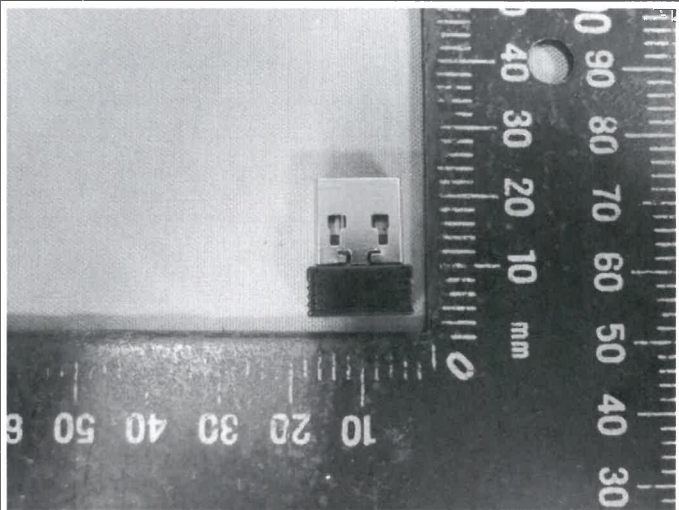
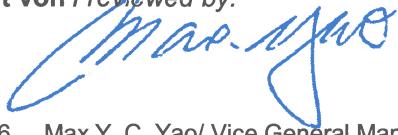


Prüfbericht-Nr.: Test Report No.:	10055826 001	Auftrags-Nr.: Order No.:	114048799	Seite 1 von 21 Page 1 of 21
Kunden-Referenz-Nr.: Client Reference No.:	392213	Auftragsdatum: Order date.:	09 Mar. 2015	
Auftraggeber: Client:	Acrox Technologies Co., Ltd. 4F., No. 89, Minshan St., Neihsu Dist., Taipei City 114, Taiwan, R.O.C.			
Prüfgegenstand: Test item:	2.4GHz dongle			
Bezeichnung / Typ-Nr.: Identification / Type No.:	RXF			
Auftrags-Inhalt: Order content:	TUV Rheinland - EMC service			
Prüfgrundlage: Test specification:	FCC 47 CFR Part 15, Subpart B: 2015 ICES-003: Issue 6 (2016)			
Wareneingangsdatum: Date of receipt:	07 Apr. 2016			
Prüfmuster-Nr.: Test sample No.:	A000000339942-001			
Prüfzeitraum: Testing period:	Refer to test report			
Ort der Prüfung: Place of testing:	TÜV Rheinland Taiwan Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland Taiwan Ltd. Taichung Branch Office			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
				
03 Jun. 2016	Neil J. N. Tsai/ Project Manager	03 Jun. 2016	Max Y. C. Yao/ Vice General Manager	
Datum Date	Name/Stellung Name/Position	Unterschrift Signature	Datum Date	Name/Stellung Name/Position
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

5.1 CONDUCTED EMISSION PER SECTION 15.107, FCC 47 CFR PART 15 SUBPART B

RESULT: Pass

5.2 RADIATED EMISSION PER SECTION 15.109, FCC 47 CFR PART 15 SUBPART B

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report.

2 Test Sites

2.1 Test Facilities

Laboratory:

TUV Rheinland Taiwan Ltd. Taichung Branch Office

No.9, Lane 36, Minsheng Rd., Sec. 3, Daya District, Taichung City 428, Taiwan, R.O.C.

Test Facility:

TÜV Rheinland Taiwan Ltd.

11F., No.758, Sec. 4, Bade Rd., Songshan Dist., Taipei City 105, Taiwan, R.O.C.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facilities and has found these test sites to be in compliance with the requirements under 47 CFR section 2.948. The registration number: 365730.

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facilities and has found these test sites to be in compliance with the Canadian requirements. The filing number: 9465A.

The test facility is accredited by TAF (member of ILAC), under number 0759 according to ISO/IEC 17025:2005.

TÜV Rheinland Taiwan Ltd. is accredited by the Federal Communications Commission as a Conformity Assessment Body under Designation Number TW1065 and Test Firm Registration#: 799772.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

For EMI/ Conduction Measurement (Taipei: Shield Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	Test Receiver	Rohde & Schwarz	ESCI7	100797	2015/12/28	2016/12/28
2	LISN	Rohde & Schwarz	ENV216	101243	2015/06/01	2016/06/01
3	LISN	Rohde & Schwarz	ENV216	101262	2015/06/16	2016/06/16
4	Telecom ISN 2 Line	FCC	FCC-TLISN-T2-02-09	101169	2015/08/26	2016/08/26
5	Telecom ISN 8 Line	FCC	FCC-TLISN-T8-02-09	101167	2015/08/26	2016/08/26
6	4 balance telecom pair ISN	FCC	F-070306-1057-1	101166	2015/08/26	2016/08/26
7	Test Software	Farad	EZ EMC	Ver. TUV3A1	N/A	N/A
8	Test Software	Audix	e3	Ver. 9	N/A	N/A

For EMI/Radiation Measurement (Taipei: Semi-Anechoic Chamber A)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	Test Receiver	Rohde & Schwarz	ESR7	101062	2015/09/10	2016/09/10
2	Spectrum Analyzer	Rohde & Schwarz	FSV-40	100921	2015/12/21	2016/12/21
3	Pre-Amplifier	Hewlett Packard	8447F	2805A03335	2015/08/31	2016/08/31
4	Pre-Amplifier	Com-Power	PAM-840	461257	2015/11/19	2016/11/19
5	Pre-Amplifier	EM Electronics	EM01G18G	060558	2015/11/19	2016/11/19
6	Bilog Antenna	TESEQ	CBL6111D	29802	2014/07/04	2016/07/04
7	Horn Antenna	ETS-Lindgren	3117	00138160	2015/01/12	2017/01/12
8	Horn Antenna	Com-Power	AH-840	101029	2014/09/26	2016/09/26
9	Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2014/10/21	2016/10/21
10	Test Software	Farad	EZ EMC	Ver. TUV3A1	N/A	N/A
11	Test Software	Audix	e3	Ver. 9	N/A	N/A

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025:2005 has been confirmed before testing.

2.3 Calibration

All equipment requiring calibration is calibrated periodically by the manufacturer or accredited calibration services according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.4 Abbreviations

PASS : Complied with requirement	N/A : Not applicable
FAIL : Not complied	N.C.R. : No calibration required

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Testing Item	Frequency Range	Uncertainty
Conducted Emission (LISN)	9kHz - 30MHz	2.69 dB
Radiated Emission (966 Chamber: 3m)	30MHz - 1000MHz	2.82 dB
Radiated Emission (966 Chamber: 3m)	Above 1GHz	2.42 dB

Note:

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

3 General Product Information

3.1 Product Function and Intended Use

The tested sample is a "2.4GHz dongle" with model number "RXF" for new approval, which is intended to enable wireless connectivity with wireless mouse.

3.2 Rating and Physical Characteristics

Type Designation:	RXF
Input Voltage:	5Vdc via USB
Protection Class:	Class III for USB Dongle; Class I for Host Notebook
Wireless Frequency:	2.4GHz ~ 2.4835GHz

3.3 Noise Generating or Sources of Interference

- 1) IC circuits
- 2) Crystal (Y1: 12MHz)

Please refer to attachment documentation for details.

3.4 Noise Suppressing Parts

Please refer to attachment documentation for details.

3.5 Submitted Documents

- 1) User Manual
- 2) Block diagram
- 3) Circuit diagram

4 Test Set-up and Operation Modes

4.1 Test Methodology

The test methodology used is based on the requirement of 47 CFR PART 15, section 15.31, 15.33, 15.35, 15.107 and 15.109 or ICES-003.

The test methods, which have been used, are based on ANSI C63.4 or CAN/CSA-CEI/IEC CISPR 22.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Independent and Test Operation Modes

The EUT was connected to a host Notebook via USB port, and enable wireless function to connect with 2.4GHz mouse. The host Notebook was run the software "EMCTEST" to display "H" in the screen.

The basic operation mode:

A. Normal operation

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C 63.4 or in CAN/CSA-CEI/IEC CISPR22.

Refer to Test setup in chapter 4.5.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested as an independent unit with the following equipment:

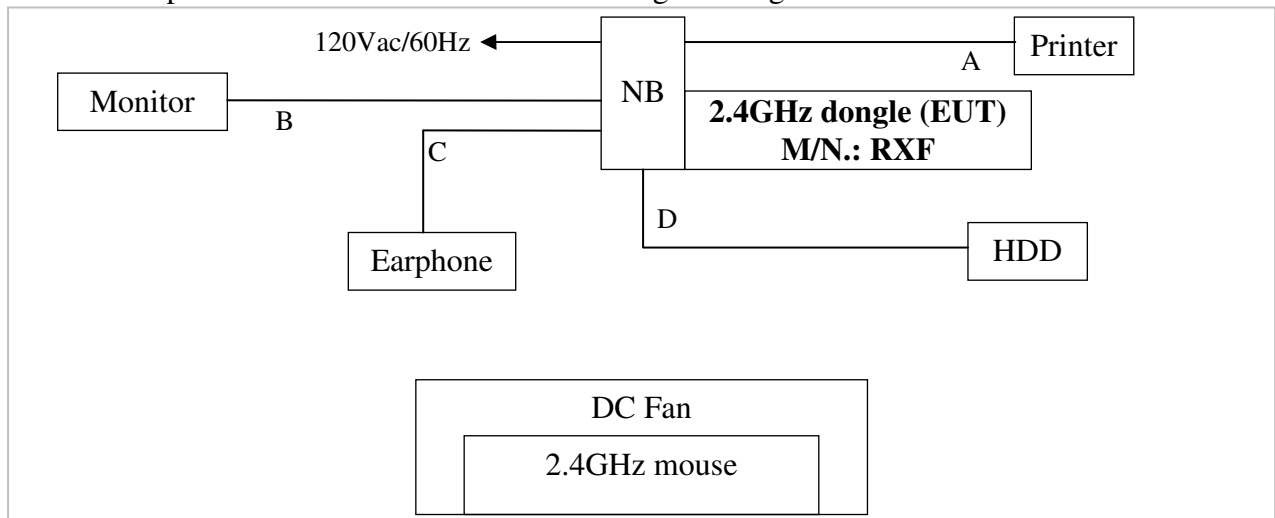
Description	Manufacturer	Model No.	Remark	Certification
Notebook(NB04)	Lenovo	TP00018B	PK-2B27H	DoC
Printer	HP	VCVRA-1004	CN0C711HY9	DoC
Monitor	CHIMEI	22VD	22VDAGIW50441593	DoC
HDD	SONY	HD-EG5	XCV0S5K28013161	DoC
Ear/Microphone	i-Acon	CW-010MV	N/A	N/A
DC Fan	Sunon	KD1208PTS1	N/A	N/A
2.4GHz mouse	Acrox	NS-PNM7013-BK	N/A	N/A

4.4 Countermeasures to achieve EMC compliance

The test sample which has been tested contained the noise suppression parts as described in the constructional data form or technical construction file or refer to the attachment photo document of test report. No additional measures were employed to achieve compliance.

4.5 Test Setup

The test setup was realized on a table of 80-cm height during all tests as described herein.



Signal Cable Type		Signal Cable Description
A	USB cable	Shielded, 1.7m
B	D-Sub cable	Shielded, 1.8m, 2 cores
C	Audio cable	Non shielded, 2m
D	USB cable	Shielded, 0.55m

5 Test Results EMISSION

5.1 Conducted Emission per section 15.107, 47 CFR part 15 subpart B

RESULT:**PASS**

Port: AC Mains
Test Procedure : ANSI C63.4 (2014) Clause 7.3
Deviations from standard
test procedure : None
Frequency Range : 0.15 – 30MHz
Limits : FCC Part 15 Subpart B Section 15.107 (a) class B
Kind of Test Site : Conducted Room (Shield)

Test Setup

The following setup caused the highest disturbance:

Date of Testing : 13 Apr. 2016
Input Voltage : See 3.2
Operational Mode : See 4.2
Temperature 18.7 °C
Relative Humidity 52 %

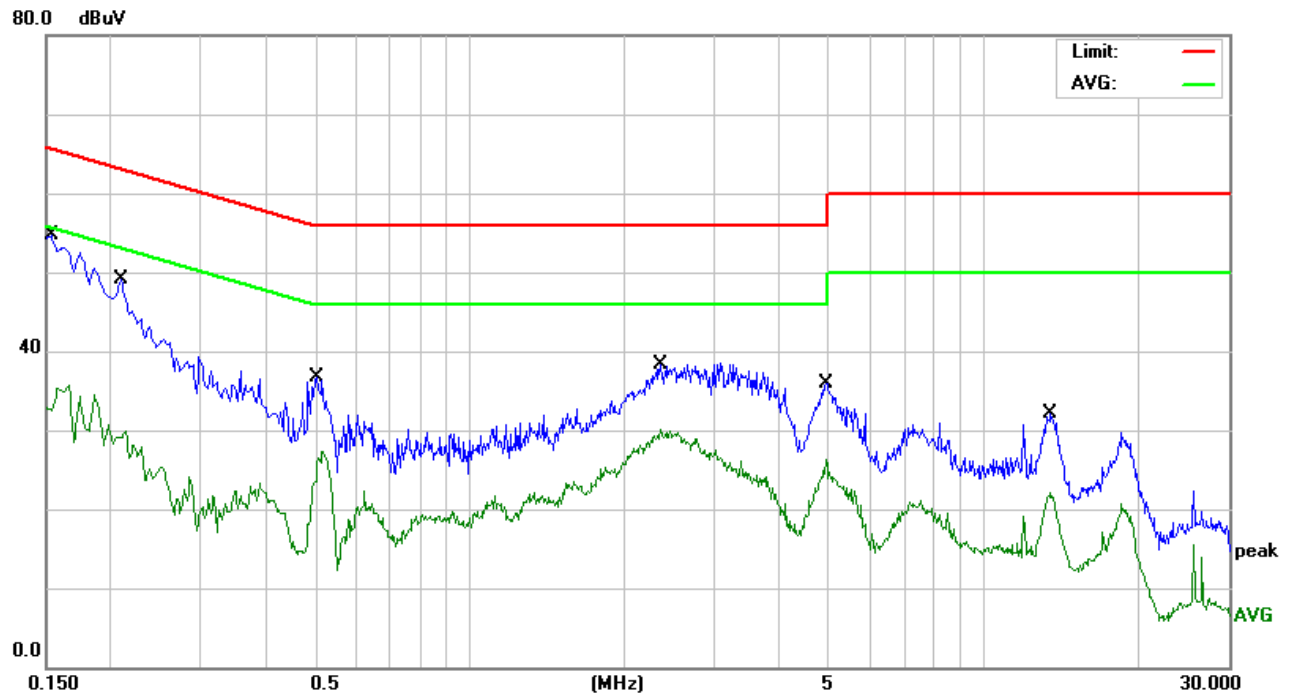
Note:

Level = Reading + Factor;

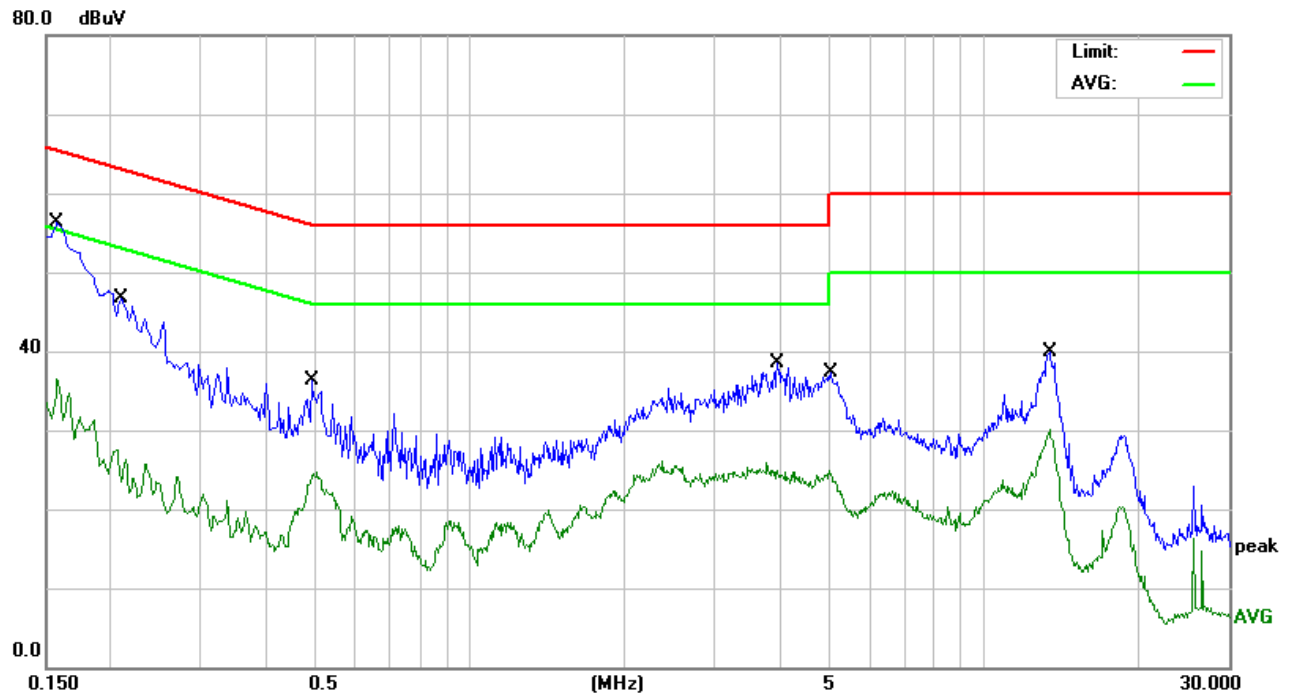
Margin = Level - Limit.

Figure 1: Conducted Emission, AC Mains; 0.15 – 30 MHz

Phase L1



No.	Frequency (MHz)	Factor ()	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	9.65	41.91	51.56	65.78	-14.22	QP	P	
2	0.1539	9.65	24.03	33.68	55.78	-22.10	AVG	P	
3	0.2100	9.63	33.40	43.03	63.20	-20.17	QP	P	
4	0.2100	9.63	18.24	27.87	53.20	-25.33	AVG	P	
5	0.5060	9.63	22.06	31.69	56.00	-24.31	QP	P	
6	0.5060	9.63	15.31	24.94	46.00	-21.06	AVG	P	
7	2.3540	9.65	23.72	33.37	56.00	-22.63	QP	P	
8	2.3540	9.65	19.04	28.69	46.00	-17.31	AVG	P	
9	4.9460	9.69	20.36	30.05	56.00	-25.95	QP	P	
10	4.9460	9.69	13.14	22.83	46.00	-23.17	AVG	P	
11	13.5260	9.81	16.35	26.16	60.00	-33.84	QP	P	
12	13.5260	9.81	10.07	19.88	50.00	-30.12	AVG	P	

Phase N


No.	Frequency (MHz)	Factor ()	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1580	9.66	40.72	50.38	65.56	-15.18	QP	P	
2	0.1580	9.66	21.72	31.38	55.56	-24.18	AVG	P	
3	0.2100	9.65	31.88	41.53	63.20	-21.67	QP	P	
4	0.2100	9.65	13.47	23.12	53.20	-30.08	AVG	P	
5	0.4940	9.64	19.78	29.42	56.10	-26.68	QP	P	
6	0.4940	9.64	13.86	23.50	46.10	-22.60	AVG	P	
7	3.9820	9.68	20.25	29.93	56.00	-26.07	QP	P	
8	3.9820	9.68	13.10	22.78	46.00	-23.22	AVG	P	
9	5.0380	9.71	21.95	31.66	60.00	-28.34	QP	P	
10	5.0380	9.71	12.56	22.27	50.00	-27.73	AVG	P	
11	13.4100	9.85	23.05	32.90	60.00	-27.10	QP	P	
12	13.4100	9.85	16.62	26.47	50.00	-23.53	AVG	P	

5.2 Radiated Emission

per section 15.109, 47 CFR part 15 subpart B

RESULT:**PASS**

Port: Enclosure
Test Procedure : ANSI C63.4 (2014) Clause 8.3
Deviations from standard
test procedure : None
Frequency Range : 30 – 1000MHz and above 1GHz
Limits : FCC Part 15 Subpart B Section 15.109 (a) class B
Kind of Test Site : 966 Semi-anechoic chamber (3m distance)

Test Setup

The following setup caused the highest disturbance:

Date of Testing : 13 Apr. 2016
Input Voltage : See 3.2
Operational Mode : See 4.2
Temperature 22.6 °C
Relative Humidity 59 %

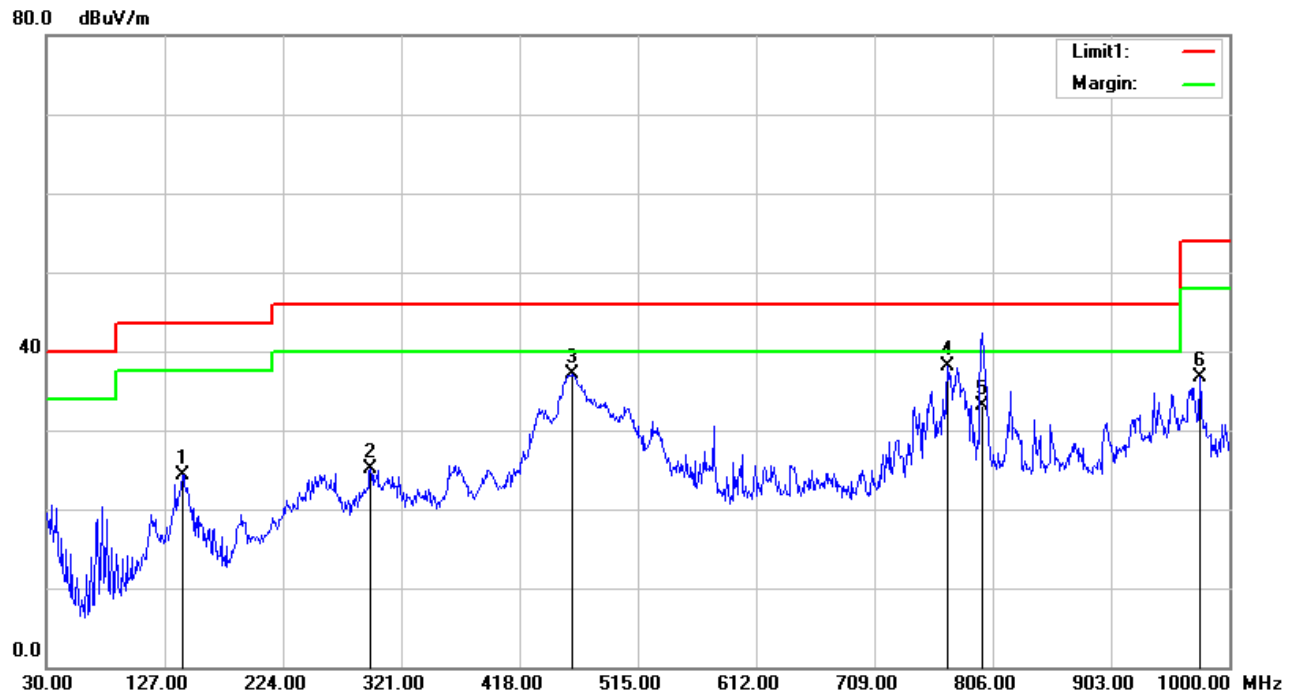
The highest frequency generated or used in the device or on which the operates or tunes of the EUT:

- ☐ below 1.705M, measuring up to 30MHz
☐ 1.705-108M, measuring up to 1000MHz
☐ 108-500MHz, measuring up to 2000MHz
☐ 500-1000MHz, measuring up to 5000MHz
☒ above 1000MHz, measuring up to 5th harmonic of the highest frequency or 40GHz, whichever is lower.

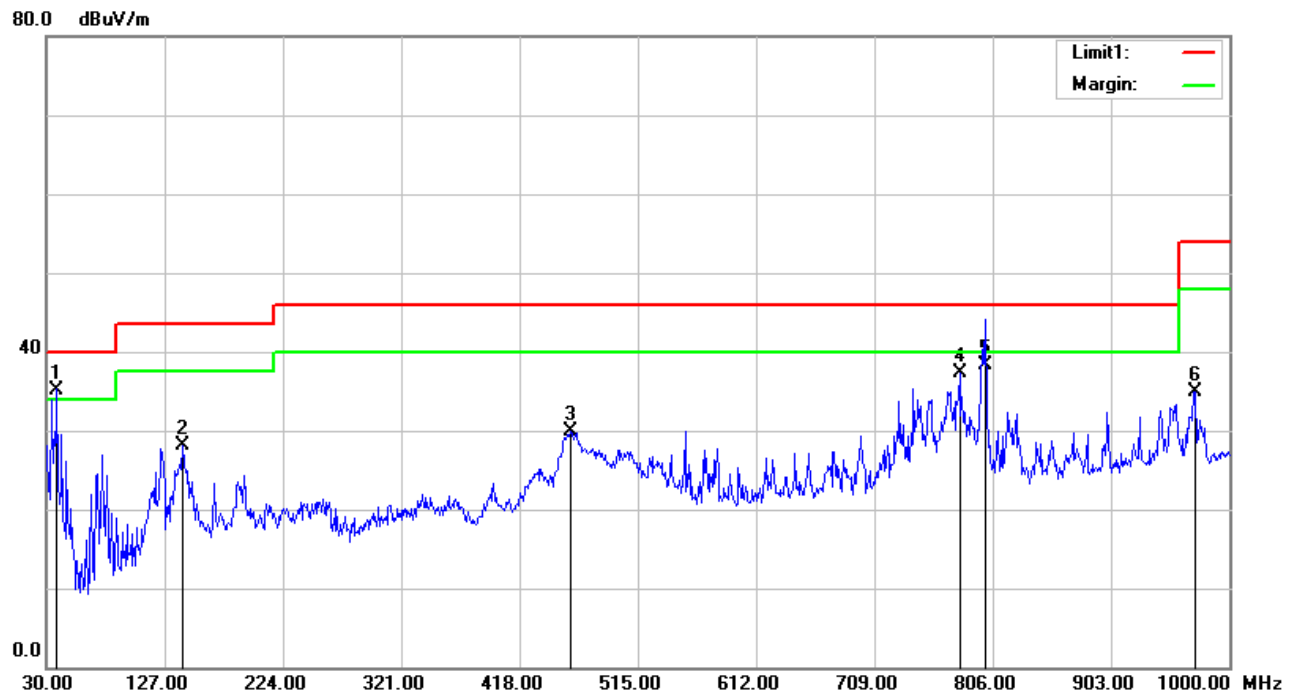
Note1:

Level = Reading + Factor;
Margin = Level - Limit.

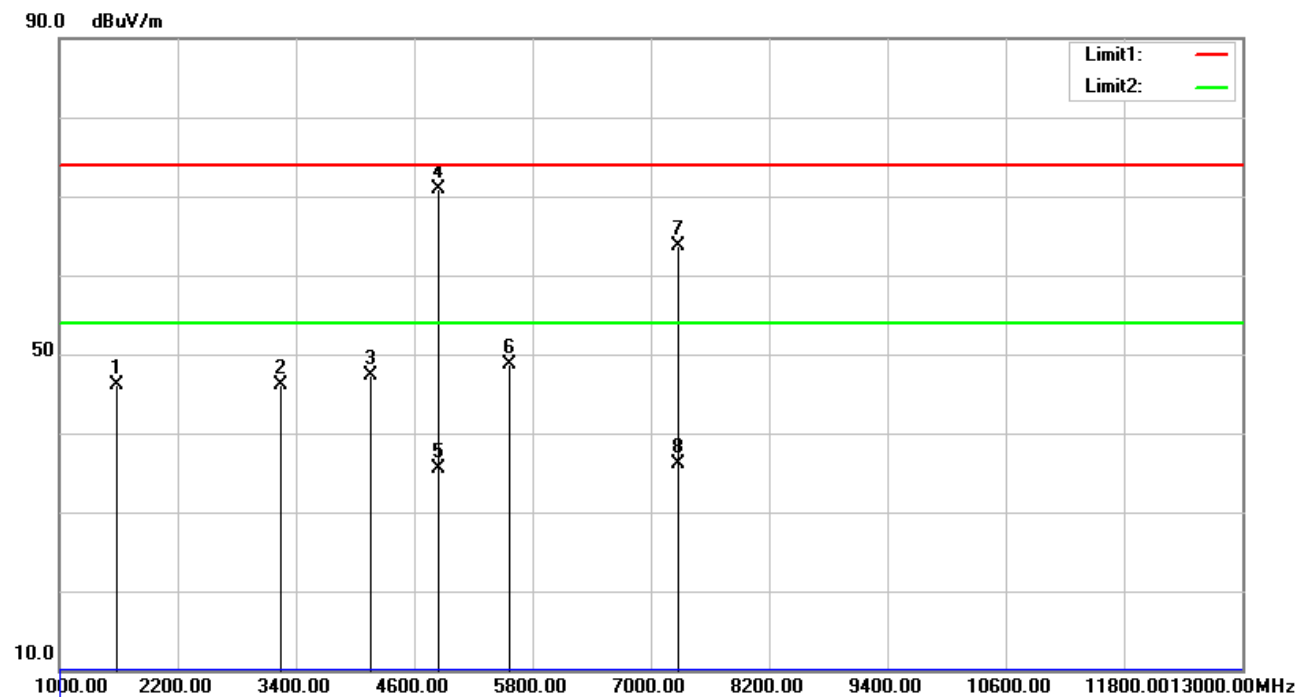
Note2: The highest frequency is 2.4GHz for wireless function, measuring up to 13GHz.

Figure 2: Radiated Emission; 30 – 1000 MHz
Horizontal


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	141.5500	-12.78	37.18	24.40	43.50	-19.10	QP	200	143	P	
2	295.7799	-10.54	35.70	25.16	46.00	-20.84	QP	100	153	P	
3	461.6500	-7.87	44.93	37.06	46.00	-8.94	QP	100	335	P	
4	769.1400	-3.93	42.07	38.14	46.00	-7.86	QP	400	360	P	
5	797.2700	-3.71	36.81	33.10	46.00	-12.90	QP	200	154	P	
6	975.7500	-0.25	37.05	36.80	54.00	-17.20	QP	100	97	P	

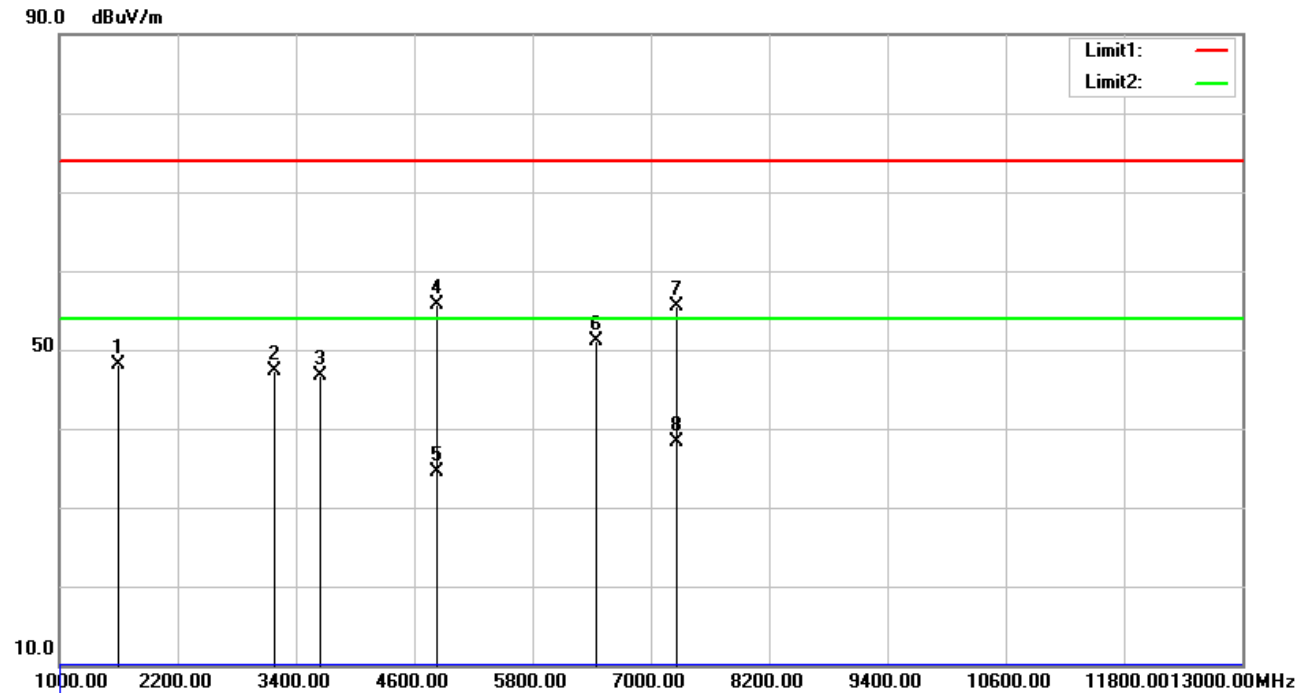
Vertical


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	38.7300	-10.76	45.86	35.10	40.00	-4.90	QP	100	141	P	
2	141.5500	-12.78	40.80	28.02	43.50	-15.48	QP	100	149	P	
3	459.7100	-7.90	37.77	29.87	46.00	-16.13	QP	300	31	P	
4	778.8400	-3.86	41.21	37.35	46.00	-8.65	QP	100	69	P	
5	800.1800	-3.69	41.99	38.30	46.00	-7.70	QP	100	80	P	
6	971.8700	-0.29	35.21	34.92	54.00	-19.08	QP	100	360	P	

Figure 3: Radiated Emission; Above 1 GHz
Horizontal


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	1588.000	-9.68	55.69	46.01	74.00	-27.99	peak	100	29	P	
2	3244.000	-5.81	51.90	46.09	74.00	-27.91	peak	100	153	P	
3	4156.000	-4.45	51.66	47.21	74.00	-26.79	peak	100	167	P	
4	4840.000	-2.19	73.01	70.82	74.00	-3.18	peak	100	12	P	
5	4840.000	-2.19	37.69	35.50	54.00	-18.50	AVG	100	12	P	
6	5560.000	1.24	47.45	48.69	74.00	-25.31	peak	100	267	P	
7	7276.000	5.97	57.76	63.73	74.00	-10.27	peak	100	23	P	
8	7276.000	5.97	30.23	36.20	54.00	-17.80	AVG	100	23	P	

Note: The other peak readings were below average limit, thus no average measuring required for those.

Vertical


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F	Remark
1	1600.000	-9.60	57.74	48.14	74.00	-25.86	peak	100	58	P	
2	3184.000	-5.86	53.24	47.38	74.00	-26.62	peak	100	268	P	
3	3640.000	-5.42	52.06	46.64	74.00	-27.36	peak	100	74	P	
4	4828.000	-2.22	57.92	55.70	74.00	-18.30	peak	100	329	P	
5	4828.000	-2.22	36.74	34.52	54.00	-19.48	AVG	100	329	P	
6	6448.000	5.83	45.29	51.12	74.00	-22.88	peak	100	121	P	
7	7264.000	5.94	49.61	55.55	74.00	-18.45	peak	100	304	P	
8	7264.000	5.94	32.30	38.24	54.00	-15.76	AVG	100	304	P	

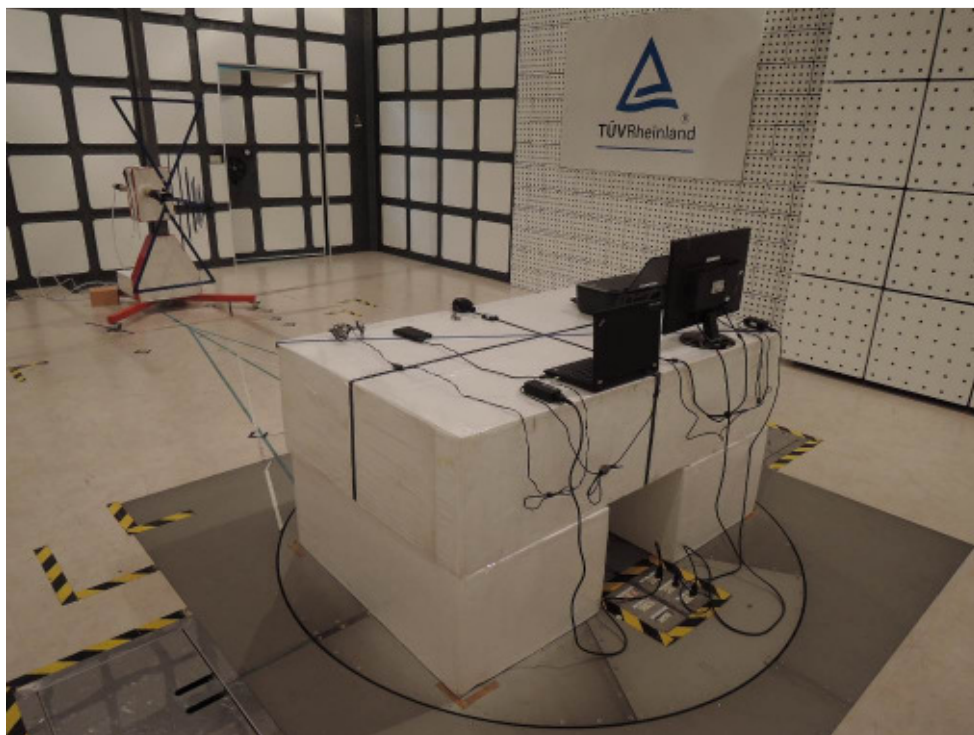
Note: The other peak readings were below average limit, thus no average measuring required for those.

6 Photographs of Test Setup

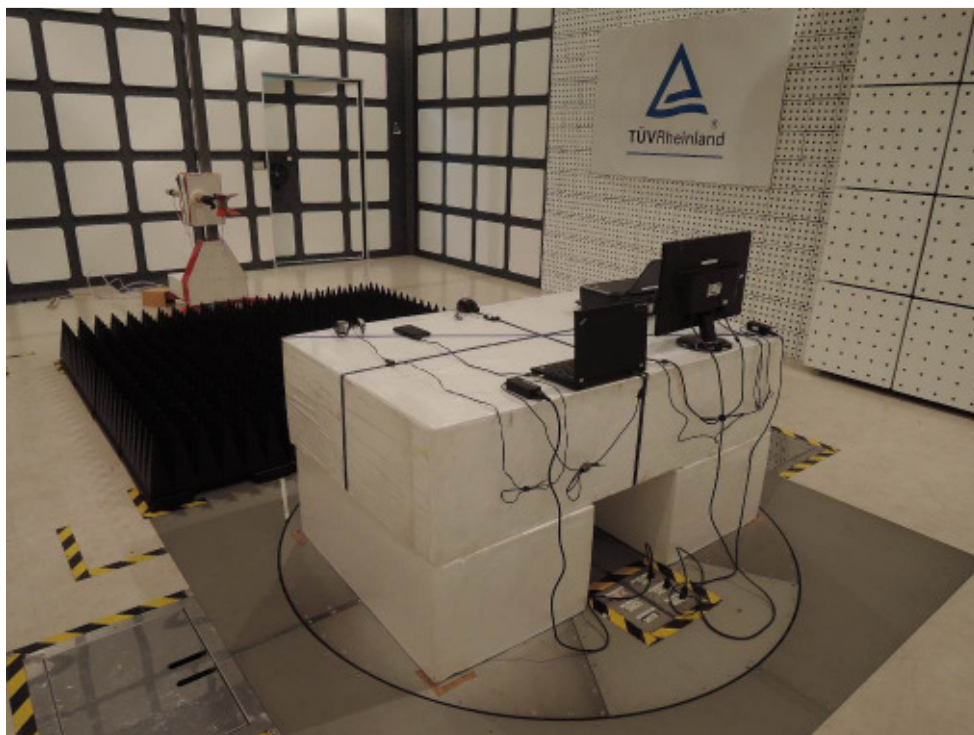
Picture 1: Conducted Emission, AC Mains; 0.15 – 30 MHz



Picture 2: Radiated Emission, 30 - 1000 MHz



Picture 3: Radiated Emission, Above 1 GHz



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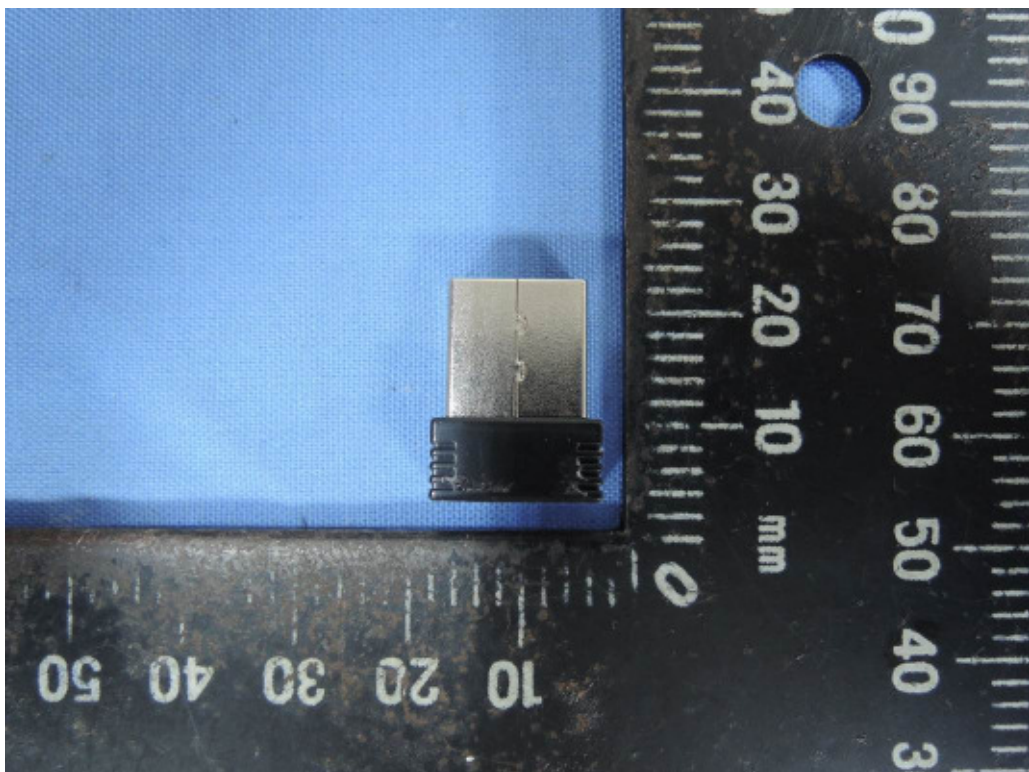
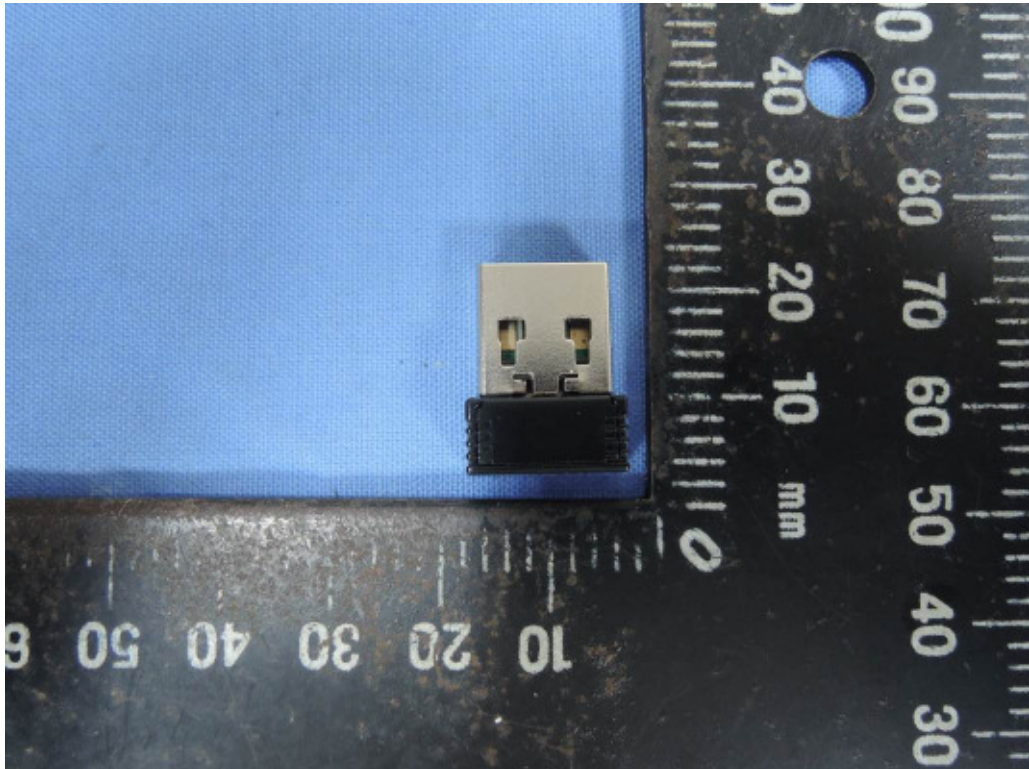
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PICTURE 2: RADIATED EMISSION, 30 - 1000 MHz	19
PICTURE 3: RADIATED EMISSION, ABOVE 1 GHz	20

Product: 2.4GHz dongle

Type Designation: RXF



Product: 2.4GHz dongle

Type Designation: RXF

