

FCC CERTIFICATION
On Behalf of
Shenzhen Yifang Digital Technologies Co.,Ltd.

FM-Transmitter
Model No.: XF101

FCC ID: S7JXF101FM

Prepared for : Shenzhen Yifang Digital Technologies Co.,Ltd.
Address : 5/F.,Bldg.H-3, Huaqiaocheng East Industrial Park, No.1
Xiangshan East Rd., Nanshan District, Shenzhen City,
Guangdong, P.R.China
Prepared by : ACCURATE TECHNOLOGY CO. LTD
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Report Number : ATE20061086
Date of Test : June 20, 2006
Date of Report : June 22, 2006

TABLE OF CONTENTS

Description	Page
Test Report Certification	
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT).....	4
1.2. Description of Test Facility	4
1.3. Measurement Uncertainty.....	4
2. MEASURING DEVICE AND TEST EQUIPMENT	5
3. RADIATED EMISSION FOR FCC PART 15 SECTION 15.239(C).....	6
3.1. Block Diagram of Test Setup.....	6
3.2. The Emission Limit for section 15.239(c)	6
3.3. Configuration of EUT on Measurement	7
3.4. Operating Condition of EUT	7
3.5. Test Procedure	7
3.6. The Field Strength of Radiation Emission Measurement Results	8
4. FUNDAMENTAL RADIATED EMISSION FOR FCC PART 15 SECTION 15.239(B)	10
4.1. Block Diagram of Test Setup.....	10
4.2. The Emission Limit For Section 15.239(b)	10
4.3. EUT Configuration on Measurement	11
4.4. Operating Condition of EUT	11
4.5. Test Procedure	11
4.6. The Emission Measurement Result	12
5. OCCUPIED BANDWIDTH FOR FCC PART 15 SECTION 15.239(A)	13
5.1. The Requirement For Section 15.239(a).....	13
5.2. EUT Configuration on Measurement	13
5.3. Operating Condition of EUT	13
5.4. Test Procedure	13
5.5. Test Result	14
APPENDIX I (TEST CURVES) (9pages)	

Test Report Certification

Applicant : Shenzhen Yifang Digital Technologies Co., Ltd.
Manufacturer : Shenzhen Yifang Digital Technologies Co., Ltd.
EUT Description : FM-Transmitter
(A) MODEL NO.: XF101
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: DC 3.0V

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.239: 2004
& ANSI C63.4: 2003

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 Section 15.239 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 : June 20, 2006

Prepared by : 
(Engineer)

Reviewer : 
(Quality Manager)

Approved & Authorized Signer : 
(Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : FM-Transmitter

Model Number : XF101

Power Supply : DC 3.0V

Applicant : Shenzhen Yifang Digital Technologies Co., Ltd.
Address : 5/F., Bldg. H-3, Huaqiaocheng East Industrial Park, No.1
Xiangshan East Rd., Nanshan District, Shenzhen City,
Guangdong, P.R.China

Manufacturer : Shenzhen Yifang Digital Technologies Co., Ltd.
Address : 5/F., Bldg. H-3, Huaqiaocheng East Industrial Park, No.1
Xiangshan East Rd., Nanshan District, Shenzhen City,
Guangdong, P.R.China

Date of sample received : June 16, 2006
Date of Test : June 20, 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

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

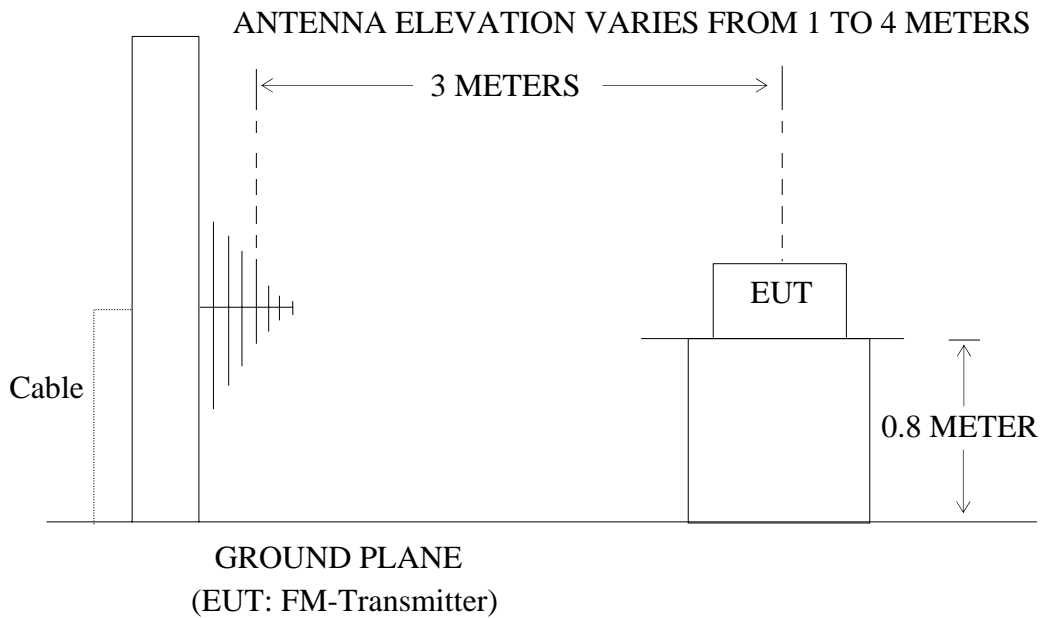
3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



(EUT: FM-Transmitter)

3.1.2. Anechoic Chamber Test Setup Diagram



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,		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands
	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	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 (EUT)

Model Number : XF101
 Serial Number : N/A
 Manufacturer : Shenzhen Yifang Digital Technologies Co., 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 (On with 1kHz signal) measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

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 ESI26) 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:	June 20, 2006	Temperature:	25°C
EUT:	FM-Transmitter	Humidity:	54%
Model No.:	XF101	Power Supply:	DC 3.0V
Test Mode:	TX 88.1MHz	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	176.200	19.1	10.2	29.3	43.5	14.2
Vertical	176.206	8.0	10.2	18.2	43.5	25.3

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:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

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

Date of Test:	June 20, 2006	Temperature:	25°C
EUT:	FM-Transmitter	Humidity:	54%
Model No.:	XF101	Power Supply:	DC 3.0V
Test Mode:	TX 98.1MHz	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	196.100	21.2	10.9	32.1	43.5	11.4
Vertical	196.250	9.7	10.9	20.6	43.5	22.9

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:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

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

Date of Test:	<u>June 20, 2006</u>	Temperature:	<u>25°C</u>
EUT:	<u>FM-Transmitter</u>	Humidity:	<u>54%</u>
Model No.:	<u>XF101</u>	Power Supply:	<u>DC 3.0V</u>
Test Mode:	<u>TX 107.9MHz</u>	Test Engineer:	<u>Andy</u>

Polarization	Frequency (MHz)	Reading(dBμV/m)	Factor Corr.(dB)	Result(dBμV/m)	Limits(dBμV/m)	Margin(dBμV/m)
		QP		QP	QP	QP
Horizontal	215.788	15.5	10.8	26.3	43.5	17.2
Vertical	215.792	6.8	10.8	17.6	43.5	25.9

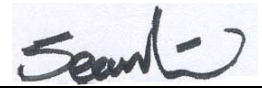
The spectral diagrams in appendix I display the measurement of un-weighted peak values.

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:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

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)

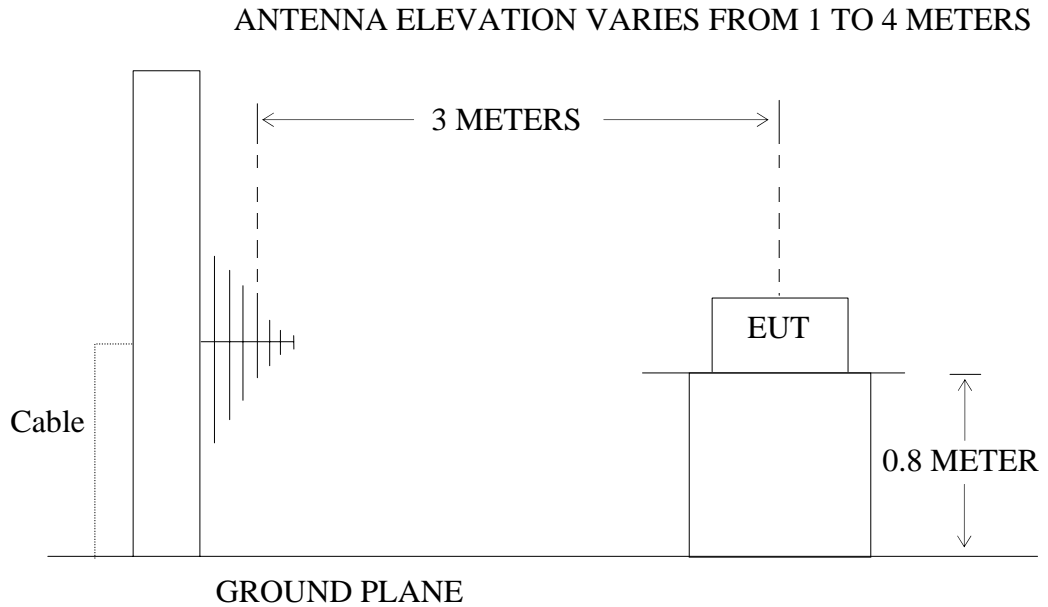
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: FM-Transmitter)

4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: FM-Transmitter)

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 (EUT)

Model Number : XF101
Serial Number : N/A
Manufacturer : Shenzhen Yifang Digital Technologies Co., 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 (On with 1kHz signal) measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

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:	June 20, 2006	Temperature:	25°C
EUT:	FM-Transmitter	Humidity:	54%
Model No.:	XF101	Power Supply:	DC 3.0V
Test Mode:	TX	Test Engineer:	Andy

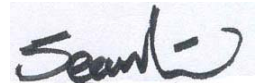
Fundamental Radiated Emissions

Test conditions		Fundamental Frequency	
		88.1MHz	
T _{nom} (22°C)	Unit	(dBμV/m)/ (μ V/m) AV	(dBμV/m)/(μ V/m) PEAK
	Horizontal	44.7/172	48.2/257
	Vertical	34.6/54	38.0/79
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	39.6/95	43.2/145
	Vertical	29.5/30	32.9/44
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	40.6/107	44.3/164
	Vertical	31.4/37	34.6/202
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 (EUT)

Model Number : XF101
Serial Number : N/A
Manufacturer : Shenzhen Yifang Digital Technologies Co., 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 (On with 1kHz signal) measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 98.1M, 107.9MHz TX frequency to transmitted.

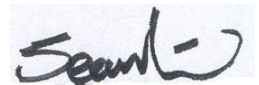
5.4.Test Procedure

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.

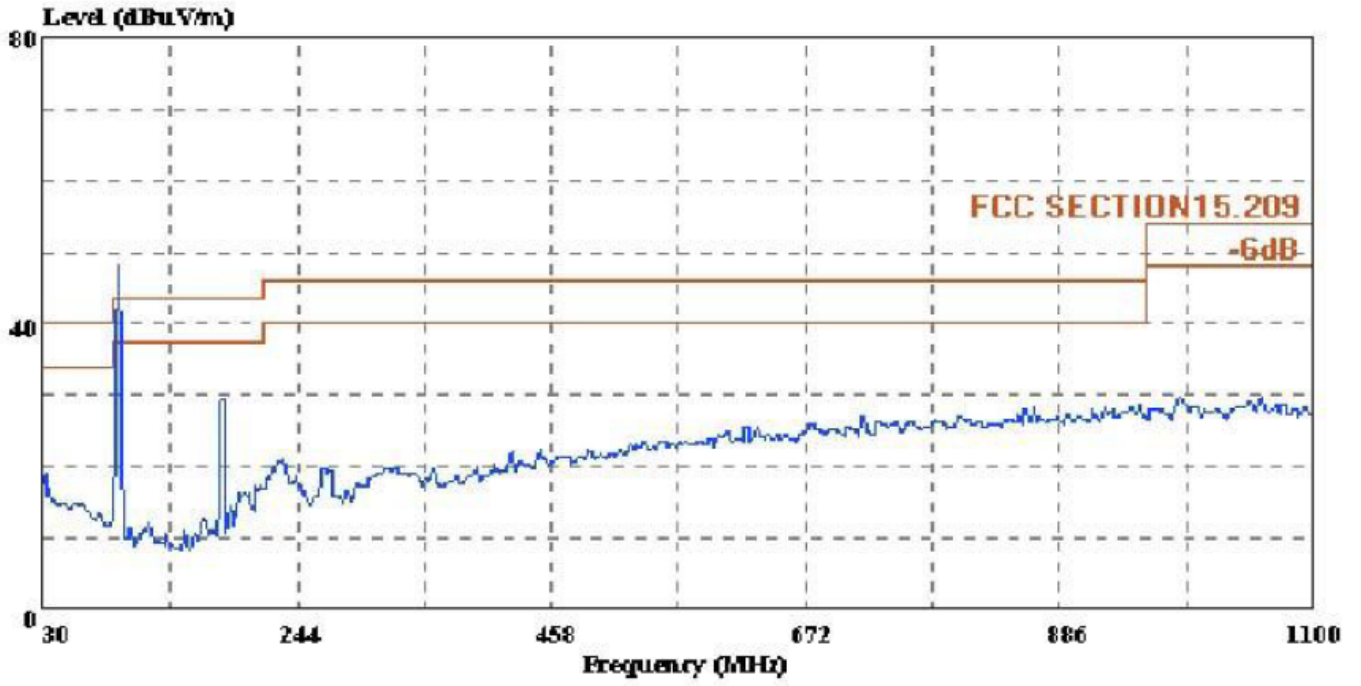
5.5. Test Result

The EUT does meet the FCC requirement.

Reviewer :

A handwritten signature in black ink, appearing to read "Sean", is written over a light grey rectangular background. The signature is positioned above a horizontal line that extends to the right.

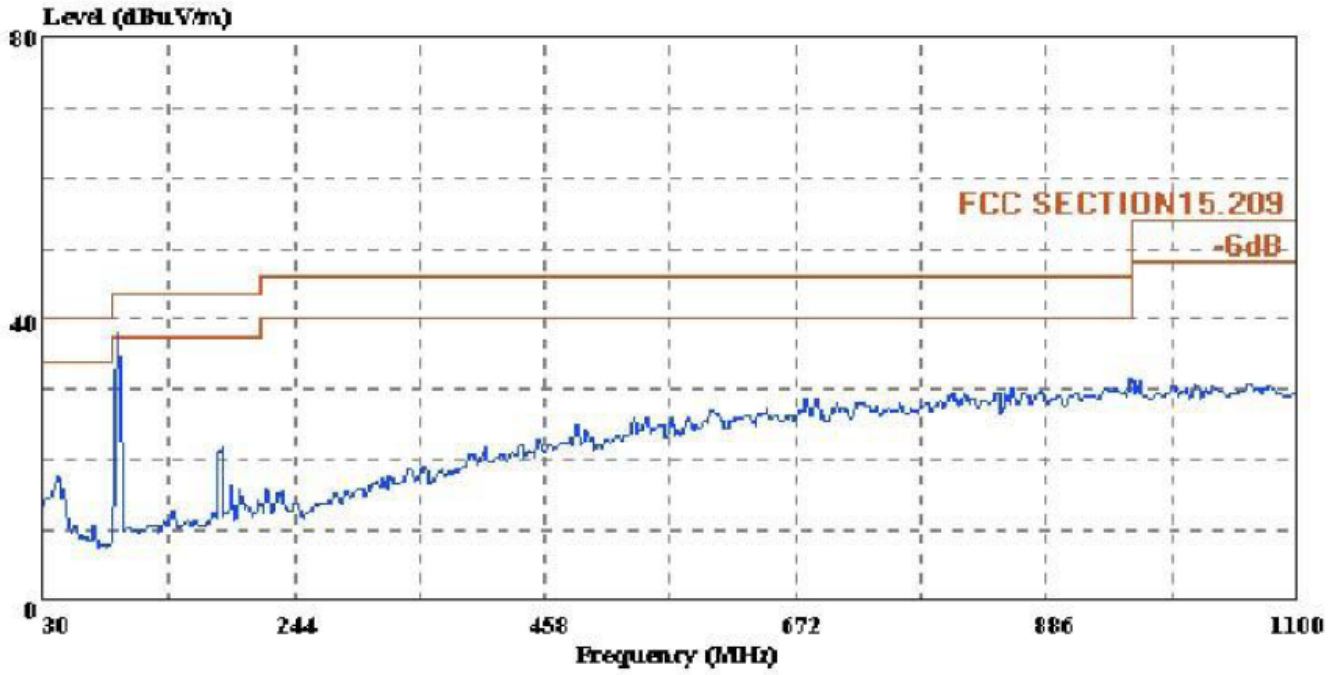
APPENDIX I (Test Curves)



Trace:

Ref Trace:

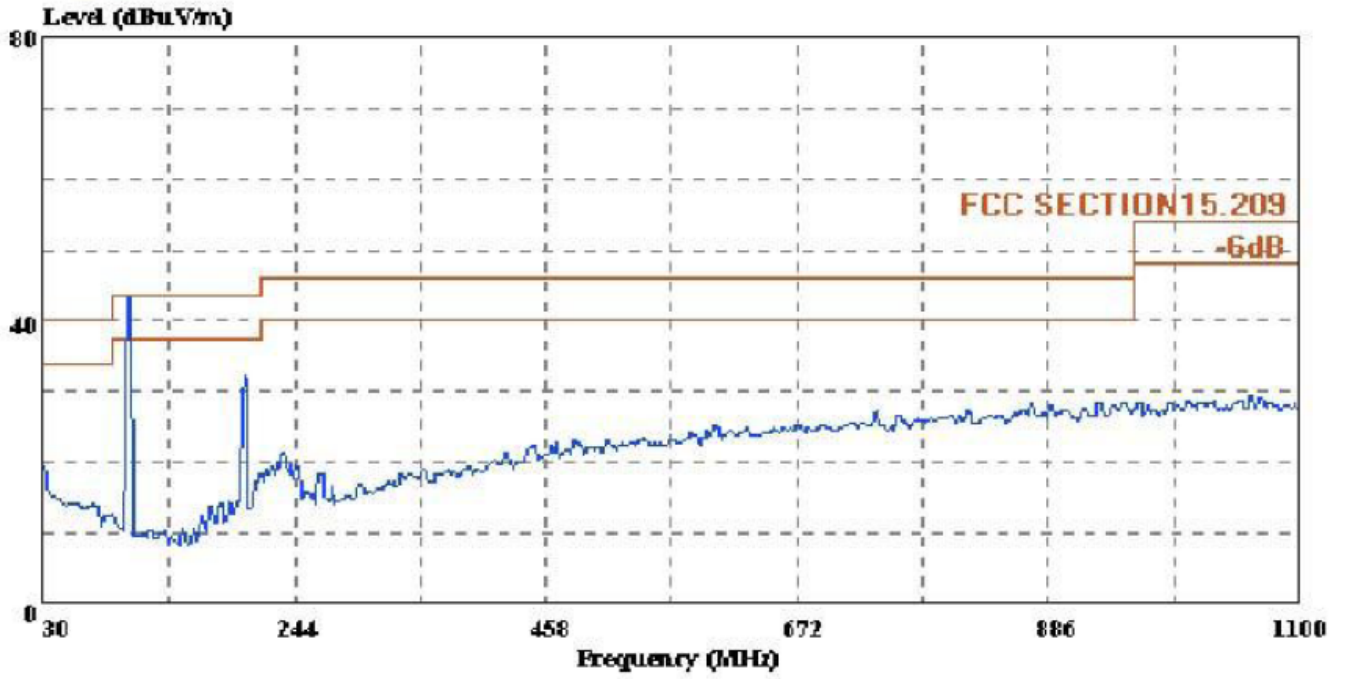
Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 88.1
manuf : YIFANG
sample NO.: 061802



Trace:

Ref Trace:

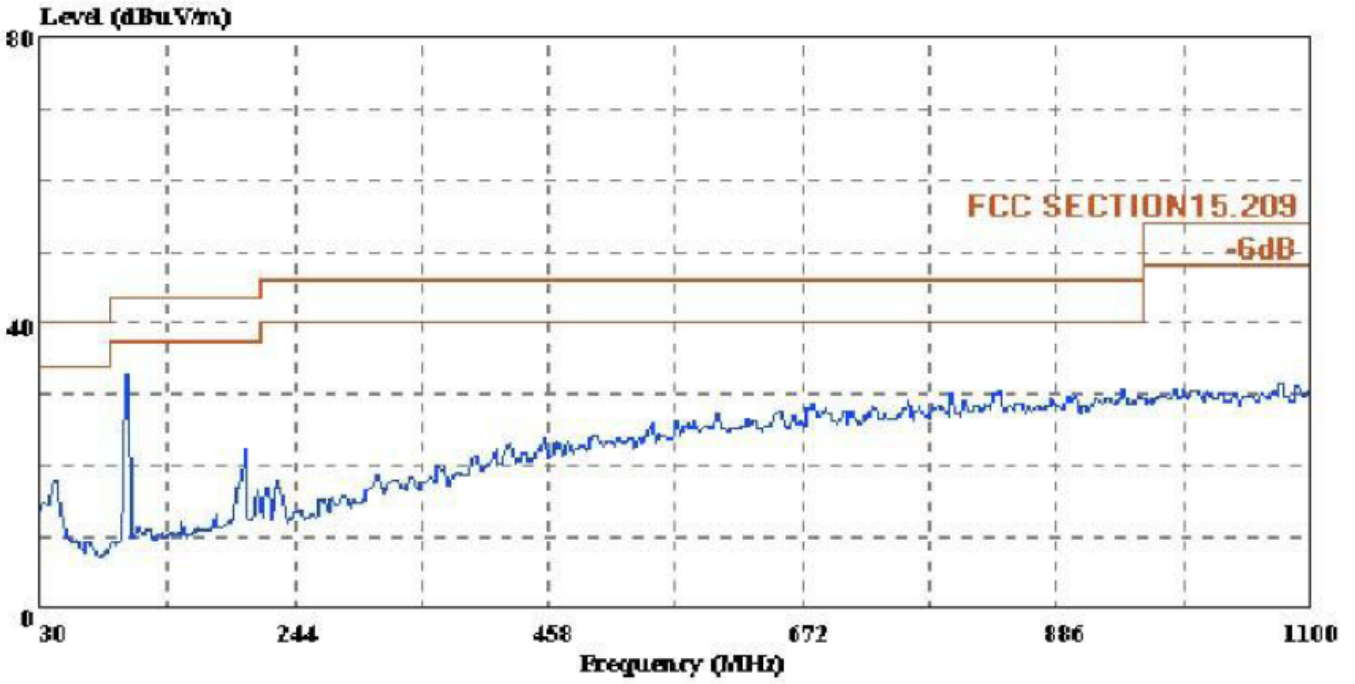
Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 88.1
manuf : YIFANG
sample NO.: 061802



Trace:

Ref Trace:

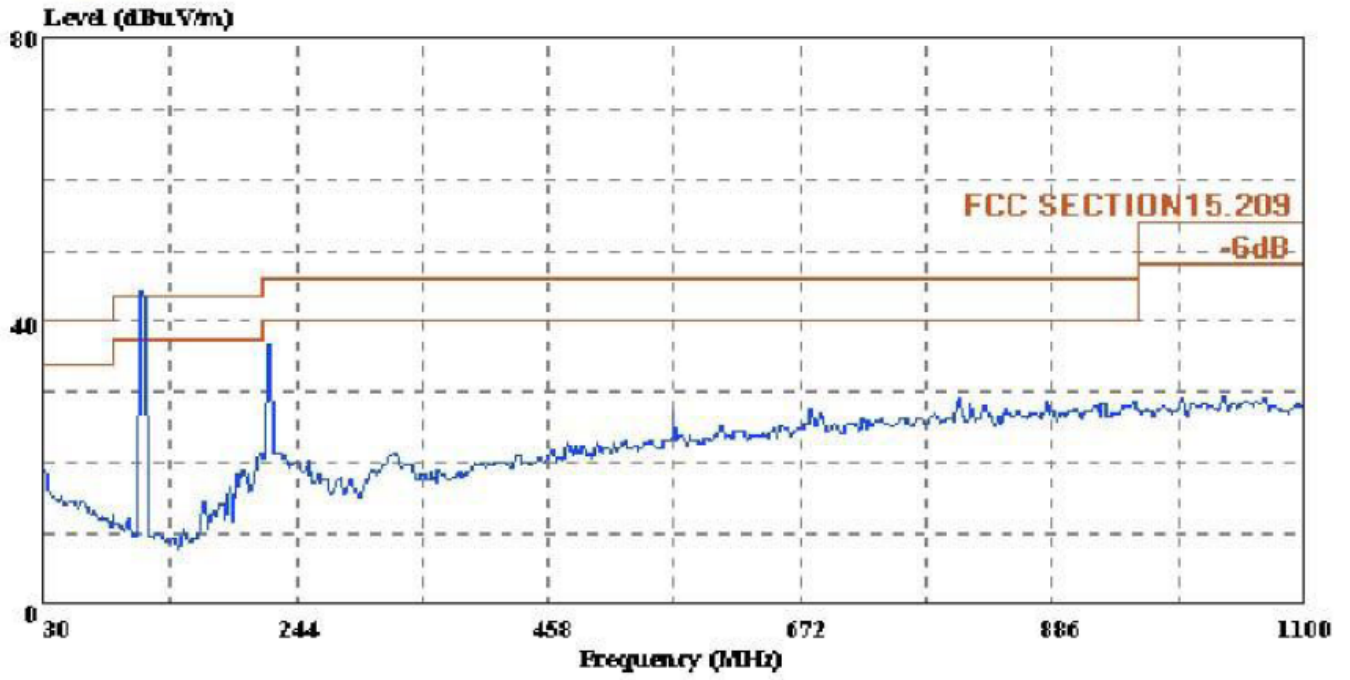
Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 98.1
manuf : YIFANG
sample NO.: 061802



Trace:

Ref Trace:

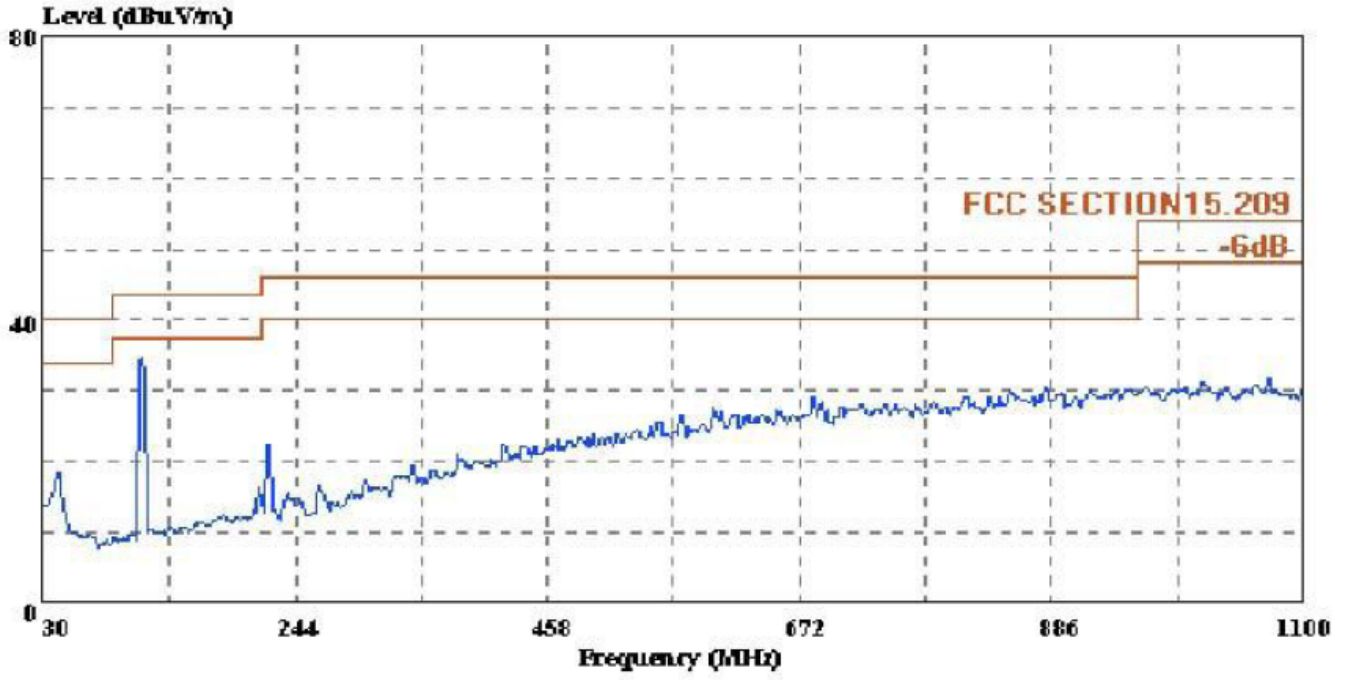
Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 98.1
manuf : YIFANG
sample NO.: 061802



Trace:

Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA HORIZONTAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 107.9
manuf : YIFANG
sample NO.: 061802



Trace:

Ref Trace:

Condition: FCC SECTION15.209 3m ATC FCC15C ANTENNA VERTICAL
eut : FM-Transmitter m/n:XF101
power : DC 3.0V
memo : FM 107.9
manuf : YIFANG
sample NO.: 061802

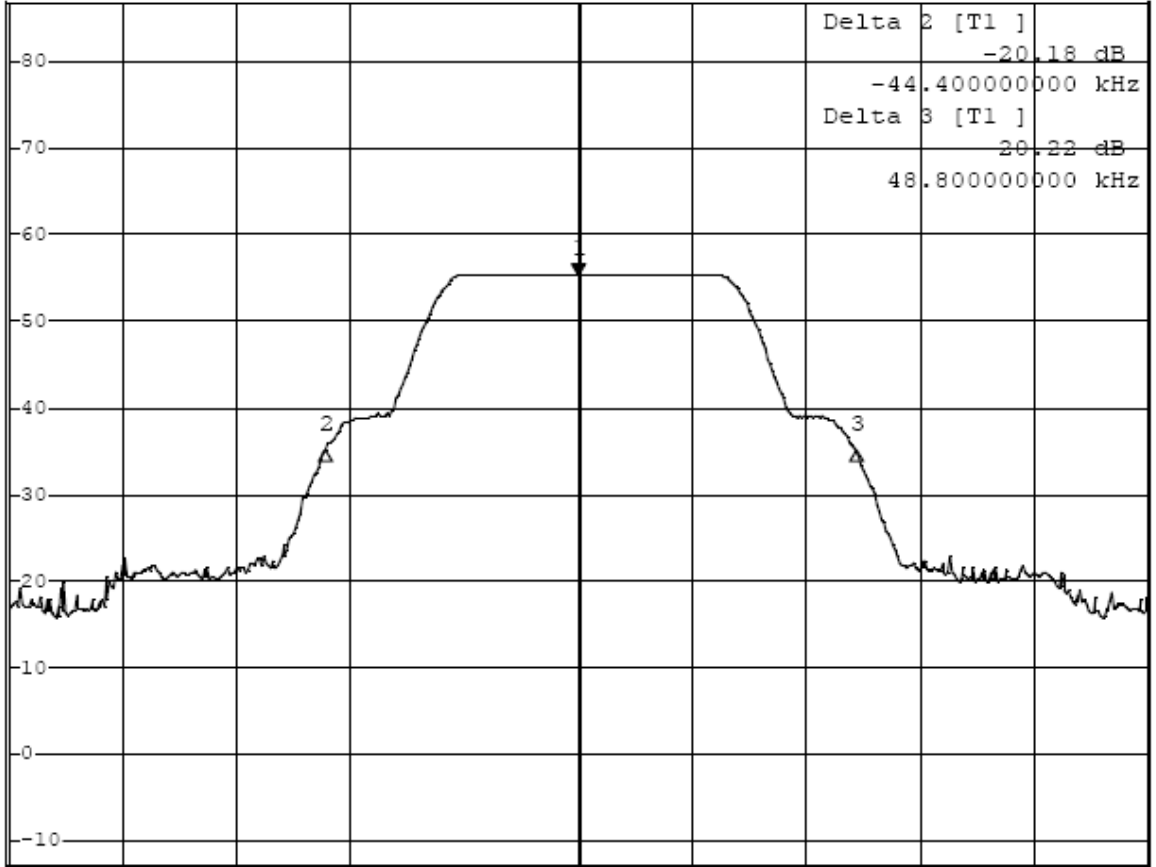


*RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 55.41 dBuV
*SWT 50 ms 88.100000000 MHz

Ref 87 dBuV

*Att 0 dB

1 PK
VIEW



B

PRN

Center 88.1 MHz

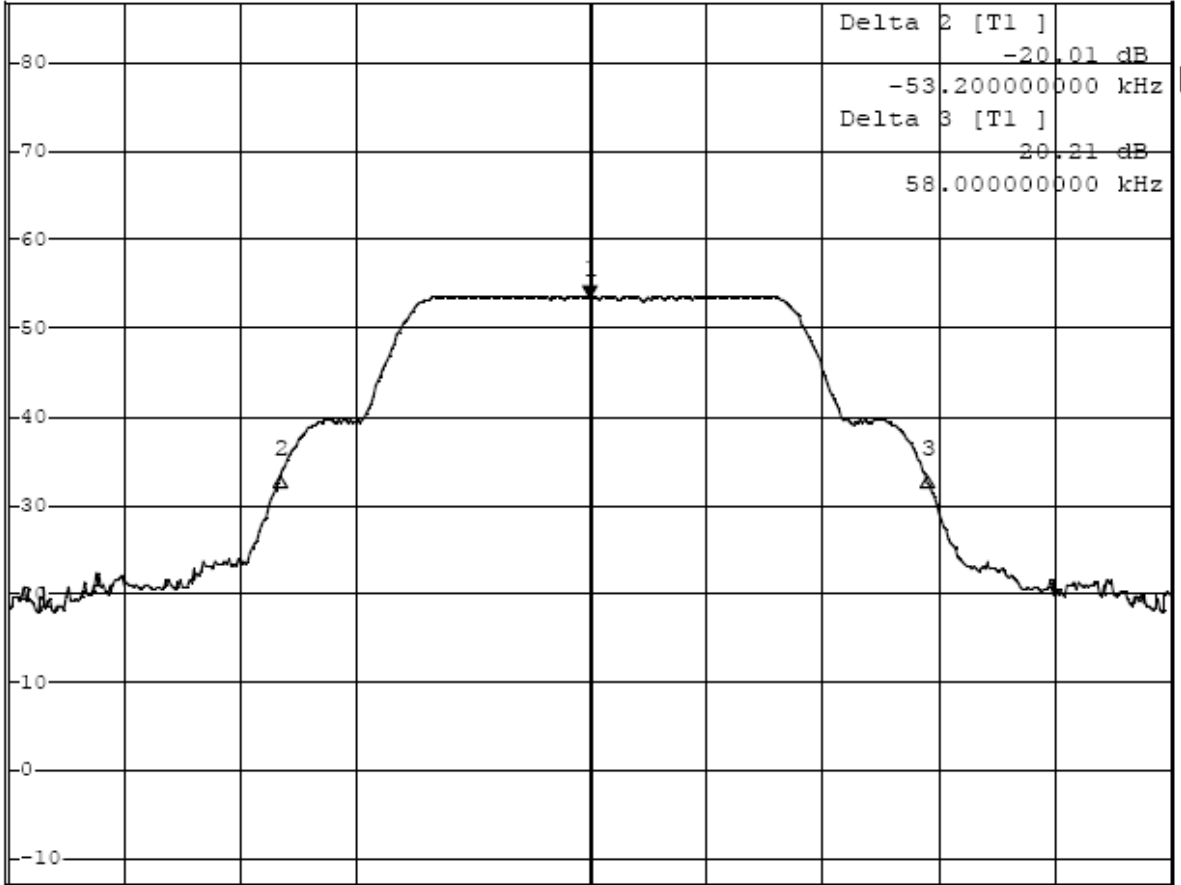
20 kHz/

Span 200 kHz



Ref 87 dBuV *Att 0 dB *RBW 10 kHz Marker 1 [T1] 53.44 dBuV
*VBW 10 kHz *SWT 50 ms 98.100000000 MHz

1 PK
VIEW



Center 98.1 MHz 20 kHz/ Span 200 kHz

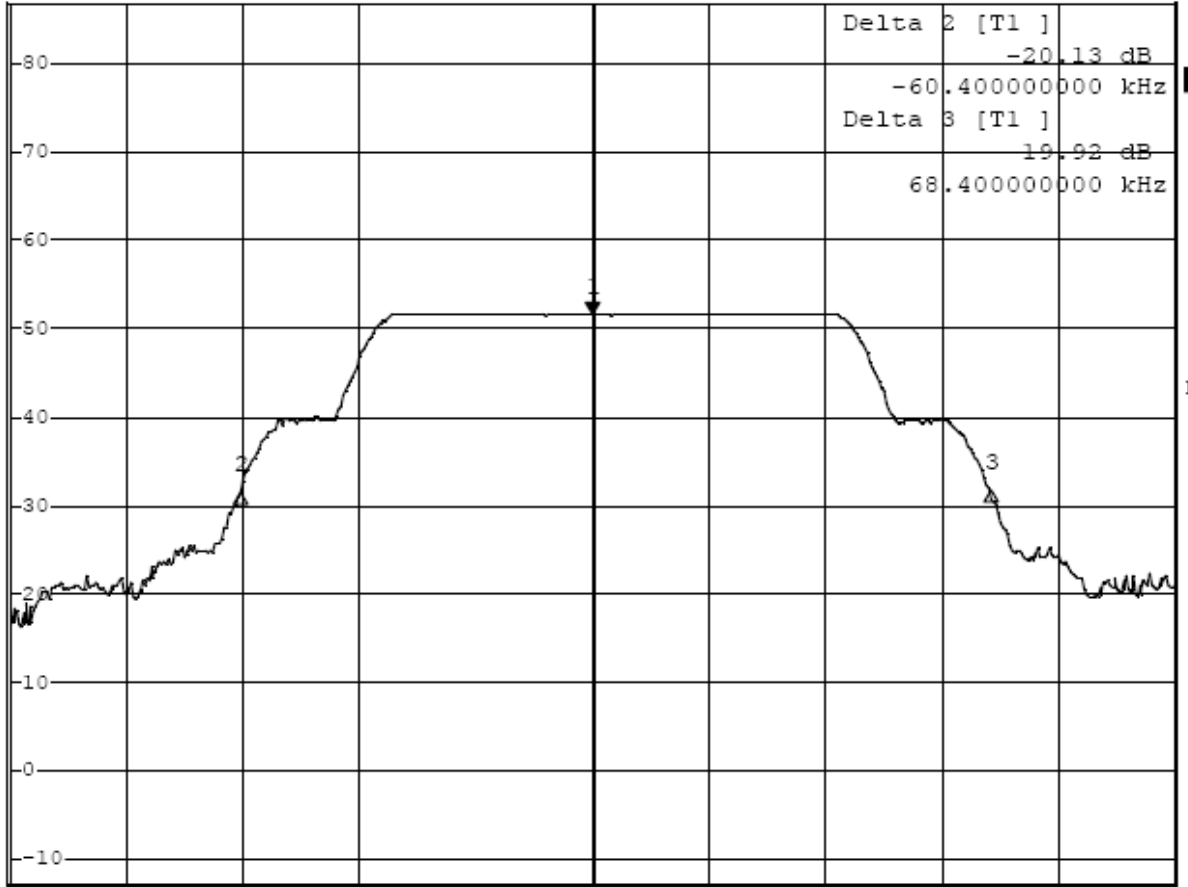


*RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 51.61 dBμV
*SWT 50 ms 107.900000000 MHz

Ref 87 dBμV

*Att 0 dB

1 PK
VIEW



B

PRN

Center 107.9 MHz

20 kHz/

Span 200 kHz