



Date: 2008-12-10
No.: 60.870.8.009.01F

TEST REPORT

Applicant:

Electronics Tomorrow Ltd.
Unit 903-7, 9/F, Tower 1, Harbour Center, 1 Hok
Cheung Street, Hung Hom, Kowloon, HK.

Description of Samples:

Model name: Color-coded LCD Weather Station &
AM/FM-Stereo Radio/ Atomic Alarm with
Projection Clock
Brand name: Nil
Model no.: 4950
FCCID PEQ495091108

Date Samples Received:

2008-12-01

Date Tested:

2008-12-01 to 2008-12-09

Investigation Requested:

FCC Part 15 Subpart B

Conclusions:

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

Equipment authorization required for this EUT:

- 1) FCC verification for AM/FM broadcast.
- 2) FCC certificate for Weather information reception mode.

Checked by:

Approved by:-

Prudence Poon
Project Manager
Telecom department

Victor Kwan
Manager
Telecom department

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1.0 **General Details**

1.1 **Test Laboratory**

Hong Kong Productivity Council
HKPC Building, 78 Tat Chee Avenue, Kowloon Tong,
Hong Kong

Registration Number: 90656

1.2 **Applicant Details**

Applicant

Electronics Tomorrow Ltd.

Unit 903-7, 9/F, Tower 1, Harbour Center,
1 Hok Cheung Street, Hung Hom, Kowloon, HK.

Manufacturer

Electronics Tomorrow Ltd.

Unit 903-7, 9/F, Tower 1, Harbour Center,
1 Hok Cheung Street, Hung Hom, Kowloon, HK.

1.3 Equipment Under Test [EUT]

Description of Sample

Model Name: Color-coded LCD Weather Station & AM/FM-Stereo
Radio/ Atomic Alarm with Projection Clock
Manufacturer: Electronics Tomorrow Ltd.
Brand Name: Nil
Model Number: 4950
FCCID: PEQ495091108
Rating: DC 10.5 V by AC/DC Adaptor :
- Model No.: 41TA-D105-050
- Input: AC 120.0V, 60Hz, 9.5W
- Output: DC 10.5V, 500mA

Accessories and Auxiliary Equipment: None
EUT Exercising Software: None

Description of EUT

The Equipment Under Test (EUT) is a Weather Station with AM/FM radio and AUX function. The EUT operates at 433.9MHz to receive the weather information from its associated transmitter.

1.4 Equipment Modification

No modification was conducted on the tested sample by TÜV SÜD Hong Kong Ltd.

1.5 Related Submittal(s) Grants

This product is subjected to FCC verification and certification.

- Verification is for AM/FM broadcast function.
- Certificate is for 433MHz RF weather information receiving function.

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 and ANSI C63.4: 2003 for FCC Verification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary					
Test Condition	FCC Test Requirement	Class / Severity	Test Result		
			Pass	Failed	N/A
Radiated Emissions, 30MHz to 4.5GHz	Part 15.109	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	Part 15.107	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90656.

3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$\begin{aligned} \text{FS} &= \text{R} + \text{System Factor} \\ \text{System Factor} &= \text{AF} + \text{CF} + \text{FA} - \text{PA} \end{aligned}$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference plane and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during measurement.

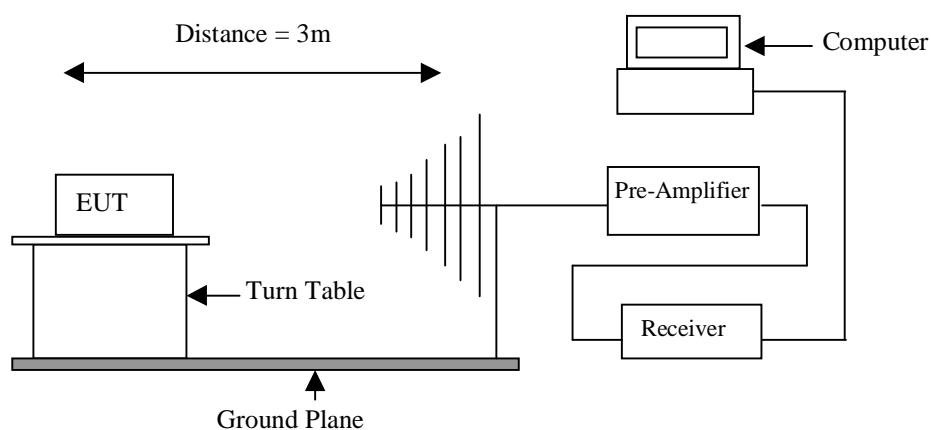
Initial measurements were performed in quasi-peak and average detection modes by the test receiver, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Spurious Radiated Emissions (30MHz to 4.5GHz)

Test Requirement:	FCC Part 15 section 15.109 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2008-12-05
Mode of Operation:	1) Receiving mode to receive RF signal from the transmitter, 2) FM Radio 3) AUX mode
Detector Function:	Quasi-peak (Below 1000 MHz) Average (Above 1000 MHz)
Measurement BW:	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)

Test Setup:



Results: PASS

Radiated Emissions (Receive Mode)							
Emissions Frequency MHz	Value	E-Field Polarity	Reading dBuV/m	System Factor dB	Field Strength at 3m dBuV/m	Limit dBuV/m	Delta to Limit dBuV/m
36.90	QP	V	-1.48	12.18	10.70	40.00	-29.30
48.36	QP	V	-1.80	10.10	8.30	40.00	-31.70
354.35	QP	V	-0.46	16.16	15.70	46.00	-30.30
512.24	QP	V	-1.58	19.48	17.90	46.00	-28.10
2127.40	PK	V	45.59	-4.29	41.30	74.00	-32.70
	AV	V	32.19	-4.29	27.90	54.00	-26.10
3871.70	PK	V	43.43	1.07	44.50	74.00	-29.50
	AV	V	33.33	1.07	34.40	54.00	-19.60
83.58	QP	H	-1.61	9.21	7.60	40.00	-32.40
150.39	QP	H	0.60	13.00	13.60	43.50	-29.90
371.78	QP	H	-1.66	16.56	14.90	46.00	-31.10
480.05	QP	H	-1.60	19.00	17.40	46.00	-28.60
1734.70	PK	H	46.89	-6.39	40.50	74.00	-33.50
	AV	H	32.69	-6.39	26.30	54.00	-27.70
4141.05	PK	H	40.58	1.72	42.30	74.00	-31.70
	AV	H	32.38	1.72	34.10	54.00	-19.90

Note:

- No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.
- Result data graph is attached at the page 10 to page13 for reference.

Radiated Emissions (AUX Mode)							
Emissions Frequency MHz	Value	E-Field Polarity	Reading dBuV/m	System Factor dB	Field Strength at 3m dBuV/m	Limit dBuV/m	Delta to Limit dBuV/m
36.45	QP	V	0.12	12.18	12.30	40.00	-27.70
483.53	QP	V	-1.74	19.04	17.30	46.00	-28.70

Note:

- No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.
- Result data graph is attached at the page 14 to page 15 for reference.

Radiated Emission (FM Radio Mode)								
Tested Frequency MHz	Emissions Frequency MHz	Value	E-Field Polarity	Reading dBuV/m	System Factor dB	Field Strength at 3m dBuV/m	Limit dBuV/m	Delta to Limit dBuV/m
88.10	98.80	QP	V	8.54	10.26	18.80	43.50	-24.70
	98.80	QP	H	16.54	10.26	26.80	43.50	-16.70
	474.17	QP	H	-0.90	19.00	18.10	46.00	-27.90
98.00	108.70	QP	V	15.16	11.04	26.20	43.50	-17.30
	108.70	QP	H	17.76	11.04	28.80	43.50	-14.70
	357.98	QP	V	-0.88	16.28	15.40	46.00	-30.60
	217.40	QP	H	8.96	11.74	20.70	46.00	-25.30
	434.80	QP	H	6.86	18.24	25.10	46.00	-20.90
107.90	118.60	QP	V	15.48	11.52	27.00	43.50	-16.50
	118.60	QP	H	22.48	11.52	34.00	43.50	-9.50
	361.46	QP	V	-2.01	16.41	14.40	46.00	-31.60
	237.20	QP	H	11.01	12.40	23.40	46.00	-22.60
	474.80	QP	H	3.80	19.00	22.80	46.00	-23.20

Note:

- No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.
- The significant emission shown in the graph of FM Radio Mode is generated from signal generator.
- Result data graph is attached at the page 16 to page 21 for reference.

Remark:

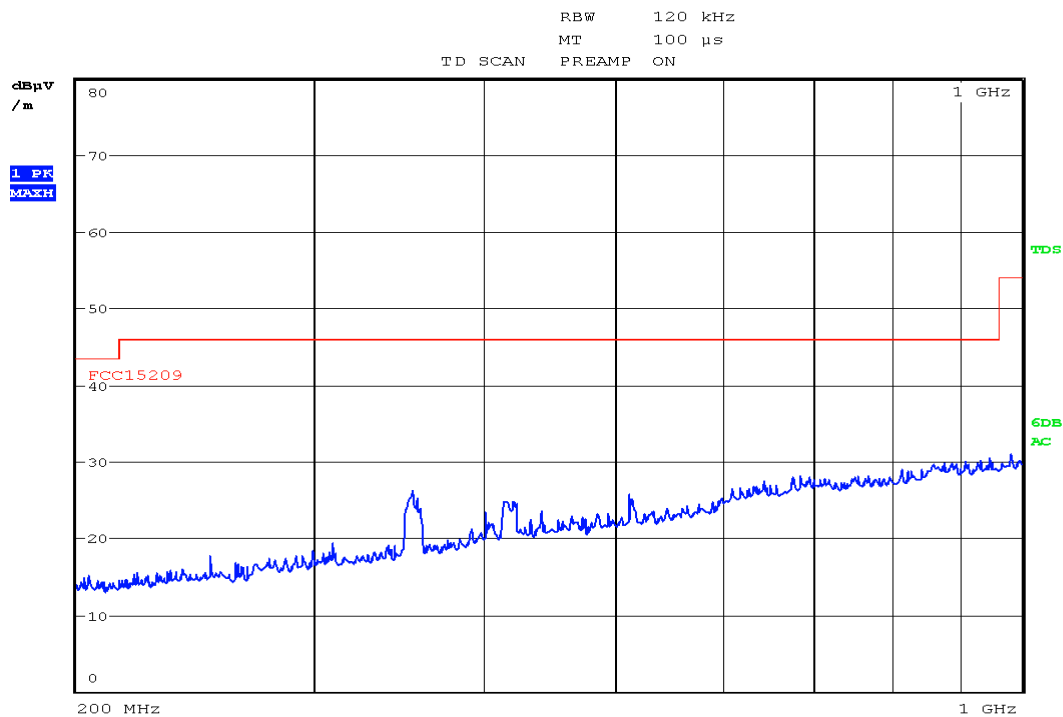
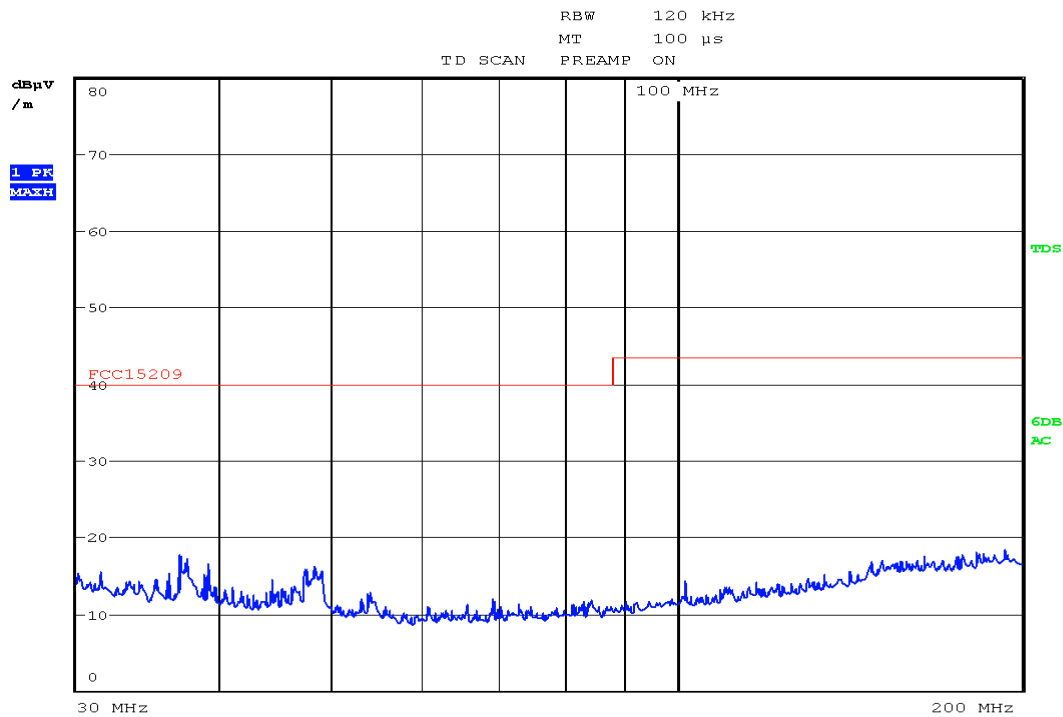
- Calculated measurement uncertainty: $\pm 5.0\text{dB}$

Limits for Radiated Emissions [Section 15.109 Class B] :

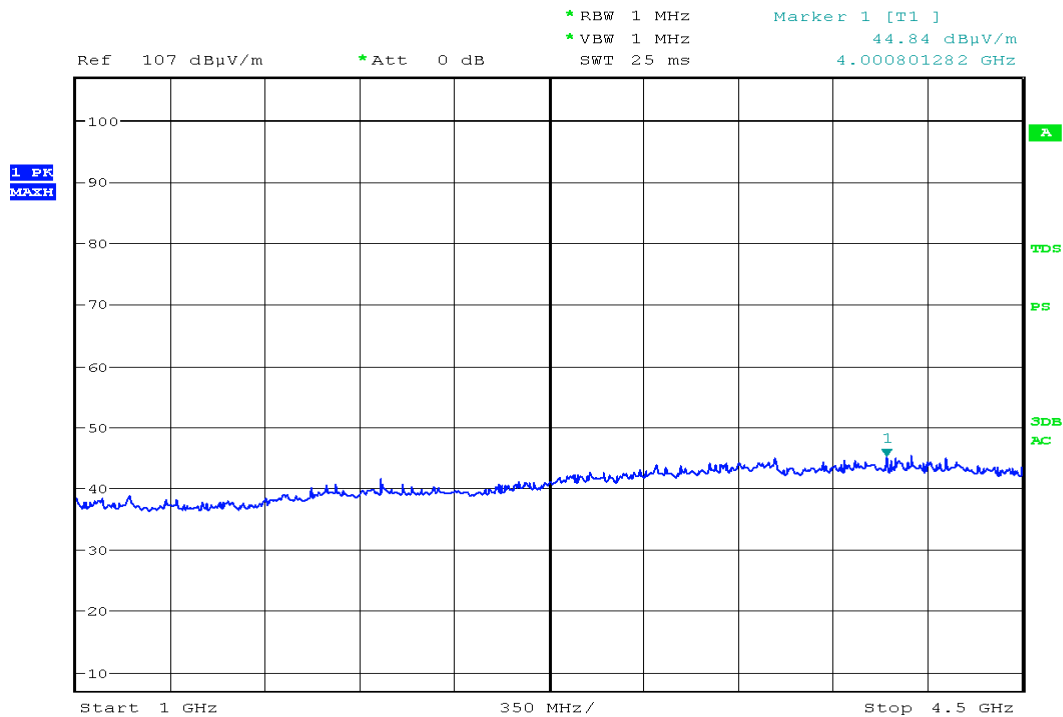
Frequency Range [MHz]	Quasi-Peak Limits [$\mu\text{V/m}$]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

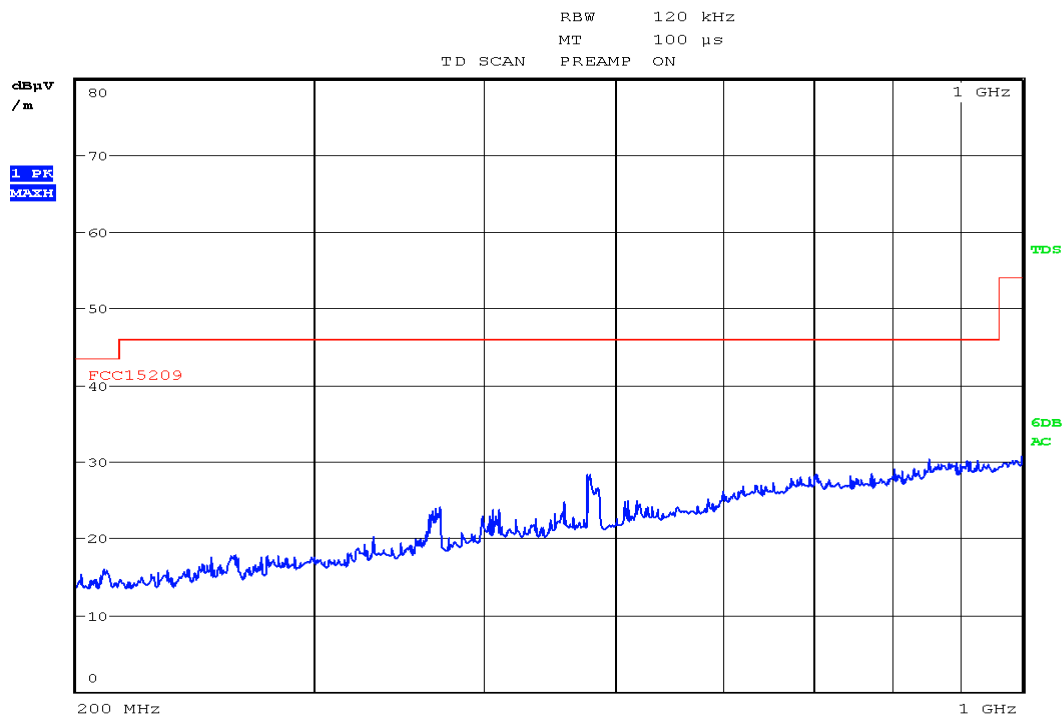
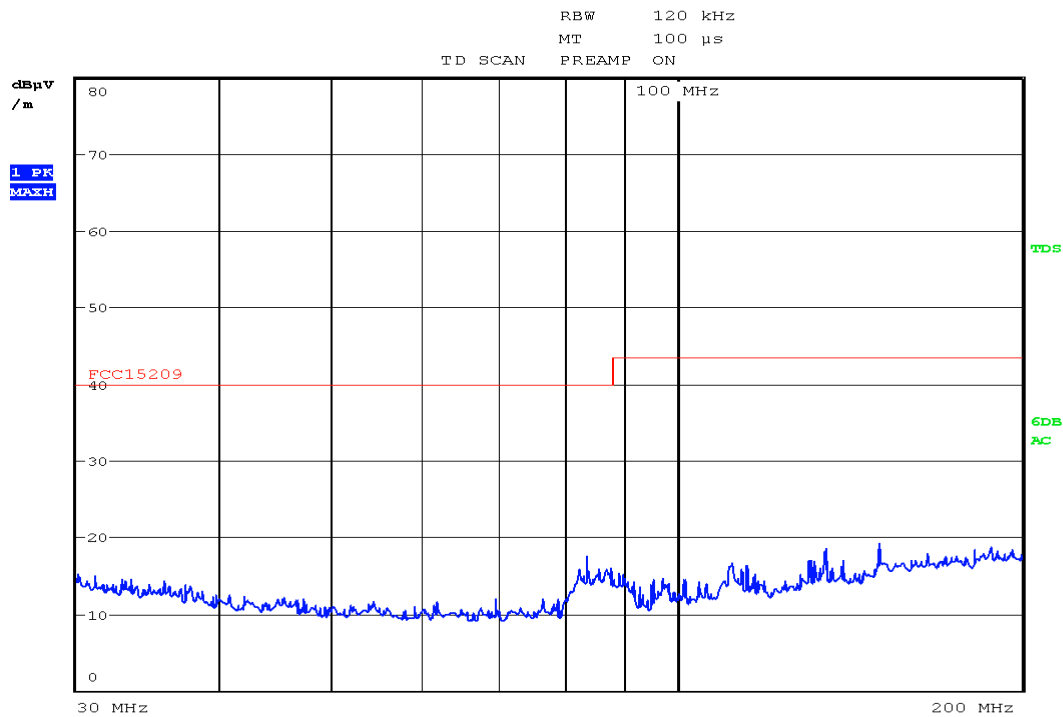
Vertical (Receive Mode)



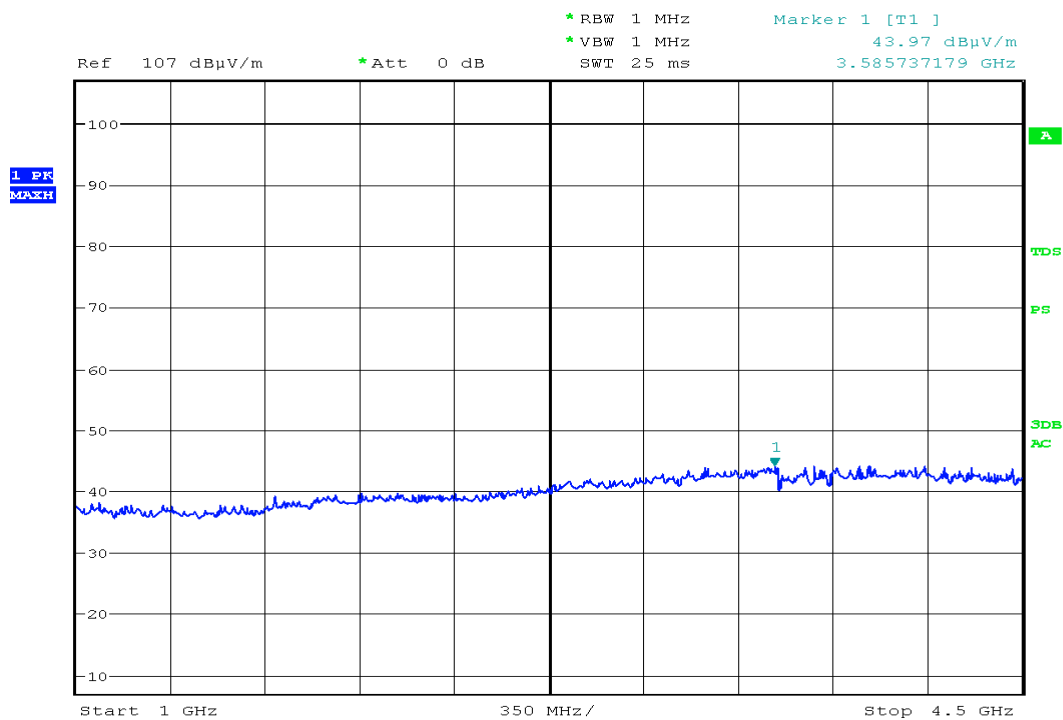
Vertical (Receive Mode)



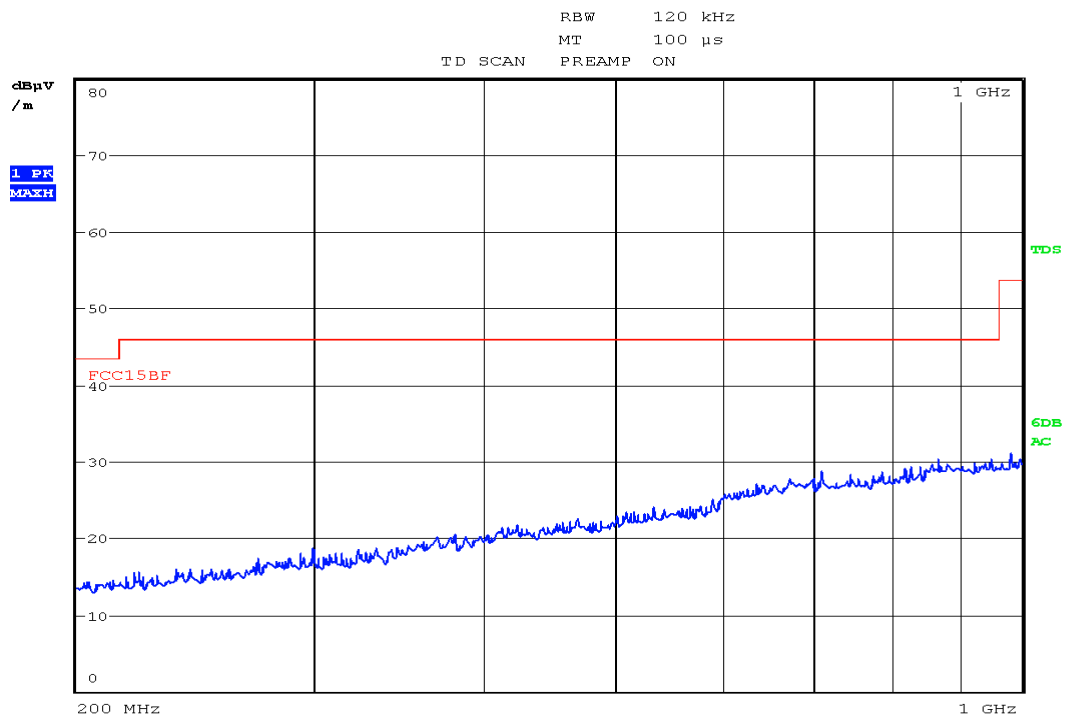
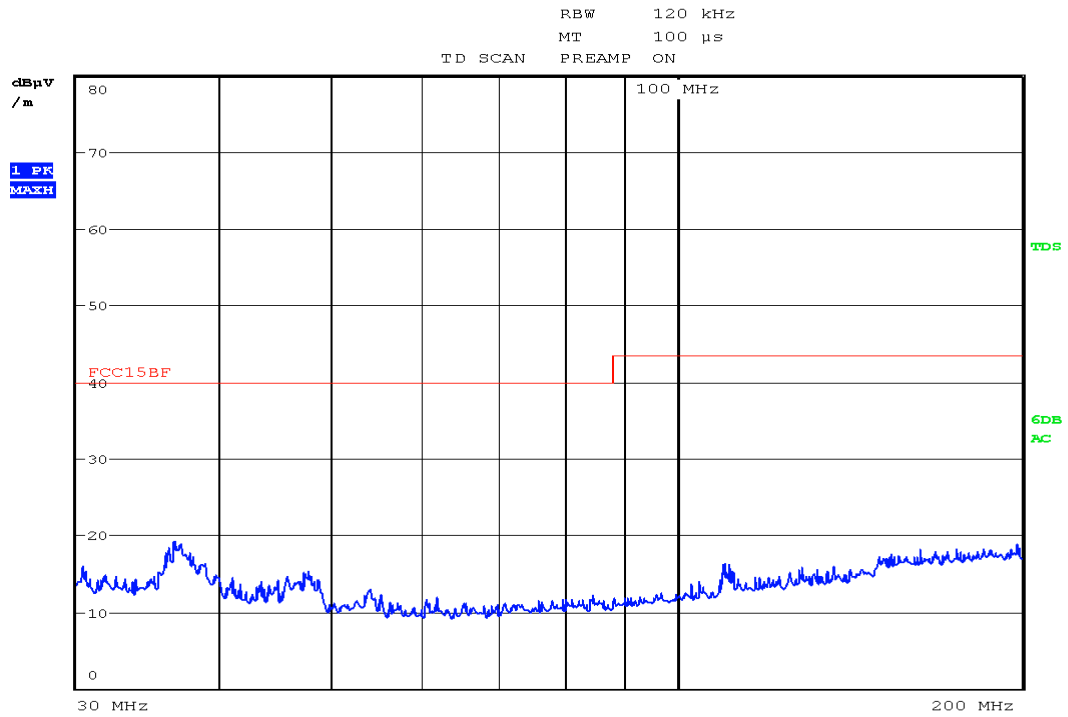
Horizontal (Receive Mode)



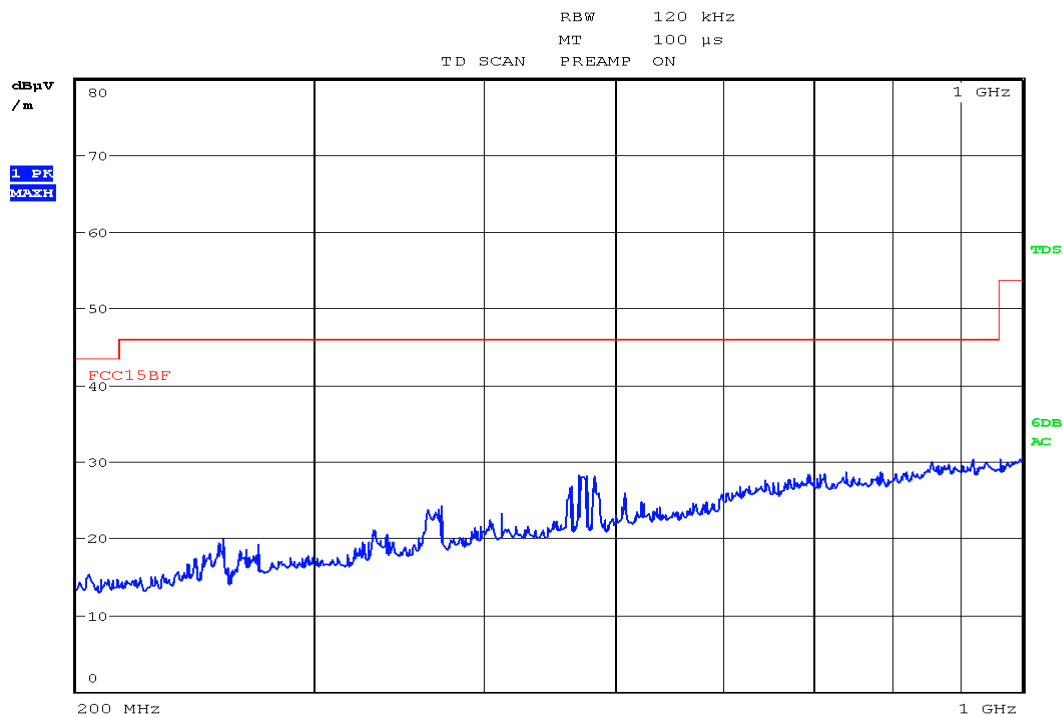
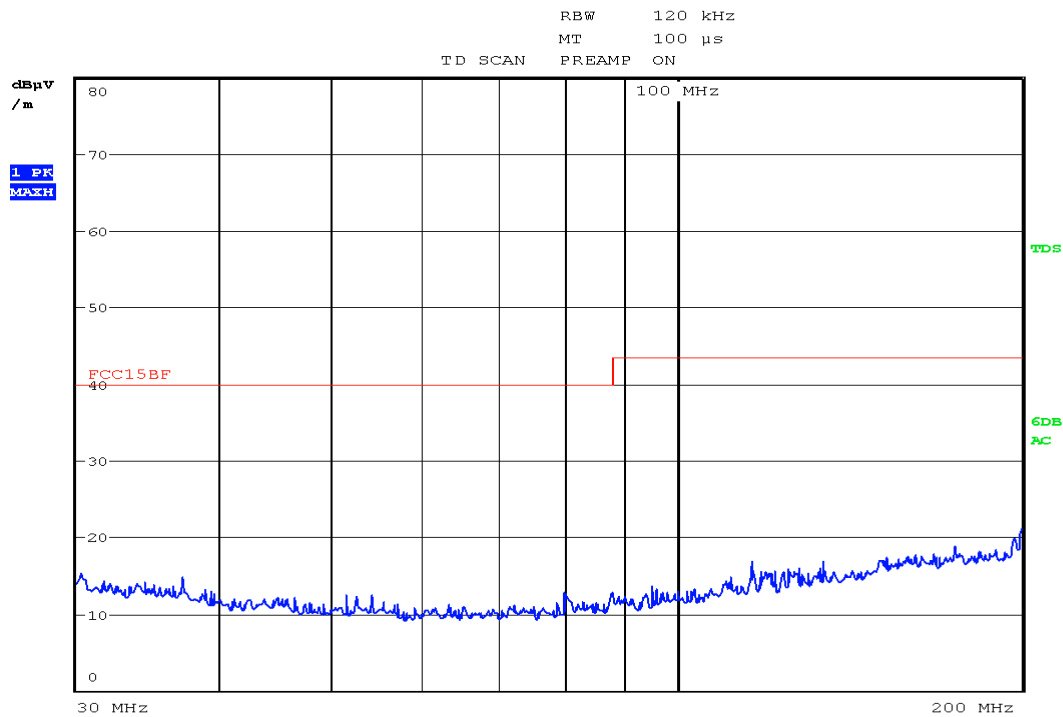
Horizontal (Receive Mode)



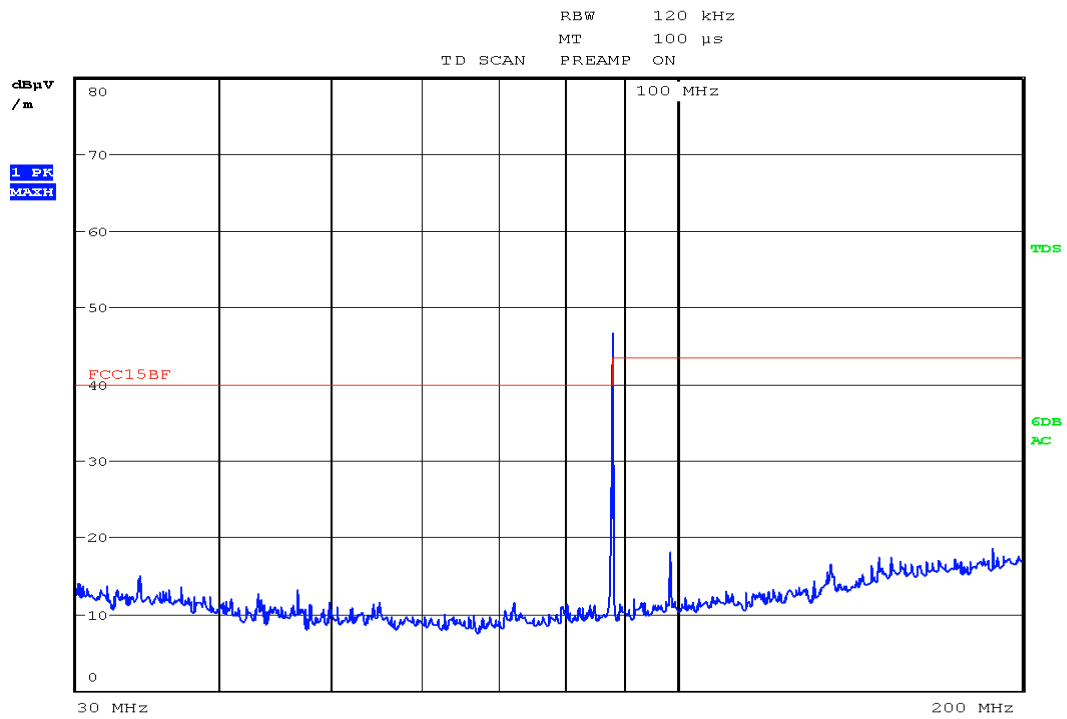
Vertical (AUX Mode)



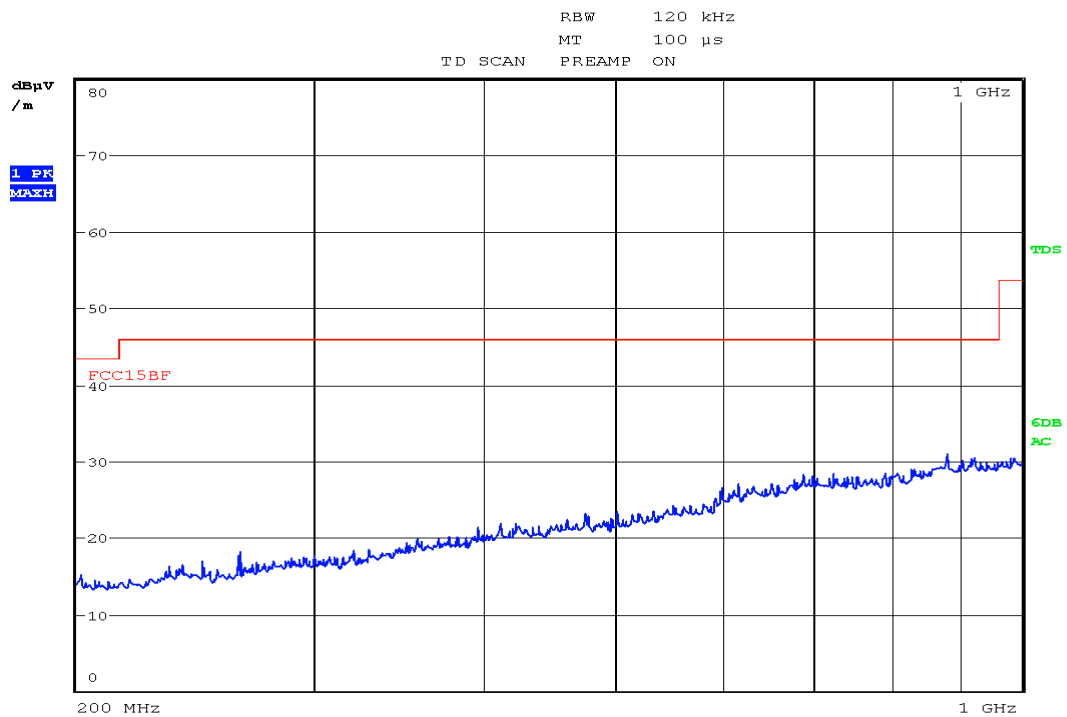
Horizontal (AUX Mode)



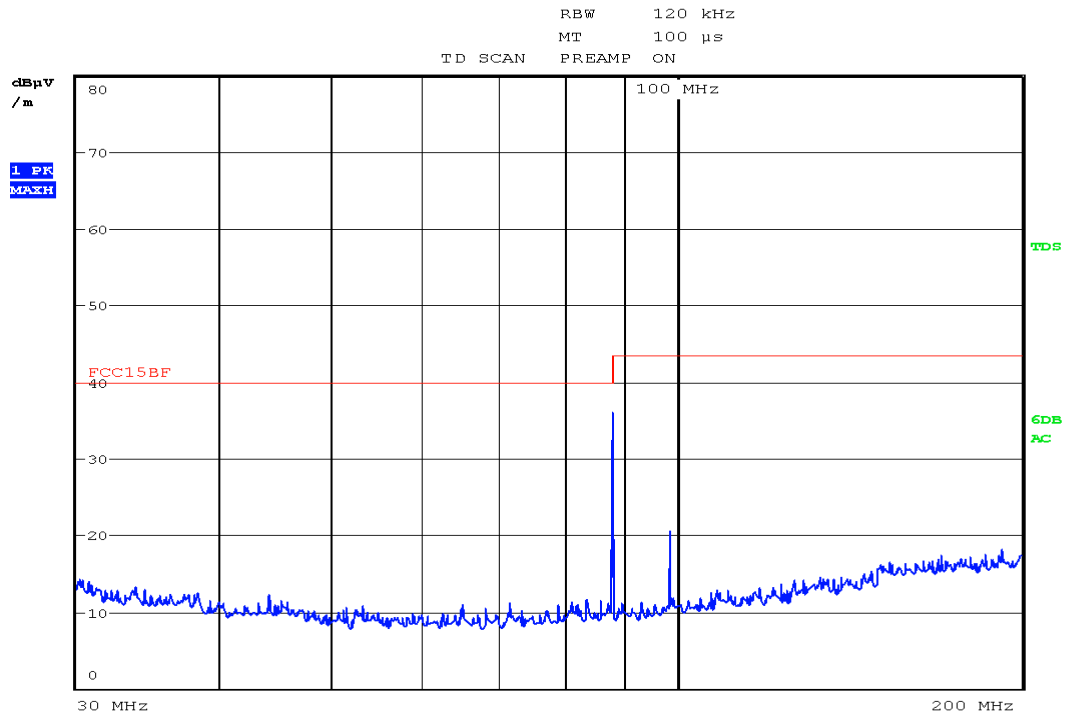
Vertical (FM Radio – 88 MHz)



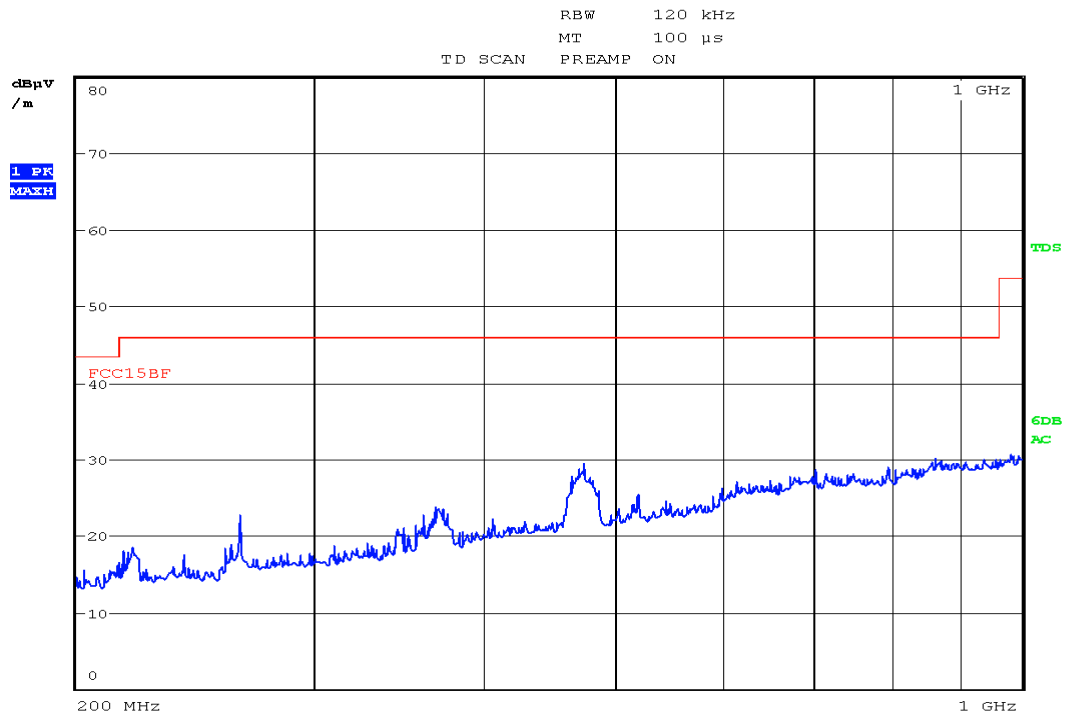
Remark: The significant emission at 88MHz shown in graph is generated from the signal generator.



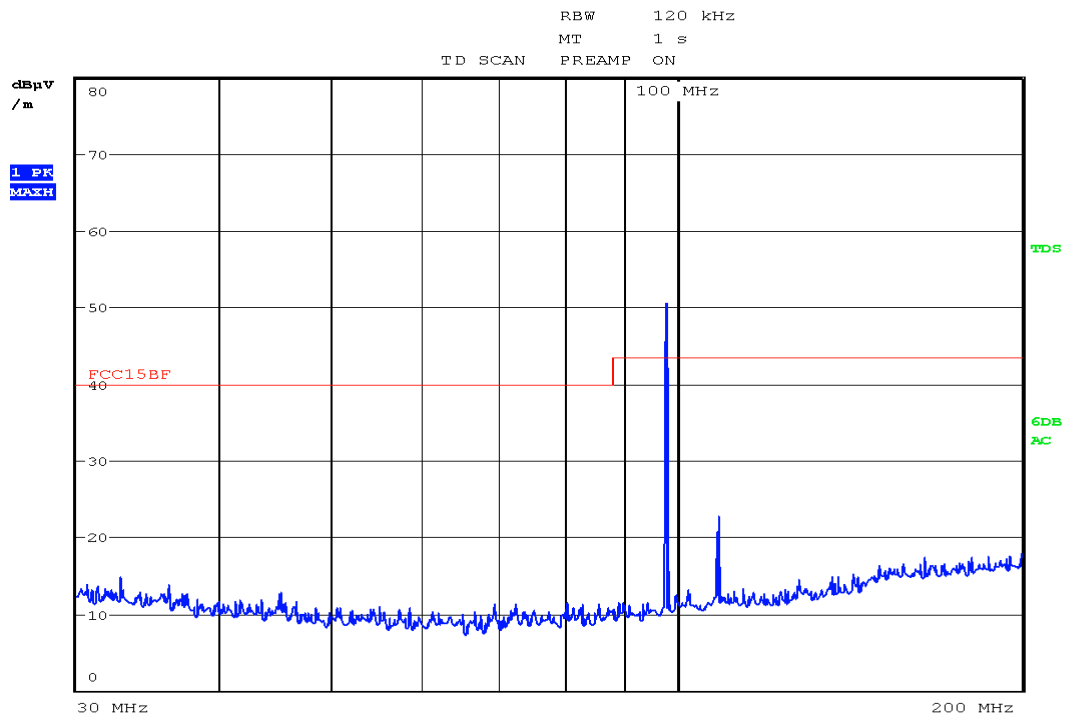
Horizontal (FM Radio – 88 MHz)



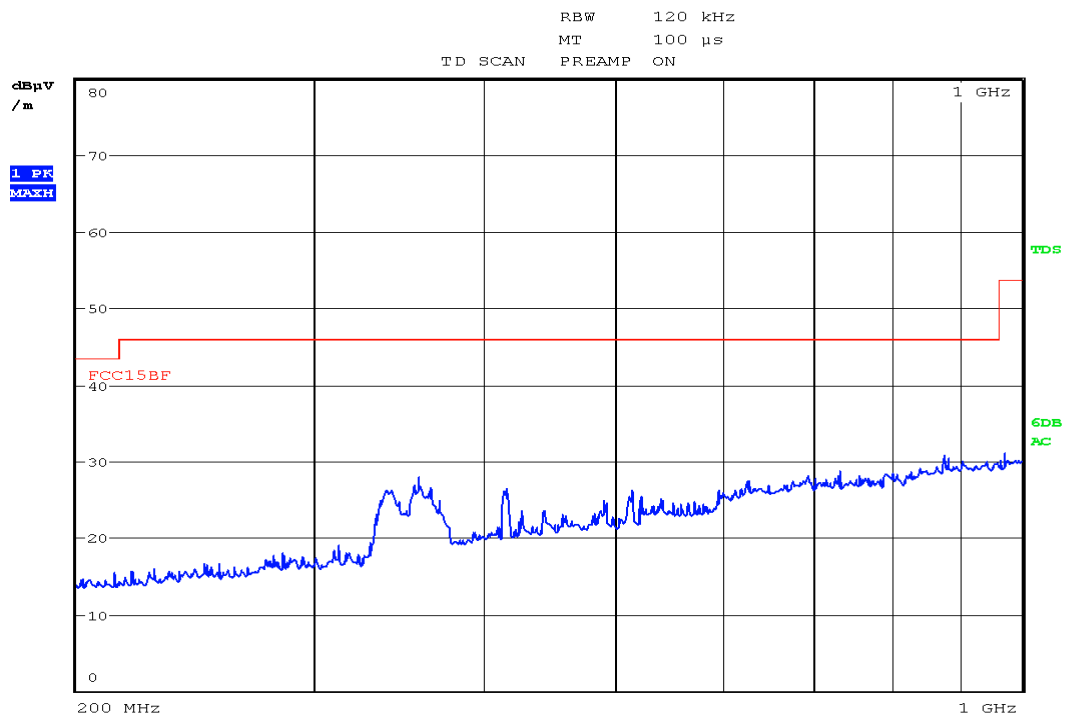
Remark: The significant emission at 88 MHz shown in graph is generated from the signal generator.



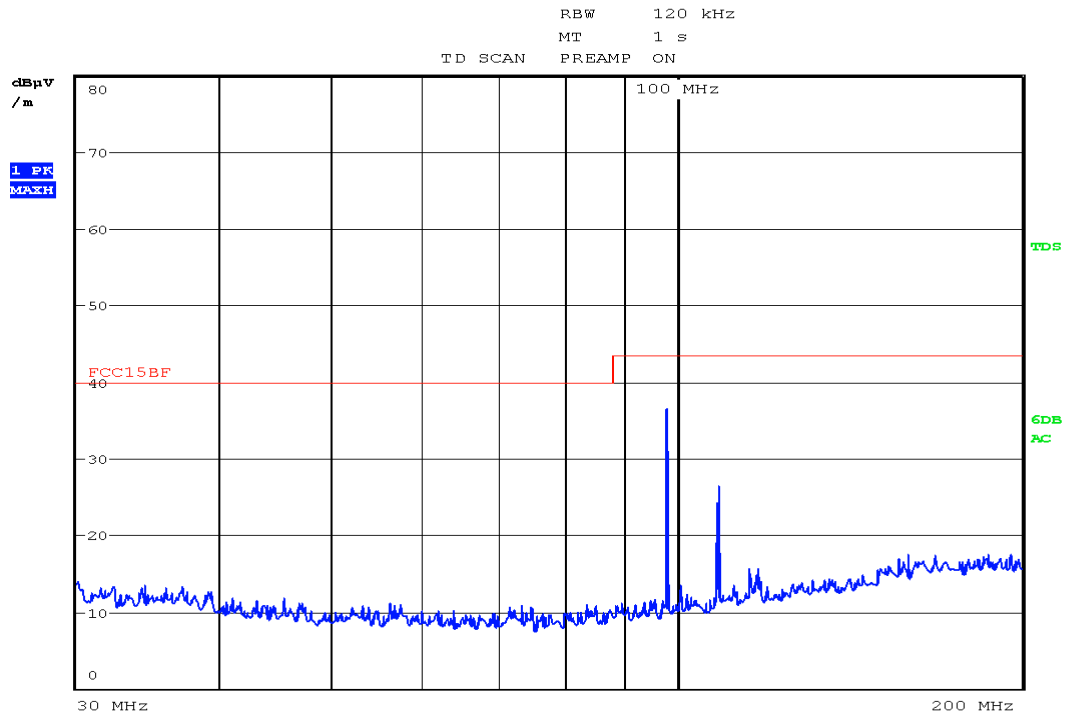
Vertical (FM Radio – 98 MHz)



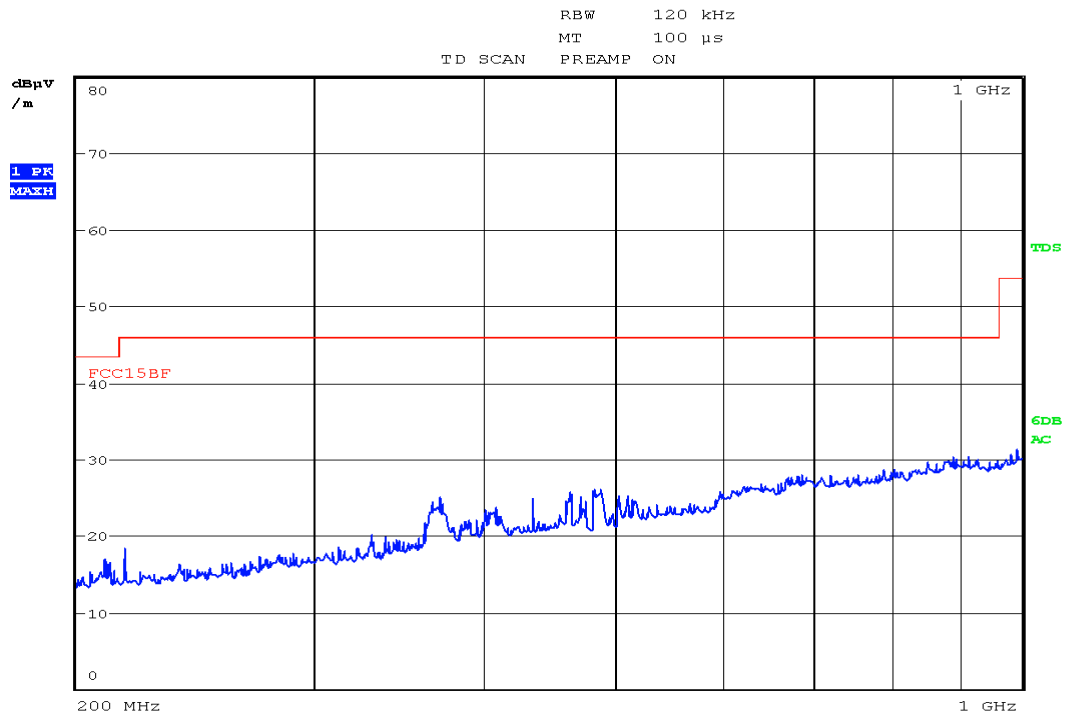
Remark: The significant emission at 98MHz shown in graph is generated from the signal generator.



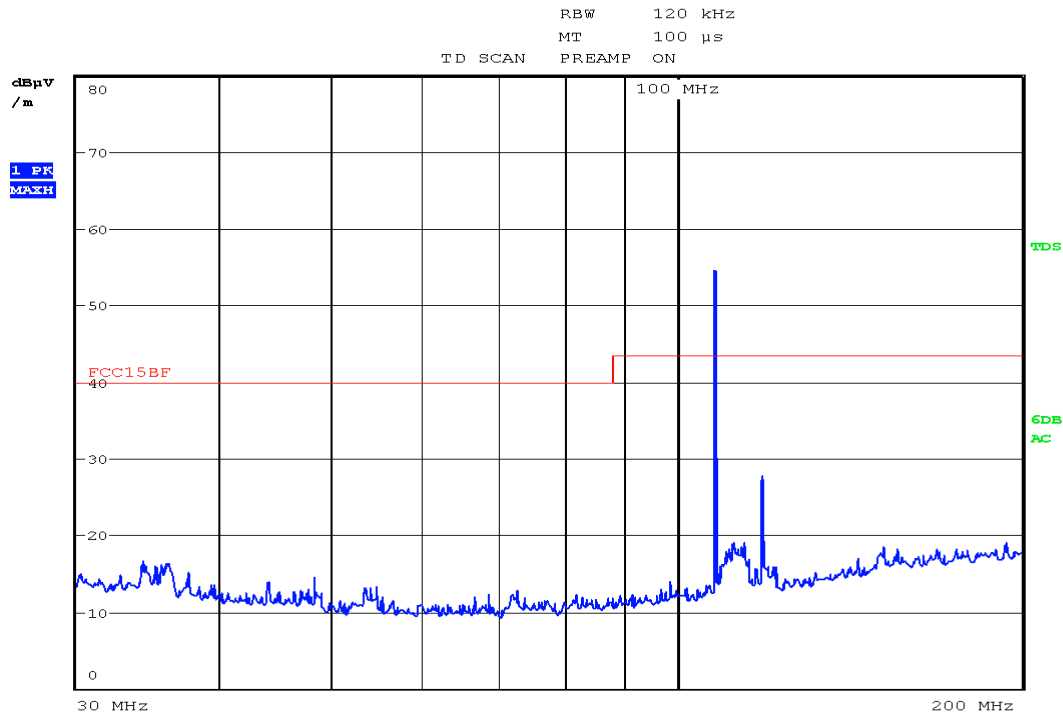
Horizontal (FM Radio – 98 MHz)



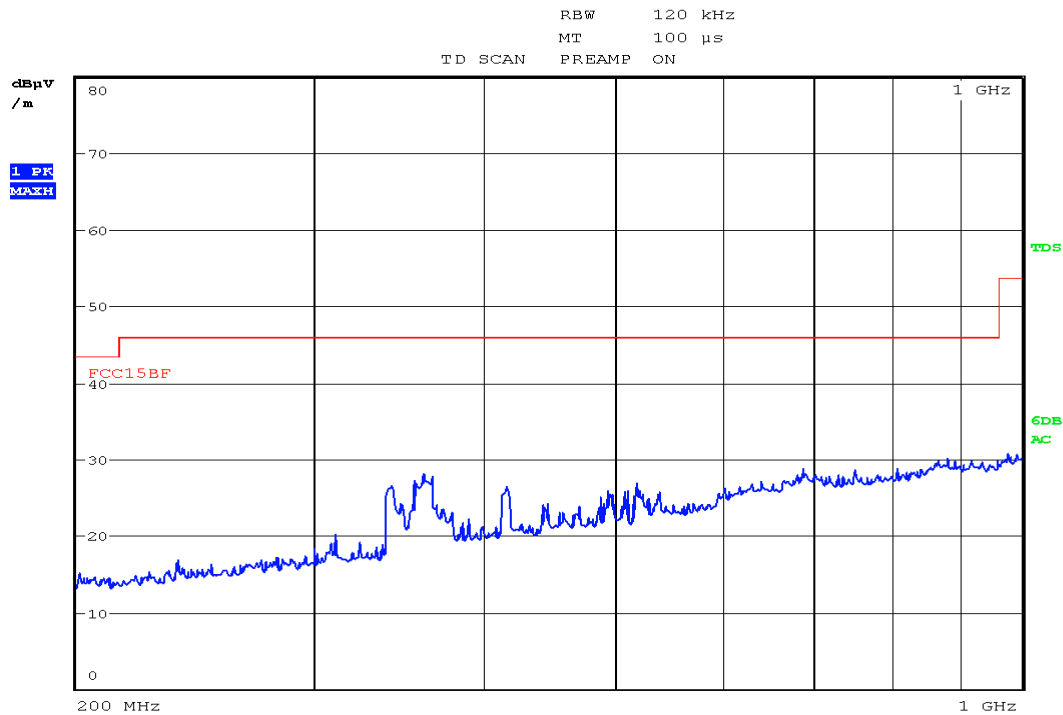
Remark: The significant emission at 99MHz shown in graph is generated from the signal generator.



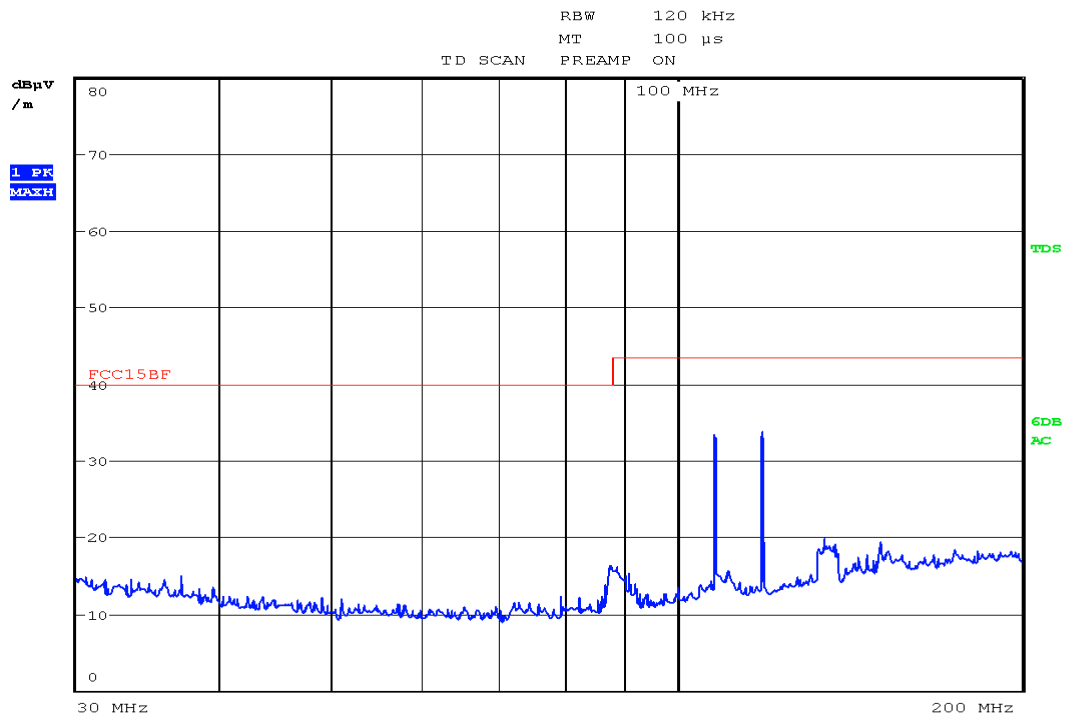
Vertical (FM Radio – 108 MHz)



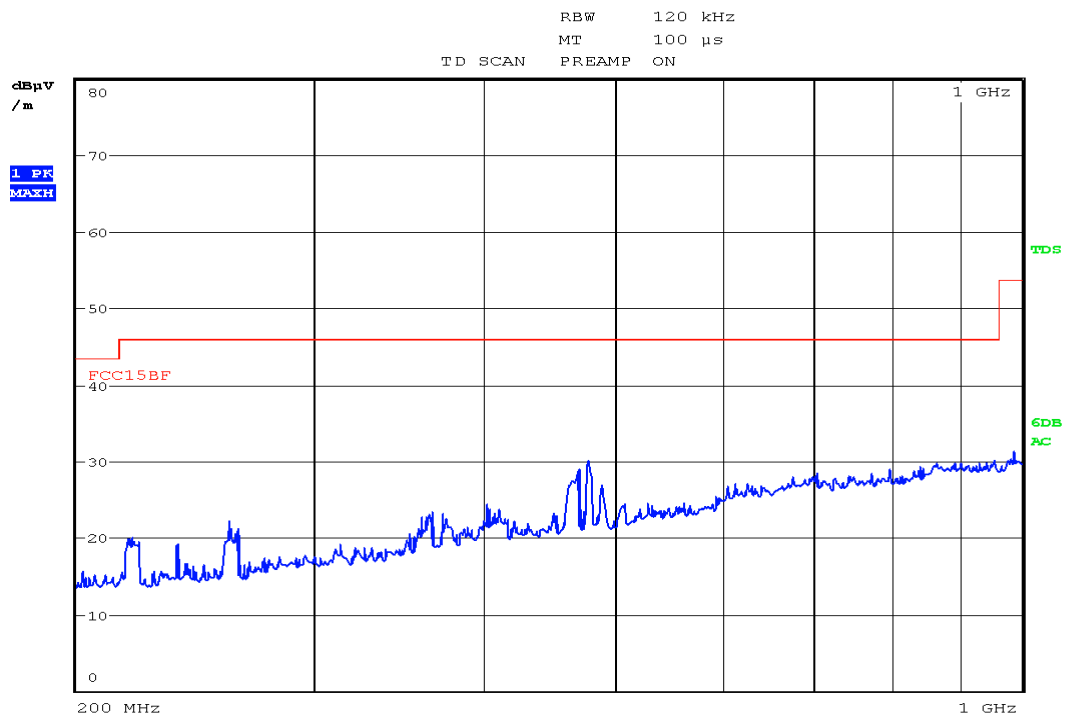
Remark: The significant emission at 108MHz shown in graph is generated from the signal generator.



Horizontal (FM Radio – 108 MHz)



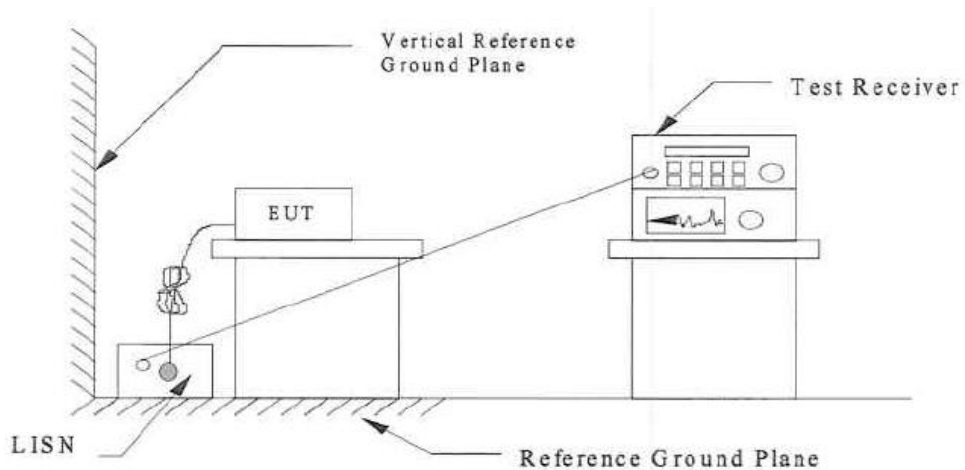
Remark: The significant emission at 108MHz shown in graph is generated from the signal generator.



4.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC Part 15 Section 15.107 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2008-12-09
Mode of Operation:	1) Receiving signal from the transmitter, 2) FM Radio 3) AUX mode
Detector Function:	Quasi-peak (0.15 MHz to 30 MHz) Average (0.15 MHz to 30 MHz)
Measurement BW:	9 kHz (0.15 MHz to 30 MHz)

Test Setup:



Results: PASS

Conducted Emissions (Receiver Mode)					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBµV)	Limit (dBµV)	Margin
0.150	QP	L	-4.1	66.0	-70.1
	AV	L	-13.7	56.0	-69.7
0.500	QP	L	-8.7	56.0	-64.7
	AV	L	-14.5	46.0	-60.5
1.500	QP	L	-8.5	56.0	-64.5
	AV	L	-14.7	46.0	-60.7
6.972	QP	L	16.3	60.0	-43.7
	AV	L	8.9	50.0	-41.1
10.542	QP	L	14.7	60.0	-45.3
	AV	L	7.9	50.0	-42.1
20.994	QP	L	13.7	60.0	-46.3
	AV	L	8.1	50.0	-41.9
0.150	QP	N	4.2	66.0	-61.8
	AV	N	-13.1	56.0	-69.1
0.500	QP	N	-9.0	56.0	-65.0
	AV	N	-14.8	46.0	-60.8
1.500	QP	N	-9.0	56.0	-65.0
	AV	N	-15.0	46.0	-61.0
6.972	QP	N	19.3	60.0	-40.7
	AV	N	14.0	50.0	-36.0
11.298	QP	N	18.1	60.0	-41.9
	AV	N	15.7	50.0	-34.3
20.640	QP	N	11.9	60.0	-48.1
	AV	N	5.8	50.0	-44.2

Note:

- Result data graph is attached at the page 26 for reference.

Results: PASS

Conducted Emissions (AUX Mode)					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBμV)	Limit (dBμV)	Margin
0.150	QP	L	10.9	66.0	-55.1
	AV	L	-11.3	56.0	-67.3
0.500	QP	L	-8.9	56.0	-64.9
	AV	L	-14.7	46.0	-60.7
1.500	QP	L	-9.1	56.0	-65.1
	AV	L	-14.9	46.0	-60.9
6.972	QP	L	12.7	60.0	-47.3
	AV	L	6.4	50.0	-43.6
10.398	QP	L	14.4	60.0	-45.6
	AV	L	10.0	50.0	-40.0
20.748	QP	L	15.5	60.0	-44.5
	AV	L	9.7	50.0	-40.3
0.150	QP	N	11.0	66.0	-55.0
	AV	N	-11.2	56.0	-67.2
0.500	QP	N	-8.8	56.0	-64.8
	AV	N	-14.6	46.0	-31.4
1.500	QP	N	-9.0	56.0	-47.0
	AV	N	-14.9	46.0	-60.9
6.972	QP	N	9.3	60.0	-50.7
	AV	N	4.5	50.0	-45.5
10.230	QP	N	11.8	60.0	-48.2
	AV	N	6.1	50.0	-43.9
20.640	QP	N	13.6	60.0	-46.4
	AV	N	7.3	50.0	-42.7

Note:

- Result data graph is attached at the page 27 for reference.

Results: PASS

Conducted Emissions (FM Radio Mode)					
Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBμV)	Limit (dBμV)	Margin
0.150	QP	L	12.6	66.0	-53.4
	AV	L	-10.7	56.0	-66.7
0.500	QP	L	-8.9	56.0	-64.9
	AV	L	-14.7	46.0	-60.7
1.500	QP	L	-9.0	56.0	-65.0
	AV	L	-14.9	46.0	-60.9
6.972	QP	L	14.8	60.0	-45.2
	AV	L	9.5	50.0	-40.5
10.506	QP	L	17.4	60.0	-42.6
	AV	L	14.0	50.0	-36.0
20.640	QP	L	11.9	60.0	-48.1
	AV	L	5.9	50.0	-44.1
0.150	QP	N	9.3	66.0	-56.7
	AV	N	-11.6	56.0	-67.6
0.500	QP	N	-8.7	56.0	-64.7
	AV	N	-14.8	46.0	-60.8
1.500	QP	N	-9.1	56.0	-65.1
	AV	N	-15.0	46.0	-61.0
6.972	QP	N	17.8	60.0	-42.2
	AV	N	12.3	50.0	-37.7
11.298	QP	N	19.1	60.0	-40.9
	AV	N	16.3	50.0	-33.7
20.748	QP	N	12.1	60.0	-47.9
	AV	N	5.9	50.0	-44.1

Note:

- Result data graph is attached at the page 28 for reference.

Remark:

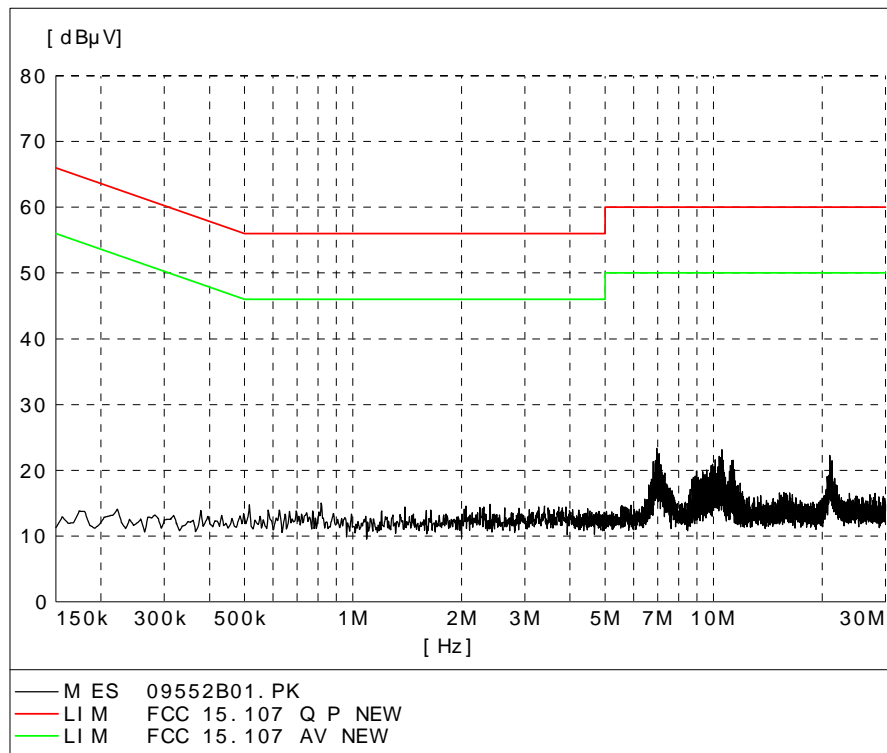
- The EUT connected the AC/DC Adaptor when testing.
- Calculated measurement uncertainty: $\pm 2.8\text{dB}$

Limits for Conducted Emissions (Section 15.107 class B):

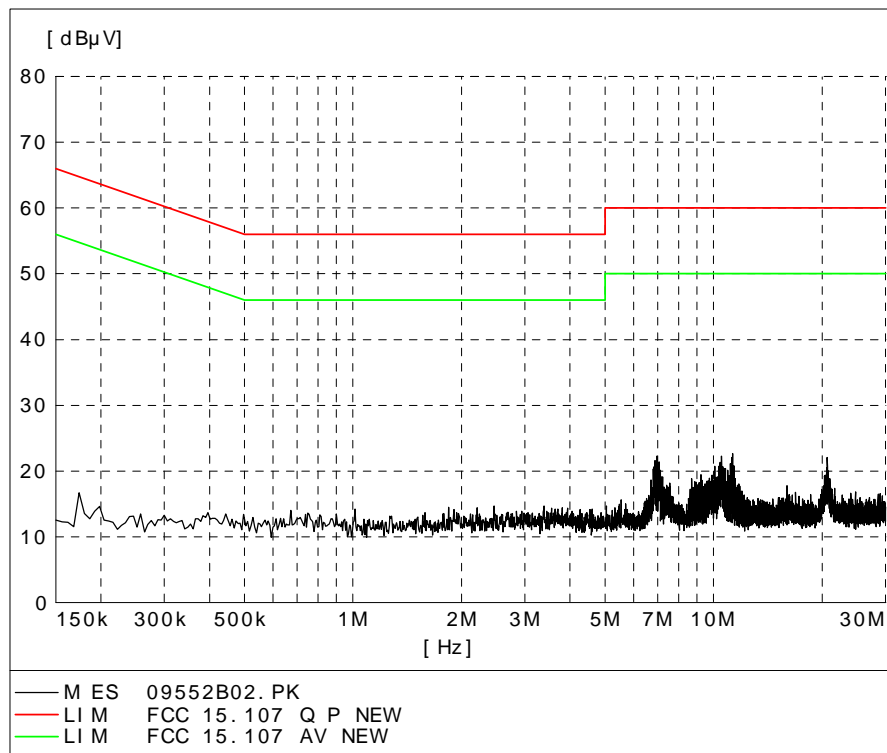
Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Conducted Emissions Result (Receiver Mode)

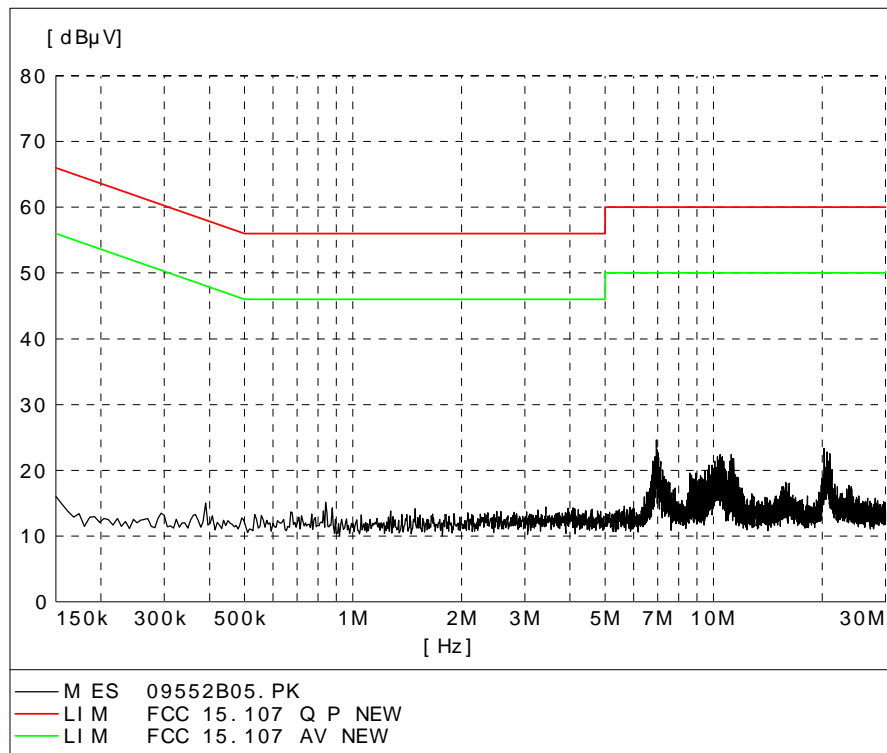


Phase - L

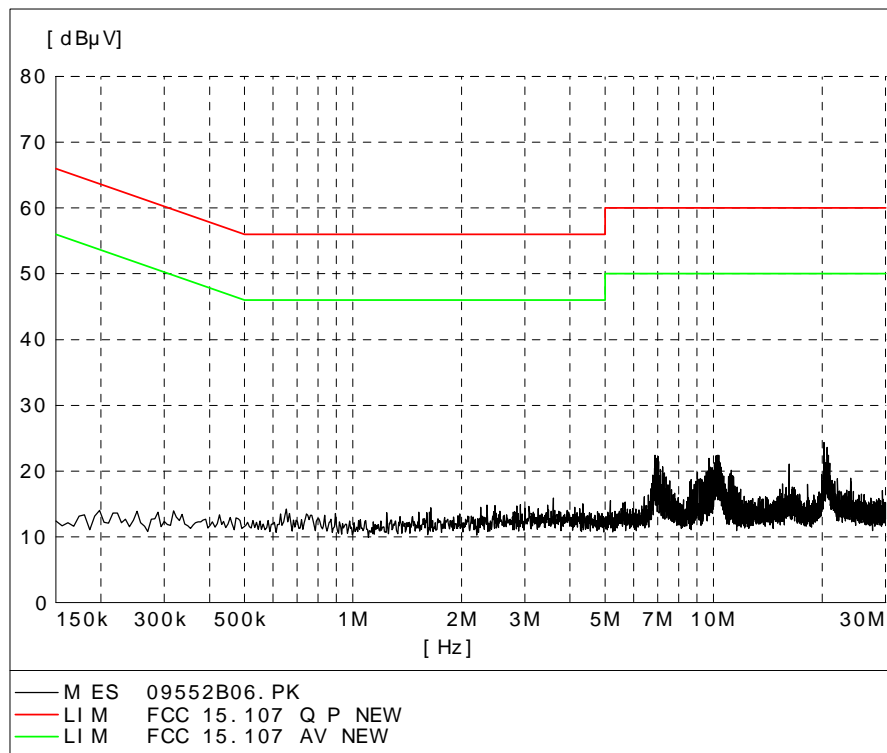


Phase - N

Conducted Emissions Result (AUX Mode)

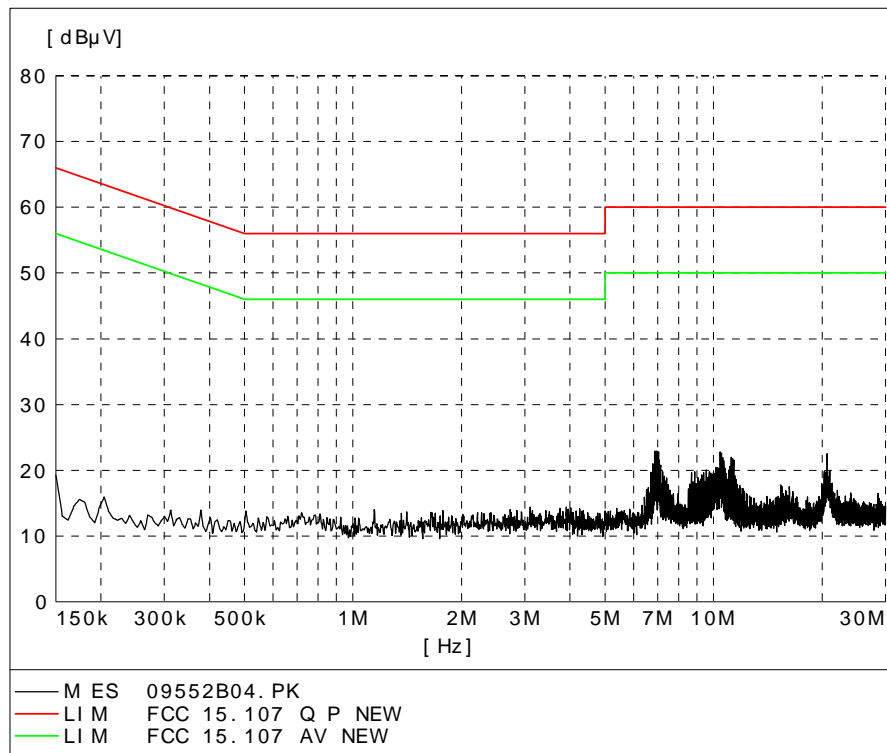


Phase - L

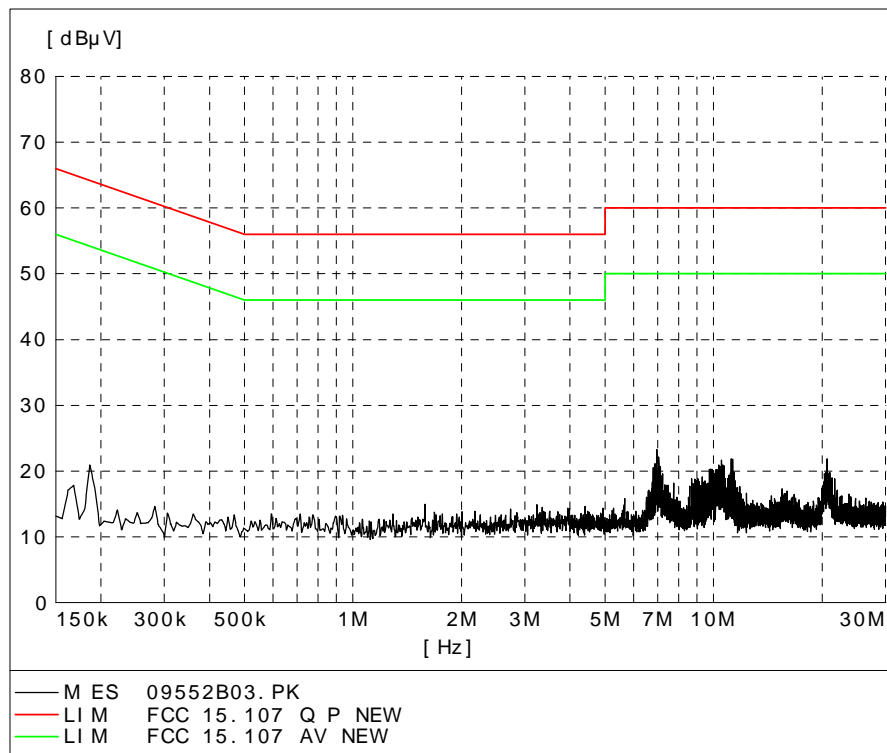


Phase - N

Conducted Emissions Result (FM Radio Mode)



Phase - L



Phase - N

5.0 List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC209	Semi-anechoic Chamber	Frankonia	N/A	N/A	28-May-08	28-May-09
EMC567	Test Receiver	R & S	ESU26	100050	06-Aug-08	06-Aug-09
EMC038	Bi-conical Antenna	R & S	HK116	841489/015	08-Mar-08	08-Mar-10
EMC039	Log Periodic Antenna	R & S	HL223	841516/017	03-Feb-08	03-Feb-10
EMC185	Horn Antenna	EMCO	3115	9002-3351	27-Feb-08	27-Feb-10
EMC138	Loop Antenna	Chase	LLA6142	1019	07-May-08	07-May-09
EMC406	Coaxial Cable 50ohm	Rosenberger	RTK081-05S-10m	LA2-001-10M/002	15-May-08	15-May-09

Conducted Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC384	Test Receiver	R & S	ESHS30	847115/005	14-May-08	14-May-09
EMC407	LISN	R & S	ESH3-Z5	849876/027	14-May-08	14-May-09
EMC160	RF Voltage Probe	Schwarzbeck	TK9416	N/A	15-Feb-08	15-Feb-09
EMC426	Double Shield	Radiall	RG142	N/A	5-Jun -08	5-Jun -09

Remarks:

N/A Not Applicable or Not Available