



FCC Test Report

Applicant : WENZHOU MTLC ELECTRIC APPLIANCES CO., LTD.

Address : Tiancheng Industrial Zone ,Yueqing, Zhejiang, China

Equipment : On/off Switch

Model No. : JRF15S

Trade Mark : N/A

FCC ID : ZZH-JRF15S

I HEREBY CERTIFY THAT :

The sample was received on Jun. 04, 2018 and the testing was carried out on Jun. 27, 2018 at CerpPASS Technology Corp., The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Kero Kuo / EMC & RF Manager

Tested by:

Amos Zhang
Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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History of this test report

☒ Original

☐ Additional attachment as following record:

Report No	Date	Description
DEFD1804121	Jun. 28, 2018	Initial Issue



1. Summary of Test Procedure and Test Result

1.1. Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in 47 CFR Part 15 Subpart B.

The energy emitted by this equipment was passed both Radiated and Conducted Emissions Class **B** limits.

Test Item	Normative References	Test Result
Conducted Emission	ANSI C63.4-2014 FCC Part 15 Subpart B	PASS
Radiated Emission	ANSI C63.4-2014 FCC Part 15 Subpart B	PASS



2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Product Name:	On/off Switch
Model Name:	JRF15S
Model Discrepancy:	N/A
Power Supply Rating	Input: 120V/60Hz
EUT Highest Frequency:	433.92MHz

Note: Please refer to user manual.

2.2. Test Manner

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- Connect the L,N and GND of the sample to AC power , then connect the bulb at the output port.
- The light bulb is turned off and on by pressing the button repeatedly by hand , Test manual mode.
- The light bulb is turned off and on by remote control , Test Remote control mode.
The test modes of Conducted Emission / Radiated Emission test as follow:
Test Mode 1. Manual mode
Test Mode 2.Remote-controlling mode
Caused "Test Mode 1" generated the worst test result, it was reported as final data.
- The maximum operating frequency is more than 108MHz, the test frequency range is from 30MHz to 18GHz.

2.3. Description of Test System

Device	Manufacturer	Model No.	Description
Remote control	Shunde Advante Electron Ltd.	JP8310-71L8	Transmitter FCC ID: Q211618278
Filament lamp	PHILIPS	100W	N/A



2.4. General Information of Test

☒	Test Site	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
	FCC	TW1079, TW1061, TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-3428, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
Frequency Range Investigated:		Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 40000MHz
Test Distance:		The test distance of radiated emission from antenna to EUT is 3 M.



2.5. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	3.25 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	3.93 dB
	1,000 MHz ~ 18,000 MHz	Vertical / Horizontal	5.18 dB

The measurement uncertainty will be considered, when test result margin to the limit.



3. Test of Conducted Emission

3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Conducted Emission Limits:

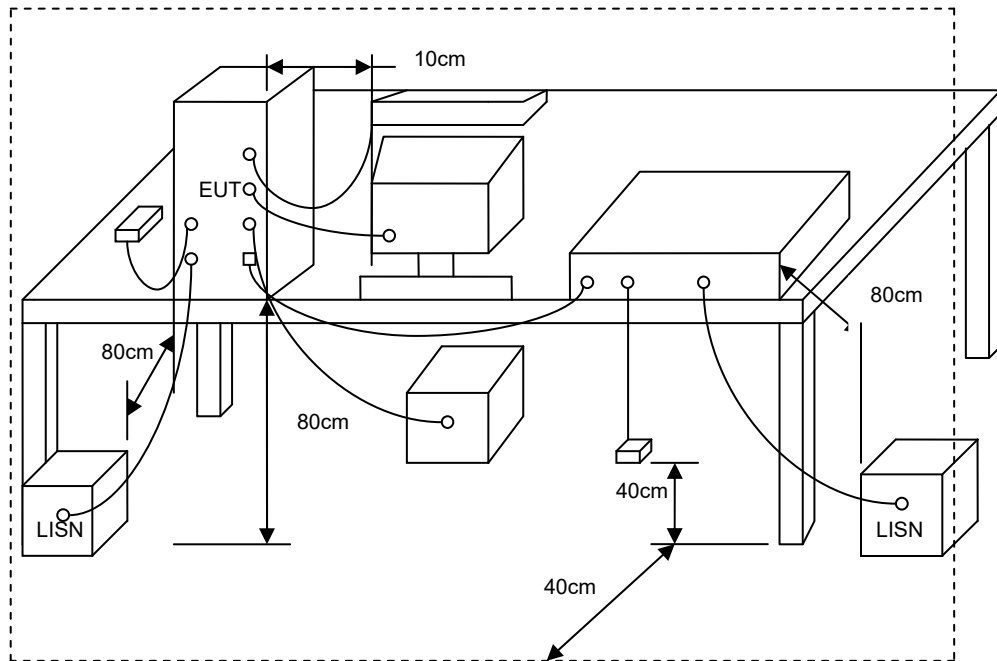
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50
*Decreases with the logarithm of the frequency		

3.2. Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



3.3. Typical Test Setup



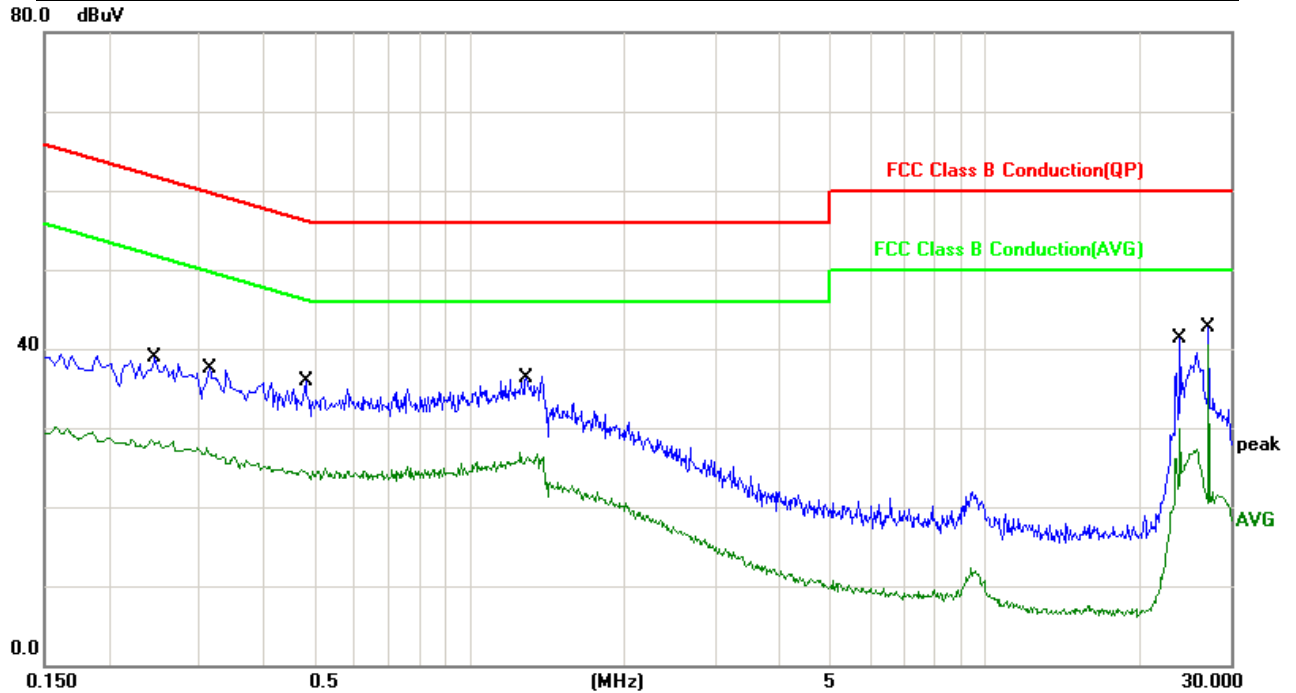
3.4. Measurement equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100564	2018.01.26	2019.01.25
LISN	SCHWARZBECK	NSLK 8127	8127748	2018.01.26	2019.01.25
LISN	SCHWARZBECK	NSLK 8127	8127749	2018.01.26	2019.01.25
ISN	TESEQ	ISN T800	42809	2018.05.21	2019.05.20
Pulse Limiter with 10dB Attenuation	SCHWARZBECK	VTSD 9561-F	9561-F106	2018.01.26	2019.01.25
Temperature/ Humidity Meter	mingle	ETH529	N/A	2018.01.29	2019.01.28



3.5. Test Result and Data

Test Mode1 :	Manual mode		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	22°C	Humidity :	50%
Pressure(mbar) :	1002	Date:	Jun. 10, 2018

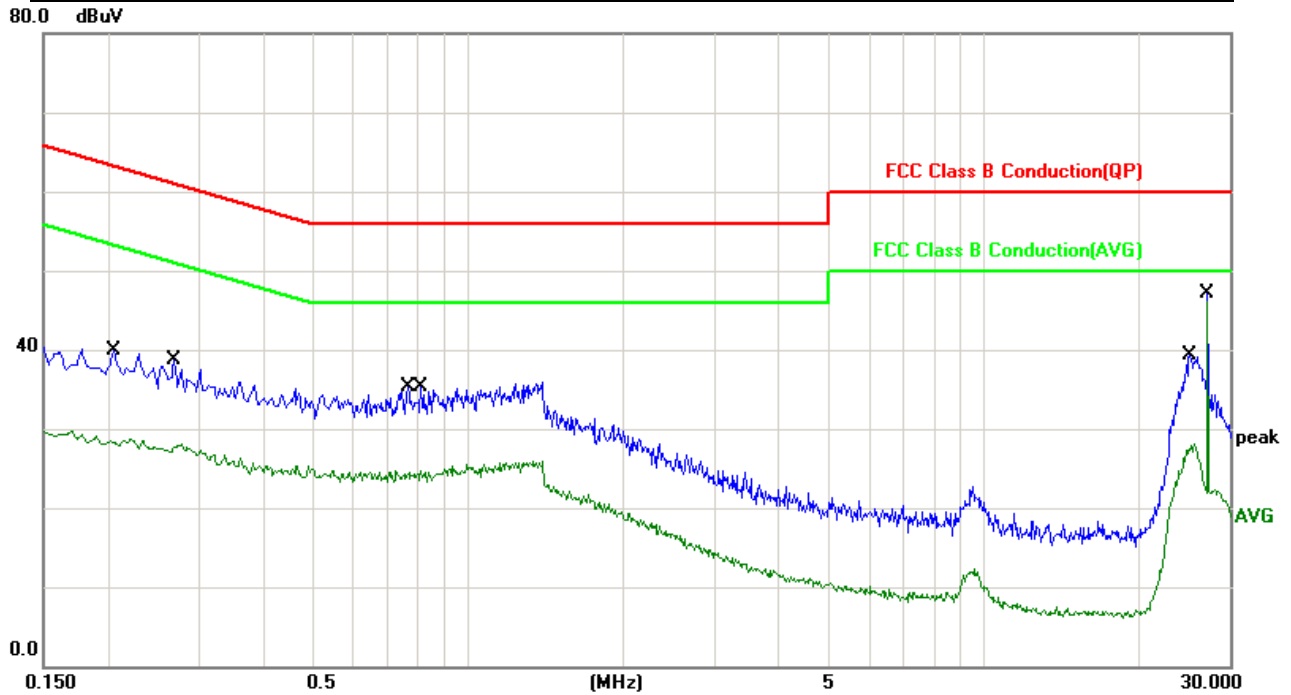


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2460	10.03	22.72	32.75	61.89	-29.14	QP
2	0.2460	10.03	17.59	27.62	51.89	-24.27	AVG
3	0.3140	10.00	21.55	31.55	59.86	-28.31	QP
4	0.3140	10.00	16.43	26.43	49.86	-23.43	AVG
5	0.4820	9.90	19.44	29.34	56.30	-26.96	QP
6	0.4820	9.90	14.35	24.25	46.30	-22.05	AVG
7	1.2900	10.40	20.37	30.77	56.00	-25.23	QP
8	1.2900	10.40	15.22	25.62	46.00	-20.38	AVG
9	23.9780	10.59	17.21	27.80	60.00	-32.20	QP
10	23.9780	10.59	11.24	21.83	50.00	-28.17	AVG
11	27.1380	10.62	30.46	41.08	60.00	-18.92	QP
12	27.1380	10.62	30.14	40.76	50.00	-9.24	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator



Test Mode 1:	Manual Mode		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	22°C	Humidity :	50%
Pressure(mbar) :	1002	Date:	Jun. 10, 2018



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2060	10.06	23.43	33.49	63.36	-29.87	QP
2	0.2060	10.06	18.34	28.40	53.36	-24.96	AVG
3	0.2700	10.02	22.42	32.44	61.12	-28.68	QP
4	0.2700	10.02	17.19	27.21	51.12	-23.91	AVG
5	0.7660	10.08	18.95	29.03	56.00	-26.97	QP
6	0.7660	10.08	13.87	23.95	46.00	-22.05	AVG
7	0.8100	10.09	19.02	29.11	56.00	-26.89	QP
8	0.8100	10.09	13.87	23.96	46.00	-22.04	AVG
9	25.1020	10.61	21.57	32.18	60.00	-27.82	QP
10	25.1020	10.61	15.05	25.66	50.00	-24.34	AVG
11	27.1380	10.62	35.71	46.33	60.00	-13.67	QP
12	27.1380	10.62	35.72	46.34	50.00	-3.66	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator

Test engineer: Nunny



4. Test of Radiated Emission

4.1. Test Limit

Radiated emissions from 30 MHz to 18,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

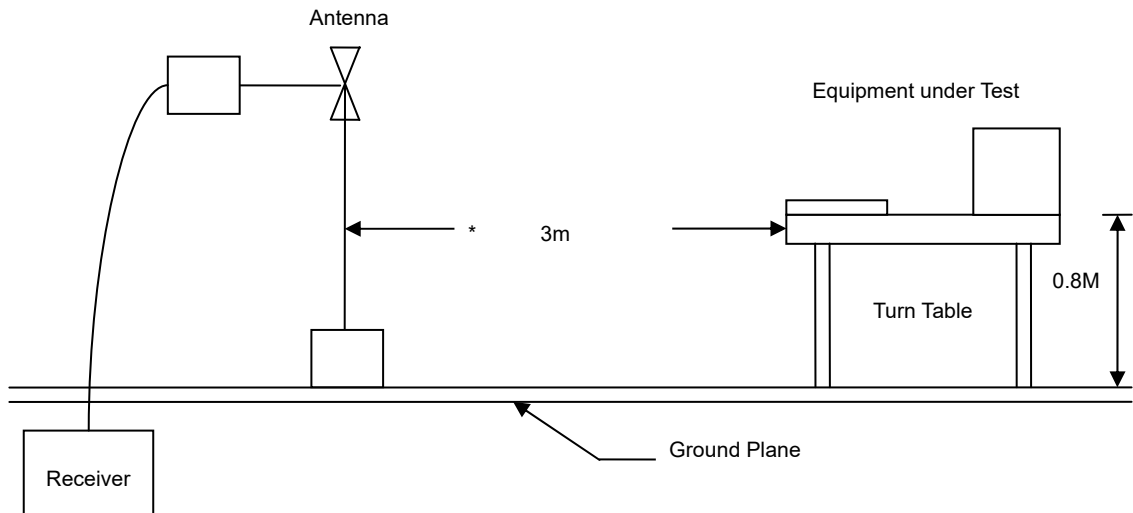
4.2. Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

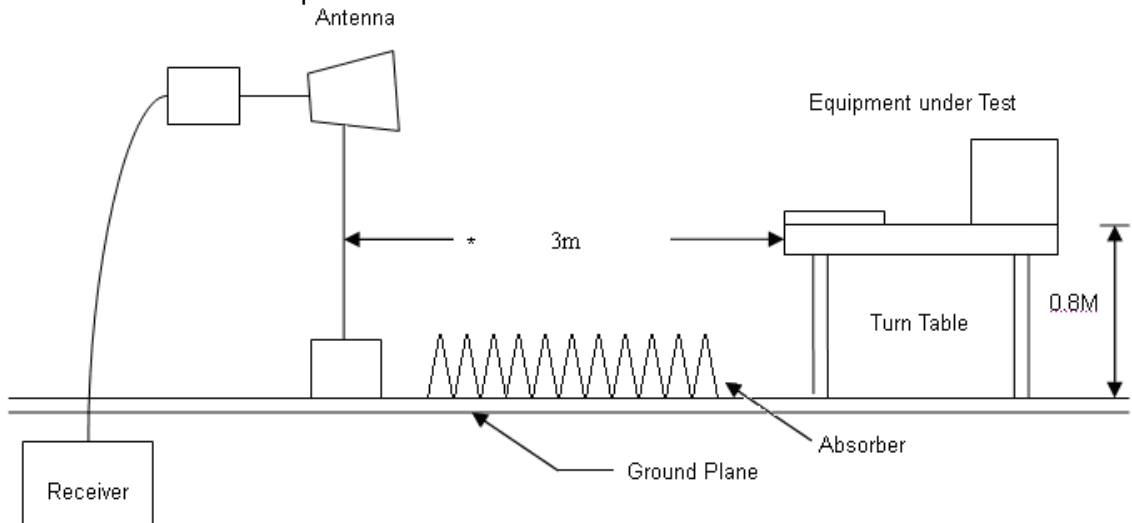


4.3. Typical Test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup



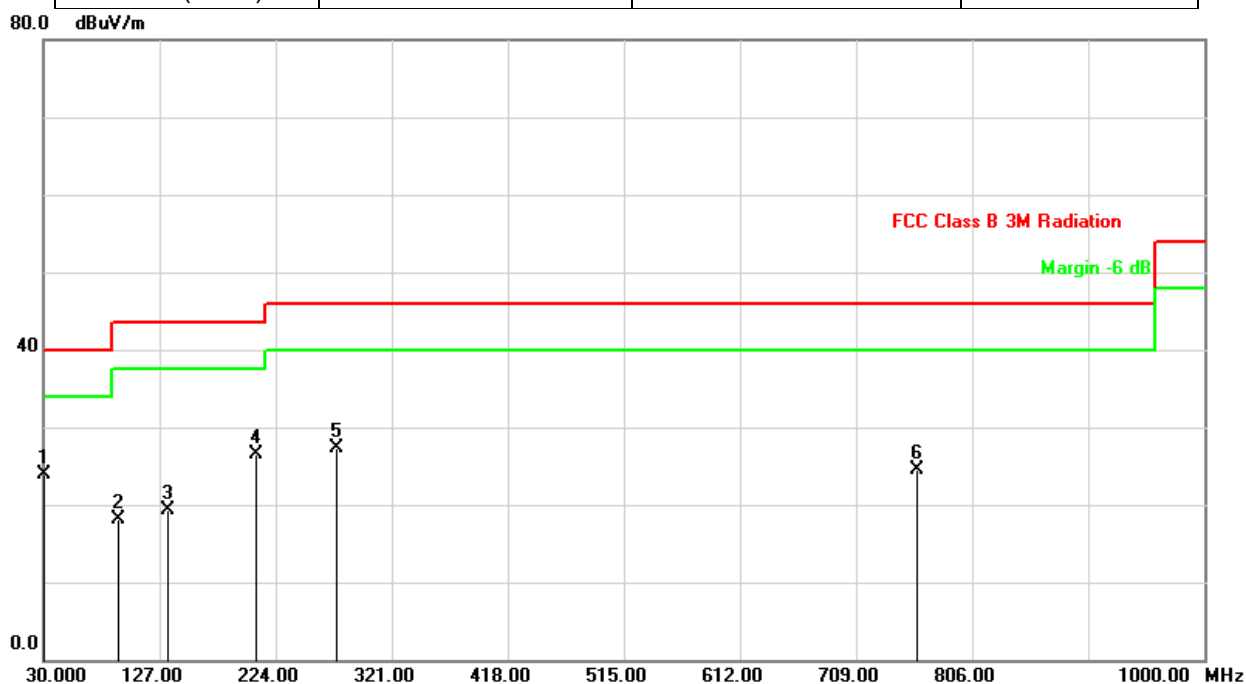
**4.4. Measurement equipment**

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
EMI Test Receiver	R&S	ESCI	100853	2018.01.26	2019.01.25
Preamplifier	HP	8447F	3113A05915	2018.01.26	2019.01.25
Preamplifier	EMC Instruments corporation	EMC051835	980085	2018.05.21	2019.05.20
Ultra Broadband Antenna	SCHAFFNER	CBL6112D	22241	2018.01.29	2019.01.28
Broad-Band Horn Antenna	Sunol	DRH-118	A072913	2017.09.22	2018.09.21
Spectrum Analyzer	Agilent	E4407B	MY45118947	2018.05.21	2019.05.20
Temperature/ Humidity Meter	mingle	ETH529	N/A	2018.01.29	2019.01.28



4.5. Test Result and Data (30MHz ~ 1000MHz)

Test Mode 1 :	Manual Mode		
Power :	AC120V/60Hz	Ant. Polarization:	Horizontal
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	Jun. 10, 2018

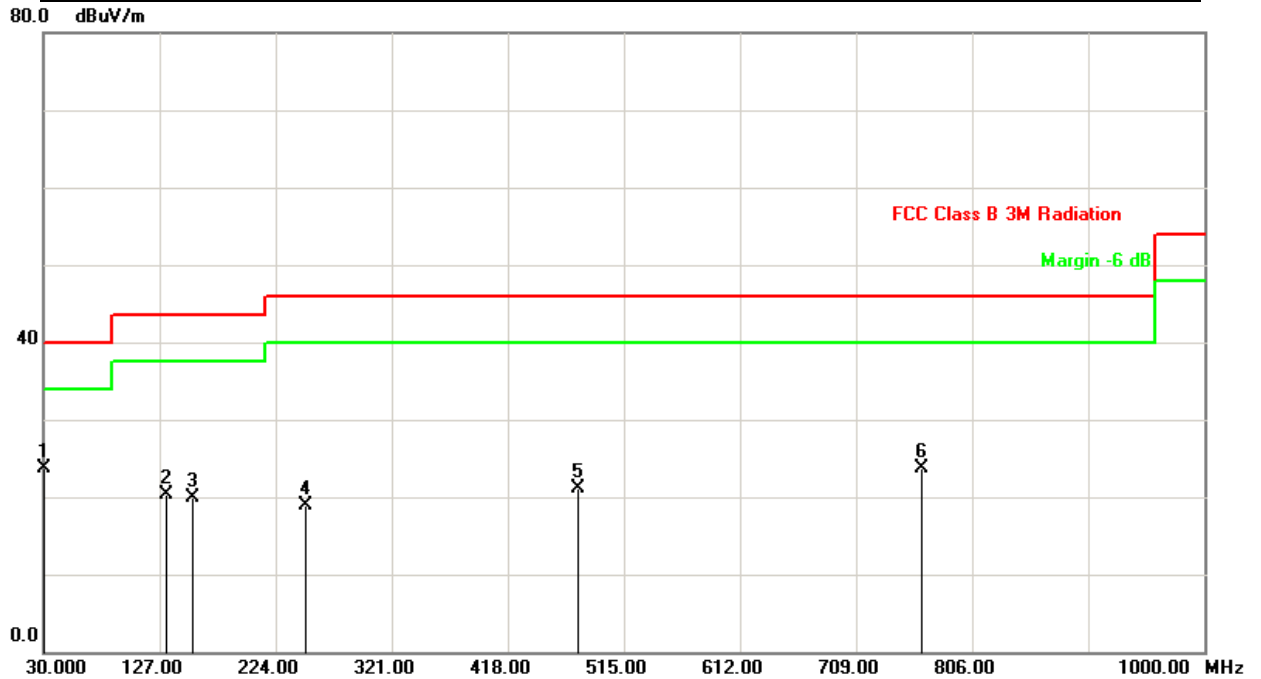


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-3.01	26.97	23.96	40.00	-16.04	peak	100	142
2	92.0800	-10.95	28.99	18.04	43.50	-25.46	peak	100	135
3	133.7899	-9.38	28.78	19.40	43.50	-24.10	peak	200	72
4	207.5100	-9.50	36.10	26.60	43.50	-16.90	peak	300	106
5	275.4100	-8.94	36.23	27.29	46.00	-18.71	peak	100	241
6	760.4099	1.78	22.77	24.55	46.00	-21.45	peak	200	38

Note: Measurement Level = Reading Level + Correct Factor



Test Mode 1 :	Manual Mode		
Power :	AC120V/60Hz	Ant. Polarization:	Vertical
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	Jun. 10, 2018



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-3.01	26.64	23.63	40.00	-16.37	peak	100	142
2	132.8200	-9.28	29.62	20.34	43.50	-23.16	peak	100	63
3	154.1600	-11.53	31.35	19.82	43.50	-23.68	peak	100	158
4	249.2200	-8.44	27.31	18.87	46.00	-27.13	peak	100	37
5	477.1700	-1.22	22.29	21.07	46.00	-24.93	peak	100	106
6	763.3200	1.69	22.08	23.77	46.00	-22.23	peak	100	113

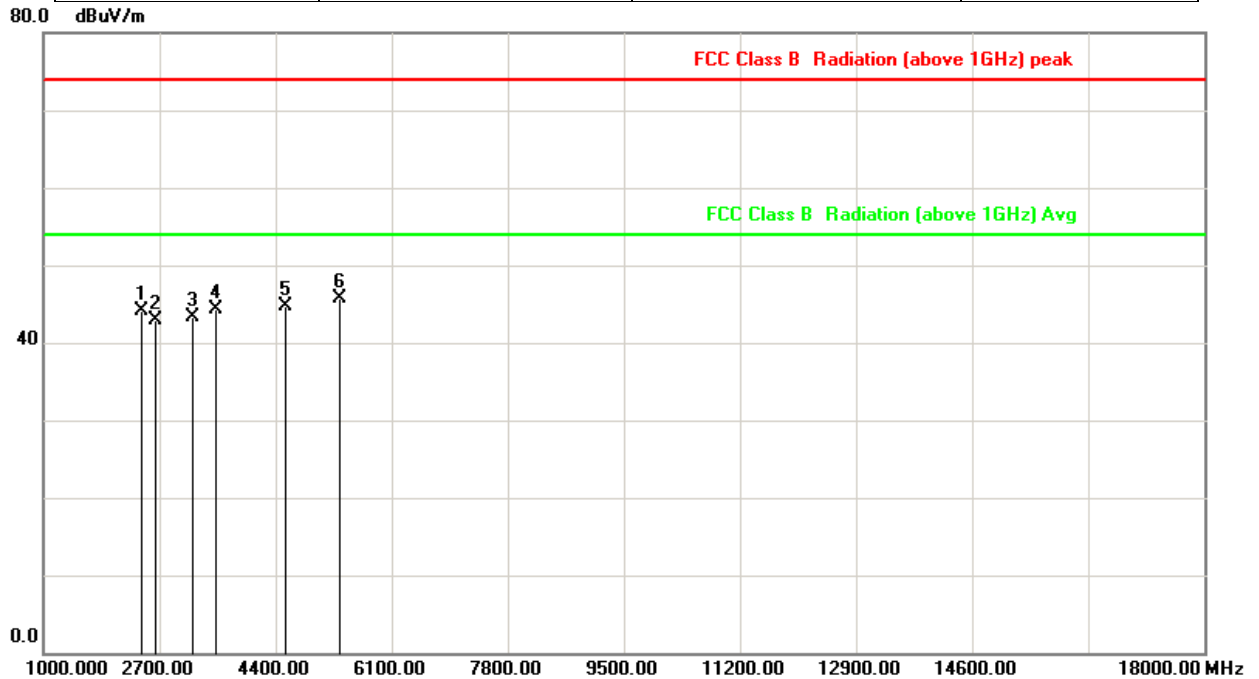
Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Nunny



4.1. Test Result and Data (1000MHz ~ 18000MHz)

Test Mode 1 :	Manual Mode		
Power :	AC120V/60Hz	Ant. Polarization:	Horizontal
Temp :	23℃	Humidity :	52%
Pressure(mbar) :	1002	Date :	Jun. 10, 2018



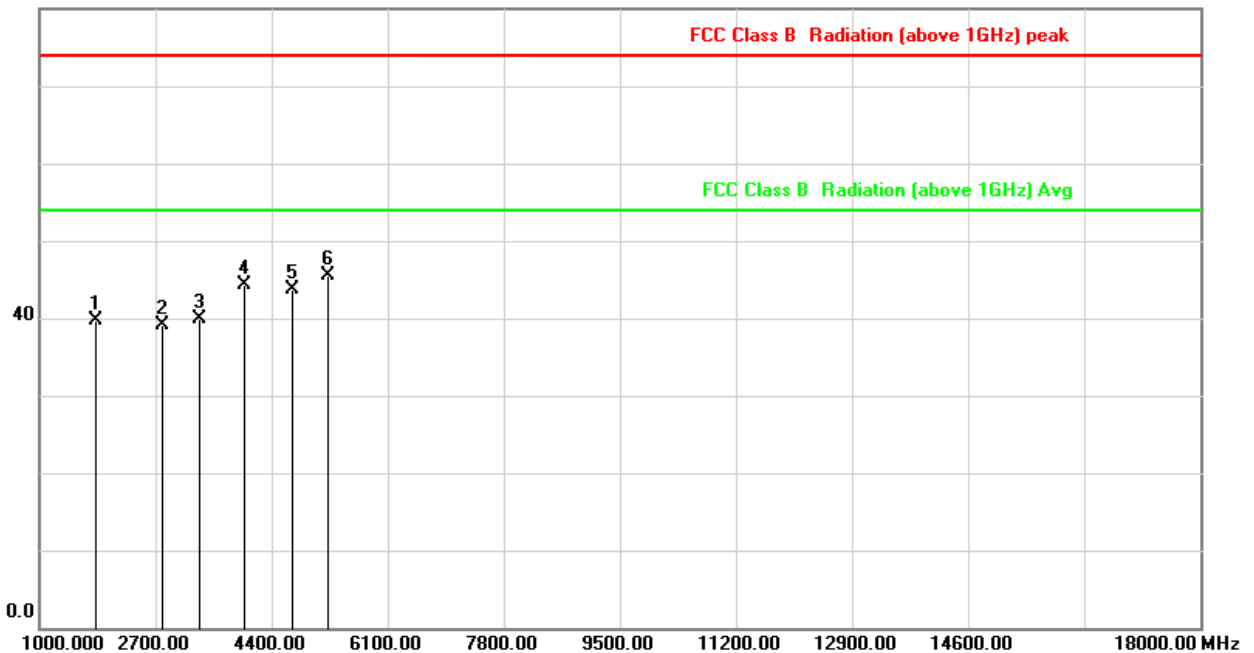
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	2445.000	3.18	40.84	44.02	74.00	-29.98	peak	100	26
2	2643.333	4.38	38.49	42.87	74.00	-31.13	peak	100	102
3	3181.667	7.73	35.57	43.30	74.00	-30.70	peak	200	8
4	3521.667	9.47	34.78	44.25	74.00	-29.75	peak	100	34
5	4541.667	13.74	30.97	44.71	74.00	-29.29	peak	200	218
6	5335.000	14.88	30.78	45.66	74.00	-28.34	peak	100	15

Note: Measurement Level = Reading Level + Correct Factor



Test Mode 1 :	Manual Mode		
Power :	AC120V/60Hz	Ant. Polarization:	Vertical
Temp :	23°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	Jun. 10, 2018

80.0 dBuV/m



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1821.667	0.24	39.39	39.63	74.00	-34.37	peak	100	53
2	2813.333	5.52	33.52	39.04	74.00	-34.96	peak	100	102
3	3351.667	8.62	31.20	39.82	74.00	-34.18	peak	100	61
4	4003.333	11.13	33.14	44.27	74.00	-29.73	peak	200	118
5	4711.667	14.06	29.64	43.70	74.00	-30.30	peak	100	342
6	5221.667	14.79	30.70	45.49	74.00	-28.51	peak	100	0

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Nunny

----- End of the report -----