

FC

Test Report

Product Name	GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
Model No.	VENC3A(EF71), EF71
FCC ID.	JVPEF71

Applicant	BenQ Corporation
Address	157 Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan, R.O.C.

Date of Receipt	Mar. 31, 2006
Issued Date	Apr. 19, 2006
Report No.	064L034-RF-US-P06V01
Reference No.	NL-6497

The Test Results relate only to the samples tested.

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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: Apr. 19, 2006

Report No.: 064L034-RF-US-P06V01



Product Name	GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
Applicant	BenQ Corporation
Address	157 Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan, R.O.C.
Manufacturer	1.BenQ Corporation 2.BenQ China Co., Ltd.
Model No.	VENC3A(EF71), EF71
FCC ID.	JVPEF71
Rated Voltage	AC 120V/60Hz
Working Voltage	Battery 3.7V
Trade Name	BenQ-Siemens,BenQ
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2005 CISPR 22: 2005 ANSI C63.4: 2003
Test Result	Complied

The Test Results relate only to the samples tested.

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Documented By : Rita Huang
(Rita Huang)



Tested By : Tom Hsieh
(Tom Hsieh)

Approved By : Gene Chang
(Gene Chang)



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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
Trade Name	BenQ-Siemens,BenQ
FCC ID.	JVPEF71
Model No.	VENC3A(EF71), EF71
Frequency Range	2402 - 2480MHz
Antenna Gain	Refer to the table "Antenna List"
Channel Number	79
Type of Modulation	FHSS
Antenna Type	Chip Antenna
Channel Control	Auto
Power Adapter	MFR: BenQ Cable Out: Non-Shielded, 1.0m

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	ACX	AT7020-E3R0HBA	-0.84dBi

Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Note:

1. This device is GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone with a built-in 2.4GHz Bluetooth transceiver.
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle, and highest frequency are selected to perform the test.
4. This device is a composite device in accordance with Part 15 Subpart B regulations.
5. Quietek verified the construction and functions in typical operation and the test results are shown on the report.

1.2. Operational Description

The EUT is a GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone with 79 channels.

This device provides wireless technology that revolutionizes personal connectivity. It is the solution for the seamless integration of Bluetooth technology into personal computer enabling short-range wireless connections between desktop/laptop computers, Bluetooth-enabled peripherals, and portable handheld devices.

Test Mode:	Mode 1: Transmitter
------------	---------------------

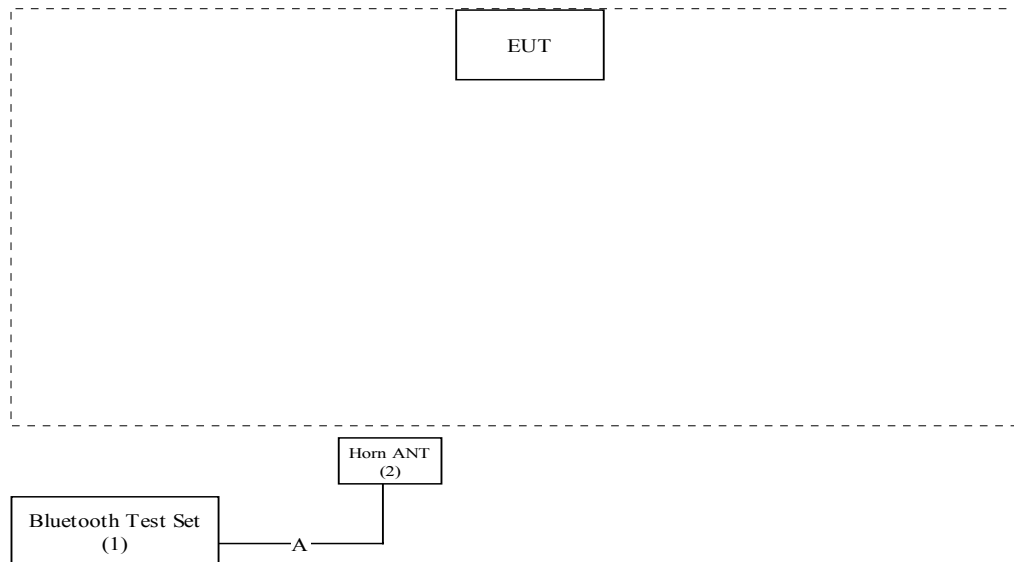
1.3. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
(1)	Bluetooth Test Set	Anritsu	MT8852A	6K00003057	N/A	Non-Shielded, 1.8m
(2)	Horn ANT	ETS	3115	6348	N/A	N/A

	Signal Cable Type	Signal cable Description
A.	RF Cable	Shielded, 1.0m

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Press “*#301#” into the test mode.
- (3) Setup the test channel and the test mode.
- (4) Start the continuous transmission.
- (5) Verify that the EUT works correctly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



July 03, 2001 Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com



2. Conducted Emission

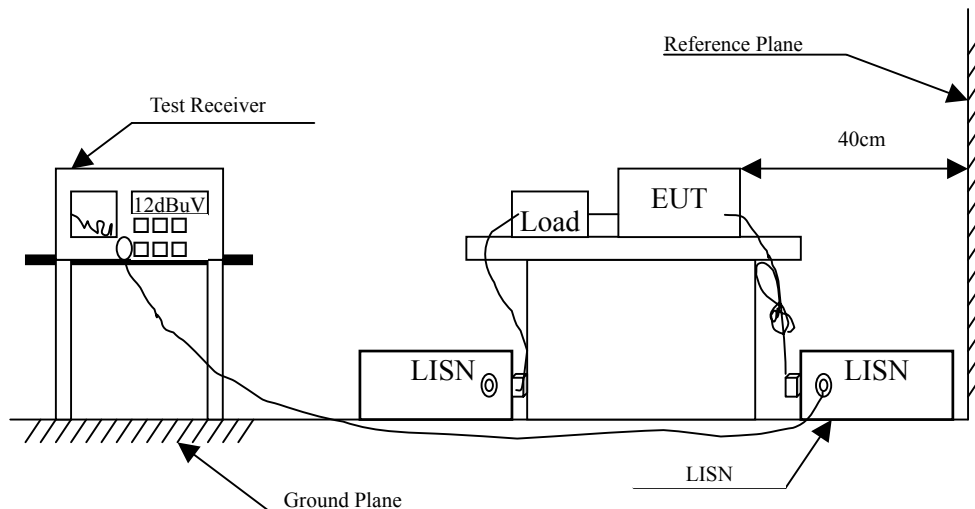
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/100367	Aug., 2005	
2	L.I.S.N.	R & S	ESH3-Z5/ 836679/023	July, 2005	EUT
3	L.I.S.N.	Kyoritsu	ESH3-Z5/ 836679/017	Feb, 2006	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2/357.8810.52	Sep., 2005	
5	No.7 Shielded Room				

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

2.6. Test Result of Conducted Emission

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmitter (Channel 39)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Quasi-Peak					
0.181	0.782	40.230	41.012	-24.102	65.114
0.369	0.300	43.330	43.630	-16.113	59.743
0.552	0.300	40.920	41.220	-14.780	56.000
2.085	0.348	35.060	35.408	-20.592	56.000
3.138	0.371	40.030	40.401	-15.599	56.000
4.855	0.430	40.590	41.020	-14.980	56.000
Average					
0.181	0.782	32.600	33.382	-21.732	55.114
0.369	0.300	36.340	36.640	-13.103	49.743
0.552	0.300	33.160	33.460	-12.540	46.000
2.085	0.348	23.820	24.168	-21.832	46.000
3.138	0.371	24.770	25.141	-20.859	46.000
4.855	0.430	30.050	30.480	-15.520	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmitter (Channel 39)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Quasi-Peak					
0.185	0.300	42.430	42.730	-22.270	65.000
0.369	0.310	39.670	39.980	-19.763	59.743
0.723	0.312	37.440	37.752	-18.248	56.000
2.215	0.350	36.440	36.790	-19.210	56.000
3.201	0.380	34.480	34.860	-21.140	56.000
4.800	0.410	37.680	38.090	-17.910	56.000
Average					
0.185	0.300	34.640	34.940	-20.060	55.000
0.369	0.310	31.120	31.430	-18.313	49.743
0.723	0.312	26.420	26.732	-19.268	46.000
2.215	0.350	28.910	29.260	-16.740	46.000
3.201	0.380	26.620	27.000	-19.000	46.000
4.800	0.410	28.940	29.350	-16.650	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

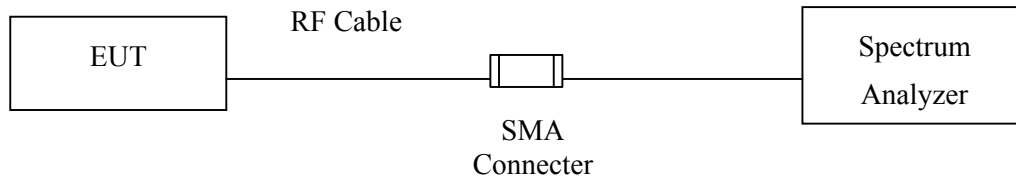
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	EMI Test Receiver	R & S	ESI 26 / 838786/004	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Limit

The maximum peak power shall be less 1Watt.

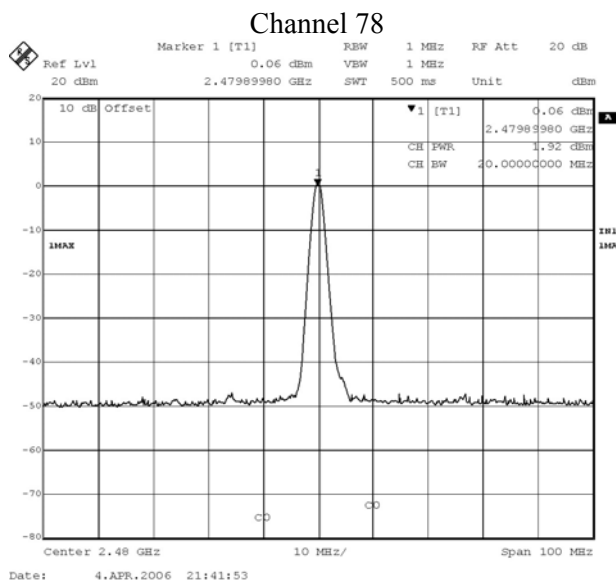
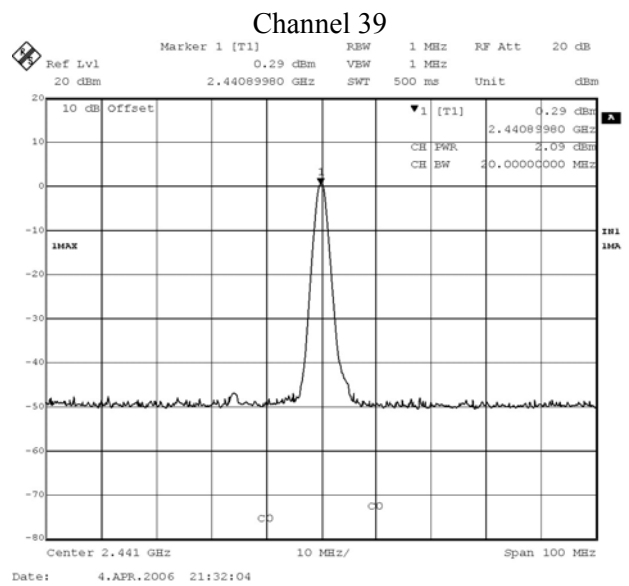
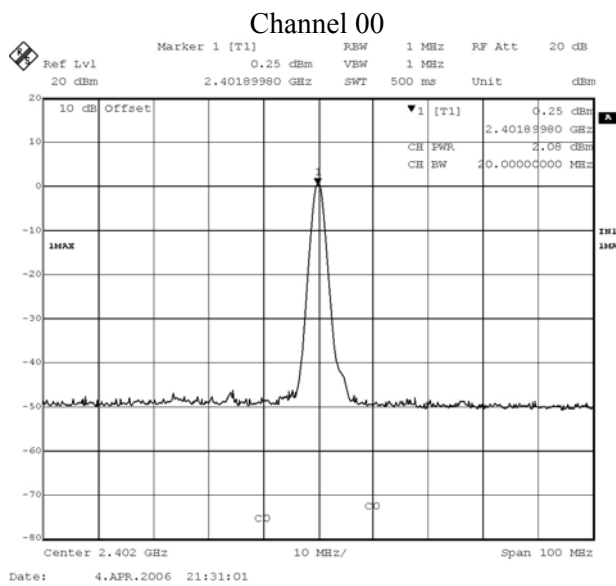
3.4. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

3.5. Test Result of Peak Power Output

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Peak Power Output
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
Channel 00	2402.00	2.08dBm	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.09dBm	1 Watt= 30 dBm	Pass
Channel 78	2480.00	1.92dBm	1 Watt= 30 dBm	Pass



Note:

1. Receiver setting (Peak Detector): RBW: 1MHz; VBW: 1MHz; Span: 100MHz ◦

4. Radiated Emission

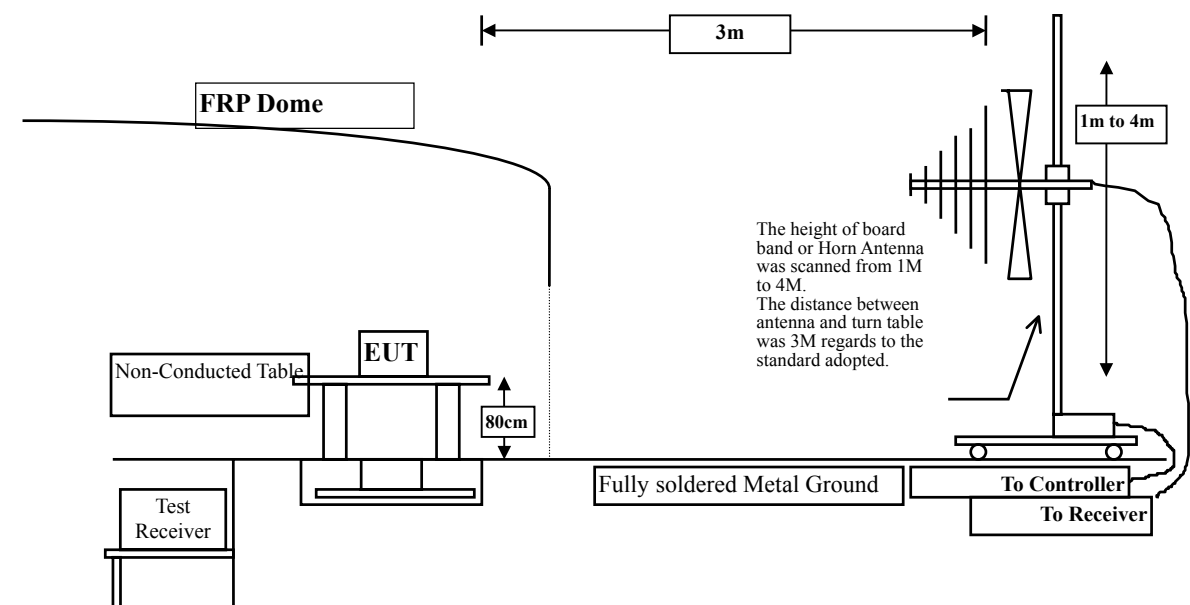
4.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐ Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	May, 2005
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2005
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sep., 2005
☐ Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	May, 2005
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2005
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	May, 2005
	Horn Antenna	ETS	3115 / 0005-6160	Sep., 2005
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	May, 2005
☒ Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2005
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2005
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2005
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2005
	Horn Antenna	ETS	3115 / 0005-6160	July, 2005
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2005

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup



4.3. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

The frequency range from 30MHz to 10th harmonics is checked.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
under 1G is defined as ± 3.8 dB

4.6. Test Result of Radiated Emission

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 00)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4804.000	4.346	43.985	48.331	-25.639	73.970
7206.000	11.565	38.242	49.807	-24.163	73.970
9608.000	15.813	37.941	53.754	-20.216	73.970
Average Detector:					
--					
Vertical					
Peak Detector:					
4804.000	4.346	44.432	48.778	-25.192	73.970
7206.000	11.565	38.545	50.110	-23.860	73.970
9608.000	15.813	37.520	53.333	-20.637	73.970
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 39)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	4.562	43.870	48.432	-25.538	73.970
7323.000	12.468	38.771	51.239	-22.731	73.970
9764.000	14.572	37.611	52.183	-21.787	73.970
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	4.562	42.356	46.918	-27.052	73.970
7323.000	12.468	38.247	50.715	-23.255	73.970
9764.000	14.572	38.455	53.027	-20.943	73.970
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 78)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4960.000	4.804	43.183	47.986	-25.984	73.970
7440.000	12.912	37.969	50.881	-23.089	73.970
9920.000	14.271	37.775	52.045	-21.925	73.970
Average Detector:					
--					
Vertical					
Peak Detector:					
4960.000	4.804	42.832	47.635	-26.335	73.970
7440.000	12.912	37.674	50.586	-23.384	73.970
9920.000	14.271	37.775	52.045	-21.925	73.970
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor..
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 00)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
112.400	12.444	12.600	25.045	-18.455	43.500
153.600	10.753	12.200	22.953	-20.547	43.500
461.100	17.602	12.620	30.222	-15.778	46.000
481.100	17.730	12.630	30.360	-15.640	46.000
619.200	19.834	12.850	32.684	-13.316	46.000
791.400	20.819	12.820	33.639	-12.361	46.000
Vertical					
153.615	9.548	15.200	24.748	-18.752	43.500
388.900	16.177	12.200	28.377	-17.623	46.000
398.600	16.980	11.600	28.580	-17.420	46.000
481.100	17.535	12.250	29.785	-16.215	46.000
815.360	20.484	8.800	29.284	-16.716	46.000
839.500	20.256	7.100	27.356	-18.644	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 39)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
153.600	10.753	12.300	23.053	-20.447	43.500
240.900	11.348	12.380	23.728	-22.272	46.000
461.600	17.609	12.630	30.240	-15.760	46.000
481.100	17.730	12.750	30.480	-15.520	46.000
786.600	20.455	12.810	33.265	-12.735	46.000
815.700	20.466	11.210	31.676	-14.324	46.000
Vertical					
153.600	9.546	15.500	25.046	-18.454	43.500
199.600	8.947	10.200	19.148	-24.352	43.500
388.900	16.177	12.230	28.407	-17.593	46.000
398.600	16.980	11.600	28.580	-17.420	46.000
679.900	18.960	12.600	31.560	-14.440	46.000
825.400	20.241	16.600	36.841	-9.159	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 78)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
294.300	13.043	11.160	24.203	-21.797	46.000
321.100	12.901	13.300	26.201	-19.799	46.000
481.100	17.730	12.750	30.480	-15.520	46.000
595.100	18.872	12.820	31.692	-14.308	46.000
798.600	20.752	12.320	33.072	-12.928	46.000
822.800	20.688	12.900	33.588	-12.413	46.000
Vertical					
199.600	8.947	10.210	19.158	-24.342	43.500
388.900	16.177	12.260	28.437	-17.563	46.000
679.900	18.960	12.630	31.590	-14.410	46.000
808.400	20.580	12.640	33.221	-12.779	46.000
825.400	20.241	12.630	32.871	-13.129	46.000
839.900	20.219	12.700	32.919	-13.081	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

5. Band Edge

5.1. Test Equipment

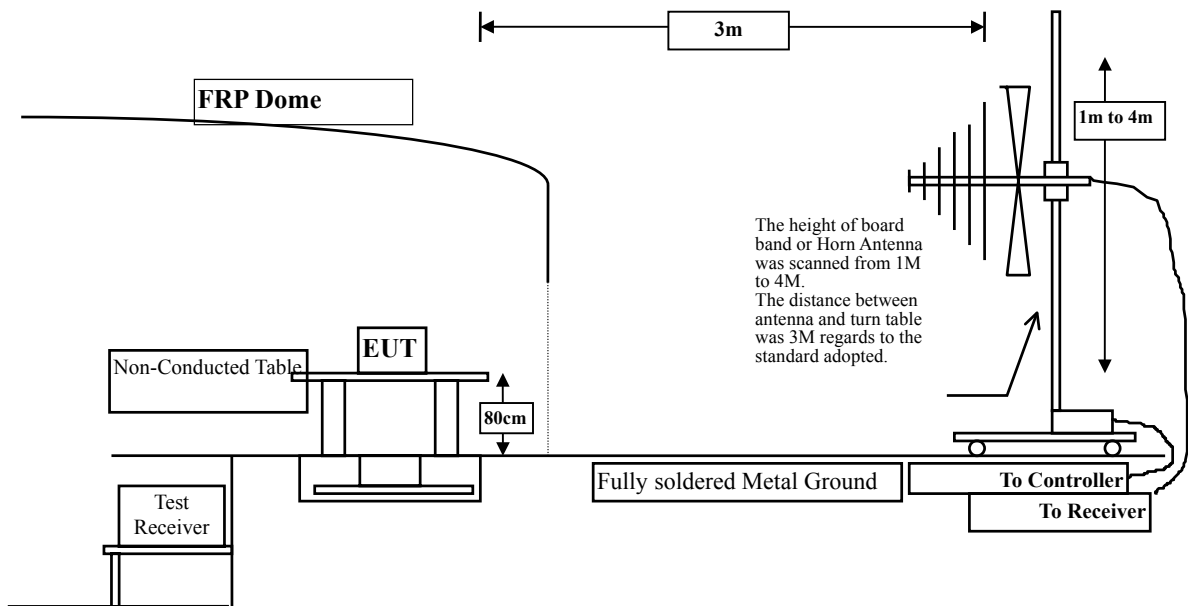
The following test equipments are used during the band edge tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2005
X Test Receiver	R & S	ESCS 30 / 825442/14	May, 2005
X Spectrum Analyzer	HP	E4407B / US39440758	May, 2005
X Pre-Amplifier	HP	8447D/3307A01812	May, 2005
X Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2005
X Horn Antenna	EM	EM6917 / 103325	May, 2005

- Note:
1. All equipments that need to calibrate are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup

RF Radiated Measurement:



5.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

5.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
under 1G is defined as ± 3.8 dB

5.6. Test Result of Band Edge

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 00)

RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2399.880	-1.707	54.797	53.090	74.00	54.00	Pass
00 (Average)	2399.880	-1.707	45.057	43.350	74.00	54.00	Pass

Figure Channel 00:

Horizontal (Peak)

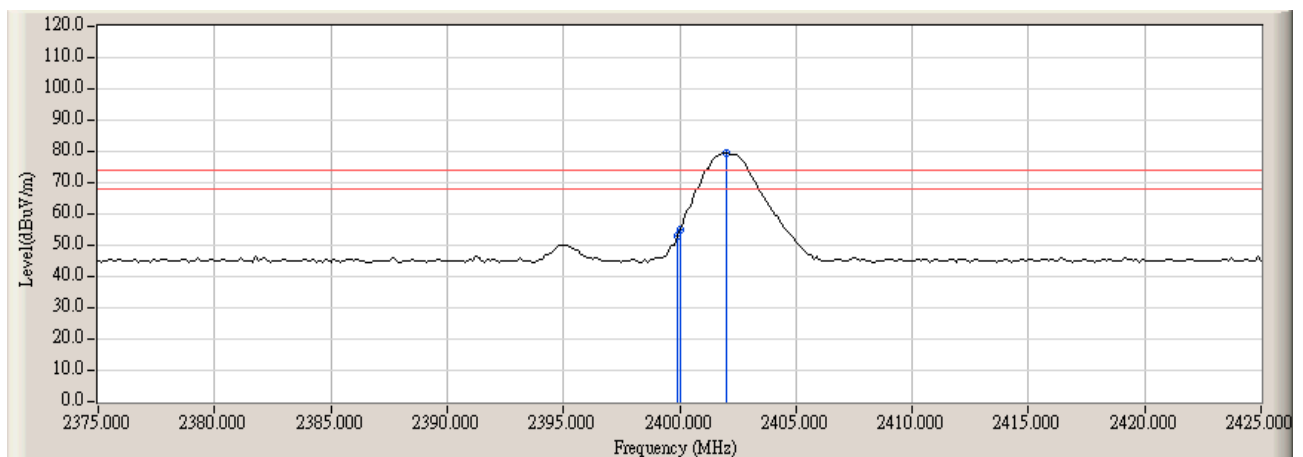
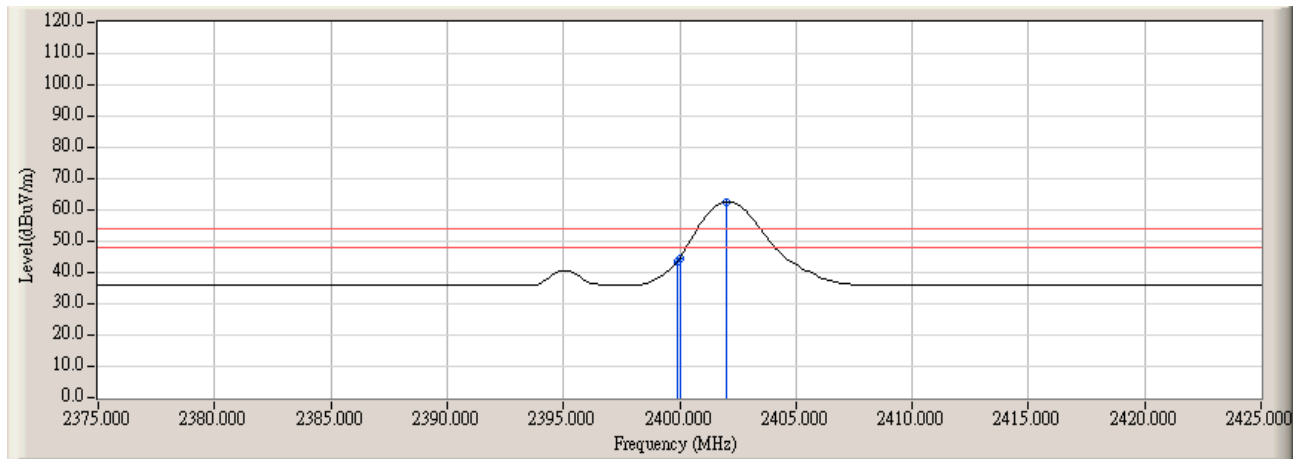


Figure Channel 00:

Horizontal (Average)



Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 00)

RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
00	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
00 (Peak)	2399.880	-1.707	63.337	61.630	74.00	54.00	Pass
00(Average)	2399.880	-1.707	47.137	45.430	74.00	54.00	Pass

Figure Channel 00:

Vertical (Peak)

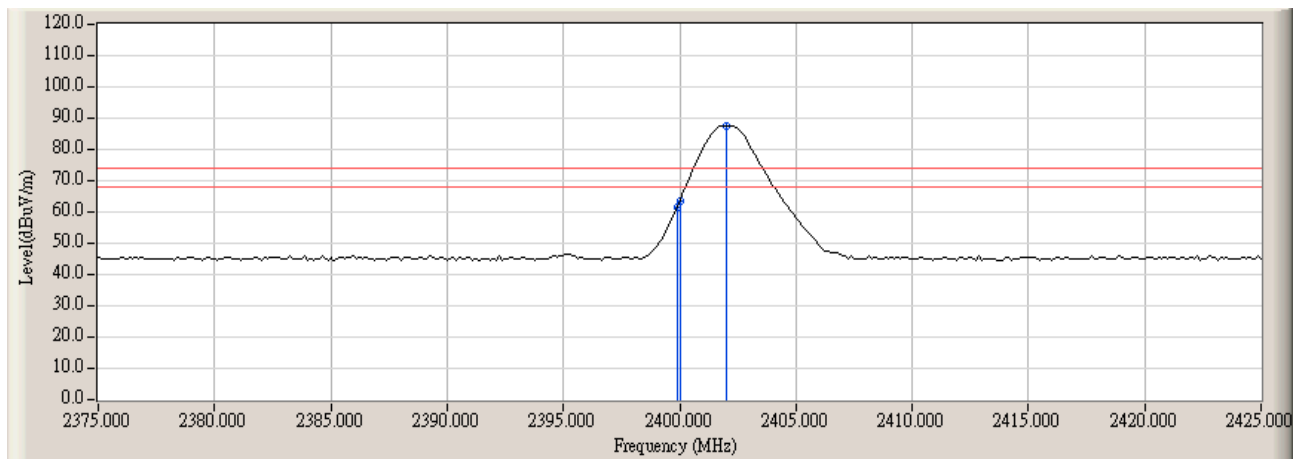
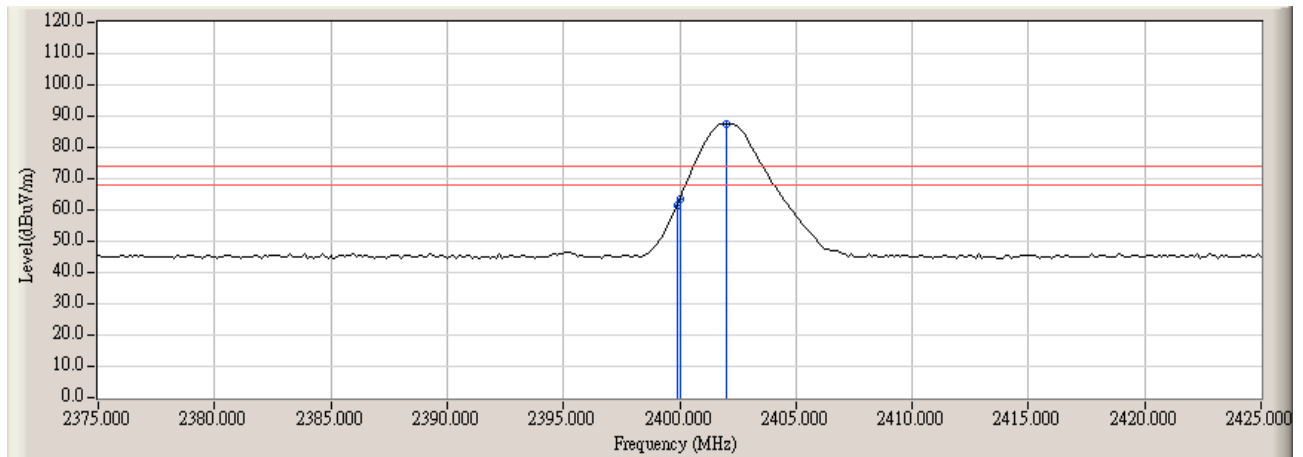


Figure Channel 00:

Vertical (Average)



Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 78)

RF Radiated Measurement:

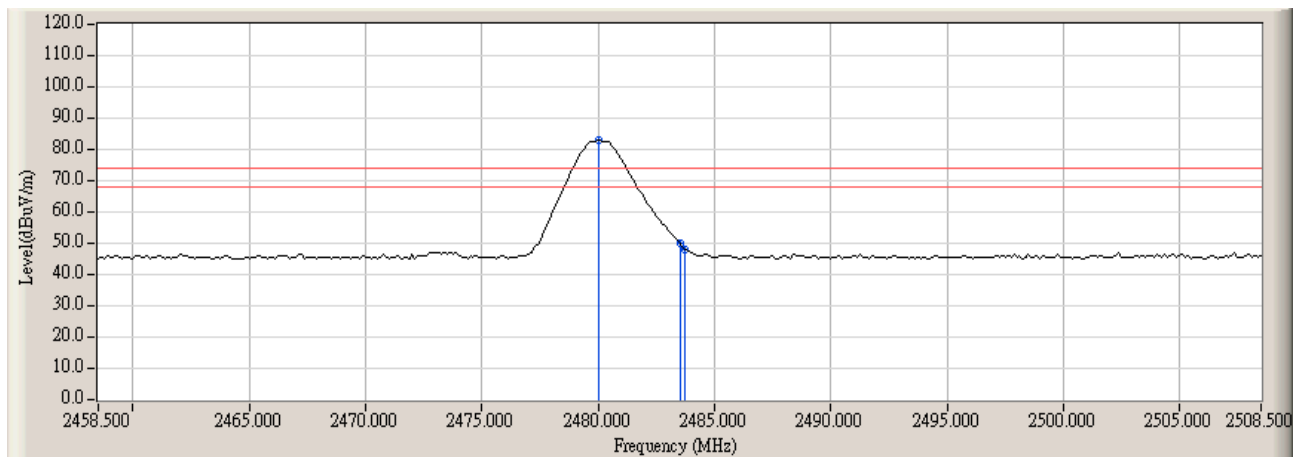
Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2483.500	-1.391	51.491	50.100	74.00	54.00	Pass
78(Average)	--		--	--	74.00	54.00	Pass

Figure Channel 78:

Horizontal (Peak)



Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 78)

RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
78(Peak)	2483.500	-1.391	56.721	55.330	74.00	54.00	Pass
78(Average)	2483.500	-1.391	44.801	43.410	74.00	54.00	Pass

Figure Channel 78:

Vertical (Peak)

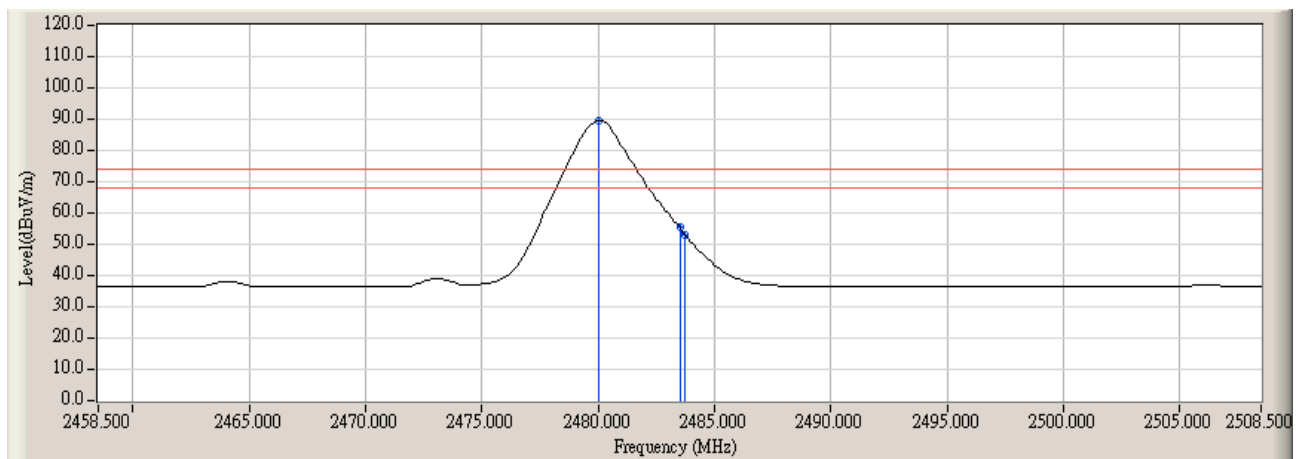
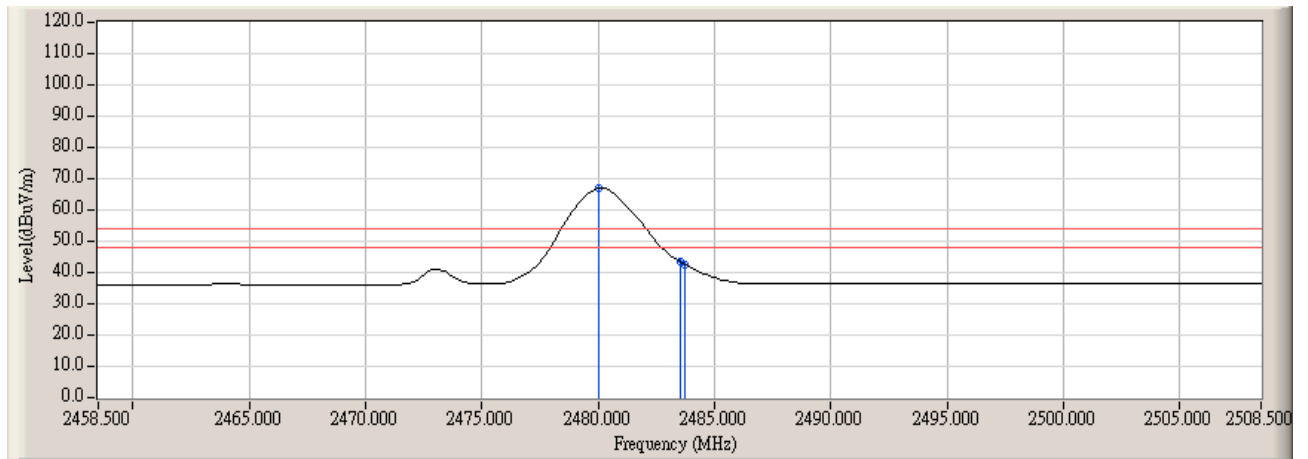


Figure Channel 78:

Vertical (Average)



Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

6. Channel Number

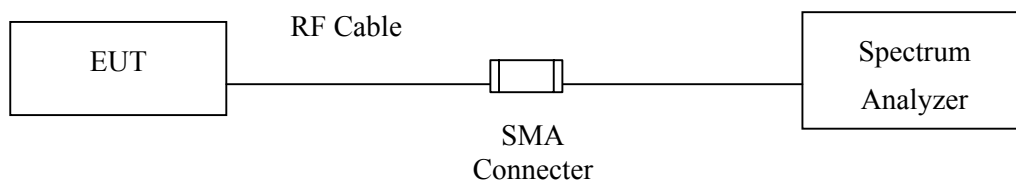
6.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	EMI Test Receiver	R & S	ESI 26 / 838786/004	March, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

6.2. Test Setup



6.3. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

6.4. Uncertainty

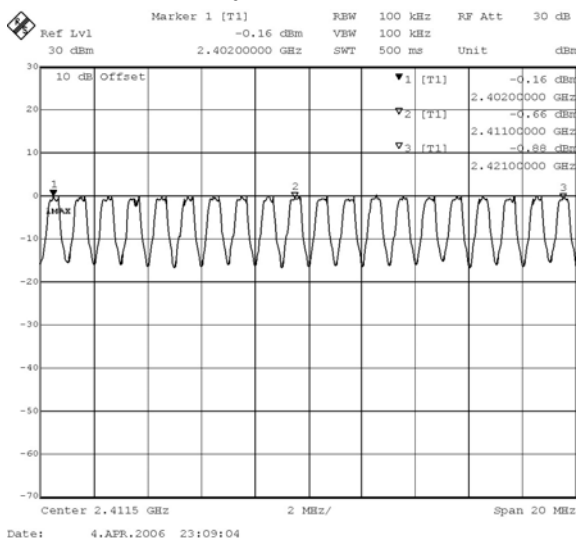
The measurement uncertainty is defined as $\pm 200\text{kHz}$

6.5. Test Result of Channel Number

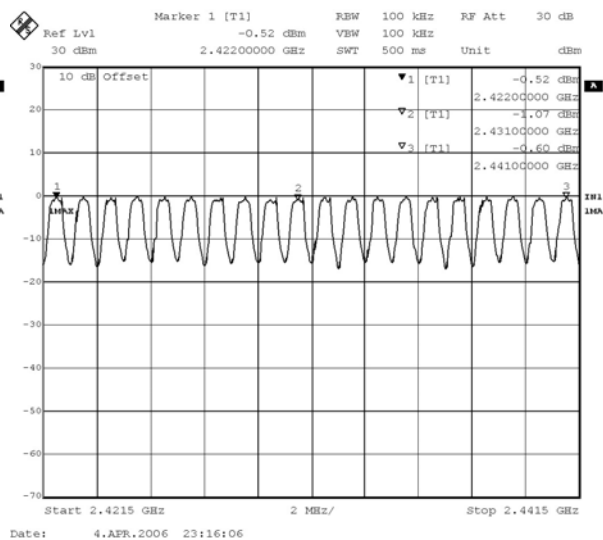
Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

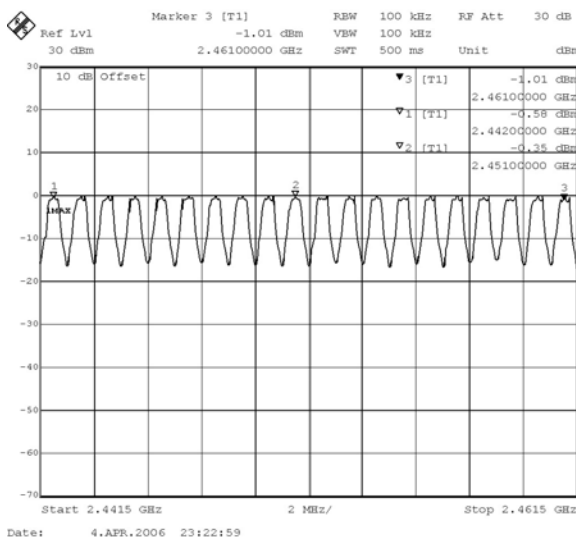
2402-2421MHz



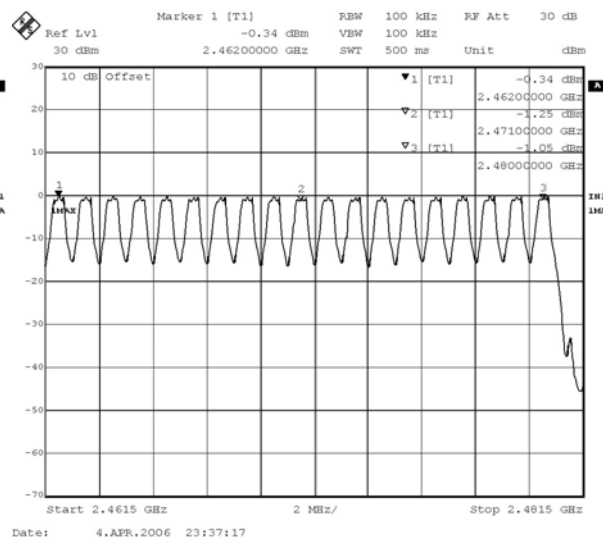
2422-2441MHz



2442-2461MHz



2462-2481MHz



7. Channel Separation

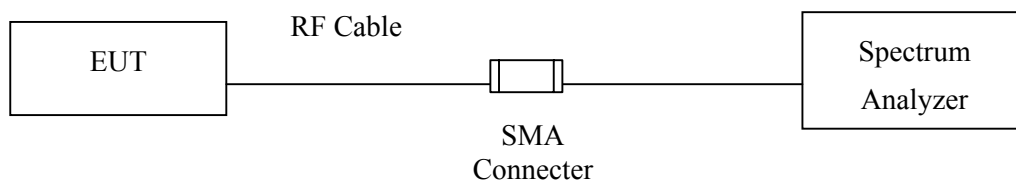
7.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	EMI Test Receiver	R & S	ESI 26 / 838786/004	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

7.2. Test Setup



7.3. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

7.4. Uncertainty

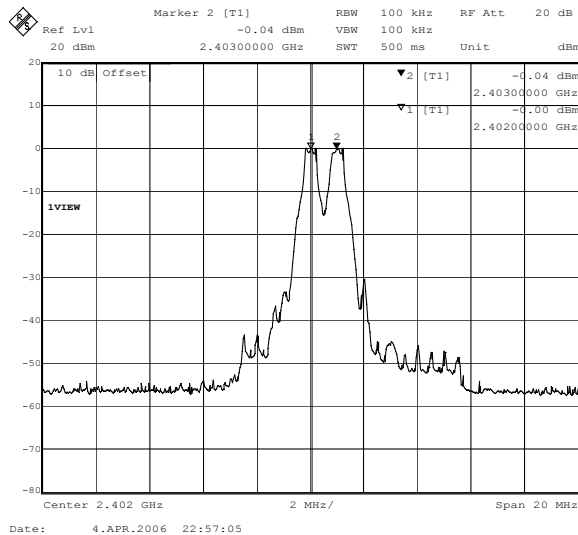
The measurement uncertainty is defined as $\pm 150\text{Hz}$

7.5. Test Result of Channel Separation

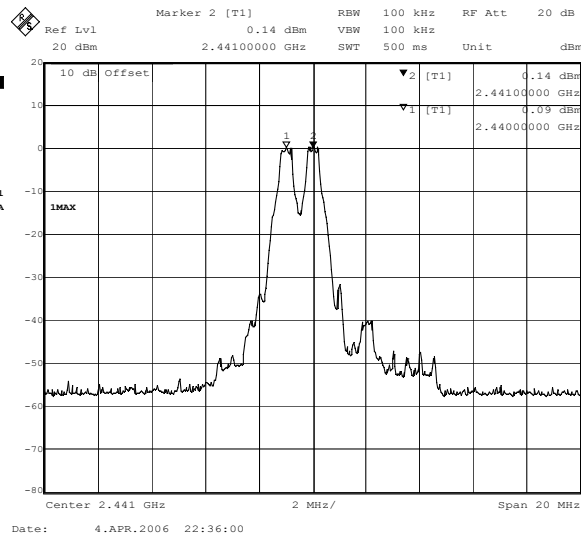
Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter

Frequency (MHz)	Measurement Level (MHz)	Required Limit	Result
2402	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2441	1.00	>25 kHz or 2/3 * 20 dB BW	Pass
2480	1.00	>25 kHz or 2/3 * 20 dB BW	Pass

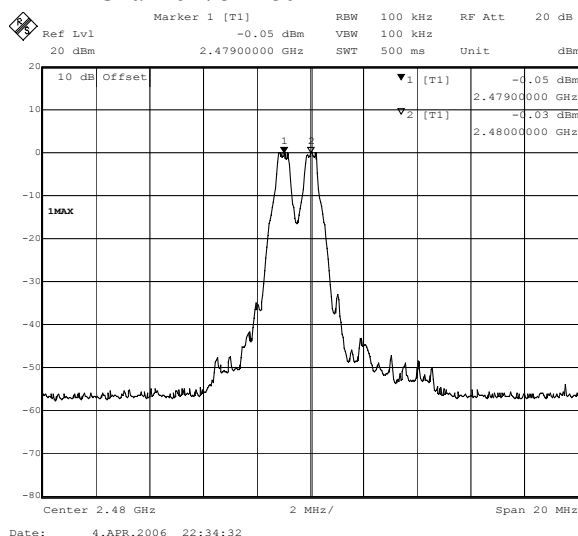
Channel 00 2402MHz



Channel 39 2441MHz



Channel 78 2480 MHz



8. Dwell Time

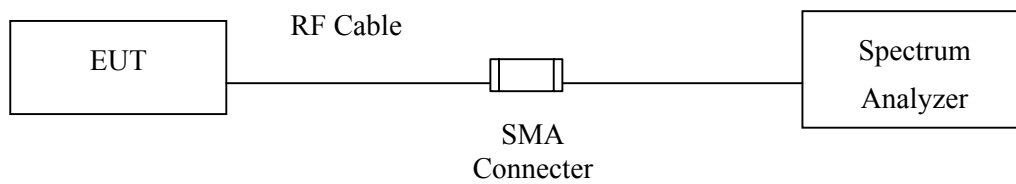
8.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	EMI Test Receiver	R & S	ESI 26 / 838786/004	March, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

8.2. Test Setup



8.3. Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

8.4. Uncertainty

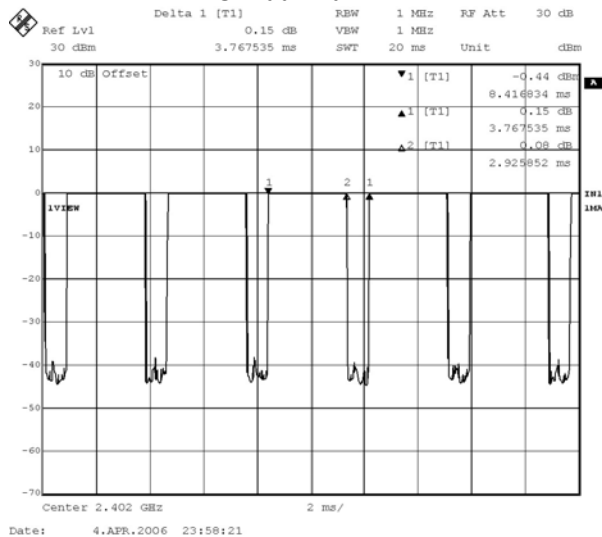
The measurement uncertainty is defined as $\pm 25\text{msec}$

8.5. Test Result of Dwell Time

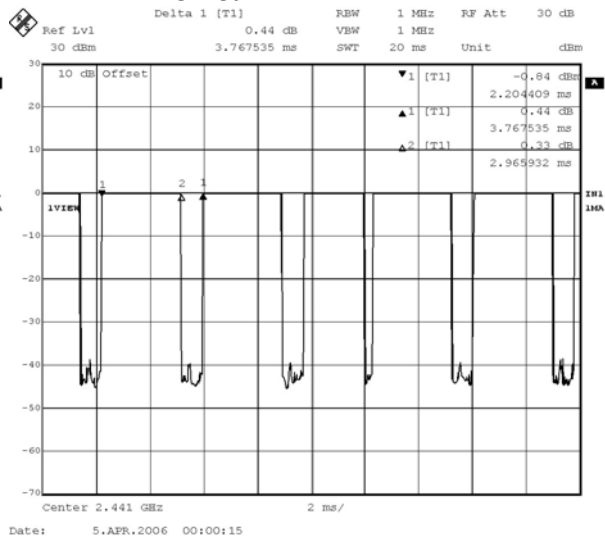
Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (Channel 00,39,78 – DH5)

Channel (MHz)	Measurement Level (ms)	Required Limit (sec.)	Result
CH 00 2402	328.072	< 0.4	Pass
CH 39 2441	332.559	< 0.4	Pass
CH 78 2480	323.586	< 0.4	Pass

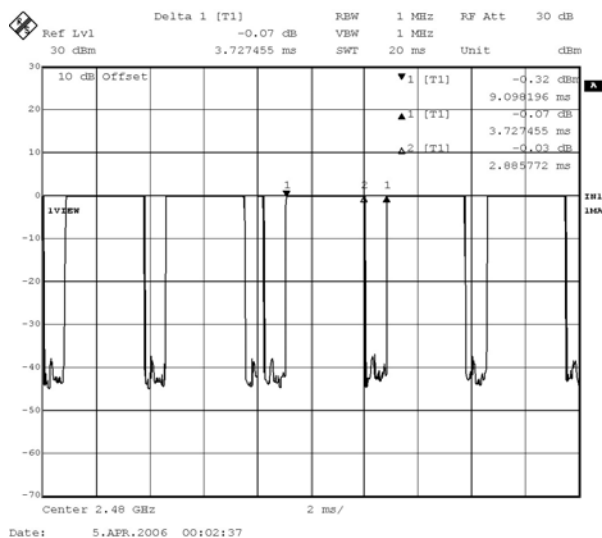
CH 00 2402MHz



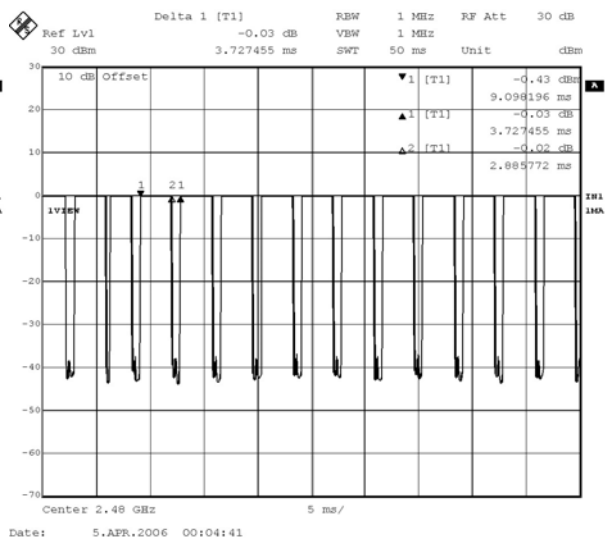
CH 39 2441MHz



CH 78 2480MHz



Total



Note: Dwell time = time slot length * hop rate / number of hopping channels * period

Occupancy Time of Frequency Hopping System

Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $14/50\text{msec} = 0.28 \text{ hops /msec}$

A) 2402MHz The Maximum Occupancy Time Within 31.6sec: $(2925 \mu\text{s} \times 280) / (79 \times 31.6) = 328.072\text{msec}$ °

B) 2441MHz The Maximum Occupancy Time Within 31.6sec: $(2965 \mu\text{s} \times 280) / (79 \times 31.6) = 332.559\text{msec}$ °

C) 2480MHz The Maximum Occupancy Time Within 31.6sec: $(2885 \mu\text{s} \times 280) / (79 \times 31.6) = 323.586\text{msec}$ °

Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard °

PS: (1) From Bluetooth Specification , It Hops 1600 Times in 1sec ° The Average Occupancy Time of Each 79 Channels is $1600/79$ Times , Therefore , We Calculate The Maximum Occupancy Time (worse cars)As Below:

A) 2402Mhz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is $0.4\text{msec} \times 1640/79 \times 31.6 = 289.056\text{msec}$

B) 2441MHz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is $0.4\text{msec} \times 1640/79 \times 31.6 = 289.056\text{msec}$

C) 2480MHz The Occupancy Time of Each Pulse is 0.4msec , The Maximum Occupancy Time within 31.6sec is $0.4\text{msec} \times 1640/79 \times 31.6 = 289.056\text{msec}$

Test Result: The Maximum Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard °

9. Occupied Bandwidth

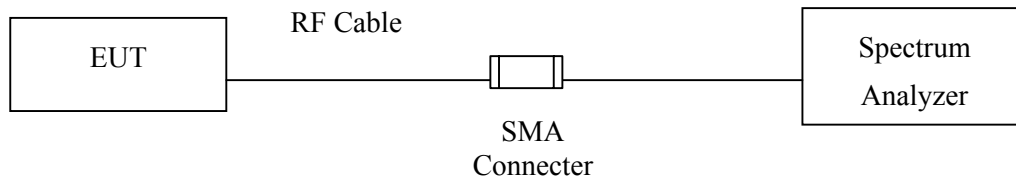
9.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	EMI Test Receiver	R & S	ESI 26 / 838786/004	May, 2005

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark “X” test instruments are used to measure the final test results.

9.2. Test Setup



9.3. Limits

The minimum bandwidth shall be at least 500kHz.

9.4. Uncertainty

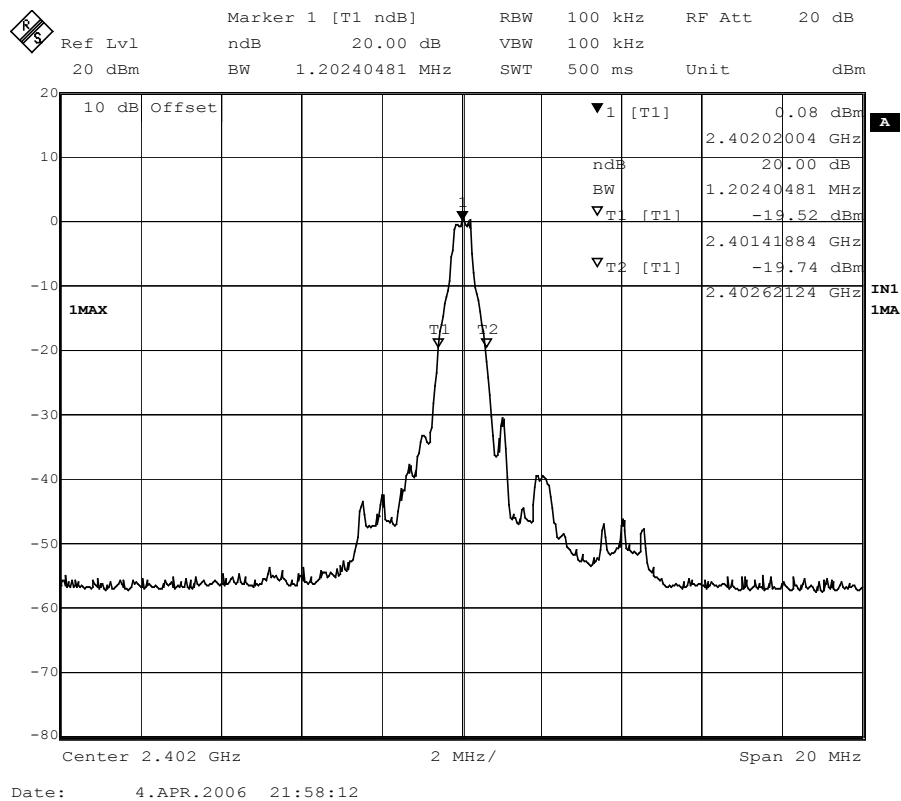
The measurement uncertainty is defined as ± 1.27 dB

9.5. Test Result of Occupied Bandwidth

Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1202	>500	Pass

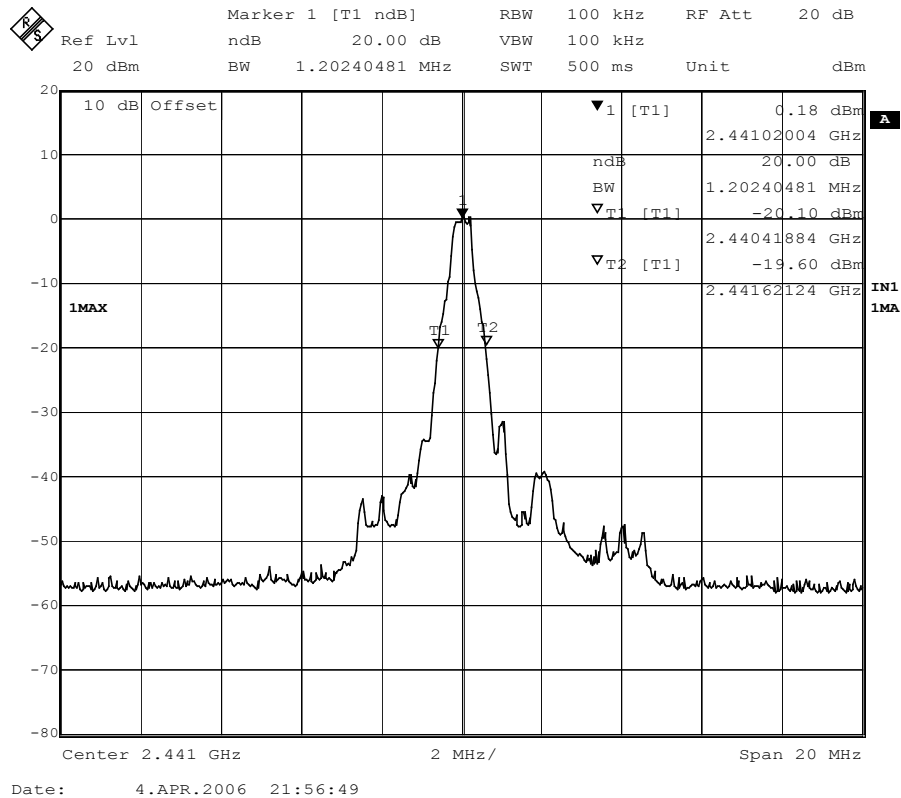
Figure Channel 00:



Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1202	>500	Pass

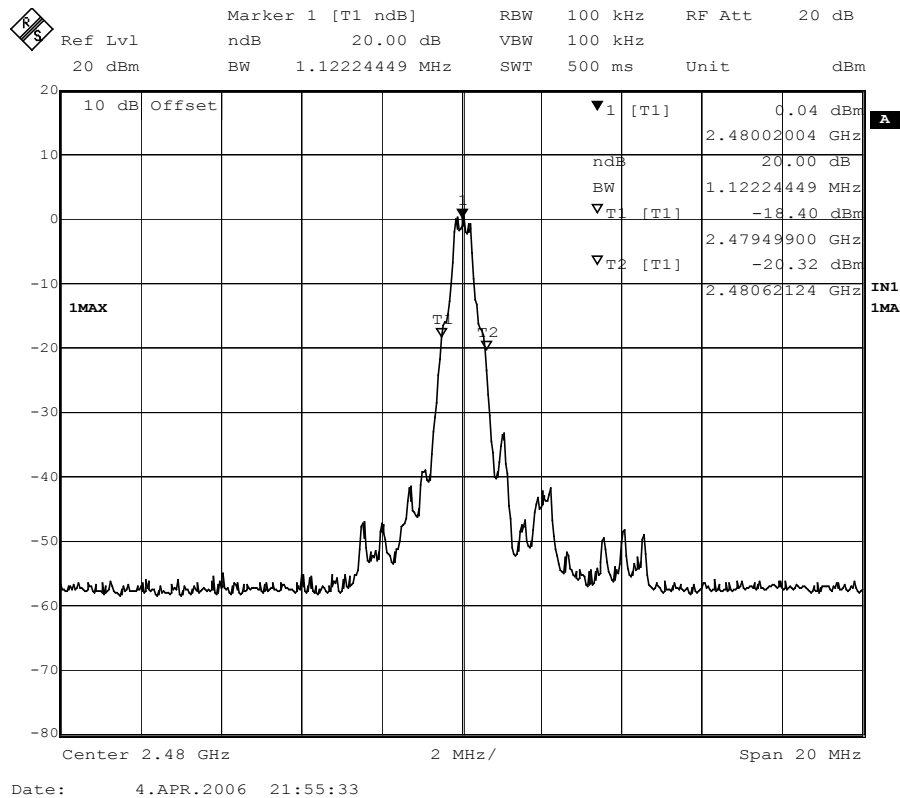
Figure Channel 39:



Product : GSM900/DCS1800/PCS1900 GSM/GPRS Mobile Phone
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1122	>500	Pass

Figure Channel 78:



10. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 1: EUT Test Setup Photographs

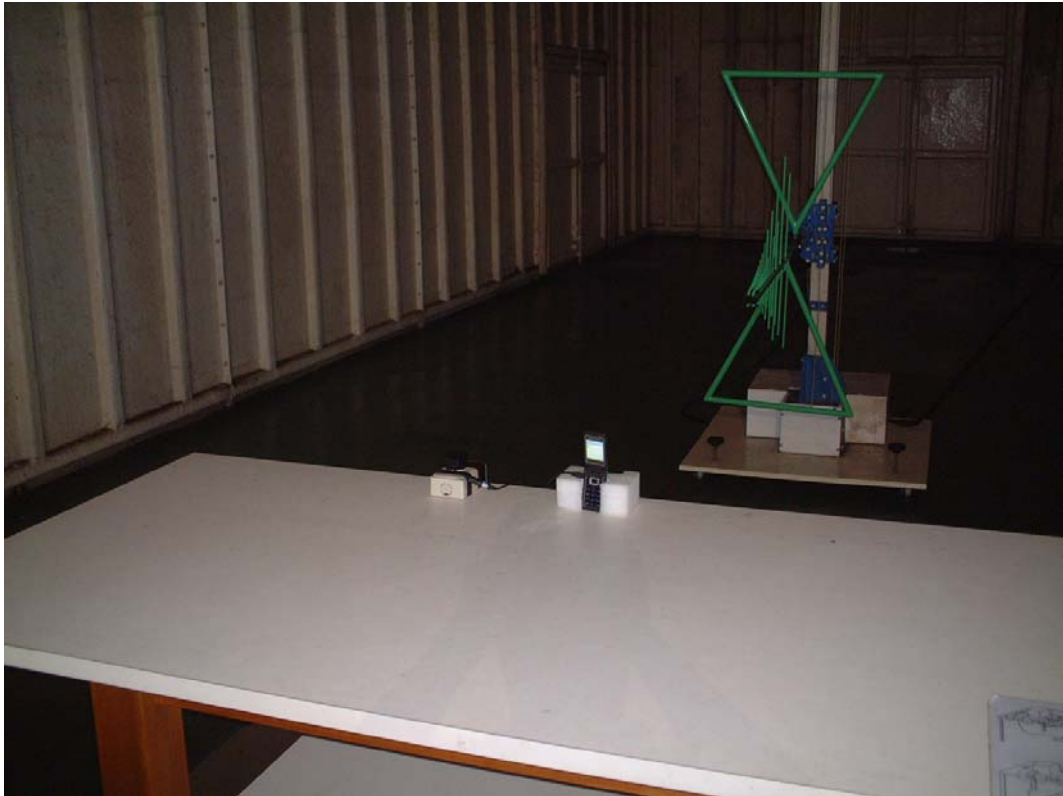
Front View of Conducted Test



Back View of Conducted Test



Front View of Radiated Test



Back View of Radiated Test



Front View of Radiated Test (Horn)



Back View of Radiated Test (Horn)

