

TEST REPORT

Reference No..... : WTD21D09101435E
FCC ID : EROUC-ENGINE-A
Applicant..... : Crestron Electronics Inc
Address..... : 15 Volvo Drive, Rockleigh, NJ 07647, United States of America
Manufacturer : SMART Wireless Computing Inc.
Address..... : 39870 Eureka Dr, Newark, CA 94560, United States of America
Product..... : UC-ENGINE-A
Model(s). : M202138002(SKU: UC-ENGINE-A-T, UC-ENGINE-A-Z)
Brand name : Crestron
Standards : FCC PART15 SUBPART B
Date of Receipt sample : 2021-09-24
Date of Test : 2021-09-24 to 2021-10-27
Date of Issue..... : 2021-10-27
Test Result..... : **Pass**
Remark..... :
...

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD21D09101435E	2021-09-24	2021-09-24 to 2021-10-27	2021-10-27	Original	-	Valid

3 General Information

3.1 General Description of E.U.T.

Product : UC-ENGINE-A

Model(s)..... : M202138002(SKU: UC-ENGINE-A-T, UC-ENGINE-A-Z)

Model Description..... : N/A

3.2 Details of E.U.T.

Ratings : DC 12V For Battery

3.3 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

3.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476. Certificate Number: 4243.01

Waltek Testing Group 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. Registration number 523476, September 10, 2019.

3.5 Abnormalities from Standard Conditions

None.

4 Test Summary

Test Item	Test Requirement	Test Result
AC Power Line Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B	N/A
Disturbance voltage at the antenna terminals (30MHz to 2150MHz)	FCC PART 15, SUBPART B	N/A
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B	Pass

Remark:

Pass Test item meets the requirement

Fail Test item does not meet the requirement

N/A Test case does not apply to the test object

5 Equipment Used during Test

5.1 Equipment List

3m Semi-anechoic Chamber for Radiation (Below 1GHz) TDK						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2021-04-26	2022-04-25
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020-10-31	2021-10-30
3	Amplifier	ANRITSU	MH648A	M43381	2021-04-26	2022-04-25
4	Cable	HUBER+SUHNER	CBL2	525178	2021-04-26	2022-04-25
3m Fully Anechoic Room for Radiation (Above 1GHz)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	2021-04-26	2022-04-25
2	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2021-04-30	2022-04-29
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2021-04-26	2022-04-25
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	NA	2021-04-26	2022-04-25

5.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Display	Philips	YDS30	/
Mouse	Lenovo	AP01	/
USB flash disk	Kingston	KS64G	/
HDMI LINE	Lenovo	E3012	/
Battery	MX412-33	/	/
Earphone	Haiwei	A6310	/

5.3 Measurement Uncertainty

Parameter	Uncertainty (Note 1)
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emission (150kHz-30MHz)	±3.64dB

Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~18GHz)	$\pm 5.47\text{dB}$

Note 1: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

5.5 Test Mode

Test Item	Test Mode	Test Voltage
FCC PART 15B		
Radiated Emissions (30MHz-1GHz)	1.HDMI IN Playing 2.Network Playing 3.USB Playing*	DC 12V
Radiated Emissions (1GHz-6GHz)	1.HDMI IN Playing 2.Network Playing 3.USB Playing*	DC 12V
** shows the worst case mode which were recorded in this report.		

6 Emission Test Results

6.1 Radiation Emission, 30MHz to 1000MHz

Test Requirement..... : FCC PART 15, SUBPART B

Test Method..... : ANSI C63.4-2014

Test Result : Pass

Frequency Range..... : 30MHz to 1000MHz

Class. : Class B

Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB μ V/m)
		Quasi-peak
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

6.1.1 E.U.T. Operation

Operating Environment:

Temperature..... : 22.5°C

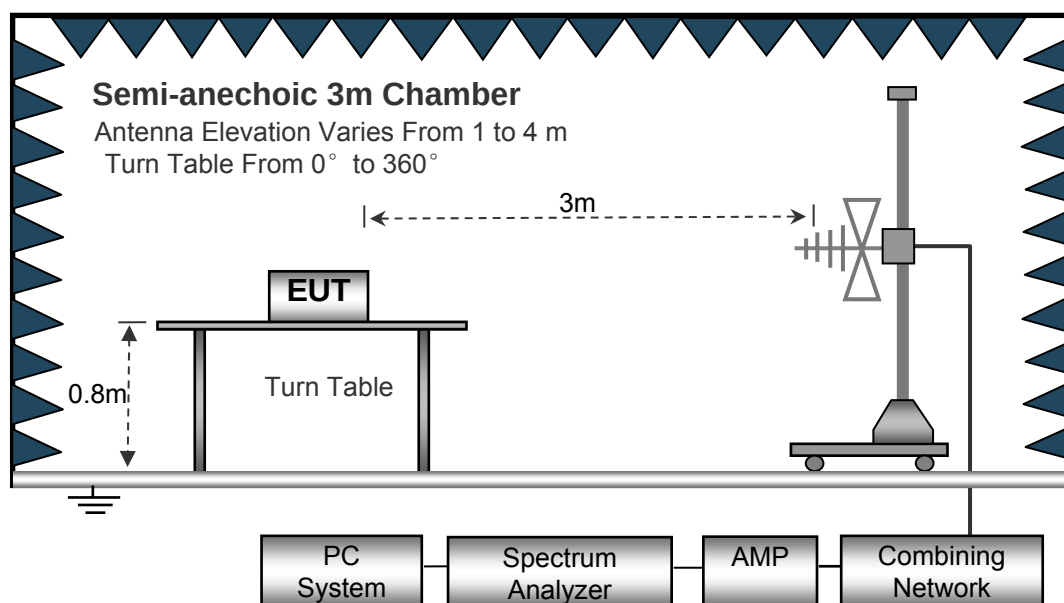
Humidity..... : 52.6%RH

Atmospheric Pressure..... : 101.8kPa

EUT Operation : Refer to section 5.5.

6.1.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4-2014.

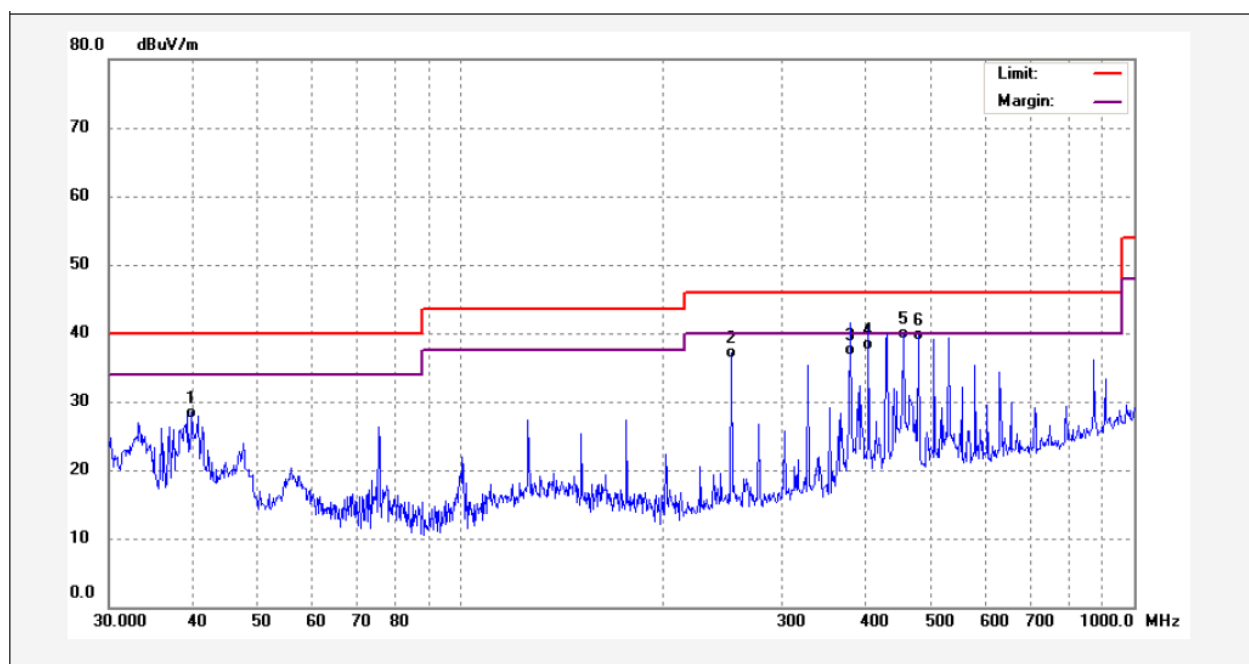


6.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.

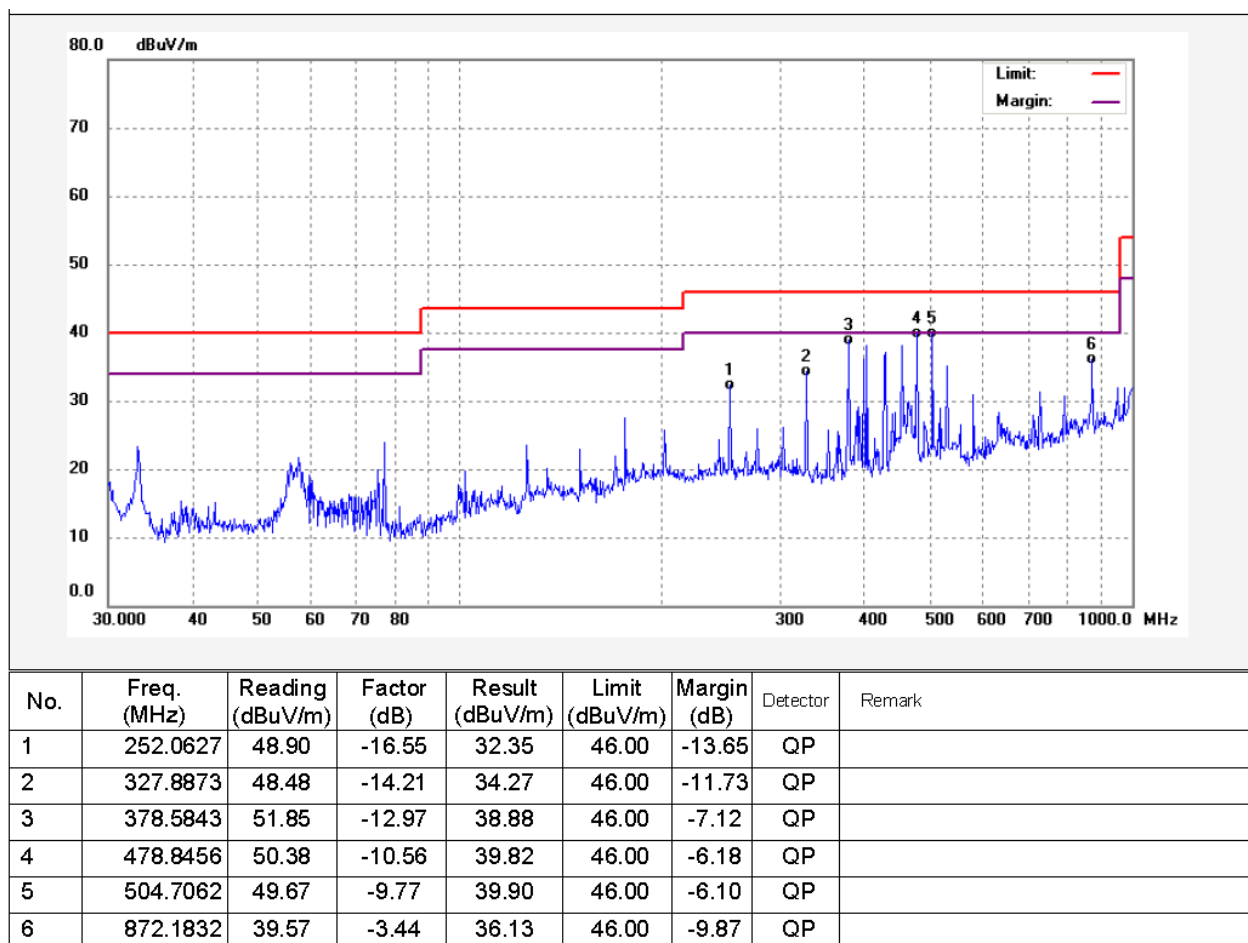
6.1.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	39.8542	46.17	-17.77	28.40	40.00	-11.60	QP	
2	252.0627	53.75	-16.55	37.20	46.00	-8.80	QP	
3	378.5843	50.57	-12.97	37.60	46.00	-8.40	QP	
4	403.2500	50.81	-12.41	38.40	46.00	-7.60	QP	
5	454.3100	51.05	-11.21	39.84	46.00	-6.16	QP	
6	478.8456	50.23	-10.56	39.67	46.00	-6.33	QP	

Antenna Polarization: Horizontal



6.2 Radiation Emission, Above 1000MHz

Test Requirement..... : FCC PART 15, SUBPART B
 Test Method..... : ANSI C63.4-2014
 Test Result : Pass
 Frequency Range..... : Above 1GHz
 Class. : Class B
 Limit. :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBuV/m)
Above 1GHz	3	54	74

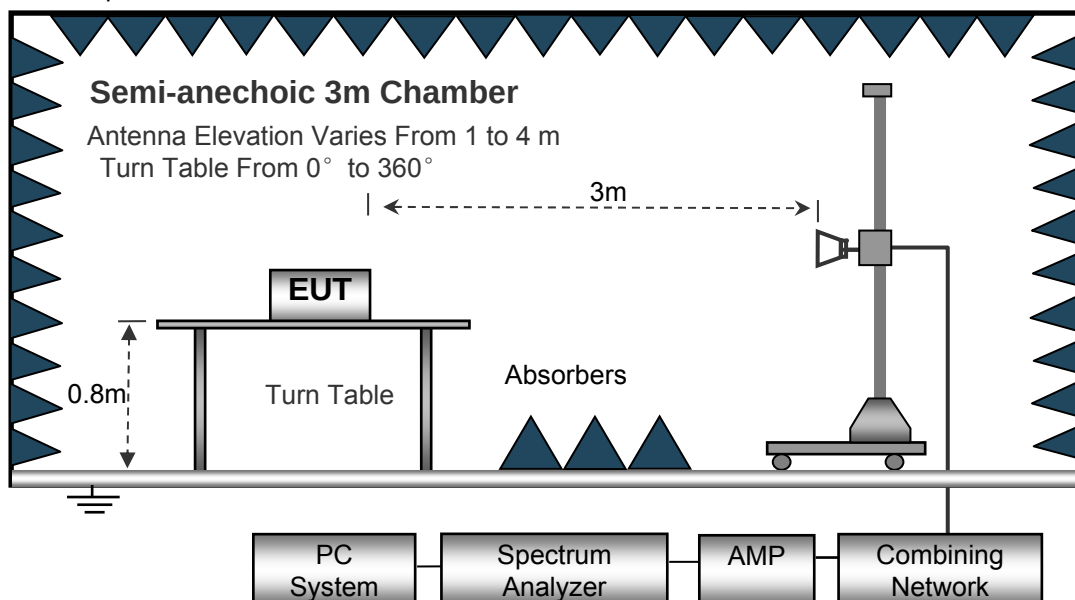
6.2.1 E.U.T. Operation

Operating Environment:

Temperature..... : 22.5°C
 Humidity..... : 52.6%RH
 Atmospheric Pressure : 101.8kPa
 EUT Operation : Refer to section 5.5.

6.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4-2014.

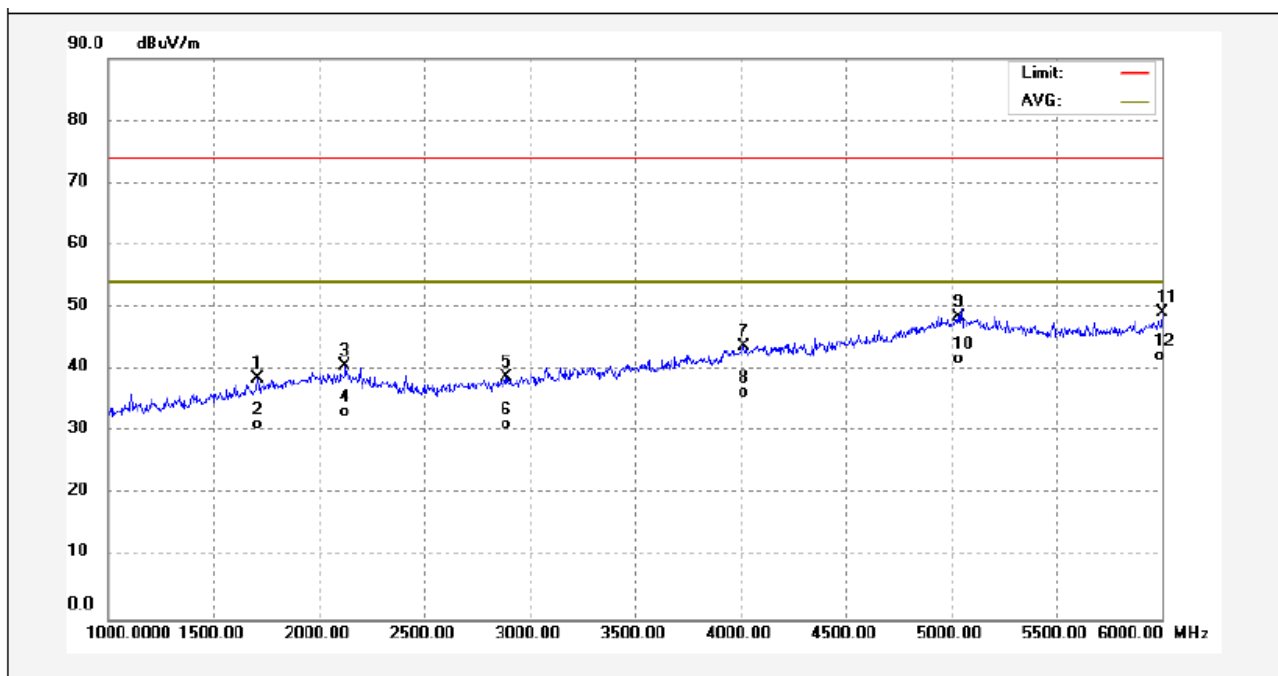


6.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line

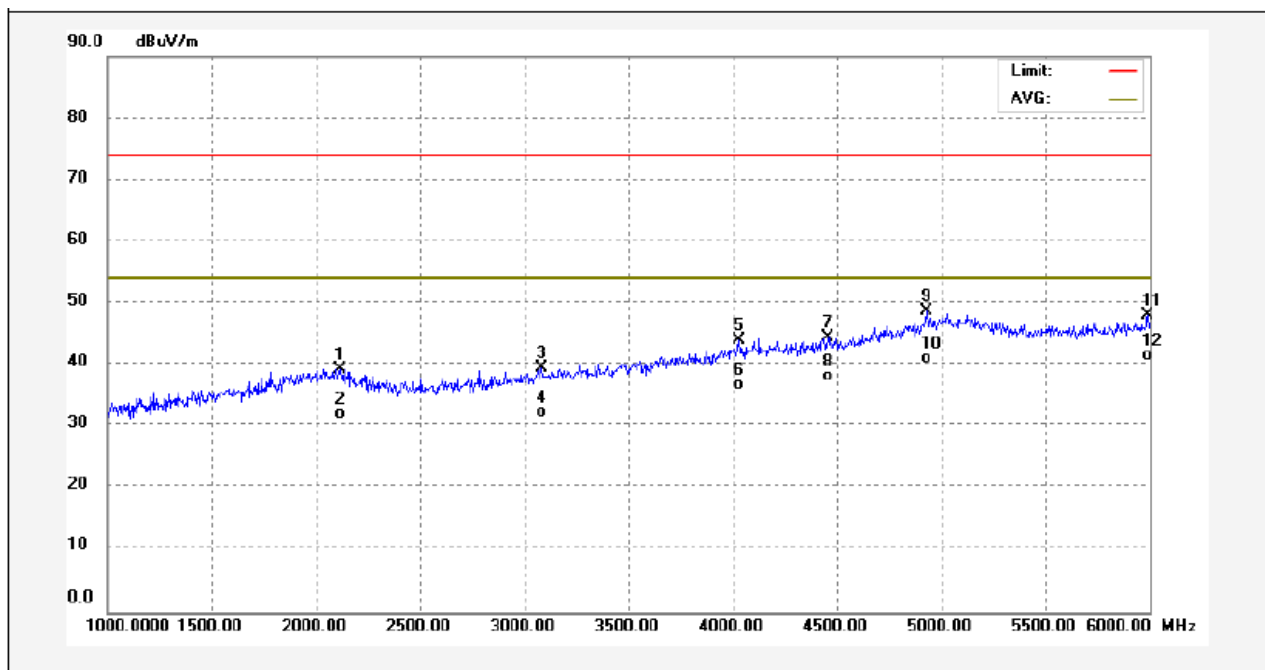
6.2.4 Radiated Emission test data, Above 1000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1710.000	50.81	-12.32	38.49	74.00	-35.51	peak	
2	1710.000	43.45	-12.32	31.13	54.00	-22.87	AVG	
3	2125.000	51.34	-10.83	40.51	74.00	-33.49	peak	
4	2125.000	43.98	-10.83	33.15	54.00	-20.85	AVG	
5	2885.000	49.83	-11.02	38.81	74.00	-35.19	peak	
6	2885.000	42.22	-11.02	31.20	54.00	-22.80	AVG	
7	4015.000	50.53	-8.77	41.76	74.00	-32.24	peak	
8	4015.000	43.06	-8.77	34.29	54.00	-19.71	AVG	
9	5030.000	49.96	-1.47	48.49	74.00	-25.51	peak	
10	5030.000	43.12	-1.47	41.65	54.00	-12.35	AVG	
11	5995.000	51.20	-1.97	49.23	74.00	-24.77	peak	
12	5995.000	44.16	-1.97	42.19	54.00	-11.81	AVG	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2115.000	49.98	-10.79	39.19	74.00	-34.81	peak	
2	2115.000	42.80	-10.79	32.01	54.00	-21.99	AVG	
3	3080.000	50.01	-10.42	39.59	74.00	-34.41	peak	
4	3080.000	42.78	-10.42	32.36	54.00	-21.64	AVG	
5	4030.000	50.59	-6.71	43.88	74.00	-30.12	peak	
6	4030.000	43.50	-6.71	36.79	54.00	-17.21	AVG	
7	4455.000	49.77	-5.42	44.35	74.00	-29.65	peak	
8	4455.000	43.66	-5.42	38.24	54.00	-15.76	AVG	
9	4930.000	50.66	-1.90	48.76	74.00	-25.24	peak	
10	4930.000	43.02	-1.90	41.12	54.00	-12.88	AVG	
11	5990.000	49.99	-1.98	48.01	74.00	-25.99	peak	
12	5990.000	43.42	-1.98	41.44	54.00	-12.56	AVG	

7 Photographs – Test Setup

7.1 Photograph – Radiated Emission Test Setup For 30MHz-1000MHz



7.2 Photograph – Radiated Emission Test Setup For Above 1GHz



8 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix- M202138002 -Photos.

=====End of Report=====