FCC CERTIFICATION
On Behalf of
SENDSTATION SYSTEMS

FM Transmitter
Model No.: JH-CMWT10401

FCC ID: TQMFM875

Prepared for	:	Best Talent Industrial Limited
Address	:	Kehui Industrial Region, Huachang Road, Longhua Town, Shenzhen, Guangdong, China
Prepared by	:	ACCURATE TECHNOLOGY CO. LTD
Address	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report Number	:	ATE20051774
Date of Test	:	October 22, 2005
Date of Report	:	October 24, 2005

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) (6pages)

Test Report Certification

Applicant	:	Best Talent Industrial Limited
Manufacturer	:	Best Talent Industrial Limited
EUT Description	:	FM Transmitter
		(A) MODEL NO.: JH-CMWT10401
		(B) SERIAL NO.: N/A
		(C) POWER SUPPLY: 12V DC

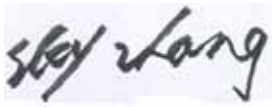
Measurement Procedure Used:

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 Section15.239 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.

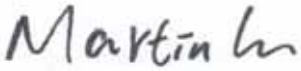
Date of Test : October 22, 2005

Prepared by : 

(Engineer)

Reviewer : 

(Quality Manager)

Approved & Authorized Signer : 

(Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	FM Transmitter
Model Number	:	JH-CMWT10401
Power Supply	:	12V DC
Applicant	:	Best Talent Industrial Limited
Address	:	Kehui Industrial Region, Huachang Road, Longhua Town, Shenzhen, Guangdong, China
Manufacturer	:	Best Talent Industrial Limited
Address	:	Kehui Industrial Region, Huachang Road, Longhua Town, Shenzhen, Guangdong, China
Date of sample received	:	October 20, 2005
Date of Test	:	October 22, 2005

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 Uncertainty = ±2.66dB

Radiated Emission Uncertainty = ±4.26dB

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	01.02.2006
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.02.2006
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	01.02.2006
Horn Antenna	Rohde&Schwarz	HF906	100013	01.02.2006
Spectrum Analyzer	Anritsu	MS2651B	6200238856	01.02.2006
Pre-Amplifier	Agilent	8447D	2944A10619	01.02.2006
Signal Generator	GW	GAG-810	0913317	01.02.2006

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

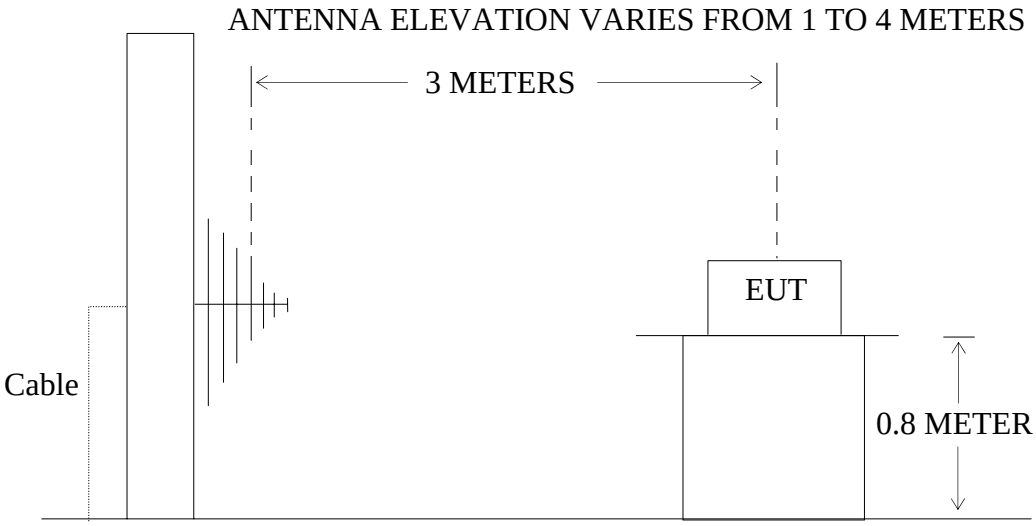
3.1.Block Diagram of Test Setup

3.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: FM Transmitter)

3.1.2.Anechoic Chamber Test Setup Diagram



(EUT: FM Transmitter)

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
30 - 88	100	40	
88 - 216	150	43.5	

216 - 960	200	46	frequency bands 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 : JH-CMWT10401
Serial Number : N/A
Manufacturer : Best Talent Industrial Limited

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, 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:	October 22, 2005	Temperature:	22°C
EUT:	FM Transmitter	Humidity:	50%
Model No.:	JH-CMWT10401	Power Supply:	12V DC
Test Mode:	TX 88.1MHz	Test Engineer:	Andy

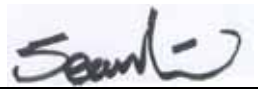
Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	176.2	22.9	16.1	39.0	43.5	4.5
Horizontal	264.3	16.3	20.0	36.3	46.0	9.7
Horizontal	352.4	13.1	22.0	35.1	46.0	10.9
Horizontal	440.5	10.0	23.3	33.3	46.0	12.7
Horizontal	528.6	7.0	25.0	32.0	46.0	14.0
Horizontal	616.7	7.2	25.3	32.5	46.0	13.5
Vertical	176.2	20.1	19.1	39.2	43.5	4.3
Vertical	264.3	13.2	22.5	35.7	46.0	10.3
Vertical	352.4	11.0	24.5	35.5	46.0	10.5
Vertical	440.5	10.0	26.2	36.2	46.0	9.8
Vertical	528.6	7.1	26.7	33.8	46.0	12.2
Vertical	616.7	7.1	28.3	35.4	46.0	10.6
Vertical	704.8	4.0	29.2	33.2	46.0	12.8

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 **:** 

Date of Test:	October 22, 2005	Temperature:	22°C
EUT:	FM Transmitter	Humidity:	50%
Model No.:	JH-CMWT10401	Power Supply:	12V DC
Test Mode:	TX 107.9MHz	Test Engineer:	Andy

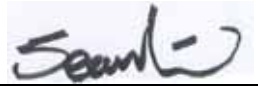
Polarization	Frequency (MHz)	Reading(dBμV/m) QP	Factor Corr.(dB)	Result(dBμV/m) QP	Limits(dBμV/m) QP	Margin(dBμV/m) QP
Horizontal	215.8	19.0	19.5	38.5	43.5	5.0
Horizontal	323.7	14.1	21.3	35.4	46.0	10.6
Horizontal	431.6	11.0	23.3	34.3	46.0	11.7
Horizontal	539.5	8.0	25.3	33.3	46.0	12.7
Horizontal	755.3	6.7	26.4	33.1	46.0	12.9
Vertical	215.8	17.9	20.0	37.9	43.5	5.6
Vertical	323.7	10.1	23.7	33.8	46.0	12.2
Vertical	431.6	7.0	25.8	32.8	46.0	13.2
Vertical	539.5	8.0	26.7	34.7	46.0	11.3
Vertical	755.2	4.0	29.5	33.5	46.0	12.5

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)

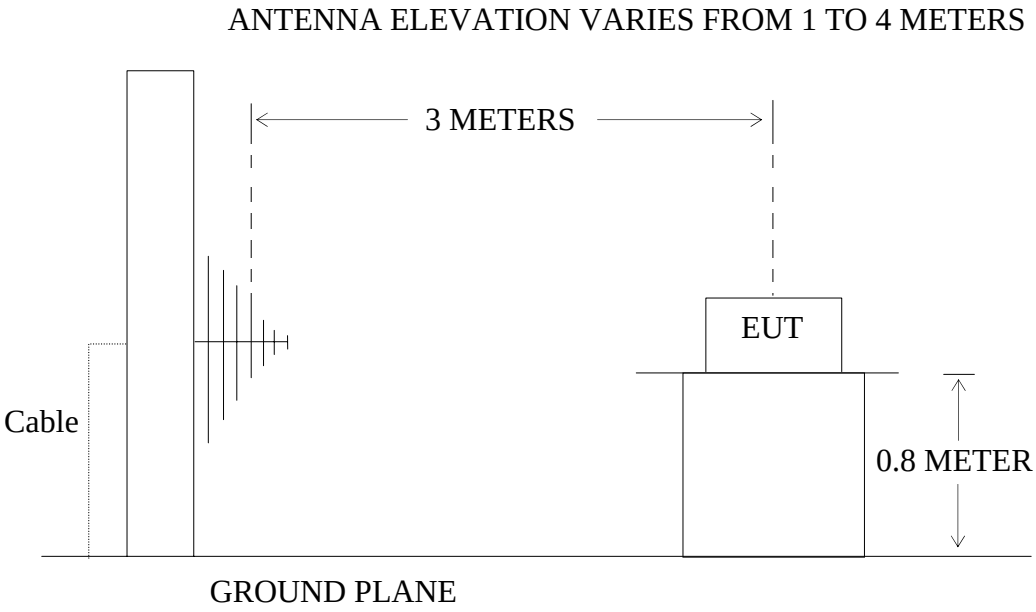
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(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	**:**	JH-CMWT10401
Serial Number	**:**	N/A
Manufacturer	**:**	Best Talent Industrial Limited

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, 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

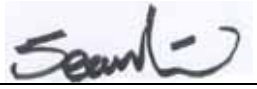
PASS.

Date of Test:	October 22, 2005	Temperature:	22°C
EUT:	FM Transmitter	Humidity:	50%
Model No.:	JH-CMWT10401	Power Supply:	12V DC
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	40.7/108	56.5/668
	Vertical	41.0/112	56.7/684
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	42.5/133	57.7/767
	Vertical	43.1/143	59.3/923
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	**:**	JH-CMWT10401
Serial Number	**:**	N/A
Manufacturer	**:**	Best Talent Industrial Limited

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.

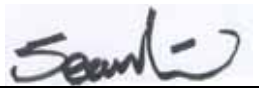
Let the EUT work in TX modes (On with 1kHz signal) measure it. The transmit frequency are 88.1-107.9MHz.We are select 88.1M, 107.9MHz TX frequency to transmitted.

5.4.Test Procedure

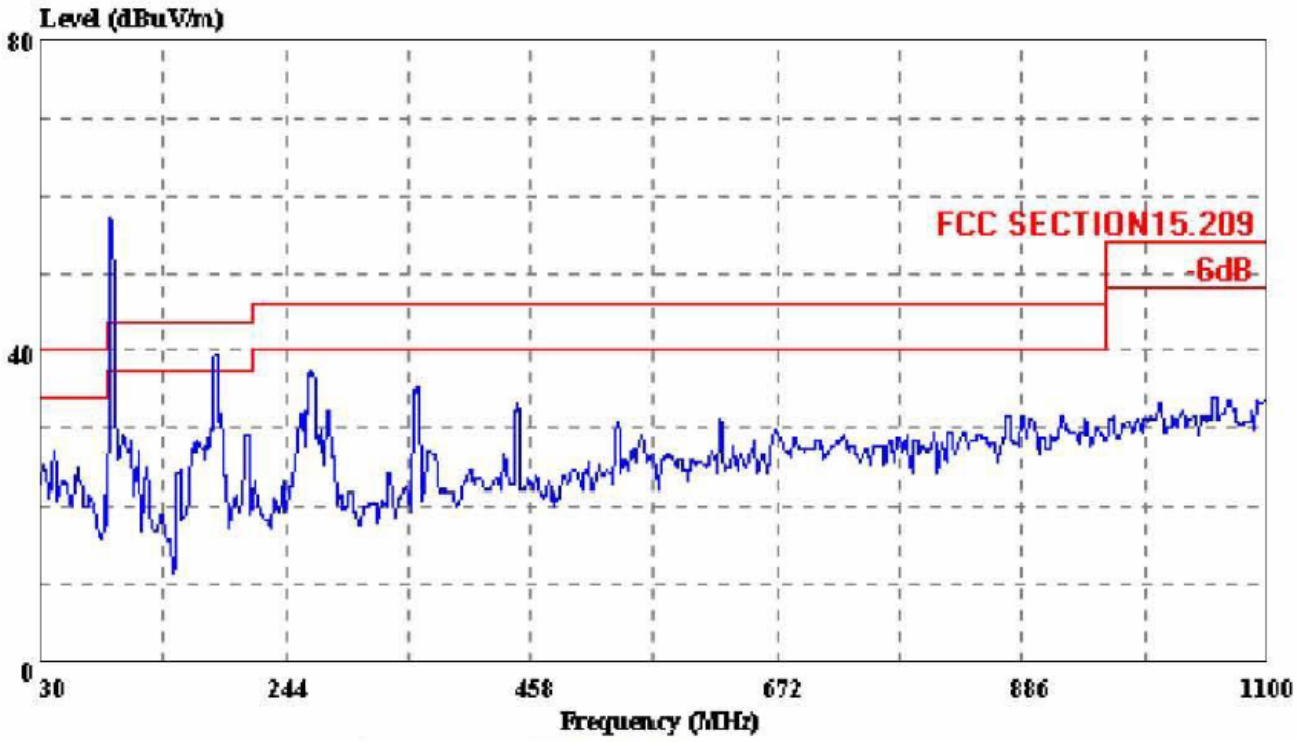
The zero level was set without modulation. A small sample of the transmitter output was fed into the spectrum analyzer and above photo was taken. The vertical scale is set to 10dB per division; the horizontal scale is set to 20kHz per division.

5.5. Test Result

The EUT does meet the FCC requirement.

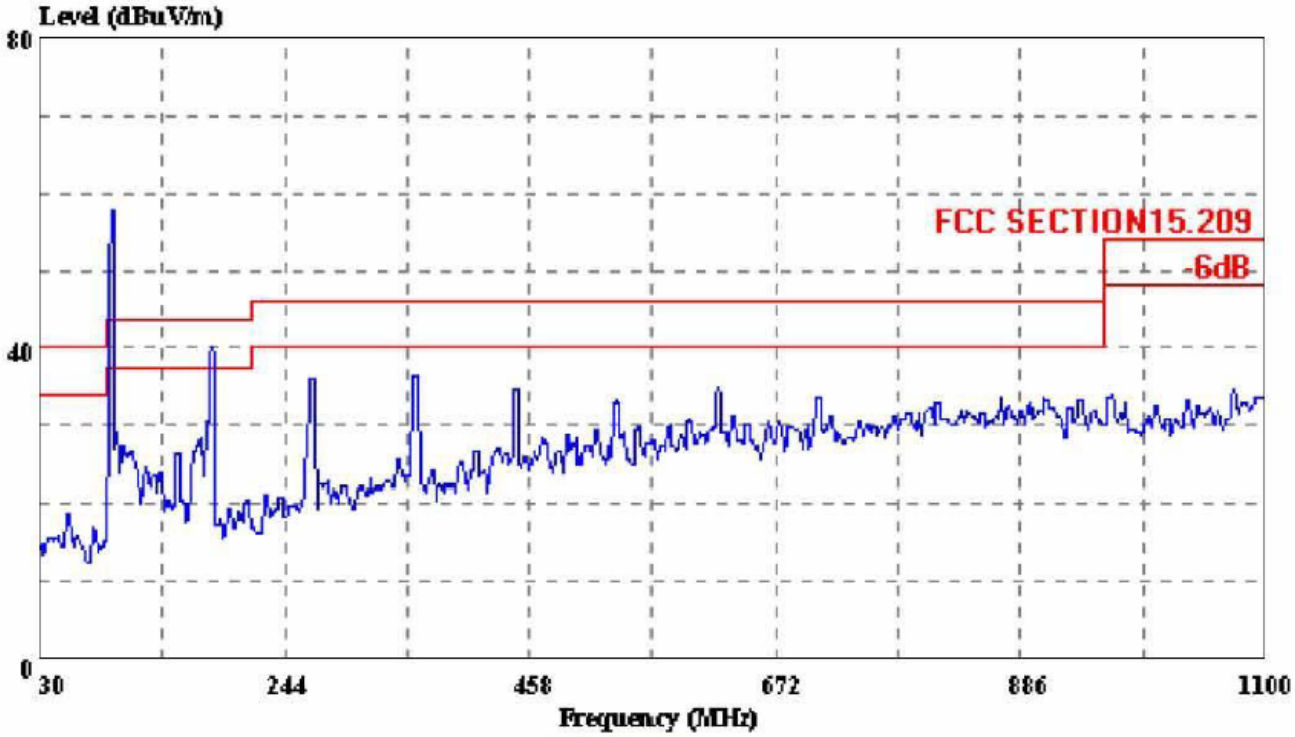
Reviewer **:** 

APPENDIX I
(Test Curves)



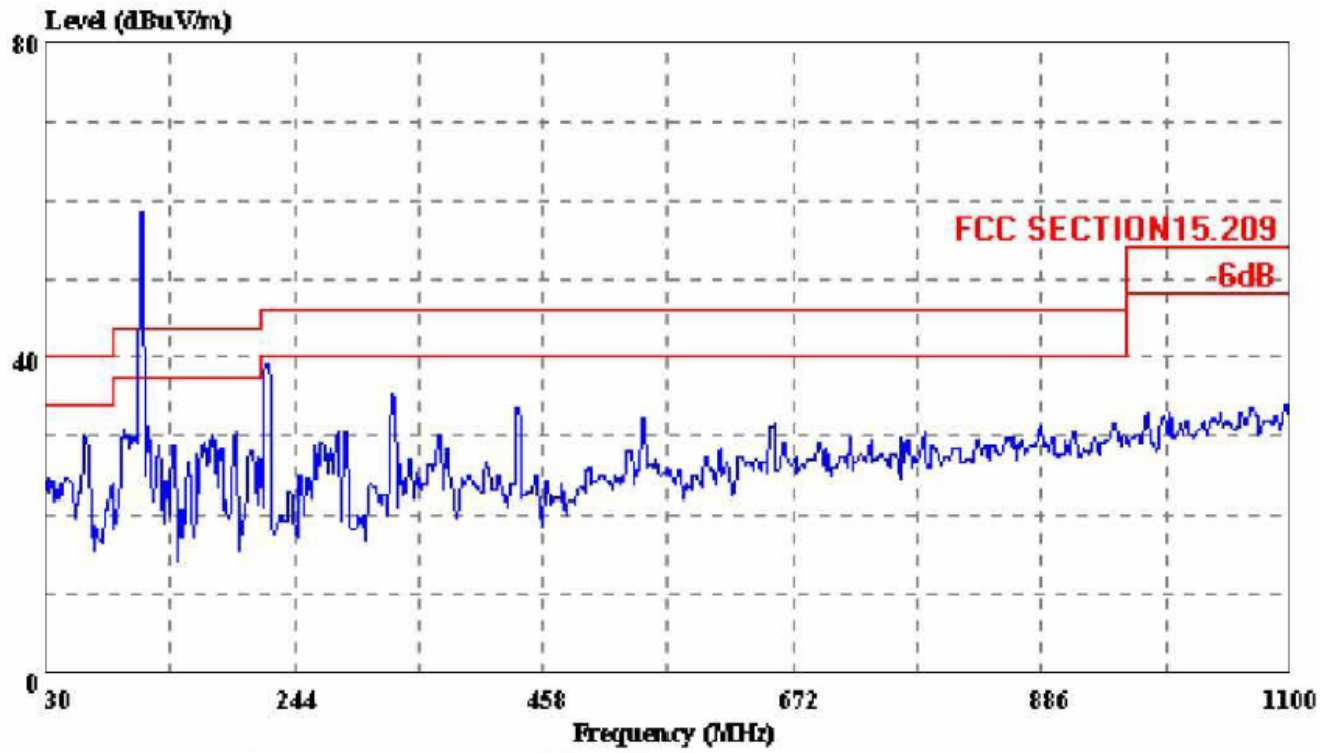
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m HORIZONTAL
eut : FM transmitter m/n:JH-CMWT10401
power: DC 12.0V
memo : TX(88.1MHz)
manuf: BEST TALENT



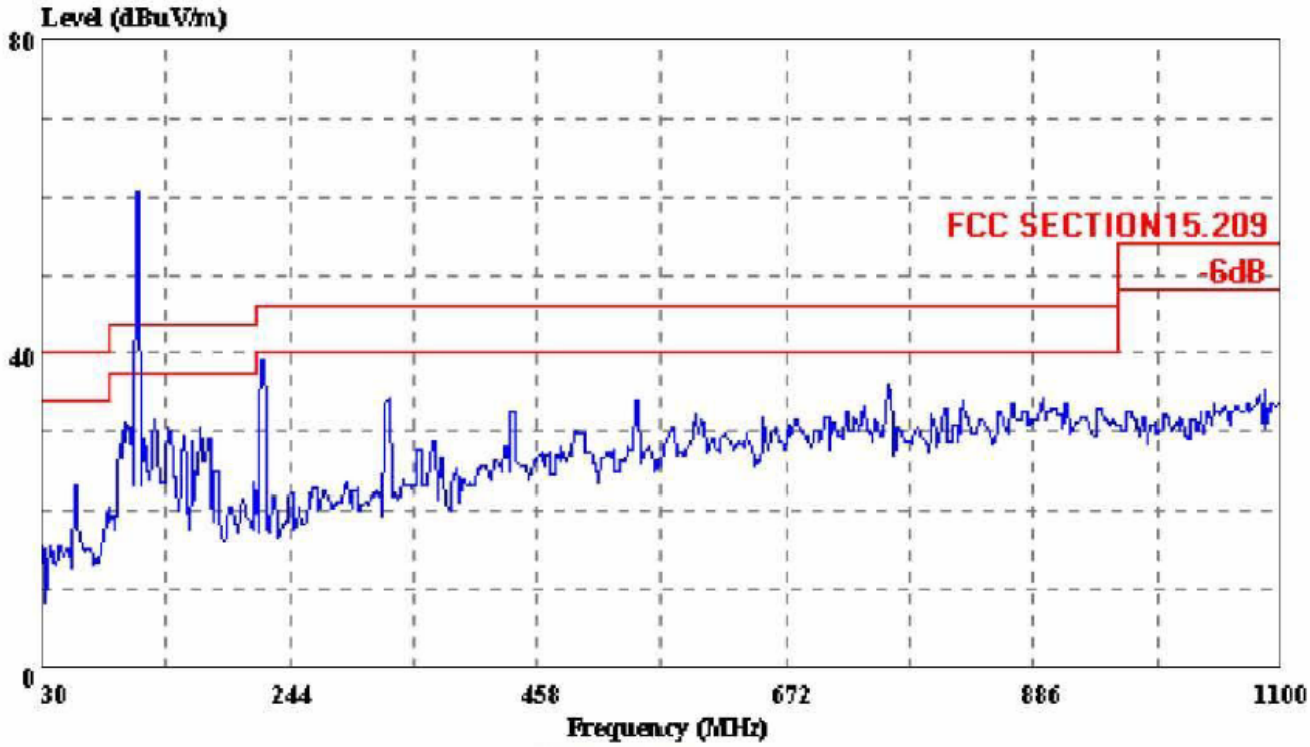
Trace: Ref Trace:

Condition: FCC SECTION15.209 3m VERTICAL
eut : FM transmitter m/n:JH-CMWT10401
power: DC 12.0V
memo : TX(88.1MHz)
manuf: BEST TALENT



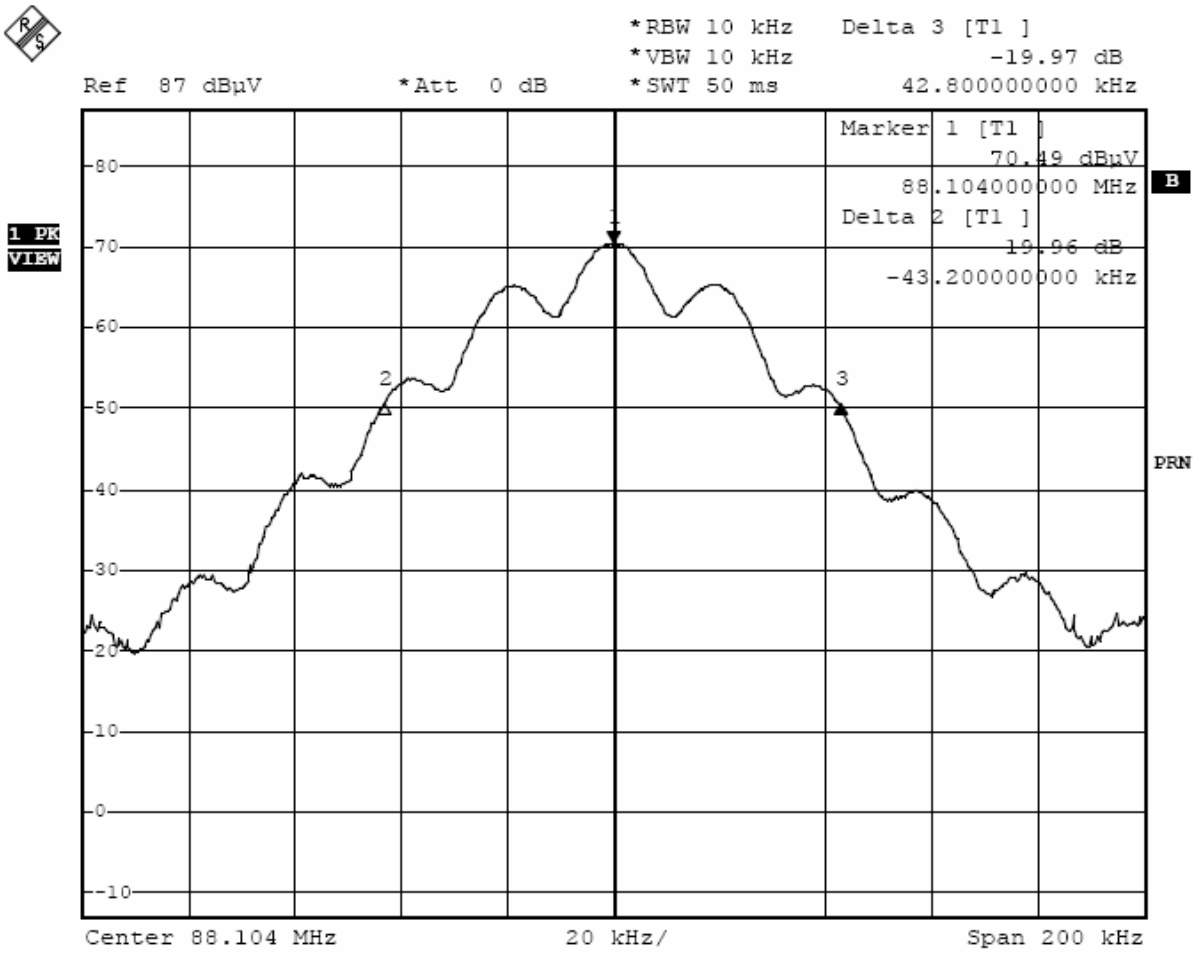
Trace: Ref Trace:

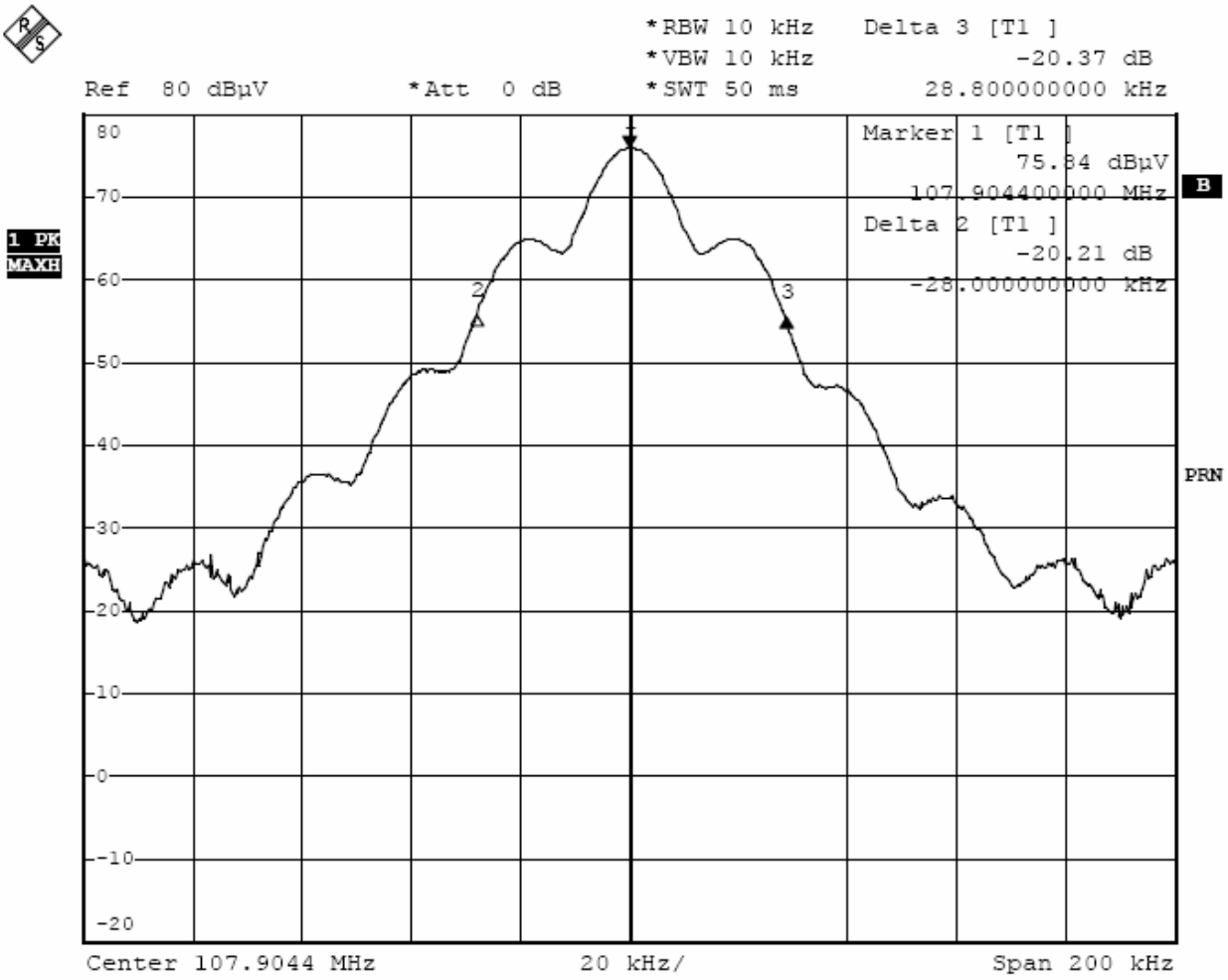
Condition: FCC SECTION15.209 3m HORIZONTAL
eut : FM transmitter m/n:JH-CMWT10401
power: DC 12.0V
memo : TX(107.9MHz)
manuf: BEST TALENT



Trace: Ref Trace:

Condition: FCC SECTION15.209 3m VERTICAL
eut : FM transmitter m/n:JH-CMWT10401
power: DC 12.0V
memo : TX(107.9MHz)
manuf: BEST TALENT


*RBW 10 kHz
*VBW 10 kHz
*SWT 50 ms
Delta 3 [T1]
-19.97 dB
42.800000000 kHz
Ref 87 dBµV
*Att 0 dB
Marker 1 [T1]
70.49 dBµV
88.104000000 MHz
Delta 2 [T1]
19.96 dB
-43.200000000 kHz
1 PK
VIEW
B
PRN
80
70
60
50
40
30
20
10
0
-10
Center 88.104 MHz
20 kHz/
Span 200 kHz


*RBW 10 kHz
*VBW 10 kHz
*SWT 50 ms
Delta 3 [T1]
-20.37 dB
28.800000000 kHz
Ref 80 dBµV
*Att 0 dB
Marker 1 [T1]
75.84 dBµV
107.904400000 MHz
Delta 2 [T1]
-20.21 dB
-28.000000000 kHz
1 PK
MAXH
B
PRN
80
70
60
50
40
30
20
10
0
-10
-20
Center 107.9044 MHz
20 kHz/
Span 200 kHz