



FCC TEST REPORT

REPORT NO.: FCC0706018

MODEL NO.: MK202

RECEIVED: Jun 18, 2007

TESTED: Jun 18, 2007 to Aug 07, 2007

APPLICANT: Martking International (HK) Co., Ltd

ADDRESS: 2/F, Building 5, Yong Qi Science&Technology Park, XiFa,
Xixiang Town, Baoan District, Shezhen, China

ISSUED BY: SHENZHEN SETTEK TECHNOLOGY CO., LTD.

LAB LOCATION: 2/F,A3 Bldg,East Industry Zone,Overseas Chinese Town,
Shenzhen,China

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SHENZHEN SETTEK TECHNOLOGY CO., LTD.

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Prepared for : Martking International (HK) Co., Ltd

Address : 2/F, Building 5, Yong Qi Science&Technology Park, XiFa, Xixiang Town, Baoan District, Shezhen, China

Product : FM TRANSMITTER

Model No. : MK202

Trademark : N/A

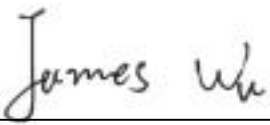
Test Standard : FCC Part 15 Paragraph 15.207, Paragraph 15.209, Paragraph 15.35 and Paragraph 15.239

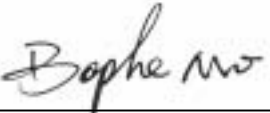
Prepared by : SHENZHEN SETEK TECHNOLOGY CO., LTD.

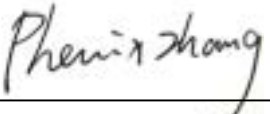
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Prepared by : 
(Engineer)

Reviewer by : 
(Project Engineer)

Approved by : 
(Manager)

Report Number : FCC0706018

Date of Test : Jun 18, 2007 to Aug 07, 2007

Date of Report : Aug 07, 2007

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

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APPENDIX I (Photos of EUT) (3 Pages)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	FM TRANSMITTER
Model Number	:	MK202
Description of EUT	:	A modulator of FM for the audio, can be transmitted by radio
Description of Antenna	:	A permanent fixed antenna, which is built-in, designed as an indispensable part of the EUT.
Power Supply	:	DC 3.0V (2 pcs AAA Batteries)
Operation Frequency	:	88.1-107.9MHz
Applicant	:	Martking International (HK) Co., Ltd
Address	:	2/F, Building 5, Yong Qi Science&Technology Park, XiFa, Xixiang Town, Baoan District, Shezhen, China
Manufacturer	:	Shenzhen Martking Ladeb Electronic Co., Ltd
Address	:	2/F, Building 5, Yong Qi Science&Technology Park, XiFa, Xixiang Town, Baoan District, Shezhen, China
Received	:	Jun 18, 2007
Date of Test	:	Jun 18, 2007 to Aug 07, 2007

1.2. Description of Support Device

PC	: Manufacturer: DELL M/N: E157FPc S/N: 53SM12X CCC,FCC,VCCI,GS,S,CE
Monitor	: Manufacturer: SAMSUNG M/N: 710MP [R]S S/N: MH17HVV500468F CCC,SA,UL
Mouse	: Manufacturer: DELL M/N: M056UOA S/N: F1101WOS CE, VCCI,FCC,GS,UL
Keyboard	: Manufacturer: DELL M/N: SK-8135 S/N: CN-0DJ340-71616683-01U6 VCCI,CE, FCC
Printer	: Manufacturer: SAMSUNG M/N: ML-1610 S/N: BKAYB04125 CCC,CE,UL
MP3	: Manufacturer: ipopman M/N: I-V07 FCC, CE

1.3. Summary of test results

FCC Rules	Description Of Test	Result
Paragraph 15.207	Conducted Emission	Compliant
Paragraph 15.239	Radiated Emission	Compliant
Paragraph 15.239	Bandwidth	Compliant

1.4. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 966959

SHENZHEN SETEK TECHNOLOGY CO., LTD, the EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission.

1.5. Measurement Uncertainty

Radiation Uncertainty : $U_r = \pm 3.84 \text{ dB}$

Conduction Uncertainty : $U_c = \pm 2.72 \text{ dB}$

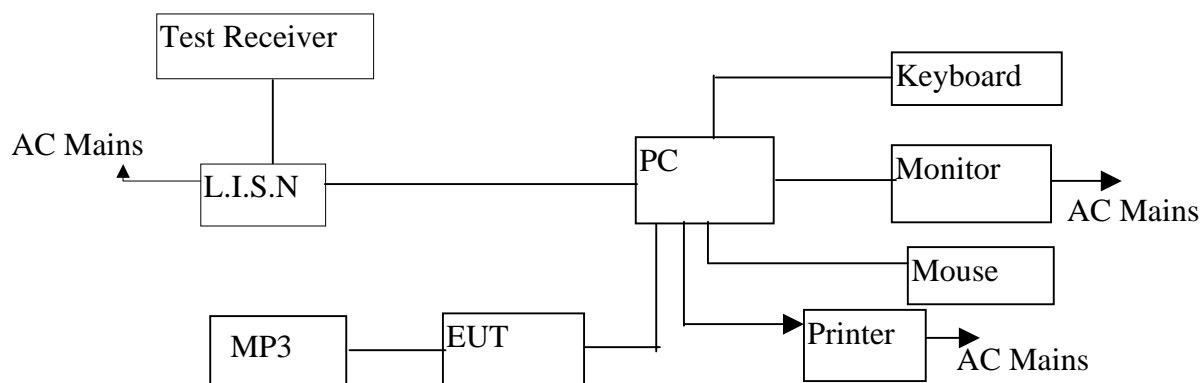
2. POWER LINE CONDUCTED MEASUREMENT

2.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	8289851018	May 29,2007	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005	May 29,2007	1 Year
3.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 29,2007	1 Year
4.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	May 29,2007	1 Year

2.2. Block Diagram of Test Setup



2.3. Power Line Conducted Emission Measurement Limits(Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.4.Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

EUT	:	FM TRANSMITTER
Model Number	:	MK202

2.5.Operating Condition of EUT

2.5.1.Setup the EUT and simulator as shown as Section 2.2.

2.5.2.Turn on the power of all equipment.

2.5.3.Let the EUT work in test mode (Normal) and measure it.

2.6.Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm-coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line 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 30 MHz is investigated.

2.7.Power Line Conducted Emission Measurement Results

PASS

The max. tuning range of EUT is verified which between 88.1MHz with 107.9MHz.
Please refer to following diagram

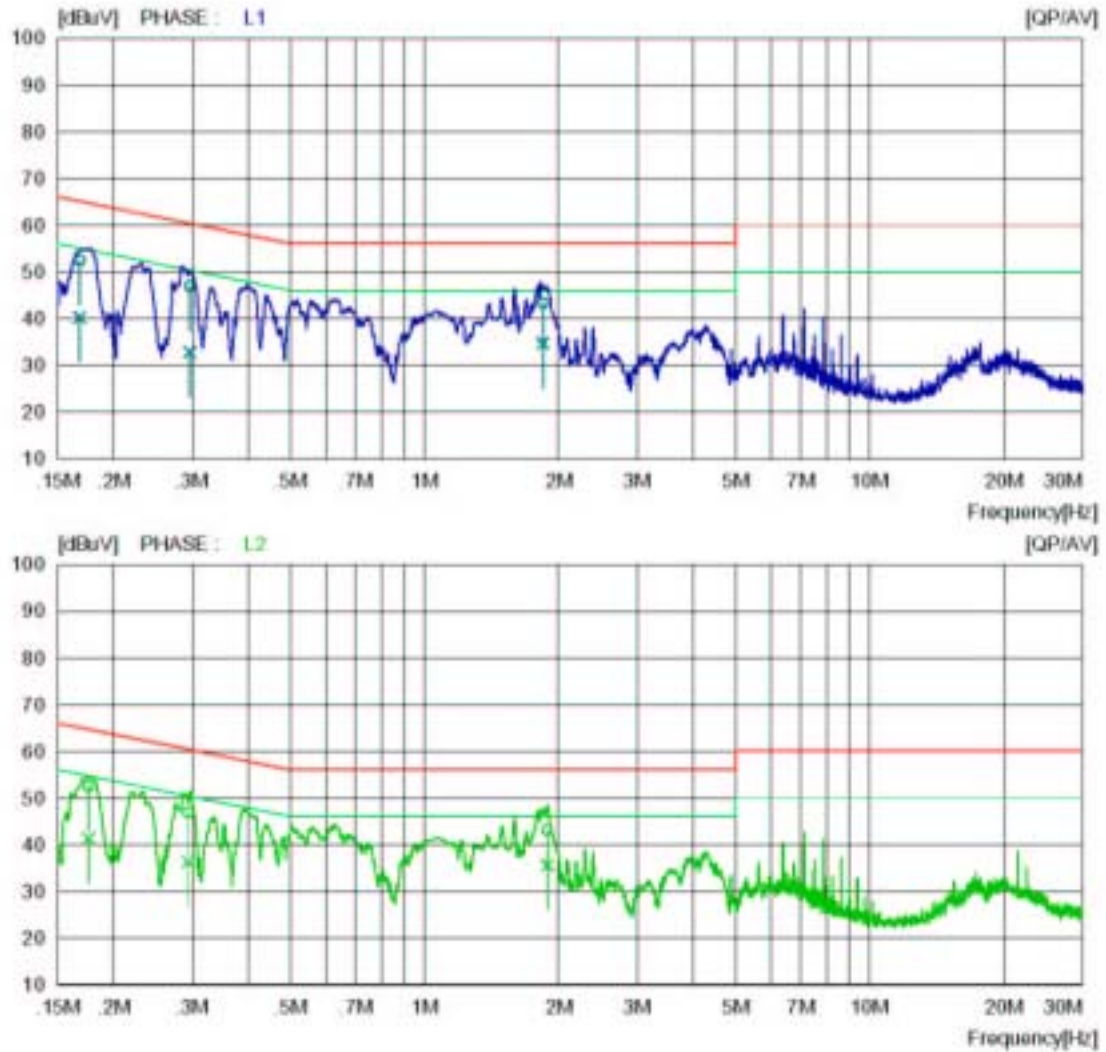
2007-08-07 11:45:29

Conducted Emission

Date : 2007-08-07 11:45:25

Trade Name	: MarKing	Document No.	:
Model Name	: FM TRANSMITTER(MK202)	Power Supply	: AC120V/60Hz
Serial No.	:	Temp/Humi	: 28deg / 67%RH
Test condition	: 88.1MHz	Operator	: Ely zhang
Memo	: ON TX (transmitting Audio from conneced MP3 player)		

LIMIT : FCC Part15 B(QP)
FCC Part15 B(AV)



2007-08-07 11:45:29

Conducted Emission

Date : 2007-08-07 11:45:25

Trade Name	:	Marking	:	Document No.	:
Model Name	:	FM TRANSMITTER(MK202)	:	Power Supply	:
Serial No.	:		:	Temp/Humi	:
Test condition	:	88.1MHz	:	Operator	:

:	AC120V/60Hz
:	28deg / 67%RH
:	Ely zhang

Memo : ON TX (transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 B(QP)
FCC Part15 B(AV)

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16800	42.4	30.2	10.0	52.4	40.2	65.1	55.1	12.7	14.9	L1
2	0.29700	36.9	22.8	10.0	46.9	32.8	60.3	50.3	13.4	17.5	L1
3	1.84200	33.2	24.6	10.1	43.3	34.7	56.0	46.0	12.7	11.3	L1
4	0.17600	42.4	31.4	10.0	52.4	41.4	64.7	54.7	12.3	13.4	L2
5	0.29400	36.9	26.3	10.0	46.9	36.3	60.4	50.4	13.5	14.1	L2
6	1.88700	33.0	25.5	10.1	43.1	35.6	56.0	46.0	12.9	10.4	L2

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

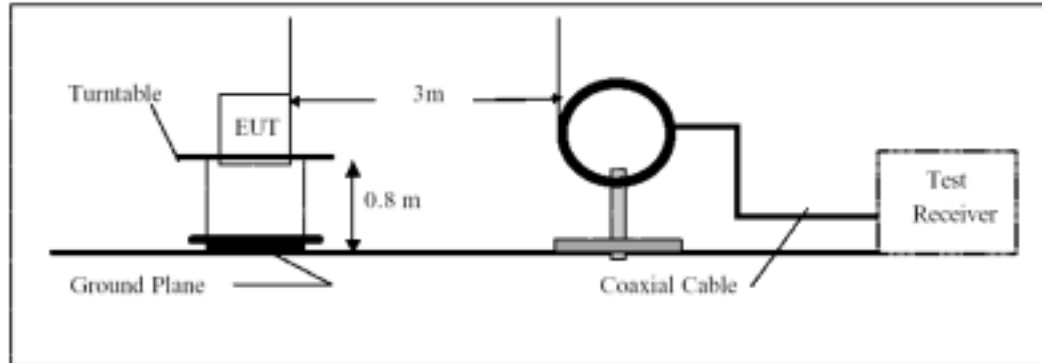
The following test equipments are used during the radiated emission measurement:

3.1.1. For Anechoic Chamber

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	May 29,2007	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 29,2007	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May 29,2007	1 Year
4.	Loop Antenna	EMCO	6502	00042960	Dec 11,2006	1 Year
5.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	May 29,2007	1 Year
6.	Cable	Schwarzbeck	AK9513(1m)	CR RX2	May 29,2007	1 Year
7.	Cable	Schwarzbeck	AK9513(10m)	AC RX1	May 29,2007	1 Year
8.	Cable	Rosenberger	N/A(6m)	CR RX1	May 29,2007	1 Year
9.	Cable	Rosenberger	N/A(10m)	FP2RX2	May 29,2007	1 Year
9.	DC Power Filter	MPE	23872C	N/A	May 29,2007	1 Year
10.	Single Phase Power Line Filter	MPE	23332C	N/A	May 29,2007	1 Year
11.	3 Phase Power Line Filter	MPE	23333C	N/A	May 29,2007	1 Year
12.	Signal Generator	HP	8648A	3625U00573	May 29,2007	1 Year

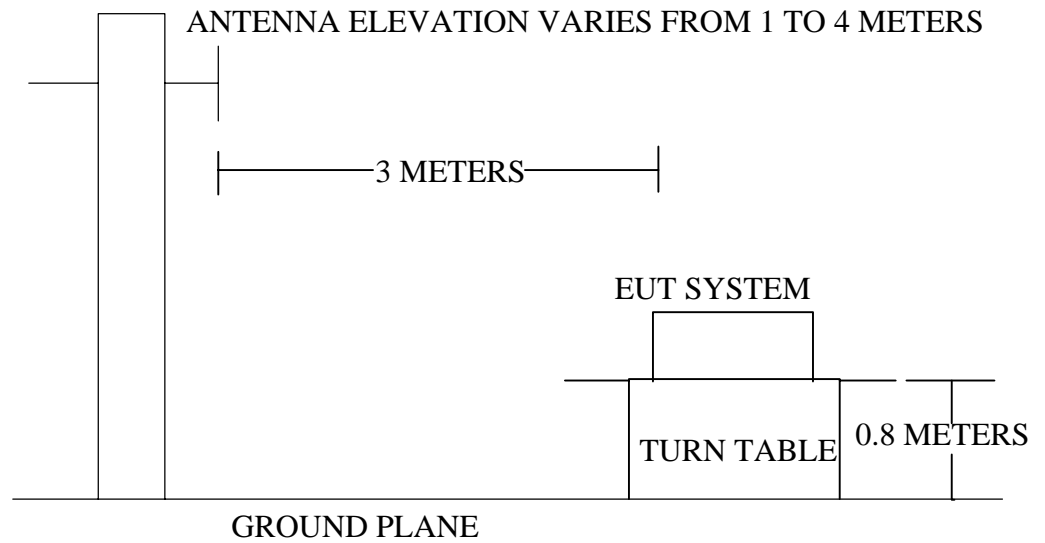
3.2.Block Diagram of Test Setup

A: Radiated Emission Test Setup, Frequency Below 30MHz



B: Radiated Emission Test Setup, Frequency 30M to 1000MHz

ANTENNA TOWER



(EUT: FM TRANSMITTER)

3.3.Radiated Emission Limit

A: FCC Part 15 Subpart C Paragraph 15.239 Limit

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

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function,corresponding to 20dB above the maximum permitted average limit.

B: Frequencies in restricted band are complied to limit on Paragraph 15.209

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
1.705 ~ 30	30	30	69.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above960	3	500	54.0

Remark : (1) Emission level (dB)μV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

As shown in 15.35(b),for frequencies above 1000MHz,the field strength limits are based on average detector,however,the peak field strength of any emission shall not exceed the maximum permitted average limits,specified above by more than 20dB under any condition of modulation.

3.4.EUT Configuration 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.

FM TRANSMITTER (EUT)

Model Number : MK202
Serial Number : N/A

3.5.Operating Condition of EUT

1. Setup the EUT as shown in Section 3.2.
2. Let the EUT work in test mode (ON TX: transmitting Audio from connected MP3 player) and measure it.
3. The EUT was connected with MP3 player. The MP3 playing a typical audio file (MP3 type music), and turn max. the volume.

3.6.Test Procedure

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.

Both horizontal and vertical polarization of the antenna is 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 test method based on FCC Part15 Paragraph 15.209 and Paragraph 15.239.

The RBW of the EMI test receiver (R&S ESCS30) is set at 120KHz between 30MHz and 1000MHz, and the RBW is 9KHz between 0.15MHz and 30MHz.

3.7. Radiated Emission Measurement Results

PASS

The max. tuning range of EUT is verified which between 88.1MHz with 107.9MHz.

A. Fundamental Radiated Emission Data

Test Item: Fundamental Radiated Emission Data

Test Voltage: 3.0V DC BATTERY

Test Mode: ON TX (transmitting Audio from connected MP3 player)

Temperature: 26°C

Humidity: 60%RH

Test Result: PASS

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
88.1	Horizontal	40.7	48	7.3
88.1	Vertical	37.9	48	10.1
98	Horizontal	43.8	48	4.2
98	Vertical	43.1	48	4.9
107.9	Horizontal	43.2	48	4.8
107.9	Vertical	42.5	48	5.5

Note: (1) All Reading are Peak Value.

(2) Emission Level = Reading Level + Probe Factor + Cable Loss.

(3) The average measurement was not performed when the peak measured data under the limit of average detection.

B. General Radiated Emission Data

Please refer to following diagram

Note: No further spurious emissions found between 30 MHz and lowest internal generated or used frequency.

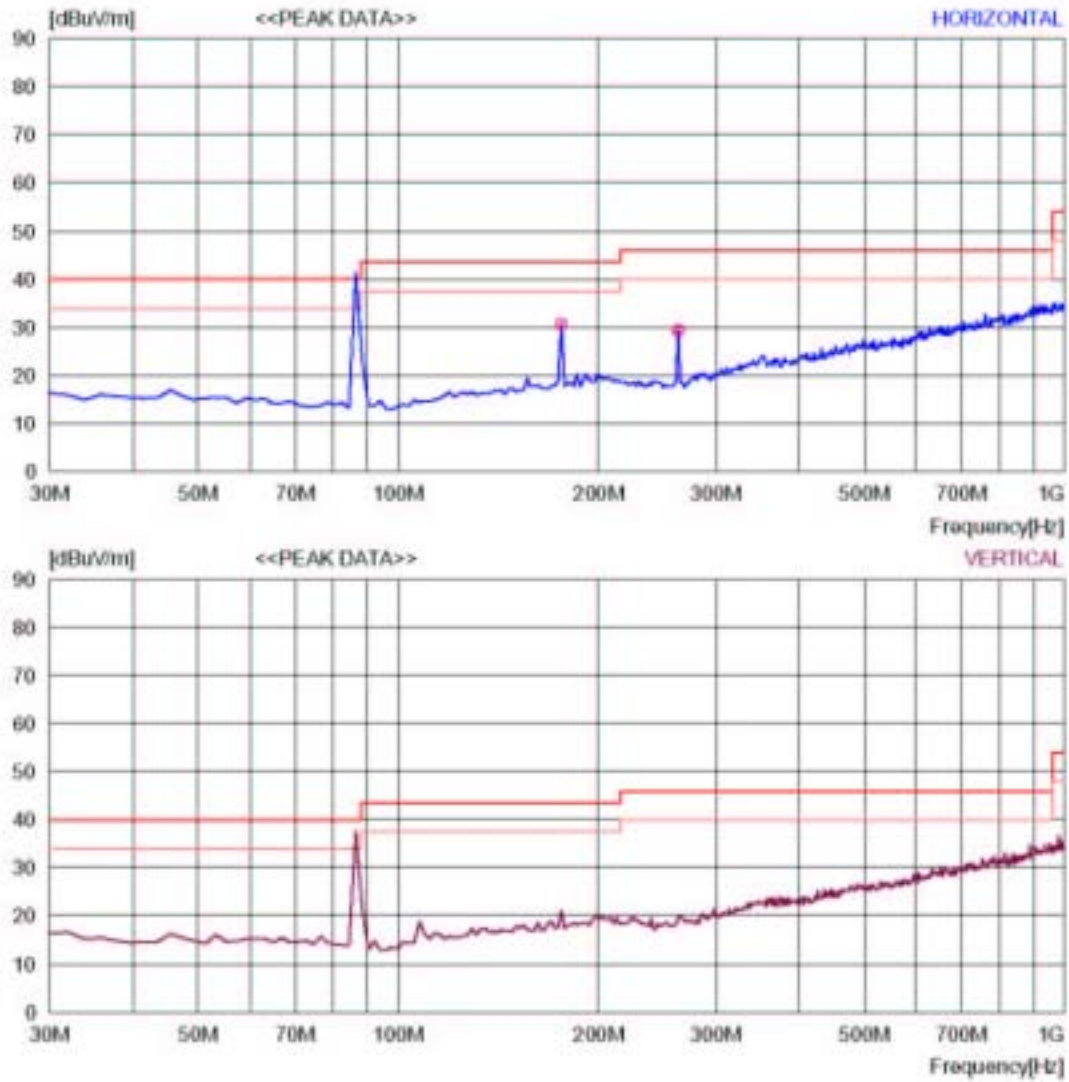
2007-06-18 15:52:07

RADIATED EMISSION

Date : 2007-06-18 15:52:03

Trade Name	: MarKing	Document No.	:
Model Name	: FM TRANSMITTER(MK202)	Power Supply	: DC 3V
Serial No.	:	Temp/Humi	: 26/60RH%
Test Condition	: 88.1MHz	Operator	: Ely zhang

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

2007-06-18 15:52:07

RADIATED EMISSION

Date : 2007-06-18 15:52:03

Trade Name	:	Marking	Document No.	:	
Model Name	:	FM TRANSMITTER(MK202)	Power Supply	:	DC 3V
Serial No.	:		Temp/Humi	:	26/60RH%
Test Condition	:	88.1MHz	Operator	:	Ely zhang

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	PEAK [dBuV]	FACTOR [dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
— Horizontal —										
1	175.792	41.8	12.3	8.1	31.6	30.6	43.5	12.9	100	325
2	263.267	40.2	12.2	8.4	31.4	29.4	46	16.6	100	288

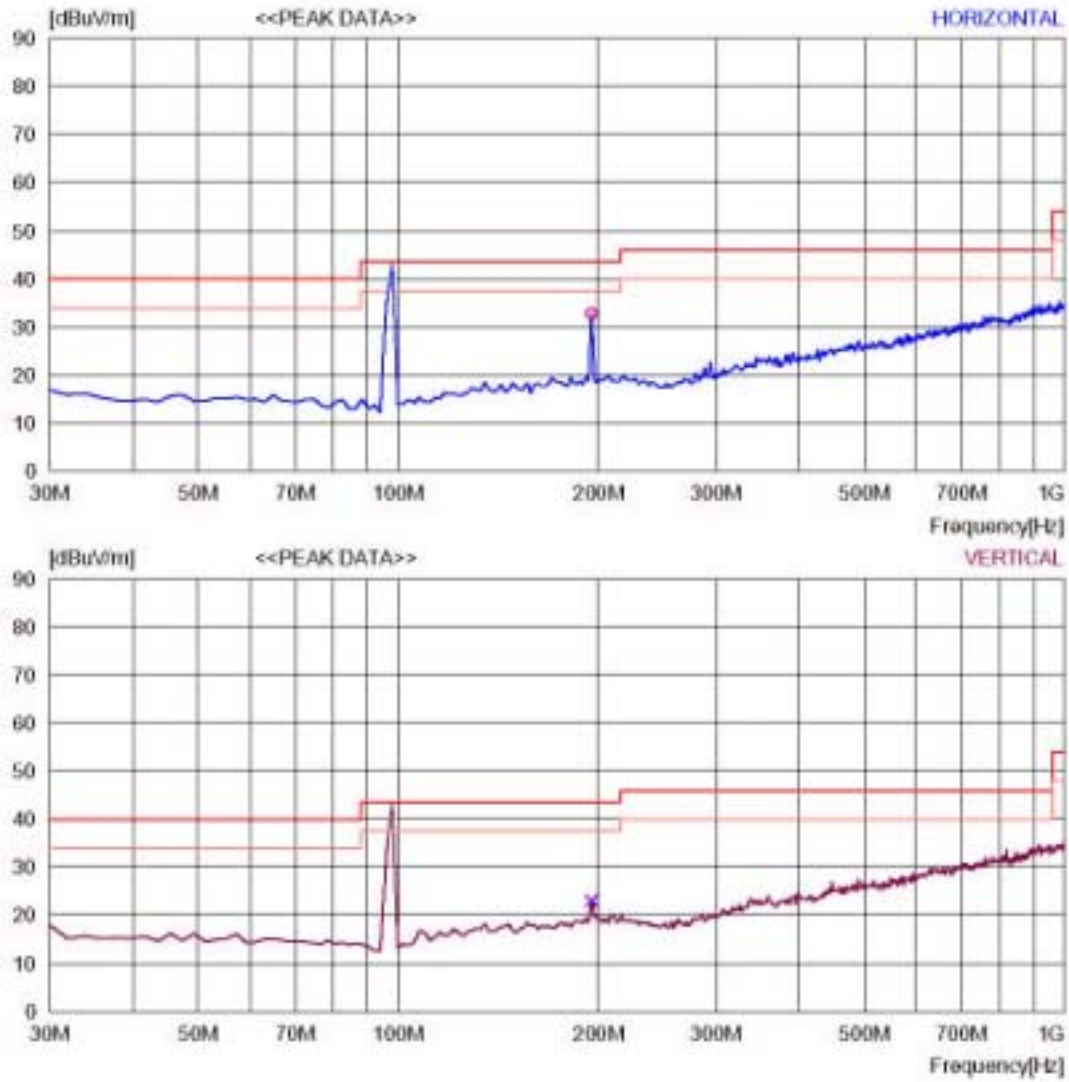
2007-06-18 15:54:54

RADIATED EMISSION

Date : 2007-06-18 15:54:51

Trade Name	: MarKing	Document No.	:	DC 3V
Model Name	: FM TRANSMITTER(MK202)	Power Supply	:	26/50dB-Hz
Serial No.	:	Temp/Hum	:	Eliy zhang
Test Condition	: 98MHz	Operator	:	

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

2007-06-18 15:54:54

RADIATED EMISSION

Date : 2007-06-18 15:54:51

Trade Name	:	Marking	Document No.	:	
Model Name	:	FM TRANSMITTER(MK202)	Power Supply	:	DC 3V
Serial No.	:		Temp/Humi	:	26/60RH%
Test Condition	:	98MHz	Operator	:	Ely zhang

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	PEAK [dBuV]	FACTOR [dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
— Horizontal —										
1	195.231	43.0	13.2	8.1	31.5	32.8	43.5	10.7	100	114
— Vertical —										
2	195.231	33.2	13.2	8.1	31.5	23.0	43.5	20.5	100	359

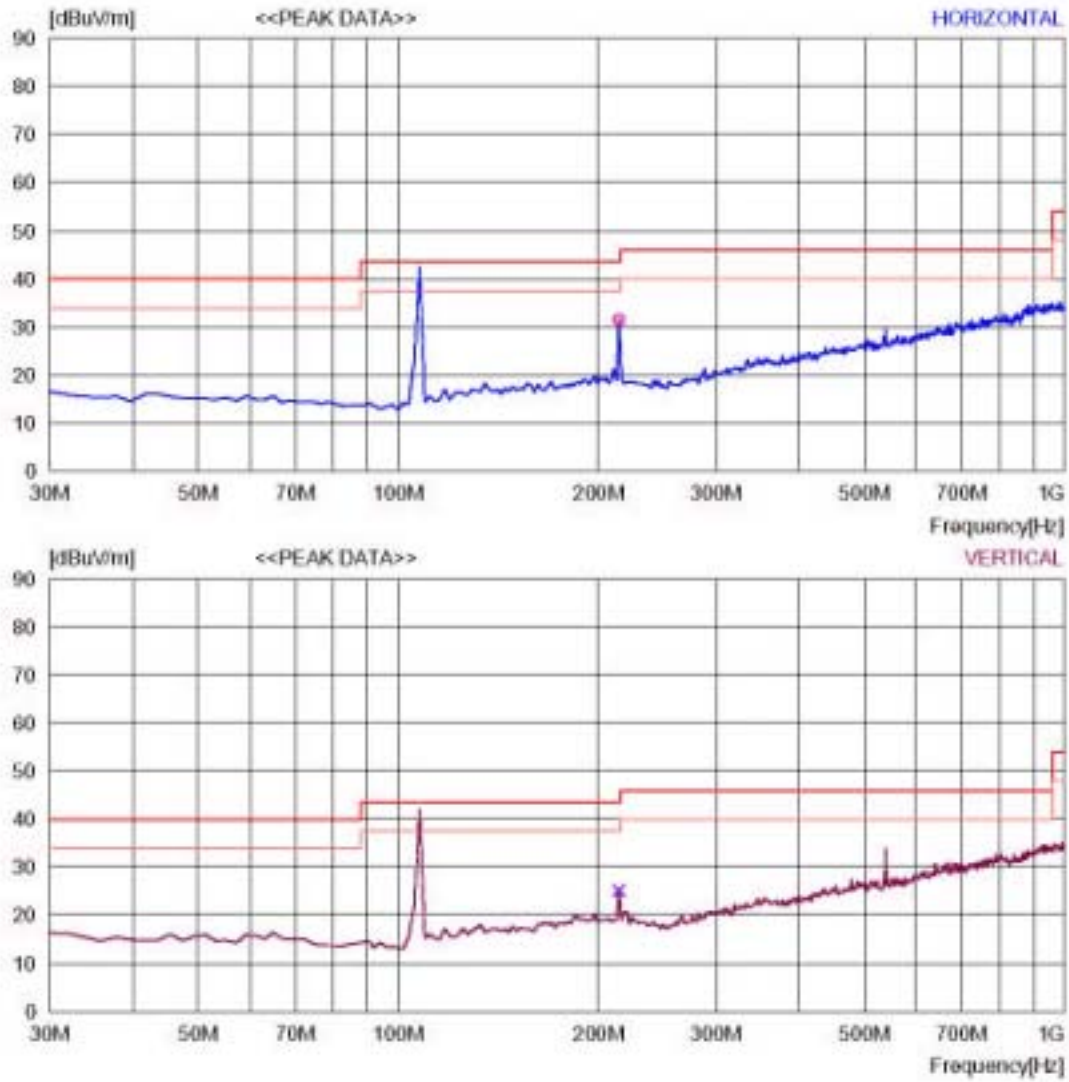
2007-06-18 15:58:55

RADIATED EMISSION

Date : 2007-06-18 15:58:52

Trade Name	: MarKing	Document No.	:	DC 3V
Model Name	: FM TRANSMITTER(MK202)	Power Supply	:	26/50R-H%
Serial No.	:	Temp/Hum	:	Eliy zhang
Test Condition	: 107.9MHz	Operator	:	

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

2007-06-18 15:58:55

RADIATED EMISSION

Date : 2007-06-18 15:58:52

Trade Name	:	Marking	Document No.	:	
Model Name	:	FM TRANSMITTER(MK202)	Power Supply	:	DC 3V
Serial No.	:		Temp/Humi	:	26/60RH%
Test Condition	:	107.9MHz	Operator	:	Ely zhang

Memo : On TX(transmitting Audio from connected MP3 player)

LIMIT : FCC Part15 Class B(3m)/USA
MARGIN: 6 dB

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
— Horizontal —										
1	214.670	41.8	13.0	8.2	31.5	31.5	43.5	12.0	100	258
— Vertical —										
2	214.670	35.4	13.0	8.2	31.5	25.1	43.5	18.4	100	10

4. EMISSION BANDWIDTH TESTING

4.1.Measurement Procedure

1. The EUT was placed on a turn table which is 0.8 m above ground plane.
2. The EUT was connected with MP3 player. The MP3 playing a typical audio file (MP3 type music), and turn max. the volume.
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10KHz. Measured the spectrum width with power higher than 20dB below carrier.
4. Set SPA Max hold.

4.2.Test SETUP (Block Diagram of Configuration)

Same as 3.2 Radiated Emission Measurement.

4.3.Bandwidth Limit

According to FCC 15.239(a), Emissions 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 88-108MHz.

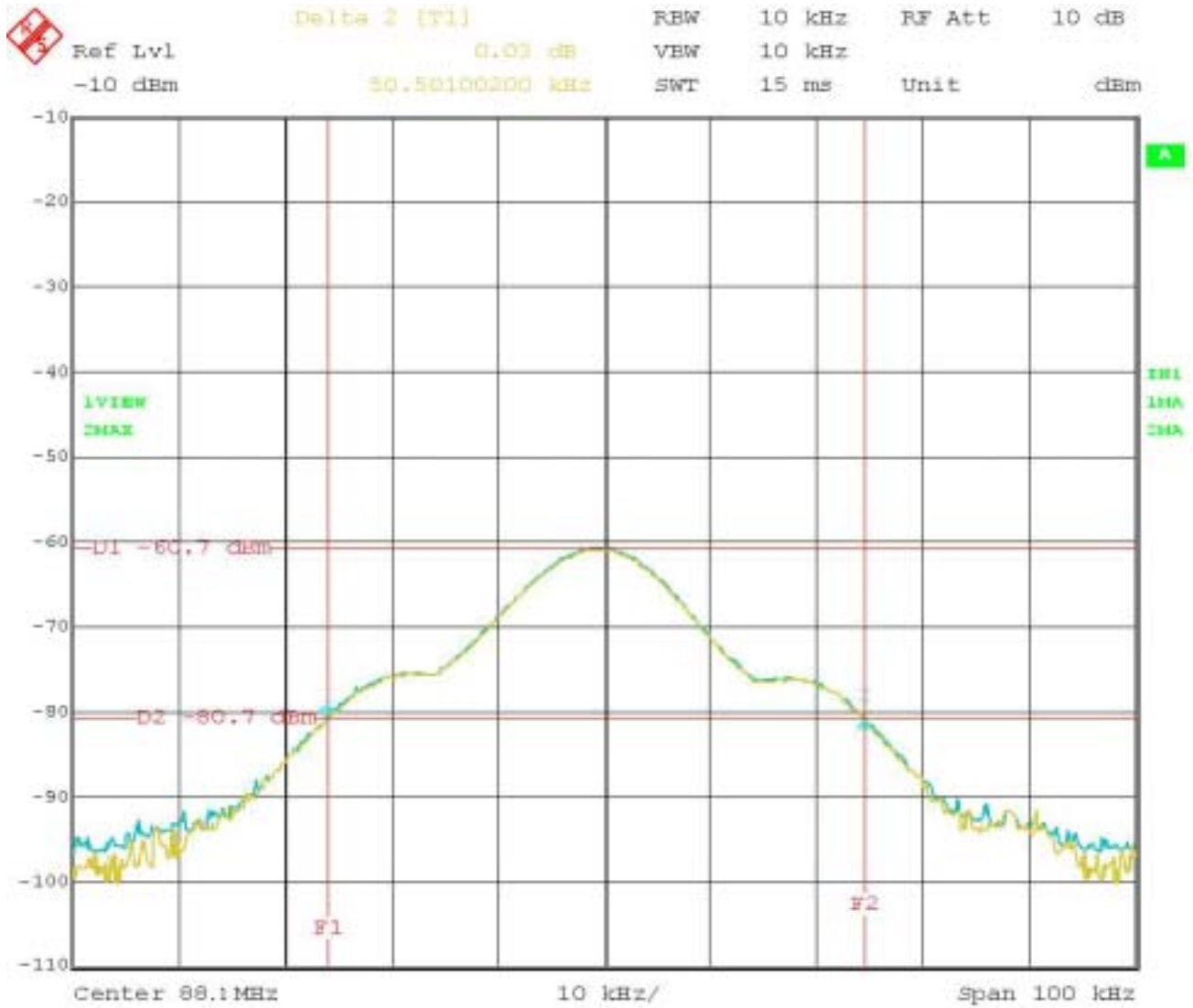
4.4.Bandwidth Test Result

Test Item:	Fundamental Radiated Emission Data
Test Voltage:	3.0V DC BATTERY
Test Mode:	ON TX(transmitting Audio from connected MP3 player)
Temperature:	26°C
Humidity:	60%RH
Test Result:	PASS

Frequency MHz	Emission Bandwidth KHz	Limit KHz
88.1	50.50	200
98	52.10	200
107.9	55.71	200

Refer to attached data chart.

On 88.1MHz

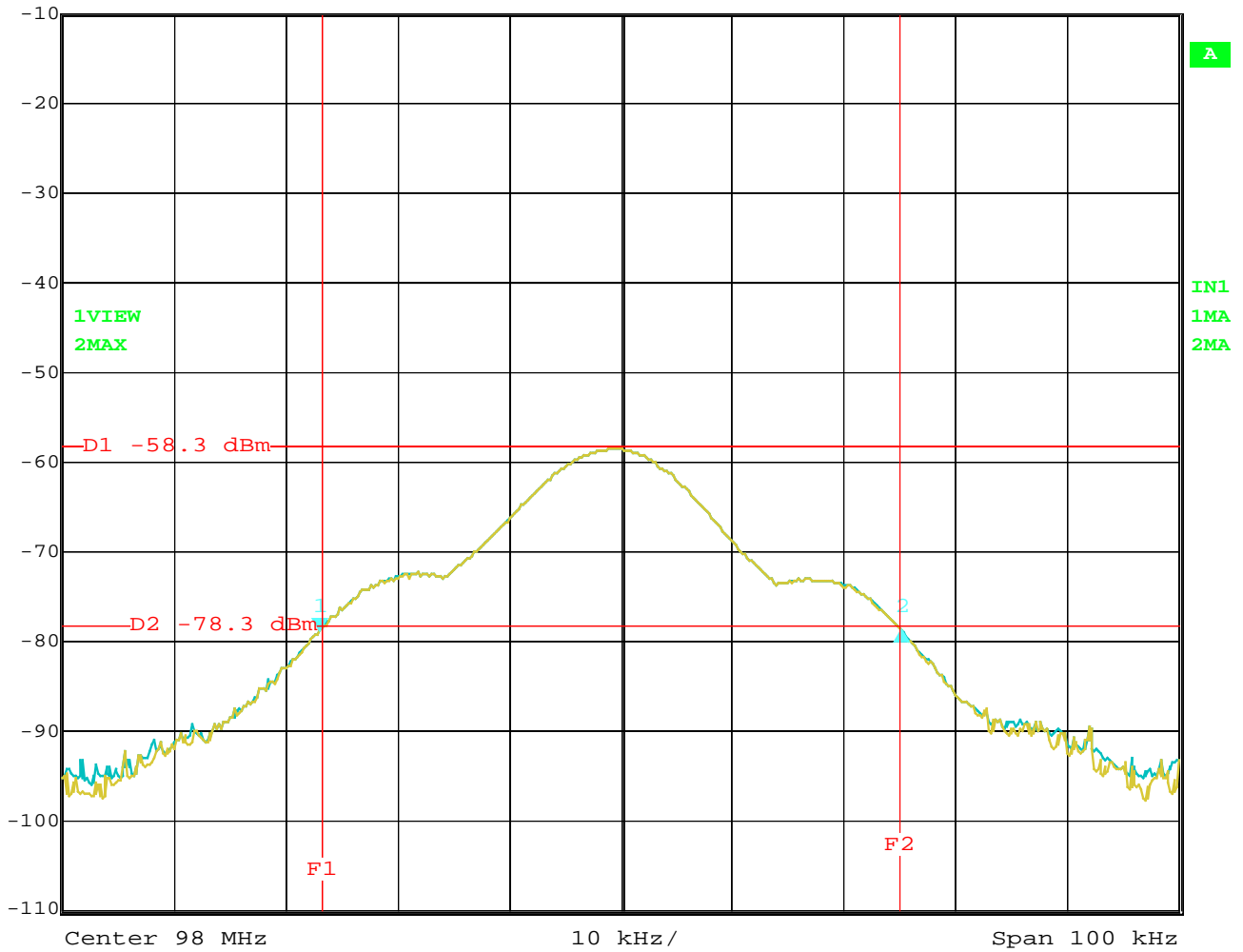


Date: 24.JUL.2007 10:48:22

On 98MHz



Ref Lvl	Delta 2 [T1]	RBW	10 kHz	RF Att	10 dB
-10 dBm	-0.07 dB	VBW	10 kHz		
	52.10420842 kHz	SWT	15 ms	Unit	dBm

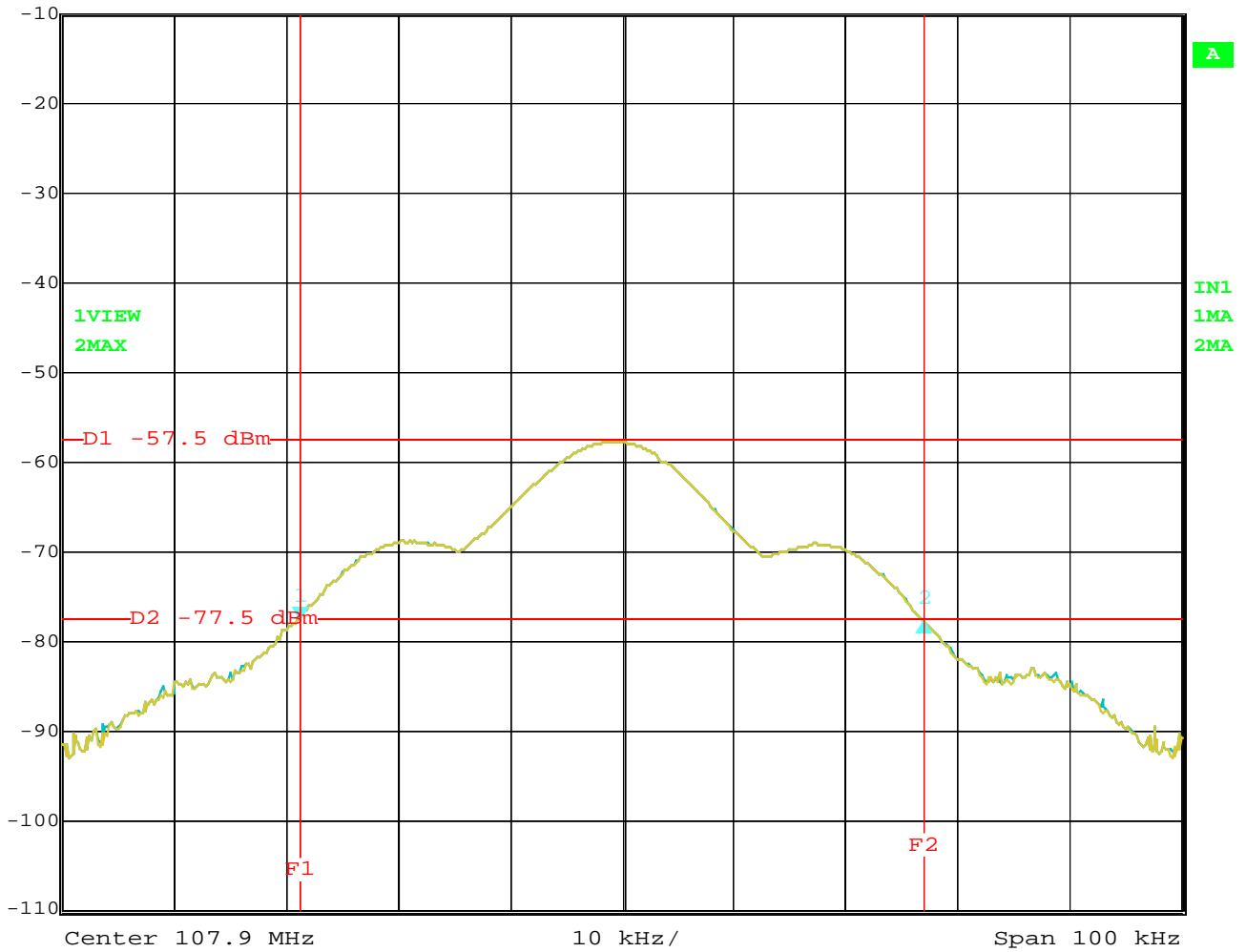


Date: 24.JUL.2007 10:51:37

On 107.9MHz



Ref Lvl	Delta 2 [T1]	RBW	10 kHz	RF Att	10 dB
-10 dBm	-0.24 dB	VBW	10 kHz		
	55.71142285 kHz	SWT	15 ms	Unit	dBm



Date: 24.JUL.2007 10:54:23

5. FCC ID LABEL

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may cause undesired operation.

The above of FCC statement only put into the user manual, haven't onto the device.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



FCC ID Label Location

6. PHOTOGRAPH

6.1.Photo of Radiated Measurement



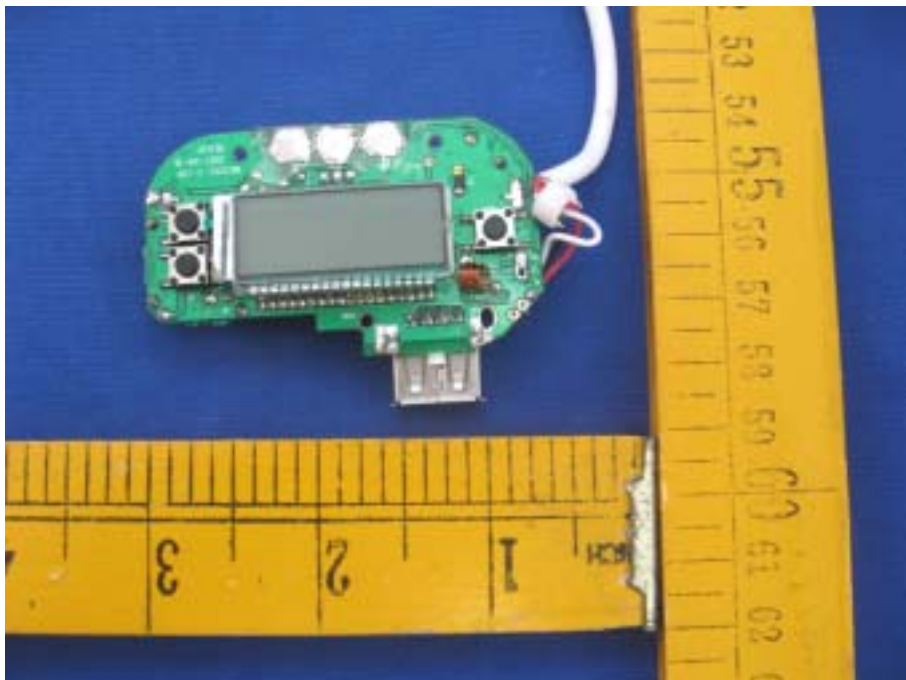
APPENDIX I

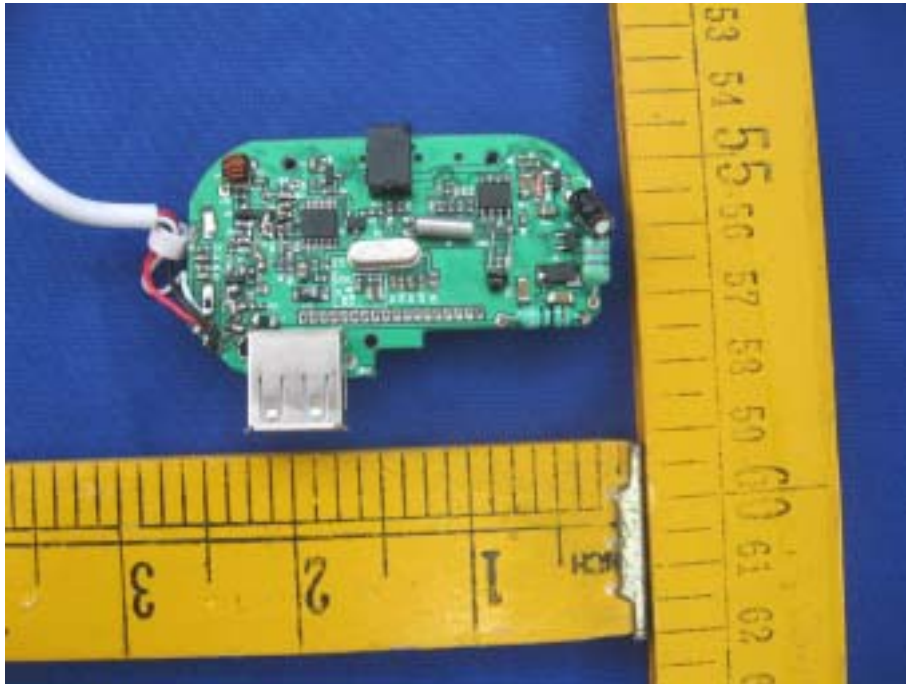
(Photos of EUT)

Outside View



Interior View





THE END