EMC
TEST REPORT

Report No.: **EME-061182**
Model No.: **EF-6630**
Issued Date: **Jan. 26, 2007**

Applicant: **Procare International Co.**
5F., No. 88, Jhou Zih Street, Nei Hu District, Taipei, Taiwan

Test By: **Intertek Testing Services Taiwan Ltd.**
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
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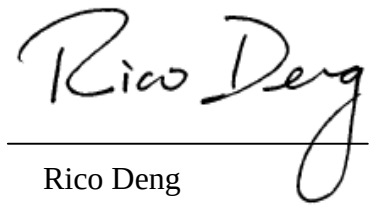
Project Engineer



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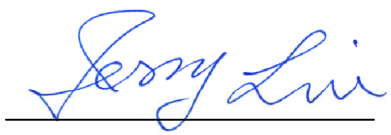
Reviewed By



Jerry Liu

Table of Contents

Summary of Tests

iPod FM Transmitter -Model: EF-6630
FCC ID: POSEF-6630

Test	Reference	Results
Bandwidth of fundamental frequency	15.239(a)	Pass
Field strength of fundamental frequency	15.239(b)	Pass
Radiated emission	15.239(c), 15.209	Pass

1. General information

1.1 Identification of the EUT

Applicant:	Procare International Co.
Product:	iPod FM Transmitter
Model No.:	EF-6630
FCC ID.:	POSEF-6630
Frequency Range:	88.1MHz to 107.9MHz
Channel Number:	199 channels
Frequency of Each Channel:	88.1 + 0.1k MHz, k=0-198
Type of Modulation:	FM
Power Supply:	DC 3V from iPod
Power Cord:	N/A
Sample Received:	Jan. 20, 2007
Test Date(s):	Jan. 22, 2007

A DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is an iPod FM Transmitter, and was defined as information technology equipment.

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain: 0dBm
Antenna Type: PCB Printed
Connector Type: N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
iPod	Apple	A1137	5U606C4KUPR	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.239、§15.207 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was supplied with DC 3V from iPod and was tested in normal operation mode.

The EUT was operated in continuously transmitting status during all the tests.

The configuration of EUT was set up by the Client.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/13/2007
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	07/14/2007
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/13/2007
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC368	05/20/2007
Controller	HDGmbH	N/A	HD 100	EP317-1	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/14/2007
Function Generator	HP	N/A	33120A	EC334	08/27/2007

Note: The above equipments are within the valid calibration period.

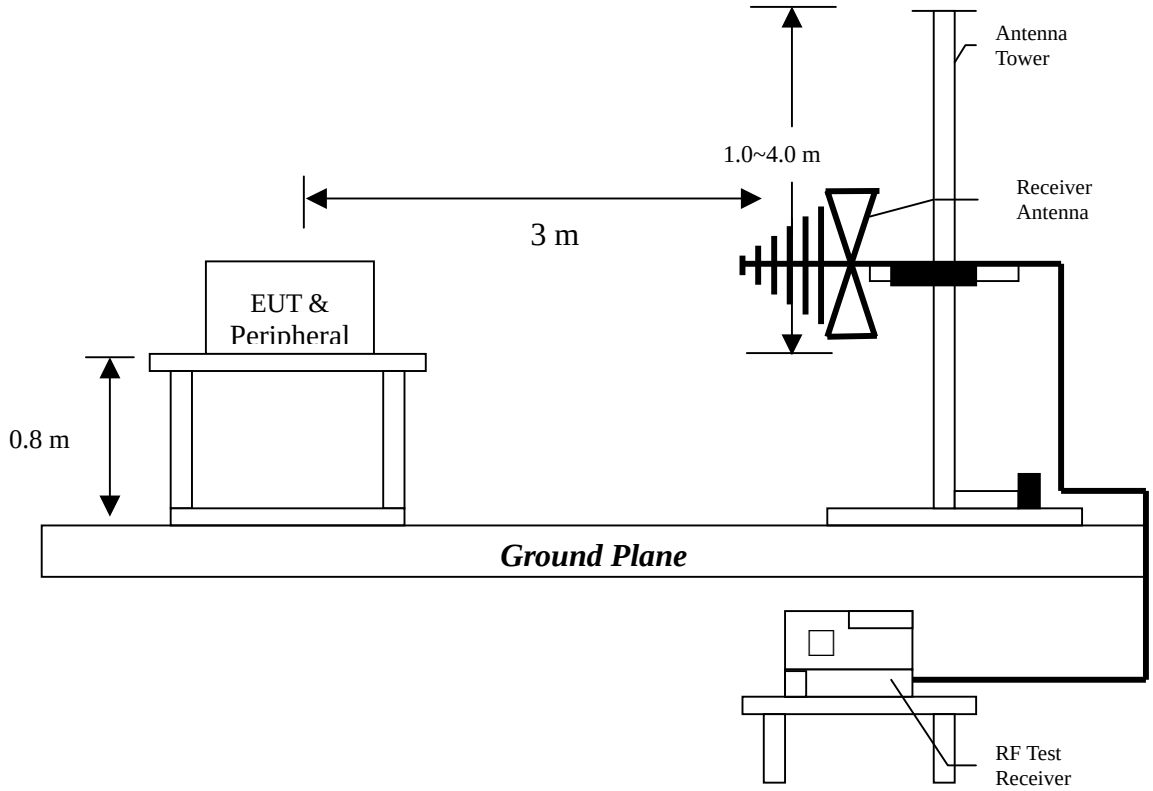
3. Radiated emission test FCC 15.239 (b)/(c)

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	51	%
Atmospheric Pressure:	1023	hPa

3.2 Test setup & procedure

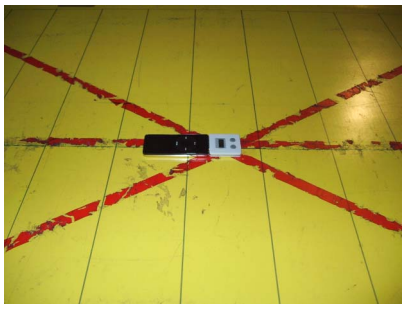
The Diagram below shows the test setup, which is utilized to make these measurements.



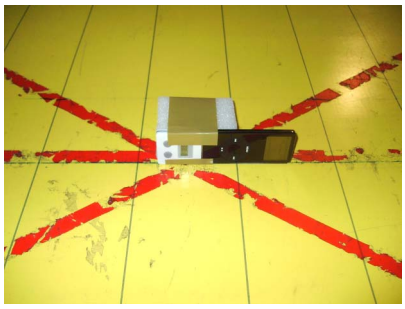
Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The signal is maximized through rotation and placement in the three orthogonal axes.



Setup 1



Setup 2

Setup 3

After verifying three axes, the worst case was occurred at setup 3 configuration. The final test was executed under this configuration and recorded in this report.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental	
	(uV/m@3m)	(dBuV/m@3m)
88-108	250	48

The emission limit above is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

3.3.2 General radiated emission limits

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is ±4.68 dB.

The EUT cannot tune outside the 88.1 - 107.9 MHz band

3.4 Radiated emission test data

3.4.1 Fundamental Radiated Emission Data

EUT : EF-6215
Test Condition : Tx at 88.1Hz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
88.100	PK	V	8.50	26.30	34.79	48.00	-13.21

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

EUT : EF-6215
Test Condition : Tx at 98.0MHz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
98.000	PK	V	7.38	29.88	37.25	48.00	-10.75

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

EUT : EF-6215
Test Condition : Tx at 107.9MHz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
107.900	PK	V	7.64	32.10	39.74	48.00	-8.26

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

3.4.2 Radiated Emission Data

EUT : EF-6630
Test Condition : Tx at 88.1MHz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
175.500	QP	V	14.96	12.30	27.26	43.50	-16.25
262.800	QP	V	12.76	7.10	19.86	46.00	-26.14
406.360	QP	V	16.47	7.50	23.97	46.00	-22.03
528.580	QP	V	19.46	7.33	26.79	46.00	-19.21
586.780	QP	V	20.71	7.57	28.28	46.00	-17.72
658.560	QP	V	21.50	8.54	30.04	46.00	-15.96
41.640	QP	H	14.20	5.72	19.92	40.00	-20.08
142.520	QP	H	13.24	5.61	18.85	43.50	-24.66
175.500	QP	H	13.48	7.03	20.51	43.50	-23.00
338.460	QP	H	14.40	4.41	18.81	46.00	-27.20
359.800	QP	H	15.48	5.20	20.68	46.00	-25.33
553.800	QP	H	19.72	5.12	24.84	46.00	-21.16

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

EUT : EF-6630
Test Condition : Tx at 98 MHz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
194.900	QP	V	12.00	14.80	26.80	43.50	-16.70
293.840	QP	V	13.95	7.71	21.66	46.00	-24.34
489.780	QP	V	18.43	10.37	28.80	46.00	-17.21
586.780	QP	V	20.71	9.99	30.70	46.00	-15.30
658.560	QP	V	21.50	8.36	29.86	46.00	-16.14
683.780	QP	V	22.33	6.74	29.07	46.00	-16.94
41.640	QP	H	14.20	5.63	19.83	40.00	-20.17
142.520	QP	H	13.24	5.24	18.48	43.50	-25.03
194.900	QP	H	11.27	9.18	20.45	43.50	-23.06
454.860	QP	H	18.16	4.68	22.84	46.00	-23.16
586.780	QP	H	20.84	6.38	27.22	46.00	-18.79
619.760	QP	H	20.88	4.82	25.70	46.00	-20.31

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

EUT : EF-6630
Test Condition : Tx at 107.9 MHz with Setup 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
214.300	QP	V	11.65	15.39	27.04	43.50	-16.46
322.940	QP	V	14.10	8.53	22.63	46.00	-23.37
419.940	QP	V	16.47	7.34	23.81	46.00	-22.19
538.280	QP	V	19.46	13.87	33.33	46.00	-12.67
646.920	QP	V	21.53	11.26	32.79	46.00	-13.21
658.560	QP	V	21.50	7.72	29.22	46.00	-16.78
142.520	QP	H	13.24	6.09	19.33	43.50	-24.18
214.300	QP	H	11.10	10.51	21.61	43.50	-21.90
431.580	QP	H	18.12	5.31	23.43	46.00	-22.57
538.280	QP	H	19.65	8.51	28.16	46.00	-17.84
646.920	QP	H	21.55	8.32	29.87	46.00	-16.14
823.460	QP	H	23.62	5.29	28.91	46.00	-17.09

Remark:
1.Corrected Level = Reading + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss

4. Bandwidth of fundamental frequency FCC 15.239(a)

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operation frequency. The 200 kHz band shall lie wholly within the frequency range of 88 – 108 MHz.

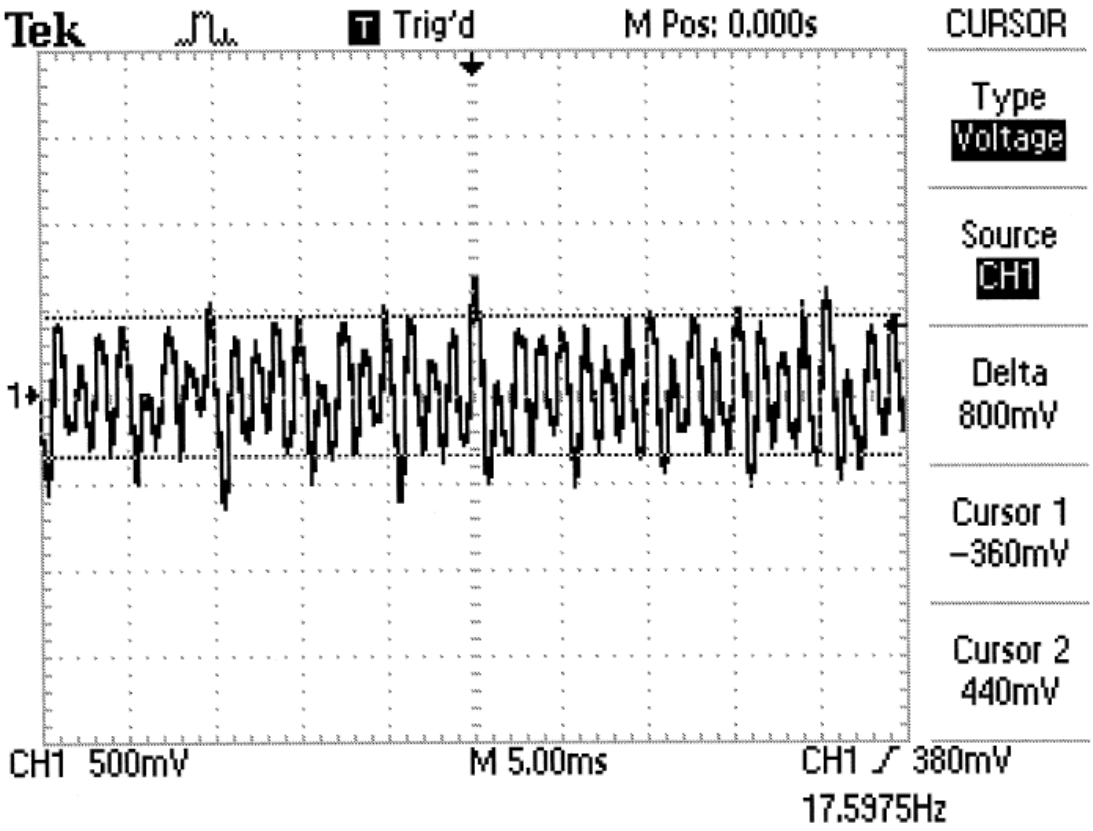
During the test, the EUT was adjusted to work at the lowest, middle and the highest channel.

Audio input was generated from an iPOD to the device and tested under normal operating conditions.

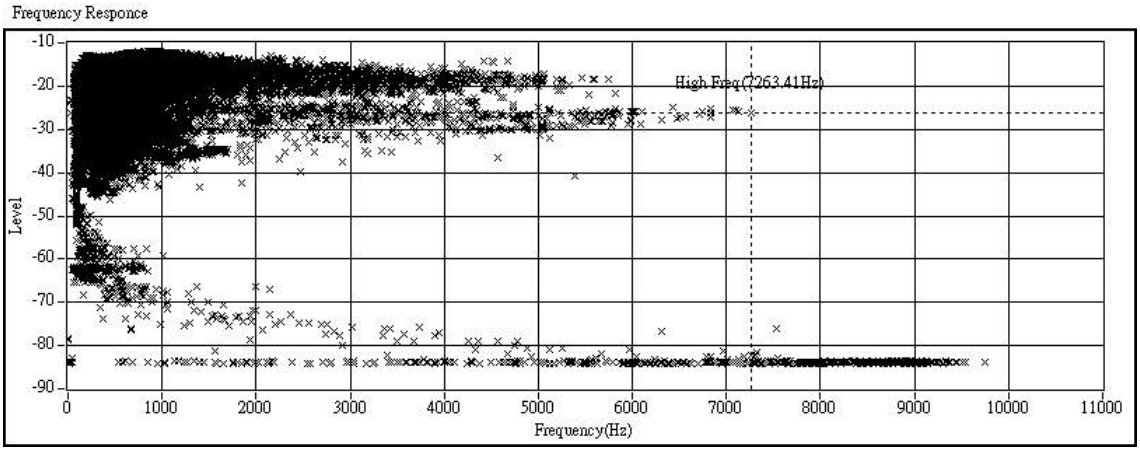
Audio input was generated from an iPOD to the device and tested under normal operating conditions. The maximum audio input from this iPOD was 800mVp-p.

The characteristic of the audio input signal please refer to the plots below.

Maximum Audio input:

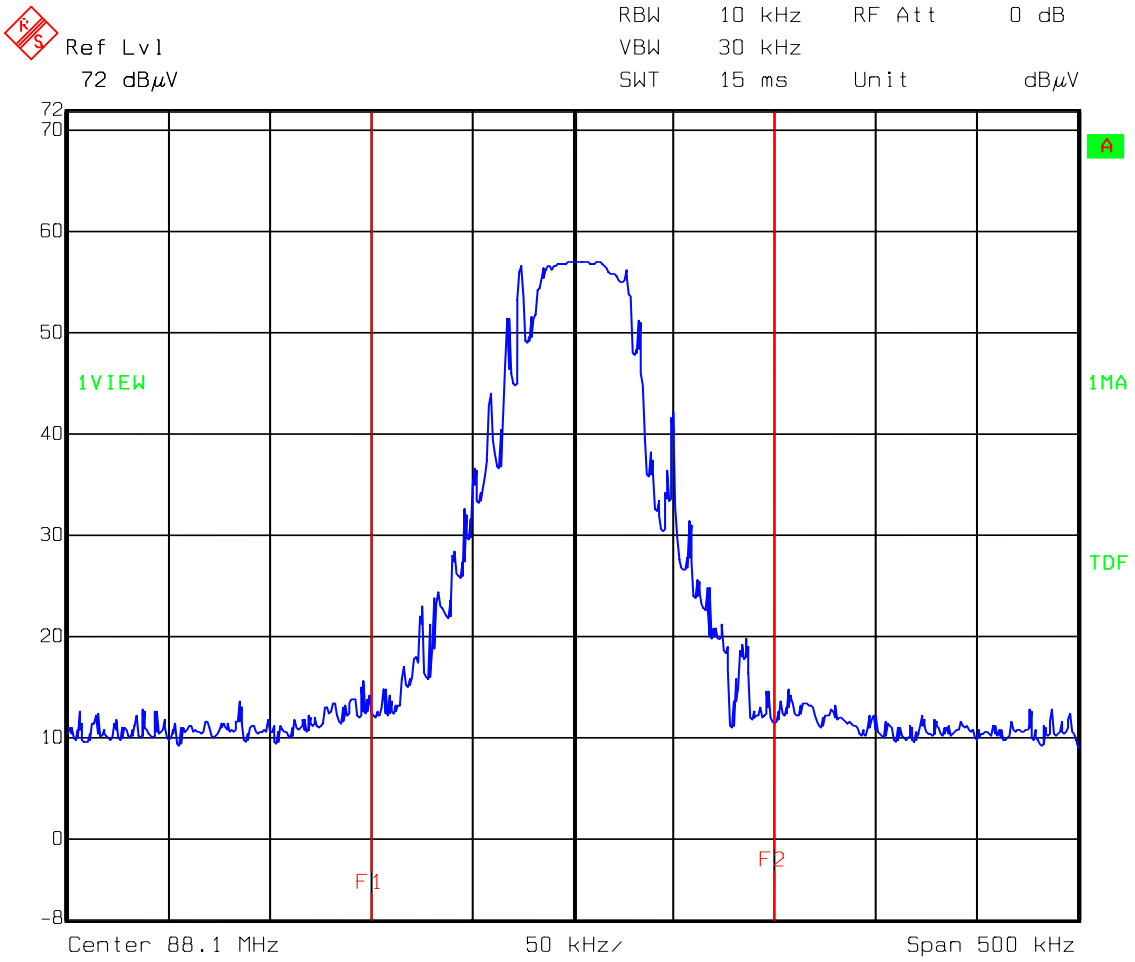


Frequency response of audio input signal:



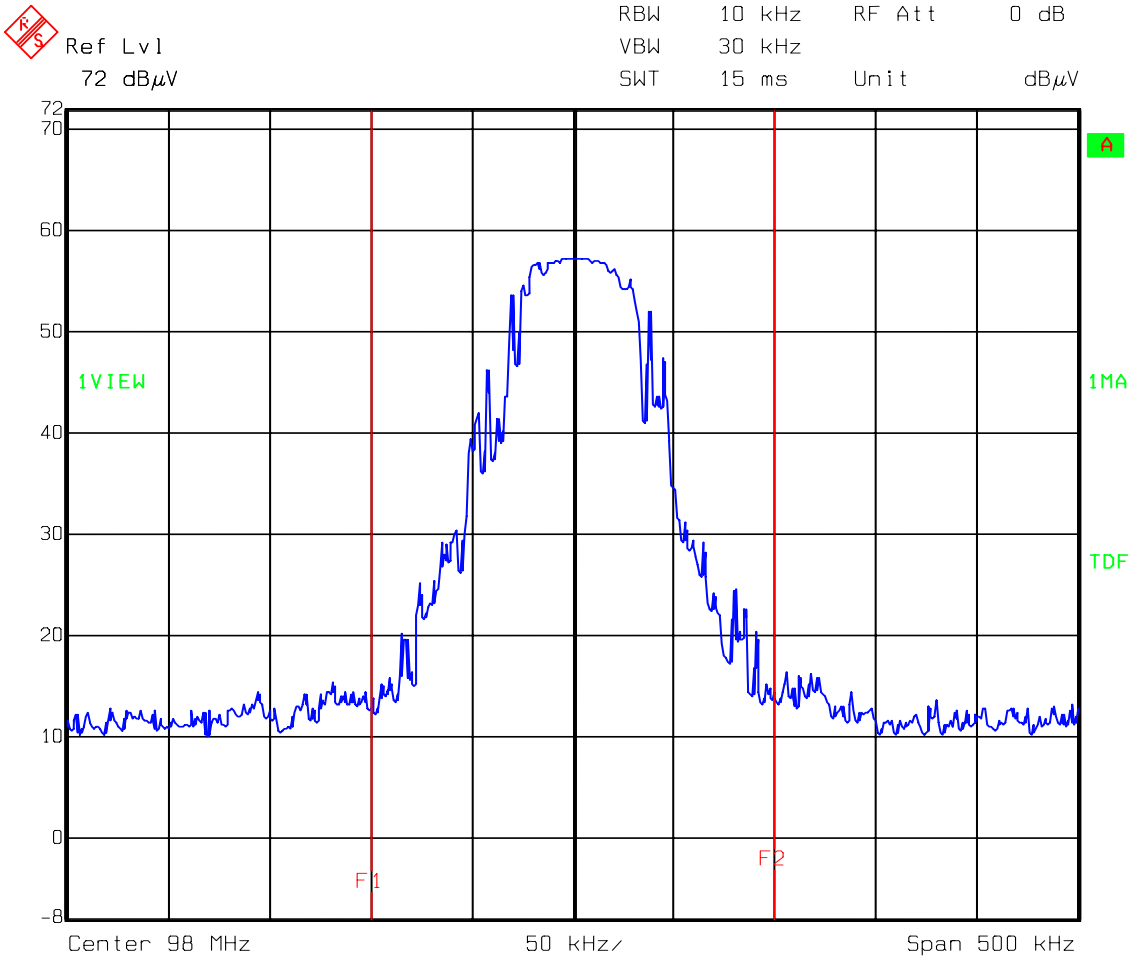
The FM transmitter output is shown in the plots below and meets the requirements of FCC Part 15.239(a).

Test Mode: 88.1 MHz



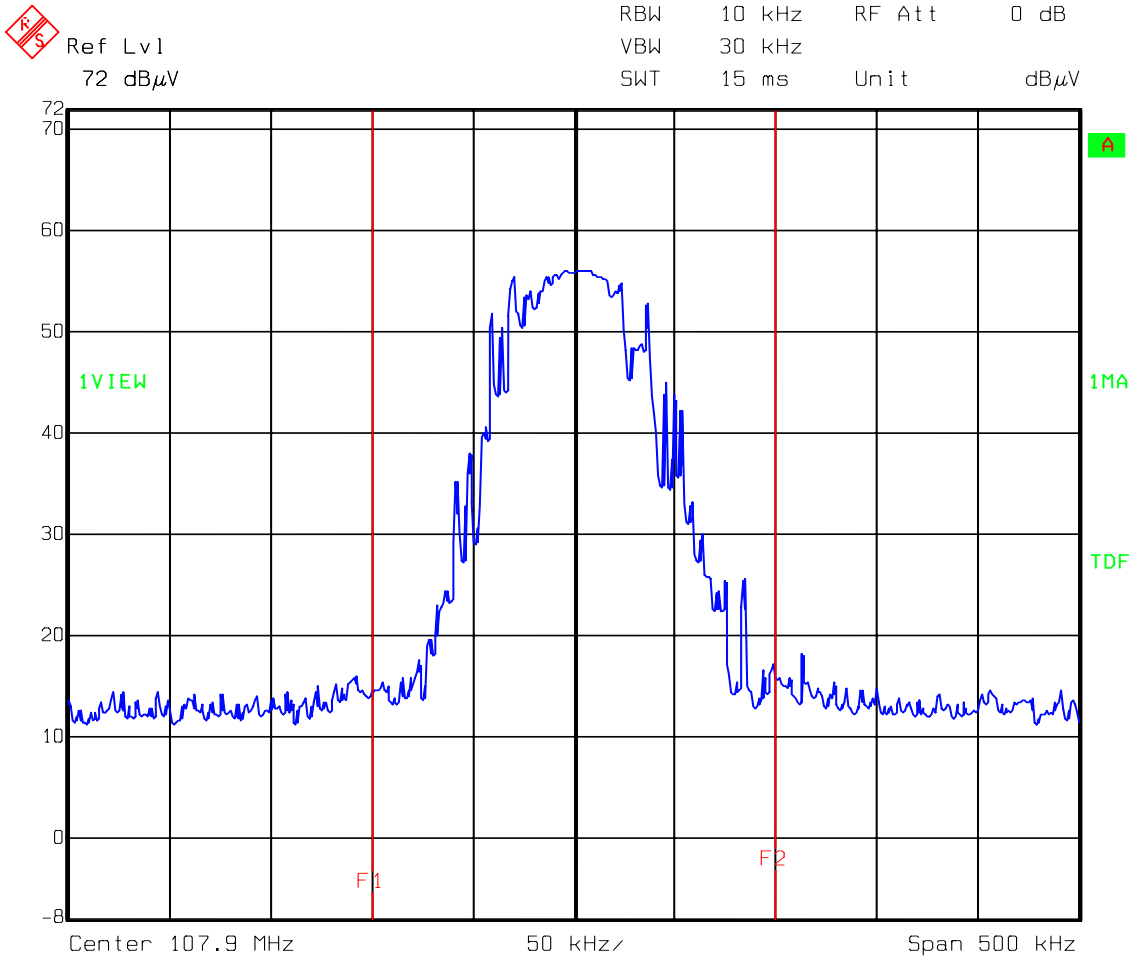
Comment A: 88.1MHz F1=88MHz
Date: 06.FEB.2007 11:05:05

Test Mode: 98 MHz



Comment A: 98MHz
Date: 06.FEB.2007 11:06:28

Test Mode: 107.9 MHz



Comment A: 107.9MHz F2=108MHz
Date: 06.FEB.2007 11:03:00