# APPLICATION CERTIFICATION FCC Part 15B On Behalf of HONG KONG NATURAL SOUND ELECTRONICS LIMITED

# MP3 Model No.: ID1839T, Eclipse-T180

# FCC ID: PWK-ID1839T

Prepared for Address	:	HONG KONG NATURAL SOUND ELECTRONICS LIMITED FLAT/RM M 4/F CONTINENTAL MANSION 300 KING'S ROAD HONG KONG
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Report Number	:	ATE20130411
Date of Test	:	March 18-22, 2013
Date of Report	:	March 22, 2013

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# **Test Report Certification**

Applicant : HONG KONG NATURAL SOUND ELECTRONICS LIMITED

Manufacturer : Shenzhen Natural Sound Electronics Co., Ltd.

EUT Description : MP3

- (A) MODEL NO.: ID1839T, Eclipse-T180
- (B) SERIAL NO .: N/A
- (C) POWER SUPPLY: DC 3.7V (Li-polymer battery) or DC 5V (Power by USB port)

Measurement Procedure Used:

# FCC Rules and Regulations Part 15 Subpart B ANSI C63.4: 2009

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 B 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 :

March 18-22, 2013

Prepared by :

(Apple Lv, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)

# **1. GENERAL INFORMATION**

# 1.1.Description of Device (EUT)

EUT	:	MP3
Model Number	:	ID1839T, Eclipse-T180 (Note: These samples are same except for the appearance color is difference. So we prepare the ID1839T for FCC test.)
Power Supply	:	DC 3.7V (Li-polymer battery) or DC 5V (Power by USB port)
Highest operation frequency of the EUT:	:	96MHz
Applicant	:	HONG KONG NATURAL SOUND ELECTRONICS LIMITED
Address	:	FLAT/RM M 4/F CONTINENTAL MANSION 300 KING'S ROAD HONG KONG
Manufacturer	:	Shenzhen Natural Sound Electronics Co., Ltd.
Address	:	4 <sup>th</sup> Building, Xinyuan Industrial Zone, Gushu Village, Bao'an District, Shenzhen, China
Date of sample received	:	March 18, 2013
Date of Test	:	March 18-22, 2013

# 1.2. Accessory and Auxiliary Equipment

1.2.1.PC		
Notebook PC	:	Manufacturer: SONY M/N: PCG-663P S/N: 28123170 7202526
1.2.2.FM Generator		
FM Generator	:	Manufacturer: Rohde & Schwarz M/N: SML01 S/N: 101161

# 1.3.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen
		Listed by FCC The Registration Number is 752051
		Listed by Industry Canada The Registration Number is 5077A-2
		Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm Site Location	:	ACCURATE TECHNOLOGY CO. LTD F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

# 1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

# 2. MEASURING DEVICE AND TEST EQUIPMENT

Kind of equipment	Manufacturer	Туре	S/N	Calibrated date	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 12, 2013	Jan. 11, 2014
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 12, 2013	Jan. 11, 2014
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 12, 2013	Jan. 11, 2014
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 12, 2013	Jan. 11, 2014
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Feb. 06, 2013	Feb. 05, 2014
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Feb. 06, 2013	Feb. 05, 2014
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 12, 2013	Jan. 11, 2014
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 12, 2013	Jan. 11, 2014

### Table 1: List of Test and Measurement Equipment

# 3. OPERATION OF EUT DURING TESTING

### 3.1.Operating Mode

The modes are used: 1) Playing

- 2) Recording
- 3) FM Receive
- 4) Transfer data & Charging

# 3.2. Configuration and peripherals



(EUT: MP3)

# 4. TEST PROCEDURES AND RESULTS

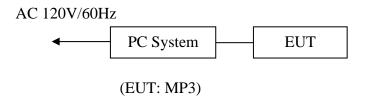
FCC Rules	Description of Test	Result
Section 15.107	Conducted Emission Test	Compliant
Section 15.109	Radiated Emission Test	Compliant

# 5. CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.107(A)

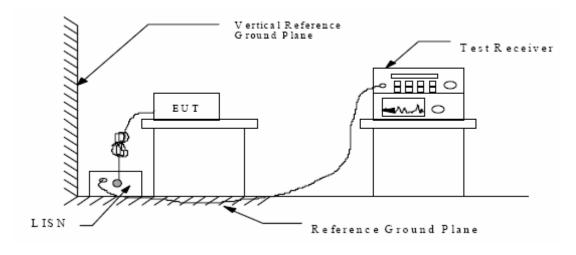
## 5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators

5.1.1.1.For Transfer data & Charging



5.1.2. Shielding Room Test Setup Diagram



(EUT: MP3)

#### 5.2. The Emission Limit

Frequency	Limit dB(µV)			
(MHz)	Quasi-peak Level	Average Level		
0.15 - 0.50	66.0 - 56.0 *	56.0 - 46.0 *		
0.50 - 5.00	56.0	46.0		
5.00 - 30.00	60.0	50.0		

5.2.1.Conducted Emission Measurement Limits According to Section 15.107(a)

\* Decreases with the logarithm of the frequency.

### 5.3.Configuration of EUT on Measurement

The following equipment are installed on the Conducted Emission 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.MP3 (EUT)

Model Number	:	ID1839T
Serial Number	:	N/A
Manufacturer	:	Shenzhen Natural Sound Electronics Co., 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 modes (Transfer data & Charging) and measure it.

#### 5.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 500hm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines 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: 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

# 5.6. Power Line Conducted Emission Measurement Results

#### PASS.

The frequency range from 150kHz to 30MHz is checked.

Date of Test: EUT: Model No.:	March 18, 2 MP3 ID1839T	2013		Temperatu Humidity: Power Sup	50%	V/60Hz	
Test Mode:	Transfer da	ta & Charg	ging	Test Engin		<b>V</b> /00112	
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000 2.843398 3.030938	40.20 29.70 29.80	11.0 11.6 11.6	66 56 56		QP QP QP	N N N	GND GND GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.184605 1.606633 2.532561	39.70 29.30 30.30	11.2 11.7 11.6		14.6 16.7 15.7	AV AV AV	N N N	GND GND GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000 0.183870 1.052309	43.40 43.80 34.40	11.0 11.2 11.8	66 64 56		QP QP QP	L1 L1 L1	GND GND GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV		Detector	Line	PE
0.186085 0.555583 0.802141	42.10 35.00 34.70	11.2 12.0 11.9	54 46 46	11.0	AV AV AV	L1 L1 L1	GND GND GND

Emissions attenuated more than 20 dB below the permissible value are not reported. The spectral diagrams are attached as below.

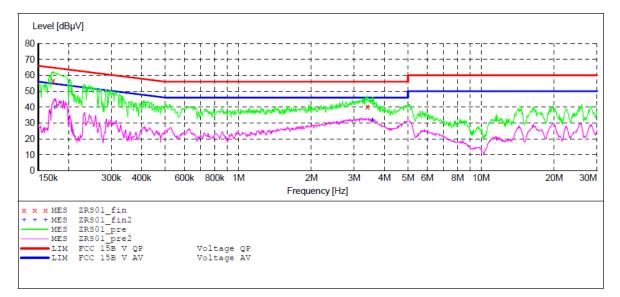
#### ACCURATE TECHNOLOGY CO., LTD

#### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT:	MP3 M/N:ID1839T
Manufacturer:	Natural Sound
Operating Condition:	Transfer data & Charging
Test Site:	1#Shielding Room
Operator:	Star
Test Specification:	N 120V/60Hz
Comment:	Report No.:ATE20130411
Start of Test:	3/18/2013 / 4:27:47PM

#### SCAN TABLE: "V 150K-30MHz fin"

CAN IADIE	1001	1-30Pm2	<u></u>			
Short Desc	ription:		_SUB_STD_VTE	RM2 1.70		
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
150.0 kHz	30.0 MHz	0.8 %	QuasiPeak	1.0 s	9 kHz	NSLK8126 2008
			Average			



#### MEASUREMENT RESULT: "ZRS01 fin"

3/18/2013 4:3	0 PM						
Frequency				-	Detector	Line	PE
MHz	dBµV	dB	dBµV	dB			
0.172493	56.70	11.2	65	8.1	OP	Ν	GND
3.402943				15.9	~	N	GND
0.102010	10.10		00	10.0	×-		0112

#### MEASUREMENT RESULT: "ZRS01\_fin2"

3/18/2013 4:3	BOPM						
Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz	dBµV	dB	dBµV	dB			
0.175269	39.80	11.2	55	14.9	AV	Ν	GND
3.569926	31.70	11.4	46	14.3	AV	Ν	GND

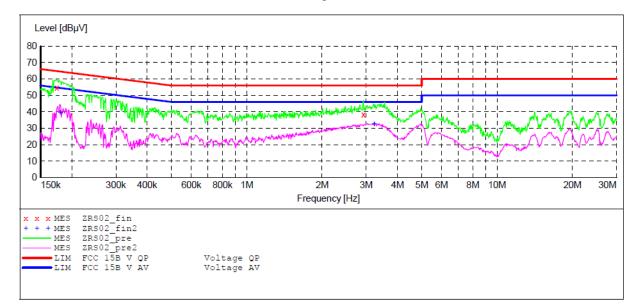
#### ACCURATE TECHNOLOGY CO., LTD

#### CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT:	MP3 M/N:ID1839T
Manufacturer:	Natural Sound
Operating Condition:	Transfer data & Charging
Test Site:	1#Shielding Room
Operator:	Star
Test Specification:	L 120V/60Hz
Comment:	Report No.:ATE20130411
Start of Test:	3/18/2013 / 4:30:42PM

#### SCAN TABLE: "V 150K-30MHz fin"

$\mathbf{\omega}$	CAN IADIE	1001		<u></u>				
	Short Desc	ription:		_SUB_STD_VTE	RM2 1.70			
	Start	Stop	Step	Detector	Meas.	IF	Transducer	
	Frequency	Frequency	Width		Time	Bandw.		
	150.0 kHz	30.0 MHz	0.8 %	QuasiPeak	1.0 s	9 kHz	NSLK8126 2008	
				Average				



#### MEASUREMENT RESULT: "ZRS02 fin"

3/18/2013 4	4:32PM						
Frequency	y Level	Transd	Limit	Margin	Detector	Line	PE
MH	z dBµV	dB	dBµV	dB			
0.173870	6 54.60	11.2	65	10.2	QP	L1	GND
2.92397	5 38.30	11.4	56	17.7	QP	L1	GND

#### MEASUREMENT RESULT: "ZRS02 fin2"

3/18/2013 4:3	32PM						
Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz	dBµV	dB	dBµV	dB			
0.179518	39.50	11.2	55	15.0	AV	L1	GND
3.230847	32.30	11.4	46	13.7	AV	L1	GND

# 6. RADIATED EMISSION FOR FCC PART 15 SECTION 15.109(A)

### 6.1.Block Diagram of Test Setup

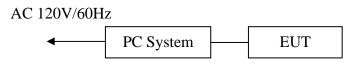
6.1.1.Block diagram of connection between the EUT and simulators

6.1.1.1.For playing & Recording & FM Receive



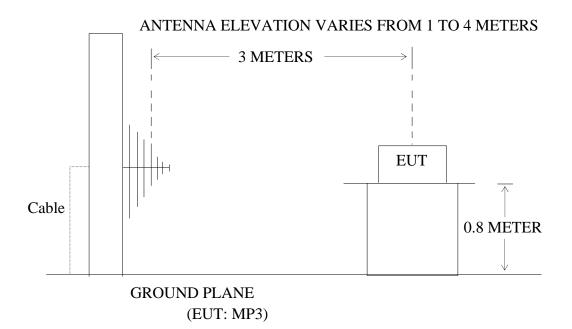
(EUT: MP3)

6.1.1.2.For Transfer data & Charging





6.1.2.Semi-Anechoic Chamber Test Setup Diagram



# 6.2. The Emission Limit For Section 15.109 (a)

	Limit				
Frequency (MHz)	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			
Above 960	500	54			

6.2.1.Radiation Emission Measurement Limits According to Section 15.109 (a).

### 6.3.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.

6.3.1.MP3 (EUT)

Model Number	:	ID1839T
Serial Number	:	N/A
Manufacturer	:	Shenzhen Natural Sound Electronics Co., Ltd.

### 6.4. Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

- 6.4.2.Turn on the power of all equipment.
- 6.4.3. Let the EUT work in (Playing, Recording, FM Receive, Transfer data & Charging) mode measures it.

### 6.5.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: 2009 on radiated emission measurement.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz

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

The highest frequency of the internal sources of the EUT is less than 108MHz; The measurement shall only be made up to 1GHz.

### 6.6. The Emission Measurement Result

### PASS.

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 3.7V
Test Mode:	Playing	Test Engineer:	PEI

Frequency: 30-2	Frequency: 30-1000MHz												
Polarization													
	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
Horizontal	1	79.8002	54.58	-22.35	32.23	40.00	-7.77	QP					
Homzontar	2	248.5518	62.44	-19.74	42.70	46.00	-3.30	QP					
	3	256.5210	61.34	-19.36	41.98	46.00	-4.02	QP					
	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
Vertical	1	80.0806	50.06	-22.56	27.50	40.00	-12.50	QP					
	2	255.6230	58.88	-18.75	40.13	46.00	-5.87	QP					
	3	280.0237	56.36	-17.76	38.60	46.00	-7.40	QP					

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

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. The spectral diagrams are attached as below display the measurement of peak values

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 3.7V
Test Mode:	Recording	Test Engineer:	PEI

Frequency: 30-1000MHz								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	79.8003	59.68	-22.35	37.33	40.00	-2.67	QP
	2	256.5211	62.98	-19.36	43.62	46.00	-2.38	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	256.5210	50.33	-18.74	31.59	46.00	-14.41	QP
	2	269.4284	54.14	-18.22	35.92	46.00	-10.08	QP

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. The spectral diagrams are attached as below display the measurement of peak values

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 3.7V
Test Mode:	FM Receive(88.1MHz)	Test Engineer:	PEI

Frequency: 30-1000MHz								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	88.1000	57.87	-22.63	35.24	40.00	-4.76	QP
	2	248.5517	53.79	-19.74	34.05	46.00	-11.95	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	88.1000	58.16	-22.38	35.78	40.00	-4.22	QP
	2	520.8881	41.69	-13.09	28.60	46.00	-17.40	QP

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. The spectral diagrams are attached as below display the measurement of peak values.
- 4. 88.1MHz is frequency for the FM generator

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 3.7V
Test Mode:	FM Receive(98.1MHz)	Test Engineer:	PEI

Frequency: 30-1000MHz								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	98.1000	62.44	-23.36	39.08	43.50	-4.42	QP
	2	274.1938	45.28	-18.58	26.70	46.00	-19.30	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	98.1000	60.36	-21.76	38.60	43.50	-4.90	QP
	2	261.0581	47.83	-18.60	29.23	46.00	-16.77	QP

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. The spectral diagrams are attached as below display the measurement of peak values.
- 4. 98.1MHz is frequency for the FM generator

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 3.7V
	FM		
Test Mode:	Receive(107.9MHz)	Test Engineer:	PEI

Frequency: 30-1000MHz								
Polarization								
Horizontal	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	107.9000	64.27	-23.49	40.78	43.50	-2.72	QP
	2	312.1792	47.39	-17.61	29.78	46.00	-16.22	QP
Vertical	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	107.9000	59.90	-21.81	38.09	43.50	-5.41	QP
	2	263.8190	52.08	-18.44	33.64	46.00	-12.36	QP

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. The spectral diagrams are attached as below display the measurement of peak values.

4. 107.9MHz is frequency for the FM generator

Date of Test:	March 18, 2013	Temperature:	25°C
EUT:	MP3	Humidity:	50%
Model No.:	ID1839T	Power Supply:	DC 5V
	Transfer data &		
Test Mode:	Charging	Test Engineer:	PEI

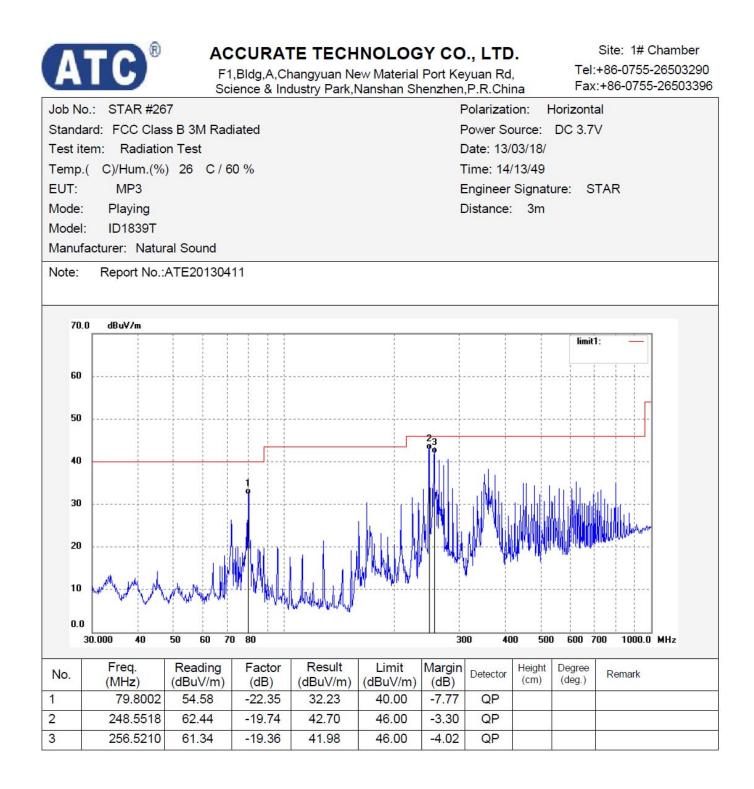
Frequency: 30-1000MHz									
Polarization									
	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
	1	88.0327	60.63	-22.64	37.99	43.50	-5.51	QP	
Horizontal	2	117.3602	65.28	-23.44	41.84	43.50	-1.66	QP	
	3	146.3735	66.05	-24.73	41.32	43.50	-2.18	QP	
	4	234.9909	64.55	-19.84	44.71	46.00	-1.29	QP	
	No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
	1	117.3602	61.91	-22.54	39.37	43.50	-4.13	QP	
Vertical	2	161.4740	61.79	-21.30	40.49	43.50	-3.01	QP	
	3	234.9909	61.84	-19.42	42.42	46.00	-3.58	QP	
	4	249.4250	62.44	-18.94	43.50	46.00	-2.50	QP	

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

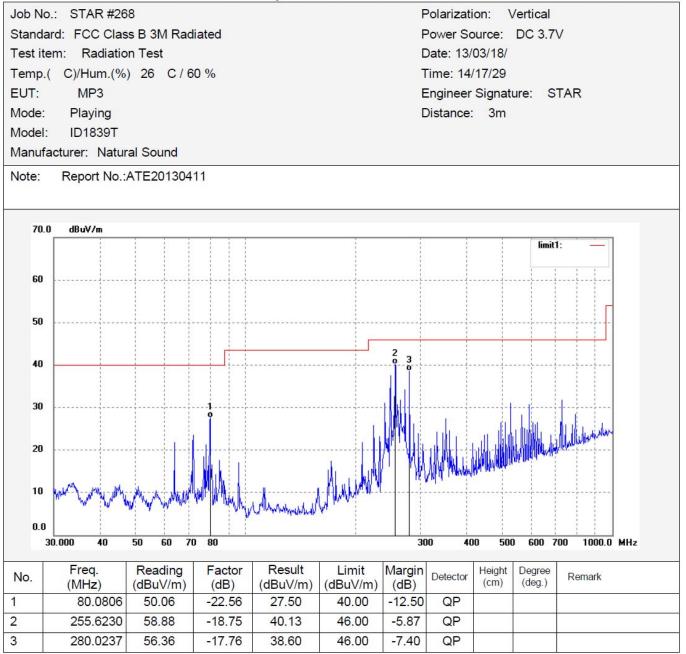
3. The spectral diagrams are attached as below display the measurement of peak values.

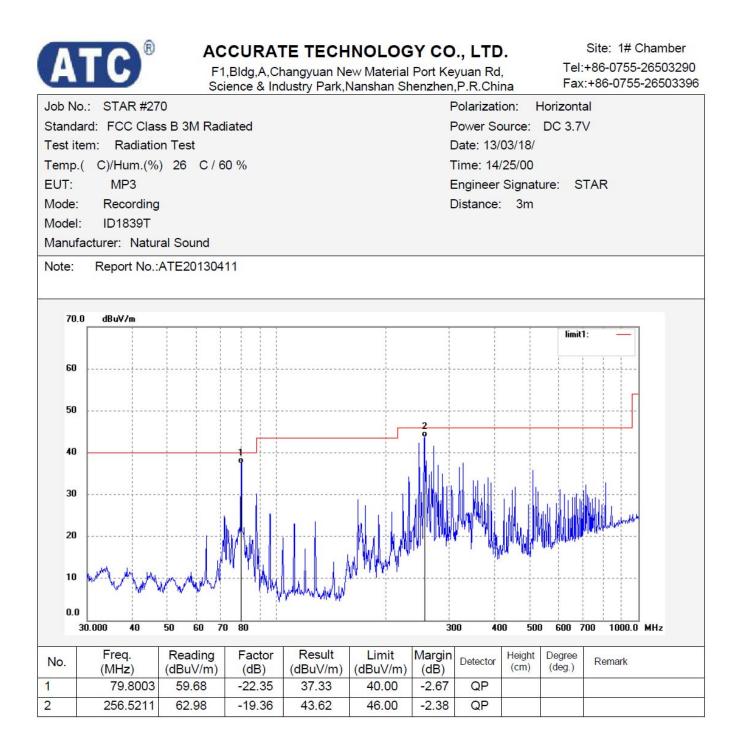




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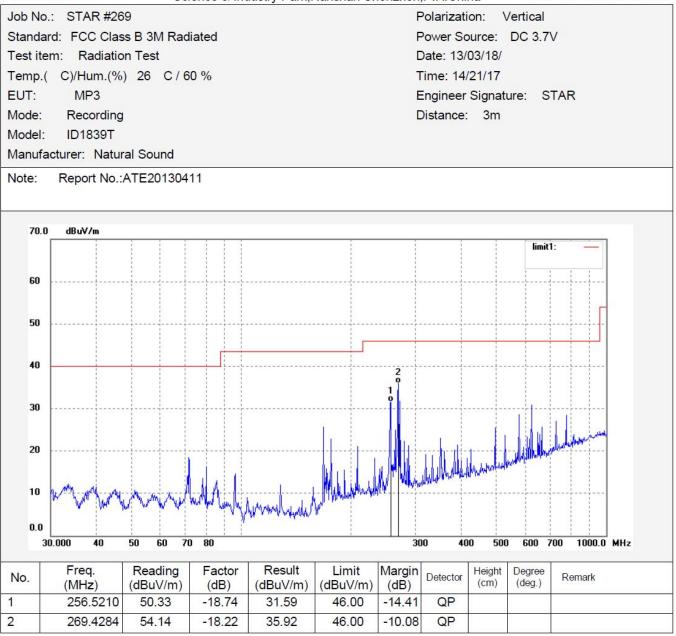






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