

APPLICATION FOR CERTIFICATION

On Behalf of

ShenZhen HaiLiang Communication CO., LTD

GSM Phone

Model Number: phone F1

Prepared for : ShenZhen HaiLiang Communication CO., LTD.
4F, No.4 buliding, Longjing Gaofa Technology Park, Nanshan
District, Shenzhen

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
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Report Number : ACS-F07310
Date of Test : Jun.28~Jul.11, 2007
Date of Report : Jul.16, 2007

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TEST REPORT CERTIFICATION

Applicant : ShenZhen HaiLiang Communication CO., LTD
 Manufacturer : ShenZhen HaiLiang Communication CO., LTD
 EUT Description : GSM Phone
 (A) MODEL NO. : phone F1
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : DC 3.7V

Test Procedure Used:

FCC CFR47 Part 2: Subpart J;
 FCC CFR47 Part 24: Subpart E;
 FCC CFR47 Part 15: Subpart B

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part 2 Subpart J, FCC CFR47 Part 24: Subpart E, FCC CFR47 Part 15: Subpart B requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

Date of Test : Jun.28~Jul.11, 2007

Prepared by :

YoYo Wang

YoYo Wang / Assistant

Reviewer :

Iceeman Hu

Iceeman Hu / Senior Engineer



信華科技(深圳)有限公司

Audix Technology (Shenzhen) Co., Ltd.

EMC 部門報告專用章

Stamp only for EMC Dept. Report

Signature:

Ken Lu

Approved & Authorized Signer :

Ken Lu / Deputy Manager

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Test Procedure Used:

FCC CFR47 Part 2: Subpart J;

FCC CFR47 Part 24: Subpart E;

FCC CFR47 Part 15: Subpart B

TIA/EIA-603: Land Mobile FM or PM communication Equipment Measurement and Performance standards

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	24.232	Effective Radiated Power of Transmitter	PASS
2.1047		Modulation Characteristics	PASS
2.1049		Occupied Bandwidth	PASS
2.1051	24.238	Band Edges Compliance	PASS
2.1051	24.238	Spurious Emission at Antenna Terminal	PASS
2.1053	24.238	Radiated Spurious Emission	PASS
2.1055	24.235	Frequency Stability	PASS
	15.109	Radiated Emission Test in Middle Mode	PASS
	15.207	Conducted Emission Test in Middle Mode	PASS

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description	:	GSM Phone
Model Number	:	phone F1
Applicant	:	ShenZhen HaiLiang Communication CO., LTD 4F, No.4 buliding, Longjing Gaofa Technology Park, Nanshan District, Shenzhen
Manufacturer	:	ShenZhen HaiLiang Communication CO., LTD 4F, No.4 buliding, Longjing Gaofa Technology Park, Nanshan District, Shenzhen
Power Adaptor	:	Manufacturer: Da tai ning, M/N: TL998D29 Cable: Unshielded, Detachable, 1.8m
Date of Test	:	Jun.28~Jul.11, 2007

2.2. Test Facility

Site Description

3m Anechoic Chamber : Jun.13, 2006 File on Federal Communication Commission
Registration Number: 90454

3m & 10m Anechoic Chamber : Jan.31, 2007 File on Federal Communication Commission
Registration Number: 794232

EMC Lab. : Accredited by DATech, German
Registration Number: DAT-P-091/99-01
Feb. 02, 2004

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Apr.01, 2006

2.3. Measurement Uncertainty

No.	Item	Uncertainty	Remark
1.	Conducted Emission Test	1.22dB	
2.	Radiated Emission Test	3.14dB	3m Chamber
3.	Radiated Emission Test	3.18dB	10m Chamber
4.	Radio Frequency	$\pm 0.42 \times 10^{-6}$	
5.	Temperature	$\pm 0.4^{\circ}\text{C}$	
6.	Humidity	$\pm 2.0\%$	
7.	RF power,conducted	$\pm 0.11\text{dB}$	
8.	Spurious emissions,conducted	$\pm 0.21\text{dB}$	
9.	All emissions,radiated(<1G)	$\pm 4.62\text{dB}$	
10.	All emissions,radiated(>1G)	$\pm 4.79\text{dB}$	

2.4. Technical Characteristics

2.4.1. Frequency Rang

Uplink Band:	1850 to 1910MHz
Downlink Band:	1930 to 1990MHz

2.4.2. Channel Spacing / Separation

Channel Spacing:	200kHz
Channel Separation:	200kHz

2.4.3. Environmental Requirements

Minimum temperature:	-20°C
Maximum temperature:	50°C
Relative Humidity:	5% - 95%RH

2.4.4. Power Source

DC voltage nominal	3.7V
DC voltage range	3.6V – 4.2V

2.5. Test Equipment

For RF Site

Item	Equipment	Manufacturer	Model No	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May 11 07	1 Year
2	Coaxial Switch	Anritsu	MP59B	M73989	July.16,07	1 Year
3	Signal Generator	HP	83732B	6K00003262	May 11, 07	1 Year
4	Substitution antenna	Schaffner	CBL6111C	2598	Feb.22, 07	1 Year
5	Amplifier	HP	8447D	2944A07794	Mar. 12, 07	1 Year
6	HF Cable	Hubersuhne	Sucoflex104	-	May 11, 07	1 Year
7	Attenuation	Agilent	8491B	MY39262166	May 11 07	1 Year
8	Generator	Marconi	2031	1196061058	May 11 07	1 Year
9	Communication Test	Agilent	8960	GB44300243	May 11 07	1 Year
10	Communication Test	R/S	CMU 200	110432	May 11 07	1 Year
11	Power Divider	Anritsu	K240C	020346	March 7 07	1/2 Year
12	Horn Antenna	EMCO	3115	9607-4877	Dec.23,07	1.5 Year
13	Horn Antenna	EMCO	3115	9510-4580	Dec.12,06	1.5 Year
14	RF Cable	MIYAZAKI	8D-FB	No.1	May.11,07	1/2 Year
15	RF Cable	MIYAZAKI	8D-FB	No.2	May.11,07	1/2 Year
16	RF Cable	MIYAZAKI	8D-FB	No.3	May.11,07	1/2 Year
17	Amplifier	HP	8449B	3008A00863	May.11,07	1 Year
18	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.15,07	1 Year
19	High Pass Filter	Agilent	3.5GHz	005	N/A	
20	Power Supply	KI	DPS-1303D	821956	N/A	

For Conducted Emission Site

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	May 11, 07	1 Year
2.	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	May 11, 07	1 Year
3.	L.I.S.N.#3	EMCO	3825/2	9006-1660	May 11, 07	1 Year
4.	Terminator	Hubersuhner	50Ω	No. 1	May 11, 07	1 Year
5.	RF Cable	MIYAZAKI	5D-2W	LISN Cable 1#	Feb.16, 07	1/2 Year
6.	Coaxial Switch	Anritsu	MP59B	M55367	Feb.16, 07	1/2 Year
7.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	Feb.16, 07	1/2 Year

For Radiated Emission Site (30MHz-1000MHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Spectrum	HP	85422E	3625A00181	May 11, 07	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	May 11, 07	1 Year
3.	Amplifier	HP	8447D	2944A07794	Mar.12, 07	1/2 Year
4.	Bilog Antenna	Schaffner	CBL6111C	2598	Feb.22, 07	1 Year
5.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Jan. 18, 07	1/2 Year
6.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Jan. 18, 07	1/2 Year
7.	RF Cable	FUJIKURAw	RG-55/U	3# Chamber No.3	Jan. 18, 07	1/2 Year
8.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Jan. 18, 07	1/2 Year
9.	Coaxial Switch	Anritsu	MP59B	M73989	Jan. 18, 07	1/2 Year

For Radiated Emission Site (above 1000MHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4407B	MY41440292	May 11, 07	1 Year
2.	Amp	HP	8449B	3008A00863	May 11, 07	1 Year
3.	Antenna	EMCO	3115	9607-4877	Jan. 23, 07	1.5 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May 11, 07	1 Year
5.	Antenna	EMCO	3115	9510-4580	Dec.12, 06	1.5 Year

3. MEASUREMENTS OF TRANSMITTER PARAMETERS

3.1. Effective Radiated Power of Transmitter

3.1.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1046 and Part 24.232
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF site
Tested Engineer	:	Iceman

3.1.2. Limits

Compliance with Part 24.232, mobile/ portable stations are limited to 2 watts ERP peak power. $W \text{ (dBm)} = 10 * \log(W_{\text{watts}})$.

Maximum Output Power (Watts)	<2 Watts
Maximum Output Power (dBm)	< 33 dBm

3.1.3. Test method and Setup

- Connect the EUT to the wireless communication tester Agilent 8960 via the air interface.
- Test the Radiated maximum output power by the Agilent 8960 received from test antenna.
- Use substitution method to verify the maximum output power. The EUT is substituted by a dipole antenna. The dipole is connected to a signal generator. And then adjust the output level of the signal generator. When it get the same received power recorded on 8960, and record the power level of Signal Generator

3.1.4. Test results

Test Conditions	RF Output Power		
	Channel B: 512	Channel M: 661	Channel T: 810
	1850.2MHz	1880MHz	1909.8MHz
	dBm	dBm	dBm
	Measured	Measured	Measured
GSM 1900MHz	29.36	28.95	28.48

Remark

- 1) Effective radiated power(ERP) refers to the radiation power output of the EUT
- 2) There is a constant difference of 2.15dB between EIRP AND ERP
 $ERP(dBm) = EIRP(dBm) - 2.15$

Substitution Results						
Freq [MHz]	Measurement Value [dBm]	Substitution Antenna type	Gain [dBi]	Cable Loss [dB]	Signal Generator Level [dBm]	e.r.p(dBm)
1850.2	30.05	Horn Ant	8.2	5.66	28.97	29.36
1880	29.16	Horn Ant	8.2	5.83	28.73	28.95
1909.8	29.34	Horn Ant	8.3	6.42	28.75	28.48

Notes

$e.r.p = \text{Signal Generator} - \text{Cable Loss} + \text{Gain} - 2.15$

3.2. Modulation Characteristics

3.2.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1047 and Part 24 subpart E
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.2.2. Limits

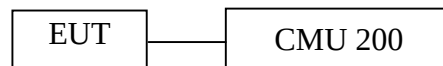
No specific modulation characteristics requirement limits in part 2.1047 and part 24 subpart E

Limits	Not applicable
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3.2.3. Test method and Setup

Connect the EUT to Universal Radio Communication Tester CMU200 via the antenna connector. The frequency band is set as PCS; The waveform quality and constellation of the EUT was tested.

Test setup



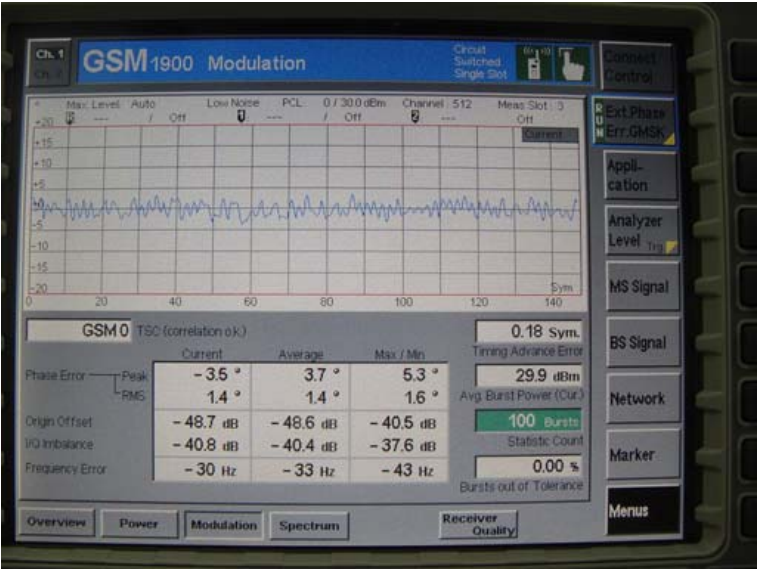
3.2.4. Test results

TEST CONDITIONS	Modulation Characteristic		
	Channel: 512 1850.2MHz	Channel: 661 1880.0MHz	Channel: 810 1909.8MHz
	Measured		
GSM 1900MHz	Refer to the following pages		

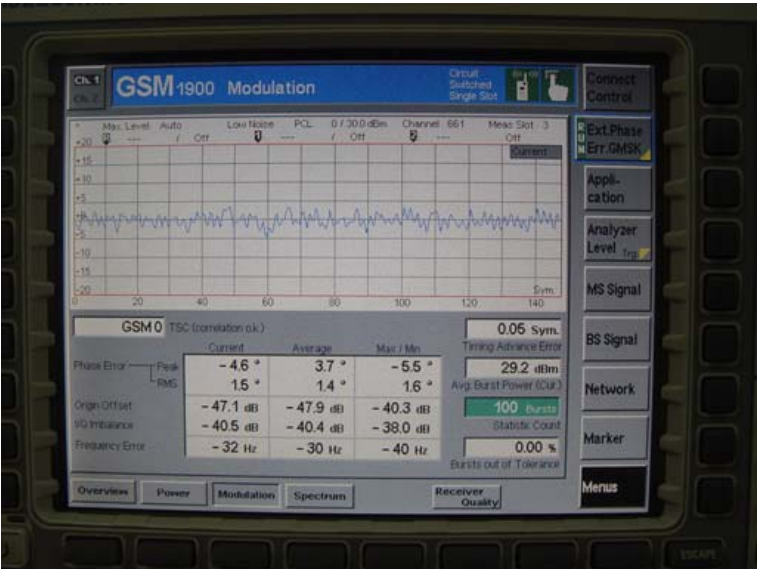
3.2.5. Conclusion

The equipment PASSED the requirement of this clause.
For the measurement results refer to the following pages.

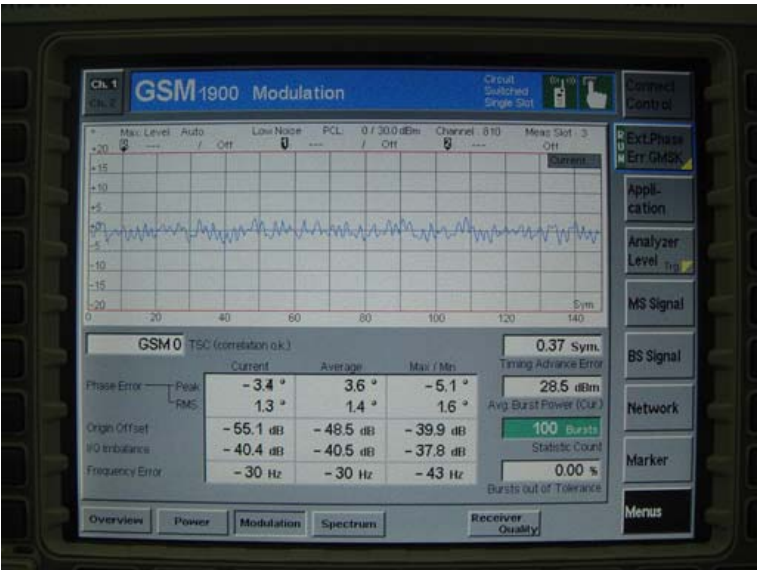
CH512 Modulation Characteristics



CH661 Modulation Characteristics



CH810 Modulation Characteristics



3.3. Occupied Bandwidth

3.3.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1049 and Part 24 subpart E
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.3.2. Limits

No specific occupied bandwidth requirement in part 24 subpart E, but the occupied bandwidth was defined in part 2.1049: the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

Upper / lower frequency limits	0.5% of the mean power
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Requirement: Clause 13.1.7 of ANSI C63.4

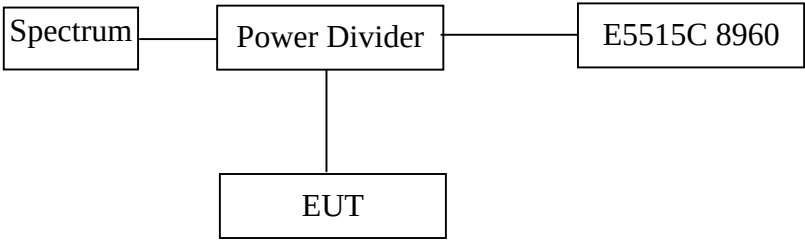
3.3.3. Test method and Setup

Refer to 47CFR part2.1049 section (g)&(h)

(g) Transmitters in which the modulating baseband comprises not more than three independent channels—when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Test setup



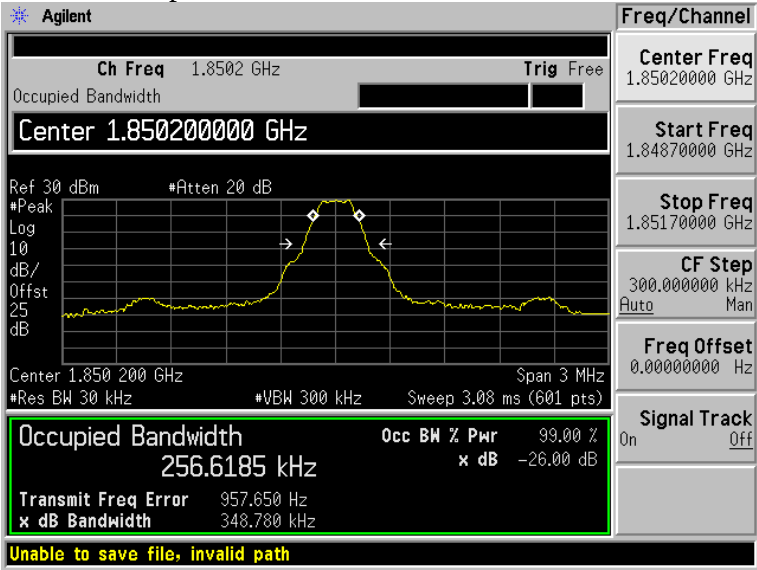
3.3.4. Test results

TEST CONDITIONS	Occupied Bandwidth		
	Channel: 512	Channel: 661	Channel: 810
	1850.2MHz	1880MHz	1909.8MHz
	Measured (kHz)	Measured (kHz)	Measured (kHz)
GSM 1900MHz	256.61	253.84	256.83

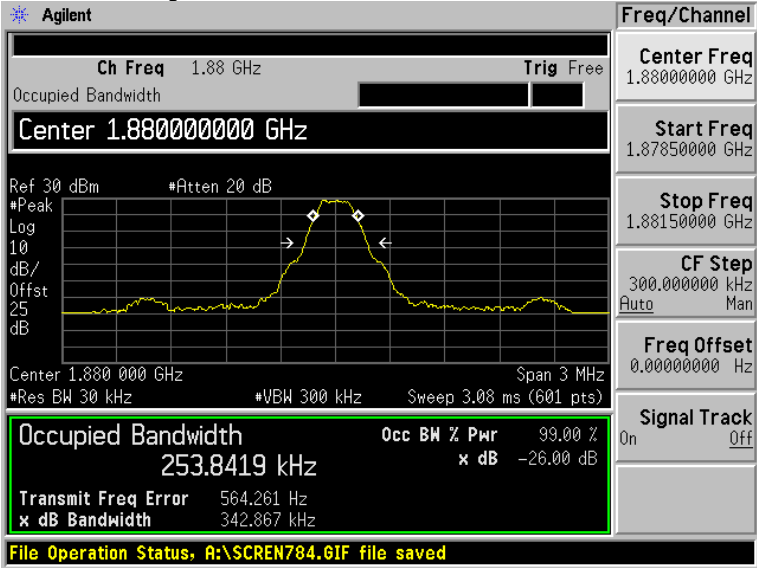
3.3.5. Conclusion

The equipment PASSED the requirement of this clause.
For the measurement results refer to the following pages.

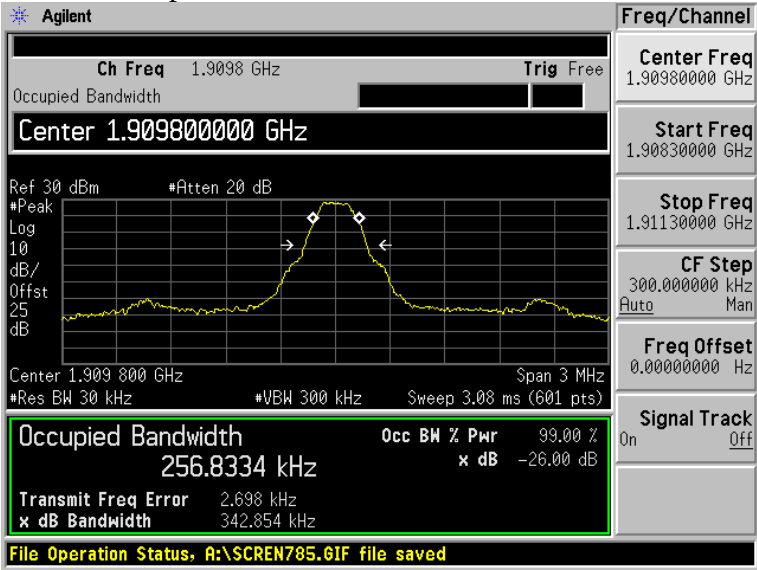
CH512 Occupied Bandwidth



CH661 Occupied Bandwidth



CH810 Occupied Bandwidth



3.4. Band Edges Compliance

3.4.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1051 and Part 24.238
Test Channel	:	CH512 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.4.2. Limits

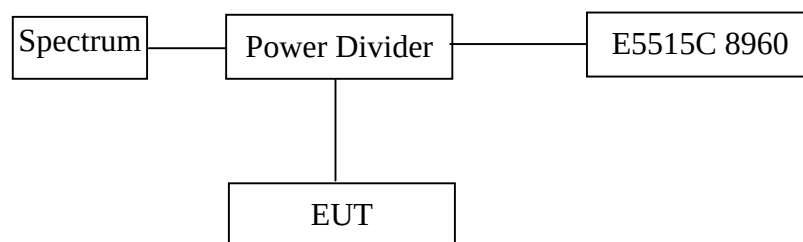
Compliance with part 24.238, all spurious emission must be attenuated below the transmitter power by at least $43 + 10\log_{10} P$. (Whereas P is the rated power of the EUT).

Limits for GSM 1900	
Rated Power:	30dBm
Required attenuation:	$43 + 10\log(1)=43$, 30dBm-43dB
Absolute level:	-13dBm

3.4.3. Test method and Setup

Connect the EUT to the test equipment via Power Divider. The EUT was controlled to transmit maximum power. Measure and record band edges compliance of the test equipment

Test setup



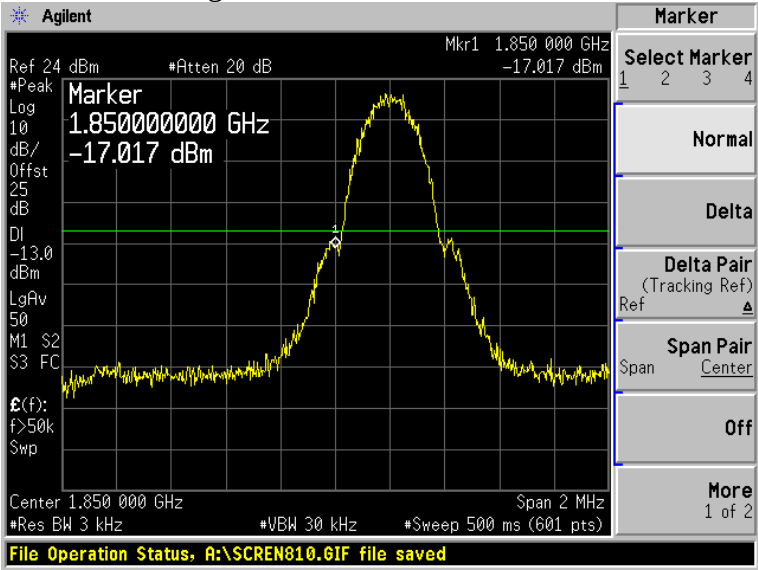
3.4.4. Test results

TEST CONDITIONS	Band edges	
	Channel: 512	Channel: 810
	1850.2MHz	1909.8MHz
	Measured (dBm)	Measured (dBm)
GSM 1900MHz	-17.017	-17.564

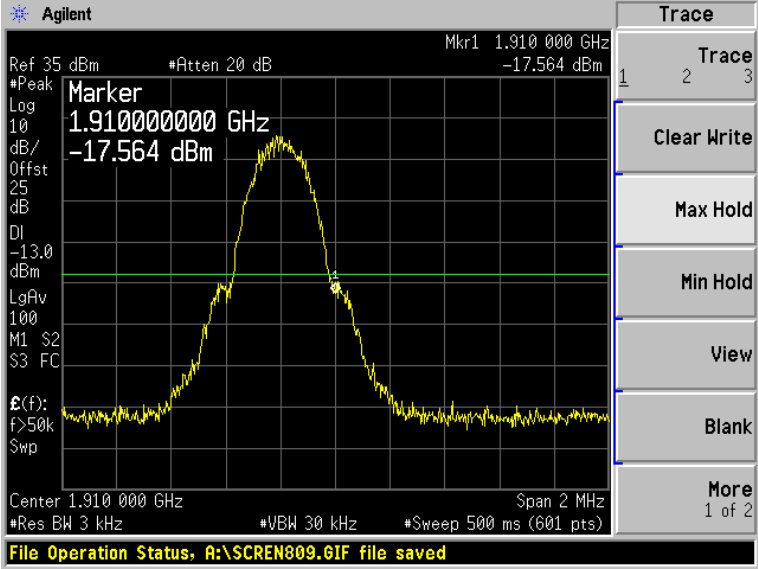
3.4.5. Conclusion

The equipment PASSED the requirement of this clause.
For the measurement results refer to the following pages.

CH512 Band edges



CH810 Band edges



3.5. Spurious Emission at Antenna Terminal

3.5.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1051 and Part 24.238
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.5.2. Limits

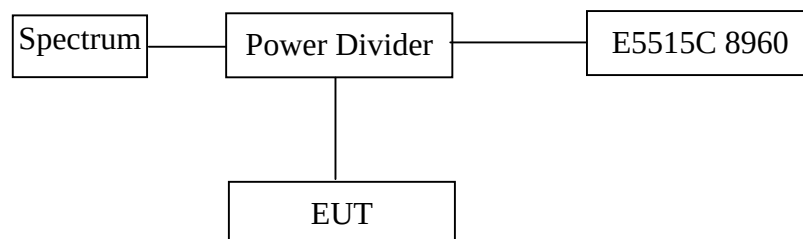
Compliance with part 24.238, all spurious emission must be attenuated below the transmitter power by at least $43 + 10\log_{10} P$. (Whereas P is the rated power of the EUT).

Limits for GSM 1900MHz	
Rated Power:	30dBm
Required attenuation:	$43 + 10\log(1)=43$, 30dBm-43dB
Absolute level:	-13dBm

3.5.3. Test method and Setup

Connect the EUT to the test equipment via Power Divider. The EUT was controlled to transmit maximum power. Measure and record band edges compliance of the test equipment

Test setup



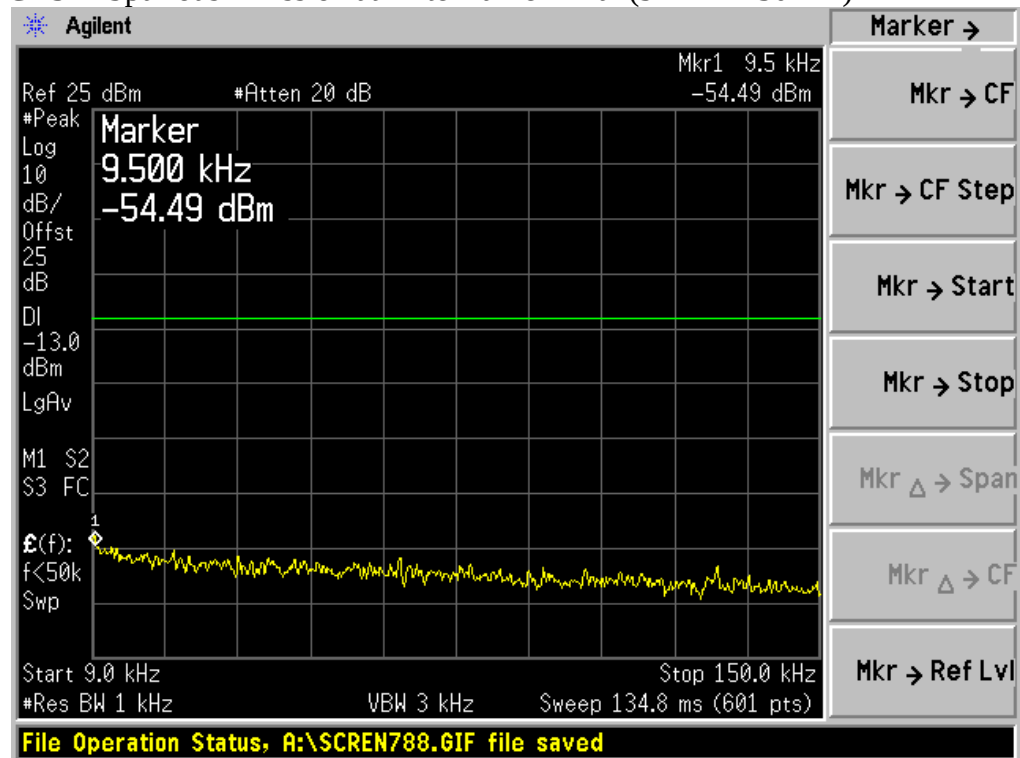
3.5.4. Test results

Channel Number	Test Mode	Test Range (Frequency)	Output Power [dBm]	Spurious Level Measured [dBm]	FCC Limit	Result
Channel 512	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass
Channel 661	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass
Channel 810	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass

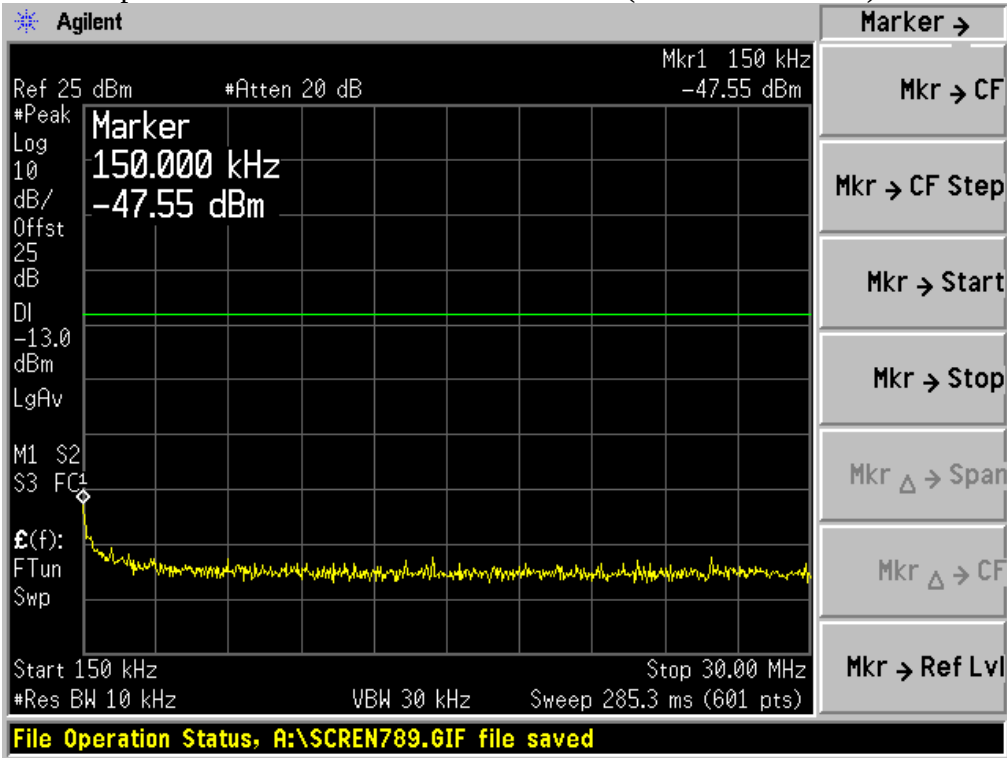
3.5.5. Conclusion

The equipment PASSED the requirement of this clause.
For the measurement results refer to the following pages.

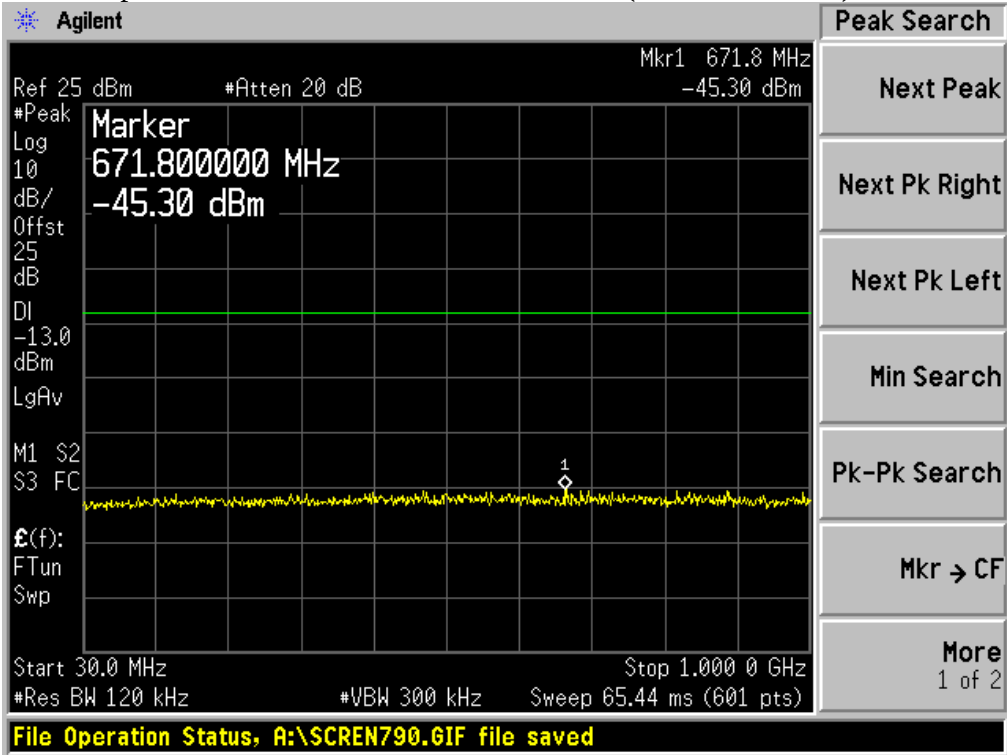
CH512 Spurious Emission at Antenna Terminal (9kHz---150kHz)



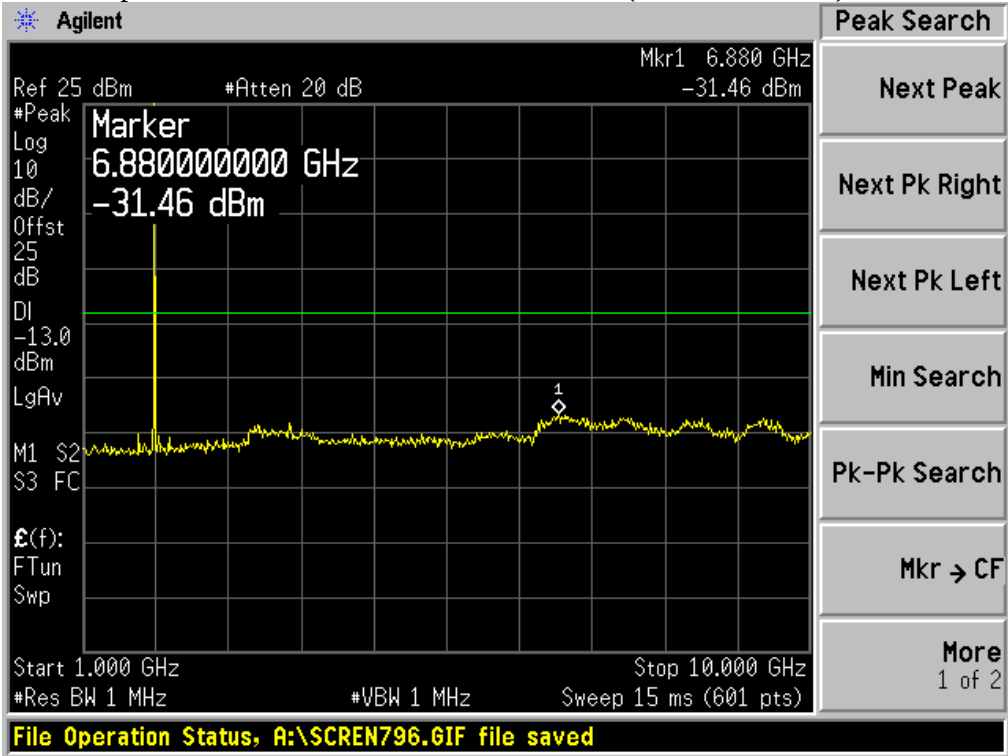
CH512 Spurious Emission at Antenna Terminal (150kHz---30MHz)



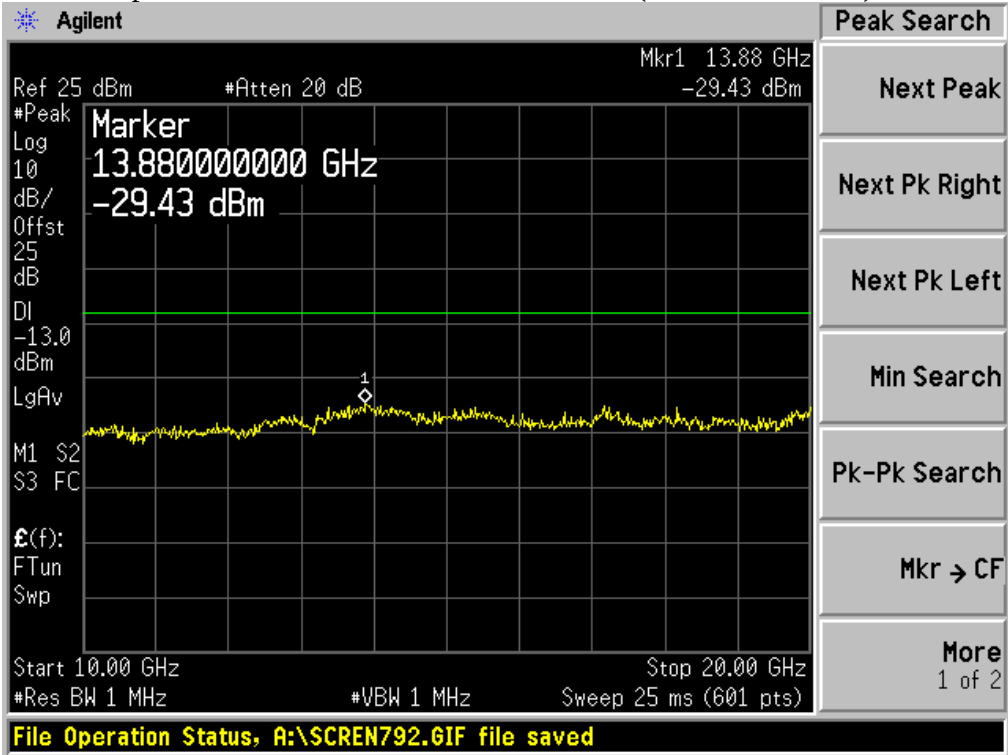
CH512 Spurious Emission at Antenna Terminal (30MHz---1GHz)



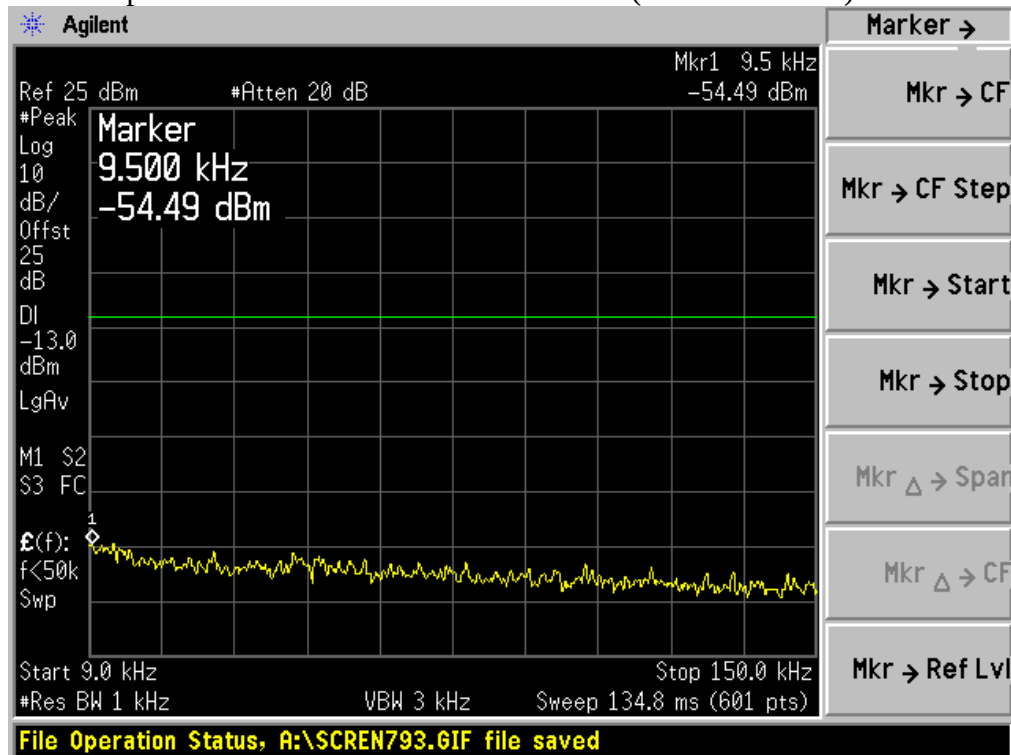
CH512 Spurious Emission at Antenna Terminal (1GHz---10GHz)



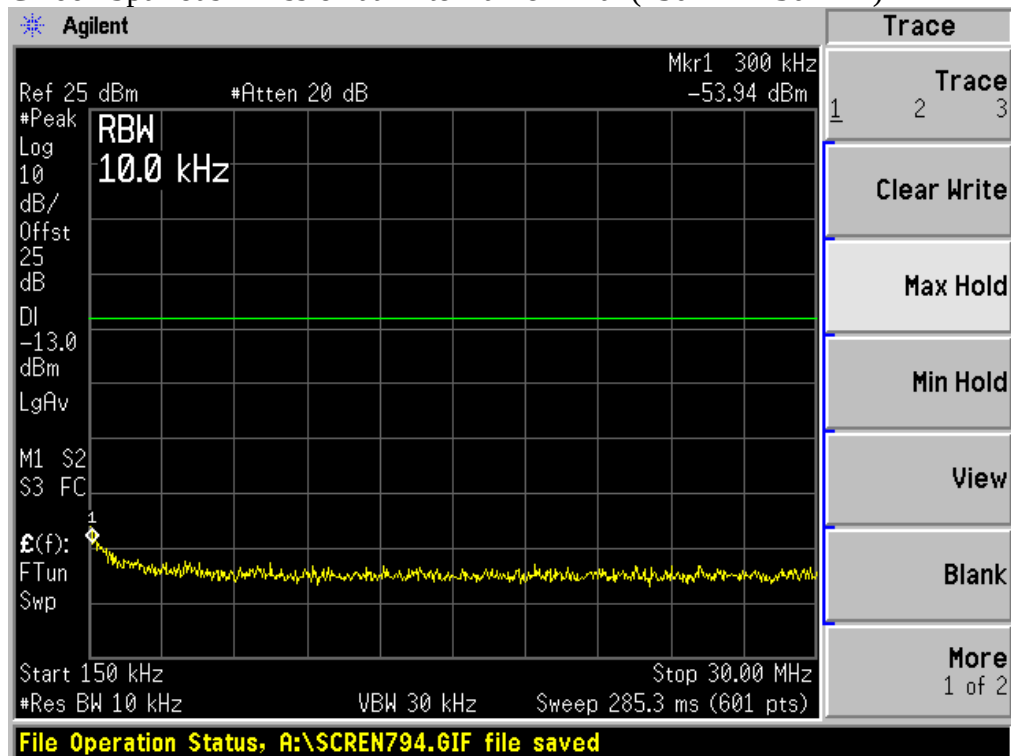
CH512 Spurious Emission at Antenna Terminal (10GHz---20GHz)



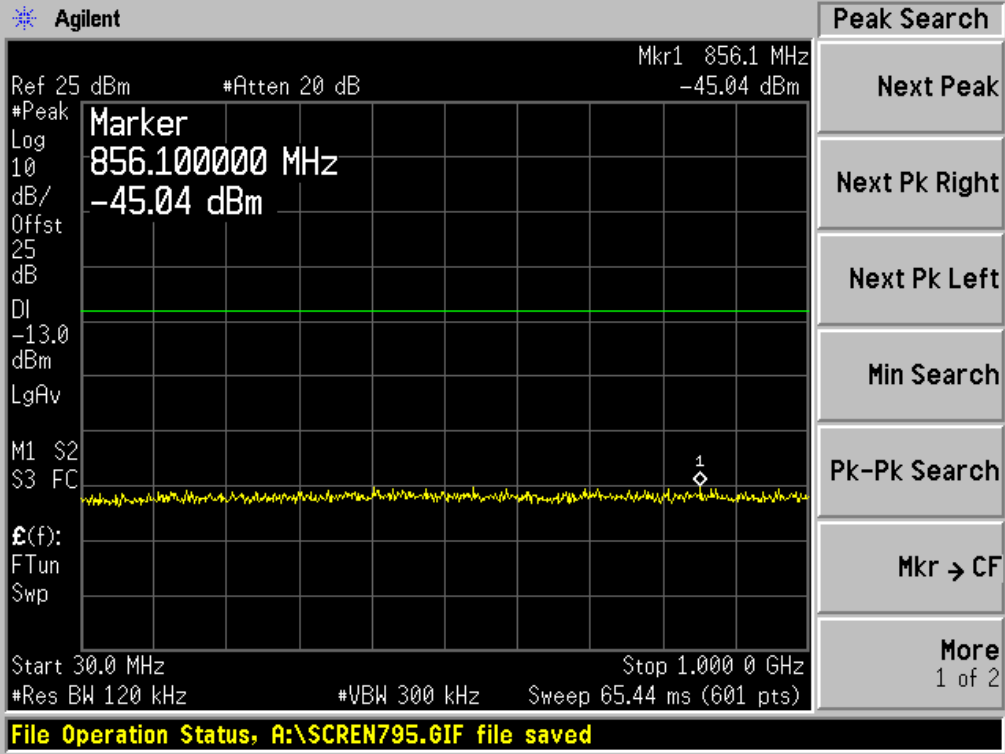
CH661 Spurious Emission at Antenna Terminal (9kHz---150kHz)



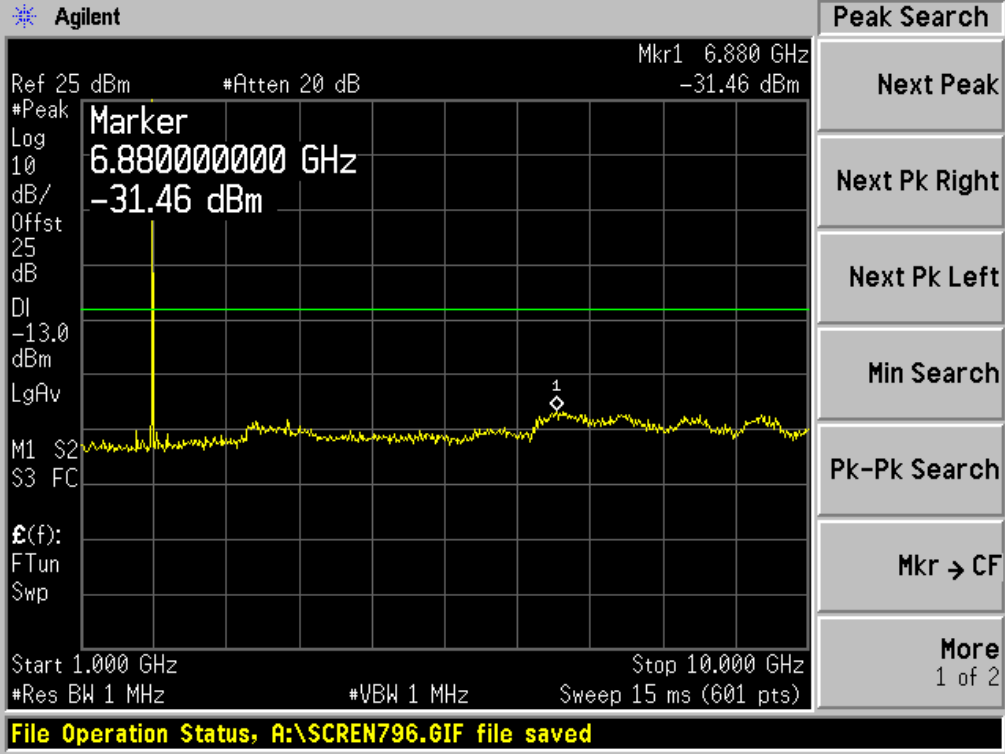
CH661 Spurious Emission at Antenna Terminal (150kHz---30MHz)



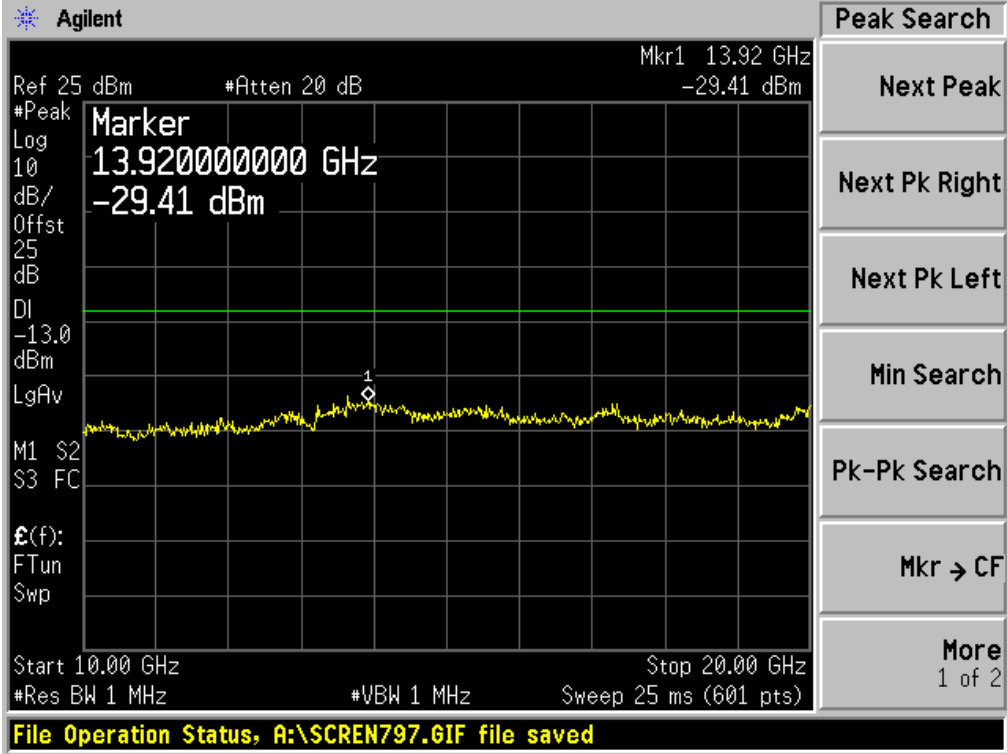
CH661 Spurious Emission at Antenna Terminal (30kHz---1GHz)



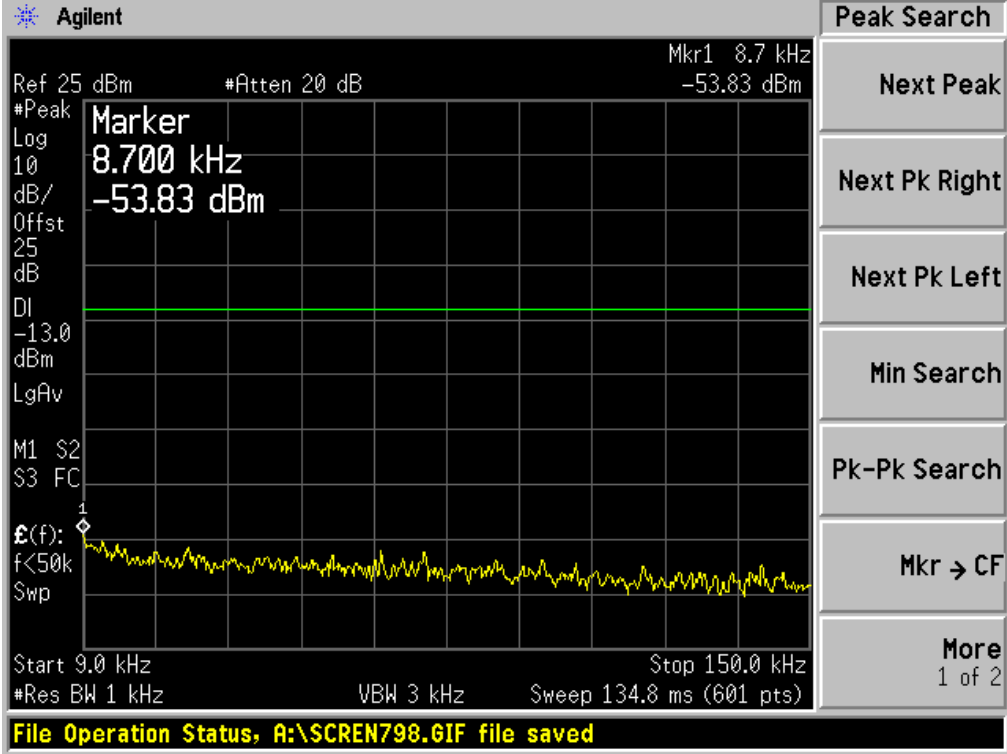
CH661 Spurious Emission at Antenna Terminal (1GHz---10GHz)



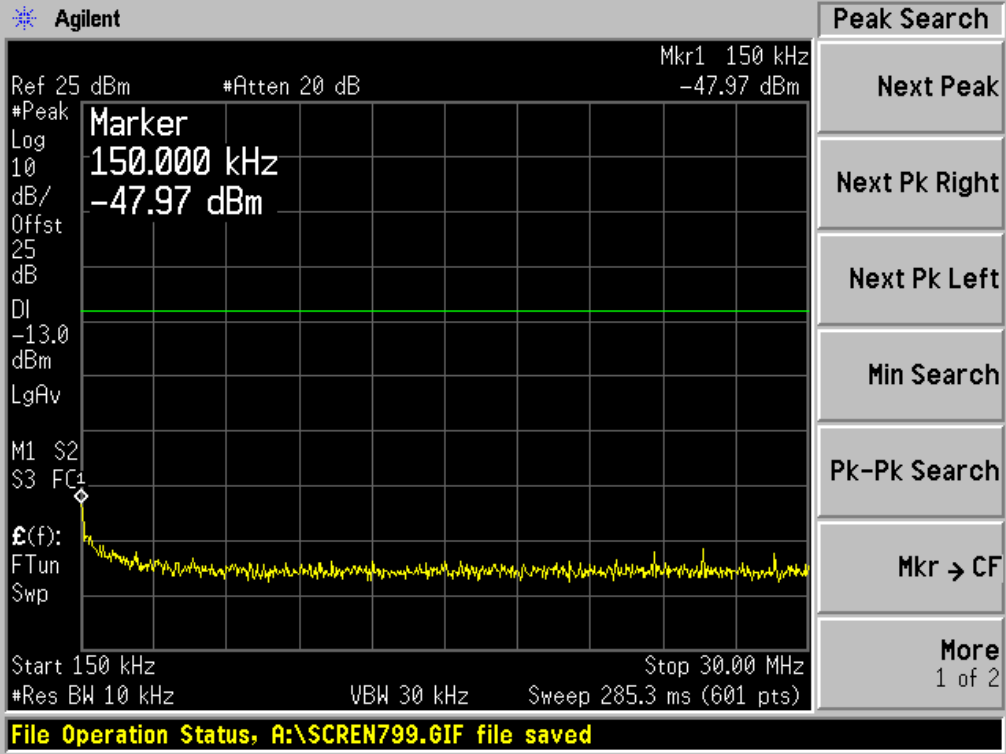
CH661 Spurious Emission at Antenna Terminal (10GHz---20GHz)



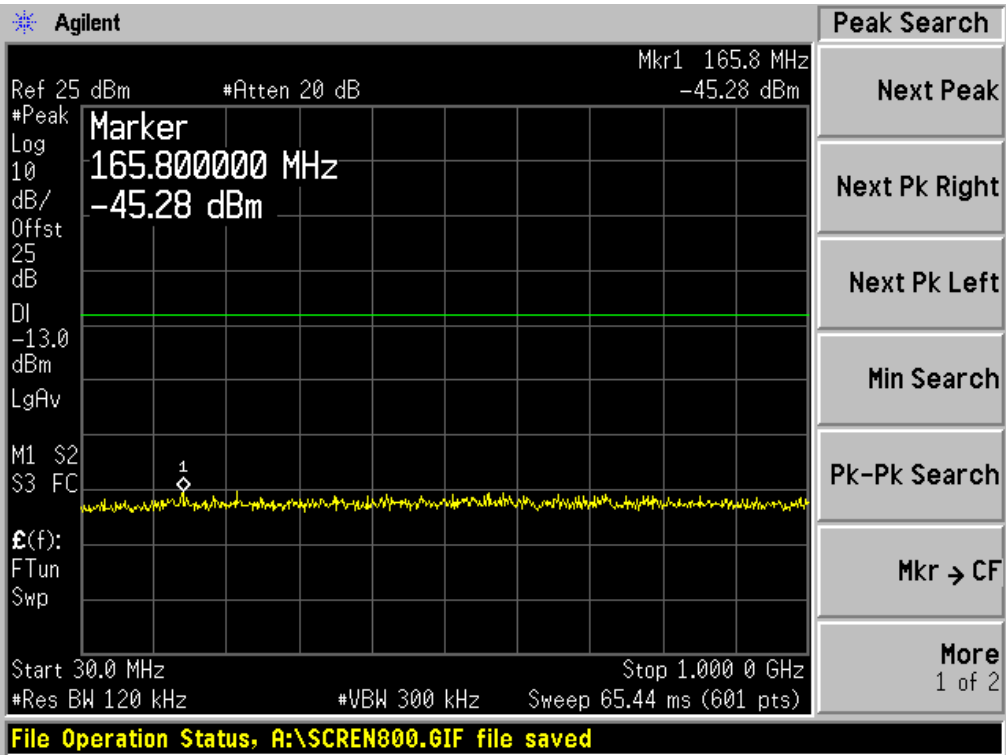
CH810 Spurious Emission at Antenna Terminal (9kHz---150kHz)



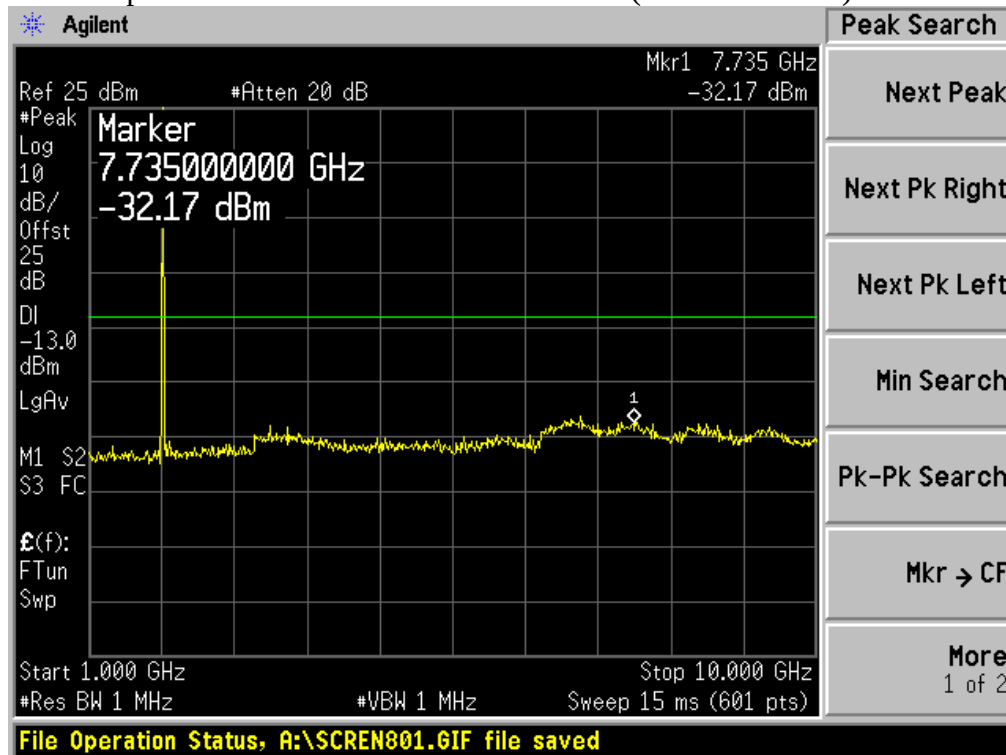
CH810 Spurious Emission at Antenna Terminal (150kHz---30MHz)



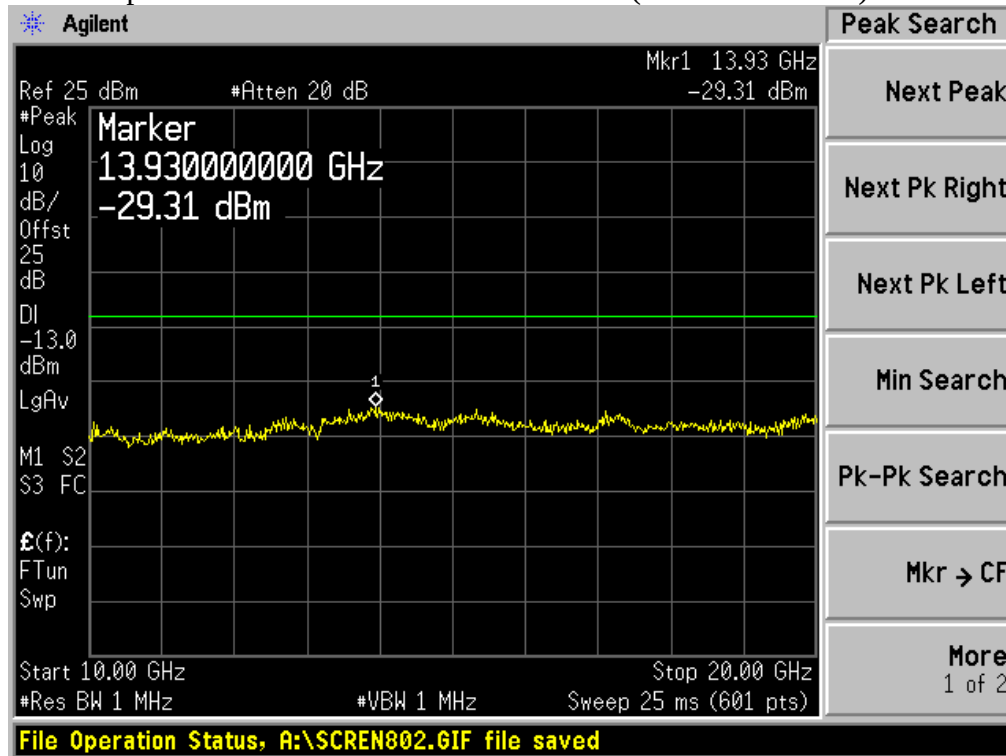
CH810 Spurious Emission at Antenna Terminal (30MHz---1GHz)



CH810 Spurious Emission at Antenna Terminal (1GHz---10GHz)



CH810 Spurious Emission at Antenna Terminal (10GHz---20GHz)



3.6. Radiated Spurious Emission

3.6.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1053 and Part 24.238
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.6.2. Limits

Compliance with part 24.238, all spurious emission must be attenuated below the transmitter power by at least $43 + 10\log_{10} P$. (Whereas P is the rated power of the EUT).

Limits for GPRS	
Rated Power:	30dBm
Required attenuation:	$43 + 10\log(1)=43$, 30dBm-43dB
Absolute level:	-13dBm

3.6.3. Test method and Setup

- (1) Connect the EUT to the wireless communication tester Agilent 8960 via one RF connector,the EUT was Controlled to transmit maximum power
- (2) Measesure and record Radiated spurious emission of the EUT by the test equipment
- (3) Use substitution method to verify the maximum output power. Record the power level of Signal Generator

3.6.4. Test results

Pre-test Measurement Results						
Channel Number	Test Mode	Test Range (Frequency)	Power [dBm]	Spurious Level Measured [dBm]	FCC Limit	Result
Channel 512	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass
Channel 661	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass
Channel 810	GSM 1900MHz	9kHz~20GHz	30	< -13	-13dBm	Pass

Substitution Results

Transmitter				Field strength of spurious emission (Test data)			
Test Result on Configure				CH661			
Polarization				Vertical			
Frequency (MHz)	FS (dBμV/m)	OPSG (dBm)	CL (dB)	Gain (dBi)	e.r.p. (dBm)	Limit of e.r.p. (dBm)	Margin (dB)
433.53	24.55	-55.37	1.96	-7.68	-67.16	-13	54.16
Polarization				Horizontal			
Frequency (MHz)	FS (dBμV/m)	OPSG (dBm)	CL (dB)	Gain (dBi)	e.r.p. (dBm)	Limit of e.r.p. (dBm)	Margin (dB)
900.09	29.40	-52.12	2.52	-7.93	-62.57	-13	49.57
$e.r.p. = OPSG - CL + IGSA - 2.15$							

Note : FS: Field strength

OPSG:Output power of the signal generator

CL: Cable loss

other test values are very low except above test data.

3.6.5. Conclusion

The equipment PASSED the requirement of this clause.

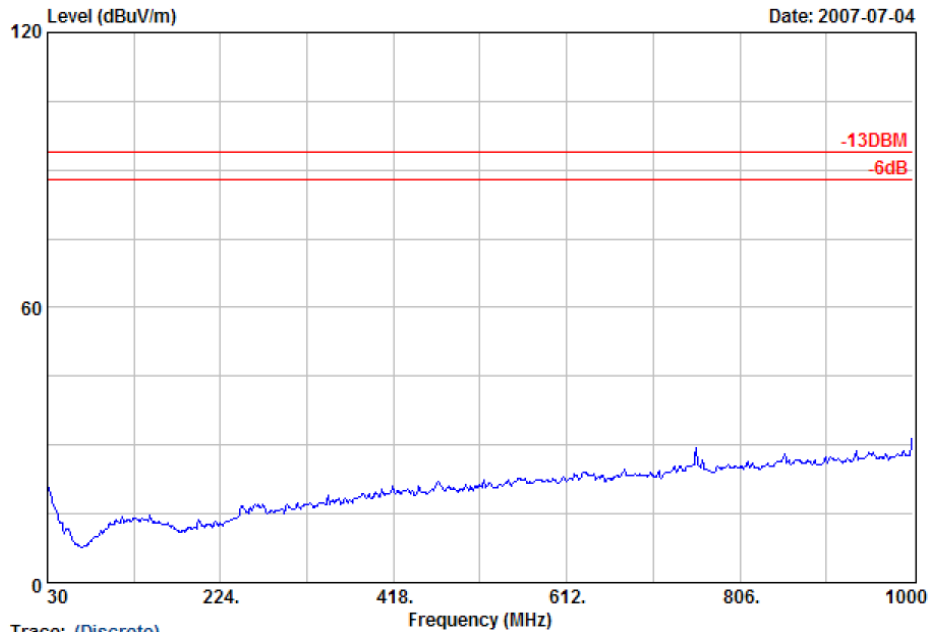
For the measurement results refer to the following pages.

Add High Pass Filte 3.5GHz before amplifier(above 1GHz)



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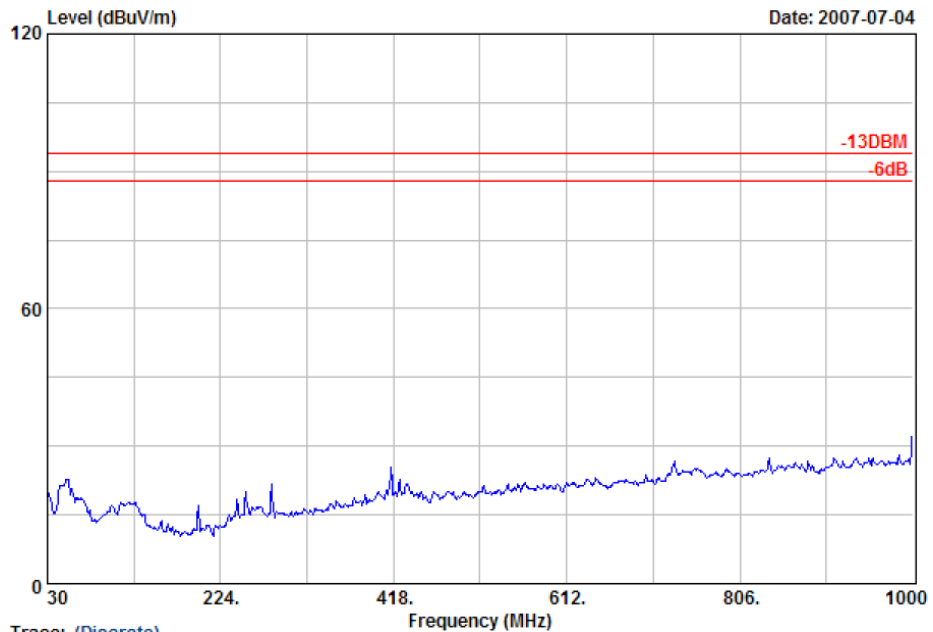
Data: 1 File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)



Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 1
Dis. / Ant. : 3m 2597 Ant. pol. : HORIZONTAL
Limit : -13DBM
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH512

Data: 2 File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)



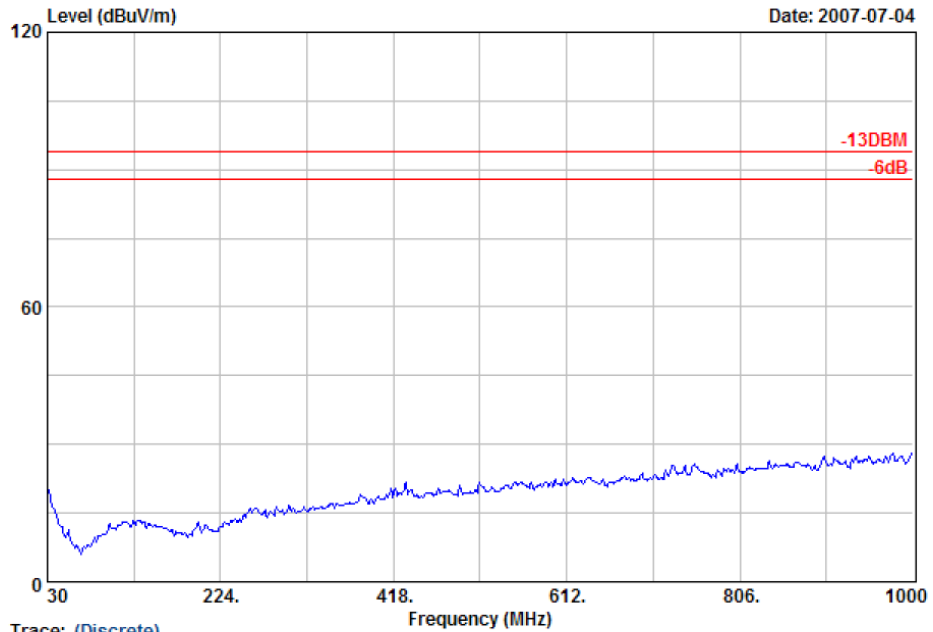
Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 2
Dis. / Ant. : 3m 2598 Ant. pol. : VERTICAL
Limit : -13DBM
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH512



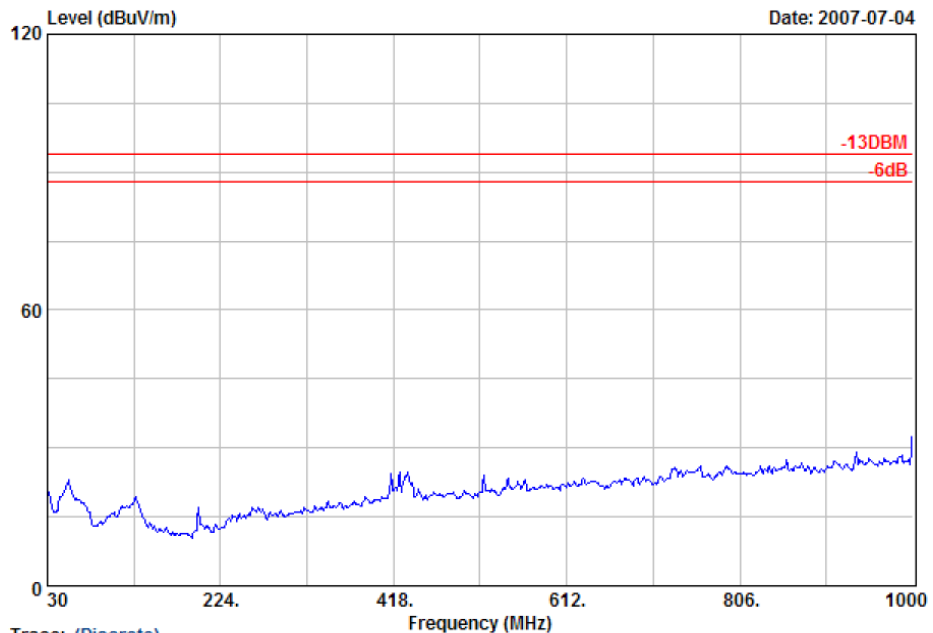
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Data: 4 File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)



Site no. : 3# Chamber Radiation Data no. : 4
Dis. / Ant. : 3m 2598 Ant. pol. : HORIZONTAL
Limit : -13DBM
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH661

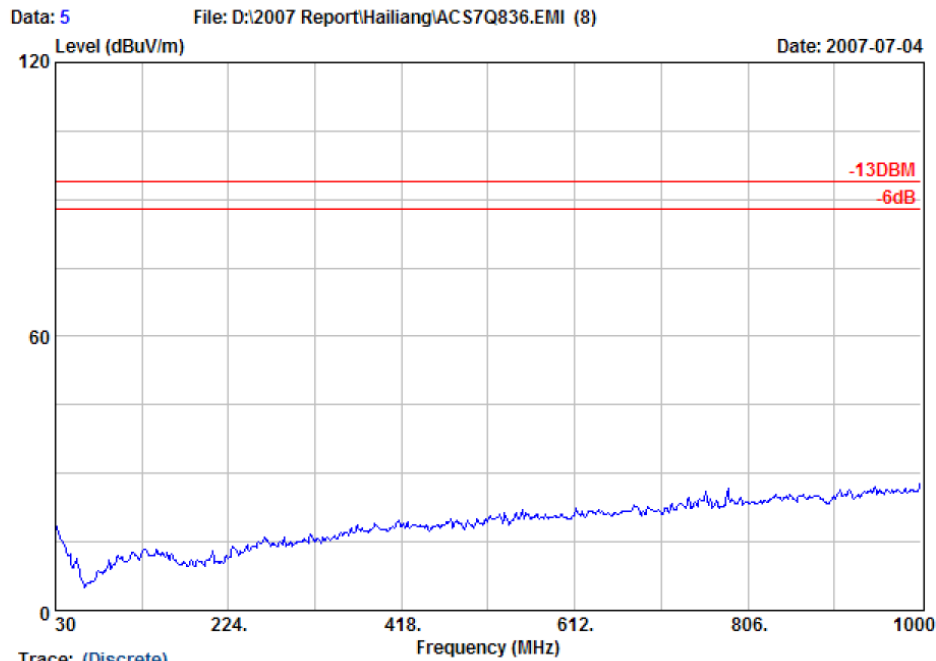
Data: 3 File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)



Site no. : 3# Chamber Radiation Data no. : 3
Dis. / Ant. : 3m 2598 Ant. pol. : VERTICAL
Limit : -13DBM
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH661

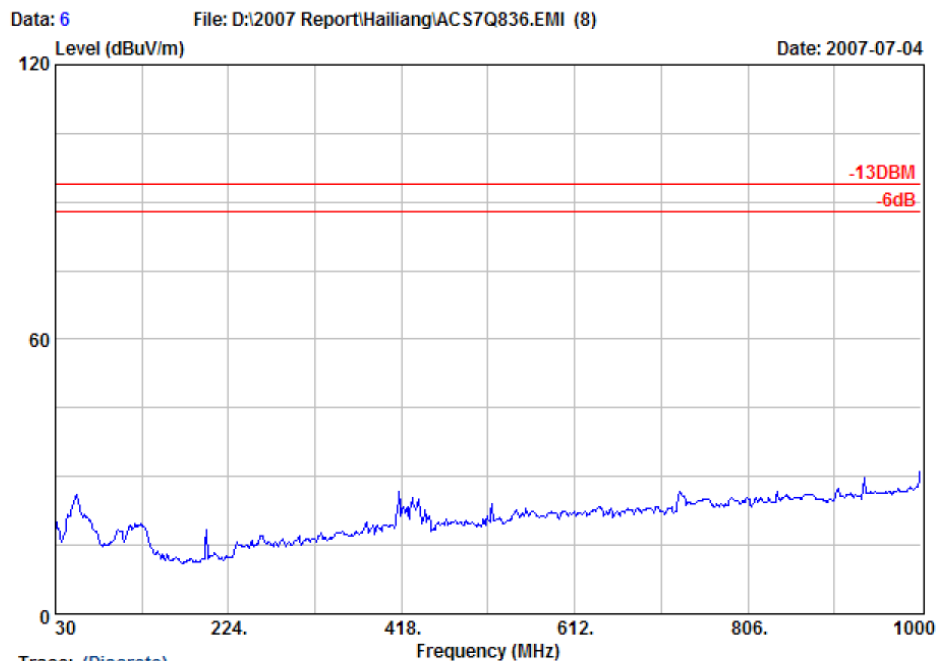


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Trace: (Discrete)

Site no. : 3# Chamber Radiation	Data no. : 5
Dis. / Ant. : 3m 2598	Ant. pol. : HORIZONTAL
Limit : -13DBM	
Env. / Ins. : 24°C/56% ESVS20	Engineer : Iceman
EUT : GSM Phone M/N: phone F1	
Power Rating : DC 3.7V Adaptor AC 120V/50Hz	
Test Mode : GSM 1900MHz CH810	



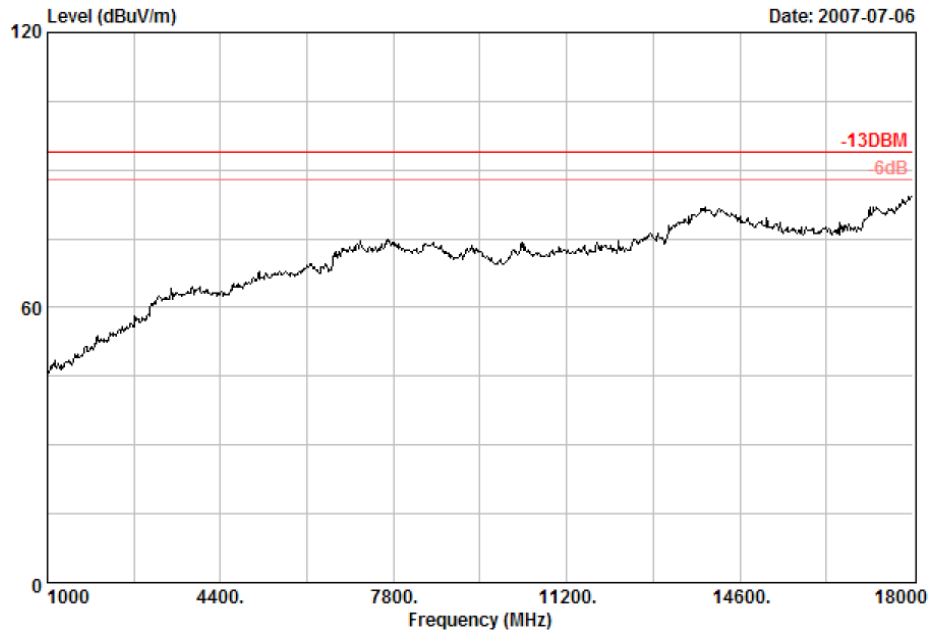
Trace: (Discrete)

Site no. : 3# Chamber Radiation	Data no. : 6
Dis. / Ant. : 3m 2598	Ant. pol. : VERTICAL
Limit : -13DBM	
Env. / Ins. : 24°C/56% ESVS20	Engineer : Iceman
EUT : GSM Phone M/N: phone F1	
Power Rating : DC 3.7V Adaptor AC 120V/50Hz	
Test Mode : GSM 1900MHz CH810	



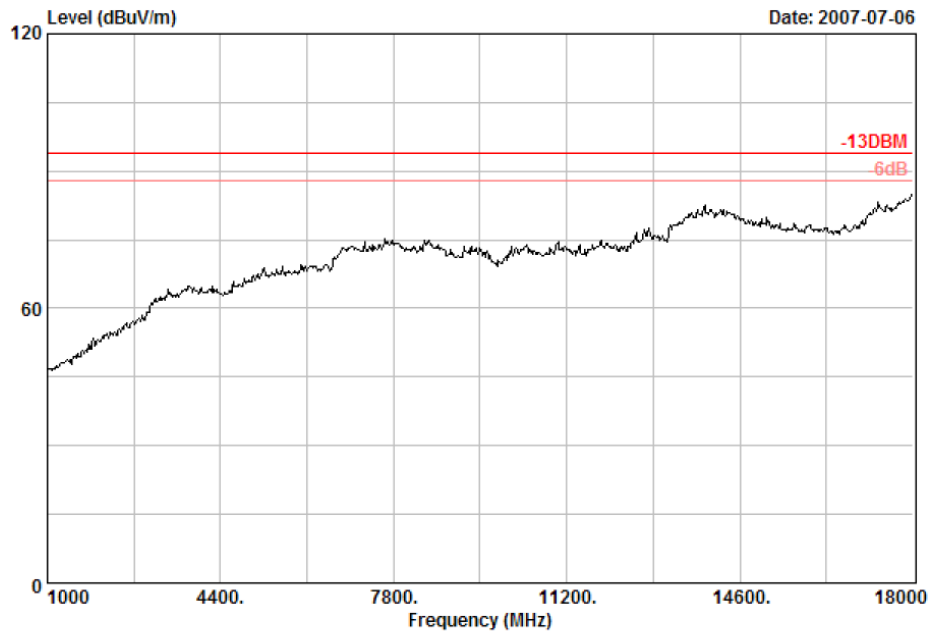
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Postcode:518057

Data: 13 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)



Site no. : Audix No.1 Chamber Data no. : 13
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH512

Data: 14 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)

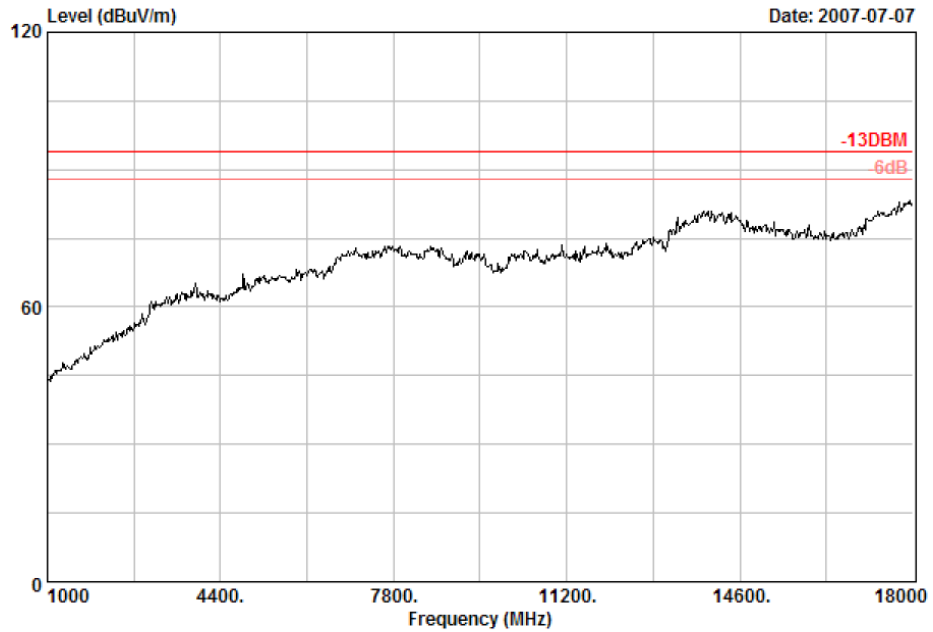


Site no. : Audix No.1 Chamber Data no. : 14
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH512



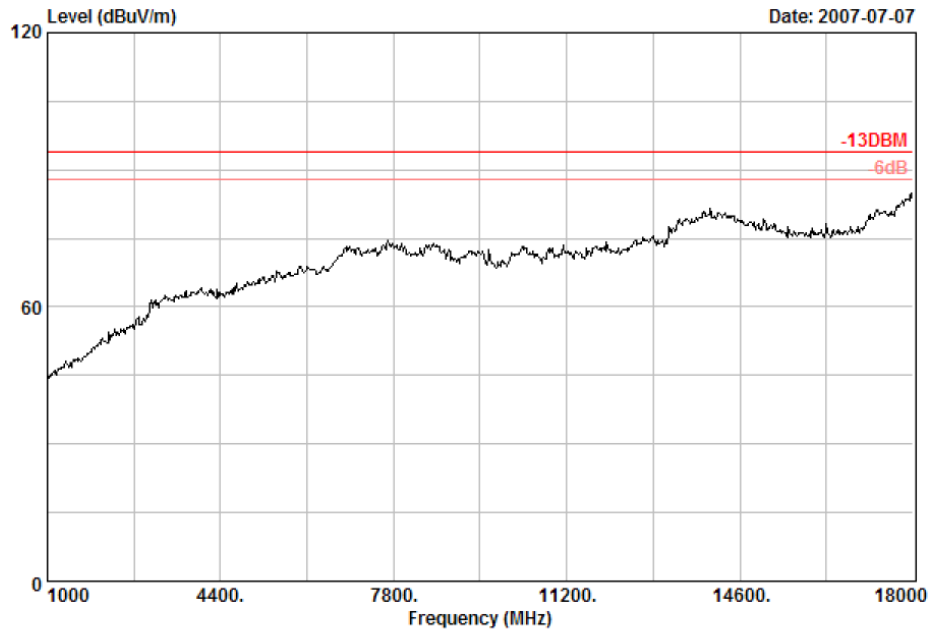
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Data: 15 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)



Site no. : Audix No.1 Chamber Data no. : 15
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH661

Data: 16 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)

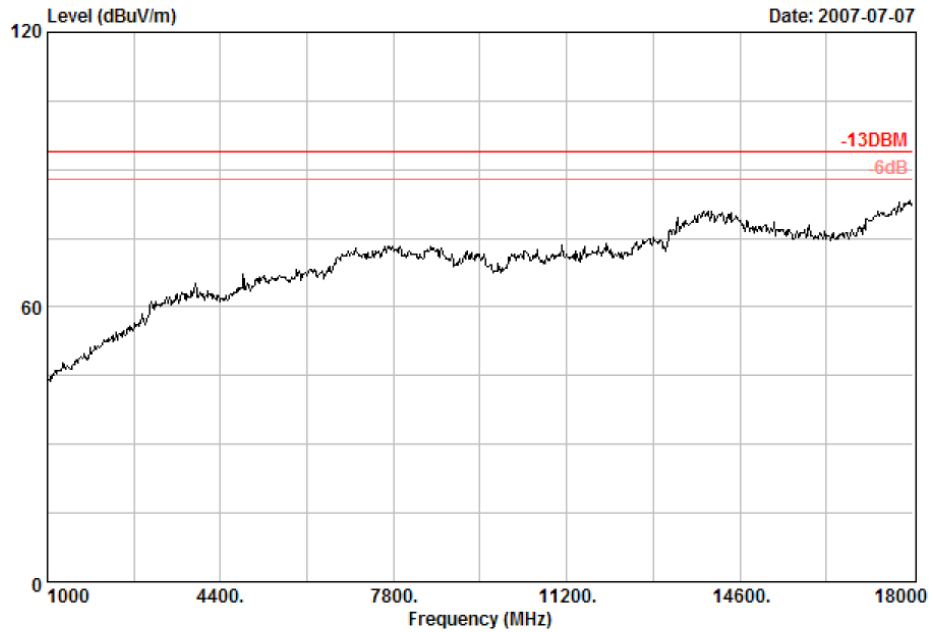


Site no. : Audix No.1 Chamber Data no. : 16
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH661



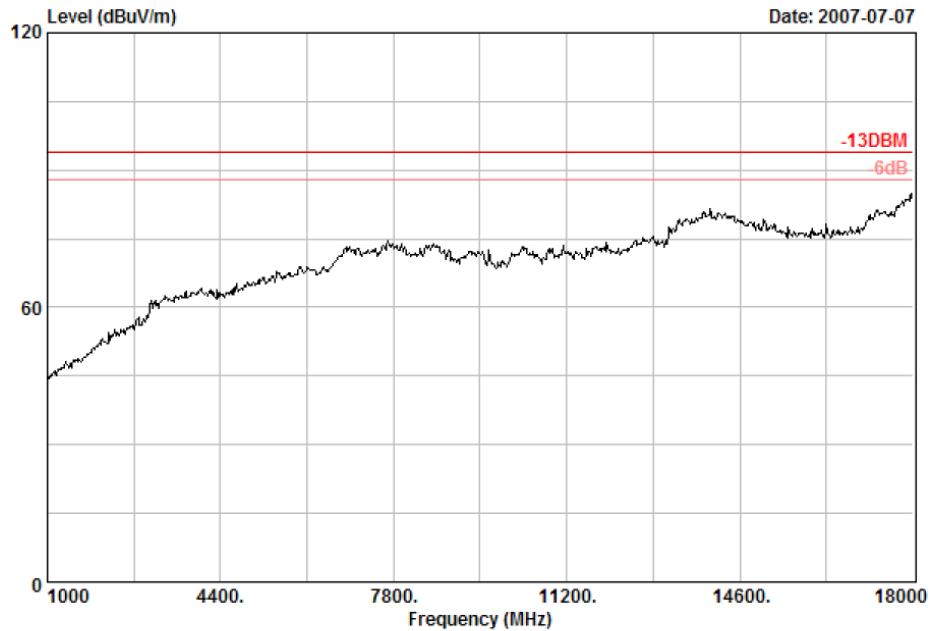
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Data: 17 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)



Site no. : Audix No.1 Chamber Data no. : 17
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH810

Data: 18 File: D:\2007 Report\Hailiang\ACS7Q836-H.EMI (18)



Site no. : Audix No.1 Chamber Data no. : 18
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL
Limit : -13DBM
Env. / Ins. : 23°C/54% Engineer : Iceman
EUT : GSM Phone M/N:phone F1
Power Rating : DC 3.7V
Test Mode : GSM 1900 CH810

3.7. Frequency Stability

3.7.1. Test Information

EUT	:	GSM Phone
M/N	:	phone F1
Power rating	:	DC 3.7V
Test Date	:	07/10/2007
Ambient Temperature	:	24°C
Relative Humidity	:	54%
Test standard	:	CFR 47 (FCC) Part 2.1055 and Part 24.235
Test Channel	:	CH512 CH661 CH810
Test Mode	:	GSM 1900MHz
Test Site	:	RF Site
Tested Engineer	:	Iceman

3.7.2. Limits

No specific frequency stability requirement in part 2.1055 and part 24.235

3.7.3. Test method and Setup

Connect the EUT to the wireless communication tester Agilent 8960 via one RF connector, the EUT was Controlled to transmit maximum power

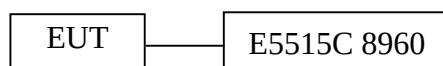
Measure and record Conducted spurious emission of the EUT by the test equipment

In 2.1055, From -30°C to +50°C centigrade for all equipment except that specified in paragraphs (a)(2) and (3) of this section

Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment

But operating temperature is -20 to +50 and operating voltage is 3.6 to 4.2

Test setup



3.7.4. Test results

GSM 1900MHz Channel 512 (1850.2MHz)				
Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
-30°C	N/A			
-20°C	30	1850.2	45.3	PASS
-10°C	30	1850.2	30.7	PASS
0°C	30	1850.2	28.5	PASS
+10°C	30	1850.2	29.7	PASS
+20°C	30	1850.2	31.3	PASS
+30°C	30	1850.2	29.1	PASS
+40°C	30	1850.2	30.8	PASS
+50°C	30	1850.2	29.6	PASS

GSM 1900MHz Channel 661 (1880.0MHz)				
Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
-30°C	N/A			
-20°C	30	1880.0	31.2	PASS
-10°C	30	1880.0	28.9	PASS
0°C	30	1880.0	32.6	PASS
+10°C	30	1880.0	34.1	PASS
+20°C	30	1880.0	29.2	PASS
+30°C	30	1880.0	30.6	PASS
+40°C	30	1880.0	29.4	PASS
+50°C	30	1880.0	31.2	PASS

GSM 1900MHz, Channel 810 (1909.8MHz)				
Temperature	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
-30°C	N/A			
-20°C	30	1909.8	32.1	PASS
-10°C	30	1909.8	30.8	PASS
0°C	30	1909.8	29.7	PASS
+10°C	30	1909.8	31.6	PASS
+20°C	30	1909.8	28.2	PASS
+30°C	30	1909.8	31.5	PASS
+40°C	30	1909.8	30.7	PASS
+50°C	30	1909.8	32.9	PASS

GSM 1900MHz, 23°C, Channel 512 (1850.2MHz)				
Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
3.15	N/A			
3.7	30	1850.2	31.2	PASS
4.25	30	1850.2	36.8	PASS

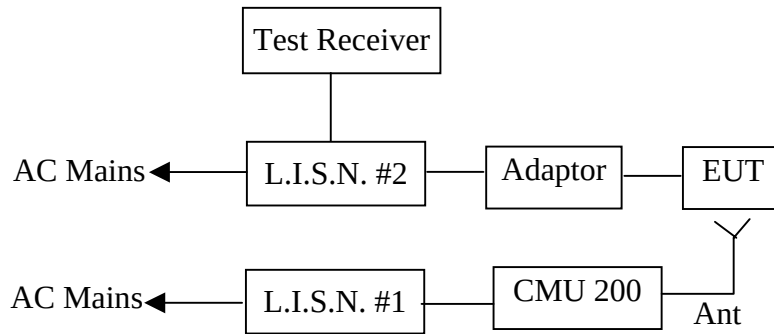
GSM 1900MHz, 23°C, Channel 661 (1880.0MHz)				
Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
3.15	N/A			
3.7	30	1880.0	32.5	PASS
4.25	30	1880.0	37.4	PASS

GSM 1900MHz, 23°C, Channel 810 (1909.8MHz)				
Voltage	Power (dBm)	Nominal Frequency (MHz)	Measured Frequency Error (Hz)	Result
3.15	N/A			
3.7	30	1909.8	31.9	PASS
4.25	30	1909.8	36.2	PASS

4. EMC TEST

4.1. Conducted Emission in Middle Mode

4.1.1. Block Diagram of Test Setup



(EUT: GSM Phone)

4.1.2. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

4.1.3. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

4.1.3.1.GSM Phone (EUT)

Model Number : phone F1

Serial Number : N/A

Manufacturer : ShenZhen HaiLiang Communication CO., LTD

4.1.4. Operating Condition of EUT

4.1.4.1.Setup the EUT and simulator as shown as Section 4.1.1.

4.1.4.2.Turn on the power of all equipment.

4.1.4.3.Let the EUT work in test mode (GSM 1900MHz CH661) and measure it.

4.1.5. Test Procedure

The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provides a 50 ohm coupling impedance for the EUT. Please refer the block diagram of the test setup and photographs. The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#1). Power on the PC and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2003 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS10) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked.

The test result are reported on Section 4.7.,

4.1.6. Power Line Conducted Emission Test Results

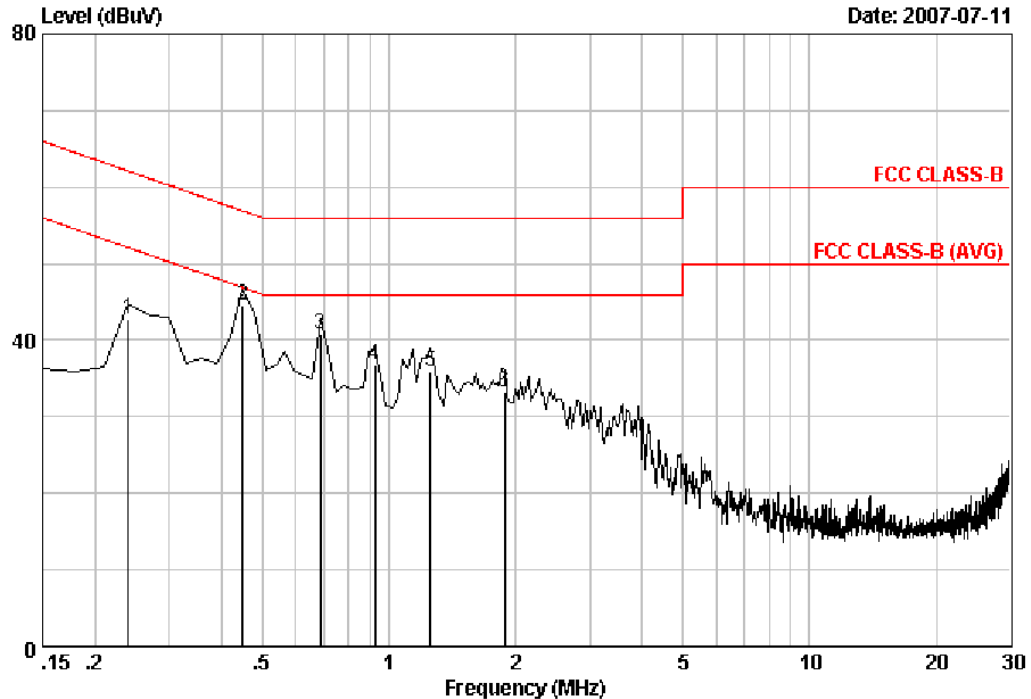
PASS.



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Data: 1 File: D:\DATA\2007 Report\Hhailiang\ACS7Q836.EMI (2)

Date: 2007-07-11



Site no. : Audix 1# Conduction Data no. : 1
Dis. / Ant. : -- KNW407 VA (1#) LISN Phase :
Limit : FCC CLASS-B
Env. / Ins. : Temp:23' Humi:54% ESHS10 Engineer : Iceman
EUT : GSM PHONE M/N:Phone F1
Power Rating : DC 3.7V Adaptor AC 120V/60Hz
Test Mode : GSM 1900MHz CH661
:

	Freq. (MHz)	LISN.	Cable		Emission			Margin (dB)	Remark
		Factor (dB)	Loss (dB)	Reading (dBuV)	Level (dBuV)	Limits (dBuV)			
1	0.24	0.14	10.15	32.59	42.88	62.11	19.23	QP	
2	0.45	0.07	10.14	34.40	44.61	56.90	12.29	QP	
3	0.69	0.05	10.14	30.53	40.72	56.00	15.28	QP	
4	0.93	0.04	10.15	26.49	36.68	56.00	19.32	QP	
5	1.25	0.04	10.15	25.78	35.97	56.00	20.03	QP	
6	1.88	0.05	10.15	22.95	33.15	56.00	22.85	QP	

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

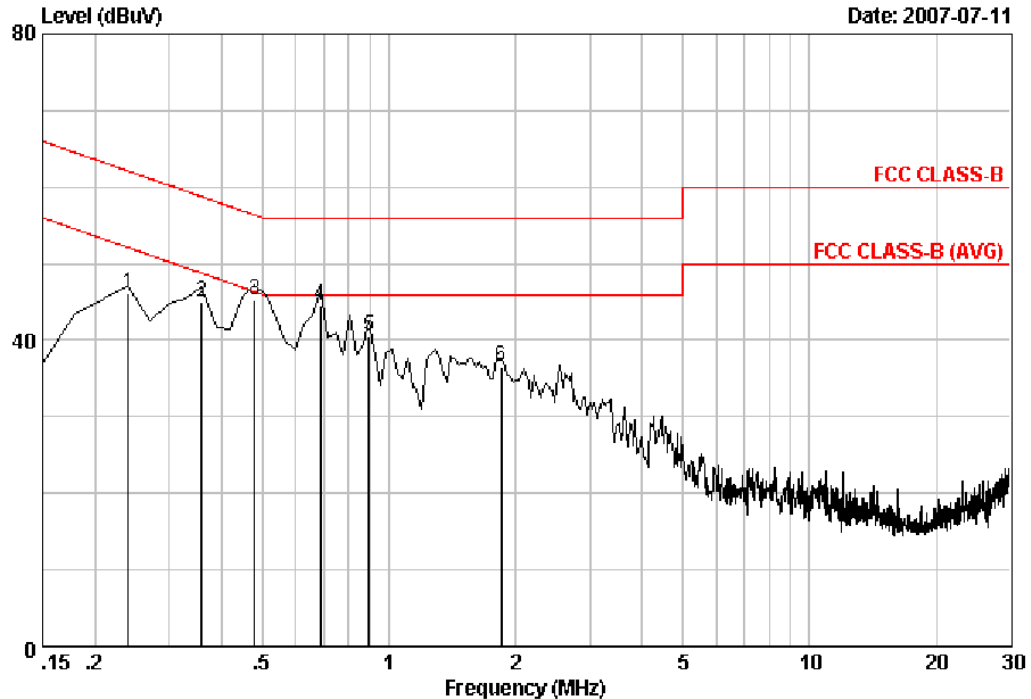


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Data: 2

File: D:\DATA\2007 Report\Hhailiang\ACS7Q836.EMI (2)

Date: 2007-07-11



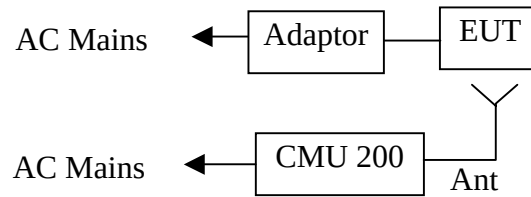
Site no. : Audix 1# Conduction Data no. : 2
Dis. / Ant. : -- KNW407 VB (1#) LISN Phase :
Limit : FCC CLASS-B
Env. / Ins. : Temp:23' Humi:54% ESHS10 Engineer : Iceman
EUT : GSM PHONE M/N:Phone F1
Power Rating : DC 3.7V Adaptor AC 120V/60Hz
Test Mode : GSM 1900MHz CH661
:

		LISN.	Cable		Emission			
Freq.		Factor	Loss	Reading	Level	Limits	Margin	Remark
(MHz)		(dB)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dB)	
1	0.24	0.14	10.15	35.80	46.09	62.11	16.02	QP
2	0.36	0.10	10.14	34.85	45.09	58.75	13.66	QP
3	0.48	0.06	10.14	34.95	45.15	56.37	11.22	QP
4	0.69	0.04	10.14	34.33	44.51	56.00	11.49	QP
5	0.90	0.04	10.15	30.48	40.67	56.00	15.33	QP
6	1.85	0.05	10.15	26.42	36.62	56.00	19.38	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4.2. Radiated Emission in Middle Mode

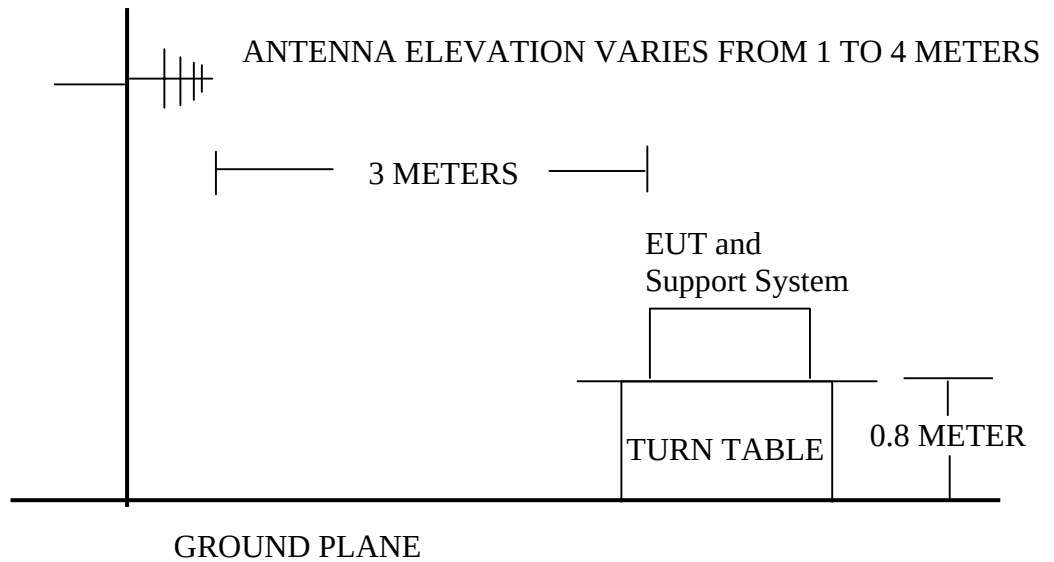
4.2.1. Block Diagram of Test Setup



(EUT: GSM Phone)

4.2.2. In Anechoic Chamber

ANTENNA TOWER



4.2.3. Radiated Emission Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

- Remark :
- (1) Emission level $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.2.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.2.4.1. GSM Phone (EUT)

Model Number: phone F1
 Serial Number: N/A
 Manufacturer : ShenZhen HaiLiang Communication CO., LTD

4.2.5. Operating Condition of EUT

4.2.5.1. Setup the EUT as shown in Section 4.7.1.

4.2.5.2. Let the EUT work in test mode (GSM 1900MHz CH661) and test it.

4.2.6. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver (R&S ESVS20) is set at 120kHz.

frequency range from 30MHz to 1000 MHz.

all the scanning waveforms are reported with antenna in horizontal and vertical polarization on Section 4.7.

4.2.7. Radiated Emission Test Results

PASS.

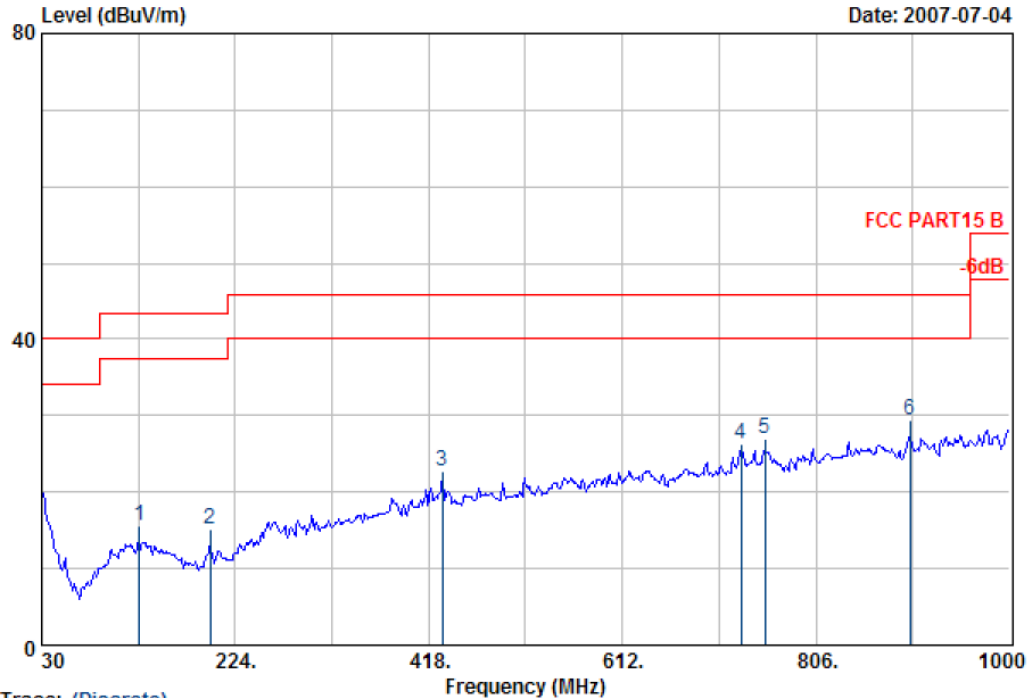


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Data: 8

File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)

Date: 2007-07-04



Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 8
Dis. / Ant. : 3m 2597 Ant. pol. : HORIZONTAL
Limit : FCC PART15 B
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH661

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	127.97	11.98	1.11	2.62	15.71	43.50	27.79	QP
2	198.78	10.04	1.32	3.79	15.15	43.50	28.35	QP
3	431.58	17.00	1.99	3.83	22.82	46.00	23.18	QP
4	731.31	21.54	2.40	2.38	26.32	46.00	19.68	QP
5	754.59	22.00	2.53	2.37	26.90	46.00	19.10	QP
6	900.09	22.90	2.52	3.98	29.40	46.00	16.60	QP

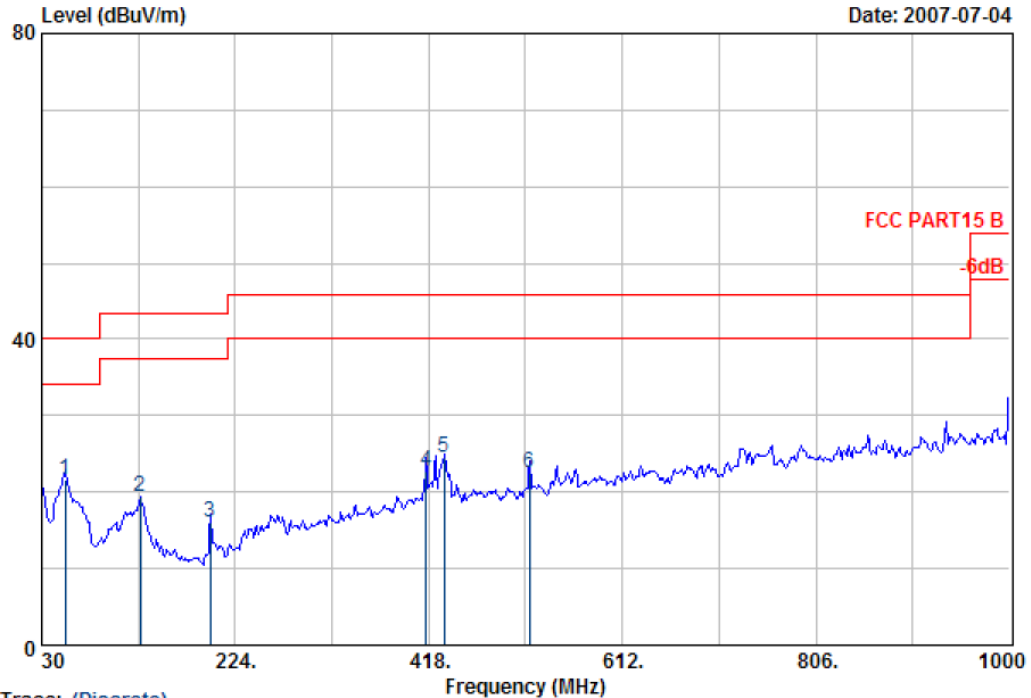
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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Data: 7 File: D:\2007 Report\Hailiang\ACS7Q836.EMI (8)

Date: 2007-07-04



Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 7
Dis. / Ant. : 3m 2597 Ant. pol. : VERTICAL
Limit : FCC PART15 B
Env. / Ins. : 24°C/56% ESVS20 Engineer : Iceman
EUT : GSM Phone M/N: phone F1
Power Rating : DC 3.7V Adaptor AC 120V/50Hz
Test Mode : GSM 1900MHz CH661

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	53.28	7.66	0.87	13.17	21.70	40.00	18.30	QP
2	128.94	12.04	1.11	6.17	19.32	43.50	24.18	QP
3	198.78	10.04	1.32	4.73	16.09	43.50	27.41	QP
4	415.09	17.20	1.85	3.64	22.69	46.00	23.31	QP
5	433.52	17.00	1.96	5.59	24.55	46.00	21.45	QP
6	518.88	18.38	2.04	2.05	22.47	46.00	23.53	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

5. DEVIATION TO TEST SPECIFICATIONS

[NONE]