

RADIO TEST REPORT

FCC ID: 2AVXR-HM-UHF

Product: UHF RFID Reader
Trade Mark: HM
Model No.: HM-UHF-V3.3
Family Model: N/A
Report No.: N26061208104E
Issue Date: Jul. 14, 2026

Prepared for

SHENZHEN WINS ELECTRONIC TECHNOLOGY CO., LTD
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Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's Name	SHENZHEN WINS ELECTRONIC TECHNOLOGY CO., LTD
Address	2F Building A1, XinBaoji Industrial Park, Tiezai RoadGongle Community, Xixiang Street, Bao'an District,Shenzhen, Guangdong, P.R. China
Manufacturer's Name	SHENZHEN WINS ELECTRONIC TECHNOLOGY CO., LTD
Address	2F Building A1, XinBaoji Industrial Park, Tiezai RoadGongle Community, Xixiang Street, Bao'an District,Shenzhen, Guangdong, P.R. China
Product description	
Product name	UHF RFID Reader
Model and/or type reference	HM-UHF-V3.3
Family Model	N/A
Test Sample Number	S2606150397-1#
Date of Test	Jun. 16, 2026 ~ Jul. 14, 2026

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD/ TEST PROCEDURE	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C KDB558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10-2020+Cor.1-2023	Complied

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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The test results of this report relate only to the tested sample identified in this report.

Prepared By: Abel Chen
Abel Chen
(Project Engineer)

Reviewed By: Aaron Cheng
Aaron Cheng
(Supervisor)

Approved By: Alex Li
Alex Li
(Manager)

2 SUMMARY OF TEST RESULTS

FCC Part15 (15.247), Subpart C			
Standard Section	Test Item	Verdict	Remark
15.207	Conducted Emission	PASS	
15.209 (a) 15.205 (a)	Radiated Spurious Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(b)(2)	Peak Output Power	PASS	
15.247(a)(i)	Number of Hopping Frequency	PASS	
15.247(a)(i)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.247 (d)	Band Edge Emission	PASS	
15.247 (d)	Spurious RF Conducted Emission	PASS	
15.203	Antenna Requirement	PASS	

Remark:

1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.

3 FACILITIES AND ACCREDITATIONS

3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

CNAS-Lab.

: The Certificate Registration Number is L5516.

IC-Registration

The Certificate Registration Number is 9270A.

CAB identifier:CN0074

FCC- Accredited

Test Firm Registration Number: 463705.

Designation Number: CN1184

A2LA-Lab.

The Certificate Registration Number is 4298.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Name of Firm

: Shenzhen NTEK Testing Technology Co., Ltd.

Site Location

: No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

3.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.80\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(30MHz~1GHz)	$\pm 2.64\text{dB}$
5	All emissions, radiated(1GHz~6GHz)	$\pm 2.40\text{dB}$
6	All emissions, radiated(>6GHz)	$\pm 2.52\text{dB}$
7	Temperature	$\pm 0.5^{\circ}\text{C}$
8	Humidity	$\pm 2\%$

4 GENERAL DESCRIPTION OF EUT

Product Feature and Specification	
Equipment	UHF RFID Reader
Trade Mark	HM
FCC ID	2AVXR-HM-UHF
Model No.	HM-UHF-V3.3
Family Model	N/A
Model Difference	N/A
Operating Frequency	902.5~927.5MHz
Modulation	ASK
Number of Channels	51 Channels
Antenna Type	External Antenna
Antenna Gain	1.5dBi
Battery	N/A
Power supply	DC 48V/0.5A From POE
HW Version	V3.2
FW Version	V3.2
SW Version	V1315

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. The RF module features 4 switchable antenna output ports, though only two are used in practice. Only one antenna activation at a time. In the test, both of the active ports were evaluated, and only the worst-case performance is reported.

Revision History

Report No.	Version	Description	Issued Date
N26061208104E	Rev.01	Initial issue of report	Jul. 14, 2026

5 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

Carrier Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.50	26	915.00	51	927.50
2	903.00	27	915.50		
3	903.50	28	916.00		
4	904.00	29	916.50		
5	904.50	30	917.00		
6	905.00	31	917.50		
7	905.50	32	918.00		
8	906.00	33	918.50		
9	906.50	34	919.00		
10	907.00	35	919.50		
11	907.50	36	920.00		
12	908.00	37	920.50		
13	908.50	38	921.00		
14	909.00	39	921.50		
15	909.50	40	922.00		
16	910.00	41	922.50		
17	910.50	42	923.00		
18	911.00	43	923.50		
19	911.50	44	924.00		
20	912.00	45	924.50		
21	912.50	46	925.00		
22	913.00	47	925.50		
23	913.50	48	926.00		
24	914.00	49	926.50		
25	914.50	50	927.00		

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Pretest Mode	Description
Mode 1	902.5
Mode 2	915
Mode 3	927.5

For AC Conducted Test Cases

Final Test Mode	Description
Mode 1	902.5

For Radiated Test Cases

Final Test Mode	Description
Mode 1	902.5
Mode 2	915
Mode 3	927.5

For RF Conducted Test Cases

Final Test Mode	Description
Mode 1	902.5
Mode 2	915
Mode 3	927.5
Mode 4	Hopping mode

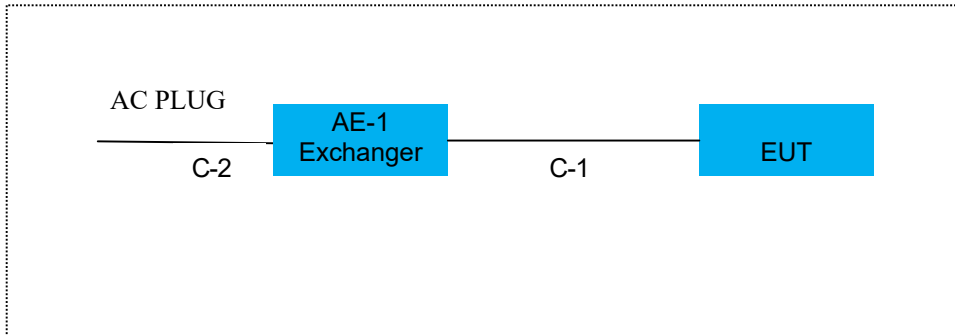
Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. For AC conducted, radiated emission 9kHz-1GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.
3. For radiated test above 1G in the pre-test, both of the active antennas were tested, Antenna 1 was the worst, only the worse case was reported.

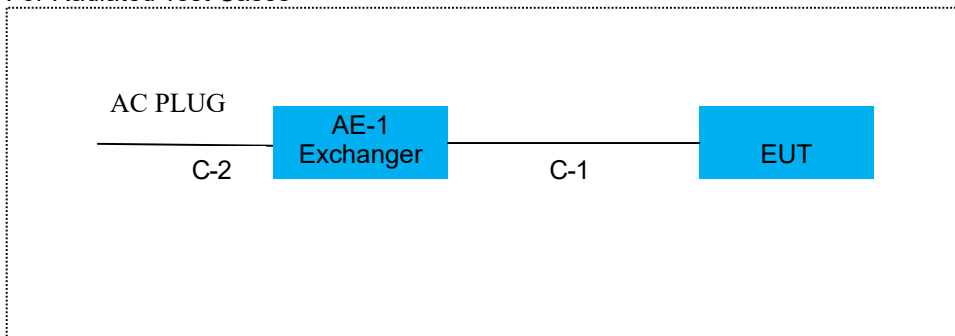
6 SETUP OF EQUIPMENT UNDER TEST

6.1 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM

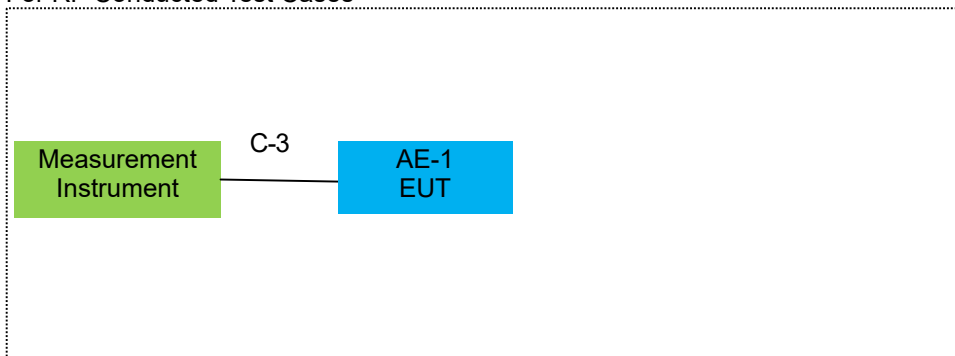
For AC Conducted Test Cases



For Radiated Test Cases



For RF Conducted Test Cases



Note: 1. The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

6.2 SUPPORT EQUIPMENT

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	Exchanger	TL-SG1005P	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	RJ45	YES	NO	100cm
C-2	Power cable	YES	NO	200cm
C-3	RF Cable	YES	NO	10cm

Notes:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation& Conducted Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4440A	MY41000130	2026.04.15	2027.04.14	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2026.04.08	2027.04.07	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2026.04.08	2027.04.07	1 year
4	Test Receiver	R&S	ESPI7	101318	2026.04.08	2027.04.07	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2027.05.11	3 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2024.05.12	2027.05.11	3 year
9	Amplifier	EMC	EMC051835SE	980246	2026.04.08	2027.04.07	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2024.05.17	2027.05.16	3 year
11	Power Meter	DARE	RPR3006W	15I00041SN084	2026.04.08	2027.04.07	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2024.05.06	2027.05.05	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2024.05.06	2027.05.05	3 year
14	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2024.05.06	2027.05.05	3 year
15	Filter	TRILTHIC	2400MHz	29	2024.04.26	2027.04.25	3 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test
And this temporary antenna connector is listed within the instrument list

AC Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2026.04.08	2027.04.07	1 year
2	LISN	R&S	ENV216	101313	2026.04.08	2027.04.07	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2026.04.08	2027.04.07	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2024.04.26	2027.04.25	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2024.04.25	2027.04.24	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2024.04.25	2027.04.24	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2024.04.25	2027.04.24	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Aux Equipment & Test Cable which is scheduled for calibration every 2 or 3 years.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8310 2.4GHz/5GHz	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest
4	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

7 TEST REQUIREMENTS

7.1 CONDUCTED EMISSIONS TEST

7.1.1 Applicable Standard

According to FCC Part 15.207(a)

7.1.2 Conformance Limit

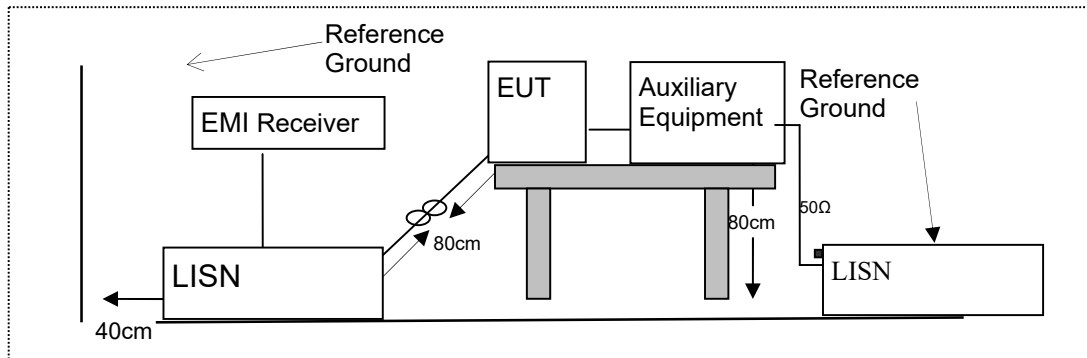
Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. *Decreases with the logarithm of the frequency
2. The lower limit shall apply at the transition frequencies
3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

7.1.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.1.4 Test Configuration



7.1.5 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2020+Cor.1-2023 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

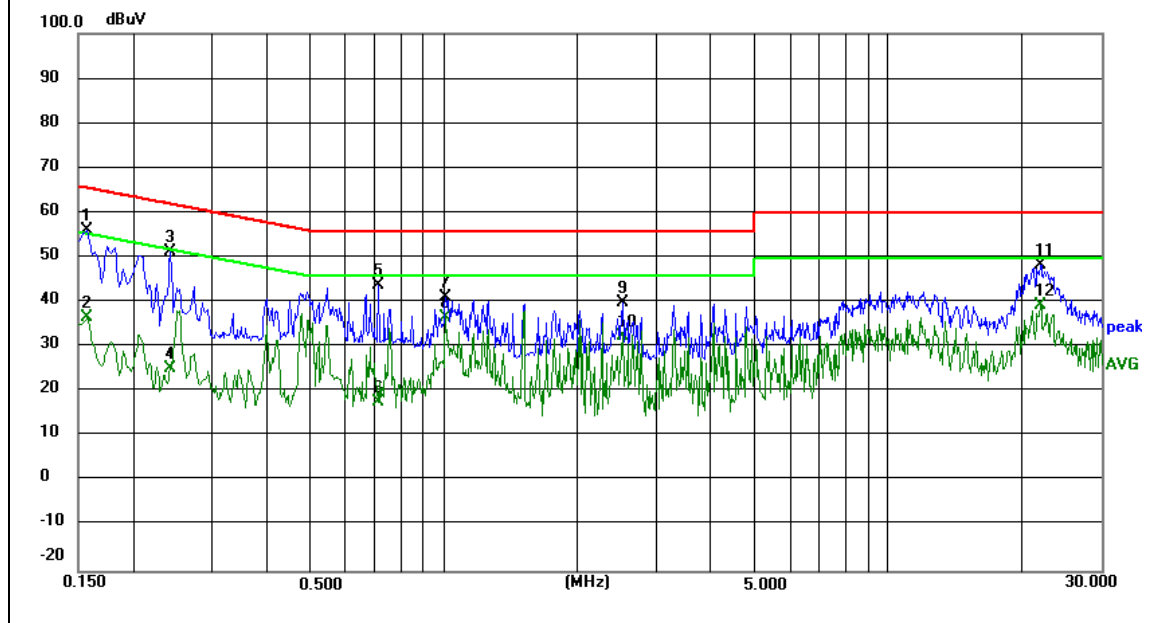
7.1.6 Test Results

EUT:	UHF RFID Reader	Model Name :	HM-UHF-V3.3
Temperature:	23.5℃	Relative Humidity:	60%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 48V from POE AC 120V/60Hz	Test Mode:	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1580	36.69	19.48	56.17	65.57	-9.40	QP
0.1580	17.27	19.48	36.75	55.57	-18.82	AVG
0.2420	31.88	19.49	51.37	62.03	-10.66	QP
0.2420	5.97	19.49	25.46	52.03	-26.57	AVG
0.7097	24.42	19.51	43.93	56.00	-12.07	QP
0.7097	-1.67	19.51	17.84	46.00	-28.16	AVG
1.0100	21.82	19.52	41.34	56.00	-14.66	QP
1.0100	17.31	19.52	36.83	46.00	-9.17	AVG
2.5180	20.41	19.54	39.95	56.00	-16.05	QP
2.5180	13.00	19.54	32.54	46.00	-13.46	AVG
21.9257	28.40	19.92	48.32	60.00	-11.68	QP
21.9257	19.63	19.92	39.55	50.00	-10.45	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

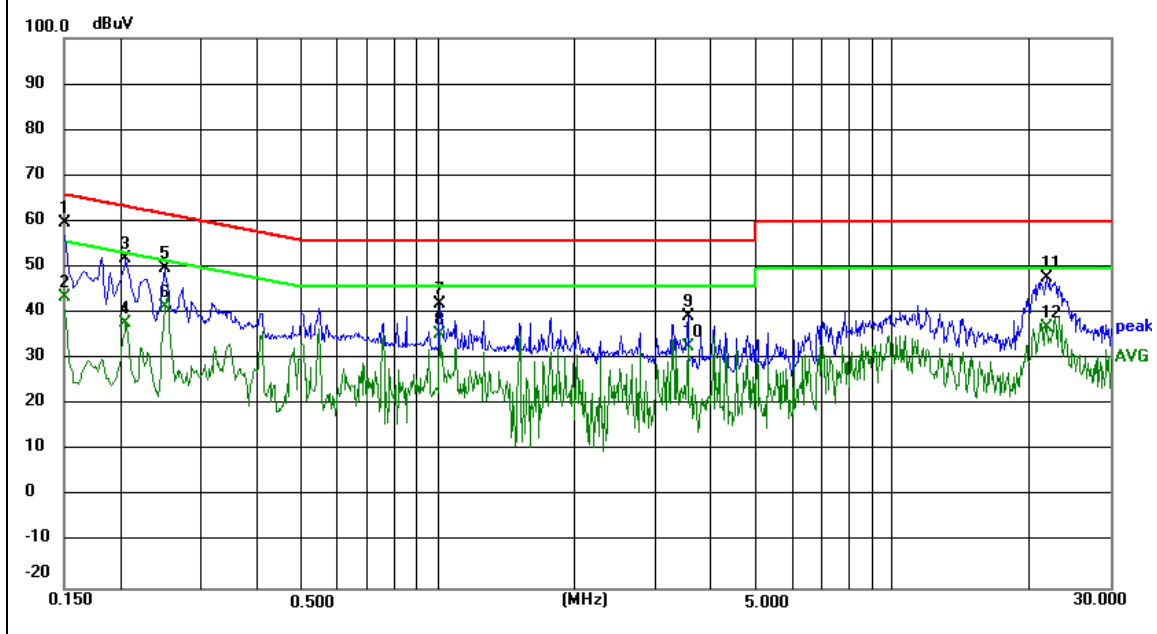


EUT:	UHF RFID Reader	Model Name :	HM-UHF-V3.3
Temperature:	23.5℃	Relative Humidity:	60%
Pressure:	1010hPa	Phase :	N
Test Voltage :	DC 48V from POE AC 120V/60Hz	Test Mode:	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1500	40.27	19.44	59.71	66.00	-6.29	QP
0.1500	24.15	19.44	43.59	56.00	-12.41	AVG
0.2058	32.64	19.41	52.05	63.37	-11.32	QP
0.2058	18.45	19.41	37.86	53.37	-15.51	AVG
0.2500	30.42	19.42	49.84	61.76	-11.92	QP
0.2500	22.14	19.42	41.56	51.76	-10.20	AVG
1.0100	22.47	19.52	41.99	56.00	-14.01	QP
1.0100	15.92	19.52	35.44	46.00	-10.56	AVG
3.5300	19.89	19.60	39.49	56.00	-16.51	QP
3.5300	13.36	19.60	32.96	46.00	-13.04	AVG
21.7777	27.90	19.88	47.78	60.00	-12.22	QP
21.7777	17.00	19.88	36.88	50.00	-13.12	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



7.2 RADIATED SPURIOUS EMISSION

7.2.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and ANSI C63.10-2020+Cor.1-2023

7.2.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	24000/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

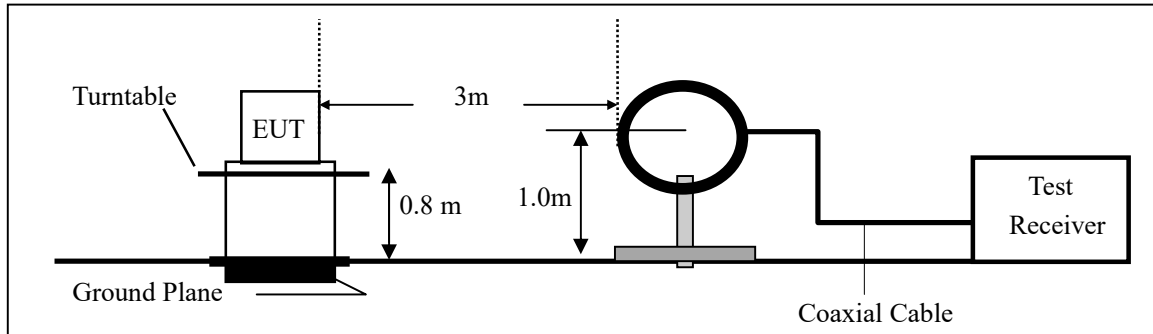
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. For Frequency 9kHz~30MHz:
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.
For Frequency above 30MHz:
Distance extrapolation factor =20log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

7.2.3 Measuring Instruments

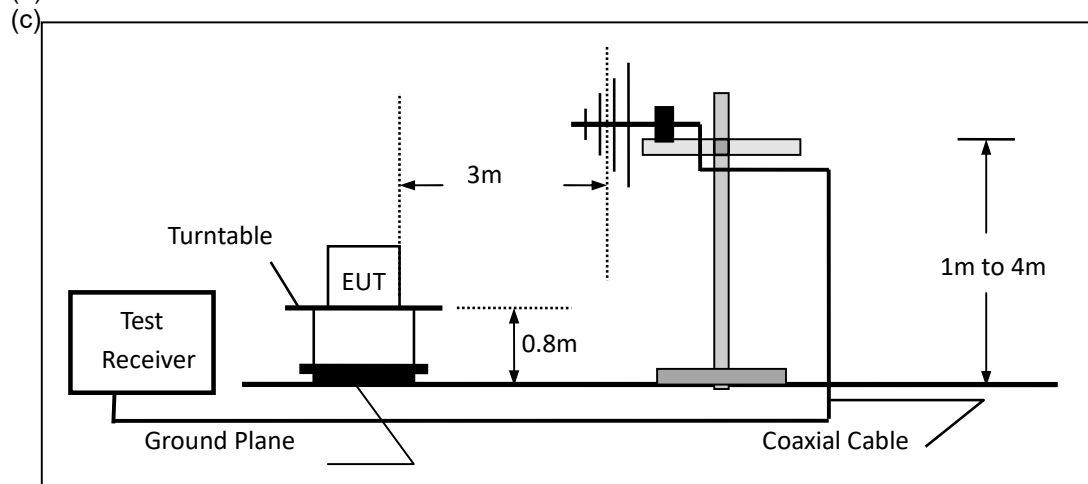
The Measuring equipment is listed in the section 6.3 of this test report.

7.2.4 Test Configuration

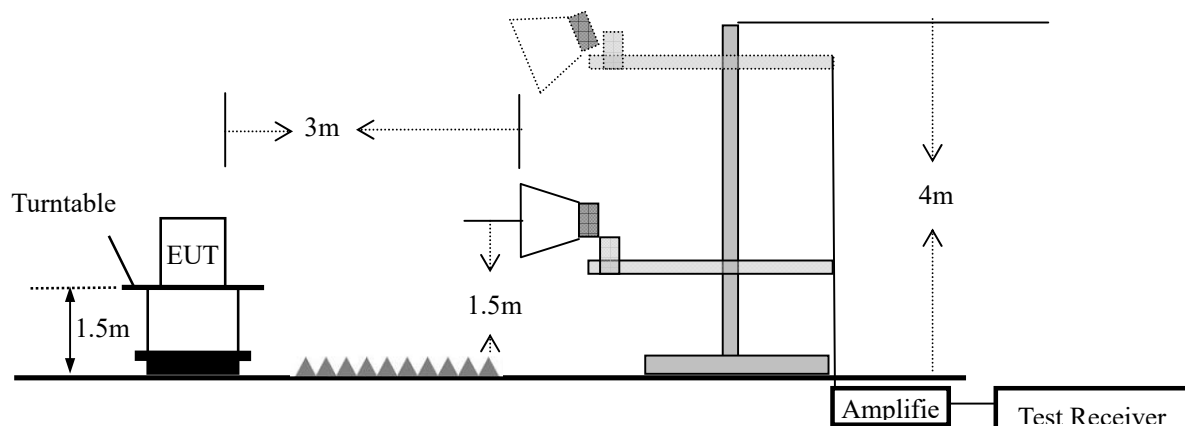
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2020+Cor.1-2023. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2020+Cor.1-2023 and CAN/CSA-CEI/IEC CISPR 22. This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW} [kHz])$. , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

7.2.6 Test Results

■ Spurious Emission below 30MHz (9KHz to 30MHz)

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	23.5℃	Relative Humidity:	60%
Test Mode:	Mode1	Test By:	Abel Chen

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

■ Spurious Emission below 1GHz (30MHz to 1GHz)

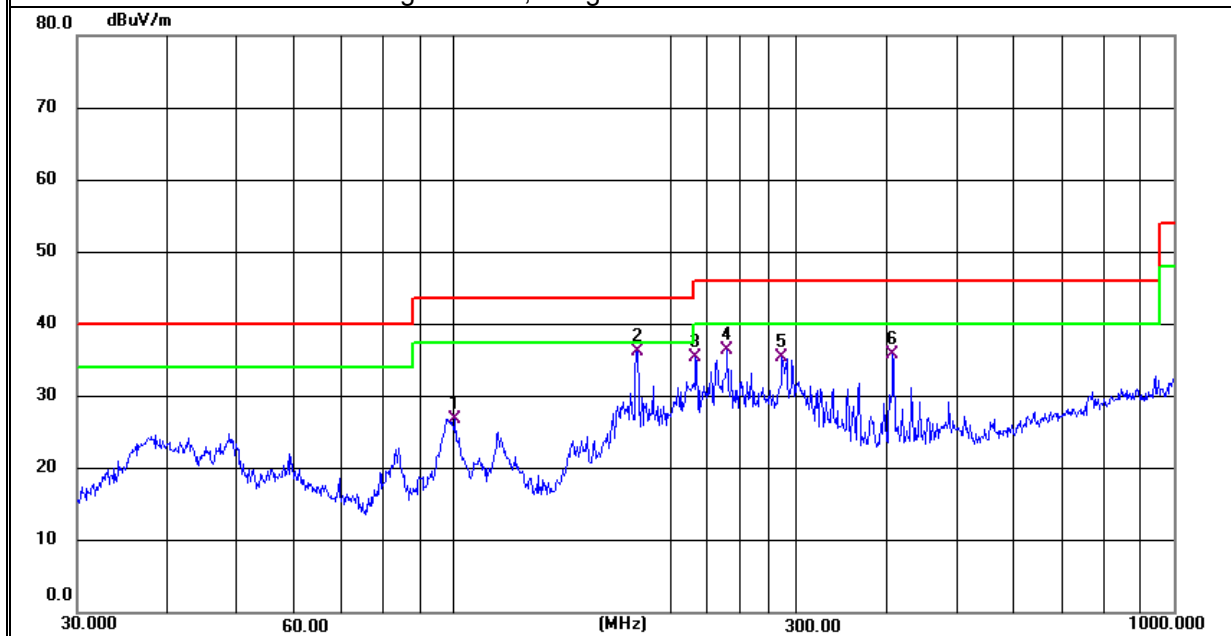
EUT:	UHF RFID Reader	Model Name :	HM-UHF-V3.3
Temperature:	20.4℃	Relative Humidity:	53.8%
Pressure:	1010hPa	Test Mode:	Mode1
Test Voltage :	DC 48V from POE AC 120V/60Hz		

All the modulation modes have been tested, and the worst result was report as below:

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	100.5806	8.85	18.04	26.89	43.50	-16.61	QP
H	180.0164	20.36	15.88	36.24	43.50	-7.26	QP
H	216.7828	17.48	17.84	35.32	46.00	-10.68	QP
H	239.9873	17.60	18.76	36.36	46.00	-9.64	QP
H	285.9777	16.12	19.27	35.39	46.00	-10.61	QP
H	407.5144	13.31	22.43	35.74	46.00	-10.26	QP

Remark:

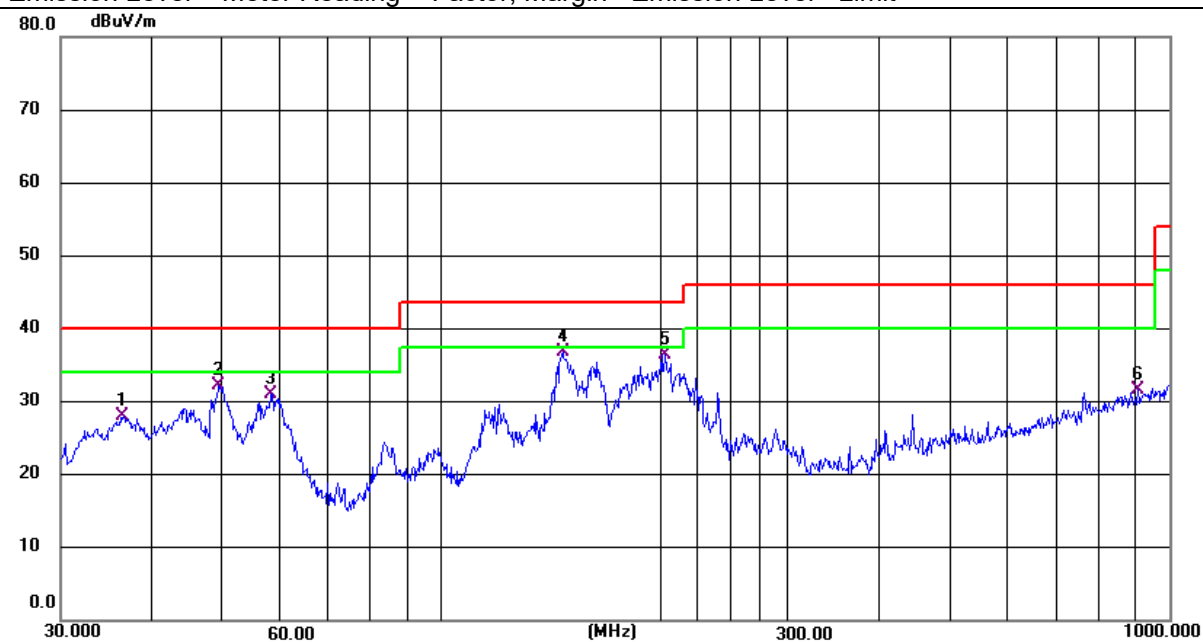
Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	36.6372	10.05	17.99	28.04	40.00	-11.96	QP
V	49.5328	12.28	20.02	32.30	40.00	-7.70	QP
V	58.2030	11.81	19.24	31.05	40.00	-8.95	QP
V	146.8874	22.34	14.44	36.78	43.50	-6.72	QP
V	202.8103	19.10	17.38	36.48	43.50	-7.02	QP
V	906.4823	1.85	29.74	31.59	46.00	-14.41	QP

Remark:

Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



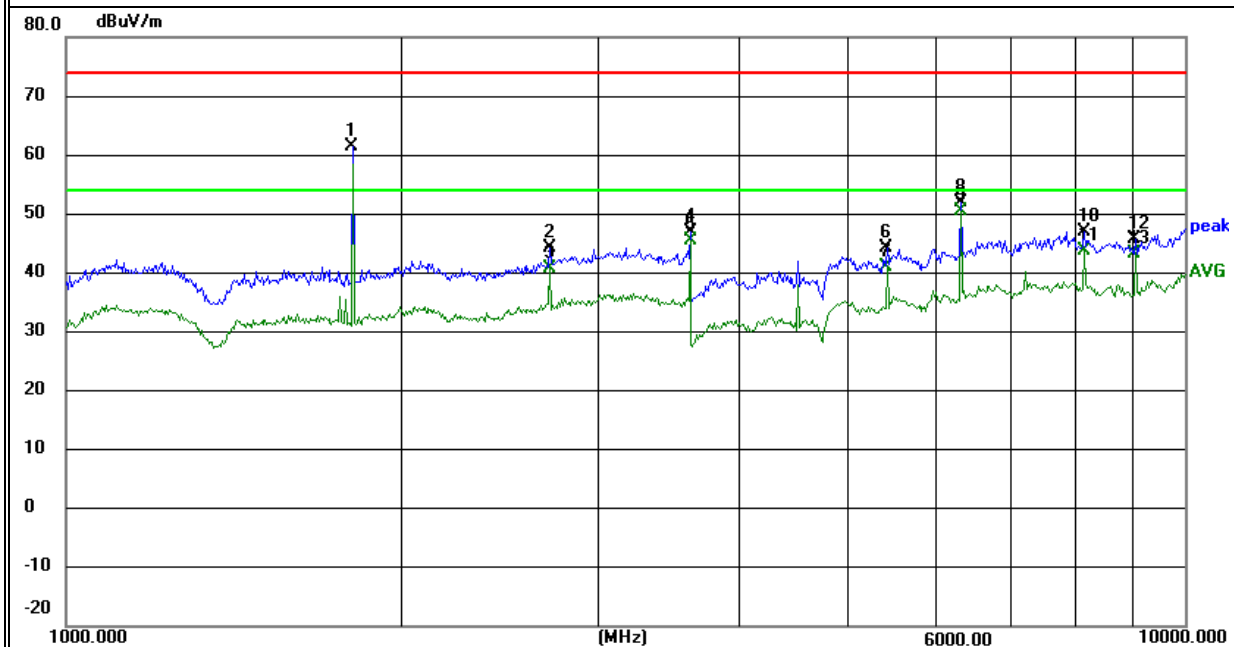
■ Spurious Emission Above 1GHz (1GHz to 10GHz)

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3℃	Relative Humidity:	50.4%
Test Mode:	902.5	Test By:	Abel Chen

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	1804.186	77.72	-16.29	61.43	/	/	peak
H	2704.960	55.32	-11.19	44.13	74.00	-29.87	peak
H	2704.960	51.84	-11.19	40.65	54.00	-13.35	AVG
H	3612.343	56.39	-9.32	47.07	74.00	-26.93	peak
H	3612.343	54.87	-9.32	45.55	54.00	-8.45	AVG
H	5415.871	50.74	-6.43	44.31	74.00	-29.69	peak
H	5415.871	47.50	-6.43	41.07	54.00	-12.93	AVG
H	6313.225	56.03	-4.16	51.87	74.00	-22.13	peak
H	6313.225	54.58	-4.16	50.42	54.00	-3.58	AVG
H	8119.845	48.70	-1.68	47.02	74.00	-26.98	peak
H	8119.845	45.31	-1.68	43.63	54.00	-10.37	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor

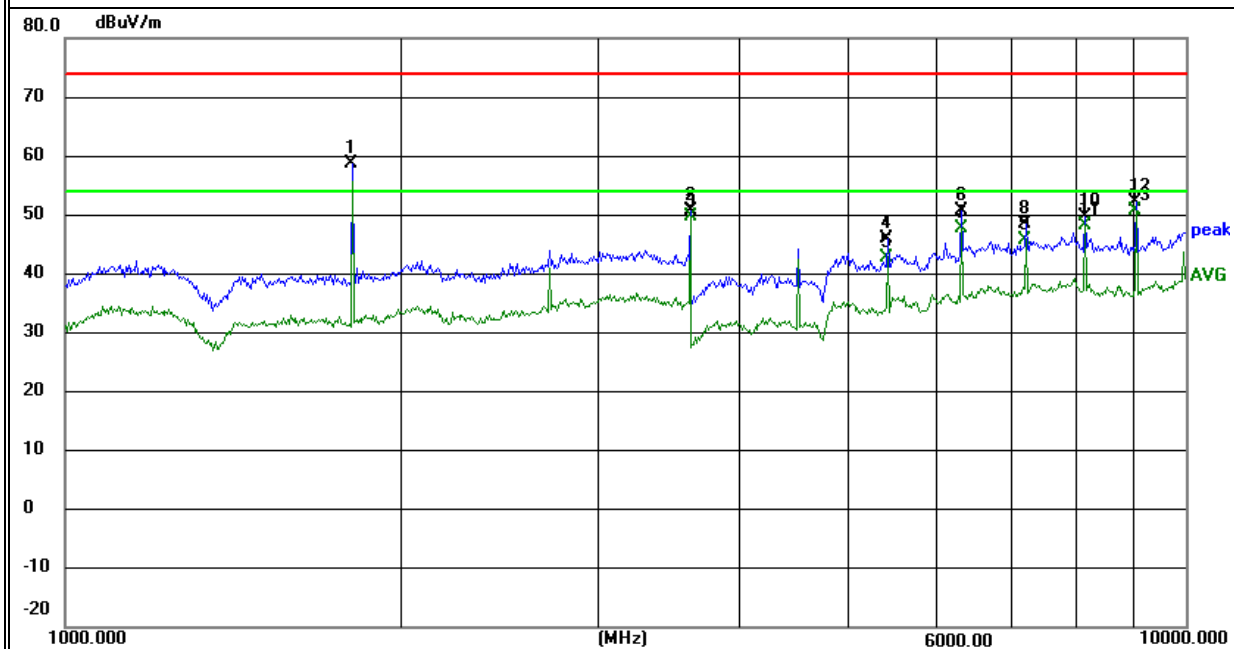


EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3℃	Relative Humidity:	50.4%
Test Mode:	902.5	Test By:	Abel Chen

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	1804.186	74.99	-16.29	58.70	/	/	peak
V	3612.343	59.94	-9.32	50.62	74.00	-23.38	peak
V	3612.343	59.11	-9.32	49.79	54.00	-4.21	AVG
V	5415.871	52.32	-6.43	45.89	74.00	-28.11	peak
V	5415.871	49.12	-6.43	42.69	54.00	-11.31	AVG
V	6313.225	54.86	-4.16	50.70	74.00	-23.30	peak
V	6313.225	51.94	-4.16	47.78	54.00	-6.22	AVG
V	7211.742	50.71	-2.17	48.54	74.00	-25.46	peak
V	7211.742	47.81	-2.17	45.64	54.00	-8.36	AVG
V	8119.845	51.37	-1.68	49.69	74.00	-24.31	peak
V	8119.845	49.94	-1.68	48.26	54.00	-5.74	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor

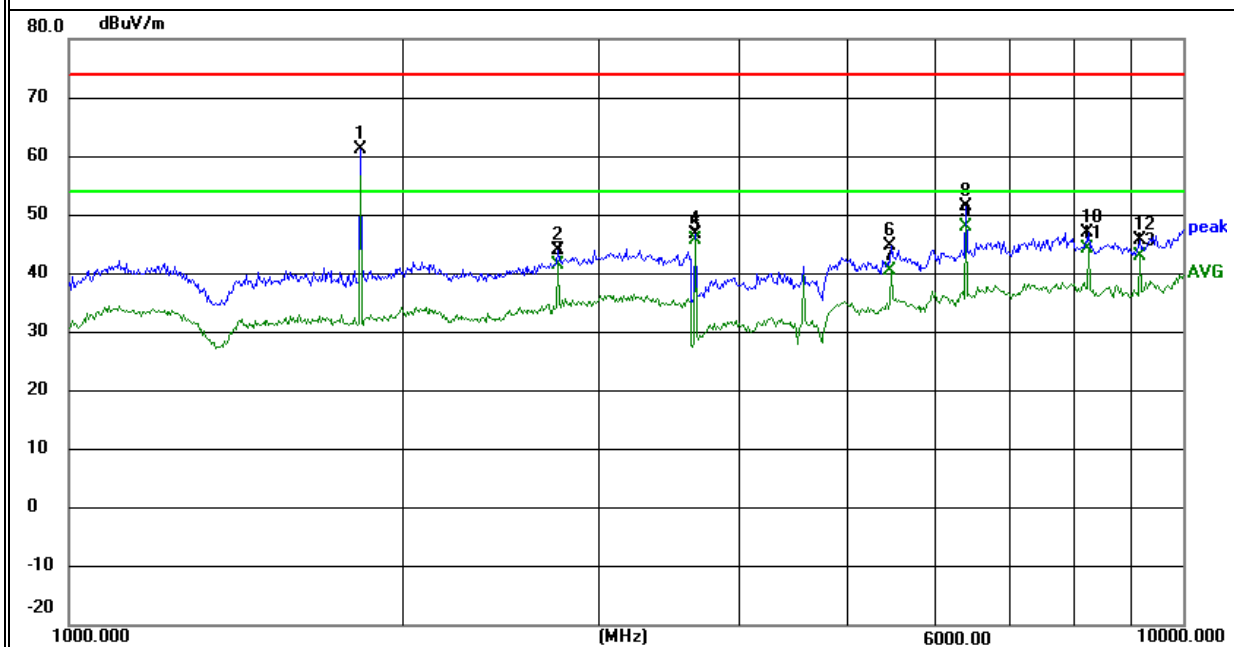


EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3°C	Relative Humidity:	50.4%
Test Mode:	915	Test By:	Abel Chen

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	1825.183	76.84	-15.74	61.10	/	/	peak
H	2744.367	54.86	-10.87	43.99	74.00	-30.01	peak
H	2744.367	52.46	-10.87	41.59	54.00	-12.41	AVG
H	3654.383	56.83	-10.11	46.72	74.00	-27.28	peak
H	3654.383	55.91	-10.11	45.80	54.00	-8.20	AVG
H	5478.901	50.31	-5.63	44.68	74.00	-29.32	peak
H	5478.901	46.16	-5.63	40.53	54.00	-13.47	AVG
H	6386.698	55.41	-3.99	51.42	74.00	-22.58	peak
H	6386.698	52.04	-3.99	48.05	54.00	-5.95	AVG
H	8238.139	48.03	-1.12	46.91	74.00	-27.09	peak
H	8238.139	45.25	-1.12	44.13	54.00	-9.87	AVG
H	9142.296	45.78	-0.04	45.74	74.00	-28.26	peak
H	9142.296	42.95	-0.04	42.91	54.00	-11.09	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor

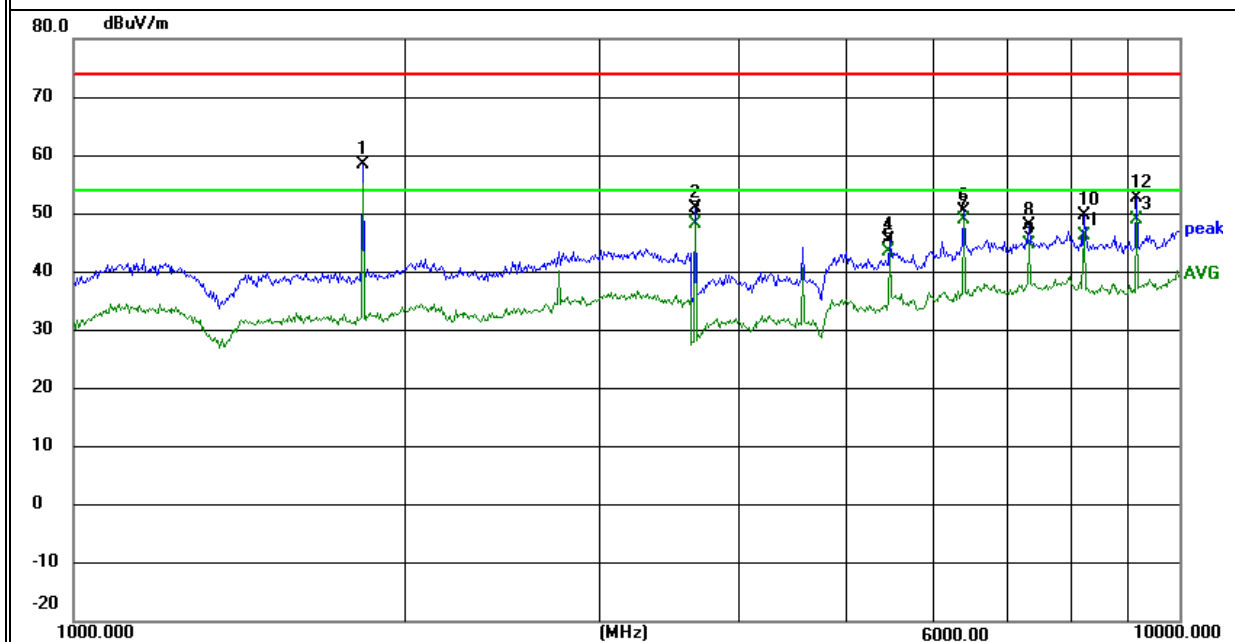


EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3°C	Relative Humidity:	50.4%
Test Mode:	915	Test By:	Abel Chen

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	1825.183	74.26	-15.74	58.52	/	/	peak
V	3654.383	60.94	-10.11	50.83	74.00	-23.17	peak
V	3654.383	58.25	-10.11	48.14	54.00	-5.86	AVG
V	5478.901	51.03	-5.63	45.40	74.00	-28.60	peak
V	5478.901	49.06	-5.63	43.43	54.00	-10.57	AVG
V	6386.698	54.40	-3.99	50.41	74.00	-23.59	peak
V	6386.698	52.85	-3.99	48.86	54.00	-5.14	AVG
V	7316.807	50.20	-2.14	48.06	74.00	-25.94	peak
V	7316.807	46.82	-2.14	44.68	54.00	-9.32	AVG
V	8214.344	50.81	-1.19	49.62	74.00	-24.38	peak
V	8214.344	47.52	-1.19	46.33	54.00	-7.67	AVG
V	9142.296	52.65	-0.04	52.61	74.00	-21.39	peak
V	9142.296	49.05	-0.04	49.01	54.00	-4.99	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor

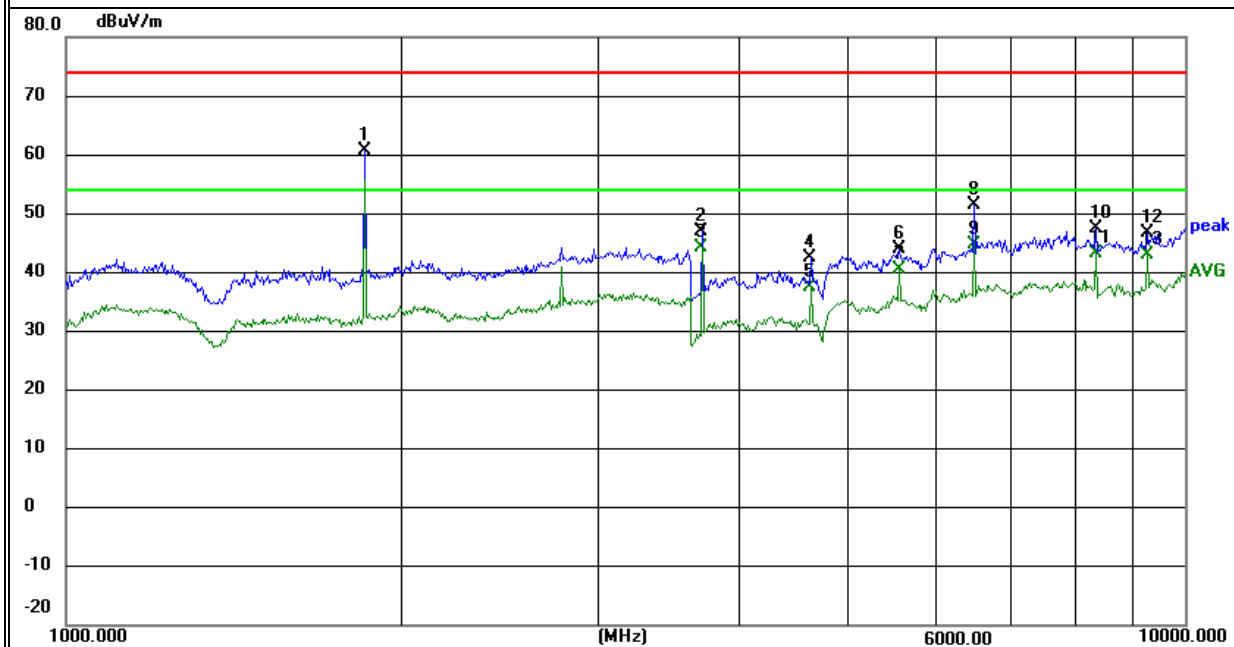


EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3℃	Relative Humidity:	50.4%
Test Mode:	927.5	Test By:	Abel Chen

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	1851.774	75.73	-15.07	60.66	/	/	peak
H	3707.622	56.23	-9.24	46.99	74.00	-27.01	peak
H	3707.622	53.37	-9.24	44.13	54.00	-9.87	AVG
H	4632.646	50.35	-7.82	42.53	74.00	-31.47	peak
H	4632.646	45.28	-7.82	37.46	54.00	-16.54	AVG
H	5558.721	49.69	-5.72	43.97	74.00	-30.03	peak
H	5558.721	46.28	-5.72	40.56	54.00	-13.44	AVG
H	6479.743	55.64	-4.08	51.56	74.00	-22.44	peak
H	6479.743	48.82	-4.08	44.74	54.00	-9.26	AVG
H	8334.015	49.21	-1.64	47.57	74.00	-26.43	peak
H	8334.015	44.87	-1.64	43.23	54.00	-10.77	AVG
H	9248.694	46.49	0.28	46.77	74.00	-27.23	peak
H	9248.694	42.64	0.28	42.92	54.00	-11.08	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor

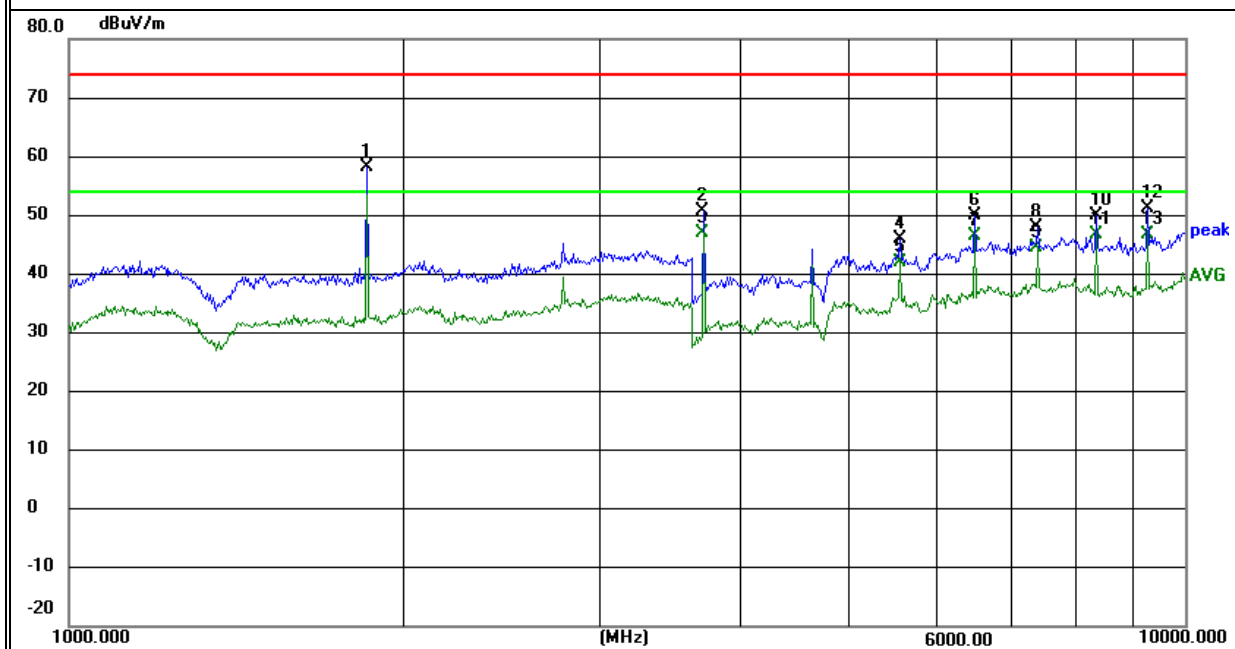


EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	24.3℃	Relative Humidity:	50.4%
Test Mode:	927.5	Test By:	Abel Chen

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	1851.774	73.32	-15.07	58.25	/	/	peak
V	3707.622	60.01	-9.24	50.77	74.00	-23.23	peak
V	3707.622	56.32	-9.24	47.08	54.00	-6.92	AVG
V	5558.721	51.56	-5.72	45.84	74.00	-28.16	peak
V	5558.721	47.70	-5.72	41.98	54.00	-12.02	AVG
V	6479.743	54.08	-4.08	50.00	74.00	-24.00	peak
V	6479.743	50.56	-4.08	46.48	54.00	-7.52	AVG
V	7380.579	50.38	-2.50	47.88	74.00	-26.12	peak
V	7380.579	46.94	-2.50	44.44	54.00	-9.56	AVG
V	8334.015	51.62	-1.64	49.98	74.00	-24.02	peak
V	8334.015	48.43	-1.64	46.79	54.00	-7.21	AVG
V	9248.694	50.88	0.28	51.16	74.00	-22.84	peak
V	9248.694	46.45	0.28	46.73	54.00	-7.27	AVG

Remark:

1. Emission Level = Meter Reading+ Factor, Margin= Emission Level- Limit, Factor= Antenna Factor + Cable Loss - Preamp Factor



For the second harmonic :

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Remark	20dBc Emission Level (dBuV/m)
	(MHz)	(dBuV)	(dB)	(dBuV/m)		
H	902.5	91.13	29.93	121.06	peak	101.06
V	902.5	87.72	29.93	117.65	peak	97.65
H	915	91.09	29.85	120.94	peak	100.94
V	915	87.68	29.85	117.53	peak	97.53
H	927.5	89.81	30.07	119.88	peak	99.88
V	927.5	86.74	30.07	116.81	peak	96.81

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
902.5							
H	1804.186	77.72	-16.29	61.43	101.06	-39.63	AVG
V	1804.186	74.99	-16.29	58.70	97.65	-38.95	AVG
915							
H	1825.183	76.84	-15.74	61.10	100.94	-39.84	AVG
V	1825.183	74.26	-15.74	58.52	97.53	-39.01	AVG
927.5							
H	1851.774	75.73	-15.07	60.66	99.88	-39.22	AVG
V	1851.774	73.32	-15.07	58.25	96.81	-38.56	AVG

7.3 NUMBER OF HOPPING CHANNEL

7.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) (i) and ANSI C63.10-2020+Cor.1-2023

7.3.2 Conformance Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

7.3.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.3.4 Test Setup

Please refer to Section 6.1 of this test report.

7.3.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 7.8.3

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW : To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

VBW $\geq$ RBW

Sweep = auto

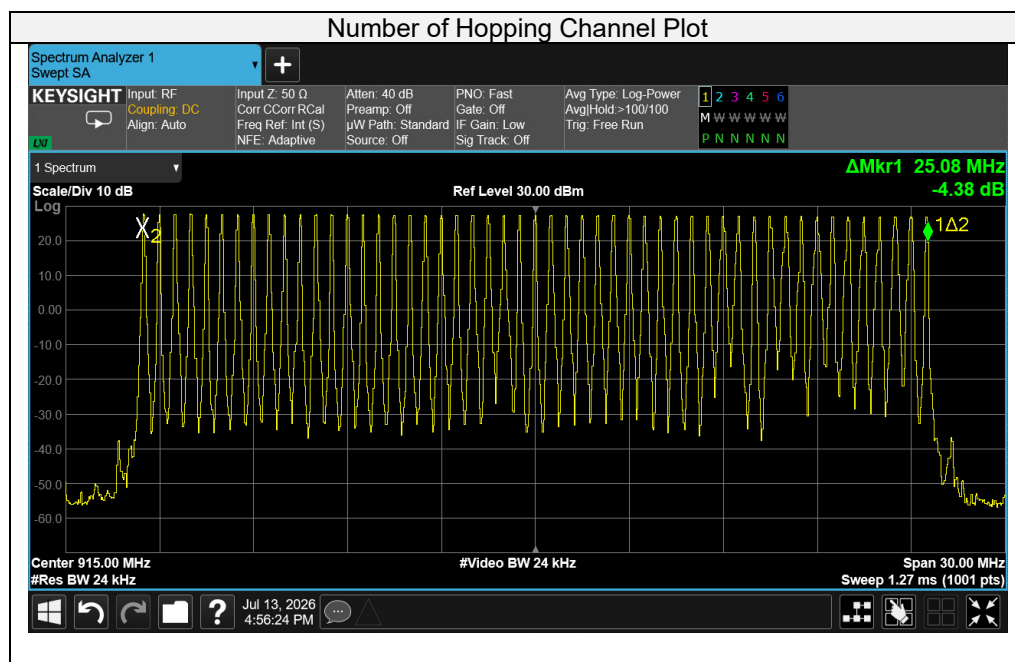
Detector function = peak

Trace = max hold

7.3.6 Test Results

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20°C	Relative Humidity:	48%
Test Mode:	Mode 4	Test By:	Abel Chen

Number of Hopping (Channel)	Limit	Verdict
51	≥ 50	Pass



7.4 HOPPING CHANNEL SEPARATION MEASUREMENT

7.4.1 Applicable Standard

According to FCC Part 15.247(a) (1) and ANSI C63.10-2020+Cor.1-2023

7.4.2 Conformance Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

7.4.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.4.4 Test Setup

Please refer to Section 6.1 of this test report.

7.4.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 7.8.2

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Measurement Bandwidth or Channel Separation

RBW: Start with the RBW set to approximately 3% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

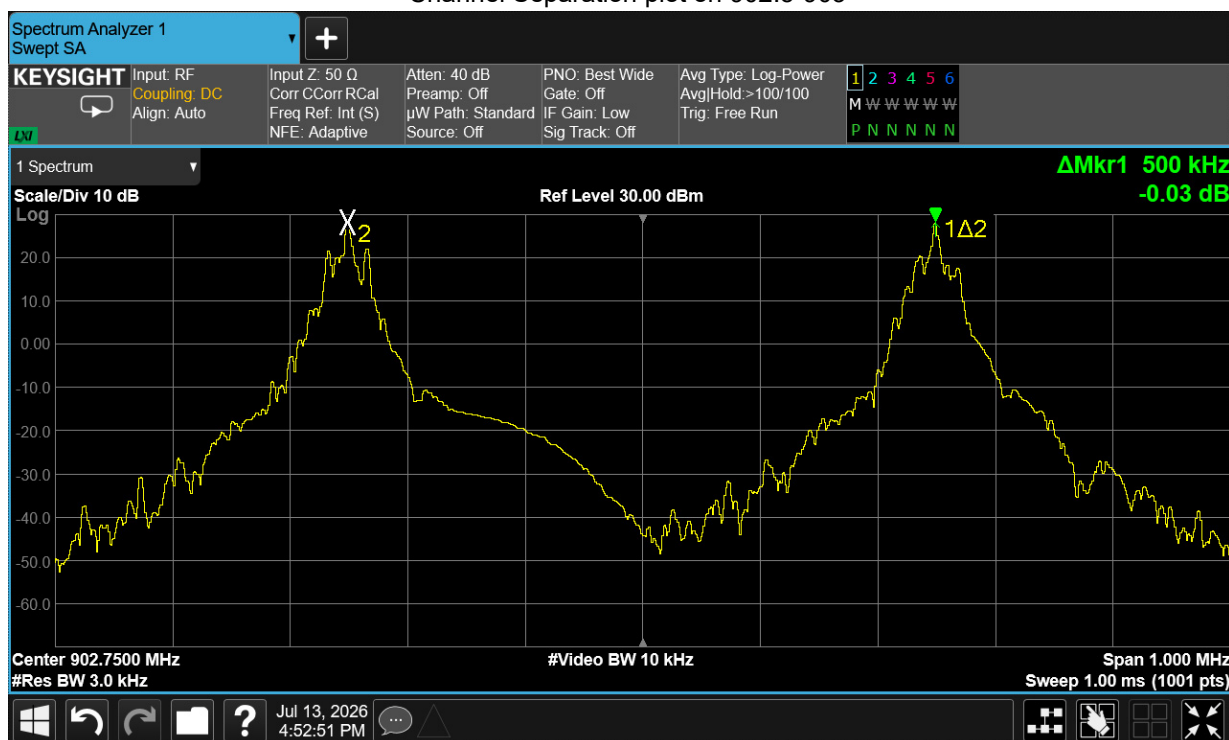
7.4.6 Test Results

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20°C	Relative Humidity:	48%
Test Mode:	Mode1/Mode2/Mode3	Test By:	Abel Chen

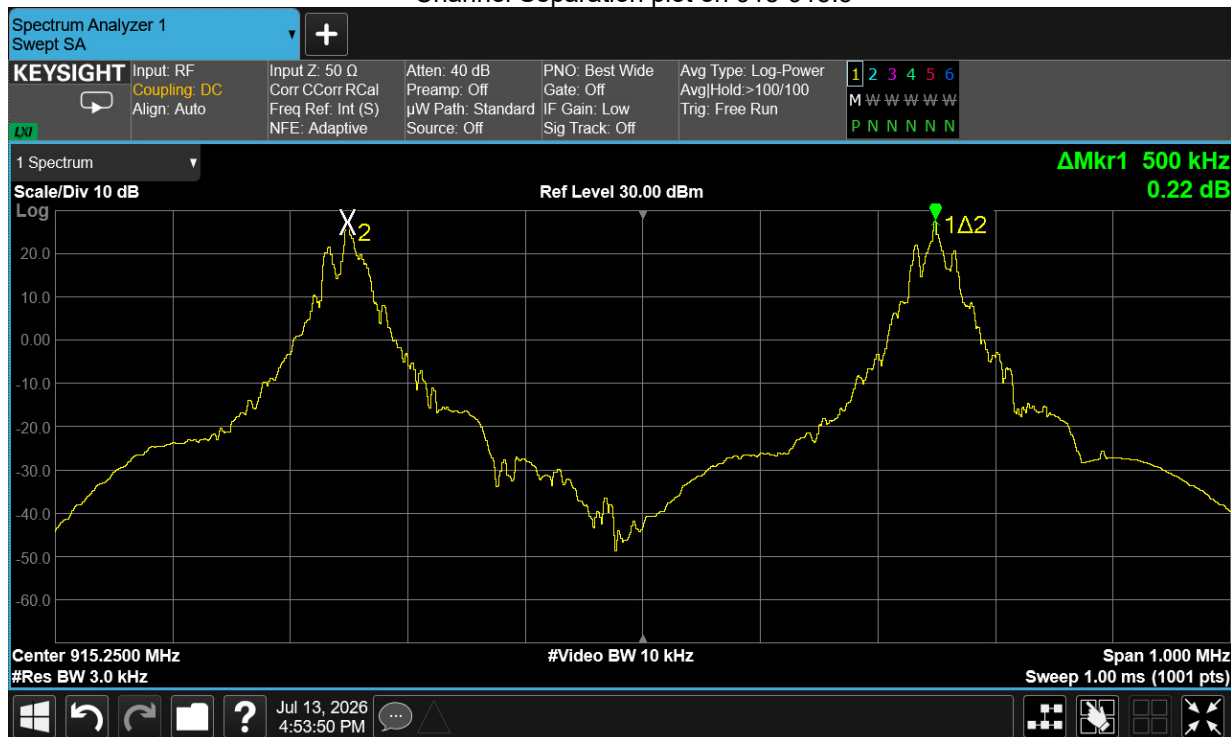
Channel Frequency (MHz)	Measured Channel Separation (kHz)	Limit (kHz)		Verdict
902.5-903	500	53.153	> 20dB BW	PASS
915-915.5	500	51.852	> 20dB BW	PASS
927-927.5	501	90.575	> 20dB BW	PASS

Test Plot

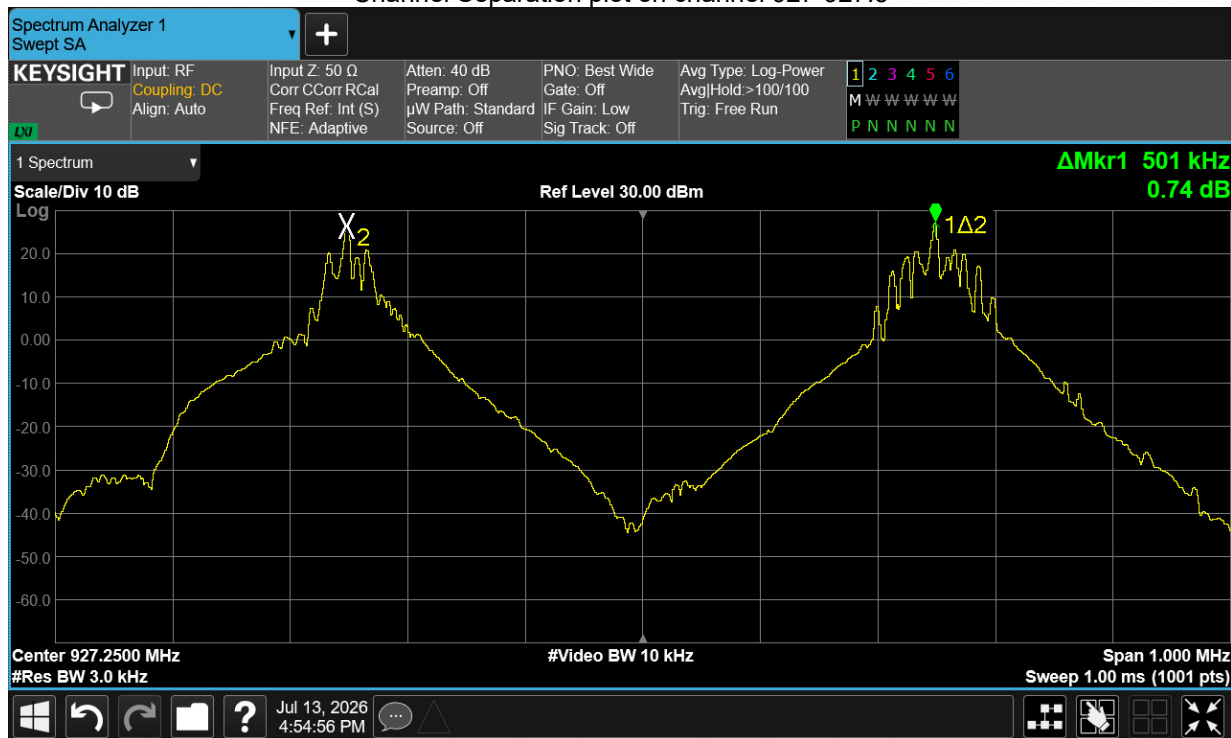
Channel Separation plot on 902.5-903



Channel Separation plot on 915-915.5



Channel Separation plot on channel 927-927.5



7.5 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

7.5.1 Applicable Standard

According to FCC Part 15.247(a)(1)(i)) and ANSI C63.10-2020+Cor.1-2023

7.5.2 Conformance Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

7.5.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 7.8.4
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously.
The EUT must have its hopping function enabled.
Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel
RBW < 200kHz
VBW ≥ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak
Trace = max hold
Measure the maximum time duration of one single pulse.
Set the EUT packet transmitting.
Measure the maximum time duration of one single pulse.

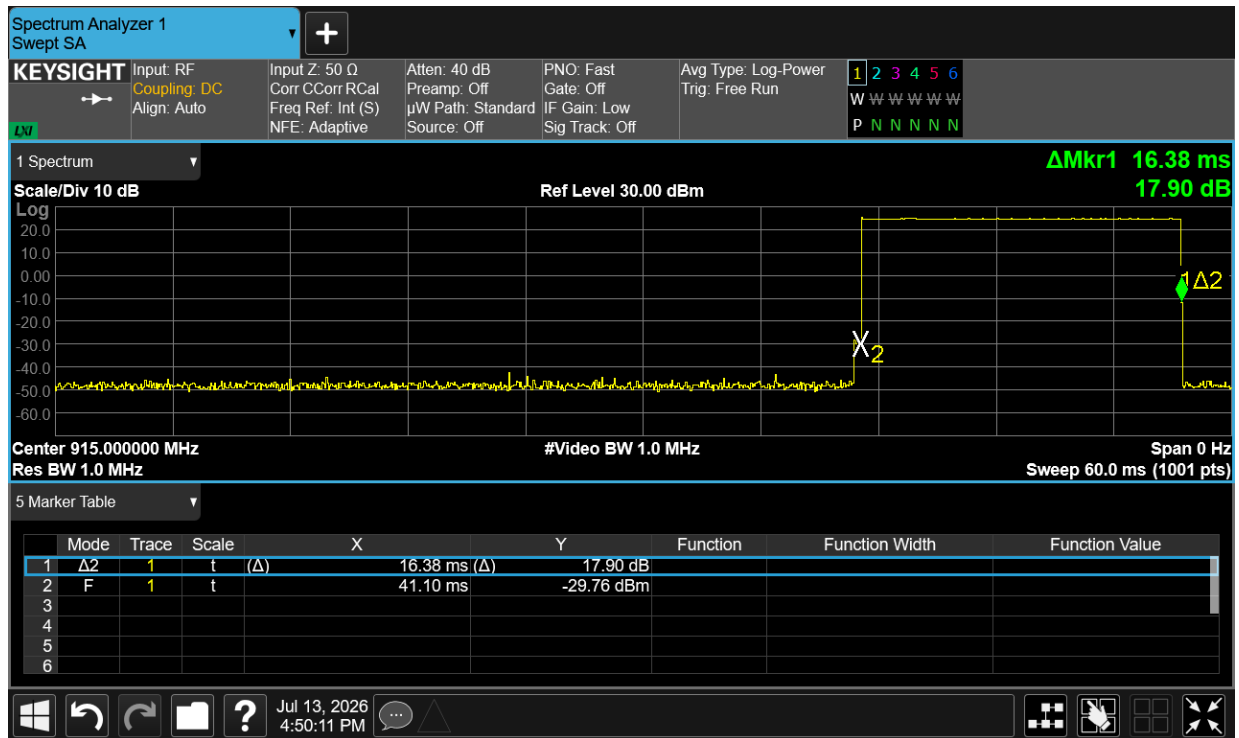
7.5.6 Test Results

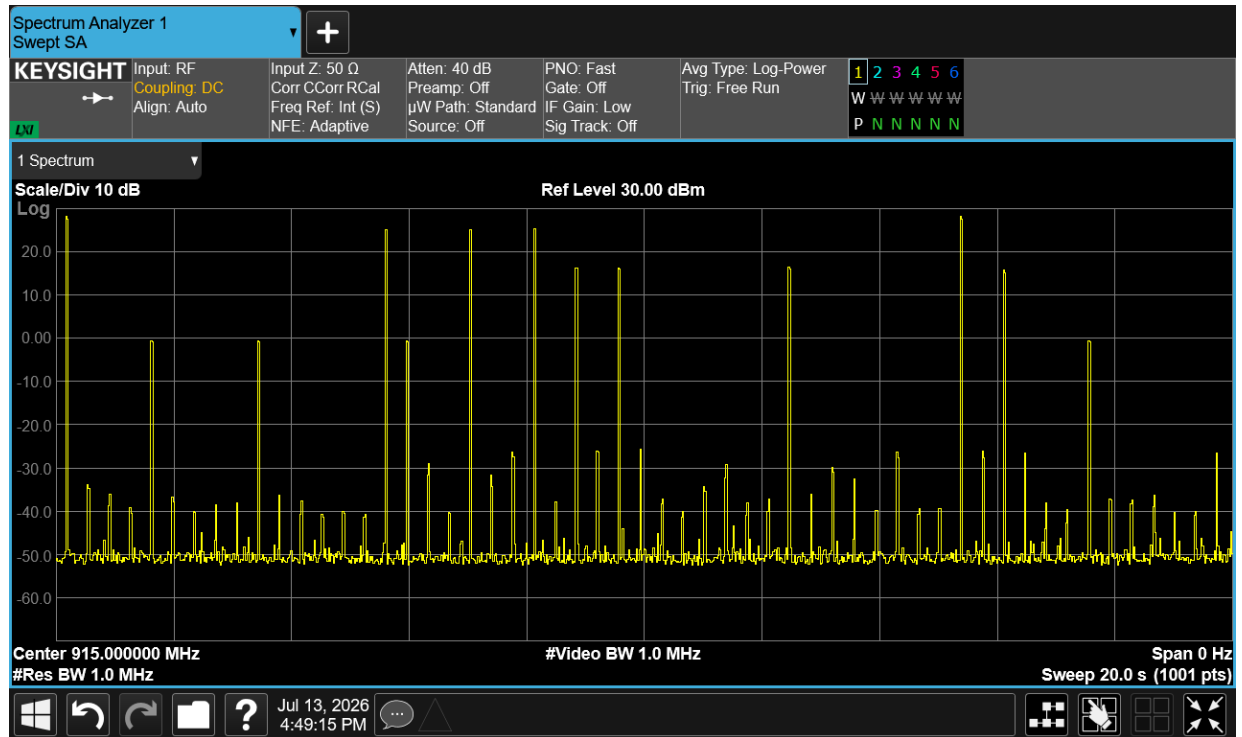
EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20℃	Relative Humidity:	48%
Test Mode:	Mode4	Test By:	Abel Chen

Center Frequency (MHz)	Transmit Time per Hop (ms)	The Number of Hop Within a limited time (N)	Dwell Time (s)	Limits (s)	Result
915	16.38	5	0.0819	0.4	Pass

Note:

1. Sweep time=20s;
2. Dwell Time(s) = Transmit Time per Hop× N





7.5.7 Pseudorandom Frequency Hopping Sequence

Each frequency used equally on the average by each transmitter.

The channel order is determined by the Channel mapping Table, system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Test Result: Meet requirements.

7.6 20DB BANDWIDTH TEST

7.6.1 Applicable Standard

According to FCC Part 15.247(a)(1) and ANSI C63.10-2020+Cor.1-2023

7.6.2 Conformance Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.6.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.6.4 Test Setup

Please refer to Section 6.1 of this test report.

7.6.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 6.9.2

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20 dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

7.6.6 Test Results

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20℃	Relative Humidity:	48%
Test Mode:	Mode1/Mode2/Mode3	Test By:	Abel Chen

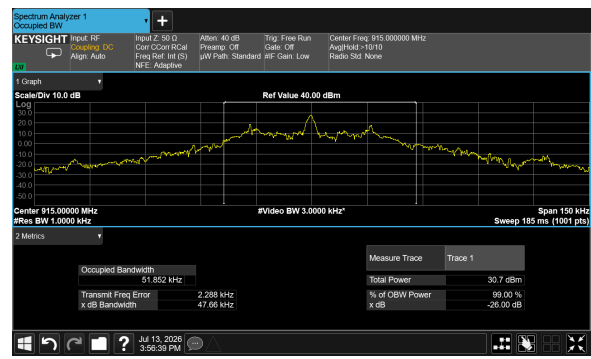
Frequency	Measured Bandwidth (KHz)	Limit	Verdict
(MHz)		≤(kHz)	
902.5	53.153	250	PASS
915	51.852	250	PASS
927.5	90.575	250	PASS

Test Plot

20dB Bandwidth plot on 902.5



20dB Bandwidth plot on 915



20dB Bandwidth plot on 927.5



7.7 PEAK OUTPUT POWER

7.7.1 Applicable Standard

According to FCC Part 15.247(b)(1) and ANSI C63.10-2020+Cor.1-2023

7.7.2 Conformance Limit

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

7.7.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 7.8.5.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq$ the 20 dB bandwidth of the emission being measured

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

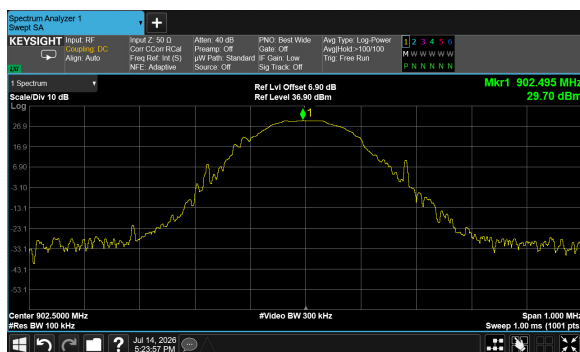
7.7.6 Test Results

EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20℃	Relative Humidity:	48%
Test Mode:	Mode1/Mode2/Mode3	Test By:	Abel Chen

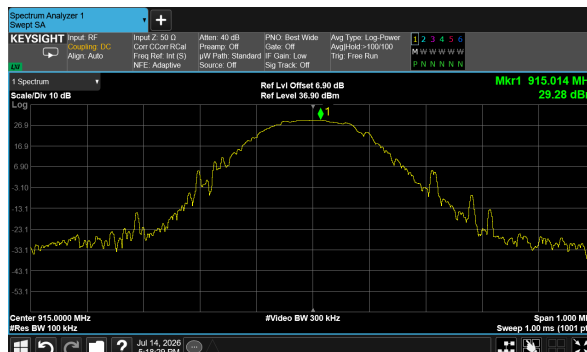
ANT	Frequency	Peak Output Power	LIMIT	Verdict
	(MHz)	(dBm)	(dBm)	
ANT 1	902.5	29.70	30	PASS
	915.0	29.28	30	PASS
	927.5	29.34	30	PASS
ANT 2	902.5	29.70	30	PASS
	915.0	29.27	30	PASS
	927.5	29.35	30	PASS

Test Plot

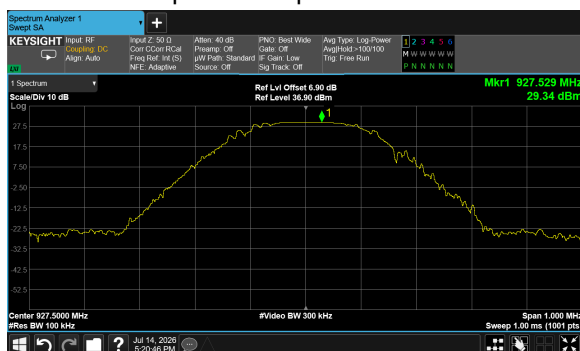
Peak output Power plot on 902.5-ANT1



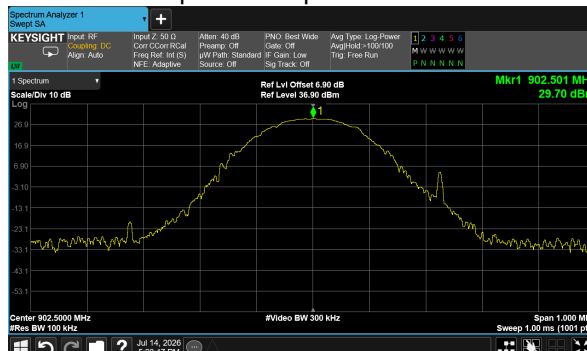
Peak output Power plot on 915-ANT1



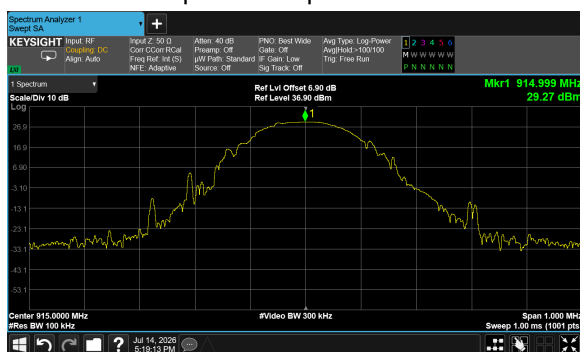
Peak output Power plot on 927.5-ANT1



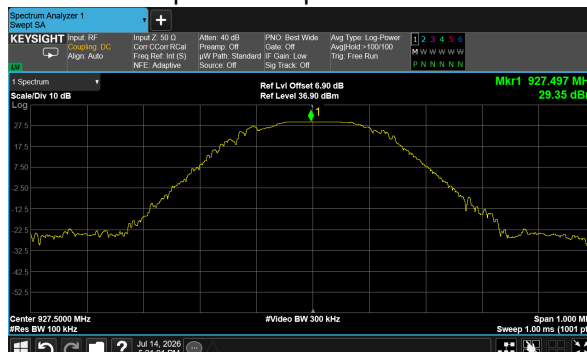
Peak output Power plot on 902.5-ANT2



Peak output Power plot on 915-ANT2



Peak output Power plot on 927.5-ANT2



7.8 CONDUCTED BAND EDGE MEASUREMENT

7.8.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2020+Cor.1-2023

7.8.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.8.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.8.4 Test Setup

Please refer to Section 6.1 of this test report.

7.8.5 Test Procedure

The testing follows ANSI C63.10-2020+Cor.1-2023 clause 7.8.6.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW = 100KHz

VBW = 300KHz

Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.

Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

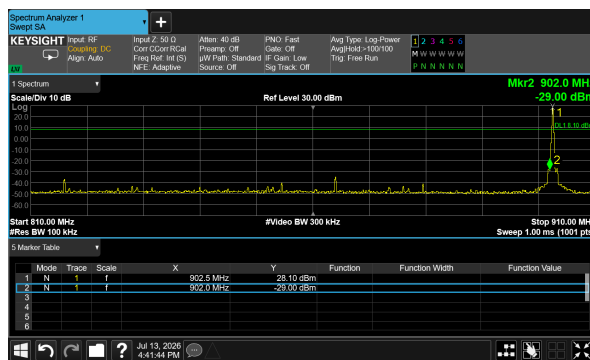
Repeat above procedures until all measured frequencies were complete.

7.8.6 Test Results

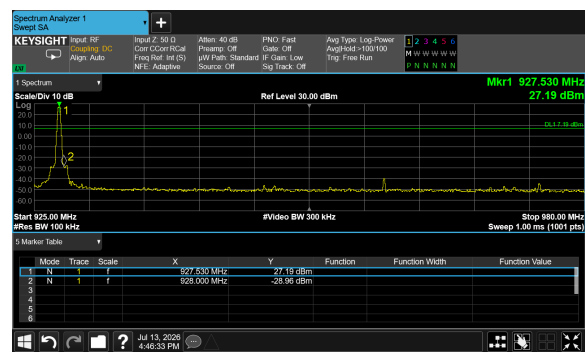
EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20°C	Relative Humidity:	48%
Test Mode:	Mode1 /Mode3/ Mode4	Test By:	Abel Chen

Test Plot

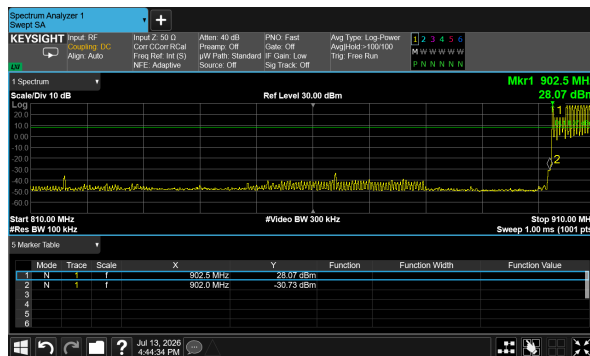
Band Edge-Low Channel



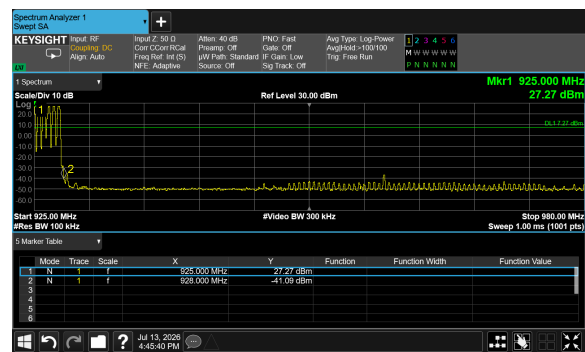
Band Edge-High Channel



Band Edge-Low Channel (Hopping Mode)



Band Edge-High Channel (Hopping Mode)



7.9 SPURIOUS RF CONDUCTED EMISSION

7.9.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2020+Cor.1-2023.

7.9.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.9.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

7.9.4 Test Setup

Please refer to Section 6.1 of this test report.

7.9.5 Test Procedure

Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
 - b) Set the RBW = 100 kHz.
 - c) Set the VBW $\geq [3 \times \text{RBW}]$.
 - d) Detector = peak.
 - e) Sweep time = auto couple.
 - f) Trace mode = max hold.
 - g) Allow trace to fully stabilize.
 - h) Use the peak marker function to determine the maximum amplitude level.
- Then the limit shall be attenuated by at least 20 dB relative to the maximum amplitude level in 100 kHz.

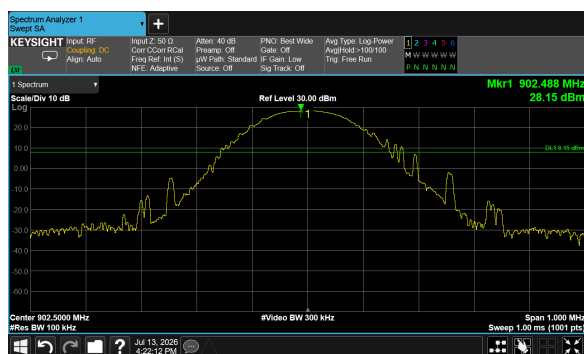
7.9.6 Test Results

Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandedge measurement data.

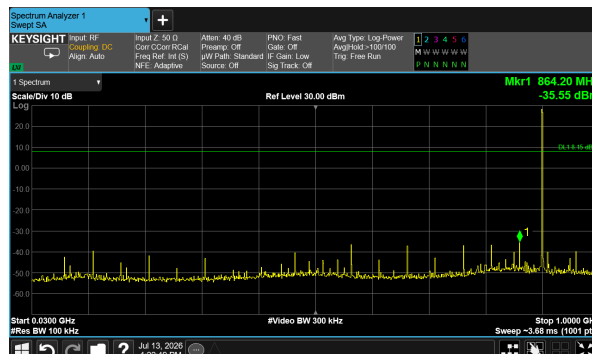
EUT:	UHF RFID Reader	Model No.:	HM-UHF-V3.3
Temperature:	20℃	Relative Humidity:	48%
Test Mode:	Mode1 /Mode2/ Mode3	Test By:	Abel Chen

Test Plot

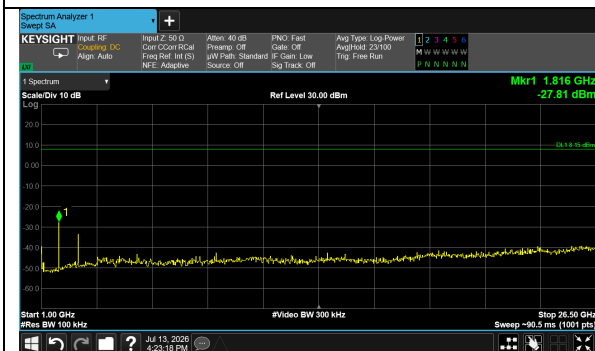
902.5



902.5

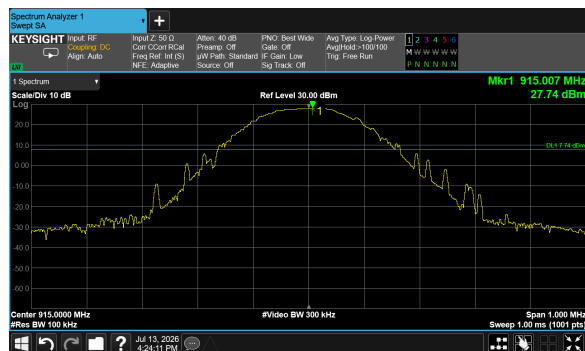


902.5

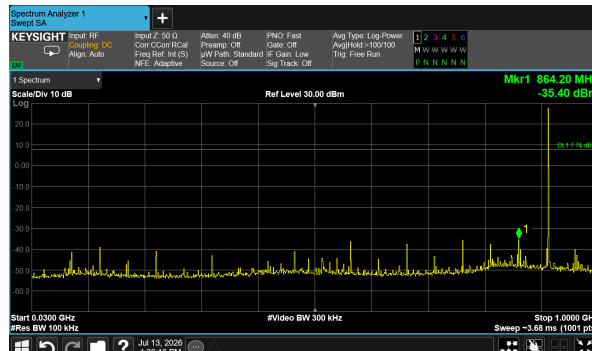


Test Plot

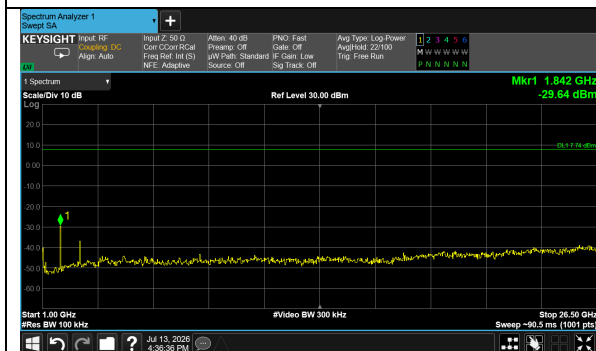
915



915

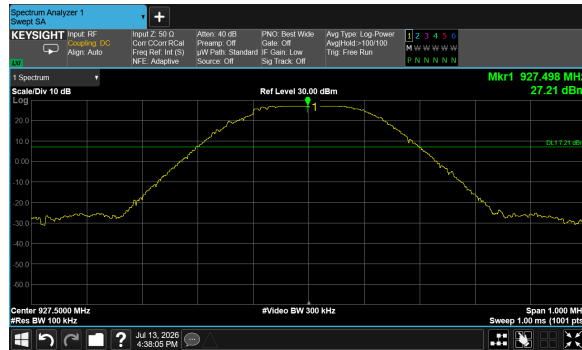


915

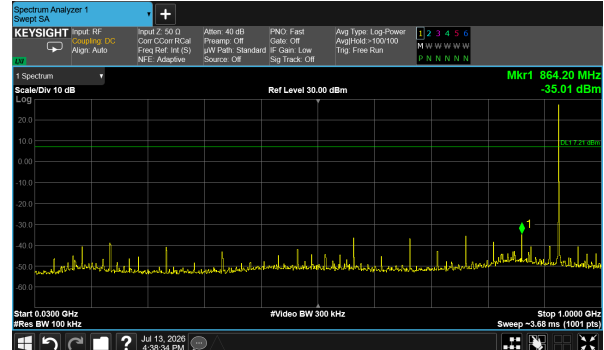


Test Plot

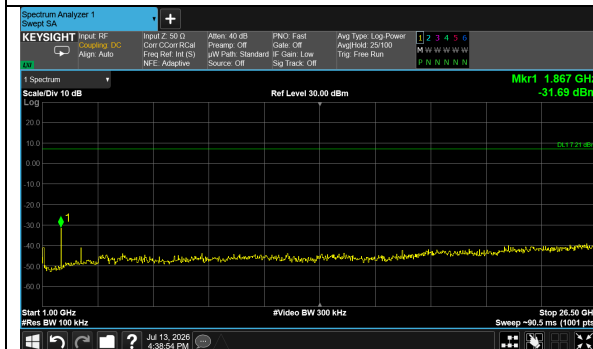
927.5



927.5



927.5



7.10 ANTENNA APPLICATION**7.10.1 Antenna Requirement**

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

7.10.2 Result

The equipment is professional-grade, and the antenna will be installed by trained personnel.

END OF REPORT