FCC TEST REPORT
No. 161201740SHA-001

Applicant	:	Ningbo Diya Electric Appliance Co.,Ltd 27th Yunhuan Rd., Simen Town, Yuyao City, Zhejiang China 315472
Manufacturer	:	Ningbo Diya Electric Appliance Co.,Ltd 27th Yunhuan Rd., Simen Town, Yuyao City, Zhejiang China 315472
Product Name	:	Remote Control Socket
Type/Model	:	DR-1692,DR-1693, DR-1694, DR-1694B, DR-1697
FCC ID	:	2AC2CDR-013
TEST RESULT	**:**	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2015): Radio Frequency Devices (Subpart B)

ANSI C63.4 (2015): 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

Date of issue: Dec.22,2016

Prepared by: Reviewed by:

Jesse Xu (*Project Engineer*) Daniel Zhao (*Reviewer*)

Content

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name	:	Remote Control Socket
Type/Model	:	DR-1692,DR-1693, DR-1694, DR-1694B, DR-1697
Description of EUT	:	The EUT is the receiver part of a Remote Control Socket system. The five models of the product covered in this report are the same on schematic diagram and electronic construction, also have same electric parameters except for their outside view. All modes have same PCB layout except that the DR-1694 and DR-1694B have two sockets, the others three models only one socket. Except different length of cable on DR-1694 and DR-1694B,the others have no cable. But all models are same on the RF part. Therefore we select the DR-1693 and DR-1694 to test, The testing data is listed in the report as representative.
Rating	:	120V~ 60Hz, 15A Resistive, 5A Tungsten lamp
Brandname		
I/O Port	:	NA
Category of EUT	:	Class B
EUT type	:	☒Table top ☐ Floor standing
Highest operating frequency	:	433.92MHz
Sample received date	:	2016/11/07
Sample identification No.	:	N/A
Date of test	:	2016/11/07~2016/11/18

1.2 Description of Client

Applicant	:	Ningbo Diya Electric Appliance Co.,Ltd 27th Yunhuan Rd., Simen Town, Yuyao City, Zhejiang China 315472
Name of contact	:	Yang Jinxian
Tel	:	13968089968
Fax	:	N/A
Email	:	service@etatests.com
Manufacturer	:	Ningbo Diya Electric Appliance Co.,Ltd 27th Yunhuan Rd., Simen Town, Yuyao City, Zhejiang China 315472

1.3 Description of Test Facility

☒ Name	:	Intertek Testing Service Shanghai
Address	:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone	:	86 21 61278200
Telefax	:	86 21 54262353

Subcontractor:

☐ Name	:	Shanghai Institute of Measurement Technology
Address	:	716 Yishan Road, Shanghai 200233, P.R. China
Telephone	:	86 21 64700066
Telefax	:	

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2014): Radio Frequency Device: Subpart B

ANSI C63.4 (2014): Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz.

2.2 Mode of operation during the test

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.
The EUT was set up and tested as typically used.
The Signal generator "SMR20" together with a transmitting antenna was employed to radiate 433.92MHz CW signal in close proximity to the EUT.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description

2.5 Instrument list

Selected	Instrument	EC no.	Model	Valid until date
☒	Shielded room	EC 2838	GB88	2017-1-8
☒	EMI test receiver	EC 2107	ESCS 30	2017-10-19
☒	A.M.N.	EC 3119	ESH2-Z5	2017-12-16
☐	A.M.N.	EC 3394	ENV 216	2017-8-1
☒	Semi anechoic chamber	EC 3048	-	2017-5-11
☒	EMI test receiver	EC 3045	ESIB26	2017-10-19
☐	Broadband antenna	EC 4206	CBL 6112D	2017-4-27
☐	Horn antenna	EC 3049	HF906	2017-4-27
☐	Horn antenna	EC 4792-1	3117	2017-4-21
☐	Horn antenna	EC 4792-3	HAP18-26W	2017-6-11
☐	Pre-amplifier	EC 5262	pre-amp 18	2017-5-25
☐	Pre-amplifier	EC 4792-2	TPA0118-40	2017-4-10
☐	High Pass Filter	EC 4797-1	WHKX 1.0/15G-10SS	2017-1-8
☐	High Pass Filter	EC 4797-2	WHKX 2.8/18G-12SS	2017-1-8
☐	High Pass Filter	EC 4797-3	WHKX 7.0/1.8G-8SS	2017-1-8
☐	Band Reject Filter	EC 4797-4	WRCGV2400/2483/10SS	2017-1-8
☐	Test Receiver	EC 4501	ESCI 7	2017-1-13
☐	PXA Signal Analyzer	EC5338	N9030A	2017-11-17
☐	Power sensor/Power meter	EC4318	N1911A/N1921A	2017-4-8
☐	Power sensor	EC5338-1	U2021XA	2017-3-5
☐	MXG Analog Signal Generator	EC5338-2	N5181A	2017-3-5
☐	MXG Vector Signal Generator	EC5175	N51812B	2017-1-8

2.6 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
Conducted emission	15.107	Pass
Radiated emission	15.109	Pass

Notes: 1: NA =Not Applicable

3 Conducted emission

Test result: Pass

3.1 Limits

3.1.1 Limits for conducted emission of class A device

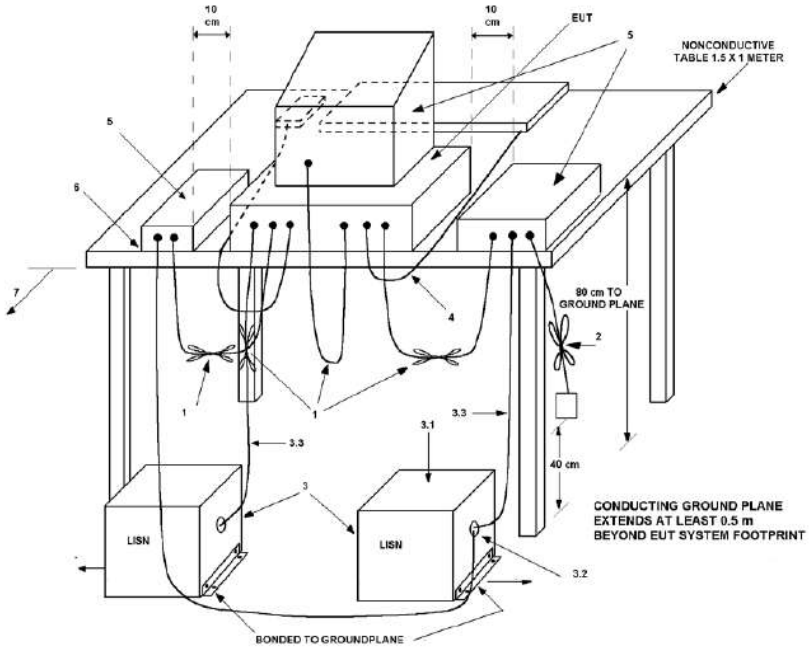
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.1.2 Limits for conducted emission of class B device

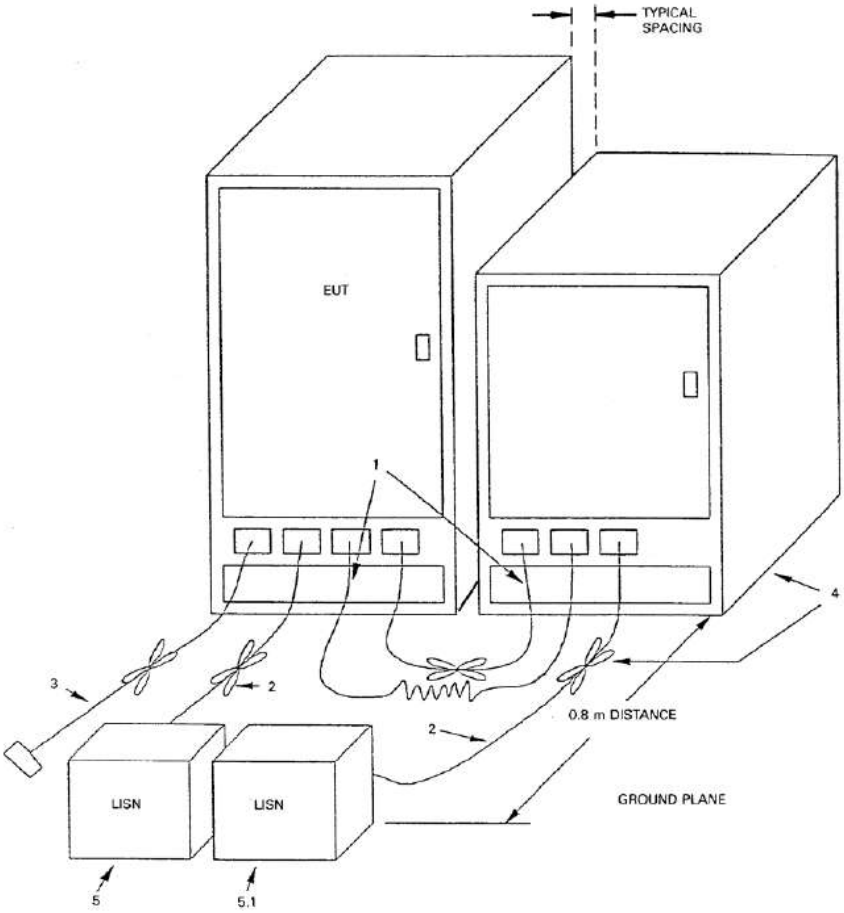
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.2 Test setup

☒ For table top equipment



☐ For floor standing equipment



3.3 Test Setup and Test Procedure

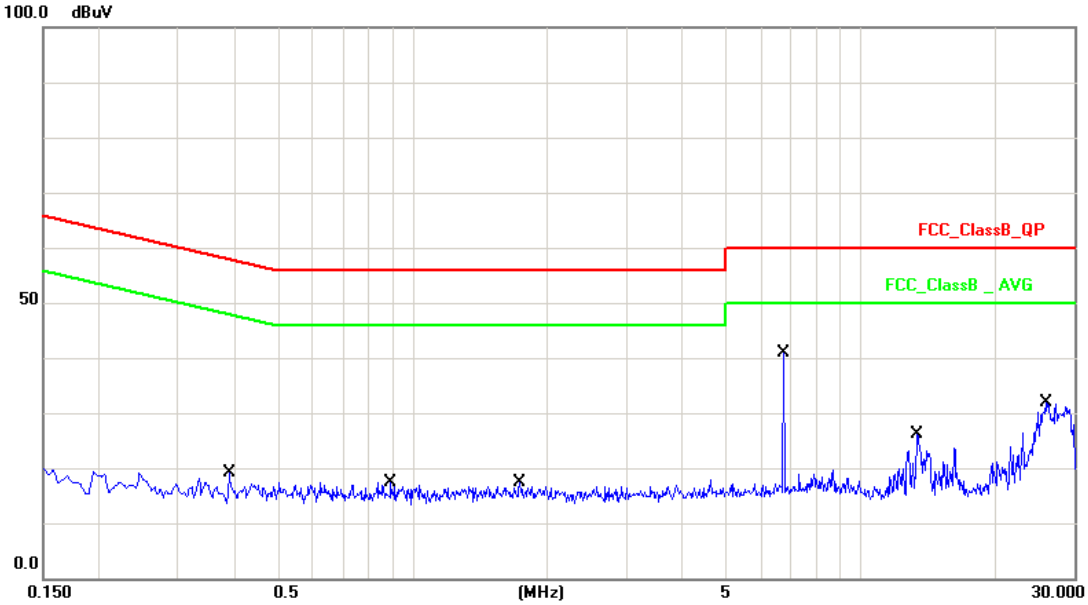
Measurement was performed in shielded room, and instruments used were following clause 4 and clause 5 of ANSI 63.4.
Detailed test procedure was following clause 7.3 of ANSI 63.4.
EUT arrangement and operation conditions were according to clause 6 and clause 7 of ANSI 63.4.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

3.4 Test Protocol

Temperature : 23°C
Relative Humidity : 54%

DR-1693
L line

Test Mode :	Mode 2: Full System with DR-1693		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

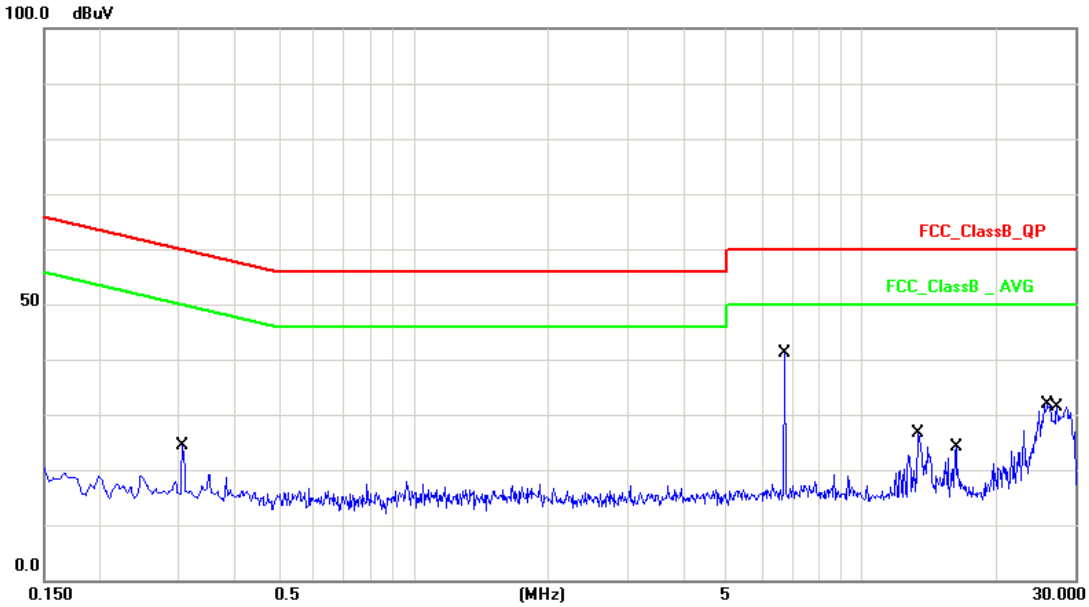


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3899	10.15	0.57	10.72	58.06	-47.34	QP
2	0.3899	10.15	-3.34	6.81	48.06	-41.25	AVG
3	0.8980	10.15	-1.18	8.97	56.00	-47.03	QP
4	0.8980	10.15	-4.01	6.14	46.00	-39.86	AVG
5	1.7380	10.17	-1.36	8.81	56.00	-47.19	QP
6	1.7380	10.17	-4.32	5.85	46.00	-40.15	AVG
7	6.7460	10.26	30.04	40.30	60.00	-19.70	QP
8	6.7460	10.26	30.36	40.62	50.00	-9.38	AVG
9	13.3580	10.43	14.33	24.76	60.00	-35.24	QP
10	13.3580	10.43	13.79	24.22	50.00	-25.78	AVG
11	25.8740	10.43	19.71	30.14	60.00	-29.86	QP
12	25.8740	10.43	17.40	27.83	50.00	-22.17	AVG

Note: Measurement Level = Reading Level + Correct Factor

N line:

Test Mode :	Mode 2: Full System with DR-1693		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

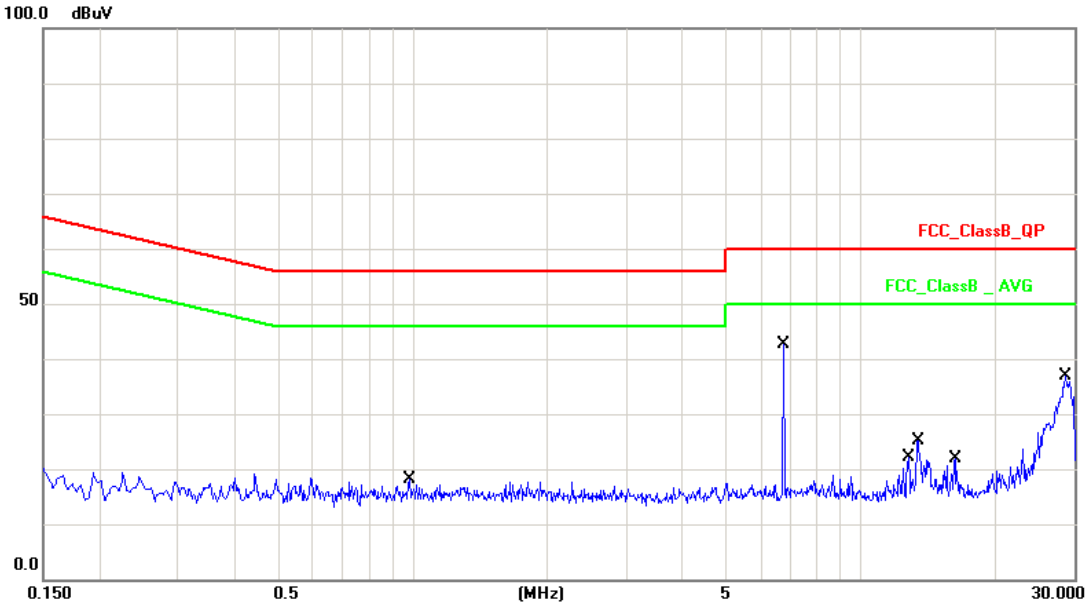


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3060	10.14	-0.08	10.06	60.08	-50.02	QP
2	0.3060	10.14	-3.59	6.55	50.08	-43.53	AVG
3	6.7460	10.27	30.20	40.47	60.00	-19.53	QP
4	6.7460	10.27	30.51	40.78	50.00	-9.22	AVG
5	13.3580	10.43	14.57	25.00	60.00	-35.00	QP
6	13.3580	10.43	14.05	24.48	50.00	-25.52	AVG
7	16.2260	10.50	11.50	22.00	60.00	-38.00	QP
8	16.2260	10.50	10.82	21.32	50.00	-28.68	AVG
9	26.0300	10.33	19.15	29.48	60.00	-30.52	QP
10	26.0300	10.33	16.31	26.64	50.00	-23.36	AVG
11	27.3420	10.31	19.39	29.70	60.00	-30.30	QP
12	27.3420	10.31	15.46	25.77	50.00	-24.23	AVG

Note: Measurement Level = Reading Level + Correct Factor

DR-1694
L line

Test Mode :	Mode 3: Full System with DR-1694		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

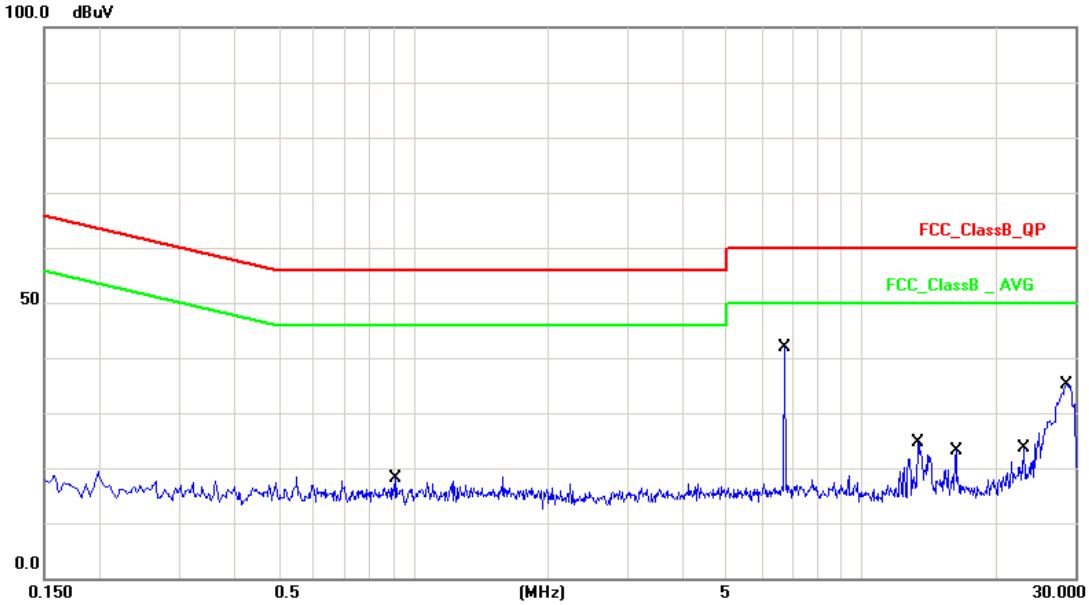


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.9860	10.16	-1.02	9.14	56.00	-46.86	QP
2	0.9860	10.16	-3.93	6.23	46.00	-39.77	AVG
3	6.7460	10.26	32.19	42.45	60.00	-17.55	QP
4	6.7460	10.26	31.89	42.15	50.00	-7.85	AVG
5	12.8100	10.40	8.34	18.74	60.00	-41.26	QP
6	12.8100	10.40	6.36	16.76	50.00	-33.24	AVG
7	13.4180	10.43	12.82	23.25	60.00	-36.75	QP
8	13.4180	10.43	12.09	22.52	50.00	-27.48	AVG
9	16.2260	10.48	9.90	20.38	60.00	-39.62	QP
10	16.2260	10.48	8.87	19.35	50.00	-30.65	AVG
11	28.6620	10.44	23.81	34.25	60.00	-25.75	QP
12	28.6620	10.44	21.66	32.10	50.00	-17.90	AVG

Note: Measurement Level = Reading Level + Correct Factor

N line:

Test Mode :	Mode 3: Full System with DR-1694		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.9140	10.17	-1.44	8.73	56.00	-47.27	QP
2	0.9140	10.17	-4.18	5.99	46.00	-40.01	AVG
3	6.7460	10.27	31.36	41.63	60.00	-18.37	QP
4	6.7460	10.27	30.78	41.05	50.00	-8.95	AVG
5	13.3580	10.43	12.93	23.36	60.00	-36.64	QP
6	13.3580	10.43	12.22	22.65	50.00	-27.35	AVG
7	16.2260	10.50	10.54	21.04	60.00	-38.96	QP
8	16.2260	10.50	9.61	20.11	50.00	-29.89	AVG
9	23.1259	10.38	11.88	22.26	60.00	-37.74	QP
10	23.1259	10.38	11.04	21.42	50.00	-28.58	AVG
11	28.6620	10.29	24.67	34.96	60.00	-25.04	QP
12	28.6620	10.29	22.31	32.60	50.00	-17.40	AVG

Note: Measurement Level = Reading Level + Correct Factor

3.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty at mains terminal: ± 3.25dB
The measurement uncertainty is given with a confidence of 95%, k=2.

4 Radiated emission

Test result: Pass

4.1 Radiated emission limits

4.1.1 Limits for radiated emission of class A device

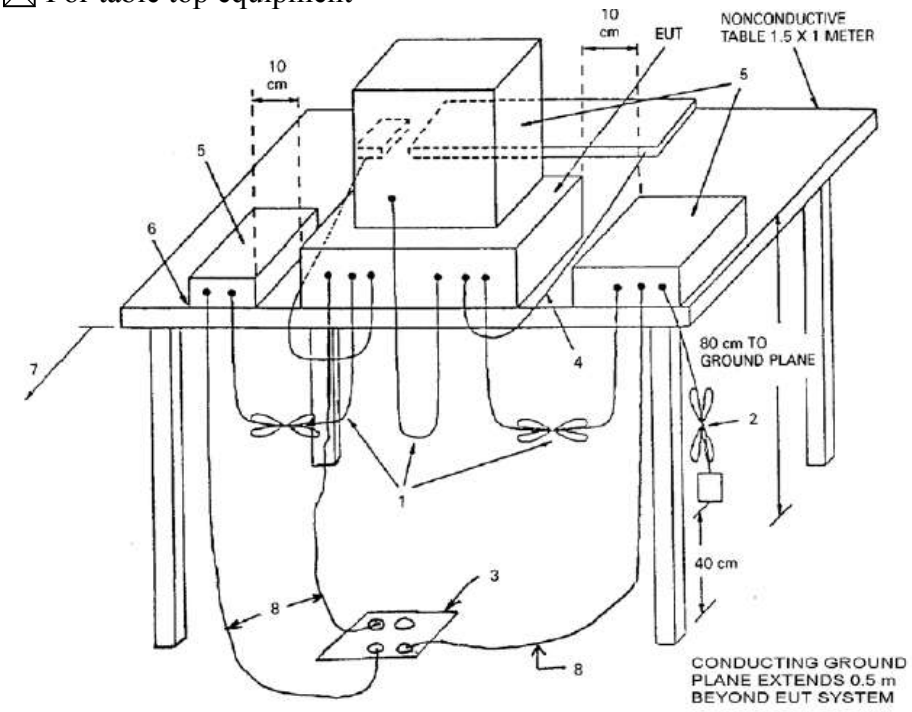
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 10m
30 – 88	39
88 – 216	43.5
216 – 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.1.2 Limits for radiated emission of class B device

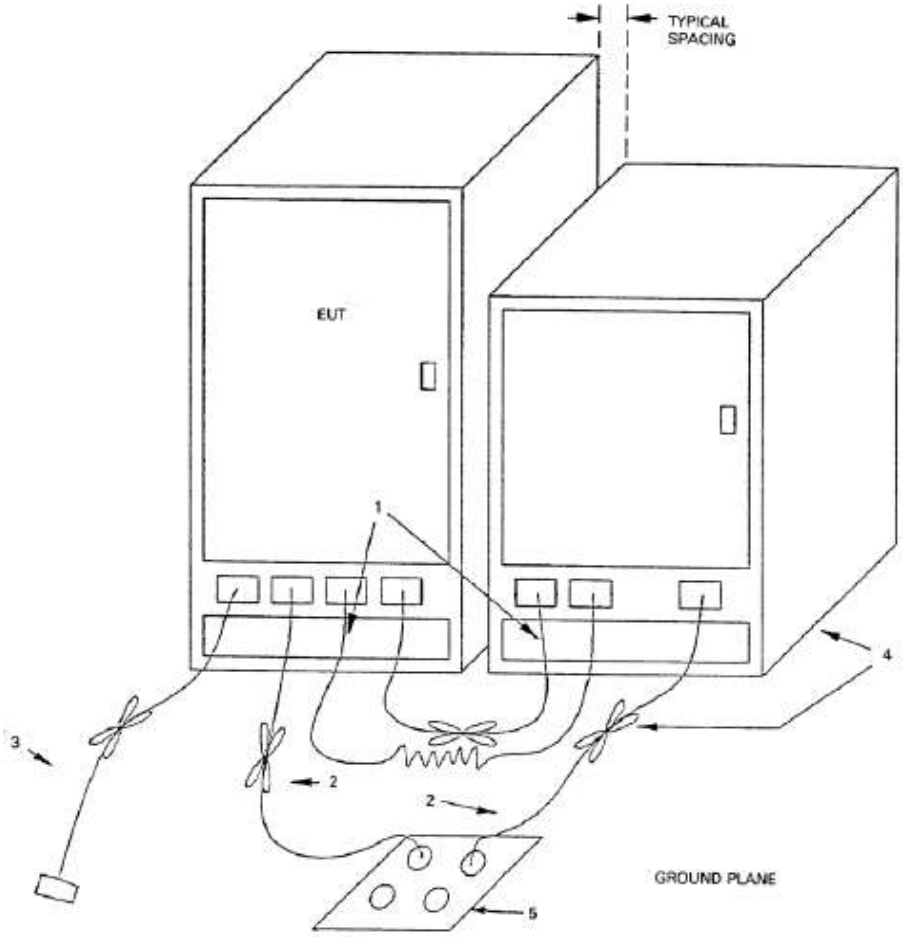
Frequency (MHz)	Permitted limit in dBμV/m (Quasi-peak) of Measurement Distance 3m
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

4.2 Block diagram and test set up

☒ For table top equipment



☐ For floor standing equipment



4.3 Test Setup and Test Procedure

The measurement was performed in a semi-anechoic chamber.
The distance from EUT to receiving antenna is **3** meter.
Measurement was performed according to clause 4 and clause 5 of ANSI 63.4.
Test procedure was according to clause 8.3 of ANSI 63.4.
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.
The bandwidth setting on R&S Test Receiver ESIB26 was 120 kHz.
The required measurement frequency range was checked.

The radiated emission was measured using the receiver with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz~1GHz)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

4.4 Test Protocol

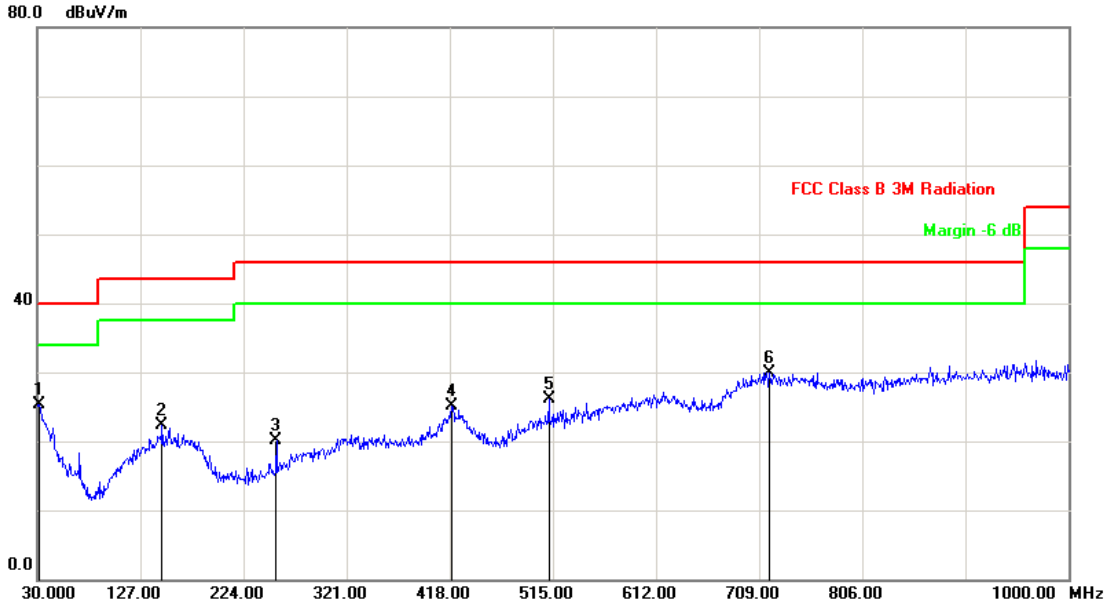
Temperature : 23 °C
Relative Humidity : 54%

Test data:

Test Result and Data
Product model: DR-1693
Horizontal:

Test Mode :	Mode 2: Full System with DR-1693		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Horizontal
Temp :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

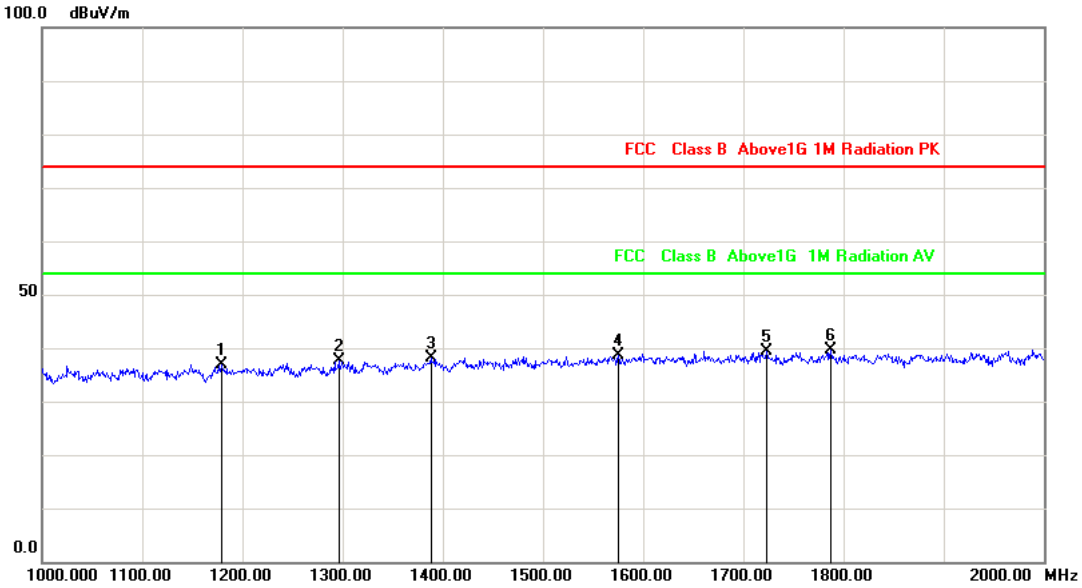
30MHz ~ 1000MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	31.9400	-3.21	28.61	25.40	40.00	-14.60	peak	100	125
2	147.3700	-7.70	29.99	22.29	43.50	-21.21	peak	200	265
3	255.0399	-10.59	30.66	20.07	46.00	-25.93	peak	200	7
4	419.9399	-3.29	28.32	25.03	46.00	-20.97	peak	100	101
5	511.1200	-4.63	30.65	26.02	46.00	-19.98	peak	100	48
6	718.7000	1.37	28.59	29.96	46.00	-16.04	peak	100	42

Note: Measurement Level = Reading Level + Correct Factor

1 GHz -2GHz



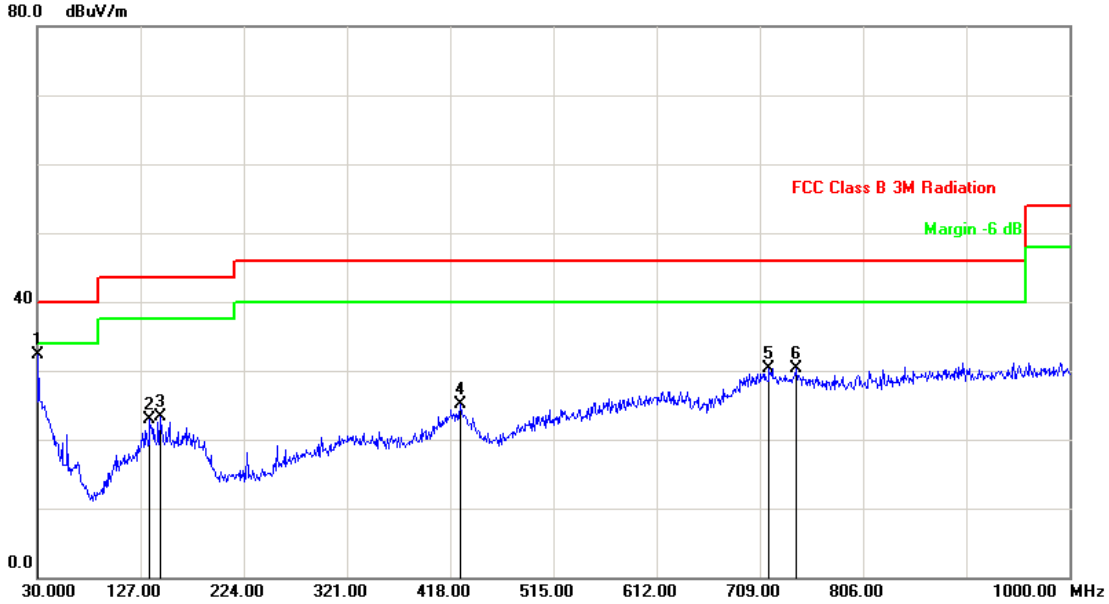
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1179.000	-8.34	45.23	36.89	74.00	-37.11	peak	200	104
2	1296.000	-7.40	44.92	37.52	74.00	-36.48	peak	100	323
3	1388.000	-6.67	44.83	38.16	74.00	-35.84	peak	100	134
4	1575.000	-5.46	44.16	38.70	74.00	-35.30	peak	200	279
5	1723.000	-4.85	44.28	39.43	74.00	-34.57	peak	200	210
6	1787.000	-4.58	44.13	39.55	74.00	-34.45	peak	200	266

Note: Measurement Level = Reading Level + Correct Factor

Vertical:

Test Mode :	Mode 2: Full System with DR-1693		
AC Power :	AC 125V/60Hz	Ant. Polarization:	Vertical
Temp :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

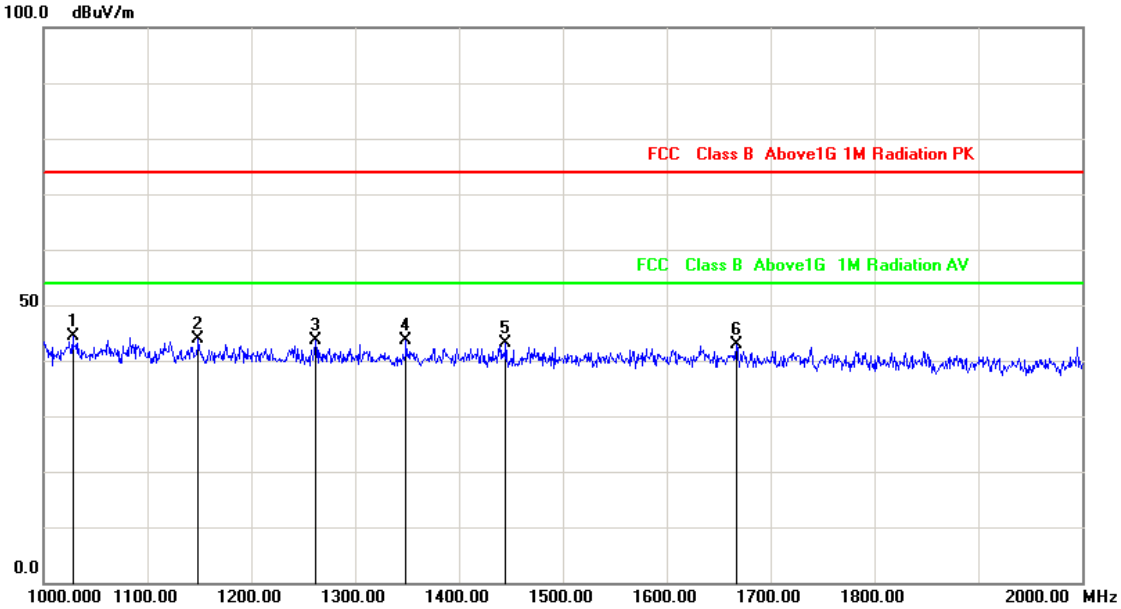
30MHz ~ 1000MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.9700	-2.85	35.09	32.24	40.00	-7.76	peak	100	170
2	135.7300	-8.25	31.09	22.84	43.50	-20.66	peak	100	205
3	145.4299	-7.73	31.02	23.29	43.50	-20.21	peak	100	356
4	427.7000	-4.10	29.17	25.07	46.00	-20.93	peak	200	179
5	717.7300	1.36	28.91	30.27	46.00	-15.73	peak	100	38
6	742.9500	1.57	28.64	30.21	46.00	-15.79	peak	100	285

Note: Measurement Level = Reading Level + Correct Factor

1GHz-2GHz



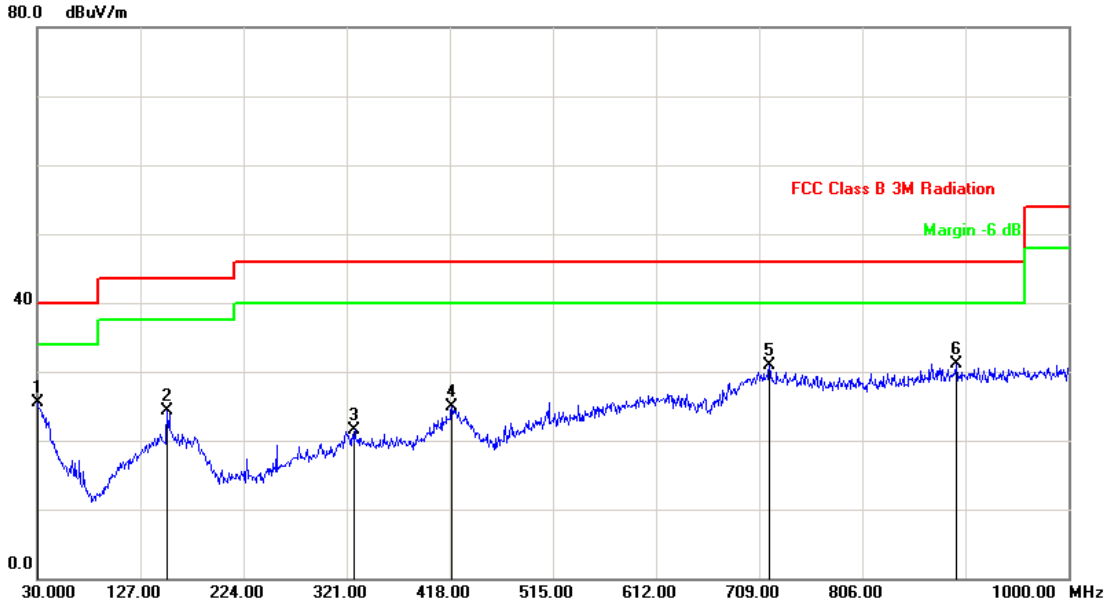
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1028.000	-9.55	53.88	44.33	74.00	-29.67	peak	100	359
2	1149.000	-8.58	52.41	43.83	74.00	-30.17	peak	100	359
3	1262.000	-7.67	51.19	43.52	74.00	-30.48	peak	100	359
4	1349.000	-6.98	50.71	43.73	74.00	-30.27	peak	100	359
5	1445.000	-6.21	49.30	43.09	74.00	-30.91	peak	100	359
6	1667.000	-5.08	47.84	42.76	74.00	-31.24	peak	100	359

Note: Measurement Level = Reading Level + Correct Factor

Test Result and Data
Product model: DR-1694
Horizontal:

Test Mode :	Mode 3: Full System with DR-1694		
AC Power :	AC 125V/60Hz	Ant. Polarization:	Horizontal
Temp :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

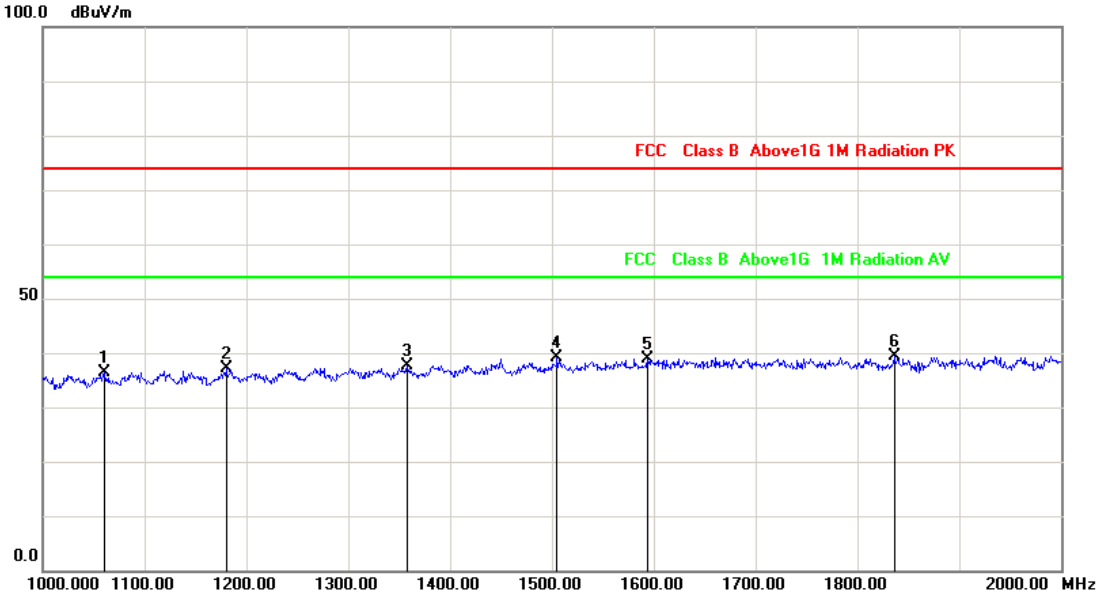
30MHz-1000MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-2.48	27.89	25.41	40.00	-14.59	peak	100	313
2	152.2199	-7.62	31.94	24.32	43.50	-19.18	peak	200	337
3	328.7599	-6.39	27.82	21.43	46.00	-24.57	peak	200	246
4	419.9399	-3.29	28.10	24.81	46.00	-21.19	peak	200	240
5	718.7000	1.37	29.63	31.00	46.00	-15.00	peak	100	176
6	894.2699	2.20	28.91	31.11	46.00	-14.89	peak	193	360

Note: Measurement Level = Reading Level + Correct Factor

1GHz-2GHz



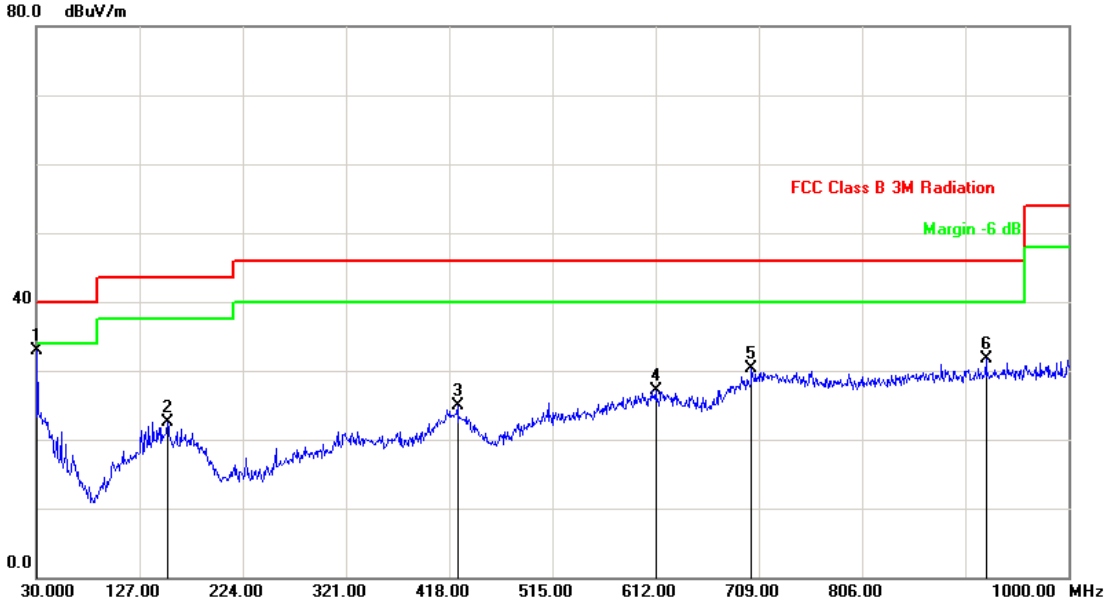
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1061.000	-9.28	45.70	36.42	74.00	-37.58	peak	200	359
2	1180.000	-8.33	45.37	37.04	74.00	-36.96	peak	200	164
3	1358.000	-6.91	44.49	37.58	74.00	-36.42	peak	100	14
4	1505.000	-5.75	44.84	39.09	74.00	-34.91	peak	200	87
5	1594.000	-5.38	44.34	38.96	74.00	-35.04	peak	100	45
6	1836.000	-4.38	43.85	39.47	74.00	-34.53	peak	200	232

Note: Measurement Level = Reading Level + Correct Factor

Vertical:

Test Mode :	Mode 3: Full System with DR-1694		
AC Power :	AC 120V/60Hz	Ant. Polarization:	Vertical
Temp :	23° C	Humidity :	54%
Pressure(mbar) :	1002	Date:	2016/11/07

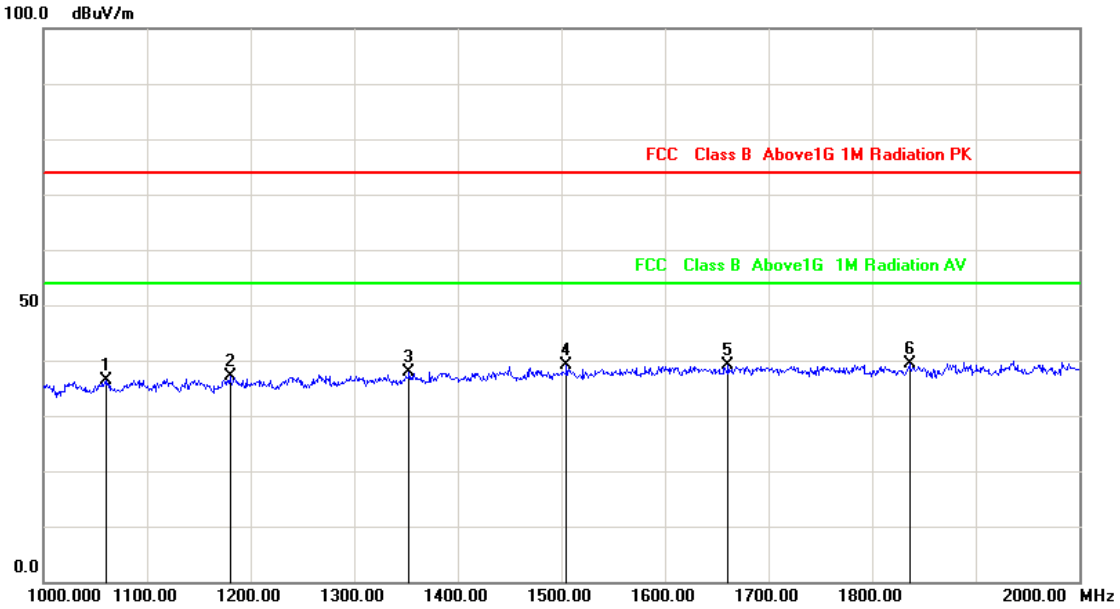
30MHz-1000MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.9700	-2.85	35.81	32.96	40.00	-7.04	peak	200	218
2	153.1900	-7.60	30.12	22.52	43.50	-20.98	peak	100	93
3	425.7600	-3.89	28.83	24.94	46.00	-21.06	peak	200	9
4	612.0000	-1.57	28.64	27.07	46.00	-18.93	peak	200	350
5	702.2100	1.16	29.12	30.28	46.00	-15.72	peak	200	269
6	922.4000	2.40	29.23	31.63	46.00	-14.37	peak	100	336

Note: Measurement Level = Reading Level + Correct Factor

1Hz-2GHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1061.000	-9.28	45.70	36.42	74.00	-37.58	peak	100	359
2	1180.000	-8.33	45.37	37.04	74.00	-36.96	peak	100	359
3	1353.000	-6.95	44.84	37.89	74.00	-36.11	peak	100	43
4	1505.000	-5.75	44.84	39.09	74.00	-34.91	peak	100	359
5	1661.000	-5.10	44.15	39.05	74.00	-34.95	peak	100	359
6	1836.000	-4.38	43.85	39.47	74.00	-34.53	peak	100	359

Note: Measurement Level = Reading Level + Correct Factor

Remark: 1.Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB, Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV, limit = 40.00dBuV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m; Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

4.5 Measurement uncertainty

Measurement uncertainty of radiated emission (30MHz-1000MHz) is: ± 3.93dB
Measurement uncertainty of radiated emission (1000MHz-6000MHz) is: ± 5.18dB
The measurement uncertainty is given with a confidence of 95%, k=2.