FCC CERTIFICATION
On Behalf of
Tunewear Ltd.

FM Transmitter for ipod
Model No.: TUN-IP-200005

FCC ID: UUXTUNIPTX

Prepared for	:	Tunewear Ltd.
Address	:	1103-1105 Silvercord Tower Ⅱ, 30 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong
Prepared by	:	ACCURATE TECHNOLOGY CO. LTD
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Report Number	:	ATE20062624
Date of Test	:	September 22, 2006
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APPENDIX I (TEST CURVES) (13pages)

Test Report Certification

Applicant	:	Tunewear Ltd.
Manufacturer	:	Micro Electronics Ltd.
EUT Description	:	FM Transmitter For ipod

(A) MODEL NO.: TUN-IP-200005

(B) SERIAL NO.: N/A

(C) POWER SUPPLY: DC 3.3V(Power By ipod), DC 5.0V(Power By PC)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.239, Section 15.109,Section 15.107: 2006

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section15.239, Section 15.109,Section 15.107 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : September 22, 2006

Prepared by :

(Engineer)

Reviewer :

(Quality Manager)

Approved & Authorized Signer :

(Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	FM Transmitter For ipod
Model Number	:	TUN-IP-200005
Power Supply	:	DC 3.3V(Power By ipod), DC 5.0V(Power By PC)
Operate Frequency	:	88.1-107.9MHz
USB Cable	:	Non-shielded, detachable, 1.1m<3m, with a ferrite core
iPod	:	Manufacturer: Apple M/N: A1136 S/N: JQ543GF9SZA
Notebook PC	:	Manufacturer: SONY M/N: PCG-663P S/N: 28123170 7202526
Printer	:	Manufacturer: Canon Model No.: BJC-1000SP
Applicant	:	Tunewear Ltd.
Address	:	1103-1105 Silvercord Tower Ⅱ, 30 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer	:	Micro Electronics Ltd.
Address	:	7/F., Enterprise Square Three, 39 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong
Date of sample received	:	September 8, 2006
Date of Test	:	September 22, 2006

1.2.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen, May 10, 2004 Accredited by FCC, May 10, 2004 The Certificate Registration Number is 253065 Accredited by Industry Canada, May 18, 2004 The Certificate Registration Number is IC 5077
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.3.Measurement Uncertainty

Conducted emission expanded uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 4.12dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

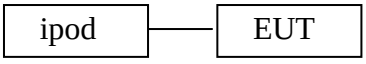
Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2007
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.02.2007
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2007
Bilog Antenna	Chase	CBL6112B	2591	03.31.2007
Horn Antenna	Rohde&Schwarz	HF906	100013	01.02.2007
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2007
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2007
Audio Generator	GW	GAG-810	0913317	01.02.2007
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100305	03.31.2007
L.I.S.N.	Rohde&Schwarz	ESH3-Z5	100310	03.31.2007

3. RADIATED EMISSION FOR FCC PART 15 SECTION 15.239(C)

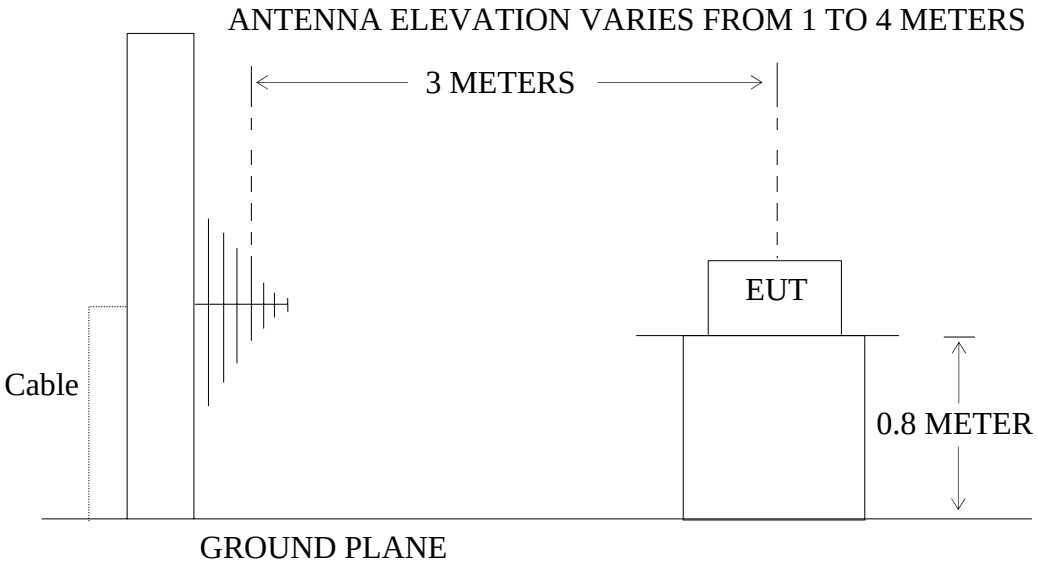
3.1.Block Diagram of Test Setup

3.1.1.Block diagram of connection between the EUT and simulators



(EUT: FM Transmitter For ipod)

3.1.2.Anechoic Chamber Test Setup Diagram



(EUT: FM Transmitter For ipod)

3.2.The Emission Limit for section 15.239(c)

3.2.1 The field strength of any emissions radiated on any frequency outside of the specified 200kHz band shall not exceed the general radiated emission limits in section 15.209

Radiation Emission Measurement Limits According to Section 15.209

Frequency (MHz)	Limit,		
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands
30 - 88	100	40	
88 - 216	150	43.5	

216 - 960	200	46	mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
Above 960	500	54	

3.3.Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.3.1.FM Transmitter For ipod (EUT)

Model Number : FM-03(US)
Serial Number : N/A
Manufacturer : Micro Electronics Ltd.

3.4.Operating Condition of EUT

3.4.1.Setup the EUT and simulator as shown as Section 3.1.

3.4.2.Turn on the power of all equipment.

Let the EUT work in TX modes [Plug iPod to EUT 30pin Connector and ipod playing typical audio signal(music song) with maximum audio level] measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

Note: The EUT is connected to iPod by the base interface of iPod. The input signal of EUT is controlled by iPod. so the volume control of iPod was set to maximum during the test. It means that the test was performed with the maximum audio input.

3.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 120KHz in 30-1000MHz; Set at 1MHz in above 1000MHz.
The frequency range from 30MHz to 1100MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

3.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 1100MHz is investigated.

Date of Test:	November 1, 2006	Temperature:	27°C
EUT:	FM Transmitter For ipod	Humidity:	55%
Model No.:	TUN-IP-200005	Power Supply:	DC 3.3V(Power By ipod)
Test Mode:	TX 88.1MHz[30pin connector Input typical audio signal(music song) with the maximum audio input]	Test Engineer:	Andy

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	176.216	21.8	8.0	29.8	43.5	13.7
Horizontal	502.940	12.1	17.0	29.1	46.0	16.9
Horizontal	582.120	14.3	18.3	32.6	46.0	13.4
Horizontal	640.970	14.7	19.1	33.8	46.0	12.2
Horizontal	658.090	15.0	19.3	34.3	46.0	11.7
Vertical	176.220	14.1	8.4	22.5	43.5	21.0
Vertical	496.520	11.2	17.5	28.7	46.0	17.3

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Date of Test:	November 1, 2006	Temperature:	27°C
EUT:	FM Transmitter For ipod	Humidity:	55%
Model No.:	TUN-IP-200005	Power Supply:	DC 3.3V(Power By ipod)
Test Mode:	TX 98.1MHz[30pin connector Input typical audio signal(music song) with the maximum audio input]	Test Engineer:	Andy

Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	196.206	20.9	9.6	30.5	43.5	13.0
Vertical	196.208	13.2	9.0	22.2	43.5	21.3
Vertical	497.590	10.6	17.5	28.1	46.0	17.9

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Date of Test:	November 1, 2006	Temperature:	27°C
EUT:	FM Transmitter For ipod	Humidity:	55%
Model No.:	TUN-IP-200005	Power Supply:	DC 3.3V(Power By ipod)
Test Mode:	TX 107.9MHz[30pin connector Input typical audio signal(music song) with the maximum audio input]	Test Engineer:	Andy

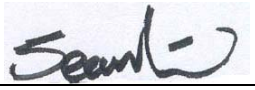
Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	215.796	21.7	9.7	31.4	46.0	14.6
Horizontal	640.970	13.2	19.1	32.3	46.0	13.7
Vertical	215.795	12.0	8.8	20.8	46.0	25.2
Vertical	496.520	10.6	17.5	28.1	46.0	17.9

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

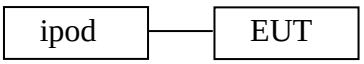
Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Reviewer **:** 

4. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15 SECTION 15.239(B)

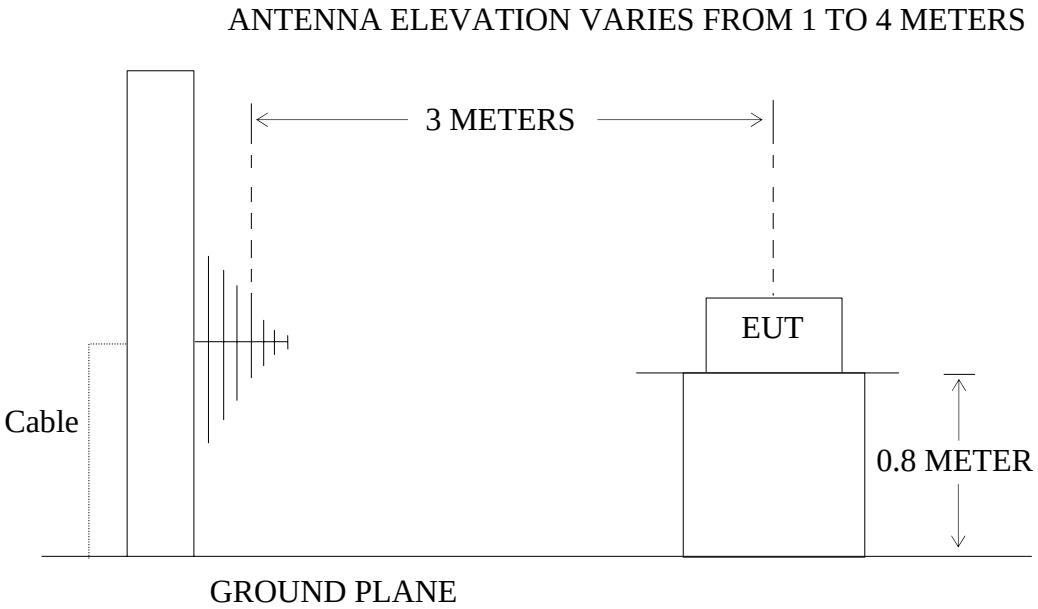
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators



(EUT: FM Transmitter For ipod)

4.1.2.Anechoic Chamber Test Setup Diagram



(EUT: FM Transmitter For ipod)

4.2.The Emission Limit For Section 15.239(b)

4.2.1 The field strength of any emission within the permitted 200kHz band shall not exceed 250microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

4.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1.FM Transmitter For ipod (EUT)

Model Number	:	TUN-IP-200005
Serial Number	:	N/A
Manufacturer	:	Micro Electronics Ltd.

4.4.Operating Condition of EUT

4.4.1.Setup the EUT and simulator as shown as Section 4.1.

4.4.2.Turn on the power of all equipment.

Let the EUT work in TX modes [Plug iPod to EUT 30pin Connector and ipod playing typical audio signal(music song) with maximum audio level] measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

Note: The EUT is connected to iPod by the base interface of iPod. The input signal of EUT is controlled by iPod. so the volume control of iPod was set to maximum during the test. It means that the test was performed with the maximum audio input.

4.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

4.6.The Emission Measurement Result

PASS.

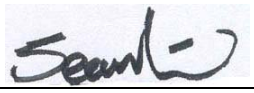
Date of Test:	November 1, 2006	Temperature:	27°C
EUT:	FM Transmitter For ipod	Humidity:	55%
Model No.:	TUN-IP-200005	Power Supply:	DC 3.3V(Power By ipod)
Test Mode:	TX [30pin connector Input typical audio signal(music song) with the maximum audio input]	Test Engineer:	Andy

Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		88.1MHz	
T_{nom}(22°C)	Unit	(dBμV/m)/ (μ V/m) AV	(dBμV/m)/(μ V/m) PEAK
	Horizontal	40.2/102	42.5/133
	Vertical	31.6/38	34.0/50
limit		48/250	68/2500
Note: Measurement was performed with modulated signal with average detector and peak detector.			

Test conditions		Fundamental Frequency	
		98.1MHz	
T_{nom}(22°C)	Unit	(dBμV/m)/ (μ V/m) AV	(dBμV/m)/(μ V/m) PEAK
	Horizontal	36.2/65	38.4/83
	Vertical	30.4/33	32.5/42
limit		48/250	68/2500
Note: Measurement was performed with modulated signal with average detector and peak detector.			

Test conditions		Fundamental Frequency	
		107.9MHz	
T_{nom}(22°C)	Unit	(dBμV/m)/ (μ V/m) AV	(dBμV/m)/(μ V/m) PEAK
	Horizontal	35.5/60	37.8/78
	Vertical	32.0/40	33.6/48
limit		48/250	68/2500
Note: Measurement was performed with modulated signal with average detector and peak detector.			

Reviewer **:** 

5. OCCUPIED BANDWIDTH FOR FCC PART 15 SECTION 15.239(A)

5.1. The Requirement For Section 15.239(a)

5.1.1. Emission from the device shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

5.2. EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.2.1. FM Transmitter For ipod (EUT)

Model Number	:	TUN-IP-200005
Serial Number	:	N/A
Manufacturer	:	Micro Electronics Ltd.

5.3. Operating Condition of EUT

5.3.1. Setup the EUT and simulator as shown as Section 4.1.

5.3.2. Turn on the power of all equipment.

Let the EUT work in TX modes [Plug iPod to EUT 30pin Connector and ipod playing typical audio signal(music song) with maximum audio level] measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

Note: The EUT is connected to iPod by the base interface of iPod. The input signal of EUT is controlled by iPod. so the volume control of iPod was set to maximum during the test. It means that the test was performed with the maximum audio input.

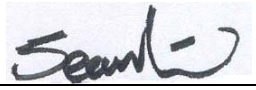
5.4. Test Procedure

The zero level was set without modulation. A small sample of the transmitter output was fed into the spectrum analyzer and above photo was taken. The vertical scale is set to 10dB per division; the horizontal scale is set to 20kHz per division.

5.5.Test Result

The EUT does meet the FCC requirement.

Input signal : play typical audio signal(music song)
FM 88.1MHz
26dB bandwidth = 162.0kHz
FM 98.1MHz
26dB bandwidth = 143.2kHz
FM 107.9MHz
26dB bandwidth = 126.0kHz

Reviewer **:** 

6. TUNING RANGE

6.1.The Requirement For Section 15.239

88-108MHz

6.2.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.2.1.FM Transmitter For iPod (EUT)

Model Number	:	TUN-IP-200005
Serial Number	:	N/A
Manufacturer	:	Micro Electronics Ltd.

6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 4.1.

6.3.2.Turn on the power of all equipment.

Let the EUT work in TX modes [Plug iPod to EUT 30pin Connector and ipod playing typical audio signal(music song) with maximum audio level] measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

Note: The EUT is connected to iPod by the base interface of iPod. The input signal of EUT is controlled by iPod. so the volume control of iPod was set to maximum during the test. It means that the test was performed with the maximum audio input.

6.4.Test Procedure

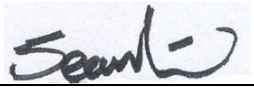
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set the EUT working on the lowest frequency.
3. Set EMI test receiver center frequency = working frequency, RBW, VBW= 10KHz, Span=300KHz.
4. Measuring the working frequency. And check the measuring result with the EUT display.
3. Set the EUT working on the mid frequency. Repeat step 3 and 4.
4. Set the EUT working on the high frequency. Repeat step 3 and 4.
5. Tune the knob to select the transmission frequency, from the low to high frequency. And check the working frequency display on the screen. The working frequency should be inside 88-108MHz.

6.5.Test Result

The EUT does meet the FCC requirement.

Low Frequency= 88.1032MHz	EUT screen display 88.1MHz
Mid Frequency= 98.1036MHz	EUT screen display 98.0MHz
High Frequency=107.9044MHz	EUT screen display 107.9MHz

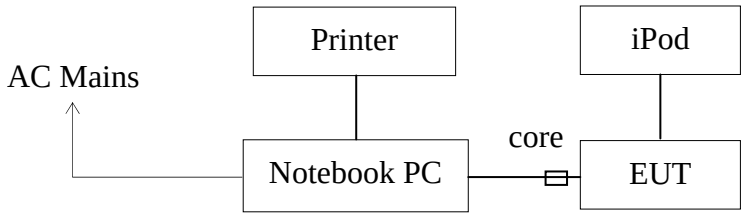
The working frequency rang is from 88.1 to 107.9MHz.

Reviewer **:** 

7. RADIATED EMISSION FOR FCC PART 15 SECTION 15.109(A)

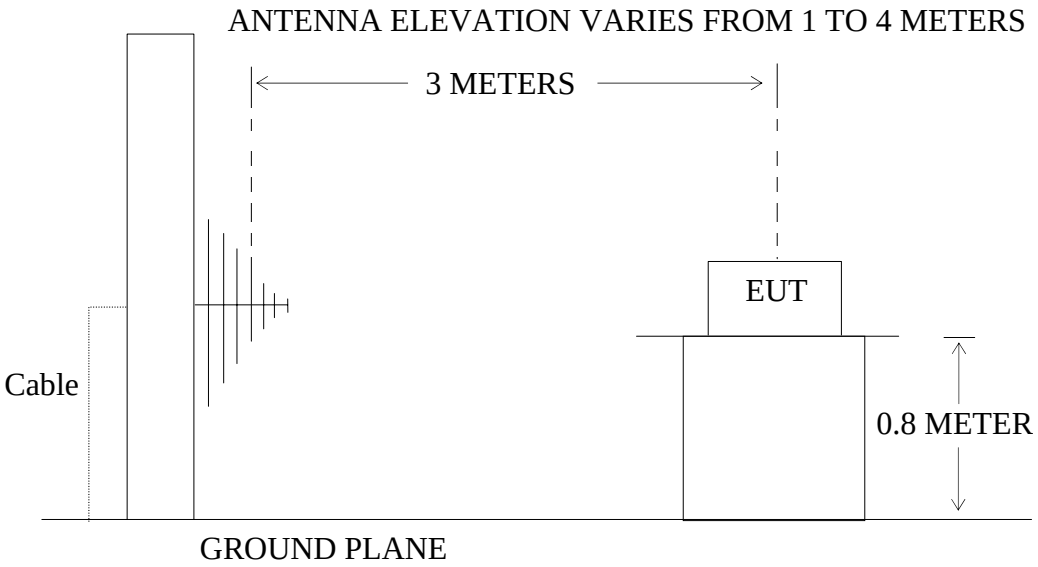
7.1.Block Diagram of Test Setup

7.1.1.Block diagram of connection between the EUT and simulators



(EUT: FM Transmitter For ipod)

7.1.2.Anechoic Chamber Test Setup Diagram



(EUT: FM Transmitter For ipod)

7.2.The Emission Limit for section 15.109(a)

Radiation Emission Measurement Limits According to Section 15.109

Frequency (MHz)	Limit	
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)
30 - 88	100	40

88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

7.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.1. FM Transmitter For ipod (EUT)

Model Number : TUN-IP-200005
Serial Number : N/A
Manufacturer : Micro Electronics Ltd.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 6.1.

7.4.2. Turn on the power of all equipment.

Let the EUT work in test modes (Connect to PC USB Port, PC run Transfer Data test program) measure it.

7.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 120KHz in 30-1000MHz; Set at 1MHz in above 1000MHz.
The frequency range from 30MHz to 1000MHz is checked.

7.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 1000MHz is investigated.

Date of Test:	September 22, 2006	Temperature:	25°C
EUT:	FM Transmitter For ipod	Humidity:	54%
Model No.:	TUN-IP-200005	Power Supply:	DC 5.0V(Power By PC)
Test Mode:	Connect to PC, Transfer Data	Test Engineer:	Andy

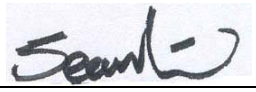
Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	43.580	22.3	12.5	34.8	40.0	5.2
Horizontal	203.630	24.7	9.6	34.3	43.5	9.2
Horizontal	222.060	26.3	9.7	36.0	46.0	10.0
Horizontal	485.900	24.4	16.7	41.1	46.0	4.9
Vertical	42.610	18.7	15.4	34.1	40.0	5.9
Vertical	371.440	21.8	14.4	36.2	46.0	9.8
Vertical	903.970	16.5	23.9	40.4	46.0	5.6

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

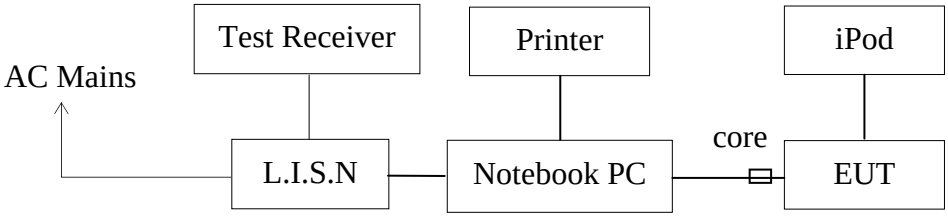
Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

Reviewer **:** 

8. CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.107(A)

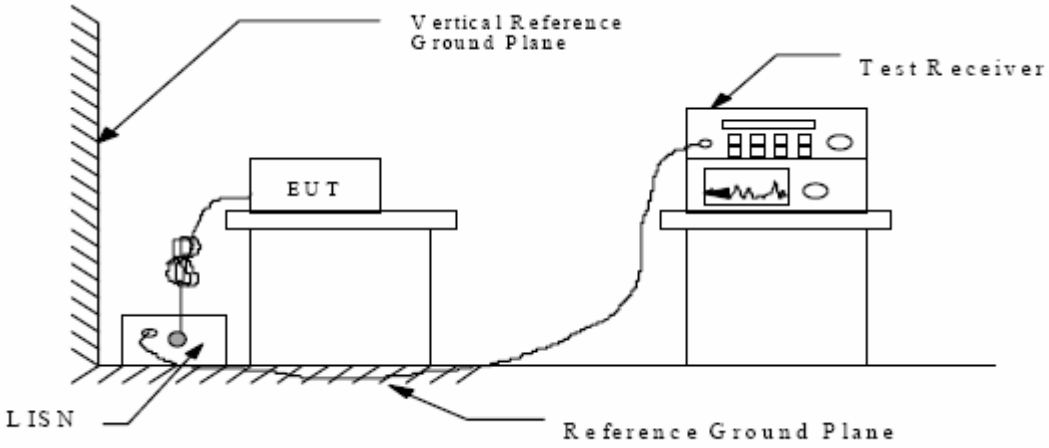
8.1.Block Diagram of Test Setup

8.1.1.Block diagram of connection between the EUT and simulators



(EUT: FM Transmitter For ipod)

8.1.2. Shielding Room Test Setup Diagram



(EUT: FM Transmitter For ipod)

8.2.The Emission Limit For Section 15.107(a)

7.2.1 Radiation Emission Measurement Limits According to Section 15.107(a)

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

8.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.3.1. FM Transmitter For ipod (EUT)

Model Number	:	TUN-IP-200005
Serial Number	:	N/A
Manufacturer	:	Micro Electronics Ltd.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 7.1.

8.4.2.Turn on the power of all equipment.

Let the EUT work in test modes (Connect to PC USB Port, PC run Transfer Data test program) measure it.

8.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2003 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

All the scanning waveforms are attached in Appendix I.

8.6.Power Line Conducted Emission Measurement Results

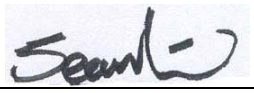
PASS.

The frequency range from 150kHz to 30MHz is checked.

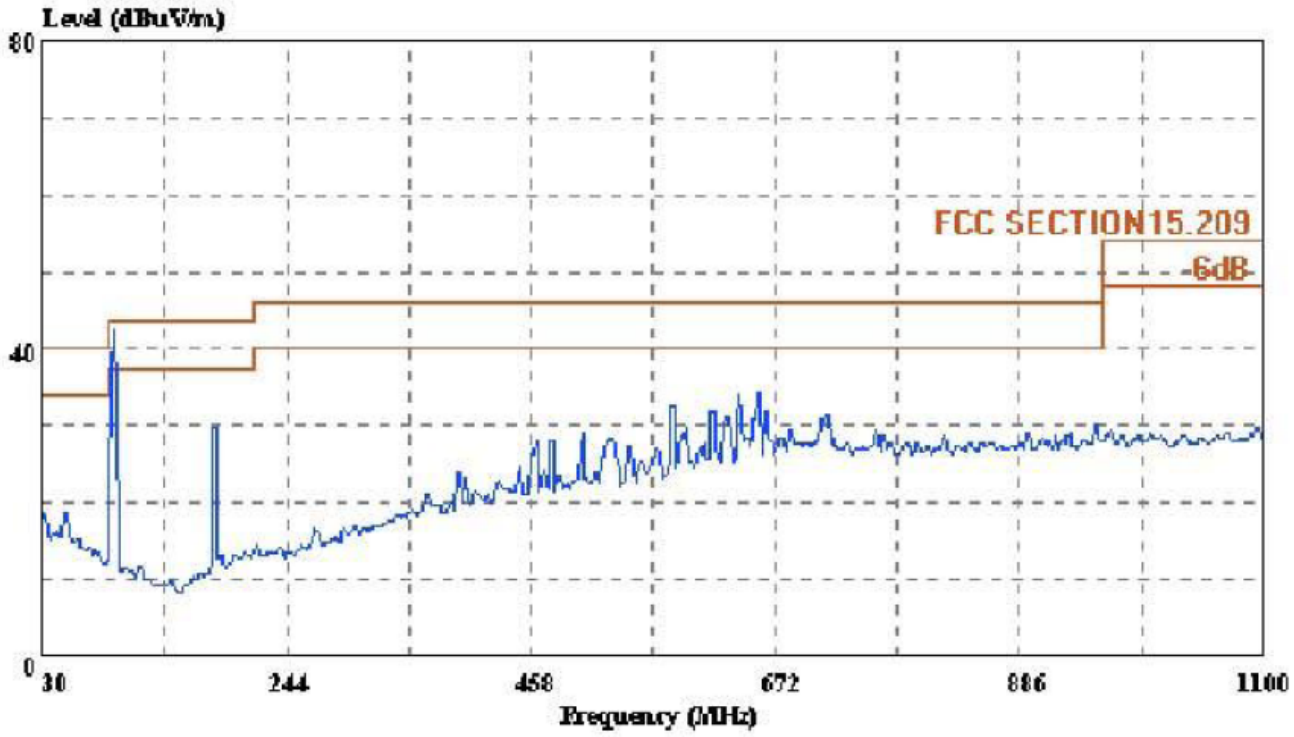
Date of Test:	September 25, 2006	Temperature:	25°C
EUT:	FM Transmitter For ipod	Humidity:	50%
Model No.:	TUN-IP-200005	Power Supply:	DC 5.0V(Power By PC)
Test Mode:	Connect to PC, Transfer Data	Test Engineer:	Andy

Test Line	Frequency MHz	Emission Level(dBμV) QP	Emission Level(dBμV) AV	Limits(dBμV) QP	Limits(dBμV) AV	Margin(dBμV) QP	Margin(dBμV) AV
Va	-	-	-	-	-	-	-
Vb	-	-	-	-	-	-	-

The spectral diagrams in appendix I display the measurement of un-weighted peak values.

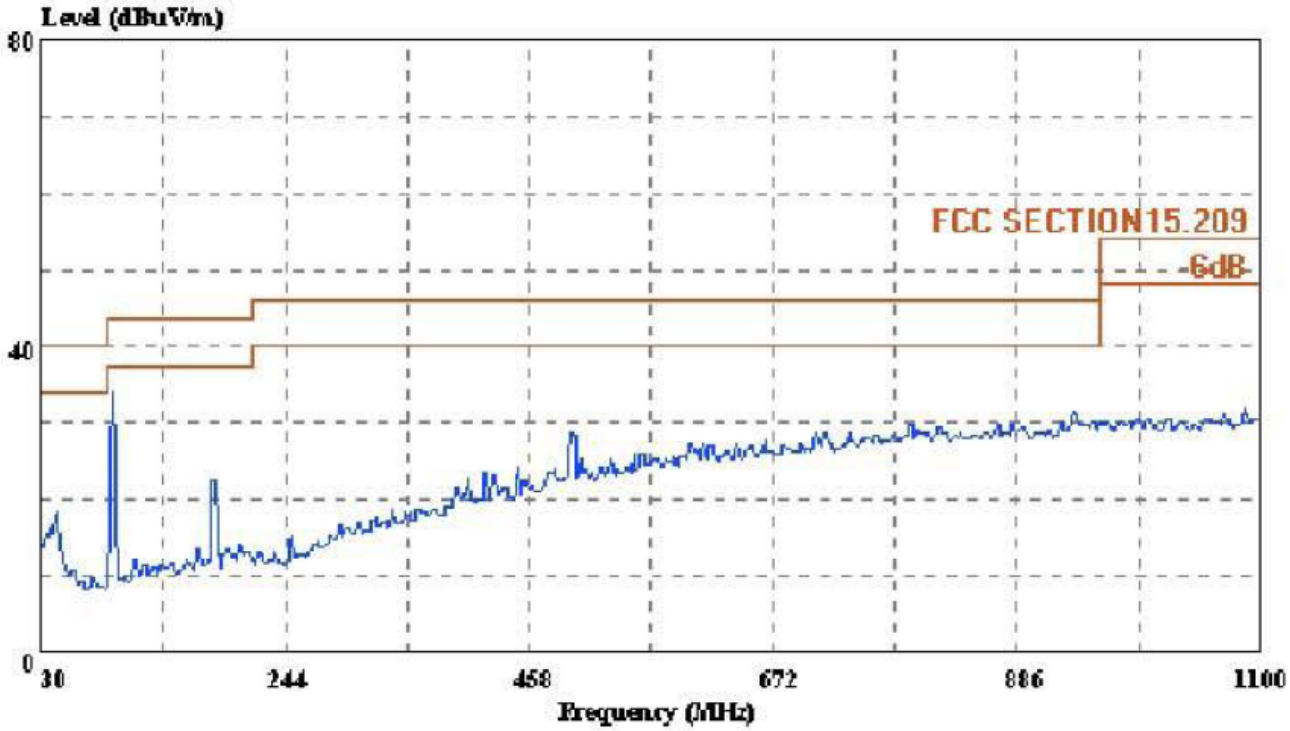
Reviewer **:** 

APPENDIX I
(Test Curves)



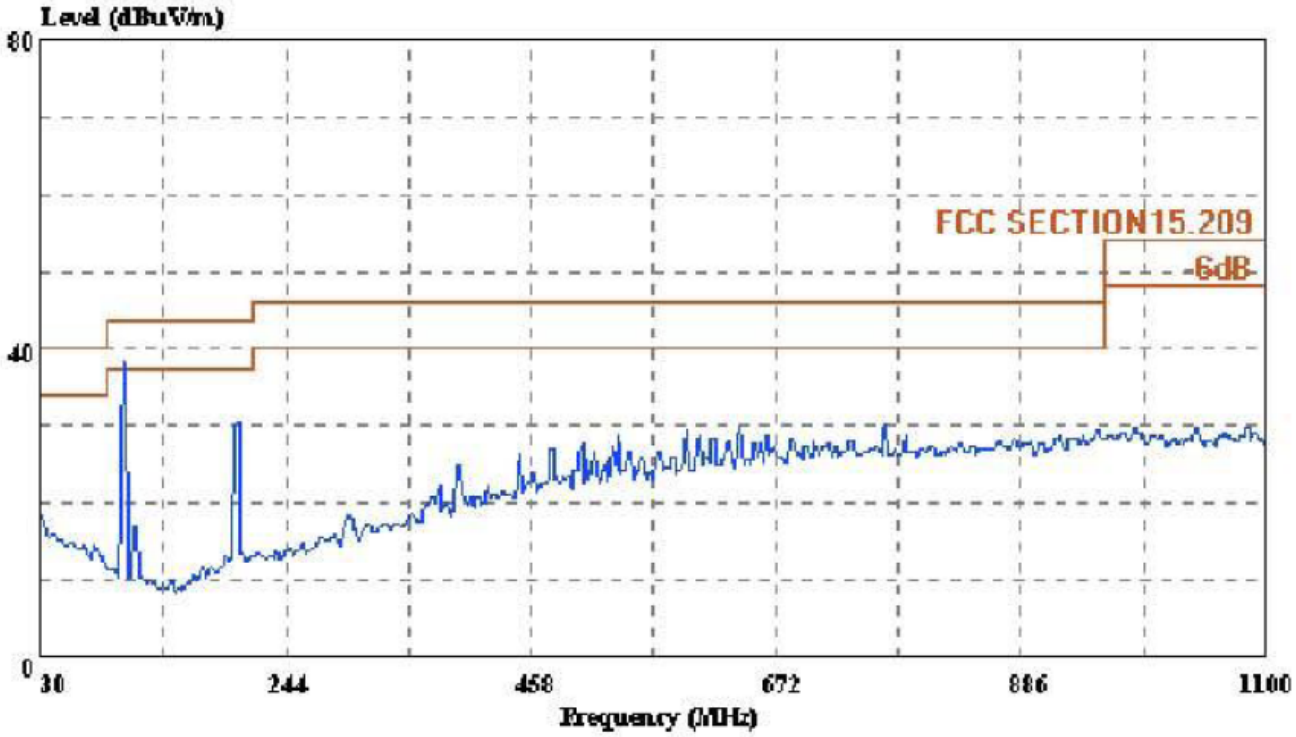
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 88.1MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



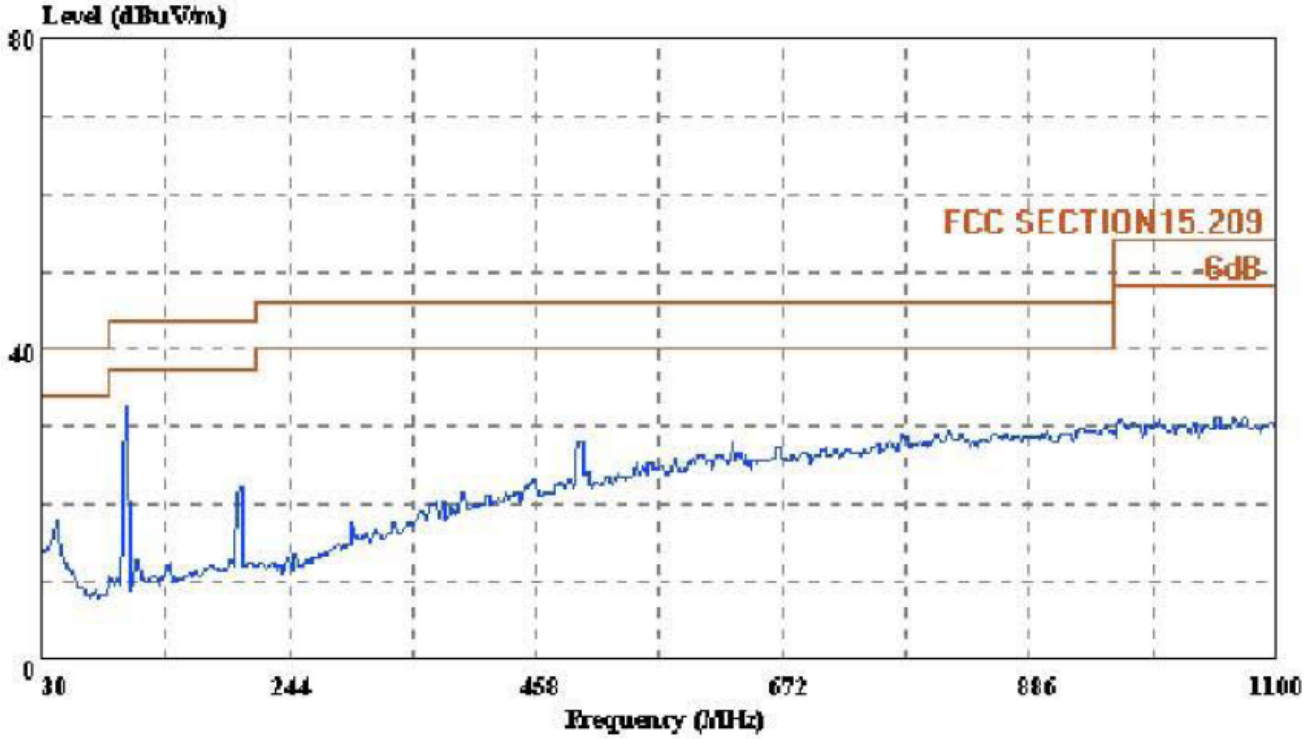
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 88.1MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



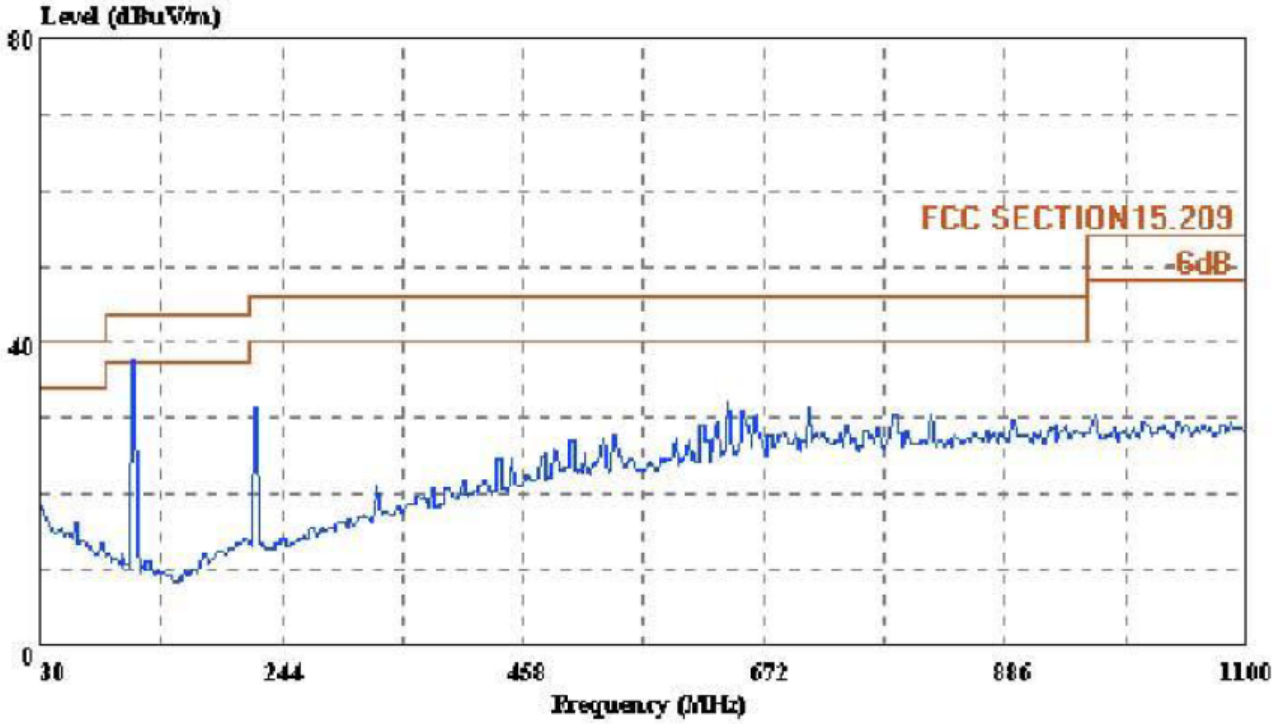
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 98.1MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



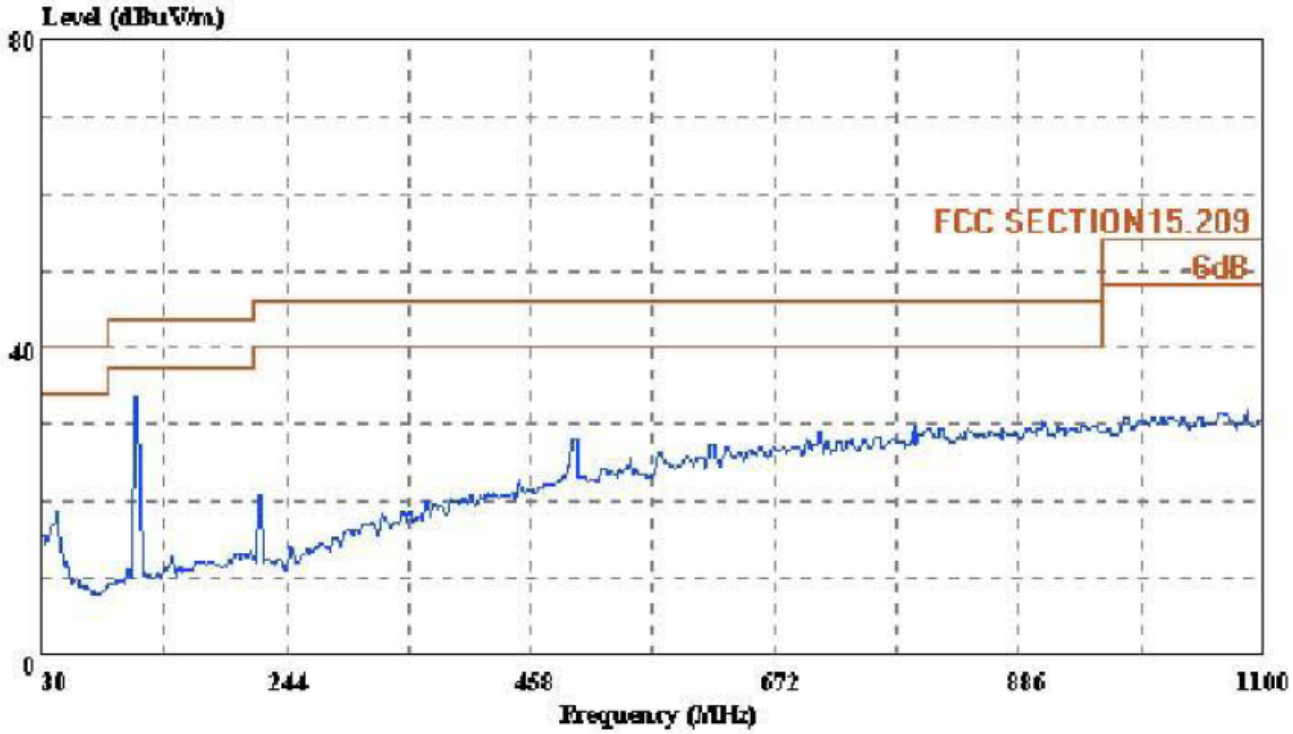
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 98.1MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



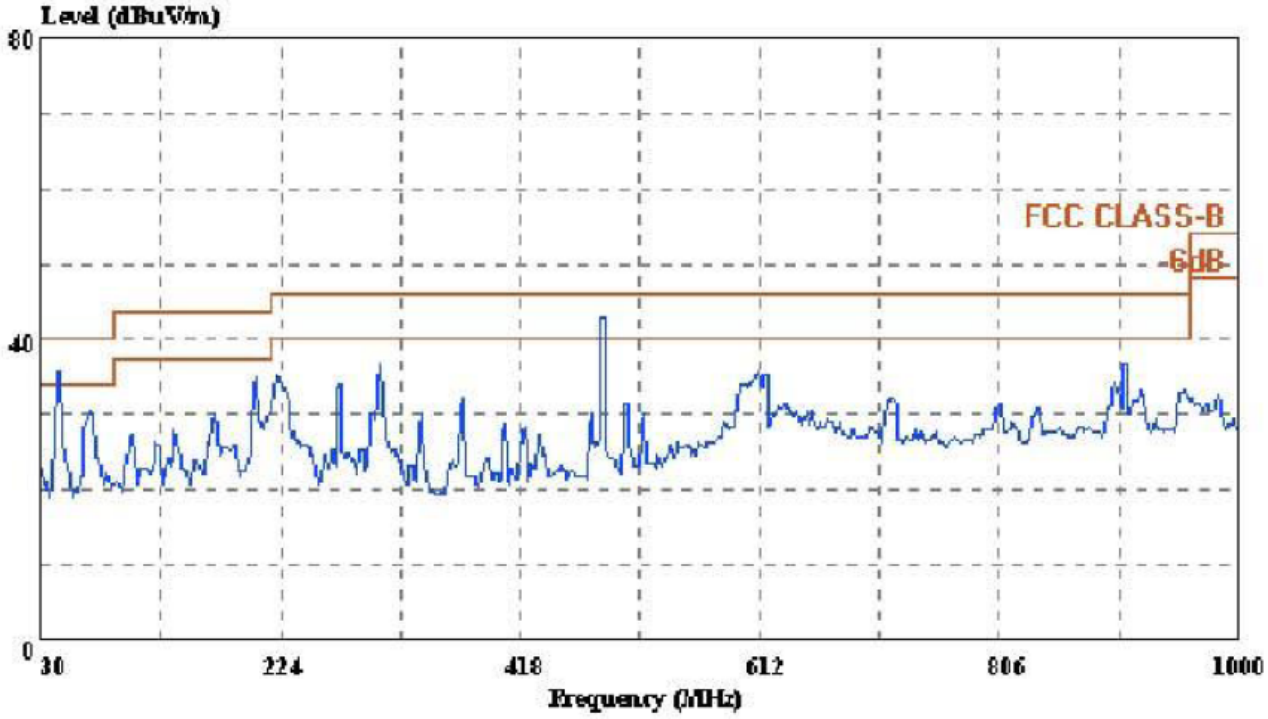
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 107.9MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



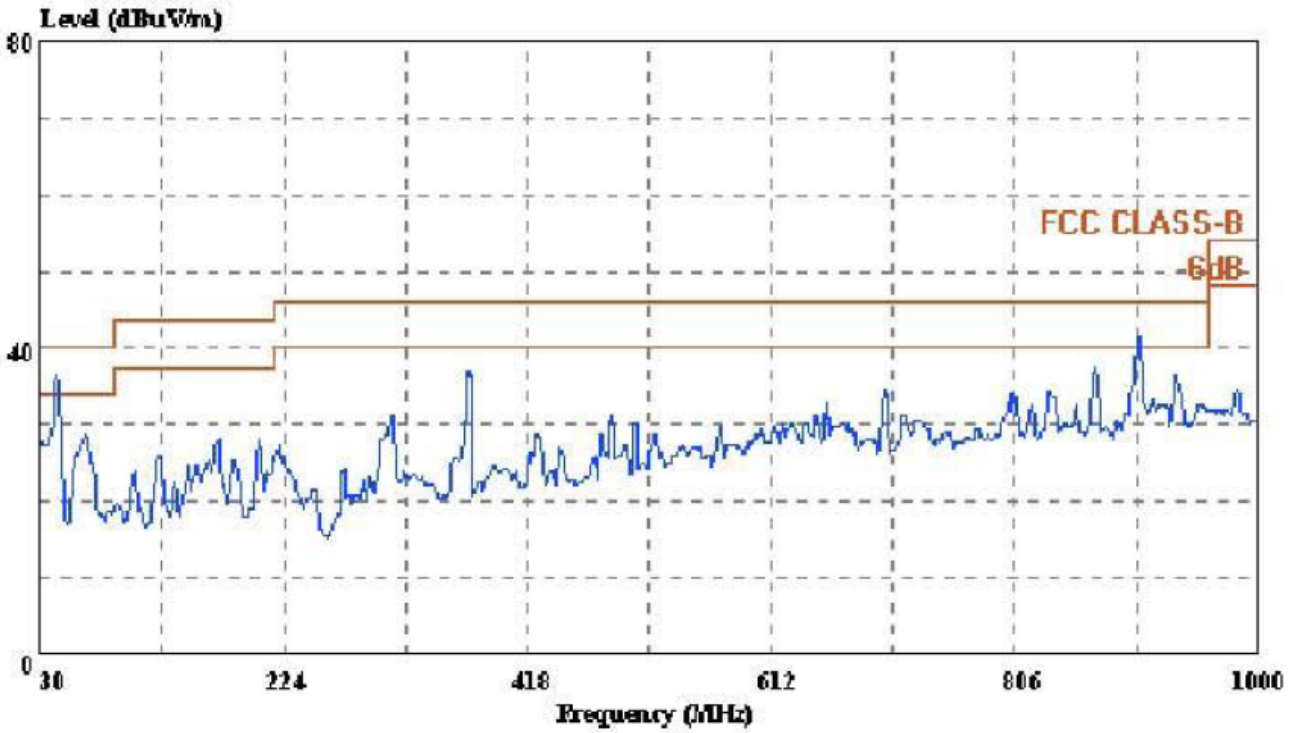
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM transmitter for iPod
power : DC 3.3V
memo : TX 107.9MHz
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005



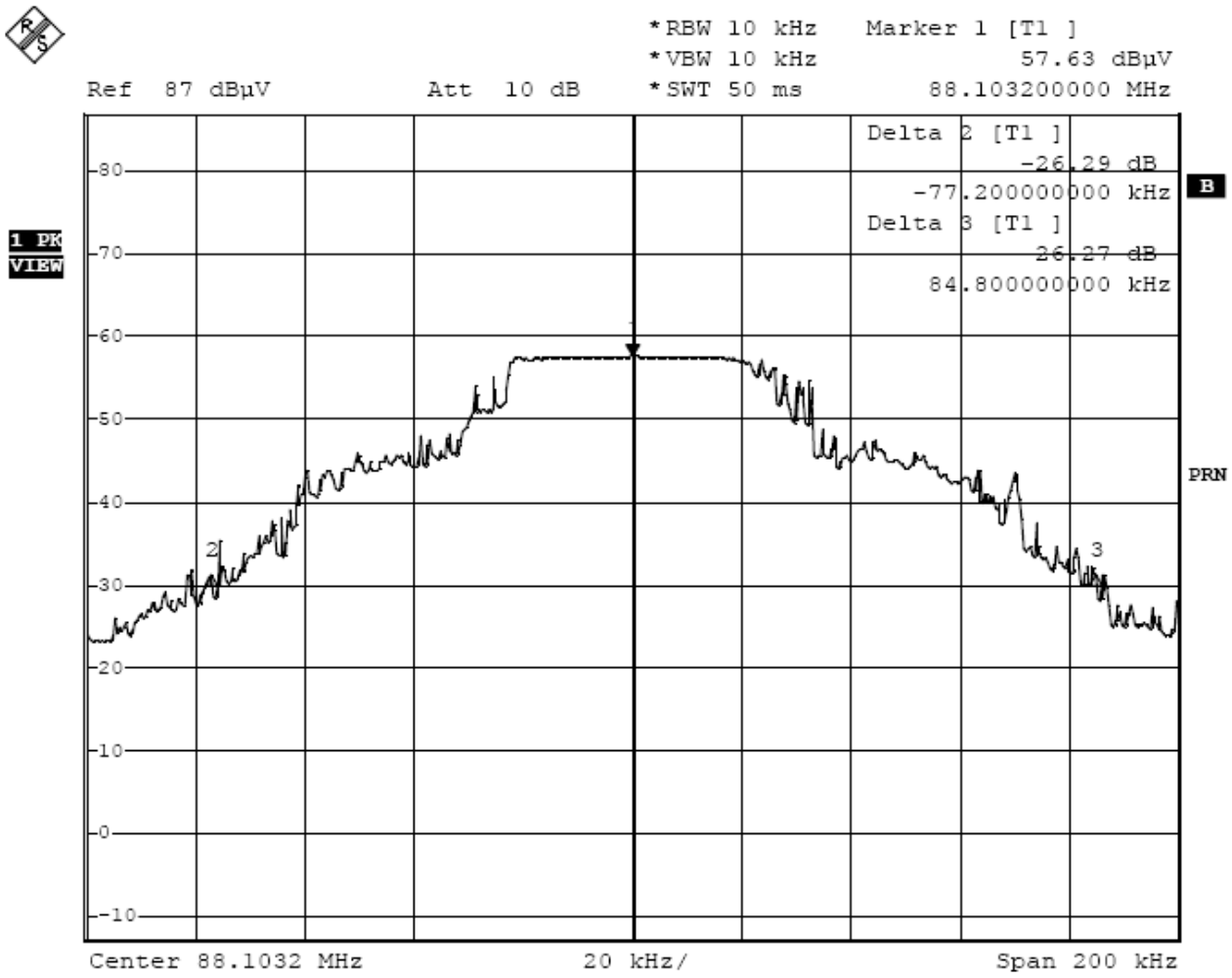
Trace: Ref Trace:

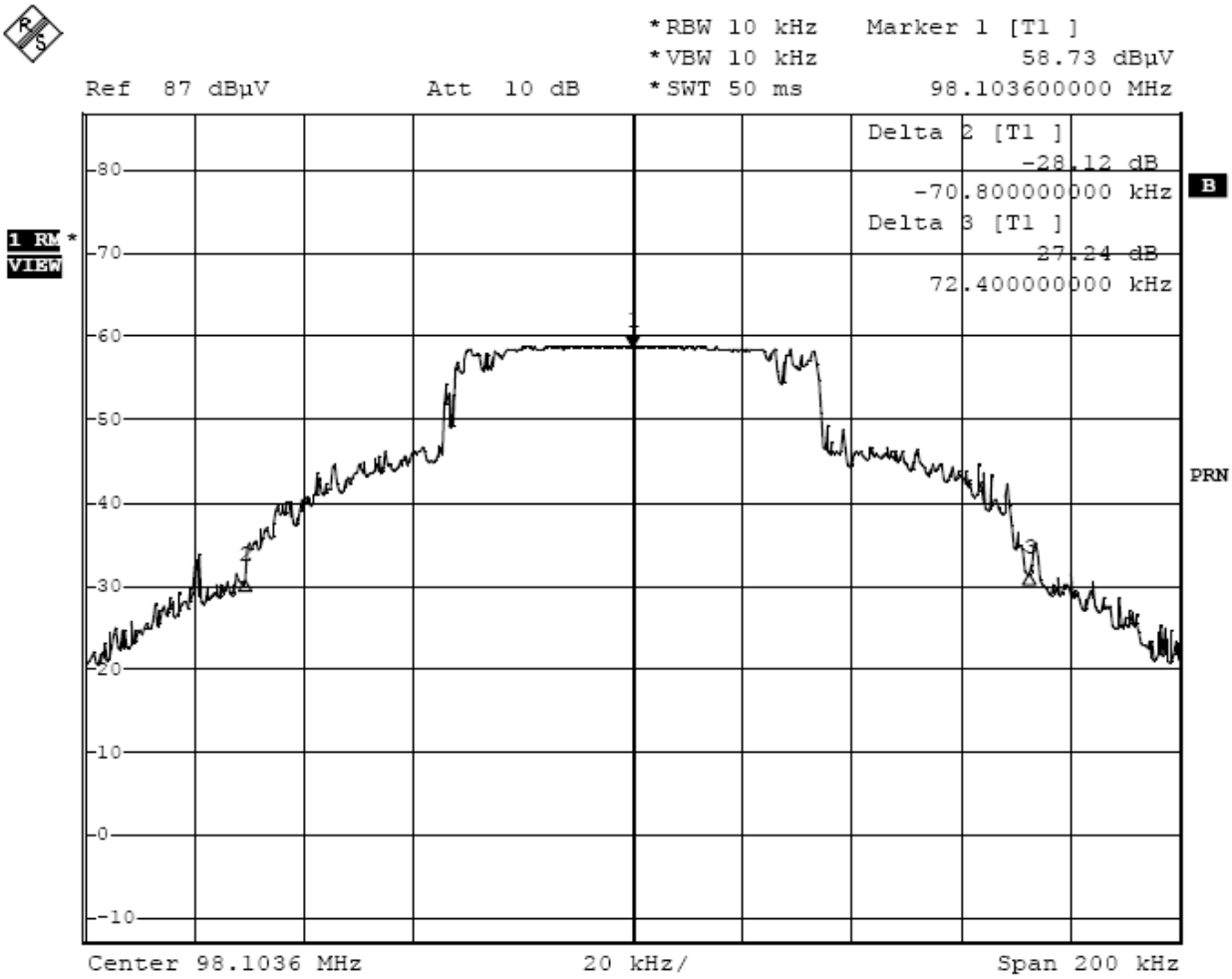
Condition: FCC CLASS-B 3m ATC VULB9163(NEW) HORIZONTAL
eut : FM transmitter for iPod
power : USB 5.0V
memo : TRANSFER DATA
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005

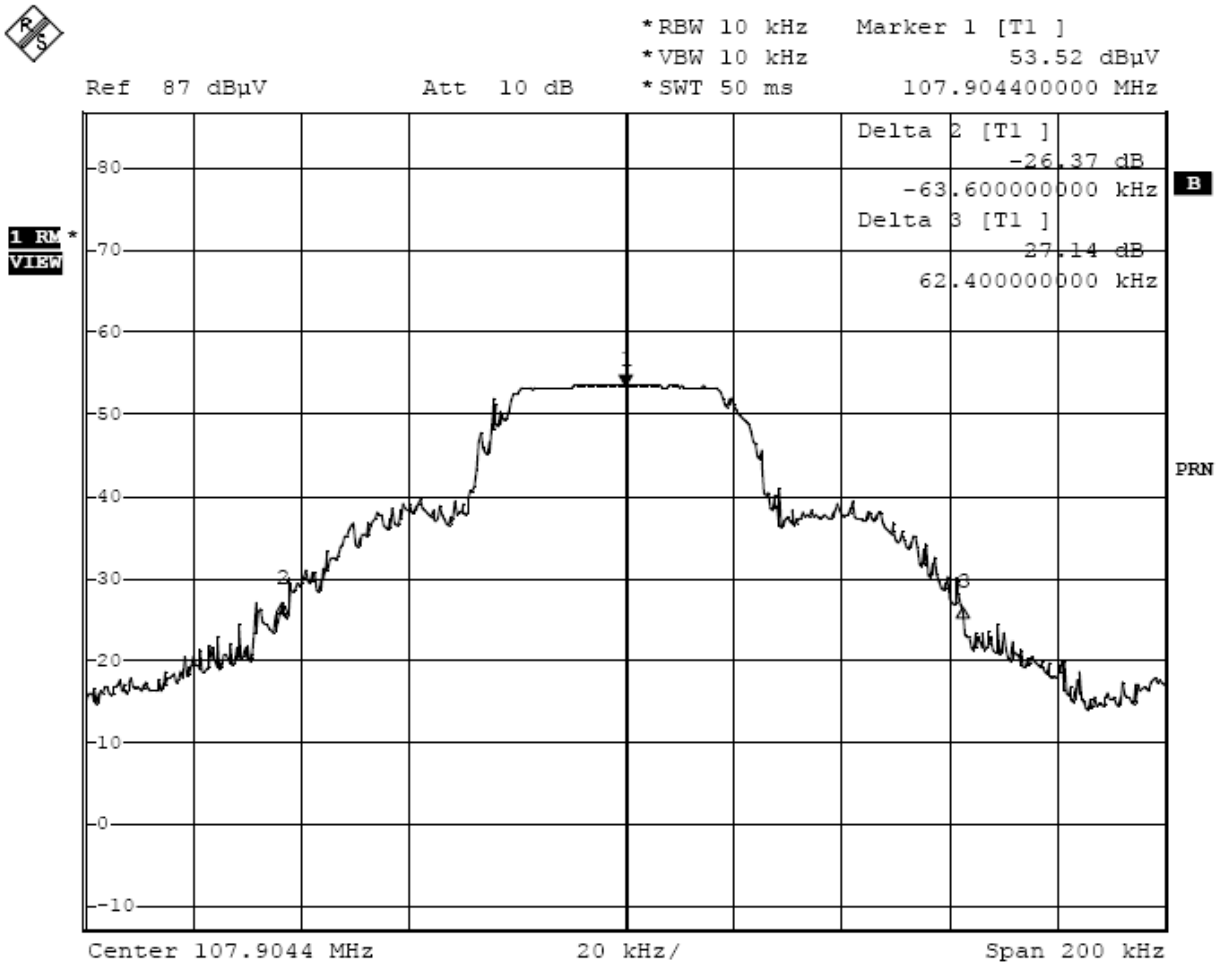


Trace: Ref Trace:

Condition: FCC CLASS-B 3m ATC VULB9163(NEW) VERTICAL
eut : FM transmitter for iPod
power : USB 5.0V
memo : TRANSFER DATA
manuf : Tunewear
sample no.: 062732
: m/n:TUN-IP-200005


*RBW 10 kHz
*VBW 10 kHz
*SWT 50 ms
Marker 1 [T1]
57.63 dBµV
88.103200000 MHz
Ref 87 dBµV
Att 10 dB
Delta 2 [T1]
-26.29 dB
-77.200000000 kHz
Delta 3 [T1]
-26.27 dB
84.800000000 kHz
1 PK
VIEW
B
PRN
80
70
60
50
40
30
20
10
0
-10
2
3
Center 88.1032 MHz
20 kHz/
Span 200 kHz


*RBW 10 kHz
*VBW 10 kHz
*SWT 50 ms
Marker 1 [T1]
58.73 dBµV
98.103600000 MHz
Ref 87 dBµV
Att 10 dB
Delta 2 [T1]
-28.12 dB
-70.800000000 kHz
Delta 3 [T1]
27.24 dB
72.400000000 kHz
1 RM
VIEW
B
PRN
80
70
60
50
40
30
20
10
0
-10
Center 98.1036 MHz
20 kHz/
Span 200 kHz


*RBW 10 kHz
*VBW 10 kHz
*SWT 50 ms
Marker 1 [T1]
53.52 dBµV
107.904400000 MHz
Ref 87 dBµV
Att 10 dB
Delta 2 [T1]
-26.37 dB
-63.600000000 kHz
Delta 3 [T1]
27.14 dB
62.400000000 kHz
1 RM
VIEW
B
PRN
80
70
60
50
40
30
20
10
0
-10
Center 107.9044 MHz
20 kHz/
Span 200 kHz

CONDUCTION EMISSION STANDARD FCC PART15B 25. Sep 06 16:25

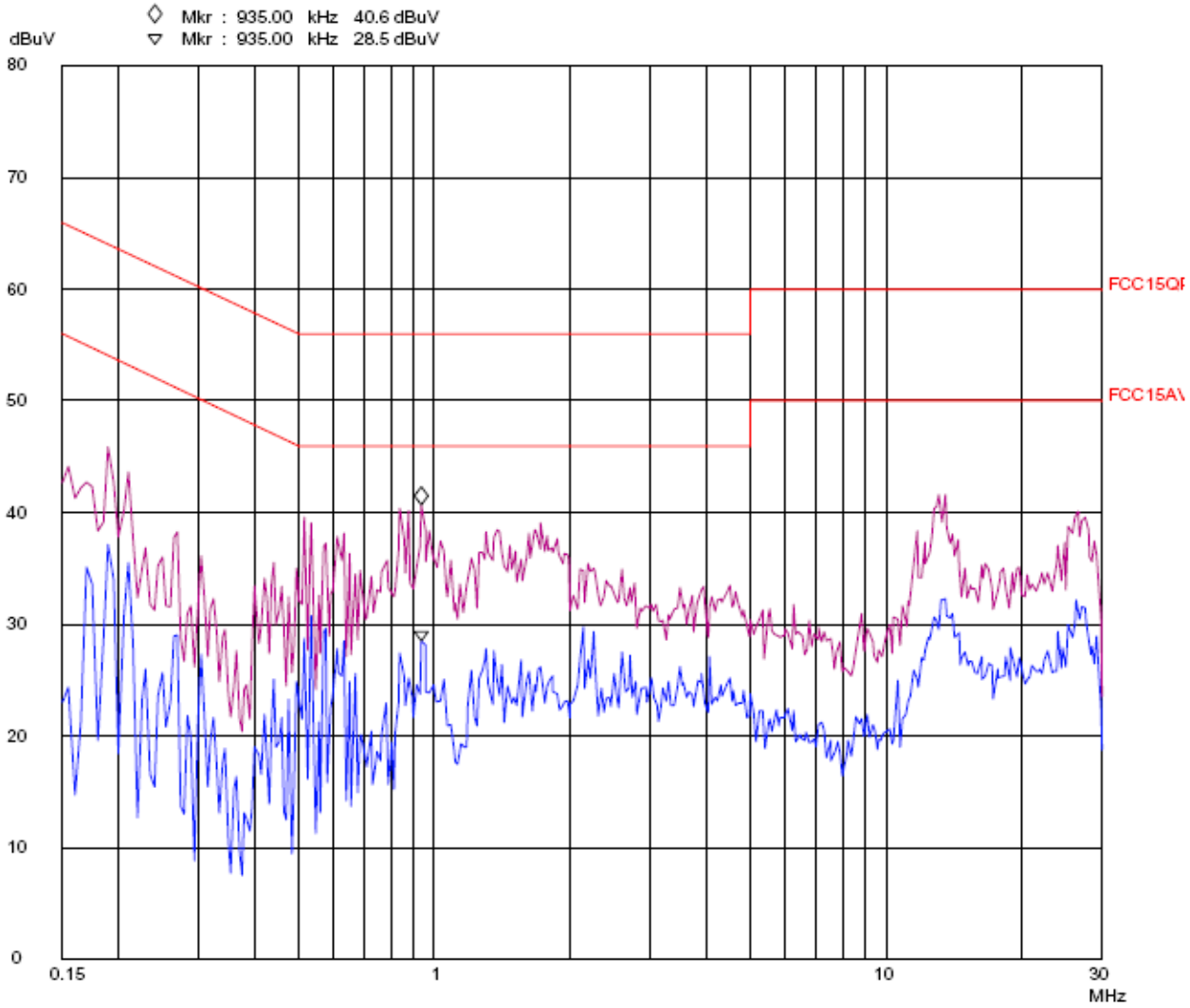
EUT:	FM transmitter for iPod m/n: TUN-IP-200005
Manuf:	Micro
Op Cond:	TRANSFER DATA
Operator:	Andy.tan
Test Spec:	Va 120V/60Hz
Comment:	Tem25% Humi50%
	Sample no.:062732

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	10ms	AUTO LN	OFF
2M	10M	10k	9k	PK+AV	1ms	AUTO LN	OFF
10M	30M	25k	9k	PK+AV	1ms	AUTO LN	OFF

Final Measurement: x QP / + AV
Meas Time: 1 s

Transducer No.	Start	Stop	Name
1	9k	30M	confac

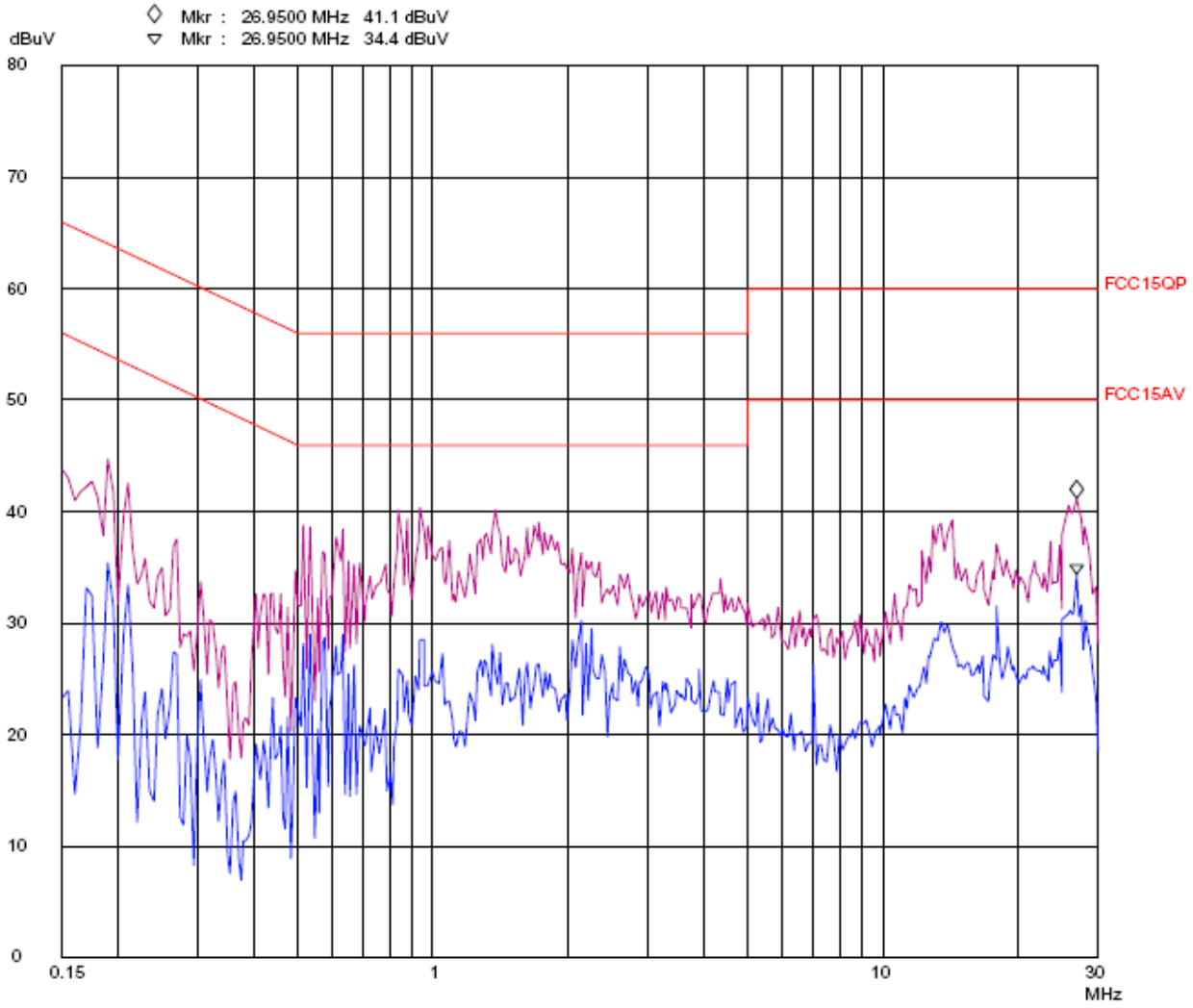


CONDUCTION EMISSION STANDARD FCC PART15B 25. Sep 06 16:30

EUT:	FM transmitter for iPod m/n: TUN-IP-200005
Manuf:	Micro
Op Cond:	TRANSFER DATA
Operator:	Andy.tan
Test Spec:	Vb 120V/60Hz
Comment:	Tem25% Humi50%
	Sample no.:062732

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	2M	5k	9k	PK+AV	10ms	AUTO LN	OFF
2M	10M	10k	9k	PK+AV	1ms	AUTO LN	OFF
10M	30M	25k	9k	PK+AV	1ms	AUTO LN	OFF

Final Measurement: x QP / + AV
Meas Time: 1 s

Transducer No.	Start	Stop	Name
1	9k	30M	confac