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Report No.: GZEM141200692801
Page: 1 of 15
FCC ID: SY9PL5101

TEST REPORT

Application No.:	GZEM1412006928CR
Applicant:	GUANGDONG LFF TECHNOLOGY CO., LTD
Manufacturer:	Same as the applicant.
FCC ID:	SY9PL5101
Product Description:	TIRE PRESSURE MONITORING SYSTEM
Model No.:	LP510
Trade Mark:	SPY
Standards:	CFR 47 FCC PART 15 SUBPART B:2014
Date of Receipt:	2015-01-05
Date of Test:	2015-02-28 to 2015-03-06
Date of Issue:	2015-09-02
Test Result :	Pass*

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

Authorized Signature: 
Jerry Chan
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.



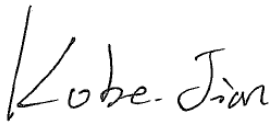
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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2015-09-02		Original

Authorized for issue by:				
Tested By				2015-02-28 to 2015-03-06
	(Terry Lai) /Project Engineer			Date
Prepared By				2015-04-01
	(Millie Li) /Clerk			Date
Checked By				2015-04-03
	(Kobe Jian) /Reviewer			Date



3 Test Summary

Electromagnetic Interference (EMI)				
Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30 MHz to 1 GHz)	FCC PART 15 SUBPART B:2014	ANSI C63.4:2009	Class B	PASS
Radiated Emission above 1 GHz	FCC PART 15 SUBPART B:2014	ANSI C63.4:2009	Class B	PASS
Remark : EUT: In this whole report EUT means Equipment Under Test.				



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5 General Information

5.1 Client Information

Applicant: GUANGDONG LFF TECHNOLOGY CO., LTD
Address of Applicant: NO.9. YONGCHENG NORTH ROAD, XIAOLAN INDUSTRIAL AREA,
XIAOLAN TWON, ZHONGSHAN CITY, GUANGDONG PROVINCE,
P.R. CHINA 528416
Manufacturer: Same as the applicant.
Address of Manufacturer: Same as the applicant.

5.2 General Description of E.U.T.

Product Description: TIRE PRESSURE MONITORING SYSTEM
Model No.: LP510

5.3 Details of E.U.T.

Power Supply: DC 12V
Type of receiver: Super heterodyne receiver
Function: 433MHz receiver
Power Cord: N/A

5.4 Description of Support Units

The EUT has been tested with DC 12V battery supplied by GS and sensor (Model: WST002) supplied by the client.

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 General Test Climate During Testing

Temperature: 15-30 °C Humidity: 30~70 %RH Atmospheric Pressure: 860~1060 mbar

5.8 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



6 Equipment Used during Test

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-12-05	2015-12-05
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2015-03-02	2016-03-02
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2015-04-07	2016-04-07
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2014-04-19	2016-04-19
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2014-07-14	2017-07-14
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2013-08-31	2016-08-31
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2014-05-04	2017-05-04
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2013-08-31	2016-08-31
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2015-03-02	2016-03-02
EMC2065	Amplifier	HP	8447F	N/A	2015-07-18	2016-07-17
EMC0075	310N Amplifier	Sonoma	310N	272683	2015-03-02	2016-03-02
EMC0523	Active Loop Antenna	EMCO	6502	42963	2014-03-03	2016-03-03
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHZ	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	9170-375	2014-05-26	2017-05-26
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2015-03-02	2016-03-02
EMC2069	2.4GHz filter	Micro-Tronics	BRM 50702	149	2015-03-02	2016-03-02
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2014-05-03	2016-05-03

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2014-09-15	2015-09-15
EMC0007	DMM	Fluke	73	70671122	2014-09-15	2015-09-15



7 Emission Test Results

7.1 Radiated Emissions, 30MHz to 1GHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Test Voltage: DC 12V
Test Date: 2015-02-28
Frequency Range: 30MHz to 1GHz
Measurement Distance: 3 m
Detector: Peak for pre-scan
Quasi-Peak if maximised peak within 20dB of limit
(120 kHz resolution bandwidth)
Class / Limit: Class B

Frequency range MHz	Quasi-peak limits dB (μ V/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54

At transitional frequencies the lower limit applies.

7.1.1 E.U.T. Operation

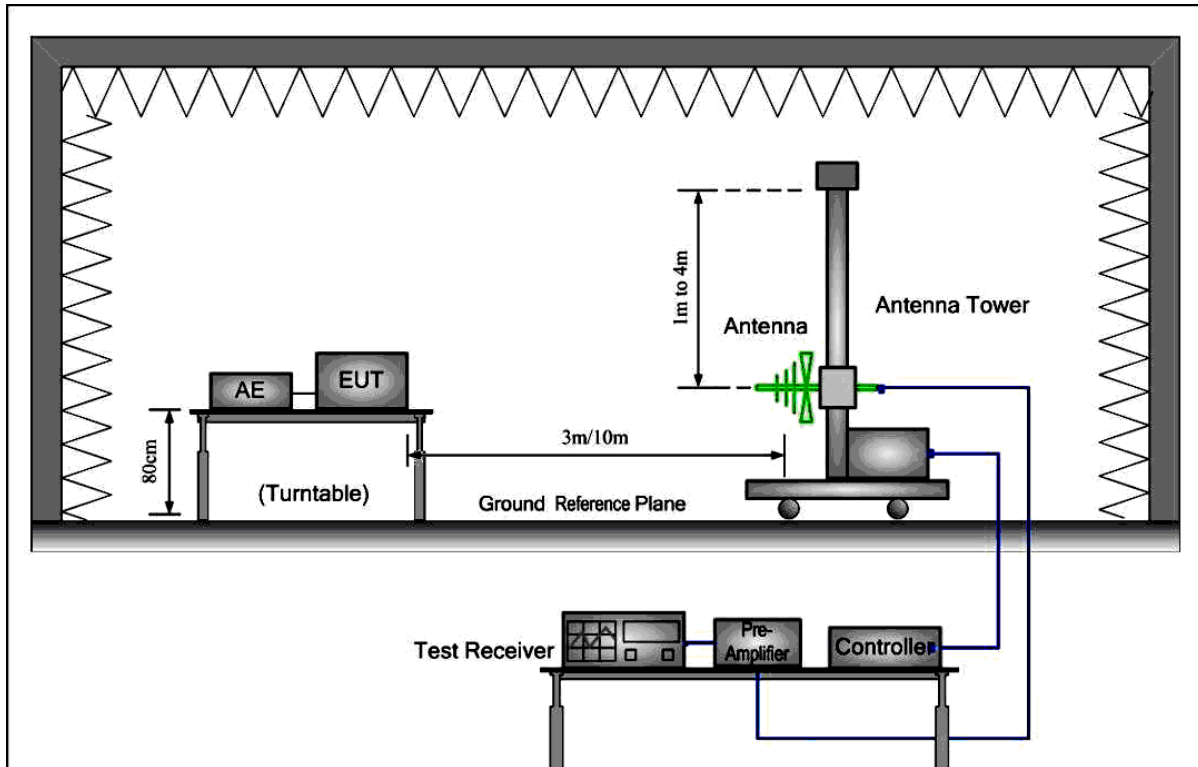
Pre-test with Peak detector with the following mode(s):

- 1: Receiving mode
- 2: Cohere mode

Final test with Quasi-Peak with the following mode(s):

- 1: Receiving mode.

7.1.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Biconical and log periodic antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

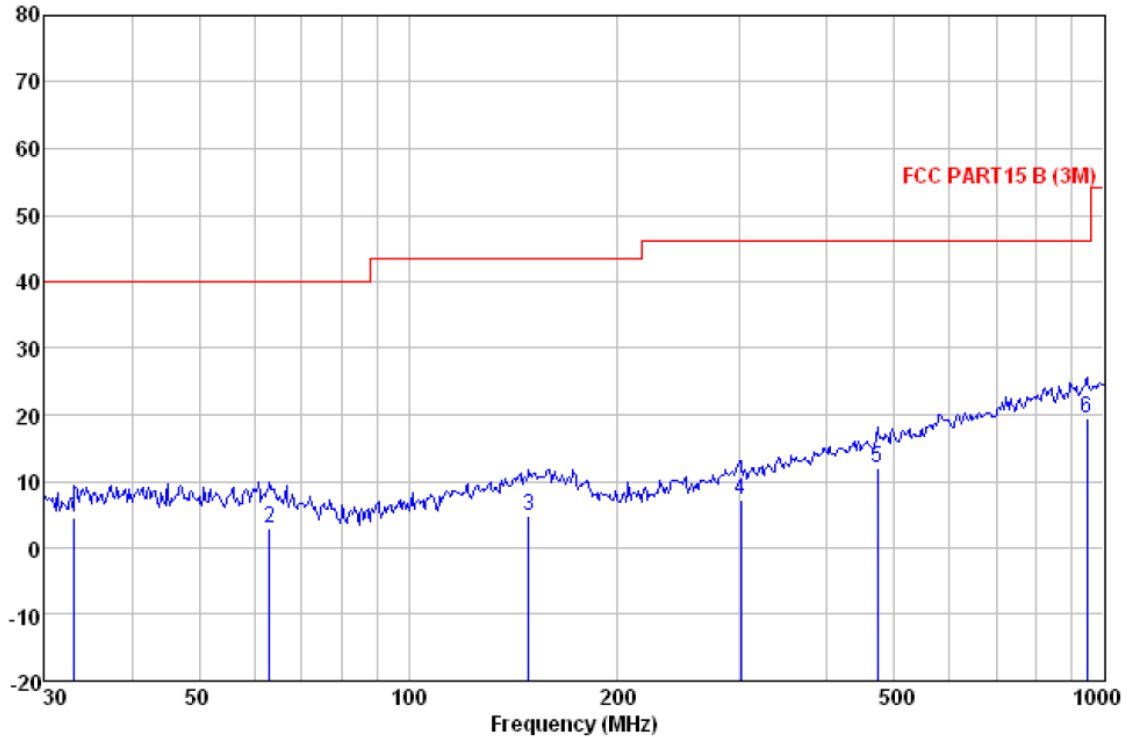


7.1.3 Measurement Data

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
33.095	22.33	12.26	0.86	31.01	4.44	40.00	-35.56	QP
63.092	20.37	12.46	1.13	31.00	2.96	40.00	-37.04	QP
148.963	20.34	13.85	1.64	31.06	4.77	43.50	-38.73	QP
300.367	22.57	13.19	2.40	31.00	7.16	46.00	-38.84	QP
472.176	23.19	16.75	3.05	30.98	12.01	46.00	-33.99	QP
945.440	22.91	23.36	4.08	30.82	19.53	46.00	-26.47	QP

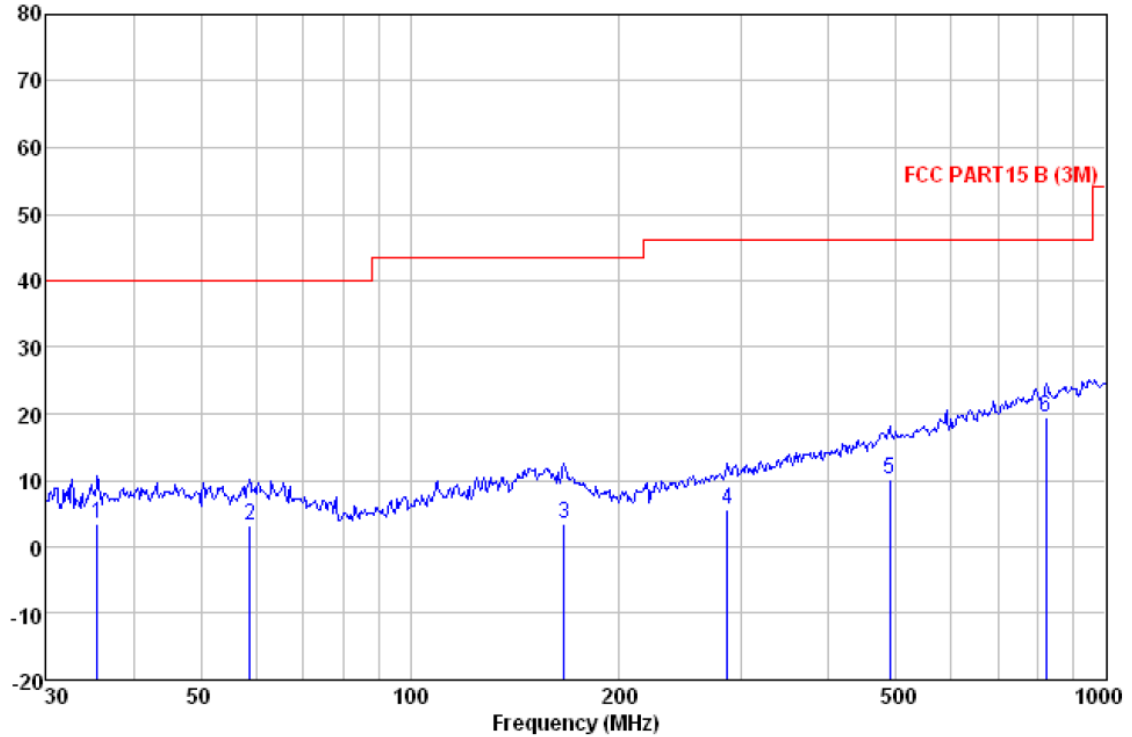
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
35.499	21.26	12.42	0.92	31.01	3.59	40.00	-36.41	QP
58.819	20.40	12.61	1.10	31.00	3.11	40.00	-36.89	QP
166.651	19.22	13.47	1.79	31.08	3.40	43.50	-40.10	QP
285.978	21.32	12.92	2.36	31.01	5.59	46.00	-40.41	QP
489.027	21.14	16.97	3.08	30.99	10.20	46.00	-35.80	QP
821.710	24.63	21.91	3.82	30.90	19.46	46.00	-26.54	QP

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



7.2 Radiated Emissions above 1 GHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Test Voltage: DC 12V
Test Date: 2015-03-06
Frequency Range: 1 GHz to 6 GHz
Measurement Distance: 3 m
Detector: Peak for pre-scan
Peak and Average if maximised peak within 20dB of limit
(1 MHz resolution bandwidth)

Class / Limit: Class B

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement Range (MHz)
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower
Average limits dB(μ V/m)	Peak limits dB(μ V/m)
54	74

7.2.1 E.U.T. Operation

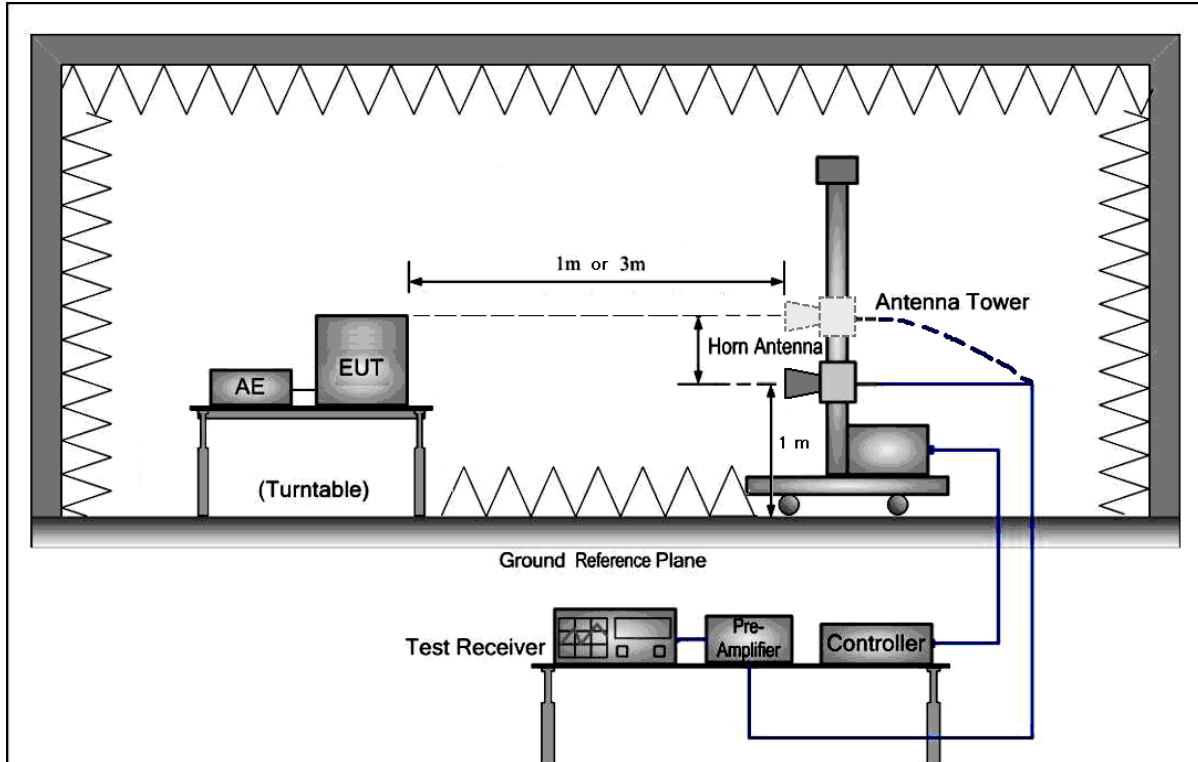
Pre-test with Peak detector with the following mode(s):

- 1: Receiving mode
- 2: Cohere mode

Final test with Quasi-Peak with the following mode(s):

- 1: Receiving mode.

7.2.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. Horn antenna was used for the frequency above 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

Remark: a unmodulated signal same as fundamental frequency of the transmitter is transmitted to activate the superregenerative receiver and maximize the emission of the receiver.

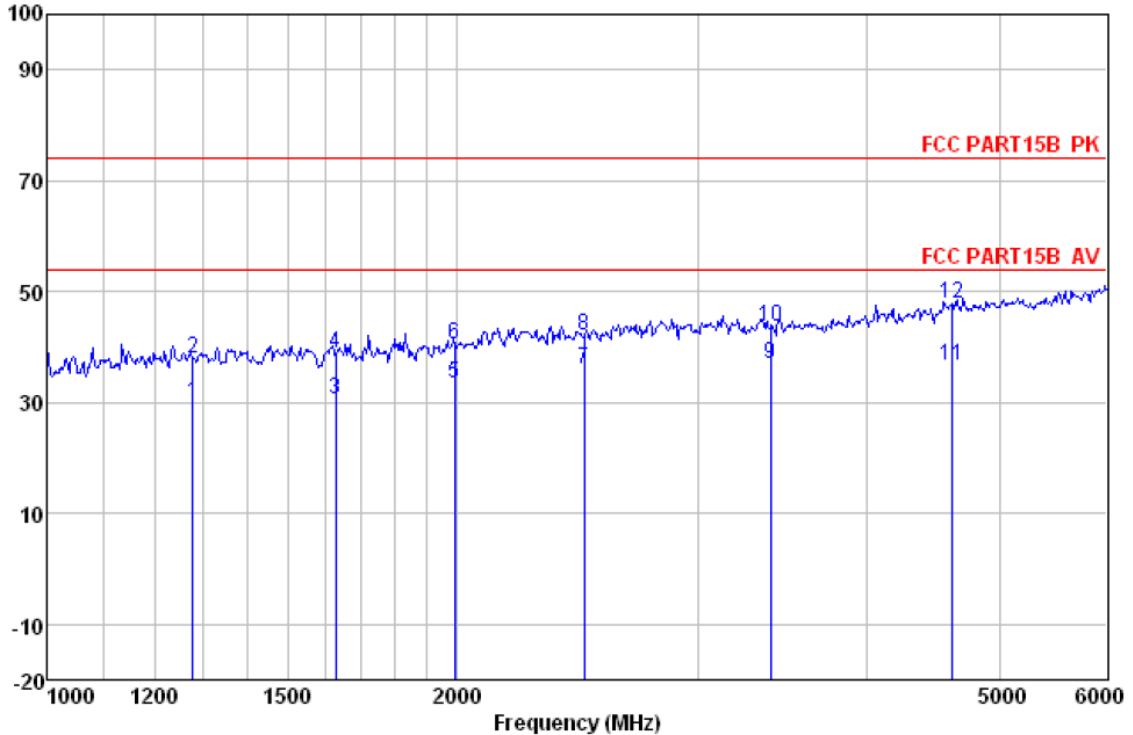


7.2.3 Measurement Data

Vertical:

Peak scan

Level (dBμV/m)



Peak and Average measurement:

Freq MHz	ReadAntenna Level dBuV	Cable Factor dB/m	Preamp Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Remark
1278.223	37.12	25.42	5.74	38.36	29.92	54.00	-24.08	Average
1278.223	45.23	25.42	5.74	38.36	38.03	74.00	-35.97	Peak
1628.010	36.77	24.98	7.00	38.26	30.49	54.00	-23.51	Average
1628.010	45.14	24.98	7.00	38.26	38.86	74.00	-35.14	Peak
1989.803	37.96	26.09	7.47	38.20	33.32	54.00	-20.68	Average
1989.803	45.21	26.09	7.47	38.20	40.57	74.00	-33.43	Peak
2475.965	38.37	27.56	8.28	38.26	35.95	54.00	-18.05	Average
2475.965	44.44	27.56	8.28	38.26	42.02	74.00	-31.98	Peak
3393.901	37.58	28.46	9.43	38.52	36.95	54.00	-17.05	Average
3393.901	44.19	28.46	9.43	38.52	43.56	74.00	-30.44	Peak
4618.928	33.38	31.08	10.82	38.58	36.70	54.00	-17.30	Average
4618.928	44.45	31.08	10.82	38.58	47.77	74.00	-26.23	Peak

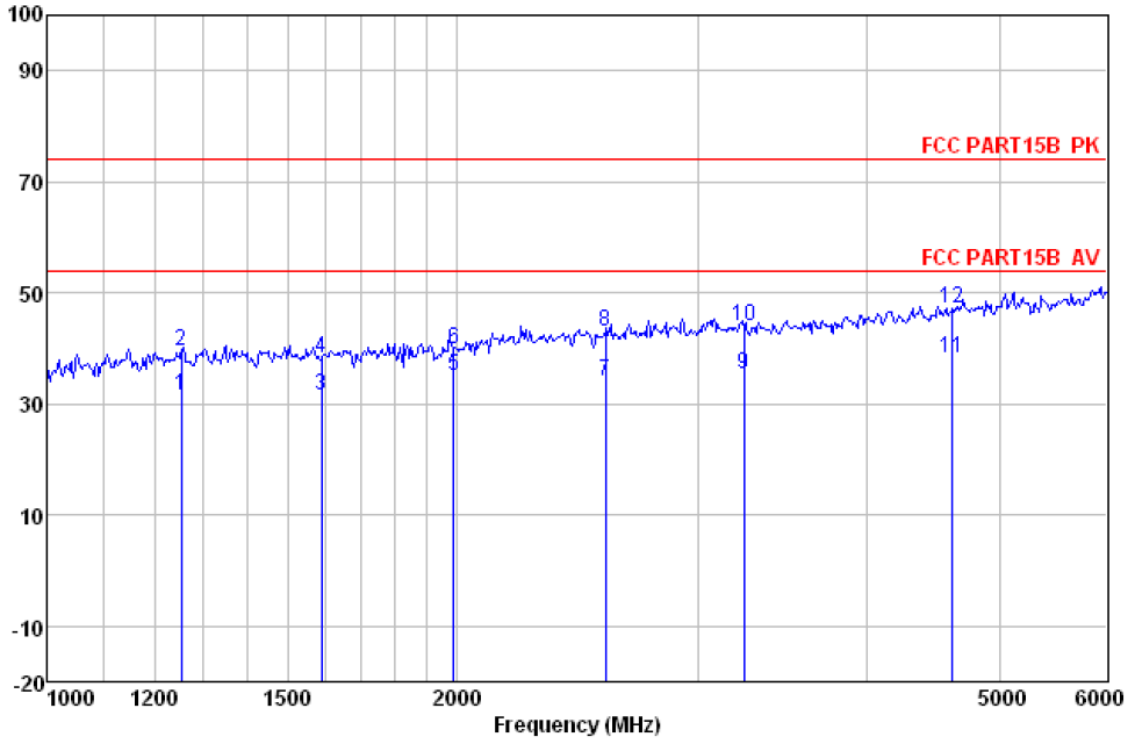
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dBμV/m)



Peak and Average measurement:

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
1253.277	38.91	25.29	5.70	38.36	31.54	54.00	-22.46	Average
1253.277	46.93	25.29	5.70	38.36	39.56	74.00	-34.44	Peak
1587.680	37.70	25.01	7.00	38.27	31.44	54.00	-22.56	Average
1587.680	44.46	25.01	7.00	38.27	38.20	74.00	-35.80	Peak
1986.241	39.55	26.07	7.47	38.20	34.89	54.00	-19.11	Average
1986.241	44.57	26.07	7.47	38.20	39.91	74.00	-34.09	Peak
2566.301	36.44	27.71	8.37	38.28	34.24	54.00	-19.76	Average
2566.301	45.12	27.71	8.37	38.28	42.92	74.00	-31.08	Peak
3245.229	35.95	28.55	9.25	38.49	35.26	54.00	-18.74	Average
3245.229	44.78	28.55	9.25	38.49	44.09	74.00	-29.91	Peak
4618.928	35.04	31.08	10.82	38.58	38.36	54.00	-15.64	Average
4618.928	44.02	31.08	10.82	38.58	47.34	74.00	-26.66	Peak

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

--End of Report--