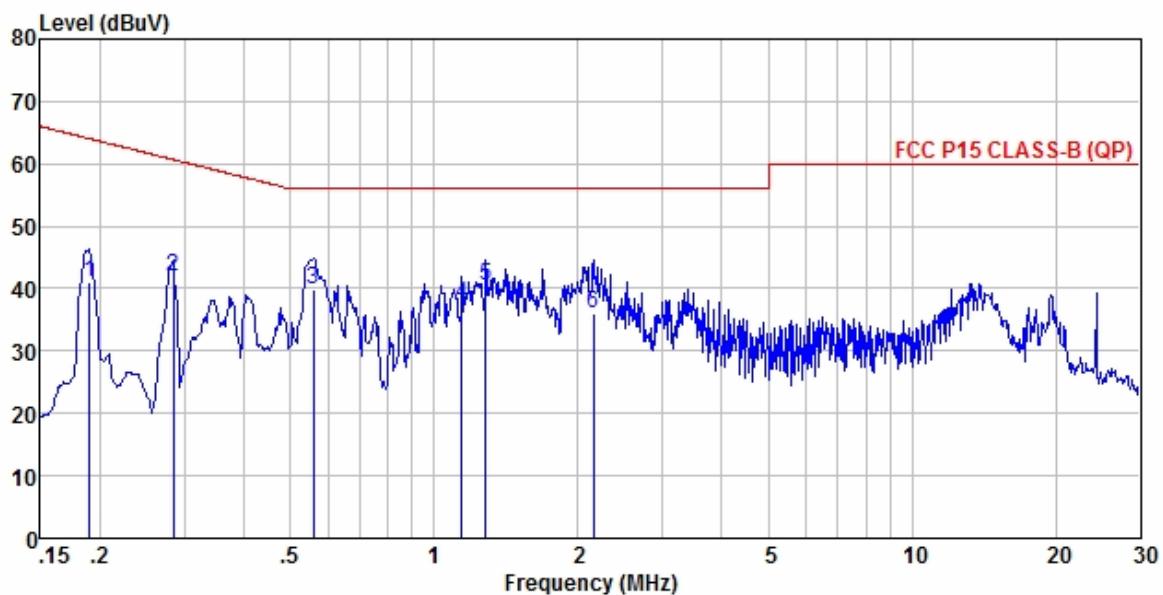


14.4 RESULTS & PERFORMANCE



Site : shielding room 3

Condition : FCC P15 CLASS-B (QP) ENV216(N)-20120730 NEUTRAL

EUT : GIS Data collector

Model Name : loka/XF300/XF200/MG868H

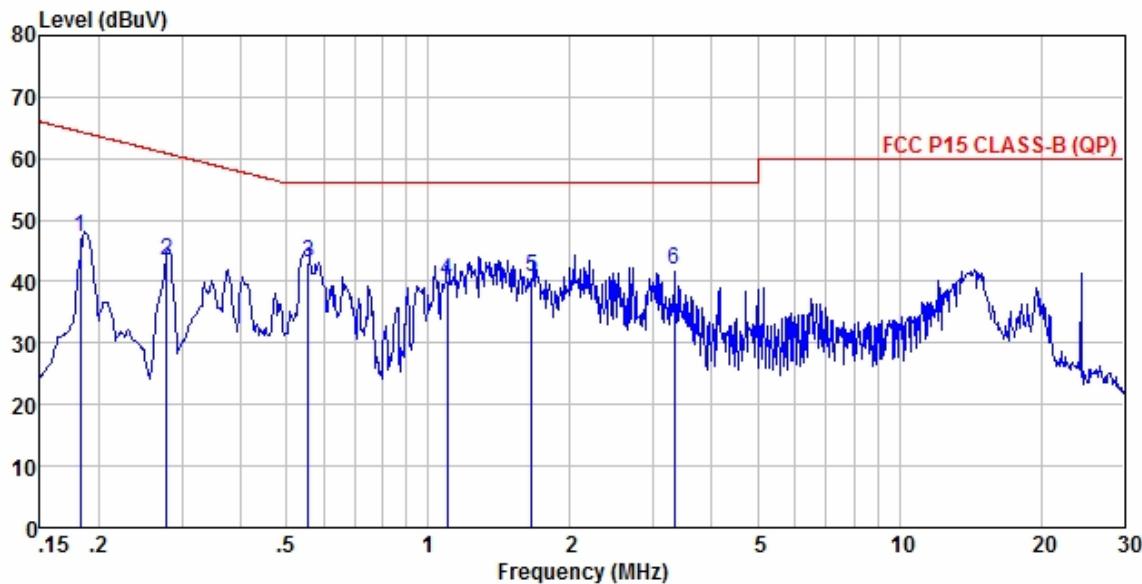
Temp/Humi : 20°C /56%

Power Rating: DC 3.8V

Mode : Bluetooth

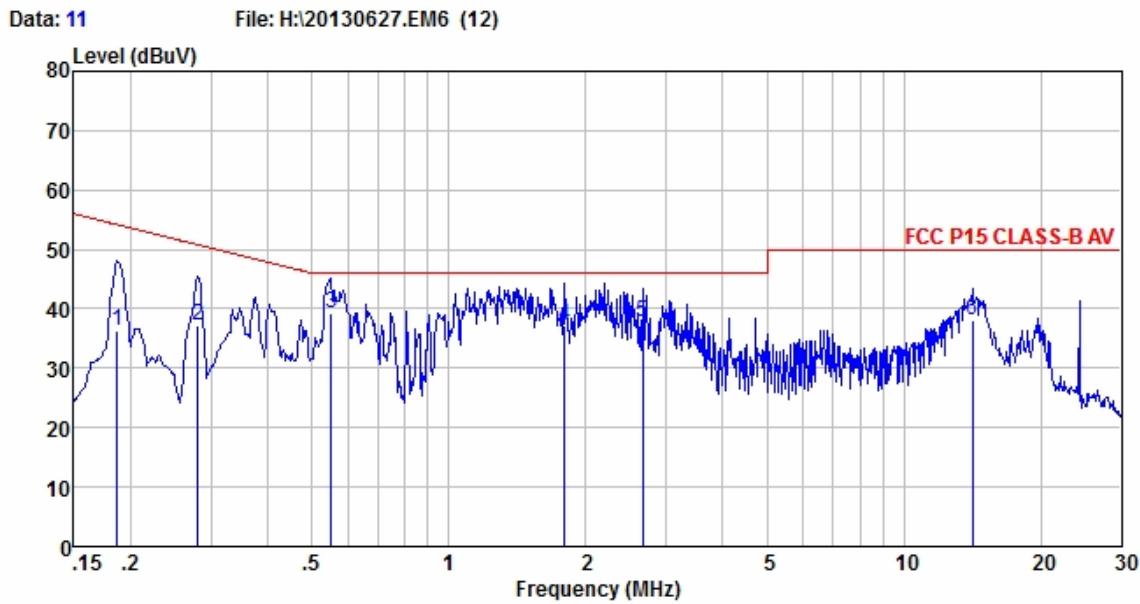
Memo :

	Read Freq	LISN Level	Cable Factor	Preamp Loss	Level Factor	Limit Level	Over Line Limit	Over Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB
1	0.19	30.54	10.33	0.23	0.00	41.10	64.02	-22.92 QP
2	0.28	31.20	10.43	0.19	0.00	41.82	60.68	-18.86 QP
3	0.56	29.40	10.38	0.11	0.00	39.89	56.00	-16.11 QP
4	1.14	27.15	10.31	0.14	0.00	37.60	56.00	-18.40 QP
5 pp	1.28	30.11	10.31	0.14	0.00	40.56	56.00	-15.44 QP
6	2.16	25.60	10.31	0.15	0.00	36.06	56.00	-19.94 QP



Site : shielding room 3
 Condition : FCC P15 CLASS-B (QP) ENV216(L)-20120730 LINE
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : Bluetooth
 Memo :

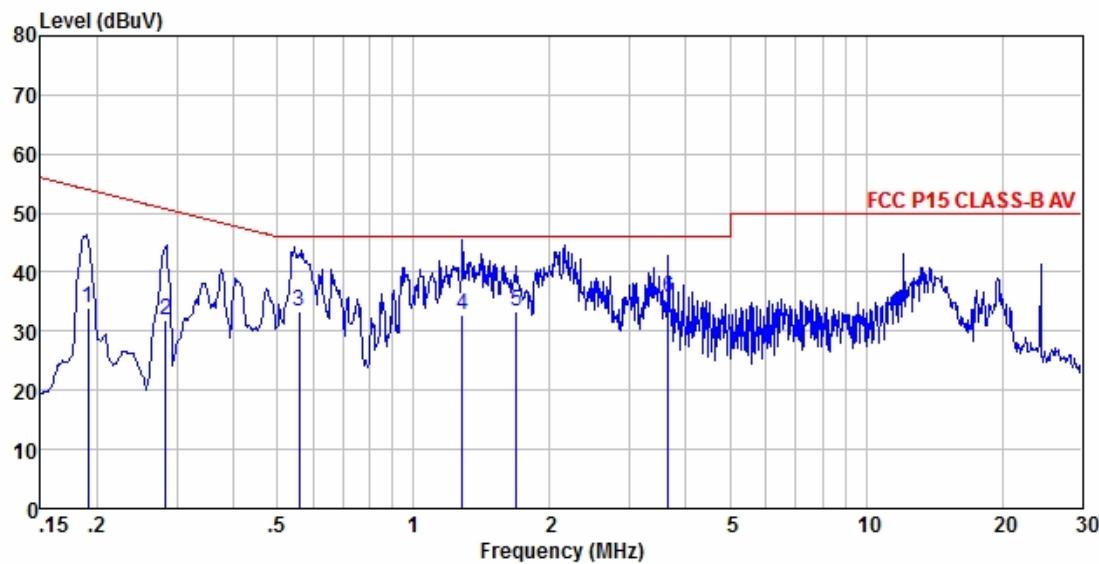
Freq	Read	LISN	Cable	Preamp	Limit	Over	Remark
	MHz	dBuV	dB	dB			
1	0.18	36.37	10.51	0.23	0.00	47.11	64.35 -17.24 QP
2	0.28	32.72	10.47	0.19	0.00	43.38	60.85 -17.47 QP
3 pp	0.56	32.40	10.51	0.11	0.00	43.02	56.00 -12.98 QP
4	1.10	29.50	10.52	0.14	0.00	40.16	56.00 -15.84 QP
5	1.66	30.20	10.52	0.15	0.00	40.87	56.00 -15.13 QP
6	3.33	31.17	10.52	0.15	0.00	41.84	56.00 -14.16 QP



Site : shielding room 3
 Condition : FCC P15 CLASS-B AV ENV216(L)-20120730 LINE

EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : Bluetooth
 Memo :

	Read Freq	LISN Level	Cable Factor	Preamp Loss	Preamp Factor	Limit Level	Line Limit	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	25.50	10.49	0.23	0.00	36.22	54.20	-17.98	Average
2	0.28	26.60	10.48	0.19	0.00	37.27	50.81	-13.54	Average
3 pp	0.55	28.60	10.51	0.11	0.00	39.22	46.00	-6.78	Average
4	1.80	26.60	10.52	0.15	0.00	37.27	46.00	-8.73	Average
5	2.66	27.20	10.52	0.15	0.00	37.87	46.00	-8.13	Average
6	14.14	27.51	10.50	0.18	0.00	38.19	50.00	-11.81	Average



Site : shielding room 3

Condition : FCC P15 CLASS-B AV ENV216(N)-20120730 NEUTRAL

EUT : GIS Data collector

Model Name : loka/XF300/XF200/MG868H

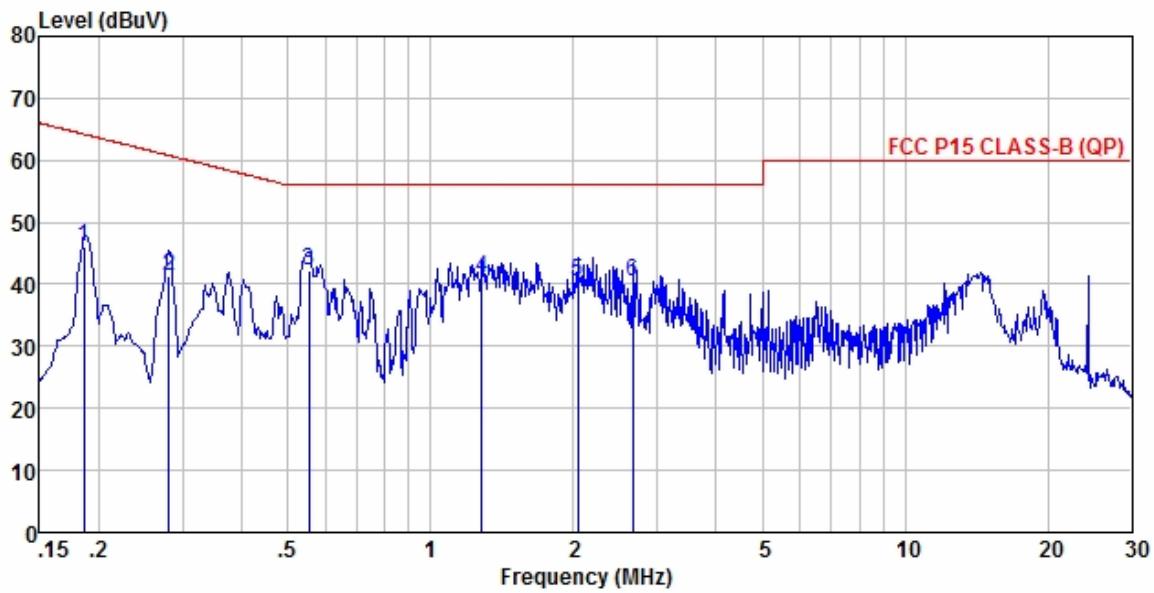
Temp/Humi : 20°C /56%

Power Rating: DC 3.8V

Mode : Bluetooth

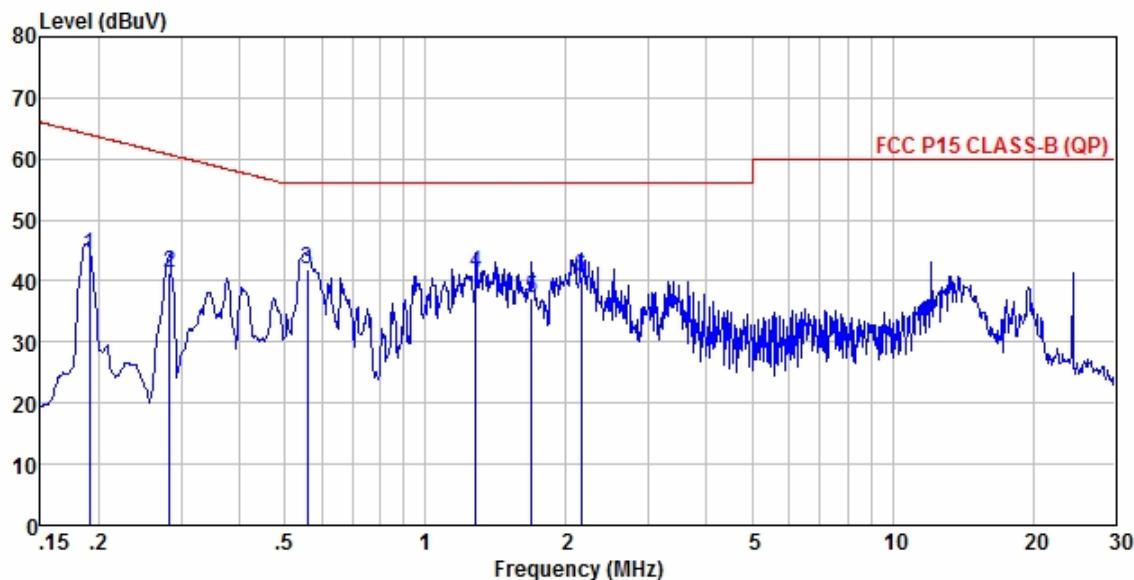
Memo :

	Freq	Read MHz	LISN Level dBuV	Cable Factor	Preamp Loss dB	Limit Level dB	Line dBuV	Over Line dB	Over Limit Remark
		MHz	dBuV		dB		dBuV		
1		0.19	23.45	10.34	0.23	0.00	34.02	53.99	-19.97 Average
2		0.28	21.18	10.43	0.19	0.00	31.80	50.70	-18.90 Average
3		0.56	22.84	10.38	0.11	0.00	33.33	46.00	-12.67 Average
4		1.28	22.23	10.31	0.14	0.00	32.68	46.00	-13.32 Average
5		1.69	22.96	10.31	0.15	0.00	33.42	46.00	-12.58 Average
6 pp		3.66	25.17	10.32	0.14	0.00	35.63	46.00	-10.37 Average



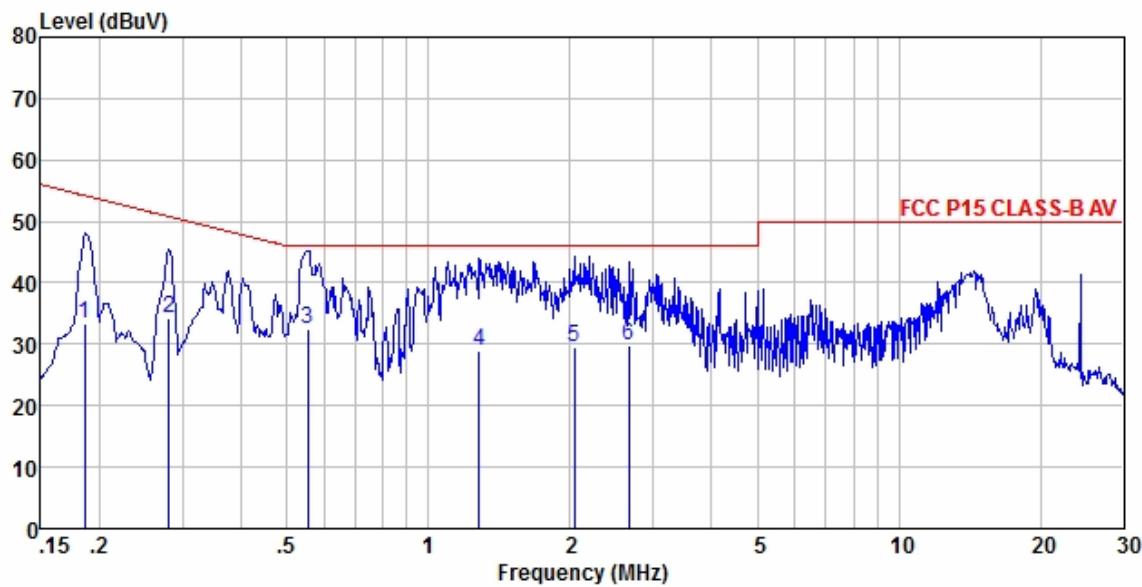
Site : shielding room 3
 Condition : FCC P15 CLASS-B (QP) ENV216(L)-20120730 LINE
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	35.37	10.50	0.23	0.00	46.10	64.21	-18.11	QP
2	0.28	30.71	10.48	0.19	0.00	41.38	60.79	-19.41	QP
3 pp	0.56	31.62	10.51	0.11	0.00	42.24	56.00	-13.76	QP
4	1.28	30.44	10.52	0.14	0.00	41.10	56.00	-14.90	QP
5	2.04	29.67	10.52	0.15	0.00	40.34	56.00	-15.66	QP
6	2.66	29.64	10.52	0.15	0.00	40.31	56.00	-15.69	QP



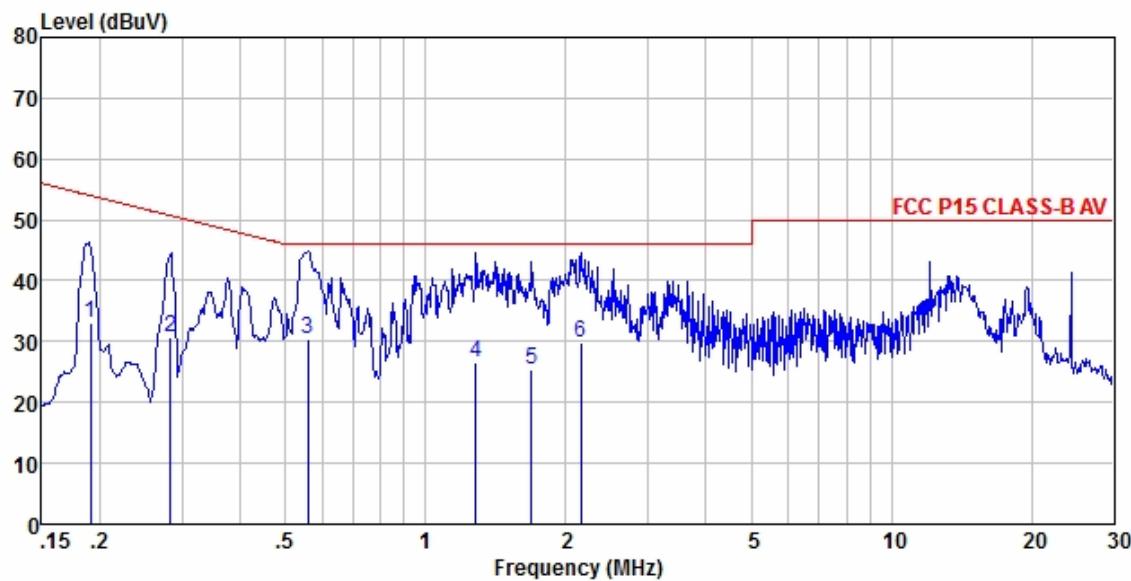
Site : shielding room 3
 Condition : FCC P15 CLASS-B (QP) ENV216(N)-20120730 NEUTRAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	33.69	10.34	0.23	0.00	44.26	63.99	-19.73	QP
2	0.28	30.82	10.43	0.19	0.00	41.44	60.70	-19.26	QP
3 pp	0.56	31.48	10.38	0.11	0.00	41.97	56.00	-14.03	QP
4	1.28	30.98	10.31	0.14	0.00	41.43	56.00	-14.57	QP
5	1.69	26.62	10.31	0.15	0.00	37.08	56.00	-18.92	QP
6	2.16	30.22	10.31	0.15	0.00	40.68	56.00	-15.32	QP



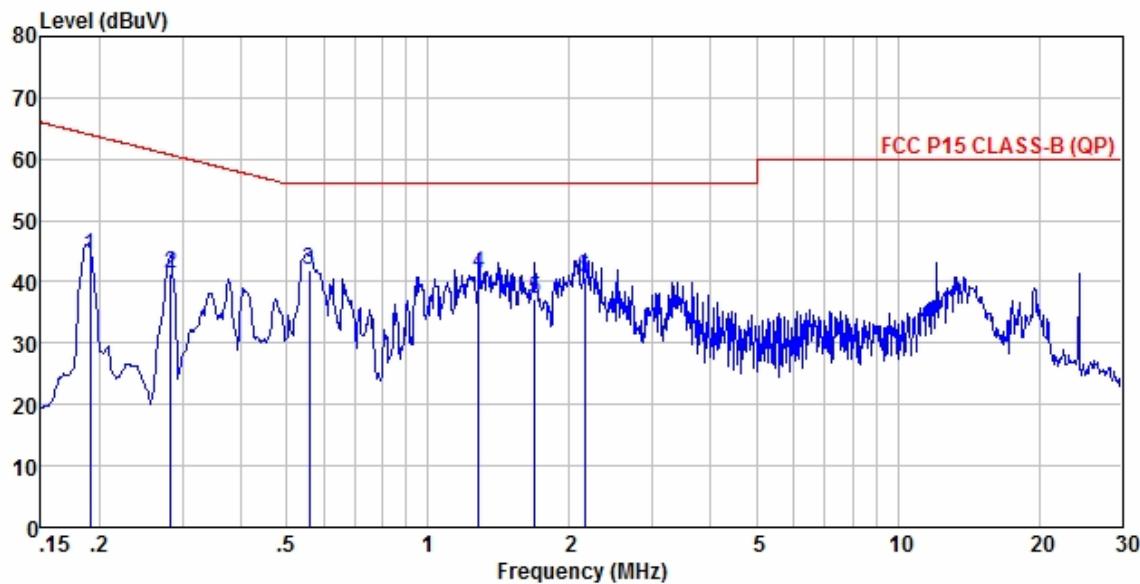
Site : shielding room 3
 Condition : FCC P15 CLASS-B AV ENV216(L)-20120730 LINE
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	22.53	10.50	0.23	0.00	33.26	54.21	-20.95	Average
2	0.28	23.69	10.48	0.19	0.00	34.36	50.79	-16.43	Average
3 pp	0.56	21.87	10.51	0.11	0.00	32.49	46.00	-13.51	Average
4	1.28	18.35	10.52	0.14	0.00	29.01	46.00	-16.99	Average
5	2.04	18.81	10.52	0.15	0.00	29.48	46.00	-16.52	Average
6	2.66	19.25	10.52	0.15	0.00	29.92	46.00	-16.08	Average



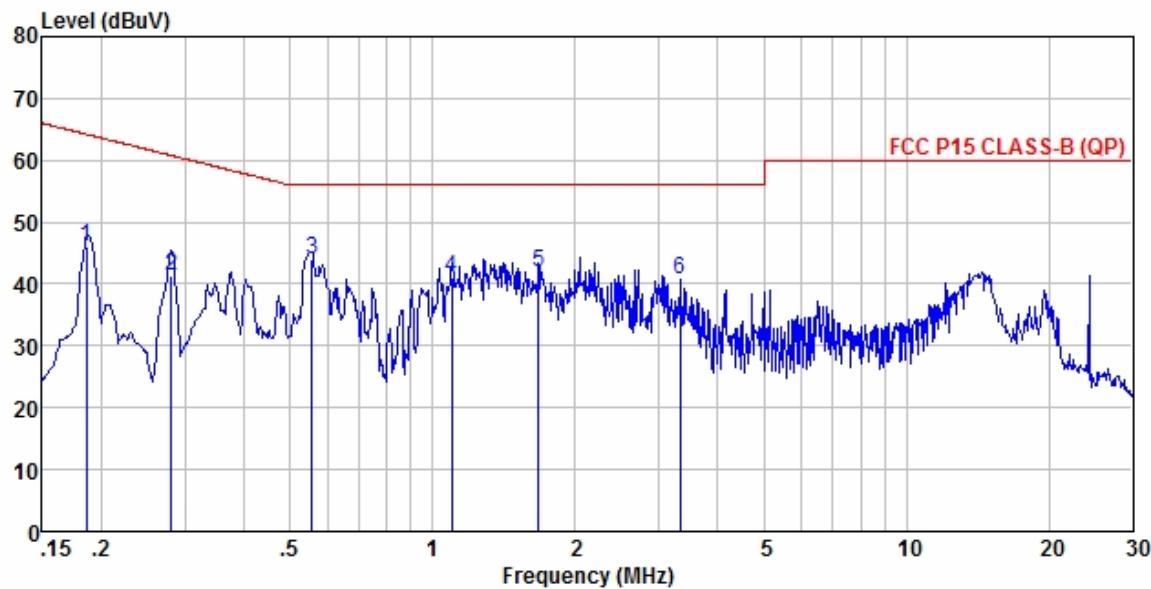
Site : shielding room 3
 Condition : FCC P15 CLASS-B AV ENV216(N)-20120730 NEUTRAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

	Read Freq	LISN Level	Cable Factor	Preamp Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.19	22.45	10.34	0.23	0.00	33.02	53.99	-20.97 Average
2	0.28	20.18	10.43	0.19	0.00	30.80	50.70	-19.90 Average
3 pp	0.56	19.84	10.38	0.11	0.00	30.33	46.00	-15.67 Average
4	1.28	16.23	10.31	0.14	0.00	26.68	46.00	-19.32 Average
5	1.69	14.96	10.31	0.15	0.00	25.42	46.00	-20.58 Average
6	2.16	19.37	10.31	0.15	0.00	29.83	46.00	-16.17 Average



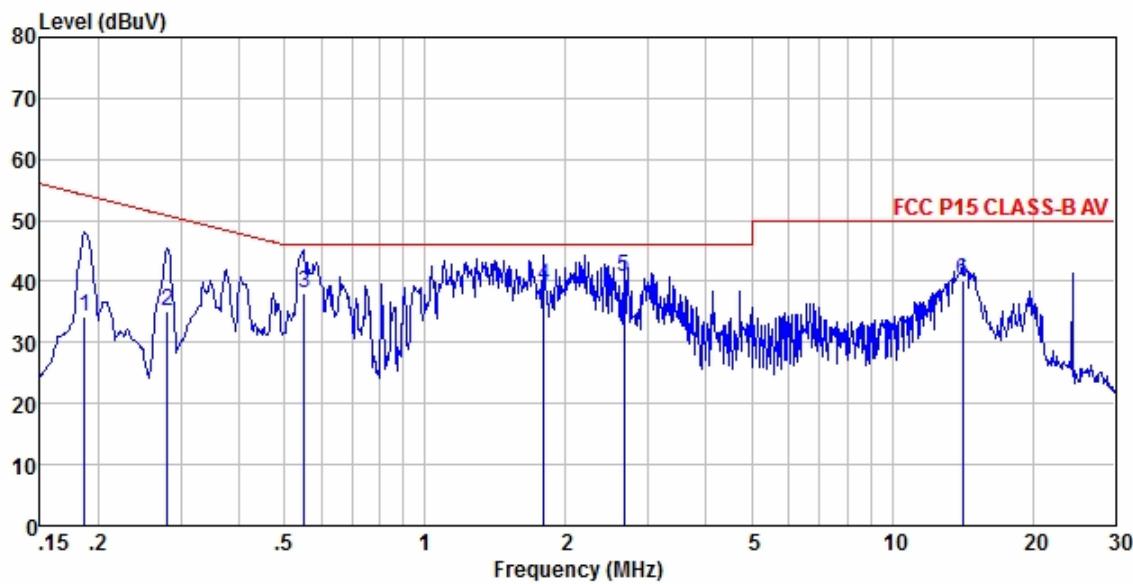
Site : shielding room 3
 Condition : FCC P15 CLASS-B (QP) ENV216(N)-20120730 NEUTRAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : WiFi
 Memo :

Freq	Read	LISN	Cable	Preamp	Limit	Over	Remark
	Freq	Level	Factor	Loss			
1	0.19	33.69	10.34	0.23	0.00	44.26	63.99 -19.73 QP
2	0.28	30.82	10.43	0.19	0.00	41.44	60.70 -19.26 QP
3 pp	0.56	31.48	10.38	0.11	0.00	41.97	56.00 -14.03 QP
4	1.28	30.98	10.31	0.14	0.00	41.43	56.00 -14.57 QP
5	1.69	26.62	10.31	0.15	0.00	37.08	56.00 -18.92 QP
6	2.16	30.22	10.31	0.15	0.00	40.68	56.00 -15.32 QP



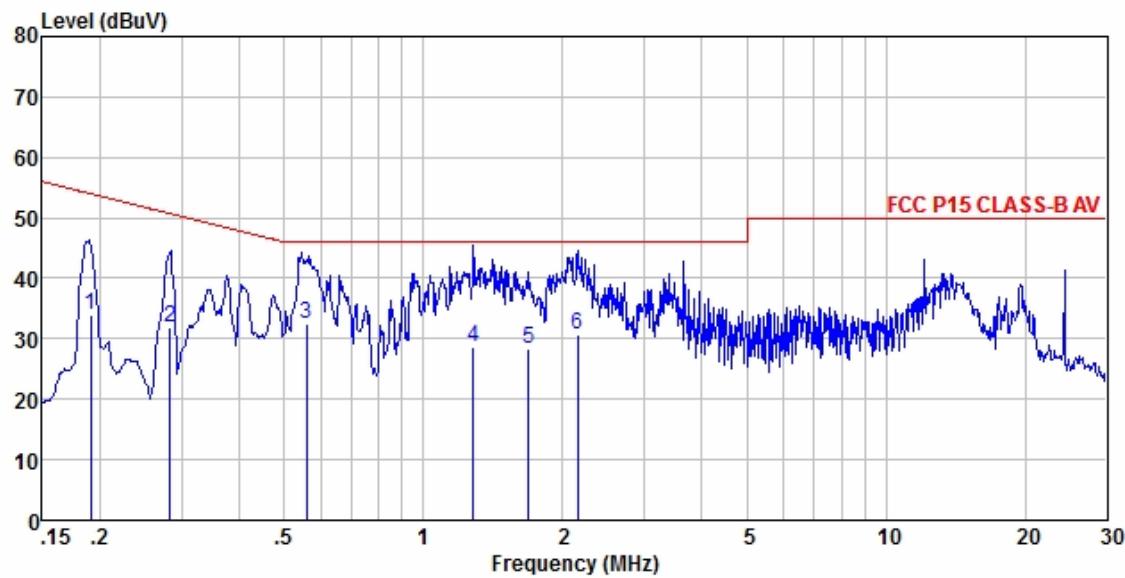
Site : shielding room 3
 Condition : FCC P15 CLASS-B (QP) ENV216(L)-20120730 LINE
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : WiFi
 Memo :

Freq	Read	LISN	Cable	Preamp	Limit	Over	Limit	Remark
	MHz	Level	Factor	Loss				
1	0.19	35.37	10.50	0.23	0.00	46.10	64.21	-18.11 QP
2	0.28	30.71	10.48	0.19	0.00	41.38	60.79	-19.41 QP
3 pp	0.56	33.40	10.51	0.11	0.00	44.02	56.00	-11.98 QP
4	1.10	30.50	10.52	0.14	0.00	41.16	56.00	-14.84 QP
5	1.67	31.20	10.52	0.15	0.00	41.87	56.00	-14.13 QP
6	3.33	30.17	10.52	0.15	0.00	40.84	56.00	-15.16 QP



Site : shielding room 3
 Condition : FCC P15 CLASS-B AV ENV216(L)-20120730 LINE
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : WiFi
 Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	23.50	10.49	0.23	0.00	34.22	54.20	-19.98	Average
2	0.28	24.60	10.48	0.19	0.00	35.27	50.81	-15.54	Average
3	0.55	27.60	10.51	0.11	0.00	38.22	46.00	-7.78	Average
4	1.80	28.60	10.52	0.15	0.00	39.27	46.00	-6.73	Average
5 pp	2.66	30.20	10.52	0.15	0.00	40.87	46.00	-5.13	Average
6	14.14	29.51	10.50	0.18	0.00	40.19	50.00	-9.81	Average



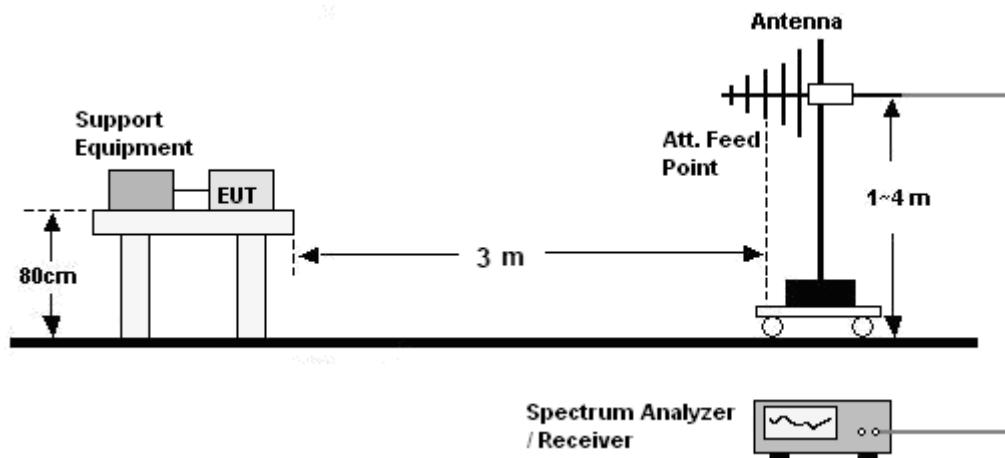
Site : shielding room 3
 Condition : FCC P15 CLASS-B AV ENV216(N)-20120730 NEUTRAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 20°C /56%
 Power Rating: DC 3.8V
 Mode : WiFi
 Memo :

	Freq	Read MHz	LISN Level dBuV	Cable Factor	Preamp Loss dB	Limit Level dBuV	Line Over Limit dBuV	Over Limit Remark
		MHz	dBuV	dB	dB	dBuV	dBuV	dB
1		0.19	23.45	10.34	0.23	0.00	34.02	53.99 -19.97 Average
2		0.28	21.18	10.43	0.19	0.00	31.80	50.70 -18.90 Average
3 pp		0.56	21.84	10.38	0.11	0.00	32.33	46.00 -13.67 Average
4		1.28	18.23	10.31	0.14	0.00	28.68	46.00 -17.32 Average
5		1.69	17.96	10.31	0.15	0.00	28.42	46.00 -17.58 Average
6		2.16	20.37	10.31	0.15	0.00	30.83	46.00 -15.17 Average

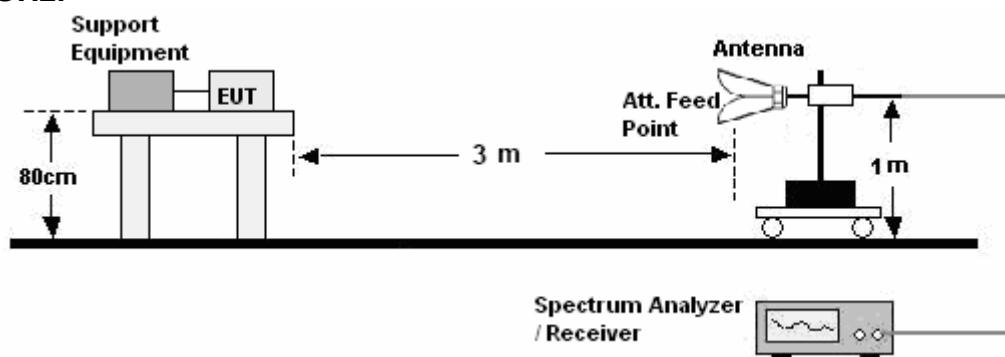
15. RADIATED EMISSIONS

15.1 TEST SETUP

30MHz ~ 1GHz:



Above 1GHz:



15.2 LIMITS

Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

15.3 TEST PROCEDURE

30MHz ~ 1GHz:

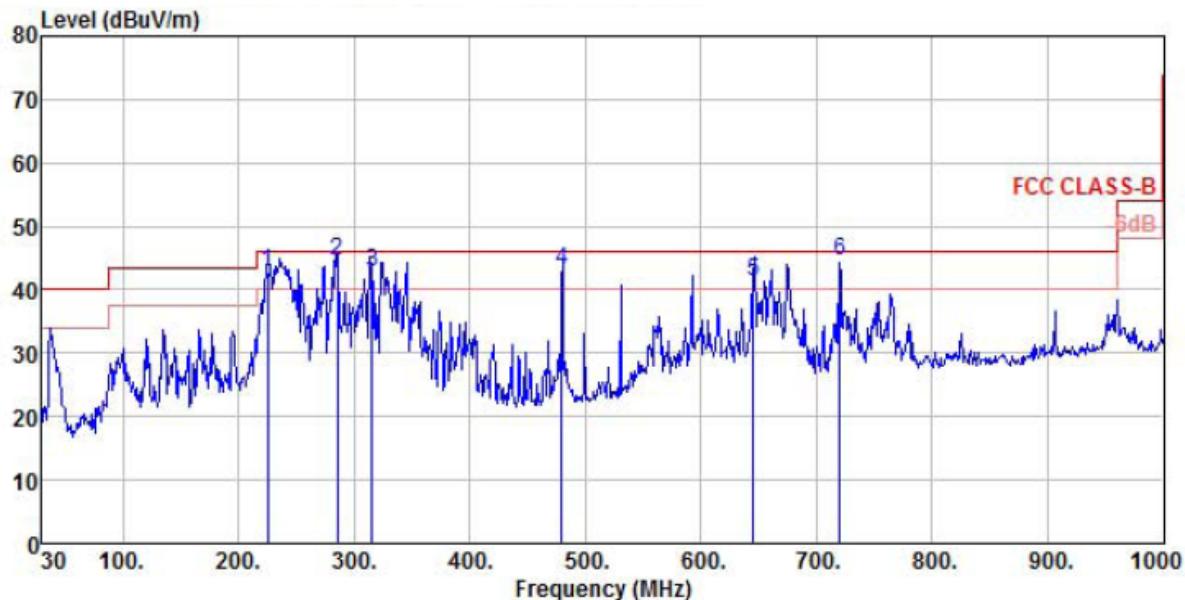
- a. The EUT and support equipment were placed on the non-conductive turntable 0.8/0.1m above the horizontal metal ground plane at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna.
- b. The frequency range from 30MHz to 1GHz was checked. The RBW of the receiver was set at 120kHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency receiver to QP Detector and record the maximum value.

Above 1GHz:

- a. The EUT and support equipment were placed on the non-conductive turntable 0.8/0.1m above the ground at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Horn antenna was used as receiving antenna.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its Average value: rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency receiver to EMI Average Detector and record the maximum value.

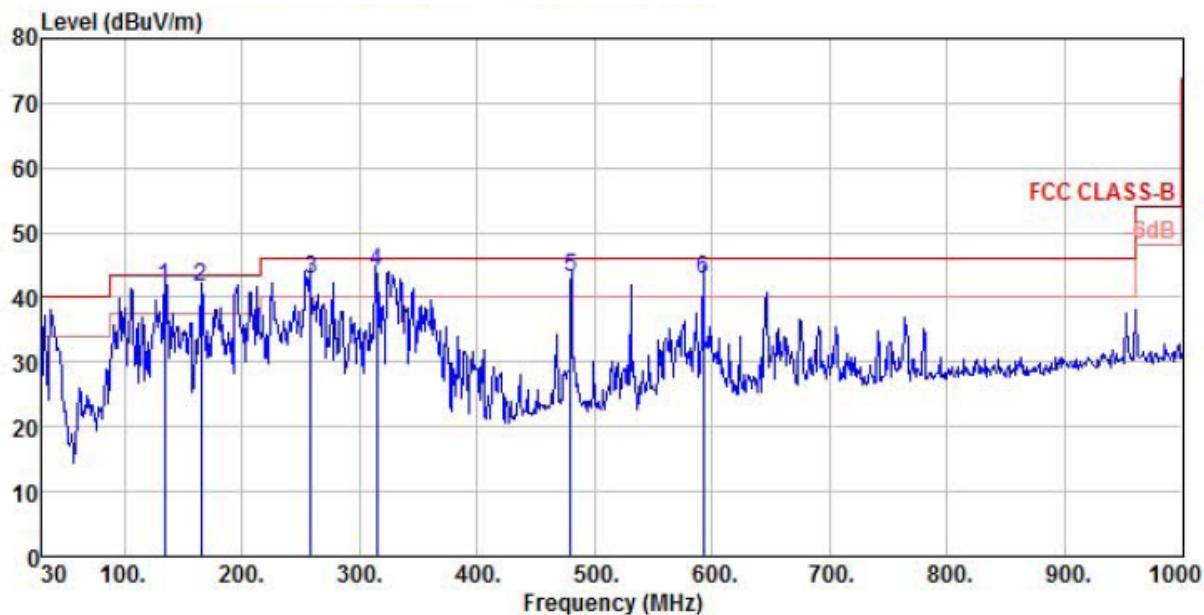
15.4 TEST RESULT

30MHz ~ 1GHz:



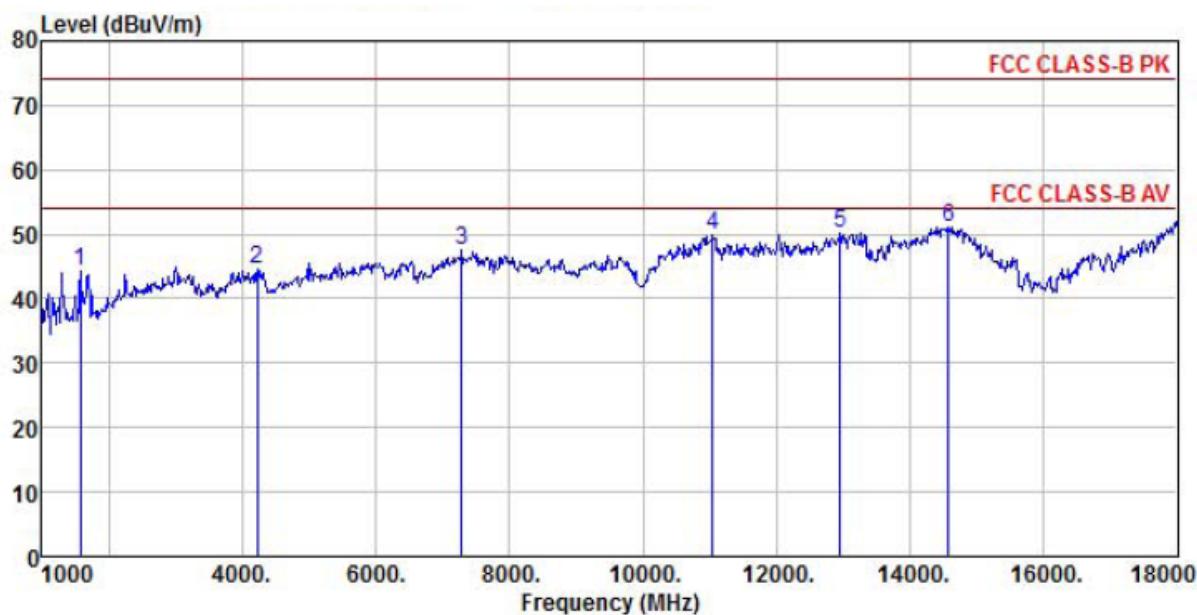
Site : chamber
 Condition : FCC CLASS-B 3m VULB9160 HORIZONTAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 21°C /52%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Limit	Remark
	Freq	Level	Factor	Loss				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 !	225.20	29.86	10.95	2.08	0.00	42.89	46.00	-3.11 QP
2 !	285.20	29.28	12.92	2.23	0.00	44.43	46.00	-1.57 QP
3 !	315.10	26.75	13.56	2.52	0.00	42.83	46.00	-3.17 QP
4 !	480.00	23.29	16.89	3.00	0.00	43.18	46.00	-2.82 QP
5 !	645.70	18.35	19.53	3.53	0.00	41.41	46.00	-4.59 QP
6 pp	720.00	20.23	20.52	3.70	0.00	44.45	46.00	-1.55 QP



Site : chamber
 Condition : FCC CLASS-B 3m VULB9160 VERTICAL
 EUT : GIS Data collector
 Model Name : loka/XF300/XF200/MG868H
 Temp/Humi : 21°C /52%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

Freq	ReadAntenna	Cable	Preamp	Limit	Over	Limit	Remark	
	Level	Factor	Loss					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 !	134.50	26.97	12.92	1.62	0.00	41.51	43.50	-1.99 QP
2 pp	164.90	26.21	13.55	1.76	0.00	41.52	43.50	-1.98 QP
3 !	258.30	28.56	12.09	2.18	0.00	42.83	46.00	-3.17 QP
4 !	314.60	27.77	13.56	2.52	0.00	43.85	46.00	-2.15 QP
5 !	480.00	23.29	16.89	3.00	0.00	43.18	46.00	-2.82 QP
6 !	592.50	20.49	18.94	3.33	0.00	42.76	46.00	-3.24 QP

Above 1G:

Site : chamber

Condition : FCC CLASS-B PK 3m BBHA9120D(942) HORIZONTAL

EUT : GIS Data collector

Model Name : loka/XF300?XF200?MG868H

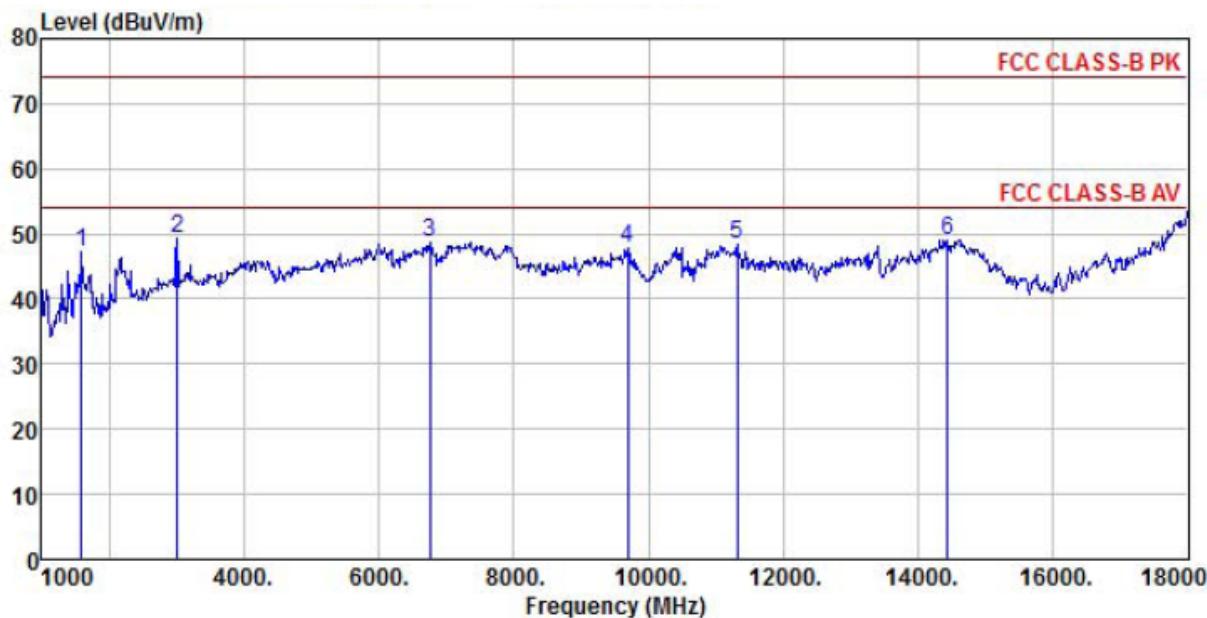
Temp/Humi : 21°C /52%

Power Rating: DC 3.8V

Mode : data exchanging

Memo :

Freq	ReadAntenna MHz	Cable		Preamp Level	Limit dBuV/m	Over Line	Over Limit	Remark
		Level	Factor					
1	1578.00	51.99	25.02	5.73	38.46	44.28	74.00	-29.72 Peak
2	4230.00	42.04	30.28	9.56	37.41	44.47	74.00	-29.53 Peak
3	7290.00	35.69	36.48	12.64	37.31	47.50	74.00	-26.50 Peak
4	11047.00	32.48	40.19	16.10	38.93	49.84	74.00	-24.16 Peak
5	12951.00	31.88	39.38	17.39	38.45	50.20	74.00	-23.80 Peak
6 pp	14583.00	28.15	42.46	18.68	38.12	51.17	74.00	-22.83 Peak



Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(942) VERTICAL
 EUT : GIS Data collector
 Model Name : loka/XF300?XF200?MG868H
 Temp/Humi : 21°C /52%
 Power Rating: DC 3.8V
 Mode : data exchanging
 Memo :

Freq	ReadAntenna	Cable	Preamp	Limit	Over	Remark			
	Level	Factor	Loss						
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1595.00	54.94	24.98	5.71	38.46	47.17	74.00	-26.83	Peak
2 pp	3006.00	50.72	28.53	8.07	38.10	49.22	74.00	-24.78	Peak
3	6763.00	38.16	34.47	12.38	36.42	48.59	74.00	-25.41	Peak
4	9687.00	35.24	38.25	14.38	39.96	47.91	74.00	-26.09	Peak
5	11319.00	31.24	40.02	16.11	39.06	48.31	74.00	-25.69	Peak
6	14430.00	26.39	42.52	18.52	38.28	49.15	74.00	-24.85	Peak

APPENDIX 1 PHOTOGRAHPS OF TEST SETUP

Peak Output Power Test Setup Photos

Description: Bluetooth measurement setup



Description: WiFi measurement setup



occupied bandwidth

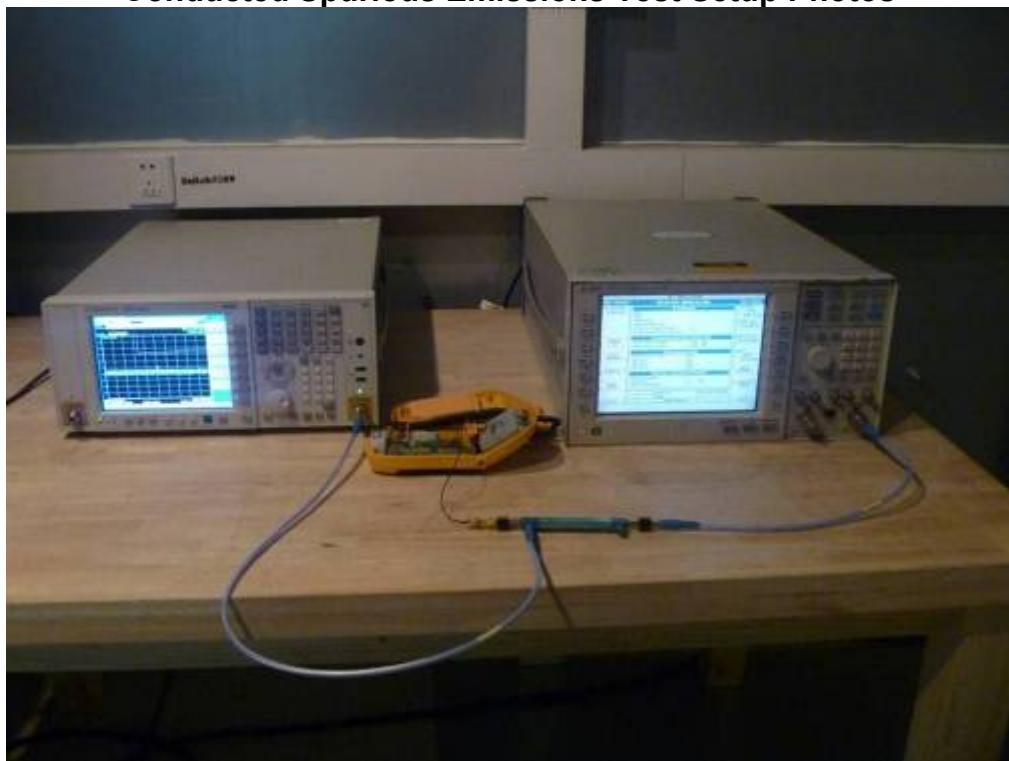
Description: Bluetooth measurement setup



Description: WiFi measurement setup

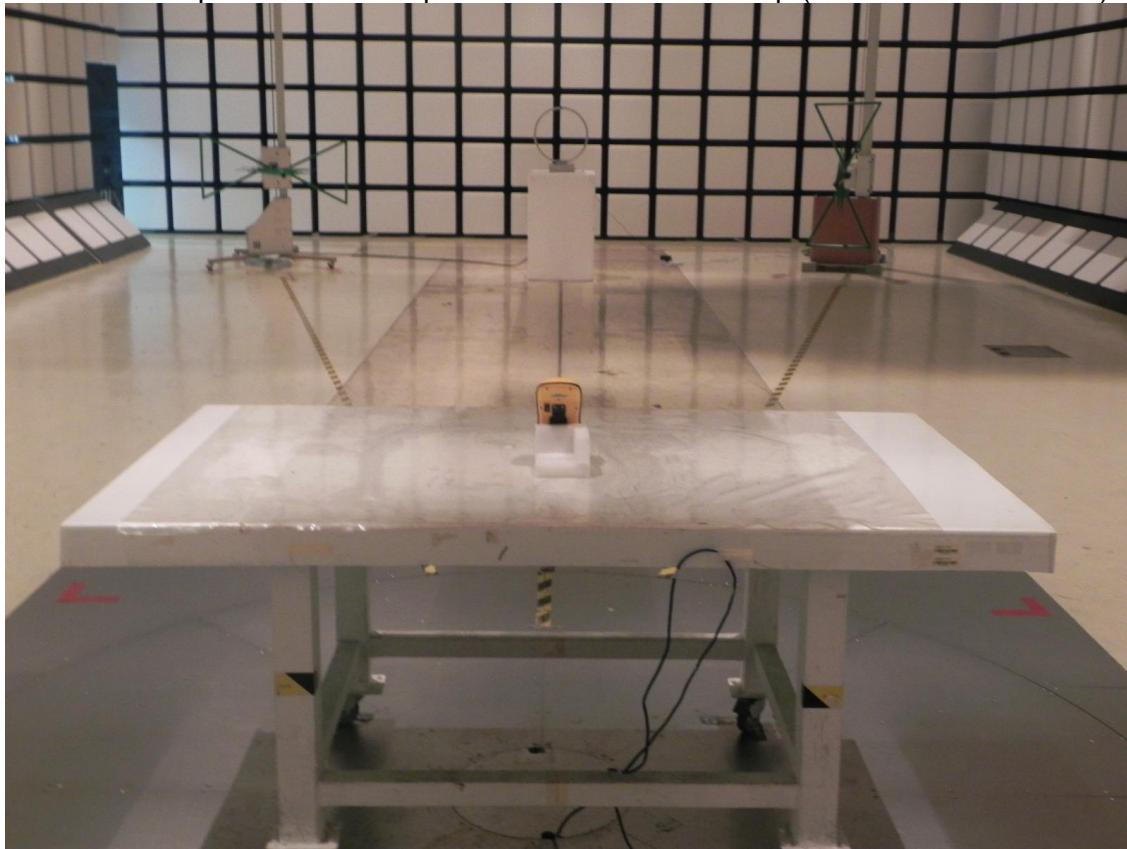


Conducted Spurious Emissions Test Setup Photos

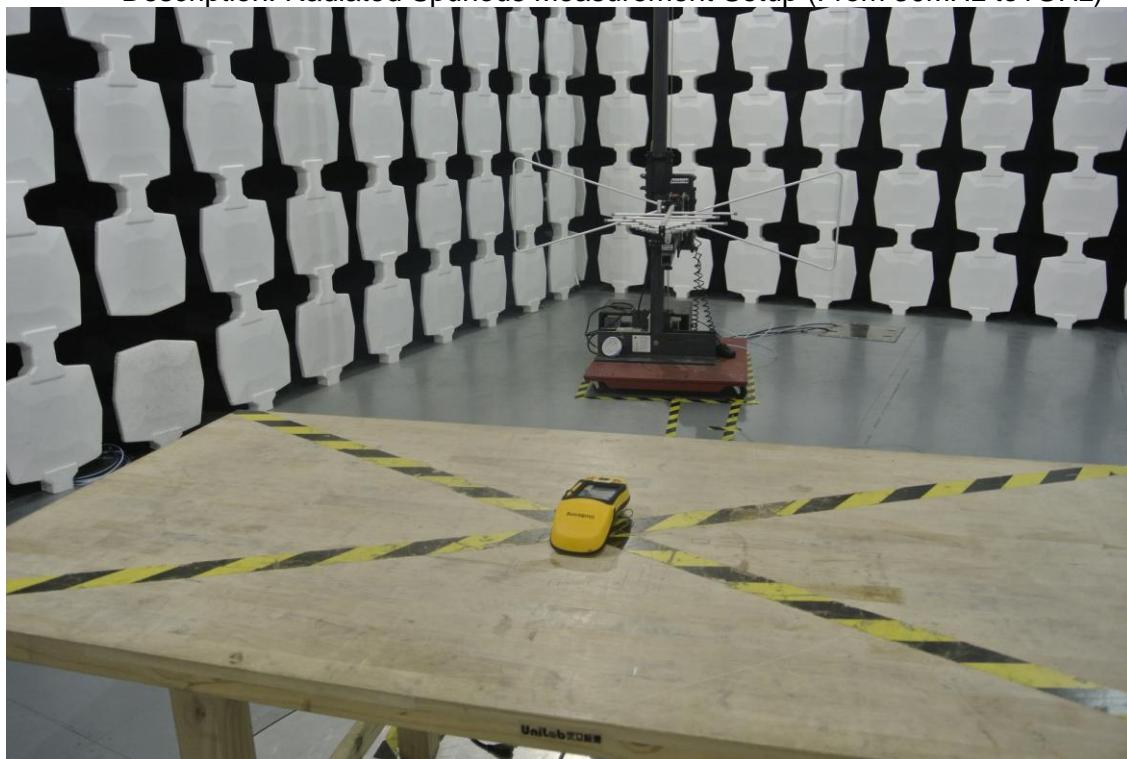


Spurious Emissions Test Setup Photos

Description: Radiated Spurious Measurement Setup (From 9KHz to 30MHz)



Description: Radiated Spurious Measurement Setup (From 30MHz to1GHz)



Description: Radiated Spurious Measurement Setup (Above 1GHz)



Radiated emission
30M-1000M



Above 1G



Conducted emission



APPENDIX 2 PHOTOGRAPHS OF EUT

View of EUT-1



View of EUT-2



View of EUT-3



View of EUT-4



View of EUT-5



View of EUT-6



View of EUT-7



View of EUT-8



View of EUT-9



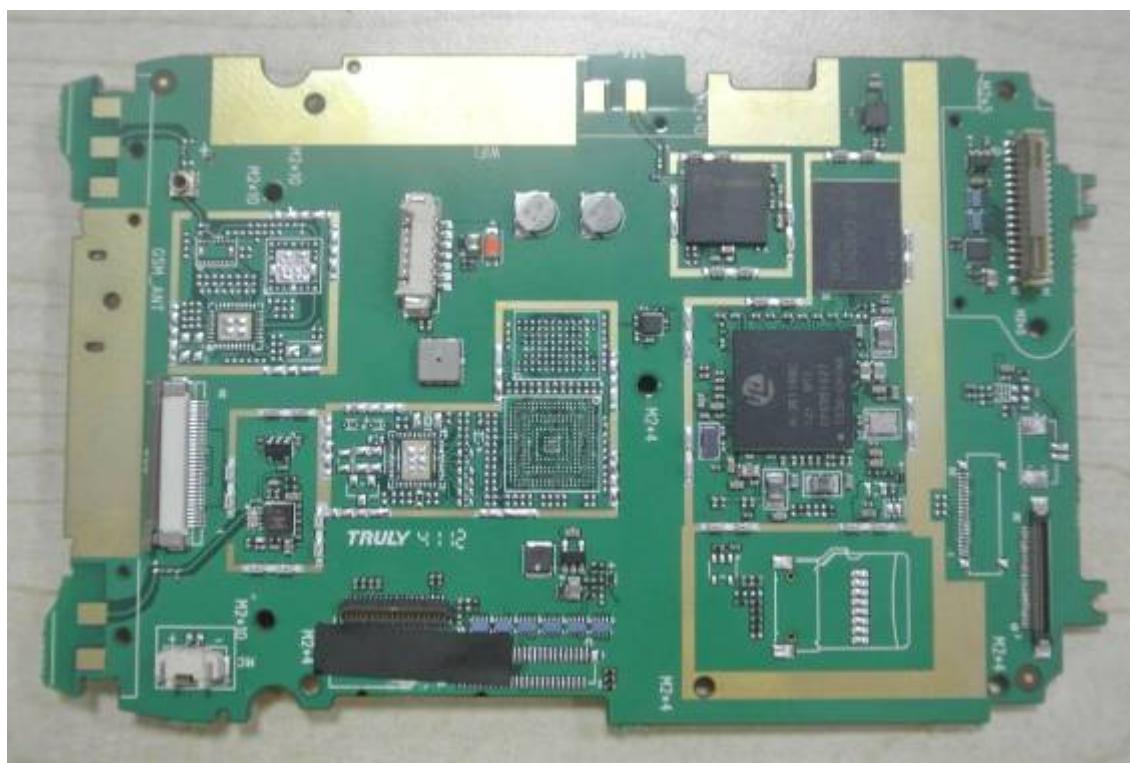
View of EUT-10



View of EUT-11



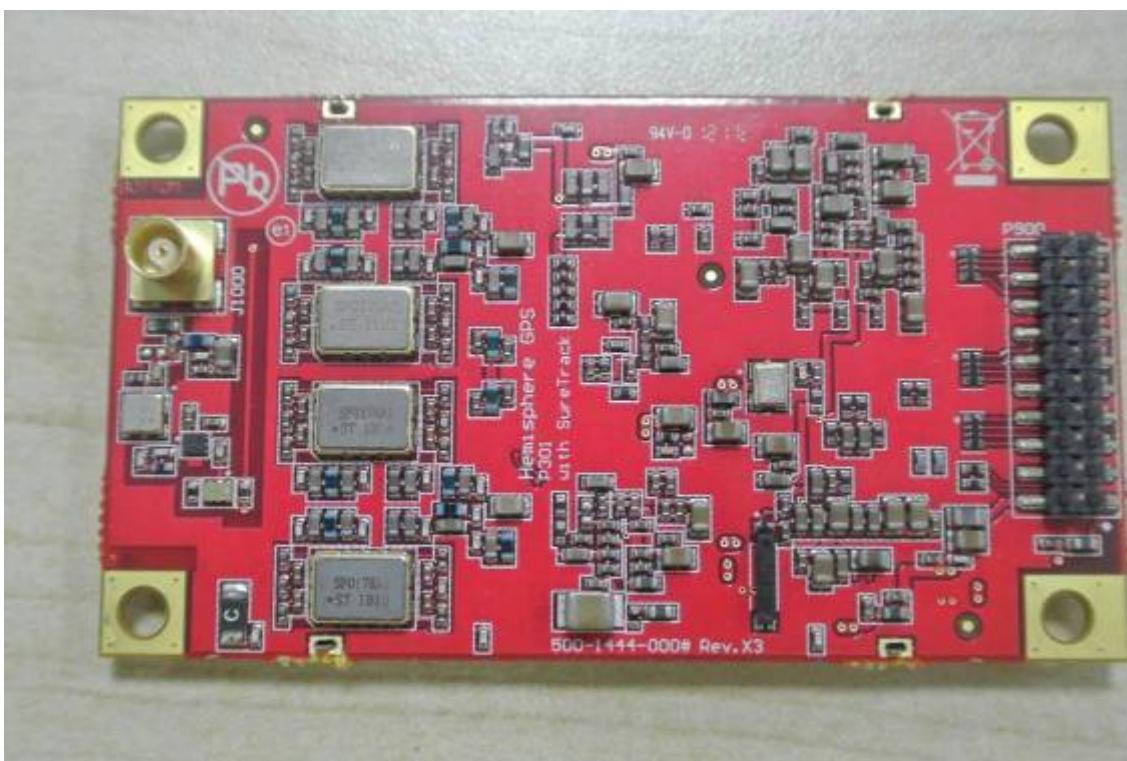
View of EUT-12



View of EUT-13



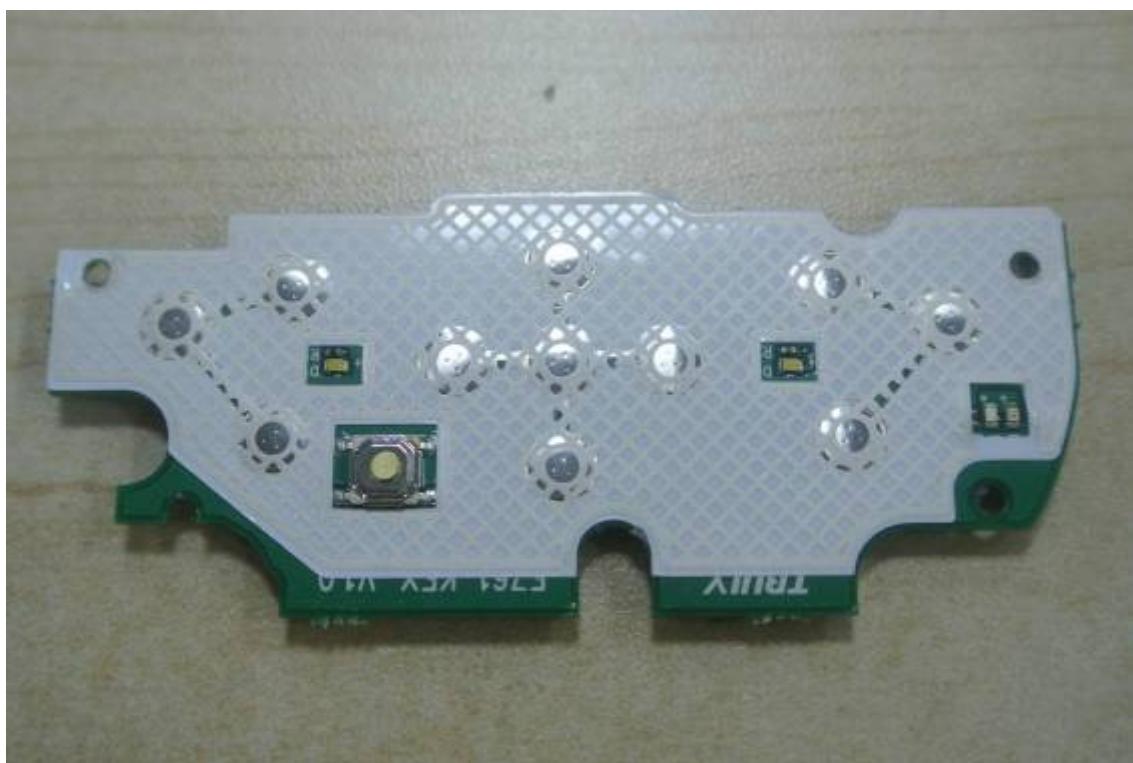
View of EUT-14



View of EUT-15



View of EUT-16



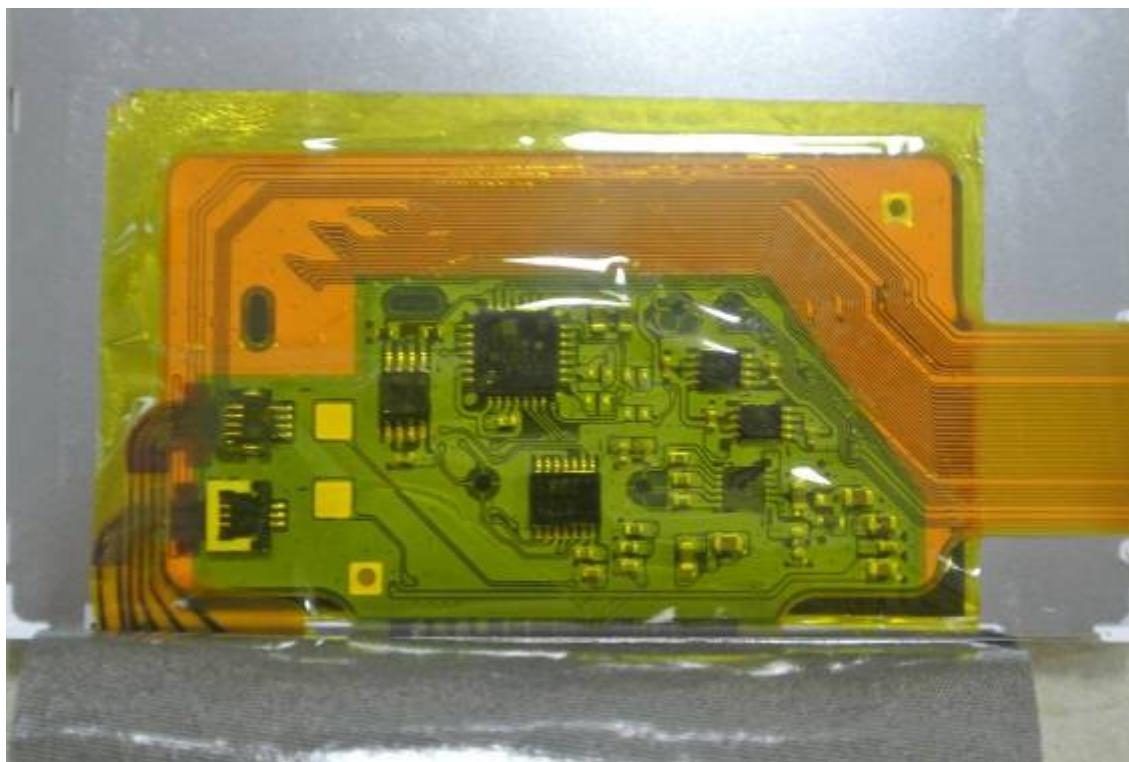
View of EUT-17



View of EUT-18



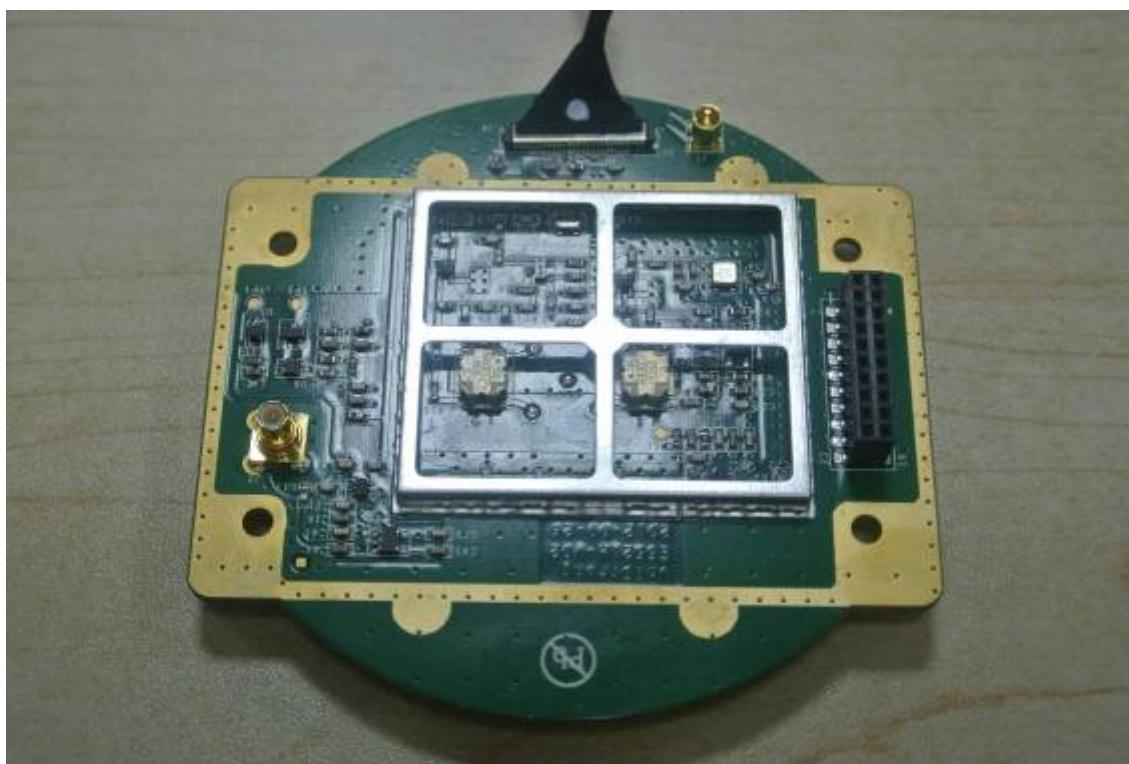
View of EUT-19



View of EUT-20



View of EUT-21



View of EUT-22



----End of the report----