FCC Report

Applicant:	Guangzhou SOUTH Surveying & Mapping Instrument Co., Ltd.
Address of Applicant:	Room 301 South Building, No.24-26 Keyun Road, Tian He District, Guangzhou
Equipment Under Test (EUT)	
Product Name:	GNSS RECEIVER
Model No.:	G1, Galaxy 1, T66, R6, K9mini, K98mini, K5plus, K58plus
Trade Mark:	SOUTH, KOLIDA, SANDING, RUIDE
FCC ID:	2ADPC-G1
Applicable standards:	FCC CFR Title 47 Part 2: 2014 FCC CFR Title 47 Part22 Subpart H: 2014 FCC CFR Title 47 Part24 Subpart E: 2014
Date of sample receipt:	May 08, 2015
Date of Test:	May 11 ~ 20, 2015
Date of report issued:	May 25, 2015
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*May 25, 2015*	*Original*

Prepared By: Edward.Pan ***Date:*** *May 25, 2015*

Project Engineer

Check By: hank.yan ***Date:*** *May 25, 2015*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (MPE)	Part 1.1307 Part 2.1093	Pass* (Please refer MPE Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Guangzhou SOUTH Surveying & Mapping Instrument Co., Ltd.
Address of Applicant:	Room 301 South Building, No.24-26 Keyun Road, Tian He District, Guangzhou
Manufacturer:	Guangzhou SOUTH Surveying & Mapping Instrument Co., Ltd.
Address of Manufacturer:	Room 301 South Building, No.24-26 Keyun Road, Tian He District, Guangzhou

5.2 General Description of EUT

Product Name:	GNSS RECEIVER
Model No.:	G1, Galaxy 1, T66, R6, K9mini, K98mini, K5plus, K58plus
Support Networks:	GPRS, EGPRS
Support Bands:	GSM850, PCS1900
TX Frequency:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz
GPRS/EGPRS Class:	12
Modulation type:	GPRS: GMSK EGPRS: GMSK/8PSK
Hardware Version:	Power Panel: HeZi_RTK002 Data Link Panel: HeZi_SL8083_001
Software Version:	1.00.150109.R82000
Antenna type:	SMAJ antenna
Antenna gain:	2.0dBi(GSM850) 2.0dBi(PCS1900)
Power supply:	DC 7.4V Li-ion Battery

Operation Frequency List:

GSM 850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
⋮	⋮	⋮	⋮
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
⋮	⋮	⋮	⋮
250	848.60	809	1909.60
251	848.80	810	1909.80

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Final test channel:

GSM 850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
190	836.60	661	1880.00
251	848.80	810	1909.80

5.3 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

5.4 Test Methodology

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

5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building, No. 300 Laodong Industrial Zone,Xixiang Road, Baoan District, Shenzhen 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 27 2015	Mar. 26 2016
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	July 01 2014	June 30 2015
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	July 01 2014	June 30 2015
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 27 2014	June 26 2015
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2015	Mar. 26 2016
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 28 2015	Mar. 27 2016
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 28 2015	Mar. 27 2016
10	Coaxial cable	GTS	N/A	GTS210	Mar. 28 2015	Mar. 27 2016
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 28 2015	Mar. 27 2016
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	July 01 2014	June 30 2015
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	July 01 2014	June 30 2015
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 27 2014	June 26 2015
15	Band filter	Amindeon	82346	GTS219	Mar. 28 2015	Mar. 27 2016
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 09 2015	May 08 2016
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 09 2015	May 08 2016
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 09 2015	May 08 2016
19	D.C. Power Supply	Instek	PS-3030	GTS232	NA	NA
20	Splitter	Agilent	11636B	GTS237	May 09 2015	May 08 2016
21	Power meter	Rohde & Schwarz	NRVS	GTS238	May 09 2015	May 08 2016
22	Spectrum Analyzer	Agilent	E4440A	GTS533	Dec. 4 2014	Dec. 3 2015
23	Temp.&Humidity chamber	Chuang wei	GDS-225	GTS005-1	May 06 2015	May 05 2016
24	Highpass filter	Micro-Tronics	HPM50108	GTS549	Mar. 28 2015	Mar. 27 2016
25	Highpass filter	Micro-Tronics	HPM50111	GTS550	Mar. 28 2015	Mar. 27 2016

7 System test configuration

7.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

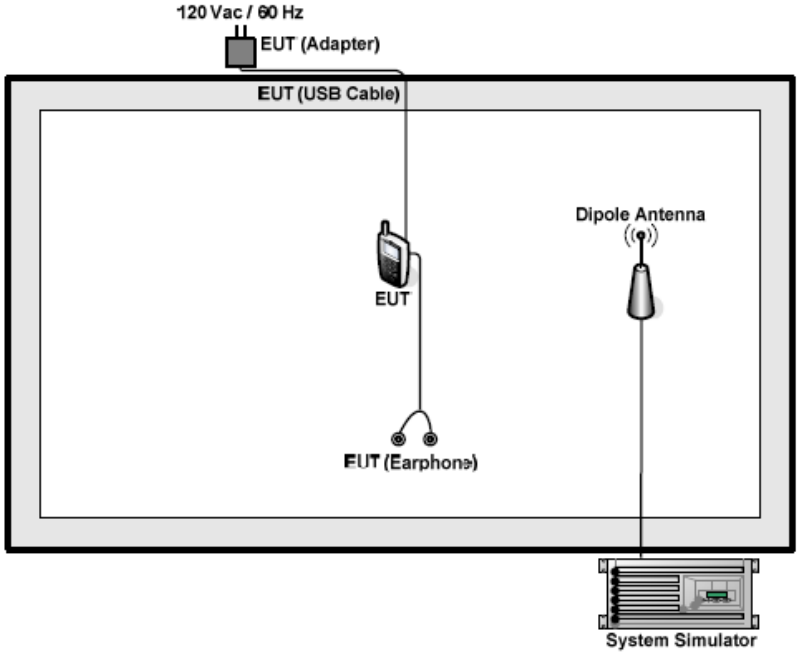
Test modes		
Band	Radiated	Conducted
GSM 850	■ GPRS link ■ EGPRS 1 link	■ GPRS link ■ EGPRS 1 link
PCS 1900	■ GPRS link ■ EGPRS 1 link	■ GPRS link ■ EGPRS 1 link

Note: The maximum power levels are GPRS mode for GMSK link, EGPRS multi-slot class 8 mode for GMSK link. only these modes were used for all tests.

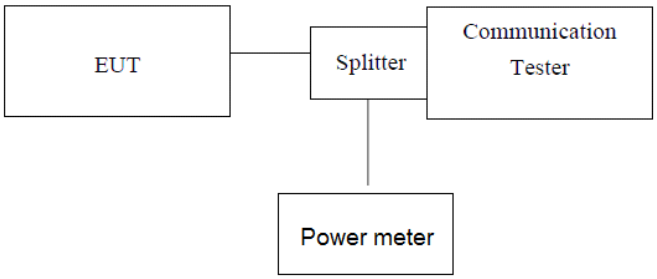
The conducted power tables are as follows:

Conducted Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GPRS (GMSK, 1 TX slot)	32.06	32.07	32.23	28.32	28.27	27.78
GPRS (GMSK, 2 TX slot)	31.43	31.35	31.65	26.88	26.77	26.32
GPRS (GMSK, 3 TX slot)	30.59	30.55	30.65	25.86	25.95	25.31
GPRS (GMSK, 4 TX slot)	29.31	29.46	29.49	25.16	25.06	24.57
EGPRS (8PSK, 1 TX slot)	32.06	32.04	32.21	28.22	28.17	27.67
EGPRS (8PSK, 2 TX slot)	31.35	31.33	31.45	27.23	27.22	26.69
EGPRS (8PSK, 3 TX slot)	30.40	30.29	30.33	26.64	26.62	26.06
EGPRS (8PSK, 4 TX slot)	29.46	29.29	29.36	25.31	25.31	24.74

7.2 Configuration of Tested System



7.3 Conducted Output Power

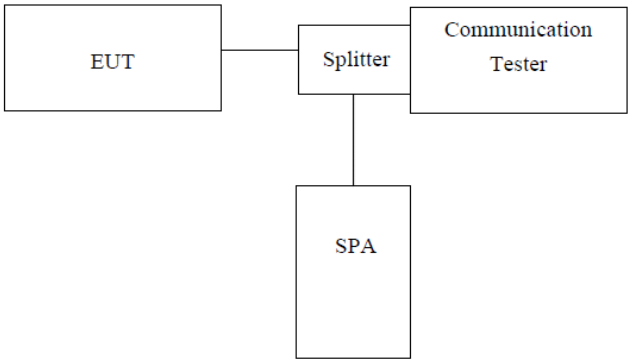
Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

EUT Mode	Channel	Frequency (MHz)	Burst Average power (dBm)
GSM 850 (GPRS 1 link)	128	824.20	32.06
	190	836.60	32.07
	251	848.80	32.23
GSM 850 (GPRS 2 link)	128	824.20	31.43
	190	836.60	31.35
	251	848.80	31.65
GSM 850 (GPRS 3 link)	128	824.20	30.59
	190	836.60	30.55
	251	848.80	30.65
GSM 850 (GPRS 4 link)	128	824.20	29.31
	190	836.60	29.46
	251	848.80	29.49
GSM 850 (EGPRS 1 link)	128	824.20	32.06
	190	836.60	32.04
	251	848.80	32.21
GSM 850 (EGPRS 2 link)	128	824.20	31.35
	190	836.60	31.33
	251	848.80	31.45
GSM 850 (EGPRS 3 link)	128	824.20	30.40
	190	836.60	30.29
	251	848.80	30.33
GSM 850 (EGPRS 4 link)	128	824.20	29.46
	190	836.60	29.29
	251	848.80	29.36

PCS 1900 (GPRS 1 link)	512	1850.20	28.32
	661	1880.00	28.27
	810	1909.80	27.78
PCS 1900 (GPRS 2 link)	512	1850.20	26.88
	661	1880.00	26.77
	810	1909.80	26.32
PCS 1900 (GPRS 3 link)	512	1850.20	25.86
	661	1880.00	25.95
	810	1909.80	25.31
PCS 1900 (GPRS 4 link)	512	1850.20	25.16
	661	1880.00	25.06
	810	1909.80	24.57
PCS 1900 (EGPRS 1 link)	512	1850.20	28.22
	661	1880.00	28.17
	810	1909.80	27.67
PCS 1900 (EGPRS 2 link)	512	1850.20	27.23
	661	1880.00	27.22
	810	1909.80	26.69
PCS 1900 (EGPRS 3 link)	512	1850.20	26.64
	661	1880.00	26.62
	810	1909.80	26.06
PCS 1900 (EGPRS 4 link)	512	1850.20	25.31
	661	1880.00	25.31
	810	1909.80	24.74

7.4 Occupy Bandwidth

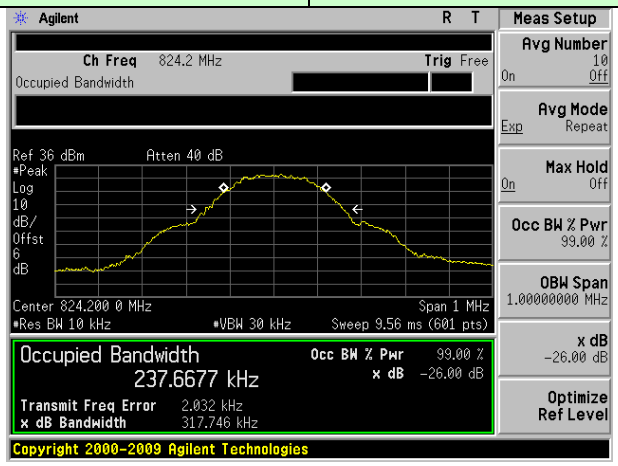
Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1049
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

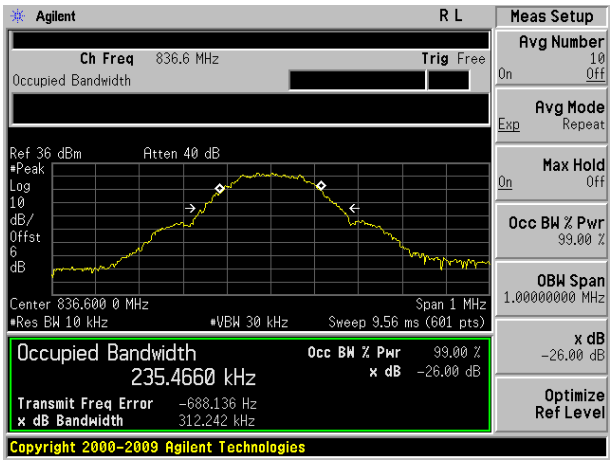
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GPRS 1 link)	128	824.20	237.668	317.746
	190	836.60	235.466	312.242
	251	848.80	238.576	312.815
GSM 850 (EGPRS 1 link)	128	824.20	243.169	310.834
	190	836.60	247.563	317.060
	251	848.80	243.972	317.606
PCS 1900 (GPRS 1 link)	512	1850.20	250.902	316.165
	661	1880.00	246.590	310.851
	810	1909.80	242.030	317.835
PCS 1900 (EGPRS 1 link)	512	1850.20	250.047	323.164
	661	1880.00	248.403	322.735
	810	1909.80	243.125	317.429

Test plot as follows:

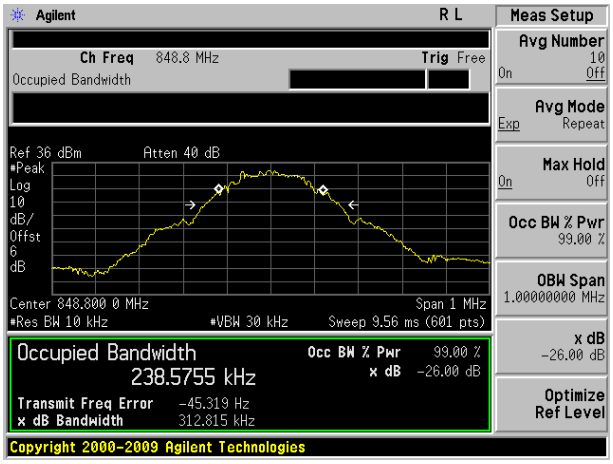
Test band:	GSM 850 (GPRS 1 link)



Lowest channel

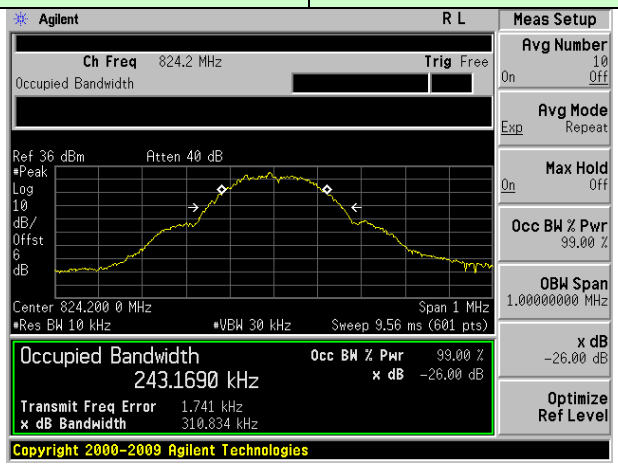


Middle channel

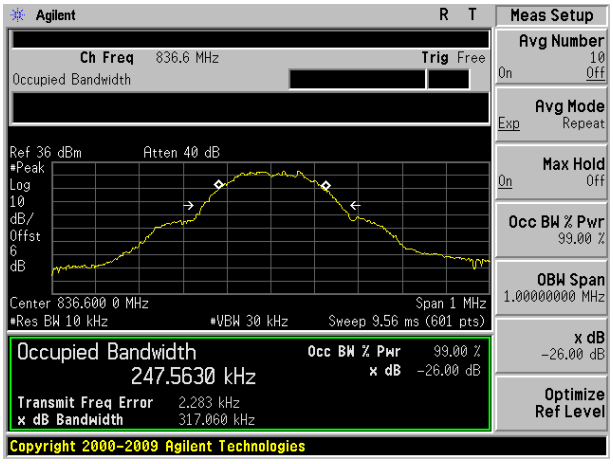


Highest channel

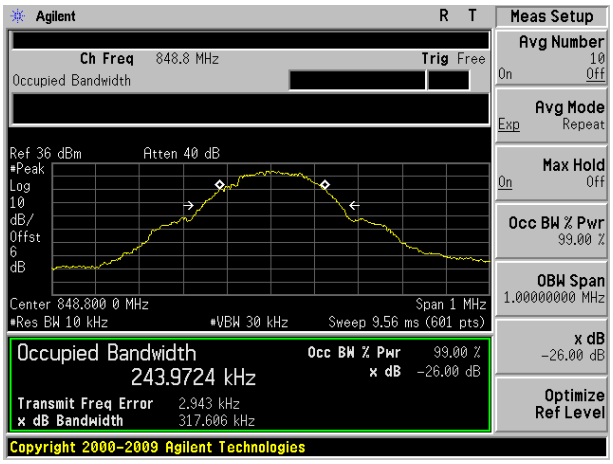
Test band:	GSM 850 (EGPRS 1 link)



Lowest channel

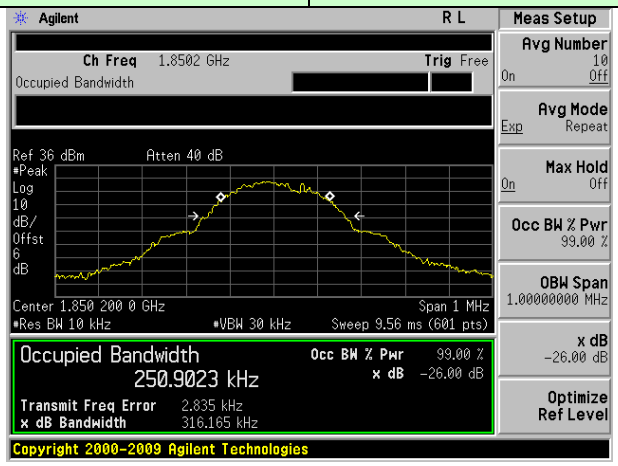


Middle channel

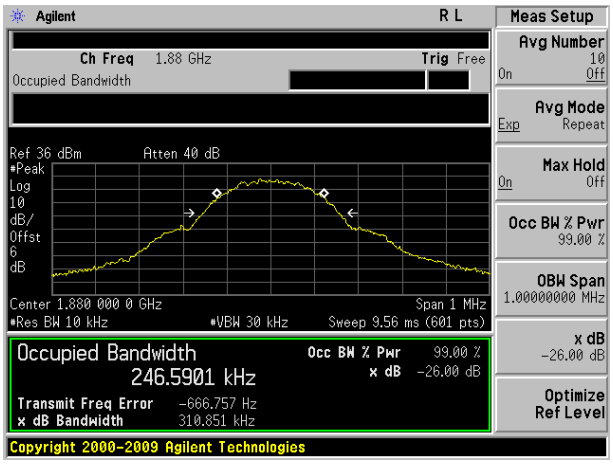


Highest channel

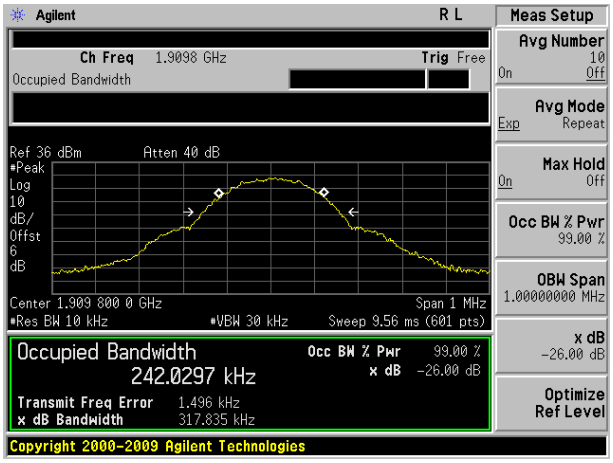
Test band:	PCS 1900 (GPRS 1 link)



Lowest channel

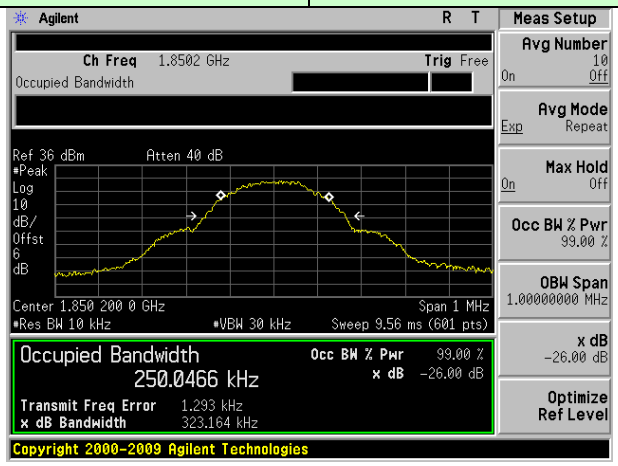


Middle channel

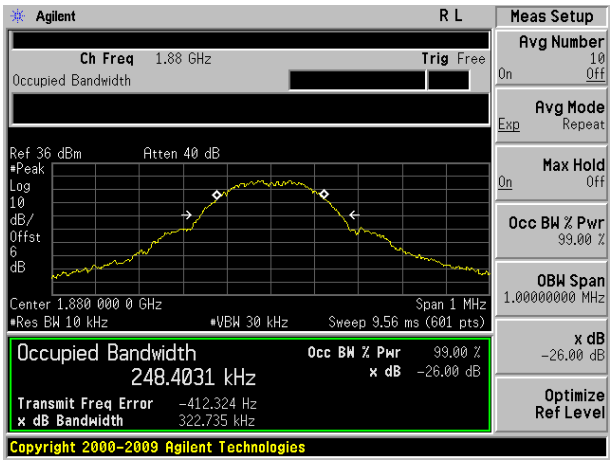


Highest channel

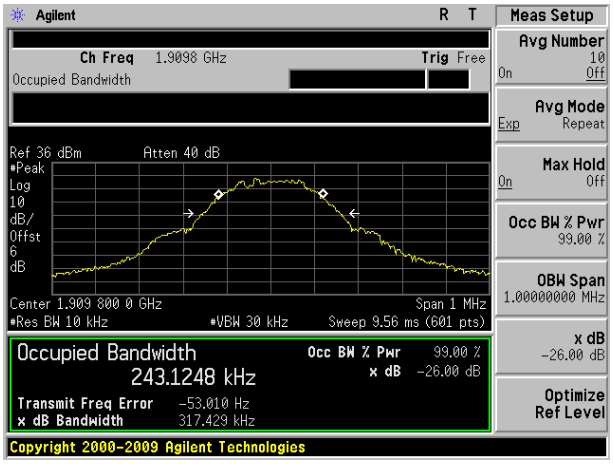
Test band:	PCS 1900 (EGPRS 1 link)



Lowest channel



Middle channel

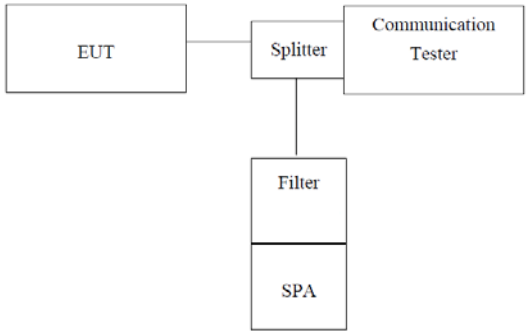


Highest channel

7.5 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

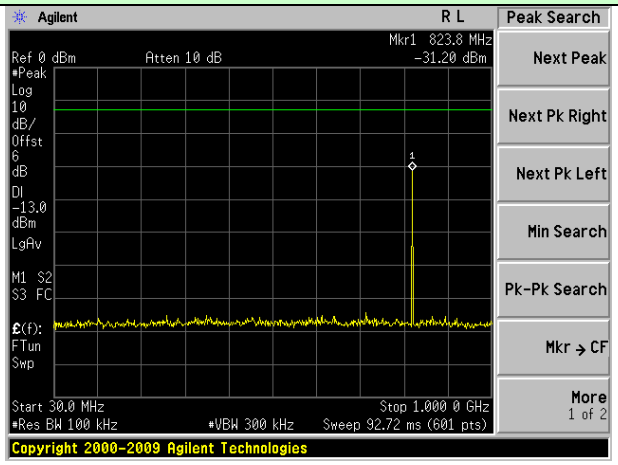
7.6 Out of band emission at antenna terminals

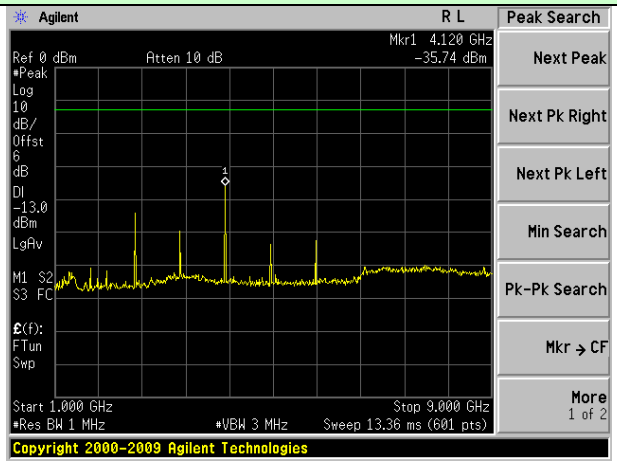
Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution 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. 3 For the out of band: Set the RBW, VBW = 100kHz for frequency range 30MHz to 1GHz. Set the RBW, VBW = 1MHz for frequency range 1GHz to 10th harmonic. 4 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Test plot as follows:

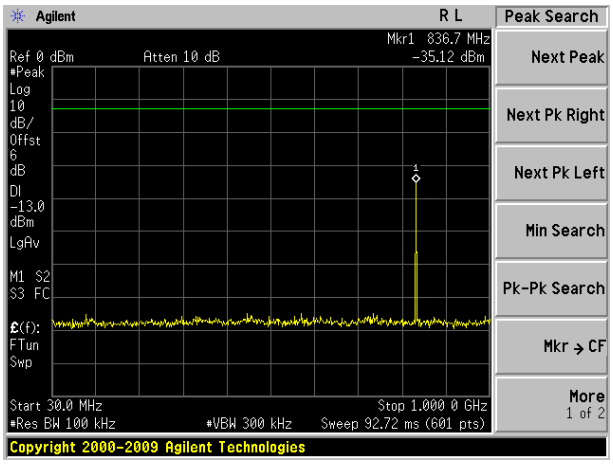
Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).

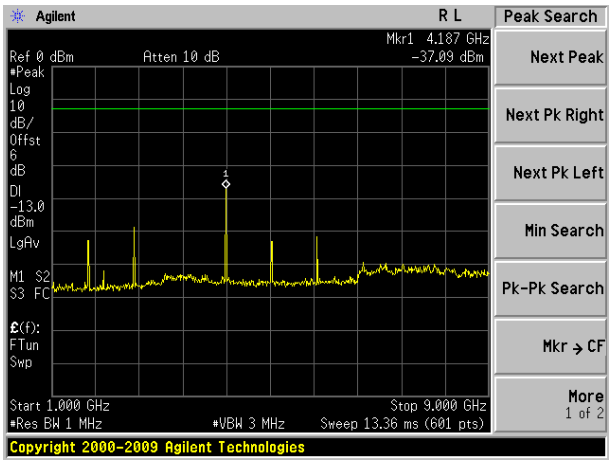
	GSM 850 (GPRS 1 link)



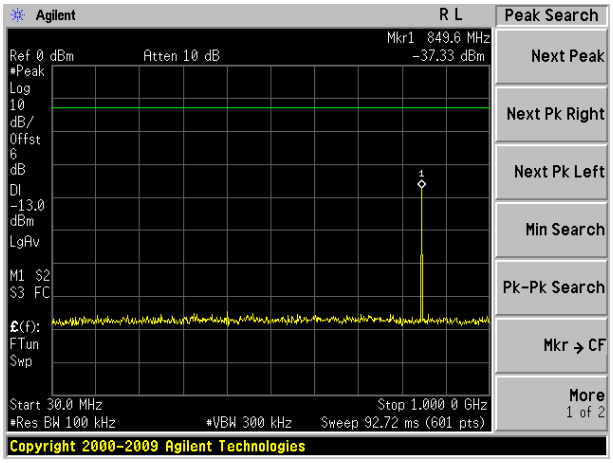


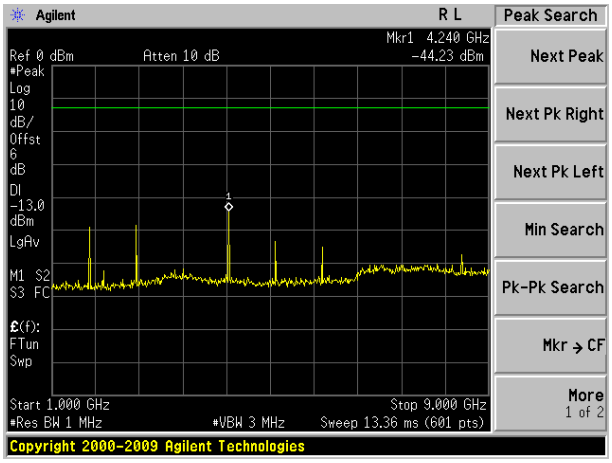
Lowest channel





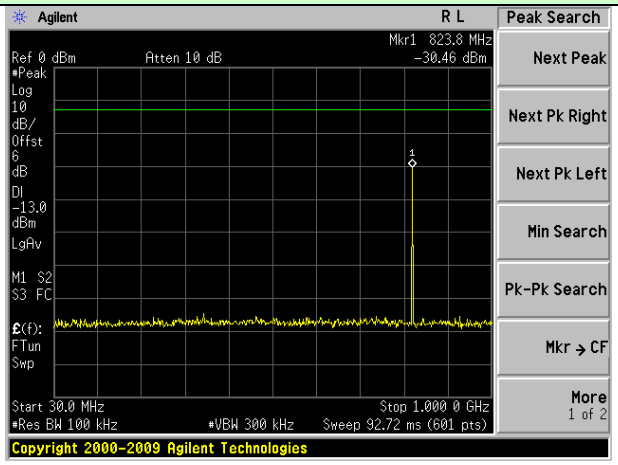
Middle channel

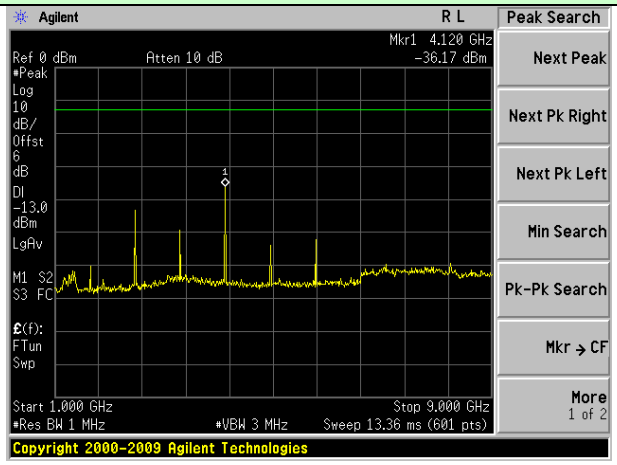




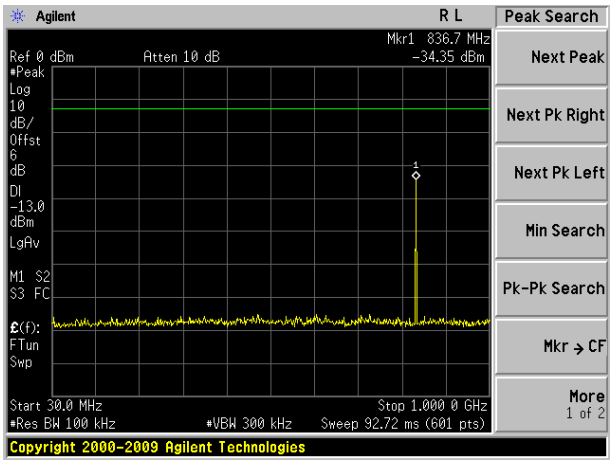
Highest channel

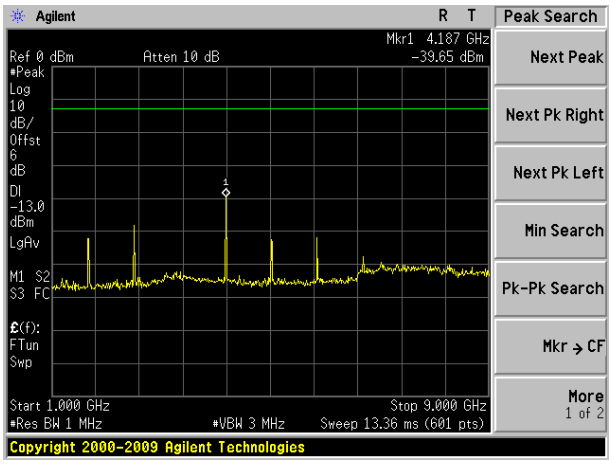
	GSM 850 (EGPRS 1 link)



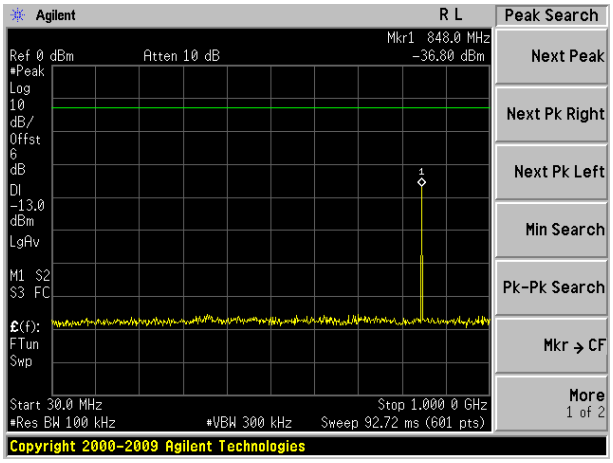


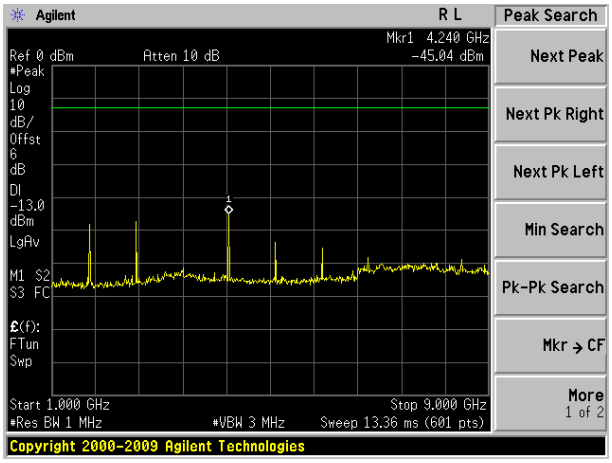
Lowest channel





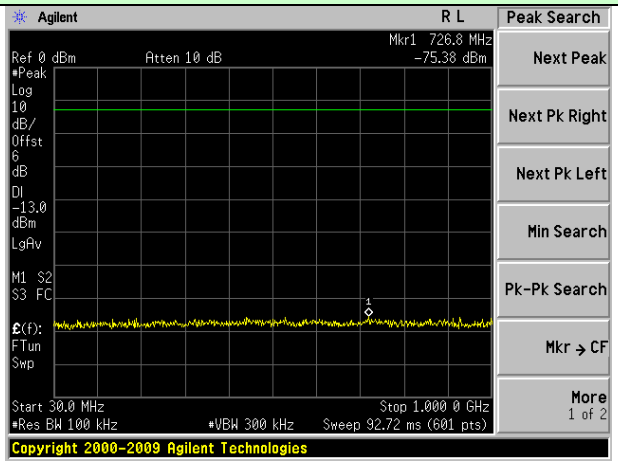
Middle channel

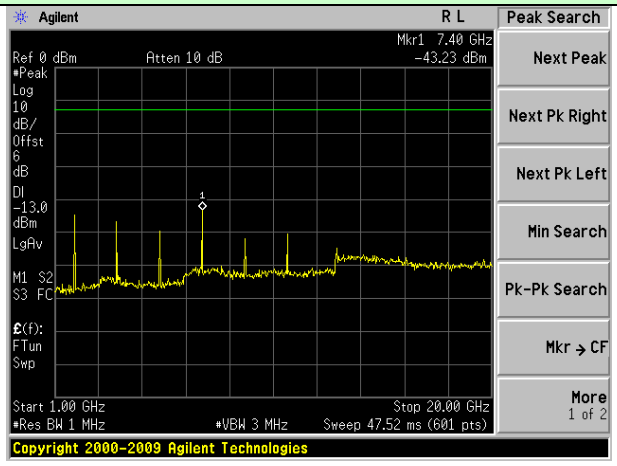




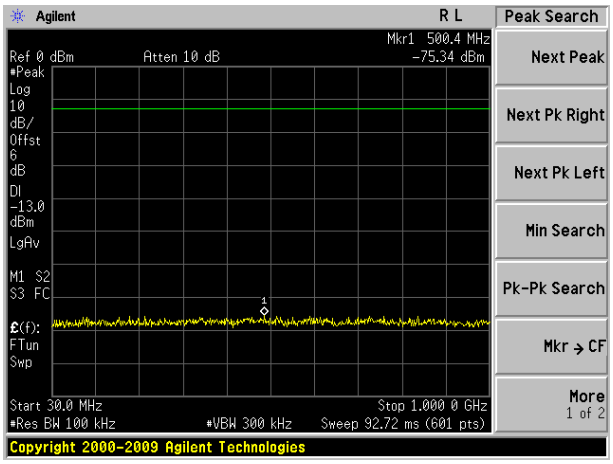
Highest channel

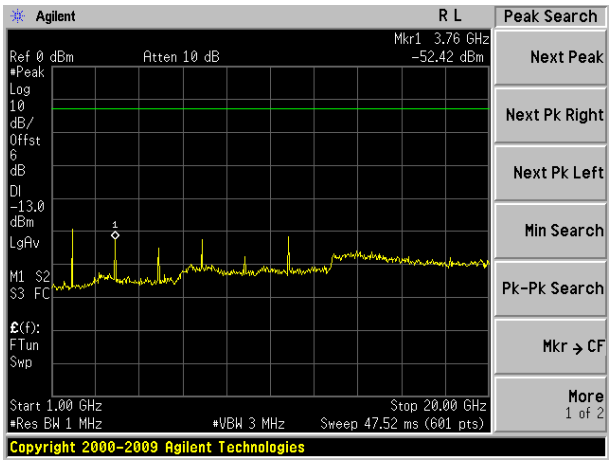
	PCS1900 (GPRS 1 link)



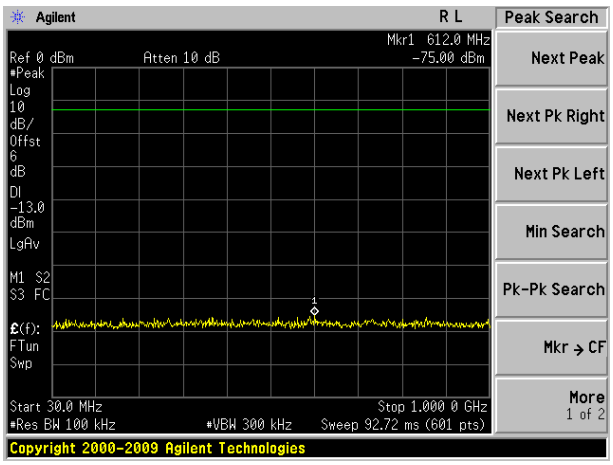


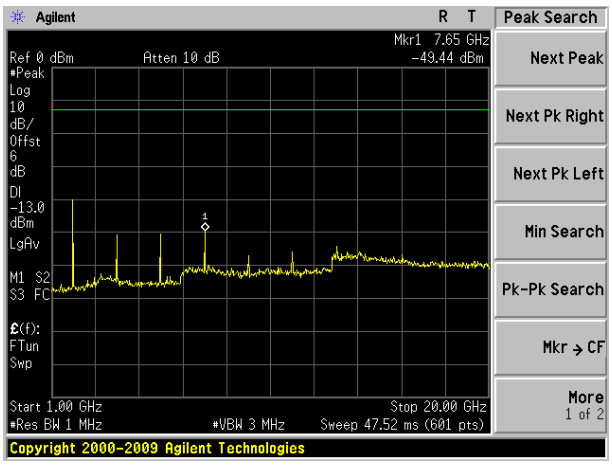
Lowest channel





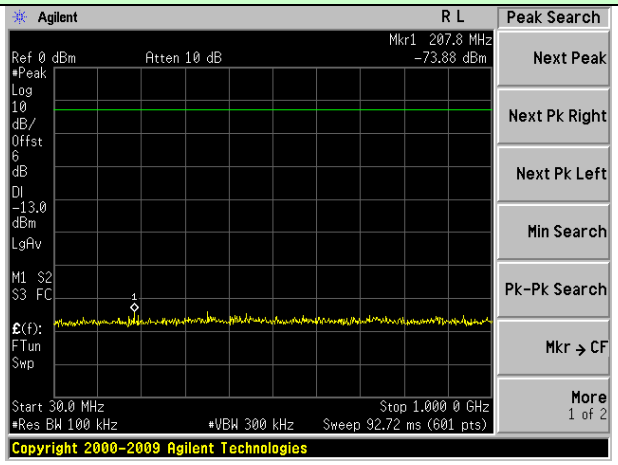
Middle channel

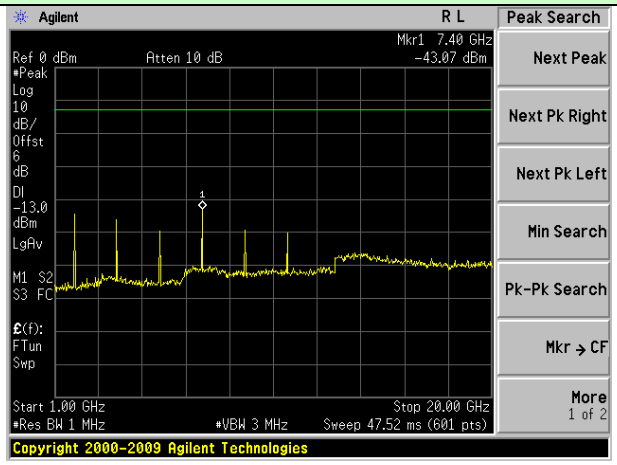




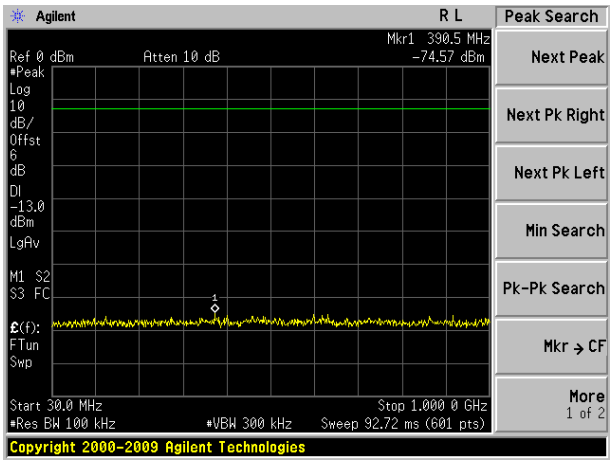
Highest channel

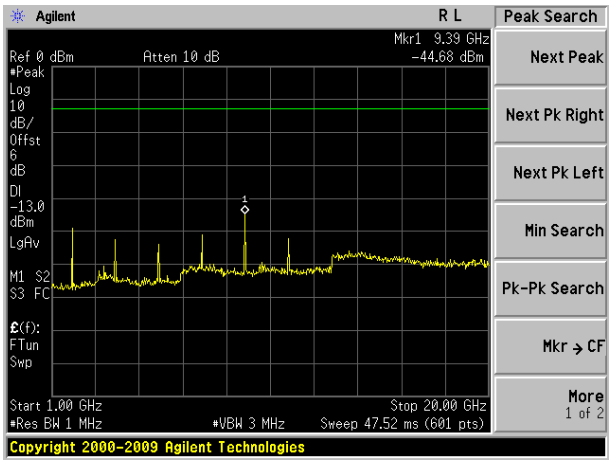
	PCS1900 (EGRPS 1 link)



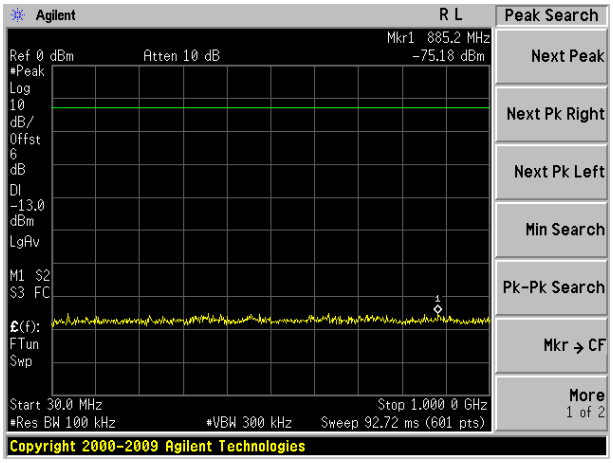


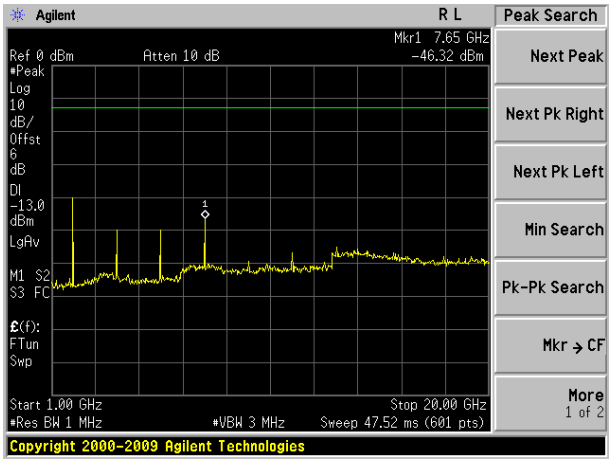
Lowest channel





Middle channel

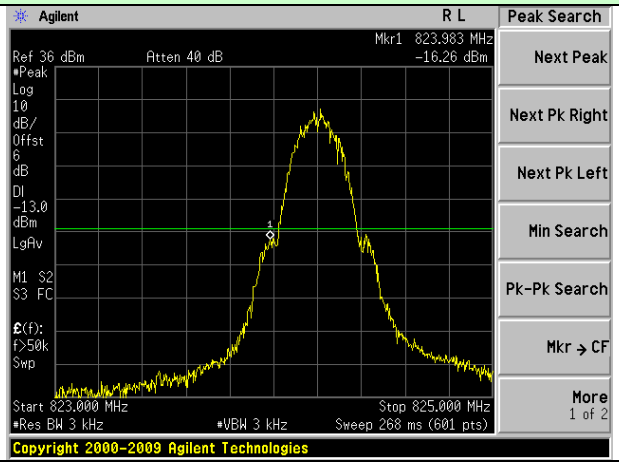




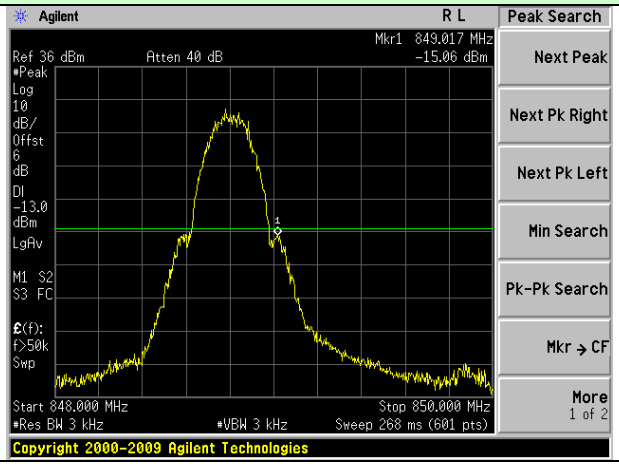
Highest channel

Band Edge:

	GSM850 (GPRS 1 link)

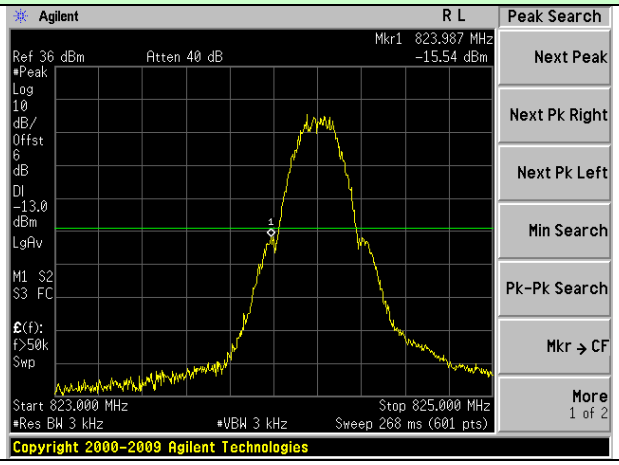


Lowest channel

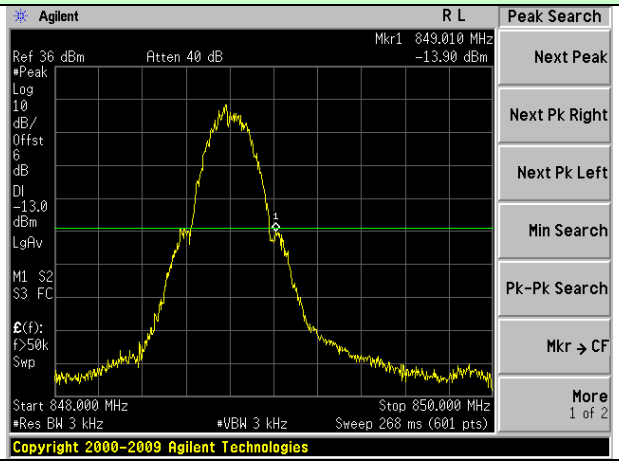


Highest channel

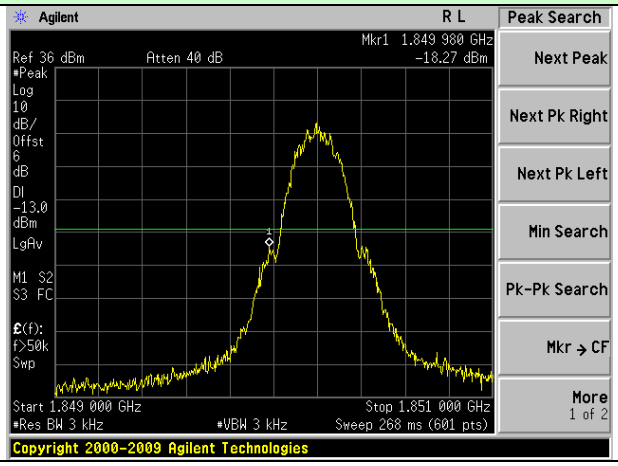
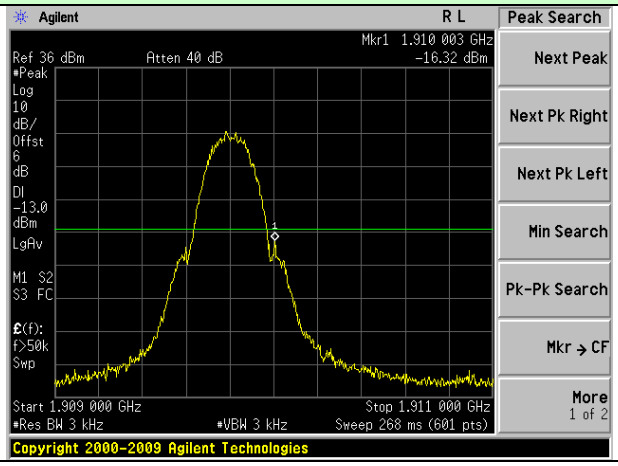
	GSM850 (EGPRS 1 link)

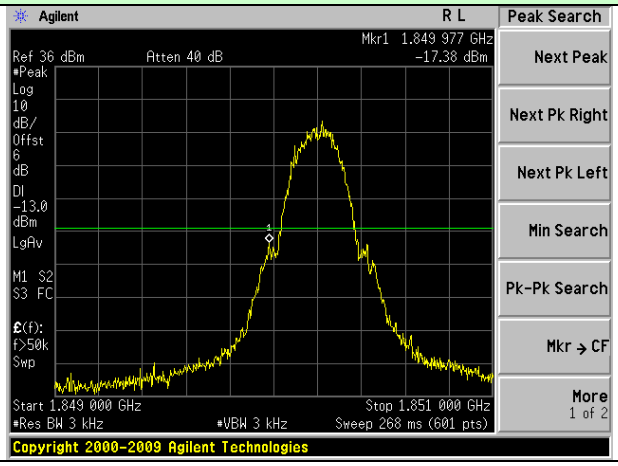
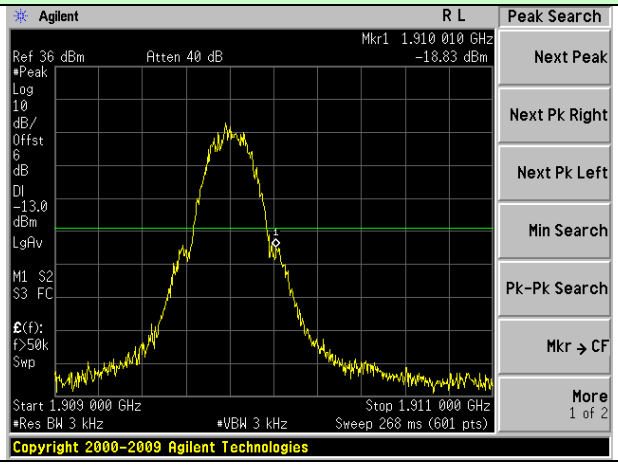


Lowest channel

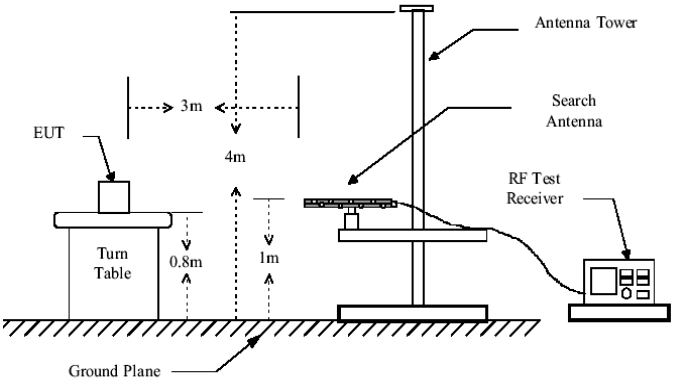
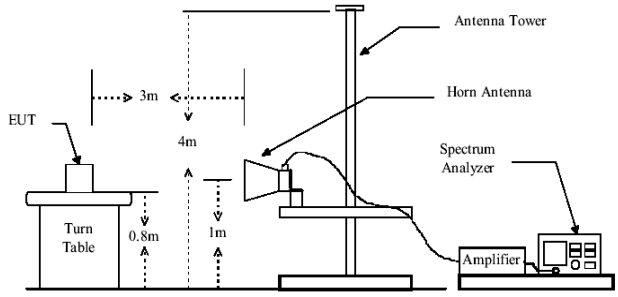
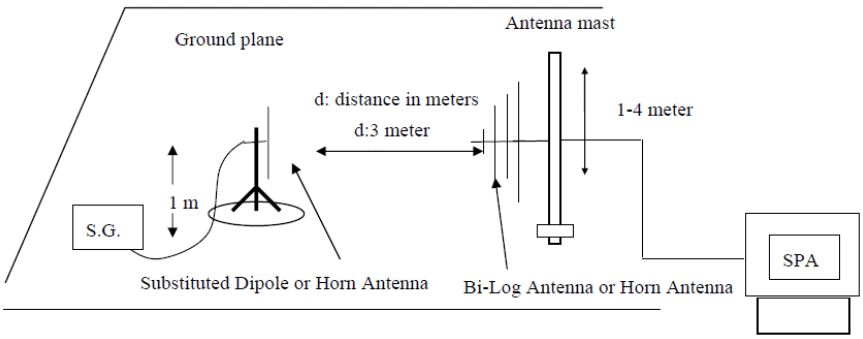


Highest channel

	PCS1900 (GPRS 1 link)
	
Lowest channel	Highest channel

	PCS1900 (EGPRS 1 link)
	
Lowest channel	Highest channel

7.7 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1046
Limit:	GSM850 7W ERP PCS1900 2W EIRP
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. 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. 2. 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. 3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

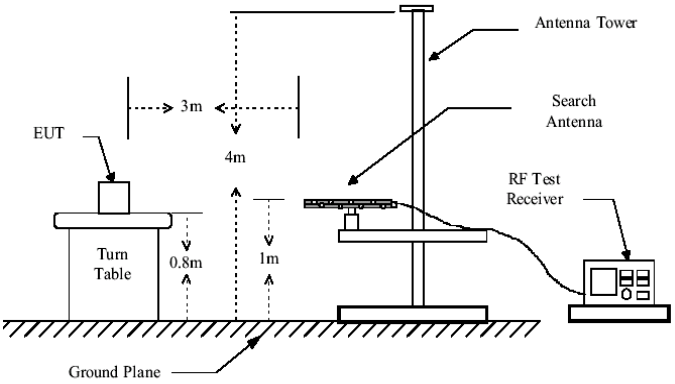
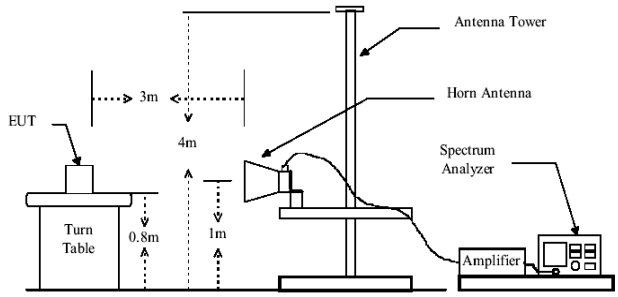
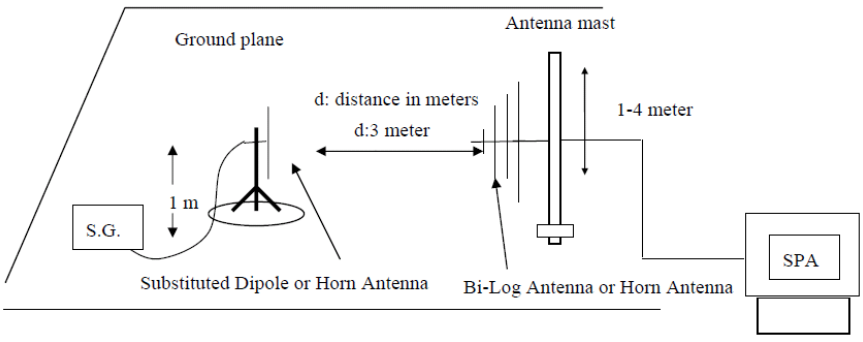
EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	31.85	38.45	Pass
			H	28.74		
		E1	V	23.39		
			H	28.93		
		E2	V	22.47		
			H	26.57		
	Middle	H	V	31.76	38.45	Pass
			H	28.63		
		E1	V	23.36		
			H	28.93		
		E2	V	24.10		
			H	27.12		
	Highest	H	V	32.18	38.45	Pass
			H	28.43		
		E1	V	23.38		
			H	27.91		
		E2	V	22.35		
			H	27.74		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (EGPRS 1 link)	Lowest	H	V	27.49	38.45	Pass
			H	24.45		
		E1	V	19.07		
			H	24.96		
		E2	V	18.44		
			H	22.84		
	Middle	H	V	27.76	38.45	Pass
			H	24.88		
		E1	V	19.64		
			H	25.57		
		E2	V	20.17		
			H	23.44		
	Highest	H	V	27.97	38.45	Pass
			H	24.25		
		E1	V	19.20		
			H	24.03		
		E2	V	17.59		
			H	23.31		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	28.03	33.01	Pass
			H	25.24		
		E1	V	20.43		
			H	25.40		
		E2	V	19.59		
			H	23.26		
	Middle	H	V	27.98	33.01	Pass
			H	25.15		
		E1	V	20.42		
			H	25.42		
		E2	V	21.10		
			H	23.79		
	Highest	H	V	28.46	33.01	Pass
			H	25.08		
		E1	V	20.56		
			H	24.60		
		E2	V	19.66		
			H	24.49		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (EGPRS 1 link)	Lowest	H	V	23.81	33.01	Pass
			H	19.35		
		E1	V	13.46		
			H	19.30		
		E2	V	12.23		
			H	16.51		
	Middle	H	V	22.24	33.01	Pass
			H	18.59		
		E1	V	12.79		
			H	18.65		
		E2	V	13.76		
			H	16.88		
	Highest	H	V	22.68	33.01	Pass
			H	18.51		
		E1	V	12.97		
			H	17.72		
		E2	V	12.30		
			H	17.97		

7.8 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. 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. 2. 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. 3. 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. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dBd/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Remark: The test is performed on GPRS and EGPRS modes, and found the GPRS mode is the worst case. Only the data of the worst case is reported.

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-35.58	-13.00	Pass
2472.60	V	-38.33		
3296.80	V	-40.61		
4121.00	V	-42.78		
4945.20	V	---		
1648.40	Horizontal	-40.85	-13.00	Pass
2472.60	H	-44.74		
3296.80	H	-46.33		
4121.00	H	-49.08		
4945.20	H	---		
Test mode:	**GSM850**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-37.01	-13.00	Pass
2509.80	V	-39.30		
3346.40	V	-41.21		
4183.00	V	-43.02		
5019.60	V	---		
1673.20	Horizontal	-41.41	-13.00	Pass
2509.80	H	-44.65		
3346.40	H	-45.97		
4183.00	H	-48.27		
5019.60	H	---		
Test mode:	**GSM850**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-37.30	-13.00	Pass
2546.40	V	-39.34		
3395.20	V	-41.03		
4244.00	V	-42.64		
5092.80	V	---		
1697.60	Horizontal	-41.21	-13.00	Pass
2546.40	H	-44.10		
3395.20	H	-45.27		
4244.00	H	-47.31		
5092.80	H	---		

Remark：

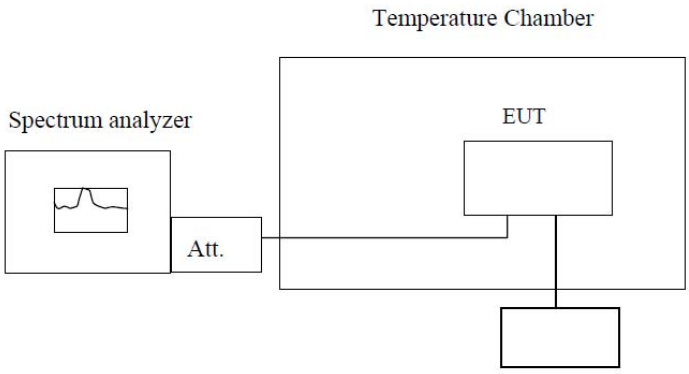
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-36.81	-13.00	Pass
5550.60	V	-39.20		
7400.80	V	-41.18		
9251.00	V	-43.08		
11101.20	V	---		
3700.40	Horizontal	-41.40	-13.00	Pass
5550.60	H	-44.79		
7400.80	H	-46.15		
9251.00	H	-48.53		
11101.20	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-34.40	-13.00	Pass
5640.00	V	-36.88		
7520.00	V	-38.93		
9400.00	V	-40.90		
11280.00	V	---		
3760.00	Horizontal	-39.16	-13.00	Pass
5640.00	H	-42.66		
7520.00	H	-44.09		
9400.00	H	-46.57		
11280.00	H	---		
Test mode:	**PCS1900**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-35.64	-13.00	Pass
5729.40	V	-38.04		
7639.20	V	-40.03		
9549.00	V	-41.93		
11458.80	V	---		
3819.60	Horizontal	-40.25	-13.00	Pass
5729.40	H	-43.65		
7639.20	H	-45.02		
9549.00	H	-47.41		
11458.80	H	---		

Remark：

1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

7.9 Frequency stability V.S. Temperature measurement

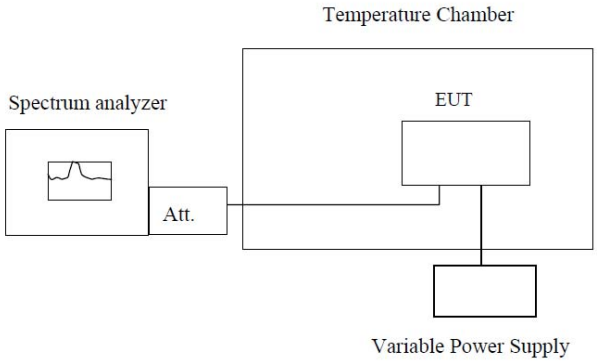
Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
7.40	-30	28	0.0337	2.5	Pass
	-20	31	0.0371		
	-10	27	0.0320		
	0	24	0.0287		
	10	25	0.0304		
	20	23	0.0270		
	30	38	0.0454		
	40	32	0.0387		
	50	31	0.0371		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
7.40	-30	68	0.0818	2.5	Pass
	-20	81	0.0964		
	-10	66	0.0787		
	0	56	0.0669		
	10	64	0.0764		
	20	54	0.0650		
	30	99	0.1179		
	40	85	0.1011		
	50	80	0.0951		

Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error			Result
		Hz	ppm		
7.40	-30	48	0.0254	2.5	Pass
	-20	56	0.0299		
	-10	44	0.0236		
	0	36	0.0190		
	10	46	0.0245		
	20	36	0.0190		
	30	65	0.0344		
	40	53	0.0281		
	50	56	0.0299		
Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error			Result
		Hz	ppm		
7.40	-30	91	0.0483	2.5	Pass
	-20	105	0.0561		
	-10	88	0.0465		
	0	74	0.0391		
	10	89	0.0471		
	20	76	0.0402		
	30	117	0.0624		
	40	100	0.0529		
	50	104	0.0554		

7.10 Frequency stability V.S. Voltage measurement

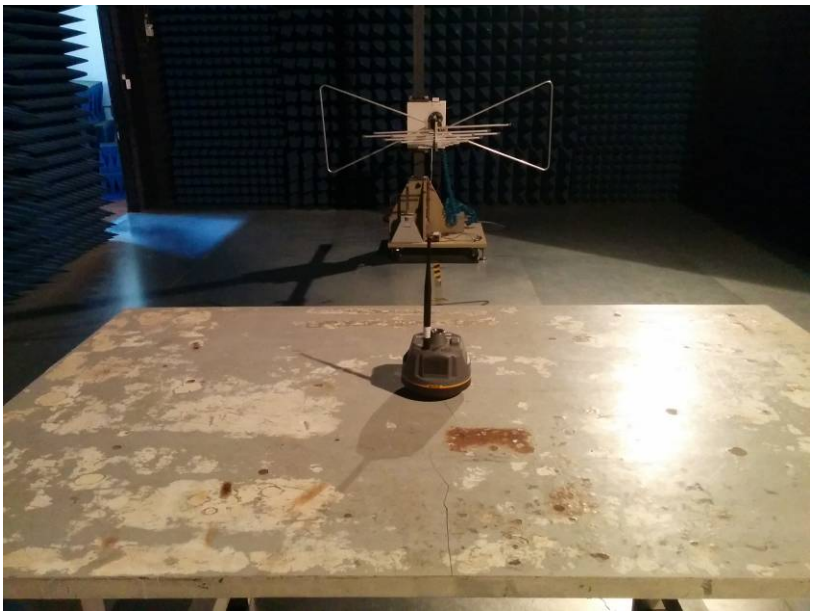
Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

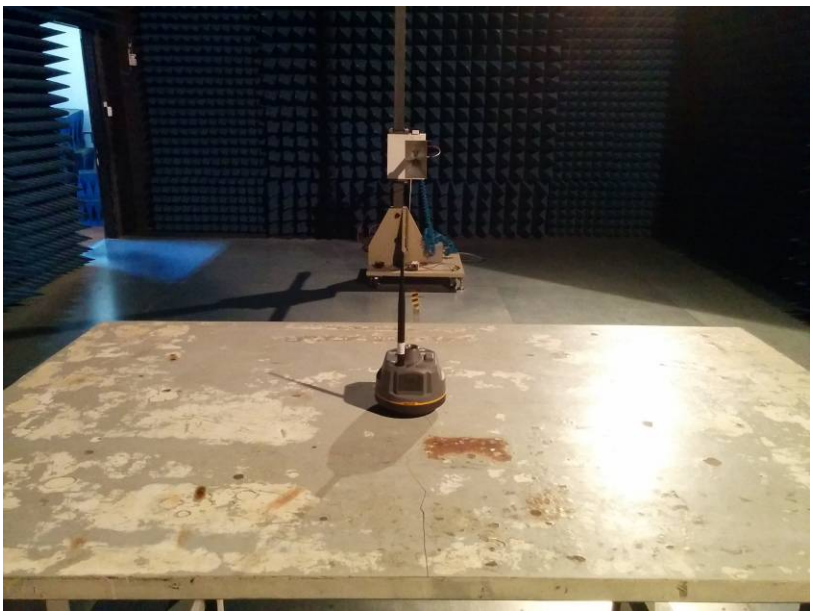
Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	8.50	22	0.0258	2.5	Pass
	7.40	12	0.0143		
	6.30	15	0.0182		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	8.50	40	0.0475	2.5	Pass
	7.40	45	0.0536		
	6.30	50	0.0597		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	8.50	57	0.0302	2.5	Pass
	7.40	41	0.0217		
	6.30	44	0.0234		
Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	8.50	68	0.0359	2.5	Pass
	7.40	79	0.0419		
	6.30	79	0.0422		

8 Test Setup Photo

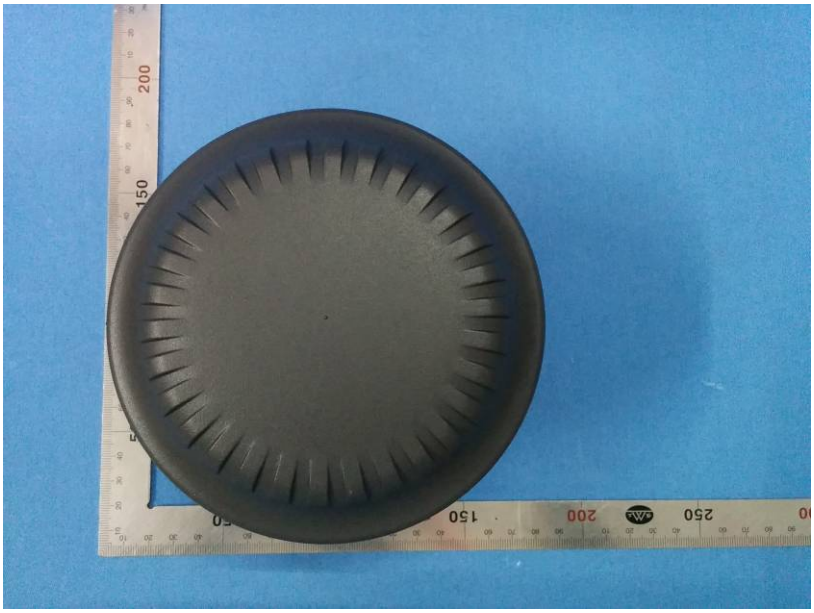
Radiated Emission





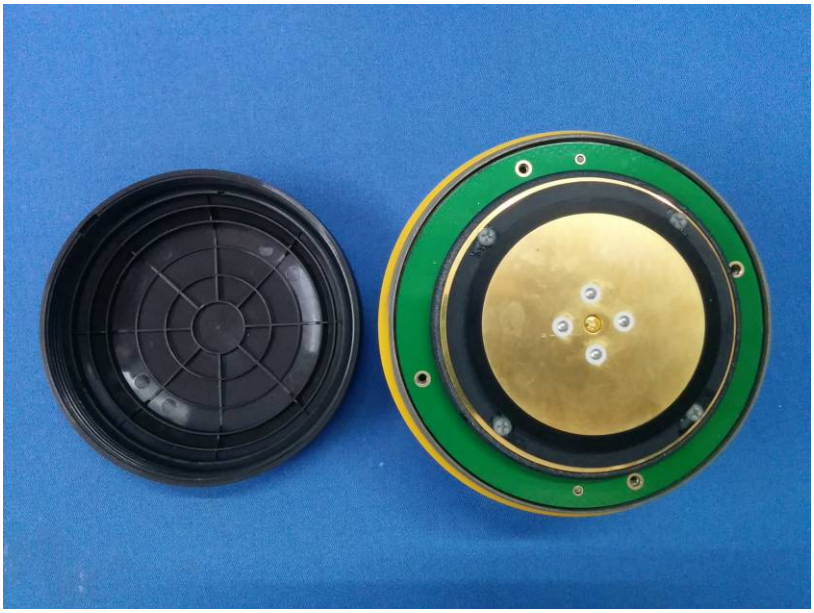
9 EUT Constructional Details

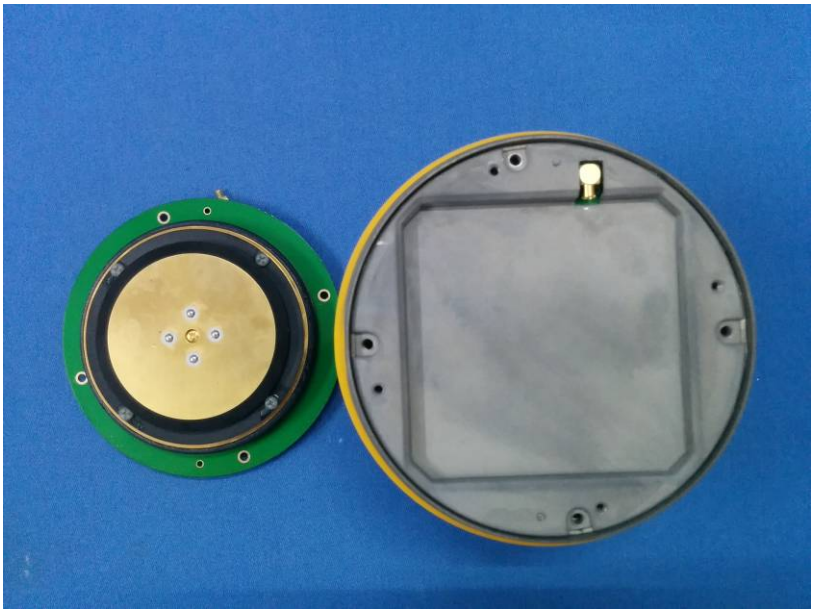

SOUTH GNSS接收机
BOTTOM OF UNIT TO NOMINAL:
L1 = 109. 5mm
L2 = 102. 5mm
PASSED

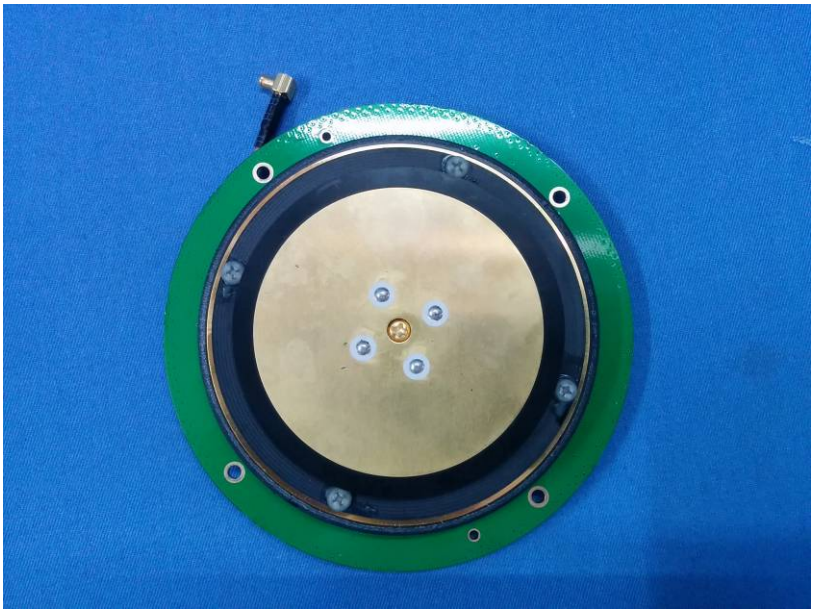



SOUTH
STAINLESS STEEL
50
150
200

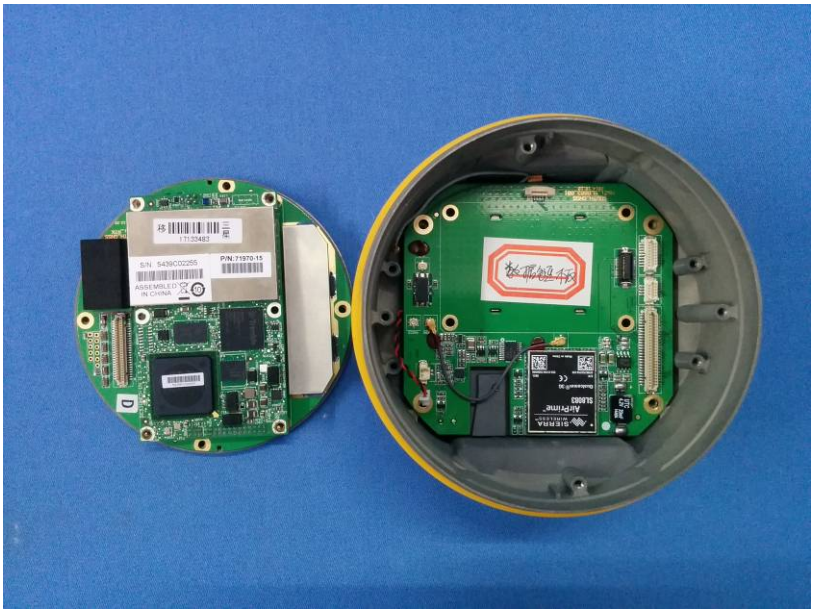

SOUTH
STAINLESS STEEL
50
150
200



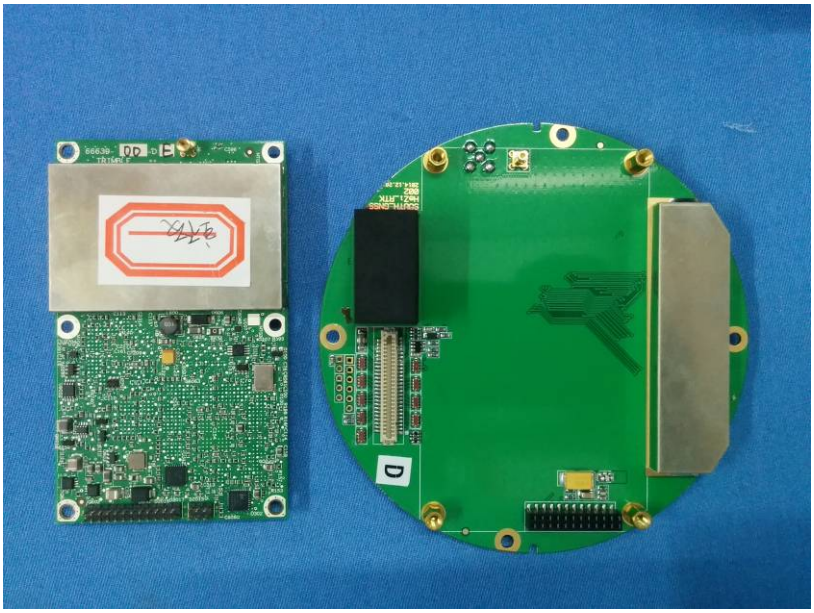


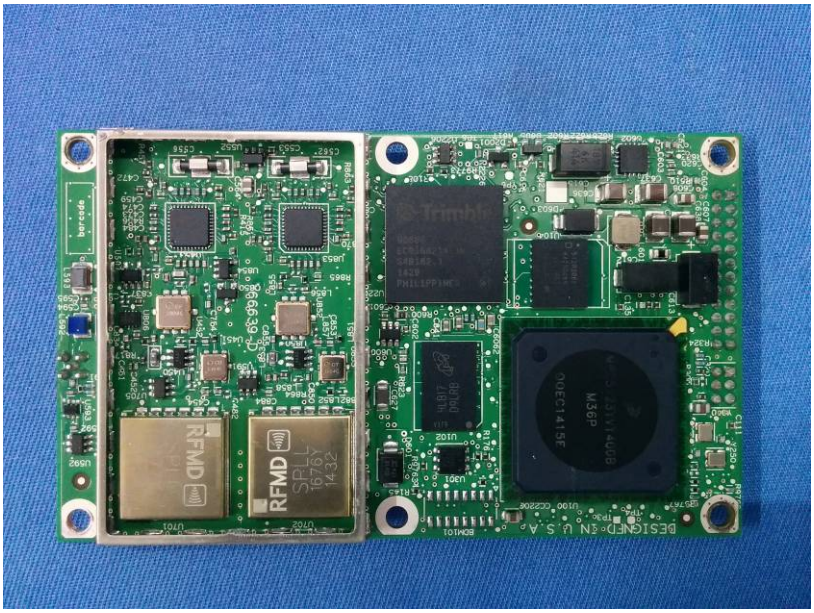



GNSS全频测量天线
Model:S82D_T970A
S/N:1501014100522
Q.C.
PASSED

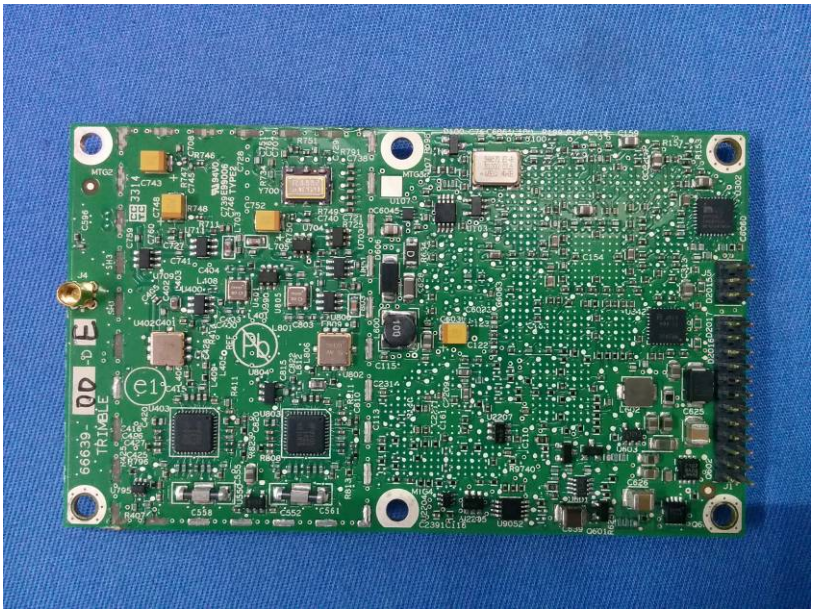


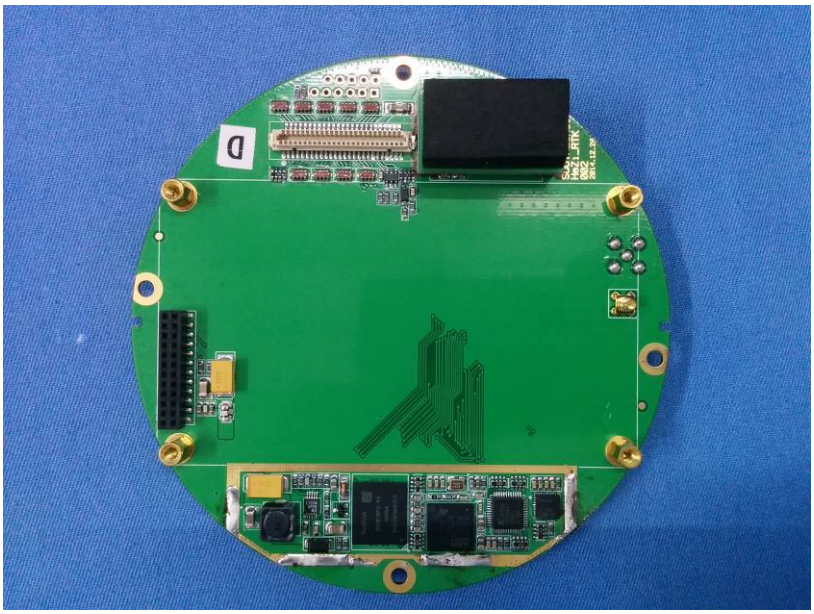

17133483
S/N: 5439C02255
P/N:71970-15
ASSEMBLED
IN CHINA

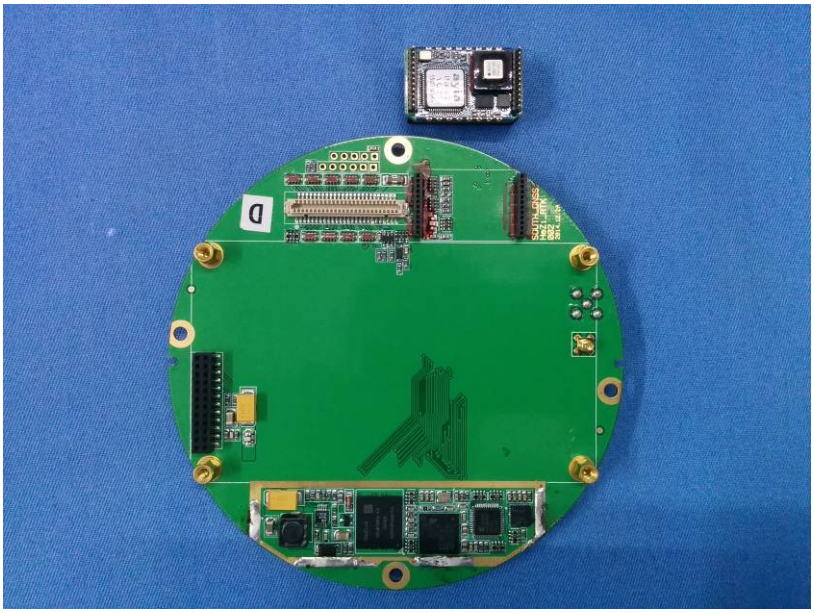


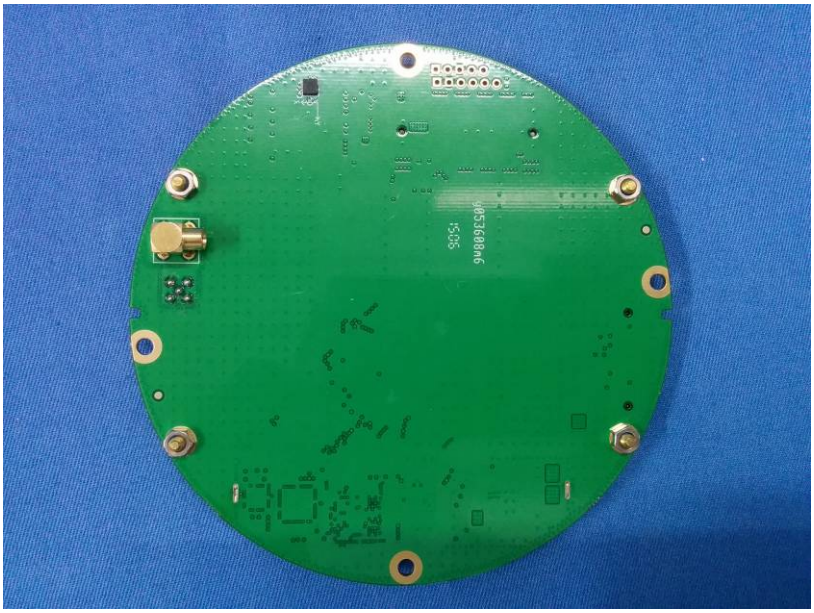

RFMD
SPLL
1676Y
1432
M36P
DESIGNED IN U.S.A.

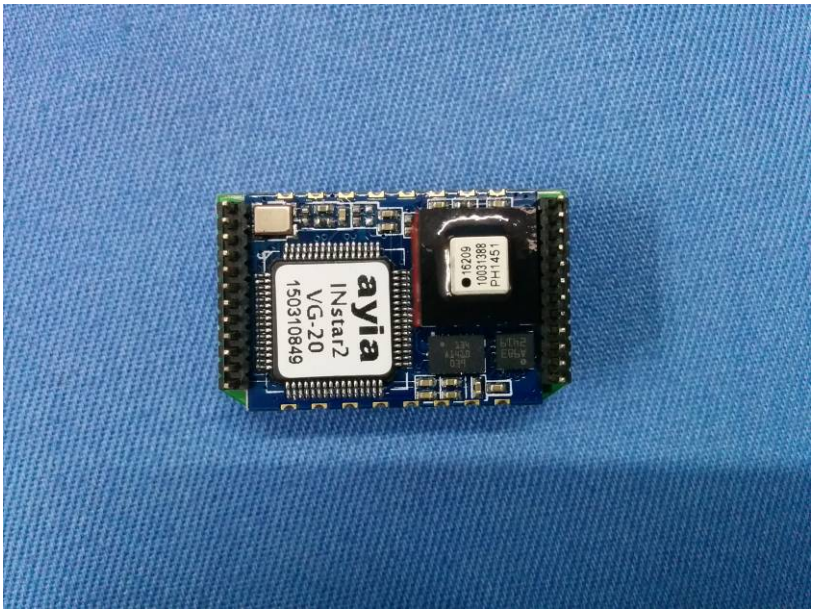

M36P
DESIGNED IN U.S.A.



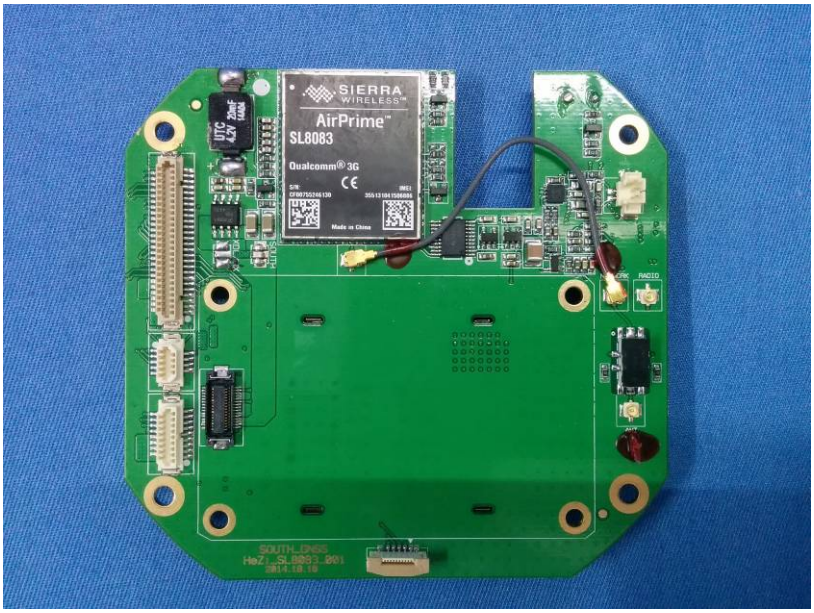


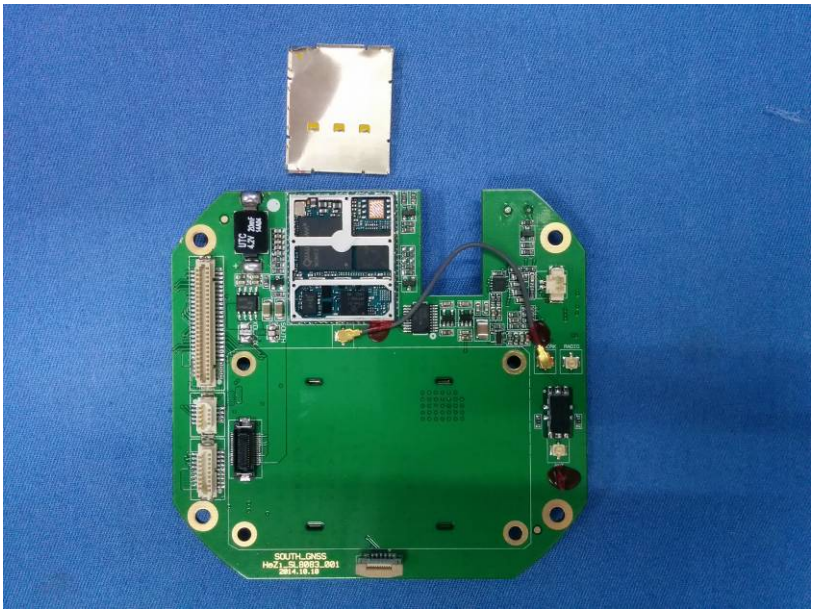


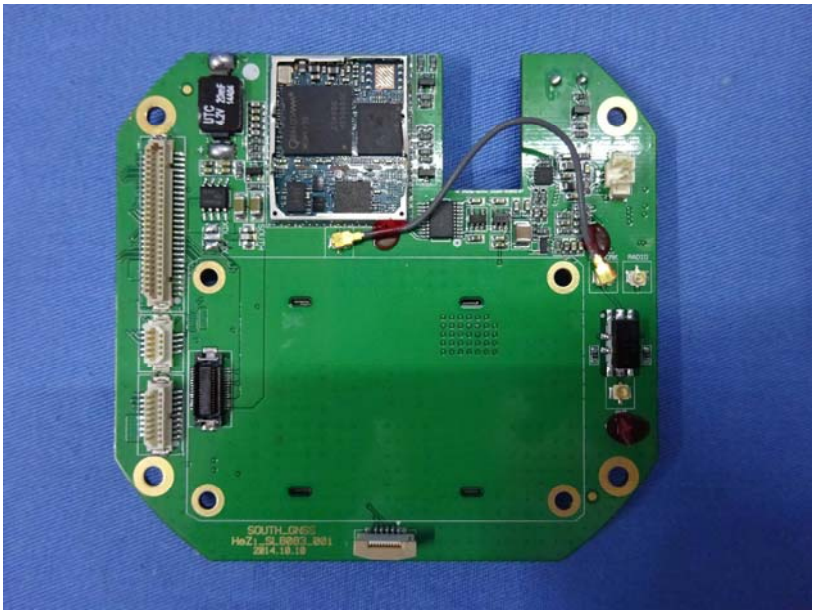


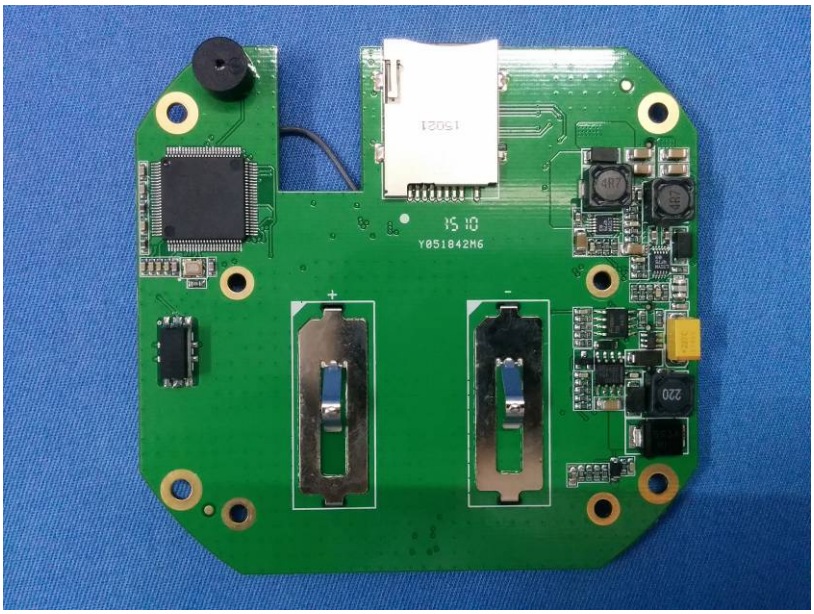

ayia
INstar2
VG-20
150310849

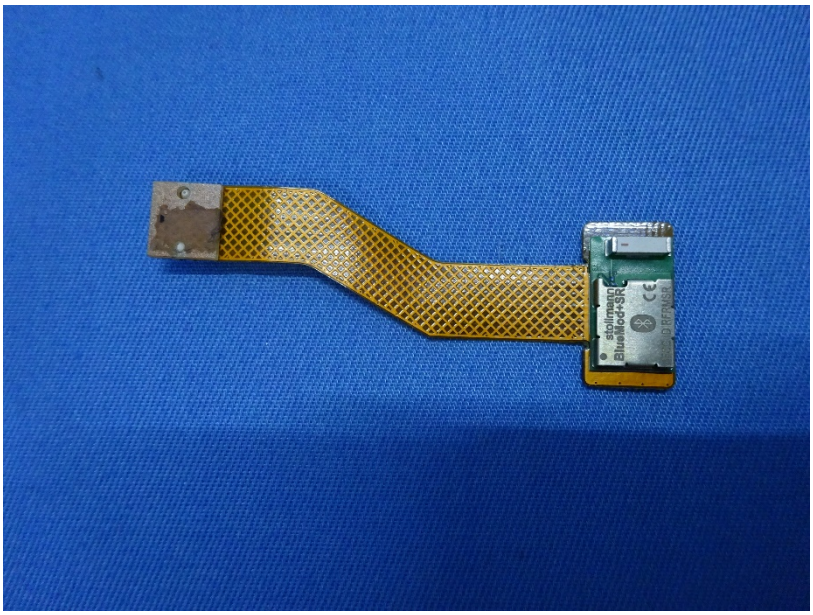

SOUTH_GNSS
HeZi_RTK
QingJiao_000
2014.12.03

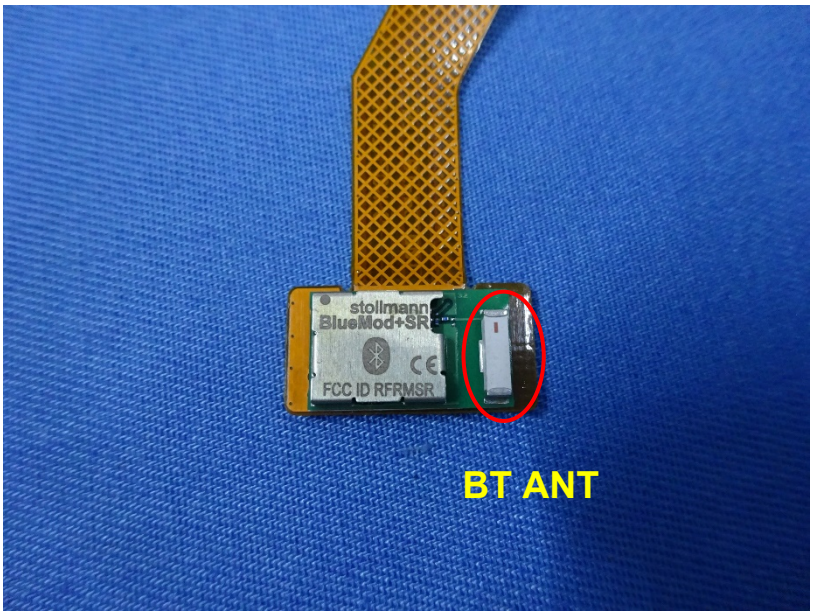

SIERRA WIRELESS
AirPrime
SL8083
Qualcomm 3G

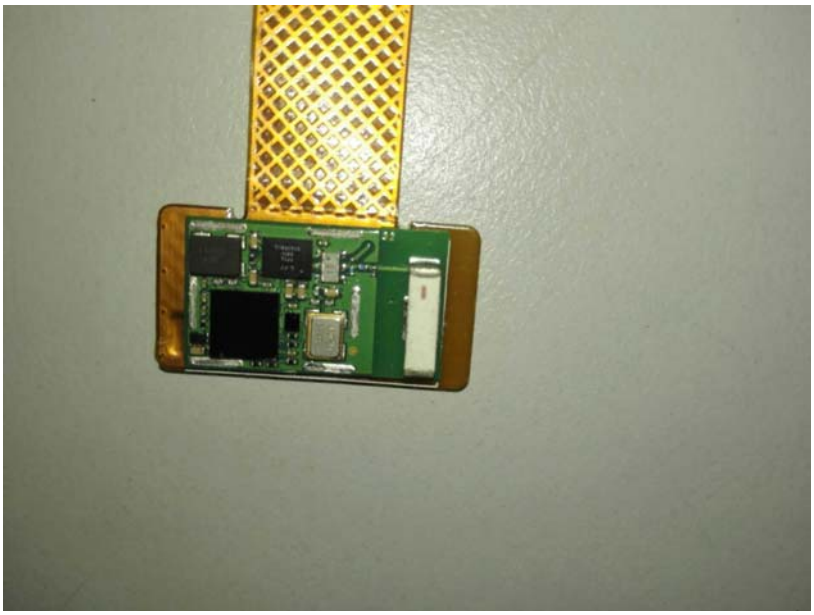


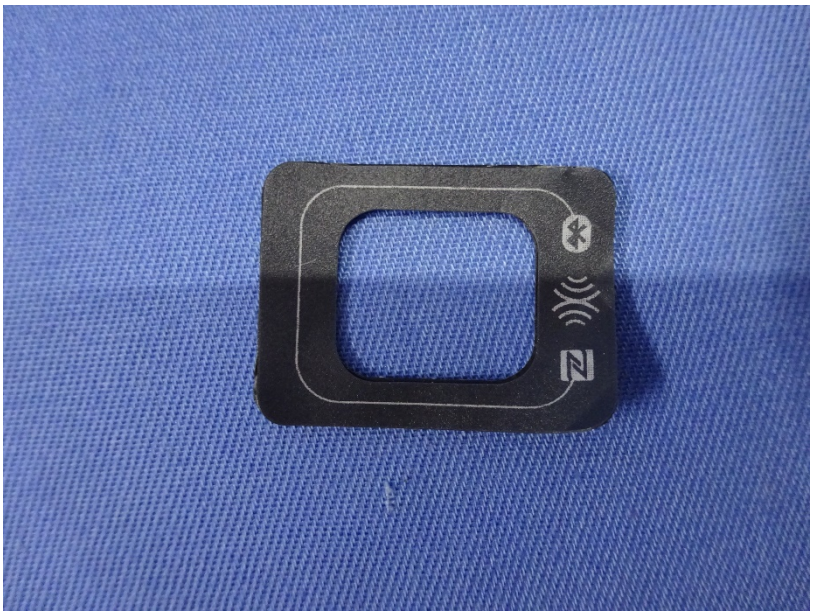


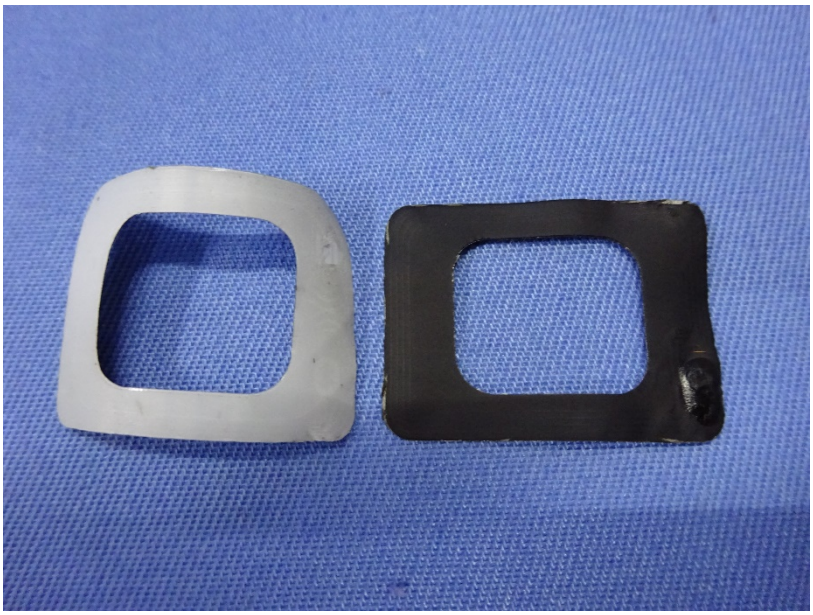





stollmann
BlueMod+SR
FCC ID RFRMSR
BT ANT








NFC Tag ANT


Lithium Battery
BTNF-L7402W
7.4V 2500mAh
WARNING!
1. Please use the standard charger.
2. Do not strike, short-circuit, heat or disassemble.
SN:13000190
SANYO
2500


SOUTH GNSS接收机
BOTTOM OF UNIT TO NOMINAL
L1=109.5mm
L2=102.5mm
GPRS/EGPRS ANT

-----end------