

# FCC EMC Test Report

## FCC ID: 2BC8Y-SMWRWRIR8H104

**Product :** SMore Wafer ID Reader  
**Trade Mark :** SmartMore Inside  
**Model Number :** SM-WR-W8-H104, SM-WR-W8-C104,  
SM-WR-R8-H104, SM-WR-IR8-H104

### Prepared for

Shenzhen SmartMore Information Technology Co., Ltd.  
2201A, Tower 2, Qianhai Kerry Business Center Phase 4, Qianhai Avenue, Nanshan Stree,  
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### Prepared by

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TEST RESULT CERTIFICATION

Applicant's Name .....: Shenzhen SmartMore Information Technology Co., Ltd.
Address.....: 2201A, Tower 2, Qianhai Kerry Business Center Phase 4, Qianhai Avenue, Nanshan Stree, Qianhai Shenzhen-Hong KongCooperation Zone, 518052 Shenzhen, PEOPLE'S REPUBLIC OF CHINA

Manufacturer's Name.....: Shenzhen SmartMore Information Technology Co., Ltd.
Address.....: 2201A, Tower 2, Qianhai Kerry Business Center Phase 4, Qianhai Avenue, Nanshan Stree, Qianhai Shenzhen-Hong KongCooperation Zone, 518052 Shenzhen, PEOPLE'S REPUBLIC OF CHINA

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Address.....: 2201A, Tower 2, Qianhai Kerry Business Center Phase 4, Qianhai Avenue, Nanshan Stree, Qianhai Shenzhen-Hong KongCooperation Zone, 518052 Shenzhen, PEOPLE'S REPUBLIC OF CHINA

Product description

Product Name .....: SMore Wafer ID Reader
Model Number .....: SM-WR-W8-H104, SM-WR-W8-C104, SM-WR-R8-H104, SM-WR-IR8-H104
Standards.....: 47 CFR FCC part 15 subpart B, 10-1-2022 ANSI C63.4:2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Test Sample Number.....: S230510046001
Date of Test .....:
Date (s) of performance of tests.....: 12 Sep. 2023 ~ 14 Sep. 2023
Date of Issue .....: 14 Sep. 2023
Test Result .....: Pass

Testing Engineer : Allen Huang (Allen Huang)
Technical Manager : Sky Zhang (Sky Zhang)
Authorized Signatory : Alex (Alex)

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## 1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
47 CFR FCC part 15 subpart B, 10-1-2022 ANSI C63.4:2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

### NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

### 1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd.

Add. : 1&5/F, Building C, 1&2/F, Building E, Fenda Science Park, Sanwei Community,  
Hangcheng Street, Baoan District, Shenzhen, Guangdong, China

CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance  
with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)  
The Certificate Registration Number is L5516

ISED-Registration : The Company Number: 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 April 2017).

### 1.2 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** %.

Test Item	Measurement Frequency Range	K	U(dB)
Conducted Emission	0.009MHz ~ 0.15MHz	2	3.6
Conducted Emission	0.15MHz ~ 30MHz	2	3.1
Radiated Emission	30MHz ~ 1000MHz	2	5.2
Radiated Emission	1000MHz ~ 18000MHz	2	5.1



**2. GENERAL INFORMATION**

**2.1 GENERAL DESCRIPTION OF EUT**

Equipment	SMore Wafer ID Reader	
Model Number	SM-WR-W8-H104	
Additional Model Number(s)	SM-WR-W8-C104, SM-WR-R8-H104, SM-WR-IR8-H104	
Model Difference	All models are identical except model's name.	
Product Description	The EUT is a SMore Wafer ID Reader.	
	Operating frequency:	100 MHz (Declaration by Manufacturer)
	Connecting I/O port:	N/A
Based on the application, features, or specification exhibited in User's Manual. More details of EUT technical specification, please refer to the User's Manual.		
Power Source	DC Voltage	
Power Rating	DC 24V, 300mA	

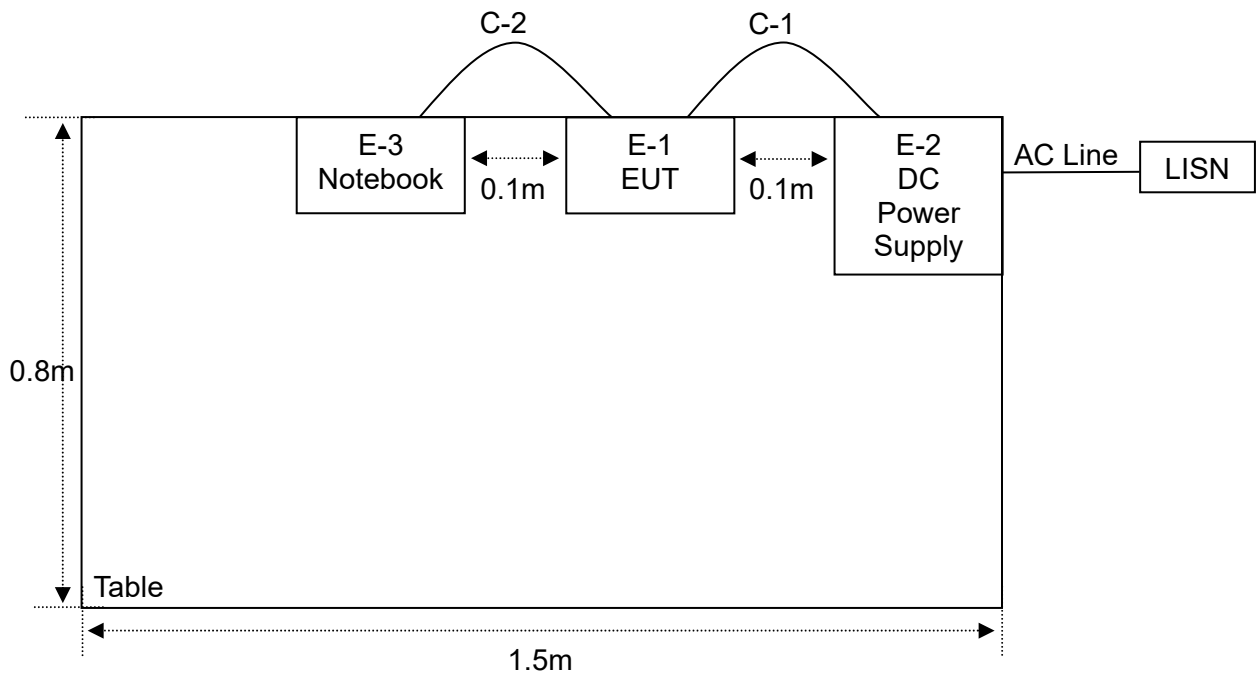
2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	Working
For Conducted Test	
Final Test Mode	Description
Mode 1	Working
For Radiated Test	
Final Test Mode	Description
Mode 1	Working

2.3 DESCRIPTION OF TEST SETUP

Mode CE : Working



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Brand	Model/Type No.	Series No.	Note
E-1	SMore Wafer ID Reader	SmartMore Inside	SM-WR-W8-H104	N/A	EUT
E-2	DC Power Supply	Zhaoxin	PS-6005D	20170400781	
E-3	Notebook	<b>DELL</b>	Inspiron 5493	9M1NN63	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	500cm	
C-2	YES	YES	500cm	

Note:

- (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" means "shielded" "with core"; "NO" means "unshielded" "without core".



## 2.5 MEASUREMENT INSTRUMENTS LIST

### 2.5.1 CONDUCTED TEST

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Single Phase LISN	R&S	ENV216	101490	May 29, 2023	May 28, 2024	1 year
2	Single Phase LISN	R&S	ENV216	101313	Mar. 27, 2023	Mar. 26, 2024	1 year
3	Three-Phase LISN	SCHWARZBECK	NNLK 8129	8129245	Mar. 27, 2023	Mar. 26, 2024	1 year
4	Low Frequency Cable	N/A	R-03	N/A	Jun. 17, 2022	Jun. 16, 2025	3 years
5	50Ω Coaxial Switch	Anritsu	MP59B	6200983704	May 06, 2023	May 05, 2026	3 years
6	EMI Test Receiver	R&S	ESCI	101160	Mar. 27, 2023	Mar. 26, 2024	1 year

### 2.5.2 RADIATED TEST

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	3m Anechoic Chamber	N/A	9*6*6	N/A	May 14, 2021	May 13, 2024	3 years
2	3m Anechoic Chamber	N/A	9*6*6	N/A	Jul. 28, 2022	Jul. 27, 2025	3 years
3	EMI Test Receiver	R&S	ESPI7	101318	Mar. 27, 2023	Mar. 26, 2024	1 year
4	Bilog Antenna	TESEQ	CBL6111D	31216	Mar. 16, 2023	Mar. 15, 2024	1 year
5	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	May 06, 2023	May 05, 2026	3 years
6	Cable	Talent Microwave	A81-NWMS MAM-12M	21120897	Dec. 16, 2021	Dec. 15, 2024	3 years
7	Cable	Talent Microwave	A81-NMN M-10M	22084896	Sep. 09, 2022	Sep. 08, 2025	3 years
8	Cable	Talent Microwave	A81-NMN M-2M	22084895	Sep. 09, 2022	Sep. 08, 2025	3 years
9	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	Jan. 11, 2023	Jan. 10, 2024	1 year
10	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	Jan. 11, 2023	Jan. 10, 2024	1 year
11	Attenuator	Eastsheep	5W-N-JK-6 G-6DB	N/A	Aug. 08, 2023	Aug. 07, 2024	1 year
12	Attenuator	Eastsheep	5W-N-JK-6 G-6DB	N/A	Jul. 31, 2023	Jul. 30, 2024	1 year
13	Broadband Horn Antenna	EM	EMAH-10180	2011071402	Mar. 31, 2022	Mar. 30, 2025	3 years
14	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2816	Jan. 12, 2023	Jan. 11, 2024	1 year
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2817	Jan. 12, 2023	Jan. 11, 2024	1 year
16	Spectrum Analyzer	Keysight	N9020A	MY53280244	Nov. 04, 2022	Nov. 03, 2023	1 year
17	Spectrum Analyzer	Agilent	E4440A	MY41000130	Mar. 27, 2023	Mar. 26, 2024	1 year
18	Pre-Amplifier	EMC	EMC05183 5SE	980246	May 29, 2023	May 28, 2024	1 year
19	Cable	Keysight	A40-2.92M 2.92M-2M	1808041	Nov. 01, 2022	Oct. 31, 2023	3 years
20	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	Nov. 07, 2022	Nov. 06, 2023	1 year

## 2.6 MEASUREMENT SOFTWARE

CONDUCTED TEST		
Software name	Manufacturer	Version number
EZ-EMC_CE	Farad	AIT-03A
RADIATED TEST		
Software name	Manufacturer	Version number
EZ-EMC_RE	Farad	AIT-03A

**3. EMC EMISSION TEST**

**3.1 CONDUCTED EMISSION MEASUREMENT**

**3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)**

Frequency Range (MHz)	<input type="checkbox"/> Class A (dB $\mu$ V)		<input checked="" type="checkbox"/> Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 - 5.0	73.00	60.00	56.00	46.00
5.0 - 30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of '\*' marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

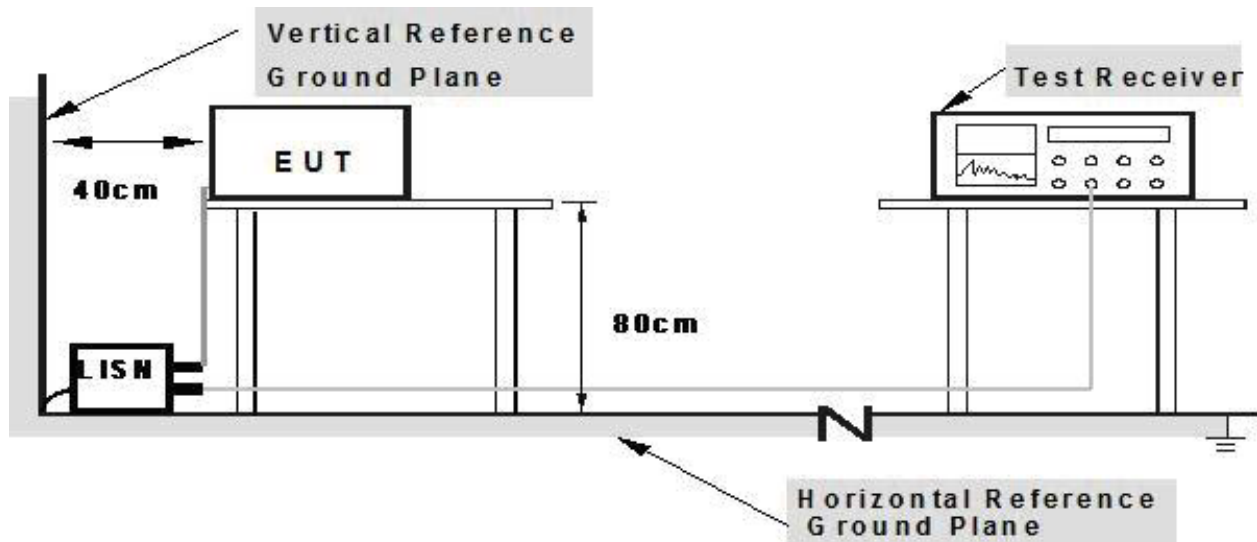
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

**3.1.2 TEST PROCEDURE**

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected 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.
- b. 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 40 cm long.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

### 3.1.3 TEST SETUP



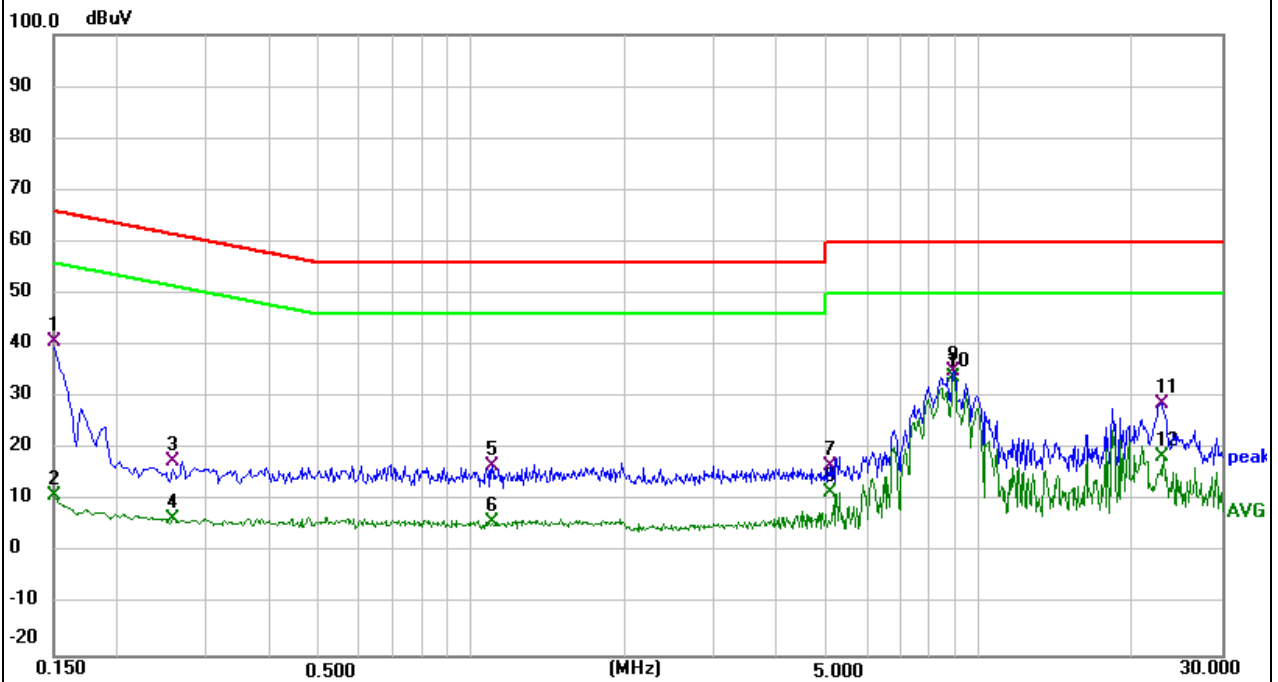
- Note: 1. Support units were connected to second LISN.**  
**2. Both of LISN s (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

EUT:	SMore Wafer ID Reader	Model Name:	SM-WR-W8-H104
Temperature:	21.9°C	Relative Humidity:	50%
Pressure:	1010hPa	Test Date:	2023-09-13
Test Mode:	Working	Phase:	L
Test Voltage:	DC 24V powered by DC Power Supply AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	30.83	9.93	40.76	66.00	-25.24	QP	P	
2	0.1500	1.20	9.93	11.13	56.00	-44.87	AVG	P	
3	0.2580	7.36	10.16	17.52	61.50	-43.98	QP	P	
4	0.2580	-3.60	10.16	6.56	51.50	-44.94	AVG	P	
5	1.0980	4.85	11.86	16.71	56.00	-39.29	QP	P	
6	1.0980	-6.01	11.86	5.85	46.00	-40.15	AVG	P	
7	5.0980	7.07	9.67	16.74	60.00	-43.26	QP	P	
8	5.0980	2.01	9.67	11.68	50.00	-38.32	AVG	P	
9	8.8820	25.49	9.69	35.18	60.00	-24.82	QP	P	
10 *	8.8820	24.04	9.69	33.73	50.00	-16.27	AVG	P	
11	23.1299	19.10	9.67	28.77	60.00	-31.23	QP	P	
12	23.1299	8.99	9.67	18.66	50.00	-31.34	AVG	P	

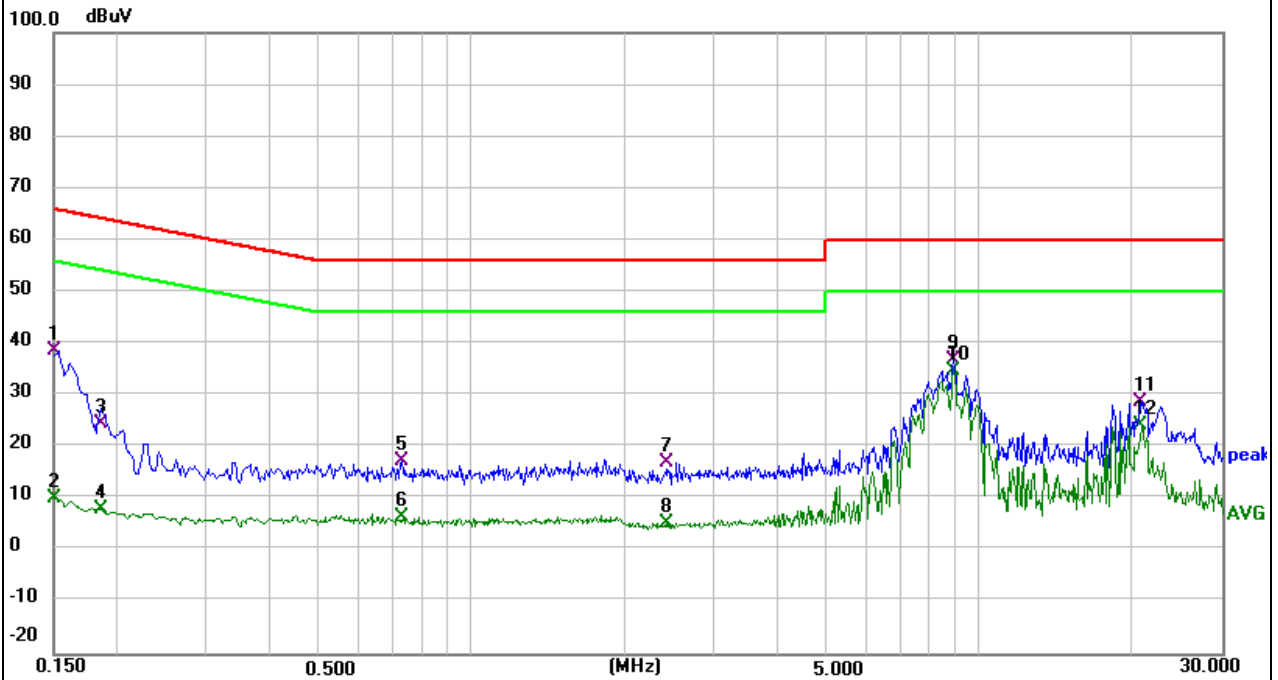
Remark:

Correct Factor = Insertion Loss + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

EUT:	SMore Wafer ID Reader	Model Name:	SM-WR-W8-H104
Temperature:	21.9°C	Relative Humidity:	50%
Pressure:	1010hPa	Test Date:	2023-09-13
Test Mode:	Working	Phase:	N
Test Voltage:	DC 24V powered by DC Power Supply AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	28.71	9.93	38.64	66.00	-27.36	QP	P	
2	0.1500	0.27	9.93	10.20	56.00	-45.80	AVG	P	
3	0.1860	14.41	10.01	24.42	64.21	-39.79	QP	P	
4	0.1860	-2.00	10.01	8.01	54.21	-46.20	AVG	P	
5	0.7300	6.16	11.11	17.27	56.00	-38.73	QP	P	
6	0.7300	-4.68	11.11	6.43	46.00	-39.57	AVG	P	
7	2.4180	7.45	9.66	17.11	56.00	-38.89	QP	P	
8	2.4180	-4.17	9.66	5.49	46.00	-40.51	AVG	P	
9	8.8820	27.22	9.69	36.91	60.00	-23.09	QP	P	
10 *	8.8820	25.13	9.69	34.82	50.00	-15.18	AVG	P	
11	20.8819	18.99	9.70	28.69	60.00	-31.31	QP	P	
12	20.8819	14.66	9.70	24.36	50.00	-25.64	AVG	P	

Remark:

Correct Factor = Insertion Loss + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	At 3m	
	<input type="checkbox"/> Class A (dBµV/m)	<input checked="" type="checkbox"/> Class B (dBµV/m)
30 ~ 88	49.5	40.0
88 ~ 216	53.9	43.5
216 ~ 960	56.9	46.0
960 ~ 1000	60.0	54.0

3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	At 3m			
	<input type="checkbox"/> Class A (dBµV/m)		<input checked="" type="checkbox"/> Class B (dBµV/m)	
	Average	Peak	Average	Peak
Above 1000	60	80	54	74

Note:

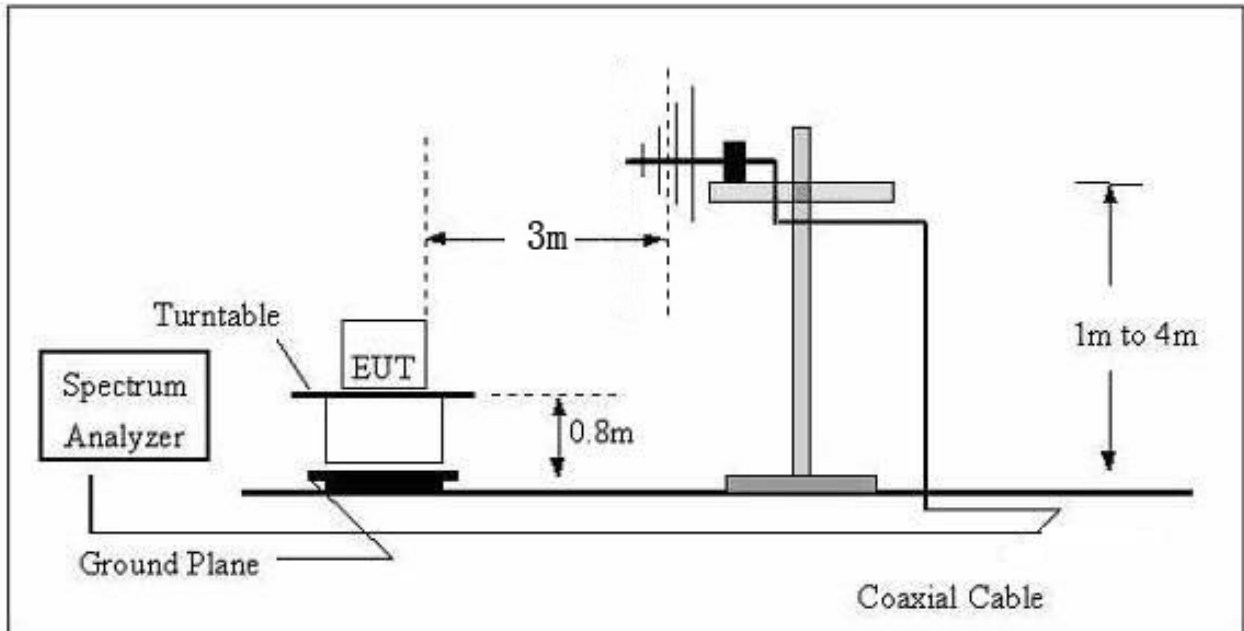
- (1) The limit for radiated test was performed according to as following: FCC PART 15B.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBµV/m)=20log Emission level (µV/m).

3.2.3 TEST PROCEDURE

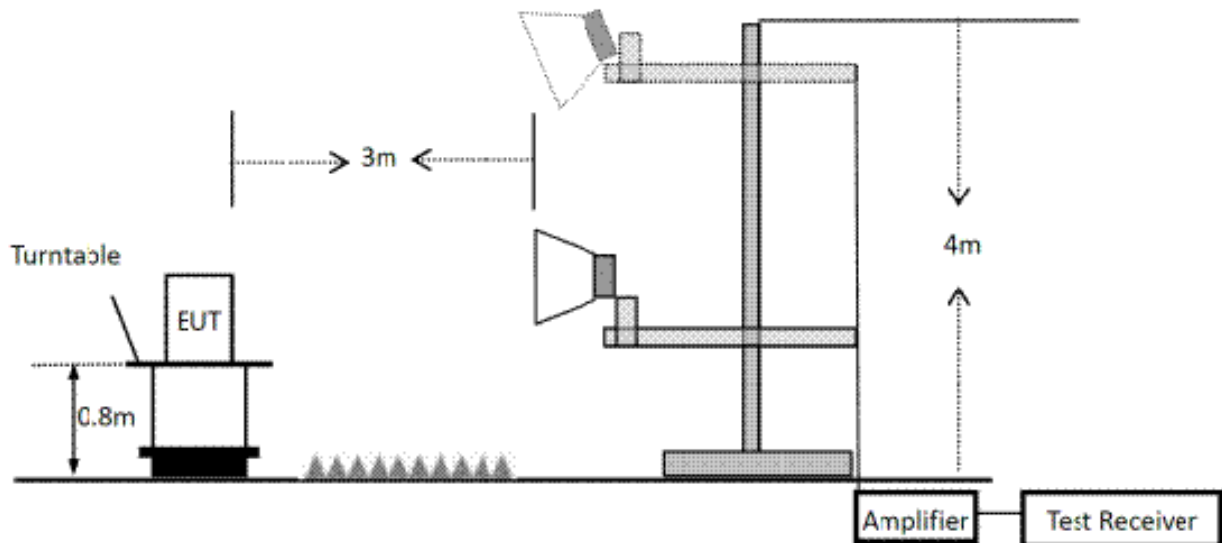
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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.
- d. 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, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

### 3.2.4 TEST SETUP

#### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



#### (B) Radiated Emission Test Set-Up Frequency Above 1GHz

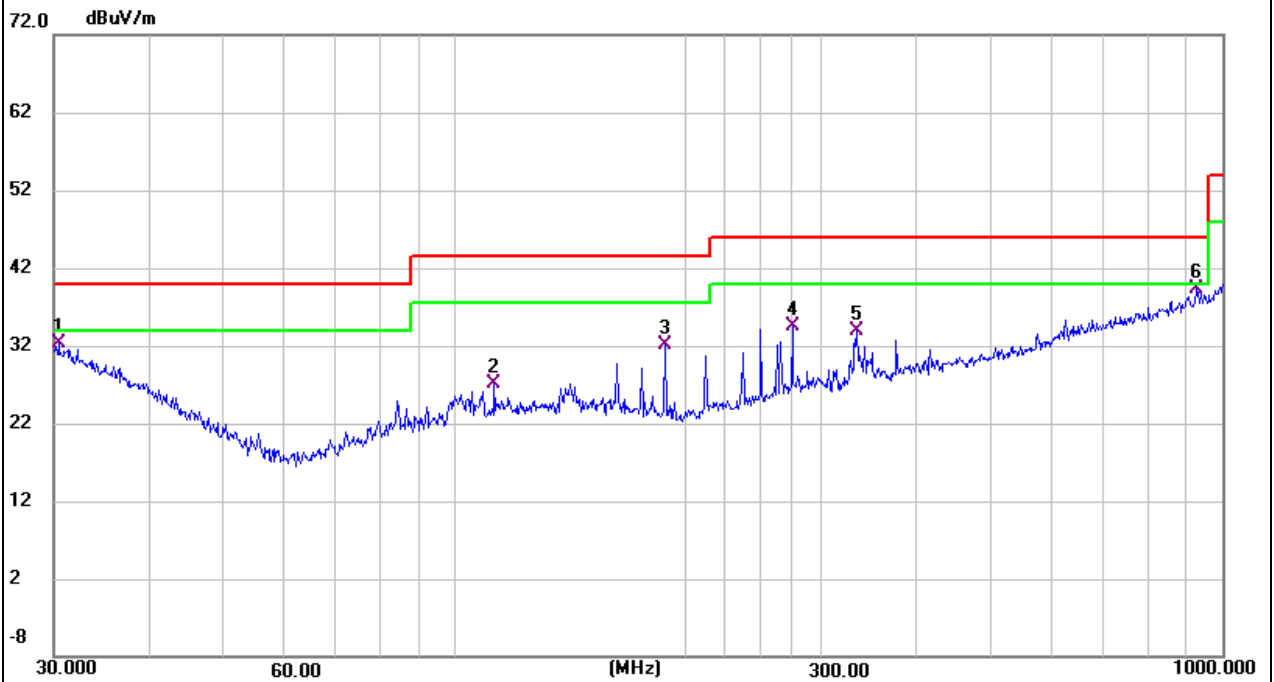


### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (30-1000MHz)

EUT:	SMore Wafer ID Reader	Model Name:	SM-WR-W8-H104
Temperature:	25.2°C	Relative Humidity:	53%
Pressure:	1010hPa	Test Date:	2023-09-12
Test Mode:	Working	Polarization:	Horizontal
Test Power:	DC 24V powered by DC Power Supply		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	30.4237	6.15	26.23	32.38	40.00	-7.62	QP			P	
2	112.5244	8.72	18.47	27.19	43.50	-16.31	QP			P	
3	187.7530	15.46	16.55	32.01	43.50	-11.49	QP			P	
4	275.1570	14.60	19.88	34.48	46.00	-11.52	QP			P	
5	333.6867	12.93	20.99	33.92	46.00	-12.08	QP			P	
6 *	925.7563	8.13	31.10	39.23	46.00	-6.77	QP			P	

Remark:

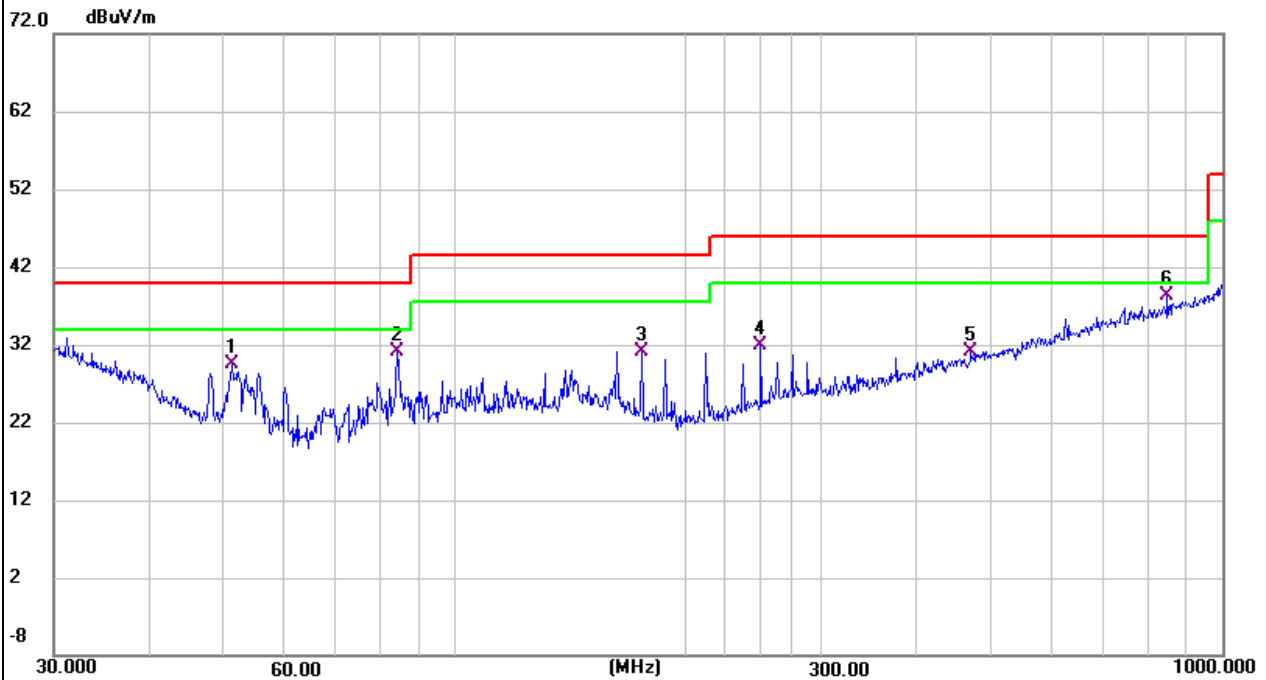
Correct Factor = Antenna Factor + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit



EUT:	SMore Wafer ID Reader	Model Name:	SM-WR-W8-H104
Temperature:	25.2°C	Relative Humidity:	53%
Pressure:	1010hPa	Test Date:	2023-09-12
Test Mode:	Working	Polarization:	Vertical
Test Power:	DC 24V powered by DC Power Supply		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	51.3005	14.81	14.66	29.47	40.00	-10.53	QP			P	
2	84.1100	15.15	15.94	31.09	40.00	-8.91	QP			P	
3	175.0368	13.93	17.22	31.15	43.50	-12.35	QP			P	
4	250.3012	12.96	18.96	31.92	46.00	-14.08	QP			P	
5	470.5232	6.73	24.43	31.16	46.00	-14.84	QP			P	
6 *	848.0563	8.12	30.19	38.31	46.00	-7.69	QP			P	

Remark:

Correct Factor = Antenna Factor + Cable Loss

Measurement Level = Reading Level + Correct Factor

Over Level = Measurement Level - Limit

----- End of Report -----