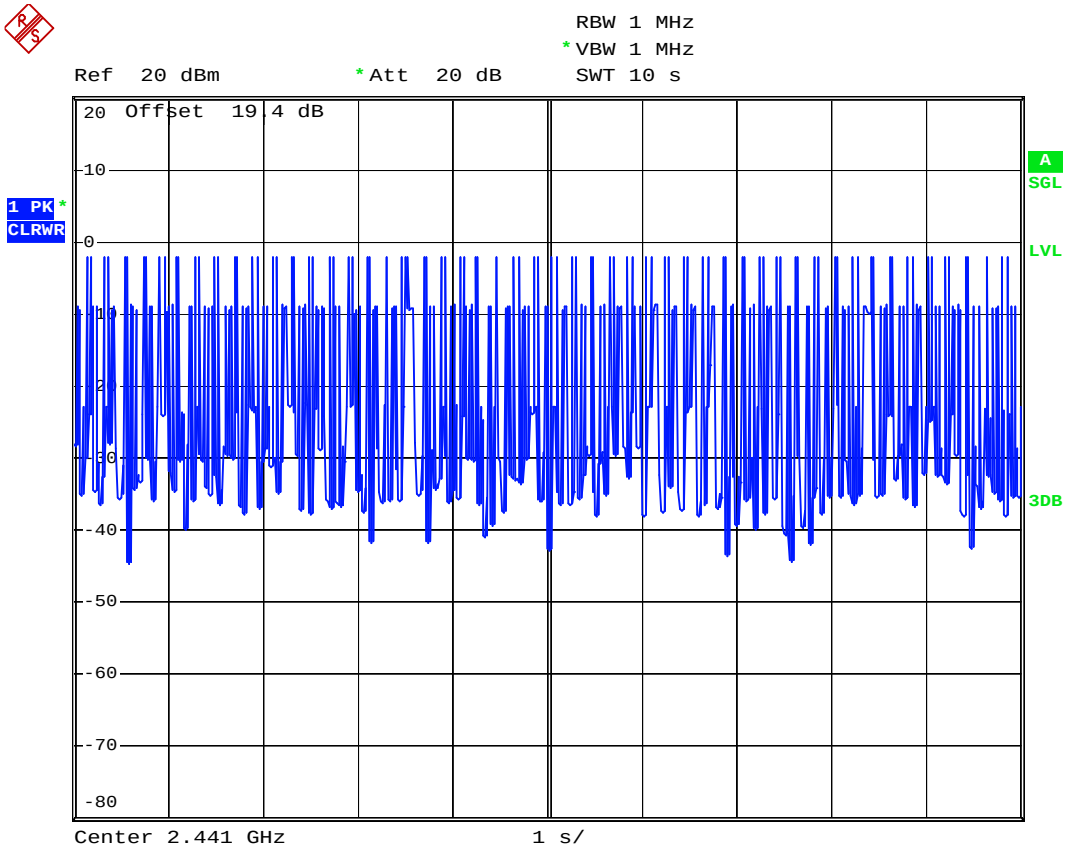
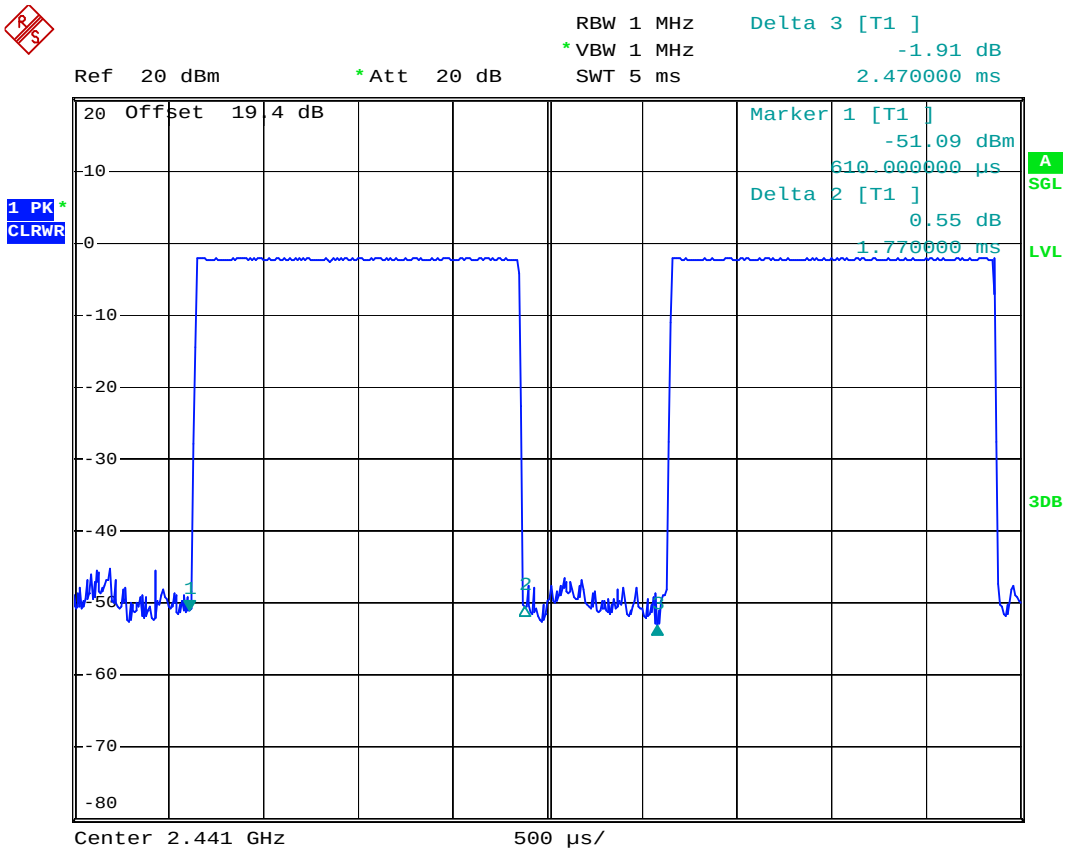


Date: 17.OCT.2007 06:02:33

DH3 (CH39)



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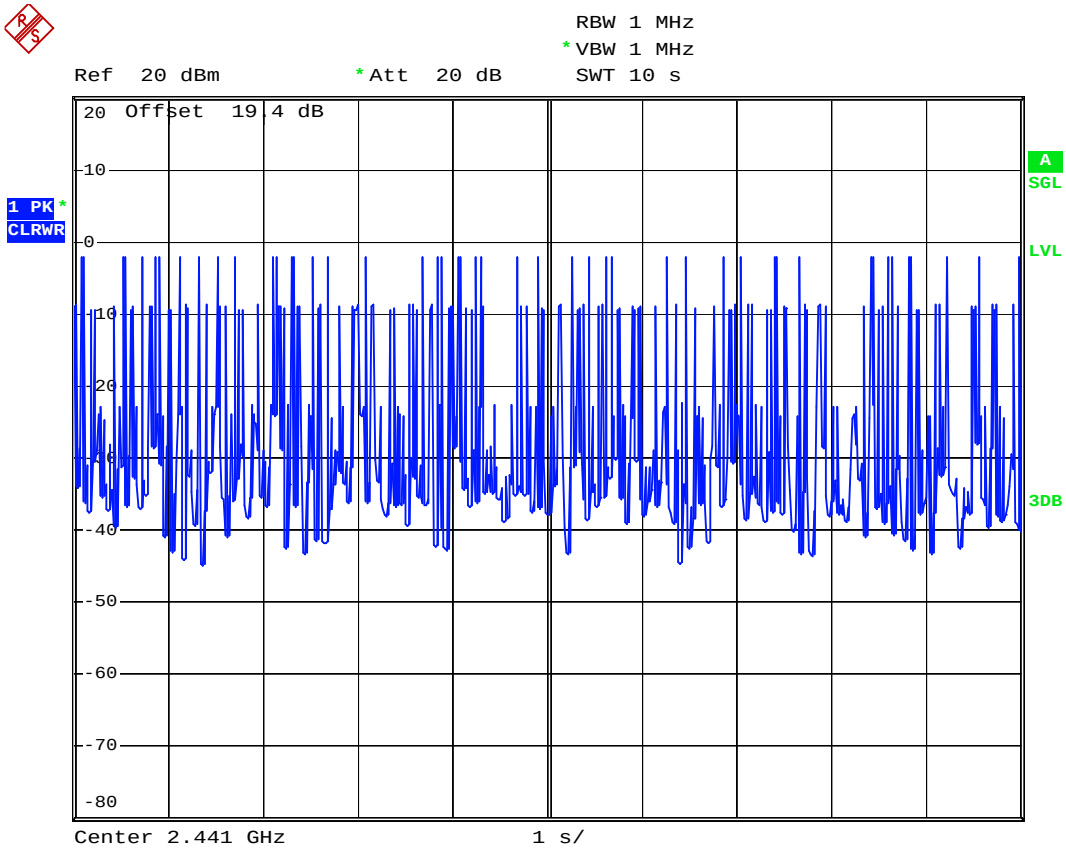
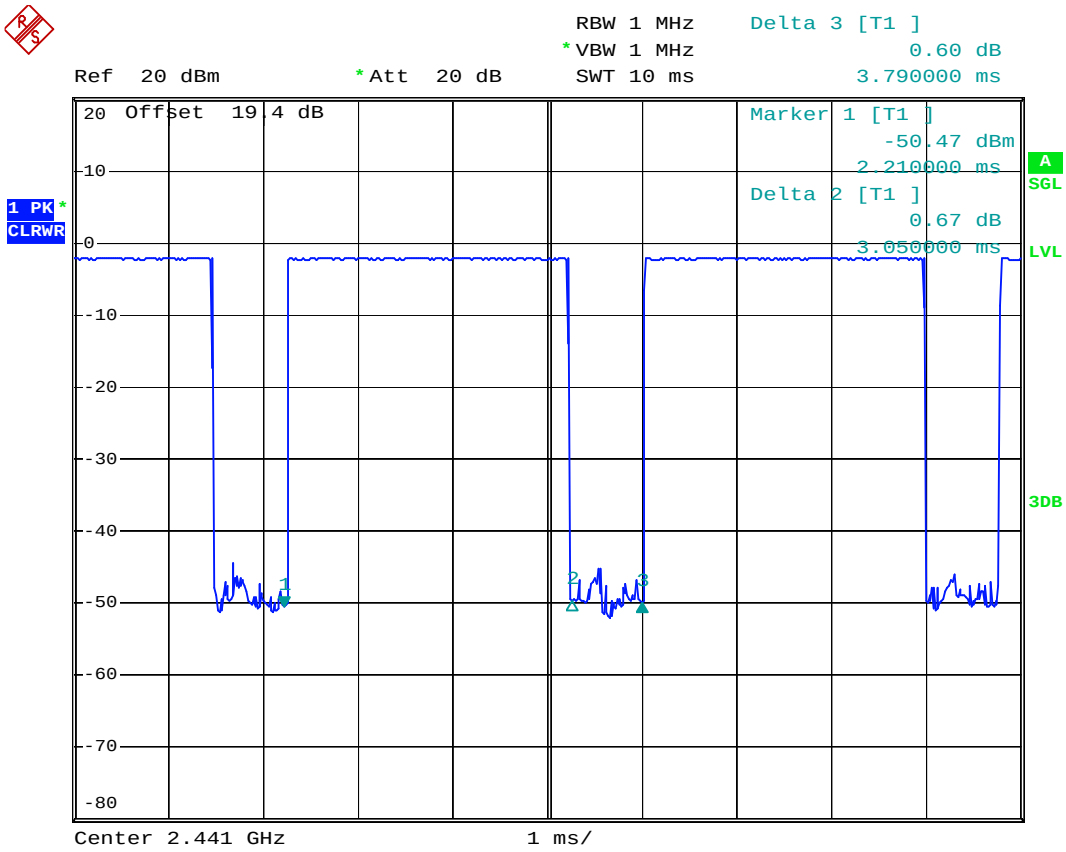


Date: 17.OCT.2007 06:03:18

DH5 (CH39)



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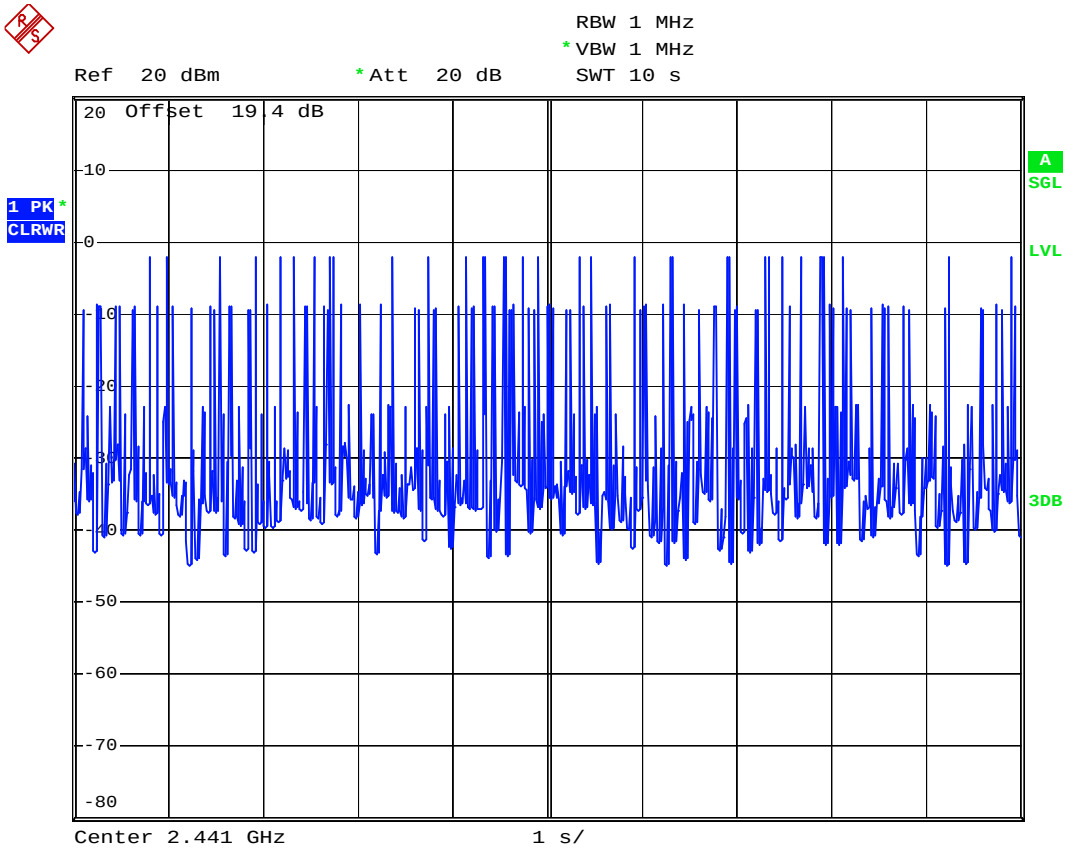


Date: 17.OCT.2007 06:04:08

5.6 Output Power

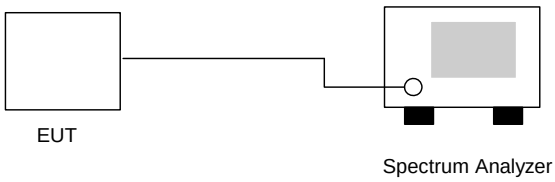
5.6.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.6.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer directly.
2. The center frequency of the spectrum analyzer was set to the fundamental frequency and set RBW to 3MHz and VBW to 3MHz.

5.6.3 Test Setup Layout：



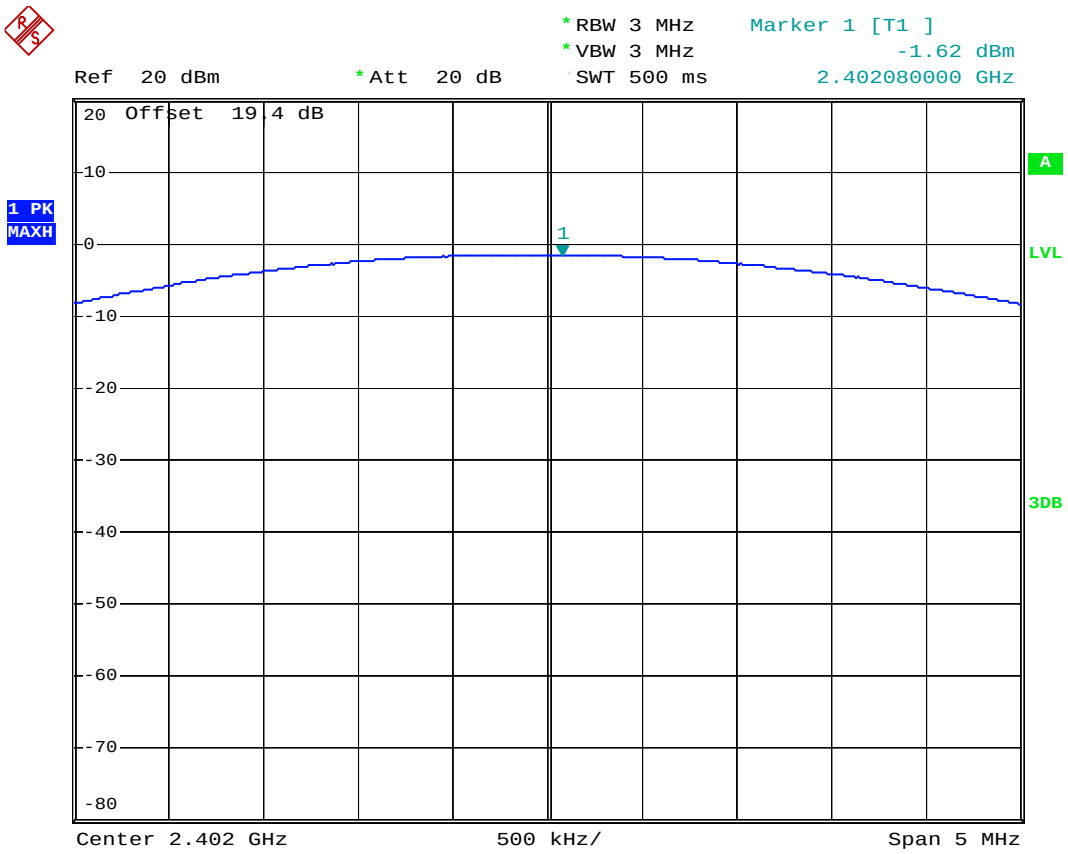
5.6.4 Test Result：See spectrum analyzer plots below

- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

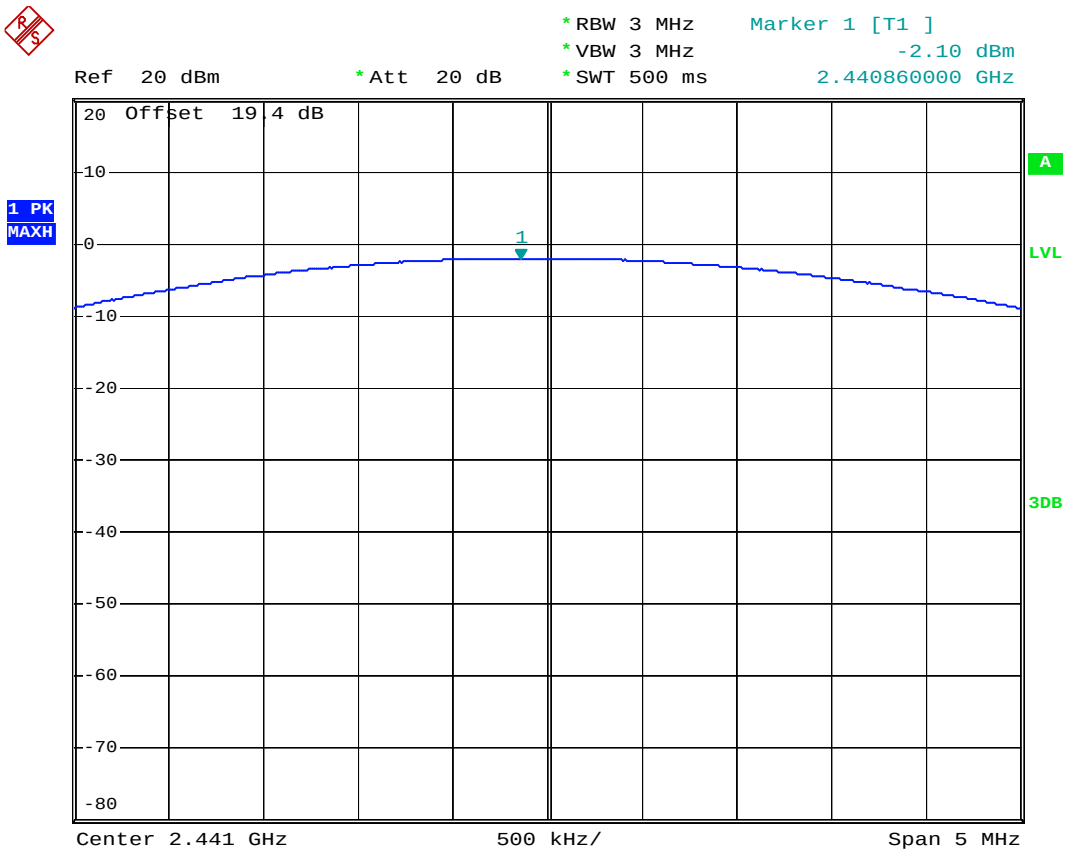
Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)	Plot Ref. No.
00	2402	-1.62	1W/30 dBm	Mode 1
39	2441	-2.10	1W/30 dBm	Mode 2
78	2480	-1.93	1W/30 dBm	Mode 3

5.6.5 Output Power

Mode 1: CH00 (2402MHz)



Mode 2: CH39 (2441MHz)



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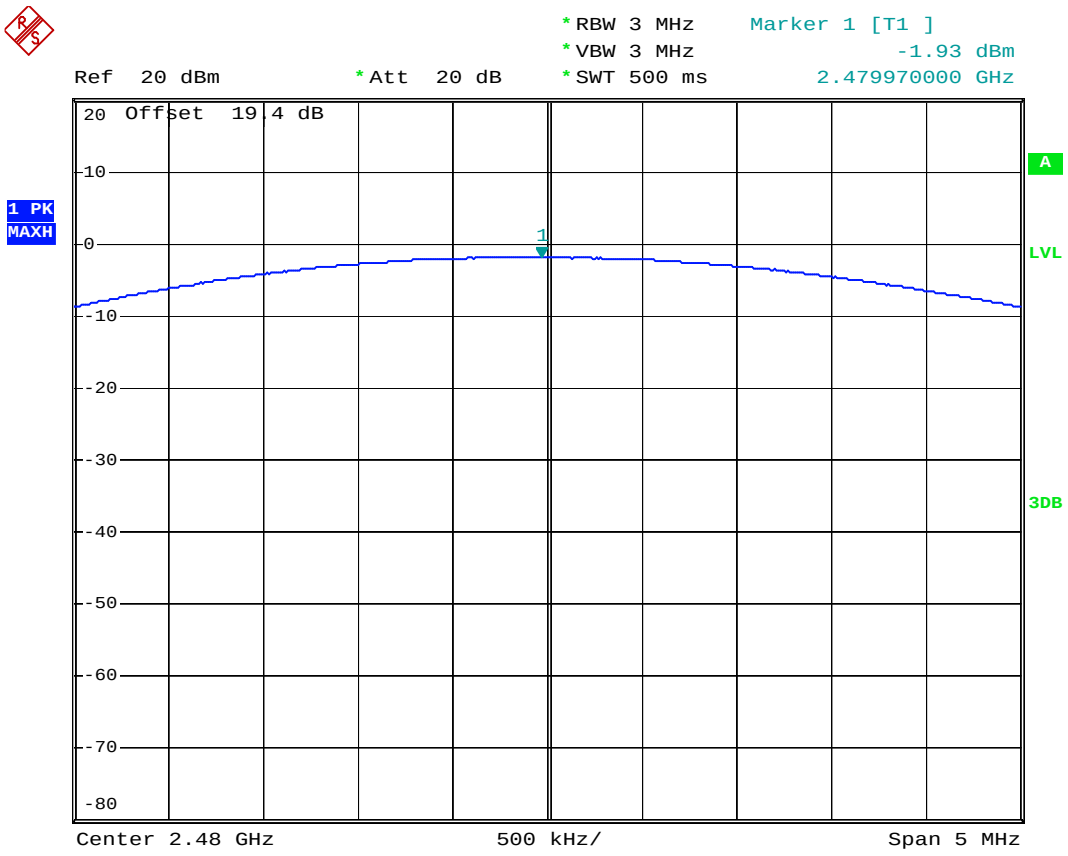
Mode 3: CH78 (2480MHz)



Date: 17.OCT.2007 05:33:14

5.7 100kHz Bandwidth of Frequency Band Edges

5.7.1 Measuring Instruments：

As described in chapter 6 of this test report.

5.7.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span for the conducted measurement, and RBW/VBW=1MHz/1MHz for peak measurement and RBW/VBW=1MHz/300Hz for average measurement in the radiated measurement.
3. The band edges was measured and recorded.

5.7.3 Test Result：

- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : Ken

Test Result in lower band (Channel 00)： PASS

Test Result in higher band(Channel 78)： PASS

5.7.4 Note on Band edge Emission

CH00 (Horizontal)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2390.00	52.01	-21.99	74.00	53.46	30.26	3.75	35.46	100	0	Peak
2390.00	41.74	-12.26	54.00	43.19	30.26	3.75	35.46	100	359	Average

CH00 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2390.00	51.95	-22.05	74.00	53.40	30.26	3.75	35.46	100	0	Peak
2390.00	42.09	-11.91	54.00	43.54	30.26	3.75	35.46	100	324	Average

CH78 (Horizontal)

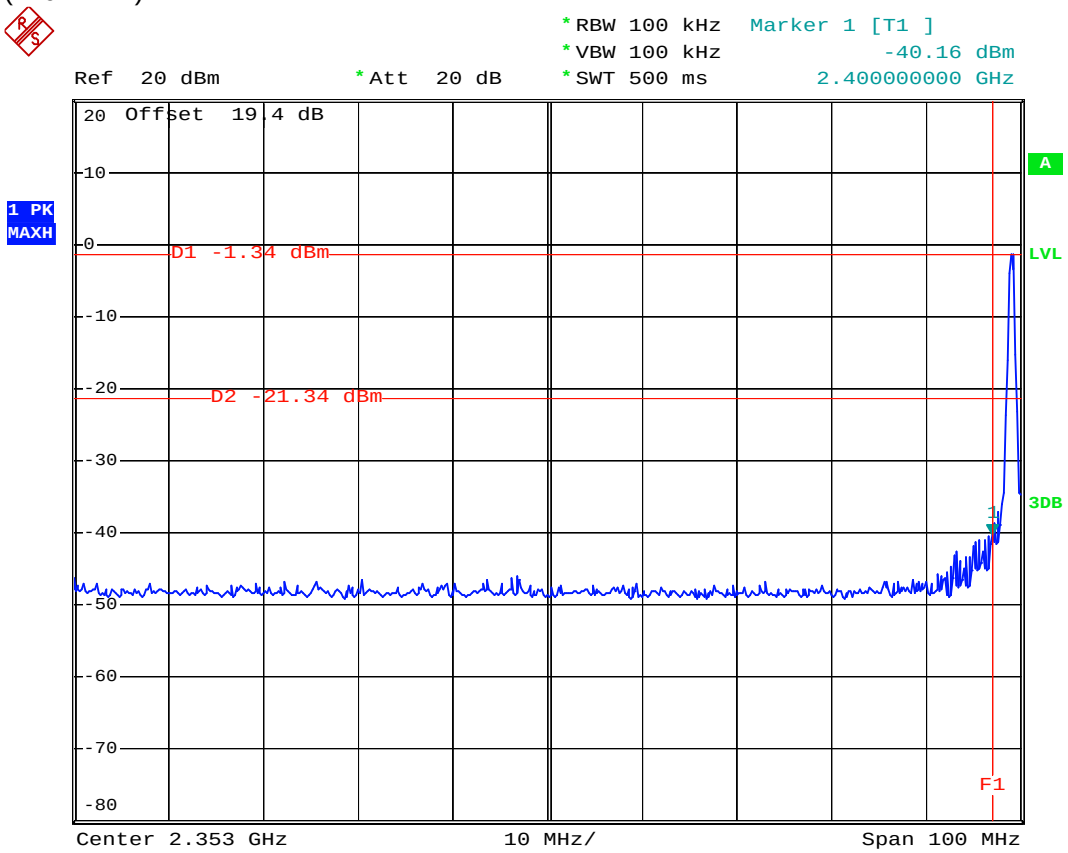
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2483.50	60.70	-13.30	74.00	62.06	30.29	3.86	35.51	100	0	Peak
2483.50	48.15	-5.85	54.00	49.51	30.29	3.86	35.51	100	3	Average

CH78 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2483.50	61.52	-12.48	74.00	62.88	30.29	3.86	35.51	100	0	Peak
2483.50	48.62	-5.38	54.00	49.98	30.29	3.86	35.51	100	327	Average

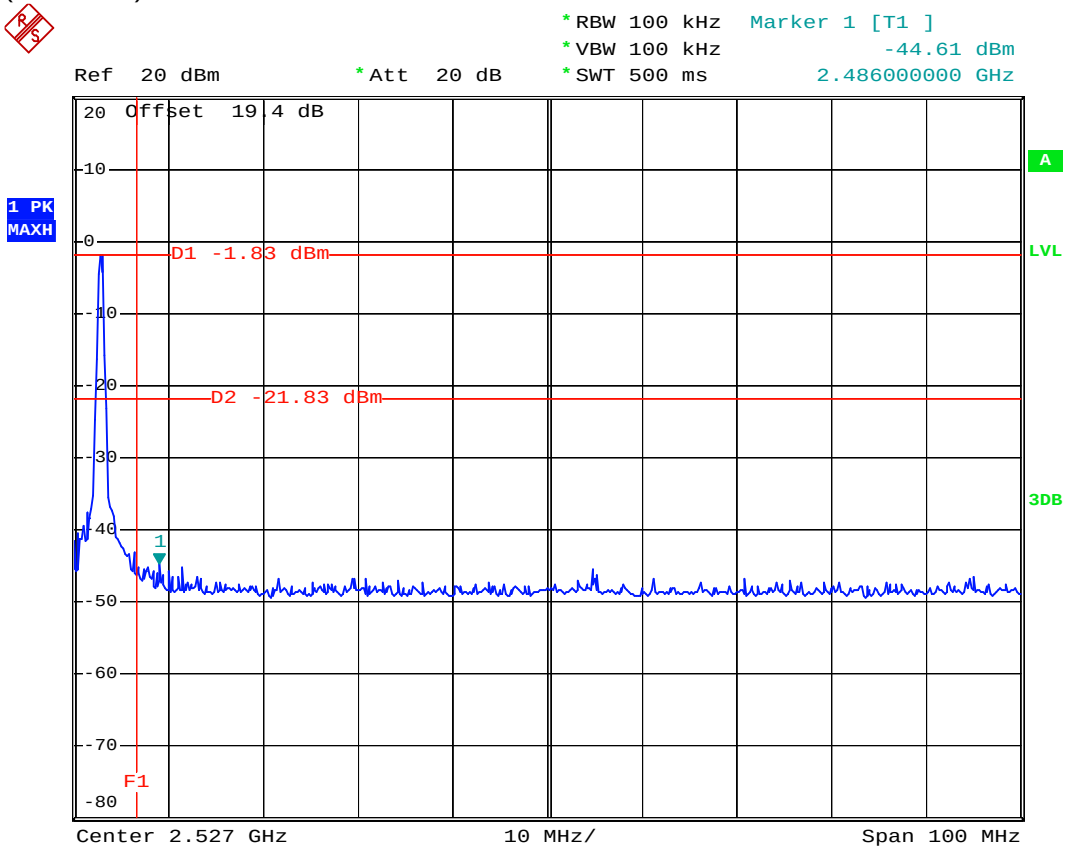
5.7.5 Frequency Band Edge

CH00 (2402 MHz)



Date: 17.OCT.2007 05:45:02

CH78 (2480 MHz)



Date: 17.OCT.2007 05:46:28

5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

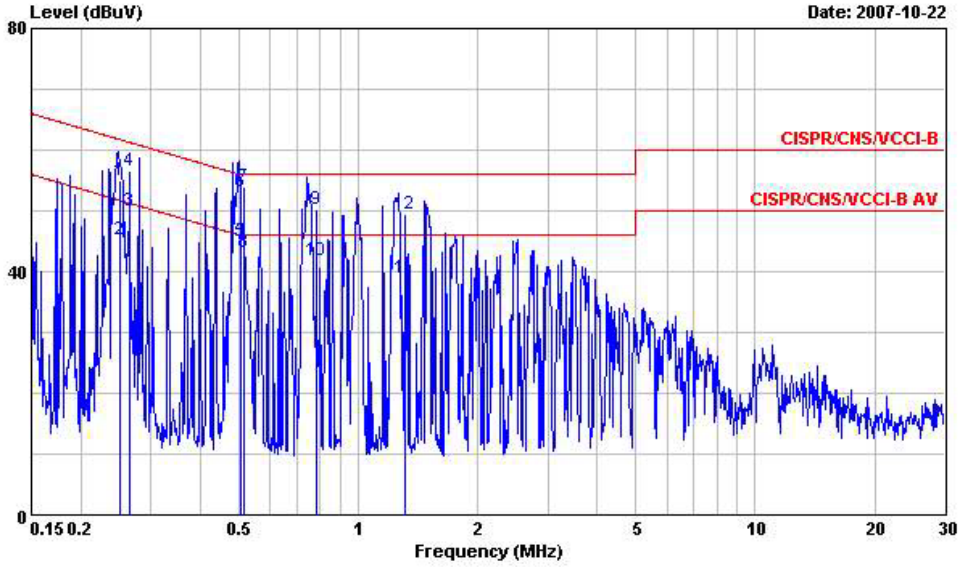
5.8.2 Test Procedures：

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power port of a line impedance stabilization network (LISN).
c. All the support units are connected to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.8.3 Test Data Test Mode 1

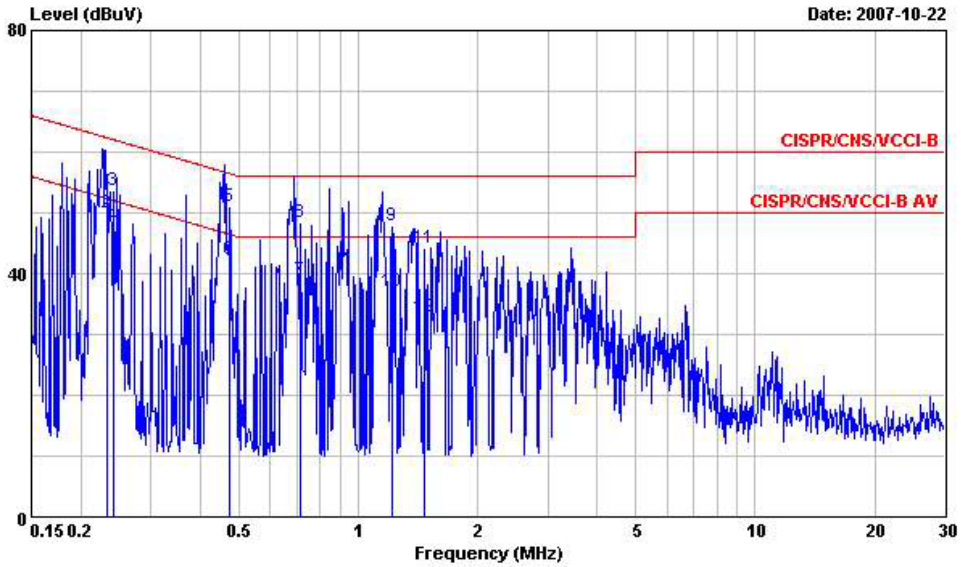
- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : James

The test that passed at minimum margin was marked by the frame in the following table.



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 LINE
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : GSM 850 Idle+BT Link+Camera+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2513860	54.97	-6.74	61.71	54.37	0.10	0.50	QP
2	0.2513860	45.28	-6.43	51.71	44.68	0.10	0.50	Average
3	0.2642930	50.07	-1.23	51.30	49.50	0.10	0.47	Average
4	0.2642930	56.59	-4.71	61.30	56.02	0.10	0.47	QP
5	0.5067760	44.91	-1.09	46.00	44.39	0.10	0.42	Average
6	0.5067760	53.22	-2.78	56.00	52.70	0.10	0.42	QP
7	0.5142760	53.85	-2.15	56.00	53.32	0.10	0.43	QP
8	0.5142760	43.05	-2.95	46.00	42.52	0.10	0.43	Average
9	0.7872730	50.22	-5.78	56.00	49.65	0.10	0.47	QP
10	0.7872730	41.80	-4.20	46.00	41.23	0.10	0.47	Average
11	1.316	39.06	-6.94	46.00	38.46	0.10	0.50	Average
12	1.316	49.59	-6.41	56.00	48.99	0.10	0.50	QP



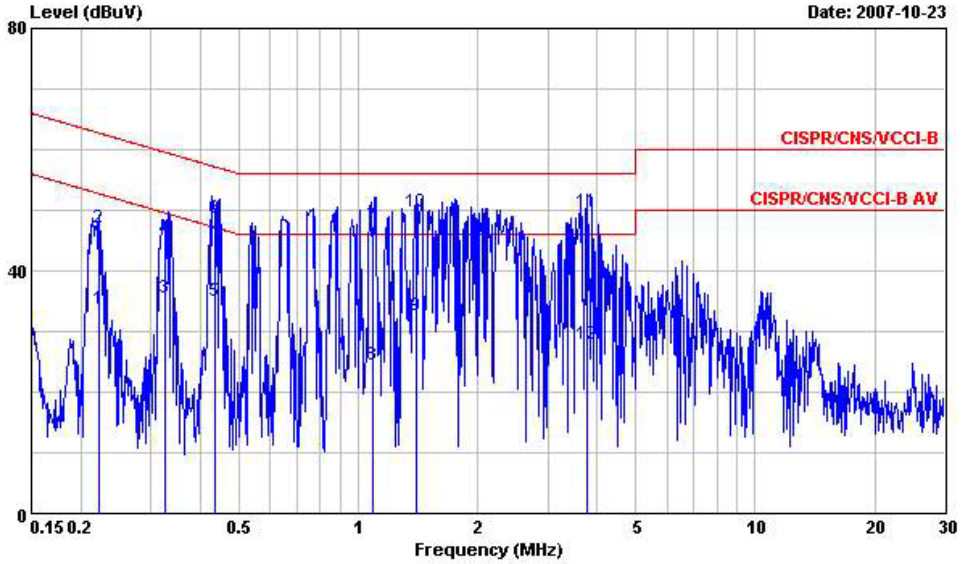
Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 NEUTRAL
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : GSM 850 Idle+BT Link+Camera+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2327630	56.59	-5.76	62.35	55.99	0.10	0.50	QP
2	0.2327630	50.13	-2.22	52.35	49.53	0.10	0.50	Average
3	0.2414090	53.74	-8.31	62.05	53.14	0.10	0.50	QP
4	0.2414090	47.89	-4.16	52.05	47.29	0.10	0.50	Average
5	0.4719720	50.98	-5.50	56.48	50.42	0.10	0.46	QP
6	0.4719720	42.27	-4.21	46.48	41.71	0.10	0.46	Average
7	0.7124030	39.01	-6.99	46.00	38.51	0.10	0.40	Average
8	0.7124030	48.45	-7.55	56.00	47.95	0.10	0.40	QP
9	1.213	47.89	-8.11	56.00	47.29	0.10	0.50	QP
10	1.213	37.18	-8.82	46.00	36.58	0.10	0.50	Average
11	1.463	44.21	-11.79	56.00	43.61	0.10	0.50	QP
12	1.463	33.02	-12.98	46.00	32.42	0.10	0.50	Average

5.8.4 Test Data Test Mode 2

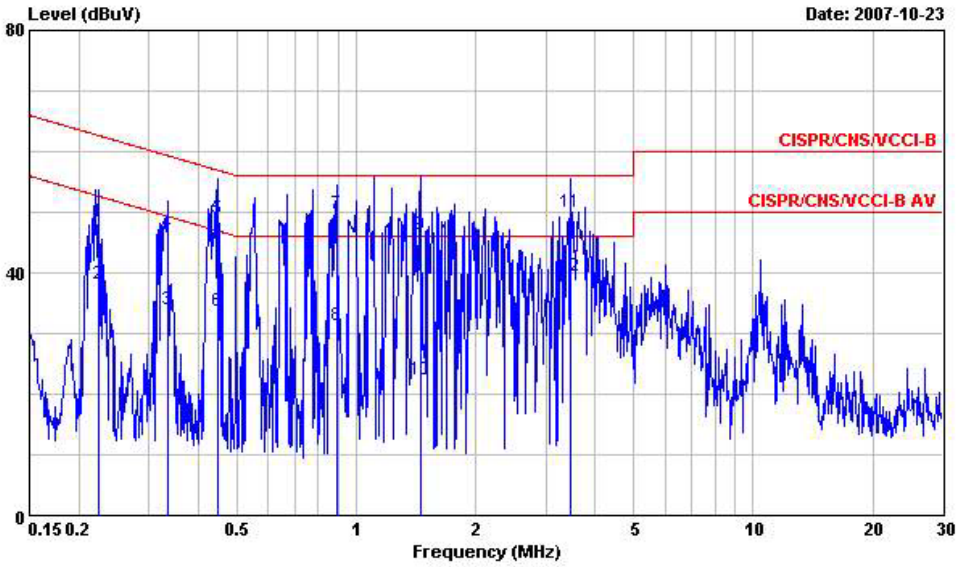
- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : James

The test that passed at minimum margin was marked by the frame in the following table.



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 LINE
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : GSM 850 Idle+BT Link+MPEG4+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2220070	33.72	-19.02	52.74	33.12	0.10	0.50	Average
2	0.2220070	46.98	-15.76	62.74	46.38	0.10	0.50	QP
3	0.3260820	35.56	-13.99	49.55	35.06	0.10	0.40	Average
4	0.3260820	45.24	-14.31	59.55	44.74	0.10	0.40	QP
5	0.4354980	34.91	-12.24	47.15	34.34	0.10	0.47	Average
6	0.4354980	48.77	-8.38	57.15	48.20	0.10	0.47	QP
7	1.090	47.47	-8.53	56.00	46.87	0.10	0.50	QP
8	1.090	24.57	-21.43	46.00	23.97	0.10	0.50	Average
9	1.400	32.59	-13.41	46.00	31.99	0.10	0.50	Average
10	1.400	49.69	-6.31	56.00	49.09	0.10	0.50	QP
11	3.780	49.73	-6.27	56.00	49.03	0.10	0.60	QP
12	3.780	27.90	-18.10	46.00	27.20	0.10	0.60	Average



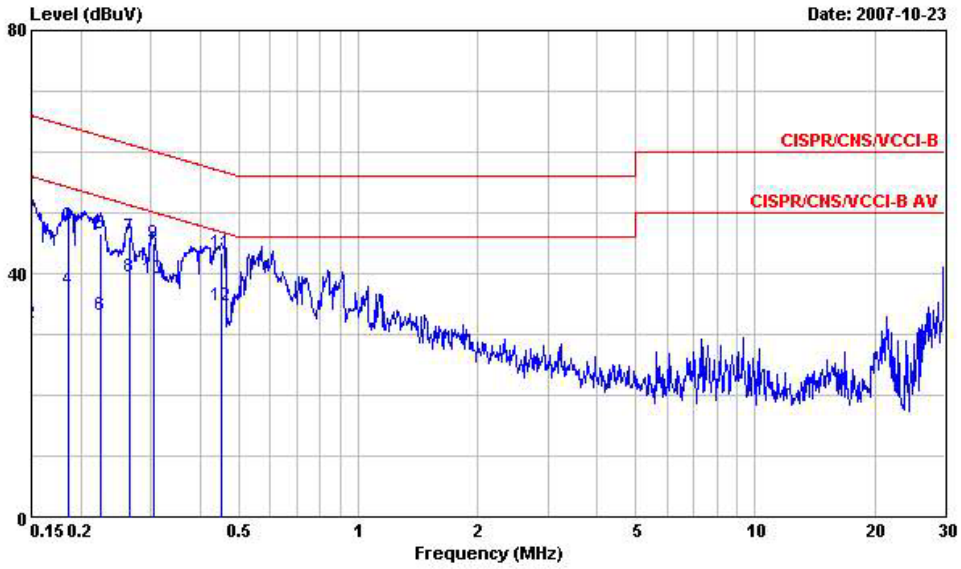
Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 NEUTRAL
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : GSM 850 Idle+BT Link+MPEG4+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2231870	48.50	-14.20	62.70	47.90	0.10	0.50	QP
2	0.2231870	38.06	-14.64	52.70	37.46	0.10	0.50	Average
3	0.3338470	33.92	-15.43	49.35	33.42	0.10	0.40	Average
4	0.3338470	46.64	-12.71	59.35	46.14	0.10	0.40	QP
5	0.4467900	48.88	-8.05	56.93	48.29	0.10	0.49	QP
6	0.4467900	33.65	-13.28	46.93	33.06	0.10	0.49	Average
7	0.8896870	49.85	-6.15	56.00	49.25	0.10	0.50	QP
8	0.8896870	31.25	-14.75	46.00	30.65	0.10	0.50	Average
9	1.450	46.38	-9.62	56.00	45.78	0.10	0.50	QP
10	1.450	22.39	-23.61	46.00	21.79	0.10	0.50	Average
11	3.450	49.91	-6.09	56.00	49.13	0.18	0.60	QP
12	3.450	39.59	-6.41	46.00	38.81	0.18	0.60	Average

5.8.5 Test Data Test Mode 3

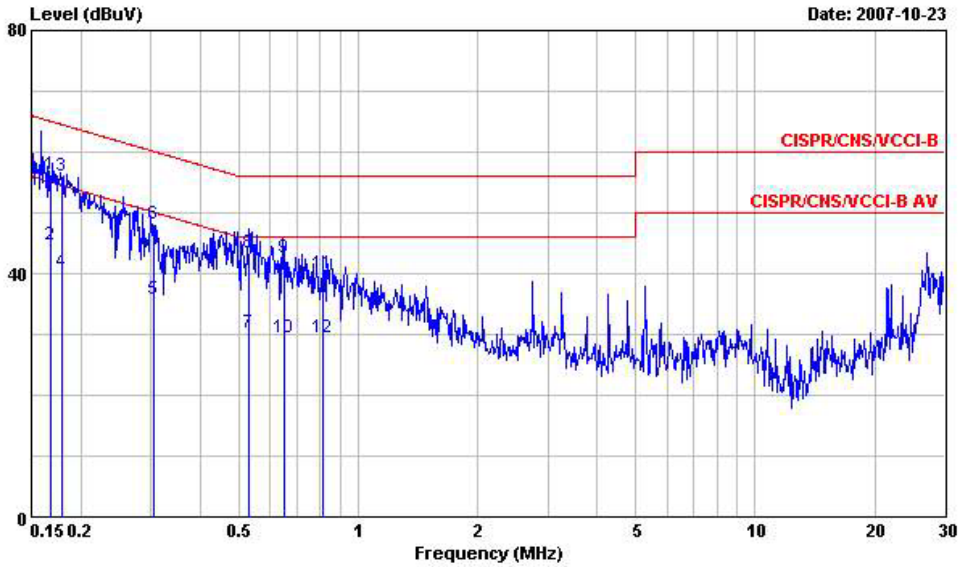
- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : James

The test that passed at minimum margin was marked by the frame in the following table.



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 LINE
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: From system
Model :
Memo : GSM 850 Idle+BT Link+Camera+USB Link

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500000	50.36	-15.64	66.00	49.56	0.10	0.70	QP
2	0.1500000	31.93	-24.07	56.00	31.13	0.10	0.70	Average
3	0.1863950	47.80	-16.40	64.20	47.15	0.10	0.55	QP
4	0.1863950	37.28	-16.92	54.20	36.63	0.10	0.55	Average
5	0.2231870	46.65	-16.05	62.70	46.05	0.10	0.50	QP
6	0.2231870	33.28	-19.42	52.70	32.68	0.10	0.50	Average
7	0.2658290	46.11	-15.14	61.25	45.54	0.10	0.47	QP
8	0.2658290	39.44	-11.81	51.25	38.87	0.10	0.47	Average
9	0.3050910	45.10	-15.00	60.10	44.60	0.10	0.40	QP
10	0.3050910	39.27	-10.83	50.10	38.77	0.10	0.40	Average
11	0.4515500	43.33	-13.52	56.85	42.74	0.10	0.49	QP
12	0.4515500	34.64	-12.21	46.85	34.05	0.10	0.49	Average



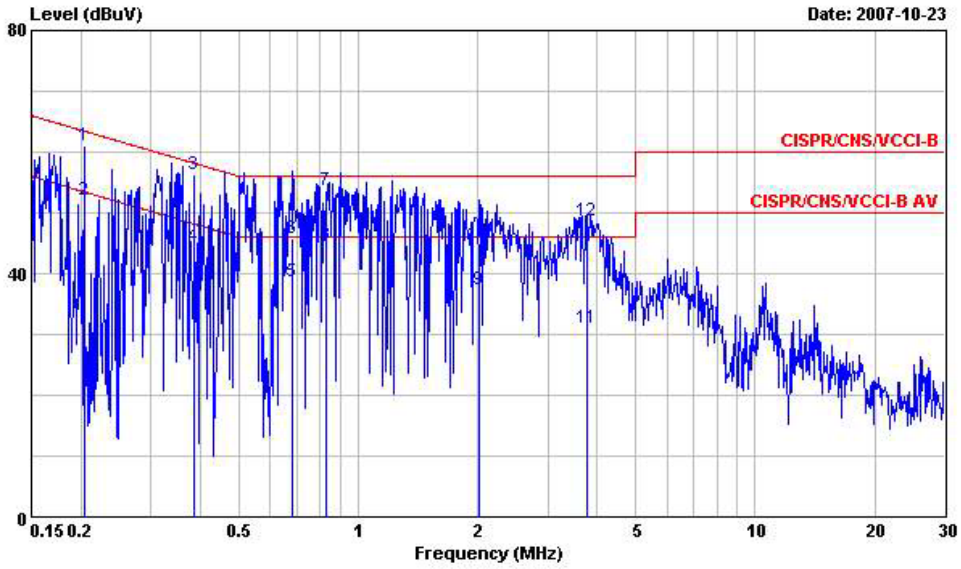
Site : site
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 NEUTRAL
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: From system
Model :
Memo : GSM 850 Idle+BT Link+Camera+USB Link

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1675020	56.35	-8.73	65.08	55.63	0.10	0.62	QP
2	0.1675020	44.75	-10.33	55.08	44.03	0.10	0.62	Average
3	0.1788310	55.98	-8.56	64.54	55.30	0.10	0.58	QP
4	0.1788310	40.32	-14.22	54.54	39.64	0.10	0.58	Average
5	0.3047970	35.84	-14.27	50.11	35.34	0.10	0.40	Average
6	0.3047970	48.20	-11.91	60.11	47.70	0.10	0.40	QP
7	0.5293420	30.30	-15.70	46.00	29.74	0.10	0.46	Average
8	0.5293420	43.31	-12.69	56.00	42.75	0.10	0.46	QP
9	0.6508440	42.58	-13.42	56.00	42.08	0.10	0.40	QP
10	0.6508440	29.50	-16.50	46.00	29.00	0.10	0.40	Average
11	0.8173740	40.01	-15.99	56.00	39.41	0.10	0.50	QP
12	0.8173740	29.47	-16.53	46.00	28.87	0.10	0.50	Average

5.8.6 Test Data Test Mode 4

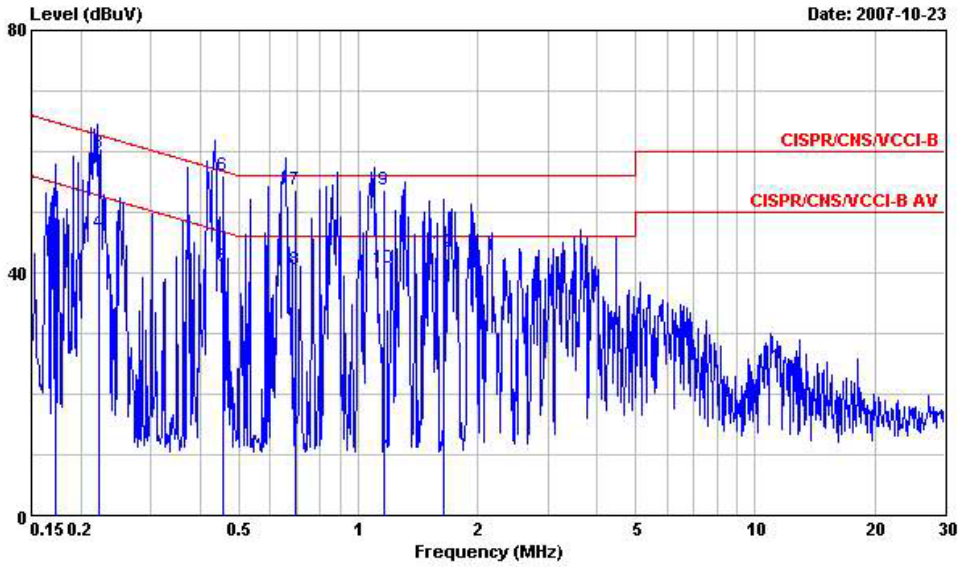
- Temperature: 26~27°C
- Relative Humidity: 60~61%
- Test Engineer : James

The test that passed at minimum margin was marked by the frame in the following table.



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 LINE
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : PCS1900 Idle+BT Link+Camera+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2035180	61.18	-2.29	63.47	60.58	0.10	0.50	QP
2	0.2035180	52.15	-1.32	53.47	51.55	0.10	0.50	Average
3	0.3854030	56.42	-1.74	58.16	55.92	0.10	0.40	QP
4	0.3854030	44.52	-3.64	48.16	44.02	0.10	0.40	Average
5	0.6826310	38.59	-7.41	46.00	38.09	0.10	0.40	Average
6	0.6826310	45.71	-10.29	56.00	45.21	0.10	0.40	QP
7	0.8301650	53.57	-2.43	56.00	52.97	0.10	0.50	QP
8	0.8301650	44.62	-1.38	46.00	44.02	0.10	0.50	Average
9	2.020	37.46	-8.54	46.00	36.86	0.10	0.50	Average
10	2.020	44.89	-11.11	56.00	44.29	0.10	0.50	QP
11	3.780	31.18	-14.82	46.00	30.48	0.10	0.60	Average
12	3.780	48.70	-7.30	56.00	48.00	0.10	0.60	QP



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 200604 99041 NEUTRAL
EUT : GSM/GPRS (Class 12)850/1900 with BT
: Mobile Phone
POWER: 120Vac/60Hz
Model :
Memo : PCS1900 Idle+BT Link+Camera+Adapter

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1721540	49.14	-15.72	64.86	48.44	0.10	0.60	QP
2	0.1721540	36.20	-18.66	54.86	35.50	0.10	0.60	Average
3	0.2222630	59.63	-3.10	62.73	59.03	0.10	0.50	QP
4	0.2222630	46.59	-6.14	52.73	45.99	0.10	0.50	Average
5	0.4548590	41.07	-5.72	46.79	40.48	0.10	0.49	Average
6	0.4548590	56.17	-0.62	56.79	55.58	0.10	0.49	QP
7	0.6923010	53.76	-2.24	56.00	53.26	0.10	0.40	QP
8	0.6923010	40.50	-5.50	46.00	40.00	0.10	0.40	Average
9	1.166	53.77	-2.23	56.00	53.17	0.10	0.50	QP
10	1.166	40.77	-5.23	46.00	40.17	0.10	0.50	Average
11	1.640	36.42	-9.58	46.00	35.82	0.10	0.50	Average
12	1.640	43.51	-12.49	56.00	42.91	0.10	0.50	QP

5.9 Radiated Emission Measurement

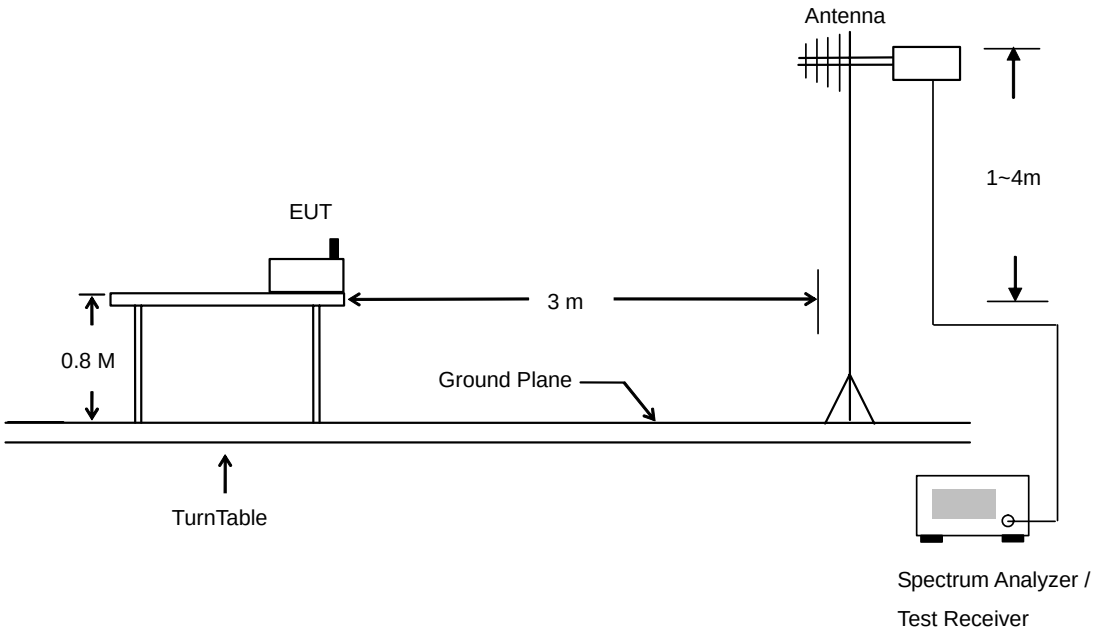
5.9.1 Measuring Instruments

As described in chapter 6 of this Report.

5.9.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

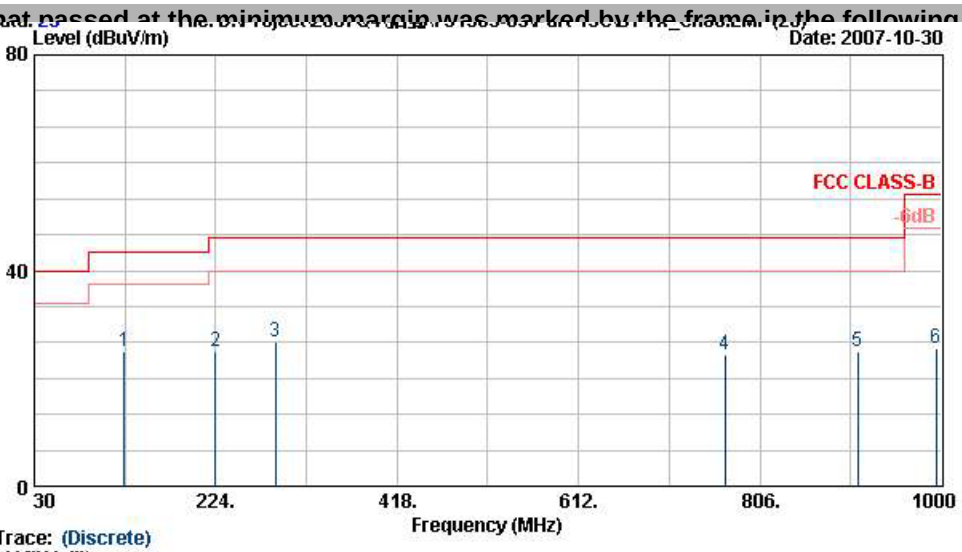
5.9.3 Typical Test Setup Layout of Radiated Emission



5.9.4 Test Data

- Temperature : 25°C
- Relating Humidity : 54%
- Test Engineer : Andrew
- Test Mode : Mode 1
- Polarization : Horizontal

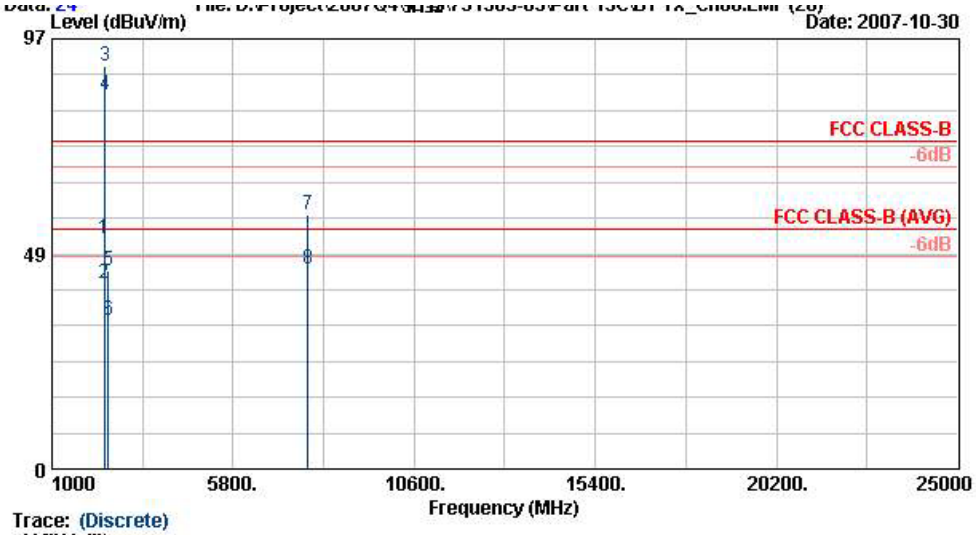
The test that passed at the minimum margin was marked by the frame in the following test record



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(9511121) HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mode : BT Tx_Ch00;2402MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	126.39	24.92	-18.58	43.50	42.30	12.50	1.21	31.09	100	134	Peak
2	223.59	25.12	-20.88	46.00	43.75	10.73	1.63	30.99	---	---	Peak
3	287.58	26.80	-19.20	46.00	42.89	12.99	1.89	30.96	---	---	Peak
4	768.30	24.48	-21.52	46.00	32.11	19.52	3.36	30.52	---	---	Peak
5	910.40	24.95	-21.05	46.00	30.86	20.61	3.84	30.35	---	---	Peak
6	994.40	25.71	-28.29	54.00	30.77	21.20	4.01	30.27	---	---	Peak



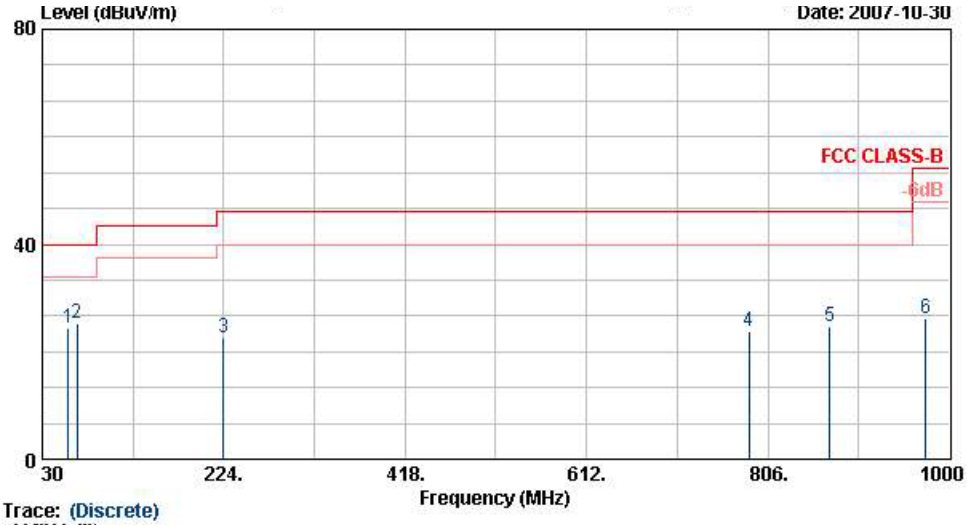
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mode : BT Tx_Ch00;2402MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2390.00	52.01	-21.99	74.00	53.46	30.26	3.75	35.46	100	0	Peak
2	2390.00	41.74	-12.26	54.00	43.19	30.26	3.75	35.46	100	359	Average
3 X	2402.00	90.69			92.11	30.27	3.77	35.46	100	0	Peak
4 X	2402.00	84.37			85.80	30.26	3.77	35.46	100	359	Average
5	2484.00	44.89	-29.11	74.00	46.25	30.29	3.86	35.51	100	0	Peak
6	2484.00	33.45	-20.55	54.00	34.81	30.29	3.86	35.51	100	359	Average
7	7776.00	57.42	-16.58	74.00	46.35	39.30	7.71	35.94	100	0	Peak
8	7776.00	45.16	-8.84	54.00	34.09	39.30	7.71	35.94	100	219	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

- Test Mode : Mode 1
- Polarization : Vertical

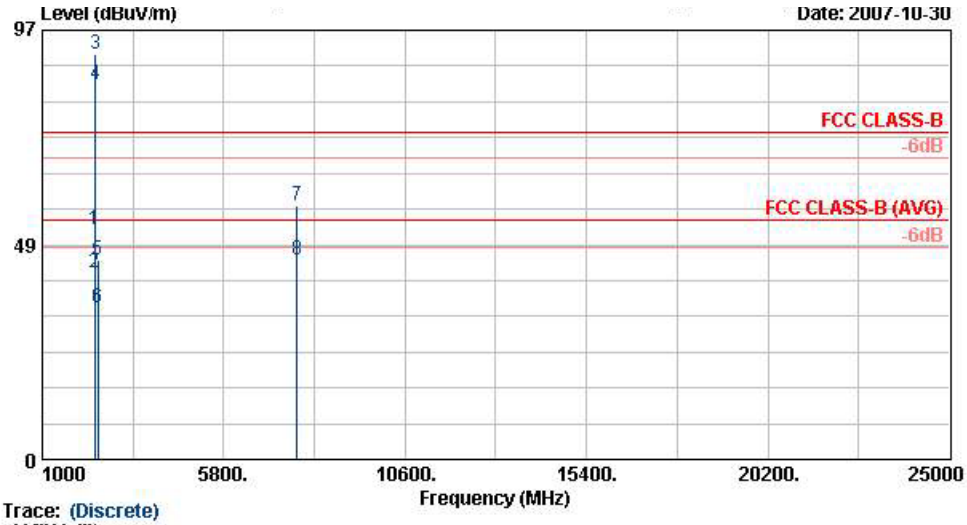
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch00;2402MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	58.08	24.32	-15.68	40.00	47.77	6.91	0.85	31.21	---	---	Peak
2	66.99	25.35	-14.65	40.00	48.78	6.81	0.90	31.14	100	103	Peak
3	224.13	22.63	-23.37	46.00	41.26	10.73	1.63	30.99	---	---	Peak
4	785.80	23.90	-22.10	46.00	31.33	19.68	3.39	30.50	---	---	Peak
5	871.90	24.82	-21.18	46.00	31.19	20.33	3.70	30.40	---	---	Peak
6	974.80	26.17	-27.83	54.00	31.41	21.06	3.97	30.28	---	---	Peak



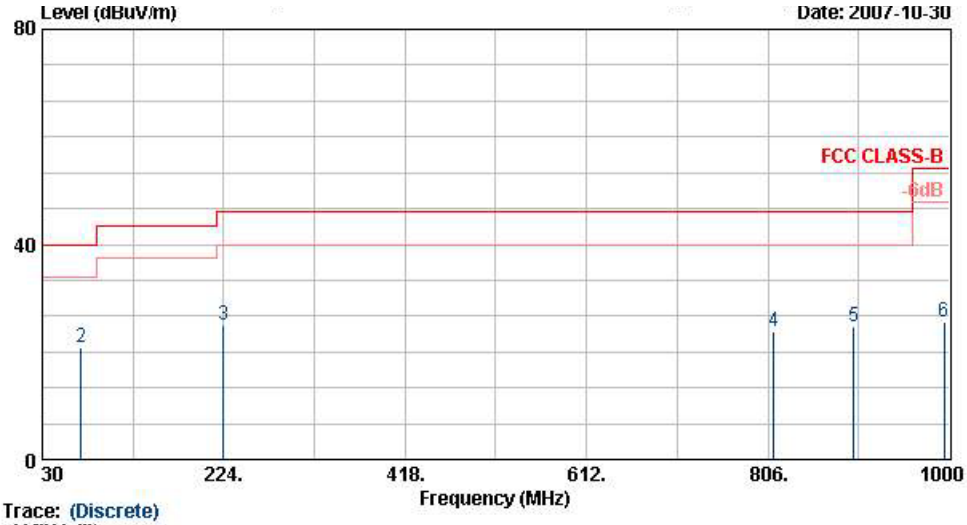
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch00;2402MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2390.00	51.95	-22.05	74.00	53.40	30.26	3.75	35.46	100	0	Peak
2	2390.00	42.09	-11.91	54.00	43.54	30.26	3.75	35.46	100	324	Average
3 X	2402.00	91.52			92.95	30.26	3.77	35.46	100	0	Peak
4 @	2402.00	84.81			86.24	30.26	3.77	35.46	100	324	Average
5	2470.00	45.17	-28.83	74.00	46.56	30.29	3.84	35.51	100	0	Peak
6	2470.00	34.42	-19.58	54.00	35.81	30.29	3.84	35.51	100	324	Average
7	7746.00	57.19	-16.81	74.00	46.19	39.25	7.70	35.95	100	0	Peak
8	7746.00	44.97	-9.03	54.00	33.97	39.25	7.70	35.95	100	346	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

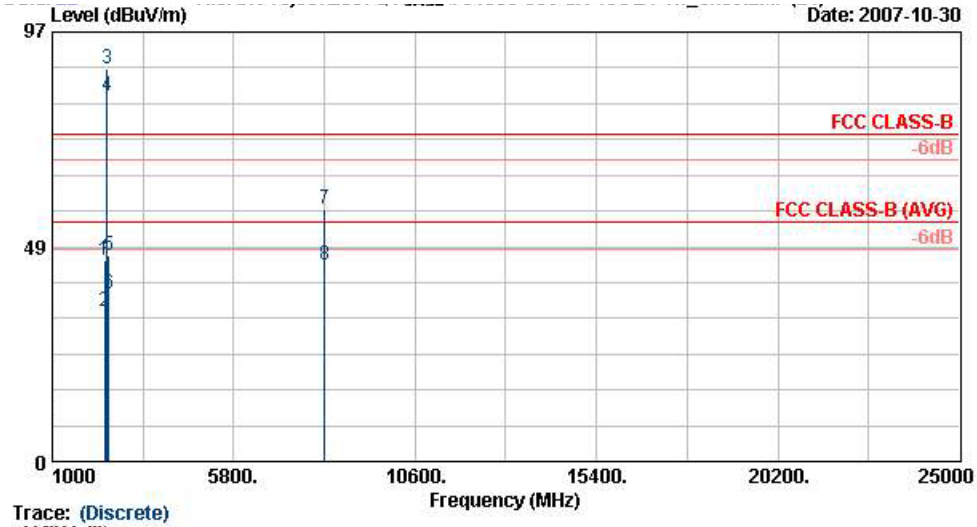
- Test Mode : Mode 2
- Polarization : Horizontal

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch39;2441MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.54	20.10	-19.90	40.00	31.93	18.95	0.64	31.43	---	---	Peak
2	71.58	20.83	-19.17	40.00	44.06	7.00	0.93	31.17	100	219	Peak
3	223.59	25.10	-20.90	46.00	43.73	10.73	1.63	30.99	---	---	Peak
4	812.40	23.84	-22.16	46.00	30.94	19.91	3.46	30.47	---	---	Peak
5	897.80	24.79	-21.21	46.00	30.84	20.52	3.81	30.37	---	---	Peak
6	994.40	25.64	-28.36	54.00	30.71	21.20	4.01	30.27	---	---	Peak



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mode : BT Tx_Ch39;2441MHz + Adaptor
Plane : H
Data Rate : DH5

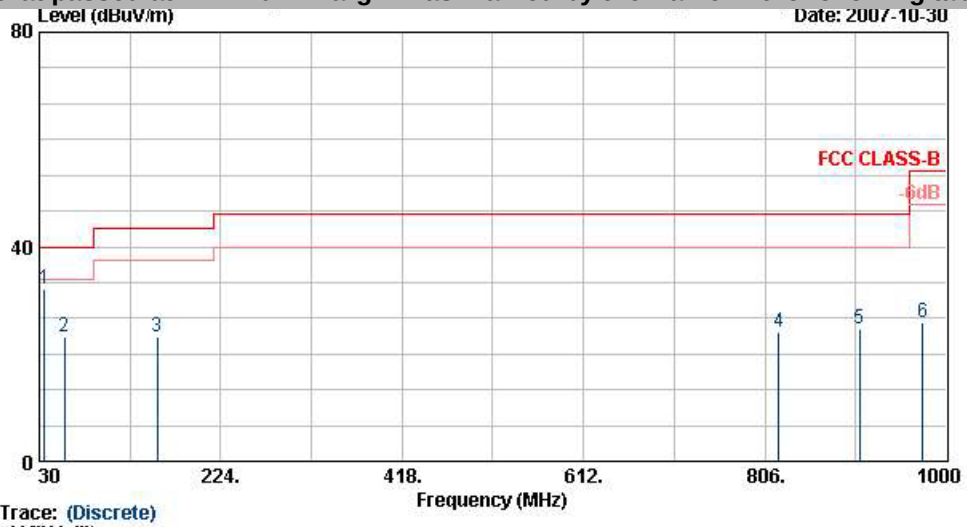
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2388.00	45.29	-28.71	74.00	46.72	30.26	3.75	35.44	100	0	Peak
2	2388.00	33.99	-20.01	54.00	35.42	30.26	3.75	35.44	100	357	Average
3 X	2441.00	88.65			90.03	30.28	3.82	35.47	100	0	Peak
4 X	2441.00	82.46			83.86	30.28	3.82	35.49	100	357	Average
5	2494.00	46.69	-27.31	74.00	48.04	30.30	3.88	35.53	100	0	Peak
6	2494.00	38.00	-16.00	54.00	39.35	30.30	3.88	35.53	100	357	Average
7	8202.00	56.80	-17.20	74.00	45.30	39.43	8.02	35.96	100	0	Peak
8	8202.00	44.24	-9.76	54.00	32.74	39.43	8.02	35.96	100	127	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

Test Mode : Mode 2

- Polarization : Vertical

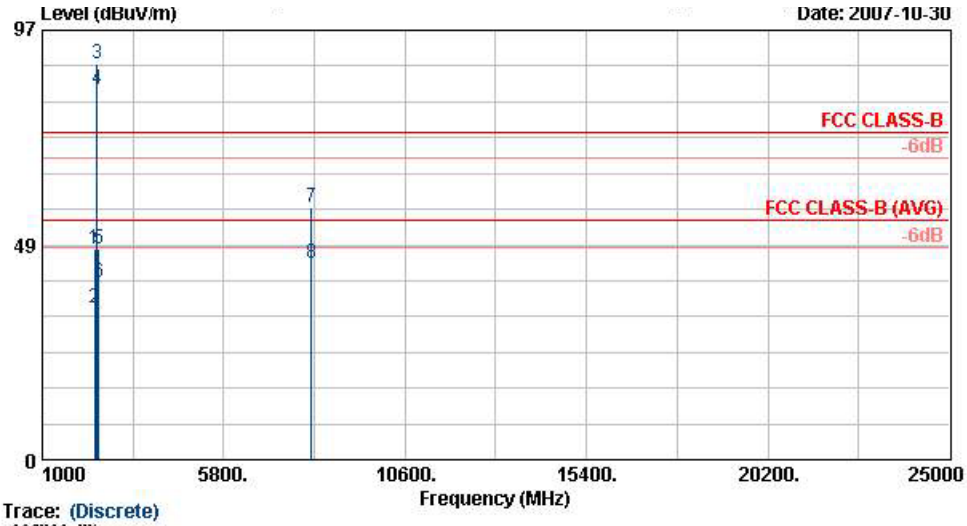
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mode : BT Tx_Ch39;2441MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	35.67	32.01	-7.99	40.00	46.99	15.61	0.68	31.27	100	106	Peak
2	56.73	23.17	-16.83	40.00	46.45	7.06	0.84	31.18	---	---	Peak
3	156.09	23.12	-20.38	43.50	42.56	10.24	1.37	31.05	---	---	Peak
4	820.80	24.02	-21.98	46.00	31.03	19.96	3.49	30.47	---	---	Peak
5	906.90	24.83	-21.17	46.00	30.77	20.58	3.83	30.36	---	---	Peak
6	974.80	25.92	-28.08	54.00	31.16	21.06	3.97	30.28	---	---	Peak



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mode : BT Tx_Ch39;2441MHz + Adaptor
Plane : H
Data Rate : DH5

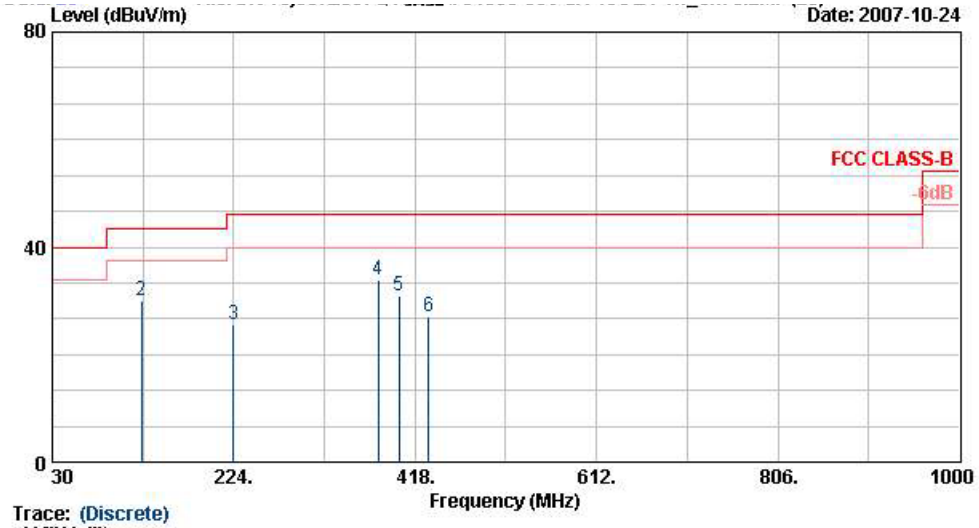
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2388.00	47.71	-26.29	74.00	49.14	30.26	3.75	35.44	100	0	Peak
2	2388.00	34.13	-19.87	54.00	35.56	30.26	3.75	35.44	100	324	Average
3 X	2441.00	89.57			90.95	30.28	3.82	35.47	100	0	Peak
4 @	2441.00	83.72			85.12	30.28	3.82	35.49	100	324	Average
5	2494.00	47.67	-26.33	74.00	49.01	30.30	3.88	35.53	100	0	Peak
6	2494.00	40.01	-13.99	54.00	41.36	30.30	3.88	35.53	100	324	Average
7	8112.00	57.00	-17.00	74.00	45.48	39.52	7.91	35.91	100	0	Peak
8	8112.00	44.47	-9.53	54.00	32.95	39.52	7.91	35.91	100	276	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

Test Mode : Mode 3

- Polarization : Horizontal

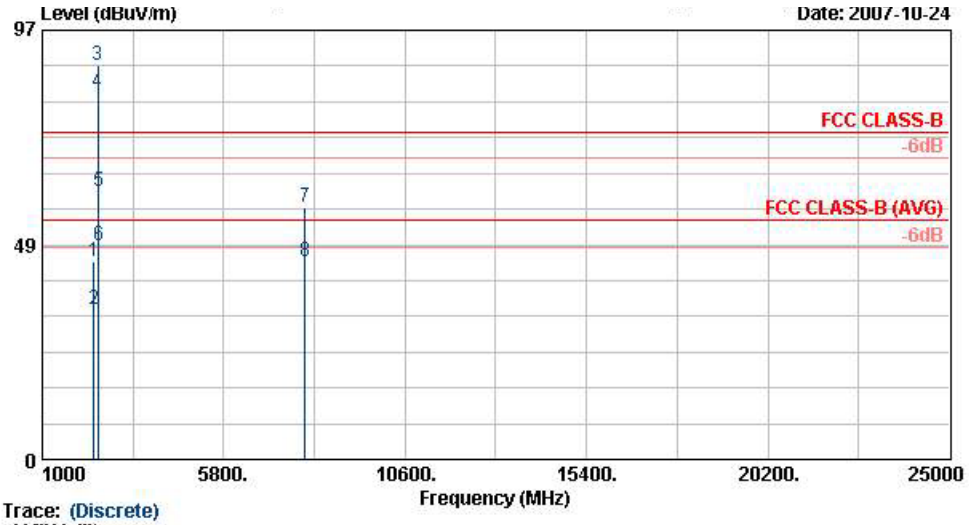
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch78;2480MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.54	21.64	-18.36	40.00	33.47	18.95	0.64	31.43	---	---	Peak
2	125.58	29.94	-13.56	43.50	47.31	12.50	1.21	31.09	---	---	Peak
3	223.59	25.68	-20.32	46.00	44.31	10.73	1.63	30.99	---	---	Peak
4	378.40	33.76	-12.24	46.00	47.25	15.22	2.17	30.88	100	335	Peak
5	400.80	30.92	-15.08	46.00	43.77	15.78	2.23	30.86	---	---	Peak
6	432.30	27.21	-18.79	46.00	39.40	16.31	2.34	30.83	---	---	Peak



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch78;2480MHz + Adaptor
Plane : H
Data Rate : DH5

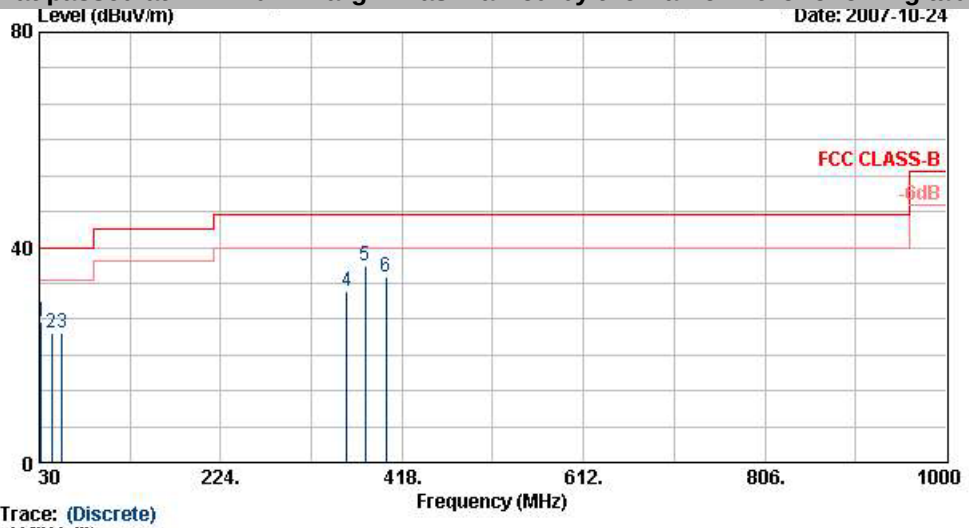
		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		2364.00	44.62	-29.38	74.00	46.06	30.24	3.73	35.42	100	0	Peak
2		2364.00	34.02	-19.98	54.00	35.47	30.24	3.73	35.42	100	3	Average
3	X	2480.00	88.93			90.29	30.29	3.86	35.51	100	0	Peak
4	X	2480.00	82.85			84.21	30.29	3.86	35.51	100	3	Average
5		2483.50	60.70	-13.30	74.00	62.06	30.29	3.86	35.51	100	0	Peak
6	!	2483.50	48.15	-5.85	54.00	49.51	30.29	3.86	35.51	100	3	Average
7		7962.00	57.13	-16.87	74.00	45.66	39.55	7.78	35.86	100	0	Peak
8		7962.00	44.67	-9.33	54.00	33.20	39.55	7.78	35.86	100	236	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

Test Mode : Mode 3

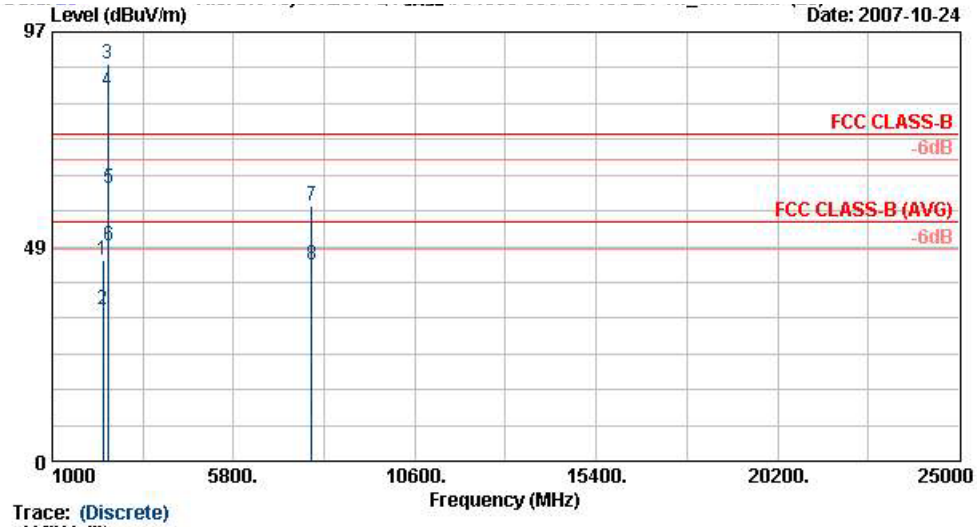
- Polarization : Vertical

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch78;2480MHz + Adaptor
Plane : H
Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.89	26.16	-13.84	40.00	38.65	18.25	0.65	31.39	---	---	Peak
2	43.23	24.11	-15.89	40.00	42.98	11.52	0.75	31.14	---	---	Peak
3	54.03	24.09	-15.91	40.00	46.91	7.50	0.82	31.13	---	---	Peak
4	358.80	31.73	-14.27	46.00	45.78	14.72	2.12	30.89	---	---	Peak
5	378.40	36.53	-9.47	46.00	50.02	15.22	2.17	30.88	100	301	Peak
6	400.80	34.62	-11.38	46.00	47.47	15.78	2.23	30.86	---	---	Peak



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : GSM/GPRS(CLASS 12) 850/1900 With BT
: Mobile Phone
Power : 120Vac/60Hz
Model : FR 751505-03
Mome : BT Tx_Ch78;2480MHz + Adaptor
Plane : H
Data Rate : DH5

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		2334.00	45.34	-28.66	74.00	46.82	30.23	3.69	35.40	100	0	Peak
2		2334.00	34.19	-19.81	54.00	35.68	30.23	3.69	35.40	100	327	Average
3	X	2480.00	89.67			91.03	30.29	3.86	35.51	100	0	Peak
4	@	2480.00	83.50			84.86	30.29	3.86	35.51	100	327	Average
5		2483.50	61.52	-12.48	74.00	62.88	30.29	3.86	35.51	100	0	Peak
6	!	2483.50	48.62	-5.38	54.00	49.98	30.29	3.86	35.51	100	327	Average
7		7872.00	57.53	-16.47	74.00	46.28	39.41	7.75	35.90	100	0	Peak
8		7872.00	44.26	-9.74	54.00	33.00	39.41	7.75	35.90	100	299	Average

Remark :1 #3 and #4 Fundamental Signal
2 There's no more obvious spurious emission except the listings above.

5.10 Antenna Requirements

5.10.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

5.10.2 Antenna Connected Construction

The antenna used in this product is a chip antenna without connecter and it is considered to meet antenna requirement of FCC.

5.10.3 Antenna Gain

The antenna gain of EUT is less than 6dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

6. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 01, 2007	Feb. 29, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Mar. 30, 2008	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Mar. 21, 2008	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2007	Apr. 19, 2008	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	Mar. 09, 2007	Mar. 08, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	N/A	Conduction (CO04-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	N/A	Conduction (CO04-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz-26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Nov. 20, 2006	Nov. 19, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Pre Amplifier	Mini Circuits	ZKL-2	D092004-1	10~2500MHz	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	106656	WCDMA	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)

7. Uncertainty Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
Combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**2.26**		

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

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.15	Normal(k=2)	0.08
Antenna factor calibration	1.12	Normal(k=2)	0.56
Cable loss calibration	0.12	Normal(k=2)	0.06
Pre Amplifier Gain calibration	0.13	Normal(k=2)	0.07
RCV/SPA specification	2.5	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1	Rectangular	0.29
Site imperfection	2.1	Rectangular	1.21
Mismatch	+0.39/-0.41	U-shaped	0.28
Combined standard uncertainty Uc(y)	**1.58**		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**3.16**		

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

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u(x_i)$
	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 Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**4.72**				