TEST REPORT

OF

FCC Part 22, 24,15 Subpart B

FCC ID: SS4BIP5XX0

Equipment Under Test	:	PDA
Model Name	:	BIP-5000
Serial No.	:	N/A
Applicant	:	BluebirdSoft., Inc.
Manufacturer	:	BluebirdSoft., Inc.
Date of Test(s)	:	2006-12-26 ~ 2007-01-05
Date of Issue	:	2007-01-11

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

Tested By: **Date** **2007-01-11**

Feel Jeong

Approved By **Date** **2007-01-11**

Albert Lim

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1. General Information

1.1. Testing Laboratory

SGS Testing Korea Co., Ltd.
Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-Si, Gyeonggi-do, Korea 435-040
www.electrolab.kr.sgs.com
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371

1.2. Details of Applicant

Applicant : BluebirdSoft., Inc
Address : 558-5, Sinsa-dong, Kangnam-gu, Seoul, Korea
Contact Person : Chan Eung Park
Phone No. : +82 +2 548 0740
Fax No. : +82 +2 548 0870

1.3. Description of EUT

Kind of Product	PDA
Model Name	BIP-5000
Serial Number	N/A
Power Supply	DC 3.7 V(Li-Polymer Battery)
Frequency Range	2412 MHz ~ 2462 MHz(11b/g), 2402 MHz ~ 2480 MHz(Bluetooth) 824.2 MHz ~ 848.8 MHz(GSM 850), 1850.2 MHz ~ 1909.8 MHz(GSM 1900)
Modulation Technique	DSSS(11b), OFDM(11g), FHSS(Bluetooth), GMSK, 8-PSK
Number of Channels	11 CH(11b/g), 79 CH(Bluetooth), 300(GSM 1900), 125(GSM 850)
Operating Conditions	-20 ℃ ~ 55 ℃
Antenna Type	Fixed Type(11b/g, Bluetooth) FPCB Type(GSM)
Antenna Gain	-0.98 dBi(WLAN, Bluetooth)

1.4. Details of modification

-N/A

1.5. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May 2007
Spectrum Analyzer	Agilent	E4440A	May 2007
Spectrum Analyzer	H.P	8593E	Sep. 2007
Power Meter	Agilent	E4416A	May 2007
Power Sensor	Agilent	E9327A	May 2007
DC Power Supply	Agilent	6674A	May 2007
DC Power Supply	Agilent	E3631A	May 2007
Attenuator	Agilent	8494B	May 2007
Two-Line V-Network	NNB 41	Schaffner	Sep. 2007
Test Receiver	Rohde & Schwarz	ESVS10	May 2007
Test Receiver	Rohde & Schwarz	ESHS10	Aug. 2007
Ultra-Broadband Antenna	Rohde & Schwarz	HL562	Sep. 2007
Horn Antenna	Electro-Metrics	RGA-60	Dec. 2007
Horn Antenna	SCHWARZBECK	BBHA9120D(0600)	Jul. 2007
Dipole Antenna	VHAP/UHAP	975/958	Jun. 2007
Communication Antenna	AR	AT 4002	N.C.R
Band Reject Filter	Wainwright	WRCG824/849-814/85960/10SS	May 2007

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Highpass Filter	Wainwright	WHK3.0/18G-10SS	Dec.2007
Mobile Test Unit	Rohde & Schwarz	CMU200	Dec.2007
Mobile Test Unit	Agilent	E5515C	May 2007
Anechoic Chamber	SY Corporation	L x W x H 9.6 x 6.4 x 6.4	Aug. 2007

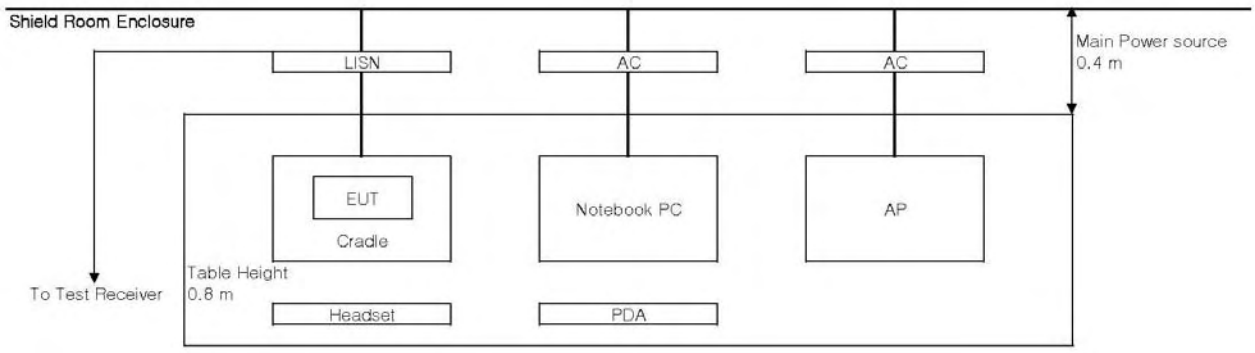
1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part 22, 24,15 Subpart B		
Standard Section	**Test Item**	**Result**
15.107(a)	AC Power Conducted Emission	Complied
22.913(a) 24.232(c)	RF Radiated Output Power	Complied
22.917(a) 24.238(a)	Spurious Radiated Emission	Complied

2. Conducted Power Line Test

2.1. Test Setup



2.2. Limit

According to §15.107(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dBμV)	
	Qausi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

The test procedure is performed in a 6.5m × 3.6m× 3.6m (L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.4. Test Results

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : 22 ℃ Relative humidity : 43 %

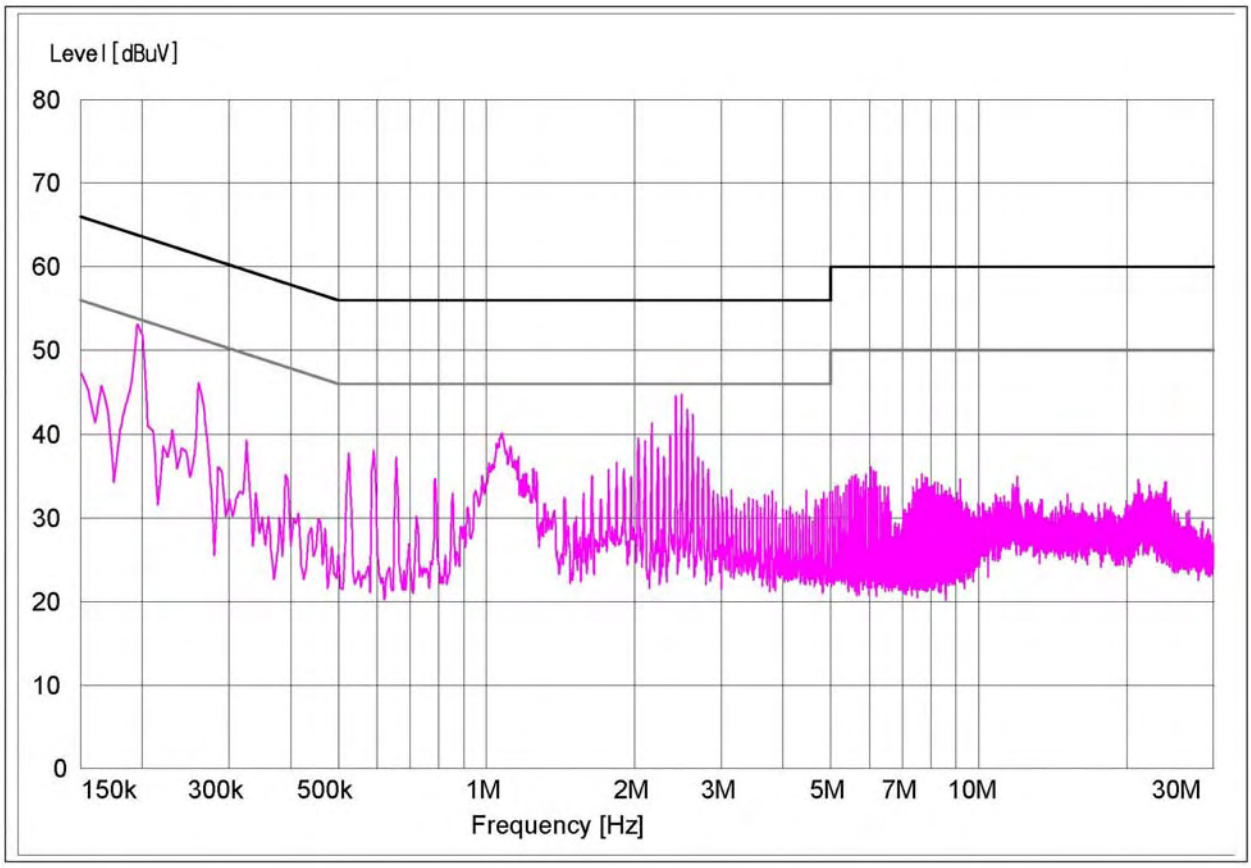
Frequency range : 0.15 MHz – 30 MHz
Measured Bandwidth : 9 kHz

FREQ.	LEVEL(dBuV)		LINE	LIMIT(dBuV)		MARGIN(dB)	
(MHz)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.196	52.1	40.2	H	63.8	53.8	11.7	13.6
0.262	44.5	33.9	H	61.4	51.4	16.9	17.5
0.526	34.7	31.8	H	56.0	46.0	21.3	14.2
1.049	37.2	29.5	H	56.0	46.0	18.8	16.5
2.162	35.6	30.6	H	56.0	46.0	20.4	15.4
2.492	37.4	26.8	H	56.0	46.0	18.6	19.2
0.195	49.5	40.4	N	63.8	53.8	14.3	13.4
0.260	42.7	36.3	N	61.4	51.4	18.7	15.1
0.521	35.9	33.6	N	56.0	46.0	20.1	12.4
0.591	39.1	35.3	N	56.0	46.0	16.9	10.7
1.150	33.9	23.2	N	56.0	46.0	22.1	22.8
2.425	38.3	30.3	N	56.0	46.0	17.7	15.7

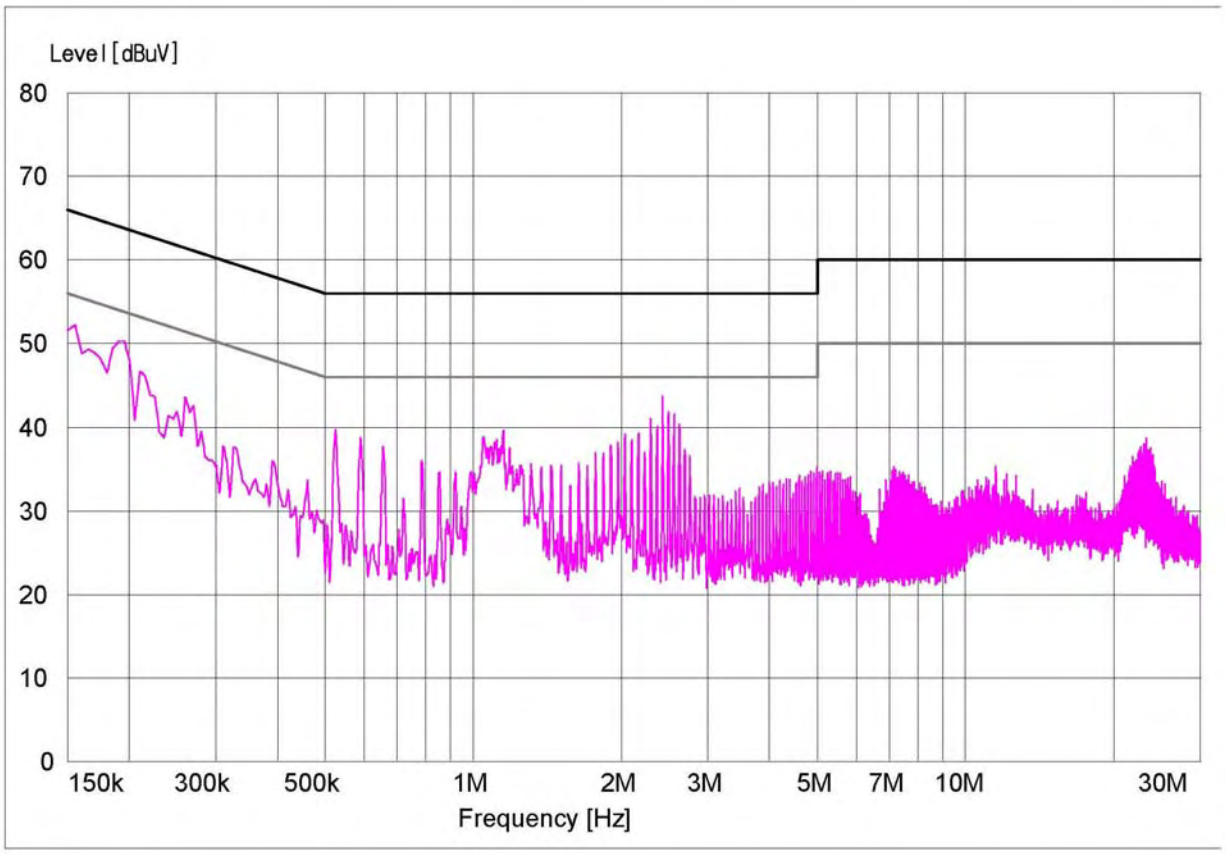
Note ;
Line (H) : Hot
Line (N) : Neutral

Plot of Conducted Power line

Test mode : (Hot)



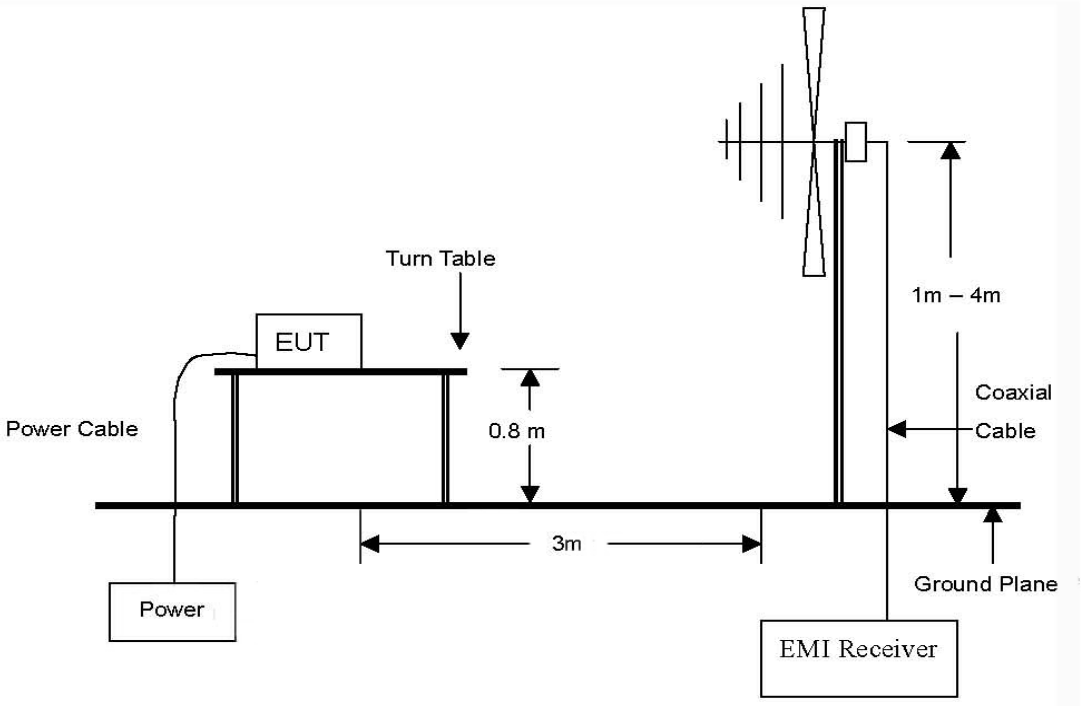
Test mode : (Neutral)



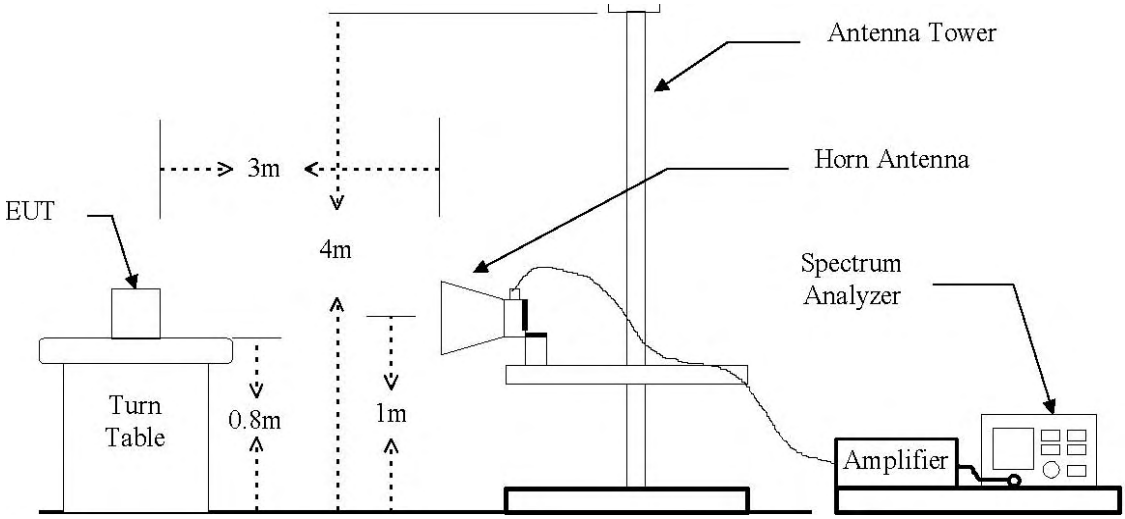
3. RF Radiated Output Power

3.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz Emissions.



3.2. Limit

FCC §22.913(a), the ERP of mobile transmitters must not exceed 7 watts. FCC §24.232(c) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

3.3. Test Procedure

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then the rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase he sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

3.4. Test Results

Ambient temperature : 22 ℃ Relative humidity : 50 %

GSM 850

Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBd)	E. R. P.	
					(dBm)	(W)
824.2	H	28.64	12.08	-8.53	32.19	1.66
836.6	H	28.64	12.01	-8.52	32.13	1.63
848.8	H	28.64	11.80	-8.50	31.94	1.56

GPRS 850

Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBd)	E. R. P.	
					(dBm)	(W)
824.2	H	28.64	12.36	-8.53	32.47	1.77
836.6	H	28.64	11.83	-8.52	31.95	1.57
848.8	H	28.64	11.40	-8.50	31.54	1.42

EGPRS 850

Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBd)	E. R. P.	
					(dBm)	(W)
824.2	H	28.64	9.67	-8.53	29.78	0.95
836.6	H	28.64	10.22	-8.52	30.34	1.08
848.8	H	28.64	10.51	-8.50	30.65	1.16

Remake: 1. ERP= SG Power Level +Amp-C.L. +Antenna Gain

GSM 1900

Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBi)	E. I. R. P.	
					(dBm)	(W)
1850.2	H	33.91	-14.66	9.02	28.27	0.67
1880.0	H	33.91	-14.83	9.06	28.14	0.65
1909.8	H	33.91	-14.19	9.09	28.81	0.76

GPRS 1900

Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBi)	E. I. R. P.	
					(dBm)	(W)
1850.2	H	33.91	-14.75	9.02	28.18	0.66
1880.0	H	33.91	-15.06	9.06	27.91	0.62
1909.8	H	33.91	-14.40	9.09	28.60	0.72

EGPRS 1900

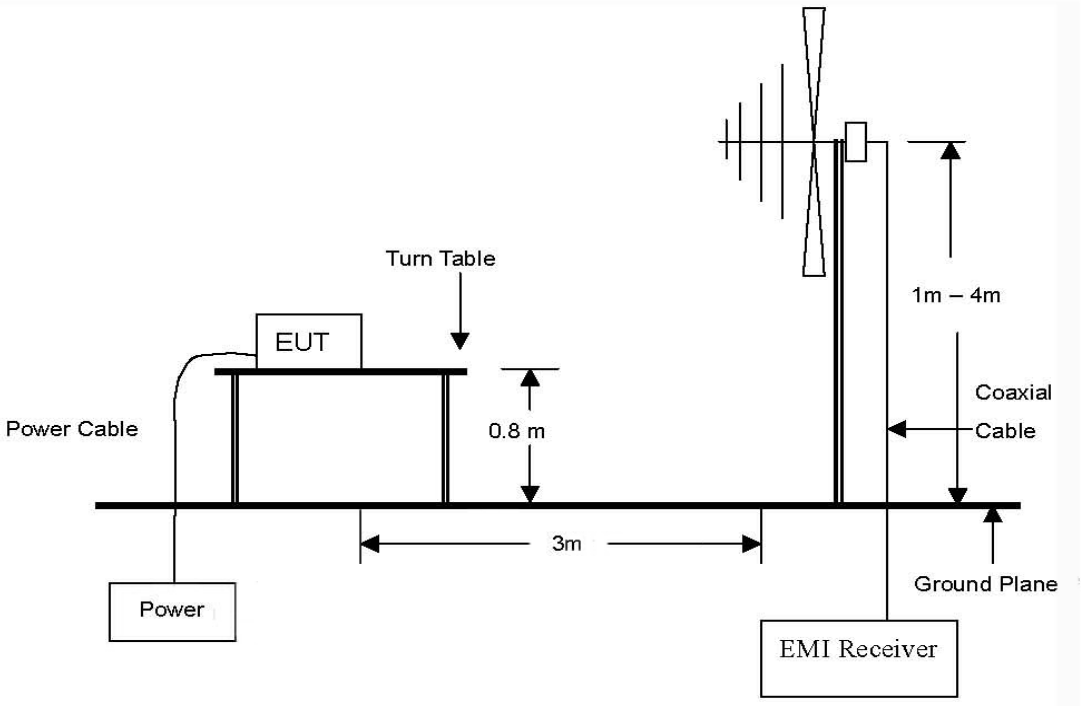
Frequency (MHz)	Ant. Pol. (H/V)	Amp-C.L (dB)	S.G Power Level (dBm)	Antenna Gain (dBi)	E. I. R. P.	
					(dBm)	(W)
1850.2	H	33.91	-15.18	9.02	27.75	0.60
1880.0	H	33.91	-15.34	9.06	27.63	0.58
1909.8	H	33.91	-15.49	9.09	27.51	0.56

Remake: 1. E.I.R.P.= S.G. Power Level +Amp-C.L. +Antenna Gain

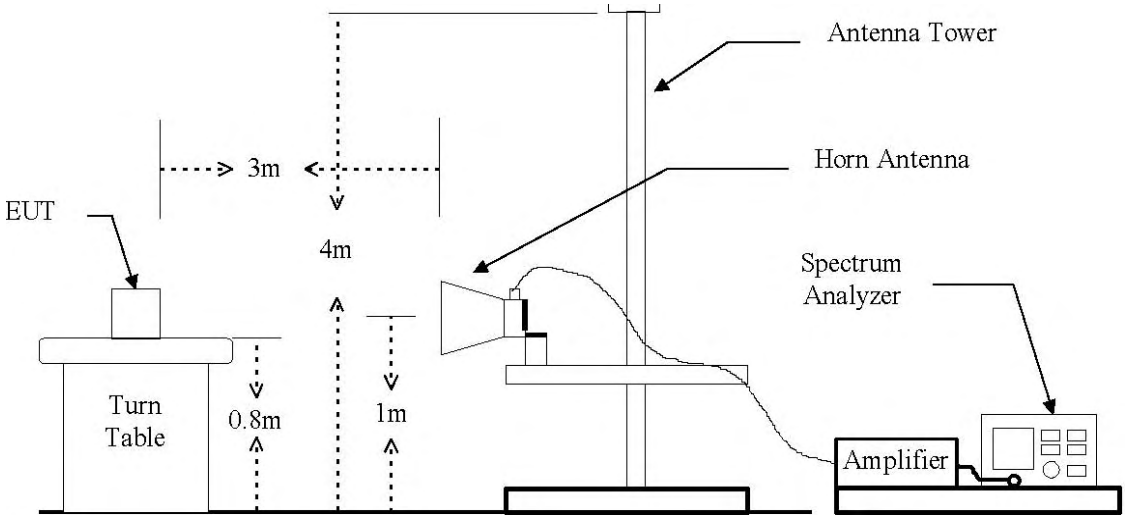
4. Spurious Radiated Emission

4.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz Emissions.



4.2. Limit

§ 22.917(a) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency must be attenuated below the transmitting (P) by a factor of at least 43+10log(P)dB.

4.3. Test Procedure

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then the rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase he sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

4.4. Test Results

Ambient temperature : 22 ℃ Relative humidity : 50 %

GSM 850

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (824.2 MHz)								
1648.4	H	-54.36	1.02	8.22	6.07	-49.31	-13	36.31
2472.6	H	-64.89	1.06	10.03	7.88	-58.07	-13	45.07
TX MID Channel (836.6 MHz)								
1673.2	H	-60.54	1.02	8.30	6.15	-55.41	-13	42.41
2509.8	H	-66.28	1.06	10.70	8.55	-58.79	-13	45.79
TX HIGH Channel (848.8 MHz)								
1697.6	H	-62.98	1.02	8.39	6.24	-57.76	-13	44.76
2546.4	H	-68.97	1.06	10.11	7.96	-62.07	-13	49.07

Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

GPRS 850

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (824.2 MHz)								
1648.4	H	-56.79	1.02	8.22	6.07	-51.74	-13	38.74
2472.6	H	-67.44	1.06	10.03	7.88	-60.62	-13	47.62
TX MID Channel (836.6 MHz)								
1673.2	H	-62.20	1.02	8.30	6.15	-57.07	-13	44.07
2509.8	H	-68.70	1.06	10.70	8.55	-61.21	-13	48.21
TX HIGH Channel (848.8 MHz)								
1697.6	H	-65.59	1.02	8.39	6.24	-60.37	-13	47.37
2546.4	H	-70.40	1.06	10.11	7.96	-63.50	-13	50.50

Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

EGPRS 850

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (824.2 MHz)								
1648.4	H	-61.43	1.02	8.22	6.07	-56.38	-13	43.38
2472.6	H	-67.97	1.06	10.03	7.88	-61.15	-13	48.15
TX MID Channel (836.6 MHz)								
1673.2	H	-63.67	1.02	8.30	6.15	-58.54	-13	45.54
2509.8	H	-69.30	1.06	10.70	8.55	-61.81	-13	48.81
TX HIGH Channel (848.8 MHz)								
1697.6	H	-67.16	1.02	8.39	6.24	-61.94	-13	48.94
2546.4	H	-72.02	1.06	10.11	7.96	-65.12	-13	52.12

Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

GSM 1900

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (1850.2 MHz)								
3700.4	H	-70.83	1.53	11.14	8.99	-63.37	-13	50.37
5550.6	H	-63.60	2.20	11.56	9.41	-56.39	-13	43.39
TX MID Channel (1880.0 MHz)								
3760.0	H	-72.13	1.53	11.18	9.03	-64.63	-13	51.63
5640.0	H	-62.95	2.20	11.62	9.47	-55.68	-13	42.68
TX HIGH Channel (1909.8 MHz)								
3819.6	H	-71.51	1.53	11.23	9.08	-63.96	-13	50.96
5729.4	H	-62.01	2.20	11.68	9.53	-54.68	-13	41.68

Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

GPRS 1900

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (1850.2 MHz)								
3700.4	H	-71.04	1.53	11.14	8.99	-63.58	-13	50.58
5550.6	H	-63.71	2.20	11.56	9.41	-56.50	-13	43.50
TX MID Channel (1880.0 MHz)								
3760.0	H	-72.24	1.53	11.18	9.03	-64.74	-13	51.74
5640.0	H	-63.09	2.20	11.62	9.47	-55.82	-13	42.82
TX HIGH Channel (1909.8 MHz)								
3819.6	H	-71.60	1.53	11.23	9.08	-64.05	-13	51.05
5729.4	H	-62.11	2.20	11.68	9.53	-54.78	-13	41.78

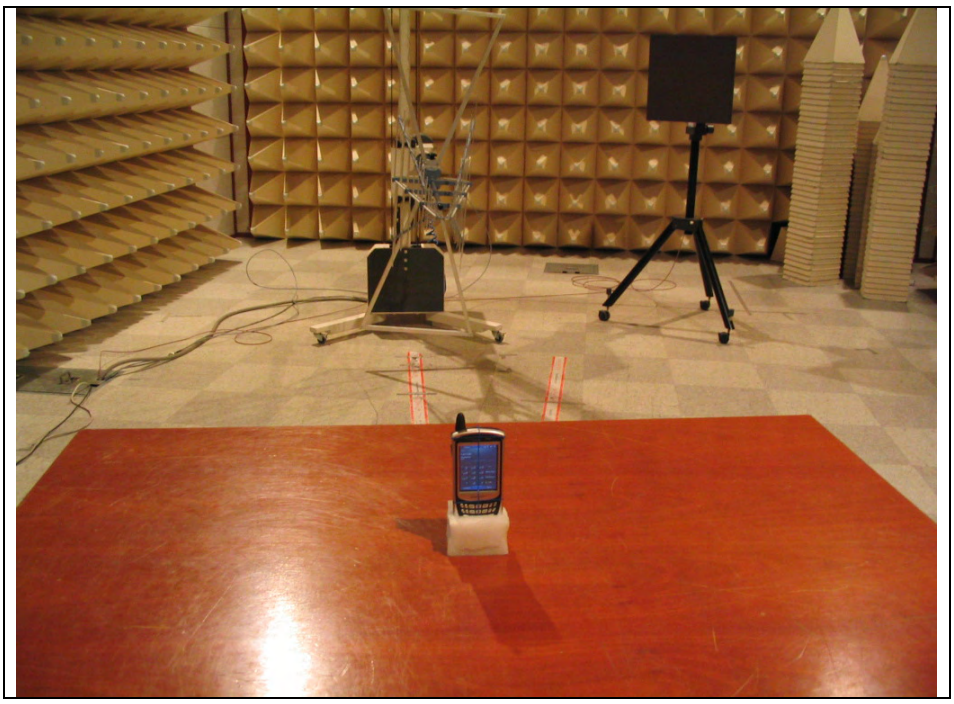
Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

EGPRS 1900

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	E.R.P. (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel (1850.2 MHz)								
3700.4	H	-70.93	1.53	11.14	8.99	-63.47	-13	50.47
5550.6	H	-62.12	2.20	11.56	9.41	-54.91	-13	41.91
TX MID Channel (1880.0 MHz)								
3760.0	H	-70.55	1.53	11.18	9.03	-63.05	-13	50.05
5640.0	H	-62.23	2.20	11.62	9.47	-54.96	-13	41.96
TX HIGH Channel (1909.8 MHz)								
3819.6	H	-71.33	1.53	11.23	9.08	-63.78	-13	50.78
5729.4	H	-61.02	2.20	11.68	9.53	-53.69	-13	40.69

Remake: 1. No more harmonic above 3rd harmonic for all channel.
2. E.R.P.= SG Reading –Cable Loss +Gain
3. The effective radiated power record the largest level between the two levels with Ant.Pol.(H/V)

Appendix A-1. Photo of Field Strength & Radiated Emission Test



Appendix A -2. Photos of Conducted Power Line Test

Appendix B. Photos of the EUT

Front View of EUT

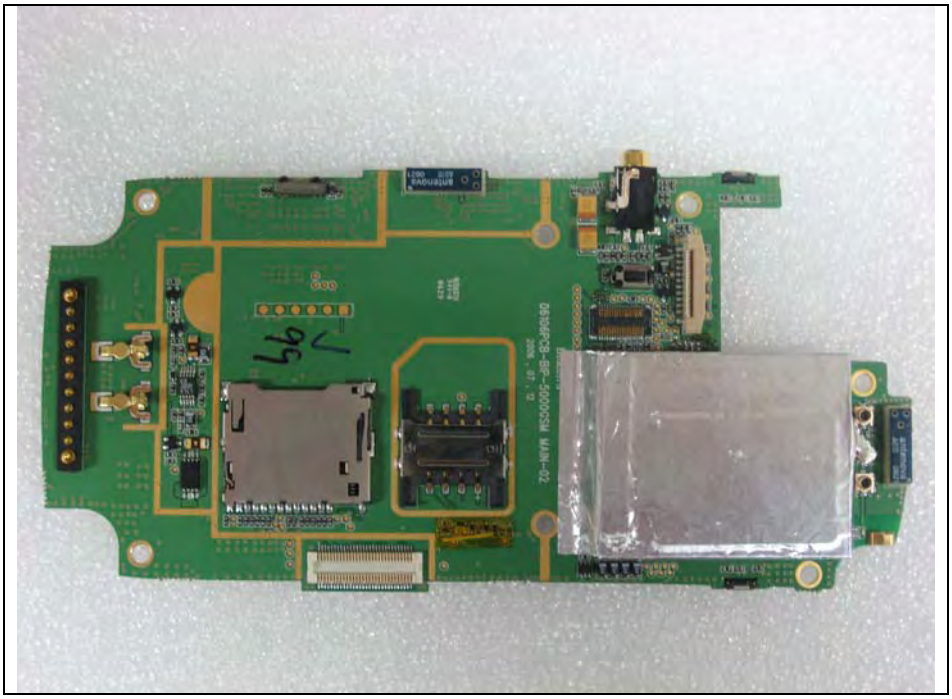
Rear View of EUT

Right View of EUT

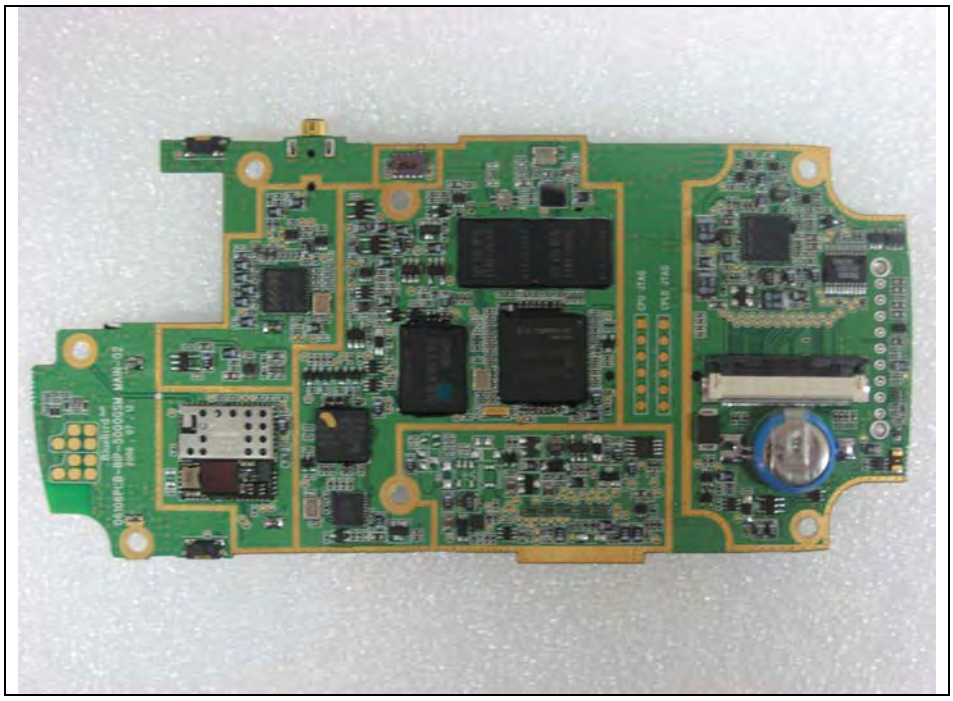
Left View of EUT

Inner of EUT

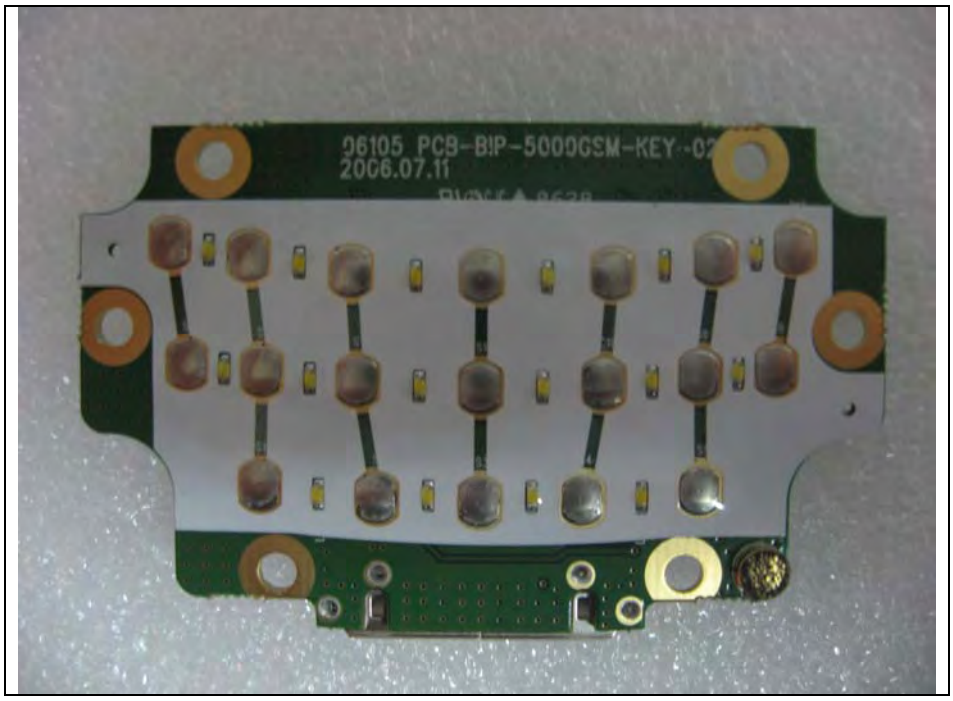
Top View of Main-board



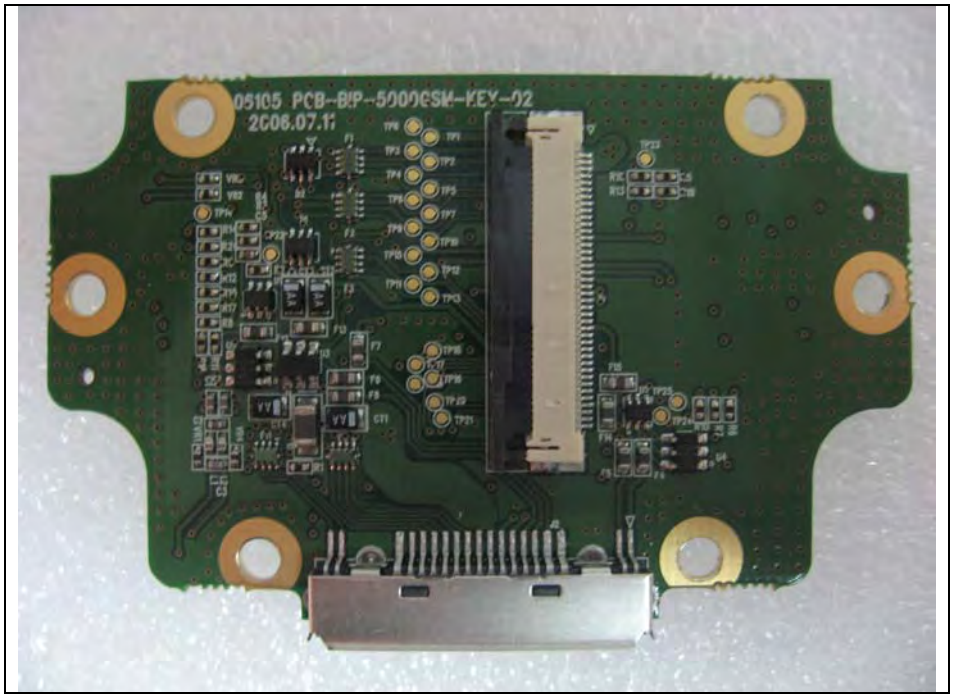
Bottom View of Main-board



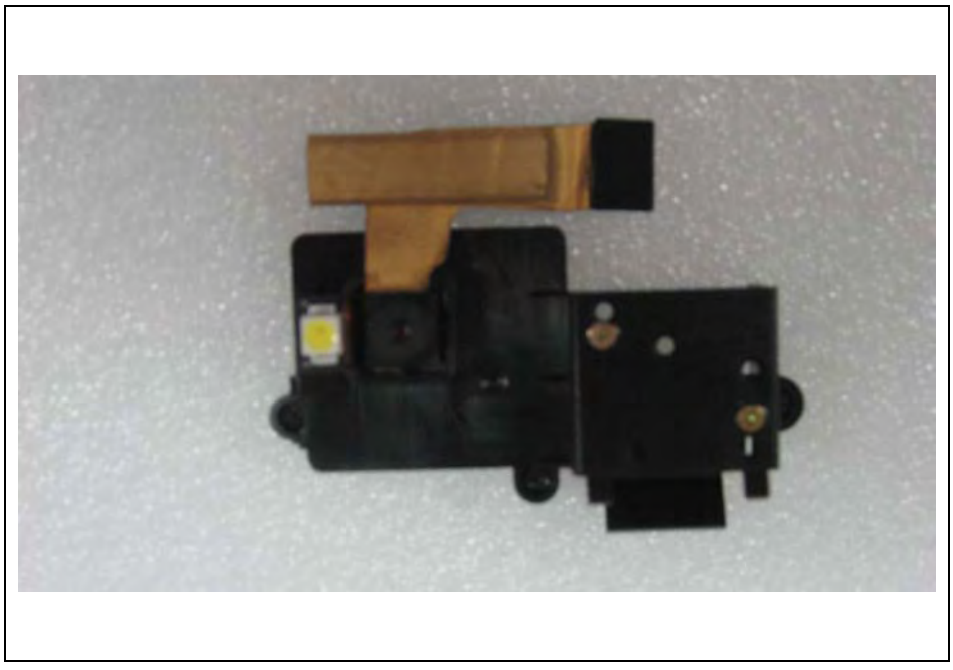
Top View of Keyboard



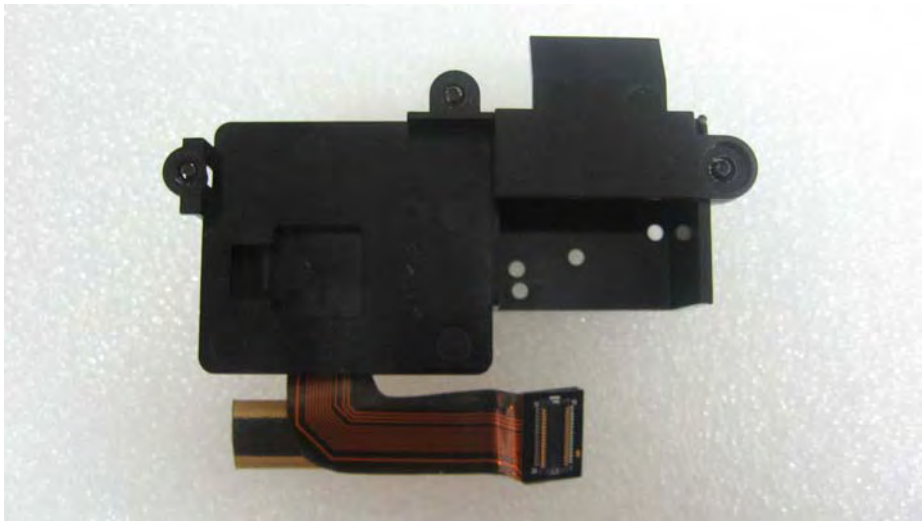
Bottom View of Keyboard



Top View of Camera



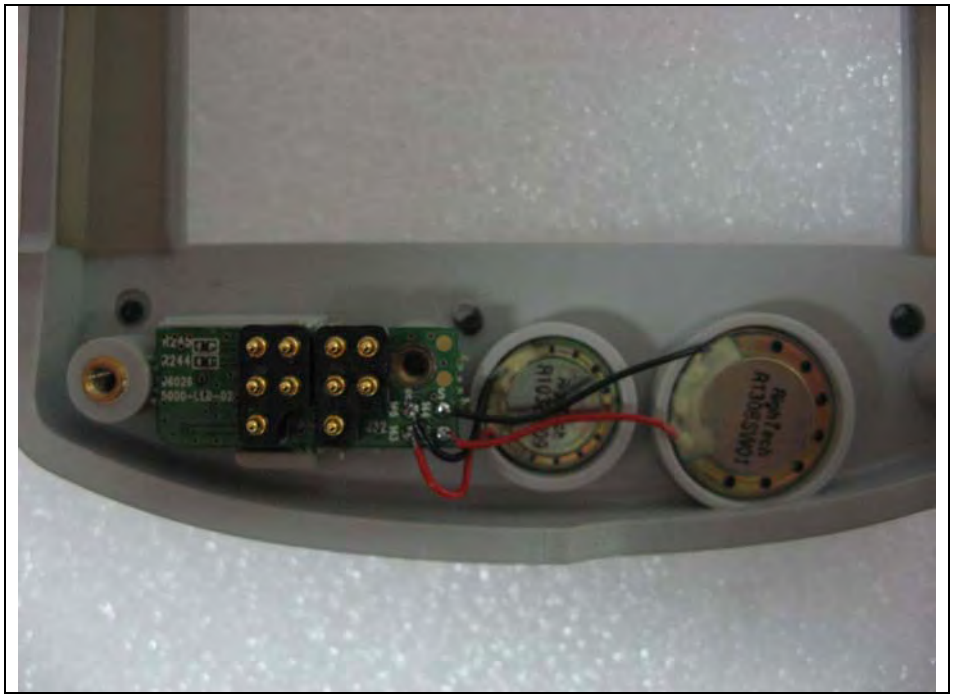
Bottom View of Camera



Top View of LCD

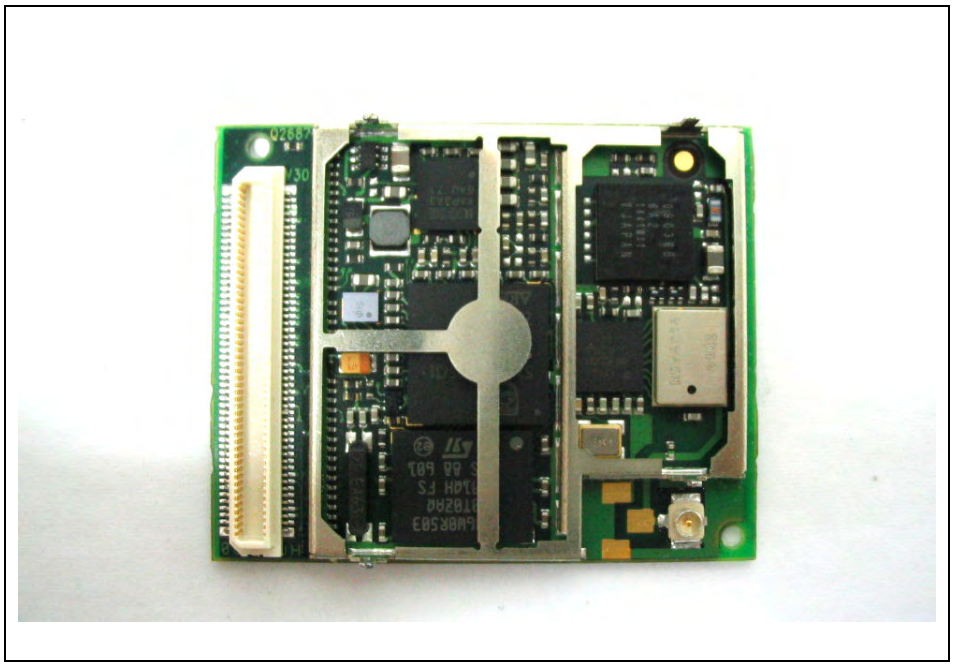
Bottom View of LCD

Top View of LED

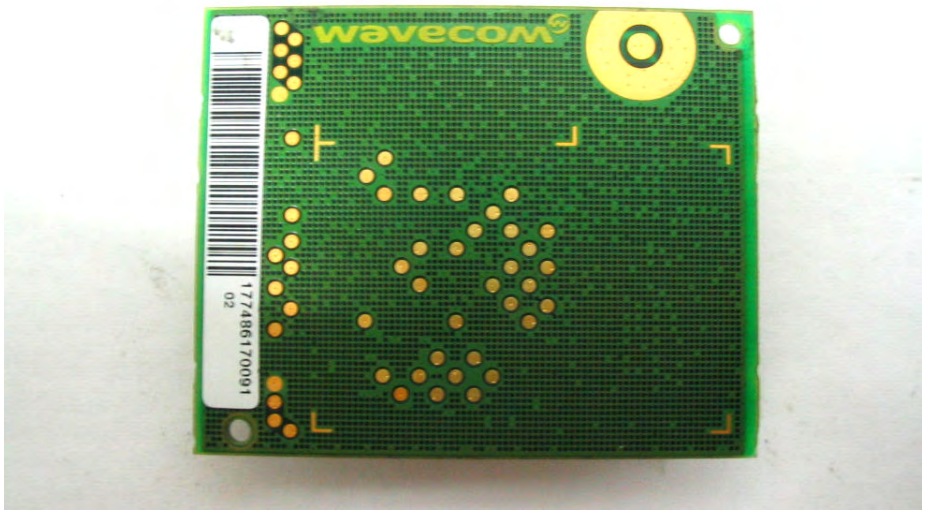


Bottom View of LED

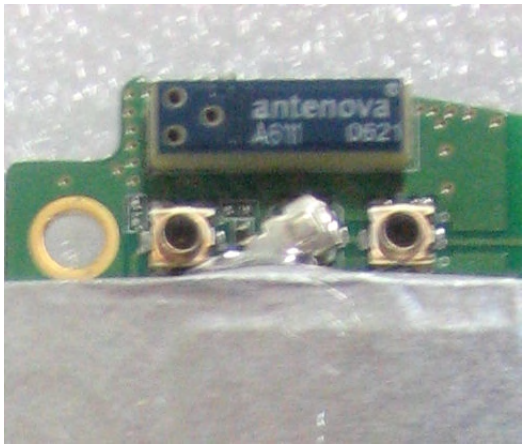
Top View of GSM



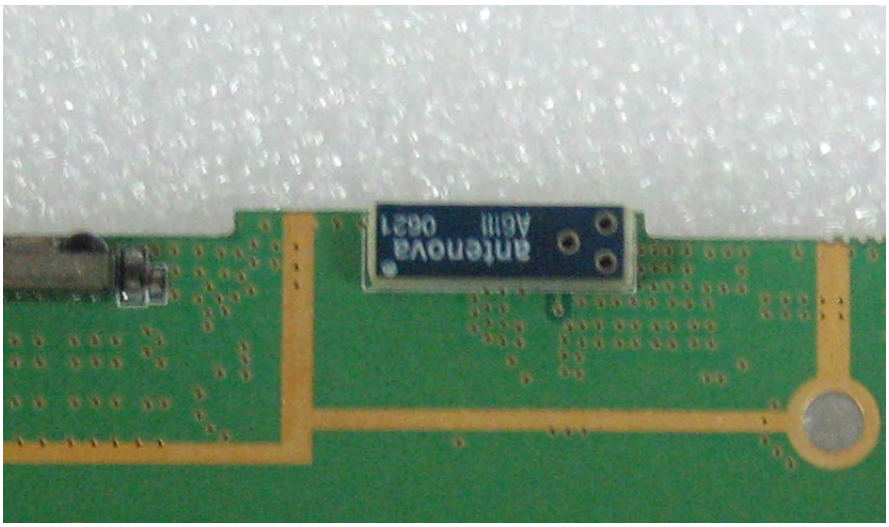
Bottom View of GSM



View of Antenna(WLAN)



View of Antenna(BT)



View of Antenna(GSM)