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IC : 6132A-DP0200SZ



NVLAP LAB CODE: 200413-



Test Firm Registration Number:90720
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Industry Canada
Industrie Canada

IC LAB Code: 3695A

February 13, 2006

Test Record

**Product Verification
According to FCC Part 15 Subpart C
and IC RSS-210 Issue No. 6
for**

Harman Multimedia

MODEL: DP-1WW

FM Text Commander

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Revision History

Revision	Date	Description of Changes	Author
0.1	13 February. 2006	Initial document	J. Banting
0.2	23 February 2006	Page 14 revised: added note 6	L. Kogan

1 Certification of Test Record

CERTIFICATION.

We, JMR Compliance Engineering, Chatsworth, CA, hereby certify that one sample of the designation product has been tested in our facility from January 19 to February 2006. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's characteristics under the conditions herein specified.

PRODUCT: Harman Multimedia _ Drive + Play iPod control system

BRAND NAME: Harman / Kardon

MODEL: DP-1WW

APPLICANT: Harman Multimedia

STANDARDS: 47 CFR FCC Part 15, Subpart C (Section 15.239)
47 CFR FCC Part 15, Subpart C (Section 15.209)
47 CFR FCC Part 15, Subpart C (Section 15.205)
47 CFR FCC Part 15, Subpart C (Section 15.203)
IC RSS Gen. Issue1
IC RSS-210, Issue 6
IC RSS-102, Issue 2
ANSI C63.4-2003
ANSI / TIA-603-C-2004

All measurements are traceable to the National Institute of Standards and Technology (NIST). This Report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the US Government.

Tests performed by

Test Record approved by::

Jeff Banting
EMC Engineer

Leon Kogan
Technical Director

**JMR Compliance Engineering, 20400 Plummer Street,
Chatsworth CA 91311. E-mail:emc@jmr.com**

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C / IC RSS-210 Issue 6			
Standard Section	Test Type	Result	Comments
15.239 / A2.8	Operation in the band 88-108MHz	PASS	Field Strength (worst case) 47.8 dBuV at 3 m 26dBc Bandwidth – 160 kHz
15.209 / 2.6 Table 2 IC:CS-03	Radiated emissions limits, general requirement; 30-1000 MHz	PASS	Tx spurious (worst case) 39 dBuV/m at 75.4 MHz
15.205 / 2.6 Table 1	Emissions produced in Restricted bands of operations	PASS	Field Strength 108 MHz 19.1 dBuV at 3 m
15.203 / RSS Gen. 7.1.4	Antenna requirements	PASS	Integral antenna.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Harman / Kardon _Drive + Play iPod control system
MODEL NO.	DP-1WW
OEM MODEL NO.	N/A
POWER SUPPLY	DC External Nominal Voltage of 13.8 VDC 85%=11.7 VDC, and 115%=15.9 VDC *EUT employ additional board level regulation of power input.
MODULATION TYPE	FM
MODULATION TECHNOLOGY	FM stereo
TRANSFER RATE	Analog
FREQUENCY RANGE	88.1 – 107.9 MHz
NUMBER OF CHANNEL	6 Channels ranging from 88.1 to 107.9 MHz
BANDWIDTH	200KHz
TRANSMIT POWER/ FIELD STRENGTH	48 dBuV/m at 3meters
DATA CABLE	iPod cable (2m): 8-pin mini DIN (M) plus to iPod dock connector
ANTENNA TYPE	integral
ANTENNA GAIN	Unknown
I/O PORTS	One iPod data port
ASSOCIATED DEVICES	<ul style="list-style-type: none">• Text Display with universal mounting base and attached cable (3m).• Control knob with 30° mounting base and attached cable (3m)• 12-Volt accessory power cable (2m) with cigarette lighter adaptor.

NOTE:

The Drive+Play device is an iPod automotive aftermarket accessory that integrates the iPod browsing and playback functionality into car audio systems. The device consists of 3 main components, the Control Knob (Controller), the Display and the Main Electronics enclosure. An iPod or other MP3 audio device is required as the audio content (music) source. The system connects to the 12VDC automotive power system via a 12VDC cigarette adapter or it can be wired directly to the car 12VDC power and ignition wiring harness. For the USA and Canada SKU's. The first way, direct audio connection is the preferred way for best audio performance. The main electronics enclosure has an "Audio-out" connector for a supplied RCA cable that connects directly to the car head units Aux-in or Line-in connection. The second method of audio output is wireless FM modulation. The main electronic enclosure unit has a built-in FM modulator and an internal wire antenna connected to the PCB. The user has the ability to



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switch FM frequencies on the device in order to get the desired audio performance. The Drive+Play device does not have a power level control that can be accessed by the user.

**ONLY MODEL WITH WIRELESS FM MODULATOR
WAS TESTED, AS REQUESTED BY CUSTOMER**

3.2 DESCRIPTION OF TEST MODES

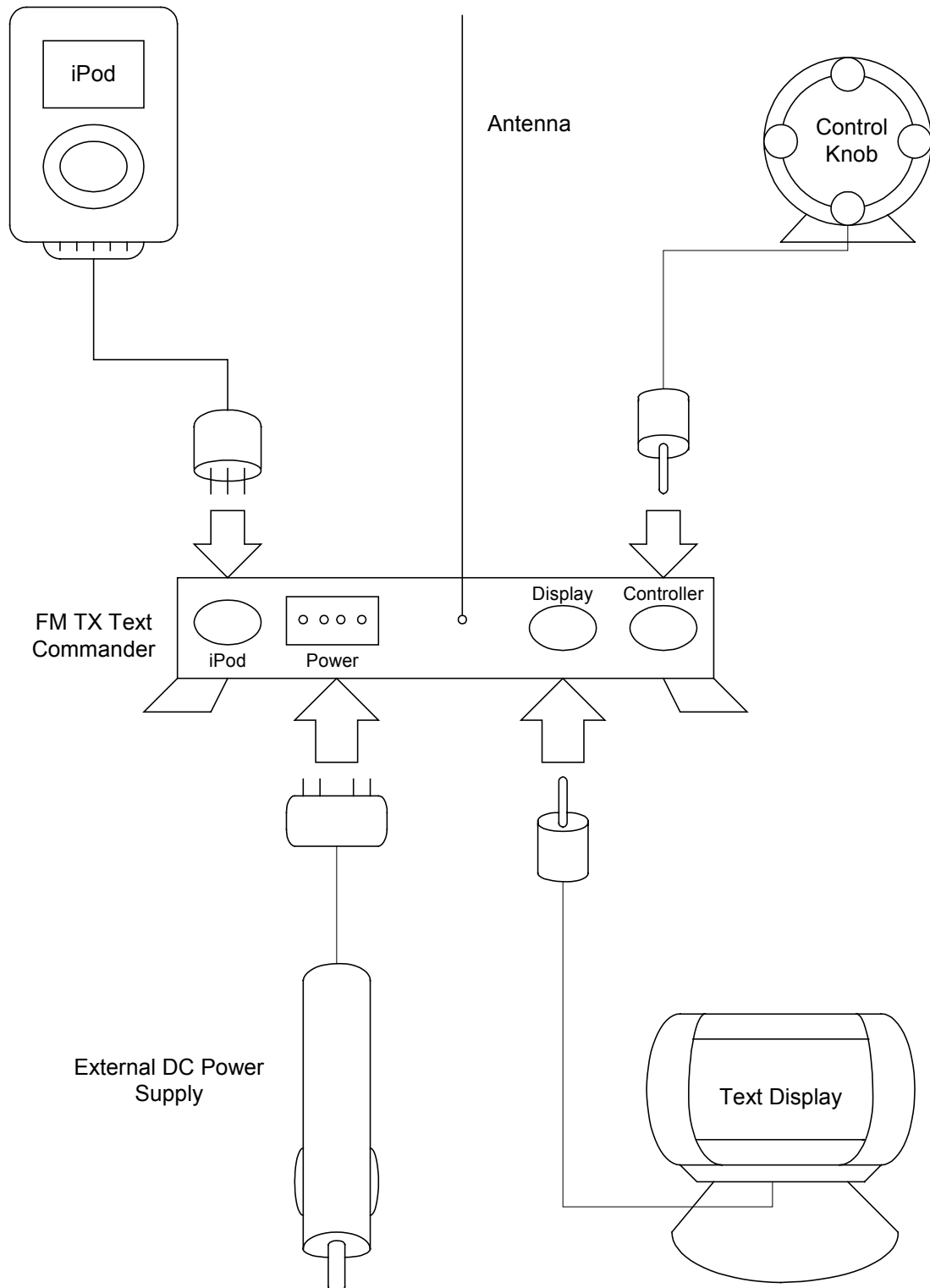
Only three channels are needed to perform a test to this EUT.

Frequency	Power supply	Modulation	Orthogonal position of EUT
88.1 MHz	N; 115%N; 85%N	FM Typical	X-Y-Z
99.9 MHz	N; 115%N; 85%N	FM Typical	X-Y-Z
107.9 MHz	N; 115%N; 85%N	FM Typical	X-Y-Z

NOTE:

1. The EUT was tested three orthogonal planes. At each frequency nominal voltages for 85% (11.8 VDC) and 115% (15.9 VDC) of 13.8VDC were tested.

3.2.1 TEST BLOCK DIAGRAM



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a FM modulator. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 15, Subpart C. (15.239),
FCC 47 CFR Part 15, Subpart C. (15.209),
FCC 47 CFR Part 15, Subpart C. (15.205),
FCC 47 CFR Part 15, Subpart C. (15.203),
ANSI C63.4: 2003
TIA 603 C**

All tests have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit. The following support units or accessories were used to set up a required test configuration.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.
1	iPod	Apple	MA004LL/A	YM536XH0SZB
2	External Power Supply	Sorenson	DC580-13E	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	iPod cable (2m): 8-pin mini DIN (M) plus to iPod dock connector

4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

Device	Model No.	Serial No.	Last Cal.	Next Cal
Cable 1	8214	CBL-006	02/19/05	02/19/06
Cable 2	8268	CBL-002	02/19/05	02/19/06
ROHDE & SCHWARZ EMI Test Receiver	ESIB 40	100201	01/23/04	01/23/06
Tower 1	EMCO 1050	9310-1786	N/A	N/A
Turntable 1	EMCO 1060	9409-1753	N/A	N/A
Bilog Antenna	CBL6112B	2604	09/03/04	11/04/05
Shielded Semi-Anechoic Chamber	RANTEC	N/A	02/11/05	02/11/06
Temperature and Humidity Recorder	Dickson TH8-24C	5097755	09/16/03	09/16/05

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

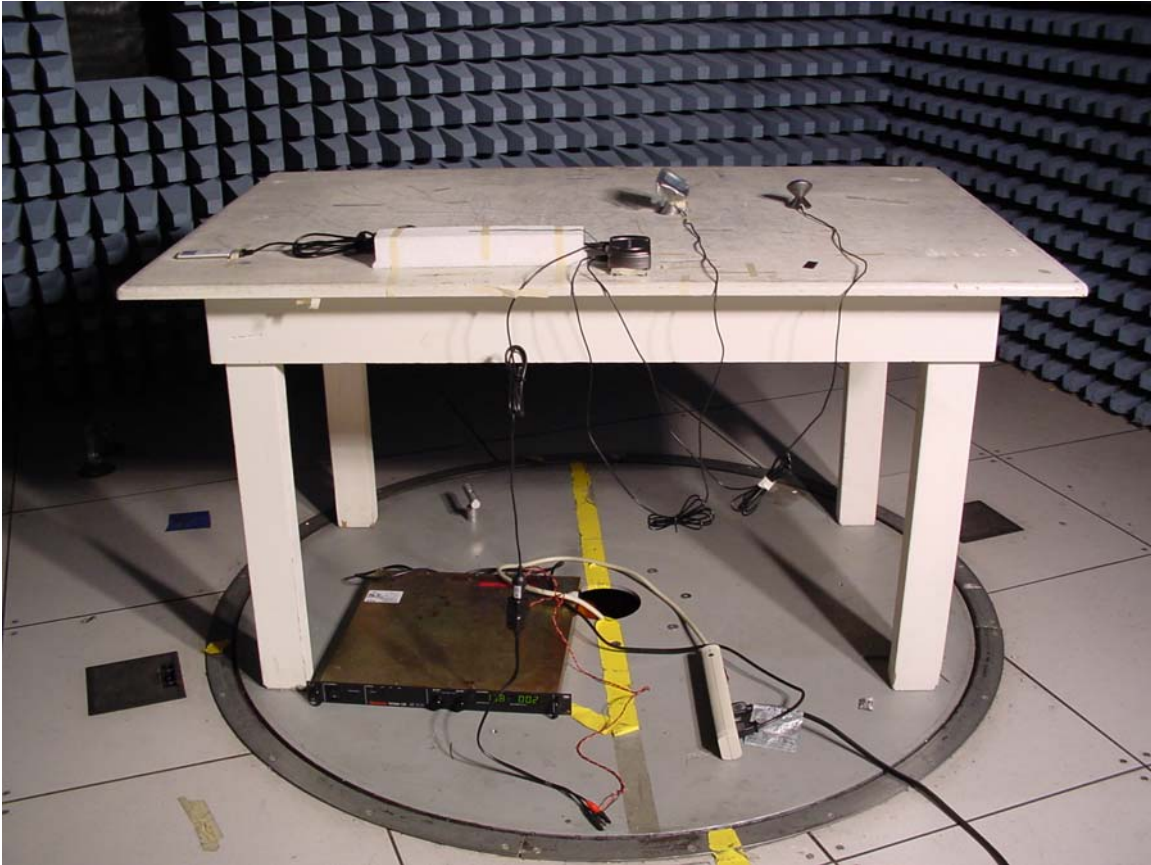
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. The EUT must be tested for three orthogonal positions which are X, Y, and Z.
5. At each frequency nominal voltages for 85% and 115% of 13.8VDC were used.
6. The fundamental frequency signals are present on all plots below.

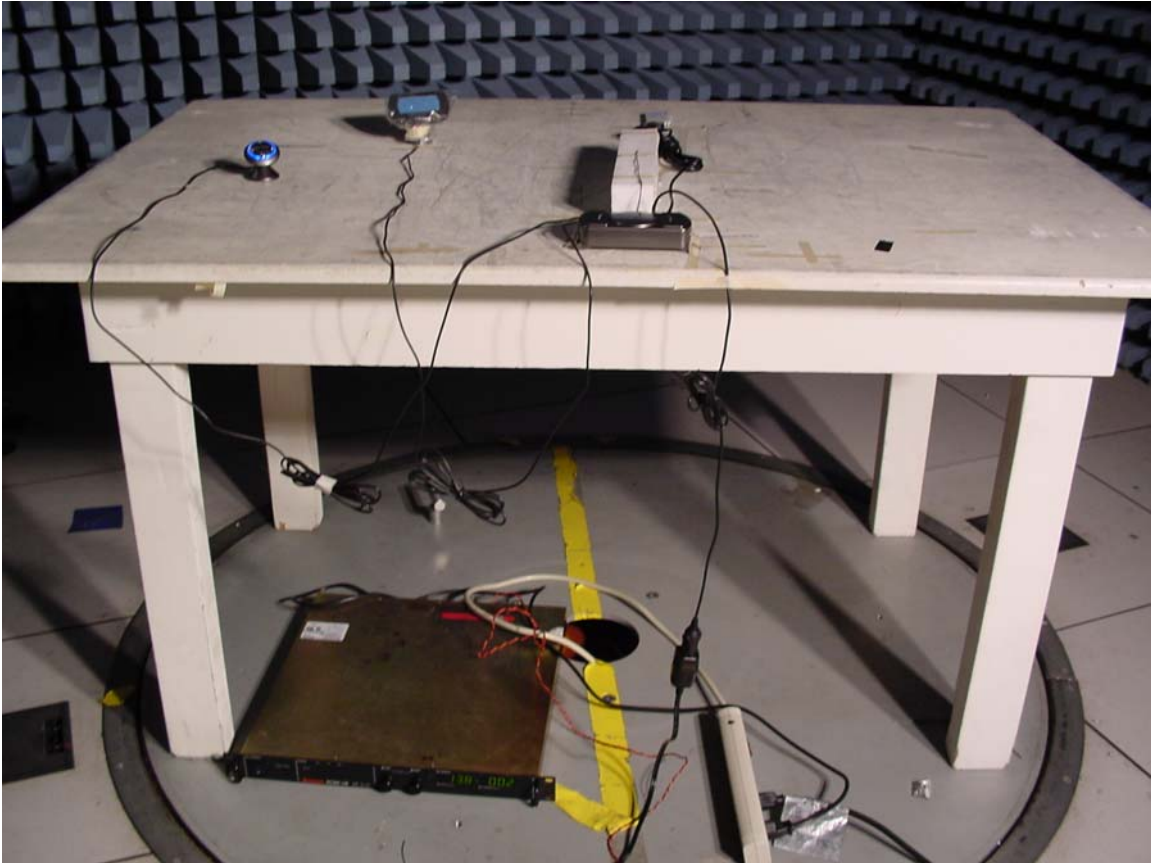
4.1.4 DEVIATION FROM TEST STANDARD

No deviation

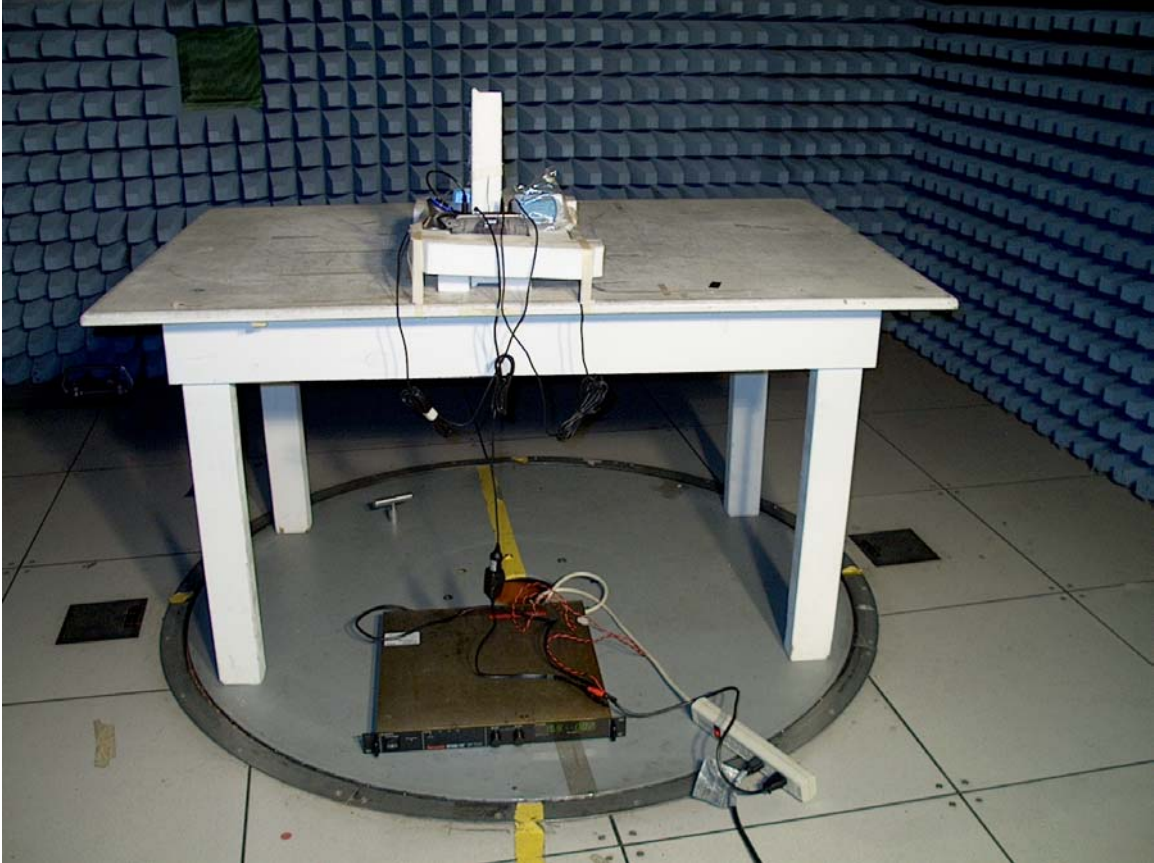
4.1.5 TEST SETUP



Radiated Emission Test
EUT placed at X position
(Front View)



Radiated Emission Test
EUT placed at Y position
(Front View)



Radiated Emission Test
EUT placed at Z position
(Front View)

4.1.6 EUT OPERATING CONDITIONS

The EUT is continuously linked with the iPod at every channel frequency. There are three channel frequencies that were tested at 88.1MHz, 99.9MHz, and 107.9MHz. During the operating condition, nominal voltages of 85% and 115% of 13.8VDC were tested. The EUT is tested for three orthogonal positions X, Y, and Z.

This program was repeated continuously for the duration of the testing. The above mentioned set-up allowed the article to perform sufficiently for the test purposes and required time, i.e. produce radiated emissions.

4.1.7 TEST RESULTS (EUT Position X at 88.1, 99.9, and 107.9 MHz)**EUT Position X****Frequency 88.1 MHz****Test Information**

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 88.1 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

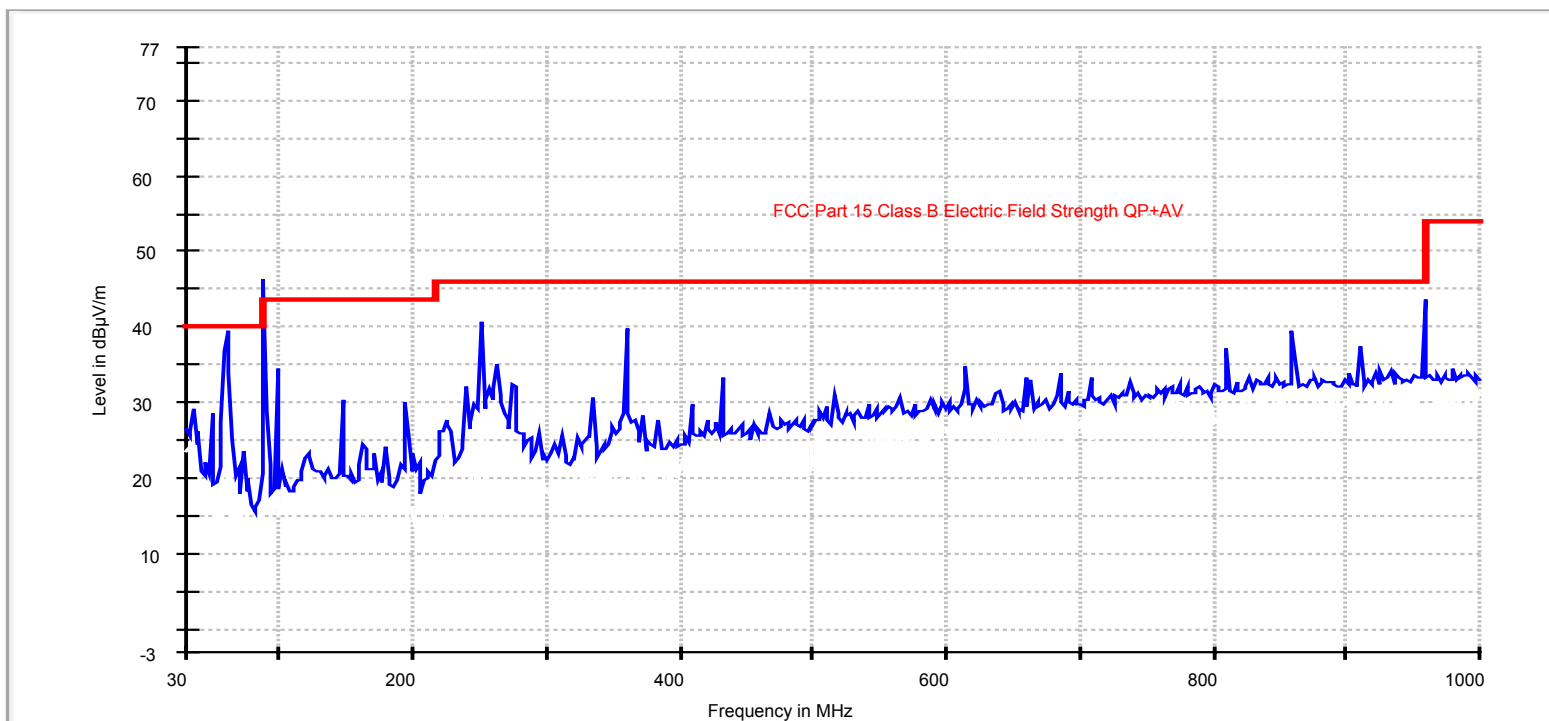
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
7. F is fundamental.
8. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
61.599198	35.0	42.3	40.0	-5.0	X	352.0	394.0	H	PASS
252.043455	39.6	41.1	46.0	-6.4	X	66.0	149.0	H	PASS
360.004008	39.3	40.9	46.0	-6.7	X	80.0	95.0	H	PASS
958.194389	42.0	45.2	46.0	-4.0	X	285.0	95.0	H	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 88.1 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

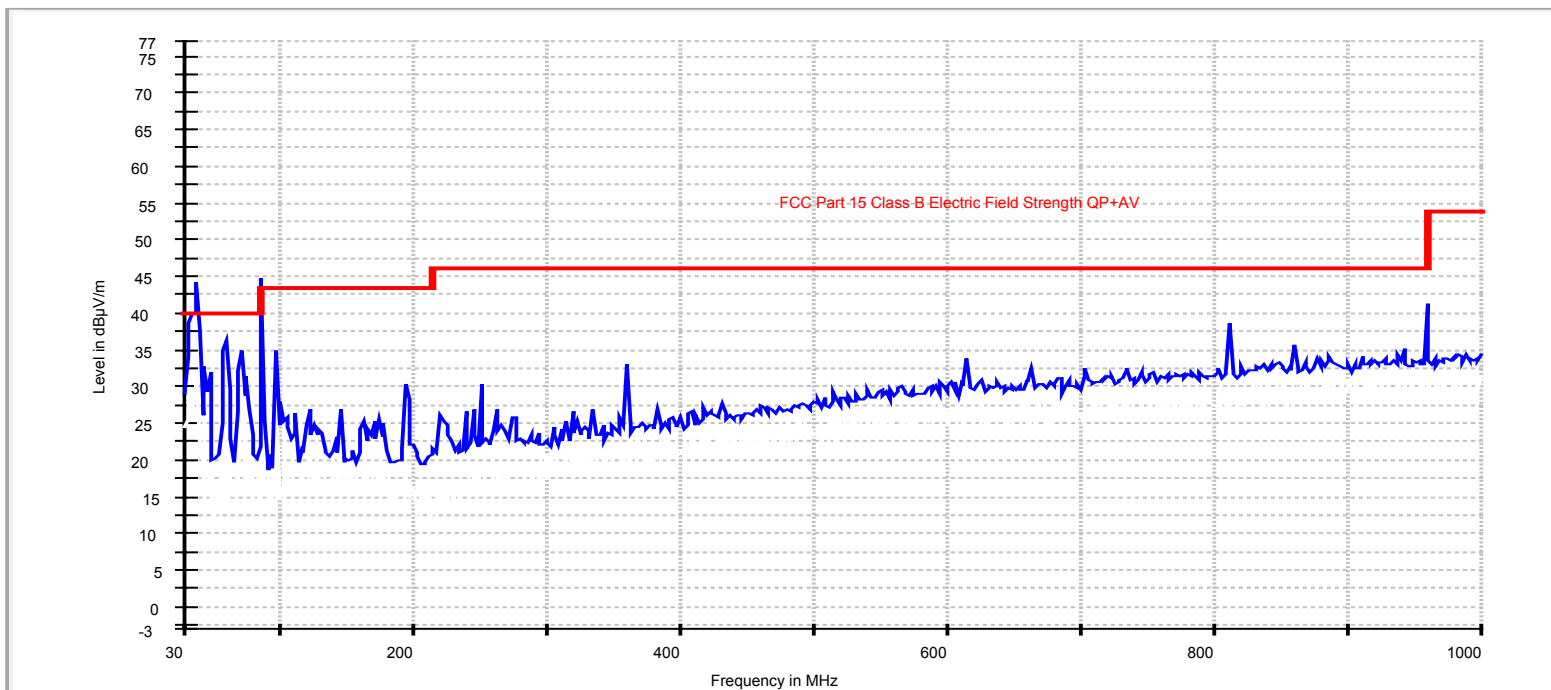
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
9. F is fundamental.
10. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.739479	38.2	44.5	40.0	-1.8	X	352.0	95.0	V	PASS
73.707415	32.4	35.6	40.0	-7.6	X	158.0	149.0	V	PASS
252.074148	26.0	29.4	46.0	-20.0	X	283.0	98.0	V	PASS
360.022044	30.2	33.1	46.0	-15.8	X	31.0	210.0	V	PASS
958.208417	38.1	43.4	46.0	-7.9	X	8.0	144.0	V	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 13.8 VDC Typical Modulation, 88.1 MHz
Operator Name: Jeff Banting
Comment: Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dB μ V/m

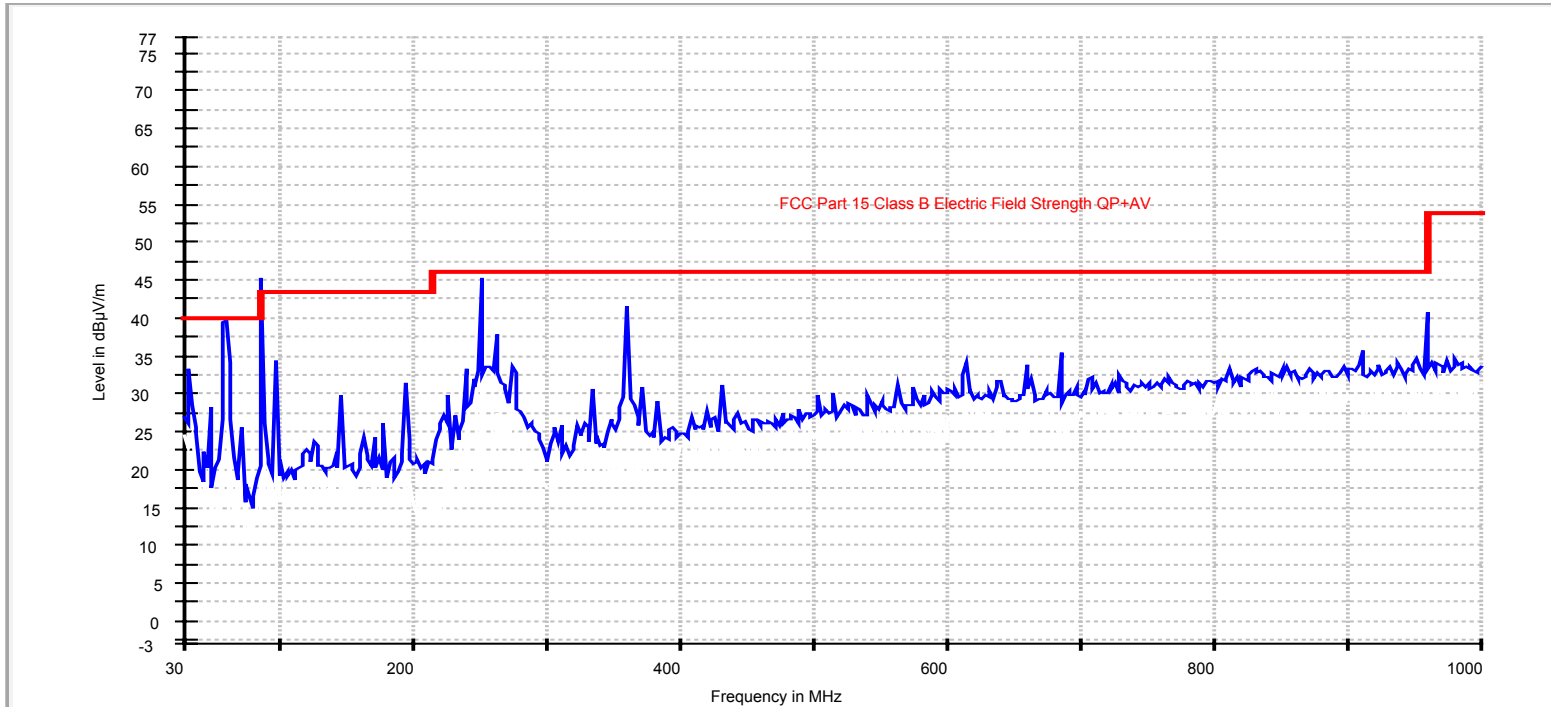
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
11. F is fundamental.
12. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
61.551100	35.4	42.5	40.0	-4.6	X	352.0	395.0	H	PASS
252.009195	45.6	46.6	46.0	-0.4	X	67.0	149.0	H	PASS
360.011583	41.1	43.3	46.0	-4.9	X	85.0	95.0	H	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	13.8 VDC Typical Modulation 88.1 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

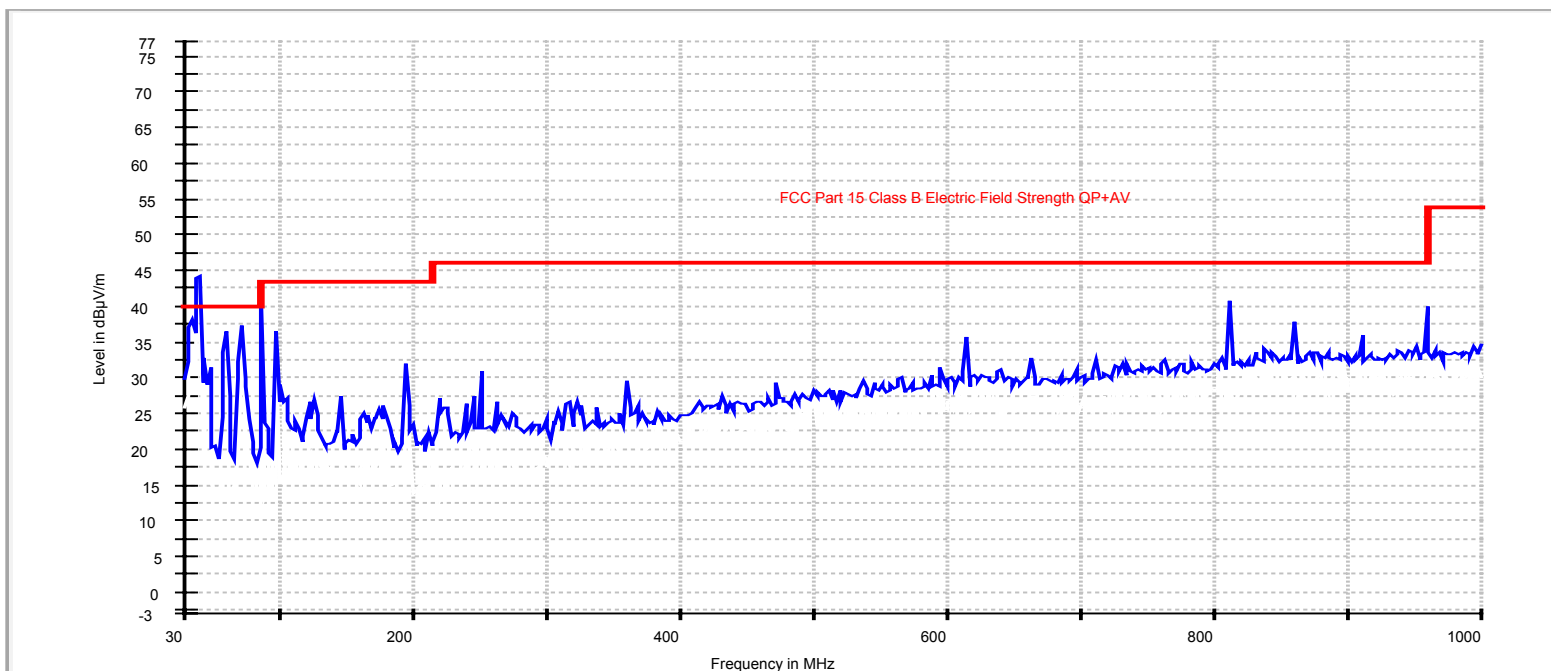
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
13. F is fundamental.
14. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.080566	38.8	44.8	40.0	-1.2	X	352.0	95.0	V	PASS
73.668596	34.4	37.2	40.0	-5.6	X	158.0	149.0	V	PASS
252.010084	34.0	35.4	46.0	-12.0	X	279.0	95.0	V	PASS
360.025351	33.0	35.3	46.0	-13.0	X	31.0	210.0	V	PASS
958.252505	37.6	43.3	46.0	-8.4	X	144.0	8.0	V	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 15.9 VDC Typical Modulation 88.1 MHz
Operator Name: Jeff Banting
Comment: Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dB μ V/m

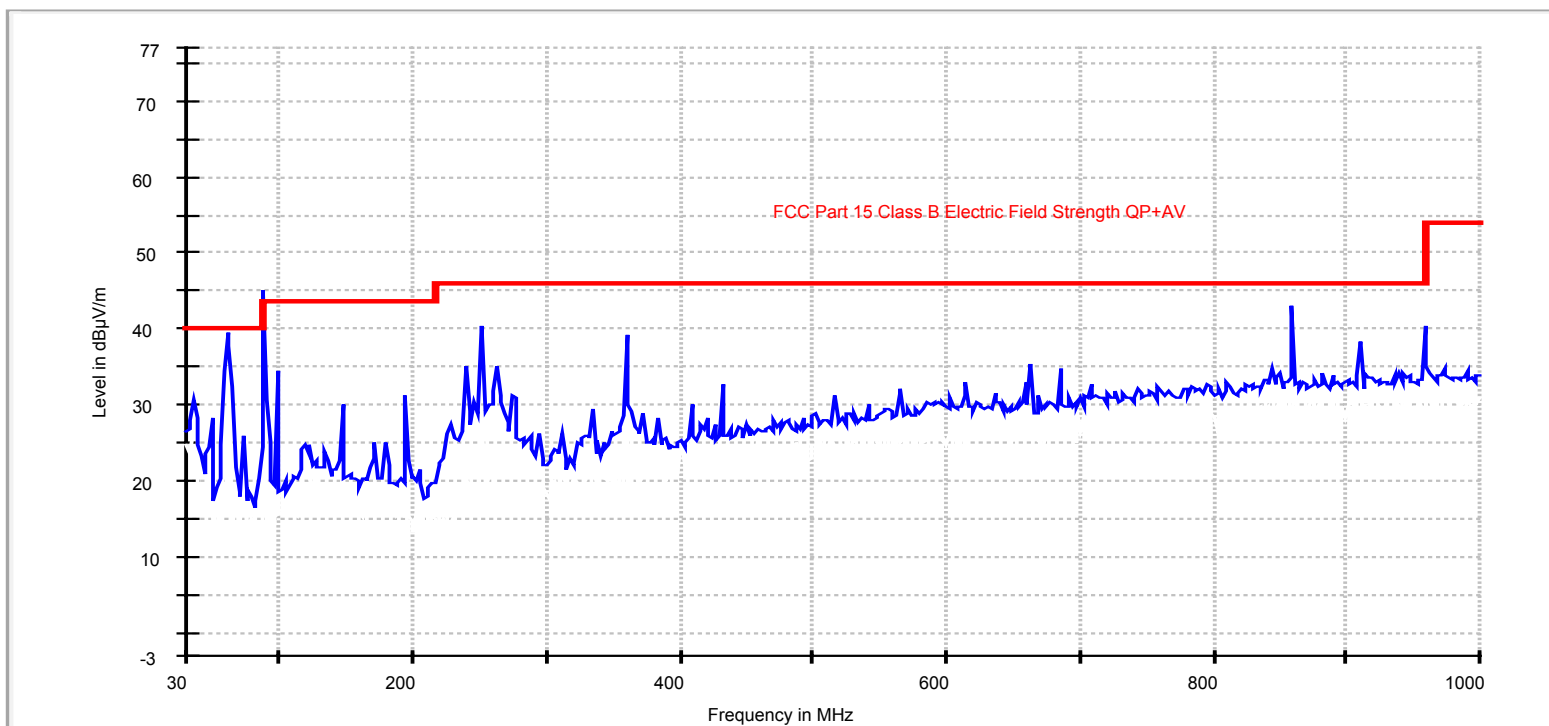
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
15. F is fundamental.
16. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
61.820661	34.9	43.3	40.0	-5.1	X	352.0	394.0	H	PASS
252.008016	39.9	41.2	46.0	-6.1	X	71.0	148.0	H	PASS
360.004008	38.8	41.2	46.0	-7.2	X	80.0	95.0	H	PASS
958.194890	37.8	42.9	46.0	-8.2	X	285.0	95.0	H	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 15.9 VDC Typical Modulation 88.1 MHz
Operator Name: Jeff Banting
Comment: Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dB μ V/m

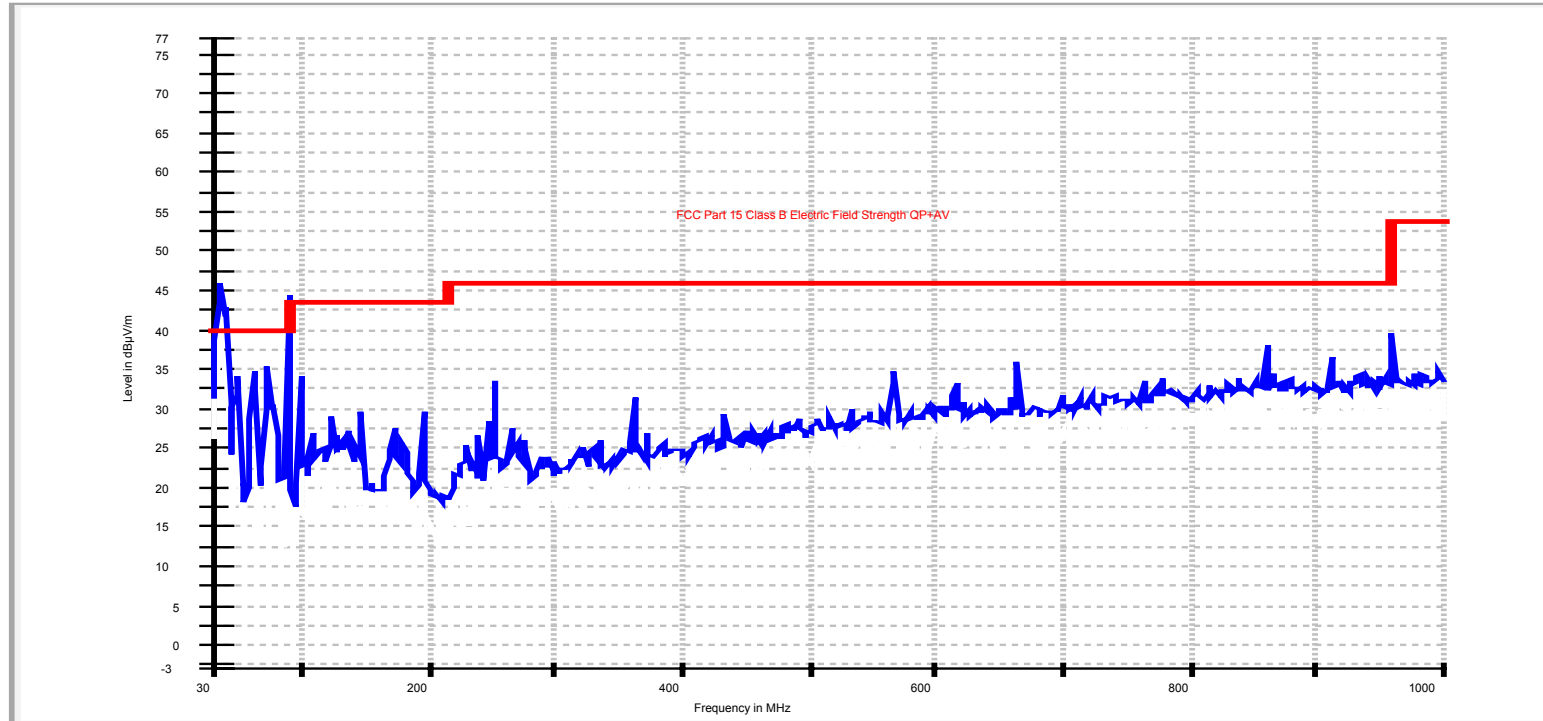
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
17. F is fundamental.
18. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.536347	36.8	43.2	40.0	-3.2	X	352.0	95.0	V	PASS
73.707415	33.2	36.5	40.0	-6.8	X	158.0	149.0	V	PASS
252.020040	29.2	31.7	46.0	-16.8	X	283.0	98.0	V	PASS
360.020040	30.2	33.1	46.0	-12.9	X	31.0	210.0	V	PASS
958.236473	36.7	42.3	46.0	-9.3	X	8.0	144.0	V	PASS

Frequency 99.9 MHz

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 99.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

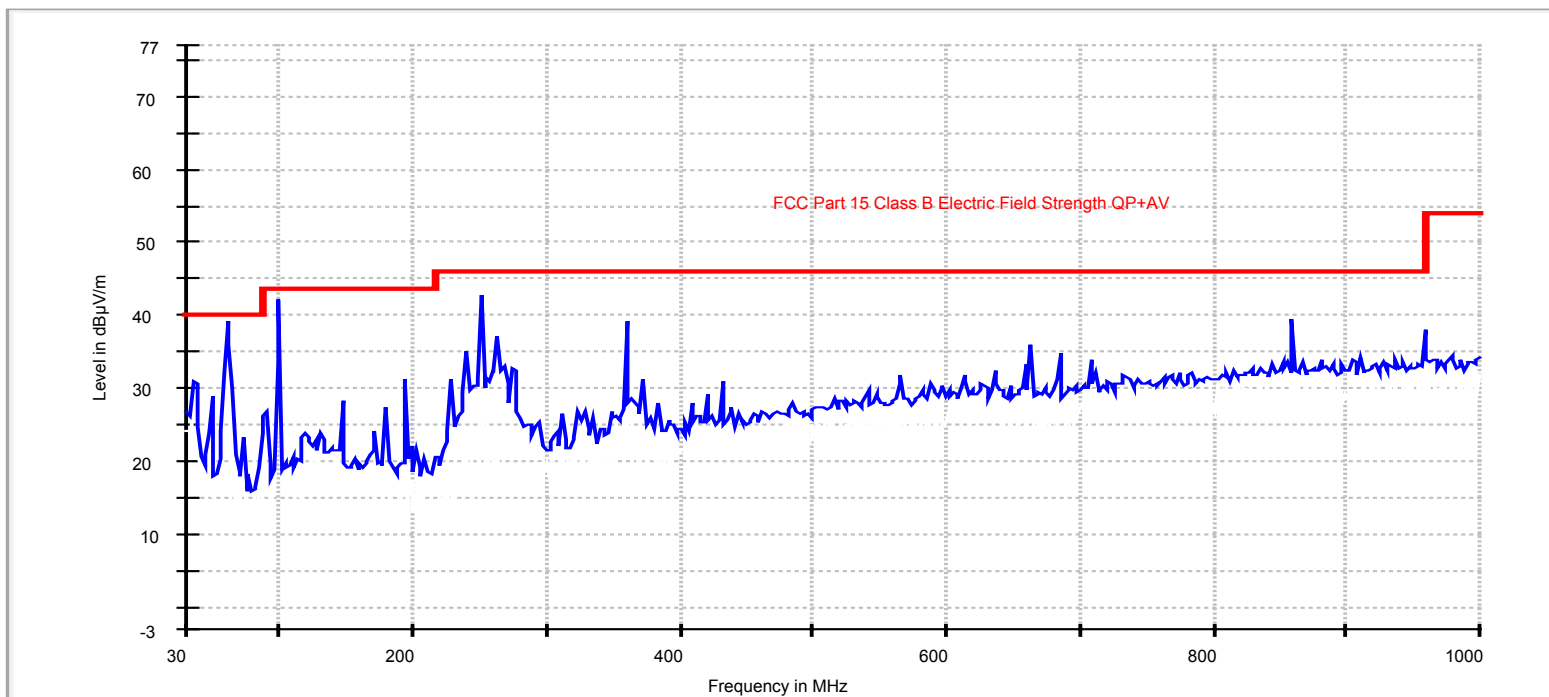
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
19. F is fundamental.
20. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
61.940040	34.5	42.6	40.0	-5.5	X	352.0	395.0	H	PASS
252.018036	43.0	44.4	46.0	-3.0	X	65.0	149.0	H	PASS
360.040080	37.1	39.6	46.0	-8.9	X	80.0	95.0	H	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 11.7 VDC Typical Modulation 99.9 MHz
Operator Name: Jeff Banting
Comment: Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dBμV/m

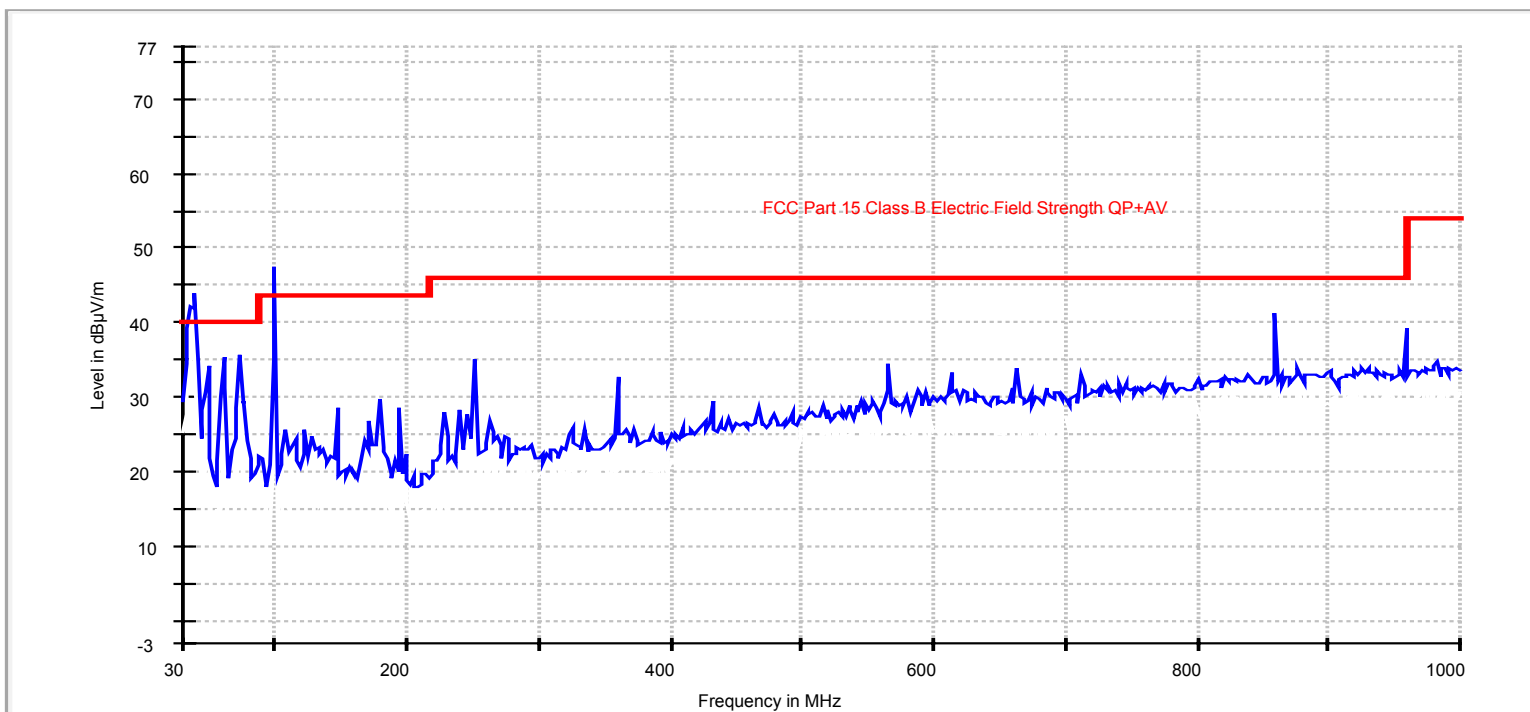
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
21. F is fundamental.
22. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
40.070140	38.6	45.1	40.0	-1.4	X	8.0	95.0	V	PASS
73.659319	33.4	36.4	40.0	-6.6	X	161.0	149.0	V	PASS
859.919840	38.3	44.0	46.0	-7.7	X	8.0	95.0	V	PASS
958.126253	37.4	41.8	46.0	-8.6	X	189	95.0	V	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 13.8 VDC Typical Modulation 99.9 MHz
Operator Name: Jeff Banting
Comment: Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dB μ V/m

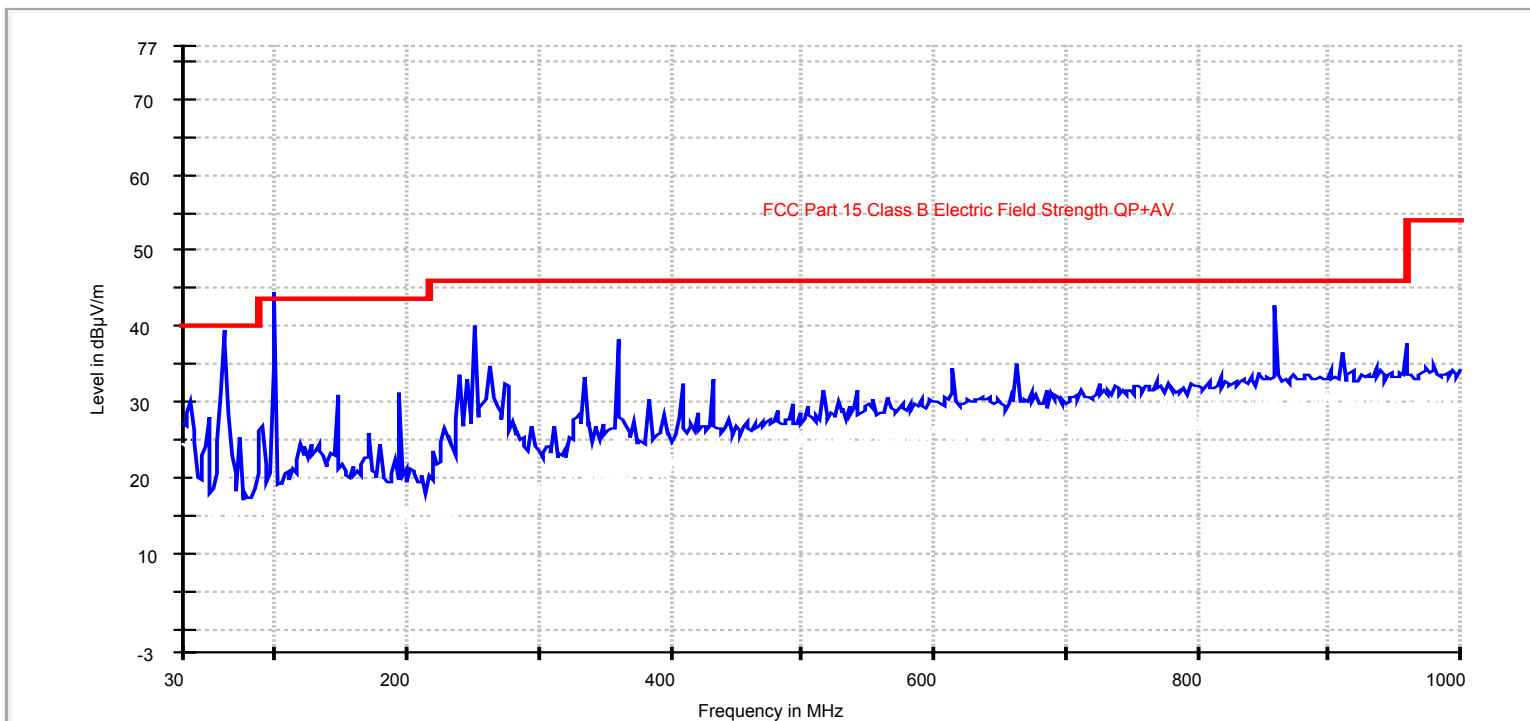
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
23. F is fundamental.
24. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
61.829310	34.5	42.7	40.0	-5.5	X	352.0	395.0	H	PASS
252.008643	39.8	41.2	46.0	-6.2	X	65.0	150.0	H	PASS
360.012410	39.3	40.7	46.0	-6.7	X	81.0	95.0	H	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 13.8 VDC Typical Modulation 99.9 MHz
Operator Name: Jeff Banting
Comment: Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dB μ V/m

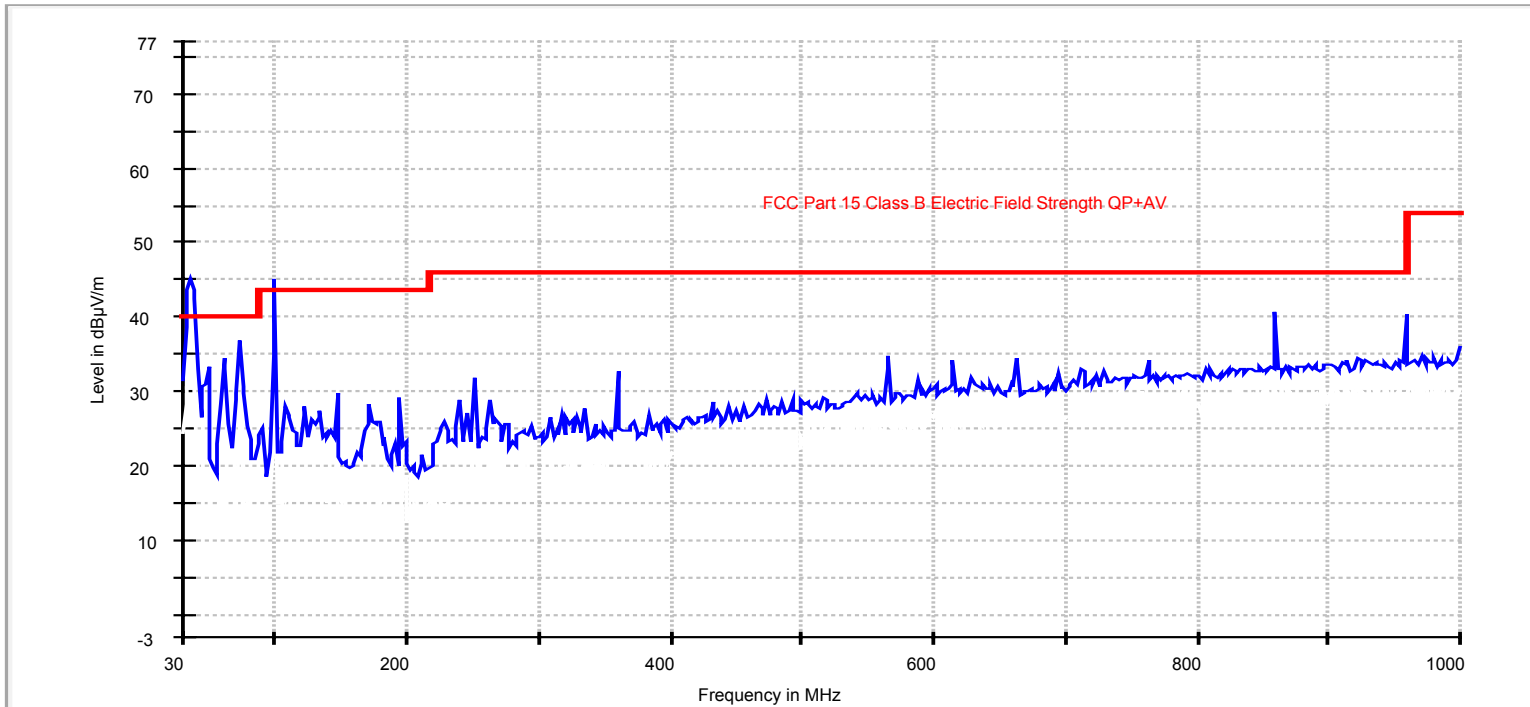
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
25. F is fundamental.
26. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.435062	36.3	43.5	40.0	-3.7	X	8.0	98.0	V	PASS
73.687375	33.7	36.6	40.0	-6.3	X	161.0	149.0	V	PASS
859.881587	39.3	43.6	46.0	-6.7	X	8.0	95.0	V	PASS
958.260737	38.9	43.9	46.0	-7.1	X	189.0	95.0	V	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	15.9 VDC Typical Modulation 99.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

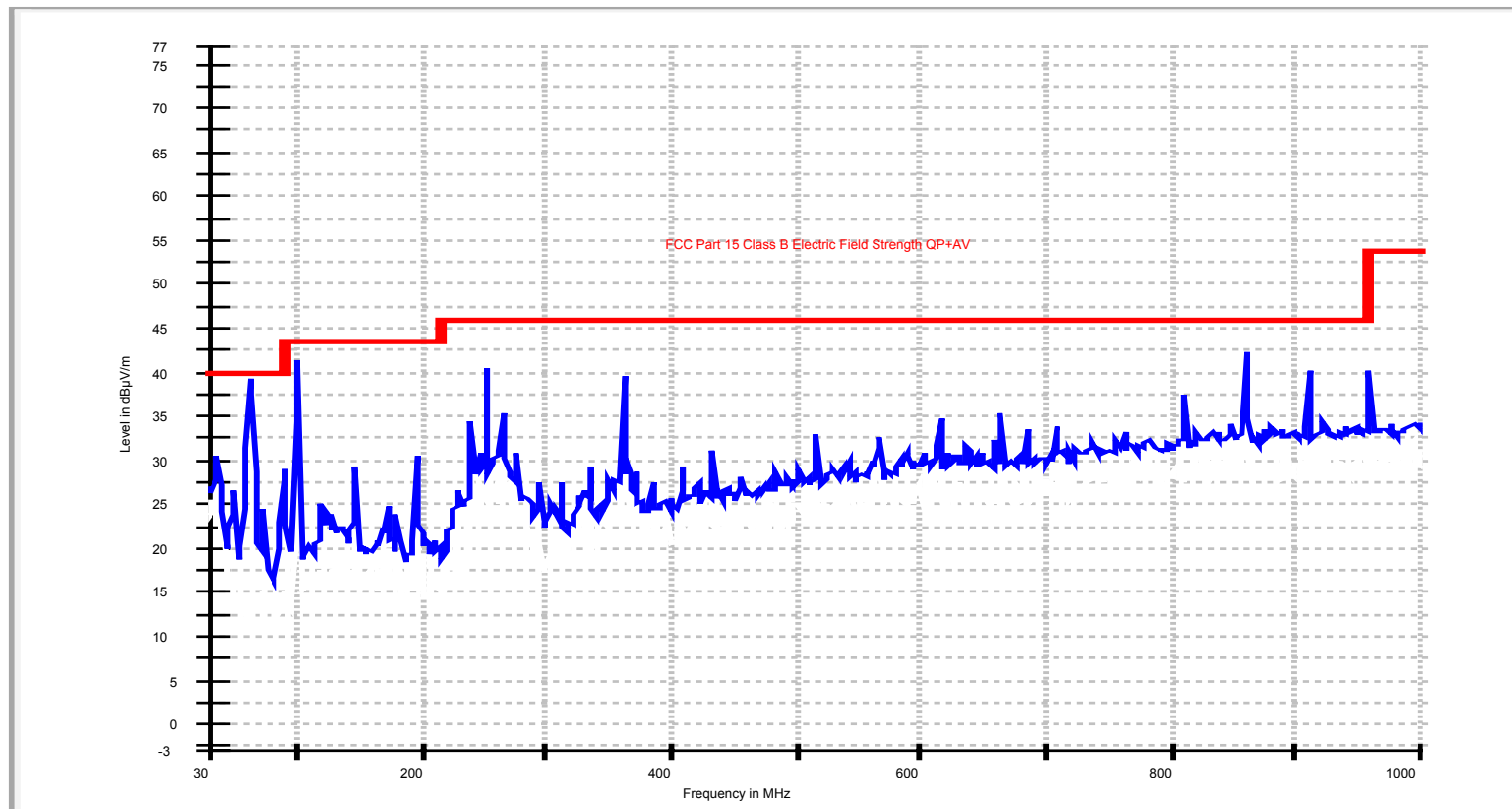
Hardware Setup:	EMI 1GHz
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
27. F is fundamental.
28. _R is for restricted band.

FCC_15_209 Peak Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	Azimuth (deg)	Antenna height (cm)	EUT Position	Polarity	Comment
62.079149	35.0	43.0	40.0	-5.0	352.0	396.0	X	H	PASS
252.013781	40.6	41.9	46.0	-5.4	71.0	149.0	X	H	PASS
360.014028	39.5	41.5	46.0	-6.5	80.0	95.0	X	H	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	15.9 VDC Typical Modulation 99.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

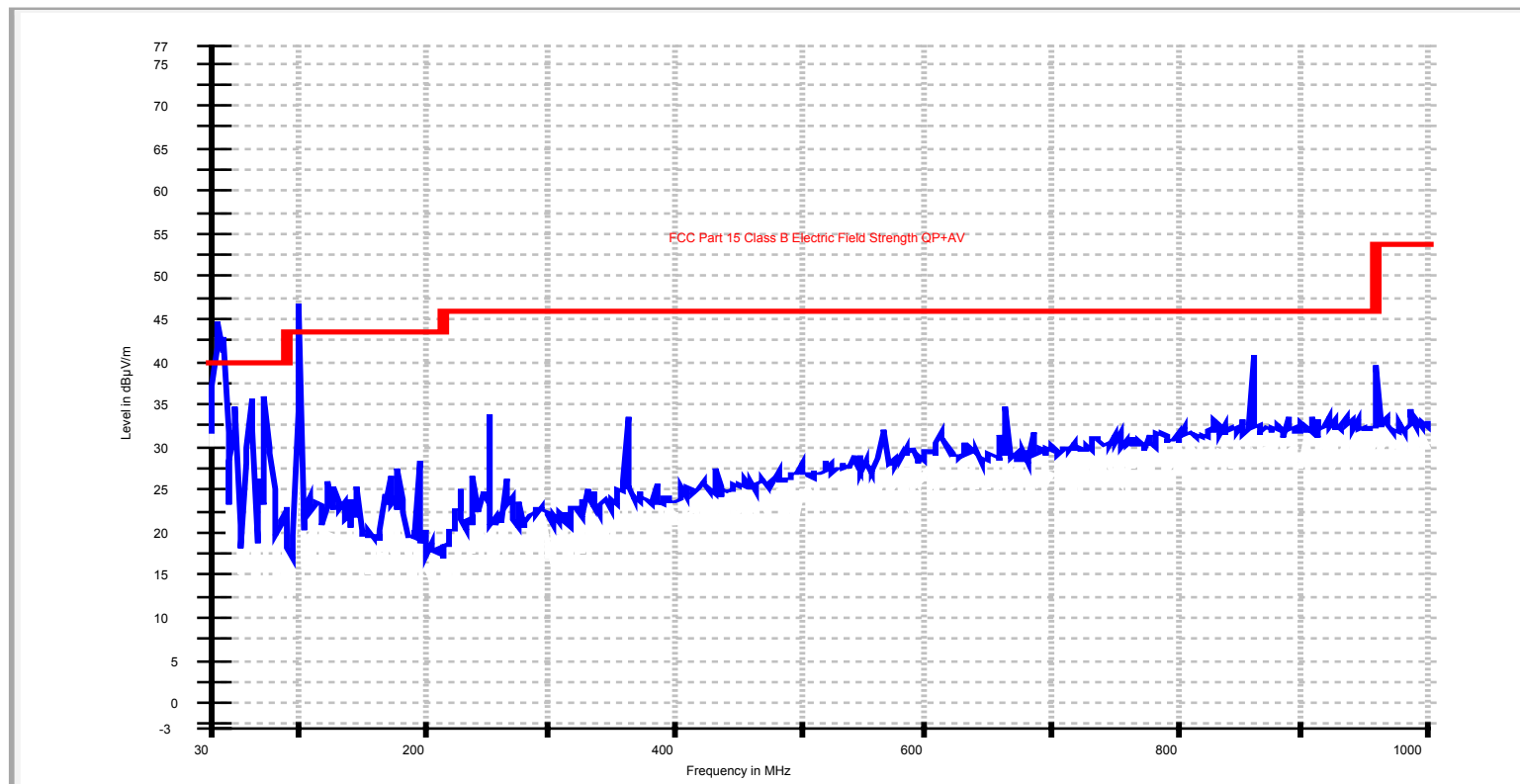
Hardware Setup:	EMI 1GHz
Level Unit:	dBμV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
29. F is fundamental.
30. R is for restricted band.

FCC_15_209 Peak Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
40.310621	38.5	45.2	40.0	-1.5	X	8.0	95.0	V	PASS
73.648818	34.1	36.9	40.0	-5.9	X	161.0	149.0	V	PASS
859.619238	39.5	43.4	46.0	-6.5	X	8.0	95.0	V	PASS
958.086172	37.5	42.7	46.0	-8.5	X	189.0	95.0	V	PASS

Frequency 107.9 MHz

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 107.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

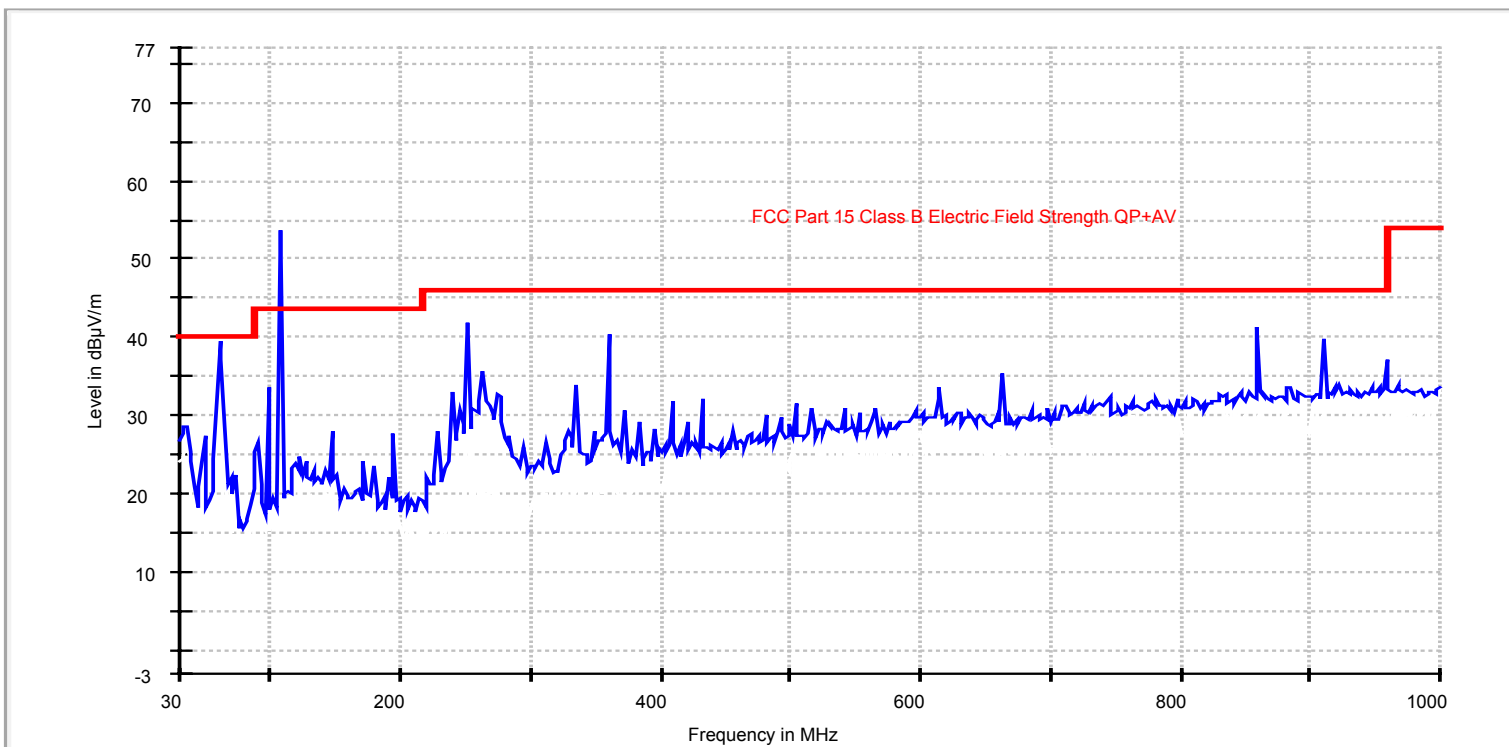
Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
31. F is fundamental.
32. _R is for restricted band.

FCC_15_209 Peak Horizontal



Result Table_Single

(MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
62.346693	27.5	35.3	40.0	-12.5	X	293.0	395.0	H	PASS
251.993988	30.0	32.2	46.0	-16.0	X	65.0	150.0	H	PASS
359.970782	25.0	28.9	46.0	-21.0	X	80.0	95.0	H	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 107.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dBµV/m

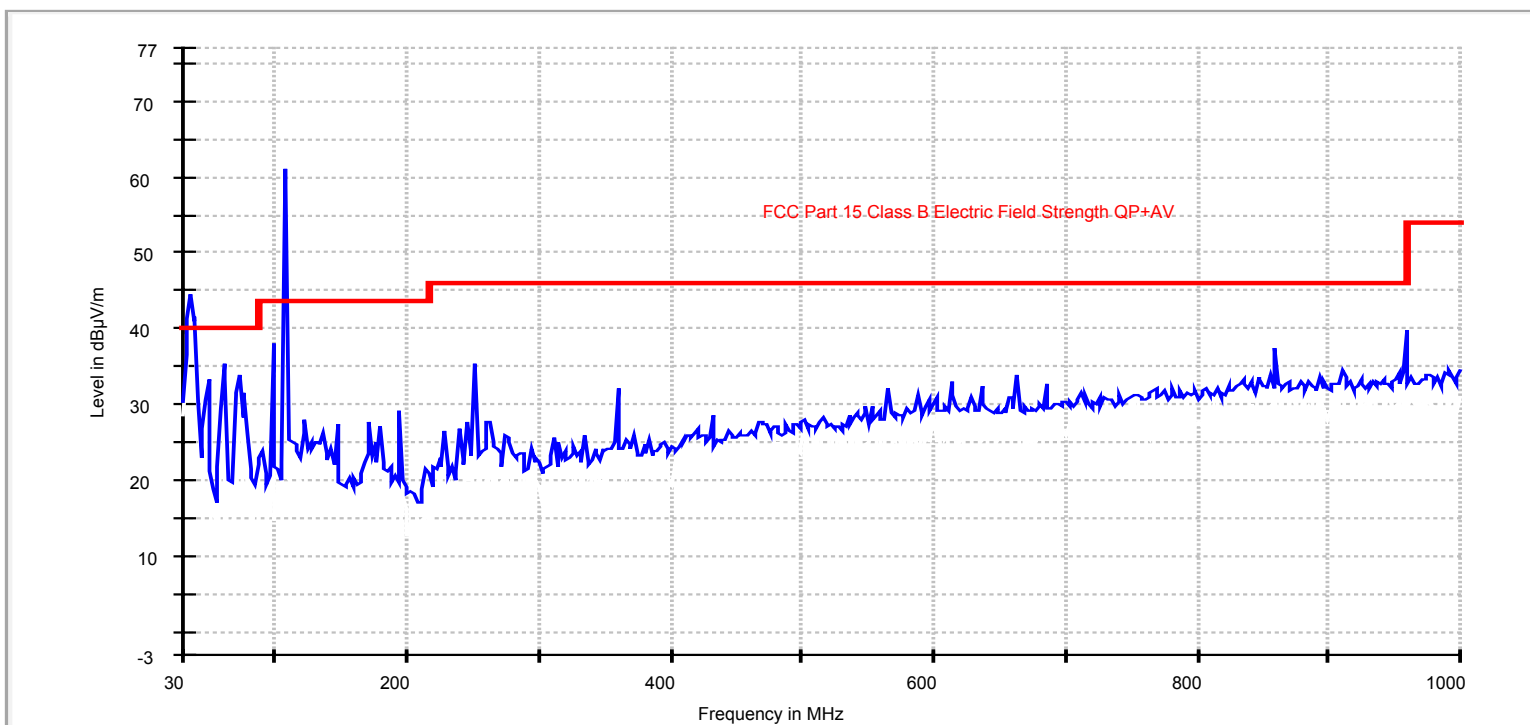
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
33. F is fundamental.
34. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.589178	37.1	43.9	40.0	-2.9	X	8.0	95.0	V	PASS
73.653307	33.4	36.3	40.0	-6.6	X	161.0	149.0	V	PASS
252.008016	35.0	36.3	46.0	-11.0	X	283.0	95.0	V	PASS
360.022044	30.9	33.5	46.0	-15.1	X	31.0	210.0	V	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 13.8 VDC Typical Modulation 107.9 MHz
Operator Name: Jeff Banting
Comment: Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dBµV/m

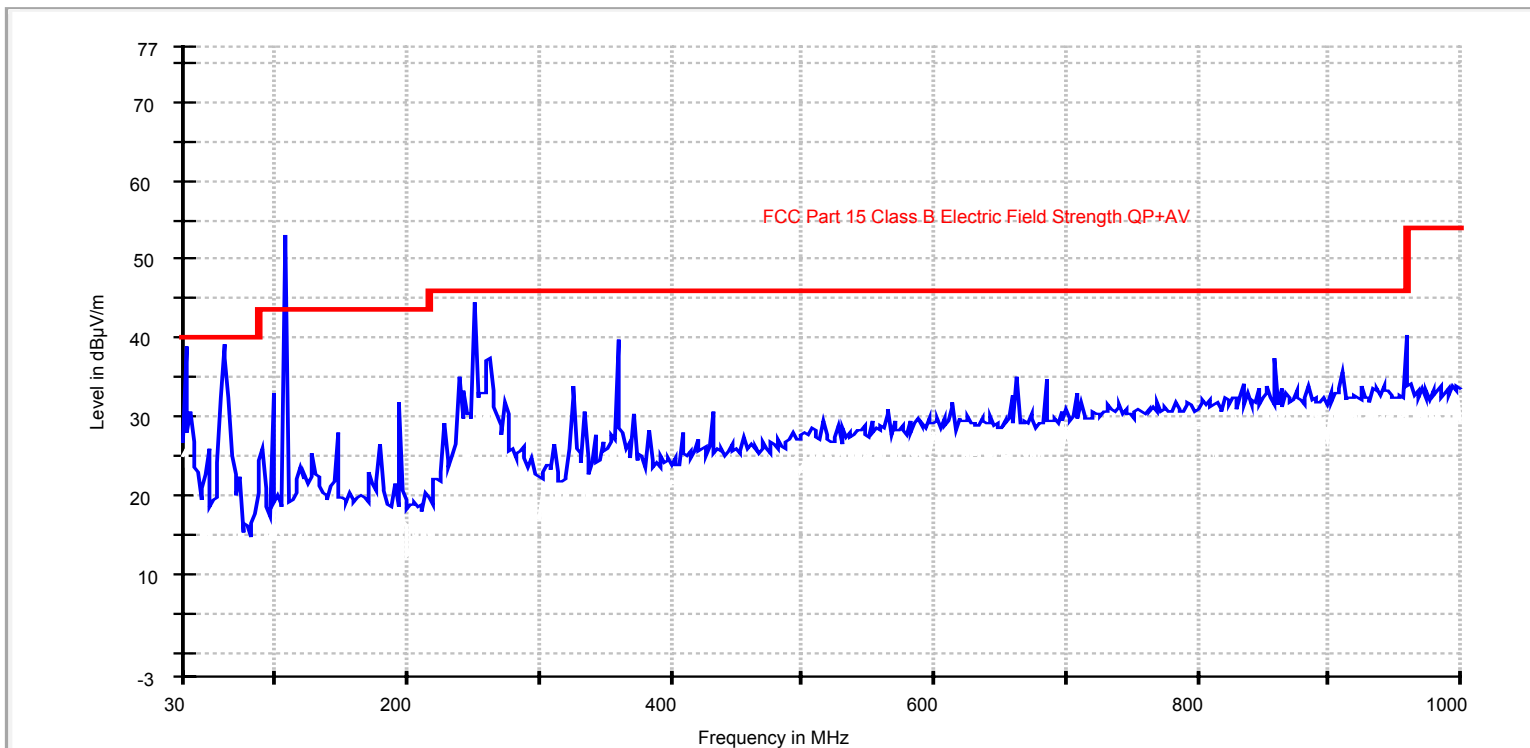
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
35. F is fundamental.
36. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
62.080160	34.6	42.1	40.0	-5.4	X	352.0	395.0	H	PASS
252.036072	42.7	44.0	46.0	-3.3	X	65.0	150.0	H	PASS
360.018036	39.0	40.7	46.0	-7.0	X	80.0	95.0	H	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 13.8 VDC Typical Modulation 107.9 MHz
Operator Name: Jeff Banting
Comment: Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dBμV/m

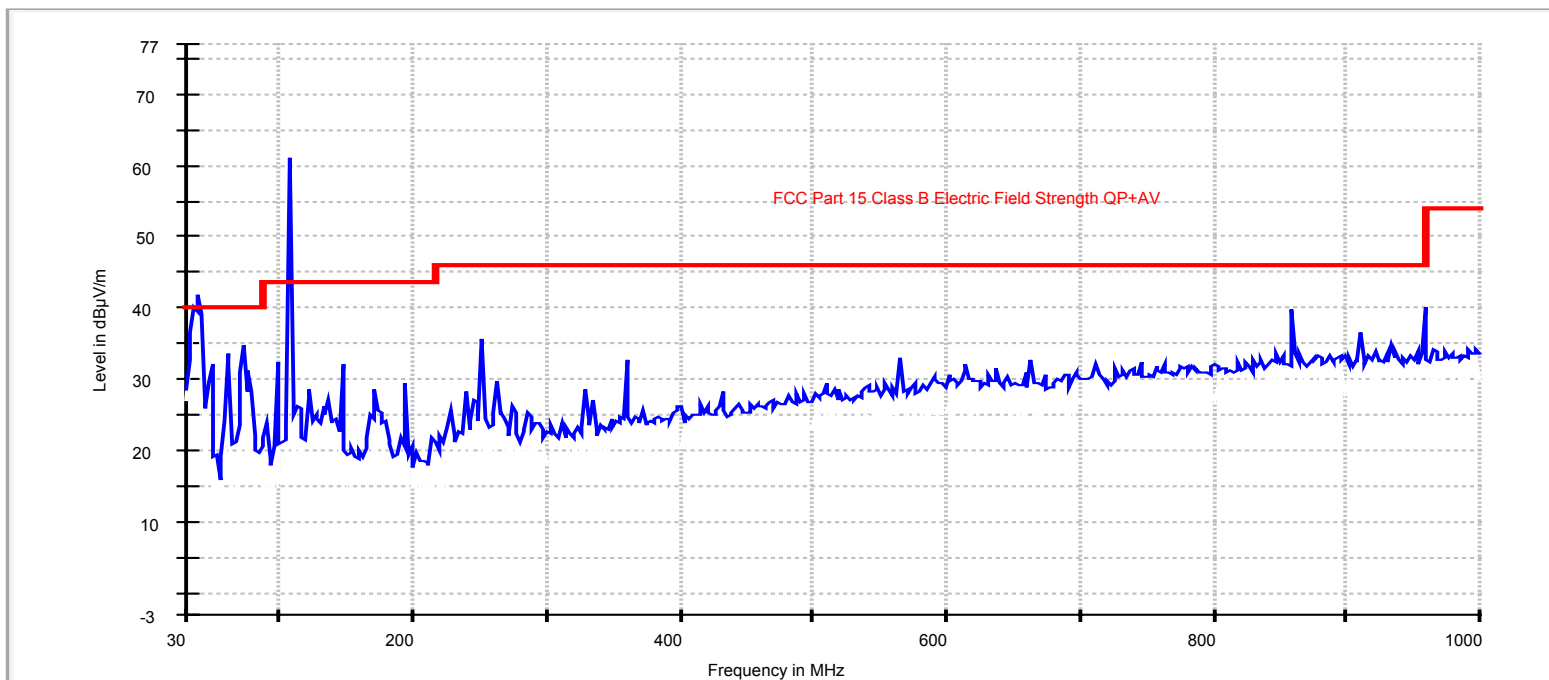
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
37. F is fundamental.
38. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.949900	32.8	39.3	40.0	-7.2	X	8.0	95.0	V	PASS
73.665331	33.7	36.6	40.0	-6.3	X	161.0	149.0	V	PASS
252.024048	35.2	36.7	46.0	-10.8	X	283.0	98.0	V	PASS
360.002004	31.3	34.0	46.0	-14.7	X	31.0	210.0	V	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	15.9 VDC Typical Modulation 107.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dBμV/m

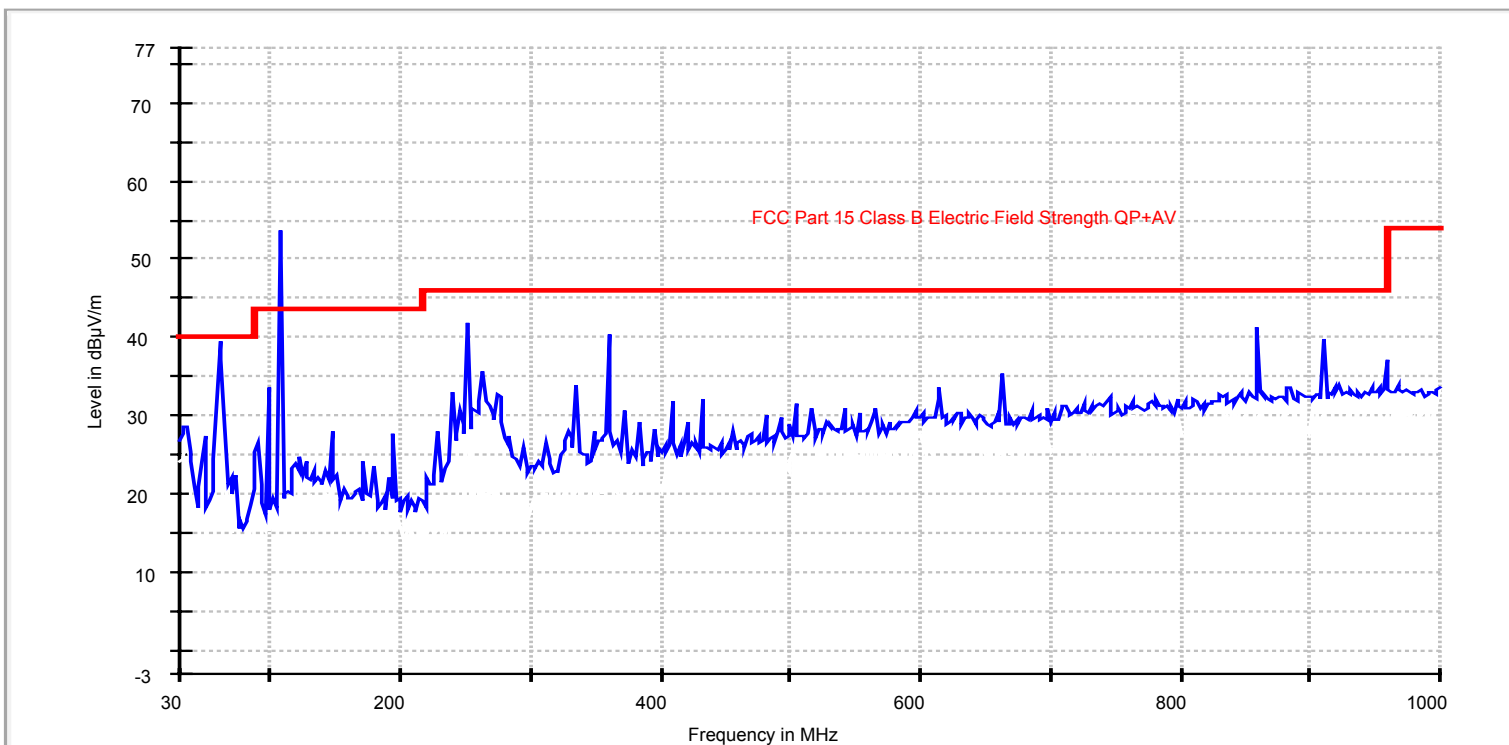
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
39. F is fundamental.
40. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
62.127783	34.6	41.1	40.0	-5.4	X	352.0	395.0	H	PASS
252.036072	42.5	43.9	46.0	-3.5	X	65.0	150.0	H	PASS
359.997996	39.8	42.1	46.0	-6.2	X	80.0	95.0	H	PASS

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	15.9 VDC Typical Modulation 107.9 MHz
Operator Name:	Jeff Banting
Comment:	Axis-X Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dBμV/m

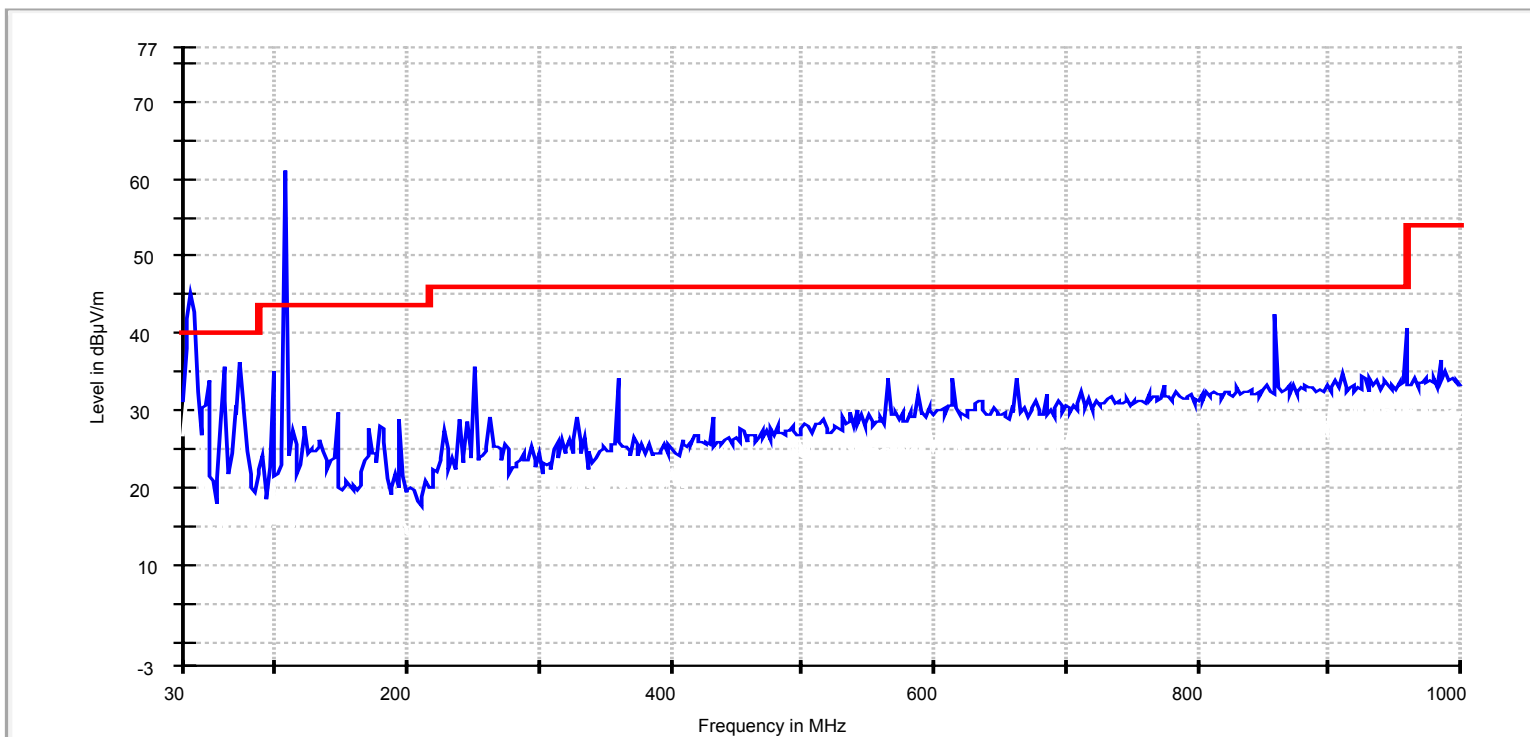
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
41. F is fundamental.
42. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
39.353255	37.0	44.6	40.0	-3.0	X	8.0	95.0	V	PASS
73.677355	34.2	37.1	40.0	-5.8	X	161.0	149.0	V	PASS
252.016032	34.1	35.8	46.0	-11.9	X	283.0	95.0	V	PASS
360.018036	29.9	32.5	46.0	-16.1	X	31.0	210.0	V	PASS

4.1.8 TEST RESULTS (EUT Position Y at 88.1, 99.9, and 107.9 MHz)

EUT Position Y

Frequency 88.1 MHz

Test Information

EUT Name:	FM_TX_TextCommander
Serial Number:	N/A
Test Description:	FCC_15_209
Operating Conditions:	11.7 VDC Typical Modulation 88.1 MHz
Operator Name:	Jeff Banting
Comment:	Axis-Y Horizontal Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup:	EMI 1GHz
Level Unit:	dB μ V/m

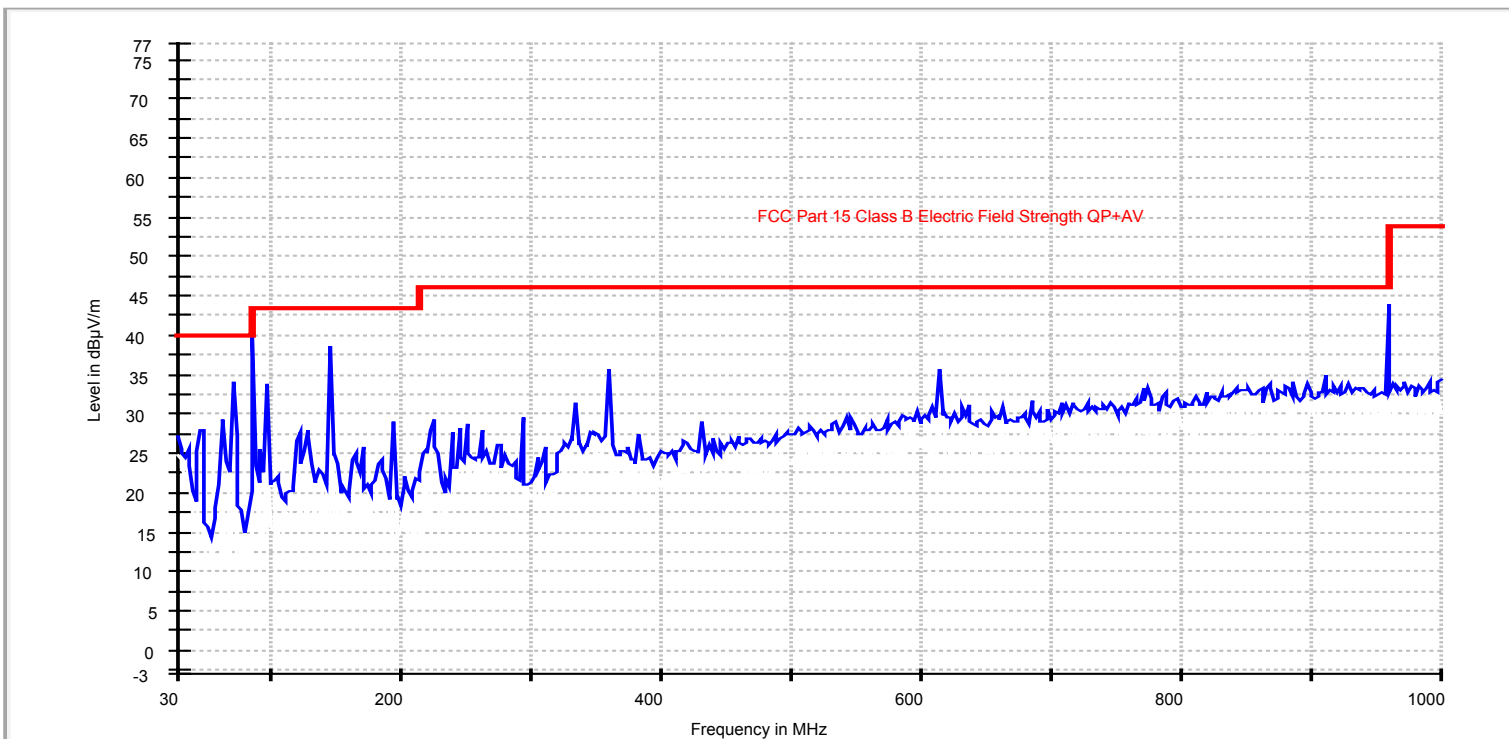
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
43. F is fundamental.
44. _R is for restricted band.

FCC_15_209 Peak

Horizontal



Result Table_Single

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	QP Limit (dBμV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
73.665331	23.2	26.8	40.0	-16.8	Y	139.0	375.0	H	PASS
98.276553	29.9	36.0	43.5	-13.6	Y	57.0	209.0	H	PASS
147.325451	38.2	39.6	43.5	-5.3	Y	129.0	309.0	H	PASS

Test Information

EUT Name: FM_TX_TextCommander
Serial Number: N/A
Test Description: FCC_15_209
Operating Conditions: 11.7 VDC Typical Modulation 88.1 MHz
Operator Name: Jeff Banting
Comment: Axis-Y Vertical Polarization

Sweep Setup: FCC_15_209 Peak [EMI radiated]

Hardware Setup: EMI 1GHz
Level Unit: dBμV/m

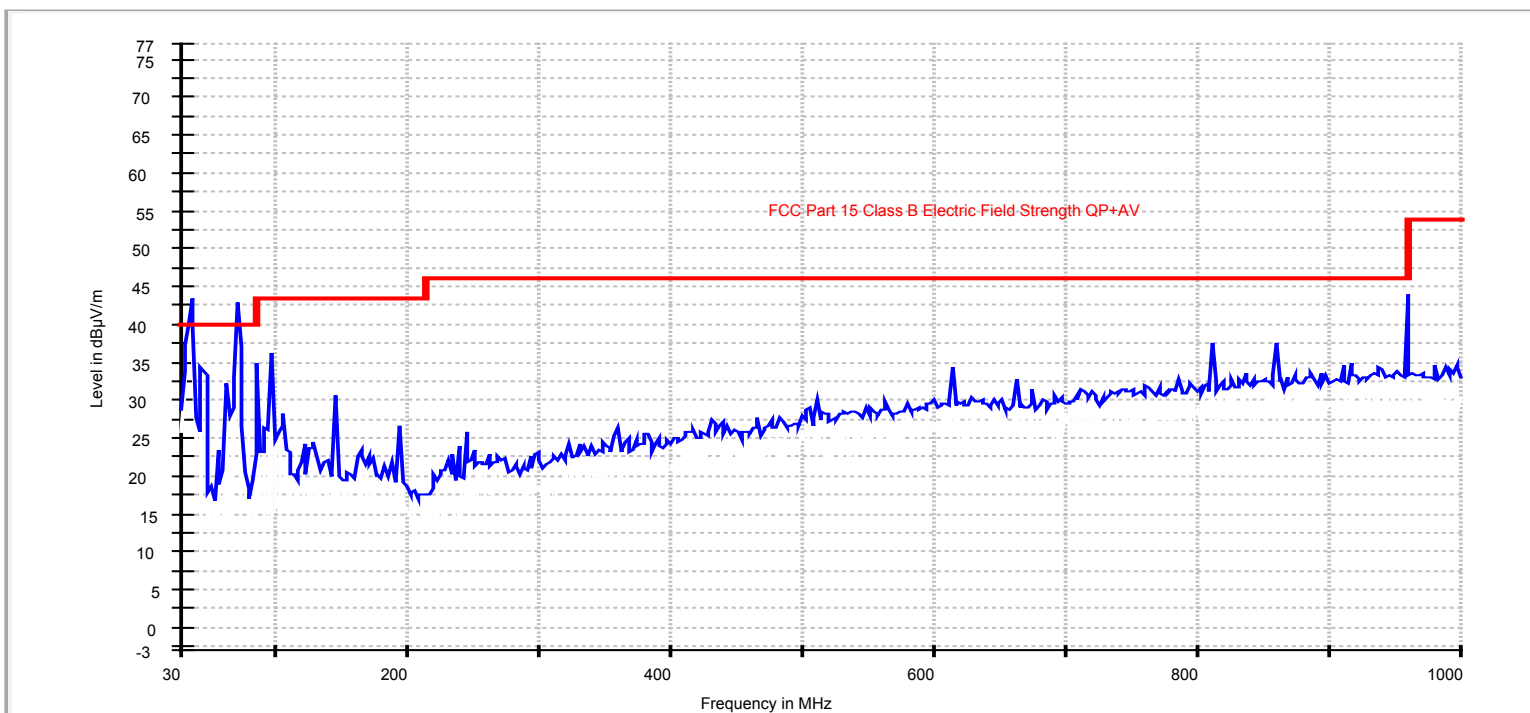
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30MHz - 1GHz	MaxPeak	120kHz	0.005s	Receiver

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier (dB) + *Filter Loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.209 and per 15.205.
6. * Filter is used
45. F is fundamental.
46. _R is for restricted band.

FCC_15_209 Peak

Vertical



Result Table_Single

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	QP Limit (dBµV)	Margin (dB)	EUT Position	Azimuth (deg)	Antenna height (cm)	Polarity	Comment
38.452906	39.1	44.1	40.0	-0.9	Y	8.0	95.0	V	PASS
73.659319	30.1	34.2	40.0	-9.9	Y	151.0	129.0	V	PASS
98.221443	33.3	37.2	43.5	-10.2	Y	334.0	111.0	V	PASS
147.318637	30.3	32.5	43.5	-13.2	Y	18.0	231.0	V	PASS

PLEASE SEE PART 2