

FCC PART 15B

TEST REPORT

For

Shenzhen Retevis Technology Co., Ltd.

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Longgang District, Shenzhen, China

FCC ID: 2ASNSRT40B

Report Type: Original Report	Product Type: TWO WAY RADIO
Test Engineer	Walker Chen, Joker Chen <i>Walker Chen</i> <i>Joker Chen</i>
Report Number:	DG1210906-46423E-00B
Report Date:	2021-09-14
Reviewed By:	Ivan Cao <i>Ivan Cao</i> Assistant Manager
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		TWO WAY RADIO
EUT Model:		RT40B
Multiple Model:		RT40
Highest Operation Frequency:		467.7125 MHz
Rated Input Voltage:		DC 3.7V from Battery or DC 5V from adapter
Adapter Information	Model:	TPA-97H050055UU01
	Input:	100~240V 50/60Hz 0.15A
	Output:	5.0V, 550mA
Serial Number:		DG1210906-46423E-S1
EUT Received Date:		2021.09.06
EUT Received Status:		Good

Objective

This report is prepared on behalf of the manufacturer in accordance with FCC Part 15B Part 2, Part J, and Part 15, Subpart A and B of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with: FCC Part 15B.

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.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~13GHz: 5.23 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in typical fashion (as normally used by a typical user)

Test mode 1: Charging and Receiving

Test mode 2: Charging and Scanning

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No software was used in test.

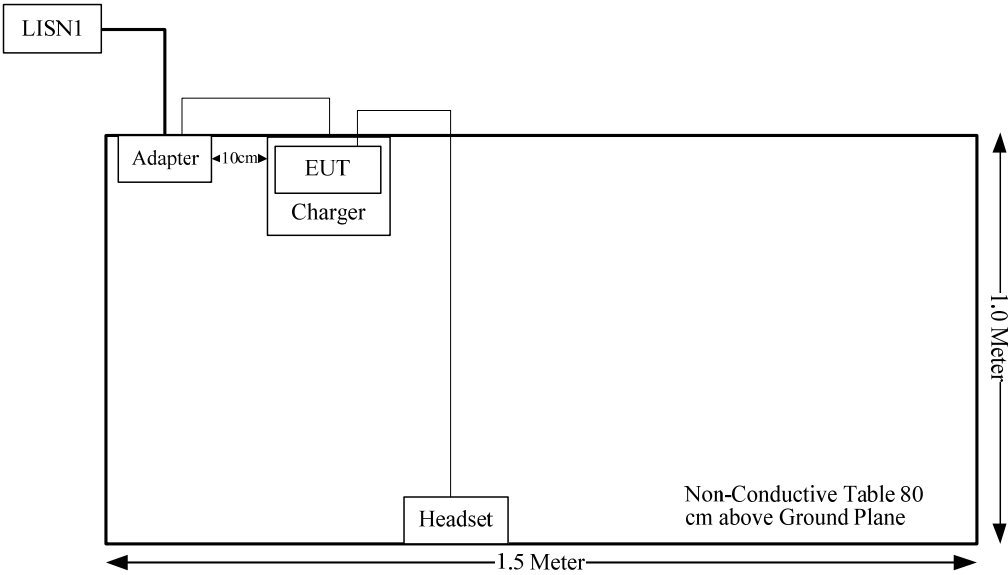
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HP	RF Communications Test Set	8920A	3438A05201

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.2	Adapter	EUT
Headset Cable	No	No	1.2	EUT	Headset

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emissions					
R&S	LISN	ENV 216	101614	2021-09-11	2022-09-10
R&S	EMI Test Receiver	ESCI	101121	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2021-09-05	2022-09-04
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions					
Sunol Sciences	Antenna	JB3	A060611-1	2020-11-10	2023-11-10
R&S	EMI Test Receiver	ESR3	102453	2020-09-23	2021-09-22
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2021-07-19	2022-07-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2021-07-19	2022-07-18
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2021-07-19	2022-07-18
Sonoma	Amplifier	310N	372193	2021-07-18	2022-07-17
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2021-09-04	2022-09-03
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2021-09-04	2022-09-03
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

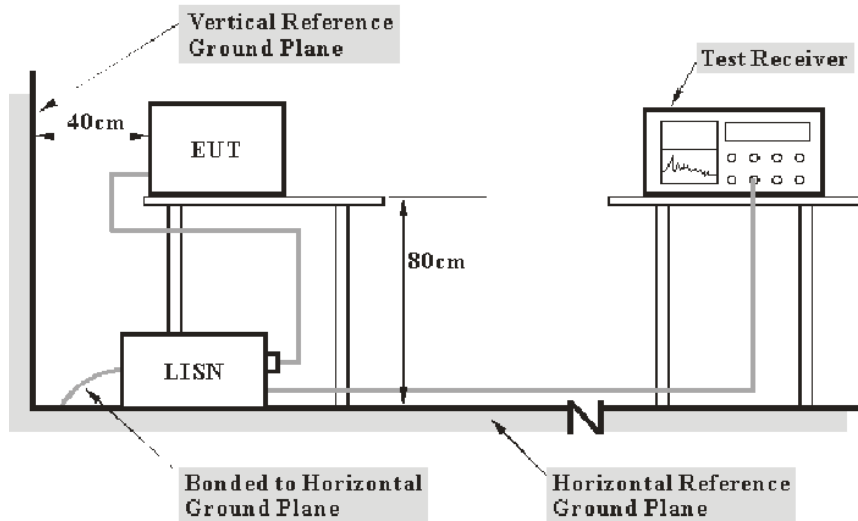
Test Item:	Conducted emissions	Radiated emissions (Below 1GHz)	Radiated emissions (Above 1GHz)
Temperature:	22.2℃	22.2 °C	23.2 °C
Relative Humidity:	61%	61 %	56 %
ATM Pressure:	101.2kPa	101.8kPa	101.1kPa
Tester:	Walker Chen	Joker Chen	Joker Chen
Test Date:	2021.09.12	2021.09.10	2021.09.11

SUMMARY OF TEST RESULTS**FCC Part 15B**

Clause	Description of Test	Test Result
§15.107	Conducted emissions	Compliance
§15.109	Radiated emissions	Compliance

FCC PART 15B §15.107 – CONDUCTED EMISSIONS

EUT Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the main LISN with a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter or EUT was connected to the first LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase (“hot”) line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

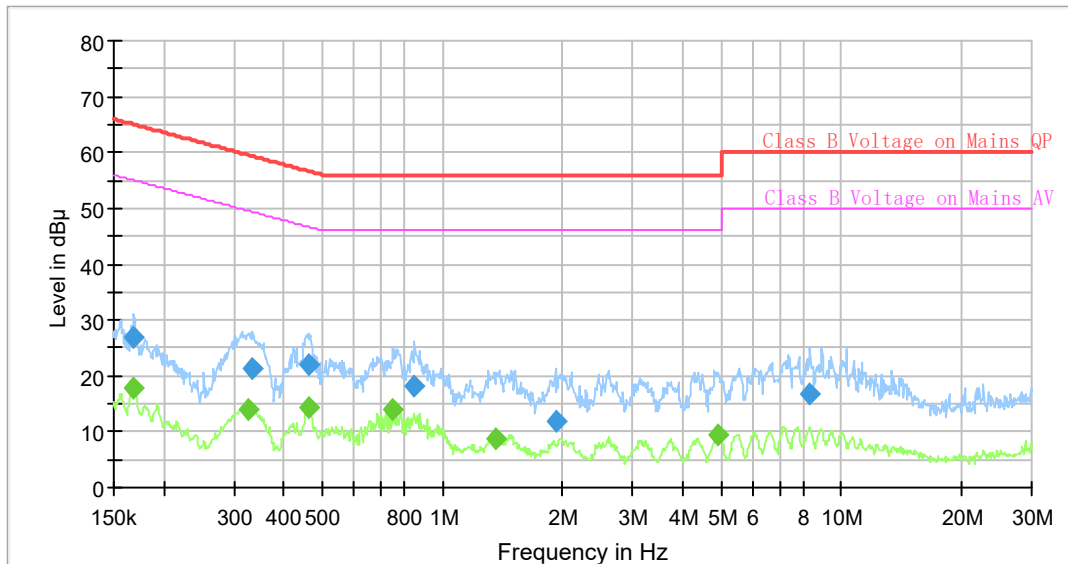
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

Test Result: Compliance, *Please refer to following table and plots:*

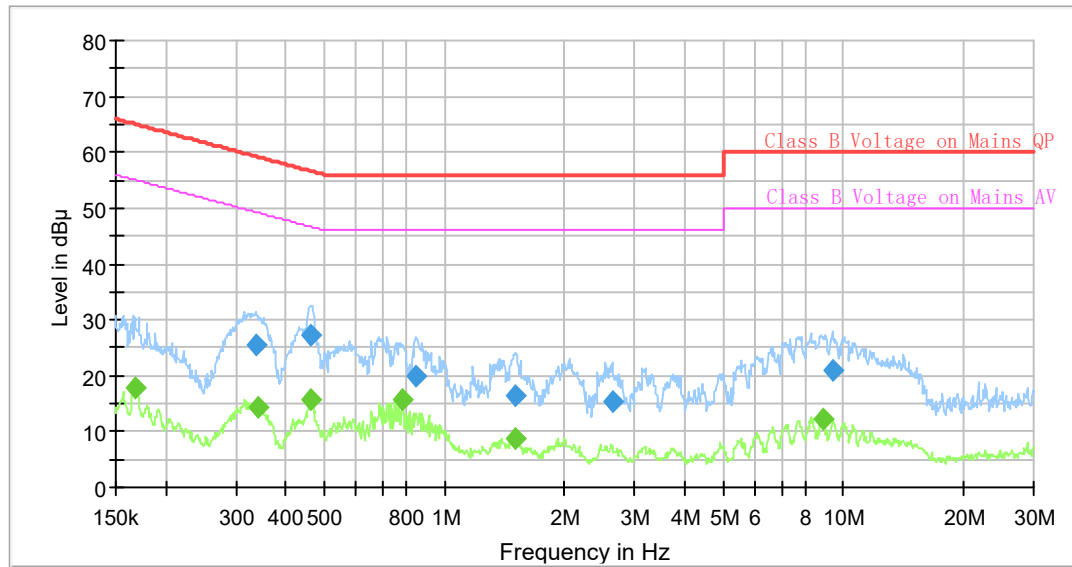
Port: L
 Test Mode: Charging&Scanning
 Power Source: AC 120V/60Hz



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.168233	---	17.71	55.05	37.34	9.000	L1	9.6
0.168233	26.76	---	65.05	38.29	9.000	L1	9.6
0.326585	---	14.07	49.54	35.47	9.000	L1	9.6
0.334832	21.24	---	59.33	38.09	9.000	L1	9.6
0.460739	21.98	---	56.68	34.70	9.000	L1	9.6
0.460739	---	14.42	46.68	32.26	9.000	L1	9.6
0.751154	---	14.09	46.00	31.91	9.000	L1	9.7
0.850904	18.14	---	56.00	37.86	9.000	L1	9.7
1.366648	---	8.89	46.00	37.11	9.000	L1	9.7
1.918443	12.04	---	56.00	43.96	9.000	L1	9.7
4.899688	---	9.49	46.00	36.51	9.000	L1	9.7
8.354819	16.80	---	60.00	43.20	9.000	L1	9.8

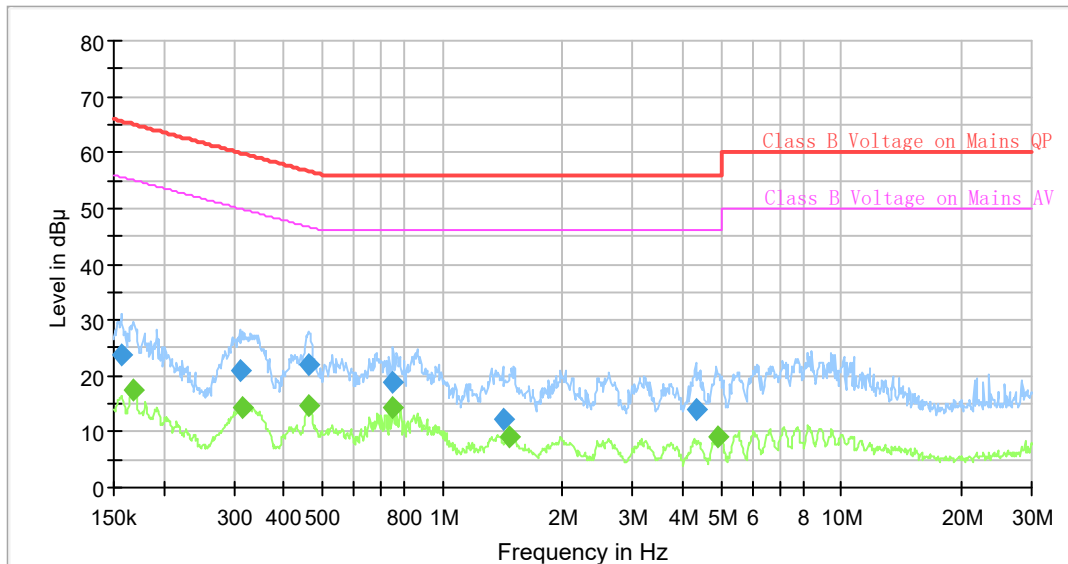
Model Number: GA70
 Port: N
 Test Mode: Charging&Scanning
 Power Source: AC 120V/60Hz



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.168233	---	17.87	55.05	37.18	9.000	N	9.6
0.336506	25.39	---	59.29	33.90	9.000	N	9.6
0.339880	---	14.21	49.21	35.00	9.000	N	9.6
0.463043	27.20	---	56.64	29.44	9.000	N	9.6
0.463043	---	15.78	46.64	30.86	9.000	N	9.6
0.785640	---	15.79	46.00	30.21	9.000	N	9.6
0.846671	19.90	---	56.00	36.10	9.000	N	9.6
1.510003	16.42	---	56.00	39.58	9.000	N	9.6
1.510003	---	8.70	46.00	37.30	9.000	N	9.6
2.639835	15.52	---	56.00	40.48	9.000	N	9.6
8.914476	---	12.07	50.00	37.93	9.000	N	9.7
9.370364	21.12	---	60.00	38.88	9.000	N	9.7

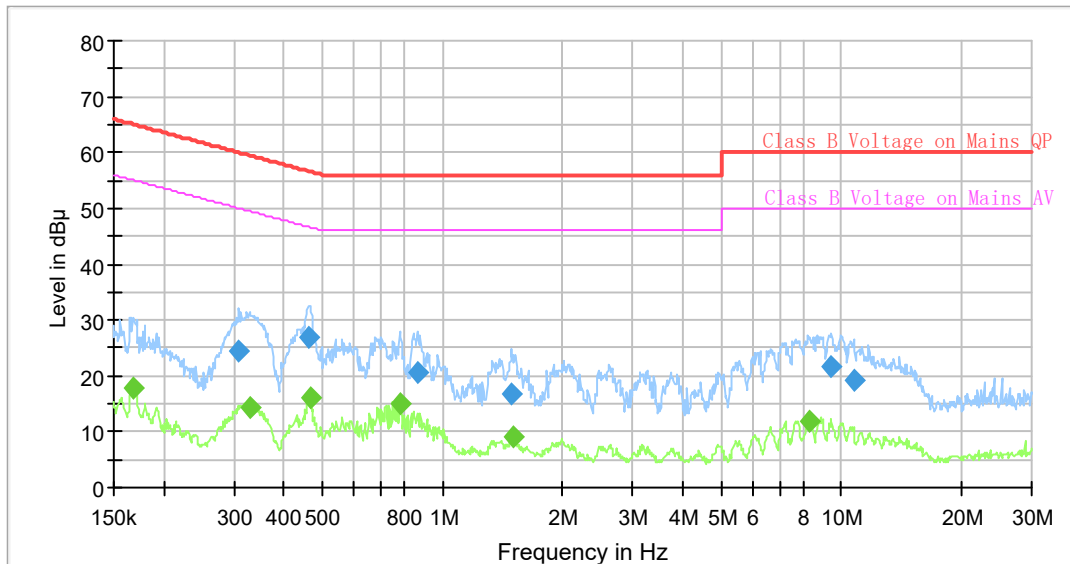
Port: L
Test Mode: Charging&Receiving
Power Source: AC 120V/60Hz



Final Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.156887	23.64	---	65.63	41.99	9.000	L1	9.6
0.167396	---	17.55	55.09	37.54	9.000	L1	9.6
0.310696	20.90	---	59.95	39.05	9.000	L1	9.6
0.313811	---	14.31	49.87	35.56	9.000	L1	9.6
0.460739	---	14.58	46.68	32.10	9.000	L1	9.6
0.460739	22.09	---	56.68	34.59	9.000	L1	9.6
0.751154	18.96	---	56.00	37.04	9.000	L1	9.7
0.751154	---	14.24	46.00	31.76	9.000	L1	9.7
1.415204	12.15	---	56.00	43.85	9.000	L1	9.7
1.472813	---	9.04	46.00	36.96	9.000	L1	9.7
4.325306	13.86	---	56.00	42.14	9.000	L1	9.7
4.899688	---	9.23	46.00	36.77	9.000	L1	9.7

Port: N
 Test Mode: Charging&Receiving
 Power Source: AC 120V/60Hz

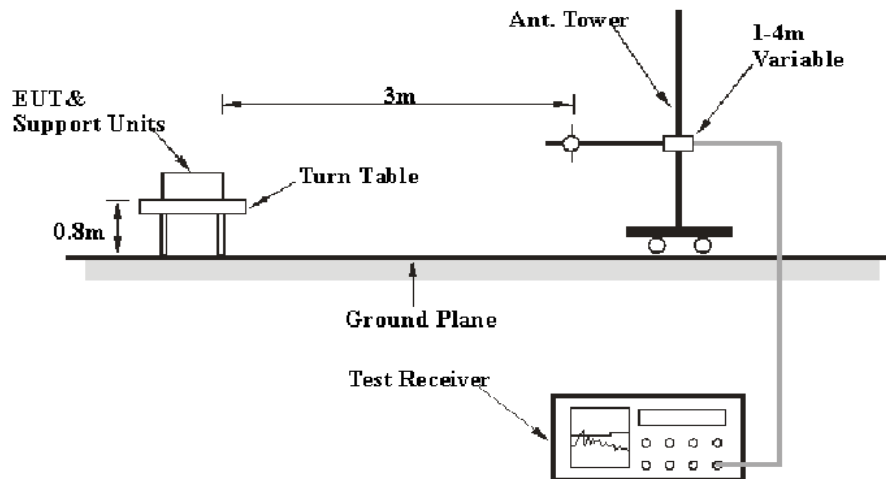


Final Result

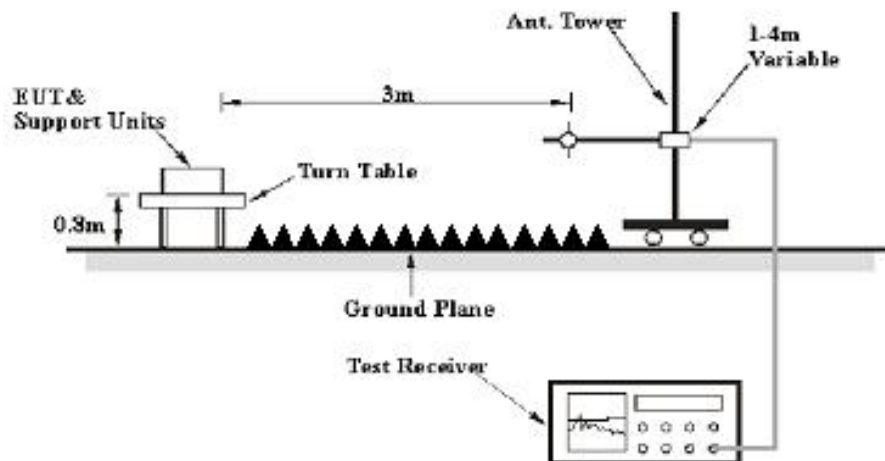
Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.168233	---	17.73	55.05	37.32	9.000	N	9.6
0.309151	24.57	---	59.99	35.42	9.000	N	9.6
0.328218	---	14.45	49.50	35.05	9.000	N	9.6
0.460739	26.99	---	56.68	29.69	9.000	N	9.6
0.465358	---	16.05	46.60	30.55	9.000	N	9.6
0.781732	---	14.89	46.00	31.11	9.000	N	9.6
0.863732	20.59	---	56.00	35.41	9.000	N	9.6
1.487578	16.65	---	56.00	39.35	9.000	N	9.6
1.502491	---	8.97	46.00	37.03	9.000	N	9.6
8.354819	---	11.80	50.00	38.20	9.000	N	9.7
9.464302	21.50	---	60.00	38.50	9.000	N	9.7
10.721119	19.27	---	60.00	40.73	9.000	N	9.7

FCC PART 15B §15.109 – RADIATED EMISSIONS**EUT Setup**

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed at the 3 meters distance, above 1GHz were performed at the 3 meters, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Corrected = Antenna Factor + Cable Loss - Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

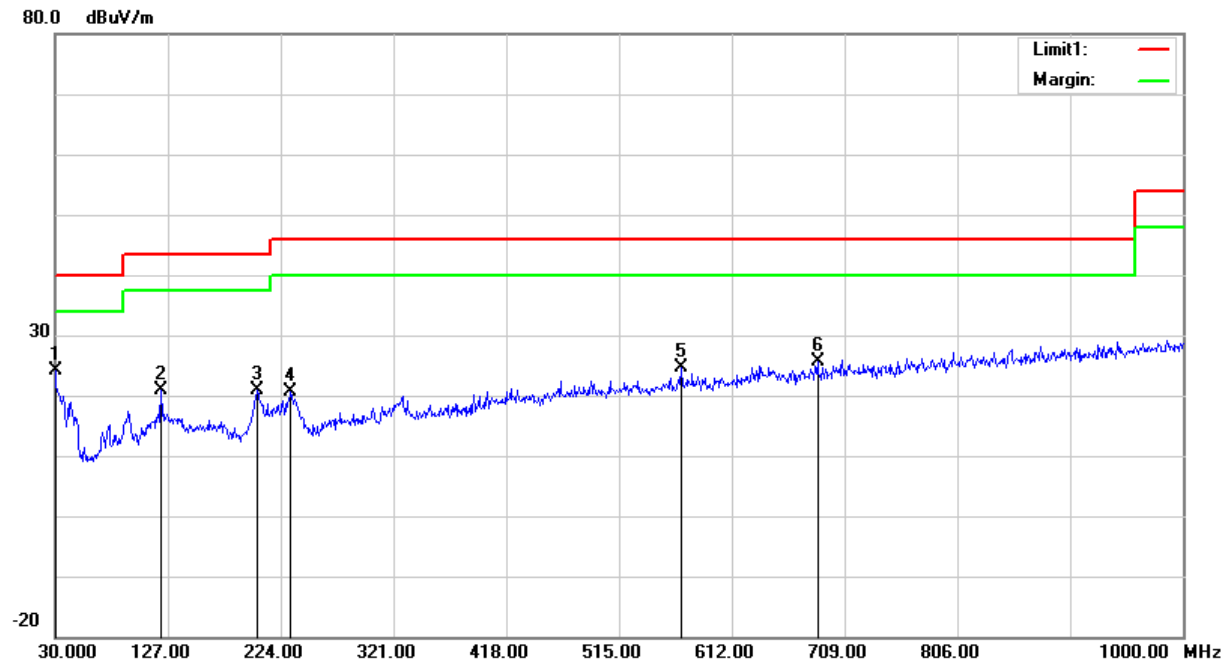
$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Data

Please refer to following table and plots:

Condition: FCC Part 15B Class B
Test Mode: Charging&Scanning

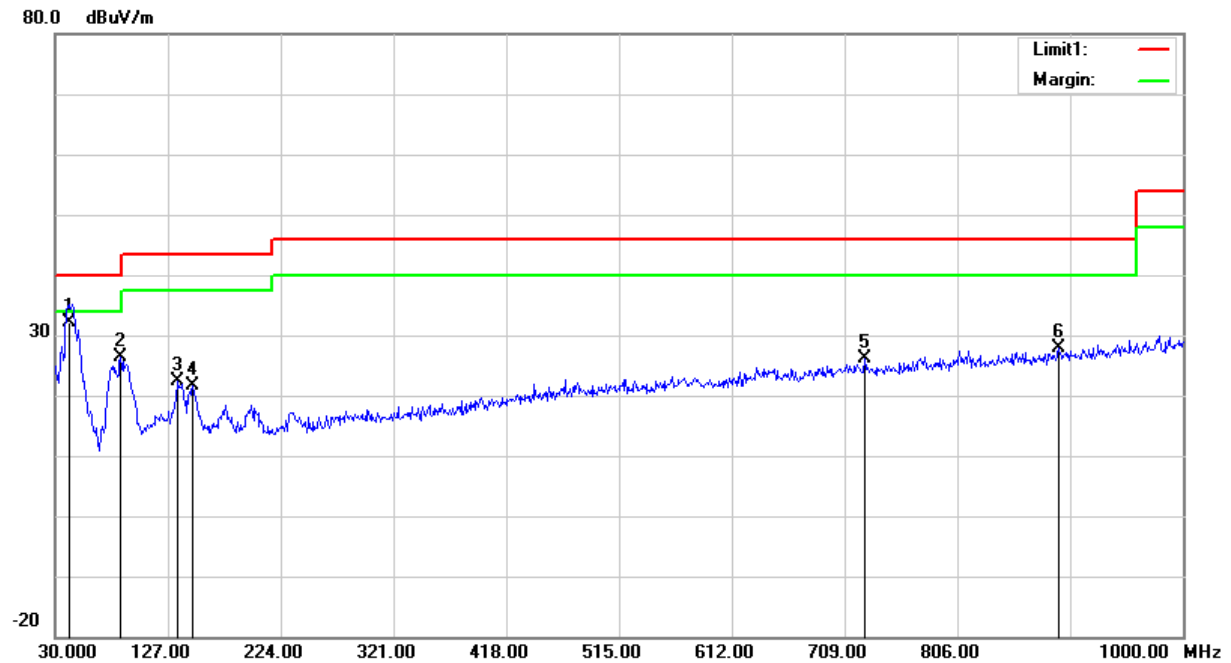
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	30.0000	27.60	peak	-3.49	24.11	40.00	15.89
2	121.1800	31.33	peak	-10.54	20.79	43.50	22.71
3	203.6300	33.50	peak	-12.66	20.84	43.50	22.66
4	232.7300	33.61	peak	-13.02	20.59	46.00	25.41
5	568.3500	29.21	peak	-4.49	24.72	46.00	21.28
6	685.7200	28.36	peak	-2.83	25.53	46.00	20.47

Condition: FCC Part 15B Class B
Test Mode: Charging&Scanning

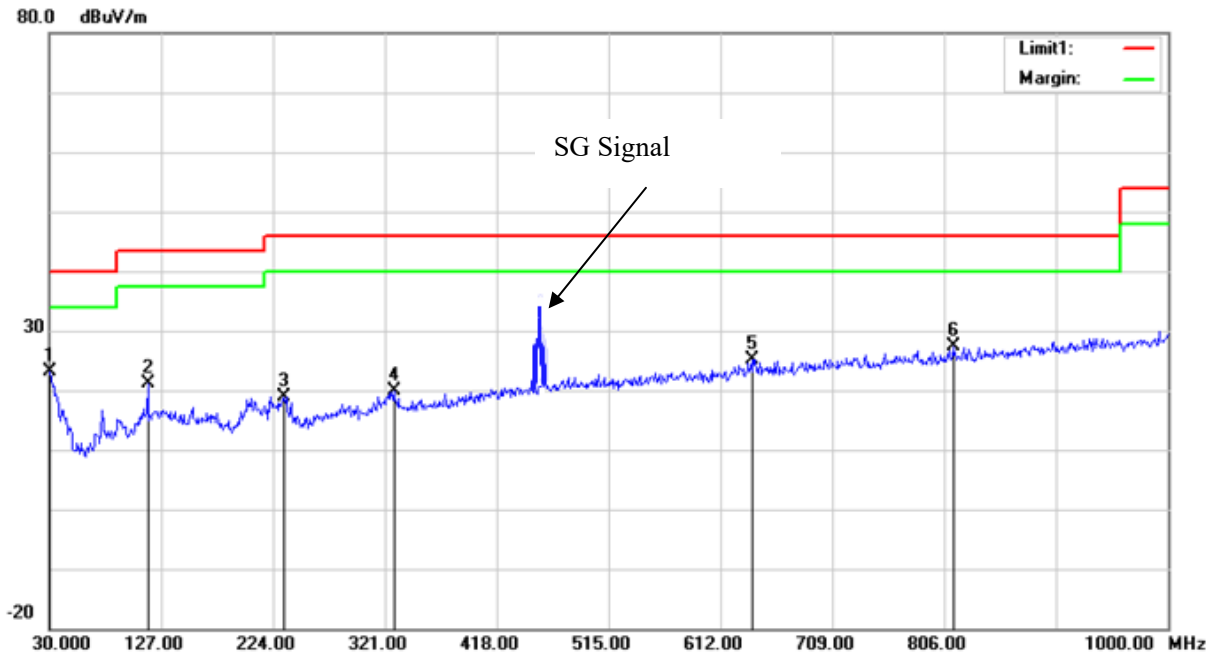
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	41.6400	44.36	QP	-12.22	32.14	40.00	7.86
2	86.2600	43.40	peak	-17.07	26.33	40.00	13.67
3	134.7600	33.49	peak	-11.16	22.33	43.50	21.17
4	148.3400	33.61	peak	-11.99	21.62	43.50	21.88
5	726.4600	28.39	peak	-2.21	26.18	46.00	19.82
6	893.3000	26.99	peak	0.82	27.81	46.00	18.19

Condition: FCC Part 15B Class B
Test Mode: Charging&Receiving

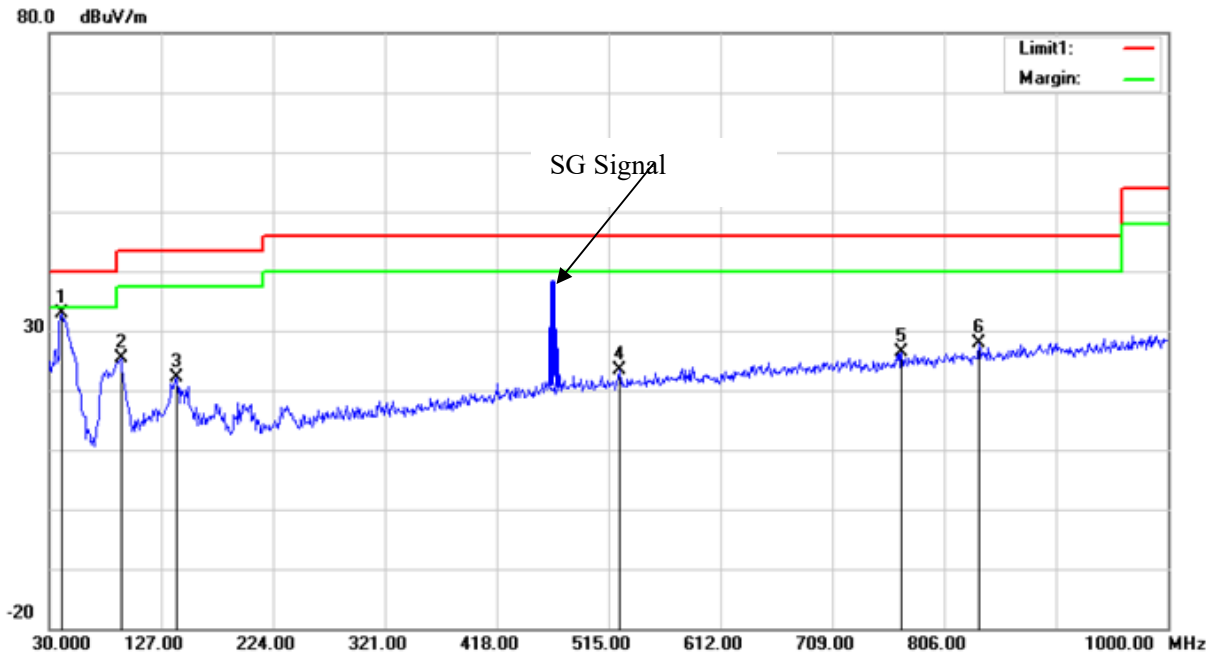
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	30.0000	26.65	peak	-3.49	23.16	40.00	16.84
2	115.3600	32.00	peak	-10.97	21.03	43.50	22.47
3	233.7000	31.85	peak	-13.02	18.83	46.00	27.17
4	328.7600	29.57	peak	-9.80	19.77	46.00	26.23
5	639.1600	28.35	peak	-3.12	25.23	46.00	20.77
6	813.7600	27.89	peak	-0.55	27.34	46.00	18.66

Condition: FCC Part 15B Class B
Test Mode: Charging&Receiving

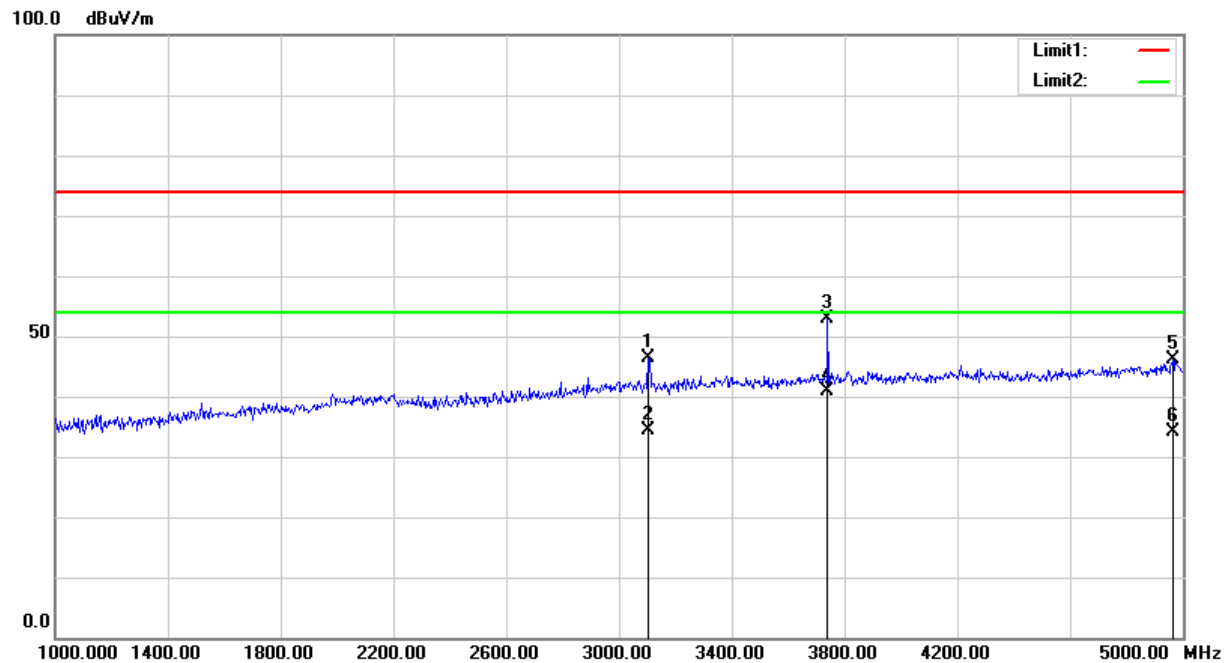
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	40.6700	44.45	peak	-11.56	32.89	40.00	7.11
2	92.0800	42.14	peak	-16.65	25.49	43.50	18.01
3	140.5800	33.86	peak	-11.78	22.08	43.50	21.42
4	524.7000	28.60	peak	-5.33	23.27	46.00	22.73
5	769.1400	27.61	peak	-1.28	26.33	46.00	19.67
6	836.0700	28.43	peak	-0.51	27.92	46.00	18.08

Condition: FCC Part 15B Class B
Test Mode: Charging&Scanning

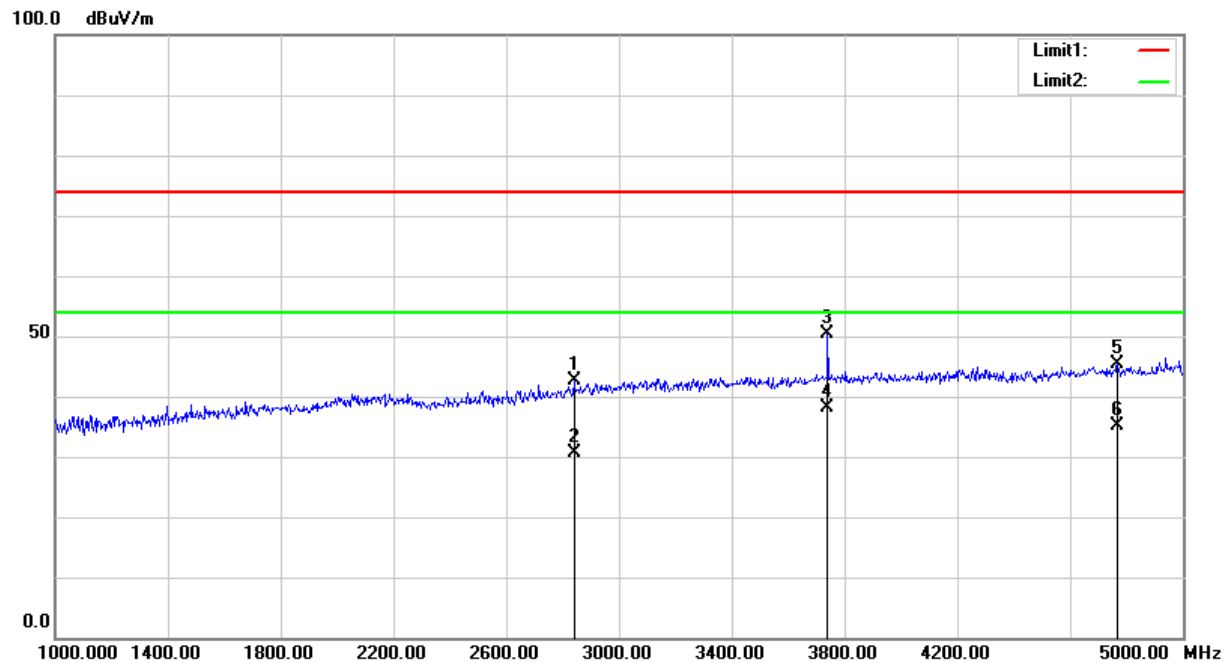
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	3106.000	39.65	peak	6.68	46.33	74.00	27.67
2	3106.000	27.58	AVG	6.68	34.26	54.00	19.74
3	3740.000	44.43	peak	8.50	52.93	74.00	21.07
4	3740.000	32.37	AVG	8.50	40.87	54.00	13.13
5	4966.000	35.19	peak	10.83	46.02	74.00	27.98
6	4966.000	23.28	AVG	10.83	34.11	54.00	19.89

Condition: FCC Part 15B Class B
Test Mode: Charging&Scanning

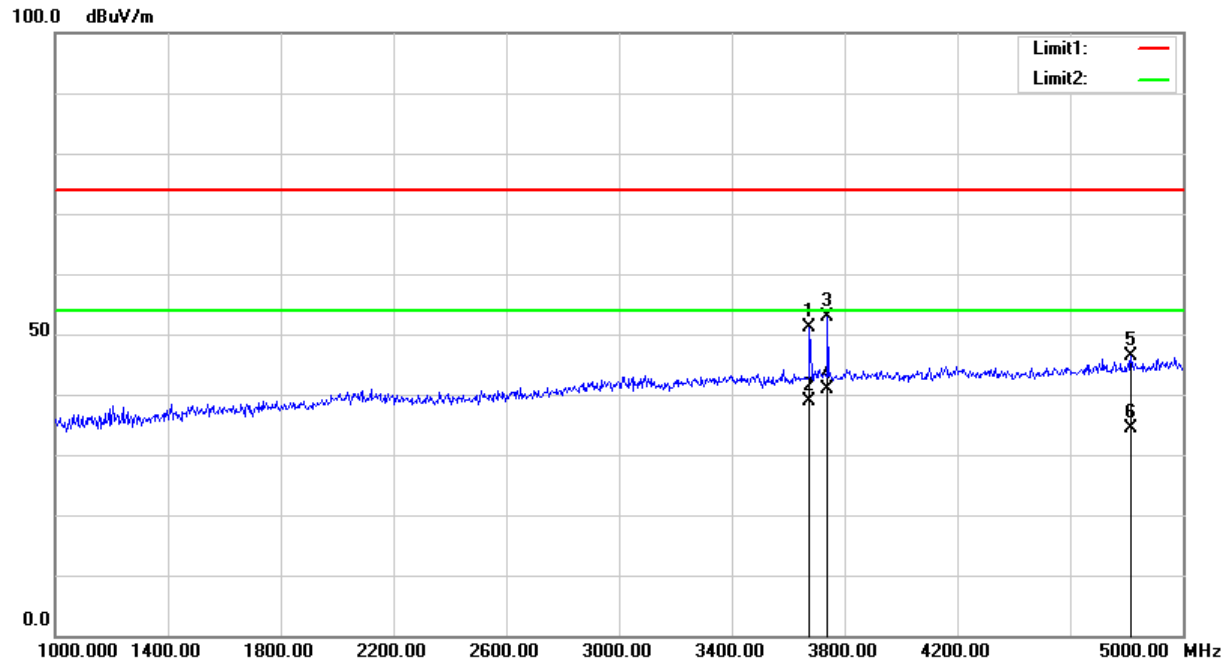
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	2842.000	37.03	peak	5.50	42.53	74.00	31.47
2	2842.000	25.14	AVG	5.50	30.64	54.00	23.36
3	3740.000	41.84	peak	8.50	50.34	74.00	23.66
4	3740.000	29.67	AVG	8.50	38.17	54.00	15.83
5	4768.000	34.99	peak	10.32	45.31	74.00	28.69
6	4768.000	24.89	AVG	10.32	35.21	54.00	18.79

Condition: FCC Part 15B Class B
Test Mode: Charging&Receiving

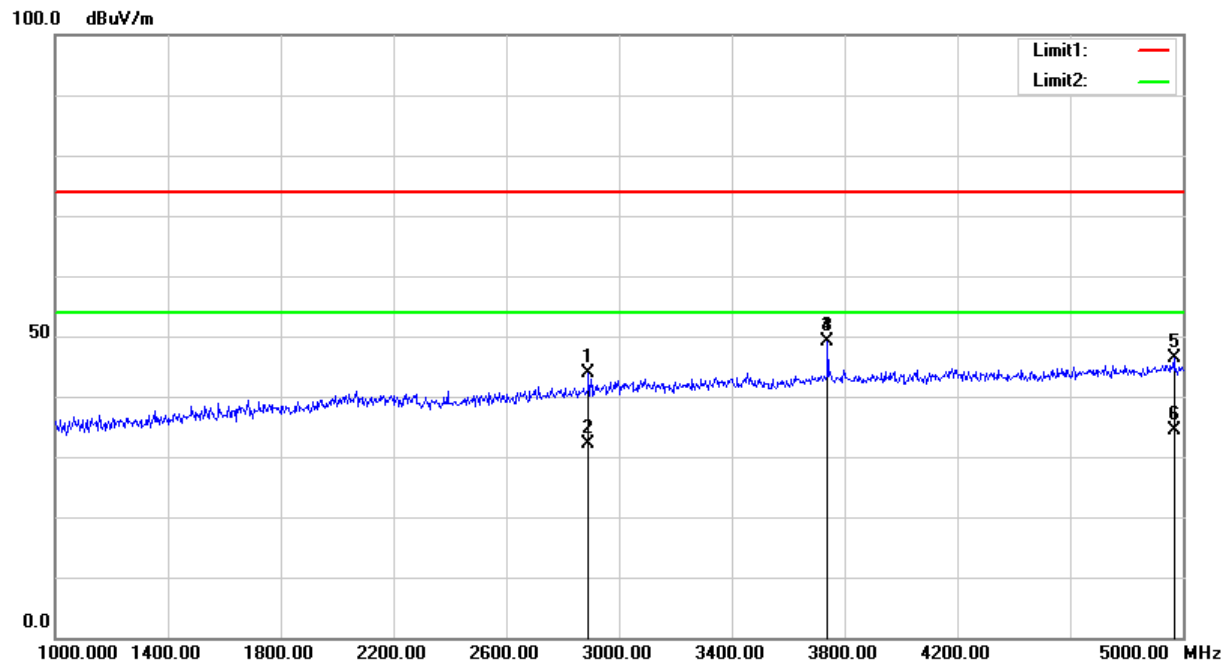
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	3678.000	42.71	peak	8.31	51.02	74.00	22.98
2	3678.000	30.56	AVG	8.31	38.87	54.00	15.13
3	3740.000	44.50	peak	8.50	53.00	74.00	21.00
4	3740.000	32.47	AVG	8.50	40.97	54.00	13.03
5	4816.000	35.99	peak	10.50	46.49	74.00	27.51
6	4816.000	23.87	AVG	10.50	34.37	54.00	19.63

Condition: FCC Part 15B Class B
Test Mode: Charging&Receiving

Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	2892.000	38.05	peak	5.80	43.85	74.00	30.15
2	2892.000	26.35	AVG	5.80	32.15	54.00	21.85
3	3740.000	40.69	peak	8.50	49.19	74.00	24.81
4	3740.000	30.61	AVG	8.50	39.11	54.00	14.89
5	4968.000	35.43	peak	10.84	46.27	74.00	27.73
6	4968.000	23.57	AVG	10.84	34.41	54.00	19.59

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