

FCC Part 15B Measurement and Test Report


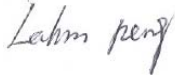

For

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: M7C-MID118

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>MID</u>
Tested Model:	<u>MID-1306</u>
Report No.:	<u>STR14018478I-2</u>
Tested Date:	<u>2014-01-15 to 2014-02-11</u>
Issued Date:	<u>2014-02-12</u>
Tested By:	<u>Daniel Liu / Engineer</u> 
Reviewed By:	<u>Lahm Peng / EMC Manager</u> 
Approved & Authorized By:	<u>Jandy so / PSQ Manager</u> 
Prepared By:	
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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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, Nanshan District, Shenzhen, China

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

General Description of EUT	
Product Name:	MID
Trade Name:	HENA, NAXA
Model No.:	MID-1306
Adding Model(s):	NID-1000, MY1306, MY1306G, MY1306P, MY1306E, MY1306S, MW1306, MW1306G, MW1306P, MW1306E, MW1306S, MY13**, MY13**G, MY13**P, MY13**E, MY13**S, MW13**, MW13**G, MW13**P, MW13**E, MW13**S(**Can be 01-99), TERRA101
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model MID-1306, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Rated Voltage:	Adapter: DC 5V charging; Battery: DC 3.7V
Rated Current:	/
Rated Power:	/
Power Adapter Model:	K15S050200U Input: AC 100-240V, 0.5A Output: DC 5.0V, 2.0A
Lowest Internal Frequency:	32.768kHz
Highest Internal Frequency:	1GHz
Classification of ITE:	Class B

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, Subpart B, and section 15.205, 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, 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.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology 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 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging & Playing & HDMI	Connected to Adaptor and Display and Earphone
TM2	Downloading	Connected to PC
TM3	Transmitting	802.11b/g/n

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.2	Unshielded	Without Core
Earphone Cable	1.0	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E23	EB12648265
Display	DELL	IN1920C	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
HDMI Cable	1.6	Shielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

3. Conducted Emissions

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.

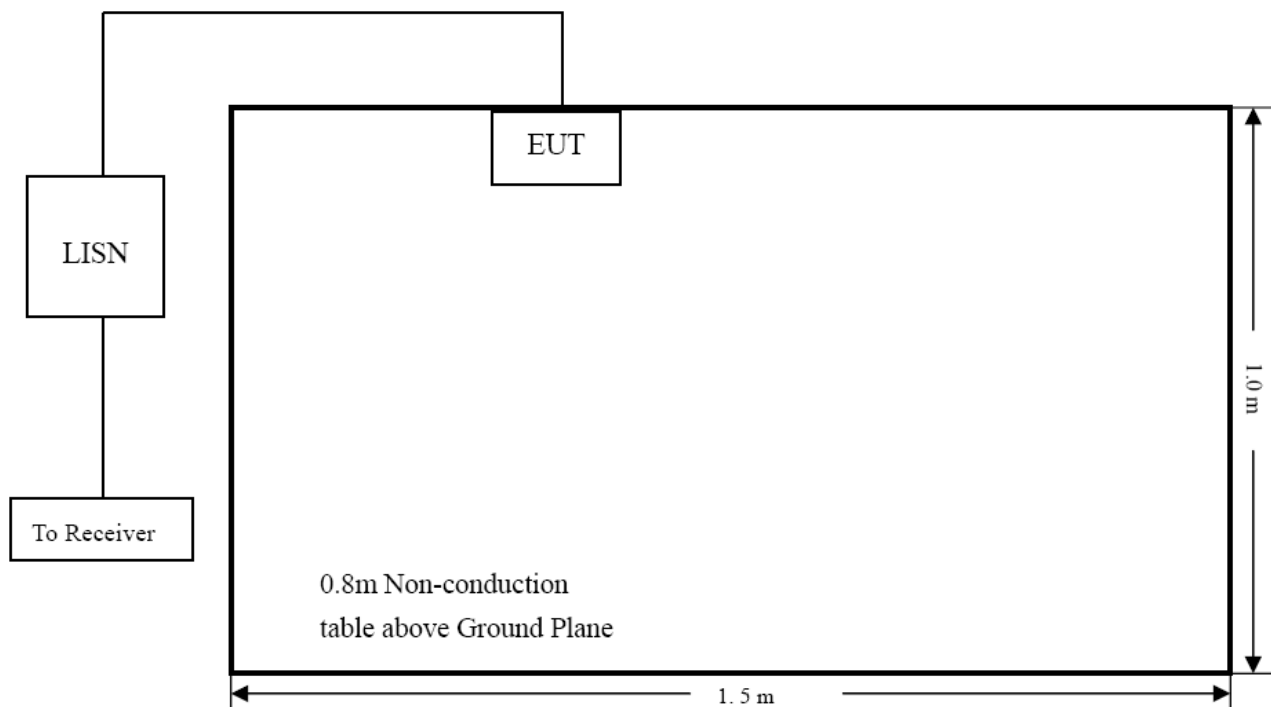
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2013-05-07	2014-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2013-05-07	2014-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2013-05-07	2014-05-06

3.3 Test Procedure

Test is conducting under the description of 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

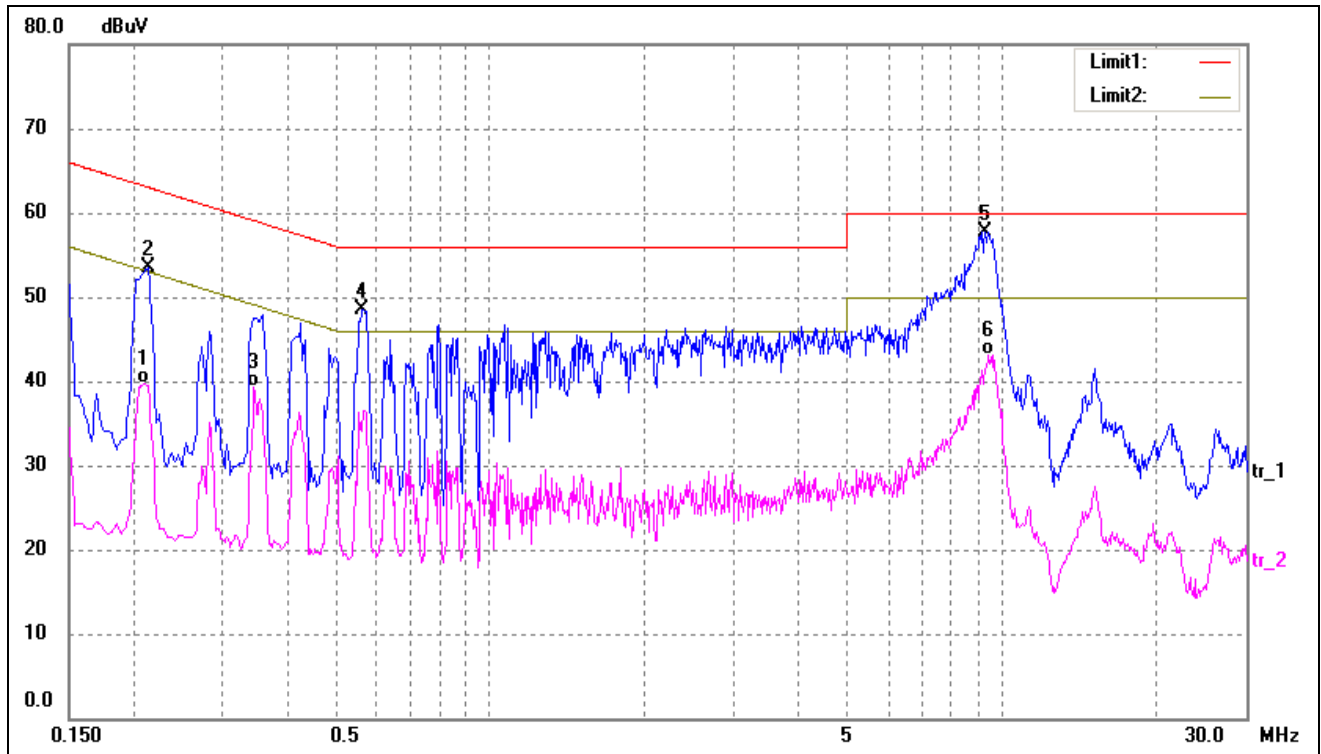
-2.21 dB at 9.2820 MHz in the **Line** mode, **Peak** detector, **0.15-30MHz**

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

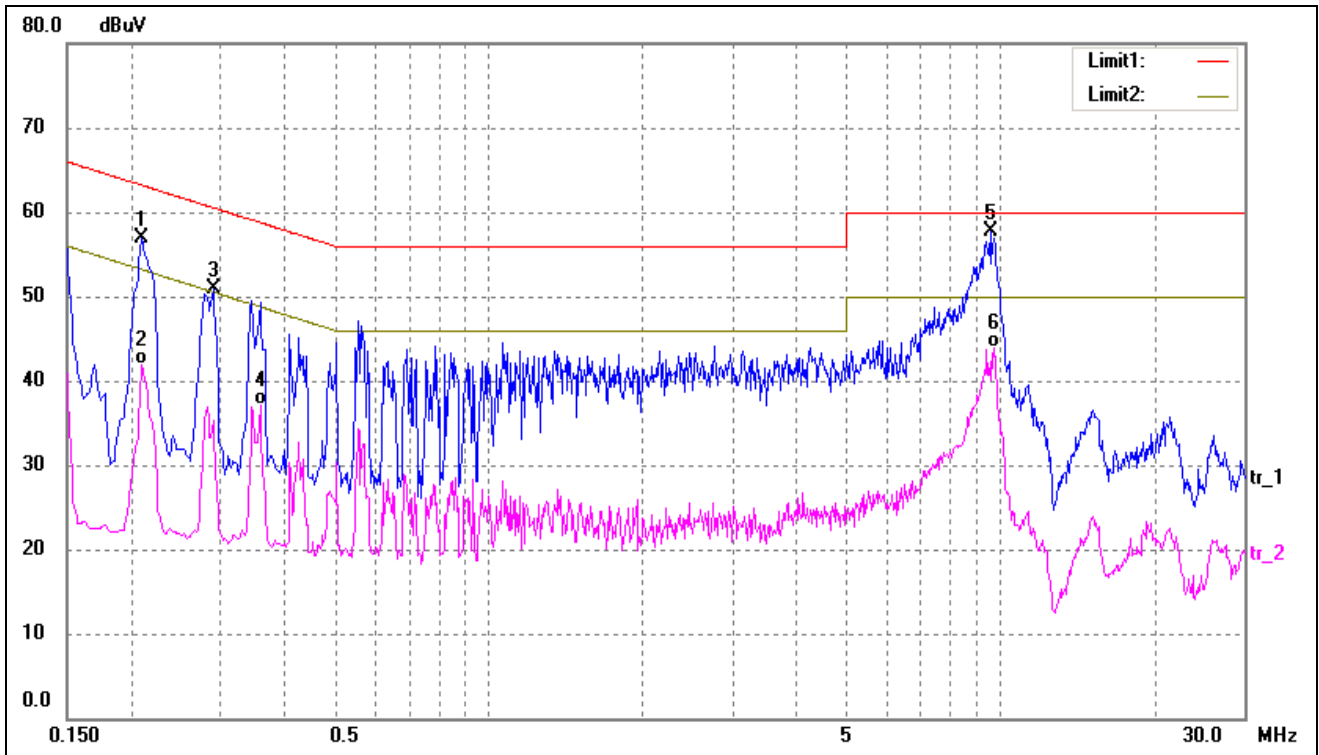
EUT: MID
 Tested Model: MID-1306
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2100	30.22	9.50	39.72	53.21	-13.49	AVG
2	0.2140	44.03	9.50	53.53	63.05	-9.52	peak
3	0.3460	29.90	9.50	39.40	49.06	-9.66	AVG
4	0.5620	39.03	9.56	48.59	56.00	-7.41	peak
5	9.2820	47.79	10.00	57.79	60.00	-2.21	peak
6	9.4300	33.05	10.00	43.05	50.00	-6.95	AVG

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2100	47.48	9.50	56.98	63.21	-6.23	peak
2	0.2100	32.44	9.50	41.94	53.21	-11.27	AVG
3	0.2900	41.33	9.50	50.83	60.52	-9.69	peak
4	0.3580	27.58	9.50	37.08	48.77	-11.69	AVG
5*	9.5660	47.69	10.00	57.69	60.00	-2.31	peak
6	9.7100	33.87	10.00	43.87	50.00	-6.13	AVG

4. Radiated Emissions

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.

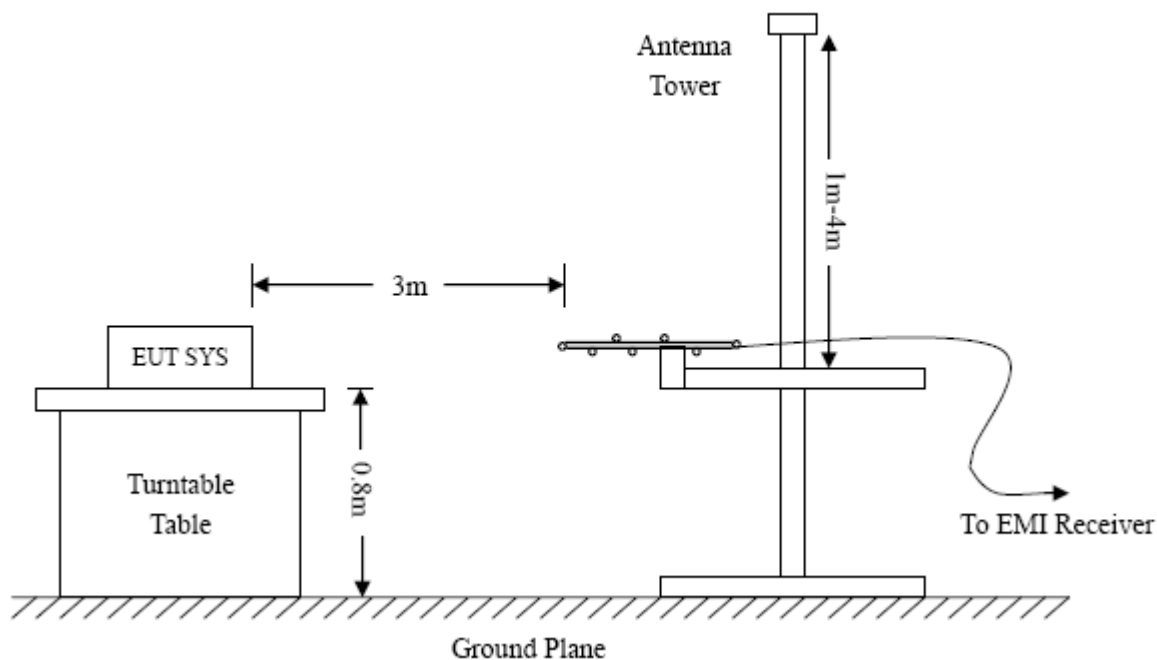
4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2013-04-20	2014-04-19

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 15.109 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

Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

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 a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.6 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

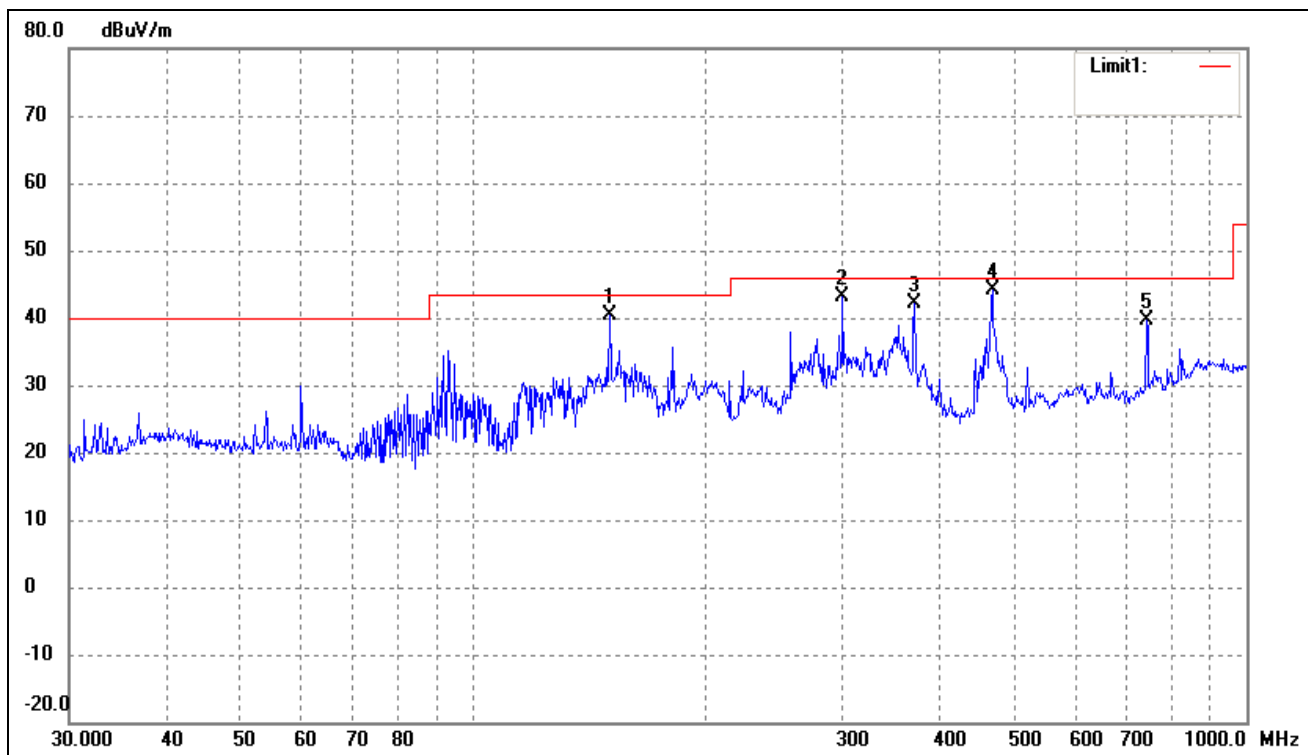
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-1.34 dB at 750.1082 MHz in the Horizontal polarization, TM2 Mode, 9 kHz to 5 GHz, 3Meters

Plot of Radiated Emissions Test Data (Below 1GHz)

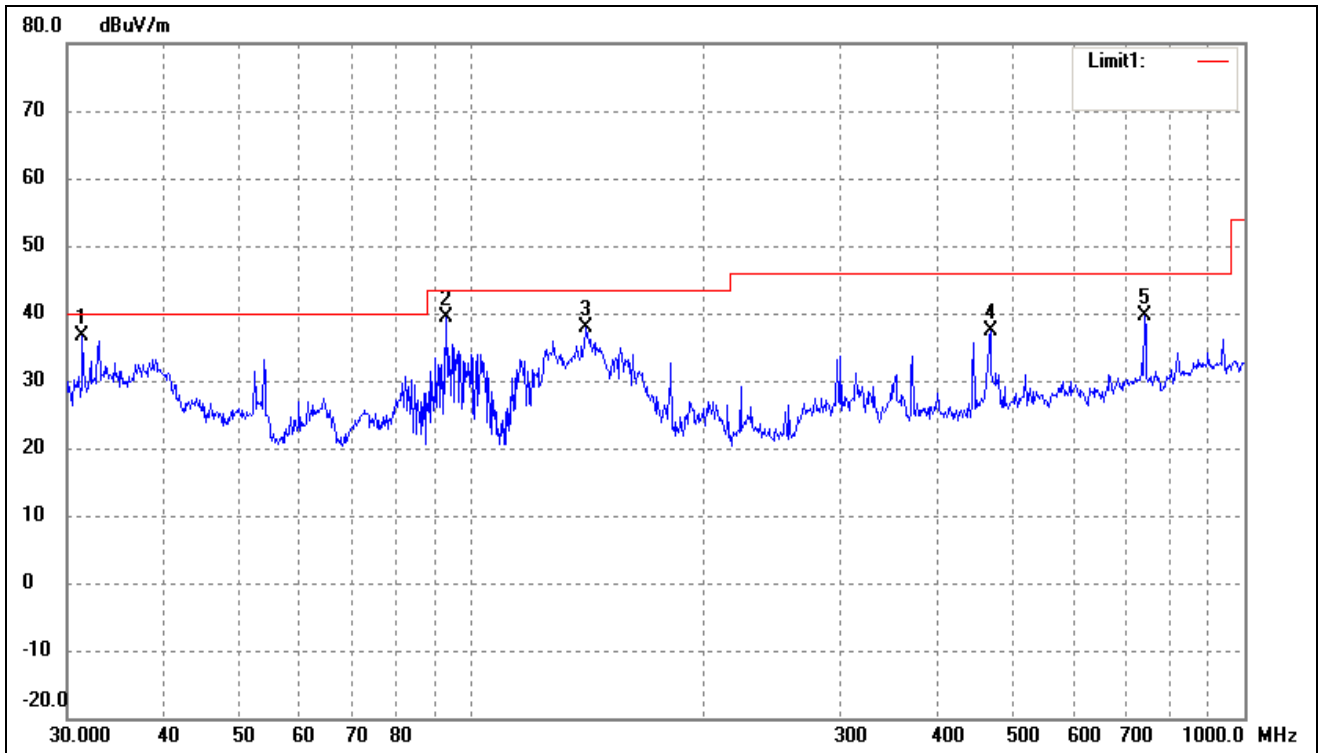
EUT: *MID*
 Tested Model: *MID-1306*
 Operating Condition: *TM1*
 Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	150.0108	37.92	2.50	40.42	43.50	-3.08	360	100	peak
2	300.3673	33.95	9.18	43.13	46.00	-2.87	360	100	peak
3	372.0045	32.86	9.21	42.07	46.00	-3.93	360	100	peak
4*	468.8762	33.74	10.37	44.11	46.00	-1.89	360	100	peak
5	742.2587	25.95	13.67	39.62	46.00	-6.38	360	100	peak

Test Specification: Vertical

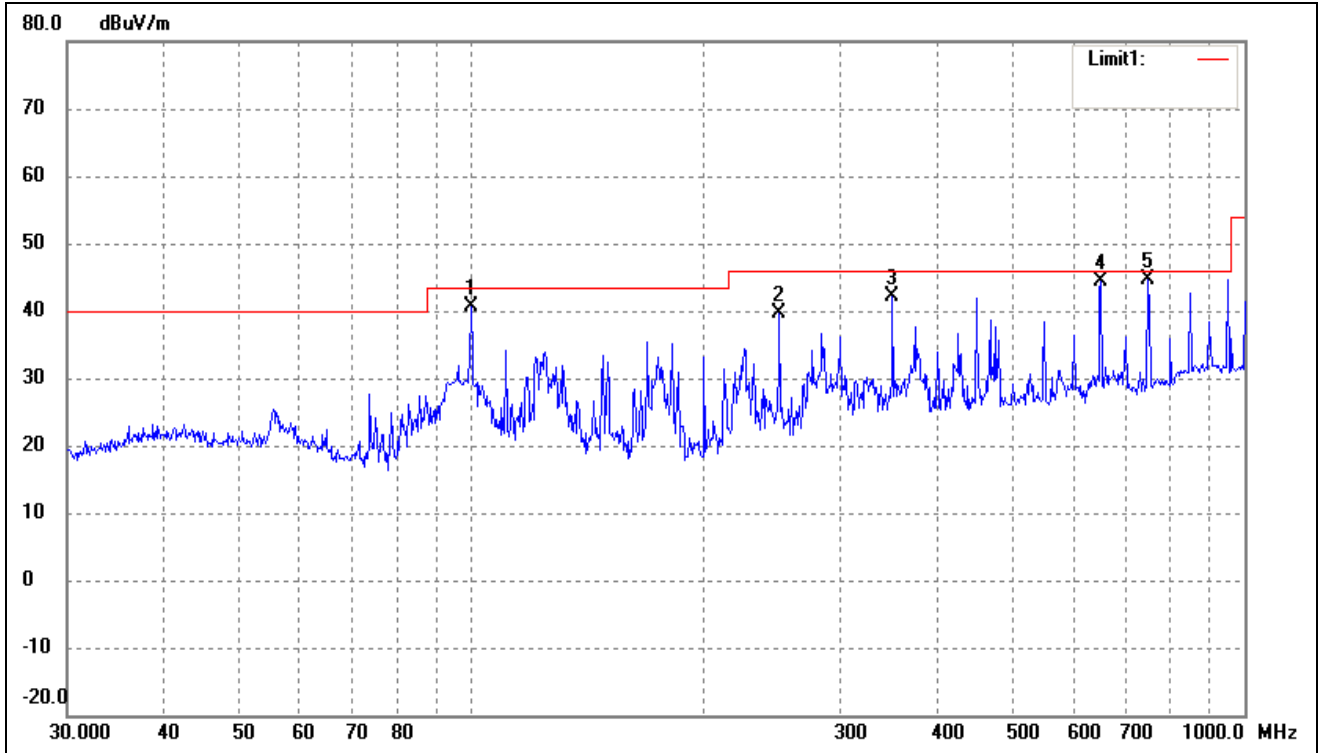


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1*	31.3992	28.76	7.85	36.61	40.00	-3.39	360	100	peak
2	92.7872	34.94	4.32	39.26	43.50	-4.24	360	100	peak
3	140.8351	35.46	2.41	37.87	43.50	-5.63	360	100	peak
4	468.8762	27.01	10.37	37.38	46.00	-8.62	360	100	peak
5	742.2587	24.29	15.45	39.74	46.00	-6.26	360	100	peak

Plot of Radiated Emissions Test Data (Below 1GHz)

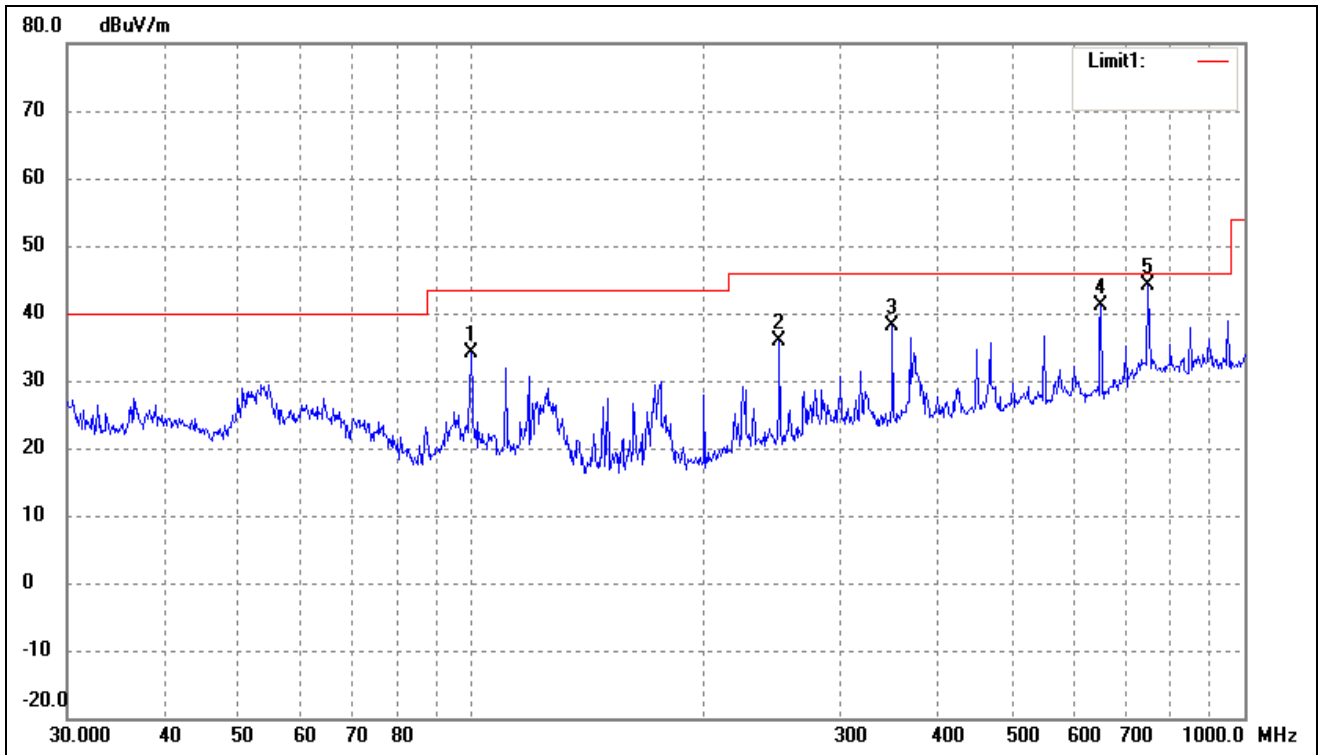
EUT: *MID*
 Tested Model: *MID-1306*
 Operating Condition: *TM2*
 Comment: *USB 5V*

 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	99.8777	34.44	6.10	40.54	43.50	-2.96	360	100	peak
2	250.3011	33.01	6.71	39.72	46.00	-6.28	360	100	peak
3	350.4768	33.13	8.99	42.12	46.00	-3.88	360	100	peak
4	651.9416	32.09	12.32	44.41	46.00	-1.59	360	100	peak
5*	750.1082	30.56	14.10	44.66	46.00	-1.34	360	100	peak

Test Specification: Vertical

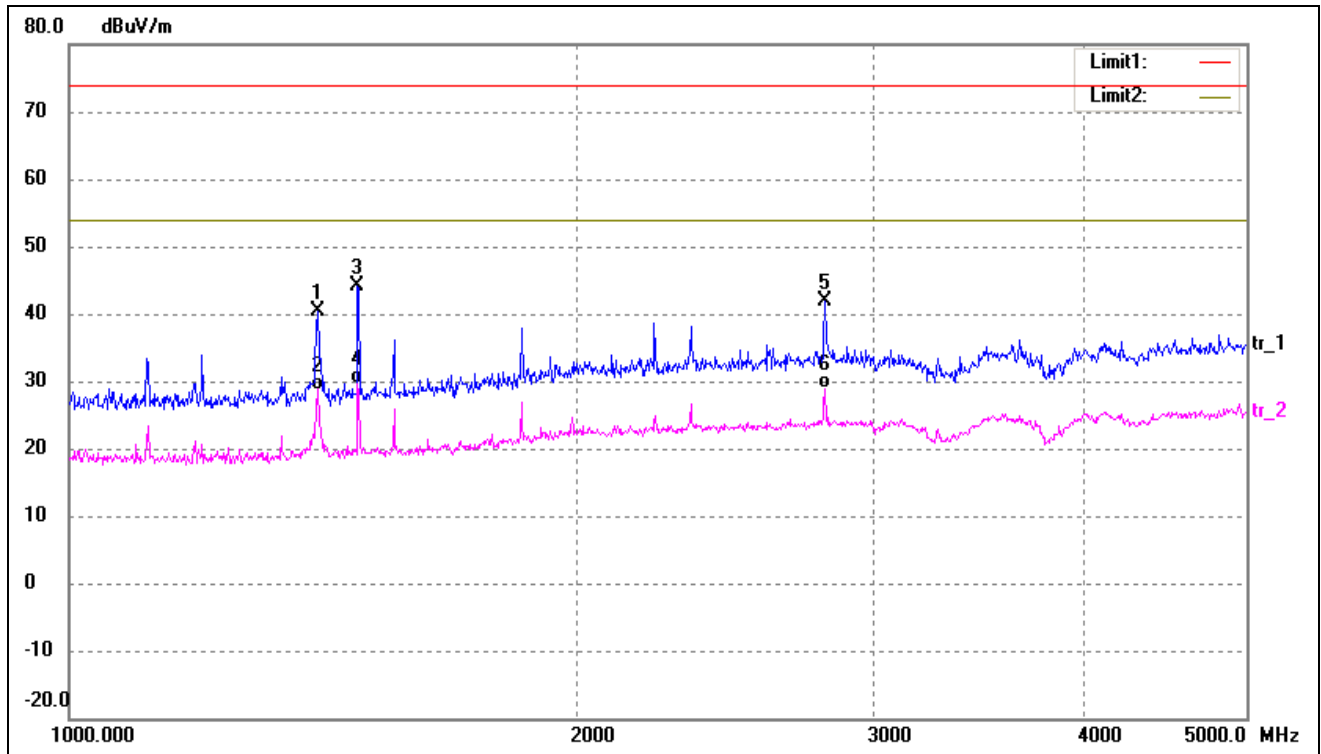


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	99.8777	28.05	6.10	34.15	43.50	-9.35	360	100	peak
2	250.3012	29.24	6.71	35.95	46.00	-10.05	360	100	peak
3	350.4768	29.25	8.99	38.24	46.00	-7.76	360	100	peak
4	651.9417	28.81	12.32	41.13	46.00	-4.87	360	100	peak
5*	750.1082	28.92	15.09	44.01	46.00	-1.99	360	100	peak

Plot of Radiated Emissions Test Data (Above 1GHz)

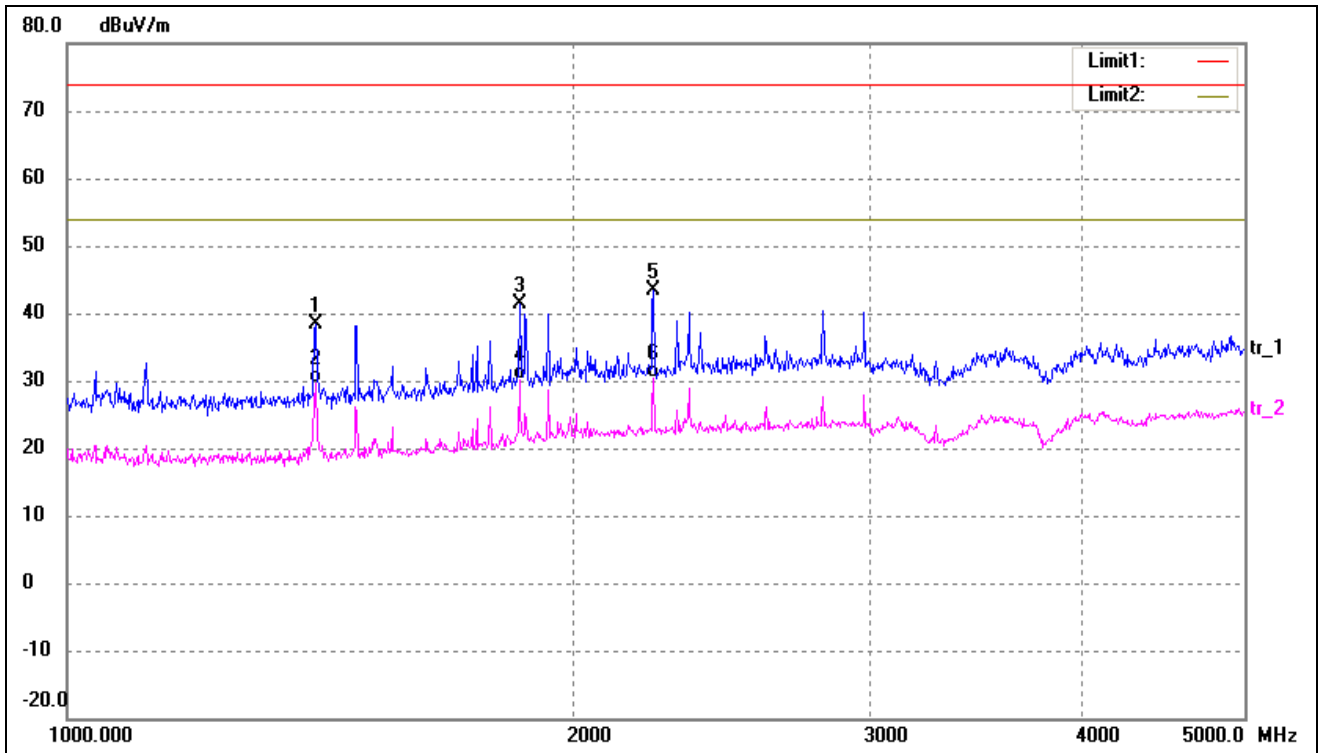
EUT: *MID*
 Tested Model: *MID-1306*
 Operating Condition: *TM1*
 Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	1404.374	48.38	-8.12	40.26	74.00	-33.74	360	100	peak
2	1404.374	36.87	-8.12	28.75	54.00	-25.25	360	100	AVG
3	1483.364	52.11	-7.94	44.17	74.00	-29.83	360	100	peak
4*	1483.364	37.67	-7.94	29.73	54.00	-24.27	360	100	AVG
5	2810.210	44.67	-2.82	41.85	74.00	-32.15	360	100	peak
6	2810.210	31.61	-2.82	28.79	54.00	-25.21	360	100	AVG

Test Specification: Vertical

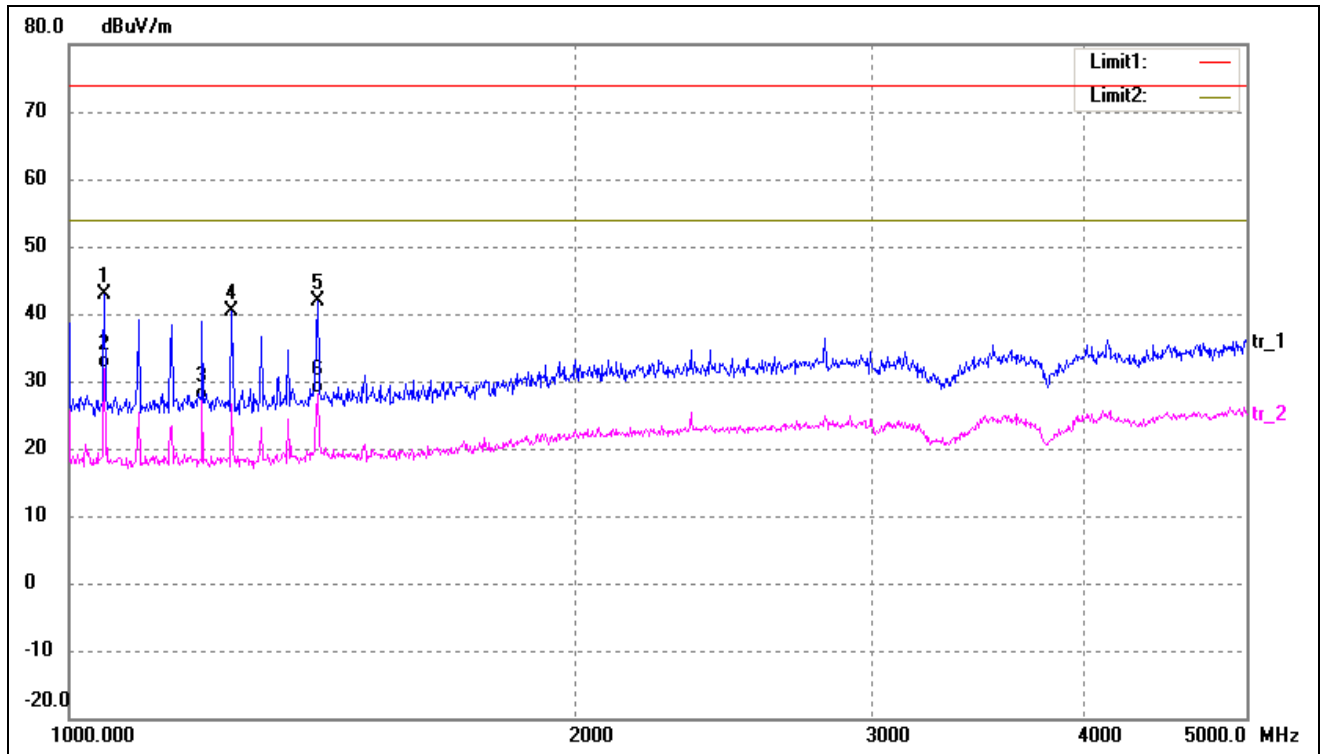


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	1404.374	46.45	-8.12	38.33	74.00	-35.67	360	100	peak
2	1404.374	37.67	-8.12	29.55	54.00	-24.45	360	100	AVG
3	1855.259	46.77	-5.42	41.35	74.00	-32.65	360	100	peak
4	1855.259	35.66	-5.42	30.24	54.00	-23.76	360	100	AVG
5	2228.882	47.22	-3.90	43.32	74.00	-30.68	360	100	peak
6*	2228.882	34.33	-3.90	30.43	54.00	-23.57	360	100	AVG

Plot of Radiated Emissions Test Data (Above 1GHz)

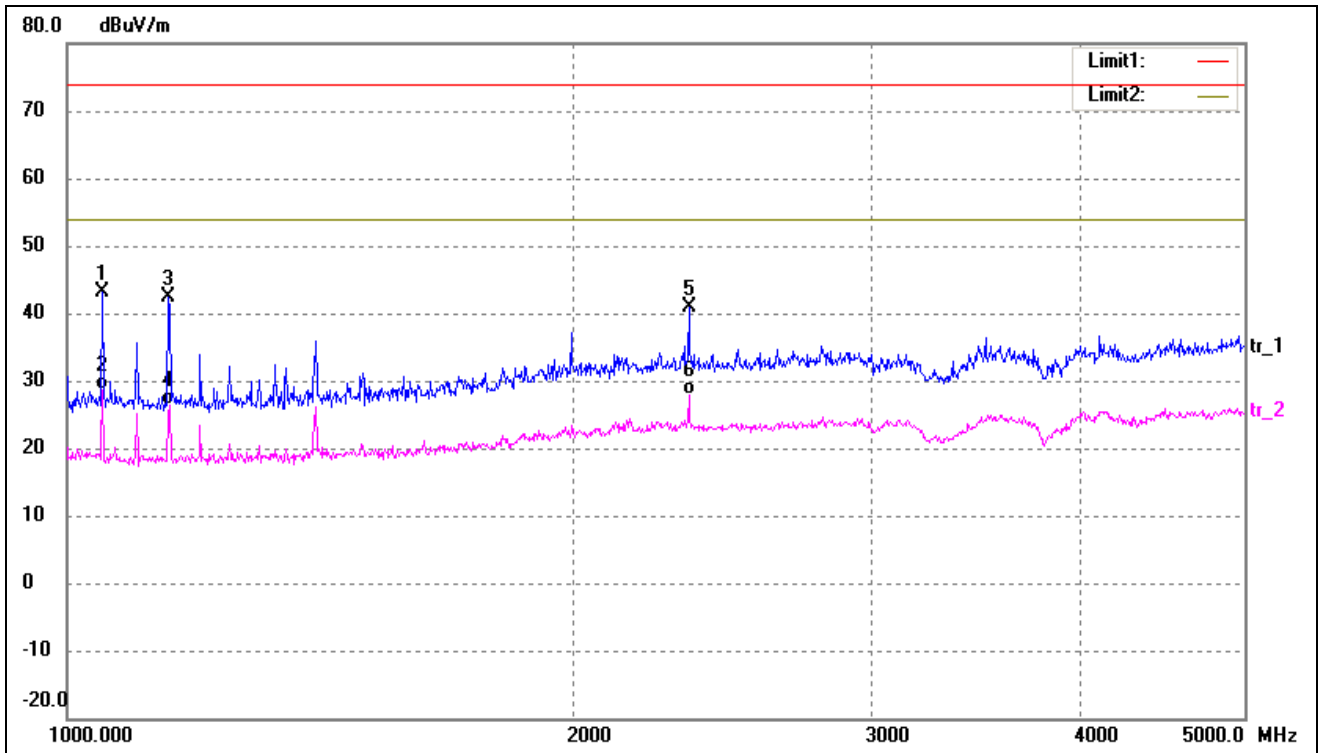
EUT: *MID*
 Tested Model: *MID-1306*
 Operating Condition: *TM2*
 Comment: *USB 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	1049.468	51.78	-8.89	42.89	74.00	-31.11	360	100	peak
2*	1049.468	40.72	-8.89	31.83	54.00	-22.17	360	100	AVG
3	1199.454	35.74	-8.56	27.18	54.00	-26.82	360	100	AVG
4	1248.699	48.83	-8.45	40.38	74.00	-33.62	360	100	peak
5	1404.374	49.94	-8.12	41.82	74.00	-32.18	360	100	peak
6	1404.374	36.15	-8.12	28.03	54.00	-25.97	360	100	AVG

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	1049.468	52.09	-8.89	43.20	74.00	-30.80	360	100	peak
2*	1049.468	37.44	-8.89	28.55	54.00	-25.45	360	100	AVG
3	1148.448	51.00	-8.67	42.33	74.00	-31.67	360	100	peak
4	1150.298	35.01	-8.67	26.34	54.00	-27.66	360	100	AVG
5	2339.140	44.41	-3.65	40.76	74.00	-33.24	360	100	peak
6	2339.140	31.53	-3.65	27.88	54.00	-26.12	360	100	AVG

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

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