FCC PART 15B

MEASUREMENT AND TEST REPORT

FOR

Hena Digital Technology (Shenzhen) Co., Ltd.

3F, South Tower, Jiuzhou Electric Building, Southern No, 12Rd, High-tech

Industrial Park, Nanshan District, Shenzhen, China

FCC ID: M7CMID008

Report Concerns: Original Report	**Equipment Type:** MID

Model:	MID1107CM
Report No.:	STR12048080I-2
Test Date:	2012-04-11 to 2012-04-24
Issue Date:	2012-04-27
Tested By:	Jason Jiang / Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Hena Digital Technology (Shenzhen) Co., Ltd.
Address of applicant: 3F, South Tower, Jiuzhou Electric Building, Southern No, 12Rd, High-tech Industrial Park

Manufacturer: Hena Digital Technology (Shenzhen) Co., Ltd.
Address of manufacturer: 3F, South Tower, Jiuzhou Electric Building, Southern No, 12Rd, High-tech Industrial Park

General Description of E.U.T

Items	Description
EUT Description:	MID
Trade Name:	HENA
Model No.:	MID1107CM
Add Models:	MID1107; MID11**CM; MID1107**(**Can be 01-99)
Rated Voltage:	DC 3.7V Battery
Supply Voltage:	100-240VAC/50-60Hz
Adaptor Model:	PS14K0502000U5
Rated Current:	0.3A
For more information refer to the circuit diagram form and the user's manual.	

Note: The test data is gathered from a production sample, provided by the manufacture. The others models listed in the report have different appearance only of MID1107CM without circuit and electronic construction changed, declared by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the Hena Digital Technology (Shenzhen) Co., Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

- **FCC – Registration No.: 994117**
  SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**
  The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**
  Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work.

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	SAMSUNG	NP-R20	124V93FP30082V

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.5	Unshielded	Without Core
Earphone	1.0	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. §15.107 (a)- CONDUCTED EMISSION

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

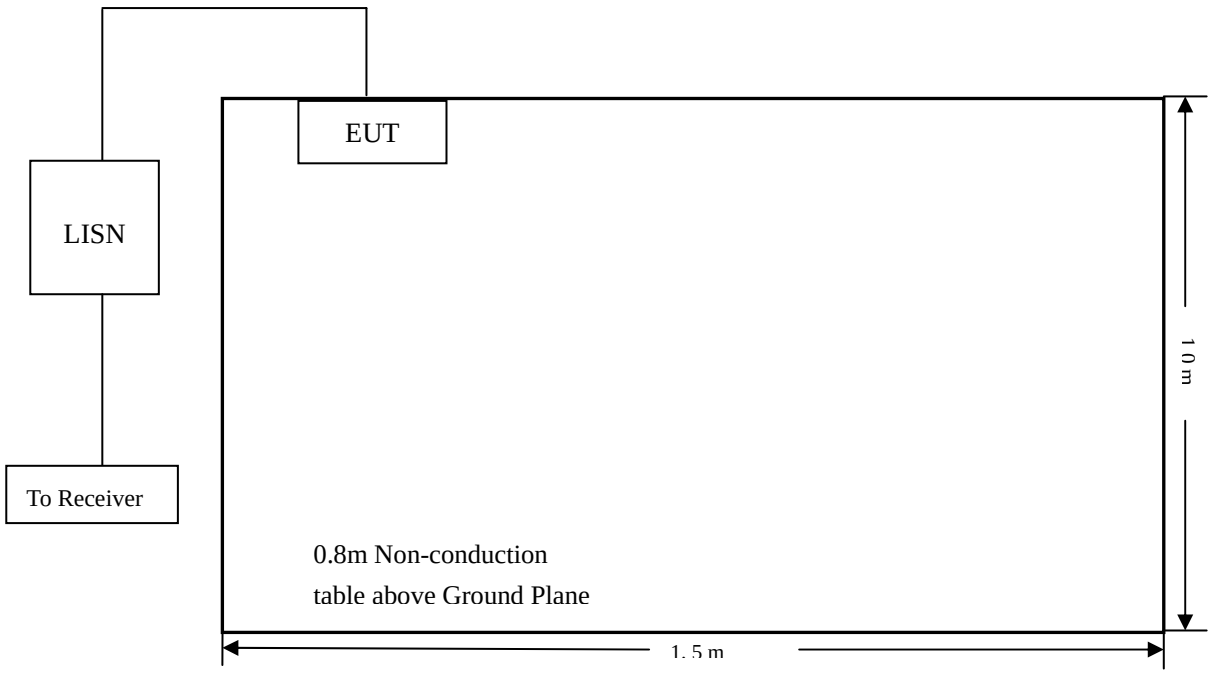
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2012-03-28	2013-03-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2012-03-28	2013-03-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2012-03-28	2013-03-27

3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

3.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC Part 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-7.49 dBμV at **0.166 MHz** in the **Neutral, Peak** Detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance

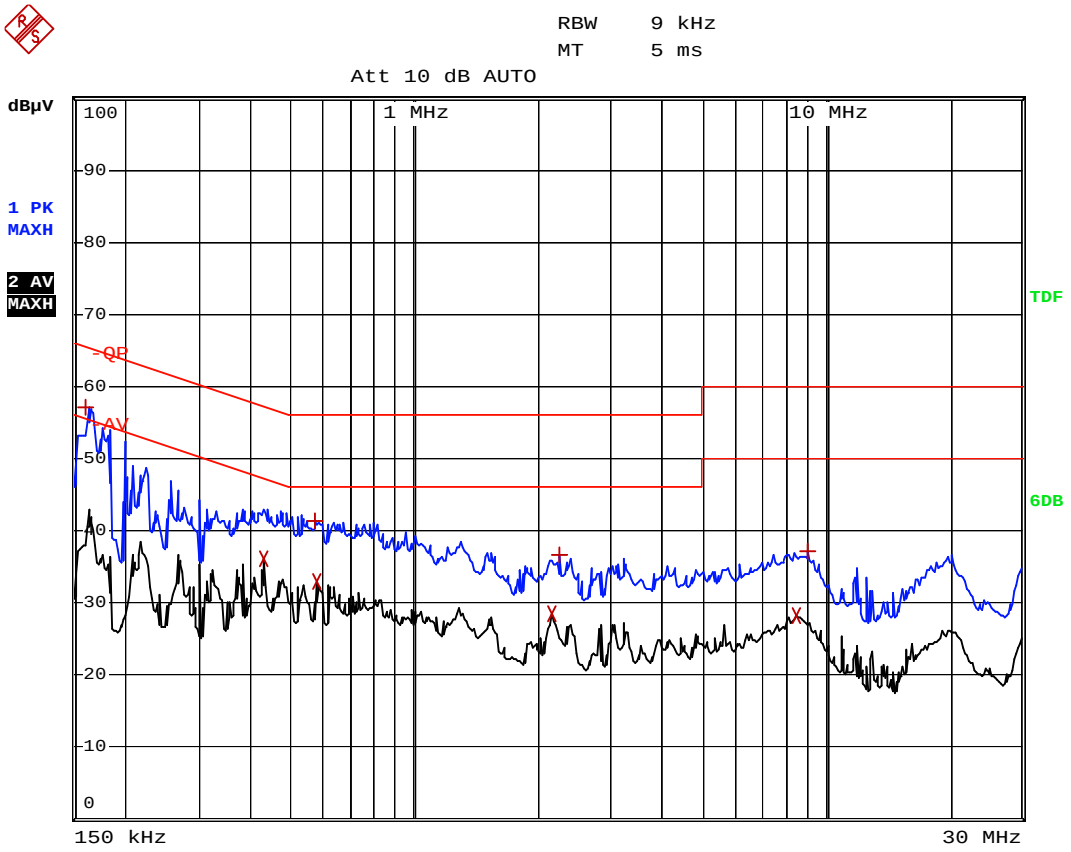
EUT: MID

M/N: MID1107CM

Operating Condition: Charging & Playing

Test Specification: Line

Comment: AC 120V/60Hz/Adapter



EDIT PEAK LIST (Prescan Results)

Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	162 kHz	57.02	-8.33
2 Average	430 kHz	36.05	-11.20
1 Max Peak	570 kHz	41.25	-14.74
2 Average	578 kHz	33.05	-12.94
2 Average	2.17 MHz	28.54	-17.46
1 Max Peak	2.266 MHz	36.48	-19.51
2 Average	8.506 MHz	28.09	-21.91
1 Max Peak	9.078 MHz	37.06	-22.93

Plot of Conducted Emissions Test Data

Conducted Disturbance

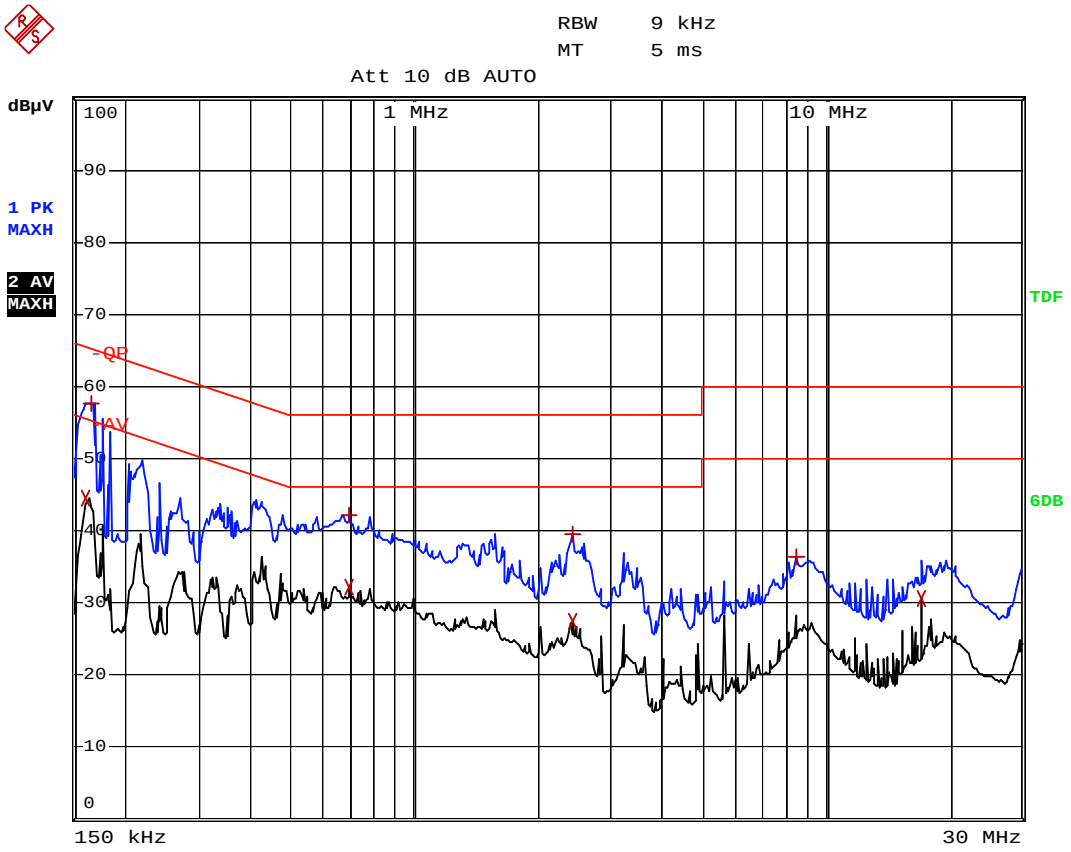
EUT: MID

M/N: MID1107CM

Operating Condition: Charging & Playing

Test Specification: Neutral

Comment: AC 120V/60Hz/Adapter



EDIT PEAK LIST (Prescan Results)

Trace1: -QP
Trace2: -AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	162 kHz	44.39	-10.96
1	Max Peak	166 kHz	57.66	-7.49
1	Max Peak	690 kHz	42.23	-13.76
2	Average	690 kHz	32.25	-13.74
1	Max Peak	2.434 MHz	39.39	-16.60
2	Average	2.434 MHz	27.44	-18.55
1	Max Peak	8.514 MHz	36.46	-23.53
2	Average	17.07 MHz	30.47	-19.52

4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

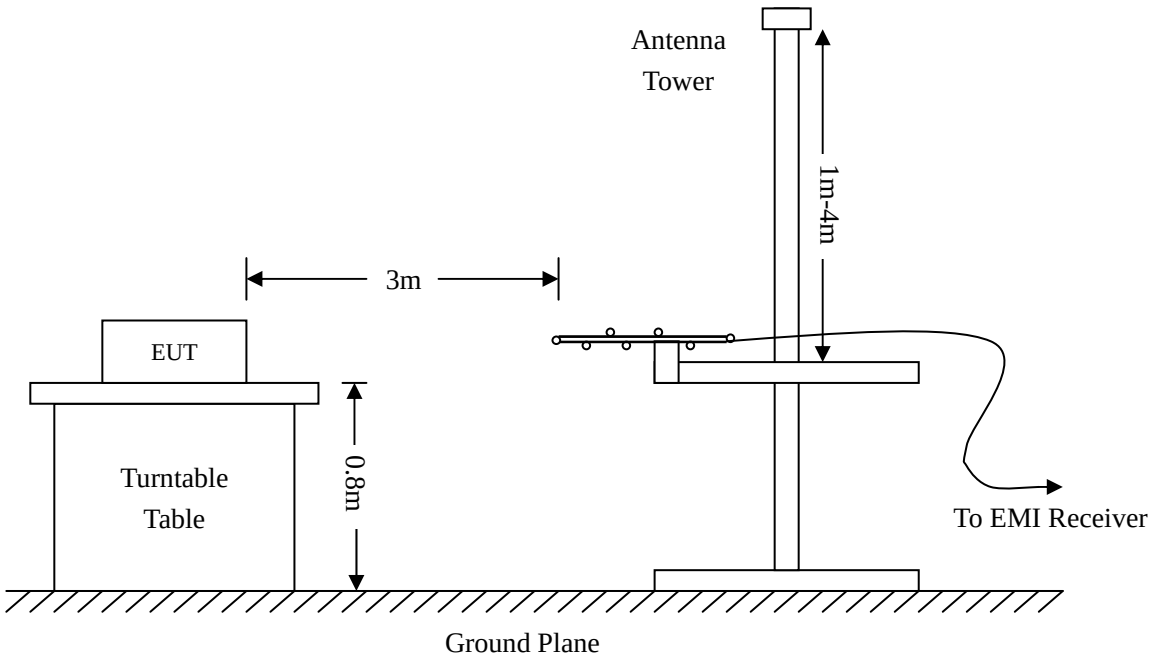
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Positioning Controller	C&C	CC-C-1F	N/A	2012-03-28	2013-03-27
RF Switch	EM	EMSW18	SW060023	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2012-02-25	2013-02-24

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.



4.4 Test Receiver Setup

During the radiated emission test, the test receiver was set with the following configurations:

Start Frequency ..... 30 MHz
Stop Frequency..... 1000 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 100 kHz
Quasi-Peak Adapter Bandwidth ..... 120 kHz
Quasi-Peak Adapter Mode ..... Normal

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading – Corr. Factor

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15B Limit

4.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

-3.28 dBμV at **31.5094MHz** in the **Vertical** polarization, **Downloading Mode**, **9 kHz to 6 GHz, 3Meters**

Note: Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

Plot of Radiation Emissions Test Data (30MHz-1GHz)

Radiated Disturbance

EUT: MID

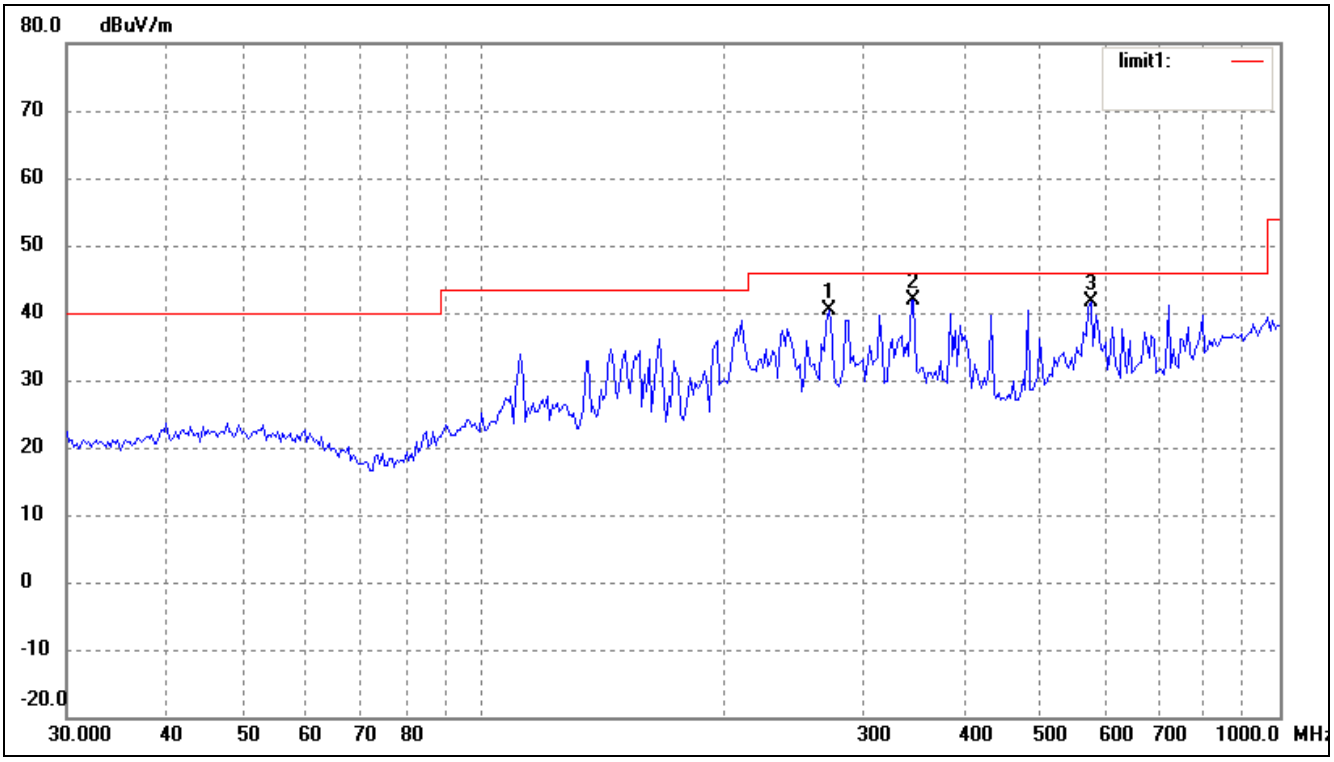
M/N: MID1107CM

Operating Condition: Downloading

Test Specification: Horizontal & Vertical

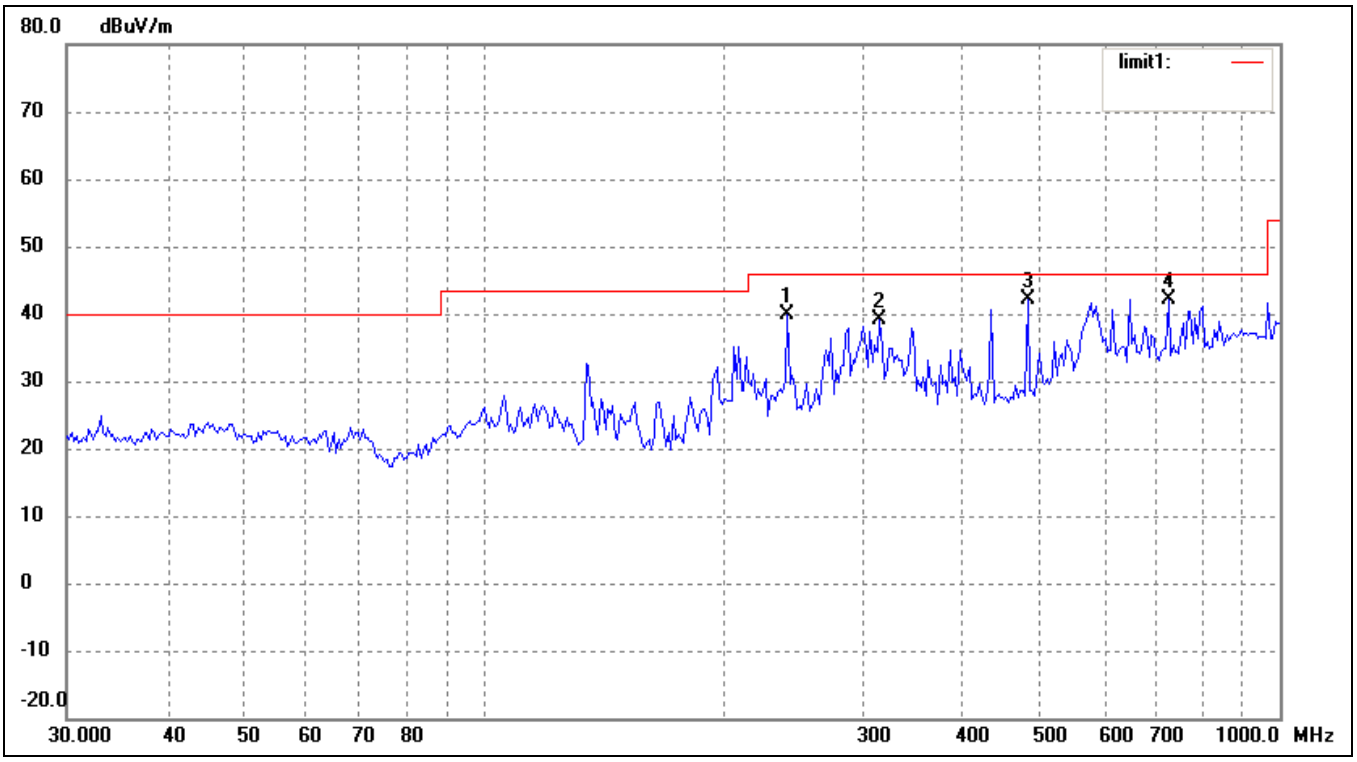
Comment: AC 120V/60Hz connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	271.3245	31.02	9.27	40.29	46.00	-5.71	223	203	peak
2	346.8091	31.39	10.58	41.97	46.00	-4.03	360	200	peak
3	578.6698	25.42	16.18	41.60	46.00	-4.40	205	104	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	240.8303	31.54	8.45	39.99	46.00	-6.01	220	100	peak
2	314.3765	29.22	9.93	39.15	46.00	-6.85	360	400	peak
3	482.2155	29.53	12.67	42.20	46.00	-3.80	120	100	peak
4	724.2611	24.25	17.86	42.11	46.00	-3.89	240	120	peak

Plot of Radiation Emissions Test Data (30MHz-1GHz)

Radiated Disturbance

EUT: MID

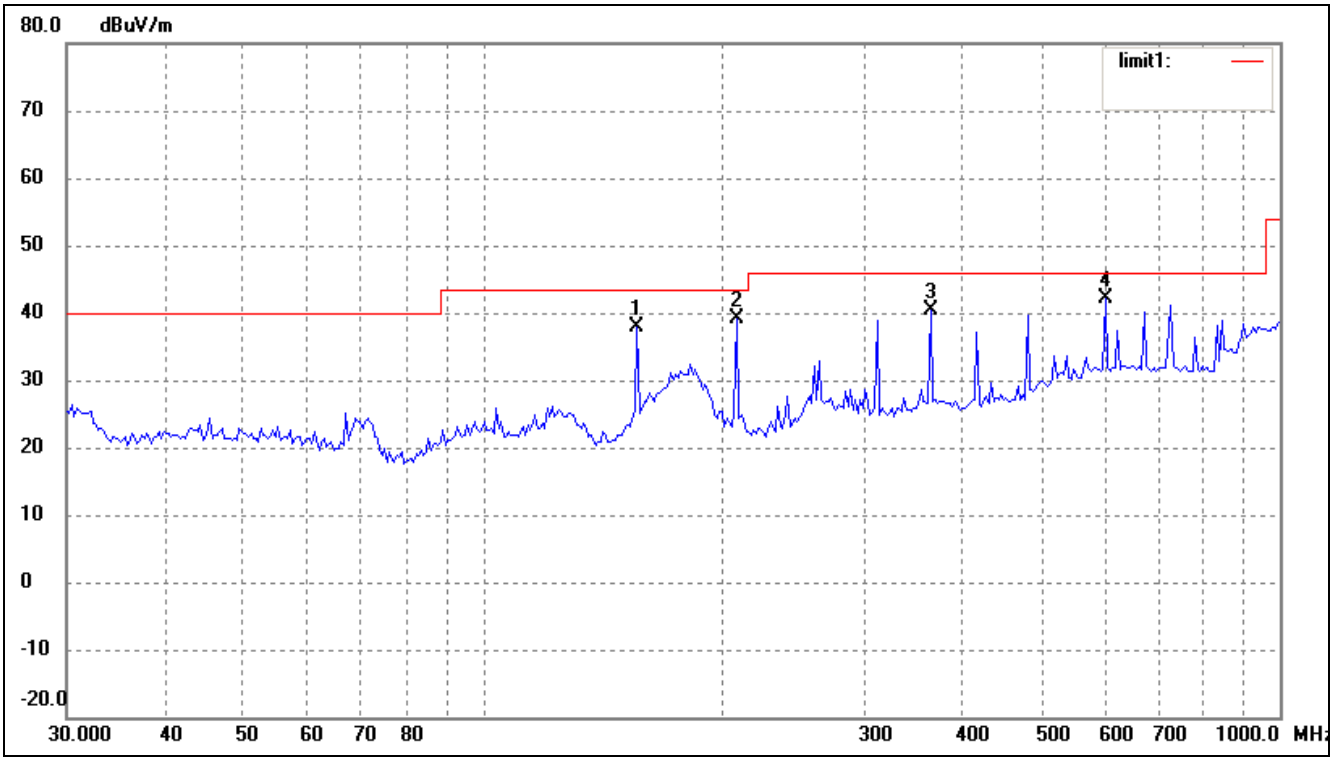
M/N: MID1107CM

Operating Condition: Charging & Playing

Test Specification: Horizontal & Vertical

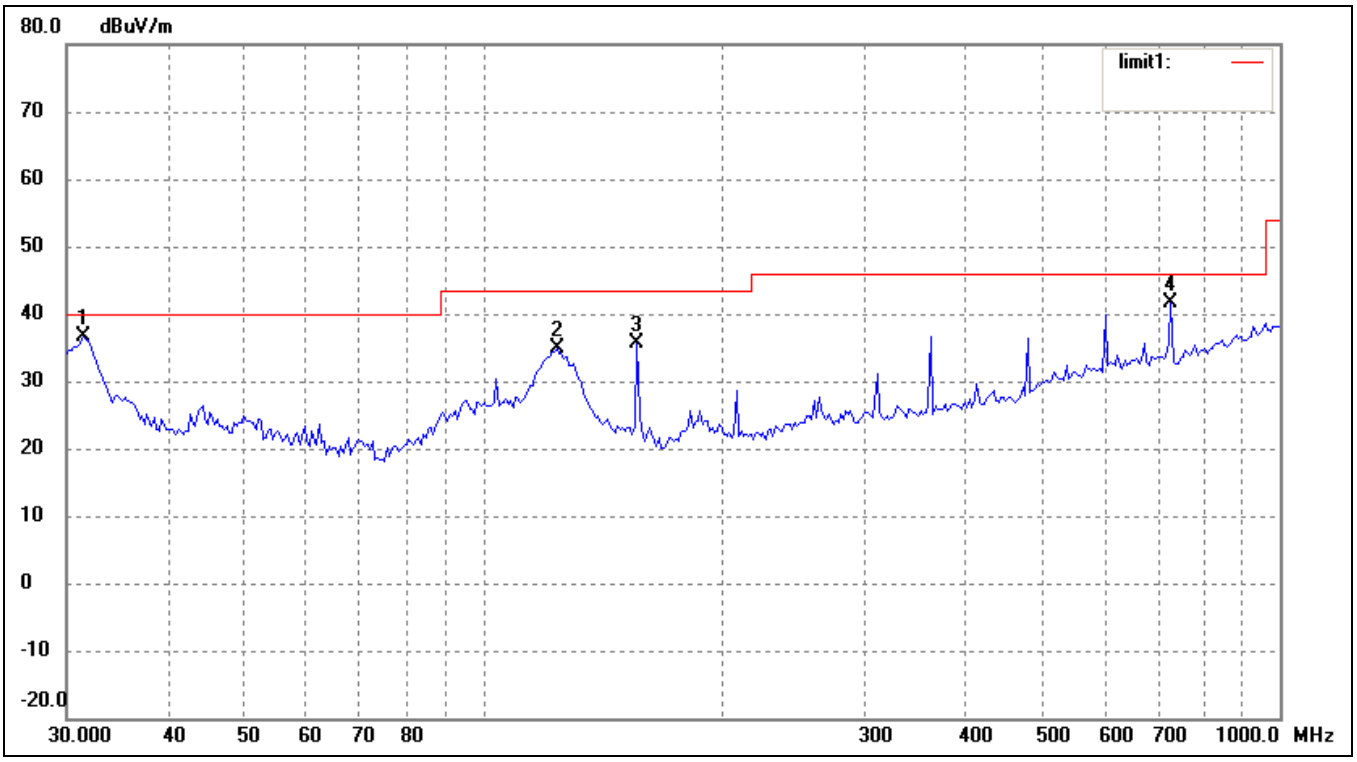
Comment: AC 120V/60Hz

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	155.9100	33.59	4.35	37.94	43.50	-5.56	223	203	peak
2	207.8500	32.27	6.86	39.13	43.50	-4.37	360	200	peak
3	364.2595	29.42	10.96	40.38	46.00	-5.62	205	104	peak
4	603.5392	25.50	16.70	42.20	46.00	-3.80	120	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	31.5094	29.95	6.77	36.72	40.00	-3.28	220	100	peak
2	123.6984	29.54	5.44	34.98	43.50	-8.52	360	400	peak
3	155.9100	31.28	4.35	35.63	43.50	-7.87	124	100	peak
4	729.3582	23.75	17.94	41.69	46.00	-4.31	200	120	peak

Plot of Radiation Emissions Test Data (Above 1GHz)

Radiated Disturbance

EUT: MID

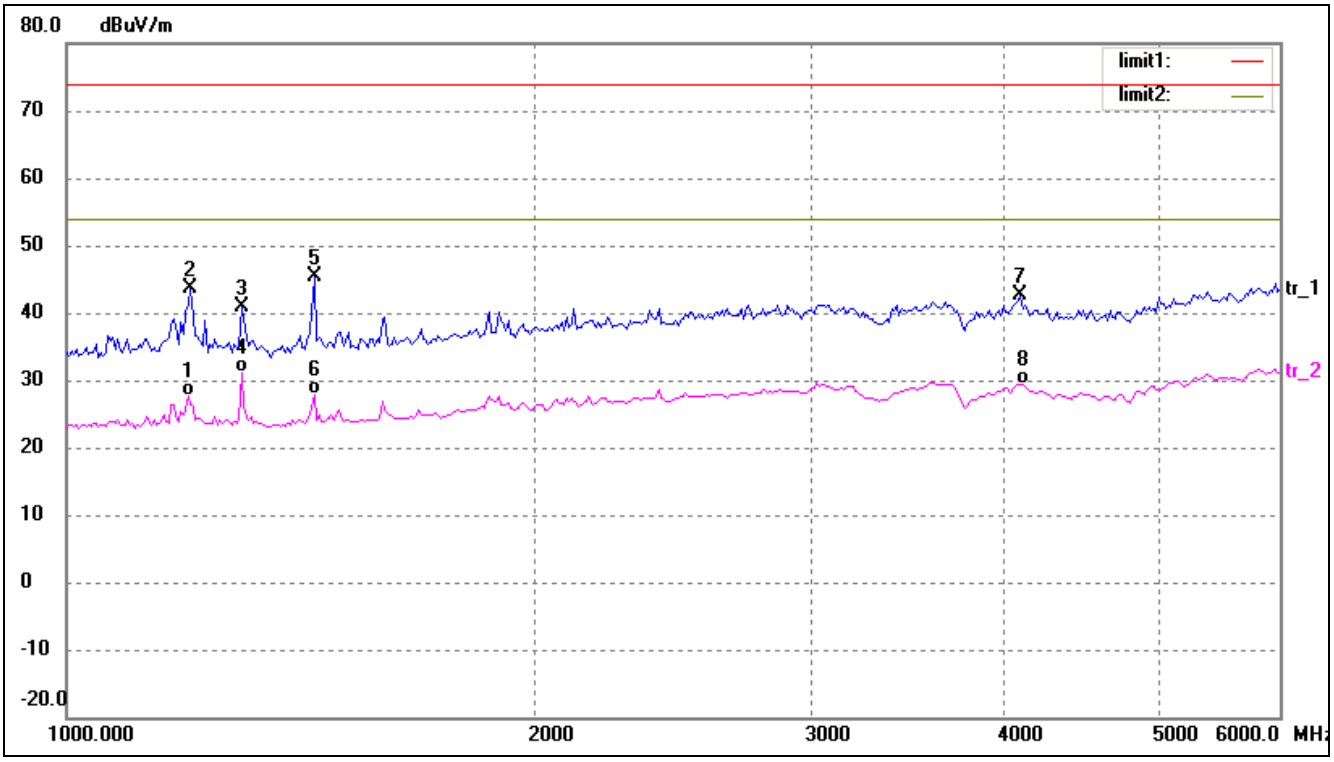
M/N: MID1107CM

Operating Condition: Downloading

Test Specification: Horizontal & Vertical

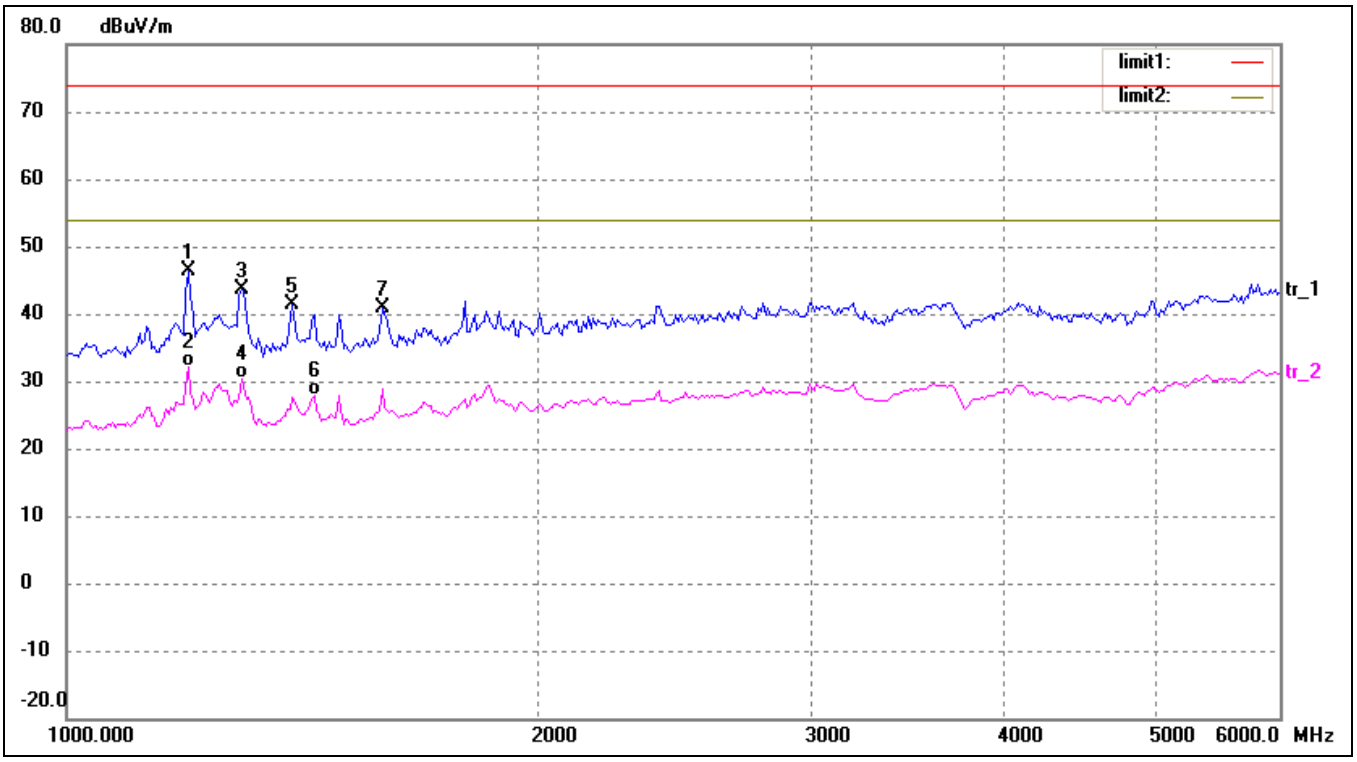
Comment: AC 120V/60Hz connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1196.231	39.25	-11.70	27.55	54.00	-26.45	100	100	AVG
2	1200.526	55.28	-11.70	43.58	74.00	-30.42	250	100	peak
3	1294.356	52.39	-11.57	40.82	74.00	-33.18	326	100	peak
4	1294.356	42.62	-11.57	31.05	54.00	-22.95	245	100	AVG
5	1441.262	56.66	-11.34	45.32	74.00	-28.68	125	100	peak
6	1441.262	39.32	-11.34	27.98	54.00	-26.02	126	100	AVG
7	4089.092	47.99	-5.28	42.71	74.00	-31.29	324	100	peak
8	4103.772	34.75	-5.27	29.48	54.00	-24.52	257	100	AVG

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1196.231	58.15	-11.70	46.45	74.00	-27.55	126	100	peak
2	1196.231	43.80	-11.70	32.10	54.00	-21.90	324	100	AVG
3	1294.356	55.29	-11.57	43.72	74.00	-30.28	257	100	peak
4	1294.356	41.88	-11.57	30.31	54.00	-23.69	247	100	AVG
5	1395.520	52.71	-11.40	41.31	74.00	-32.69	157	100	peak
6	1441.262	39.14	-11.34	27.80	54.00	-26.20	147	100	AVG
7	1593.380	51.45	-10.69	40.76	74.00	-33.24	256	100	peak

Plot of Radiation Emissions Test Data (Above 1GHz)

Radiated Disturbance

EUT: MID

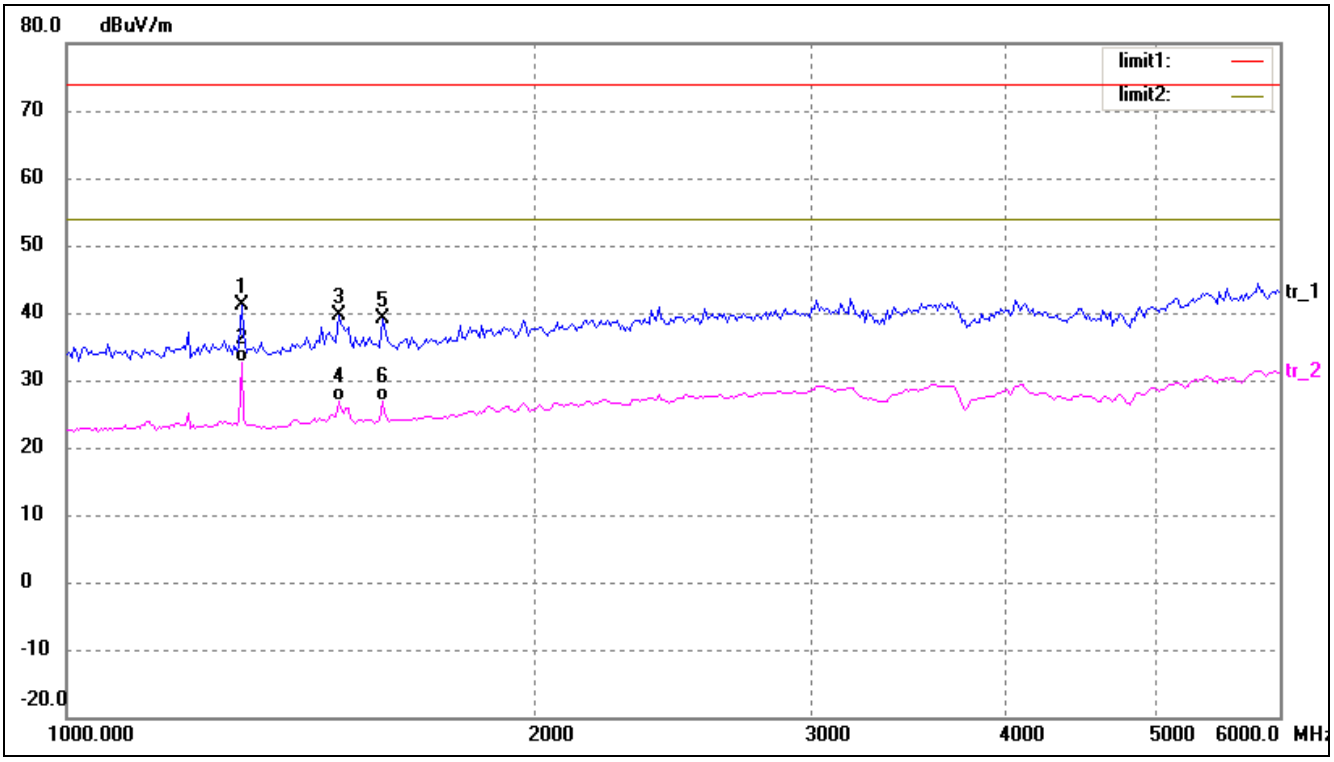
M/N: MID1107CM

Operating Condition: Charging & Playing

Test Specification: Horizontal & Vertical

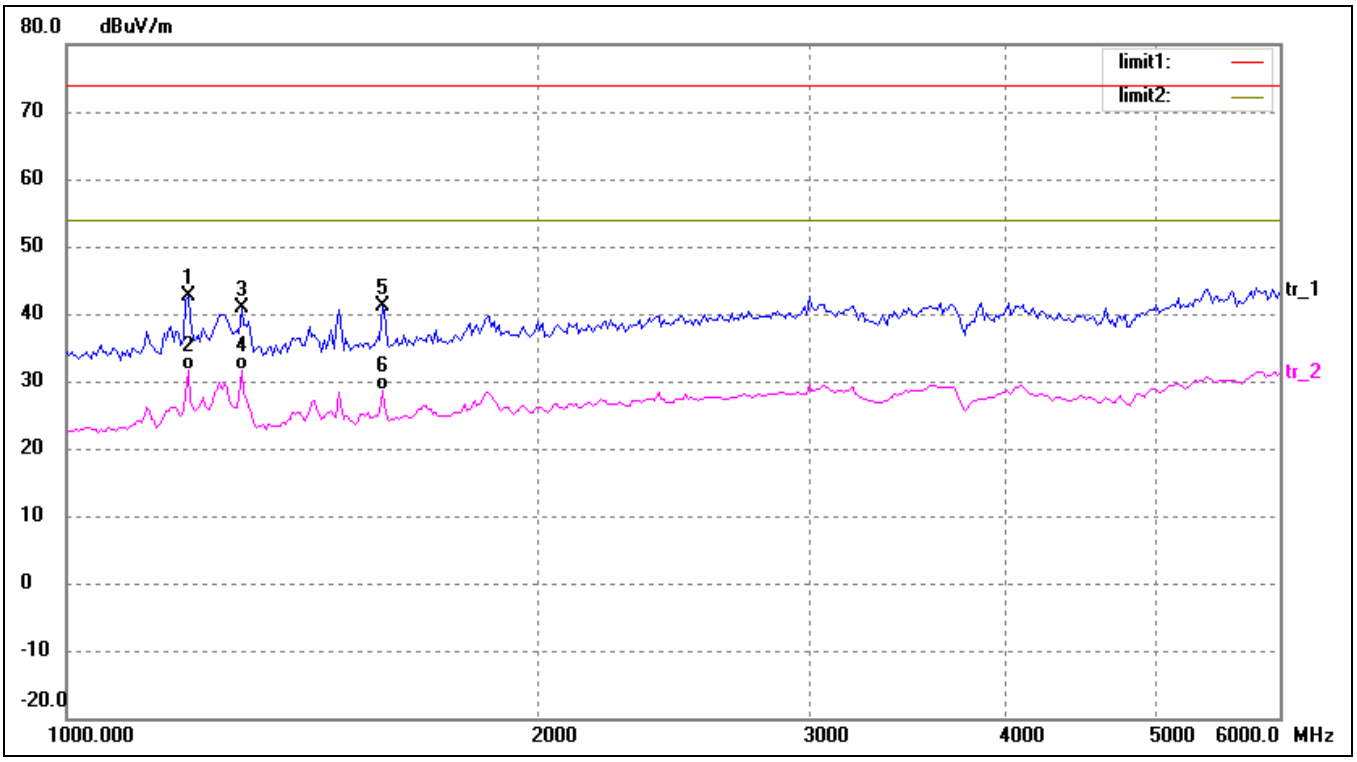
Comment: AC 120V/60Hz

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1294.356	52.74	-11.57	41.17	74.00	-32.83	223	203	peak
2	1294.356	44.25	-11.57	32.68	54.00	-21.32	360	200	AVG
3	1493.846	50.79	-11.27	39.52	74.00	-34.48	205	104	peak
4	1493.846	38.06	-11.27	26.79	54.00	-27.21	120	100	AVG
5	1593.380	49.71	-10.69	39.02	74.00	-34.98	358	200	peak
6	1593.380	37.69	-10.69	27.00	54.00	-27.00	258	125	AVG

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1196.231	54.41	-11.70	42.71	74.00	-31.29	220	100	peak
2	1196.231	43.39	-11.70	31.69	54.00	-22.31	360	400	AVG
3	1294.356	52.35	-11.57	40.78	74.00	-33.22	124	100	peak
4	1294.356	43.12	-11.57	31.55	54.00	-22.45	200	120	AVG
5	1593.380	51.74	-10.69	41.05	74.00	-32.95	265	120	peak
6	1593.380	39.39	-10.69	28.70	54.00	-25.30	352	100	AVG

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
The measurements greater than 20dB below the limit from 9kHz to 30MHz..

******* END OF REPORT *******