

FCC CERTIFICATION  
On Behalf of  
Micro Electronics Ltd.

RF Remote Control For iPod  
Model No.: RC-03(US)

FCC ID: UJDRF433

Prepared for : Micro Electronics Ltd.  
Address : 7/F., Enterprise Square Three, 39 Wang Chiu Road,  
Kowloon Bay, Kowloon, Hongkong

Prepared by : ACCURATE TECHNOLOGY CO. LTD  
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Report Number : ATE20061789  
Date of Test : August 30, 2006  
Date of Report : September 12, 2006

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## Test Report Certification

Applicant : Micro Electronics Ltd.  
 Manufacturer : Micro Electronics Ltd.  
 EUT Description : RF Remote Control For iPod  
                           (A) MODEL NO.: RC-03(US)  
                           (B) SERIAL NO.: N/A  
                           (C) POWER SUPPLY: 3.0V DC ("Lithium Cell" battery Type×1)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231: 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 15.231 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 : August 30, 2006

Prepared by :   
 (Engineer)

Reviewer :   
 (Quality Manager)

Approved & Authorized Signer :   
 (Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

EUT	:	RF Remote Control For iPod
Model Number	:	RC-03(US)
Power Supply	:	3.0V DC ("Lithium Cell" battery Type × 1)
Operation Frequency	:	433.92MHz±50kHz
Applicant	:	Micro Electronics Ltd.
Address	:	7/F., Enterprise Square Three, 39 Wang Chiu Road, Kowloon Bay, Kowloon, Hongkong
Manufacturer	:	Micro Electronics Ltd.
Address	:	7/F., Enterprise Square Three, 39 Wang Chiu Road, Kowloon Bay, Kowloon, Hongkong
Date of sample received	:	August 28, 2006
Date of Test	:	August 30, 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

### 3. THE FIELD STRENGTH OF RADIATION EMISSION

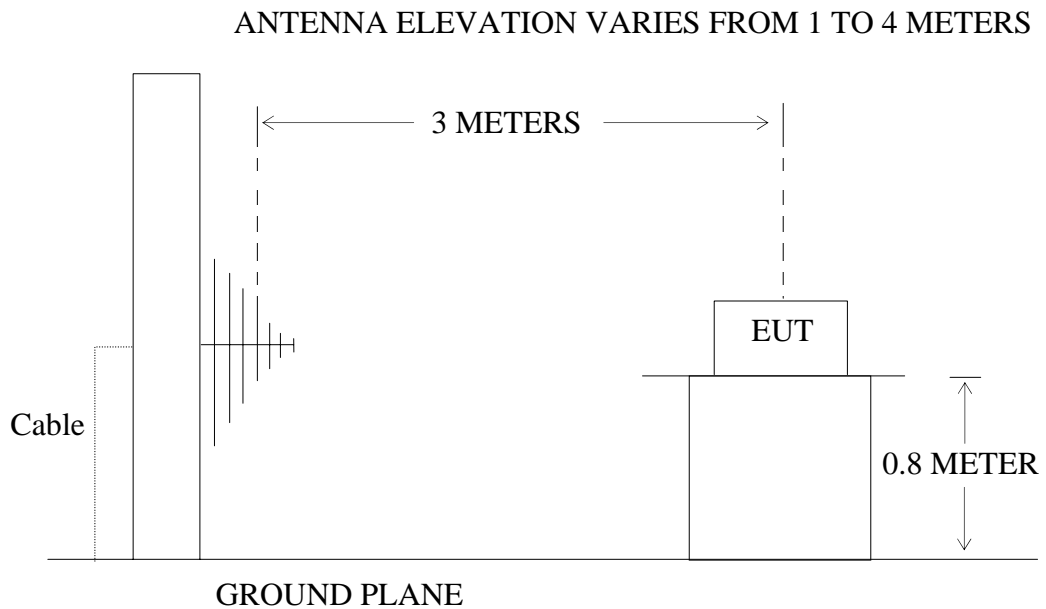
#### 3.1. Block Diagram of Test Setup

##### 3.1.1. Block diagram of connection between the EUT and simulators



(EUT: RF Remote Control For iPod)

##### 3.1.2. Anechoic Chamber Test Setup Diagram



(EUT: RF Remote Control For iPod)

#### 3.2. The Field Strength of Radiation Emission Measurement Limits

##### 3.2.1 Radiation Emission Measurement Limits According to Section 15.231(b)

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [ $\mu\text{V/m}$ ]	Field Strength of Spurious Emission [Average] [ $\mu\text{V/m}$ ]
40.66-40.70	2250	225
70-130	1250	125
130-174	1250-3750	125-375
174-260	3750	375
260-470	3750-12500	375-1250
Above 470	12500	1250

Where F is the frequency in MHz, The formulas for calculating the maximum permitted fundamental

field strengths are as follows: for the band 130-174MHz,  $\mu\text{V/m}$  at 3 meters=56.81818(F)-6136.3636; For the band 260-470MHz,  $\mu\text{V/m}$  at 3 meters=41.6667(F)-7083.3333. The maximum permissible unwanted emission level is 20dB below the maximum permitted fundamental level.

### 3.2.2 Restricted Band Radiation Emission Measurement Limits According to Section 15.205 and Section 15.209

### 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. RF Remote Control For iPod (EUT)

Model Number	:	RC-03(US)
Serial Number	:	N/A
Manufacturer	:	Micro Electronics 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.

3.4.3. Let the EUT work in measuring modes (TX) measure it.

### 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 bi-log 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 EUT location must be manipulated according to ANSI 63.4 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz, and 1MHz in 1000-5000MHz.

The frequency range from 30MHz to 5000MHz is checked.

### 3.6. The Field Strength of Radiation Emission Measurement Results

**PASS.**

The frequency range 315MHz to 3150MHz is investigated.

Date of Test:	<u>August 30, 2006</u>	Temperature:	<u>23°C</u>
EUT:	<u>RF Remote Control For iPod</u>	Humidity:	<u>54%</u>
Model No.:	<u>RC-03(US)</u>	Power Supply:	<u>3.0V DC ("Lithium Cell" battery Type×1)</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Andy</u>

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
433.896	78.9	81.3	-16.1	62.8	65.2	80.8	100.8	18.0	35.6	Horizontal
837.793	62.0	64.3	-12.3	49.7	52.0	60.8	80.8	11.1	28.8	
*1301.688	47.3	50.3	-7.2	40.1	43.1	54	74	13.9	30.9	
1735.584	40.7	43.1	-5.7	35.0	37.4	60.8	80.8	25.8	43.4	
2169.481	41.8	44.4	-4.4	37.4	40.0	60.8	80.8	23.4	40.8	
2603.376	31.1	33.5	-3.0	28.1	30.5	60.8	80.8	32.7	50.3	
3037.272	32.5	35.0	-1.8	30.7	33.2	60.8	80.8	30.1	47.6	
3471.168	35.8	38.5	-0.4	35.4	38.1	60.8	80.8	25.4	42.7	
*3905.064	35.1	37.9	0.7	35.8	38.6	54	74	18.2	35.4	
*4338.961	27.6	30.9	1.5	29.1	32.4	54	74	24.9	41.6	
433.896	75.7	78.1	-16.1	59.6	62.0	80.8	100.8	21.2	38.8	Vertical
837.793	59.0	60.9	-12.3	46.7	48.6	60.8	80.8	14.1	32.2	
*1301.688	40.4	43.0	-7.2	33.2	35.8	54	74	20.8	38.2	
1735.584	37.1	39.7	-5.7	31.4	34.0	60.8	80.8	29.4	46.8	
2169.481	44.1	46.8	-4.4	39.7	42.4	60.8	80.8	21.1	38.4	
2603.376	30.8	33.5	-3.0	27.8	30.5	60.8	80.8	33.0	50.3	
3037.272	29.0	31.8	-1.8	27.2	30.0	60.8	80.8	33.6	50.8	
3471.168	41.3	44.1	-0.4	40.9	43.7	60.8	80.8	19.9	37.1	
*3905.064	30.5	33.5	0.7	31.2	34.2	54	74	22.8	39.8	
*4338.961	27.8	30.8	1.5	29.3	32.3	54	74	24.7	41.7	

Note:

1. \*: Denotes restricted band of operation.

Measurements were made using a peak detector and average detector. Any emission Above 1000MHz and falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.



2. 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:

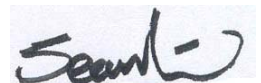
Result = Reading + Corrected Factor

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

$$3. \quad \text{FCC Limit for Average Measurement} = 41.6667(433.9) - 7083.3333 = 10995.8478 \mu\text{V/m} \\ = 80.8 \text{dB}\mu\text{V/m}$$

4. The spectral diagrams in appendix I display the measurement of peak values.

Reviewer :



## 4. OCCUPIED BANDWIDTH

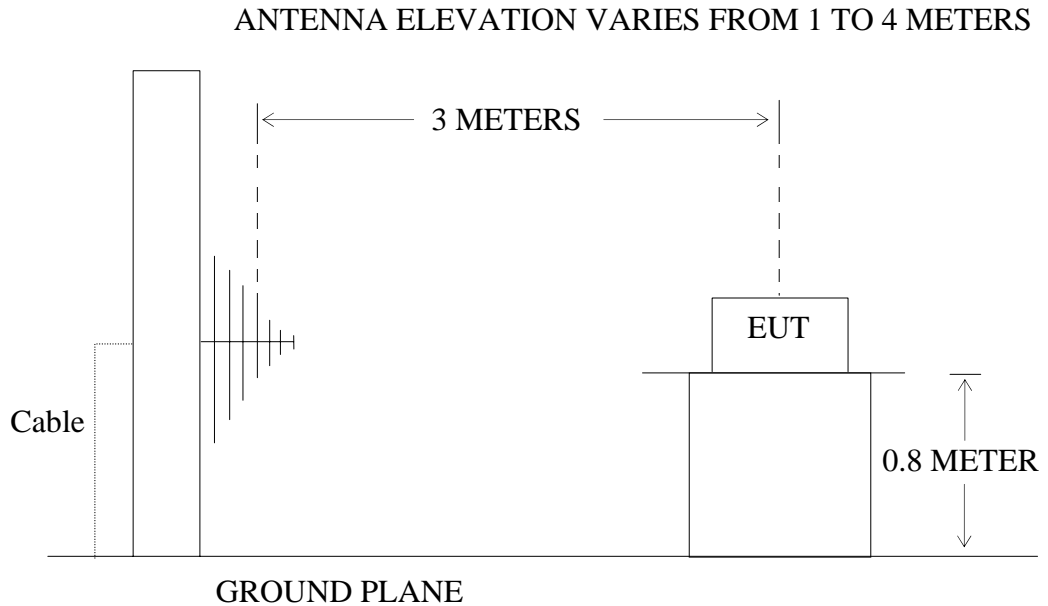
### 4.1. Block Diagram of Test Setup

#### 4.1.1. Block diagram of connection between the EUT and simulators



(EUT: RF Remote Control For iPod)

#### 4.1.2. Anechoic Chamber Test Setup Diagram



(EUT: RF Remote Control For iPod)

### 4.2. The Bandwidth of Emission Limit According To Section 15.231(c)

The bandwidth of emission shall be no wider than 0.25% of the center frequency. Therefore, the bandwidth of the emission limit is  $433.9\text{MHz} \times 0.25\% = 1084.75\text{KHz}$ . Bandwidth is determined at the two points 20 dB down from the top of modulated carrier.

### 4.3.EUT Configuration on Measurement

The following equipment are installed on the bandwidth of 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.RF Remote Control For iPod (EUT)

Model Number : RC-03(US)  
Serial Number : N/A  
Manufacturer : Micro Electronics 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.

4.4.3.Let the EUT work in measuring mode (TX) measure it.

### 4.5.Test Procedure

4.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 9kHz, VBW = 10kHz, Span = 200kHz.

4.5.2. Set SPA Max hold. Mark peak, -20dB

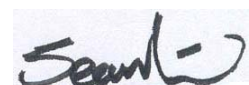
#### 4.6. Measurement Result

**The EUT does meet the FCC requirement.**

-20dB bandwidth = 42.8KHz < 1084.75KHz.

The spectral diagrams in appendix I.

Reviewer :

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## 5. RELEASE TIME MEASUREMENT

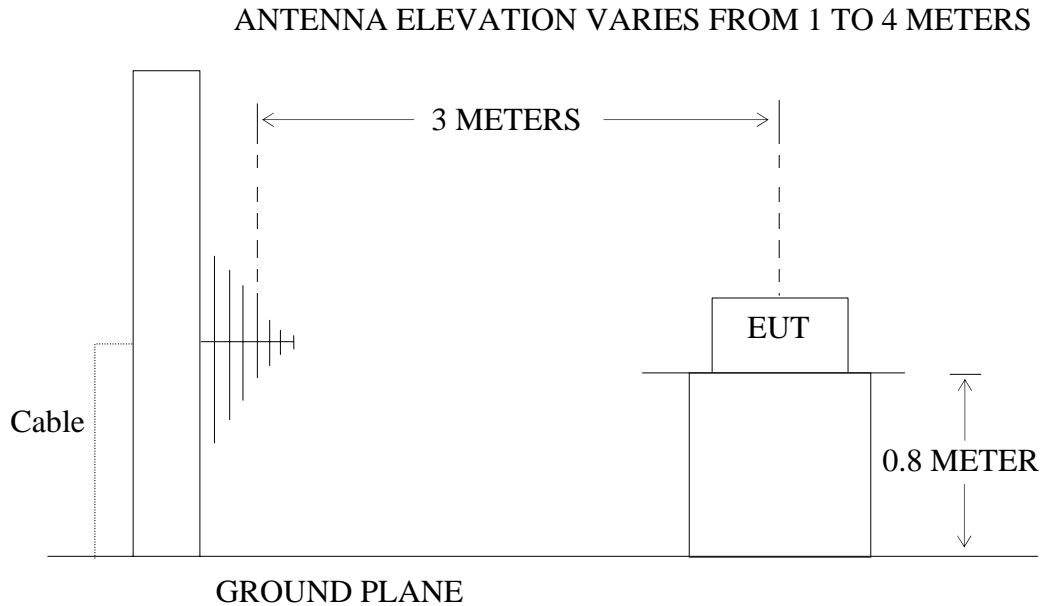
### 5.1. Block Diagram of Test Setup

#### 5.1.1. Block diagram of connection between the EUT and simulators



(EUT: RF Remote Control For iPod)

#### 5.1.2. Anechoic Chamber Test Setup Diagram



(EUT: RF Remote Control For iPod)

### 5.2. Release Time Measurement According To Section 15.231(a)

Section 15.231(a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### 5.3.EUT Configuration on Measurement

The following equipment are installed on Release Time Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 5.3.1.RF Remote Control For iPod (EUT)

Model Number : RC-03(US)  
Serial Number : N/A  
Manufacturer : Micro Electronics Ltd.

### 5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in measuring mode (TX) measure it.

### 5.5.Test Procedure

5.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 120kHz, VBW = 100kHz, Span = 0Hz. Sweep time = 3seconds.

5.5.2. Set EUT as normal operation and press Transmitter button for 0.528 seconds.

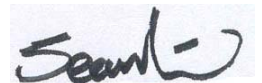
5.5.3. Set SPA View. Delta Mark time.

## 5.6. Measurement Result

**The release time less than 5 seconds.**

The spectral diagrams in appendix I.

Reviewer :

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# APPENDIX I (Test Curves)

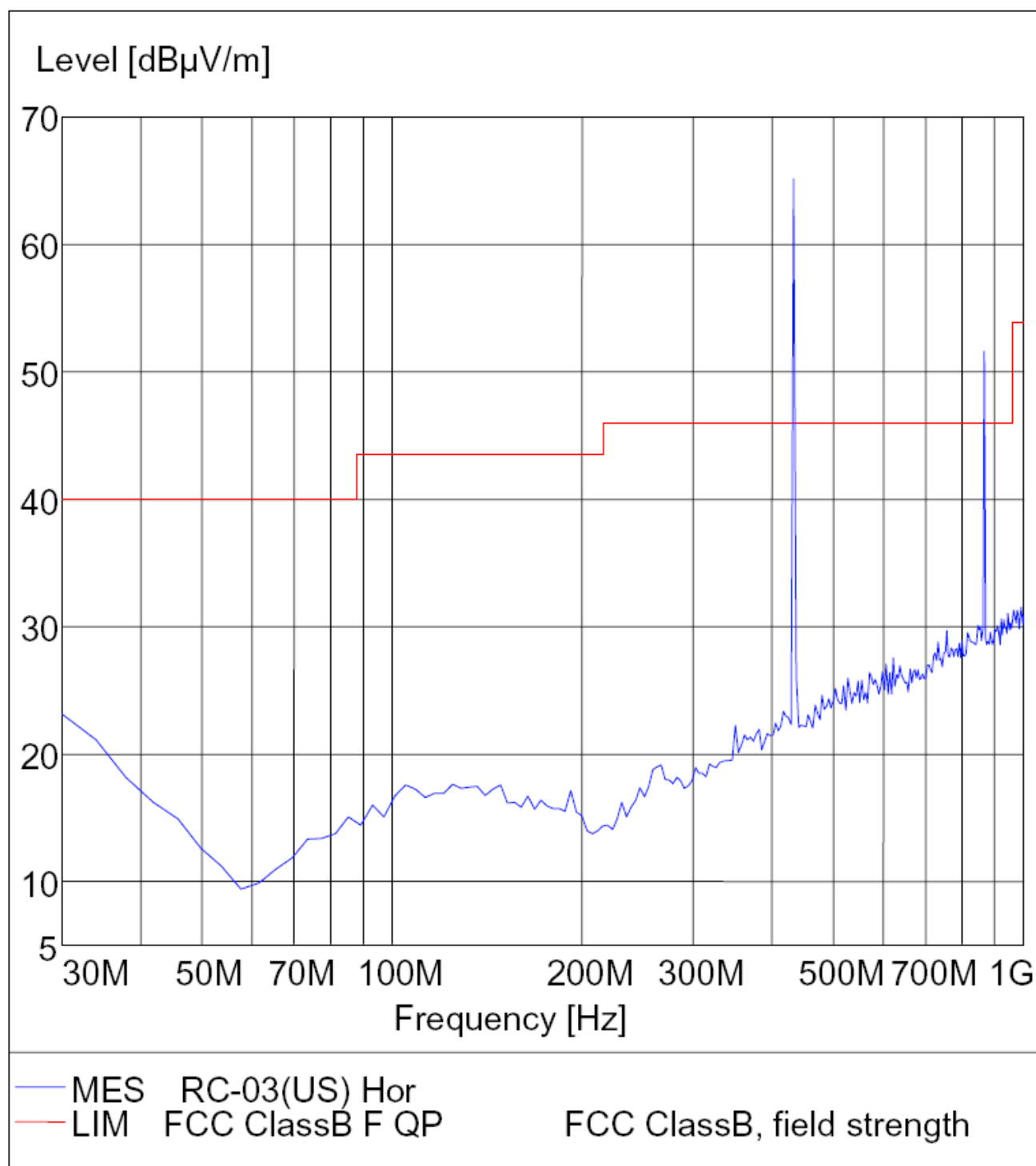


## Radiated Disturbance

## FCC Part 15

EUT: RF Remote Control For iPOD  
 Manufacturer: Micro Electronics Ltd.  
 Operating Condition: TX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Horizontal  
 Comment : DC 3.0V

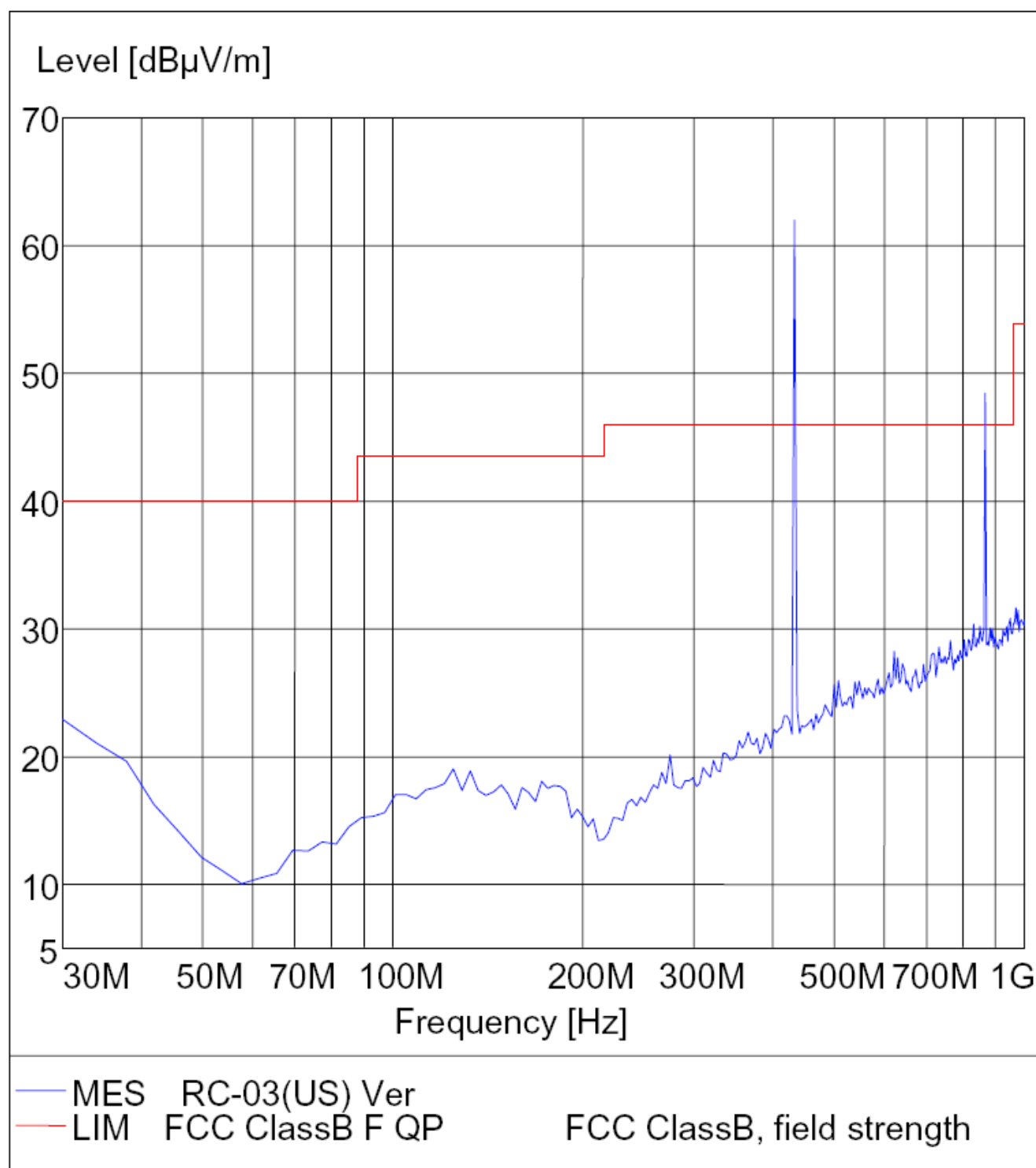
M/N:RC-03 (US)



## Radiated Disturbance

## FCC Part 15

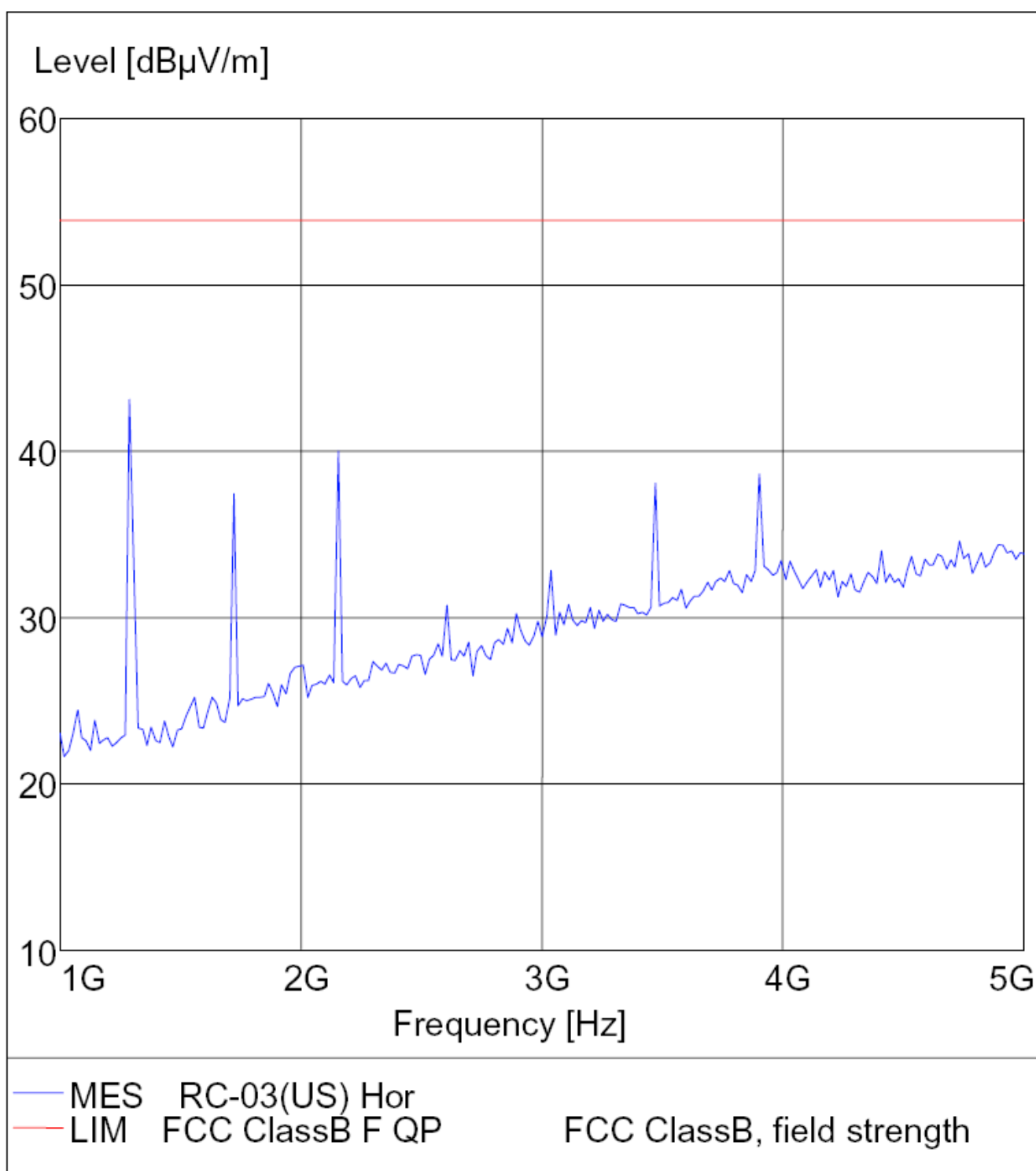
EUT: RF Remote Control For iPod M/N:RC-03 (US)  
 Manufacturer: Micro Electronics Ltd.  
 Operating Condition: TX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Vertical  
 Comment : DC 3.0V



## Spurious Emission

## FCC Part 15

EUT: RF Remote Control For iPod M/N:RC-03(US)  
 Manufacturer: Micro Electronics Ltd.  
 Operating Condition: TX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Horizontal  
 Comment : DC 3.0V



**Spurious Emission****FCC Part 15**

EUT: RF Remote Control For iPOD M/N:RC-03(US)  
 Manufacturer: Micro Electronics Ltd.  
 Operating Condition: TX  
 Test Site: ATC EMC Lab.SAC  
 Operator: Andy  
 Test Specification: Vertical  
 Comment : DC 3.0V

