

Prüfbericht-Nr.: <i>Test Report No.:</i>	50213594 001	Auftrags-Nr.: <i>Order No.:</i>	114085340	Seite 1 von 38 <i>Page 1 of 38</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	459883	Auftragsdatum: <i>Order date.:</i>	28 Dec. 2018	
Auftraggeber: <i>Client:</i>	AAEON Technology Inc. 5F., No. 135, Lane 235, Pao Chiao Rd., TW-23415 Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.			
Prüfgegenstand: <i>Test item:</i>	LoRa Long Range Node System, LoRa Long Range Node Board			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	xAIOT-ILND02x, xAIOT-ILND01x (x - Where x may be any combination of alphanumeric characters or "-" or blank for marketing purpose.)			
Auftrags-Inhalt: <i>Order content:</i>	TUV Rheinland - EMC service			
Prüfgrundlage: <i>Test specification:</i>	EN 55032: 2015 EN 55024: 2010+ A1: 2015			
Wareneingangsdatum: <i>Date of receipt:</i>	25 Jan. 2019			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000862828-003			
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: <div style="text-align: center; margin-top: 20px;">  08 Mar. 2019 Neil J. N. Tsai/ Senior Project Manager <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Datum</th> <th style="width: 35%;">Name/Stellung</th> <th style="width: 50%;">Unterschrift</th> </tr> <tr> <td><i>Date</i></td> <td><i>Name/Position</i></td> <td><i>Signature</i></td> </tr> </table> </div>	Datum	Name/Stellung	Unterschrift	<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	kontrolliert von / reviewed by: <div style="text-align: center; margin-top: 20px;">  08 Mar. 2019 Spring C. Y. Wang/ Department Manager <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Datum</th> <th style="width: 35%;">Name/Stellung</th> <th style="width: 50%;">Unterschrift</th> </tr> <tr> <td><i>Date</i></td> <td><i>Name/Position</i></td> <td><i>Signature</i></td> </tr> </table> </div>	Datum	Name/Stellung	Unterschrift	<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>
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<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>											

Sonstiges / Other:
 Class A device.

Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged
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* 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.

V04

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1 Test Site

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

1.1 Measurement Uncertainty

Testing Item	Frequency Range	Uncertainty
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 $k=2$.

2 Description of the Test Sample

2.1 General Description of Equipment

The tested samples are "LoRa Long Range Node System" and "LoRa Long Range Node Board" with model number "xAIOT-ILND02x" and "xAIOT-ILND01x" for new approval, which are LoRa Long Range Radio Node System.

Due to all model electrical constructions are similar, except for "xAIOT-ILND01x" is a board which build-in on system, one representative model with number "xAIOT-ILND02x" was tested only.

(x - Where x may be any combination of alphanumeric characters or "-" or blank for marketing purpose.)

2.2 Rating and Physical Characteristics

Type Designation:	xAIOT-ILND02x
Rating:	3.7Vdc battery
Protection Class:	III
Wireless Frequency:	863 - 870 MHz (LoRa function)

2.3 Sources of Interference

- 1) IC circuits

2.4 Noise Suppression Parts

Please refer to attachment documentation for details.

2.5 Submitted Documents

- 1) Product Specification

3 Measurement Conditions

3.1 Modes of Operation

The EUT was linked to Gateway via RoLa function, and the EUT was transmit signal to Gateway continued, then the Gateway used "The Things Network" web page to monitor the status.

The final mode:

- A. LoRa link by battery
- B. LoRa link by USB port

3.2 Additional Equipment

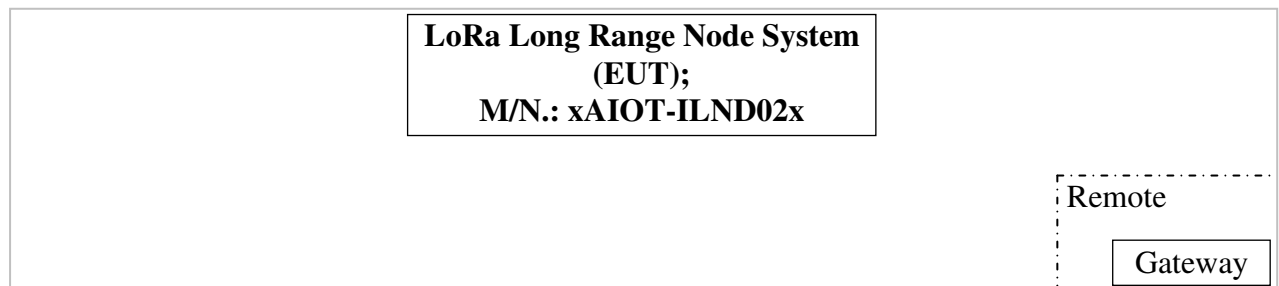
The subject sample was tested as an independent unit with the following equipment:

Description	Manufacturer	Model No.	Remark
Gateway	AAEON	UP-CHT01-A20-0464	N/A
USB Power Adapter	Apple	A1401	0012ADU00

3.3 Test Setup

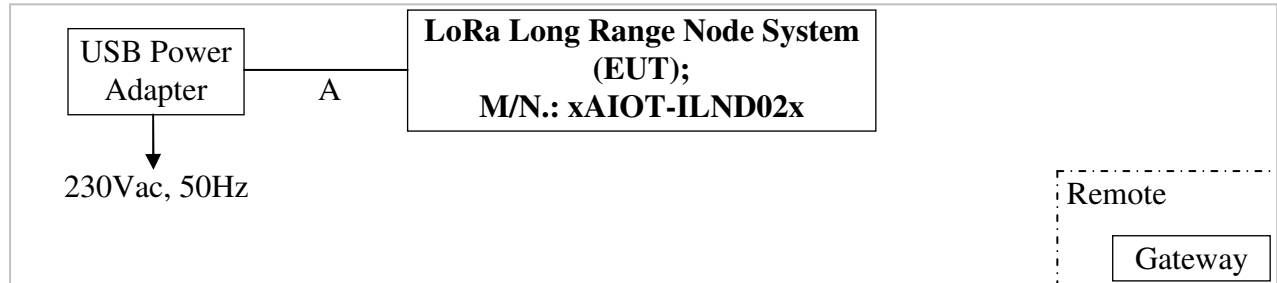
The test arrangement is configured and set according to manufacturer's installations.

Mode A:



Signal Cable Type		Signal Cable Description
A	N/A	N/A

Mode B:



Signal Cable Type		Signal Cable Description
A	USB cable	Shielding, 1m

3.4 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment
For EMI/Radiated Measurement (Taipei: Semi-Anechoic Chamber B)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	EMI Test Receiver	Rohde & Schwarz	ESR 7	101549	2018/11/12	2019/11/10
2	Spectrum Analyzer	Rohde & Schwarz	FSV-40	101112	2018/10/01	2019/10/01
3	Pre-Amplifier	Hewlett Packard	8447D	2944A09270	2018/08/31	2019/08/31
4	Pre-Amplifier	EM Electronics	EM01G18G	060649	2018/08/24	2019/08/24
5	Pre-Amplifier	EMC Instruments	EMC184045SE	980408	2018/06/08	2019/06/08
6	Bilog Antenna	TESEQ	CBL 6111D	29804	2018/07/02	2019/07/02
7	Horn Antenna	ETS-Lindgren	3117	00138160	2018/06/01	2019/06/01
8	Horn Antenna	Com-Power	AH-840	101029	2018/12/22	2019/12/22
9	Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/21	2019/06/21
10	Test Software	Audix	e3	Ver. 9	N/A	N/A

For EMS/Electrostatic Discharge Test (Taipei: Shield Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	ESD Simulator	TESEQ	NSG437	1259	2018/05/23	2019/05/23

For EMS/Radio-Frequency Electromagnetic Field Test (Taipei: Fully-Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	Signal Generator	Rohde & Schwarz	SMB-100A	104167	2018/08/23	2019/08/23
2	Power Amplifier (20-1GHz)	FRANKONIA	FLH-200B	1088	N.C.R.	N.C.R.
3	Power Amplifier (1-6GHz)	Bonn	BLMA1060-50D	108052	N.C.R.	N.C.R.
4	Broadband Antenna (30M-3GHz)	FRANKONIA	BTA-M	08009	N.C.R.	N.C.R.
5	Horn Antenna (0.7-10.5GHz)	FRANKONIA	MAX-9	MAX-9-801	N.C.R.	N.C.R.
6	Power Meter	FRANKONIA	PMS_1084	108B1251	2018/05/16	2019/05/16
7	2 Directional Coupler	AR	DC6180A	334572	N.C.R.	N.C.R.
8	Test Software	FRANKONIA	RF-LAB	Ver. 4.97	N/A	N/A

For EMS/Power Frequency Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	Inductive Coil	EMC-PARTNER	MF-1000-1	191	2018/08/27	2019/08/27
2	ELF Magnetic Field Meter	F.W. BELL	4190	1526001	2018/03/26	2019/03/26
3	RMS Clamp Multimeter	Chauvin Amoux	F15	N100866JAV	2018/08/30	2019/08/30

3.5 Abbreviations

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

3.6 Decision rule of conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in this test report, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty.

4 Test Results EMISSION

Result:	PASS
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4.1 Continuous Interference

4.1.1 Conducted Emission (AC Mains)

Port:	AC Mains
Product Standard:	EN 55032: 2015
Frequency Range:	0.15 – 30 MHz
Limits:	EN 55032: 2015, Table A.9, Class A

Result:	N/A
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The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

4.1.2 Conducted Emission (Telecommunication Ports)

Port:	Telecommunication Ports
Product Standard:	EN 55032: 2015
Frequency Range:	0.15 - 30 MHz
Limits:	EN 55032: 2015, Table A.11, Class A

Result:	N/A
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The subject sample has not telecommunication port. Therefore, this test is not applicable.

4.1.3 Radiated Emission (Below 1GHz)

Port:	Enclosure
Product Standard:	EN 55032: 2015
Frequency Range:	30 - 1000 MHz
Limits:	EN 55032: 2015, Table A.2, Class A (3m distance)

Result:	PASS
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Test Setup

Date of Test:	28 Jan. 2019 / 04 Mar. 2019
Input Voltage:	See 2.2
Operational Mode:	See 3.1
Temperature	23 °C / 21 °C
Relative Humidity	48 % / 51 %

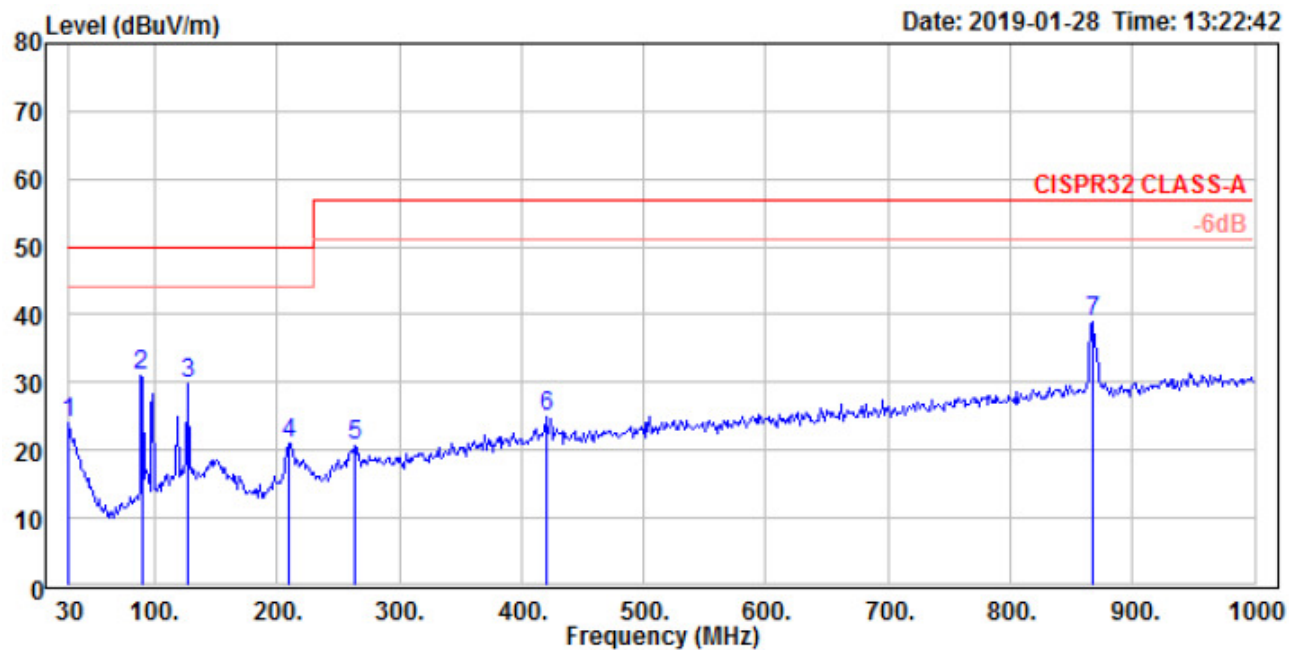
Table 2: Radiated Emission; 30 - 1000 MHz

Setting:

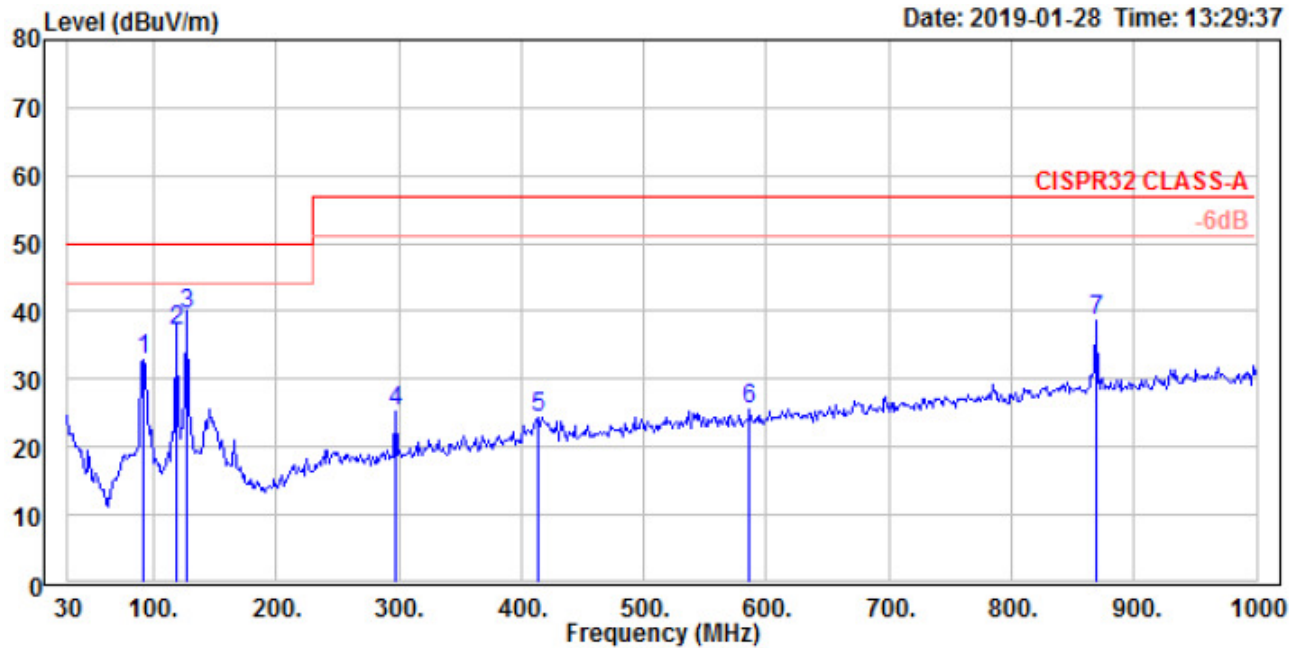
Frequency		Settings	
Start	Stop	IF Bandwidth	Detector
30 MHz	1 GHz	120 kHz	QP

Note1: Level = Reading(Read Level) + Factor
Margin(Over Limit) = Level – Limit(Limit Line)

Note2: Factor= Antenna factor + Cable loss + (- Amplifier gain)

Figure 1: Radiated Emission; 30 – 1000 MHz (Mode A)
Horizontal


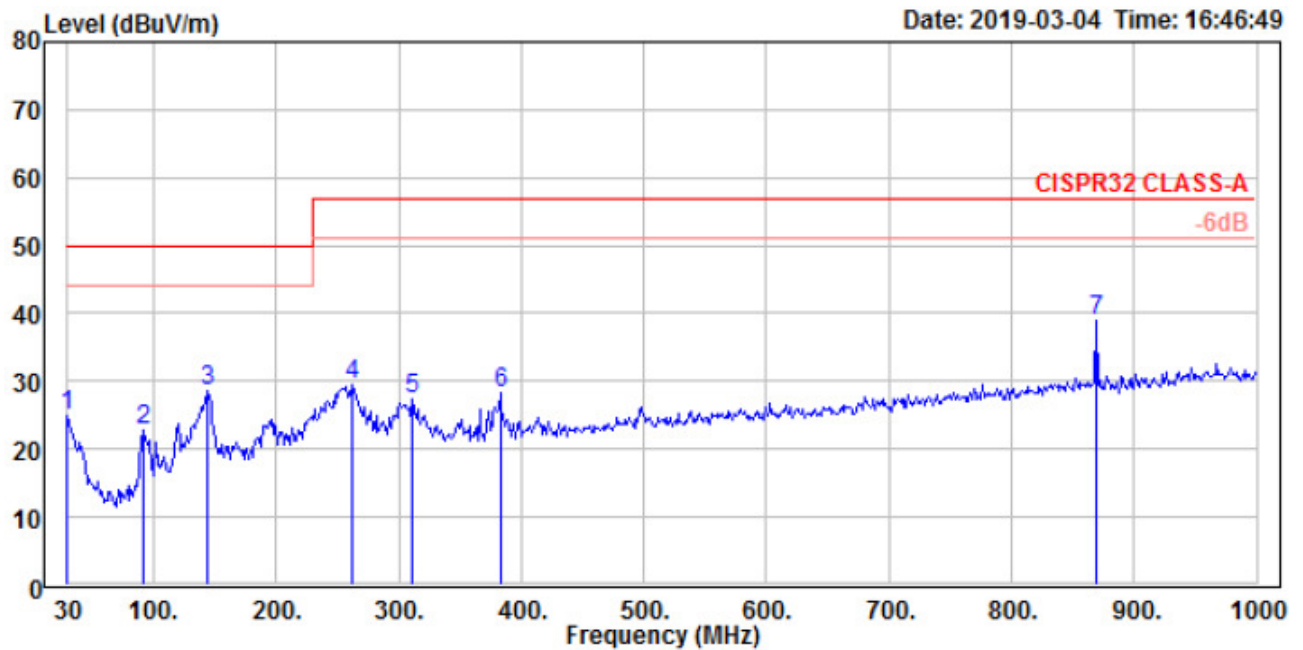
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	30.000	24.04	27.32	-3.28	50.00	-25.96	100	244	QP
2	89.043	30.91	45.23	-14.32	50.00	-19.09	100	0	QP
3	127.000	29.83	40.30	-10.47	50.00	-20.17	200	287	QP
4	209.942	21.01	33.08	-12.07	50.00	-28.99	100	181	QP
5	263.362	20.75	29.23	-8.48	57.00	-36.25	300	344	QP
6	420.812	24.80	30.34	-5.54	57.00	-32.20	100	105	QP
7	867.855	38.79	37.21	1.58	57.00	-18.21	200	360	QP

Vertical


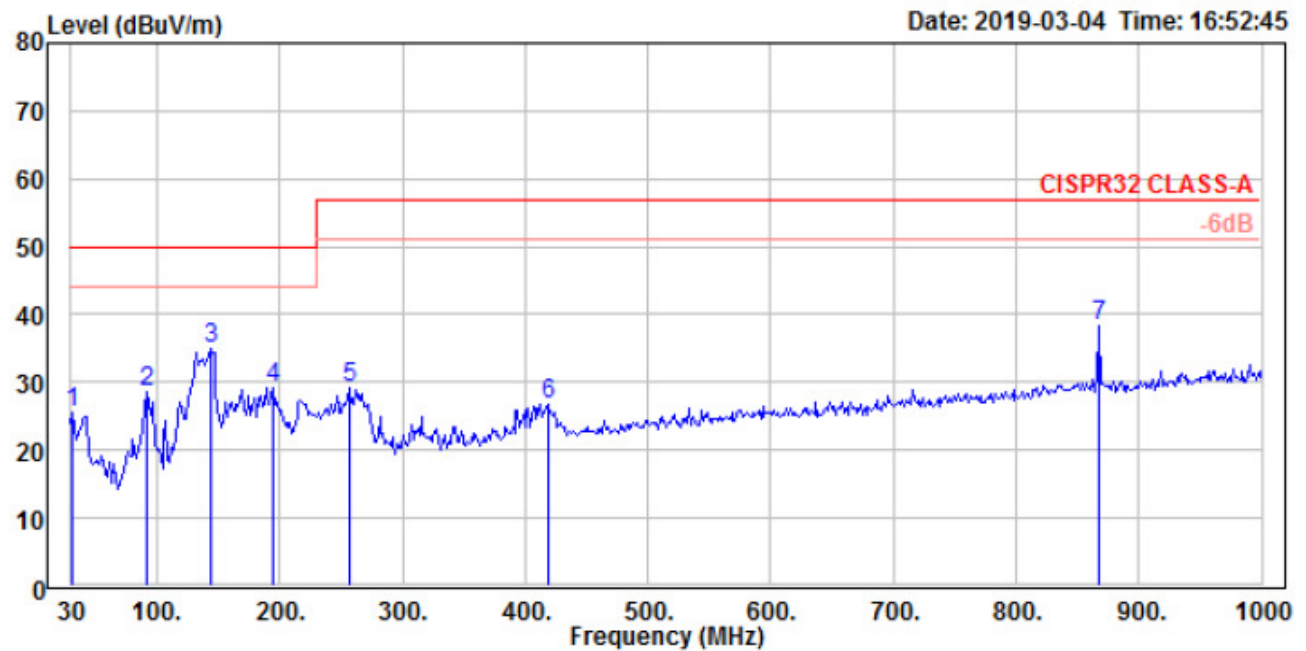
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	91.855	32.82	46.75	-13.93	50.00	-17.18	100	7	QP
2	118.565	37.10	48.01	-10.91	50.00	-12.90	100	2	QP
3	127.000	39.63	50.10	-10.47	50.00	-10.37	100	131	QP
4	297.101	25.24	33.31	-8.07	57.00	-31.76	100	58	QP
5	413.783	24.46	30.05	-5.59	57.00	-32.54	200	4	QP
6	586.696	25.61	28.74	-3.13	57.00	-31.39	100	243	QP
7	869.261	38.66	37.08	1.58	57.00	-18.34	100	62	QP

Figure 2: Radiated Emission; 30 – 1000 MHz (Mode B)

Horizontal



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	30.000	24.96	28.24	-3.28	50.00	-25.04	200	339	QP	
2	91.855	22.74	36.67	-13.93	50.00	-27.26	200	5	QP	
3	143.870	28.59	39.01	-10.42	50.00	-21.41	200	223	QP	
4	261.957	29.52	37.93	-8.41	57.00	-27.48	100	265	QP	
5	311.159	27.37	35.09	-7.72	57.00	-29.63	100	257	QP	
6	382.855	28.27	34.29	-6.02	57.00	-28.73	100	360	QP	
7	869.261	38.90	37.32	1.58	57.00	-18.10	200	128	QP	TX

Vertical


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	31.406	25.45	29.55	-4.10	50.00	-24.55	100	2	QP	
2	91.855	28.49	42.42	-13.93	50.00	-21.51	100	358	QP	
3	143.870	34.89	45.31	-10.42	50.00	-15.11	100	106	QP	
4	194.478	29.24	41.83	-12.59	50.00	-20.76	100	59	QP	
5	256.333	29.22	37.84	-8.62	57.00	-27.78	200	157	QP	
6	419.406	26.81	32.37	-5.56	57.00	-30.19	100	244	QP	
7	867.855	38.45	36.87	1.58	57.00	-18.55	200	172	QP	TX

4.1.4 Radiated Emission (Above 1GHz)

Port:	Enclosure
Product Standard:	EN 55032: 2015
Frequency Range:	1 - 6 GHz
Limits:	EN 55032: 2015, Table A.3, Class A

Result:
PASS

The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes.

- ☐ highest frequency is less than 108MHz, measurement shall only be made up to 1GHz
☐ highest frequency is between 108 & 500MHz, measurement shall only be made up to 2GHz
☐ highest frequency is between 500 & 1GHz, measurement shall only be made up to 5GHz
☒ highest frequency is above 1GHz, measurement shall be made up to 5 times the highest frequency or 6GHz, whichever is less.

Test Setup

Date of Test:	28 Jan. 2019 / 04 Mar. 2019
Input Voltage:	See 2.2
Operational Mode:	See 3.1
Temperature	23 °C / 21 °C
Relative Humidity	48 % / 51 %

Table 3: Radiated Emission, Above 1 GHz

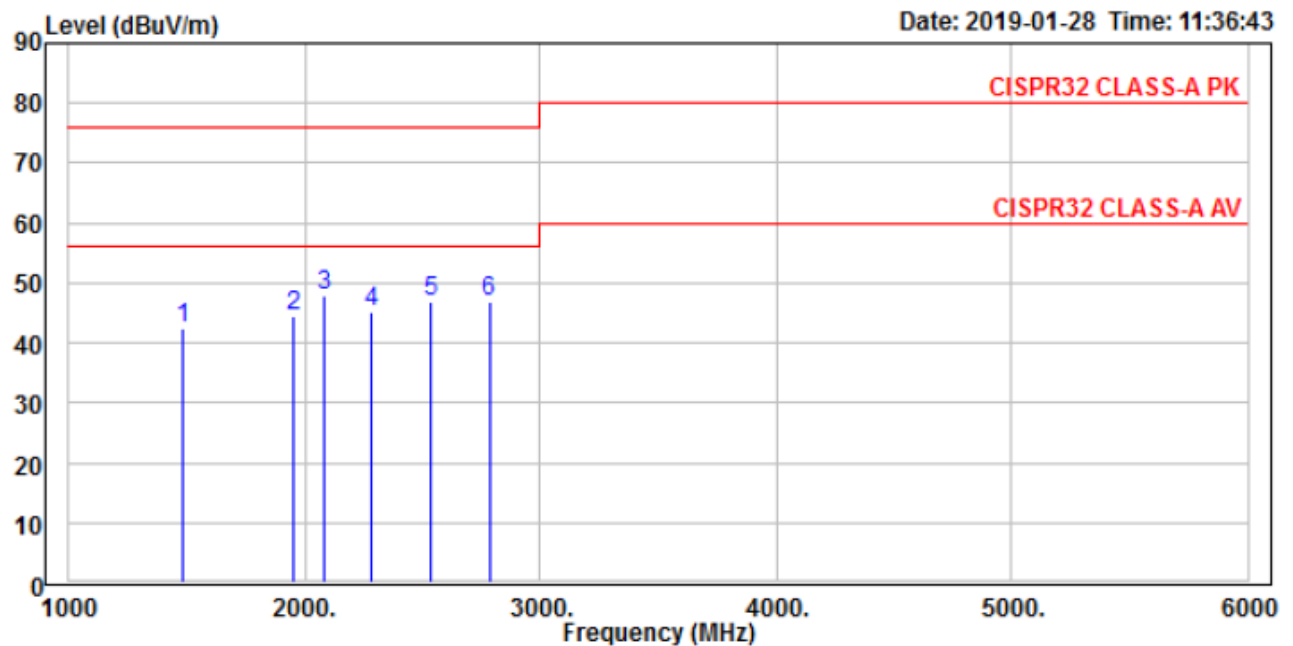
Setting:

Frequency		Settings	
Start	Stop	IF Bandwidth	Detector
1 GHz	6 GHz	1 MHz	Peak/Average

Note1: The highest frequency is 2.4GHz for BT function, measuring up to 6GHz.

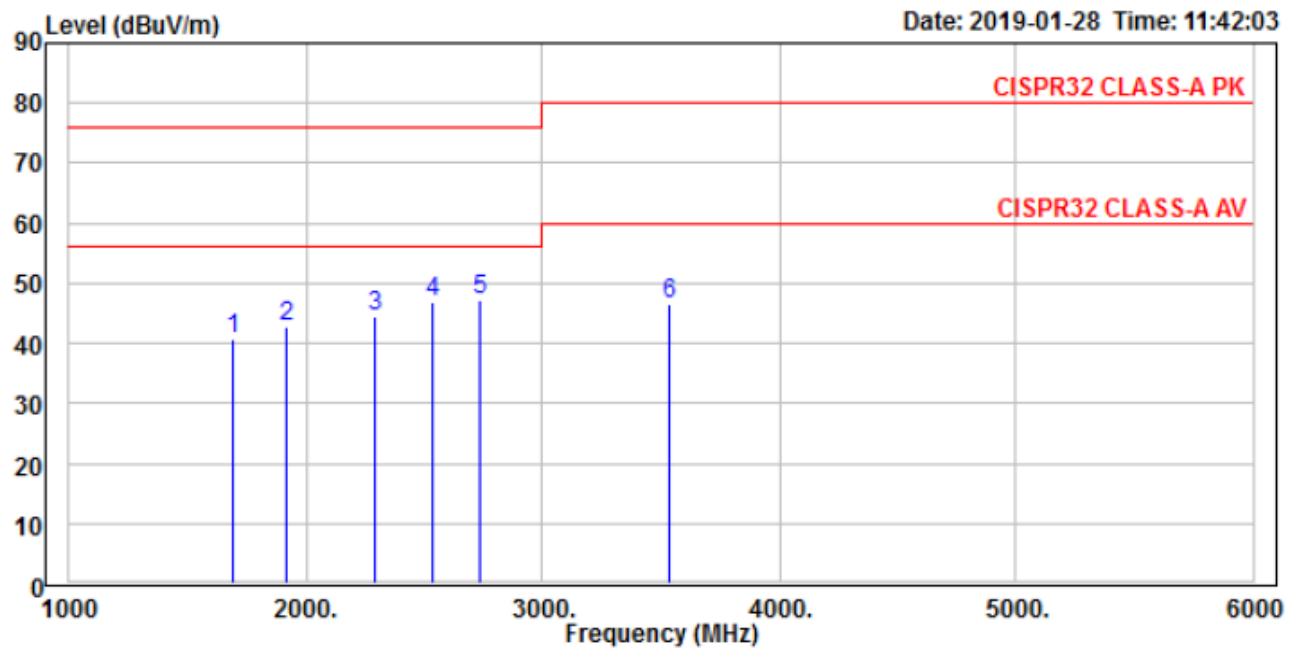
Note2: Level = Reading(Read Level) + Factor
 Margin(Over Limit) = Level – Limit(Limit Line)

Note3: Factor= Antenna factor + Cable loss + (- Amplifier gain)

Figure 3: Radiated Emission; Above 1 GHz (Mode A)
Horizontal


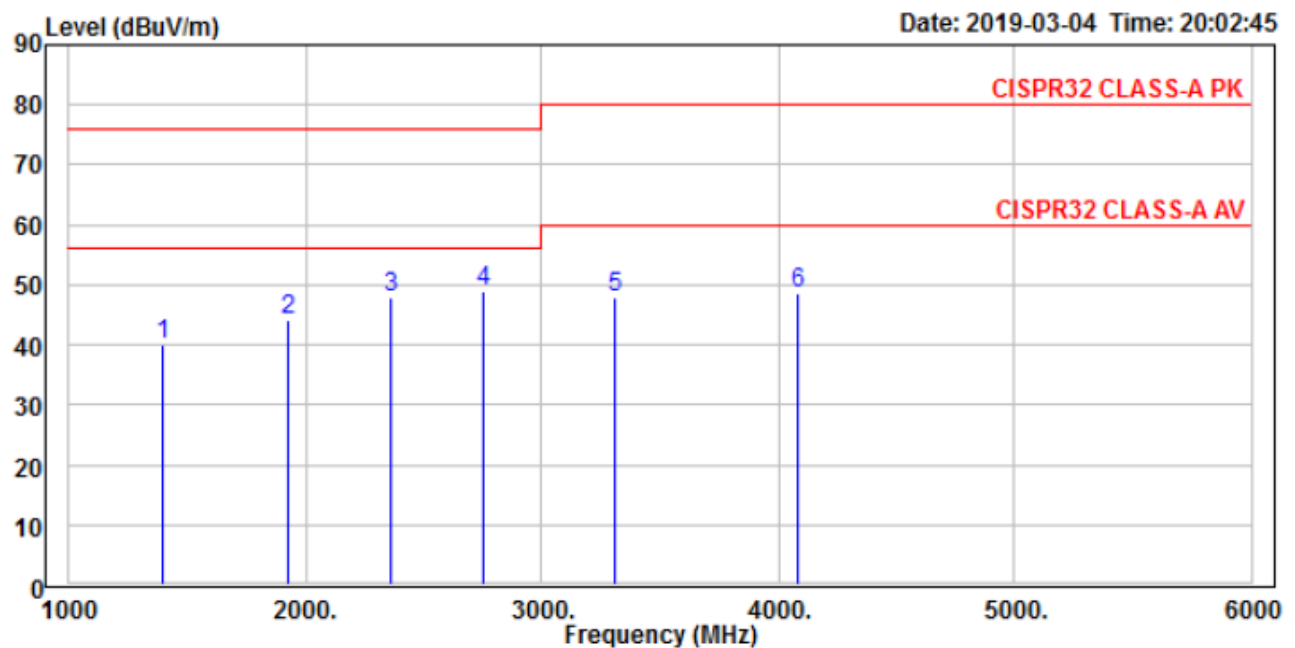
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	1485.507	42.50	50.65	-8.15	76.00	-33.50	100	97	Peak
2	1949.275	44.36	48.18	-3.82	76.00	-31.64	100	0	Peak
3	2079.710	47.94	50.98	-3.04	76.00	-28.06	100	29	Peak
4	2282.609	45.07	47.48	-2.41	76.00	-30.93	100	57	Peak
5	2536.232	46.77	48.20	-1.43	76.00	-29.23	100	290	Peak
6	2782.609	47.04	47.61	-0.57	76.00	-28.96	100	360	Peak

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

Vertical


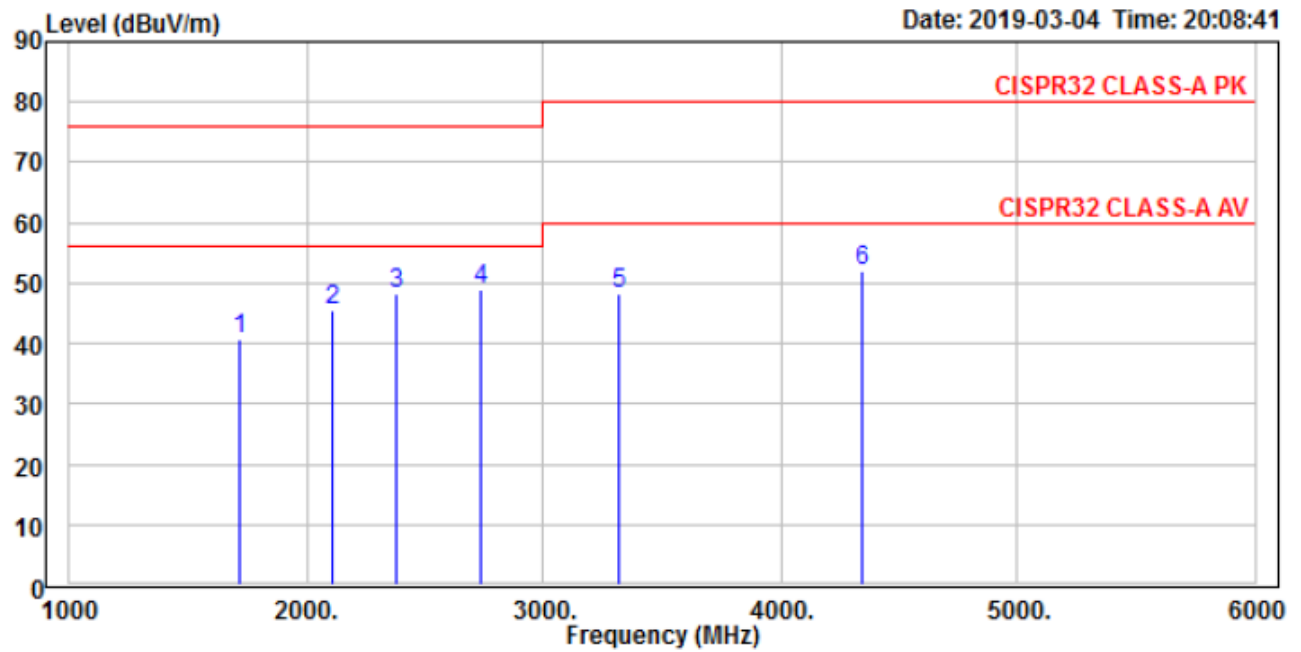
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	1695.652	40.83	47.13	-6.30	76.00	-35.17	100	134	Peak
2	1920.290	42.61	46.69	-4.08	76.00	-33.39	100	329	Peak
3	2289.855	44.53	46.89	-2.36	76.00	-31.47	100	167	Peak
4	2536.232	46.99	48.42	-1.43	76.00	-29.01	100	119	Peak
5	2739.130	47.25	47.93	-0.68	76.00	-28.75	100	155	Peak
6	3536.232	46.60	45.19	1.41	80.00	-33.40	100	1	Peak

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

Figure 4: Radiated Emission; Above 1 GHz (Mode B)
Horizontal


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	1398.551	40.14	47.98	-7.84	76.00	-35.86	100	168	Peak	
2	1927.536	44.09	48.09	-4.00	76.00	-31.91	100	14	Peak	
3	2362.319	47.85	49.75	-1.90	76.00	-28.15	200	357	Peak	
4	2753.623	48.78	49.43	-0.65	76.00	-27.22	100	358	Peak	
5	3311.594	47.95	47.04	0.91	80.00	-32.05	100	314	Peak	
6	4079.710	48.64	45.84	2.80	80.00	-31.36	200	303	Peak	

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

Vertical


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	1717.391	40.86	46.99	-6.13	76.00	-35.14	100	14	Peak	
2	2108.696	45.35	48.30	-2.95	76.00	-30.65	100	354	Peak	
3	2376.812	48.24	50.08	-1.84	76.00	-27.76	100	312	Peak	
4	2731.884	48.87	49.57	-0.70	76.00	-27.13	100	3	Peak	
5	3318.841	48.28	47.40	0.88	80.00	-31.72	100	108	Peak	
6	4340.580	52.18	48.33	3.85	80.00	-27.82	100	231	Peak	

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

4.2 Disturbances in Supply Systems

4.2.1 Harmonics

Port:	AC Mains
Basic Standard:	EN 61000-3-2: 2014
Limits:	EN 61000-3-2: 2014, clause 7

Result:	N/A
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The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

4.2.2 Voltage Fluctuations

Port:	AC Mains
Basic Standard:	EN 61000-3-3: 2013
Limits:	EN 61000-3-3: 2013, clause 5

Result:	N/A
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The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

5 Test Results I M M U N I T Y

Result:	PASS
----------------	-------------

5.1 Enclosure Port

5.1.1 Radiated Susceptibility

Port:	Enclosure	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-3:2006	
Performance Criteria:	A	
Test Specification:	Frequency Range:	80 - 1000 MHz
	Field Strength	3 V/m (unmodulated)
	Modulation:	1kHz AM 80%

Result:	PASS
----------------	-------------

Test Setup

Date of Test:	31 Jan. 2019 / 05 Mar. 2019
Input Voltage:	See 2.2
Operational Mode:	See 3.1
Temperature	21 °C / 23 °C
Relative Humidity	50 % / 49 %

Table 4: Radiated Susceptibility (Mode A & B)

Setting:

Freq.	Freq. Step	Field Strength	Sweep mode	Meas. Time	Modulation	Observation	Result
80 – 1000 MHz	1% of the Preceding freq.	3 V/m	auto	3000 ms	1 kHz, AM 80%	Normal function	PASS

No abnormalities were observed during and after the tests.

5.1.2 Electrostatic Discharge

Port:	Enclosure	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-2:2008	
Performance Criteria:	B	
Test Specification:	Voltage:	8 kV (Air Discharge) 4 kV (Contact Discharge) H.C.P. and V.C.P.

Result:	PASS
----------------	-------------

Test Setup

Date of Test:	01 Feb. 2019 / 06 Mar. 2019
Input Voltage:	See 2.2
Operational Mode:	See 3.1
Temperature	21.4 °C / 20.8 °C
Relative Humidity	57 % / 52 %

Table 5: Electrostatic Discharge (Mode A & B)

Setting:

Test point	Polarity	Number of Discharges	Observation	Result
H.C.P.	+/- 4 kV	50	normal function	PASS
V.C.P.	+/- 4 kV	50	normal function	PASS

No abnormalities were observed during and after the tests.

Note 1: For EN 55024, the total contact discharges were 200 times.

Note 2: The testing was performed by air (+/- 8 kV) and contact (+/- 4 kV) method but there was no discharge to the EUT except for points in the table shown above.

5.1.3 Power Frequency Magnetic Field

Port:	Enclosure	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-8:2009	
Performance Criteria:	A	
Test Specification:	Frequency:	50Hz
	Magnetic Field Strength	1 A/m

Result:	PASS
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Test Setup

Date of Test:	01 Feb. 2019 / 06 Mar. 2019
Input Voltage:	See 2.2
Operational Mode:	See 3.1
Temperature	21.3 °C / 21.1 °C
Relative Humidity	56 % / 56 %

Table 6: Power Frequency Magnetic Field (Mode A & B)
Setting:

Directions	Magnetic field strength	Test Frequency	Observation	Results
X axis	1 A/m	50 Hz	normal function	PASS
Y axis	1 A/m	50 Hz	normal function	PASS
Z axis	1 A/m	50 Hz	normal function	PASS

No abnormalities were observed during and after the tests.

5.2 Input and Output AC Power Ports

5.2.1 Conducted Disturbances

Port:	AC Mains	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-6:2008	
Performance Criteria:	A	
Test Specification:	Frequency Range:	0.15 - 80 MHz
	Voltage Level:	3 Vrms (unmodulated)
	Modulation:	AM 80%, 1kHz sine wave

Result:	N/A
----------------	------------

The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

5.2.2 Electrical Fast Transients

Port:	AC Mains	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-4:2004	
Performance Criteria:	B	
Test Specification:	Peak Voltage:	1.0 kV
	T _r /T _n	5/50 ns
	Rep. Frequency	5 kHz

Result:	N/A
----------------	------------

The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

5.2.3 Surges

Port:	AC Mains	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-5:2005	
Performance Criteria:	B	
Test Specification:	Peak Voltage:	1.0 kV (line to line) 2.0 kV (line to ground)
	T_r/T_h	1,2/50 μ s

Result:
N/A

The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

5.2.4 Voltage Dips and Interruptions

Port:	AC Mains	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-11:2004	
Performance Criteria:	B (for >95%, 0.5 period) C (for 30 %, 25 periods) C (for >95%, 250 periods)	
Test Specification:	Test Level:	>95% UT for Voltage Reductions, no. of 0.5 period 30% UT for Voltage Reductions, no. of 25 period >95% UT for Voltage Reductions, no. of 250 period

Result:
N/A

The subject sample is not intended to be connected to AC mains supply. Therefore, this test is not applicable.

5.3 Signal and Telecommunication Port

5.3.1 Conducted Disturbances

Port:	Signal / Telecommunication Port	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-6:2008	
Performance Criteria:	A	
Test Specification:	Frequency Range: Voltage Level	0.15 - 80 MHz 3 Vrms (unmodulated) AM 80%, 1kHz sine wave

Result:
N/A

All signal lines of the sample are not exceeding 3m during normal operation. Therefore this test item is not applicable.

5.3.2 Electrical Fast Transients

Port:	Signal / Telecommunication Port	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-4:2004	
Performance Criteria:	B	
Test Specification:	Peak Voltage: T_r/T_n Rep. Frequency	0.5 kV 5/50 ns 5 kHz

Result:
N/A

All signal lines of the sample are not exceeding 3m during normal operation. Therefore this test item is not applicable.

5.3.3 Surges

Port:	Signal / Telecommunication port	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-5:2004	
Performance Criteria:	B	
Test Specification:	Peak Voltage:	1.0 kV
	T _r /T _h	1,2/50 µs

Result:**N/A**

The subject sample is not connected directly to outdoor cable. Therefore, this test is not applicable.

5.4 Input DC Power Ports

5.4.1 Conducted Disturbances

Port:	Input DC ports	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-6:2008	
Performance Criteria:	A	
Test Specification:	Frequency Range: Voltage Level	0.15 - 80 MHz 3 Vrms (unmodulated) AM 80%, 1kHz sine wave

Result:	N/A
----------------	------------

This test is applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification exceeds 3m. All signal lines of the sample are not exceeding 3m during normal operation. Therefore this test item is not applicable.

5.4.2 Fast Transients Common Mode

Port:	Input DC Ports	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-4:2004	
Performance Criteria:	B	
Test Specification:	Peak Voltage: Tr/Th: Rep. Frequency:	0.5kV 5/ 50ns 5 kHz

Result:	N/A
----------------	------------

This test is applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification exceeds 3m. All signal lines of the sample are not exceeding 3m during normal operation. Therefore this test item is not applicable.

5.4.3 Surges

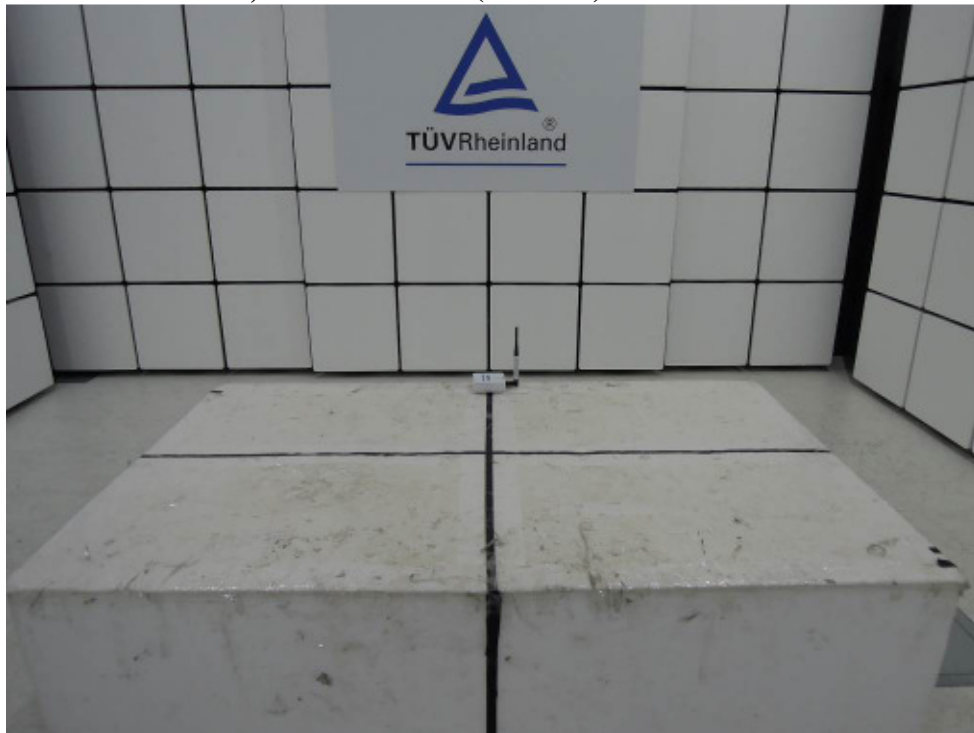
Port:	Input DC Ports	
Product Standard:	EN 55024: 2010+ A1: 2015	
Basic Standard:	IEC 61000-4-5:2004	
Performance Criteria:	B	
Test Specification:	Peak Voltage:	0.5 kV (lines to ground)
	Tr/Th:	1,2/ 50µs

Result:**N/A**

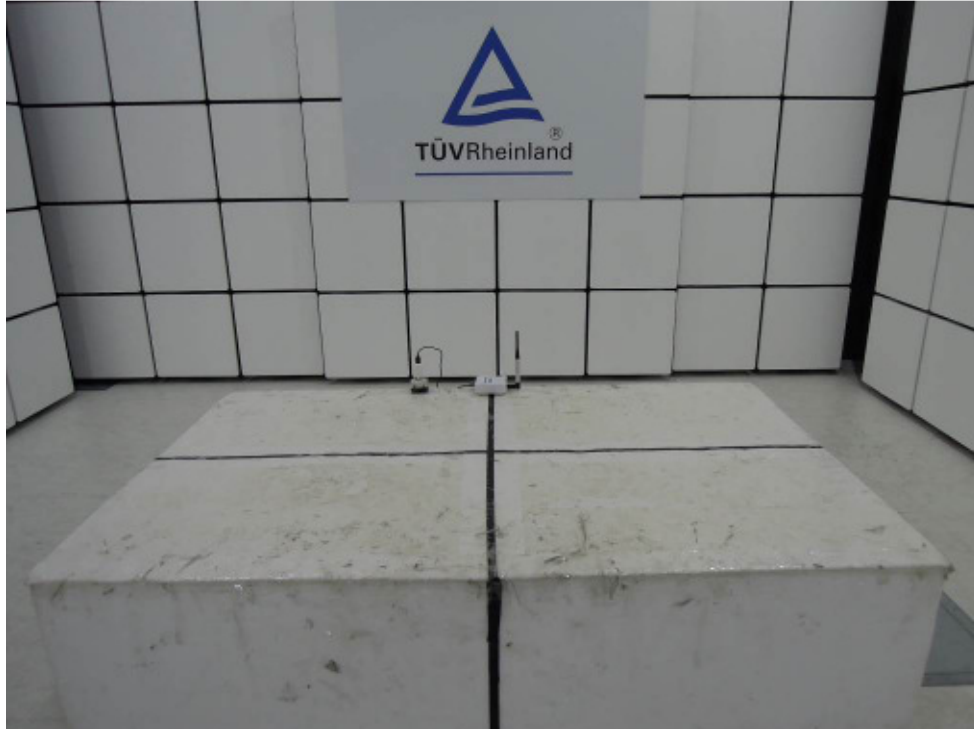
The subject sample is not connected directly to outdoor cable. Therefore, this test is not applicable.

6 Photographs of the Test Set-up

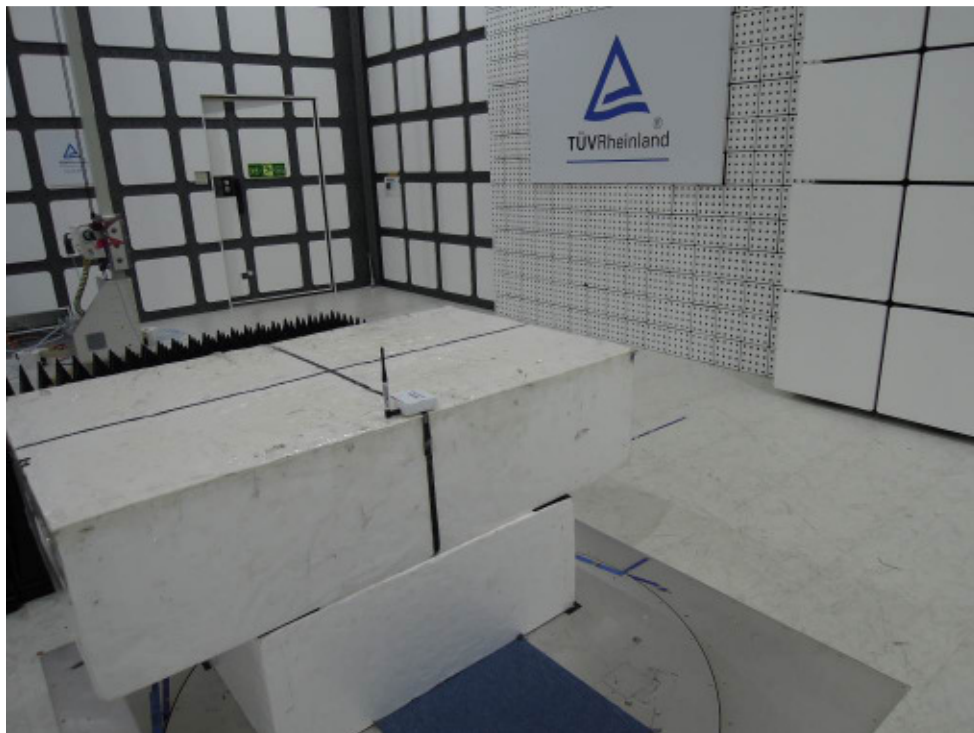
Picture 1: Radiated Emission, 30 - 1000 MHz (Mode A)



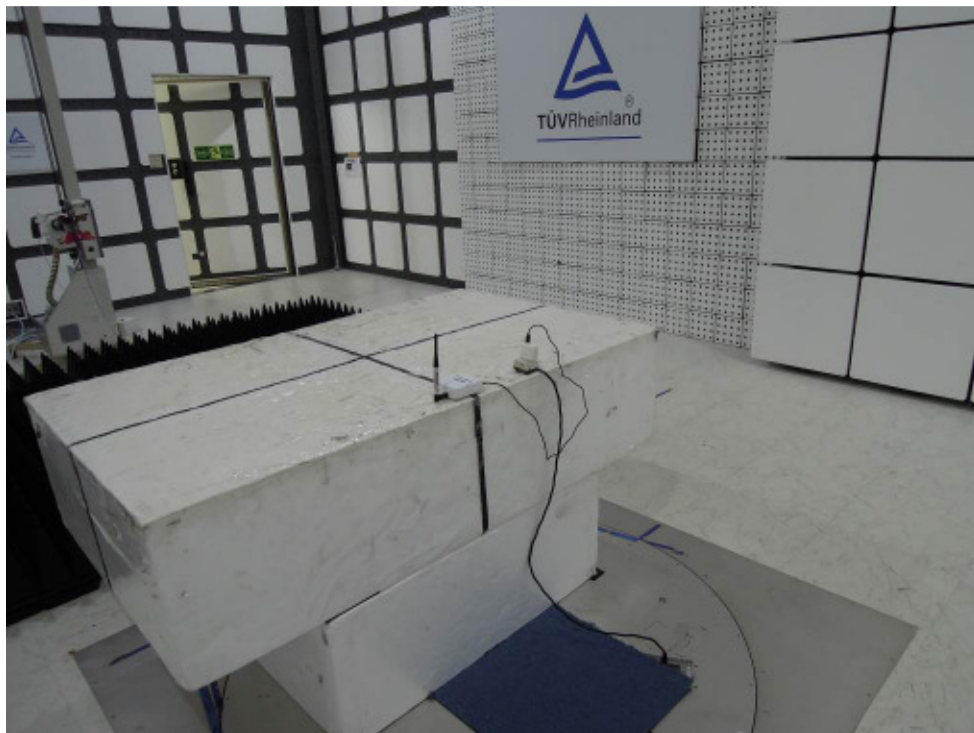
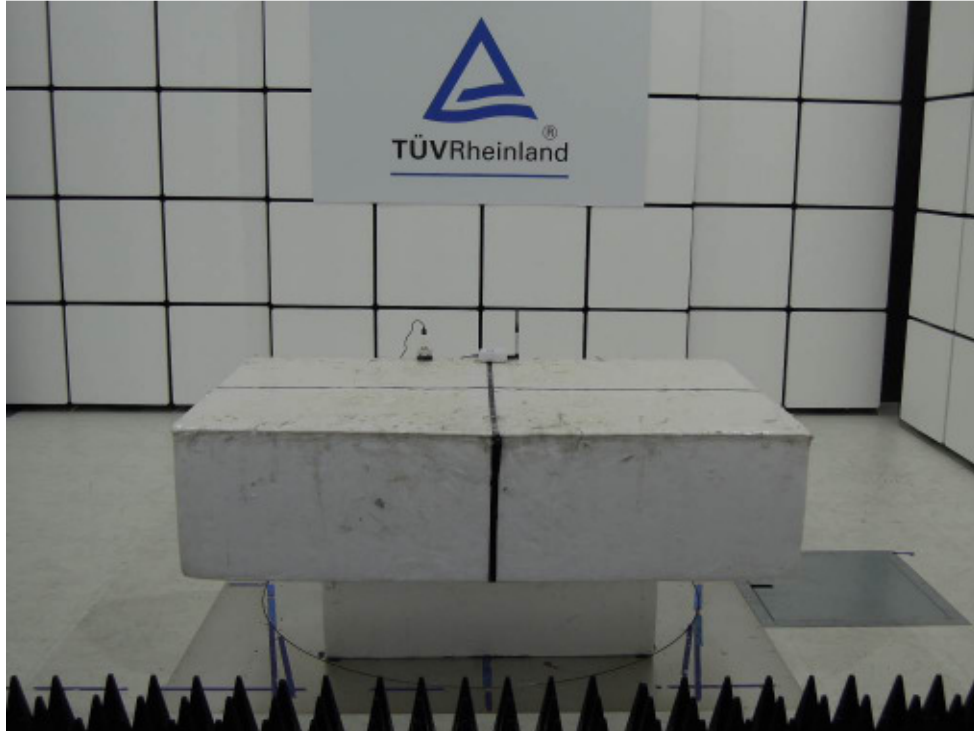
Picture 2: Radiated Emission, 30 - 1000 MHz (Mode B)



Picture 3: Radiated Emission, Above 1 GHz (Mode A)



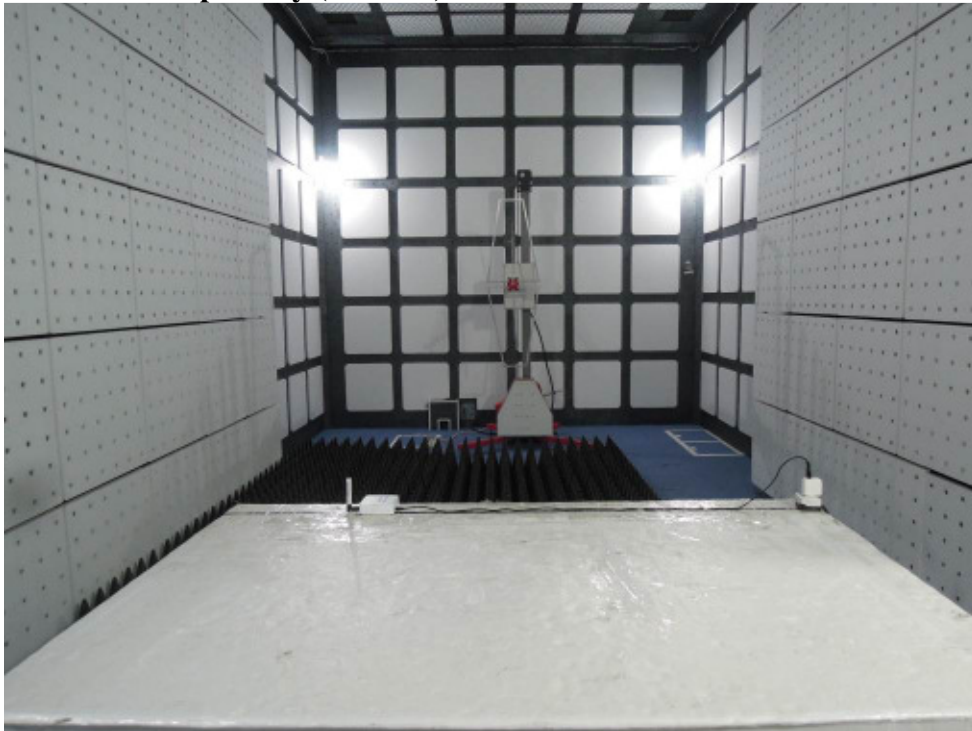
Picture 4: Radiated Emission, Above 1 GHz (Mode B)



Picture 5: Radiated Susceptibility (Mode A)



Picture 6: Radiated Susceptibility (Mode B)



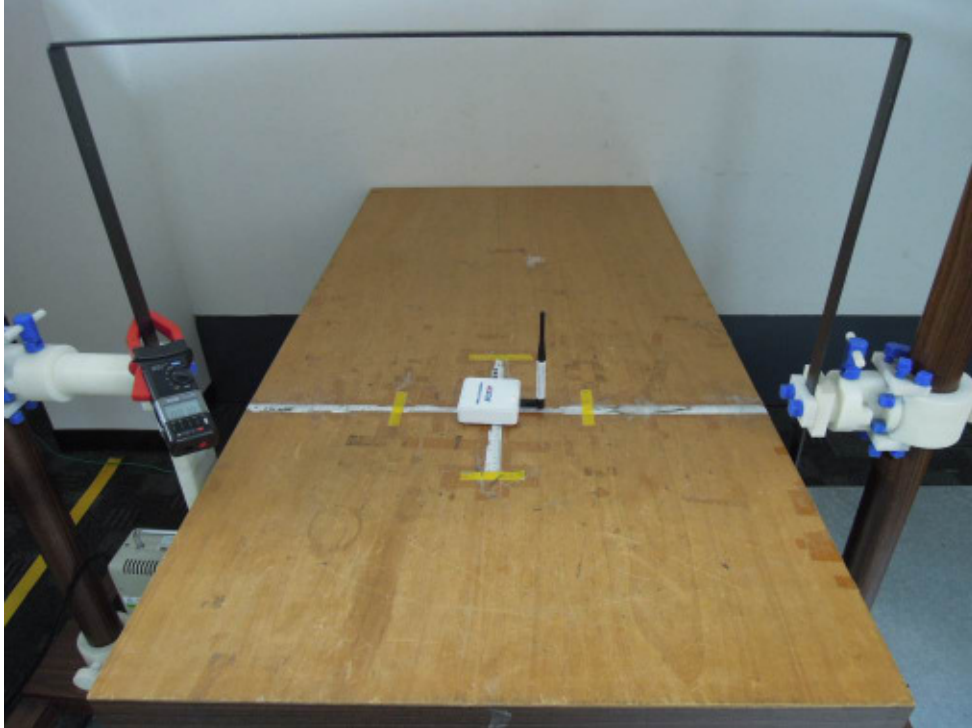
Picture 7: Electrostatic Discharge (Mode A)



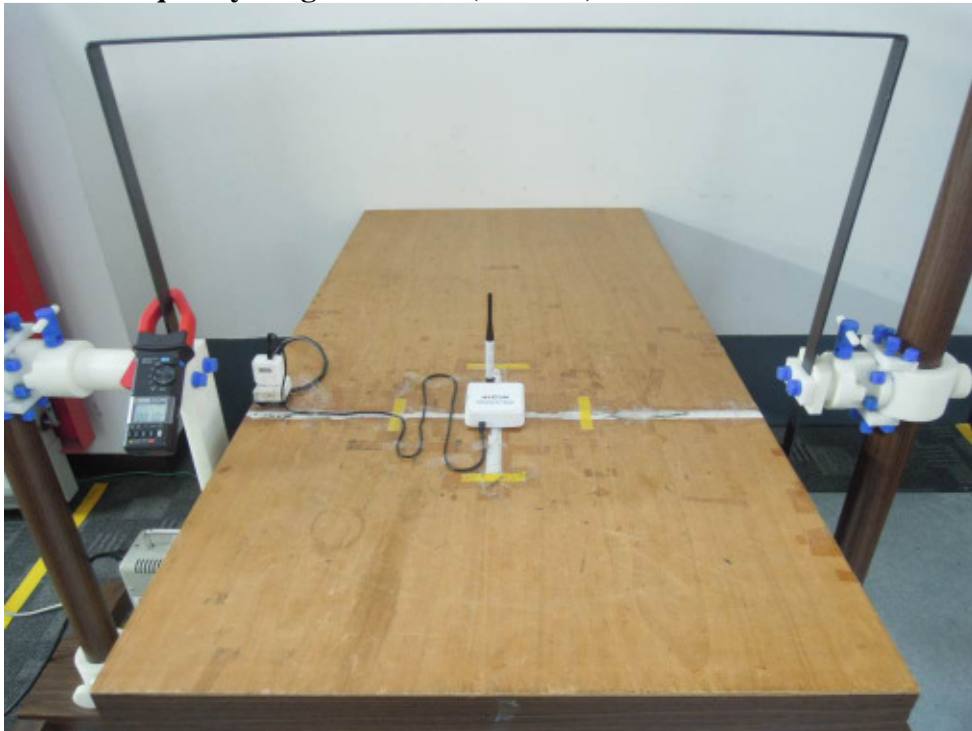
Picture 8: Electrostatic Discharge (Mode B)



Picture 9: Power Frequency Magnetic Field (Mode A)



Picture 10: Power Frequency Magnetic Field (Mode B)



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PICTURE 9: POWER FREQUENCY MAGNETIC FIELD (MODE A)..... 36

PICTURE 10: POWER FREQUENCY MAGNETIC FIELD (MODE B)..... 36

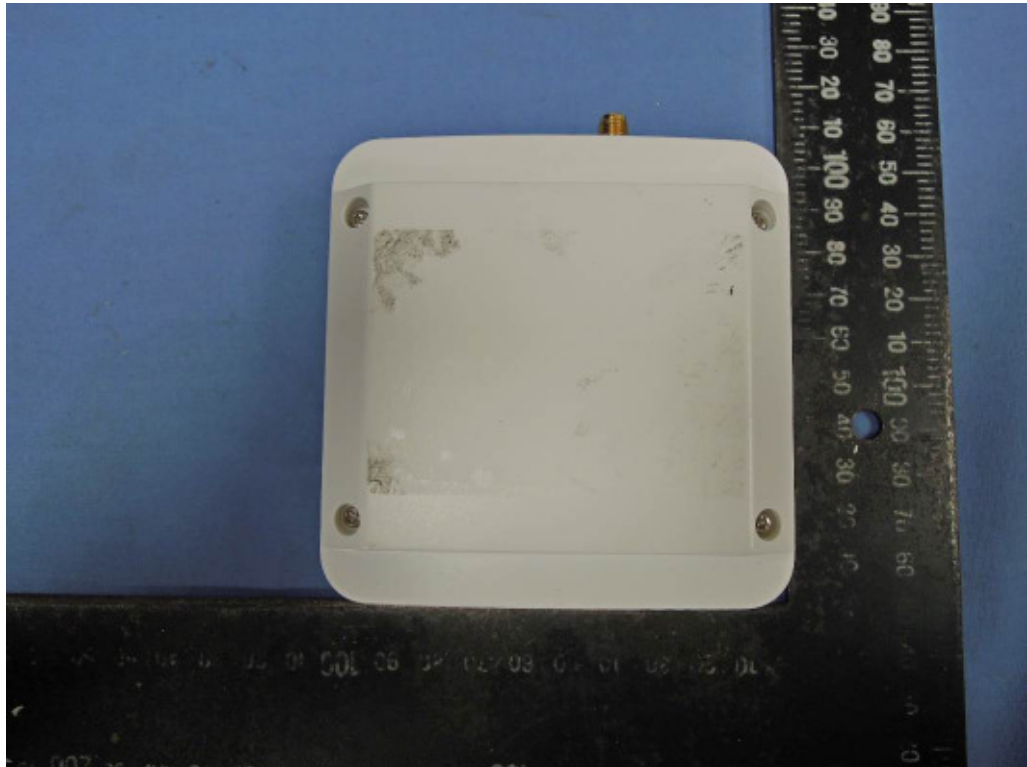
Product: LoRa Long Range Node System

Type Designation: xAIOT-ILND02x



Product: LoRa Long Range Node System

Type Designation: xAIOT-ILND02x



Product: LoRa Long Range Node System

Type Designation: xAIOT-ILND02x



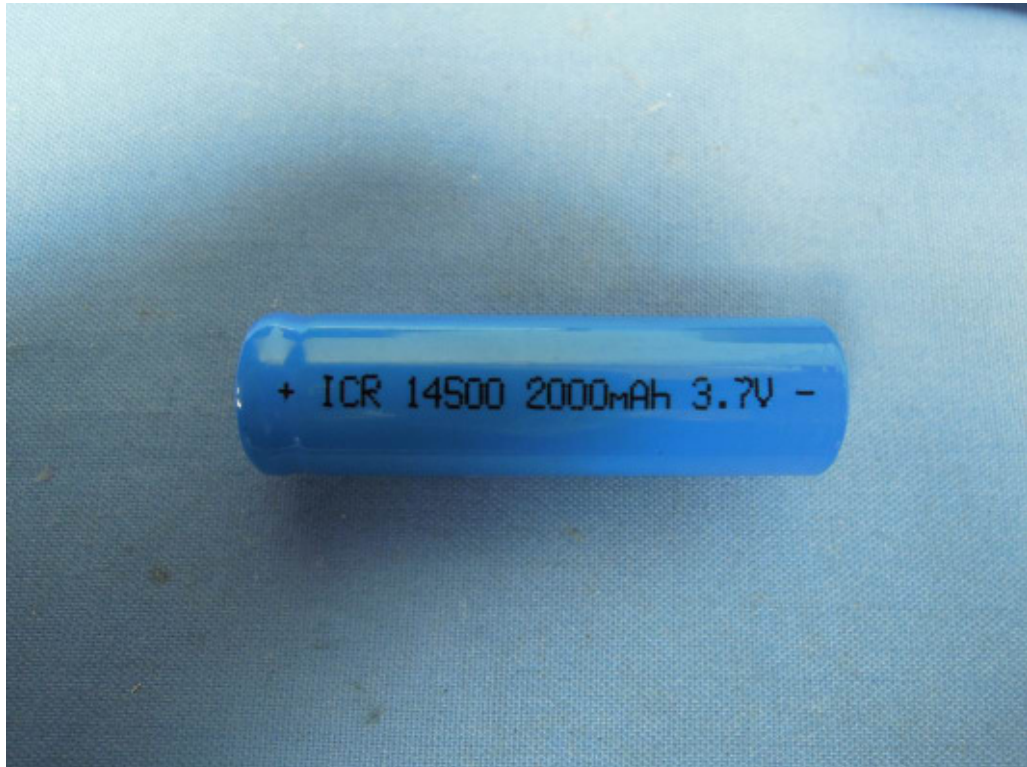
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Type Designation: xAIOT-ILND02x



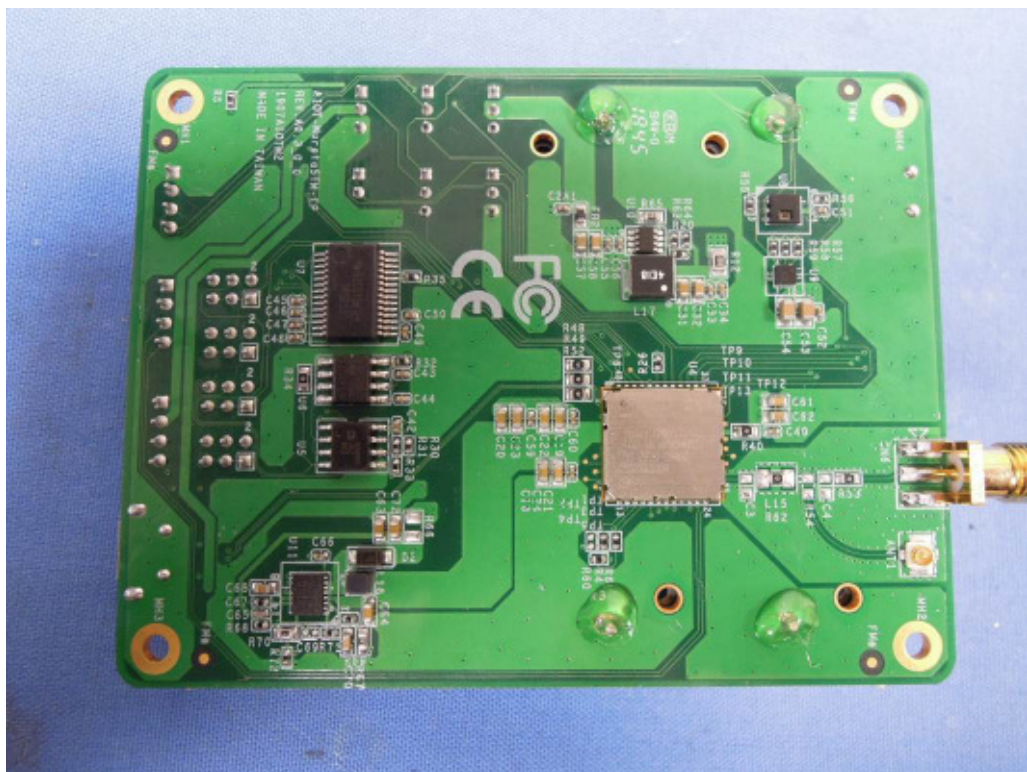
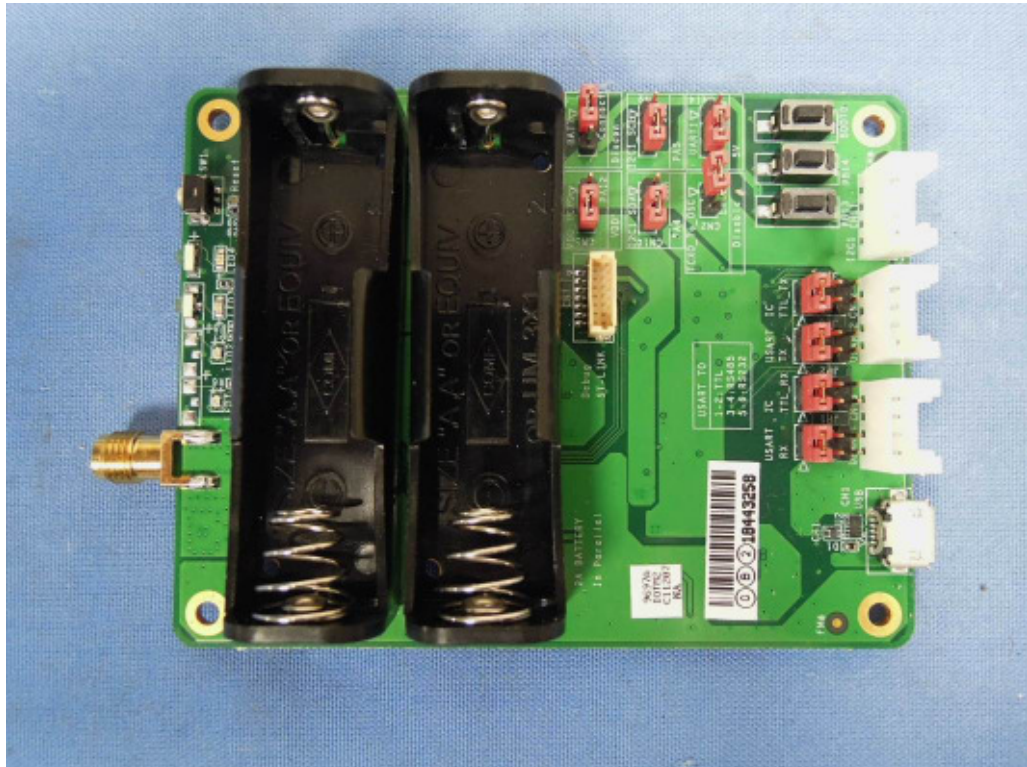
Product: LoRa Long Range Node System

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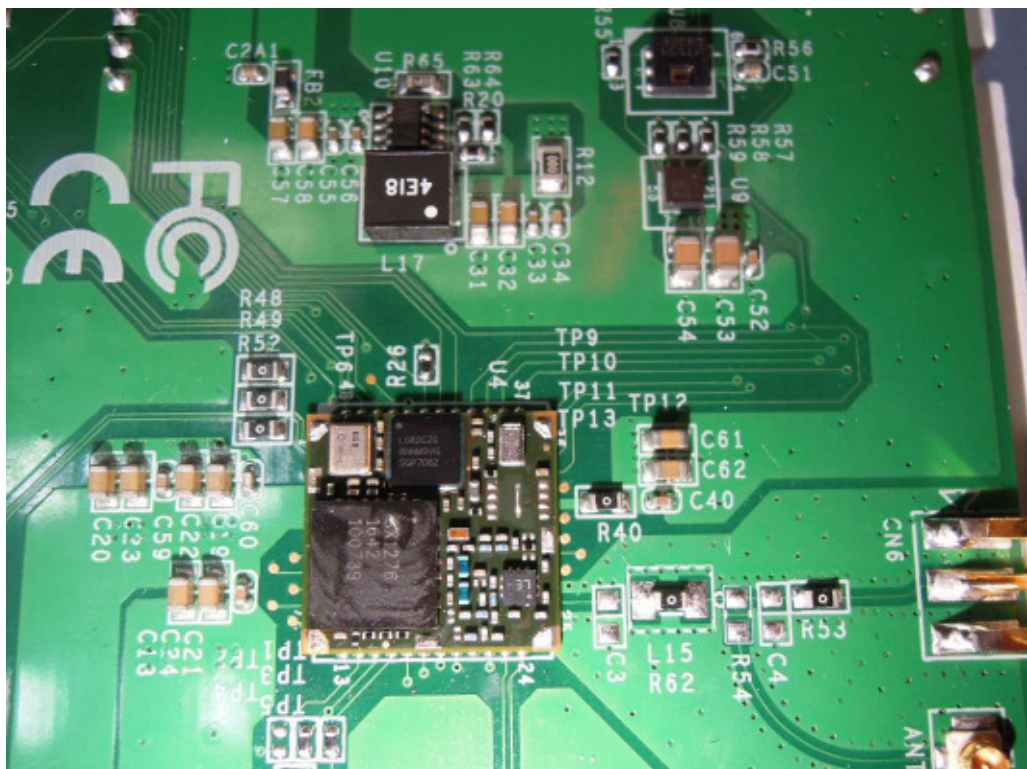
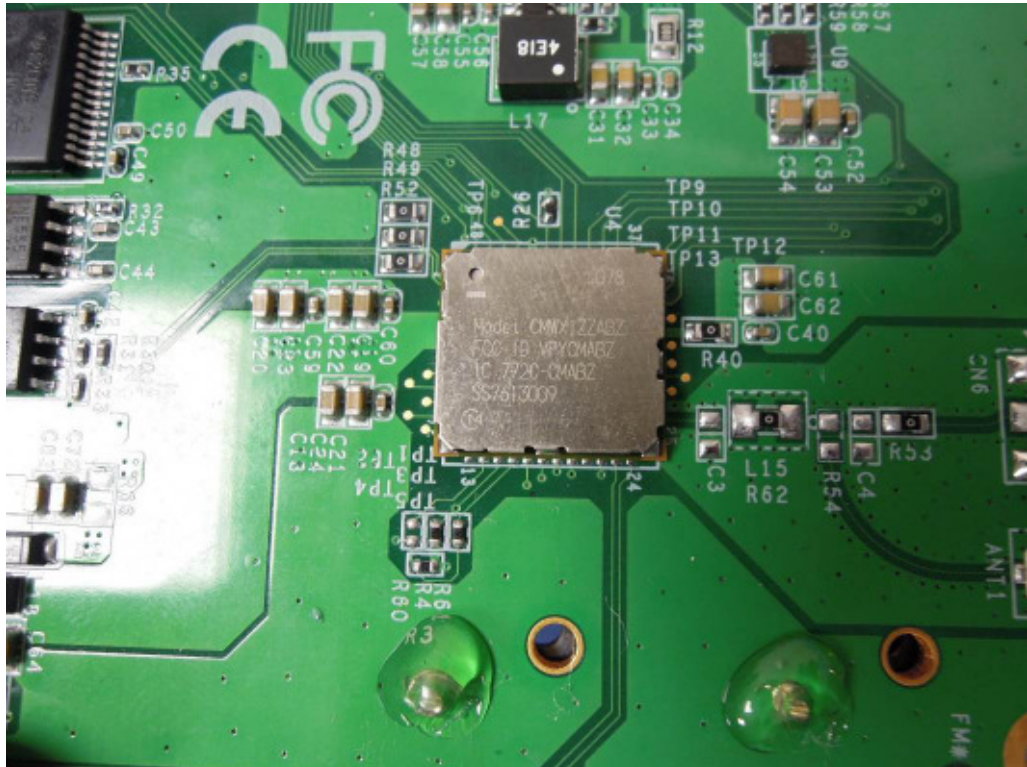
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