



Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SRD TEST REPORT

PRODUCT	POS System
BRAND	SUNMI
MODEL	L15A2,L15B2
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25T3PRO
IC	22621-T3PRO
ISSUE DATE	December 17, 2024
STANDARD(S)	FCC Part15C, RSS-247 Issue 3, RSS-Gen Issue 5

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CONTENTS

1. SUMMARY OF TEST REPORT	3
1.1 TEST STANDARD(S)	3
1.2 REFERENCE DOCUMENTS.....	3
1.3 SUMMARY OF TEST RESULTS.....	3
1.4 DATA PROVIDED BY APPLICANT.....	4
2. GENERAL INFORMATION OF THE LABORATORY	5
2.1 TESTING LABORATORY	5
2.2 LABORATORY ENVIRONMENTAL REQUIREMENTS.....	5
2.3 PROJECT INFORMATION	5
3. GENERAL INFORMATION OF THE CUSTOMER	6
3.1 APPLICANT	6
3.2 MANUFACTURER	6
4. GENERAL INFORMATION OF THE PRODUCT.....	7
4.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST	7
4.2 INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	7
4.3 ADDITIONAL INFORMATION	8
5. TEST CONFIGURATION INFORMATION	9
5.1 LABORATORY ENVIRONMENTAL CONDITIONS.....	9
5.2 TEST EQUIPMENTS UTILIZED.....	9
5.3 MEASUREMENT UNCERTAINTY	11
6 TEST RESULTS	13
6.1 RADIATED EMISSION.....	13
6.2 AC POWERLINE CONDUCTED EMISSION	26
ANNEX A: REVISED HISTORY	29
ANNEX B: ACCREDITATION CERTIFICATE.....	30

1. Summary of Test Report

1.1 Test Standard(s)

No.	Test Standard	Title	Version
1	FCC Part15C	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.	--
2	RSS-247 Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2023
3	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2021

1.2 Reference Documents

No.	Test Standard	Title	Version
1	ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
2	KDB 558074 D01 15.247 Meas Guidance v05r02	Guidance for Performing Compliance Measurements on Frequency Hopping Spread Spectrum systems (DSS) Operating Under §15.247	--
3	KDB 484596 D01 Referencing Test Data v02r03	Test Reductions Via Data Referencing	--

Note: KDB 558074 D01 15.247 Meas Guidance v05r02 and KDB 484596 D01 Referencing Test Data v02r03 are not A2LA certified.

1.3 Summary of Test Results

No.	Measurement Items	FCC Rules	IC Rules	Verdict
1	Maximum Peak Output Power	15.247(b)	RSS-247 5.4	Pass (Note 3)
2	20dB Occupied Bandwidth	15.247(a)	RSS-247 5.1	Pass (Note 3)
3	99% Occupied Bandwidth	15.247(a)	RSS-GEN 6.7	Pass (Note 3)
4	Band Edges Compliance	15.247 (d)	RSS-247 5.5	Pass (Note 3)
5	Time Of Occupancy (Dwell Time)	15.247(a)	RSS-247 5.1	Pass (Note 3)
6	Carrier Frequency Separation	15.247(a)	RSS-247 5.1	Pass (Note 3)
7	Number Of Hopping Channels	15.247(a)	RSS-247 5.1	Pass (Note 3)
8	Transmitter Spurious Emission- Conducted	15.247(d)	RSS-247 5.5	Pass (Note 3)
9	Transmitter Spurious Emission- Radiated	15.247,15.209,15.205	RSS-GEN 8.9, 8.10	Pass
10	AC Powerline Conducted Emission	15.207	RSS-GEN 8.8	Pass

11	Antenna requirement	15.203/15.247(c)	RSS Gen 6.8, RSS-247 5.4	Pass (Note 2)
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Note 1:

The L15A2,L15B2 manufactured by Shanghai Sunmi Technology Co.,Ltd. is a variant product for testing. This project is a variant project based on the original report I23W00036-BT-Rev1 with below changes:

SOFTWARE MODIFICATIONS:

Other changes detailed: The original operating system is Android, and the new system has both Android and windows, which can be switched by app. Operating system changes do not affect RF/EMC performance.

HARDWARE MODIFICATION:

Components on PCB changes:

- 1) Main Board:Delete MIPI to eDP IC U5201 and its peripheral devices.
- 2) IO Board: Add Q0703 for second cash box and its peripheral devices.

According to the Product Change Description We tested the radiated spurious emission in the original report, and the test data of the worst mode was recorded in this report

There are two configurations S03aa Main Supply-L15A2 (With Printer) & S04aa Secondary Supply-L15B2 (Without Printer). The description of the differences between S03aa and S04aa is as follows.

EUT ID	SN or IMEI	Model	Printer
S03aa	TP02E4AT40024	L15A2	80 Printer
S04aa	TR02E4AV40026	L15B2	N/A

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

Note 2:

Bluetooth used a FPC antenna with max Gain 2.6 dBi that complied with 15.203 Requirements.

Note 3:

The test verdict of this item come from the original report.

Note:

- a. All the test data for each data were verified, but only the worst case was reported.
- b.The GFSK, $\pi/4$ DQPSK and 8DPSK were set in DH5 for GFSK, 2-DH5 for $\pi/4$ DQPSK, 3-DH5 for 8DPSK.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	2.6 dBi

Note: The data of antenna gain is provided by the Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.

2. General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364
IC Designation No.	10766A
CAB identifier	CN0067

2.2 Laboratory Environmental Requirements

Temperature	15°C~35°C
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa

2.3 Project Information

Project Manager	Gao Hongning
Test Date	November 14, 2024 to December 10, 2024

3. General Information of The Customer

3.1 Applicant

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	+86 17302160204

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	+86 17302160204

4. General Information of The Product

4.1 Product Description for Equipment under Test

Product Name	POS System
Model name	L15A2,L15B2
Date of Receipt	S03aa/S04aa: November 14, 2024
EUT ID*	S03aa/S04aa
SN/IMEI	S03aa: TP02E4AT40024 S04aa: TR02E4AV40026
Supported Radio Technology and Bands	Wi-Fi 2.4G:802.11b/g/n/ax Wi-Fi 5G U-NII-1/ U-NII-2a/U-NII-2c/U-NII-3:802.11a/n/ac/ax Wi-Fi 6E U-NII-5/U-NII-6/U-NII-7/U-NII-8:802.11ax
Hardware Version	6490Coreboard_MB_V3.0
Software Version	3.0.0
FCC ID	2AH25T3PRO
IC	22621-T3PRO
NOTE1: EUT ID is the internal identification code of the laboratory. NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Internal Identification of AE used during the test

AE ID*	Description	Model	SN/Remark
CA03	Adapter	CYSE65-240250	Jiangsu Chenyang Electron Co.,Ltd. Input:100-240V~50/60Hz 1.7A Output: 24.0V=2.5A 60.0W
UA03	AC Cable	N/A	N/A
NOTE1: AE ID is the internal identification code of the laboratory.			

4.3 Additional Information

Bluetooth Frequency	2402MHz-2480MHz
Bluetooth Channel	Ch0-78
Bluetooth Modulation	GFSK; $\pi/4$ DQPSK; 8DPSK

Test frequency list:

GFSK	Channel	0	39	78
	Freq. (MHz)	2402	2441	2480
$\pi/4$ DQPSK	Channel	0	39	78
	Freq. (MHz)	2402	2441	2480
8DPSK	Channel	0	39	78
	Freq. (MHz)	2402	2441	2480

Note: This report is for BT only.

5. Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Relative Humidity	Min. = 45 %, Max. = 55 %		
Atmospheric Pressure	101kPa		
Temperature	Normal	Minimum	Maximum
	25°C	0°C	40°C
Working Voltage of EUT	Normal	Minimum	Maximum
	24V	25.2V	22.8V

5.2 Test Equipments Utilized

5.2.1 Radiated Emission Test System

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Universal Radio Communication Tester	CMU200	123126	V5.2.1	B12	R&S	2024-10-9	1 Year
2	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2024-10-9	1 Year
3	EMI Test Receiver	ESU40	100307	V5.1-24-3	01	R&S	2023-12-19	1 Year
4	TRILOG Broadband Antenna	VULB9163	01345	N/A	N/A	Schwarzbeck	2024-03-29	1 Year
5	Double-ridged Waveguide Antenna	ETS-3117	00135890	N/A	N/A	ETS	2024-03-16	1 Year
6	EMI Test Software	EMC32 V10.35.02	N/A	V10.35.02	N/A	R&S	N-A	N/A
7	Horn Antenna	3160-09	LM6321	N/A	N/A	R&S	2024-08-3	1 Year
8	Horn Antenna	3160-10	LM5942	N/A	N/A	R&S	2024-08-3	1 Year

9	Loop Antenna	AL-130R	12108 3	N/A	N/A	COM- POWER	2024- 08-31	1 Year
10	Preamplifier	SCU08F1	83200 24	N/A	N/A	R&S	2024- 10-09	1 Year
11	Preamplifier	SCU18	10155	N/A	N/A	R&S	2024- 10-09	1 Year
12	Preamplifier	SCU26	10025	N/A	N/A	R&S	2024- 10-09	1 Year
13	Preamplifier	SCU40	10020	N/A	N/A	R&S	2024- 10-09	1 Year
14	2-Line V- Network	ENV216	10138 0	N/A	N/A	R&S	2023- 12-19	1 Year
15	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
16	Test Receiver	ESCI	10123 5	V5.1- 24-3	0	R&S	2023- 12-19	1 Year
17	Antenna Tower	TPMDC-LF	N/A	N/A	N/A	Top Precision	N/A	N/A
18	Antenna Tower	TPMDC- HF	N/A	N/A	N/A	Top Precision	N/A	N/A

5.2.3 Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω
Temperature	Min. = 15 °C, Max. = 35 °C

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (9.8 meters×6.7 meters×6.7 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB, 30MHz to 1GHz

5.3 Measurement Uncertainty

Measurement Uncertainty of Conduction test

Measurement Items	Range	Confidence Level	Calculated Uncertainty
20dB Emission Bandwidth	2400–2483.5MHz	95%	±1.9%
Carrier Frequency Separation	2400–2483.5MHz	95%	±1.9%
Maximum Power Spectral Density Level	2400–2483.5MHz	95%	±0.98 dB
Number of Hopping Channel	2400–2483.5MHz	95%	±1.9%
Time of Occupancy	2400–2483.5MHz	95%	±0.11%

Max Peak Conducted Output Power	2400–2483.5MHz	95%	±0.98 dB
Band-edge Spurious Emission	2400–2483.5MHz	95%	±1.21dB
Conducted RF Spurious Emission	9kHz-40GHz	95%	9kHz-7GHz:±1.21dB 7GHz-40GHz: ±3.31dB

Measurement Uncertainty of Radiation test

Measurement Items	Uncertainty(dB)
Radiated Emission 30MHz-1000MHz	±5.10
Radiated Emission 1000MHz-18000MHz	±5.66
Radiated Emission 18000MHz-40000MHz	±5.22
AC Powerline Conducted Emission	±4.38

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6 Test Results

6.1 Radiated Emission

6.1.1 Measurement Limit

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power
RSS-GEN 8.9, 8.10	20dB below peak output power

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)).

Limit in restricted band

Frequency of emission (MHz)	Field strength (mV/m)	Field strength (dBuV/m)
0.009~0.49	2400/F (kHz)	129-94
0.49~1.705	24000/F (kHz)	74-63
1.705~30	30	70
30~88	100	40
88~216	150	43.5
216~960	200	46
Above 960	500	54

6.1.2 Test Method

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Test Settings – Below 1GHz (Quasi-Peak Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 100 kHz.
3. Set the VBW = 300 kHz.

4. Detector = quasi-peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Trace was allowed to stabilize.

Test Settings – Above 1GHz (Peak Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = peak
5. Trace mode = max hold
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

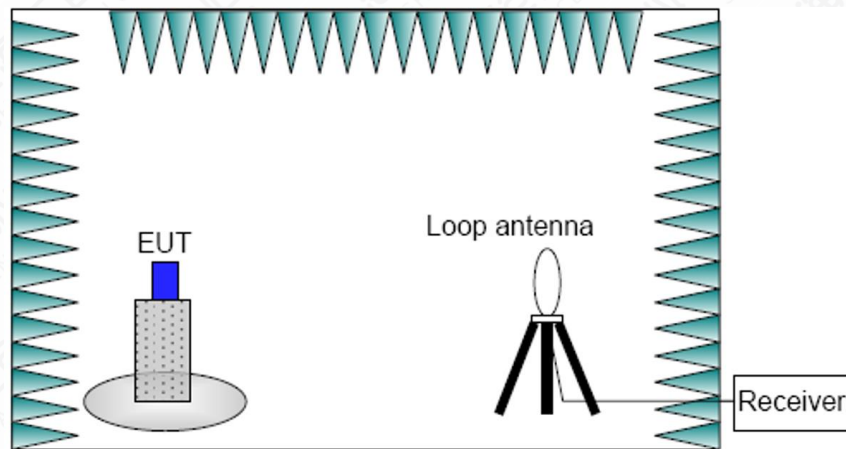
Test Settings – Above 1GHz (Average Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = power average (RMS).
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span} \backslash \text{RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

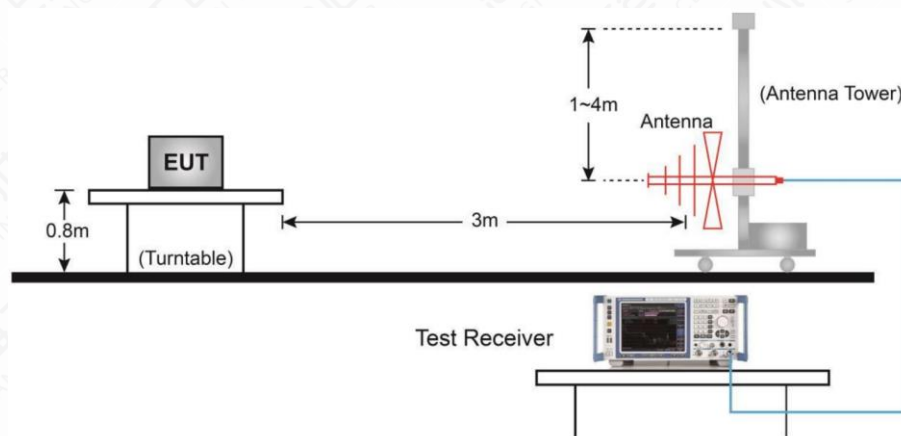
Frequency of emission	RBW/VBW	Sweep Time (s)
0.009~30	9KHz/30KHz	Auto
30~1000	100KHz/300KHz	5
1000~4000	1MHz/3MHz	15
4000~18000	1MHz/3MHz	40
18000~26500	1MHz/3MHz	20

6.1.3 Test Setup

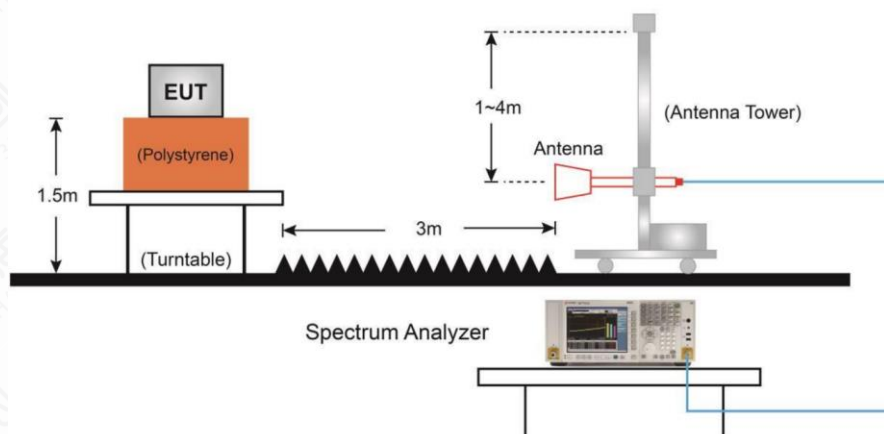
Below 30MHz Test Setup



Below 1GHz Test Setup



Above 1GHz Test Setup



6.1.4 Measurement Results

A “reference path loss” is established and AR_{pi} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

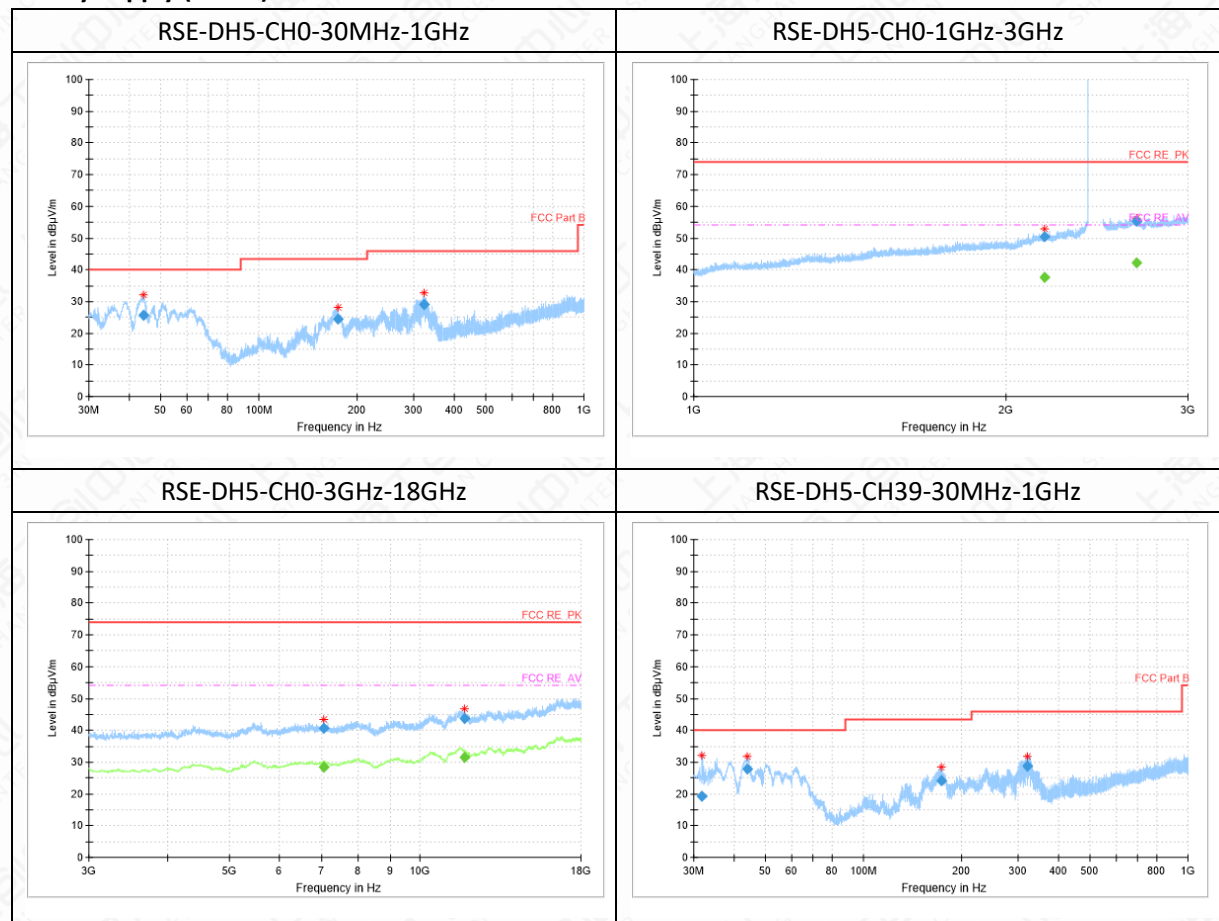
$AR_{pi} = \text{Cable loss} + \text{Antenna Factor} - \text{Preamplifier gain}$

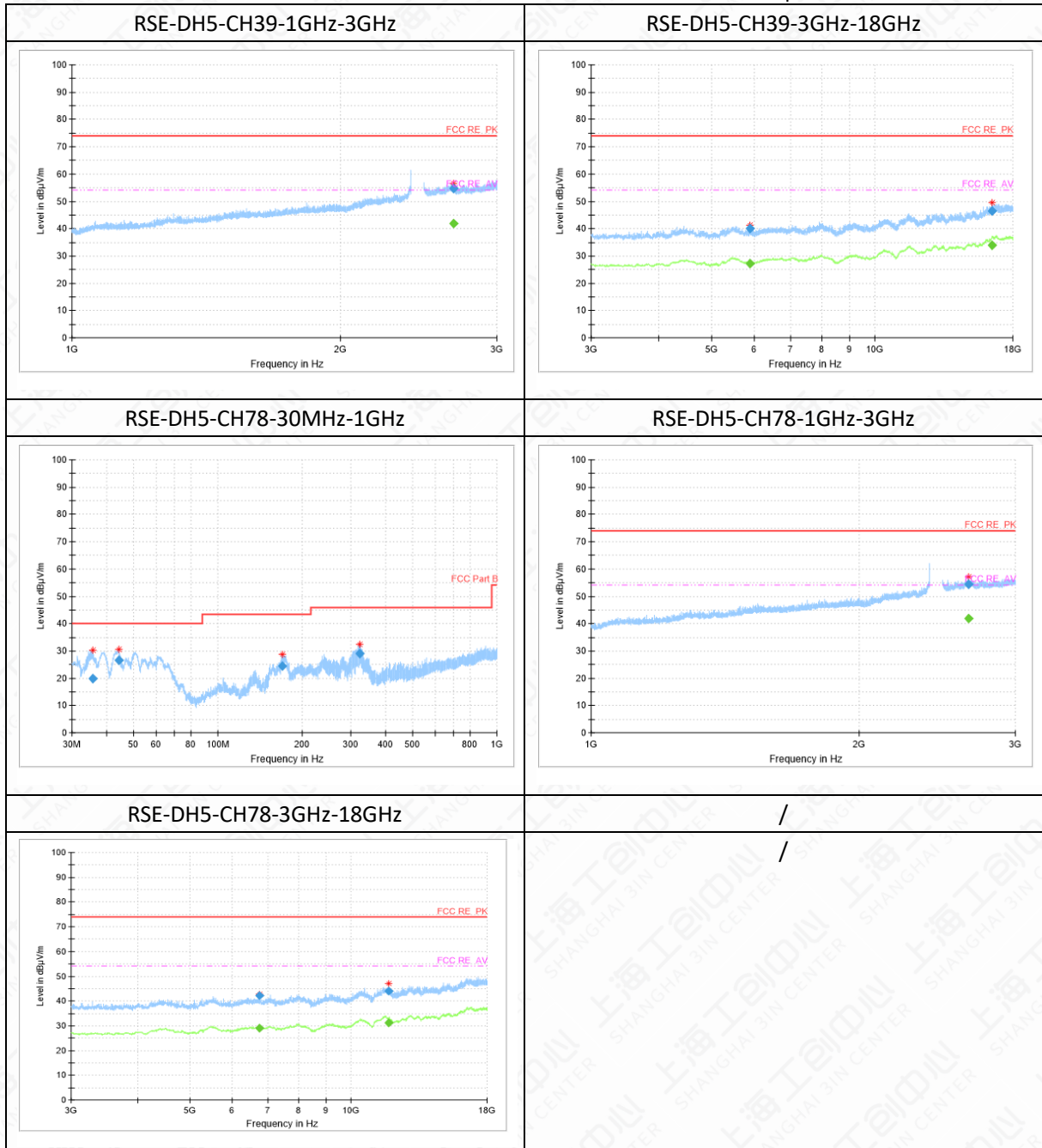
$\text{Result} = P_{\text{Mea}} + AR_{pi}$

Note:

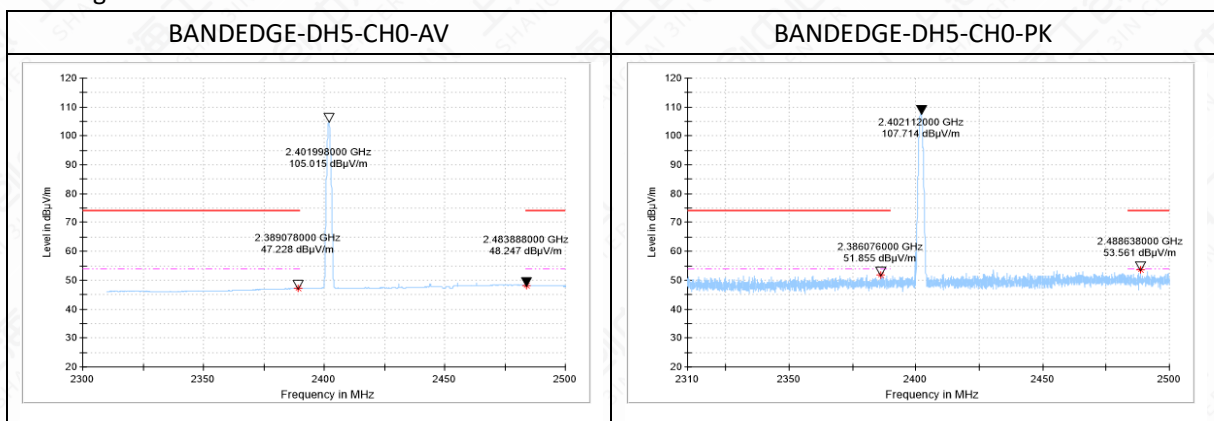
1. The out-of- limit signal in the picture is the main frequency signal.
2. Only data in worst mode is provided.
3. Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the Emissions in the frequency band 18GHz-26.5GHz is more than 20dB below the limit are not report.
4. The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.
5. Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

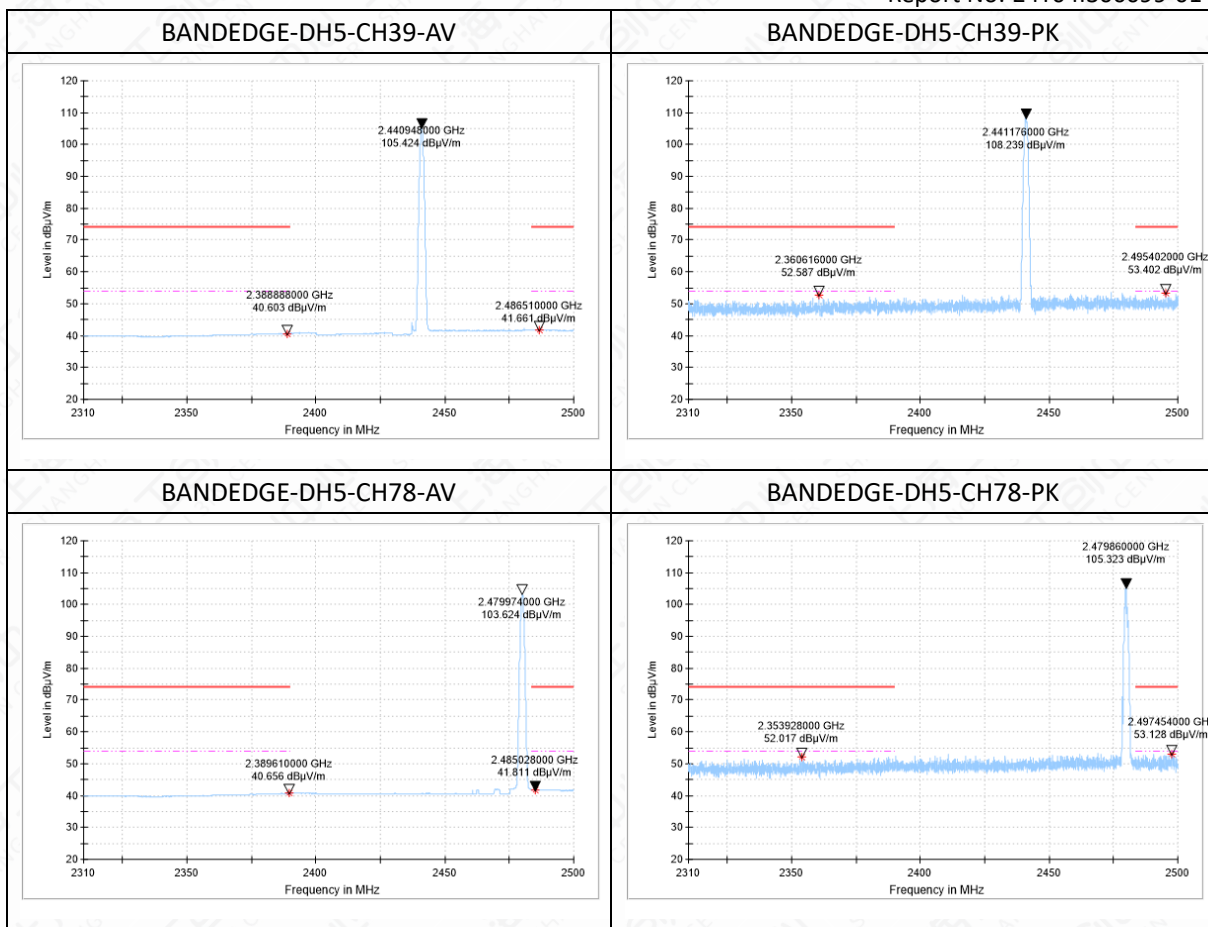
Mainly Supply (S03aa)



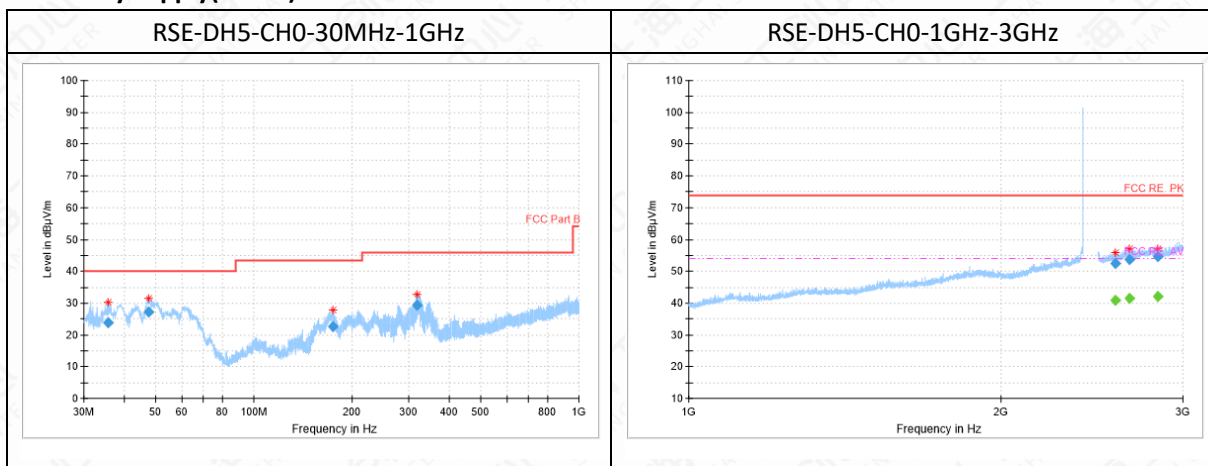


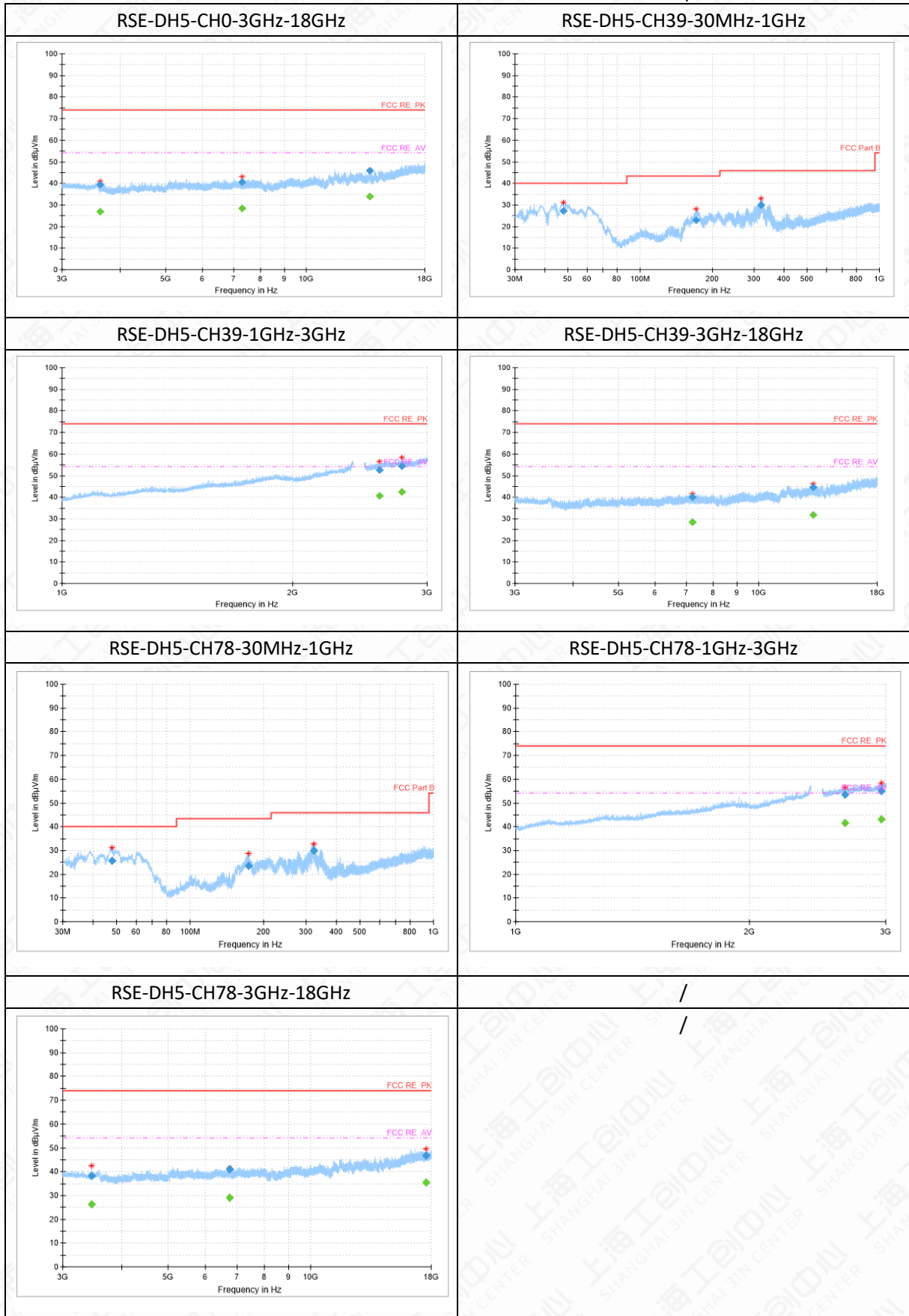
Bandedge



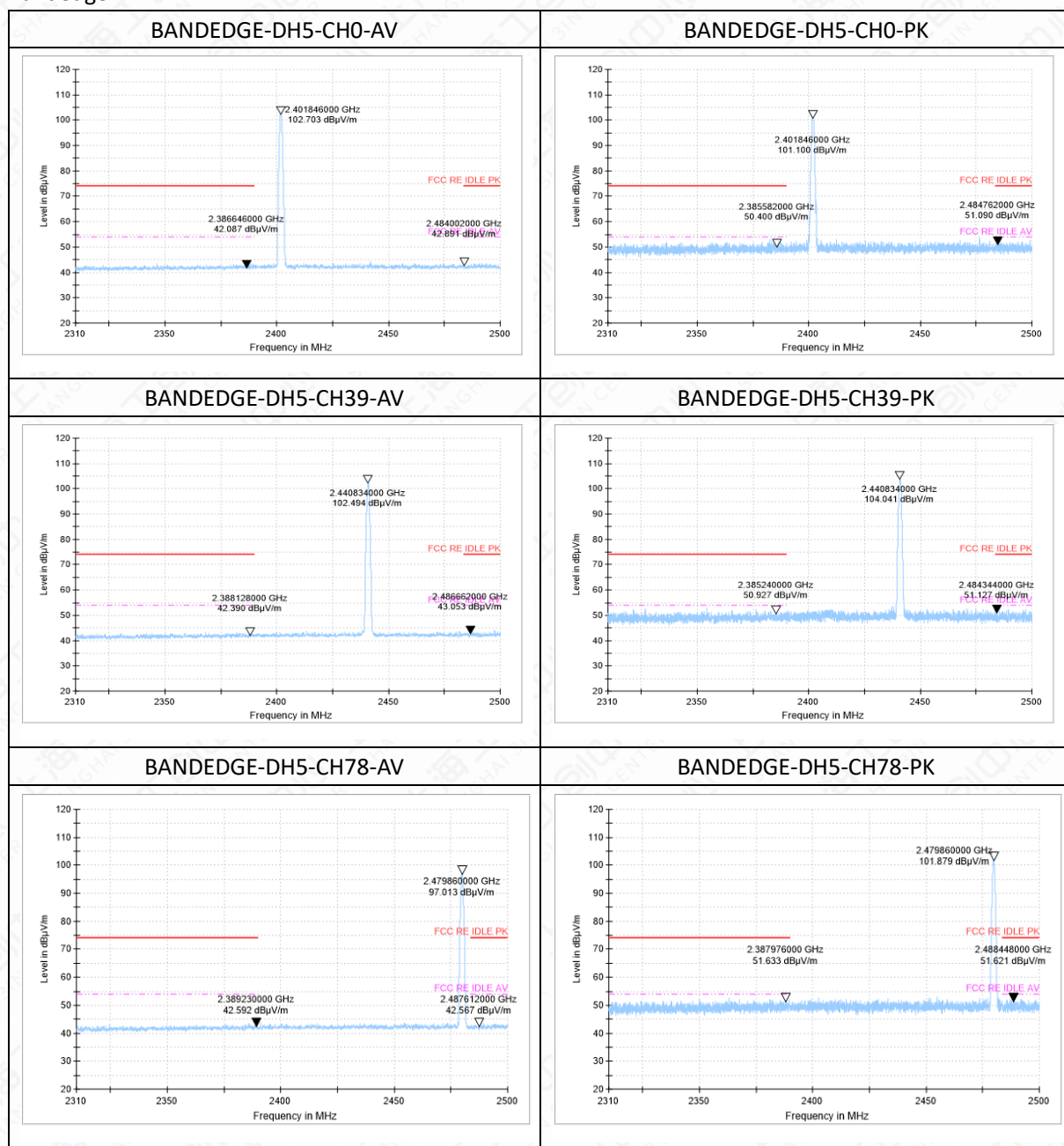


Secondary supply(S04aa)





Bandedge



Note:

1. The out-of- limit signal in the picture is the main frequency signal.
2. Only data in worst mode is provided.
3. Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the Emissions in the frequency band 18GHz-26.5GHz is more than 20dB below the limit are not report.
4. The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.
5. Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

Mainly Supply (S03aa)
RSE-DH5-CH0-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
44.0	25.63	-12	37.63	14.37	40.00	V
174.5	24.45	-15	39.45	19.05	43.50	V
321.8	28.96	-9	37.96	17.04	46.00	H

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2182.6	50.53	13	37.53	23.47	74.00	V
2675.6	55.5	18	37.5	18.50	74.00	V

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2182.6	37.71	13	24.71	16.29	54.00	V
2675.6	42.12	18	24.12	11.88	54.00	V

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
7052.8	40.56	-2	42.56	33.44	74.00	H
11787.6	43.73	3	40.73	30.27	74.00	V

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
7052.8	28.33	-2	30.33	25.67	54.00	H
11787.6	31.35	3	28.35	22.65	54.00	V

RSE-DH5-CH39-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
31.7	19.4	-15	34.4	20.60	40.00	V
44.0	27.82	-12	39.82	12.18	40.00	V
173.9	24.18	-15	39.18	19.32	43.50	V
319.2	28.86	-9	37.86	17.14	46.00	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2681.2	54.75	17	37.75	19.25	74.00	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2681.2	41.91	17	24.91	12.09	54.00	H

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5895.5	40.11	-3	43.11	33.89	74.00	H
16478.4	46.48	10	36.48	27.52	74.00	V

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5895.5	27.21	-3	30.21	26.79	54.00	H
16478.4	34.08	10	24.08	19.92	54.00	V

RSE-DH5-CH78-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
35.6	19.94	-14	33.94	20.06	40.00	V
44.1	26.5	-12	38.5	13.50	40.00	V
169.9	24.36	-15	39.36	19.14	43.50	V
322.8	29.03	-9	38.03	16.97	46.00	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2656.9	54.46	18	36.46	19.54	74.00	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2656.9	41.86	18	23.86	12.14	54.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
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6746.2	42.19	-2	44.19	31.81	74.00	H
11776.0	44.1	3	41.1	29.90	74.00	V

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
6746.2	29.13	-2	31.13	24.87	54.00	H
11776.0	31.28	3	28.28	22.72	54.00	V

Secondary supply(S04aa)
RSE-DH5-CH0-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
35.7	23.88	-14	37.88	16.12	40.00	V
47.4	27.2	-12	39.2	12.80	40.00	V
175.4	22.75	-15	37.75	20.75	43.50	V
318.5	29.45	-9	38.45	16.55	46.00	H

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2583.2	52.59	16	36.59	21.41	74.00	H
2664.5	53.78	17	36.78	20.22	74.00	H
2833.9	54.71	18	36.71	19.29	74.00	H

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2583.2	40.8	16	24.8	13.20	54.00	H
2664.5	41.49	17	24.49	12.51	54.00	H
2833.9	42.04	18	24.04	11.96	54.00	H

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3621.4	39.59	-6	45.59	34.41	74.00	V
7306.3	40.73	-2	42.73	33.27	74.00	H
13715.9	45.98	4	41.98	28.02	74.00	H

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3621.4	27.05	-6	33.05	26.95	54.00	V
7306.3	28.47	-2	30.47	25.53	54.00	H
13715.9	33.88	4	29.88	20.12	54.00	H

RSE-DH5-CH39-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
47.8	27.11	-12	39.11	12.89	40.00	V
170.9	22.83	-15	37.83	20.67	43.50	V
320.4	29.92	-9	38.92	16.08	46.00	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2596.5	52.69	16	36.69	21.31	74.00	H
2782.3	54.56	18	36.56	19.44	74.00	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2596.5	40.6	16	24.6	13.40	54.00	H
2782.3	42.55	18	24.55	11.45	54.00	H

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
7219.5	40.18	-2	42.18	33.82	74.00	V
13097.2	44.52	4	40.52	29.48	74.00	H

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
7219.5	28.32	-2	30.32	25.68	54.00	V
13097.2	31.78	4	27.78	22.22	54.00	H

RSE-DH5-CH78-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
47.7	25.71	-12	37.71	14.29	40.00	V

173.2	23.67	-15	38.67	19.83	43.50	V
321.3	29.97	-9	38.97	16.03	46.00	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2655.1	53.46	17	36.46	20.54	74.00	H
2962.9	55.08	19	36.08	18.92	74.00	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2655.1	41.5	17	24.5	12.50	54.00	H
2962.9	43.06	19	24.06	10.94	54.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3447.2	38.35	-7	45.35	35.65	74.00	V
6746.0	40.89	-2	42.89	33.11	74.00	V
17522.3	46.94	10	36.94	27.06	74.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3447.2	26.3	-7	33.3	27.70	54.00	V
6746.0	29.03	-2	31.03	24.97	54.00	V
17522.3	35.45	10	25.45	18.55	54.00	H

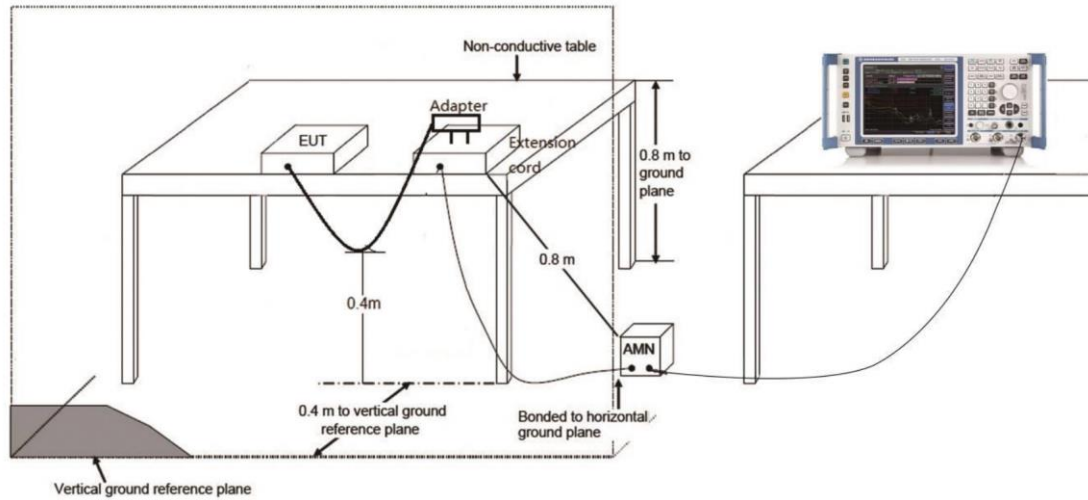
6.2 AC Powerline Conducted Emission

6.2.1 Method of Measurement: ANSI C63.10-2013-clause 6.2

1. The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
2. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
3. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
4. If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.³⁶ Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

6.2.2 Test Setup



6.2.3 Test Condition

Voltage (V)	Frequency (Hz)
120	60

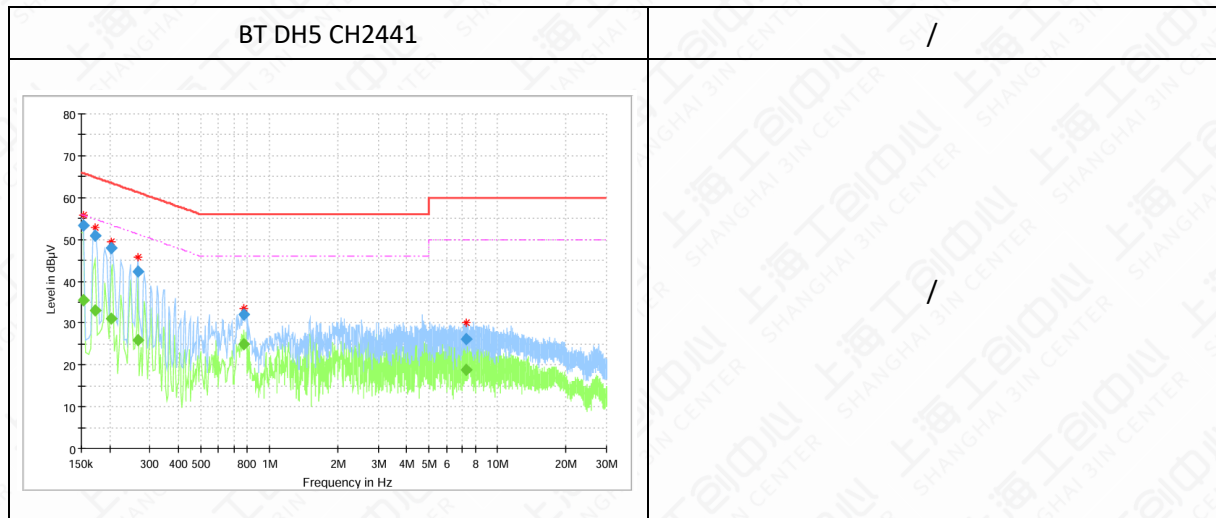
6.2.4 Measurement limit

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	66 to 56	56 to 46	P
0.5 to 5	56	46	
5 to 30	60	50	

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

6.2.5 Measurement Result



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.153731	---	35.40	55.80	20.39	15000.0	9.000	L1	ON	10.0
0.153731	53.43	---	65.80	12.36	15000.0	9.000	L1	ON	10.0
0.172388	---	32.91	54.85	21.94	15000.0	9.000	L1	ON	10.0
0.172388	50.82	---	64.85	14.02	15000.0	9.000	L1	ON	10.0
0.202238	---	31.08	53.52	22.44	15000.0	9.000	L1	ON	10.1
0.202238	47.85	---	63.52	15.67	15000.0	9.000	L1	ON	10.1
0.265669	---	26.03	51.25	25.22	15000.0	9.000	L1	ON	10.2
0.265669	42.24	---	61.25	19.01	15000.0	9.000	L1	ON	10.2
0.776850	---	25.00	46.00	21.00	15000.0	9.000	L1	ON	9.9
0.776850	32.17	---	56.00	23.83	15000.0	9.000	L1	ON	9.9
7.261763	---	18.91	50.00	31.09	15000.0	9.000	L1	ON	9.7
7.261763	26.14	---	60.00	33.86	15000.0	9.000	L1	ON	9.7

Note: All modes have been tested and only the worst mode is recorded in the report.

Annex A: Revised History

Version	Revised Content
V0	Initial

Annex B: Accreditation Certificate

**Accredited Laboratory**

A2LA has accredited

**INDUSTRIAL INTERNET INNOVATION CENTER
(SHANGHAI) CO., LTD.**

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

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).

Presented this 20th day of September 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

END OF REPORT