



RF MEASUREMENT REPORT

FCC ID: Y7V-VC3170C1
Applicant: ASSA ABLOY Global Solutions Norway AS
Product: Wall reader 3170
Model No.: VC510, VC520, VC530, VC540
Brand Name: vingcard ASSA ABLOY
FCC Classification: Part 15 Low Power Communication Device Transmitter (DXX)
FCC Rule Part(s): Part 15 Subpart C (Section 15.225)
Result: Complies
Received Date: 2025-11-19
Test Date: 2025-11-28 ~ 2025-12-02

Reviewed By:

Denise Zhou

Denise Zhou

Approved By:

Robin Wu

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report. Testing was performed in accordance with the applicable measurement procedures. The test results reported herein apply only to the specific item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
R25S1040116-U202	V01	Initial Report	2026-10-12	Valid

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1. General Information

1.1. Applicant

ASSA ABLOY Global Solutions Norway AS
Postboks 340, Anolitveien 1-3, 1402, Ski, Norway

1.2. Manufacturer

ASSA ABLOY Global Solutions Norway AS
Postboks 340, Anolitveien 1-3, 1402, Ski, Norway

1.3. Testing Facility

☒	Test Site - MRT Suzhou Laboratory	
	☐ Laboratory Location (Suzhou - Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
	☐ Laboratory Location (Suzhou - SIP)	
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China	
	☒ Laboratory Location (Suzhou - Wujiang)	
Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of China		
Laboratory Accreditations		
A2LA: 3628.01		CNAS: L10551
FCC: CN1166		ISED: CN0001
☐	Test Site - MRT Shenzhen Laboratory	
	Laboratory Location (Shenzhen)	
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China	
	Laboratory Accreditations	
	A2LA: 3628.02	
FCC: CN1284		ISED: CN0105

1.4. Product Information

Product Name	Wall reader 3170
Model No.	VC510, VC520, VC530, VC540
Model Difference	VC510: No Keypad Low Ingress Protection VC520: No Keypad High Ingress Protection VC530: With Keypad Low Ingress Protection VC540: With Keypad High Ingress Protection
Brand Name	vingcard ASSA ABLOY
EUT Identification No.	20251119Sample#05
Bluetooth Specification	Bluetooth_LE
ZigBee Specification	802.15.4
NFC Specification	13.56 MHz
Operating Temperature	-20 ~ 70 °C
Power Voltage	12 VDC (5 ~ 32 VDC)
Notes: 1. The information of the EUT (Equipment Under Test) was provided by the manufacturer. The accuracy, completeness, and validity of the information are solely the responsibility of the manufacturer. 2. High ingress protection device has ring oval and potted and fixed cable. Low ingress protection device does not have ring oval and potted and fixed cable, others are identical. The difference does not affect test. Model VC540 is selected for test.	

1.5. Radio Specification

Frequency Range	13.56 MHz
Channel Number	1
Type of modulation	ASK

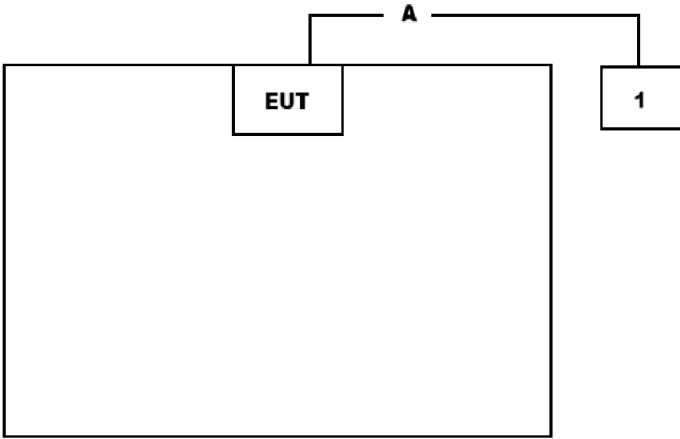
2. Test Configuration

2.1. Test Mode

Test Mode
Mode 1: Transmit by NFC at 13.56 MHz

2.2. Test Configuration and Software

The device was tested per the guidance ANSI C63.10-2020 that was used to reference the appropriate EUT setup for radiated spurious emissions testing.

Connection Diagram			
			
No.	Cable Type	Cable Description	Length
A	DC Cable	Non shielded	> 10 m
No.	Product	Manufacturer	Model No.
1	DC Power Supply	MESTEK	DP 6020

2.3. Test Software

N/A. The EUT could transmit after powered on.

2.4. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.225
- ANSI C63.10-2020
- ANSI C63.10-2020/Cor1-2023
- ANSI C63.10a-2024

2.5. Test Environment Condition

Ambient Temperature	15 ~ 35 °C
Relative Humidity	20 ~ 75 %RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of this device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
EMI Test Receiver	R&S	ESR3	MRTSUE07110	1 year	2026-04-19	WJ-AC1
EXA Signal Analyzer	Keysight	N9010B	MRTSUE07148	1 year	2026-04-26	WJ-AC1
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07076	1 year	2026-11-18	WJ-AC1
TRILOG Broad Band Antenna	Schwarzbeck	VULB 9163	MRTSUE07099	1 year	2026-04-22	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11333	1 year	2026-06-16	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11402	1 year	2025-12-01	WJ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11402	1 year	2026-11-30	WJ-AC1
Anechoic Chamber	TDK	WJ-AC1	MRTSUE07115	1 year	2026-05-16	WJ-AC1
Signal Analyzer	Keysight	N9020B	MRTSUE07037	1 year	2026-08-31	WJ-TR1
High and low temperature-humidity test chamber	GWS	EL-01JA	MRTSUE07114	1 year	2026-05-17	WJ-TR1
Thermohygrometer	testo	608-H1	MRTSUE11403	1 year	2026-11-05	WJ-TR1

Software	Version	Function
e3	230711	RE & CE
CONTROLLER CO3000	V 1.03.02	RE Antenna & Turntable

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2.

(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Emission Measurement

The maximum measurement uncertainty is evaluated as:

Coaxial: 9 kHz ~ 30 MHz: 2.56 dB

Coplanar: 9 kHz ~ 30 MHz: 2.55 dB

Horizontal: 30 MHz ~ 200 MHz: 3.48 dB

200 MHz ~ 1 GHz: 4.17 dB

Vertical: 30 MHz ~ 200 MHz: 4.09 dB

200 MHz ~ 1 GHz: 5.30 dB

6. Test Result

6.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
15.225 (a), (b), (c)	In-Band Emission	Radiated	Pass
15.225 (d)	Out-Band Emission		Pass
15.215 (c)	20 dB Bandwidth		Pass
15.225 (e)	Frequency Tolerance		Pass
15.207	AC Conducted Emissions 150 kHz-30 MHz	Line Conducted	N/A

Notes:

1. "N/A" means that this item is not applicable, and the detail information refer to relevant section.
2. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

6.2. In-band Emission Measurement

6.2.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.225		
Frequency (MHz)	Distance (m)	Level ($\mu\text{V/m}$)
13.553 ~ 13.567	30	15848
13.410 ~ 13.553, 13.567 ~ 13.710	30	334
13.110 ~ 13.410, 13.710 ~ 14.010	30	106

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength ($\text{dB}\mu\text{V/m}$) = $20\log(\text{E field strength } (\mu\text{V/m}))$

6.2.2. Test Procedure

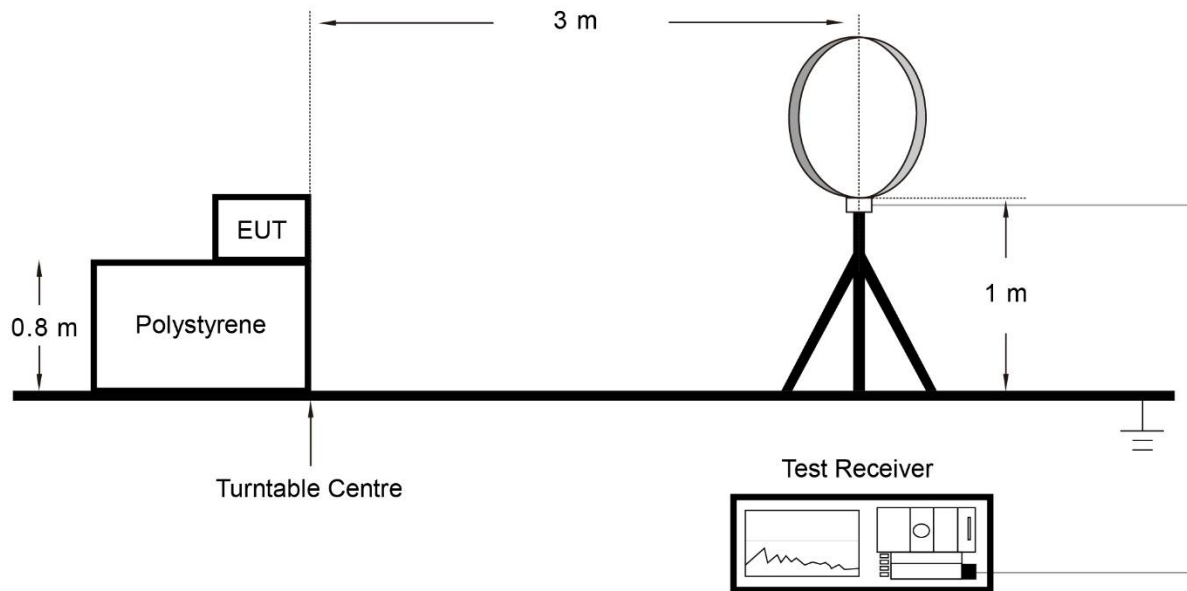
ANSI C63.10 - 2020 - Section 6.4

6.2.3. Test Setting

1. RBW = 9 kHz or 10 kHz
2. VBW = $3 \times \text{RBW}$
3. Detector = Peak
4. Trace mode = Max hold
5. Sweep = Auto couple
6. Allow the trace to stabilize

6.2.4. Test Setup

9 kHz ~ 30 MHz Test Setup:



6.2.5. Test Result

Refer to Appendix A.1.

6.3. Out-band Emission Measurement

6.3.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level ($\mu\text{V/m}$)
0.009 ~ 0.490	300	2400/F (kHz)
0.490 ~ 1.705	30	24000/F (kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: $E \text{ field strength (dB}\mu\text{V/m)} = 20\log(E \text{ field strength (}\mu\text{V/m)})$

6.3.2. Test Procedure

ANSI C63.10 - 2020 - Section 6.3 (General Requirements)

ANSI C63.10 - 2020 - Section 6.4 (Standard test method below 30 MHz)

ANSI C63.10 - 2020 - Section 6.5 (Standard test method above 30 MHz to 1 GHz)

6.3.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz

Peak Measurement

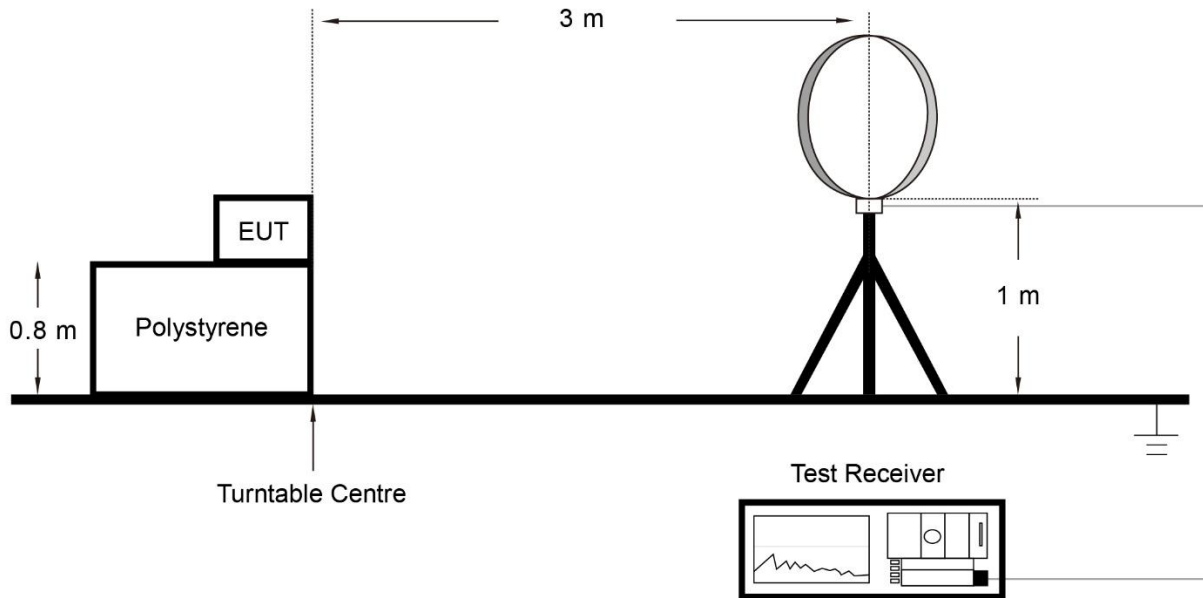
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = $3 \times \text{RBW}$
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

Quasi-Peak Measurement

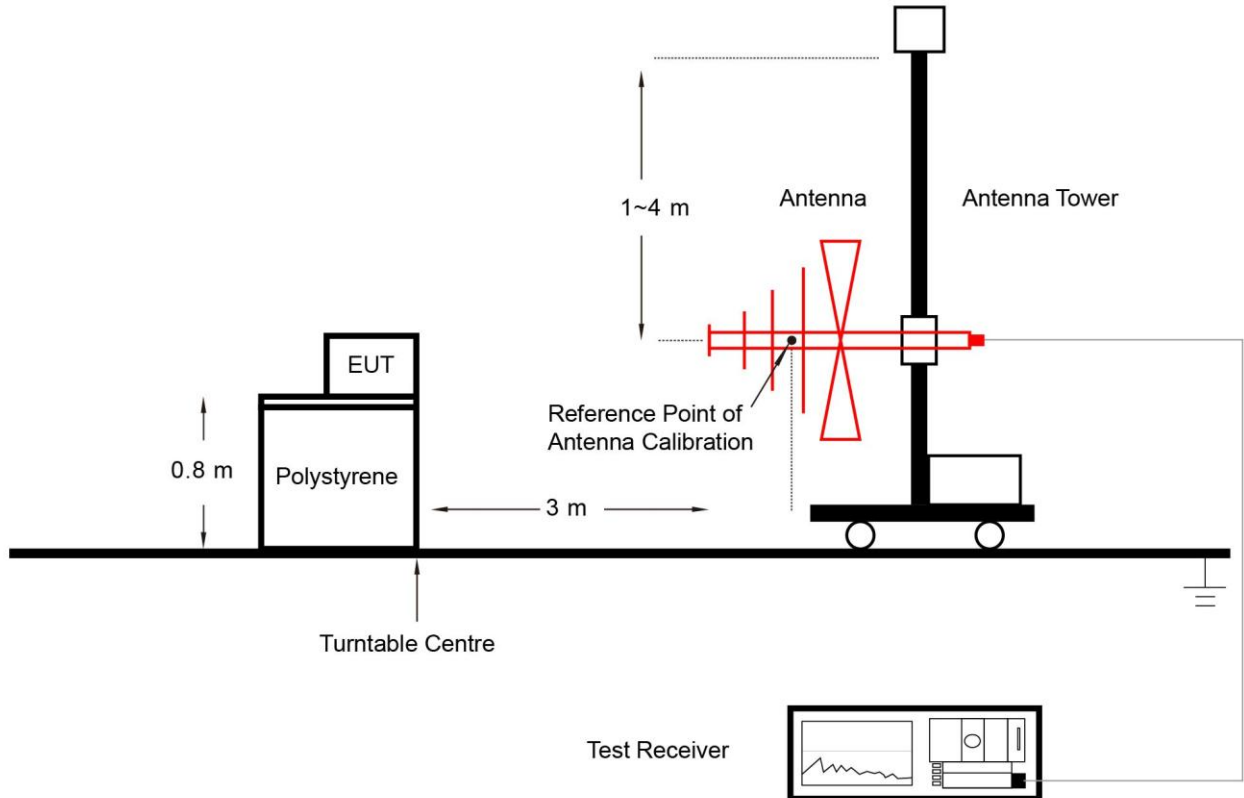
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1 MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

6.3.4. Test Setup

9 kHz ~ 30 MHz Test Setup:



Above 30 MHz Test Setup:



6.3.5. Test Result

Refer to Appendix A.2.

6.4. 20 dB Bandwidth Measurement

6.4.1. Test Limit

The occupied bandwidth is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequency.

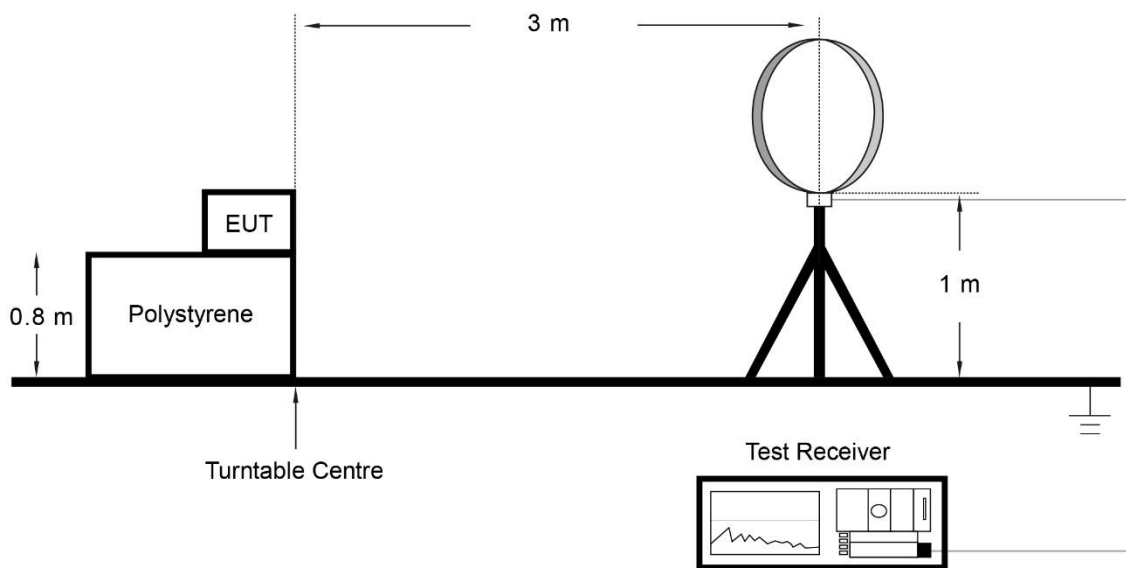
6.4.2. Test Procedure

ANSI C63.10a-2024 - Section 6.9.2

6.4.3. Test Setting

1. Spectrum analyzer frequency is set to the nominal EUT channel center frequency
2. Span = 2 times to 5 times the 20 dB bandwidth
3. RBW = 1% to 5% the 20 dB bandwidth, without going below 0.1 kHz.
4. VBW $\geq 3 \times$ RBW
5. Detector = Peak
6. Trace mode = Max hold
7. Sweep = Auto couple
8. Allow the trace to stabilize
9. Use the 20 dB bandwidth function of the instrument

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

6.5. Frequency Tolerance Measurement

6.5.1. Test Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

6.5.2. Test Procedure

ANSI C63.10-2020 - Section 6.8

6.5.3. Test Setting

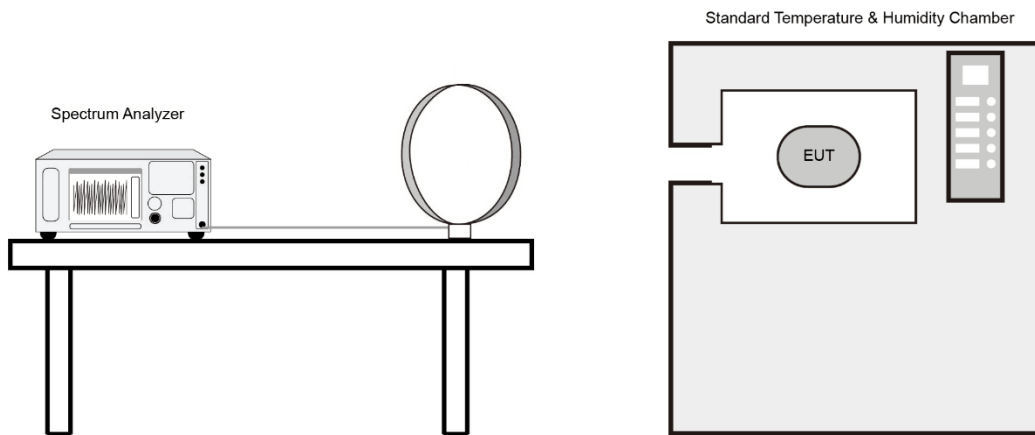
Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20 °C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10 °C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20 °C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change. For hand-carried battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

6.5.4. Test Setup**6.5.5. Test Result**

Refer to Appendix A.4.

6.6. AC Conducted Emissions Measurement

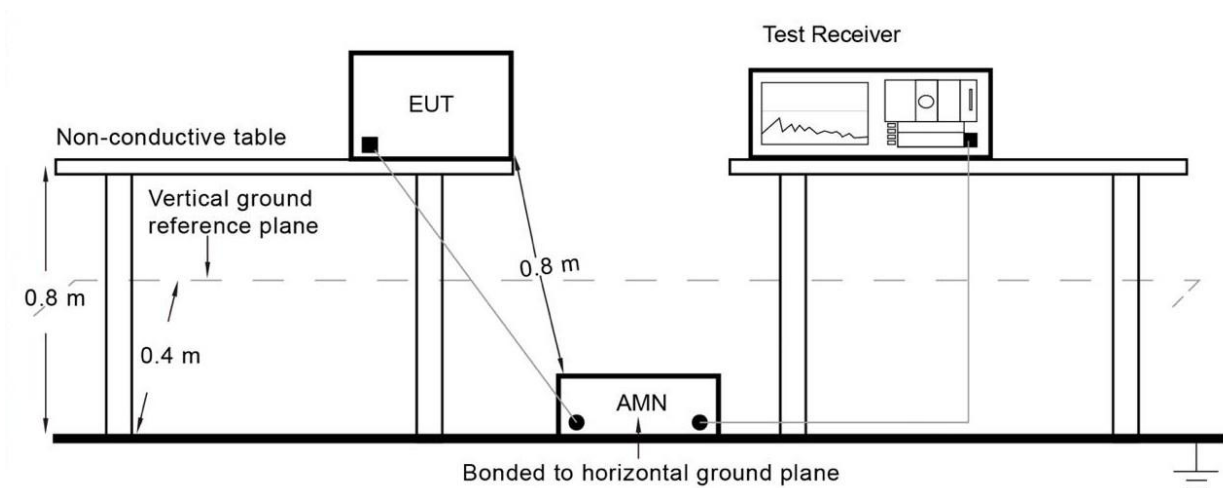
6.6.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207		
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 ~ 0.50	66 ~ 56	56 ~ 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

6.6.2. Test Setup



6.6.3. Test Result

The EUT is powered by DC, so this item is not applicable.

Appendix A - Test Result

A.1 In-band Emission Test Result

Test Site	WJ-AC1	Test Date	2025-11-28
Test Engineer	Alex Liu	Test Mode	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level@3 m (dBμV/m)	Measure Level@30 m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Coaxial						
13.11	16.34	19.66	36.00	-4.00	40.51	-44.51
13.41	16.02	19.72	35.74	-4.26	40.51	-44.77
13.55	39.95	19.74	59.69	19.69	50.48	-30.79
13.56	45.43	19.73	65.16	25.16	84.00	-58.84
13.57	39.24	19.73	58.97	18.97	50.48	-31.51
13.71	16.15	19.76	35.91	-4.09	40.51	-44.60
14.01	17.01	19.81	36.82	-3.18	40.51	-43.69
Coplanar						
13.11	15.98	19.66	35.64	-4.36	40.51	-44.87
13.41	15.96	19.72	35.68	-4.32	40.51	-44.83
13.55	46.14	19.74	65.88	25.88	50.48	-24.60
13.56	51.59	19.73	71.32	31.32	84.00	-52.68
13.57	45.26	19.73	64.99	24.99	50.48	-25.49
13.71	16.29	19.76	36.05	-3.95	40.51	-44.46
14.01	16.04	19.81	35.85	-4.15	40.51	-44.66

Notes:

- All measurements were performed using a loop antenna. The antenna was positioned in two orthogonal (coaxial and coplanar) and the position with the highest emission level was recorded.
- Measure Level@3 m (dBμV/m) = Reading Level (dBμV) + Factor (dB/m),
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).
- Measurements were tested at 3 m and the data was extrapolated to the specified measurement distance of 30 m using the square of an inverse linear extrapolation factor (40 dB/decade).
Extrapolation Factor = $40 \times \log(30/3) = 40$ dB
- All measurements were recorded using an EMI test receiver employing a peak detector.

A.2 Out-Band Emission Test Result

Test Site	WJ-AC1	Test Date	2025-11-28
Test Engineer	Alex Liu	Test Mode	Mode 1

Out-Band Emission						
Frequency Range: 9 kHz ~ 490 kHz						
Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level@3 m (dBμV/m)	Measure Level@300 m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Coaxial						
0.04	19.68	19.86	39.54	-40.46	35.56	-76.02
0.11	8.70	19.77	28.47	-51.53	26.78	-78.31
0.20	22.73	19.73	42.46	-37.54	21.58	-59.12
Coplanar						
0.10	9.77	19.78	29.55	-50.45	27.60	-78.05
0.15	13.98	19.75	33.73	-46.27	24.08	-70.35
0.17	24.17	19.74	43.91	-36.09	23.00	-59.09

Out-Band Emission						
Frequency Range: 490 kHz ~ 30 MHz						
Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level@3 m (dBμV/m)	Measure Level@30 m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Coaxial						
0.96	19.44	19.63	39.07	-0.93	27.96	-28.89
1.51	19.38	19.72	39.10	-0.90	24.02	-24.92
27.13	19.41	20.14	39.55	-0.45	29.54	-29.99
Coplanar						
1.01	19.53	19.62	39.15	-0.85	27.52	-28.37
1.65	18.88	19.75	38.63	-1.37	23.25	-24.62
27.13	17.49	20.14	37.63	-2.37	29.54	-31.91

Notes:

- Below 30 MHz measurement was performed using a loop antenna. The antenna was positioned in two orthogonal (Coaxial and Coplanar) and the position with the highest emission level was recorded.
- Measure Level@3 m (dBμV/m) = Reading Level (dBμV) + Factor (dB/m),
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).
- Measurements were tested at 3 m and the data was extrapolated to the specified measurement distance of 30 m or 300 m using the square of an inverse linear extrapolation factor (40 dB/decade).

Extrapolation Factor = $40 \times \log(300/3) = 80$ dB for range 0.009 ~ 0.490 MHz,

Extrapolation Factor = $40 \times \log(30/3) = 40$ dB for range 0.490 ~ 30 MHz.

4. All measurements were recorded using an EMI test receiver employing a peak detector.

Out-Band Emission Above 30 MHz							
Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
38.85	-9.60	18.86	9.26	40.00	-30.74	QP	Horizontal
40.67	-0.80	19.46	18.66	40.00	-21.34	QP	Horizontal
54.24	-4.00	20.19	16.19	40.00	-23.81	QP	Horizontal
63.86	-11.10	18.20	7.10	40.00	-32.90	QP	Horizontal
105.17	-11.00	18.62	7.62	43.50	-35.88	QP	Horizontal
135.59	-9.20	15.02	5.82	43.50	-37.68	QP	Horizontal
40.67	18.30	19.46	37.76	40.00	-2.24	QP	Vertical
54.24	15.30	20.19	35.49	40.00	-4.51	QP	Vertical
73.68	-0.90	14.80	13.90	40.00	-26.10	QP	Vertical
87.02	2.70	15.40	18.10	40.00	-21.90	QP	Vertical
92.29	-2.50	17.26	14.76	43.50	-28.74	QP	Vertical
122.04	1.70	16.08	17.78	43.50	-25.72	QP	Vertical

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 2: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

A.3 20 dB Bandwidth Test Result

Test Site	WJ-AC1	Test Date	2025-12-01
Test Engineer	Alex Liu	Test Mode	Mode 1

Frequency (MHz)	20 dB Bandwidth (kHz)
13.56	2.851



Note: Because the measured signal is CW adjusting the RBW per ANSI C63.10-2020 would not be practical since measured bandwidth will always follow the RBW.

A.4 Frequency Tolerance Test Result

Test Site	WJ-TR1	Test Date	2025-12-01 ~ 2025-12-02
Test Engineer	Simon Lu	Test Mode	Mode 1

Reference Voltage: 12.0 Vdc						
Deviation Limit: +/- 0.01% = +/- 1356 Hz						
Voltage (%)	Voltage (Vdc)	Temp (°C)	Frequency Deviation (Hz)			
			0 minutes	2 minutes	5 minutes	10 minutes
100%	12.0	-20	128	130	130	130
		-10	130	130	130	130
		0	130	130	129	129
		+10	123	123	123	122
		+20	115	114	113	113
		+30	93	91	90	90
		+40	62	61	61	60
		+50	65	54	51	49
115%	13.8	+20	42	42	41	41
85%	10.2	+20	42	41	41	41
Test Result			Pass	Pass	Pass	Pass

Appendix B - Test Setup Photograph

Refer to "R26S1036089-UT" file.

Appendix C - EUT Photograph

Refer to "R26S1036089-UE" file.

The End