

FCC TEST REPORT (Part 24)

REPORT NO.: RF941201L15

MODEL NO.: S789+

RECEIVED: Dec. 07, 2005

TESTED: Dec. 14 ~ 23, 2005

ISSUED: Jan. 09, 2006

APPLICANT: NINGBO BIRD CO., LTD

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TABLE OF CONTENTS

1	CERTIFICATION	4
2	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY	6
3	GENERAL INFORMATION	7
3.1	GENERAL DESCRIPTION OF EUT	7
3.2	DESCRIPTION OF TEST MODES	8
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	9
3.4	DESCRIPTION OF SUPPORT UNITS	9
4	TEST TYPES AND RESULTS	10
4.1	MODULATION CHARACTERISTICS	10
4.1.1	DESCRIPTION OF MODULATION TECHNIQUE	10
4.1.2	THE ACTIVE TIME SLOT 8 MODULATED FRAME PLOT	11
4.2	OUTPUT POWER MEASUREMENT	13
4.2.1	LIMITS OF OUTPUT POWER MEASUREMENT	13
4.2.2	TEST INSTRUMENTS	14
4.2.3	TEST PROCEDURES	15
4.2.4	TEST SETUP	16
4.2.5	EUT OPERATING CONDITIONS	17
4.2.6	TEST RESULTS	18
4.3	FREQUENCY STABILITY MEASUREMENT	20
4.3.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	20
4.3.2	TEST INSTRUMENTS	20
4.3.3	TEST PROCEDURE	21
4.3.4	TEST SETUP	21
4.3.5	TEST RESULTS	22
4.4	OCCUPIED BANDWIDTH MEASUREMENT	26
4.4.1	LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT	26
4.4.2	TEST INSTRUMENTS	26
4.4.3	TEST SETUP	26
4.4.4	TEST PROCEDURES	27
4.4.5	EUT OPERATING CONDITION	27
4.4.6	TEST RESULTS	28
4.5	BAND EDGE MEASUREMENT	32
4.5.1	LIMITS OF BAND EDGE MEASUREMENT	32
4.5.2	TEST INSTRUMENTS	32
4.5.3	TEST SETUP	32
4.5.4	TEST PROCEDURES	33
4.5.5	EUT OPERATING CONDITION	33
4.5.6	TEST RESULTS	34
4.6	CONDUCTED SPURIOUS EMISSIONS	36
4.6.1	LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT	36
4.6.2	TEST INSTRUMENTS	36
4.6.3	TEST PROCEDURE	37



4.6.4	TEST SETUP	37
4.6.5	EUT OPERATING CONDITIONS	37
4.6.6	TEST RESULTS	38
4.7	RADIATED EMISSION MEASUREMENT (BELOW 1GHz).....	56
4.7.1	LIMITS OF RADIATED EMISSION MEASUREMENT	56
4.7.2	TEST INSTRUMENTS.....	57
4.7.3	TEST PROCEDURES	58
4.7.4	DEVIATION FROM TEST STANDARD	58
4.7.5	TEST SETUP.....	59
4.7.6	EUT OPERATING CONDITIONS	59
4.7.7	TEST RESULTS	60
4.8	EFFECTIVE RADIATED POWER MEASUREMENT (ABOVE 1GHz).....	62
4.8.1	LIMITS OF RADIATED EMISSION MEASUREMENT	62
4.8.2	TEST INSTRUMENTS.....	63
4.8.3	TEST PROCEDURES	64
4.8.4	DEVIATION FROM TEST STANDARD	64
4.8.5	TEST SETUP.....	65
4.8.6	EUT OPERATING CONDITIONS	65
4.8.7	TEST RESULTS	66
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	69
6	INFORMATION ON THE TESTING LABORATORIES	70
APPENDIX-A		A-1



1 CERTIFICATION

PRODUCT: Tri-Band GSM GPRS Mobile Phone
MODEL: S789+
BRAND: BIRD
APPLICANT: NINGBO BIRD CO., LTD
TESTED: Dec. 14 ~ 23, 2005
TEST SAMPLE: MASS-PRODUCTION
TEST STANDARDS: **FCC Part 24, Subpart E**
ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Rennie Wang , **DATE:** Jan. 09, 2006
Rennie Wang

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Jan. 09, 2006
Responsible for RF Long Chen

APPROVED BY : Gary Chang , **DATE:** Jan. 09, 2006
Gary Chang / Supervisor

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2 / IC RSS-133			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1047(d)	Modulation Characteristics	PASS	NA
2.1046 24.232	Maximum Peak Output Power Limit: max. 2 watts e.i.r.p peak power	PASS	Meet the requirement of limit. Minimum passing margin is 31.98dBm at 1880.00MHz.
2.1055 24.235	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature Limit: max. ± 2.5 ppm	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	NA
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -16.73dB at 3751.00MHz.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -47.56dB at 55.27MHz.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~ 1000MHz	3.58 dB
	1GHz ~ 18GHz	1.10 dB
	18GHz ~ 40GHz	0.91 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Tri-Band GSM GPRS Mobile Phone
MODEL NO.	S789+
POWER SUPPLY	3.7Vdc from rechargeable lithium battery 5.0Vdc from power adapter for charger
MODULATION TYPE	GMSK for GSM, GPRS
FREQUENCY RANGE	Tx Frequency: 1850.2MHz ~ 1909.8MHz Rx Frequency: 1930.2MHz ~ 1989.8MHz
NUMBER OF CHANNEL	299
MAX. CONDUCTED PEAK OUTPUT POWER	29.56dBm (0.904Watts)
MAX. EIRP POWER	31.98dBm (1.578Watts)
ANTENNA TYPE	Fixed internal antenna with 2dBi gain
DATA CABLE	1.27m non-shielded cable for earphone
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Earphone
EUT EXTREME VOL. RANGE	3.3Vdc to 4.2Vdc

NOTE:

1. The EUT is a Tri-Band GSM GPRS Mobile Phone. The protocol of this system are GSM900, DCS1800, and PCS1900.
2. IMEI Code: 356916000000000-356916999999999.
3. Hardware version: V02.
4. Software version: KZ3, UE.
5. The EUT has one lithium battery listed as below:

BRAND:	BIRD
MODEL:	S-GHI L
RATING:	3.7Vdc, 500mAh

6. The EUT was operated with following adapter:

BRAND:	BIRD
MODEL:	MU03-M050045-A1
INPUT:	100-240Vac, 50/60Hz, 0.15A
OUTPUT:	5.0Vdc, 450mA
POWER LINE:	DC 1.97m non-shielded cable without core

7. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

299 channels are provided to this EUT in the PCS1900 band. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
LOW	512	1850.2 MHz	GSM
MIDDLE	661	1880.0 MHz	GSM
HIGH	810	1909.8 MHz	GSM

NOTE:

1. Below 1 GHz, the channel 512, 661, and 810 were pre-tested in chamber. The channel 810 was chosen for final test.
2. Above 1 GHz, the channel 512, 661, and 810 were tested individually.
3. When the Power Control Level set 0, the worst case, was chosen for final test.
4. The channel space is 0.2MHz.
5. Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane. Therefore only the test data of this Y-plane was used for radiated emission measurement test.
6. For the radiated emission measurement test, GSM mode has been chosen for the worst and recorded in this test report after pre-testing both GSM and GPRS mode.



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Tri-Band GSM GPRS Mobile Phone. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

IC RSS-133

ANSI C63.4-2003

NOTE: All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	CAL. DATE
1	Universal Radio Communication Tester	R&S	CMU200	101095	Oct. 06, 2006

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 MODULATION CHARACTERISTICS

4.1.1 DESCRIPTION OF MODULATION TECHNIQUE

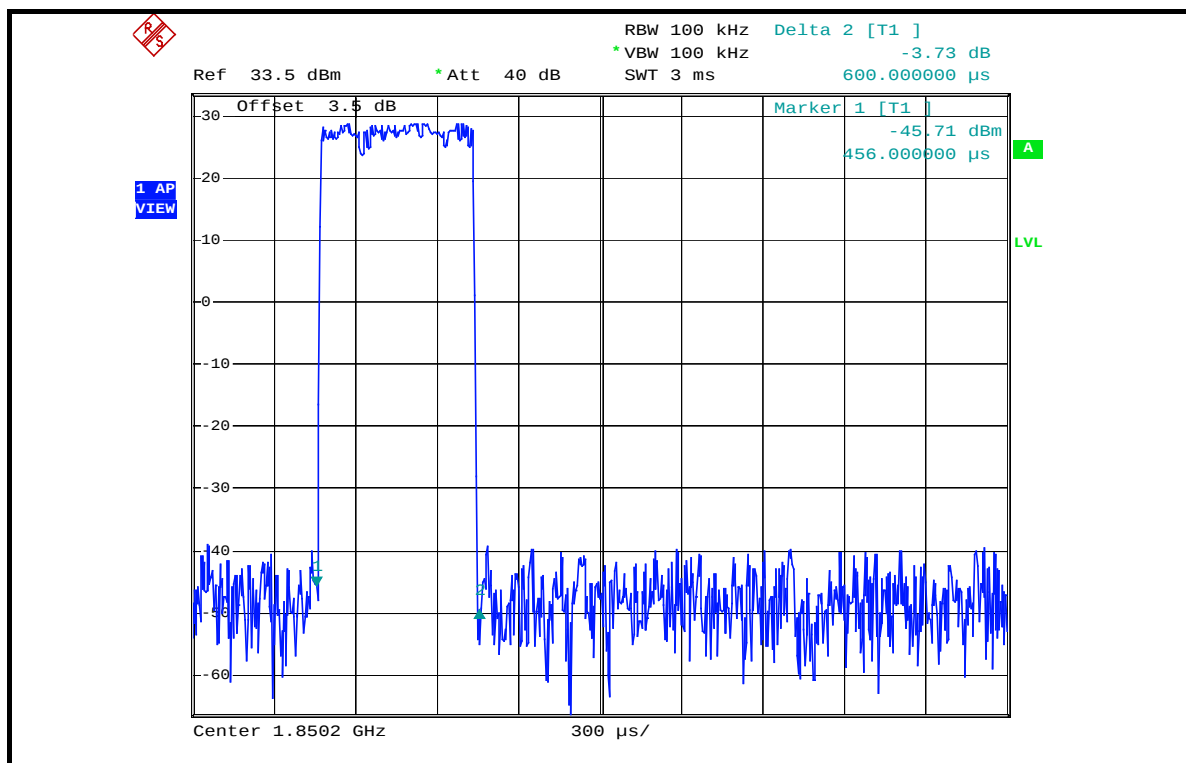
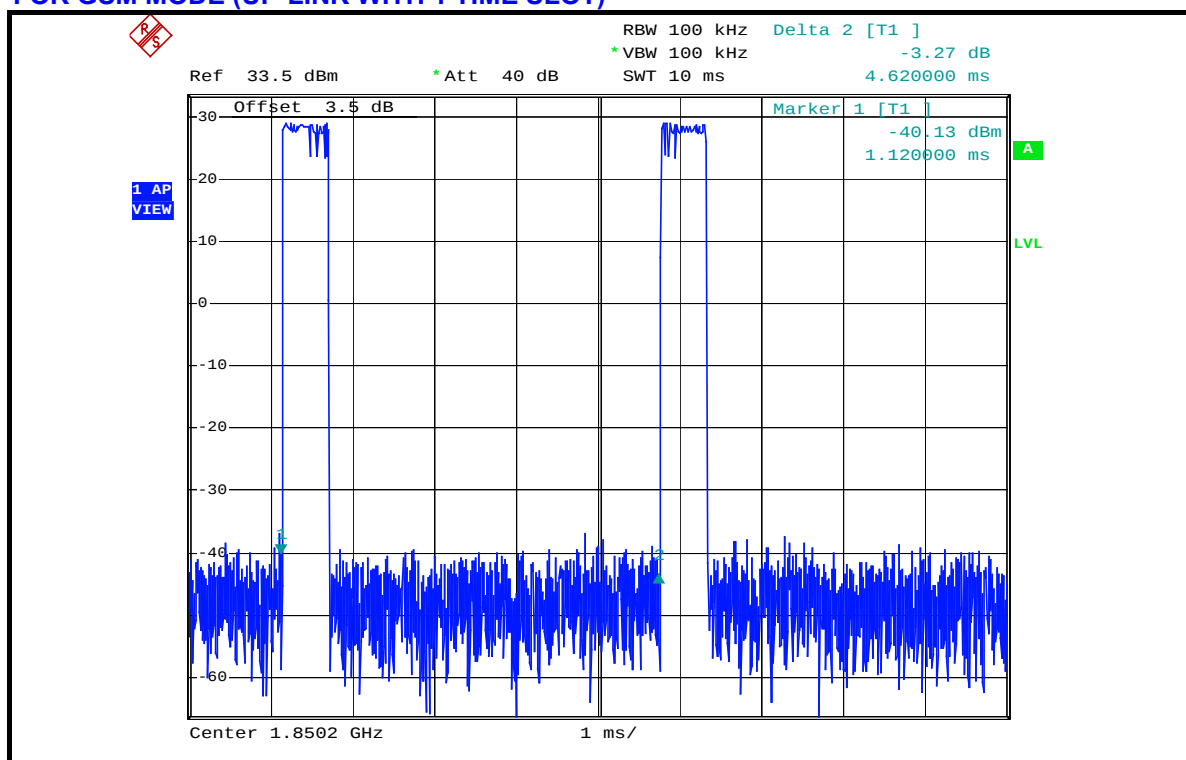
According to FCC 2.1047(d), the system is used the digital modulation and accomplished with the PCS requirement as defined in the 3GPP TS 05:01, TS 05:02, TS 05:04. It uses narrowband TDMA. Eight simultaneous calls can occupy the same radio frequency.

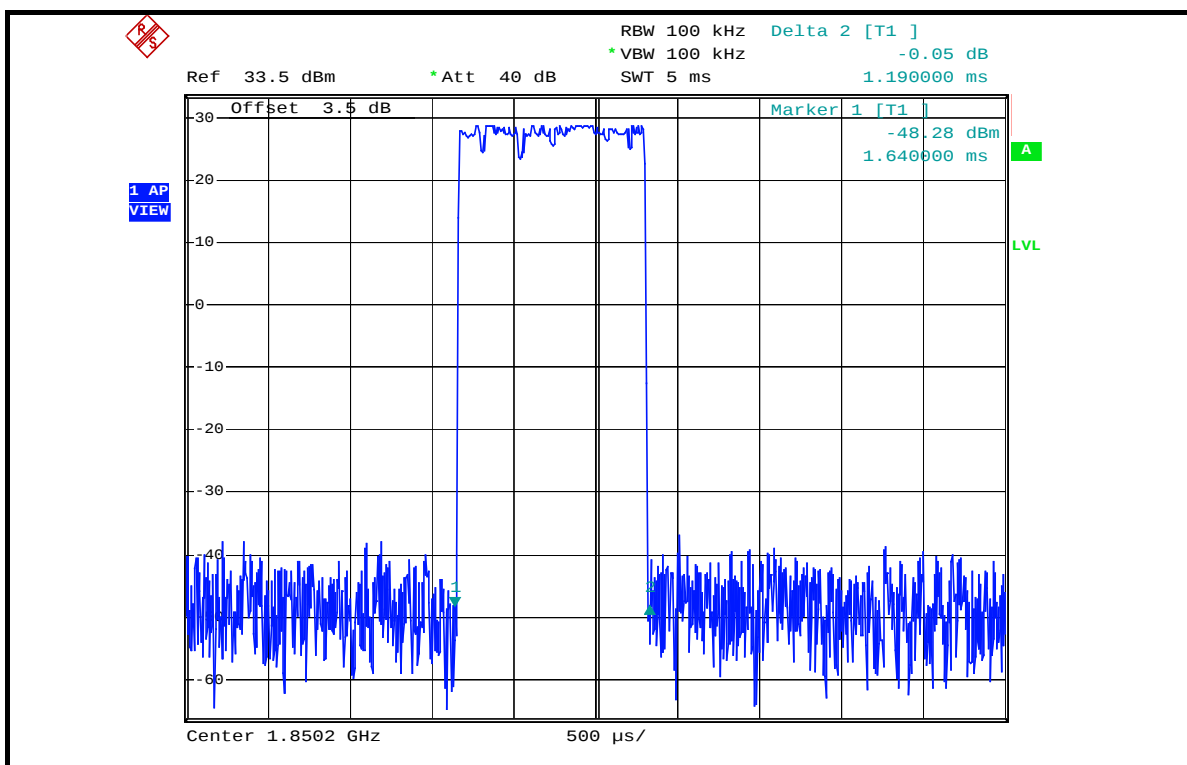
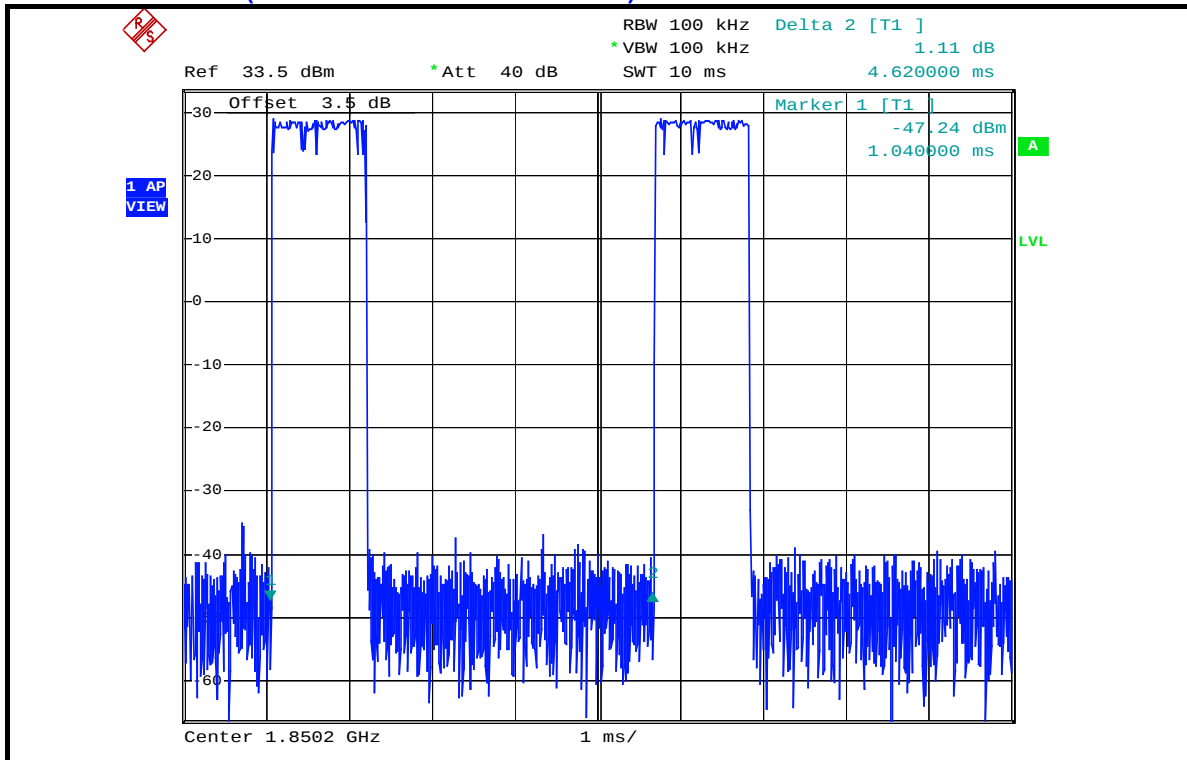
There are 299 channels and channel space is 200kHz. The frequency band 1850 ~ 1910MHz is allocated to the uplink and 1930 ~ 1990MHz to the downlink. The uplink and downlink channel space is 80MHz and is duplex at the same time.

The modulation scheme used the GMSK (Gaussian Minimum Shift Keying) that is the special case of FSK (frequency Shift Keying). The each time slot is last about 580 μ s and data length is 156.25bits. A frame contains the eight time slots.

4.1.2 THE ACTIVE TIME SLOT 8 MODULATED FRAME PLOT

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)



FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)



4.2 OUTPUT POWER MEASUREMENT

4.2.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 24.232(b) that "Mobile / Portable station are limited to 2 watts e.i.r.p" and 24.232(c) specific that "Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage."



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 07, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 22, 2006
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170242	Jan. 23, 2006
Preamplifier Agilent	8449B	3008A01960	Nov. 09, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Jan. 26, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219275/4	Jan. 26, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-4.

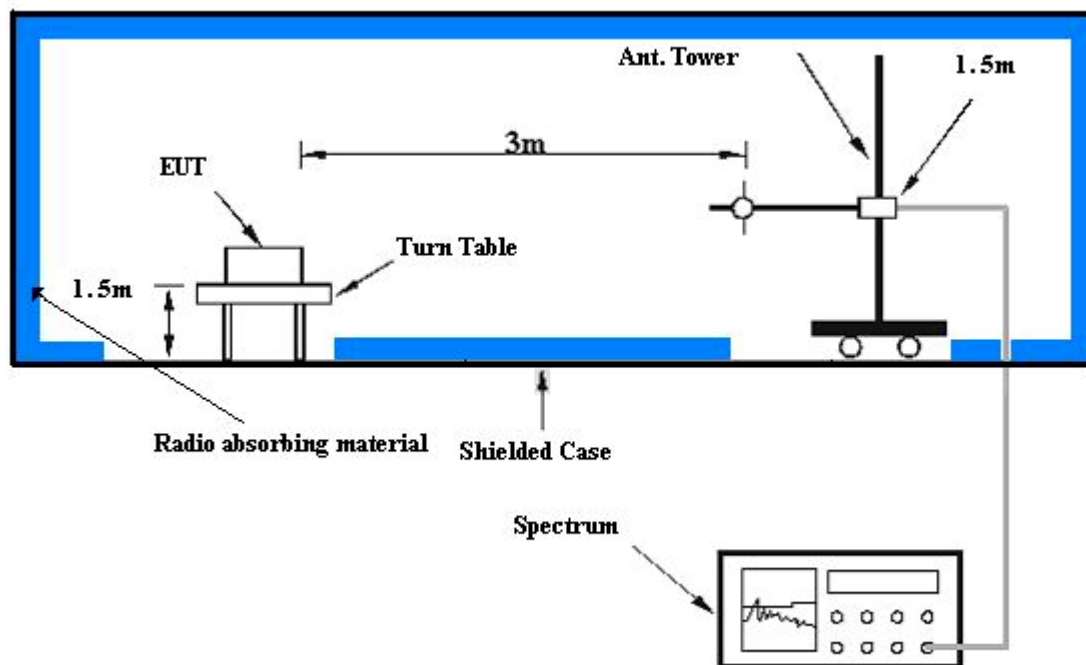
4.2.3 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with GSM link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810(low, middle and high operational frequency range.)
- b. The conducted peak output power used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. The path loss included the splitter loss, cable loss and 20dB pad loss. The spectrum set RB/VB 3MHz, then read peak power value and record to the test. (All transmitted path loss shall be considered in the test report data.)
- c. E.I.R.P peak power measurement. In the fully anechoic chamber, EUT placed on the 1.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- d. The substitution horn antenna is substituted for EUT at the same position and signal generator export the CW signal to the calibration antenna. Rotated the Turn Table to find the maximum radiation power. "Raw" is the spectrum reading value, "SG" is signal generator export power, "TX Gain" is calibration antenna isotropic gain value, "TX cable" is the transmitted cable loss between the calibration antenna and signal generator. The "Factor" means that the transmission path loss is equal to "SG" - "TX cable" + "TX Gain" - "Raw".
- e. Actually the real E.I.R.P peak power is equal to "Read Value" + "Factor"
- f. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection (PK)

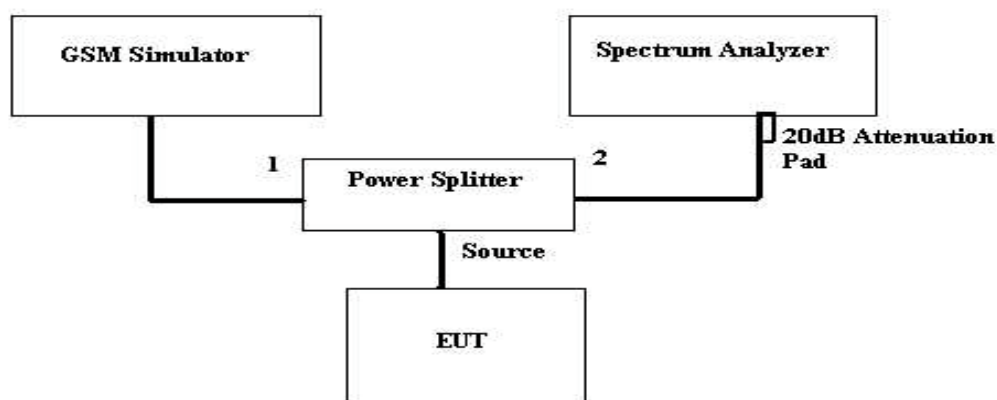
4.2.4 TEST SETUP

EIRP POWER MEASUREMENT:



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



4.2.5 EUT OPERATING CONDITIONS

- a. The EUT makes a phone call to the GSM simulator.
- b. The GSM simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

4.2.6 TEST RESULTS

EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX connected	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

CONDUCTED PEAK OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	PEAK OUTPUT POWER	
				dBm	Watt
512	1850.2	26.03	3.50	29.53	0.89743
661	1880.0	26.06	3.50	29.56	0.90365
810	1909.8	26.04	3.50	29.54	0.89950

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).

FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)

CONDUCTED PEAK OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	PEAK OUTPUT POWER	
				dBm	Watt
512	1850.2	26.00	3.50	29.50	0.89125
661	1880.0	25.98	3.50	29.48	0.88716
810	1909.8	26.03	3.50	29.53	0.89743

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX connected	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

EIRP RADIATED PEAK OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	PEAK OUTPUT POWER	
				dBm	Watt
512	1850.2	-8.88	40.39	31.51	1.41579
661	1880.0	-8.69	40.67	31.98	1.57761
810	1909.8	-9.33	40.95	31.62	1.45211

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Receiver Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)

EIRP RADIATED PEAK OUTPUT POWER					
CHANNEL NO.	FREQUENCY (MHz)	RAW VALUE (dBm)	CORRECTION FACTOR (dB)	PEAK OUTPUT POWER	
				dBm	Watt
512	1850.2	-8.94	40.39	31.45	1.39637
661	1880.0	-9.27	40.67	31.40	1.38038
810	1909.8	-9.49	40.95	31.46	1.39959

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Receiver Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).



4.3 FREQUENCY STABILITY MEASUREMENT

4.3.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

According to the FCC part 2.4235 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 2.5ppm of the received frequency from the base station. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 2.1055(a)(1) -30°C $\sim 50^{\circ}\text{C}$.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* Hewlett Packard RF cable	8120-6192	01428251	NA
* Suhner RF cable	Sucoflex104	204850/4	NA
* WIT Standard Temperature & Humidity Chamber	TH-4S-C	W981030	Jul. 18, 2006

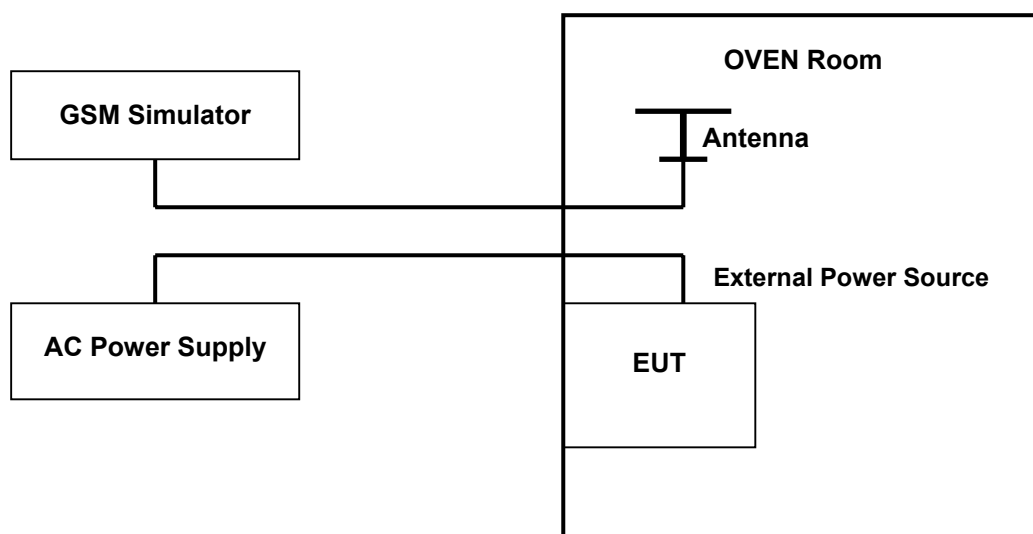
- NOTE:**
1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. "*" = These equipments are used for the final measurement.
 3. The test was performed in ADT RF OVEN room.

4.3.3 TEST PROCEDURE

- Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the GSM / GPRS / E-GPRS link mode. This is accomplished with the use of the R&S CMU200 simulator station. The oven room could control the temperatures and humidity. The GSM link channel is the 661.
- Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The various Volts from the minimum 3.3 Volts to 4.2 Volts. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing.
- The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the GSM simulator.

4.3.4 TEST SETUP



4.3.5 TEST RESULTS

EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 661	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu		

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
3.3	49	0.026486486	0.1
3.4	43	0.023243243	0.1
3.5	39	0.021081081	0.1
3.6	40	0.021621622	0.1
3.7	41	0.022162162	0.1
3.8	38	0.020540541	0.1
3.9	42	0.022702703	0.1
4.0	44	0.023783784	0.1
4.1	38	0.020540541	0.1
4.2	39	0.021081081	0.1

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)

AFC FREQUENCY ERROR vs. VOLTAGE			
VOLTAGE (Volts)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
3.3	51	0.027567568	0.1
3.4	47	0.025405405	0.1
3.5	43	0.023243243	0.1
3.6	42	0.022702703	0.1
3.7	44	0.023783784	0.1
3.8	43	0.023243243	0.1
3.9	46	0.024864865	0.1
4.0	45	0.024324324	0.1
4.1	42	0.022702703	0.1
4.2	43	0.023243243	0.1

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 661	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu		

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

AFC FREQUENCY ERROR vs. VOLTAGE			
TEMP. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
50	43	0.023243243	0.1
40	44	0.023783784	0.1
30	40	0.021621622	0.1
20	38	0.020540541	0.1
10	36	0.019459459	0.1
0	42	0.022702703	0.1
-10	41	0.022162162	0.1
-20	44	0.023783784	0.1
-30	46	0.024864865	0.1

FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)

AFC FREQUENCY ERROR vs. VOLTAGE			
TEMP. (°C)	FREQUENCY ERROR (Hz)	FREQUENCY ERROR (ppm)	LIMIT (ppm)
50	49	0.026486486	0.1
40	48	0.025945946	0.1
30	47	0.025405405	0.1
20	44	0.023783784	0.1
10	43	0.023243243	0.1
0	41	0.022162162	0.1
-10	45	0.024324324	0.1
-20	43	0.023243243	0.1
-30	47	0.025405405	0.1



4.4 OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

According to FCC 24.238(b) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Apr. 13, 2006
* Mini-Circuits Power Splitter	ZAPD-4	400005	NA
* Hewlett Packard RF cable	8120-6192	01428251	NA
* JFW 20dB attenuation	50HF-020-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. "*" = These equipments are used for the final measurement.

4.4.3 TEST SETUP

Same as Item 4.2.4 (Conducted Power Setup)



4.4.4 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with GSM link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810(low, middle and high operational frequency range.)
- b. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 3.5dB in the transmitted path track.
- c. FCC 24.238(b) required a measurement bandwidth is the fundamental emission below 26dB bandwidth.

4.4.5 EUT OPERATING CONDITION

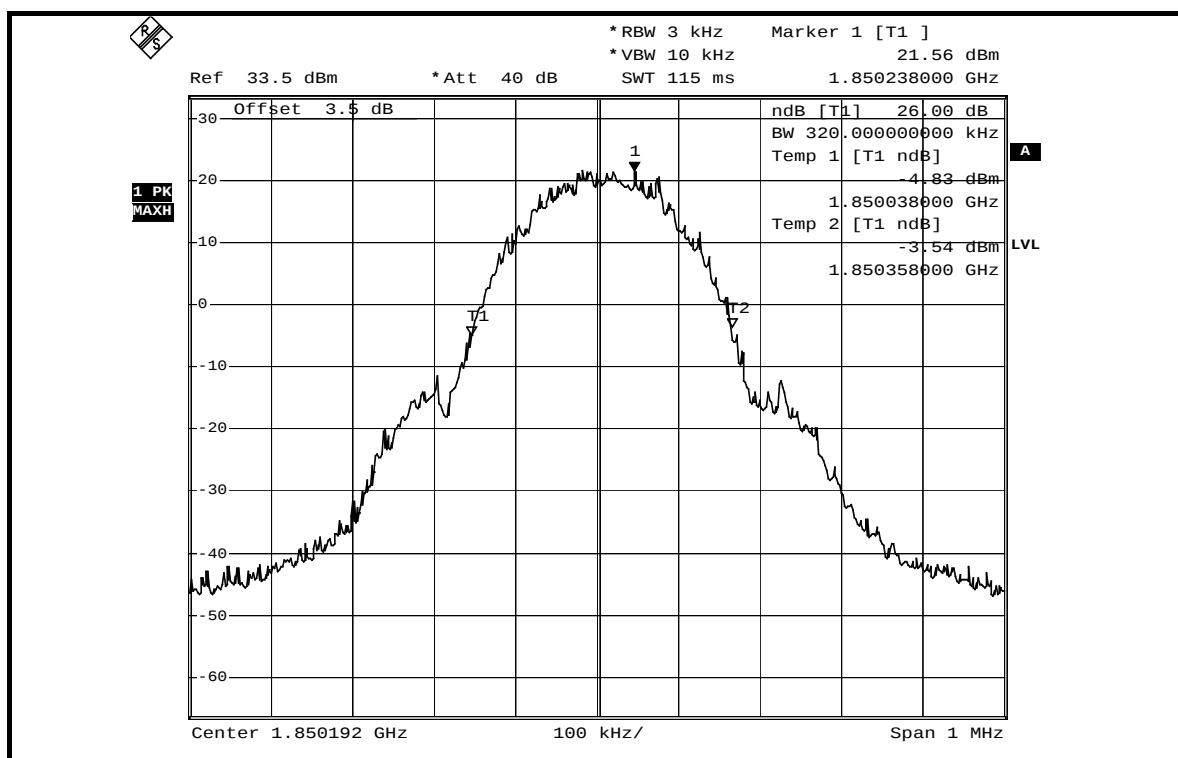
- a. The EUT makes a phone call to the GSM simulator.
- b. The GSM simulator station system controlled a EUT to export maximum and minimum output power under transmission mode and specific channel frequency Same as Item 4.4.5

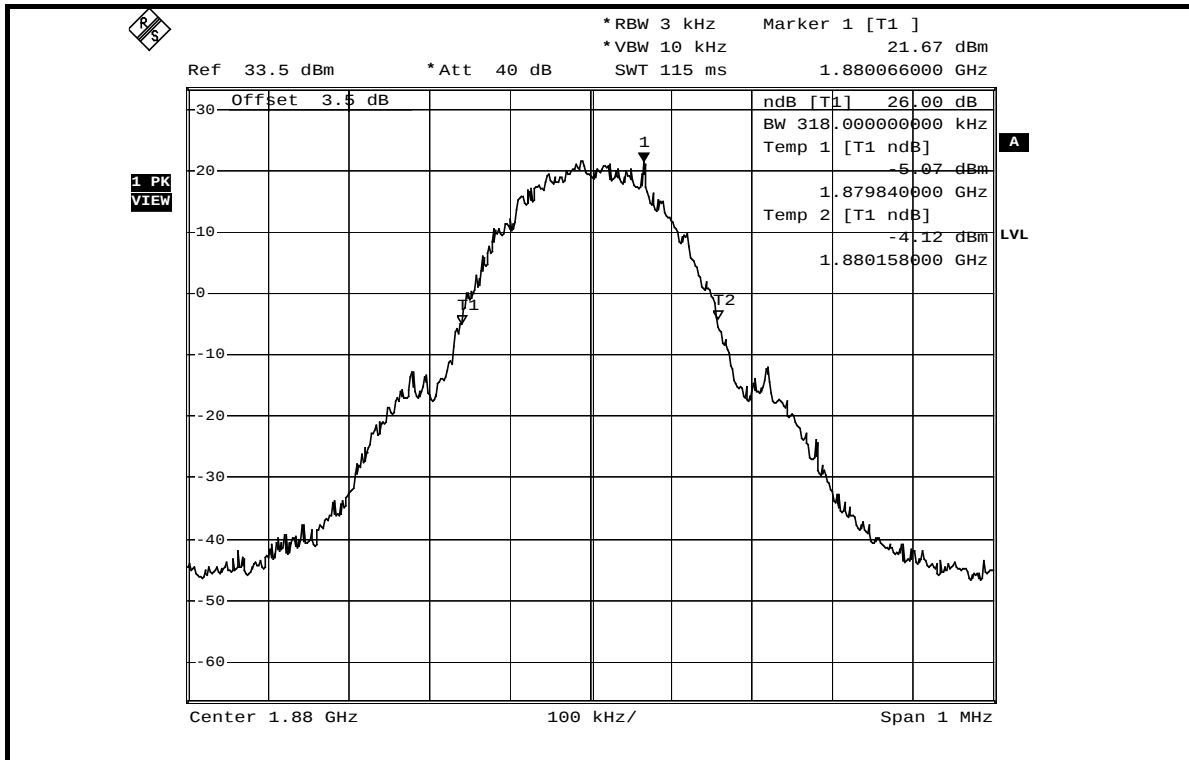
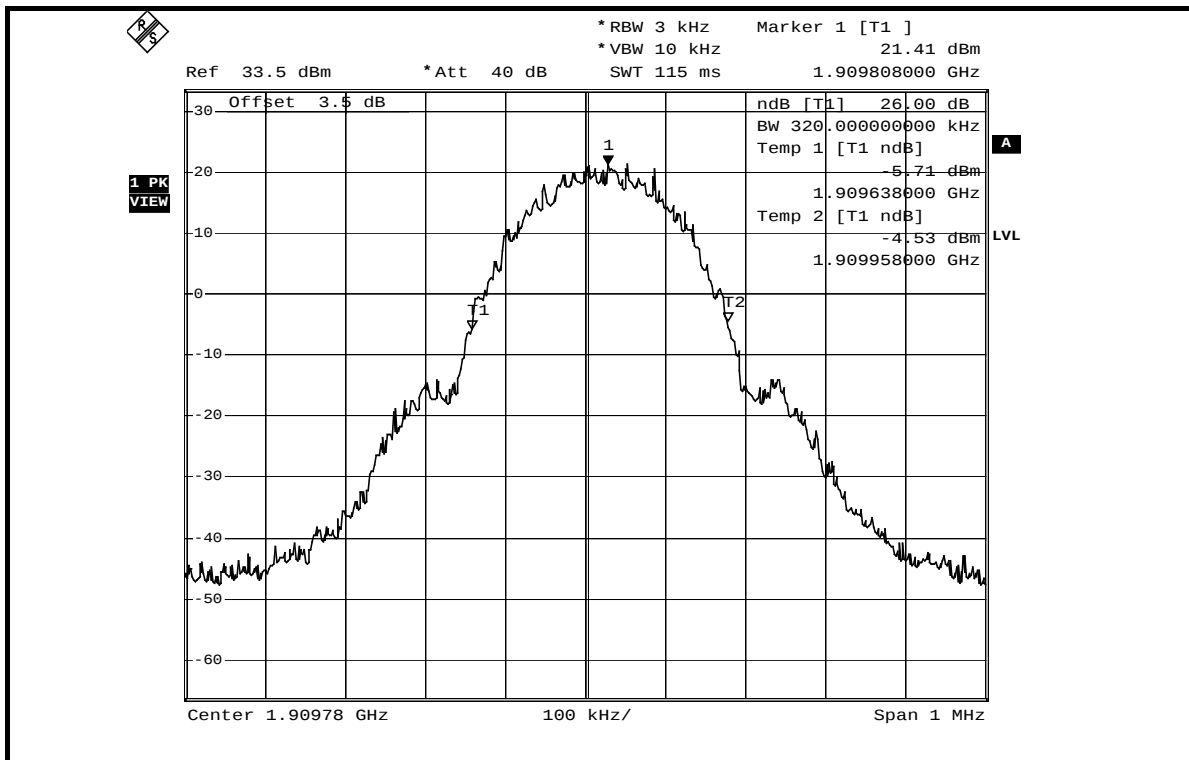
4.4.6 TEST RESULTS

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

FREQUENCY (MHz)	OUTPUT POWER -26 dBc BANDWIDTH (kHz)
1850.2	320
1880.0	318
1909.8	320

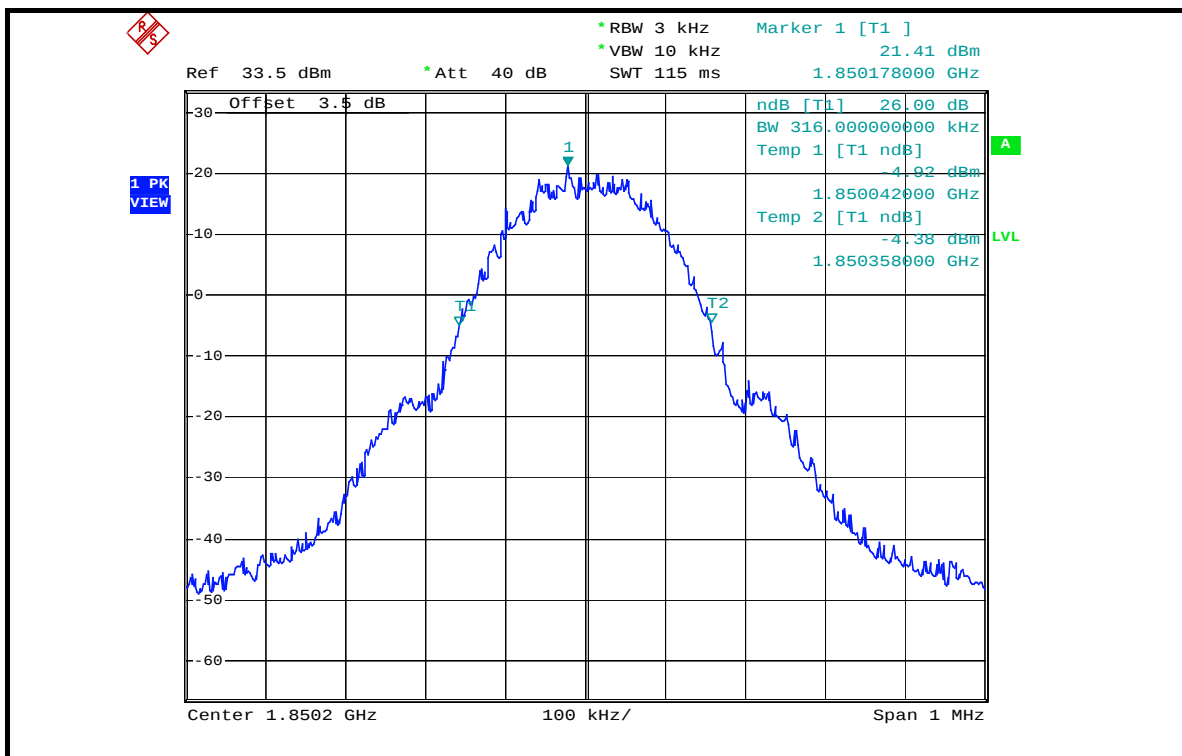
CH 512 POWER



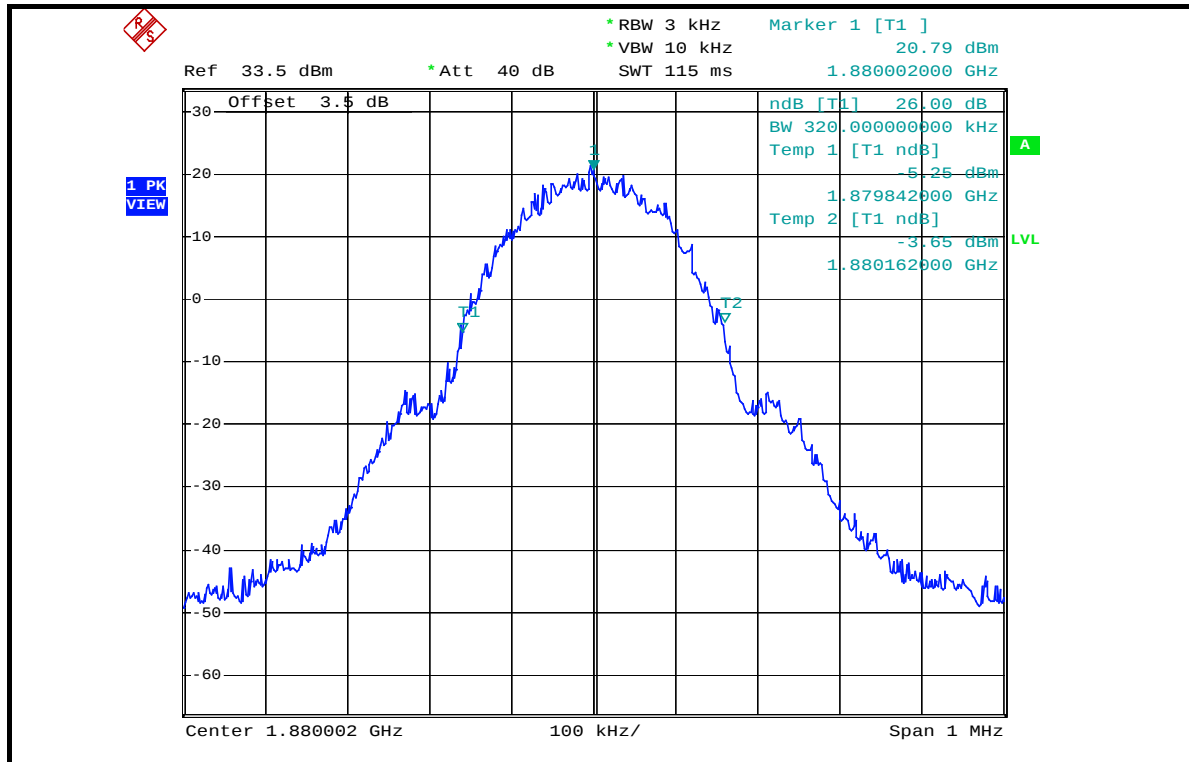
CH 661 POWER**CH 810 POWER**

FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)

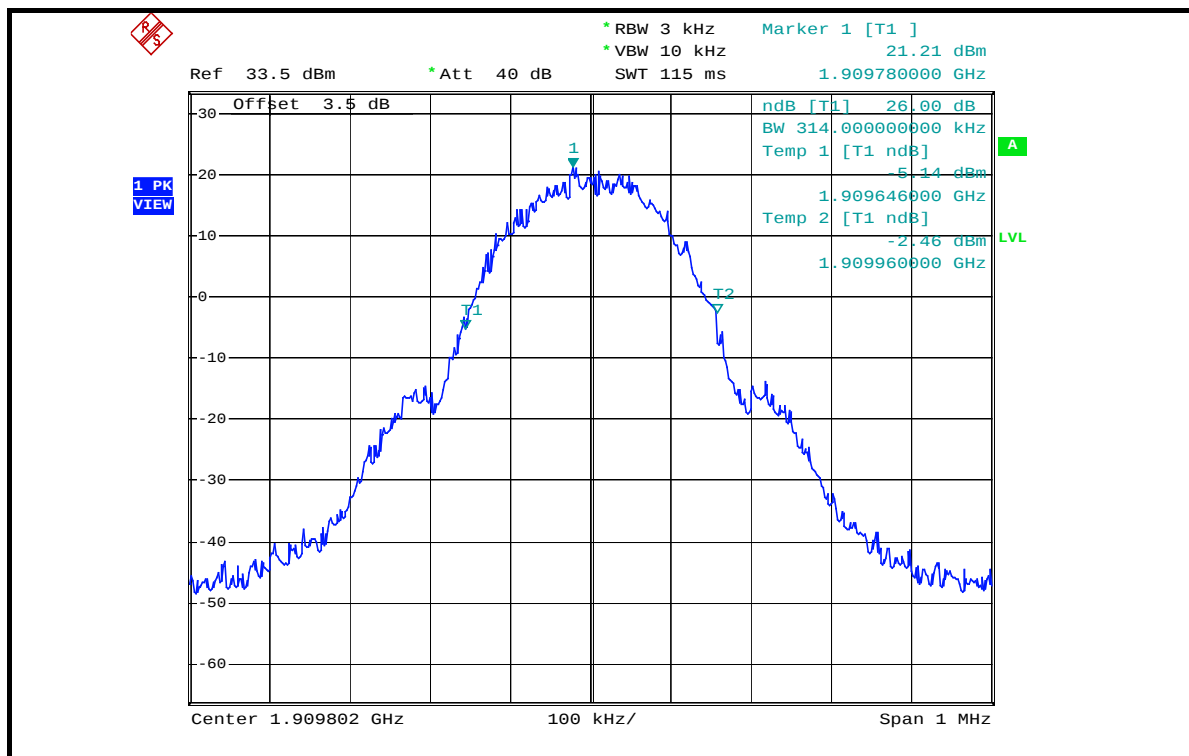
FREQUENCY (MHz)	OUTPUT POWER -26 dBc BANDWIDTH (kHz)
1850.2	316
1880.0	320
1909.8	314

CH 512 POWER

CH 661 POWER



CH 810 POWER



4.5 BAND EDGE MEASUREMENT

4.5.1 LIMITS OF BAND EDGE MEASUREMENT

The PCS frequency bands refer to the FCC 24.229 rule. According to FCC 24.238(a) specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. Then we measure that the bandwidth is about 300kHz and the resolution bandwidth is 3kHz.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Apr. 13, 2006
* Mini-Circuits Power Splitter	ZAPD-4	400005	NA
* Hewlett Packard RF cable	8120-6192	01428251	NA
* JFW 20dB attenuation	50HF-020-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

2. "*" = These equipments are used for the final measurement.

4.5.3 TEST SETUP

Same as Item 4.2.4 (Conducted Power Setup)



4.5.4 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with GSM link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, 512 and 810(low and high operational frequency range.)
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 3.5dB in the transmitted path track.
- c. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10KHz.
- d. Record the max trace plot into the test report.

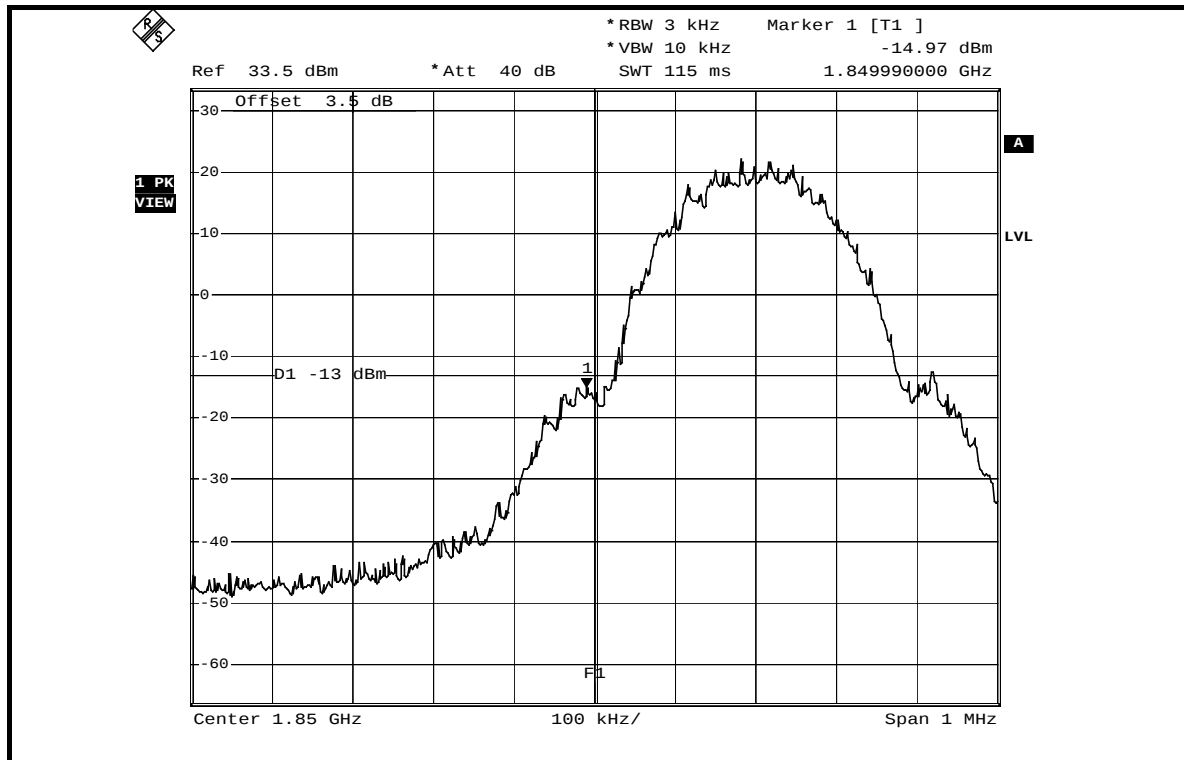
4.5.5 EUT OPERATING CONDITION

- a. The EUT makes a phone call to the GSM simulator.
- b. The GSM simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency Same as Item 4.4.5.

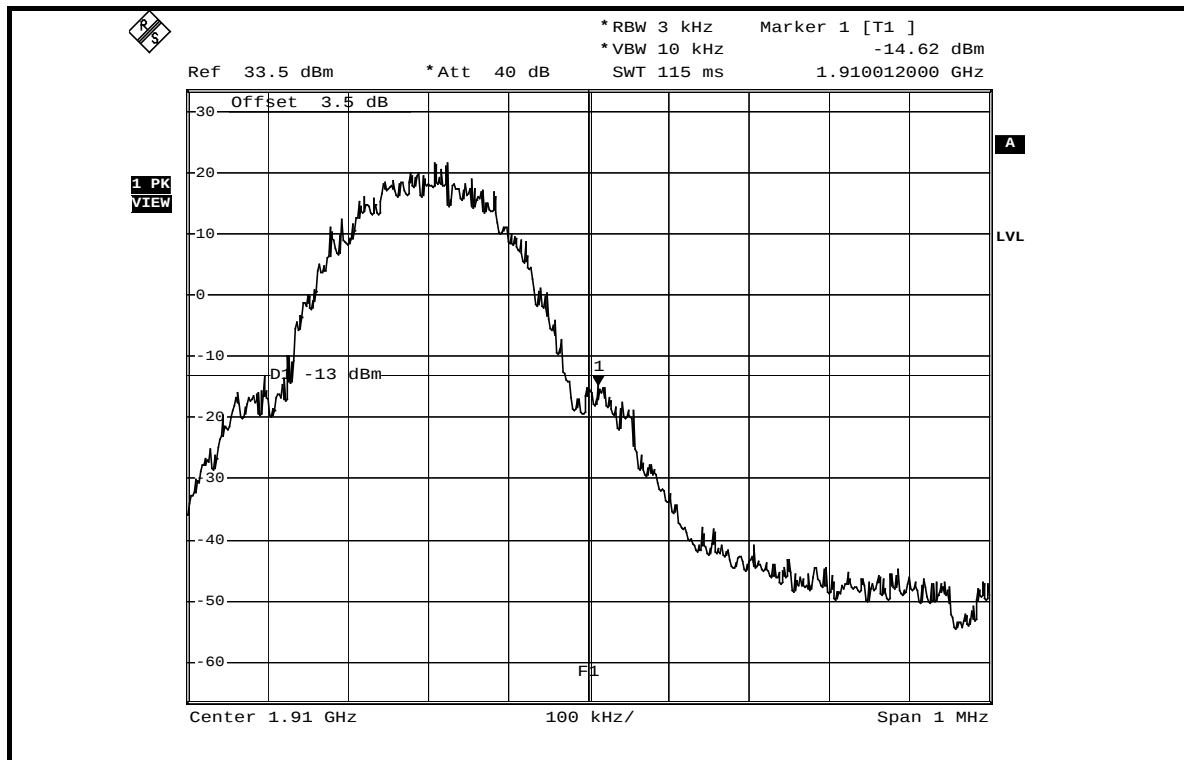
4.5.6 TEST RESULTS

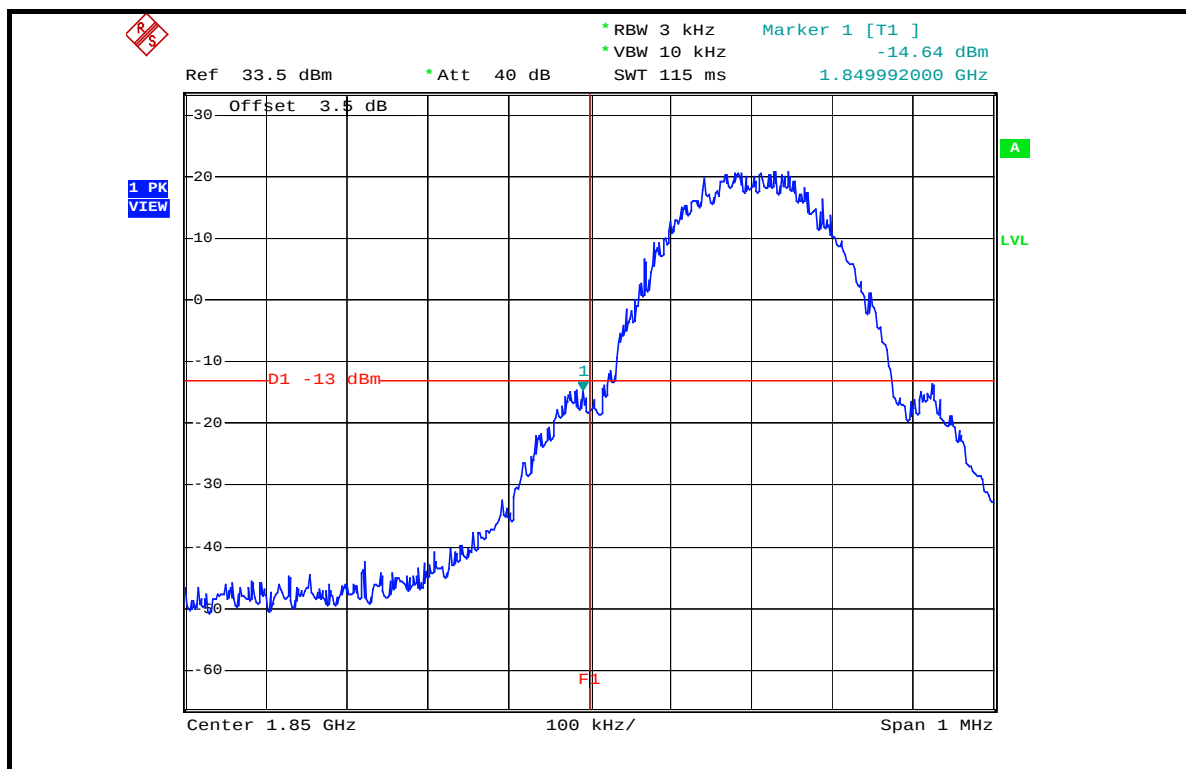
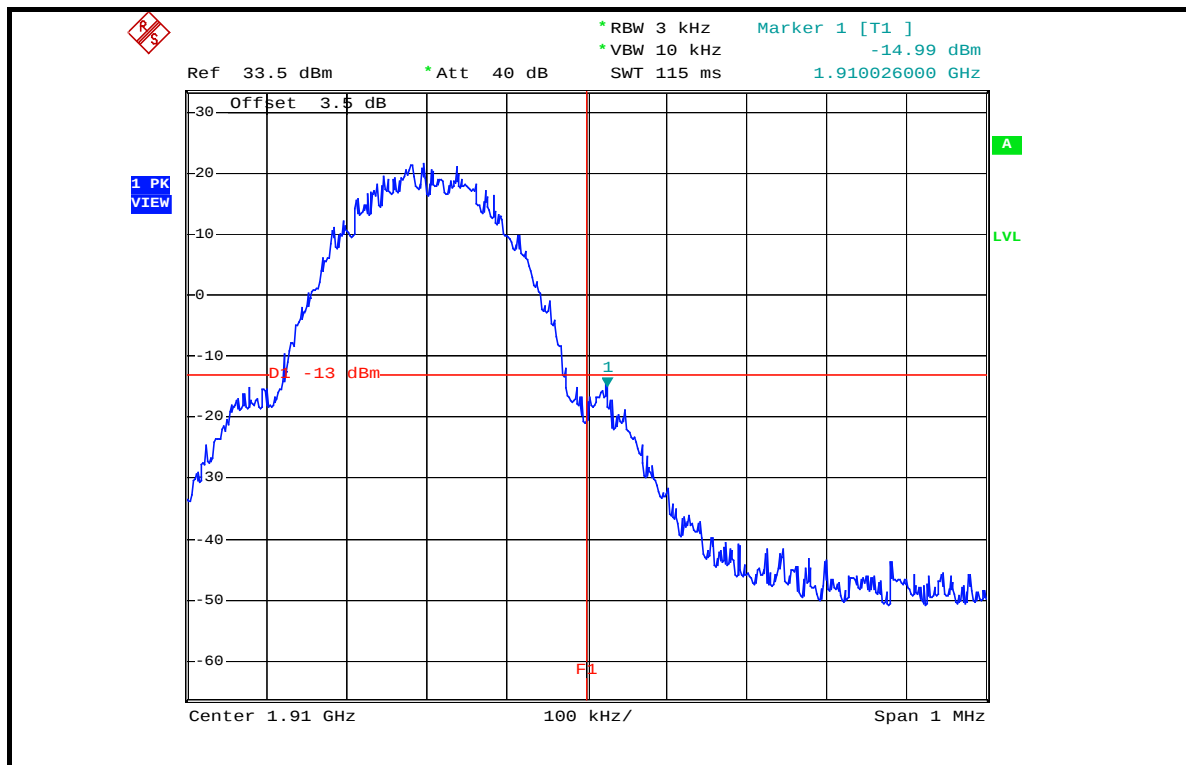
FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

LOWER BAND EDGE



HIGHER BAND EDGE



FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)**LOWER BAND EDGE****HIGHER BAND EDGE**

4.6 CONDUCTED SPURIOUS EMISSIONS

4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit translates in the relevant power range (1 to 0.001W). At 1W(Power Control Level 0) the specified minimum attenuation becomes 43dB and the limit of emission equal to -13dBm . At 0.001W(Power Control Level 15) the specified minimum attenuation becomes 13dB and the emission of limit equal to -13dBm . So the limit of emission is the same absolute specified line. In the FCC 24.238(c), When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges (low channel 512 and high channel 810), both upper and lower edges are compliance with FCC 24.238(b), Adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.6.2 TEST INSTRUMENTS

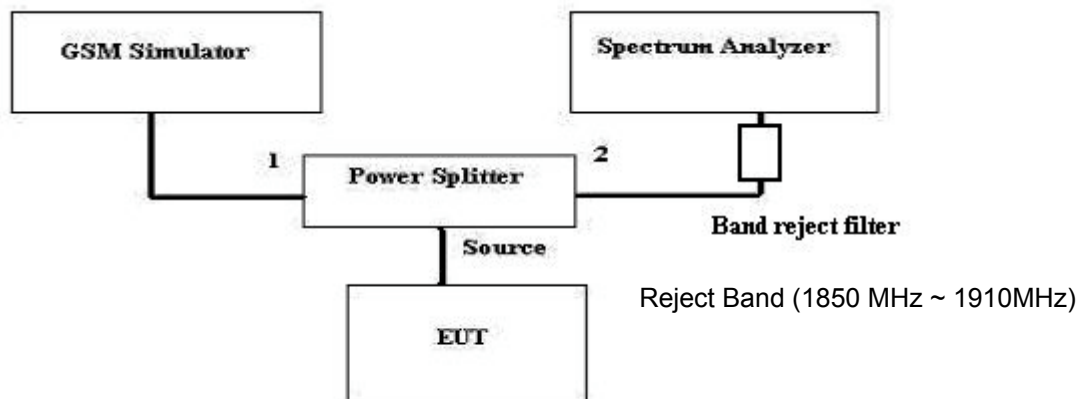
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Apr. 13, 2006
* Wainwright Instruments Band Reject Filter	WRCG1850/1910- 1830/1930-60/10SS	SN1	NA
* Wainwright Instruments High Pass Filter	WHK3.1/18G-10SS	SN1	NA
* Mini-Circuits Power Splitter	ZAPD-4	400005	NA
* Hewlett Packard RF cable	8120-6192	01428251	NA
* JFW 20dB attenuation	50HF-020-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. "*" = These equipments are used for the final measurement.

4.6.3 TEST PROCEDURE

- a. The EUT was set up for the maximum peak power with GSM link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810(low, middle and high operational frequency range.)
- b. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 3.5dB in the transmitted path track.
- c. When the spectrum scanned from 9kHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB/VB 1MHz.
- d. When the spectrum scanned from 3kHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB/VB 1MHz.

4.6.4 TEST SETUP



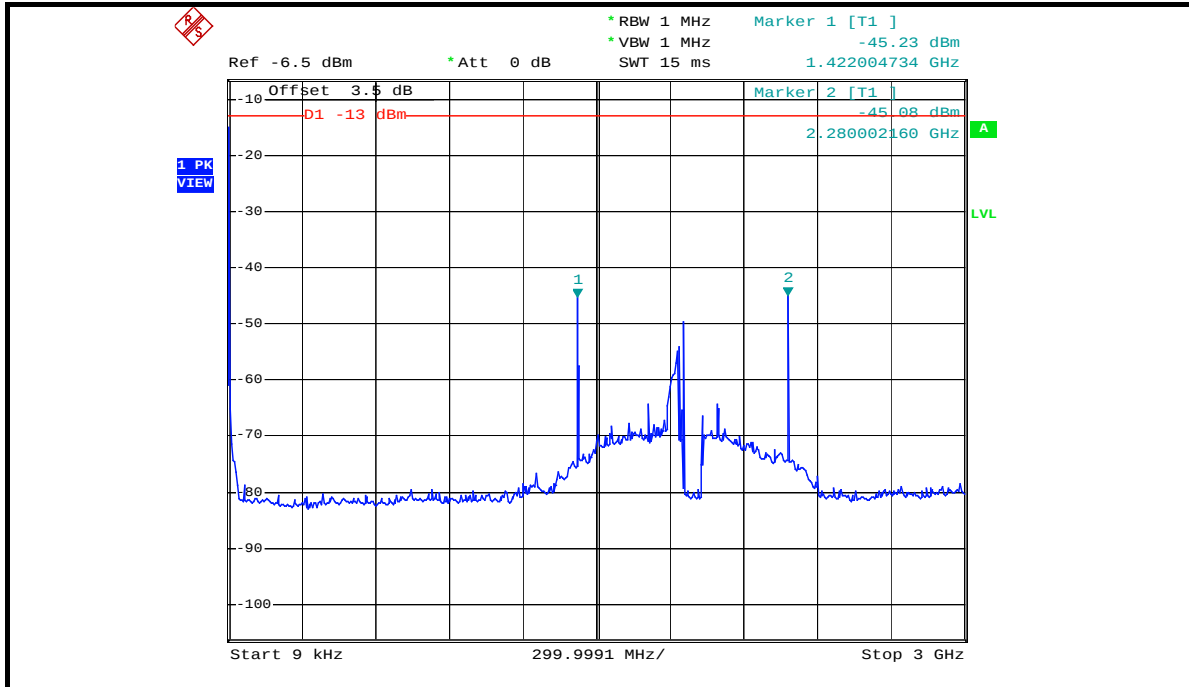
4.6.5 EUT OPERATING CONDITIONS

- a. The EUT makes a phone call to the GSM simulator.
- b. The GSM simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

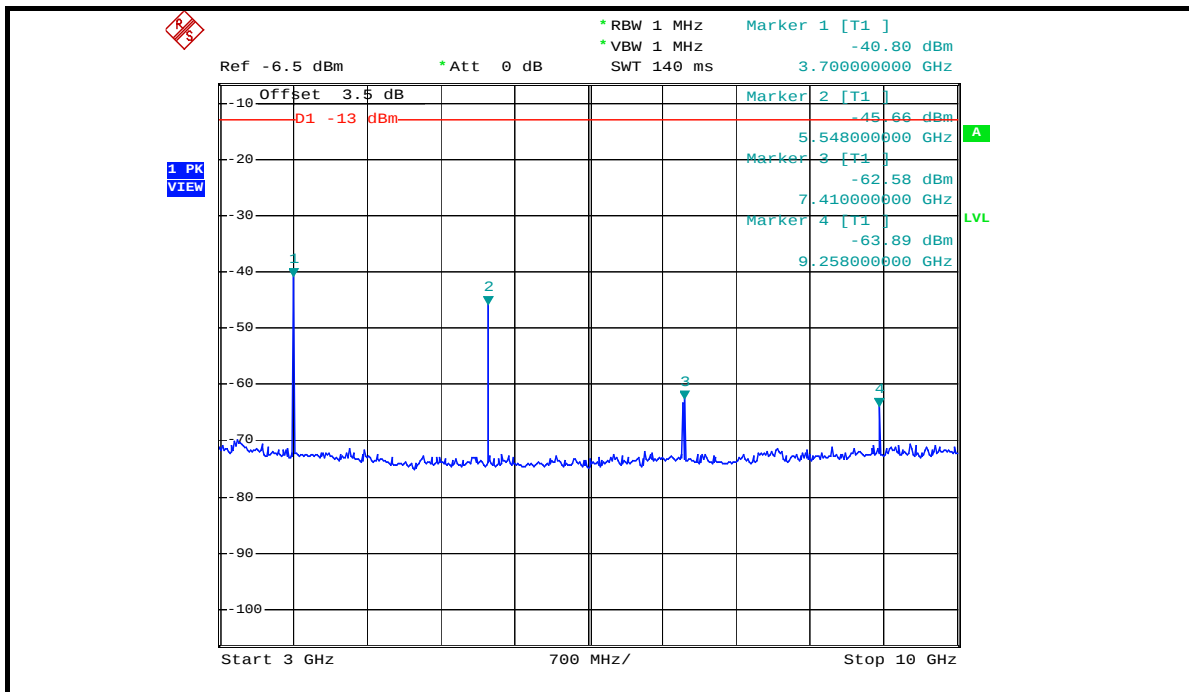
4.6.6 TEST RESULTS

FOR GSM MODE (UP-LINK WITH 1 TIME SLOT)

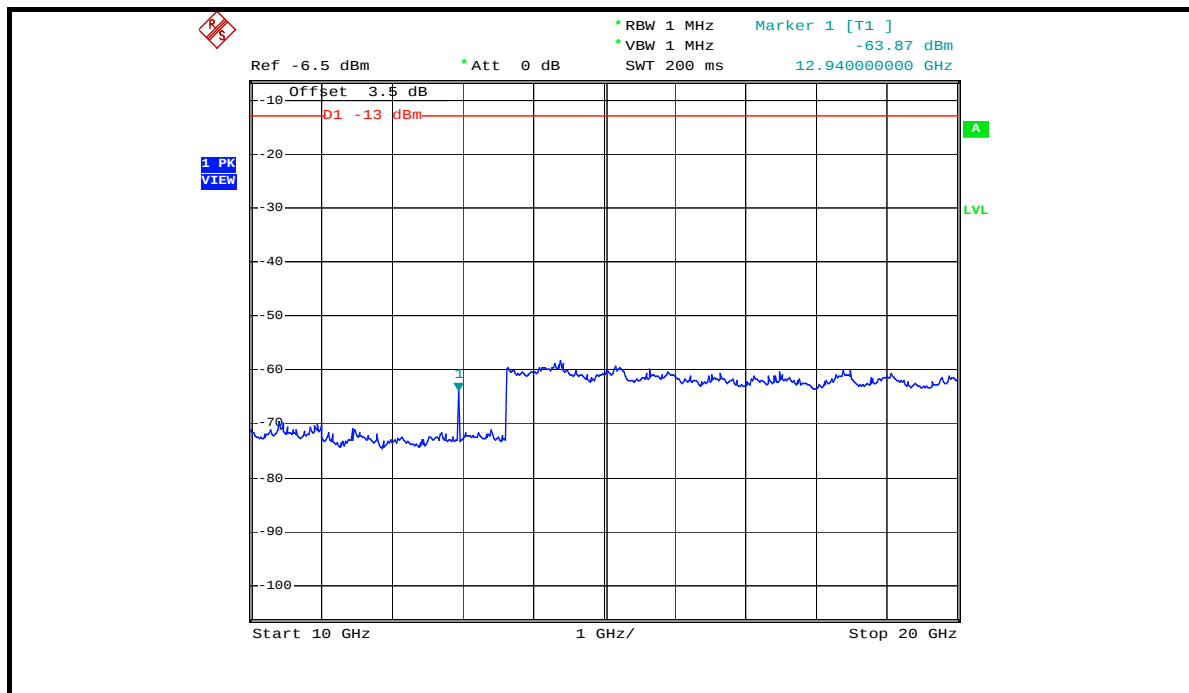
CH 512: 9kHz ~ 3GHz



3GHz ~ 10GHz



10GHz ~ 20GHz



1 PK VIEW

Ref -6.5 dBm * Att 0 dB * RBW 1 MHz * VBW 1 MHz SWT 15 ms Marker 1 [T1] -41.26 dBm 1.452004644 GHz

Offset 3.5 dB Marker 2 [T1] -43.81 dBm 2.310002070 GHz

D1 -13 dBm

LVL

Start 9 kHz 299.9991 MHz/ Stop 3 GHz

1 PK VIEW

Ref -6.5 dBm * Att 0 dB SWT 140 ms

Offset 3.5 dB

Marker 1 [T1] -33.94 dBm 3.756000000 GHz

Marker 2 [T1] -53.04 dBm 5.646000000 GHz

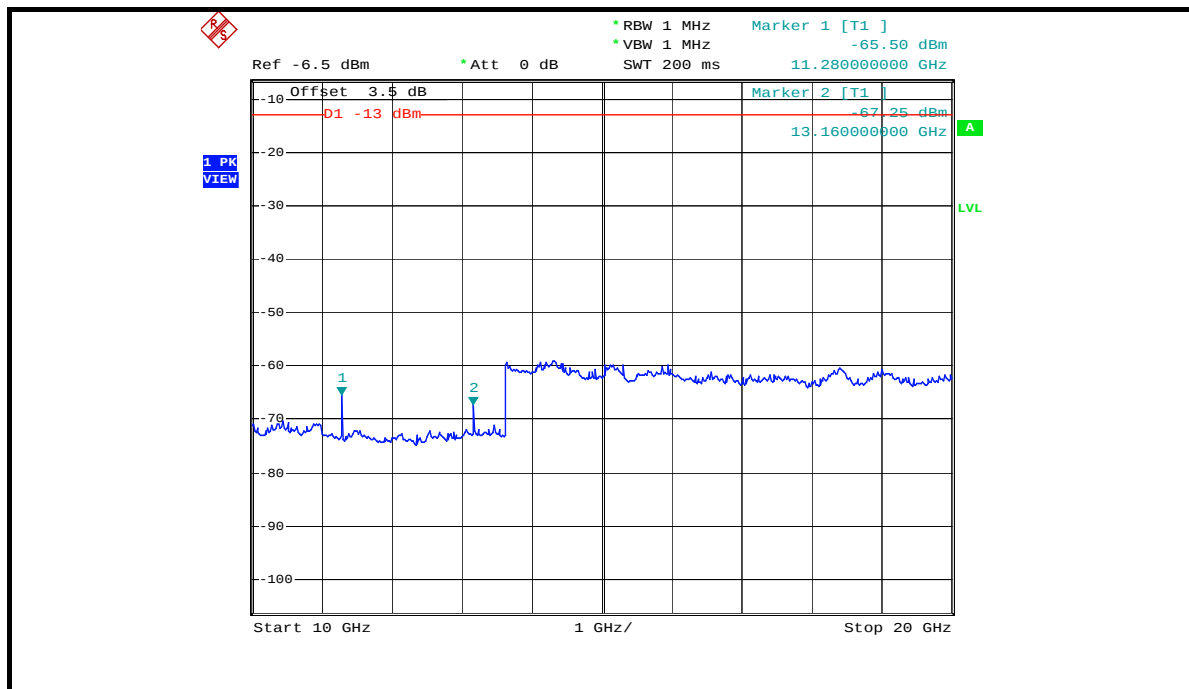
Marker 3 [T1] -59.94 dBm 7.522000000 GHz

Marker 4 [T1] -54.69 dBm 9.412000000 GHz

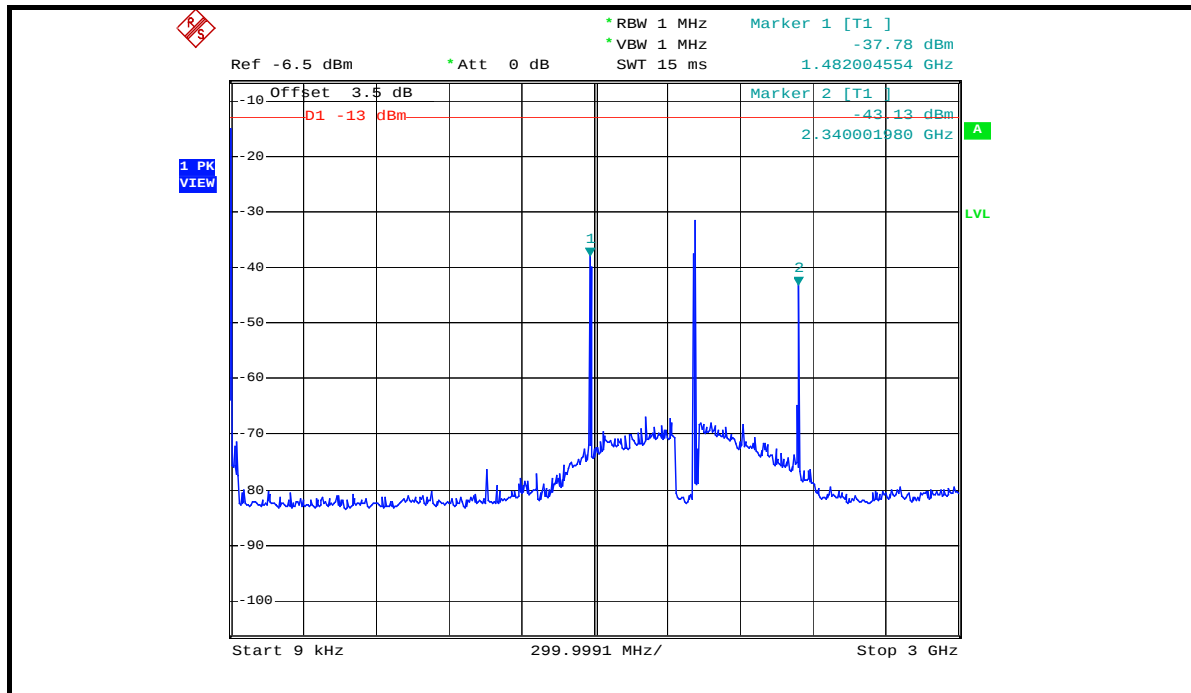
LVL

Start 3 GHz 700 MHz/ Stop 10 GHz

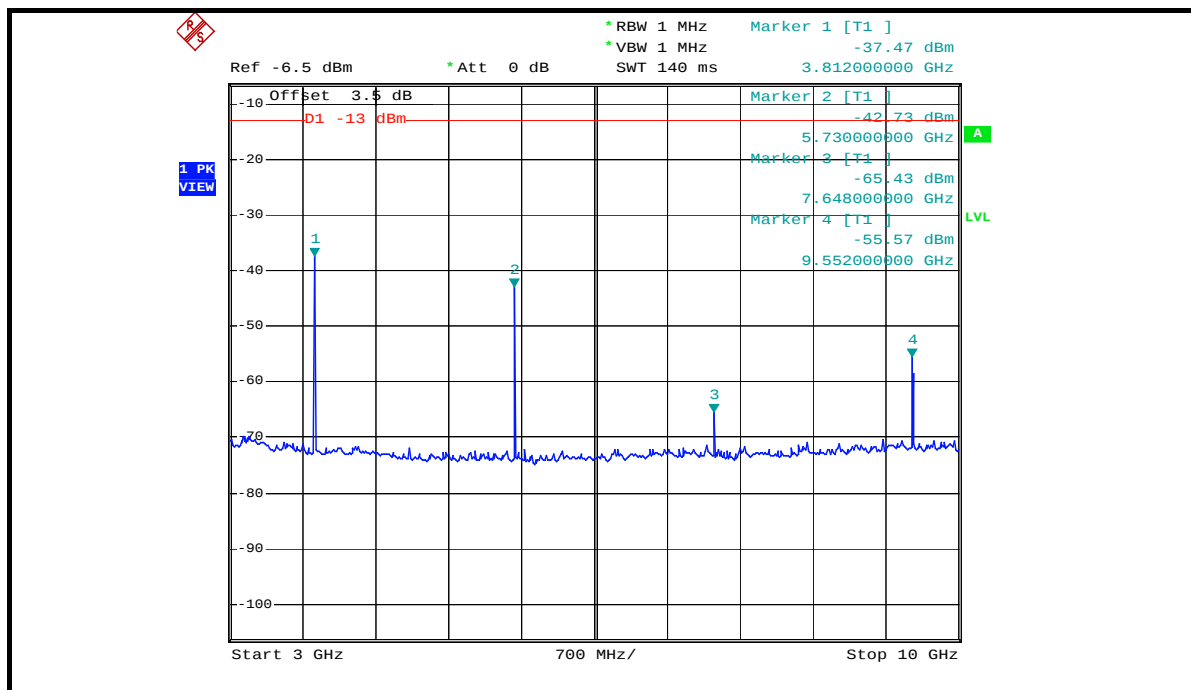
10GHz ~ 20GHz



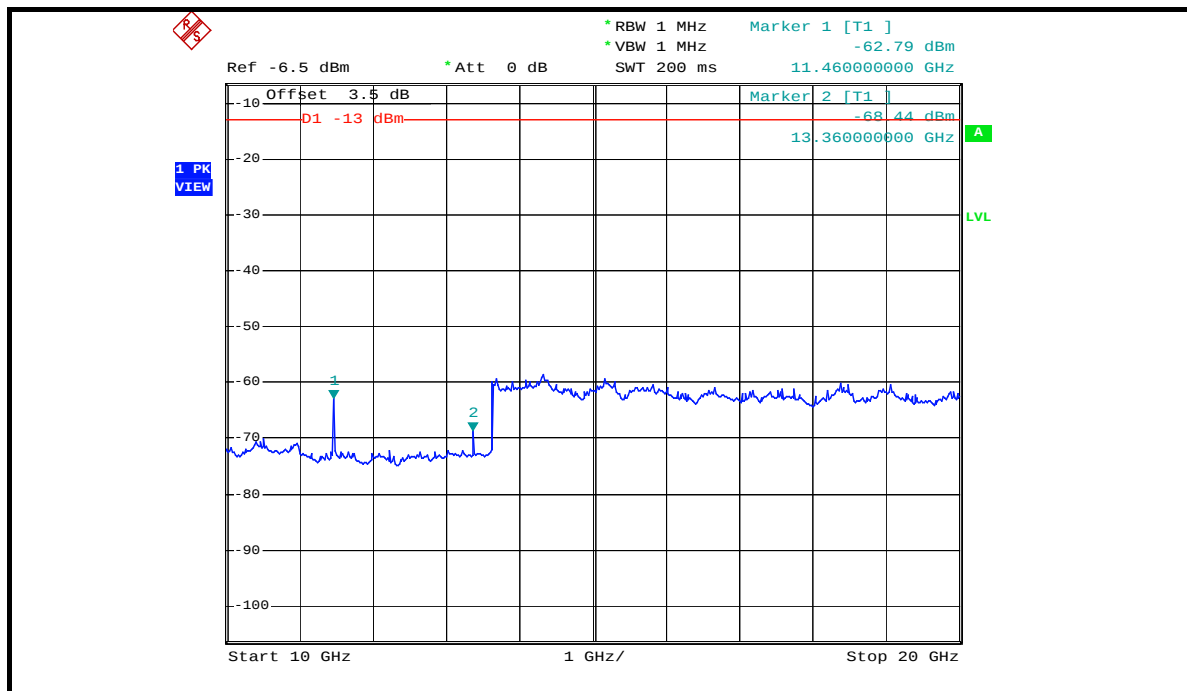
CH 810: 9kHz ~ 3GHz



3GHz ~ 10GHz



10GHz ~ 20GHz





EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 512	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (dBm)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1422.00	3.79	-45.23	-41.44	-13.00	-28.44
2280.00	3.84	-45.08	-41.24	-13.00	-28.24
3700.00	4.21	-40.80	-36.59	-13.00	-23.59
5548.00	4.32	-45.66	-41.34	-13.00	-28.34
7410.00	4.46	-62.58	-58.12	-13.00	-45.12
9258.00	4.55	-63.89	-59.34	-13.00	-46.34
12940.00	5.35	-63.87	-58.52	-13.00	-45.52

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 661	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (dBm)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1452	3.79	-41.26	-37.47	-13	-24.47
2310	3.84	-43.81	-39.97	-13	-26.97
3751	4.21	-33.94	-29.73	-13	-16.73
5646	4.32	-53.04	-48.72	-13	-35.72
7522	4.46	-59.94	-55.48	-13	-42.48
9412	4.56	-54.69	-50.13	-13	-37.13
11280	4.93	-65.5	-60.57	-13	-47.57
13160	5.35	-67.25	-61.9	-13	-48.90

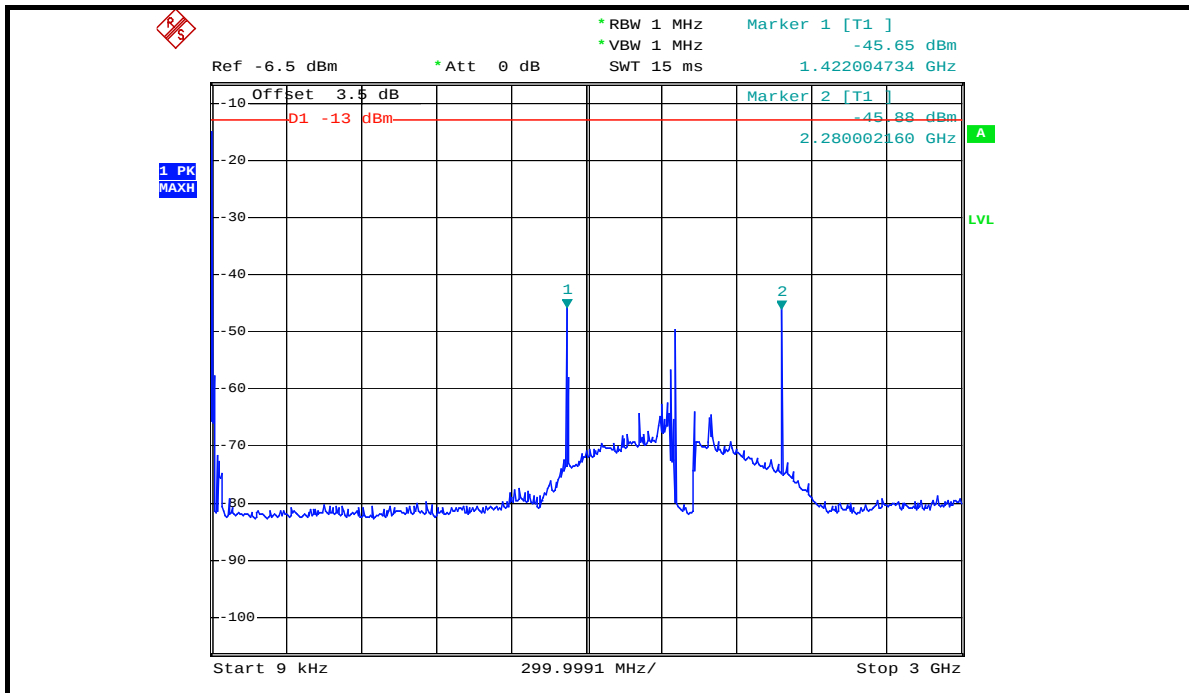
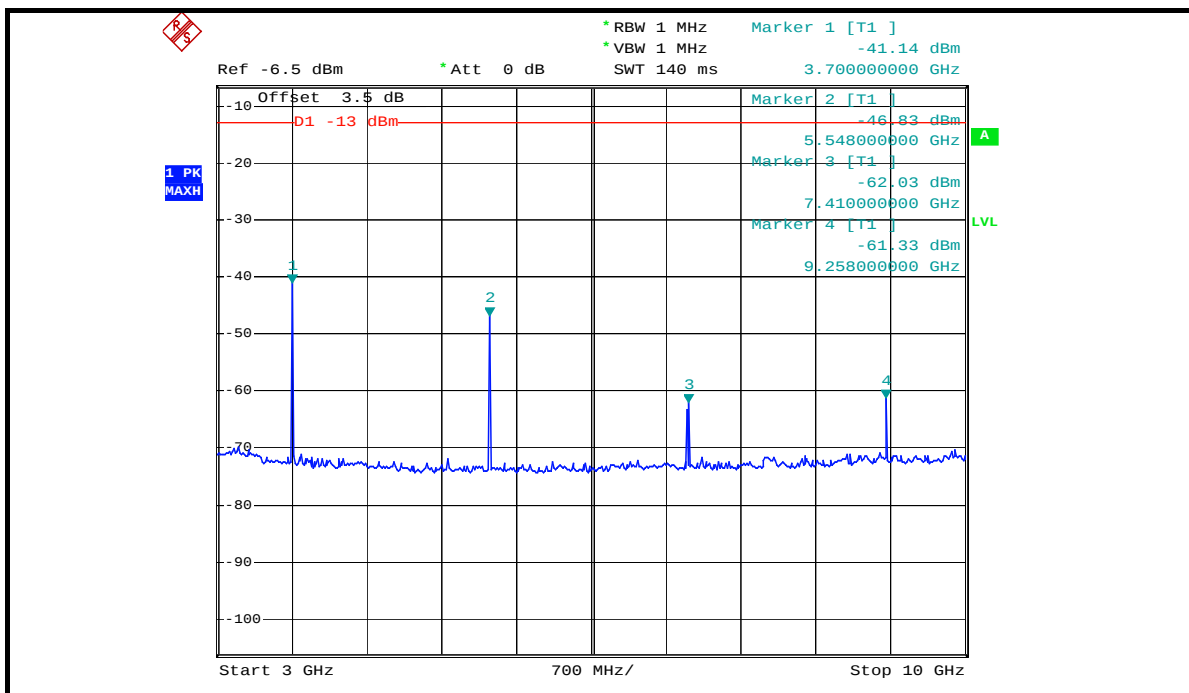
REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).



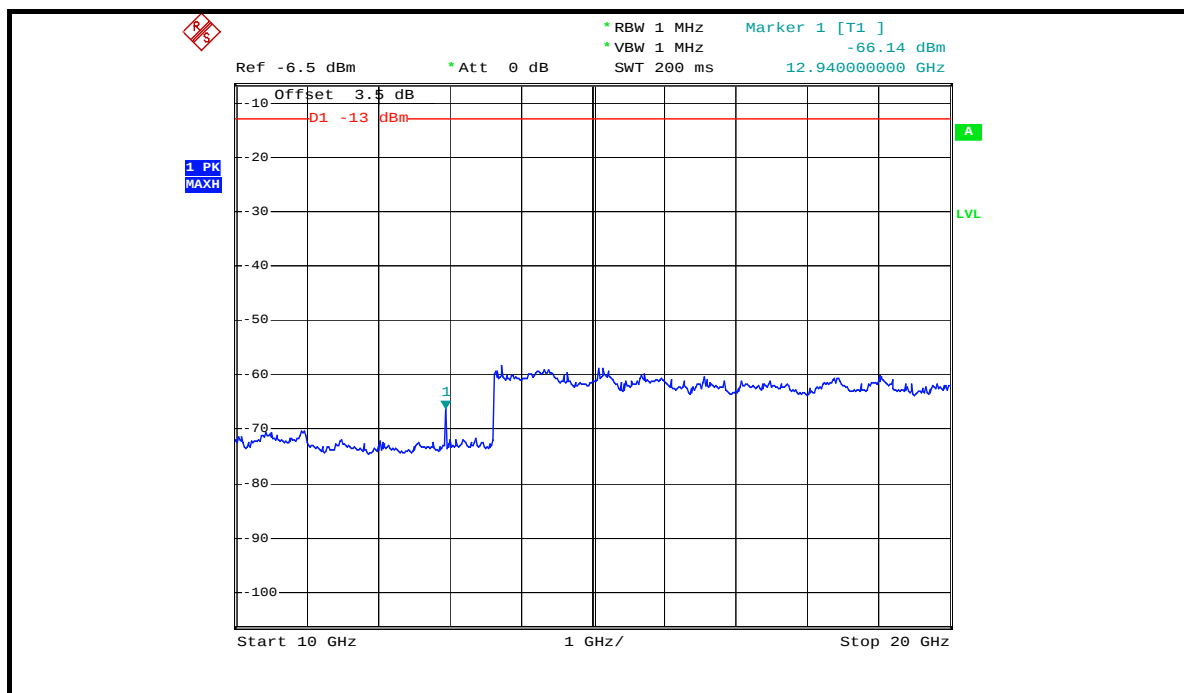
EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 810	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

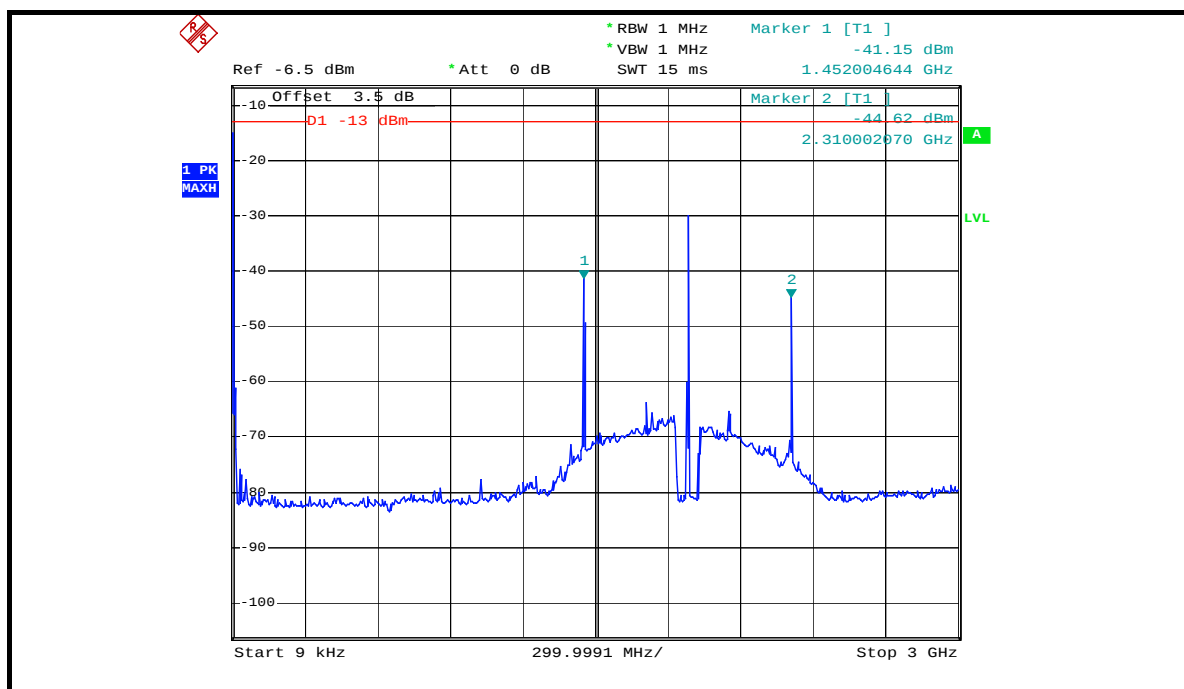
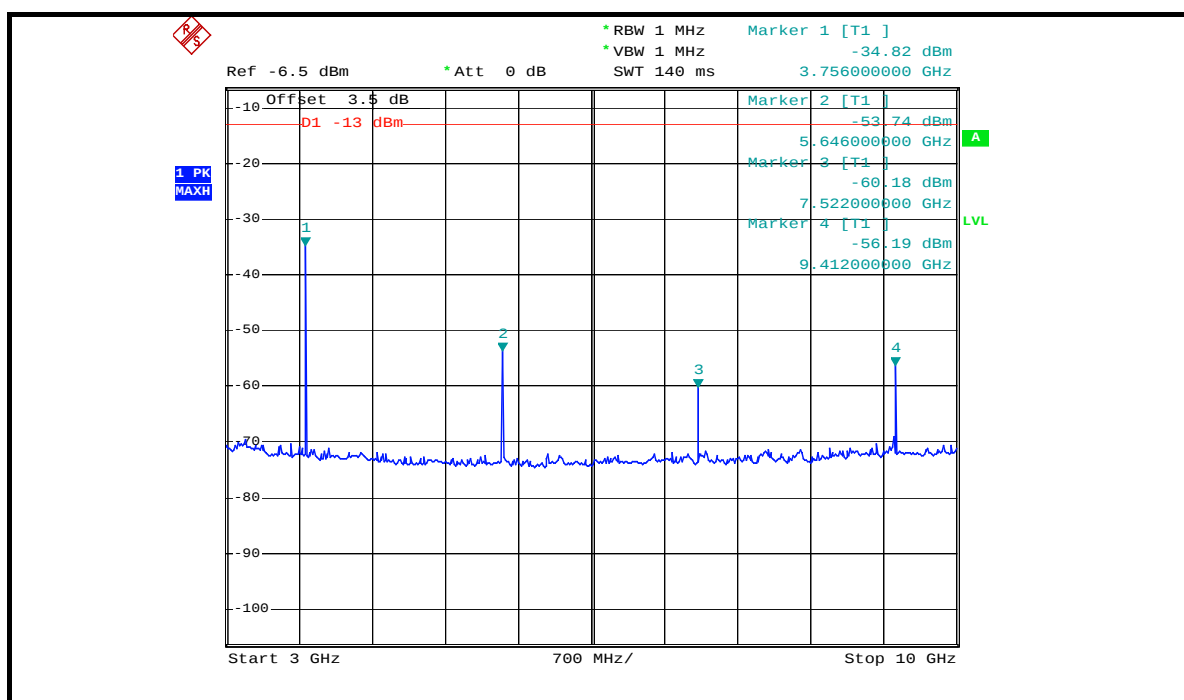
CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (Dbm)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1482.00	3.79	-37.78	-33.99	-13.00	-20.99
2340.00	3.84	-43.13	-39.29	-13.00	-26.29
3812.00	4.21	-37.47	-33.26	-13.00	-20.26
5730.00	4.32	-42.73	-38.41	-13.00	-25.41
7648.00	4.47	-65.43	-60.96	-13.00	-47.96
9552.00	4.56	-55.57	-51.01	-13.00	-38.01
11460.00	4.94	-62.79	-57.85	-13.00	-44.85
13360.00	5.36	-68.44	-63.08	-13.00	-50.08

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).

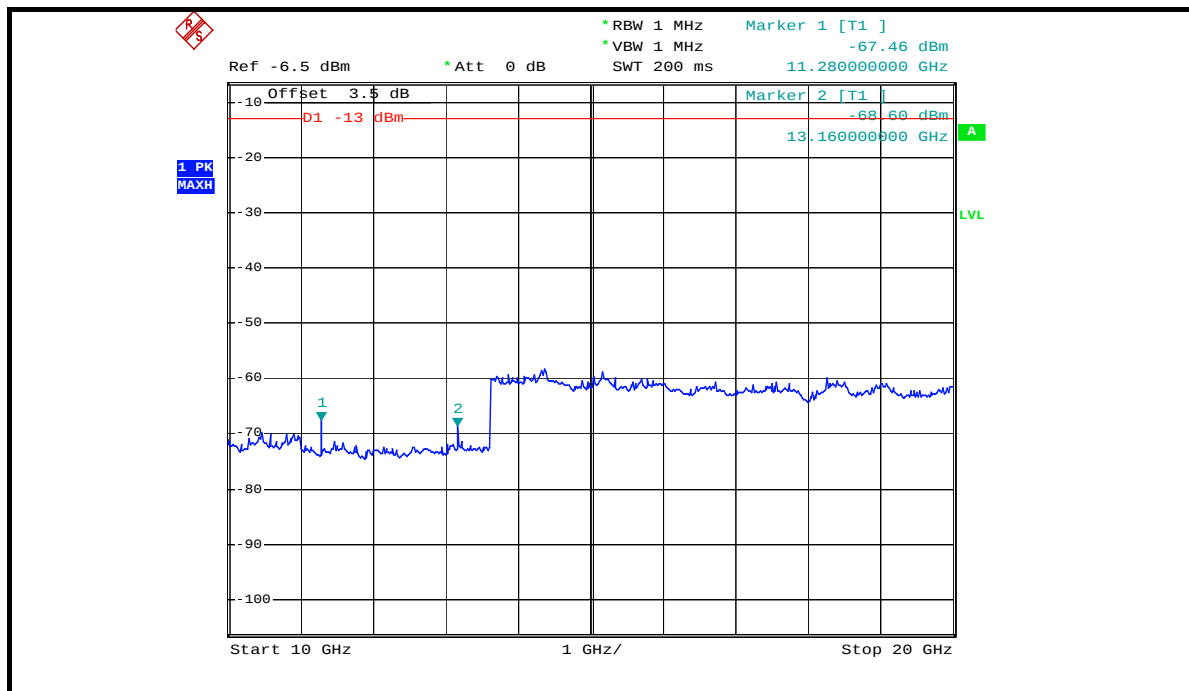
FOR GPRS MODE (UP-LINK WITH 2 TIME SLOTS)**CH 512: 9kHz ~ 3GHz****3GHz ~ 10GHz**

10GHz ~ 20GHz

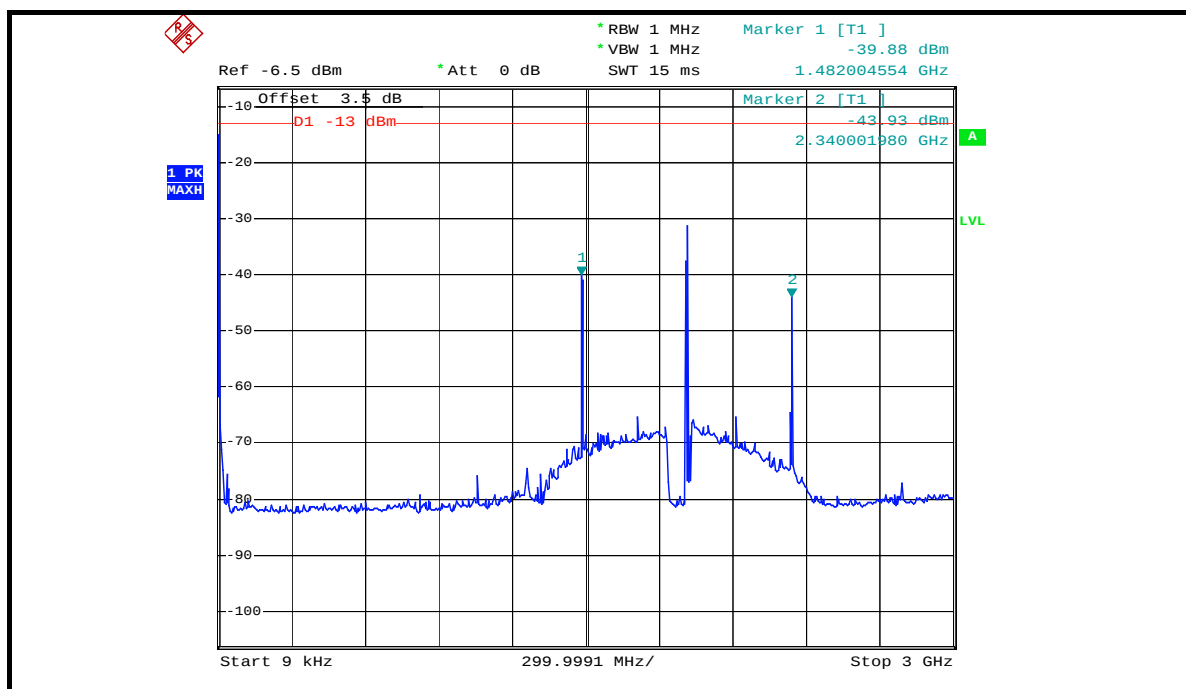


CH 661: 9kHz ~ 3GHz**3GHz ~ 10GHz**

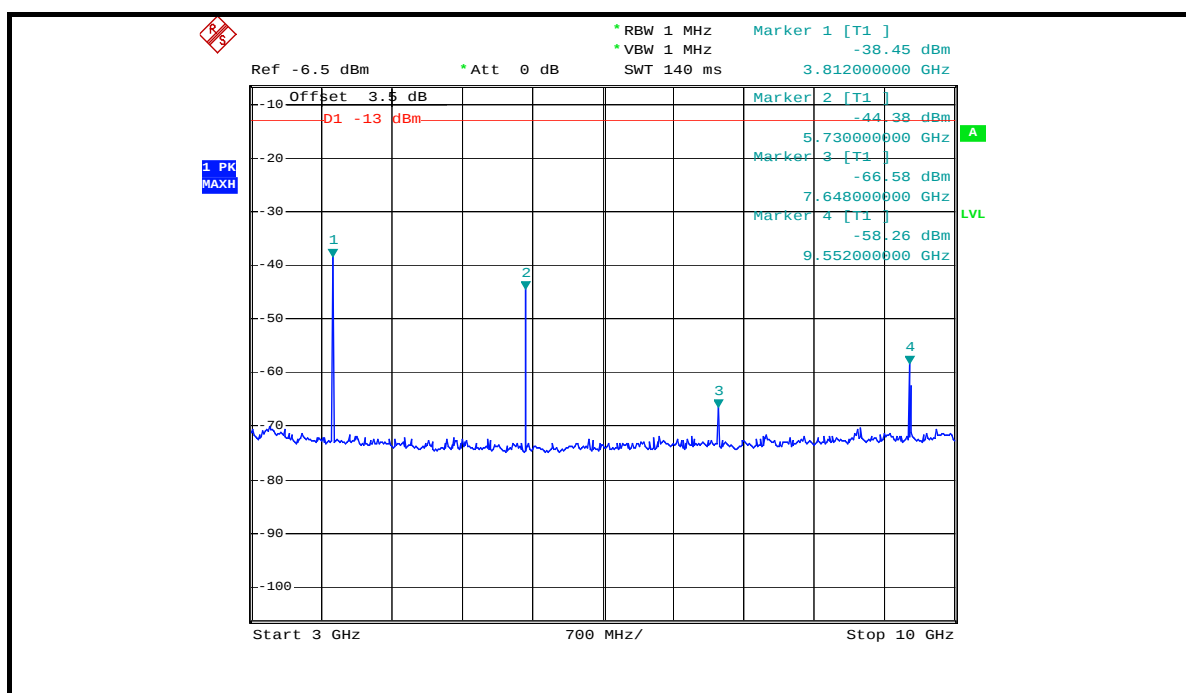
10GHz ~ 20GHz



CH 810: 9kHz ~ 3GHz



3GHz ~ 10GHz



Ref -6.5 dBm *Att 0 dB *RBW 1 MHz Marker 1 [T1] -66.12 dBm
 *VBW 1 MHz SWT 200 ms 11.46000000 GHz

Offset 3.5 dB

Marker 2 [T1] -70.48 dBm 13.36000000 GHz

1 PK
MAXH

Start 10 GHz 1 GHz/ Stop 20 GHz



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 512	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (dBm)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1422.00	3.79	-45.65	-41.86	-13.00	-28.86
2280.00	3.84	-45.88	-42.04	-13.00	-29.04
3700.00	4.21	-41.14	-36.93	-13.00	-23.93
5548.00	4.32	-46.88	-42.56	-13.00	-29.56
7410.00	4.46	-62.03	-57.57	-13.00	-44.57
9258.00	4.55	-61.33	-56.78	-13.00	-43.78
12940.00	5.35	-66.14	-60.79	-13.00	-47.79

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 661	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (dBm)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1452.00	3.79	-41.15	-37.36	-13.00	-24.36
2310.00	3.84	-44.62	-40.78	-13.00	-27.78
3751.00	4.21	-34.82	-30.61	-13.00	-17.61
5646.00	4.32	-53.74	-49.42	-13.00	-36.42
7522.00	4.46	-60.18	-55.72	-13.00	-42.72
9412.00	4.56	-56.19	-51.63	-13.00	-38.63
11280.00	4.93	-67.46	-62.53	-13.00	-49.53
13160.00	5.35	-68.60	-63.25	-13.00	-50.25

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 810	POWER CONTROL LEVEL	0
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

CONDUCTED SPURIOUS EMISSION					
FREQUENCY (MHz)	CORRECTION FACTOR (dB)	S.A READING (DbM)	CONDUCTED LEVEL (dBm)	LIMIT (dBm)	MARGIN (dB)
1482.00	3.79	-39.88	-33.99	-13.00	-20.99
2340.00	3.84	-43.93	-39.29	-13.00	-26.29
3812.00	4.21	-38.45	-33.26	-13.00	-20.26
5730.00	4.32	-44.38	-38.41	-13.00	-25.41
7648.00	4.47	-66.58	-60.96	-13.00	-47.96
9552.00	4.56	-58.26	-51.01	-13.00	-38.01
11460.00	4.94	-66.12	-57.85	-13.00	-44.85
13360.00	5.36	-70.48	-63.08	-13.00	-50.08

REMARKS: 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
 2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB).

4.7 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit translates in the relevant power range (1 to 0.001W). At 1W(Power Control Level 0) the specified minimum attenuation becomes 43dB and the limit of emission equal to -13dBm . At 0.001W(Power Control Level 15) the specified minimum attenuation becomes 13dB and the emission of limit equal to -13dBm . So the limit of emission is the same absolute specified line.

LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE)
-13	82.22

NOTE: The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts.}$$



4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 07, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 22, 2006
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170242	Jan. 23, 2006
Preamplifier Agilent	8449B	3008A01960	Nov. 09, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Jan. 26, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219275/4	Jan. 26, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-4.



4.7.3 TEST PROCEDURES

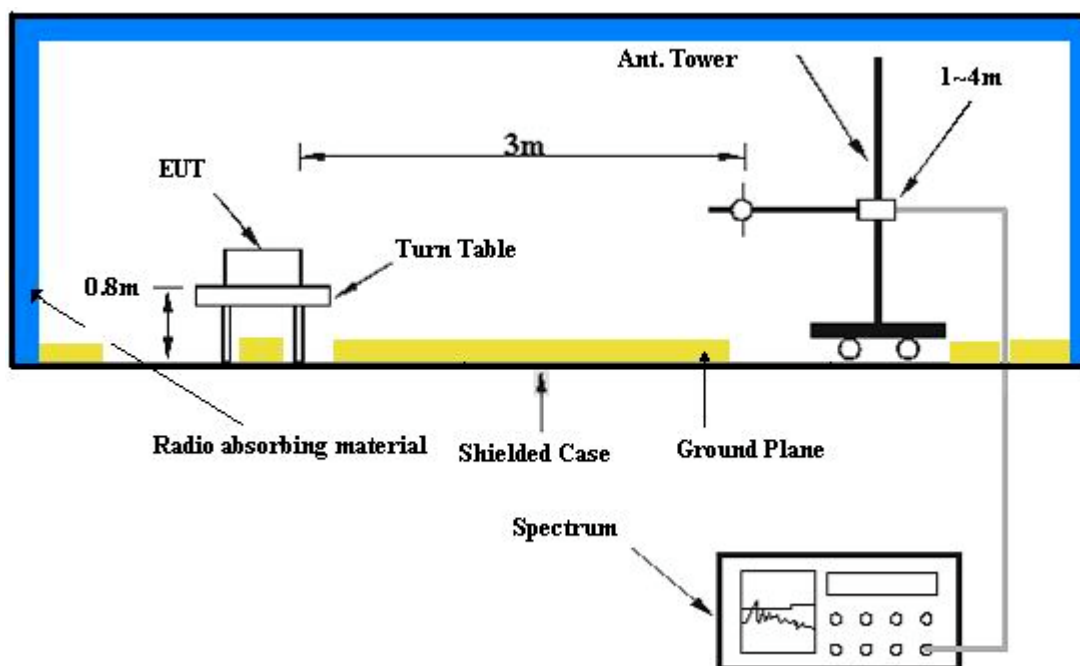
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
- c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
- d. Repeat step a ~ c for horizontal polarization.

NOTE: 1. The resolution bandwidth of spectrum analyzer is 10 kHz and the video bandwidth is 300 kHz for spurious emission below 1GHz.
2. The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for spurious emission above 1GHz.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.7.6 EUT OPERATING CONDITIONS

- The EUT makes a phone call to the GSM simulator.
- The GSM simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

4.7.7 TEST RESULTS

EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 810	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 991hPa	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	53.33	22.46 QP	82.22	-59.76	1.50 H	67.00	8.24	14.22
2	63.05	17.76 QP	82.22	-64.46	1.00 H	103.00	4.56	13.21
3	101.92	20.66 QP	82.22	-61.56	1.50 H	10.00	11.11	9.55
4	134.97	22.33 QP	82.22	-59.89	1.50 H	10.00	9.58	12.75
5	428.50	23.29 QP	82.22	-58.93	1.00 H	79.00	4.67	18.62
6	718.14	23.71 QP	82.22	-58.51	1.00 H	193.00	-0.90	24.61
7	737.58	24.97 QP	82.22	-57.25	1.50 H	37.00	-0.43	25.40
8	772.57	25.96 QP	82.22	-56.26	2.00 H	64.00	-0.11	26.07
9	807.56	26.18 QP	82.22	-56.04	1.50 H	67.00	-0.17	26.35
10	842.55	26.19 QP	82.22	-56.03	1.00 H	193.00	-0.49	26.67
11	854.21	26.78 QP	82.22	-55.44	2.00 H	40.00	0.00	26.78
12	904.75	27.42 QP	82.22	-54.80	1.00 H	193.00	0.21	27.21
13	924.19	27.30 QP	82.22	-54.92	1.50 H	37.00	-0.20	27.49
14	949.46	28.35 QP	82.22	-53.87	1.00 H	40.00	0.49	27.86

NOTE:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. This is valid for all 3 channels.



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 810	FREQUENCY RANGE	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 991hPa	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	55.27	34.66 QP	82.22	-47.56	1.00 V	328.00	20.64	14.03
2	63.05	27.73 QP	82.22	-54.49	1.00 V	169.00	14.52	13.21
3	109.70	25.24 QP	82.22	-56.98	1.00 V	286.00	15.00	10.24
4	675.37	23.00 QP	82.22	-59.22	1.00 V	286.00	-0.56	23.56
5	718.14	23.62 QP	82.22	-58.60	1.00 V	349.00	-0.99	24.61
6	743.41	25.26 QP	82.22	-56.96	1.00 V	289.00	-0.38	25.64
7	753.13	25.73 QP	82.22	-56.49	1.00 V	169.00	-0.20	25.93
8	793.95	25.70 QP	82.22	-56.52	1.00 V	346.00	-0.53	26.23
9	842.55	26.28 QP	82.22	-55.94	1.00 V	349.00	-0.39	26.67
10	869.76	26.36 QP	82.22	-55.86	1.00 V	283.00	-0.54	26.90
11	895.03	26.91 QP	82.22	-55.31	1.00 V	286.00	-0.20	27.10

NOTE:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. This is valid for all 3 channels.



4.8 EFFECTIVE RADIATED POWER MEASUREMENT (ABOVE 1GHz)

4.8.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The limit translates in the relevant power range (1 to 0.001W). At 1W(Power Control Level 0) the specified minimum attenuation becomes 43dB and the limit of emission equal to -13dBm . At 0.001W(Power Control Level 15) the specified minimum attenuation becomes 13dB and the emission of limit equal to -13dBm . So the limit of emission is the same absolute specified line.

4.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 07, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 22, 2006
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170242	Jan. 23, 2006
Preamplifier Agilent	8449B	3008A01960	Nov. 09, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Jan. 26, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219275/4	Jan. 26, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-4.



4.8.3 TEST PROCEDURES

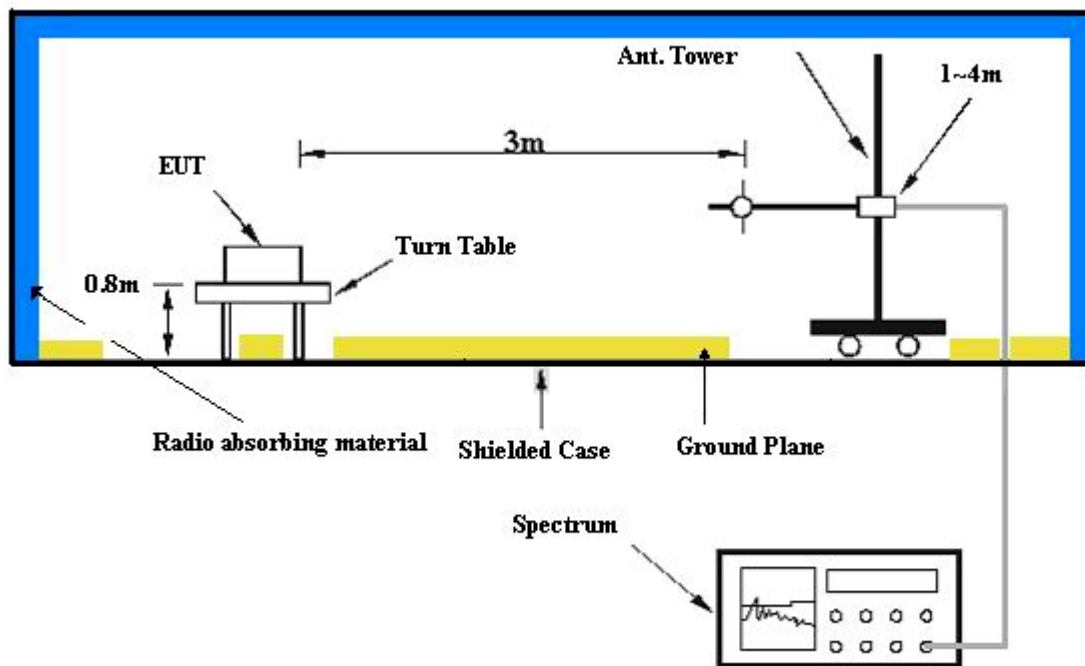
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
- c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
- d. The EUT is replaced by a horn antenna connected to a signal generator tuned to the frequency of emission.
- e. The signal generator level has to be adjusted to have the same emission nature.
- f. The radiated power can be calculated via the factor and antenna gain.
- g. Repeat step a ~ f for horizontal polarization.

NOTE: 1. The resolution bandwidth of spectrum analyzer is 10 kHz and the video bandwidth is 300 kHz for spurious emission below 1GHz.
2. The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for spurious emission above 1GHz.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.8.6 EUT OPERATING CONDITIONS

- The EUT makes a phone call to the GSM simulator.
- The GSM simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.



4.8.7 TEST RESULTS

EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 512	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.00	57.85	-13.00	-51.03	13.65	-37.38
2	5550.00	58.39	-13.00	-51.18	14.34	-36.84

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.00	58.36	-13.00	-50.52	13.65	-36.87
2	5550.00	59.36	-13.00	-50.21	14.34	-35.87

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 661	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760.00	56.56	-13.00	-52.32	13.65	-38.67
2	5640.00	57.77	-13.00	-51.83	14.37	-37.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760.00	57.06	-13.00	-51.82	13.65	-38.17
2	5640.00	58.16	-13.00	-51.44	14.37	-37.07

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).



EUT	Tri-Band GSM GPRS Mobile Phone	MODEL	S789+
MODE	TX channel 810	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu		

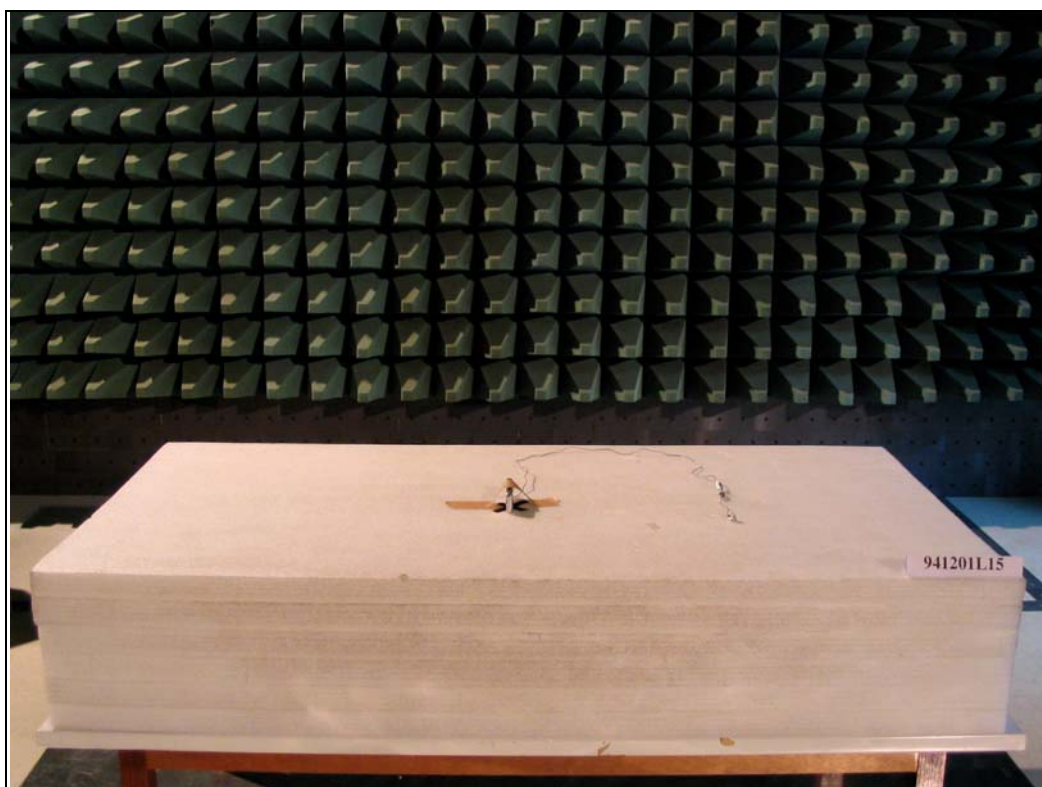
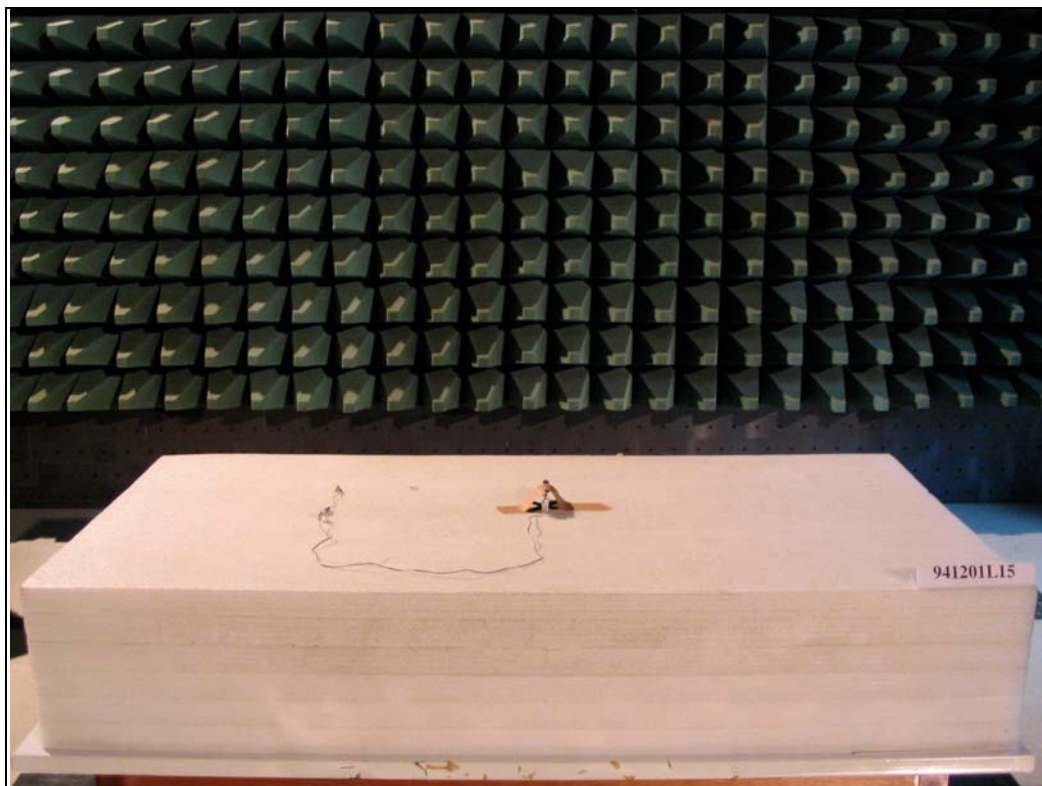
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.00	58.89	-13.00	-50.00	13.66	-36.34
2	5729.00	60.32	-13.00	-49.30	14.39	-34.91

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.00	58.49	-13.00	-50.40	13.66	-36.74
2	5729.00	59.49	-13.00	-50.13	14.39	-35.74

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST





6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP, UL, A2LA
GERMANY	TUV Rheinland
JAPAN	VCCI
NORWAY	NEMKO
CANADA	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
NETHERLANDS	Telefication
SINGAPORE	PSB , GOST-ASIA (MOU)
RUSSIA	CERTIS (MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab: Linko RF Lab.

Tel: 886-3-3183232

Fax: 886-3-3185050

Tel: 886-3-3270910

Fax: 886-3-3270892

Email: service@adt.com.tw

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.