

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E

	OF
Product Name:	LISA-U120, LISA-U100
Brand Name:	u-blox AG
Model Name:	LISA-U120, LISA-U100
Model Difference:	Please refer to page 6
FCC ID:	XPYLISAU120
Report No.:	EH/2010/A0041
Issue Date:	Nov. 12, 2010
FCC Rule Part:	2 , 22H & 24E
Prepared for:	u-blox AG
	Zurcherstrasse 68, 8800 Thalwil, Switzerland
Prepared by:	SGS Taiwan Ltd.
	Electronics & Communication Laboratory
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.

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FCC ID: XPYLISAU120

Report No.: EH/2010/A0041 Issue Date: Nov. 12, 2010 Page: 2 of 95

VERIFICATION OF COMPLIANCE

Applicant:	u-blox AG
	Zurcherstrasse 68, 8800 Thalwil, Switzerland
Product Name:	LISA-U120, LISA-U100
Brand Name:	u-blox AG
Model No.:	LISA-U120, LISA-U100
Model Difference:	Please refer to page 6
FCC ID:	XPYLISAU120
File Number:	EH/2010/A0041
Date of test:	Oct. 29, 2010 ~ Nov. 09, 2010
Date of EUT Received:	Oct. 29, 2010

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 subpart H.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Jason When	Date:	Nov. 12, 2010
Prepared By:	Jason Wu / Asst. Supervisor Tiffany Kao	Date:	Nov. 12, 2010
Approved By:	Tiffany Kao / Clerk ALW HSTEH Arno Hsieh /Asst. Supervisor	Date:	Nov. 12, 2010

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Version

Version No.	Date	Description
00	Nov. 12, 2010	Initial creation of document



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1. GENERAL PRODUCT INFORMATION

General:

Product Name:	LISA-U120, LISA-U100
Brand Name:	u-blox AG
Model Name:	LISA-U120, LISA-U100
Model Difference:	Please refer to page 6
Power Supply	3.8Vdc

Model Difference:

Module	Techn	ology	Bands			Int	erfac	e		Vo	ice
	HSUPA [Mb/s]	HSDPA [Mb/s]	UMTS/HSPA bands	GSM/GPRS/EDGE quad-band	UART	DDC for u-blox GPS	GPIO	SPI	USB	Analog Audio	Digital Audio
LISA-U100	5.6	7.2	850/1900		1	1	5	1	1		
LISA-U110	5.6	7.2	900/2100	•	1	1	5	1	1	1.1	
LISA-U120	5.6	7.2	850/1900		1	1	5	1	1	1	1
LISA-U130	5.6	7.2	900/2100		1	1	5	1	1	1	1

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GSM / WCDMA:

	Operating Frequency		Rated Power		
	GSM/GPRS 850 Class 12 824.2MHz–848.8MHz		33 dBm		
	EDGE 850 Class 12	824.2MHz-848.8MHz	33 dBm		
Cellular Phone Standards	GSM/GPRS 1900 Class 12	1850.2MHz –1909.8MHz	30 dBm		
Frequency Range and Power:	EDGE 1900 Class 12	1850.2MHz –1909.8MHz	30 dBm		
	WCDMA/HSUPA/HSDPA Band II	1852.4MHz – 1907.6MHz	24 dBm		
	WCDMA/HSUPA/HSDPA Band V	826.4MHz – 846.6MHz	24dBm		
Hardware Version.	LISA-U120: HP02.HW.HR.132000				
That water version.	LISA-U100: HP02.HW.HR.1320A0				
Software Version:	HP02.SW.SR.08.03.00				
	GSM850: 242KGXW, GSM1900: 243KGXW				
Type of Emission:	EDGE 850: 250KG7W, EDGE 1900: 248KG7W				
	WCDMA Band II: 4M06F9W, WCDMA Band V: 4M05F9W				
IMEI code	355306040000350				



Test Mode	DC voltage (V)	DC current (mA)
GPRS 850	3.8Vdc	245
GPRS 1900	3.8Vdc	185
EDGE 850	3.8Vdc	165
EDGE 1900	3.8Vdc	140
WCDMA B2	3.8 Vdc	600
WCDMA B5	3.8 Vdc	530
HSUPA B2	3.8 Vdc	570
HSUPA B5	3.8 Vdc	590
HSDPA B2	3.8 Vdc	580
HSDPA B5	3.8 Vdc	590

Final Amplifier Voltage and Current Information:

This test report applies for GSM/GPRS/EDGE 850/1900 and WCDMA/HSDPA/HSUPA Bands II, Band V.

No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan /台北縣五股工業區五工路 134 號 Taiwan Ltd.



1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: XPYLISAU120 filing to comply with Section Part 22 subpart H, Part 24 subpart E of the FCC CFR 47 Rules.

1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures document of TIA/EIA 603C and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: 990257 and 236194, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

All equipment is calibrated externally and traceable to SI (International System of Unit).

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 AC Power Line Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4: 2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.3 Radiated Emissions (ERP/EIRP):

The EUT is a placed on as turn table which is 80 cm above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 2 of TIA/EIA 603C.

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2.4. Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
ТҮРЕ		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012					
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2011	01/24/2012					
Radio Communication Analyzer	R&S	CMU200	111787	10/31/2010	10/30/2012					
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012					
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012					
Temperature Chamber	TERCHY	MHG-120LF	911009	04/30/2010	04/29/2012					
Temperature Chamber	GIANT FORCE	GTH-150-40- CP-AR	MAA0512-018	02/24/2010	02/23/2012					
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011					
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2010	07/04/2011					
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2010	07/04/2011					
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2010	07/04/2011					
Splitter	Agilent	11636B	N/A	07/05/2010	07/04/2011					
DC Power Supply	Chroma	41901	777188	04/15/2010	04/14/2012					
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012					
Power Sensor	Anritsu	MA2411B	917032	01/21/2010	01/20/2012					



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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
ТҮРЕ		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2011	02/11/2012					
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2010	11/18/2011					
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2010	07/16/2012					
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012					
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	03/09/2011	03/08/2013					
Signal Generator	R&S	SMR40	100210	02/10/2010	02/09/2012					
Signal Generator	Agilent	E4438C	MY45093613	07/08/2010	07/07/2011					
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2010	11/27/2011					
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012					
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011					
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011					
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011					
Radio Communication Analyzer	R&S	CMU200	111787	10/31/2010	10/30/2012					
Turn Table	HD	DT420	N/A	N.C.R	N.C.R					
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R					
Controller	HD	HD100	N/A	N.C.R	N.C.R					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012					
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2011	01/04/2012					
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2011	01/04/2012					
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011					



2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel)



Fig. 2-2 Configuration of Tested System (Remote Side)



Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.
1.	DC Power Supply	Topward	3303D	N/A	981327
2.	Notebook	DELL	E5400	N/A	3704625136
3.	Radio Communi- cation Analyzer	R&S	CMU200	N/A	102189



3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a)		
§22.913(a)(2)	ERP/ EIRP measurement	Compliant
§24.232(c)		
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051	Out of Band Emissions at Antenna	
§22.917(a)	Terminals and	Compliant
§24.238(a)	Band Edge	
§2.1053		
§22.917(a)	Field Strength of Spurious Radiation	Compliant
§24.238(a)		
§2.1055(a)(1)		
§22.355	Frequency Stability vs. Temperature	Compliant
§24.235		
§2.1055(d)(2)		
§22.355	Frequency Stability vs. Voltage	Compliant
§24.235		

Max ERP/EIRP measurement result:

	dBm		W
GPRS 850 Band	25.84	ERP	0.384
GPRS 1900 Band	24.80	EIRP	0.302
EDGE 850 Band	23.29	ERP	0.213
EDGE 1900 Band	24.70	EIRP	0.295
WCDMA Band II	24.53	EIRP	0.284
WCDMA Band V	21.95	ERP	0.157
HSUPA Band II	22.45	EIRP	0.176
HSUPA Band V	21.30	ERP	0.135



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4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for GSM/GPRS/EDGE with power adaptors. The worst-case of E2 position for GPRS 850 band, E2 position for GPRS 1900. E2 position for WCDMA Band II and E2 position for WCDMA Band V were reported..

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RF POWER OUTPUT MEASUREMENT 5.

5.1. Standard Applicable:

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(C) Peak Power Measurement to 2W.

3GPP Power limitation for HSDPA and HSUPA

Sub-test in table	Power	Class 3	Power Class 4			
C.10.1.4	Power Tol (dBm) (dB)		Power (dBm)	Tol (dB)		
1	+24	+1.7/-3.7	+21	+2.7/-2.7		
2	+24	+1.7/-3.7	+21	+2.7/-2.7		
3	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7		
4	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7		

Maximum Output Powers for HSDPA

Maximum Output Powers for HSUPA

Sub-test in table	Power	Class 3	Power Class 4		
C.11.1.3	PowerTol(dBm)(dB)		Power (dBm)	Tol (dB)	
1	+24	+1.7/-6.7	+21	+2.7/-5.7	
2	+22	+3.7/-5.2	+19	+4.7/-4.2	
3	+23	+2.7/-5.2	+20	+3.7/-4.2	
4	+22	+3.7/-5.2	+19	+4.7/-4.2	
5	+24	+1.7/-6.7	+21	+2.7/-5.7	

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5.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

5.3. Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. The Procedure of KDB941225 KDB941125 (SAR Measurement Procedures for 3G devices, WCDMA/HSDPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing

5.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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5.5. Measurement Result:

5.5.1. RF Conducted Output Power

5.5.1.1.: GSM/EDGE (GMSK; 8-PSK)

Result:

			1 Tim	e Slot		2 Time Slot			
Frequency		GMSK	Mode 8-PSK Mode		GMSK Mode		8-PSK Mode		
(MHz)	СН	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)
824.2	128	33.50	33.20	30.50	27.70	33.50	33.20	30.50	27.70
836.6	190	33.60	33.20	30.50	27.70	33.50	33.20	30.40	27.60
848.8	251	33.60	33.30	30.60	27.70	33.60	33.30	30.50	27.70
1850.2	512	29.70	29.50	29.00	26.20	29.70	29.40	28.90	26.20
1880.0	661	29.80	29.50	29.10	26.30	29.70	29.50	29.00	26.30
1909.8	810	29.80	29.60	29.10	26.30	29.80	29.50	29.10	26.30

			3 Tim	e Slot		4 Time Slot			
Frequency		GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
(MHz)	СН	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)	Peak Power (dBm)	AV Power (dBm)
824.2	128	33.10	32.70	29.80	27.00	31.90	31.60	29.30	26.40
836.6	190	33.10	32.80	29.70	27.00	31.90	31.60	29.10	26.20
848.8	251	33.20	32.90	29.90	27.00	31.90	31.60	29.40	26.30
1850.2	512	29.40	29.20	28.40	25.40	29.20	29.10	28.00	25.00
1880.0	661	29.50	29.30	28.40	25.50	29.30	29.20	28.00	25.10
1909.8	810	29.50	29.20	28.50	25.50	29.10	29.00	28.10	25.20



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5.5.1.2.: WCDMA mode

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

Results:

EUT Mode Frequency (MHz)		СН	Peak Power	Avg. Power
WCDMA Band II	1852.4	9262	26.54	22.83
	1880.0	9400	26.66	22.84
	1907.6	9538	26.71	22.90

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg. Power (dBm)
	826.4	4132	28.01	24.00
WCDMA Band V	836.6	4183	27.79	23.98
	846.6	4233	27.64	24.03

Note: The results above reflect max power with all up bits.



5.5.1.4.:HSDPA Release 6 mode

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β _c	βa	β _d (SF)	β _c /β _d	β _{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

Results:

Mode	Sub-test	Avg. 9262	Power (d Channel 9400	Bm) 9538	Power Class 3 Limita- tion (dBm)	Comments
	1	23.00	22.73	22.76	20.3dBm - 25.7dBm	Pass
HSDPA	2	22.71	22.70	22.75	20.3dBm - 25.7dBm	Pass
(B2)	3	22.52	22.28	22.23	19.8dBm – 25.7dBm	Pass
	4	22.59	22.29	22.35	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	Avg.	Power (d) Channel 4183	Bm)	Power Class 3 Limita- tion (dBm)	Comments
	1	23.79	23.84	24.15	20.3dBm – 25.7dBm	Pass
HSDPA	2	23.93	23.87	23.90	20.3dBm - 25.7dBm	Pass
(B5)	3	23.33	23.36	23.66	19.8dBm – 25.7dBm	Pass
	4	23.38	23.40	23.72	19.8dBm – 25.7dBm	Pass



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5.5.1.5.: HSPA (HSDPA & HSUPA) Release 6 mode

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub- test	β _c	β_d	β _d (SF)	β_c/β_d	β _{HS}	β _{ec}	β_{ed}	β _{ed} (SF)	β _{ed} (Codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	$\begin{array}{c} \beta_{ed}1:47/15\\ \beta_{ed}2:47/15 \end{array}$	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.



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Results:							
Mode	Sub-test	Avg.	Power (d) Channel	Bm)	Power Class 3 Limita-	Comments	
		9262	9400	9538			
	1	22.75	22.82	22.84	18.8dBm – 25.7dBm	Pass	
	2	20.80	20.89	20.88	16.8dBm – 25.7dBm	Pass	
HSUPA(B2)	3	21.81	21.84	21.92	17.8dBm – 25.7dBm	Pass	
	4	20.93	20.94	20.92	16.8dBm – 25.7dBm	Pass	
	5	22.64	22.68	22.75	18.8dBm – 25.7dBm	Pass	

Mode	Sub-test	Avg.	Power (d Channel	Bm)	Power Class 3 Limita-	Comments
		4132	4183	4233	uon (adm)	
	1	23.96	23.91	23.95	18.8dBm – 25.7dBm	Pass
	2	22.02	21.99	21.99	16.8dBm – 25.7dBm	Pass
HSUPA(B5)	3	23.00	22.97	23.03	17.8dBm – 25.7dBm	Pass
	4	22.07	22.05	22.07	16.8dBm – 25.7dBm	Pass
	5	23.82	23.74	23.84	18.8dBm – 25.7dBm	Pass



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5.5.2. Minimum Communications Power Measurement

PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.5	28	26	24.1	22.3	20.3	18.1	16.3	14.3
PCL	9	10	11	12	13	14	15		
Output power (dBm)	12.6	10.6	8.6	6.5	4.5	2.8	0.5		

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

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ERP, EIRP MEASUREMENT 6.

6.1. Standard Applicable:

According to FCC §2.1046 FCC 22.913(a) Mobile station are limited to 7W ERP. FCC 24.232(b) Mobile station are limited to 2W EIRP.

6.2. Test SET-UP (Block Diagram of Configuration):

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz

(C) Substituted Method Test Set-UP





6.3. Measurement Procedure:

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)

6.4. Measurement Equipment Used:

Refer to section 2.4 in this report



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6.5. Measurement Result:

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	122.42	36.03	-7.87	3.62	24.53	38.45
	824.20	128	E2	Н	120.56	34.29	-7.87	3.62	22.79	38.45
		100		V	121.63	35.38	-7.88	3.65	23.85	38.45
GPK5 850	836.60	190	E2	Н	121.60	35.37	-7.88	3.65	23.84	38.45
-				V	123.52	37.40	-7.88	3.68	25.84	38.45
	848.80	251	E2	Н	120.85	34.66	-7.88	3.68	23.10	38.45

Remark:

(1)The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	123.75	19.36	9.90	5.56	23.70	33.00
	1850.20	512	E2	Н	115.72	11.54	9.90	5.84	15.60	33.00
DCS 1000				V	124.78	20.42	9.99	5.61	24.80	33.00
PCS 1900	1880.00	661	E2	Н	114.87	10.73	9.99	5.61	15.10	33.00
	1909.80	810	E2	V	123.96	19.63	10.08	5.66	24.05	33.00
				Н	113.85	9.74	10.08	5.66	14.16	33.00

Remark:

(1)The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

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Measurement Result:

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	120.17	33.78	-7.87	3.62	22.28	38.45
	824.20	128	E2	Н	118.14	31.87	-7.87	3.62	20.37	38.45
				V	121.04	34.79	-7.88	3.65	23.26	38.45
EDGE 850	836.60	190	E2	Н	118.41	32.18	-7.88	3.65	20.65	38.45
	848.80	251	E2	V	120.97	34.85	-7.88	3.68	23.29	38.45
				Н	118.08	31.89	-7.88	3.68	20.33	38.45

Remark:

(1)The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	124.75	20.36	9.90	5.56	24.70	33.00
	1850.20	512	E2	Н	114.98	10.80	9.90	5.84	14.86	33.00
EDCE 1000				V	124.26	19.90	9.99	5.61	24.28	33.00
EDGE 1900	1880.00	661	E2	Н	114.71	10.57	9.99	5.61	14.94	33.00
	1909.80	810	E2	V	124.42	20.09	10.08	5.66	24.51	33.00
				Н	113.83	9.72	10.08	5.66	14.14	33.00

Remark:

(1) The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,



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Measurement Result:

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
				V	122.93	18.41	9.48	5.33	22.55	33.00
	1852.40	9262	E2	Н	112.59	8.26	9.90	5.84	12.32	33.00
				V	123.99	19.49	9.54	5.36	23.66	33.00
WCDMA II	1880.00	600	E2	Н	114.11	9.80	9.54	5.36	13.97	33.00
				V	124.81	20.33	9.61	5.40	24.53	33.00
	1908.75	1175	E2	Н	113.64	9.35	9.61	5.40	13.56	33.00

Remark:

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
	0.0 4 40			V	118.93	32.57	-7.88	3.63	21.06	38.45
	826.40	4132	E2	Н	117.60	31.34	-7.88	3.63	19.84	38.45
WCDMA				V	119.67	33.41	-7.88	3.65	21.88	38.45
Band V	836.60	600	E2	Н	118.04	31.81	-7.88	3.65	20.28	38.45
	0.4.6.60			V	119.65	33.50	-7.88	3.67	21.95	38.45
846.0	846.60	1175	E2	Н	118.09	31.89	-7.88	3.67	20.34	38.45

Remark:

The RBW, VBW of SPA for frequency (1)

RBW = 5MHz, VBW = 5MHz



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Measurement Result:

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
	10.50 10			V	119.92	15.40	9.48	5.33	19.54	33.00
	1852.40 9262	9262	E2	Н	110.43	6.10	9.90	5.84	EIRP (dBm) 19.54 10.16 21.22 12.06 22.45 12.08	33.00
HSUPA	JPA 1880.00 600	600 E2		V	121.55	17.05	9.54	5.36	21.22	33.00
Band II			E2	Н	112.20	7.89	9.54	5.36	12.06	33.00
	1908.75 1175			V	122.73	18.25	9.61	5.40	22.45	33.00
		1175	E2	Н	112.16	7.87	9.61	5.40	12.08	33.00

Remark :

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	119.17	32.81	-7.88	3.63	21.30	38.45
HSUPA Band V	826.40 413	4132	E2	Н	116.36	30.10	-7.88	3.63	ERP (dBm) 21.30 18.60 21.05 19.48 20.90	38.45
	836.60 600			V	118.84	32.58	-7.88	3.65	21.05	38.45
		600	E2	Н	117.24	31.01	-7.88	3.65	18.60 21.05 19.48	38.45
				V	118.60	32.45	-7.88	3.67	20.90	38.45
	846.60	1175	E2	Н	117.19	30.99	-7.88	3.67	19.44	38.45

Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz



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7. 99% OCCUPIED BANDWIDTH MEASUREMENT

7.1. Standard Applicable:

According to §FCC 2.1049.

7.2. Test Set-up:

Refer to section 5.2 in this report

7.3. Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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7.5. Measurement Result:

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
GPRS 850	824.20	128	0.2434
	836.60	190	0.2445
	848.80	251	0.2427

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
EDGE 850	824.20	128	0.2500
	836.60	190	0.2488
	848.80	251	0.2498

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
GPRS 1900	1850.20	512	0.2404
	1880.00	661	0.2433
	1909.80	810	0.2413

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
EDGE 1900	1850.20	512	0.2471
	1880.00	661	0.2478
	1909.80	810	0.2488



EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA II	1852.40	9262	4.0625
	1880.00	9400	4.0426
	1907.60	9538	4.0352

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA V	826.40	4132	4.0518
	836.00	4180	4.0396
	846.60	4233	4.0492

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA II	1852.4	9262	4.0546
	1880.0	9400	4.0512
	1907.6	9538	4.0412

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.0394
	836.60	4183	4.0536
	846.60	4233	4.0483



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Figure 7-1: GPRS 850 Channel Low



Figure 7-2 GPRS 850 Channel Mid



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Figure 7-3: GPRS 850 Channel High



Figure 7-4: GPRS 1900 Channel Low



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Figure 7-5 GPRS 1900 Channel Mid



Figure 7-6: GPRS 1900 Channel High



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Figure 7-7: EDGE 850 Channel Low



Figure 7-8 EDGE 850 Channel Mid



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Figure 7-9: EDGE 850 Channel High



Figure 7-10: EDGE 1900 Channel Low



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Figure 7-11 EDGE 1900 Channel Mid







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Figure 7-13: WCDMA II Channel Low





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Figure 7-15: WCDMA II Channel High



Figure 7-16: WCDMA V Channel Low



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Figure 7-17: WCDMA II Channel Mid



Figure 7-18: WCDMA II Channel High



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Figure 7-19: HSUPA II Channel Low



Figure 7-20: HSUPA II Channel Mid



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Figure 7-21: HSUPA II Channel High



Figure 7-22: HSUPA V Channel Low



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Figure 7-23: HSUPA V Channel Mid



Figure 7-24: HSUPA V Channel High



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8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

8.1. Standard Applicable:

According to FCC §2.1051.

FCC 22.917(a),24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

8.2. Test SET-UP:

Out of band emission



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8.3. Measurement Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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8.5. Measurement Result:

Figure 8-1: Out of Band emission at antenna terminals- GPRS 850 Channel Lowest Peak Search Agilent Т





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Figure 8-2: Out of Band emission at antenna terminals -GPRS 850 Channel Mid



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Figure 8-3: Out of Band emission at antenna terminals-GPRS 850 Channel Highest



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Figure 8-4: Band edge emission at antenna terminals –GPRS 850 Channel Lowest

Figure 8-5: Band edge emission at antenna terminals –GPRS 850 Channel Highest



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🔆 Agilent T	Peak Search
Mkr1 1.850 GHz Ref 35 dBm #Atten 40 dB 29.81 dBm	Next Peak
*Peak Log 10 dB/	Next Pk Right
Offst 16.5 dB DI	Next Pk Left
-13.0 dBm LgAv	Min Search
Start 30 MHzStop 2.500 GHz#Res BW 1 MHz#VBW 1 MHzSweep 4.12 ms (601 pts)MarkerTraceTypeX AxisAmplitude	Pk-Pk Search
1 (1) Freq 1.850 GHz 29.81 dBm	Mkr → CF
	More 1 of 2

Figure 8-6: Out of Band emission at antenna terminals-GPRS 1900 Channel Lowest



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Aglient I	Peak Search
Mkr1 1.878 GHz Ref 35 dBm #Atten 40 dB 30.01 dBm #Peak ?	Next Peak
Log 10 dB/ Offst	Next Pk Right
16.5 dB DI	Next Pk Left
-15.0 dBm LgAv	Min Search
Start 30 MHz Stop 2.500 GHz #Res BW 1 MHz #VBW 1 MHz Sweep 4.12 ms (601 pts) Marker Trace Type X Axis Amplitude	Pk-Pk Search
1 (1) Freq 1.878 GHz 30.01 dBm	Mkr → CF
	More 1 of 2

Figure 8-7: Out of Band emission at antenna terminals -GPRS 1900 Channel Mid



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Figure 8-8: Out of Band emission at antenna terminals-GPRS 1900 Channel Highest



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Figure 8-9: Bad edge emission at antenna terminals -GPRS 1900 Channel Lowest

Figure 8-10: Band edge emission at antenna terminals –GPRS 1900 Channel Highest



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Figure 8-11: Out of Band emission at antenna terminals- WCDMA II Channel Lowest

dB/ Offst 16.5 dB Next Pk Left ò DI Marker -13.0 14.450000000 GHz dBm Min Search -29.17 dBm LgAv Start 3.00 GHz Stop 20.00 GHz #Res BW 1 MHz #VBW 1 MHz Sweep 42.52 ms (601 pts) Pk-Pk Search Amplitude -29.17 dBm X Axis 14.45 GHz Marker Trace (1) Type Frea 1 Mkr → CF More 1 of 2 Copyright 2000-2005 Agilent Technologies

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Figure 8-12: Out of Band emission at antenna terminals -WCDMA II Channel Mid



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Figure 8-13: Out of Band emission at antenna terminals-WCDMA II Channel Highest



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Figure 8-14: Bad edge emission at antenna terminals –WCDMA II Channel Lowest





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Figure 8-16: Out of Band emission at antenna terminals- WCDMA V Channel Lowest



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Figure 8-17: Out of Band emission at antenna terminals –WCDMA V Channel Mid



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Figure 8-18: Out of Band emission at antenna terminals-WCDMA V Channel Highest



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Figure 8-19: Bad edge emission at antenna terminals –WCDMA V Channel Lowest





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9.1. Standard Applicable:

According to FCC §2.1053,

FCC \$22.917(a), \$24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

9.2. EUT Setup (Block Diagram of Configuration):



Radiated Emission Test Set-Up, Frequency Below 1000MHz

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Radiated Emission Test Set-UP Frequency Over 1 GHz

9.3. Measurement Procedure:

The EUT was placed on a non-conductive; The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP= S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

9.5. Measurement Result:

Refer to attach tabular data sheets.

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Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 824.20 MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
92.08	53.56	V	-49.37	-7.75	1.29	-58.41	-13.00	-45.41
213.33	47.24	V	-54.04	-7.85	1.78	-63.67	-13.00	-50.67
256.98	48.82	V	-50.84	-7.89	2.02	-60.75	-13.00	-47.75
284.14	49.82	V	-48.95	-7.91	2.11	-58.97	-13.00	-45.97
424.79	39.97	V	-54.75	-7.68	2.58	-65.02	-13.00	-52.02
499.48	42.89	V	-51.25	-7.72	2.80	-61.77	-13.00	-48.77
824.00	76.43	V	-9.96	-7.87	3.62	-21.46	-13.00	-8.46
1648.40	62.78	V	-41.80	9.29	5.23	-37.74	-13.00	-24.74
2472.60	60.70	V	-40.31	10.08	6.53	-36.76	-13.00	-23.76
3296.80	53.67	V	-45.20	12.17	7.71	-40.75	-13.00	-27.75
4121.00	36.33	V	-59.79	12.61	8.86	-56.04	-13.00	-43.04
4945.20		V		12.65	9.74		-13.00	
5769.40	40.00	V	-50.20	13.55	10.54	-47.18	-13.00	-34.18
6593.60		V		12.05	11.30		-13.00	
7417.80		V		11.49	12.10		-13.00	
8242.00		V		11.48	12.71		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Report No.: EH/2010/A0041 Issue Date: Nov. 12, 2010 Page: 67 of 95

Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 824.20 MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	48.64	Н	-55.16	-4.16	0.91	-60.22	-13.00	-47.22
92.08	46.88	Н	-56.71	-7.75	1.29	-65.75	-13.00	-52.75
218.18	45.58	Н	-55.19	-7.86	1.81	-64.86	-13.00	-51.86
255.04	47.11	Н	-51.95	-7.89	2.01	-61.85	-13.00	-48.85
286.08	46.99	Н	-51.10	-7.91	2.12	-61.14	-13.00	-48.14
499.48	41.28	Н	-52.17	-7.72	2.80	-62.69	-13.00	-49.69
824.00	74.17	Н	-12.10	-7.87	3.62	-23.60	-13.00	-10.60
1648.40	63.88	Н	-40.52	9.29	5.23	-36.46	-13.00	-23.46
2472.60	54.92	Н	-45.99	10.08	6.53	-42.44	-13.00	-29.44
3296.80	56.41	Н	-42.69	12.17	7.71	-38.23	-13.00	-25.23
4121.00		Н		12.61	8.86		-13.00	
4945.20		Н		12.65	9.74		-13.00	
5769.40		Н		13.55	10.54		-13.00	
6593.60		Н		12.05	11.30		-13.00	
7417.80		Н		11.49	12.10		-13.00	
8242.00		Н		11.48	12.71		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 836.60 MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
92.08	53.38	V	-49.55	-7.75	1.29	-58.59	-13.00	-45.59
213.33	47.51	v	-53.77	-7.85	1.78	-63.40	-13.00	-50.40
261.83	49.26	V	-50.24	-7.90	2.03	-60.17	-13.00	-47.17
284.14	50.40	v	-48.37	-7.91	2.11	-58.39	-13.00	-45.39
426.73	40.27	V	-54.39	-7.68	2.59	-64.66	-13.00	-51.66
499.48	43.53	V	-50.61	-7.72	2.80	-61.13	-13.00	-48.13
1673.20	67.35	V	-37.21	9.36	5.27	-33.11	-13.00	-20.11
2509.80	66.45	V	-34.33	10.09	6.58	-30.83	-13.00	-17.83
3346.40	45.53	V	-53.33	12.28	7.79	-48.85	-13.00	-35.85
4183.00	38.37	v	-57.52	12.62	8.93	-53.83	-13.00	-40.83
5019.60		V		12.67	9.81		-13.00	
5856.20		V		13.68	10.62		-13.00	
6692.80		V		11.95	11.39		-13.00	
7529.40		V		11.45	12.20		-13.00	
8366.00		V		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belongs to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 836.60 MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	48.40	Н	-55.40	-4.16	0.91	-60.46	-13.00	-47.46
96.93	46.32	Н	-56.91	-7.76	1.33	-66.00	-13.00	-53.00
213.33	45.09	Н	-55.91	-7.85	1.78	-65.55	-13.00	-52.55
261.83	45.44	Н	-53.41	-7.90	2.03	-63.34	-13.00	-50.34
439.34	40.04	Н	-54.39	-7.69	2.63	-64.71	-13.00	-51.71
499.48	40.58	Н	-52.87	-7.72	2.80	-63.39	-13.00	-50.39
1673.20	70.42	Н	-33.96	9.36	5.27	-29.86	-13.00	-16.86
2509.80	65.21	Н	-35.49	10.09	6.58	-31.99	-13.00	-18.99
3346.40	47.36	Н	-51.70	12.28	7.79	-47.22	-13.00	-34.22
4183.00		Н		12.62	8.93		-13.00	
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 848.80 MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
92.08	52.71	V	-50.22	-7.75	1.29	-59.26	-13.00	-46.26
213.33	46.40	V	-54.88	-7.85	1.78	-64.51	-13.00	-51.51
520.19	48.11	V	-45.36	-7.74	2.86	-55.96	-13.00	-42.96
290.93	49.51	V	-49.04	-7.91	2.14	-59.09	-13.00	-46.09
426.73	40.65	V	-54.01	-7.68	2.59	-64.28	-13.00	-51.28
494.63	42.50	V	-51.62	-7.72	2.78	-62.12	-13.00	-49.12
849.00	77.69	V	-8.43	-7.88	3.68	-19.99	-13.00	-6.99
1697.60	48.78	V	-55.76	9.44	5.31	-51.63	-13.00	-38.63
2546.40	56.14	V	-44.50	10.20	6.63	-40.94	-13.00	-27.94
3395.20	44.33	V	-54.52	12.38	7.87	-50.01	-13.00	-37.01
4244.00		V		12.63	9.00		-13.00	
5092.80		V		12.74	9.88		-13.00	
5941.60		V		13.81	10.70		-13.00	
6790.40		V		11.86	11.48		-13.00	
7639.20		V		11.40	12.27		-13.00	
8488.00		V		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB			
	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 848.80 MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
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96.93	45.96	Н	-57.27	-7.76	1.33	-66.36	-13.00	-53.36
218.18	45.03	Н	-55.74	-7.86	1.81	-65.41	-13.00	-52.41
255.04	46.30	Н	-52.76	-7.89	2.01	-62.66	-13.00	-49.66
426.73	38.70	Н	-56.37	-7.68	2.59	-66.64	-13.00	-53.64
499.48	40.64	Н	-52.81	-7.72	2.80	-63.33	-13.00	-50.33
849.00	74.59	Н	-11.60	-7.88	3.68	-23.16	-13.00	-10.16
1697.60	68.65	Н	-35.70	9.44	5.31	-31.57	-13.00	-18.57
2546.40	53.62	Н	-46.98	10.20	6.63	-43.42	-13.00	-30.42
3395.20	44.46	Н	-54.57	12.38	7.87	-50.05	-13.00	-37.05
4244.00		Н		12.63	9.00		-13.00	
5092.80		Н		12.74	9.88		-13.00	
5941.60		Н		13.81	10.70		-13.00	
6790.40		Н		11.86	11.48		-13.00	
7639.20		Н		11.40	12.27		-13.00	
8488.00		Н		11.70	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB				
	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1850.20MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
90.14	51.99	V	-51.19	-7.75	1.27	-60.21	-13.00	-47.21
130.88	44.39	V	-54.67	-7.78	1.50	-63.96	-13.00	-50.96
250.19	46.13	V	-53.75	-7.89	1.99	-63.63	-13.00	-50.63
288.99	46.49	V	-52.12	-7.91	2.13	-62.16	-13.00	-49.16
426.73	40.03	V	-54.63	-7.68	2.59	-64.90	-13.00	-51.90
499.48	42.66	V	-51.48	-7.72	2.80	-62.00	-13.00	-49.00
1850.00	71.53	V	-32.86	9.90	5.56	-28.52	-13.00	-15.52
3700.40	43.62	V	-54.31	12.61	8.31	-50.01	-13.00	-37.01
5550.60	45.06	V	-45.78	13.23	10.33	-42.88	-13.00	-29.88
7400.80		V		11.50	12.08		-13.00	
9251.00		V		11.92	13.50		-13.00	
11101.20		V		11.66	15.11		-13.00	
12951.40		V		13.63	16.60		-13.00	
14801.60		V		12.76	17.95		-13.00	
16651.80		V		15.92	19.14		-13.00	
18502.00		V		18.75	10.40		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB			
	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1850.20MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	47.09	Н	-56.71	-4.16	0.91	-61.77	-13.00	-48.77
92.08	46.51	Н	-57.08	-7.75	1.29	-66.12	-13.00	-53.12
216.24	43.77	Н	-57.09	-7.86	1.80	-66.75	-13.00	-53.75
288.99	42.63	Н	-55.37	-7.91	2.13	-65.42	-13.00	-52.42
494.63	40.56	Н	-52.94	-7.72	2.78	-63.44	-13.00	-50.44
800.18	34.27	Н	-52.07	-7.87	3.57	-63.51	-13.00	-50.51
1850.00	60.92	Н	-43.26	9.90	5.56	-38.92	-13.00	-25.92
3700.40	42.65	Н	-55.39	12.61	8.31	-51.09	-13.00	-38.09
5550.60	35.80	Н	-55.25	13.23	10.33	-52.35	-13.00	-39.35
7400.80		Н		11.50	12.08		-13.00	
9251.00		Н		11.92	13.50		-13.00	
11101.20		Н		11.66	15.11		-13.00	
12951.40		Н		13.63	16.60		-13.00	
14801.60		Н		12.76	17.95		-13.00	
16651.80		Н		15.92	19.14		-13.00	
18502.00		Н		18.75	10.40		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
92.08	51.10	V	-51.83	-7.75	1.29	-60.87	-13.00	-47.87
221.09	44.89	V	-56.09	-7.86	1.83	-65.78	-13.00	-52.78
288.99	45.71	V	-52.90	-7.91	2.13	-62.94	-13.00	-49.94
424.79	38.83	V	-55.89	-7.68	2.58	-66.16	-13.00	-53.16
494.63	42.49	V	-51.63	-7.72	2.78	-62.13	-13.00	-49.13
887.48	34.84	V	-50.25	-7.93	3.76	-61.95	-13.00	-48.95
3760.00	46.10	V	-51.56	12.60	8.39	-47.34	-13.00	-34.34
5640.00	41.74	V	-48.84	13.36	10.41	-45.89	-13.00	-32.89
7520.00		V		11.45	12.19		-13.00	
9400.00		V		11.93	13.61		-13.00	
11280.00		V		11.92	15.27		-13.00	
13160.00		V		13.33	16.71		-13.00	
15040.00		V		13.76	18.15		-13.00	
16920.00		V		15.27	19.32		-13.00	
18800.00		V		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH Mid E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1880MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	47.49	Н	-56.31	-4.16	0.91	-61.37	-13.00	-48.37
92.08	47.34	Н	-56.25	-7.75	1.29	-65.29	-13.00	-52.29
259.89	44.68	Н	-54.23	-7.90	2.03	-64.15	-13.00	-51.15
395.69	40.97	Н	-55.53	-7.66	2.50	-65.68	-13.00	-52.68
494.63	41.40	Н	-52.10	-7.72	2.78	-62.60	-13.00	-49.60
800.18	36.51	Н	-49.83	-7.87	3.57	-61.27	-13.00	-48.27
3760.00	44.19	Н	-53.58	12.60	8.39	-49.37	-13.00	-36.37
5640.00	34.41	Н	-56.34	13.36	10.41	-53.39	-13.00	-40.39
7520.00		Н		11.45	12.19		-13.00	
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"----" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1909.8 MHz	Test By:	Jason
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	47.26	V	-55.47	-4.16	0.91	-60.54	-13.00	-47.54
90.14	51.64	V	-51.54	-7.75	1.27	-60.56	-13.00	-47.56
250.19	46.80	V	-53.08	-7.89	1.99	-62.96	-13.00	-49.96
293.84	47.40	V	-51.05	-7.92	2.15	-61.12	-13.00	-48.12
424.79	39.77	V	-54.95	-7.68	2.58	-65.22	-13.00	-52.22
494.63	43.54	V	-50.58	-7.72	2.78	-61.08	-13.00	-48.08
1910.00	74.25	V	-30.08	10.08	5.66	-25.66	-13.00	-12.66
3819.60	45.39	V	-52.00	12.60	8.47	-47.87	-13.00	-34.87
5729.40	38.00	V	-52.32	13.49	10.50	-49.32	-13.00	-36.32
7639.20		V		11.40	12.27		-13.00	
9549.00		V		11.95	13.74		-13.00	
11458.80		V		12.17	15.43		-13.00	
13368.60		V		12.97	16.82		-13.00	
15278.40		V		15.00	18.29		-13.00	
17188.20		V		14.47	19.52		-13.00	
19098.00		V		18.66	20.78		-13.00	

	30MHz - 80MHz: 5.04dB			
Measurement uncertainty	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"----" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode	: TX CH High E2 Mode	Test Date:	Nov. 09, 2010
Fundamental Frequency	: 1909.8 MHz	Test By:	Jason
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
36.79	47.12	Н	-56.68	-4.16	0.91	-61.74	-13.00	-48.74
92.08	47.20	Н	-56.39	-7.75	1.29	-65.43	-13.00	-52.43
266.68	43.48	Н	-55.22	-7.90	2.05	-65.17	-13.00	-52.17
288.99	43.90	Н	-54.10	-7.91	2.13	-64.15	-13.00	-51.15
400.54	40.06	Н	-56.34	-7.66	2.51	-66.51	-13.00	-53.51
499.48	42.23	Н	-51.22	-7.72	2.80	-61.74	-13.00	-48.74
1910.00	61.91	Н	-42.20	10.08	5.66	-37.78	-13.00	-24.78
3819.60	40.42	Н	-57.09	12.60	8.47	-52.95	-13.00	-39.95
5729.40	35.89	Н	-54.56	13.49	10.50	-51.57	-13.00	-38.57
7639.20		Н		11.40	12.27		-13.00	
9549.00		Н		11.95	13.74		-13.00	
11458.80		Н		12.17	15.43		-13.00	
13368.60		Н		12.97	16.82		-13.00	
15278.40		Н		15.00	18.29		-13.00	
17188.20		Н		14.47	19.52		-13.00	
19098.00		Н		18.66	20.78		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH Low Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1852.4MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
150.28	36.08	V	-61.24	-7.80	1.59	-70.63	-13.00	-57.63
241.46	37.96	V	-62.25	-7.88	1.94	-72.08	-13.00	-59.08
287.05	39.18	V	-59.49	-7.91	2.12	-69.53	-13.00	-56.53
439.34	36.99	V	-57.27	-7.69	2.63	-67.59	-13.00	-54.59
652.74	32.99	V	-55.96	-7.81	3.17	-66.94	-13.00	-53.94
975.75	32.45	V	-51.58	-7.99	3.96	-63.53	-13.00	-50.53
1850.00	70.51	V	-33.88	9.90	5.56	-29.54	-13.00	-16.54
3704.80		V		12.61	8.31		-13.00	
5557.20		V		13.24	10.33		-13.00	
7409.60		V		11.49	12.09		-13.00	
9262.00		V		11.92	13.51		-13.00	
11114.40		V		11.68	15.12		-13.00	
12966.80		V		13.62	16.61		-13.00	
14819.20		V		12.83	17.96		-13.00	
16671.60		V		15.87	19.15		-13.00	
18524.00		V		18.74	10.86		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark " --- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH Low Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1852.4MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	35.60	Н	-62.24	-7.80	1.59	-71.63	-13.00	-58.63
250.19	39.35	Н	-59.86	-7.89	1.99	-69.74	-13.00	-56.74
287.05	41.03	Н	-57.03	-7.91	2.12	-67.07	-13.00	-54.07
558.65	33.26	Н	-58.28	-7.77	2.97	-69.02	-13.00	-56.02
612.00	33.97	Н	-56.49	-7.79	3.06	-67.35	-13.00	-54.35
922.40	33.80	Н	-50.76	-7.97	3.83	-62.57	-13.00	-49.57
1850.00	66.53	Н	-37.65	9.90	5.56	-33.31	-13.00	-20.31
3210.00	37.16	Н	-62.00	11.98	7.58	-57.60	-13.00	-44.60
3704.80		Н		12.61	8.31		-13.00	
5557.20		Н		13.24	10.33		-13.00	
7409.60		Н		11.49	12.09		-13.00	
9262.00		Н		11.92	13.51		-13.00	
11114.40		Н		11.68	15.12		-13.00	
12966.80		Н		13.62	16.61		-13.00	
14819.20		Н		12.83	17.96		-13.00	
16671.60		Н		15.87	19.15		-13.00	
18524.00		Н		18.74	10.86		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH Mid Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1880MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	36.34	V	-61.01	-7.80	1.59	-70.40	-13.00	-57.40
241.46	38.31	V	-61.90	-7.88	1.94	-71.73	-13.00	-58.73
287.05	38.75	V	-59.92	-7.91	2.12	-69.96	-13.00	-56.96
516.94	34.68	V	-58.90	-7.73	2.85	-69.49	-13.00	-56.49
650.80	33.11	V	-55.82	-7.81	3.16	-66.79	-13.00	-53.79
970.90	32.48	V	-51.66	-8.00	3.94	-63.60	-13.00	-50.60
3760.00	35.77	V	-61.89	12.60	8.39	-57.67	-13.00	-44.67
5640.00		V		13.36	10.41		-13.00	
7520.00		V		11.45	12.19		-13.00	
9400.00		V		11.93	13.61		-13.00	
11280.00		V		11.92	15.27		-13.00	
13160.00		V		13.33	16.71		-13.00	
15040.00		V		13.76	18.15		-13.00	
16920.00		V		15.27	19.32		-13.00	
18800.00		V		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB			
Measurement uncertainty	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "--- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH Mid Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1880MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	35.81	Н	-62.03	-7.80	1.59	-71.42	-13.00	-58.42
250.19	39.60	Н	-59.61	-7.89	1.99	-69.49	-13.00	-56.49
289.96	41.47	Н	-56.50	-7.91	2.13	-66.55	-13.00	-53.55
558.85	32.73	Н	-58.81	-7.77	2.97	-69.55	-13.00	-56.55
665.35	33.77	Н	-55.31	-7.83	3.20	-66.33	-13.00	-53.33
970.90	33.51	Н	-50.57	-8.00	3.94	-62.51	-13.00	-49.51
3760.00	35.55	Н	-62.22	12.60	8.39	-58.01	-13.00	-45.01
5640.00		Н		13.36	10.41		-13.00	
7520.00		Н		11.45	12.19		-13.00	
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

	30MHz - 80MHz: 5.04dB			
Measurement uncertainty	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "--- " means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH High Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1907.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	36.74	V	-60.61	-7.80	1.59	-70.00	-13.00	-57.00
241.46	37.53	V	-62.68	-7.88	1.94	-72.51	-13.00	-59.51
296.75	38.94	V	-59.42	-7.92	2.16	-69.49	-13.00	-56.49
559.62	32.67	V	-59.26	-7.77	2.97	-70.00	-13.00	-57.00
660.50	33.29	V	-55.74	-7.82	3.19	-66.75	-13.00	-53.75
990.30	32.78	V	-50.91	-7.99	4.00	-62.91	-13.00	-49.91
1910.00	69.27	V	-35.06	10.08	5.66	-30.64	-13.00	-17.64
3600.00	35.05	V	-63.33	12.61	8.17	-58.89	-13.00	-45.89
3815.20		V		12.60	8.46		-13.00	
5722.80		V		13.48	10.49		-13.00	
7630.40		V		11.41	12.27		-13.00	
9538.00		V		11.95	13.73		-13.00	
11445.60		V		12.15	15.42		-13.00	
13353.20		V		13.00	16.81		-13.00	
15260.80		V		14.91	18.28		-13.00	
17168.40		V		14.53	19.50		-13.00	
19076.00		V		18.65	20.76		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark " --- " means that the emission level is too low to be measured

- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA II Mode

Operation Mode	: TX CH High Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 1907.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	35.76	Н	-62.08	-7.80	1.59	-71.47	-13.00	-58.47
250.19	38.94	Н	-60.27	-7.89	1.99	-70.15	-13.00	-57.15
296.75	41.91	Н	-55.85	-7.92	2.16	-65.93	-13.00	-52.93
558.65	33.41	Н	-58.13	-7.77	2.97	-68.87	-13.00	-55.87
650.80	33.23	Н	-56.46	-7.81	3.16	-67.43	-13.00	-54.43
970.90	33.29	Н	-50.79	-8.00	3.94	-62.73	-13.00	-49.73
1910.00	64.14	Н	-39.97	10.08	5.66	-35.55	-13.00	-22.55
3717.00	34.60	Н	-63.37	12.61	8.33	-59.09	-13.00	-46.09
3815.20		Н		12.60	8.46		-13.00	
5722.80		Н		13.48	10.49		-13.00	
7630.40		Н		11.41	12.27		-13.00	
9538.00		Н		11.95	13.73		-13.00	
11445.60		Н		12.15	15.42		-13.00	
13353.20		Н		13.00	16.81		-13.00	
15260.80		Н		14.91	18.28		-13.00	
17168.40		Н		14.53	19.50		-13.00	
19076.00		Н		18.65	20.76		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark " --- " means that the emission level is too low to be measured

- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH Low Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 826.4MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
163.86	36.52	V	-62.01	-7.81	1.62	-71.45	-13.00	-58.45
241.46	37.67	v	-62.54	-7.88	1.94	-72.37	-13.00	-59.37
287.05	38.23	v	-60.44	-7.91	2.12	-70.48	-13.00	-57.48
516.94	34.21	V	-59.37	-7.73	2.85	-69.96	-13.00	-56.96
699.30	33.81	V	-55.62	-7.86	3.29	-66.77	-13.00	-53.77
823.00	68.94	V	-17.46	-7.87	3.62	-28.96	-13.00	-15.96
975.75	34.08	V	-49.95	-7.99	3.96	-61.90	-13.00	-48.90
1652.80	55.27	V	-49.31	9.30	5.23	-45.24	-13.00	-32.24
2479.20		V		10.07	6.54		-13.00	
3305.60		V		12.19	7.73		-13.00	
4132.00		V		12.62	8.87		-13.00	
4958.40		V		12.65	9.75		-13.00	
5784.80		V		13.58	10.55		-13.00	
6611.20		V		12.03	11.31		-13.00	
7437.60		V		11.48	12.12		-13.00	
8264.00		V		11.50	12.73		-13.00	
163.86	36.52	V	-62.01	-7.81	1.62	-71.45	-13.00	-58.45

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH Low Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 826.4MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
160.95	40.20	Н	-58.42	-7.81	1.62	-67.84	-13.00	-54.84
250.19	37.90	Н	-61.31	-7.89	1.99	-71.19	-13.00	-58.19
289.96	42.28	Н	-55.69	-7.91	2.13	-65.74	-13.00	-52.74
558.65	33.18	Н	-58.36	-7.77	2.97	-69.10	-13.00	-56.10
691.54	33.67	Н	-54.31	-7.85	3.27	-65.43	-13.00	-52.43
823.00	72.62	Н	-13.65	-7.87	3.62	-25.15	-13.00	-12.15
936.95	34.15	Н	-50.23	-7.99	3.86	-62.07	-13.00	-49.07
1652.80	59.57	Н	-44.83	9.30	5.23	-40.76	-13.00	-27.76
2479.20		Н		10.07	6.54		-13.00	
3305.60		Н		12.19	7.73		-13.00	
4132.00		Н		12.62	8.87		-13.00	
4958.40		Н		12.65	9.75		-13.00	
5784.80		Н		13.58	10.55		-13.00	
6611.20		Н		12.03	11.31		-13.00	
7437.60		Н		11.48	12.12		-13.00	
8264.00		Н		11.50	12.73		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark " --- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH Mid Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 836.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	36.78	V	-60.57	-7.80	1.59	-69.96	-13.00	-56.96
241.46	37.22	V	-62.99	-7.88	1.94	-72.82	-13.00	-59.82
296.75	38.84	V	-59.52	-7.92	2.16	-69.59	-13.00	-56.59
516.94	34.23	V	-59.35	-7.73	2.85	-69.94	-13.00	-56.94
699.30	33.95	V	-55.48	-7.86	3.29	-66.63	-13.00	-53.63
963.14	34.13	V	-50.19	-8.00	3.92	-62.10	-13.00	-49.10
1673.20	49.14	V	-55.42	9.36	5.27	-51.32	-13.00	-38.32
2509.80		V		10.09	6.58		-13.00	
3346.40		V		12.28	7.79		-13.00	
4183.00		V		12.62	8.93		-13.00	
5019.60		V		12.67	9.81		-13.00	
5856.20		V		13.68	10.62		-13.00	
6692.80		V		11.95	11.39		-13.00	
7529.40		V		11.45	12.20		-13.00	
8366.00		V		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB			
Measurement uncertainty	80MHz -1000MHz: 3.76dB			
	1GHz - 13GHz: 4.45dB			

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "--- " means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH Mid Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 836.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	35.41	Н	-62.43	-7.80	1.59	-71.82	-13.00	-58.82
250.19	39.05	Н	-60.16	-7.89	1.99	-70.04	-13.00	-57.04
289.96	41.47	Н	-56.50	-7.91	2.13	-66.55	-13.00	-53.55
555.74	32.86	Н	-58.74	-7.76	2.97	-69.47	-13.00	-56.47
694.45	33.82	Н	-54.04	-7.85	3.28	-65.17	-13.00	-52.17
961.20	34.43	Н	-49.71	-8.00	3.91	-61.62	-13.00	-48.62
1673.20		Н		9.36	5.27		-13.00	
1682.50	53.76	Н	-50.61	9.39	5.28	-46.50	-13.00	-33.50
2509.80		Н		10.09	6.58		-13.00	
3346.40		Н		12.28	7.79		-13.00	
4183.00		Н		12.62	8.93		-13.00	
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---- " means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH High Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 846.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	35.62	V	-61.73	-7.80	1.59	-71.12	-13.00	-58.12
241.46	37.26	V	-62.95	-7.88	1.94	-72.78	-13.00	-59.78
284.14	40.07	V	-58.70	-7.91	2.11	-68.72	-13.00	-55.72
555.74	33.17	V	-58.98	-7.76	2.97	-69.72	-13.00	-56.72
694.45	33.95	V	-55.43	-7.85	3.28	-66.56	-13.00	-53.56
850.00	66.16	V	-19.95	-7.88	3.68	-31.51	-13.00	-18.51
956.35	34.01	V	-50.46	-8.00	3.90	-62.36	-13.00	-49.36
1693.20	50.67	V	-53.87	9.42	5.30	-49.75	-13.00	-36.75
2539.80		V		10.18	6.62		-13.00	
3386.40		V		12.36	7.85		-13.00	
4233.00		V		12.63	8.99		-13.00	
5079.60		V		12.73	9.87		-13.00	
5926.20		V		13.79	10.69		-13.00	
6772.80		V		11.87	11.47		-13.00	
7619.40		V		11.41	12.26		-13.00	
8466.00		V		11.68	12.89		-13.00	

	30MHz - 80MHz: 5.04dB	
Measurement uncertainty	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark " --- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Radiated Spurious Emission Measurement Result: WCDMA V Mode

Operation Mode	: TX CH High Mode	Test Date:	May. 11, 2011
Fundamental Frequency	: 846.6MHz	Test By:	Sky
Temperature	: 25	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	36.63	Н	-61.21	-7.80	1.59	-70.60	-13.00	-57.60
250.19	38.01	Н	-61.20	-7.89	1.99	-71.08	-13.00	-58.08
289.96	41.42	Н	-56.55	-7.91	2.13	-66.60	-13.00	-53.60
553.80	33.24	Н	-58.40	-7.76	2.97	-69.13	-13.00	-56.13
697.36	33.72	Н	-54.02	-7.86	3.28	-65.16	-13.00	-52.16
850.00	67.73	Н	-18.46	-7.88	3.68	-30.02	-13.00	-17.02
972.84	34.36	Н	-49.71	-8.00	3.95	-61.66	-13.00	-48.66
1693.20	57.78	Н	-46.57	9.42	5.30	-42.45	-13.00	-29.45
2539.80		Н		10.18	6.62		-13.00	
3386.40		Н		12.36	7.85		-13.00	
4233.00		Н		12.63	8.99		-13.00	
5079.60		Н		12.73	9.87		-13.00	
5926.20		Н		13.79	10.69		-13.00	
6772.80		Н		11.87	11.47		-13.00	
7619.40		Н		11.41	12.26		-13.00	
8466.00		Н		11.68	12.89		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB	
	80MHz -1000MHz: 3.76dB	
	1GHz - 13GHz: 4.45dB	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark " --- " means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

10.1. Standard Applicable:

According to FCC §2.1055(a) (1) Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

10.2. Test Set-up:

Temperature Chamber



Variable DC Power Supply

Note: Measurement setup for testing on Antenna connector

10.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25° C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30° C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10° C increased per stage until the highest temperature of $+50^{\circ}$ C reached.

10.4. Measurement Equipment Used:

Refer to section 2.4 in this report



10.5. Measurement Result:

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 25°C				
	Limit	+/-2.5 ppm = 209	91 Hz	
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Uz)
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Liniit (HZ)
3.80	-30	836.599998	-7.00	2091
3.80	-20	836.599992	-1.00	2091
3.80	-10	836.599994	-3.00	2091
3.80	0	836.599996	-5.00	2091
3.80	10	836.599993	-2.00	2091
3.80	20	836.599991	0.00	2091
3.80	30	836.599996	-5.00	2091
3.80	40	836.599992	-1.00	2091
3.80	50	836.599995	-4.00	2091

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 20°C					
	Limit:	+/-2.5 ppm = 470	00 Hz		
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Uz)	
Vdc	Temperature (°C)	(MHz)	Delta (IIZ)	Linint (112)	
3.80	-30	1879.999998	-6.00	4700	
3.80	-20	1880.000008	-16.00	4700	
3.80	-10	1880.000015	-23.00	4700	
3.80	0	1880.000001	-9.00	4700	
3.80	10	1879.999998	-6.00	4700	
3.80	20	1879.999992	0.00	4700	
3.80	30	1879.999986	6.00	4700	
3.80	40	1879.999996	-4.00	4700	
3.80	50	1879.999999	-7.00	4700	

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Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz @ 20° C				
	Limit	: +/- 2.5 ppm = 470	00 Hz	
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Uz)
Vdc	Temperature (°C)	(MHz)	Delta (HZ)	Lillint (HZ)
3.80	-30	1880.000004	-5.00	4700
3.80	-20	1880.000003	-4.00	4700
3.80	-10	1880.000002	-3.00	4700
3.80	0	1879.999999	0.00	4700
3.80	10	1880.000008	-9.00	4700
3.80	20	1880.000002	-3.00	4700
3.80	30	1880.000005	-6.00	4700
3.80	40	1880.000002	-3.00	4700
3.80	50	1880.000003	-4.00	4700

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz @ 20° C						
	Limit: +/- 2.5 ppm = 2090 Hz					
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Uz)		
Vdc	Temperature (°C)	(MHz)	Delta (IIZ)	Lillint (112)		
3.80	-30	836.600003	-6.00	2091		
3.80	-20	836.599995	2.00	2091		
3.80	-10	836.599999	-2.00	2091		
3.80	0	836.599997	0.00	2091		
3.80	10	836.599993	4.00	2091		
3.80	20	836.600002	-5.00	2091		
3.80	30	836.600005	-8.00	2091		
3.80	40	836.600003	-6.00	2091		
3.80	50	836.600005	-8.00	2091		

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11. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

11.1. Standard Applicable:

According to FCC §2.1055(a) (1) Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

11.2. Test Set-up:

Refer to section 10.2 in this report

11.3. Measurement Procedure:

Set chamber temperature to 25° C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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11.5. Measurement Result:

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 25°C					
	Limit	: +/- 2.5 ppm = 209	91 Hz		
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (HZ)	Limit (HZ)	
4.20	25.00	836.599996	-3.00	2091.00	
3.80	25.00	836.599993	0.00	2091.00	
3.23	25.00	836.599992	1.00	2091.00	
2.9	25.00	826 500005	0.00	2001.00	
(End Point)	25.00	836.399983	8.00	2091.00	

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 25°C				
	Limit	: +/- 2.5 ppm = 470)0 Hz	
Power Supply	Environment	Frequency	Dolta (Hz)	Limit (Uz)
Vdc	Temperature (°C)	(MHz)	Delta (HZ)	Limit (HZ)
4.20	25	1879.999985	7.00	4700
3.80	25	1879.999992	0.00	4700
3.23	25	1879.999994	-2.00	4700
2.9 (End Point)	25	1879.999968	24.00	4700

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Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz					
	Limit	: +/- 2.5 ppm = 470	00 Hz		
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (HZ)	Limit (HZ)	
4.20	25	1880.000005	-3.00	4700	
3.80	25	1880.000002	0.00	4700	
3.23	25	1880.000001	1.00	4700	
2.9	25	1000 00000	2.00	4700	
(End Point)	25	1880.000008	-3.00	4700	

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz					
	Limit	: +/- 2.5 ppm = 209	90 Hz		
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (HZ)	Limit (HZ)	
4.20	25	836.600003	0.00	2091.00	
3.80	25	836.600002	1.00	2091.00	
3.23	25	836.600001	2.00	2091.00	
2.9	25	0.26 500000	5.00	2001.00	
(End Point)	25	836.599998	5.00	2091.00	

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