TEST REPORT FOR CERTIFICATION

On Behalf of

Halloa Enterprise Co., Ltd.

FM Wireless Transmitter

Model No.：HN-1305

Brand：halloa

FCC ID：T4AHN-1305

Prepared for : Halloa Enterprise Co., Ltd.
Fl. 9, No. 111-33, Sec. 4, San Ho Road,
San Chung City, Taipei Hsien, 241
Taiwan, R.O.C.

Prepared by : AUDIX Technology Corporation
EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei Hsien, Taiwan

Tel : (02) 2609-9301, 2609-2133
Fax: (02) 2609-9303

File Number	：	EM961610
Report Number	：	EM-F970550
Date of Test	：	Aug. 16 ~ 19, 2008
Date of Report	：	Sep. 08, 2008

TABLE OF CONTENTS

TEST REPORT CERTIFICATION

Applicant	:	Halloa Enterprise Co., Ltd.
EUT Description	:	FM Wireless Transmitter
FCC ID	:	T4AHN-1305
		(A) MODEL NO. : HN-1305
		(B) SERIAL NO. : N/A
		(C) BRAND : halloa
		(D) POWER SUPPLY : DC 9-12V
		(E) TEST VOLTAGE : DC 12V (Via DC Power Supply)

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, Sep. 2007
AND ANSI C63.4/2003
(FCC CFR 47 Part 15C, §15.203, §15.207, §15.209 and §15.239)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: Aug. 16 ~ 19, 2008

Prepared by: Tina Huang Sep. 18, 2008
(Tina Huang/Administrator)

Test Engineer: Ben Cheng Sep. 18, 2008
(Ben Cheng/Manager)

Approved & Authorized Signer: Ben Cheng for Sep 18, 2008
(Leon Liu/Vice President)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	FM Wireless Transmitter
Model Number	:	HN-1305
Brand	:	halloa
FCC ID	:	T4AHN-1305
Applicant	:	Halloa Enterprise Co., Ltd. Fl. 9, No. 111-33, Sec. 4, San Ho Road, San Chung City, Taipei Hsien, 241 Taiwan, R.O.C.
Frequency	:	Fixed 88.1MHz, 88.5MHz, 88.9MHz
Channel Number	:	3 channels
Date of Receipt of Sample	:	Dec. 05, 2007
Date of Test	:	Aug. 16 ~ 19, 2008

1.2. Tested Supporting System Details

1.2.1. MP3 PLAYER

Model Number	:	PD-399
Serial Number	:	S/N
FCC ID	:	By DoC
Manufacturer	:	Perception Digital
Mini USB to USB Adapter Cable	:	Non-Shielded, Detachable, 0.1m

1.2.2. DC POWER SUPPLY

Model Number	:	3303A
Serial Number	:	721773
Manufacturer	:	TOP WARD
DC Power Cable*2	:	Non-Shielded, Detachable, 0.3m
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.3. EARPHONE

Model Number	:	RP-HV103
Serial Number	:	N/A
Manufacturer	:	Panasonic
Earphone Cable*2	:	Non-Shielded, Detachable, 1.1m

1.3. Description of Test Facility

Name of Firm **:** **AUDIX Technology Corporation**
EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei Hsien, Taiwan

Test Location & Facility (AC) **:** **Semi-Anechoic Chamber**
No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei Hsien, Taiwan

Renewal on May 16, 2006
Federal Communication Commission
Registration Number: 90993

NVLAP Lab. Code : 200077-0
(NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB

Remark：Uncertainty = $ku_c(y)$

2. POWERLINE CONDUCTED EMISSION MEASUREMENT

【The EUT only employ DC power and battery for operation, no conductive emissions limits are required according to FCC Part 15 Section §15.207】

3. RADIATED EMISSION MEASUREMENT

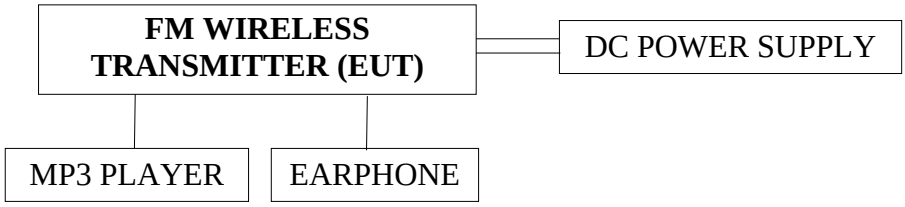
3.1. Test Equipment

The following test equipment was used during the radiated emission measurement: (Semi-Anechoic Chamber)

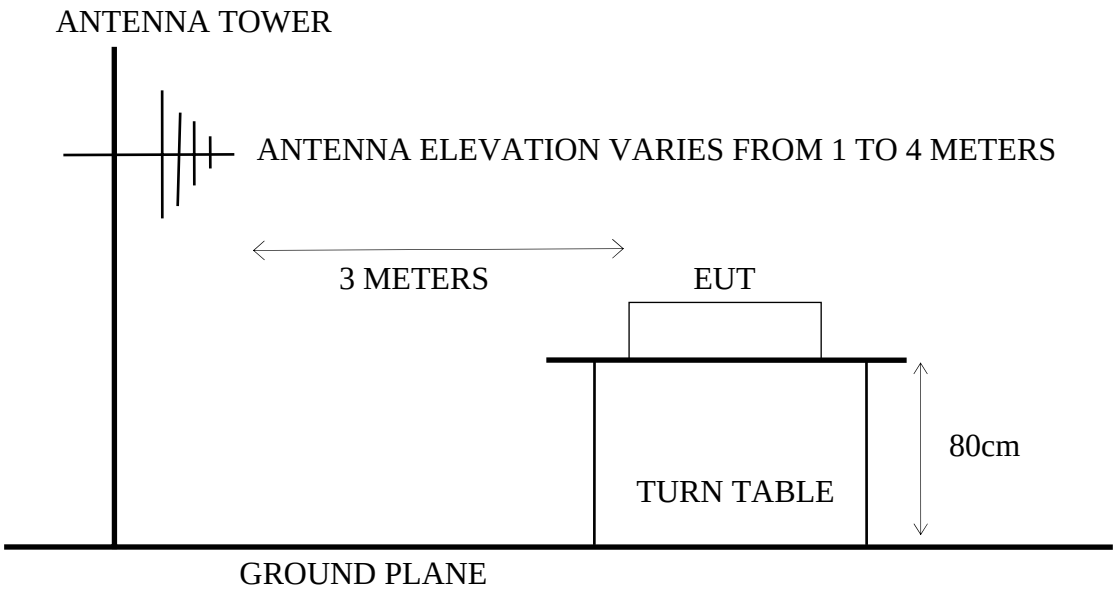
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00272	Jul.03, 08’	Jul.02, 09’
2.	Test Receiver	R&S	ESCS30	100265	Sep. 04, 07’	Sep. 03, 08’
3.	Pre-Amplifier	HP	8447D	2944A06305	Feb.19, 08’	Feb.18, 09’
4.	Broadband Antenna	CHASE	VBA6106A	1264	Apr.10, 08’	Apr.09, 09’
5.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Apr.10, 08’	Apr.09, 09’

3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram



3.3. Radiation Limit (Comply with §15.239 & §15.209)

3.3.1. §15.239 Radiated Emission Limits (Fundamental Frequency)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
Fundamental Freq.	3	250	48.0 (Average)
		---	68.0 (Peak)*(2)

Remark： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The provision in section 15.35 for limiting peak emission apply.

3.3.2. §15.209 Radiated Emission Limits (Spurious Frequency)

FREQUENCY	DISTANCE	FIELD STRENGTHS LIMITS	
MHz	Meters	μV/m	dBμV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

Remark： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and 15.205(b) & Part 15.209(e).

3.4. EUT's Configuration during Compliance Measurement

The following equipment were installed on radiated measurement to meet the commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

3.4.1. FM Wireless Transmitter (EUT)

Model Number	:	HN-1305
Serial Number	:	N/A
FCC ID	:	T4AHN-1305
Frequency	:	Fixed 88.1MHz, 88.5MHz, 88.9MHz
Channel Number	:	3 channels

3.4.2. Supporting System : As in Section 1.2.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown on 3.2.

3.5.2. Turn on the power of all equipment.

3.5.3. The MP3 player to provide a pop music and the sound volume adjust to maximum for test. (Set EUT transmitting frequency tune into 88.5MHz)

3.5.4. The other peripheral devices were driven and operated in turn during all testing.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of R & S test receiver ESCS 30 was set at 120kHz.

The frequency range from 30MHz to 1000MHz was checked.

EUT was measured within Semi-Anechoic Chamber and all the test results are listed in section 3.7.

The details of test mode as follows:

Mode	Operating Condition of EUT	Power Supply
1.	Transmitting FM Radio Frequency 88.5MHz	DC 12V

3.7. Radiated Emission Noise Measurement Results

PASSED. Please refer to the following pages.
All the emissions not reported below are too low against the FCC Part 15 Subpart C official limits.

Date of Test： Aug. 19, 2008 Temperature： 26℃

EUT： FM Wireless Transmitter Humidity： 75%

Test Mode： Transmitting FM Radio Frequency 88.5MHz

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Fundamental Freq. (Quasi Peak Value)						
88.500	15.57	0.61	30.04	46.22	48.00	1.78
Spurious Freq. (Quasi-Peak Value)						
57.540	13.77	0.48	18.02	32.27	40.00	7.73
152.580	20.68	0.82	13.12	34.62	43.50	8.88
156.630	20.70	0.83	16.16	37.69	43.50	5.81
168.780	20.99	0.85	14.08	35.93	43.50	7.57
177.000	21.28	0.89	19.71	41.87	43.50	1.63
205.230	21.94	0.98	12.78	35.70	43.50	7.80
241.680	23.16	1.03	20.31	44.50	46.00	1.50
265.500	24.79	1.12	15.02	40.93	46.00	5.07
360.900	15.72	1.31	15.33	32.36	46.00	13.64
442.500	17.10	1.57	5.80	24.47	46.00	21.53
481.300	17.49	1.54	12.45	31.48	46.00	14.52
531.000	18.22	1.67	7.74	27.63	46.00	18.37
796.500	21.21	2.02	8.81	32.04	46.00	13.96
885.000	22.29	2.22	7.03	31.54	46.00	14.46

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Measurement was up to 10^{th} harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test： Aug. 19, 2008 Temperature： 26℃

EUT： FM Wireless Transmitter Humidity： 75%

Test Mode： Transmitting FM Radio Frequency 88.5MHz

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Fundamental Freq. (Quasi Peak Value)						
88.500	15.57	0.61	29.09	45.27	48.00	2.73
Spurious Freq. (Quasi-Peak Value)						
57.540	13.77	0.48	22.83	37.08	40.00	2.92
66.990	11.80	0.53	18.64	30.96	40.00	9.04
72.390	12.42	0.56	23.03	36.01	40.00	3.99
108.840	18.02	0.67	10.60	29.29	43.50	14.21
177.000	21.28	0.89	14.95	37.11	43.50	6.39
241.680	23.16	1.03	9.70	33.89	46.00	12.11
265.500	24.79	1.12	6.06	31.97	46.00	14.03
360.900	15.72	1.31	6.94	23.97	46.00	22.03
481.300	17.49	1.54	10.50	29.53	46.00	16.47
531.000	18.22	1.67	8.78	28.67	46.00	17.33
796.500	21.21	2.02	3.75	26.98	46.00	19.02
885.000	22.29	2.22	1.28	25.79	46.00	20.21

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Measurement was up to 10^{th} harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

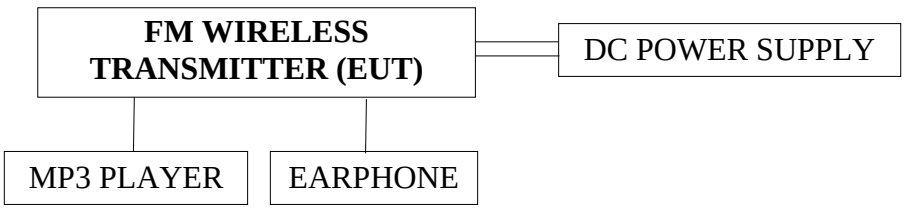
4. 26dB BANDWIDTH MEASUREMENT

4.1. Test Equipment

The following test equipment were used during the Emission Bandwidth Measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug.07, 08’	Aug.06, 09’
2.	Test Receiver	R&S	ESCS30	100265	Sep. 04, 07’	Sep. 03, 08’
3.	Pre-Amplifier	HP	8447D	2944A06305	Feb.19, 08’	Feb.18, 09’
4.	Broadband Antenna	CHASE	VBA6106A	1264	Apr.10, 08’	Apr.09, 09’

4.2. Block Diagram of Test Setup



4.3. Specification Limits (§15.239)

The 26dB bandwidth of fundamental emission from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88.1-88.8MHz.

4.4. EUT’s Configuration during Compliance Measurement

The configuration of EUT were same as section 3.4.

4.5. Operating Condition of EUT

4.5.1. Setup the EUT and simulator as shown on 4.2.

4.5.2. Turn on the power of all equipment.

4.5.3. The MP3 player to provide a pop music and the sound volume adjust to maximum for test. (Set EUT transmitting frequency tune into 88.1MHz, 88.5MHz and 88.9MHz)

4.5.4. The other peripheral devices were driven and operated in turn during all testing.

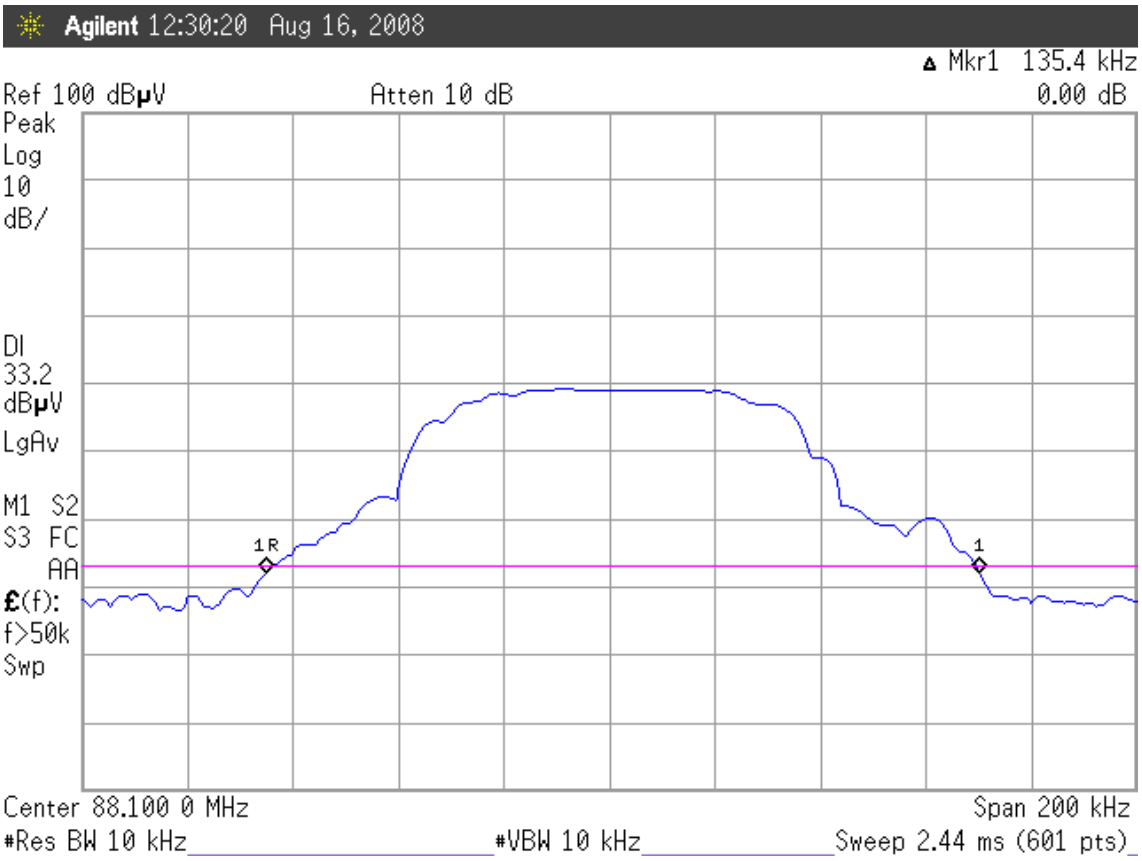
4.6. 26dB Bandwidth Measurement Results

PASSED. The graph of bandwidth measured is attached in next pages.
(Remark: –26dB below the peak level to measure)

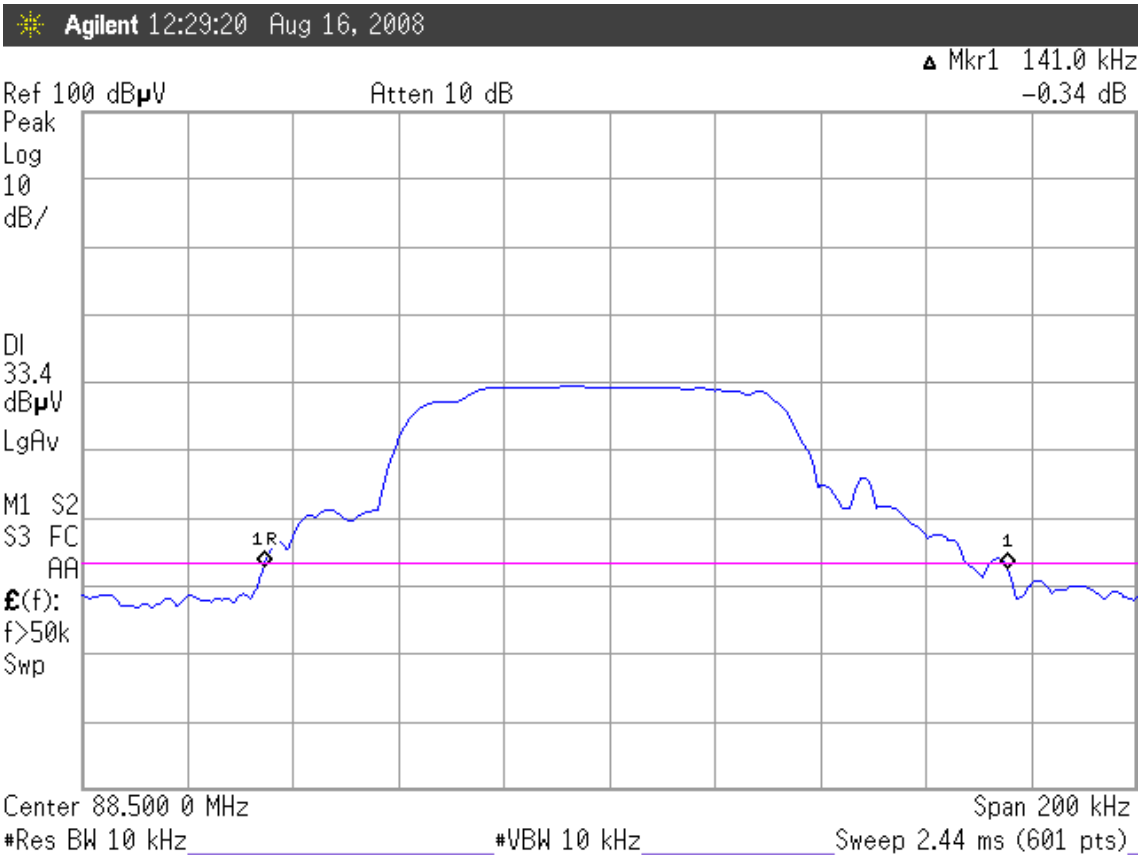
Date of Test: Aug. 16, 2008 Temperature：26℃ Humidity：75%

Mode	Center Frequency	**26dB Bandwidth**	Limits
1.	88.1MHz	**135.4kHz**	200kHz
2.	88.5MHz	**141.0kHz**	200kHz
3.	88.9MHz	**147.0kHz**	200kHz

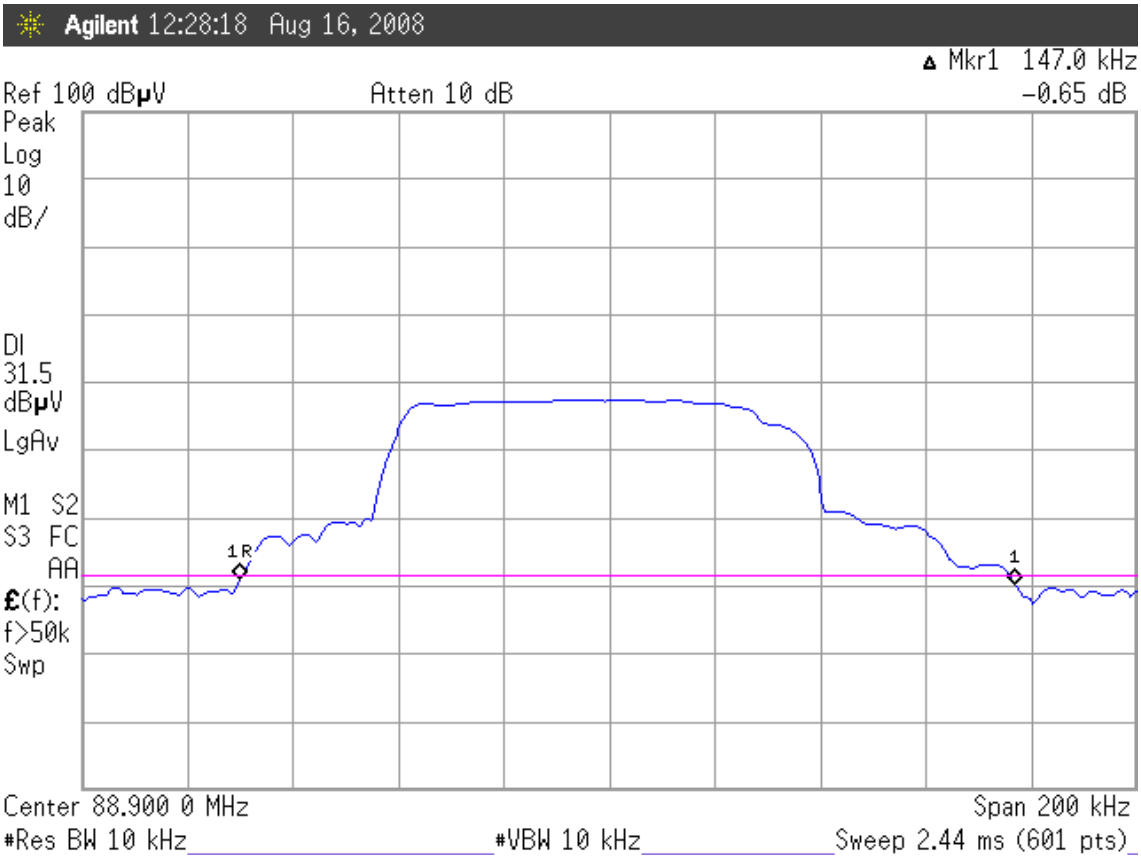
Frequency: 88.1MHz



Frequency: 88.5MHz



Frequency: 88.9MHz



5. DEVIATION TO TEST SPECIFICATIONS

【NONE】