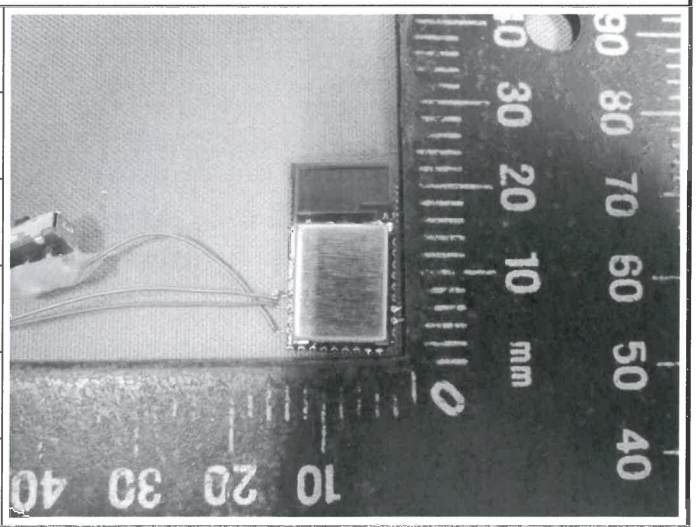

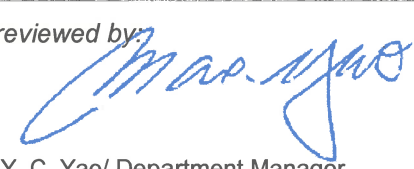


Prüfbericht-Nr.: <i>Test Report No.:</i>	10055530 001	Auftrags-Nr.: <i>Order No.:</i>	114048539	Seite 1 von 21 <i>Page 1 of 21</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	60031609	Auftragsdatum: <i>Order date.:</i>	21 Mar. 2016	
Auftraggeber: <i>Client:</i>	Avant-Com Inc 3F., No. 13-23, Sec. 6, Minquan E., TW-11494 Neihu Dist., Taipei City, Taiwan, R.O.C.			
Prüfgegenstand: <i>Test item:</i>	Bluetooth module			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	ACI 8107			
Auftrags-Inhalt: <i>Order content:</i>	TUV Rheinland - EMC service			
Prüfgrundlage: <i>Test specification:</i>	FCC 47 CFR Part 15, Subpart B: 2015			

Wareneingangsdatum: <i>Date of receipt:</i>	31 Mar. 2016
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000333764-001
Prüfzeitraum: <i>Testing period:</i>	Refer to test report
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland Taiwan Ltd.
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland Taiwan Ltd. Taichung Branch Office
Prüfergebnis*: <i>Test result*:</i>	Pass



geprüft von / tested by:		kontrolliert von / reviewed by:			
19 Apr. 2016	Neil J. N. Tsai/ Project Manager	19 Apr. 2016	Max Y. C. Yao/ Department Manager		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>

Sonstiges / Other:

Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	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.
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.

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_EMG	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 B)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	Test Receiver	Rohde & Schwarz	ESR7	101549	2015/09/22	2016/09/22
2	Spectrum Analyzer	Rohde & Schwarz	FSV-40	101112	2015/09/22	2016/09/22
3	Pre-Amplifier	Hewlett Packard	8447D	2944A09270	2015/07/06	2016/07/06
4	Pre-Amplifier	Com-Power	PAM-840	461257	2015/08/25	2016/08/25
5	Pre-Amplifier	EM Electronics	EM01G18G	060649	2015/07/06	2016/07/06
6	Bilog Antenna	TESEQ	CBL6111D	40101	2015/09/03	2016/09/03
7	Horn Antenna	ETS-Lindgren	3117	00201918	2015/08/03	2016/08/03
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	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 "Bluetooth module" with model number "ACI 8107" for new approval, which is intended to enable wireless connected with other Bluetooth LE devices. The tested sample is a module where built in control host panel.

3.2 Rating and Physical Characteristics

Type Designation:	ACI 8107
Rated Voltage:	3.3Vdc
Protection Class:	III

3.3 Noise Generating or Sources of Interference

- 1) IC circuits
- 2) Crystal (Y1: 16MHz, Y2: 32.768kHz)

3.4 Noise Suppressing Parts

Please refer to attachment documentation for details.

3.5 Submitted Documents

- 1) Product Specification
- 2) Block 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.

The test methods, which have been used, are based on ANSI C63.4.

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 with iPhone via “LightBlue” App software.

The basic operation mode:

A. Normal link

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.

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:

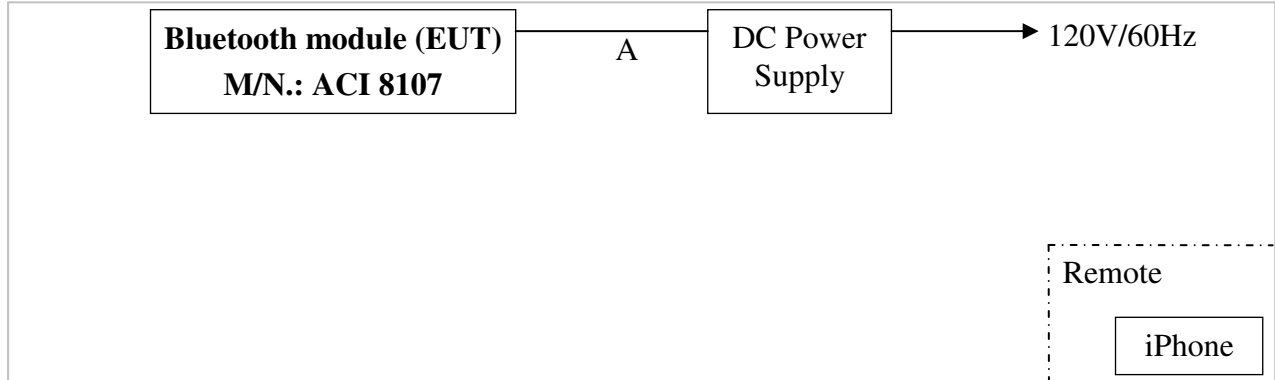
Description	Manufacturer	Model No.	Serial No.	Certification
DC Power Supply	LOKO	DPS-5050	L7000002376	N/A
iPhone 4S	Apple	A1387	C37HF4VQDTD2	DoC

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	DC power cable	Non Shielded, 0.3m

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)

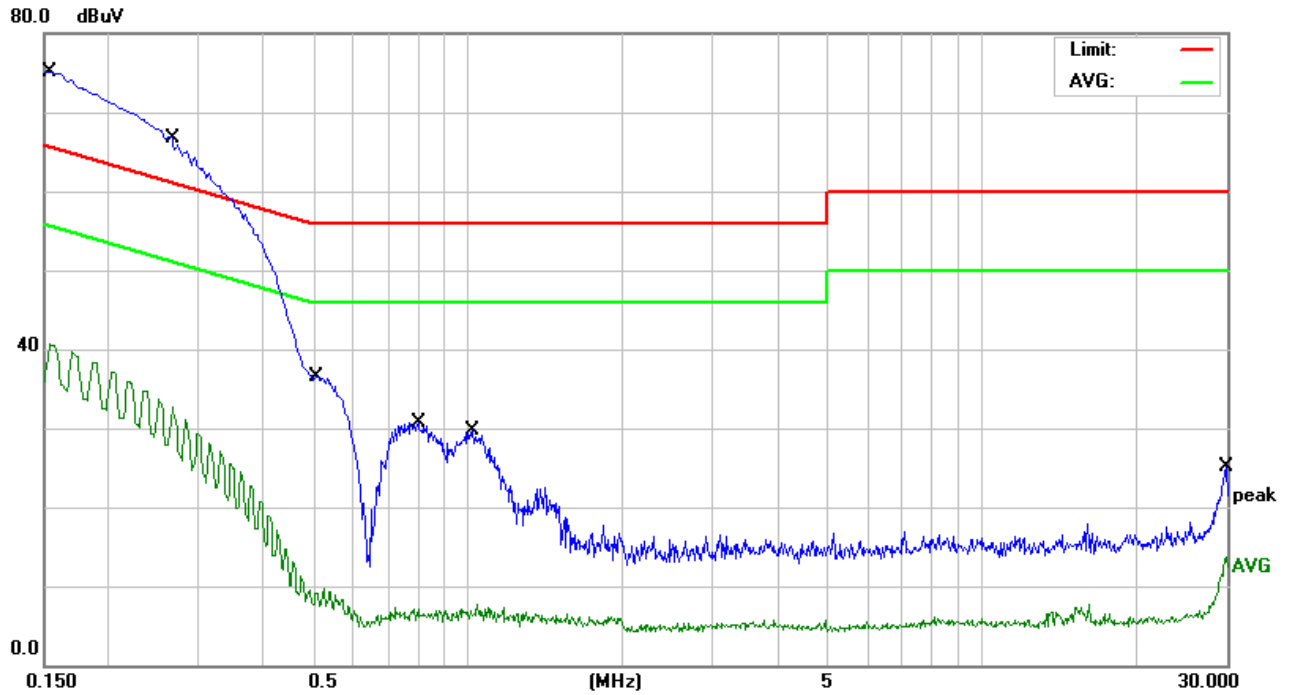
Test Setup

The following setup caused the highest disturbance:

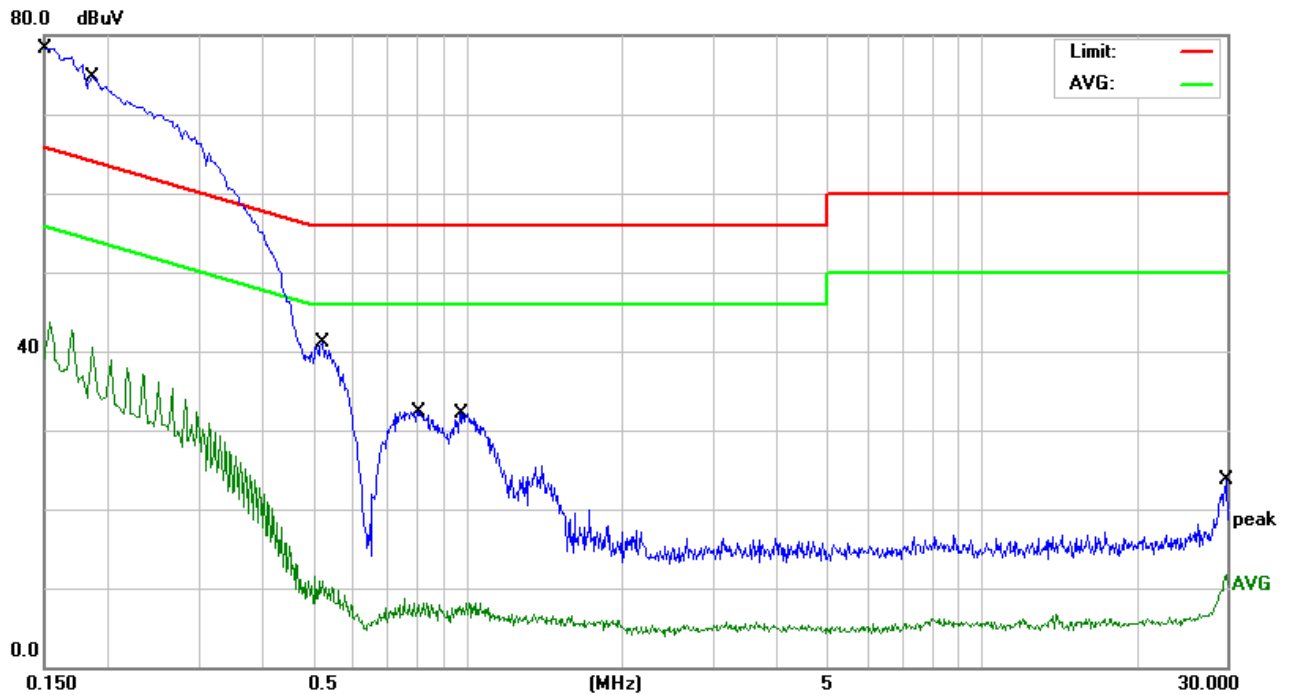
Date of Testing : 06 Apr. 2016
Input Voltage : 3.3Vdc
Operational Mode : See 4.2
Temperature : 21.1 °C
Relative Humidity : 47 %

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	52.72	62.37	65.78	-3.41	QP	P	
2	0.1539	9.65	26.03	35.68	55.78	-20.10	AVG	P	
3	0.2672	9.62	47.40	57.02	61.20	-4.18	QP	P	
4	0.2672	9.62	18.12	27.74	51.20	-23.46	AVG	P	
5	0.5100	9.63	19.74	29.37	56.00	-26.63	QP	P	
6	0.5100	9.63	-1.83	7.80	46.00	-38.20	AVG	P	
7	0.8020	9.63	13.45	23.08	56.00	-32.92	QP	P	
8	0.8020	9.63	-3.12	6.51	46.00	-39.49	AVG	P	
9	1.0220	9.63	10.92	20.55	56.00	-35.45	QP	P	
10	1.0220	9.63	-3.58	6.05	46.00	-39.95	AVG	P	
11	29.9900	9.87	9.09	18.96	60.00	-41.04	QP	P	
12	29.9900	9.87	2.55	12.42	50.00	-37.58	AVG	P	

Phase N


No.	Frequency (MHz)	Factor ()	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	9.65	53.23	62.88	65.99	-3.11	QP	P	
2	0.1500	9.65	29.03	38.68	55.99	-17.31	AVG	P	
3	0.1860	9.63	50.69	60.32	64.21	-3.89	QP	P	
4	0.1860	9.63	26.02	35.65	54.21	-18.56	AVG	P	
5	0.5220	9.63	21.94	31.57	56.00	-24.43	QP	P	
6	0.5220	9.63	-1.00	8.63	46.00	-37.37	AVG	P	
7	0.8059	9.63	15.96	25.59	56.00	-30.41	QP	P	
8	0.8059	9.63	-2.67	6.96	46.00	-39.04	AVG	P	
9	0.9700	9.63	13.54	23.17	56.00	-32.83	QP	P	
10	0.9700	9.63	-3.14	6.49	46.00	-39.51	AVG	P	
11	29.9940	9.87	7.23	17.10	60.00	-42.90	QP	P	
12	29.9940	9.87	0.89	10.76	50.00	-39.24	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 : 06 Apr. 2016
Input Voltage : 3.3Vdc
Operational Mode : See 4.2
Temperature : 19 °C
Relative Humidity : 57 %

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

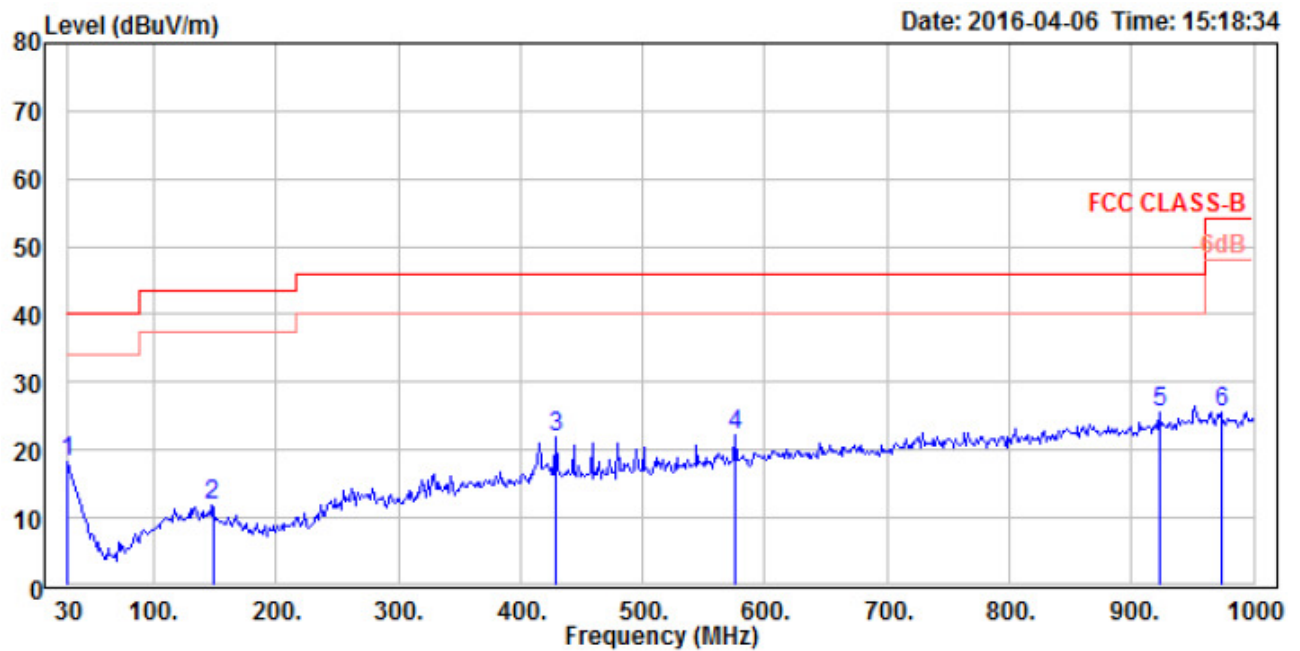
- below 1.705M, measuring up to 30MHz
 1.705-108M, measuring up to 1000MHz
 108-500MHz, measuring up to 2000MHz
 500-1000MHz, measuring up to 5000MHz
 above 1000MHz, measuring up to 5th harmonic of the highest frequency or 40GHz, whichever is lower.

Note1: The highest frequency is 2.4GHz for BLE function, measuring up to 13GHz.

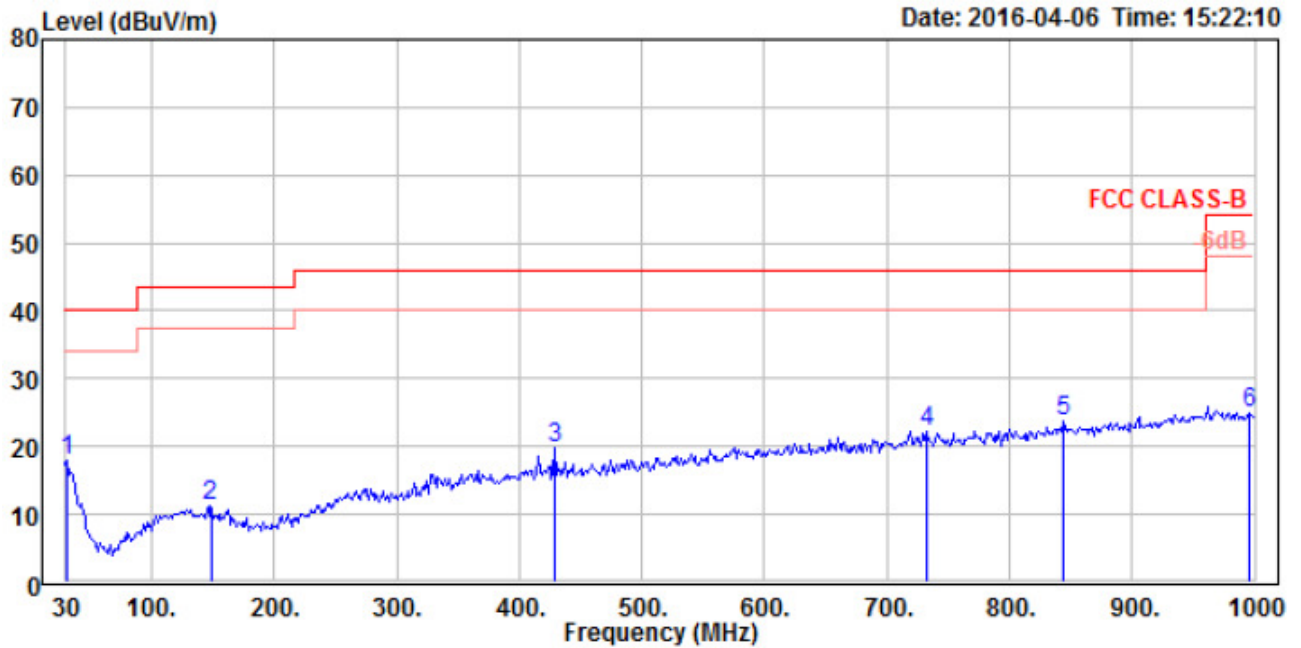
Note2:

Level = Reading + Factor;

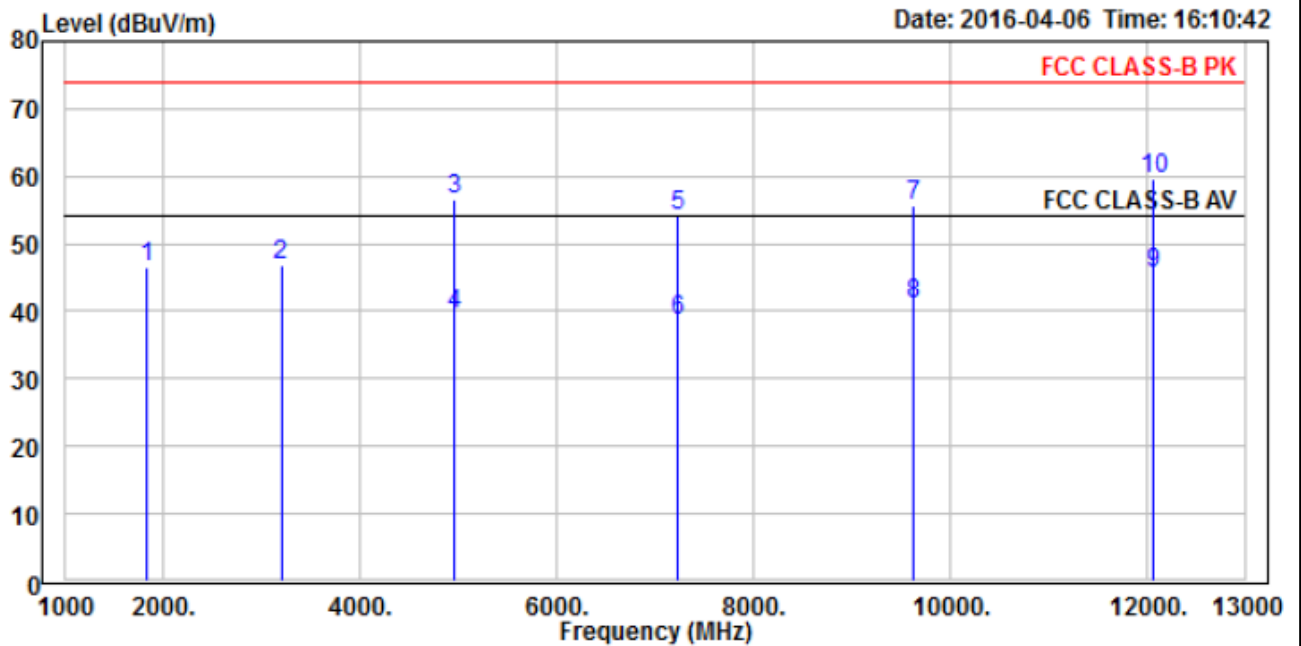
Margin = Level - Limit.

Figure 2: Radiated Emission; 30 – 1000 MHz
Horizontal


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB		
1	30.000	18.28	27.48	-9.20	40.00	-21.72	QP	
2	148.087	11.99	28.70	-16.71	43.50	-31.51	QP	
3	429.246	22.03	33.46	-11.43	46.00	-23.97	QP	
4	575.449	22.11	31.42	-9.31	46.00	-23.89	QP	
5	922.681	25.51	29.36	-3.85	46.00	-20.49	QP	
6	973.290	25.61	28.47	-2.86	54.00	-28.39	QP	

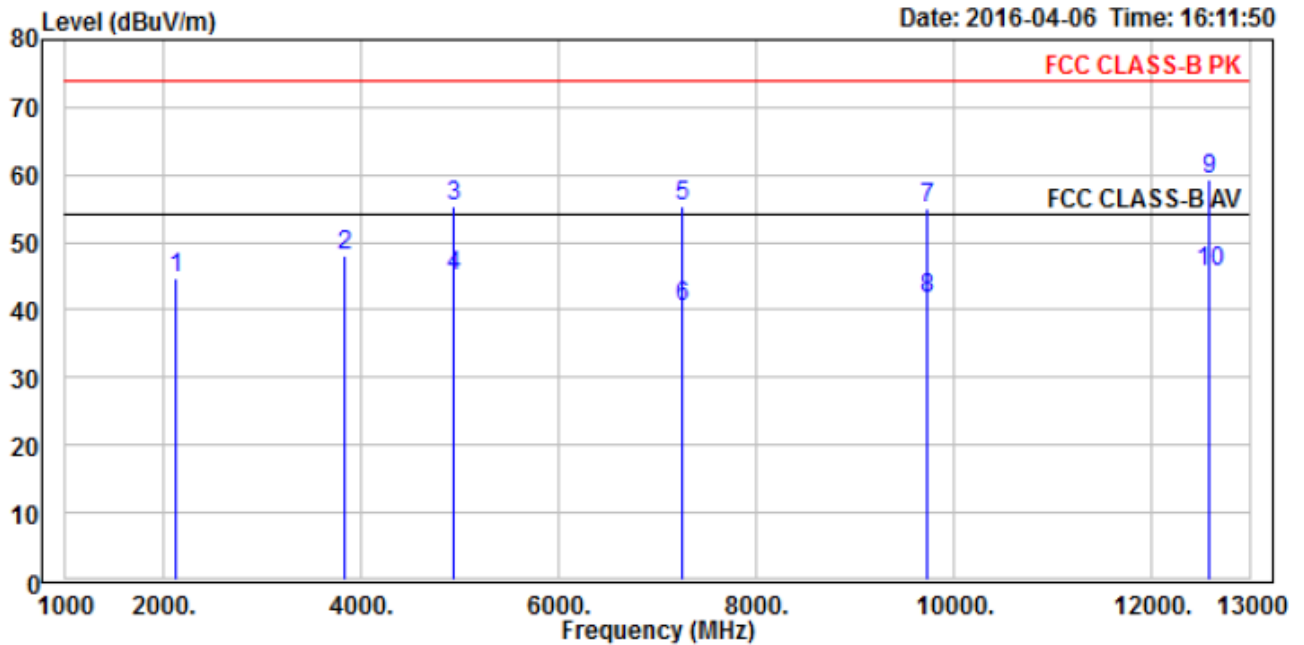
Vertical


	Read	Limit	Over				
Freq	Level	Level	Factor	Line	Limit	Remark	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB		
1	31.406	17.97	27.91	-9.94	40.00	-22.03	QP
2	148.087	11.19	27.90	-16.71	43.50	-32.31	QP
3	429.246	19.91	31.34	-11.43	46.00	-26.09	QP
4	732.899	22.15	29.28	-7.13	46.00	-23.85	QP
5	843.957	23.59	28.81	-5.22	46.00	-22.41	QP
6	995.783	25.03	27.79	-2.76	54.00	-28.97	QP

Figure 3: Radiated Emission; Above 1 GHz
Horizontal


	Freq	Level	Read Level	Limit Factor	Over Limit	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	
1	1834.783	46.66	52.12	-5.46	74.00	-27.34	Peak
2	3191.304	46.97	46.45	0.52	74.00	-27.03	Peak
3	4947.826	56.63	50.90	5.73	74.00	-17.37	Peak
4	4947.826	39.47	33.74	5.73	54.00	-14.53	Average
5	7226.087	54.29	47.13	7.16	74.00	-19.71	Peak
6	7226.087	38.62	31.46	7.16	54.00	-15.38	Average
7	9626.087	55.65	45.13	10.52	74.00	-18.35	Peak
8	9626.087	41.09	30.57	10.52	54.00	-12.91	Average
9	12078.260	45.57	31.59	13.98	54.00	-8.43	Average
10	12078.260	59.52	45.54	13.98	74.00	-14.48	Peak

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

Vertical


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark	Note
	MHz	dBUV/m	dBuV	dB/m	dBUV/m	dB		
1	2113.043	44.66	48.10	-3.44	74.00	-29.34	Peak	
2	3834.783	48.06	45.98	2.08	74.00	-25.94	Peak	
3	4930.435	55.46	49.78	5.68	74.00	-18.54	Peak	
4	4930.435	44.95	39.27	5.68	54.00	-9.05	Average	
5	7243.478	55.33	48.16	7.17	74.00	-18.67	Peak	
6	7243.478	40.32	33.15	7.17	54.00	-13.68	Average	
7	9730.435	55.13	44.29	10.84	74.00	-18.87	Peak	
8	9730.435	41.69	30.85	10.84	54.00	-12.31	Average	
9	12600.000	59.18	45.12	14.06	74.00	-14.82	Peak	
10	12600.000	45.74	31.68	14.06	54.00	-8.26	Average	

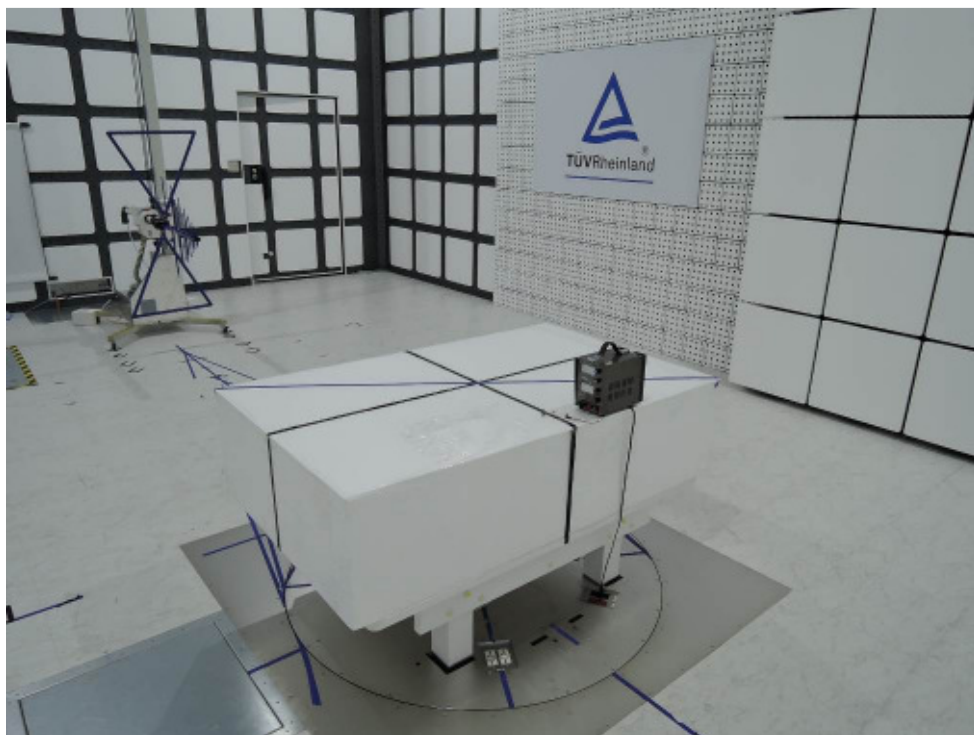
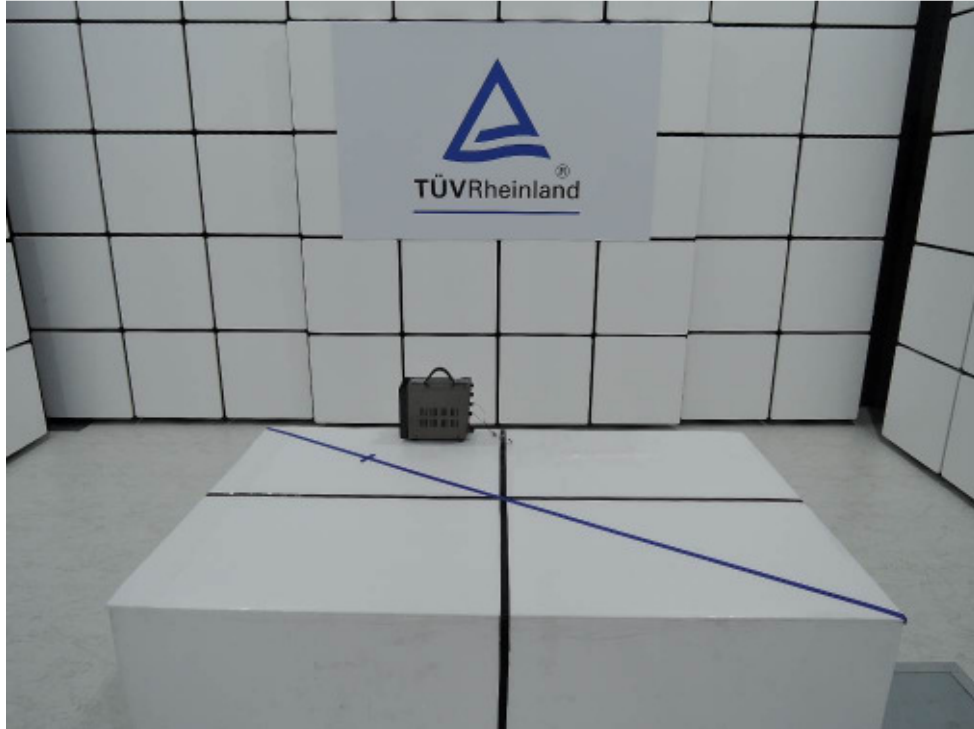
Note: The other peak readings were below average limit, thus no average measuring required for those.

6 Photographs of Test Setup

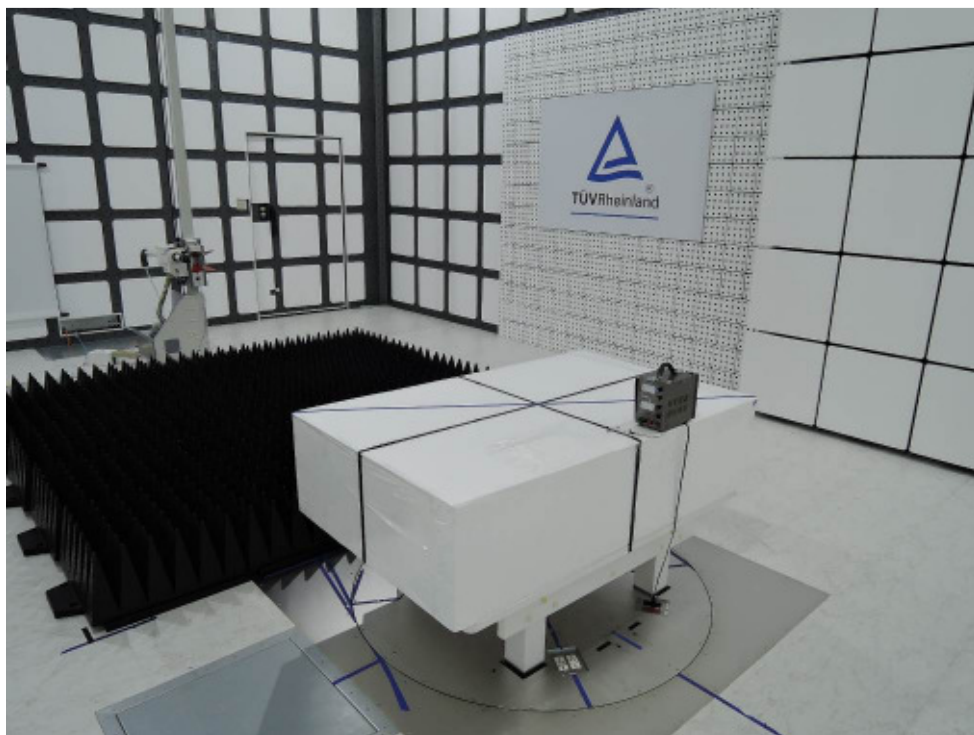
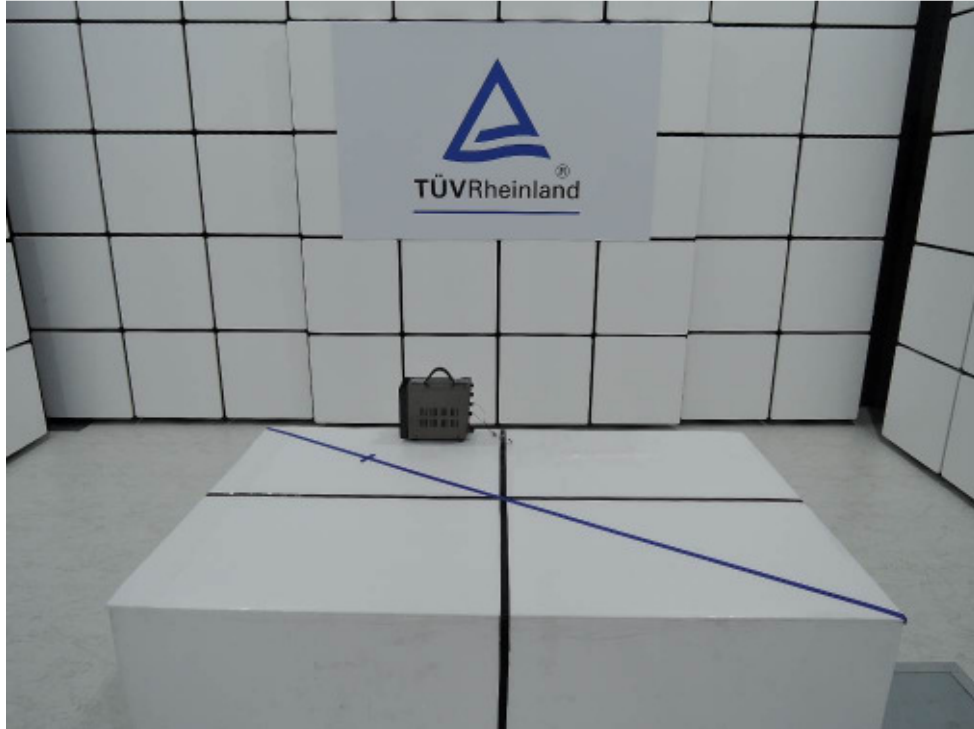
Picture 1: Conducted Emission, AC Mains; 0.15 – 30 MHz



Picture 2: Radiated Emission, 30 - 1000 MHz



Picture 3: Radiated Emission, Above 1 GHz



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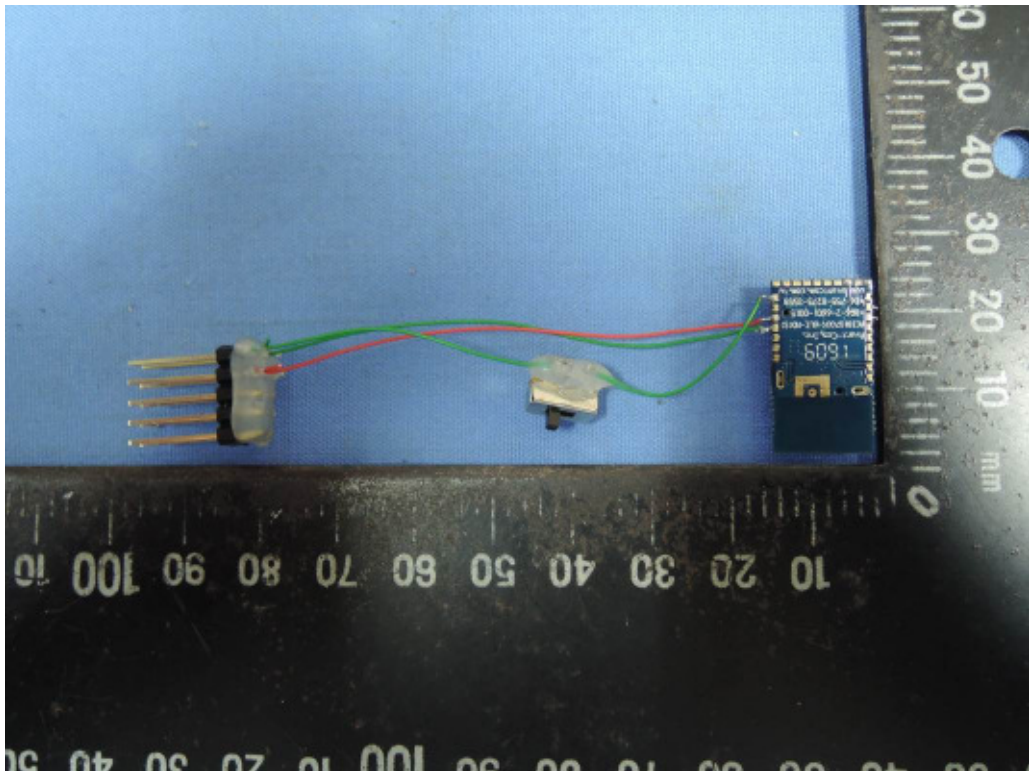
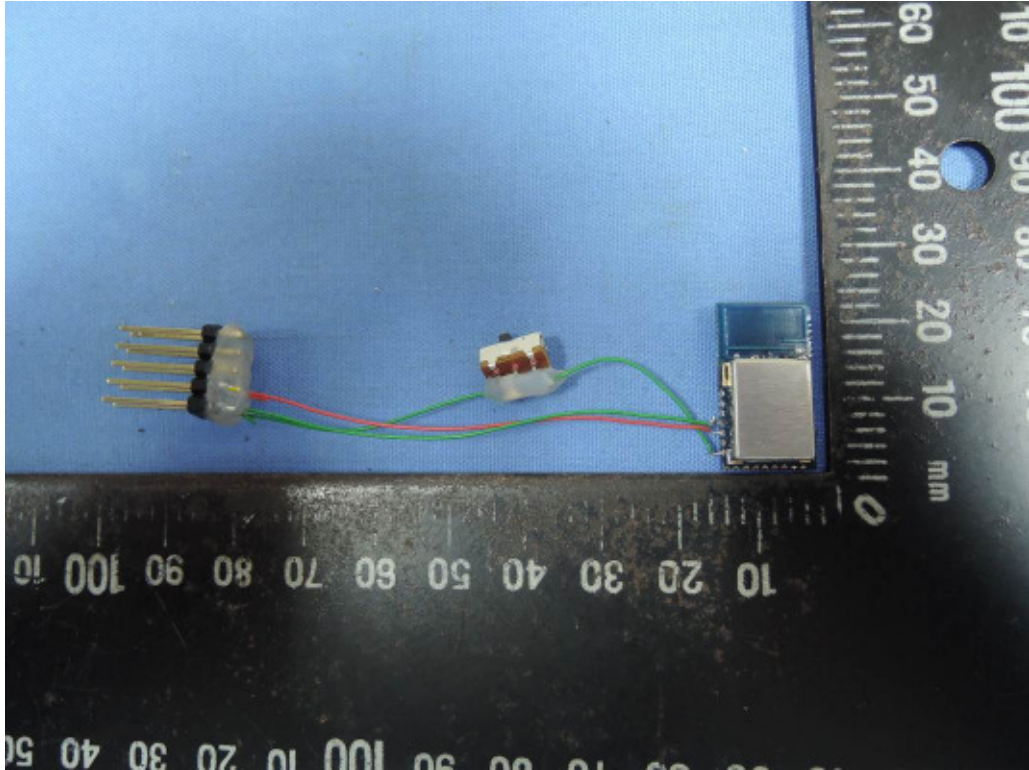
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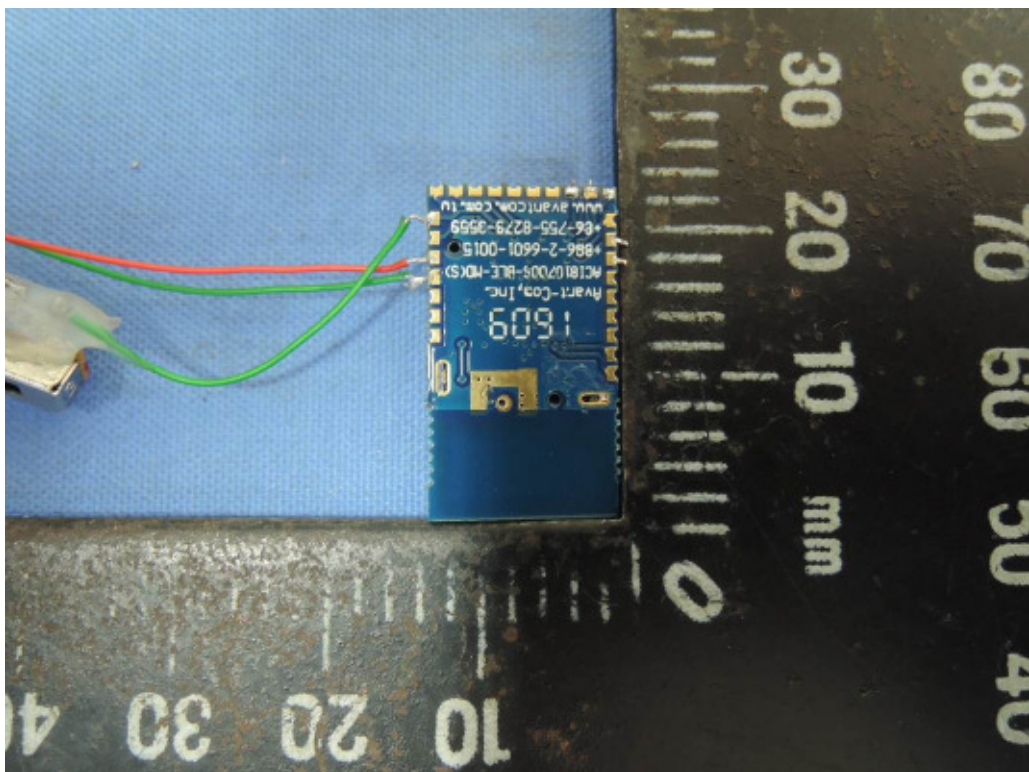
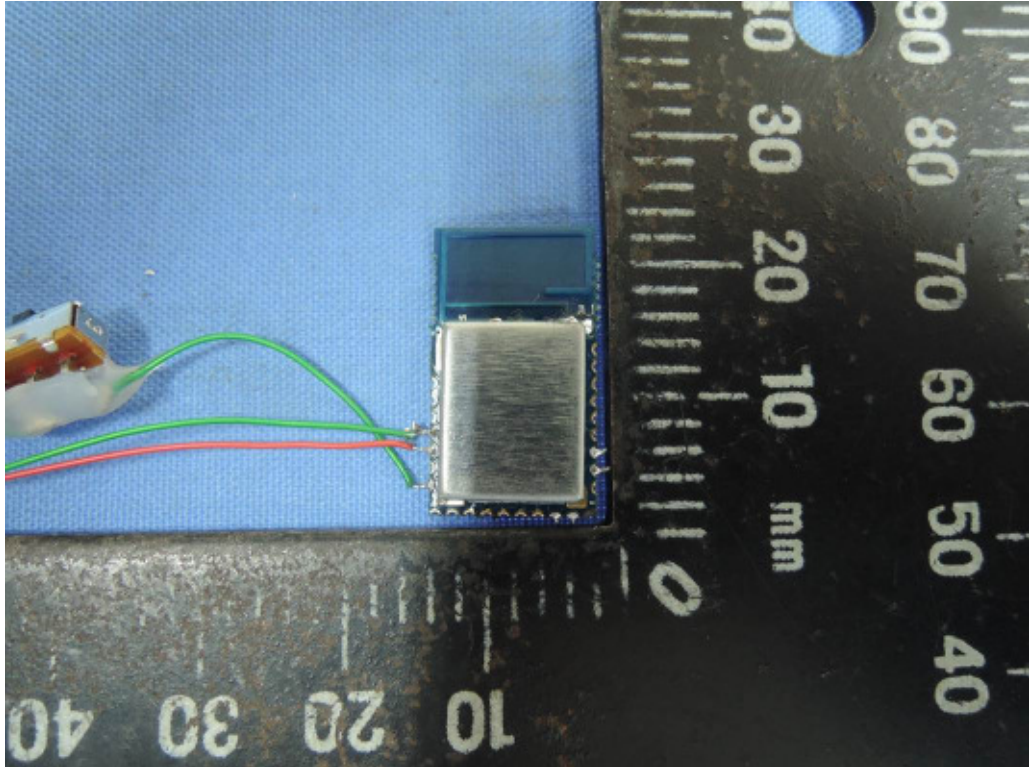
Product: Bluetooth module

Type Designation: ACI 8107



Product: Bluetooth module

Type Designation: ACI 8107



Product: Bluetooth module

Type Designation: ACI 8107

