FCC Part 15B
Measurement and Test Report

For

Shenzhen WOWOTO Technology Co., Ltd.

Floor 4th, Gaoxinqi Industrial Park, Liuxian 1st Road, district 67,

Bao'an, Shenzhen, China

FCC ID: 2AQYK-QSERIEC

FCC Rule(s):	FCC Part 15 Subpart B
Product Description:	SMART PROJECTOR
Tested Model:	Q1
Report No.:	STRD1807122I-4
Sample Receipt Date:	2018-07-26
Tested Date:	2018-07-26 to 2018-09-18
Issued Date:	2018-09-19
Tested By:	Ray Yang / Engineer
Reviewed By:	Silin Chen / 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:	Shenzhen WOWOTO Technology Co., Ltd.
Address of applicant:	Floor 4th, Gaoxinqi Industrial Park, Liuxian 1st Road, district 67, Bao'an, Shenzhen, China
Manufacturer:	Shenzhen WOWOTO Technology Co., Ltd.
Address of manufacturer:	Floor 4th, Gaoxinqi Industrial Park, Liuxian 1st Road, district 67, Bao'an, Shenzhen, China

General Description of EUT	
Product Name:	SMART PROJECTOR
Trade Name:	WOWOTO
Model No.:	Q1
Adding Model(s):	Q1 Pro, Q2, Q3, Q5, Q6, Q6 Pro, Q8, Q9
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 Q1, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	DC 3.7V
Rated Current:	3A
Rated Power:	/
Power Adapter Model:	MODEL:AW015WR-0500300 INPUT:AC100-240V 50/60Hz 0.5A OUTPUT:DC5V/3A
Lowest Internal Frequency:	32.768kHz
Highest Internal Frequency:	5825MHz
Classification of ITE:	Class B

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B: Unintentional Radiators

ANSI C63.4-2014: 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.

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 C63.4-2014, 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.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

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.

1.5 EUT Setup and Operation Mode

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

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Charging+Speaker+USB play mode	/	AC120V 60Hz for adapter
TM2	Charging+Speaker+TF Card play mode	/	AC120V 60Hz for adapter

EUT Cable List and Details

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

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
USB Disk	SanDisk	CZ50	/
MicroSD(TF)	SanDisk	CLASS4	/
Router	TP-Link	TL-WE886N	/

Special Cable List and Details

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

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Radiated Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2018-05-22	2019-05-21
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2018-05-22	2019-05-21
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2018-05-22	2019-05-21

2. SUMMARY OF TEST RESULTS

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

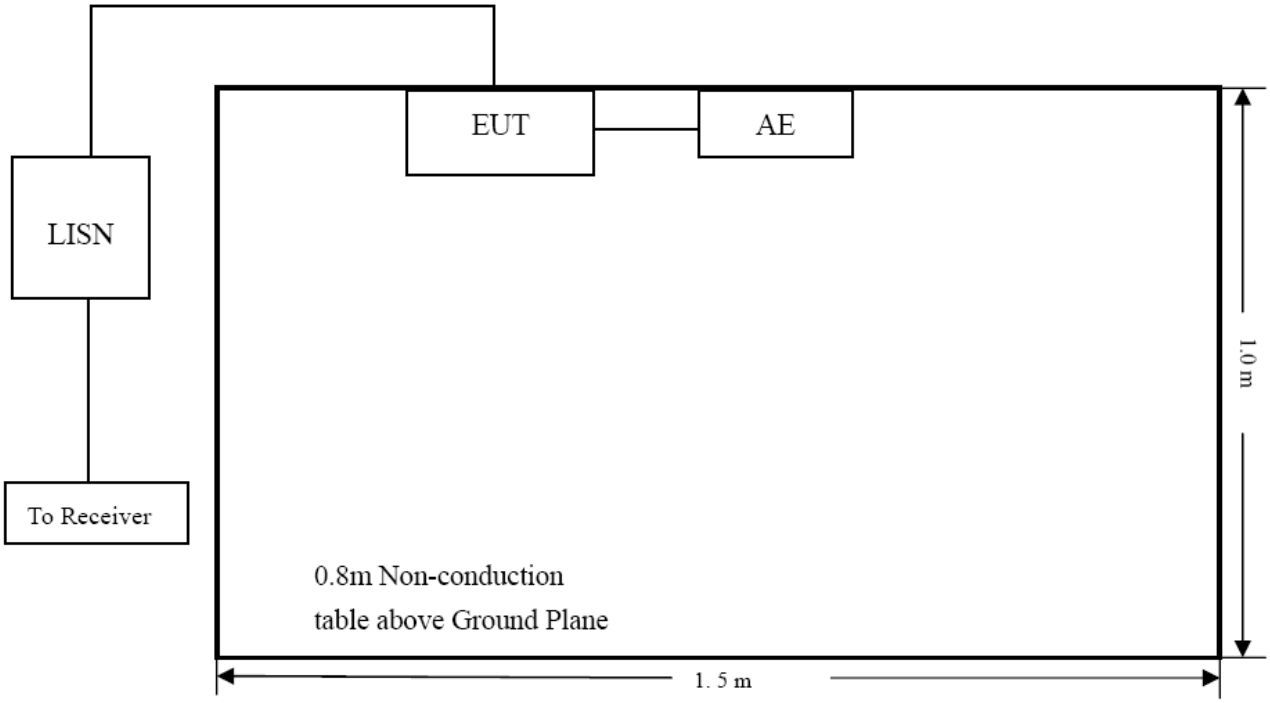
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, 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.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

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

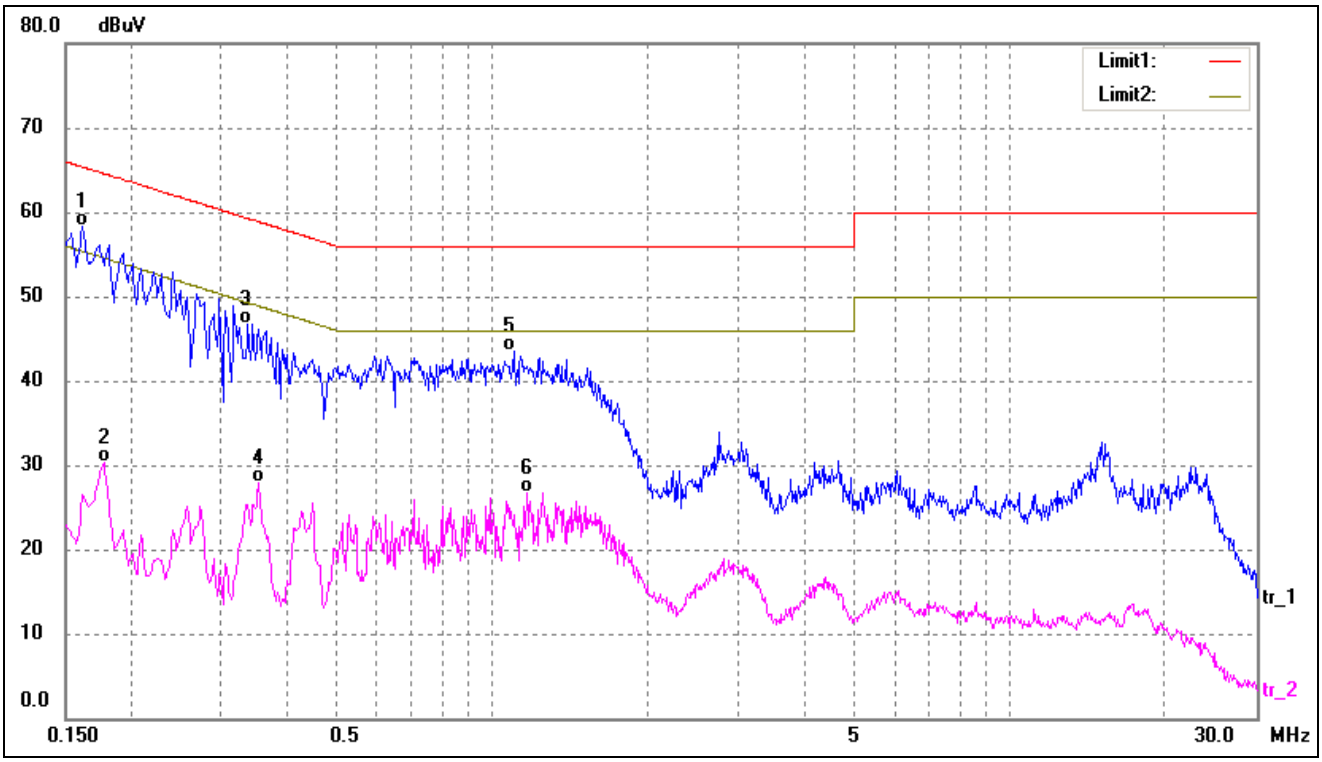
3.4 Summary of Test Results/Plots

According to the data in section 3.5, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

-7.13 dB at **0.1620 MHz** in the **Line**, **QP** detector, **TM1** mode, 0.15-30MHz

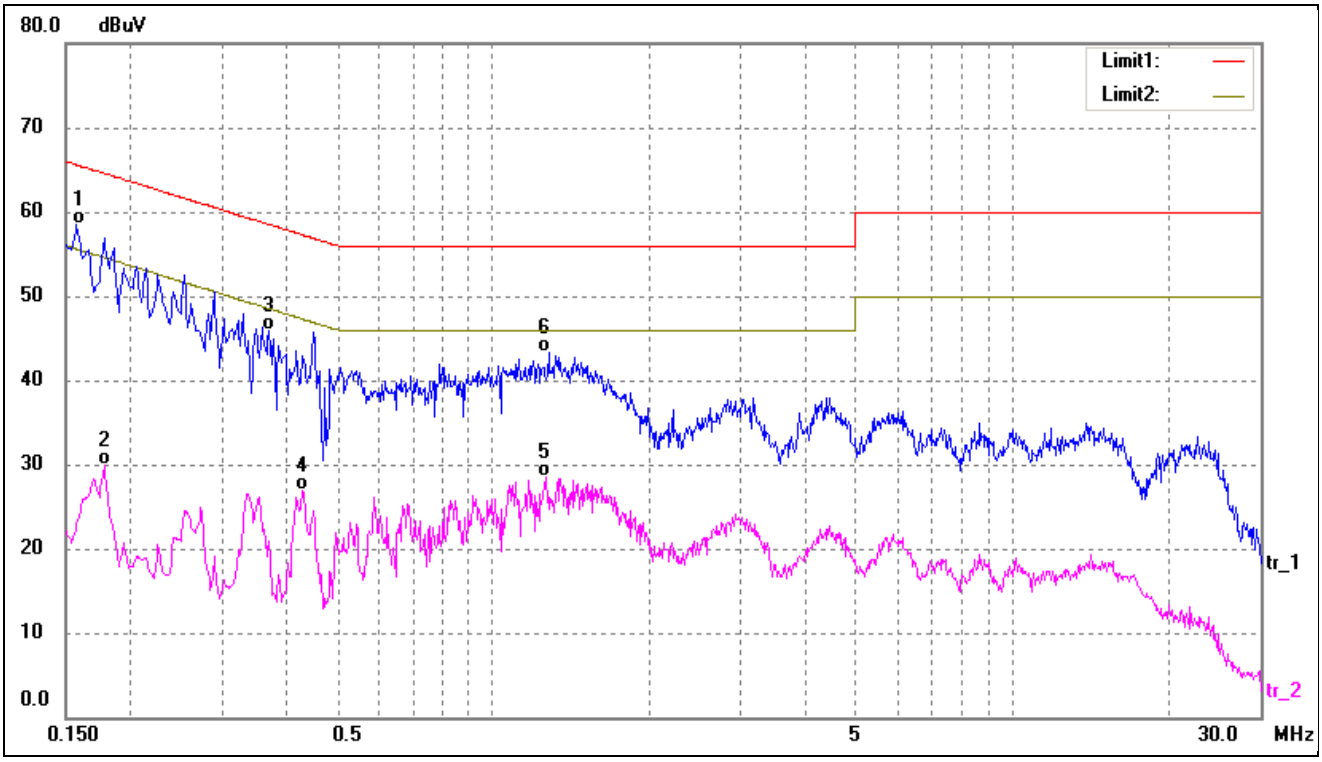
3.5 Conducted Emissions Test Data

Test mode:	TM1	Polarity:	Line



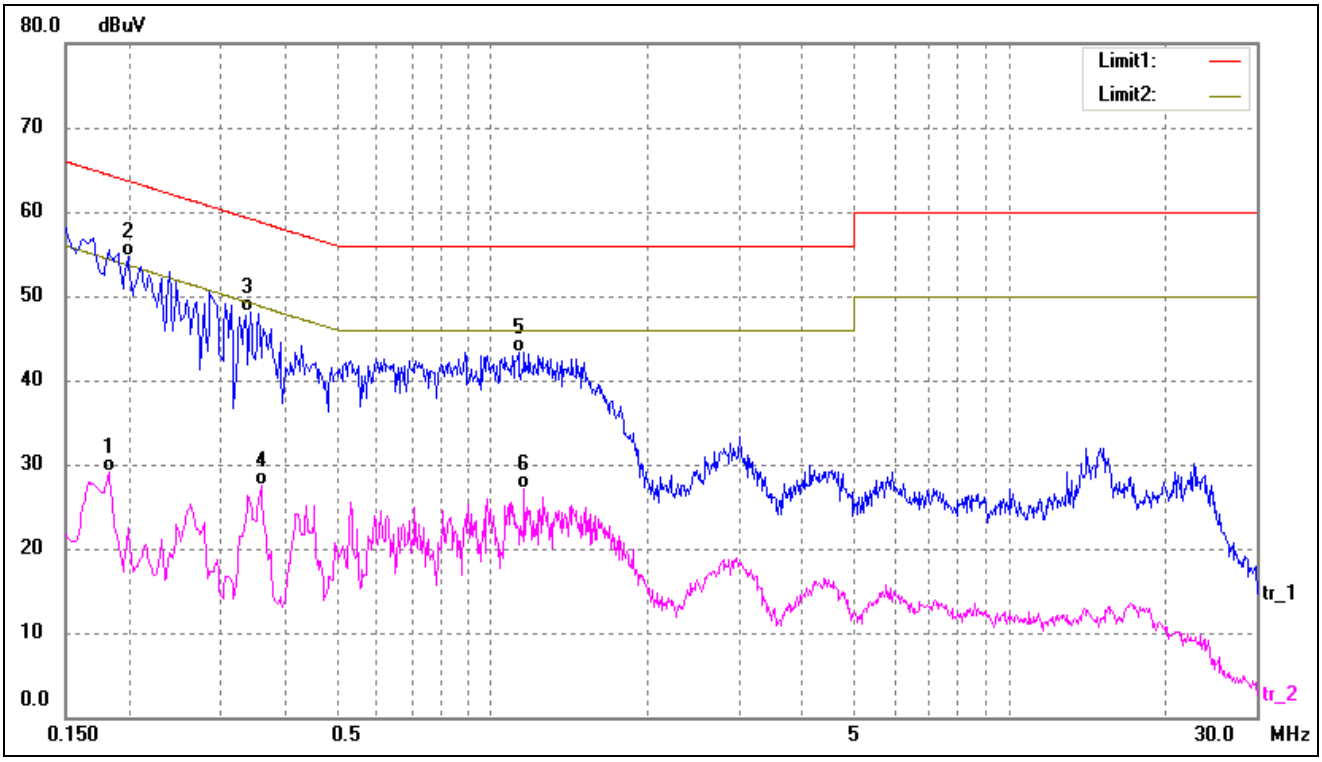
No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1620	57.98	0.25	58.23	65.36	-7.13	QP
2	0.1780	30.09	0.26	30.35	54.57	-24.22	AVG
3	0.3379	46.30	0.36	46.66	59.25	-12.59	QP
4	0.3540	27.51	0.37	27.88	48.87	-20.99	AVG
5	1.1019	42.92	0.57	43.49	56.00	-12.51	QP
6	1.1700	26.08	0.58	26.66	46.00	-19.34	AVG

Test mode:	TM1	Polarity:	Neutral



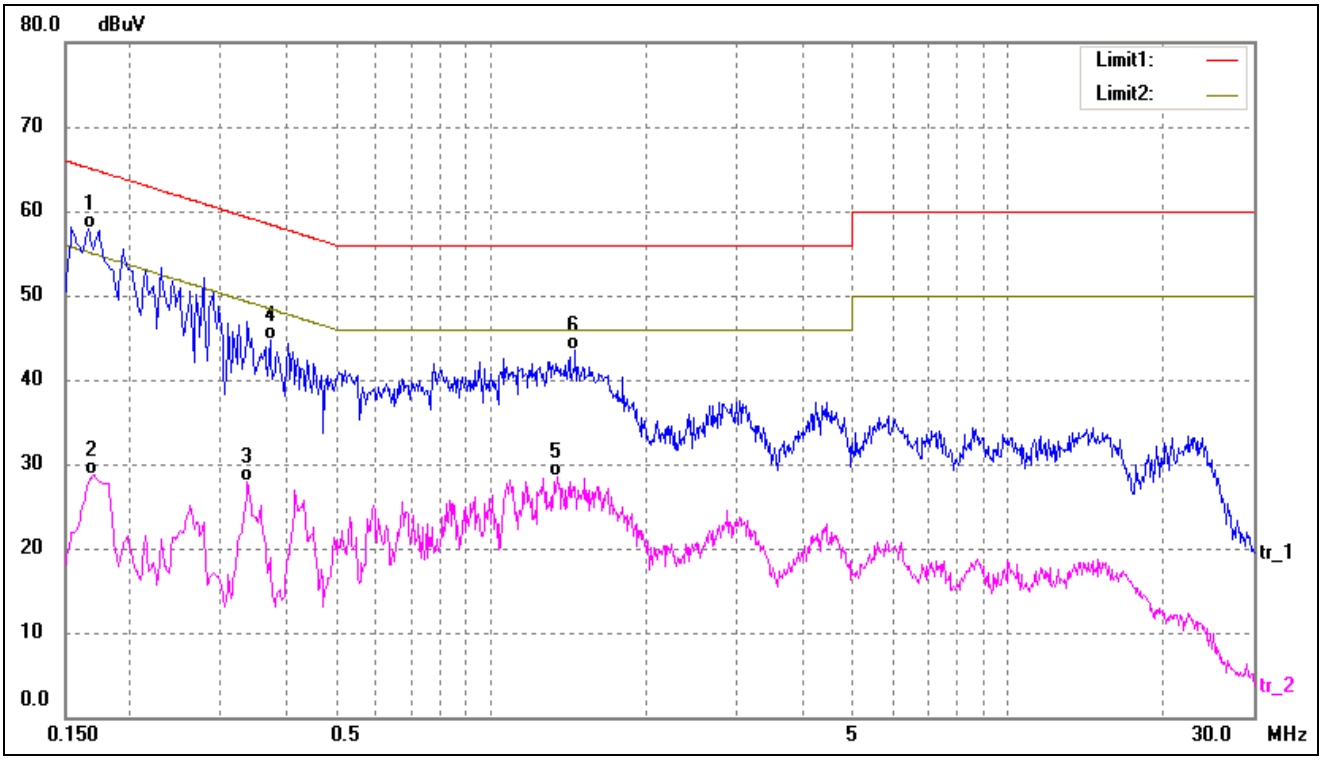
No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1580	58.17	0.25	58.42	65.56	-7.14	QP
2	0.1780	29.72	0.26	29.98	54.57	-24.59	AVG
3	0.3700	45.58	0.38	45.96	58.50	-12.54	QP
4	0.4300	26.56	0.40	26.96	47.25	-20.29	AVG
5	1.2660	27.87	0.59	28.46	46.00	-17.54	AVG
6	1.2780	42.79	0.59	43.38	56.00	-12.62	QP

Test mode:	TM2	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1819	28.84	0.26	29.10	54.39	-25.29	AVG
2*	0.1980	54.49	0.27	54.76	63.69	-8.93	QP
3	0.3420	47.79	0.36	48.15	59.15	-11.00	QP
4	0.3580	27.18	0.37	27.55	48.77	-21.22	AVG
5	1.1260	42.79	0.58	43.37	56.00	-12.63	QP
6	1.1580	26.46	0.58	27.04	46.00	-18.96	AVG

Test mode:	TM2	Polarity:	Neutral

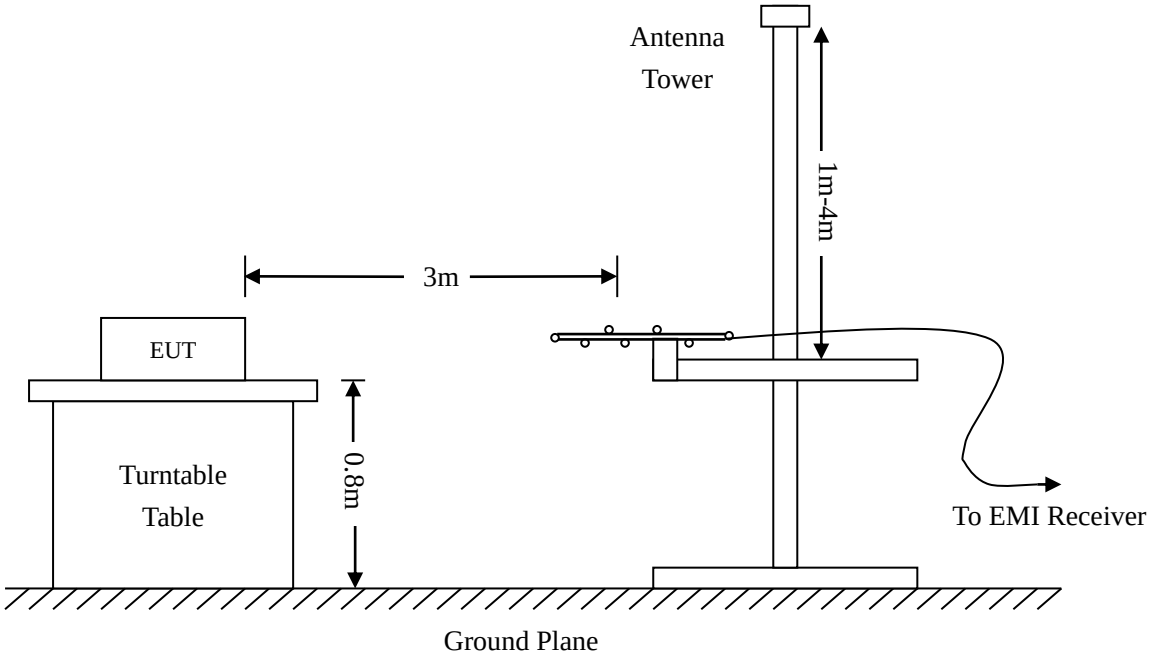


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1660	57.57	0.26	57.83	65.15	-7.32	QP
2	0.1700	28.41	0.26	28.67	54.96	-26.29	AVG
3	0.3379	27.46	0.36	27.82	49.25	-21.43	AVG
4	0.3740	44.27	0.38	44.65	58.41	-13.76	QP
5	1.3460	27.92	0.60	28.52	46.00	-17.48	AVG
6	1.4580	42.84	0.61	43.45	56.00	-12.55	QP

4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 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.



4.2 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

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

Margin = Corr. Ampl. – FCC Part 15.109(a) Limit

4.4 Environmental Conditions

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

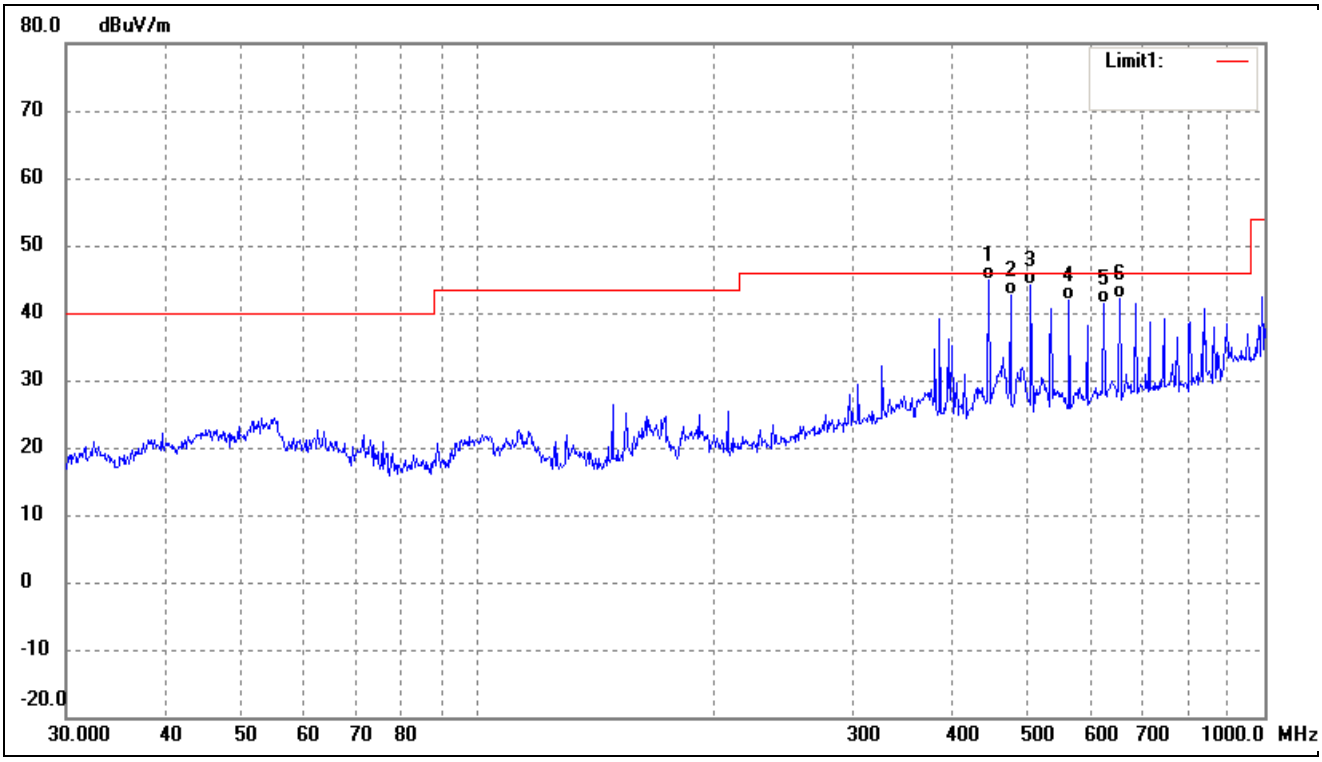
4.5 Summary of Test Results/Plots

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

-1.24 dB at **446.4141 MHz** in the **Horizontal** polarization, **TM1** mode, **9 kHz** to **40 GHz**, **3Meters**

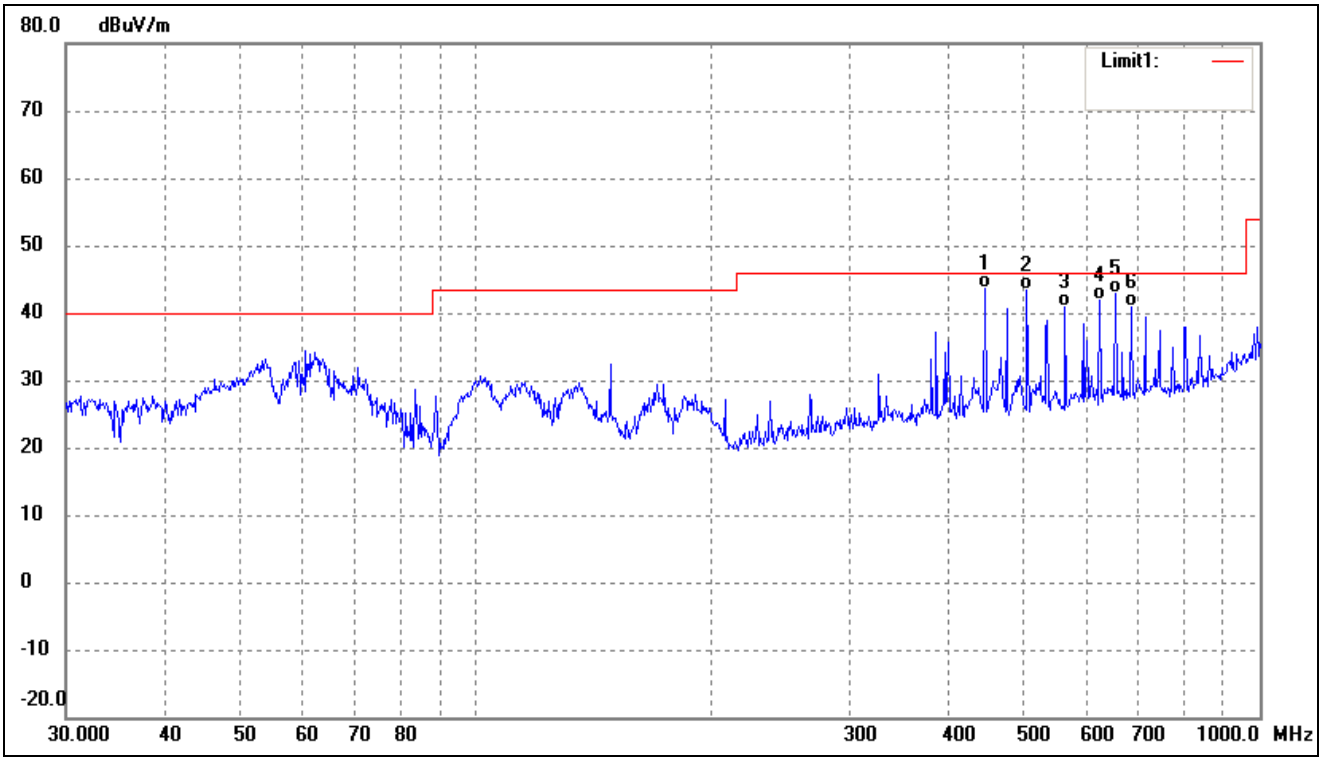
Below 1GHz

Test mode:	TM1	Polarity:	Horizontal



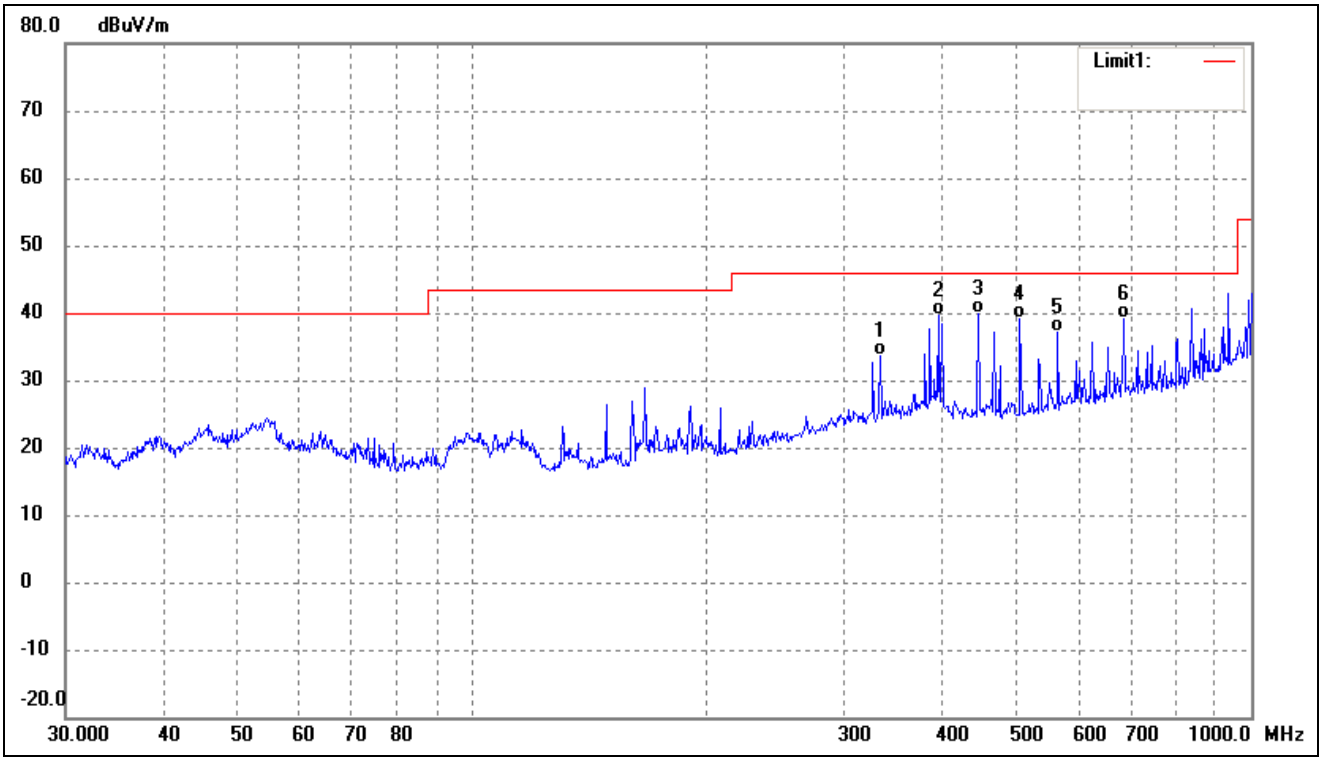
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	446.4141	51.20	-6.44	44.76	46.00	-1.24	214	100	QP
2	475.4991	48.90	-6.18	42.72	46.00	-3.28	94	100	QP
3	504.7062	50.15	-5.98	44.17	46.00	-1.83	82	100	QP
4	564.6389	46.64	-4.84	41.80	46.00	-4.20	97	100	QP
5	625.0780	45.10	-3.76	41.34	46.00	-4.66	163	100	QP
6	654.2318	45.52	-3.36	42.16	46.00	-3.84	147	100	QP

Test mode:	TM1	Polarity:	Vertical



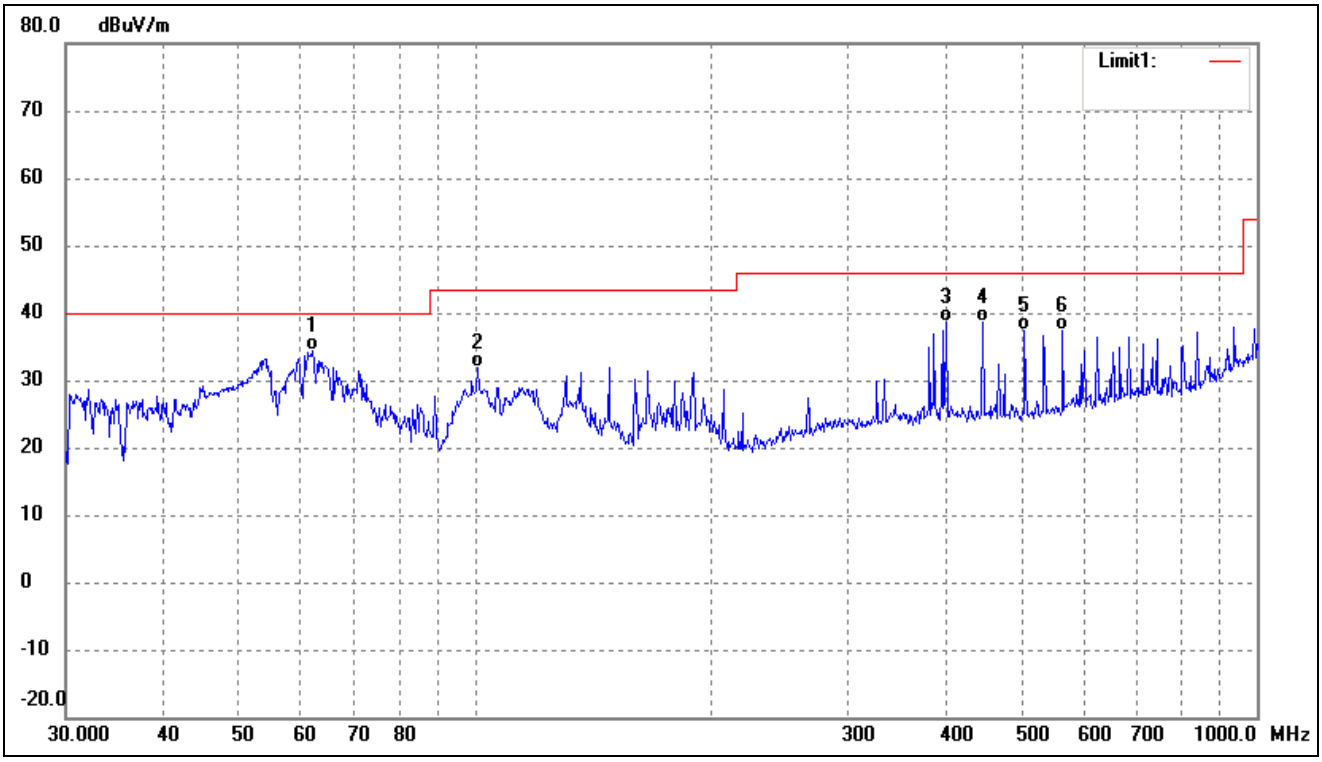
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	446.4141	49.96	-6.44	43.52	46.00	-2.48	253	100	QP
2	504.7062	49.46	-5.98	43.48	46.00	-2.52	96	100	QP
3	564.6389	45.75	-4.84	40.91	46.00	-5.09	203	100	QP
4	625.0780	45.67	-3.76	41.91	46.00	-4.09	97	100	QP
5	654.2318	46.27	-3.36	42.91	46.00	-3.09	147	100	QP
6	684.7454	43.61	-2.83	40.78	46.00	-5.22	196	100	QP

Test mode:	TM2	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	333.6867	40.29	-6.68	33.61	46.00	-12.39	128	100	QP
2	396.2415	46.26	-6.59	39.67	46.00	-6.33	312	100	QP
3	446.4141	46.37	-6.44	39.93	46.00	-6.07	85	100	QP
4	504.7062	45.04	-5.98	39.06	46.00	-6.94	237	100	QP
5	564.6389	41.89	-4.84	37.05	46.00	-8.95	251	100	QP
6	687.1507	41.98	-2.79	39.19	46.00	-6.81	262	100	QP

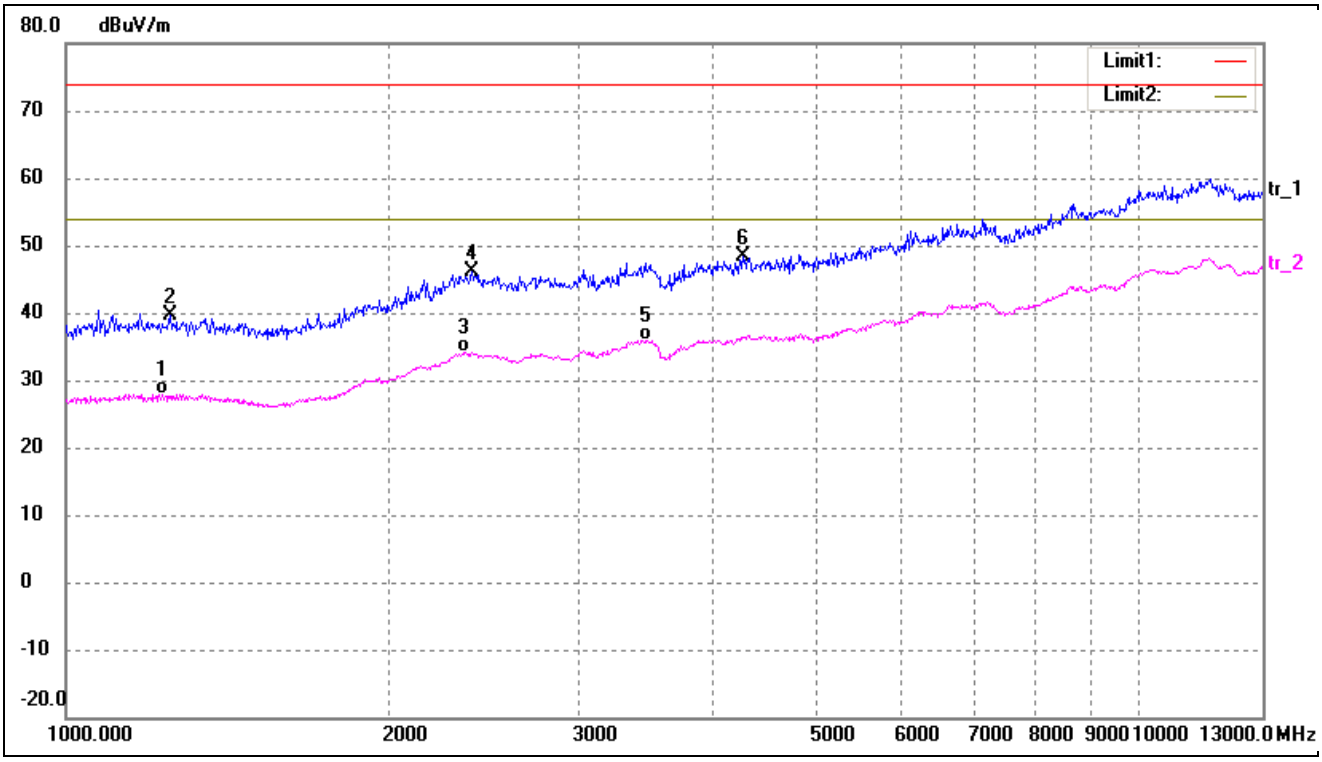
Test mode:	TM2	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	61.9951	49.23	-14.85	34.38	40.00	-5.62	121	100	QP
2	100.9339	46.17	-14.38	31.79	43.50	-11.71	131	100	QP
3	400.4319	45.09	-6.45	38.64	46.00	-7.36	65	100	QP
4	446.4141	45.03	-6.44	38.59	46.00	-7.41	135	100	QP
5	504.7062	43.29	-5.98	37.31	46.00	-8.69	104	100	QP
6	564.6389	42.14	-4.84	37.30	46.00	-8.70	190	100	QP

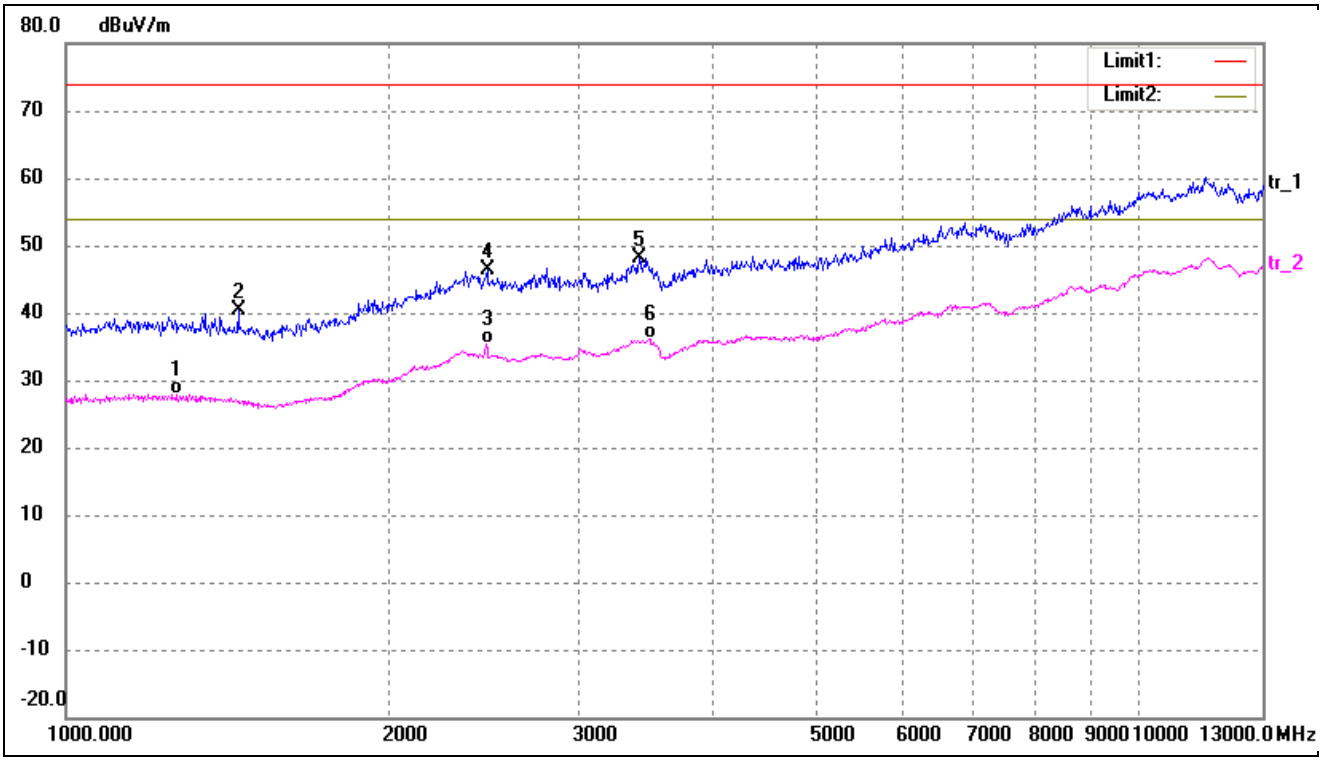
Above 1GHz

Test mode:	TM1	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1230.919	41.80	-13.89	27.91	54.00	-26.09	119	100	AVG
2	1250.009	53.38	-13.84	39.54	74.00	-34.46	96	100	peak
3	2343.307	41.72	-7.59	34.13	54.00	-19.87	136	100	AVG
4	2385.760	53.46	-7.33	46.13	74.00	-27.87	107	100	peak
5	3460.577	41.57	-5.71	35.86	54.00	-18.14	289	100	AVG
6	4270.630	52.69	-4.32	48.37	74.00	-25.63	306	100	peak

Test mode:	TM1	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	1266.143	41.75	-13.81	27.94	54.00	-26.06	70	100	AVG
2	1446.798	53.94	-13.44	40.50	74.00	-33.50	116	100	peak
3	2460.334	42.31	-6.90	35.41	54.00	-18.59	59	100	AVG
4	2466.653	53.24	-6.86	46.38	74.00	-27.62	139	100	peak
5	3416.480	53.91	-5.74	48.17	74.00	-25.83	115	100	peak
6	3496.265	41.74	-5.71	36.03	54.00	-17.97	222	100	AVG

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