

# **FCC Test Report**

**APPLICANT**: Brightstar Corporation

**EQUIPMENT**: Mobile Phone

BRAND NAME : Avvio

MODEL NAME : Avvio 785S/Avvio 785

FCC ID : WVBA785X

STANDARD : FCC 47 CFR FCC Part 15 Subpart B

CLASSIFICATION : Certification

The product was received on Aug. 16, 2013 and testing was completed on Sep. 03, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Louis Wu / Manager

Louis Win

Approved by: Jones Tsai / Manager

# SPORTON INTERNATIONAL (SHENZHEN) INC.

No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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Report Issued Date : Sep. 13, 2013

Testing Laboratory 2353



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**Report No. : FC381604** 



# **REVISION HISTORY**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC381604	Rev. 01	Initial issue of report	Sep. 13, 2013

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**SUMMARY OF TEST RESULT** 

Report Section	FCC Rule	Description	Limit	Result	Remark
					Under limit
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	8.90 dB at
					3.800 MHz
					Under limit
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	12.62 dB at
					165.800 MHz

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## 1. General Description

## 1.1. Applicant

#### **Brightstar Corporation**

9725 NW 117th Ave., Miami, Florida, FL 33178, United States

#### 1.2. Manufacturer

#### Tinno Mobile Technology Corp.

4/F., H-3 Building, OCT Eastern Industrial Park. No. 1 XiangShan East Road., Nan Shan District, Shenzhen, P.R.China

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## 1.3. Feature of Equipment Under Test

	Product Feature
Equipment	Mobile Phone
Brand Name	Avvio
Model Name	Avvio 785S/Avvio 785
FCC ID	WVBA785X
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/WLAN 2.4GHz 802.11bgn/Bluetooth v3.0 + EDR/ Bluetooth v4.0
HW Version	V1.0
SW Version	MEU_AN450_Brazil_V1.03
EUT Stage	Production Unit

#### Remark:

- 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- 2 · There are two different types of EUT. They are single SIM card mobile (Model Name: Avvio 785) and dual SIM card mobile (Model Name: Avvio 785S). The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan two types of EUT, we found test result of the sample that dual SIM (Model Name: Avvio 785S) was the worst, so we choose dual SIM card mobile to perform all test.
- 3 · For dual SIM card mobile, SIM1 supports GSM and WCDMA functions, and SIM2 only supports GSM function.

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1.4. Product Specification of Equipment Under Test

Product Specif	ication subjective to this standard					
	GSM850 : 824.2 MHz ~ 848.8 MHz					
	GSM1900 : 1850.2 MHz ~ 1909.8MHz					
	WCDMA Band V : 826.4 MHz ~ 846.6 MHz					
Tx Frequency	WCDMA Band II : 1852.4 MHz ~ 1907.6 MHz					
	802.11b/g/n: 2412 MHz ~ 2462 MHz					
	Bluetooth: 2402 MHz ~ 2480 MHz					
	GSM850 : 869.2 MHz ~ 893.8 MHz					
	GSM1900 : 1930.2 MHz ~ 1989.8 MHz					
	WCDMA Band V : 871.4 MHz ~ 891.6 MHz					
Rx Frequency	WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz					
	802.11b/g/n: 2412 MHz ~ 2462 MHz					
	Bluetooth: 2402 MHz ~ 2480 MHz					
	GPS : 1.57542 GHz					
	WWAN : PIFA Antenna					
Antenna Type	WLAN: PIFA Antenna					
	Bluetooth : PIFA Antenna					
	GSM: GMSK					
	GPRS: GMSK					
	EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK					
	WCDMA: QPSK (Uplink)					
	HSDPA: QPSK (Uplink)					
	HSUPA: QPSK (Uplink)					
Type of Modulation	HSPA+ :16QAM (Downlink Only)					
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK)					
	802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)					
	Bluetooth BR (1Mbps) : GFSK					
	Bluetooth EDR (2Mbps) : π /4-DQPSK					
	Bluetooth EDR (3Mbps) : 8-DPSK					
	Bluetooth v4.0 - LE : GFSK					
	GPS: BPSK					

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## 1.5. Modification of EUT

No modifications are made to the EUT during all test items.

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### 1.6. Test Site

Test Site	SPORTON INTERI	SPORTON INTERNATIONAL (SHENZHEN) INC.						
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.							
	TEL: +86-755- 3320-2398							
Toot Site No	Sporton	Site No.	FCC Registration No.					
Test Site No.	CO01-SZ 03CH01-SZ		831040					

# 1.7. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2003

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

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# 2. Test Configuration of Equipment Under Test

#### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

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Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

		Те	Test Condition	
Item	EUT Configuration	EMI AC	EMI RE<1G	EMI RE≥1G
1.	Charging Mode (EUT with adapter)	$\boxtimes$		Note 1
2.	Data application transferred mode (EUT with notebook)	$\boxtimes$	$\boxtimes$	$\boxtimes$

#### Abbreviations:

• EMI AC: AC conducted emissions

EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz

EMI RE < 1G: EUT radiated emissions < 1GHz</li>

Note 1: Testing for this mode is not required or not the worst case.

Remark: For signal above 1GHz, the worst case was test item 2.

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Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera + Earphone + SIM 1 <fig.1>  Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1<fig.2></fig.2></fig.1>
Radiated Emissions < 1GHz	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) + Camera + Earphone + SIM 1 <fig.1>  Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1<fig.2></fig.2></fig.1>
Radiated Emissions ≥ 1GHz	2	Mode 1: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1 <fig.2></fig.2>

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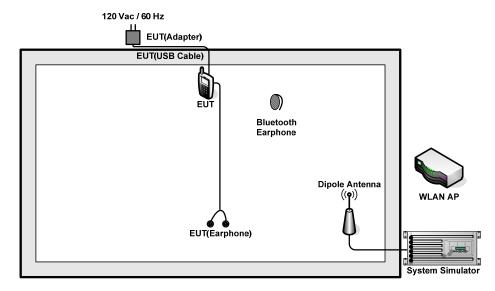
#### Remark:

- The worst case of AC is mode 1, and the USB Link Mode of AC is mode 2; the test data of these modes are reported.
- The worst case of RE < 1G is mode 2; only the test data of this mode is reported.
- 3. Link with Notebook means data application transferred mode between EUT and Notebook.

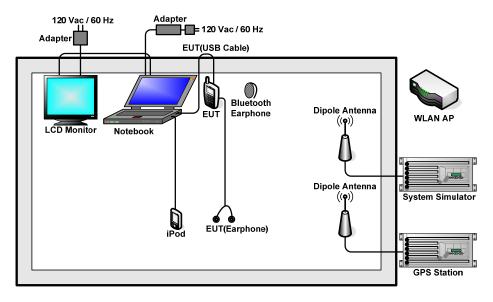
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# 2.2. Connection Diagram of Test System



<Fig.1>



<Fig.2>

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2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Agilent	E5515C	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-612	N/A	N/A	Unshielded, 1.8 m
4.	WLAN AP	D-Link	DIR-615	N/A	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-108	N/A	N/A	N/A
6.	Notebook	DELL	P08S	FCC DoC	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
7.	Monitor	DELL	IN1940MWB	FCC DoC	Shielded, 1.2m	Unshielded, 1.8 m
8.	iPod	Apple	MC525 ZP/A	FCC DoC	Shielded, 1.0m	N/A

## 2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA idle mode during the testing. The EUT was synchronized to the BCCH, and was in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

- 1. Execute the program, "Winthrax.exe" under WIN7 installed in notebook for files transfer with EUT via USB cable.
- 2. Turn on GPS function to make the EUT receive continuous signals from GPS station.
- 3. Turn on camera to capture images.
- 4. Execute "H Pattern" to show H Pattern via VGA Cable on the Monitor.

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#### 3. Test Result

#### 3.1. Test of AC Conducted Emission Measurement

#### 3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission	Conducted	limit (dBuV)
(MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

<sup>\*</sup>Decreases with the logarithm of the frequency.

#### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.1.3 Test Procedure

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference. 6.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

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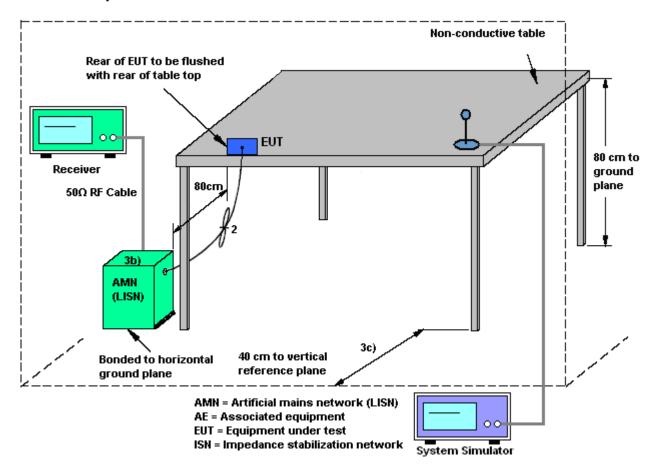
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## 3.1.4 Test Setup



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3.1.5 Test Result of AC Conducted Emission

st Mode :	Mode 1			Tem	peratur	e:	23~24	<b>1</b> °C	
st Engineer :	Henry Chen		Rela	tive Hu	midity:	49~50%			
st Voltage :	120Vac /	Phas	Phase :			Line			
unation Tyma I	GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from A								
inction Type :	+ Camera + Earphone + SIM 1								
100	Level (dBuV)				9 10	Dat	e: 2013-0	9-03 Time: 09:11:1:	
90									
80									
70									
	-							FCC 15B_QP	
60								Section Section	
50	14618VIII.					(428 h		FCC 15B_AVG	
40	35 T	White When a	MAL AN	a repulled the service	10 W/124	172 15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	destinates their	MANAGEMENT OF THE PARTY OF THE	
30	35 7	11 1 1 1 1 1	"Made, Avildad	Mr. 1	9 1113	425	-0.4	old Addison, add tax	
20									
10									
					2 5			10 20 30	
Site Condit:	.15 .2 : COO1-S		1 N L 2013	Frequ	ency (MHz		10	20	
Site	: CO01-5	SZ SB_QP LIS		Frequ	ency (MHz		10	20	
Site Conditi	: CO01-5 ion: FCC 15 : Mode 1	SZ SB_QP LIS	N_L_2013 Over	Frequ	ency (MHz NE Read	)	Cable	Remark	
Site Conditi	: CO01-5 ion: FCC 15 : Mode 1	SZ SB_QP LIS	N_L_2013 Over	Frequ 30328 LII Limit	ency (MHz NE Read	LISN Factor	Cable		
Site Conditi	: C001-5 ion: FCC 15 : Mode 1 Freq MHz	SZ SB_QP LIS L	N_L_2013 Over Limit dB	Frequence Freque	ency (MHz NE Read Level	LISN Factor dB	Cable Loss dB		
Site Condit: Mode	: C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15	SZ SB_QP LIS Level dBuV 37.92 51.52	Over Limit dB -18.04	Frequence Freque	Read Level dBuV 27.50 41.10	LISN Factor dB 0.06 0.06	Cable Loss  dB 10.36 10.36	Remark Average QP	
Site Condit: Mode	: C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17	EVEL 1	Over Limit dB -18.04 -14.44 -24.43	Frequ 30328 LII Limit Line dBuV 55.96 65.96 54.81	Read Level dBuV 27.50 41.10 20.00	LISN Factor dB 0.06 0.06 0.06	Cable Loss dB 10.36 10.36 10.36	Remark  Average QP Average	
Site Condit: Mode	: C001-S : C001-S : Mode 1  Freq  MHz  0.15 0.15 0.17 0.17	Level  dBuV  37.92 51.52 30.38 47.18	Over Limit dB -18.04 -14.44 -24.43 -17.63	Limit Line dBuV 55.96 65.96 54.81 64.81	Read Level dBuV 27.50 41.10 20.00 36.80	LISN Factor dB 0.06 0.06 0.06 0.06 0.06	Cable Loss  dB  10.36 10.36 10.32 10.32	Remark  Average QP Average QP	
Site Condit: Mode	.15 .2 : C001-S ton: FCC 1S : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18	Level  dBuV  37.92 51.52 30.38 47.18	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77	Limit Line dBuV 55.96 65.96 54.81 64.81 54.33	Read Level dBuV 27.50 41.10 20.00 36.80 20.19	LISN Factor dB 0.06 0.06 0.06 0.06 0.07	Cable Loss  dB  10.36 10.36 10.32 10.32	Remark  Average QP Average QP Average	
Site Condit: Mode	.15 .2 : C001-S ton: FCC 1S : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.18	Level  dBuV  37.92 51.52 30.38 47.18 30.56 46.36	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97	Limit Line dBuV 55.96 65.96 54.81 64.81 54.33 64.33	Read Level dBuV 27.50 41.10 20.00 36.80 20.19 35.99	LISN Factor dB 0.06 0.06 0.06 0.07 0.07	Cable Loss  dB  10.36 10.36 10.32 10.32 10.30 10.30	Remark  Average QP Average QP Average	
Site Condit: Mode	: C001-S ion: FCC 1S : Mode 1  Freq  MHz  0.15 0.15 0.17 0.17 0.18 0.18 0.20 0.20	Level  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 44.84	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65	Limit Line dBuV 55.96 65.96 54.81 64.81 54.33 64.33 53.49 63.49	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07	Cable Loss  dB  10.36 10.32 10.32 10.30 10.30 10.27	Remark  Average QP Average QP Average QP Average QP	
Site Condit: Mode	.15 .2 : C001-S ion: FCC 1S : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.18 0.20 0.20 2.25	Devel  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 44.84 28.23	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77	Limit Line dBuV 55.96 65.96 54.81 64.83 64.33 53.49 63.49 46.00	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.0	Cable Loss  dB  10.36 10.36 10.32 10.32 10.30 10.30 10.30 10.27 10.27 10.19	Remark  Average QP Average QP Average QP Average QP Average QP Average	
Site Condit: Mode	.15 .2 : C001-S ion: FCC 1S : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.18 0.20 0.20 2.25 2.25	Level  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 44.84 28.23 36.93	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07	Dimit Line  dBuV  55.96 65.96 54.81 64.81 54.33 64.33 53.49 63.49 46.00 56.00	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.0	Cable Loss  dB  10.36 10.36 10.32 10.32 10.30 10.30 10.30 10.27 10.27 10.19 10.19	Remark  Average QP Average QP Average QP Average QP Average QP	
Site Condit: Mode	.15 .2 : C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90	Level  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 44.84 28.23 36.93 31.97	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03	Frequence	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.0	Cable Loss  dB  10.36 10.36 10.32 10.32 10.30 10.27 10.27 10.19 10.19 10.20	Remark  Average QP Average QP Average QP Average QP Average QP Average	
Site Condit: Mode	.15 .2 : C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90	Level  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 44.84 28.23 36.93 31.97 40.47	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -17.77 -19.07 -14.03 -15.53	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.26	Cable Loss  dB  10.36 10.36 10.32 10.30 10.30 10.27 10.27 10.19 10.19 10.20 10.20	Remark  Average QP Average QP Average QP Average QP Average QP Average QP	
Site Condit: Mode	.15 .2 : C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.25 2.90 2.90 3.11	Tevel  dBuV  37.92 51.52 30.38 47.18 30.56 46.36 30.44 428.23 36.93 31.97 40.47 33.08	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -17.77 -19.07 -14.03 -15.53 -12.92	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60	LISN Factor dB 0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.07	Cable Loss  dB  10.36 10.32 10.32 10.30 10.27 10.27 10.19 10.20 10.20 10.20	Remark  Average QP Average QP Average QP Average QP Average QP Average QP Average	
Site Condit: Mode	.15 .2 : C001-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.11	Tevel    dBuV     37.92     51.52     30.38     47.18     30.56     46.36     30.44     44.84     28.23     31.97     40.47     33.08     41.48	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03 -15.53 -12.92 -14.52	Frequence   South   Limit   Line   dBuV   S5.96   65.96   54.81   64.81   54.33   64.33   53.49   63.49   46.00   56.00   46.00   56.00   46.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.00   56.0	Read Level dBuV 27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.26 0.27 0.27	Cable Loss  dB  10.36 10.36 10.32 10.30 10.27 10.27 10.19 10.20 10.20 10.20 10.21	Remark  Average QP Average	
Site Condit: Mode	.15 .2 : CO01-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.11 3.31	Tevel    dBuV     37.92     51.52     30.38     47.18     30.56     46.36     30.44     44.84     28.23     36.93     31.97     40.47     33.08     41.48     34.78	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03 -15.53 -15.53 -12.92 -14.52 -11.22	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00 24.30	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.27 0.27	Cable Loss  dB  10.36 10.36 10.32 10.30 10.27 10.27 10.19 10.20 10.20 10.20 10.21	Remark  Average QP Average QP Average QP Average QP Average QP Average QP Average	
Site Condit: Mode 1 2 3 4 5 6 7 8 9 10 11 12 13 14	.15 .2 : CO01-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.11 3.31	Tevel    dBuV     37.92     51.52     30.38     47.18     30.56     46.36     30.44     44.84     28.23     31.97     40.47     33.08     41.48	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03 -15.53 -15.53 -12.92 -14.52 -11.22	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00 24.30	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.27 0.27	Cable Loss  dB  10.36 10.36 10.32 10.30 10.27 10.27 10.19 10.20 10.20 10.20 10.21	Remark  Average QP Average	
Site Condit: Mode  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	.15 .2 : COO1-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.31 3.31	The very series of the very seri	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -17.77 -19.07 -14.03 -15.53 -15.53 -12.92 -14.52 -11.22 -12.82	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00 24.30 32.70	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.27 0.27 0.27	Cable Loss  dB  10.36 10.36 10.32 10.30 10.27 10.19 10.20 10.20 10.21 10.21 10.21	Remark  Average QP Average	
Site Condit: Mode  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	.15 .2 : CO01-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.31 3.31 3.60	The velue of the v	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03 -15.53 -12.92 -14.52 -11.22 -12.82 -9.20	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00 24.30 32.70 26.31	LISN Factor  dB  0.06 0.06 0.06 0.07 0.07 0.07 0.07 0.24 0.24 0.26 0.27 0.27 0.27	Cable Loss  dB  10.36 10.36 10.32 10.30 10.27 10.19 10.20 10.21 10.21 10.21 10.21	Remark  Average QP Average	
Site Condit: Mode  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	.15 .2 : COO1-5 ion: FCC 15 : Mode 1 Freq MHz 0.15 0.17 0.17 0.18 0.20 0.20 2.25 2.90 2.90 3.11 3.31 3.31 3.60 3.60	Tevel    dBuV     37.92     51.52     30.38     47.18     30.56     46.36     30.44     44.84     28.23     36.93     31.97     40.47     33.08     41.48     34.78     43.18     36.80     45.10	Over Limit dB -18.04 -14.44 -24.43 -17.63 -23.77 -17.97 -23.05 -18.65 -17.77 -19.07 -14.03 -15.53 -12.92 -14.52 -14.52 -11.22 -9.20 -10.90	Frequence   Freque	Read Level  dBuV  27.50 41.10 20.00 36.80 20.19 35.99 20.10 34.50 17.80 26.50 21.51 30.01 22.60 31.00 24.30 32.70 26.31 34.61	LISN Factor dB	Cable Loss  dB  10.36 10.32 10.32 10.30 10.27 10.27 10.19 10.20 10.21 10.21 10.21 10.21 10.21	Remark  Average QP Average	

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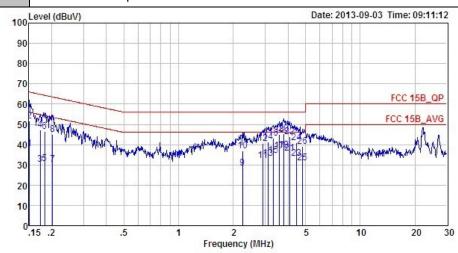
**Report No. : FC381604** 



**23~24**℃ Test Mode: Mode 1 Temperature: 49~50% Henry Chen Relative Humidity: Test Engineer: 120Vac / 60Hz Phase: Test Voltage : Line

Report No.: FC381604

GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) Function Type: + Camera + Earphone + SIM 1



: CO01-SZ Condition: FCC 15B QP LISN\_L\_20130328 LINE

Mode : Mode 1

	Freq	Level	Over Limit			LISN Factor		Remark
-	MHz	dBu∀	dB	dBu∀	dBu∀	dB	dB	
21	4.11	35.72	-10.28	46.00	25.21	0.29	10.22	Average
22	4.11	43.82	-12.18	56.00	33.31	0.29	10.22	QP
23	4.45	33.13	-12.87	46.00	22.60	0.30	10.23	Average
24	4.45	40.93	-15.07	56.00	30.40	0.30	10.23	QP
25	4.82	31.04	-14.96	46.00	20.49	0.31	10.24	Average
26	4.82	39.14	-16.86	56.00	28.59	0.31	10.24	OP

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**23~24**℃ Test Mode: Mode 1 Temperature: 49~50% Relative Humidity: Test Engineer: Henry Chen Phase: Test Voltage : 120Vac / 60Hz Neutral GSM850 Idle + Bluetooth Idle + WLAN Idle + USB Cable (Charging from Adapter) Function Type: + Camera + Earphone + SIM 1 100 Level (dBuV) Date: 2013-09-03 Time: 09:22:45 90 80 70 FCC 15B\_QP 60 FCC 15B\_AVG 50 40 30 20 10 0.15 .2

5

10

20

30

: C001-SZ Site

Condition: FCC 15B\_QP LISN\_N\_20130328 NEUTRAL

.5

: Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	-	MHz	dBu∇	dB	dBu∇	dBuV	dB	dB	-
1		3.29	32.60	-13.40	46.00	22.30	0.09	10.21	Average
2		3.29	41.00	-15.00	56.00	30.70	0.09	10.21	QP
3		3.47	33.50	-12.50	46.00	23.20	0.09	10.21	Average
4 5		3.47	42.10	-13.90	56.00	31.80	0.09	10.21	QP
5	*	3.74	34.31	-11.69	46.00	24.00	0.09	10.22	Average
6		3.74	42.71	-13.29	56.00	32.40	0.09	10.22	QP
7		3.94	33.82	-12.18	46.00	23.50	0.10	10.22	Average
7		3.94	42.32	-13.68	56.00	32.00	0.10	10.22	QP
9		4.18	32.32	-13.68	46.00	22.00	0.10	10.22	Average
10		4.18	40.82	-15.18	56.00	30.50	0.10	10.22	QP
11		4.70	28.64	-17.36	46.00	18.30	0.11	10.23	Average
12		4.70	36.84	-19.16	56.00	26.50	0.11	10.23	QP

Frequency (MHz)

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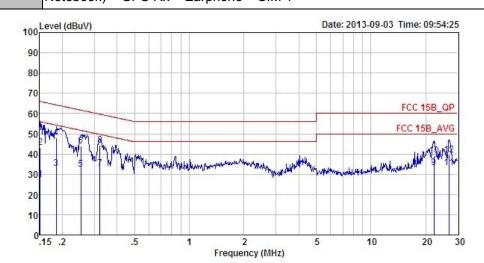


 Test Mode :
 Mode 2
 Temperature :
 23~24°C

 Test Engineer :
 Henry Chen
 Relative Humidity :
 49~50%

 Test Voltage :
 120Vac / 60Hz
 Phase :
 Line

 Function Type :
 WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1



Site : COO1-SZ

Condition: FCC 15B\_QP LISN\_L\_20130328 LINE

Mode : Mode 2

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	100	MHz	dBu∇	dB	dBu∀	dBuV	dB	dB	
1		0.15	27.22	-28.74	55.96	16.80	0.06	10.36	Average
2		0.15	43.02	-22.94	65.96	32.60	0.06	10.36	QP
3		0.19	32.86	-21.38	54.24	22.50	0.07	10.29	Average
4		0.19	48.06	-16.18	64.24	37.70	0.07	10.29	QP
5		0.25	32.61	-19.03	51.64	22.30	0.09	10.22	Average
6		0.25	43.91	-17.73	61.64	33.60	0.09	10.22	QP
7		0.32	32.70	-16.96	49.66	22.40	0.11	10.19	Average
8	*	0.32	44.30	-15.36	59.66	34.00	0.11	10.19	QP
9		22.18	33.23	-16.77	50.00	21.00	1.66	10.57	Average
10		22.18	39.23	-20.77	60.00	27.00	1.66	10.57	QP
11		26.84	33.16	-16.84	50.00	20.70	1.90	10.56	Average
12		26.84	39.56	-20.44	60.00	27.10	1.90	10.56	QP

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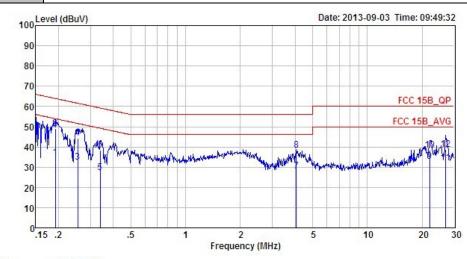
 Test Mode :
 Mode 2
 Temperature :
 23~24°C

 Test Engineer :
 Henry Chen
 Relative Humidity :
 49~50%

 Test Voltage :
 120Vac / 60Hz
 Phase :
 Neutral

 WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with

Function Type: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1



Site : CO01-SZ Condition: FCC 15B\_QP LISN\_N\_20130328 NEUTRAL

Mode : Mode 2

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	99	MHz	dBuV	— dB	dBu∇	dBu∀	dB	dB	-
1		0.19	34.62	-19.31	53.93	24.30	0.04	10.28	Average
2	4	0.19	49.02	-14.91	63.93	38.70	0.04	10.28	QP
3		0.25	32.46	-19.14	51.60	22.20	0.04	10.22	Average
4		0.25	44.36	-17.24	61.60	34.10	0.04	10.22	QP
5		0.34	27.22	-22.00	49.22	17.00	0.04	10.18	Average
6		0.34	38.22	-21.00	59.22	28.00	0.04	10.18	QP
7 8		4.07	28.12	-17.88	46.00	17.80	0.10	10.22	Average
8		4.07	38.52	-17.48	56.00	28.20	0.10	10.22	QP
9		22.06	32.71	-17.29	50.00	21.20	0.94	10.57	Average
10		22.06	38.51	-21.49	60.00	27.00	0.94	10.57	QP
11		26.98	32.25	-17.75	50.00	20.51	1.18	10.56	Average
12		26.98	38.75	-21.25	60.00	27.01	1.18	10.56	QP

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#### 3.2. Test of Radiated Emission Measurement

#### 3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency	Field Strength	Measurement Distance		
(MHz)	(microvolts/meter)	(meters)		
30 – 88	100	3		
88 – 216	150	3		
216 - 960	200	3		
Above 960	500	3		

## 3.2.2. Measuring Instruments

See list of measuring instruments of this test report.

#### 3.2.3. Test Procedures

- 1. The EUT was placed on a turntable with 0.8 meter above ground.
- 2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest radiation.
- 4. The antenna height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- 5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- 6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- 7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
- 8. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m)
- 9. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level

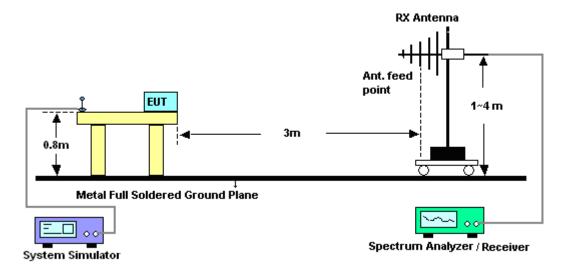
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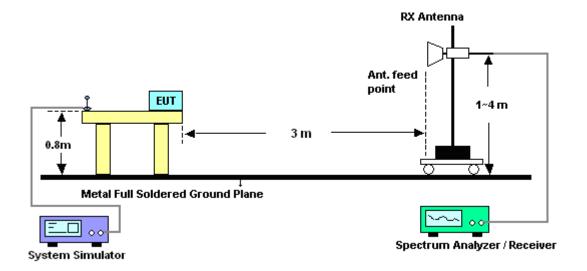


## 3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



#### For radiated emissions above 1GHz



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3.2.5. Test Result of Radiated Emission

est Mode :	Mode 2				Tempe	eratur	e :	23	~25°C		
est Engineer : Gavin Zhang			Relative Humidity :			49	49~52%				
est Distance :	3m				Polari	zation	ı :	Но	rizont	al	
unction Type :	WCDMA Notebook							ldle +	USB	Cable (I	Data Lir
l evel	(dBuV/m)	., . 01	O TOX .		110110	Olivi	<u> </u>			Date: 20	013-08-31
117 Level	(4247)										
110											
90											
										FCC (	CLASS-B
70											6dB
										ECC CLASS	D (AVC)
50										FCC CLASS	6dB
<u></u>											
30 11	6  5										
30											
10											
030	1000.	3000.		5000.		7000.		9000.		11000.	13000
Site	: 03CH01	27			Frequen	cy (MHz)	)				
		ASS-B 3	m LF_AN	NT_1211	03 HORIZ	ZONTAL					
Condition	. 1 00 02										
Mode	: Mode 2										
			Limit	Read/	Antenna	Cable	Preamp	A/Pos	T/Pos		
		0ver			Antenna Factor		Preamp Factor	A/Pos	T/Pos	Remark	
	: Mode 2	Over Limit						A/Pos 	T/Pos deg	Remark	-
Mode	: Mode 2  Freq Level  MHz dBuV/m  39.52 31.47	Over Limit ———————————————————————————————————	Line dBuV/m	dBuV 48.12	Factor dB/m 11.73	Loss dB	Factor dB 30.20		deg 263	Peak	-
1 P 2: 2 3: 3 3:	: Mode 2  Freq Level  MHz dBuV/m 39.52 31.47 75.48 30.21 30.71	Over Limit ———————————————————————————————————	dBuV/m 46.00 46.00 46.00	dBuV 48.12 45.09 42.16	Tactor  dB/m  11.73 13.06 16.04	Loss dB 1.82 2.04 2.24	30.20 29.98 29.73	cm 145	deg 263 	Peak Peak Peak	-
1 P 2 2 3 3 3 4 6 6 5 8 8	: Mode 2  Freq Level  MHz dBuV/m 39.52 31.47 35.48 30.21	Over Limit dB -14.53 -15.79 -15.29 -16.66 -16.52	Line dBuV/m 46.00 46.00 46.00 46.00 46.00	48.12 45.09 42.16 36.38 34.12	Factor  dB/m  11.73 13.06 16.04 19.12 21.00	Loss dB 1.82 2.04 2.24 2.93 3.24	30.20 29.98 29.73 29.09 28.88	cm 145	deg 263 	Peak Peak	-

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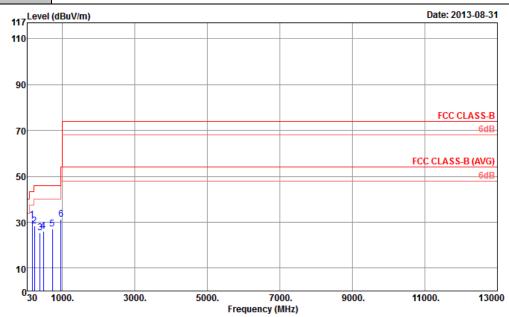


Test Mode: Mode 2 Temperature: 23~25°C

Test Engineer: Gavin Zhang Relative Humidity: 49~52%

Test Distance: 3m Polarization: Vertical

Function Type: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle + USB Cable (Data Link with Notebook) + GPS Rx + Earphone + SIM 1



Site : 03CH01-SZ

Condition : FCC CLASS-B 3m LF\_ANT\_121103 VERTICAL

Mode : Mode 2

	Freq	Level		Limit Line						T/Pos	Remark
-	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 P	165.80	30.88	-12.62	43.50	49.87	9.90	1.56	30.45	145	301	Peak
2	228.85	28.32	-17.68	46.00	46.17	10.60	1.79	30.24			Peak
3	381.14	25.42	-20.58	46.00	36.91	16.00	2.24	29.73			Peak
4	480.08	26.16	-19.84	46.00	35.88	17.20	2.48	29.40			Peak
5	721.61	27.21	-18.79	46.00	33.17	20.08	3.00	29.04			Peak
6	960.23	31.15	-22.85	54.00	34.64	21.80	3.43	28.72			Peak

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4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristic s	Calibration Date	Test Date	Due Date	Remark
ESCIO TEST Receiver	R&S	1142.8007.03	100724	9kHz~3GHz	Mar. 28, 2013	Sep. 03, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 28, 2013	Sep. 03, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 28, 2013	Sep. 03, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	N/A	Nov. 20, 2012	Sep. 03, 2013	Nov. 19, 2013	Conduction (CO01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GH z	Apr. 04, 2013	Aug. 31, 2013	Apr. 03, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 12, 2012	Aug. 31, 2013	Oct. 11, 2013	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30MHz~2GHz	Nov. 03, 2012	Aug. 31, 2013	Nov. 02, 2013	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz ~3000MHz GAIN 30db	Mar. 28, 2013	Aug. 31, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GH z	Mar. 28, 2013	Aug. 31, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF-Hor	Schwarzbeck	BBHA9170	BBHA9170249	14GHz~40GH z	Nov. 23, 2012	Aug. 31, 2013	Nov. 22, 2013	Radiation (03CH01-SZ)
Turn Table	EM Electronic	EM 1000	N/A	0 ~ 360 degree	N/A	Aug. 31, 2013	N/A	Radiation (03CH01-SZ)
Antenna Mast	EM electronic	EM 1000	N/A	1 m~4 m	N/A	Aug. 31, 2013	N/A	Radiation (03CH01-SZ)

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# 5. Uncertainty of Evaluation

#### <u>Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)</u>

Measuring Uncertainty for a Level of	2.26
Confidence of 95% (U = 2Uc(y))	2.26

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#### <u>Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)</u>

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54
Confidence of 35% (0 = 200(y))	

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

Measuring Uncertainty for a Level of	
Confidence of 95% (U = 2Uc(y))	4.72
20111acrice 01 00 /0 (3 200(y))	

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