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

SRD TEST REPORT

PRODUCT	Smart label printing scale
BRAND	SUNMI
MODEL	ACS-F2531,ACS-F2532
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25S2LCC
IC	22621-S2LCC
ISSUE DATE	October 16, 2024
STANDARD(S)	FCC Part15C, RSS-Gen Issue 5, RSS-247 Issue 3

Prepared by: ***Tao Lingyan*** **Reviewed by:** ***Yang Fan*** **Approved by:** ***Zhang Min***

CONTENTS

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-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2021
3	RSS-247 Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2023

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: The standard of KDB 558074 D01 15.247 Meas Guidance v05r02 and KDB 484596 D01 Referencing Test Data v02r03 have not been accredited by A2LA.			

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 4)
3	99% Occupied Bandwidth	15.247(a)	RSS-GEN 6.7	Pass (Note 4)
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 4)
6	Carrier Frequency Separation	15.247(a)	RSS-247 5.1	Pass (Note 4)
7	Number Of Hopping Channels	15.247(a)	RSS-247 5.1	Pass (Note 4)
8	Transmitter Spurious Emission-Conducted	15.247(d)	RSS-247 5.5	Pass (Note 4)
9	Transmitter Spurious Emission-Radiated	15.247,15.209,15.205	RSS-GEN 8.9, 8.10	Pass (Note 3)

10	AC Powerline Conducted Emission	15.207	RSS-GEN 8.8	Pass (Note 3)
11	Antenna requirement	15.203/15.247(c)	RSS Gen 6.8, RSS-247 5.4	Pass (Note 2)

Note 1:

The ACS-F2531,ACS-F2532 manufactured by Shanghai Sunmi Technology Co.,Ltd. is a variant product for testing.

This project is a variant project based on the original report 23T04I30142-SRD01-V00 with below changes:

SOFTWARE MODIFICATIONS:

Other changes detailed: Optimize functions, solve bugs, and iterate software versions. Iterative software upgrades do not affect RF performance.

HARDWARE MODIFICATIONS:

PCB Layout changes: Yes(Only printer)

Components on PCB changes: Yes

MECHANICAL MODIFICATIONS:

Use new metal front/back cover or keypad: YES

Mechanical shell changes: YES

There are two configurations Mainly Supply(S01aa) and Secondary Supply(S05aa) in this project. According to the Product Change Description, we verified the worst mode of Maximum Output Power, Radiated Spurious Emission and AC Powerline Conducted Emission of Mainly Supply(S01aa) and Secondary Supply(S05aa). All test data was recorded in this report.

The description of the differences between Mainly Supply(S01aa) and Secondary Supply(S05aa) are as follows:

Product	S2CC(Original Report)	S2LCC(This Report)
Type	15.6" 15.6"+15.6" 15.6"+10.1"	15.6"(Mainly Supply) 15.6"+15.6"(Secondary Supply)
Difference	Base 58 Printer	Base 60 Printer

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 1.58 dBi that complied with 15.203 Requirements.

Note 3:

The test data refer to the original report, and the data in this report is spot check data,The verification datameets the KDB484596 reauirements within 3dB.

Note 4:

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

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	1.58 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℃~35℃
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa

2.3 Project Information

Project Manager	Gao Hongning
Test Date	August 13,2024 to September 25,2024

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	Smart label printing scale
Model name	ACS-F2531,ACS-F2532
Date of Receipt	S07aa/S01aa/S05aa:August 13,2024
EUT ID*	S07aa/S01aa/S05aa
SN/IMEI	S07aa: SF01P36940197 S01aa: SF02P47540169 S05aa: SF01P36940168
Supported Radio Technology and Bands	BT 4.2 BR/EDR/BLE WLAN 802.11b/g/n WLAN 802.11a/n/ac
Hardware Version	RK3568 MB V2.0
Software Version	3.0.11
FCC ID	2AH25S2LCC
IC	22621-S2LCC
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
CA01	Adapter	CYSE65-240250	Jiangsu chenyangElectron Co.. Ltd. 24V,2.5A
UA01	AC Cable	N/A	N/A
AE1	Notebook PC	DELL Latitude E6510	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; π/4 DQPSK; 8DPSK

Test frequency list:

GFSK	Channel	0	39	78
	Freq. (MHz)	2402	2441	2480
π/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℃	-10℃	40℃
Working Voltage of EUT	Normal	Minimum	Maximum
	230V	207V	253V

5.2 Test Equipments Utilized

5.2.1 Conducted Test System

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Test Software	TS1120	10671	V3.2.22	N/A	Tonscend	N/A	N/A
2	Automatic control unit	JS0806-2	2218060621	N/A	N/A	Tonscend	2024-03-25	1 year
3	Wireless communication comprehensive tester	CMW270	100919	V3.5.137	N/A	R&S	2024-07-25	1 year
4	Spectrum Analyzer	FSQ40	200063	V4.75	N/A	R&S	2023-10-16	1 year
5	Vector Signal Generator	SMU200A	104684	V03.20.286.21	N/A	R&S	2024-07-25	1 year
6	Vector Signal Generator	SMBV100A	257904	V4.15.125.49	N/A	R&S	2023-12-19	1 Year
7	Programmable Power Supply	Keithley 2303	4039070	N/A	N/A	Keithley	2024-06-07	1 Year
8	Temperature box	B-TF-107C	BTF107C-201804107	N/A	N/A	Boyi	2024-06-07	1 Year
9	Network test unit AP	GT-AXE11000	N2IG0X401637KWF	V3.0.0.4.386_45940	N/A	ASUS	N/A	N/A
10	Vector Signal Generator	SMBV100A	257904	V4.15.125.49	N/A	R&S	2023-10-16	1 Year

5.2.2 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	2023-10-16	1 Year
2	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2023-10-16	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 Years
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	2024-08-03	1 Year
8	Horn Antenna	3160-10	LM5942	N/A	N/A	R&S	2024-08-03	1 Year
9	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2023-10-16	1 Year
10	Preamplifier	SCU18	10155	N/A	N/A	R&S	2023-10-16	1 Year
11	Preamplifier	SCU26	10025	N/A	N/A	R&S	2023-10-16	1 Year
12	Preamplifier	SCU40	10020	N/A	N/A	R&S	2023-10-16	1 Year
13	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19	1 Year
14	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
15	Test Receiver	ESCI	101235	V5.1-24-3	0	R&S	2023-12-19	1 Year
16	Antenna Tower	TPMDC-LF	N/A	N/A	N/A	Top Precision	N/A	N/A
17	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 ℃, Max. = 35 ℃
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω
Temperature	Min. = 15 ℃, Max. = 35 ℃

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
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 ℃, Max. = 35 ℃
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 Peak Output Power-Conducted

6.1.1 Measurement Limit

Standard	Conducted Limit (dBm)	EIRP Limit(dBm)
FCC 47 Part 15.247(b)	GFSK:≤30, pi/4-DQPSK and 8DPSK≤20.97	N/A
RSS-247 5.4(b)	GFSK:≤30, pi/4-DQPSK and 8DPSK≤20.97	≤36

6.1.2 Test Condition

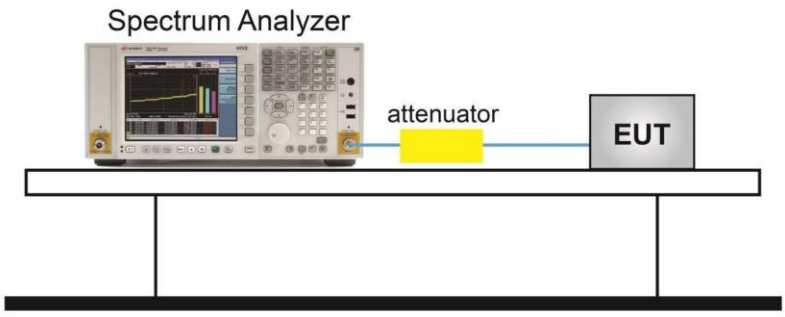
Hopping Mode	RBW	VBW	Span	Sweeptime
Hopping OFF	3MHz	10MHz	9MHz	Auto

6.1.3 Test Procedure

The measurement is according to ANSI C63.10 clause 7.8.5.

1. The output power of EUT was connected to the spectrum analyzer by cable and divide. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Use the following spectrum analyzer settings:
   a) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
   b) RBW > 20 dB bandwidth of the emission being measured.
   c) VBW ≥ RBW.
   d) Sweep: Auto.
   e) Detector function: Peak.
   f) Trace: Max hold.
4. Allow trace to stabilize.
5. Use the marker-to-peak function to set the marker to the peak of the emission.
6. The indicated level is the peak output power, after any corrections for external attenuators and cables.
7. Record the results.

6.1.4 Test setup



Note: The attenuator shown in the figure is the attenuation of the entire test system.

6.1.5 Measurement Results

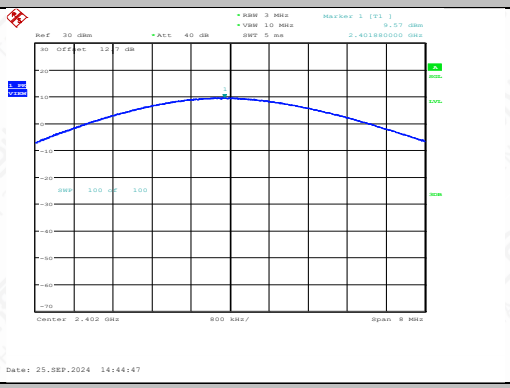
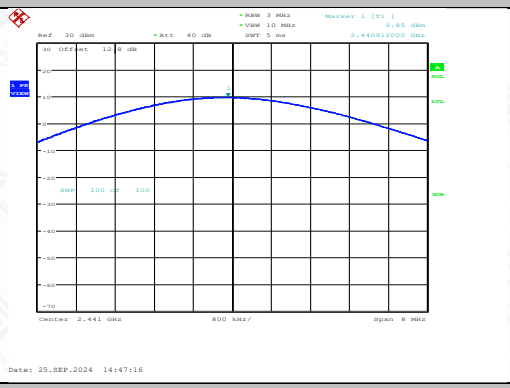
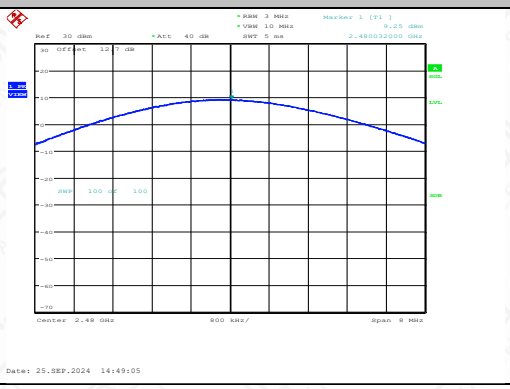
Test Mode	Antenna	Frequency [MHz]	Original Power [dBm]	Validation Power [dBm]	d_{dB} Note3	Conducted Limit [dBm]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
3DH5	Ant1	2402	7.57	9.57	2	≤20.97	11.15	≤36	PASS
3DH5	Ant1	2441	8.35	9.85	1.5	≤20.97	11.43	≤36	PASS
3DH5	Ant1	2480	8.46	9.25	0.79	≤20.97	10.83	≤36	PASS

Note1: Only data in worst mode is provided.

Note2:The verified power is still in the tune-up power range and meets the requirements of KDB484596 D01 data reference. The power listed in the original certificate still applies to this case.

Note3: d_{dB}=|Verified$_{dB}$-original$_{dB}$|

Test Graphs

3DH5-Ant1-2402-PASS	3DH5-Ant1-2441-PASS
	
3DH5-Ant1-2480-PASS	**/**
	/

6.2 Radiated Emission

6.2.1 Measurement Limit

According to the FCC 15.205&15.209/RSS-Gen section 8.9&1.0

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

6.2.2 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.

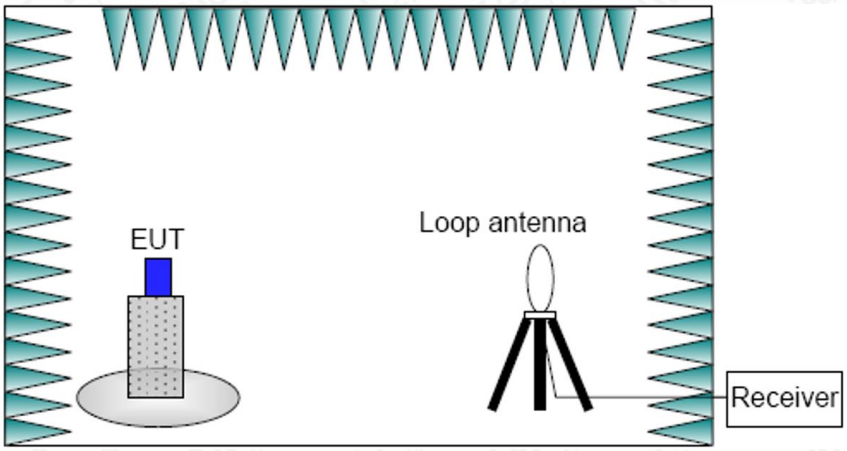
Test Settings – Above 1GHz (Average Field Strength Measurements)

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 ≥ 2 × span\\RBW)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

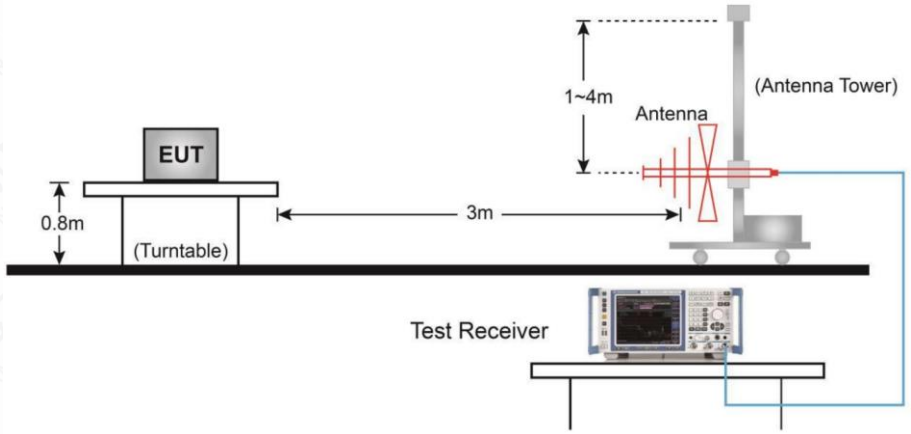
Frequency of emission	RBW/VBW	Sweep Time (s)
0.009~30	9KHz/30KHz	Auto
30~1000	100KHz/300KHz	5
1000~4000	1MHz/3MHz	15
4000~18000	1MHz/3MHz	40
18000~26500	1MHz/3MHz	20

6.2.3 Test Setup

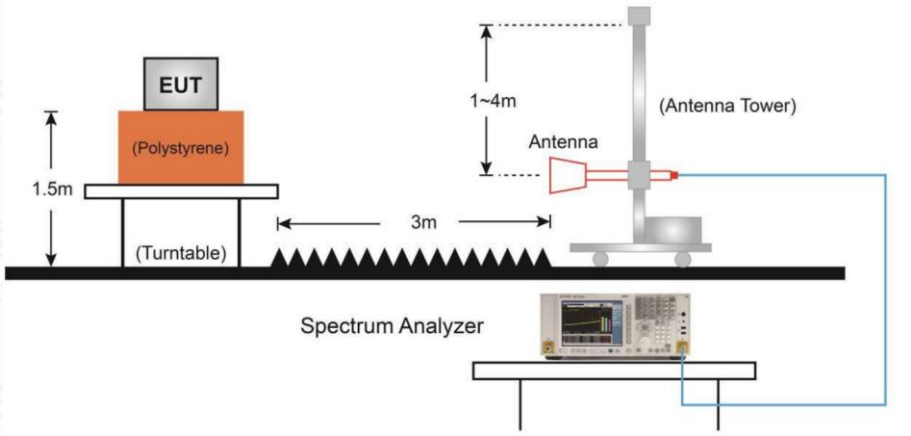
Below 30MHz Test Setup



Below 1GHz Test Setup



Above 1GHz Test Setup



6.2.4 Measurement Results

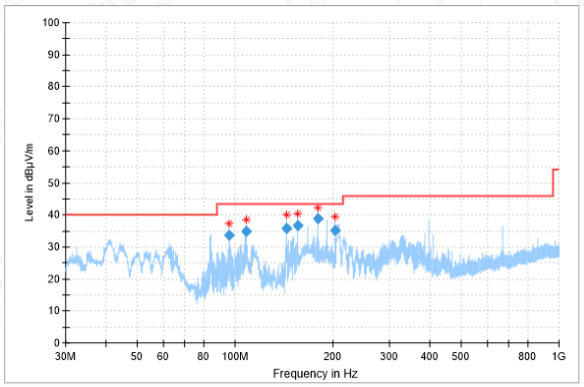
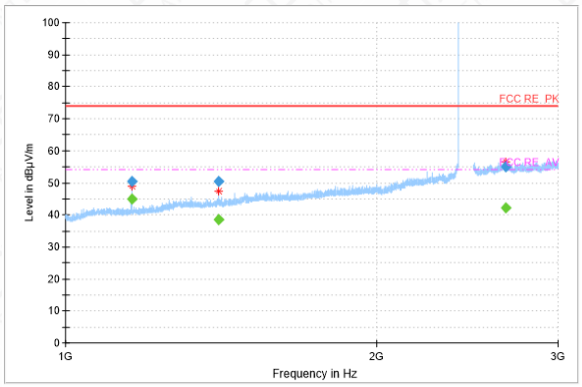
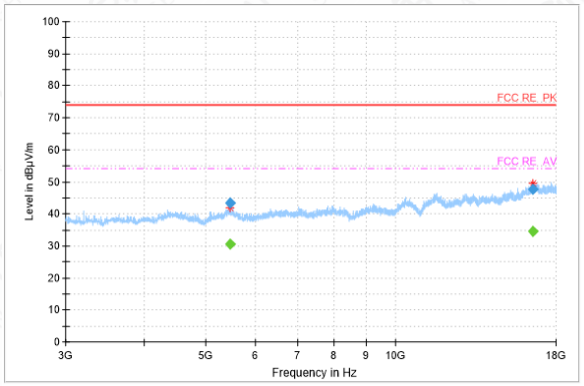
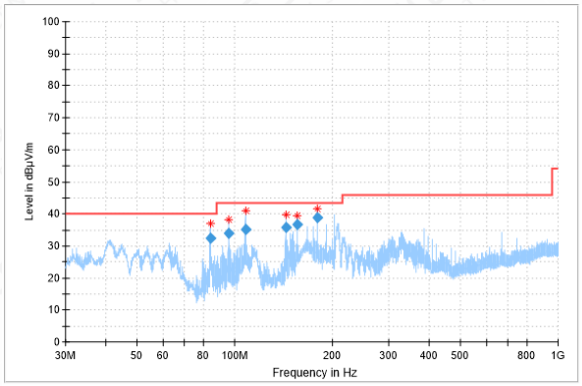
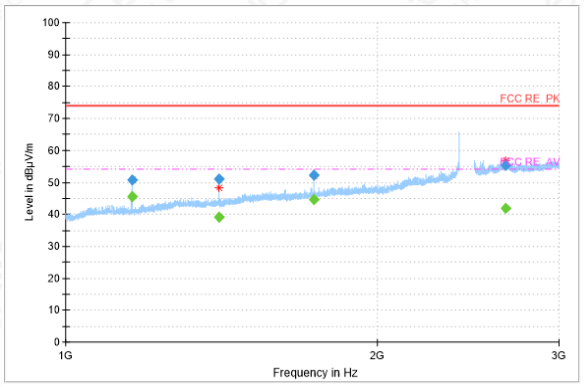
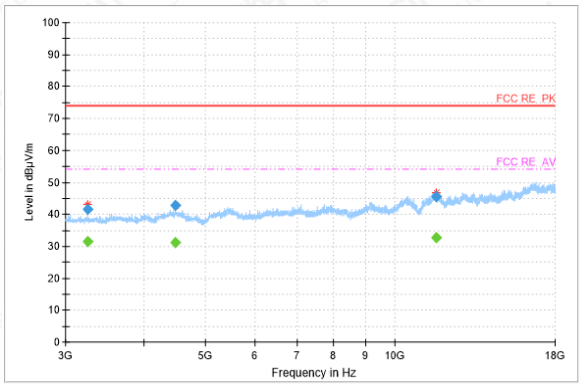
A “reference path loss” is established and ARpi is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

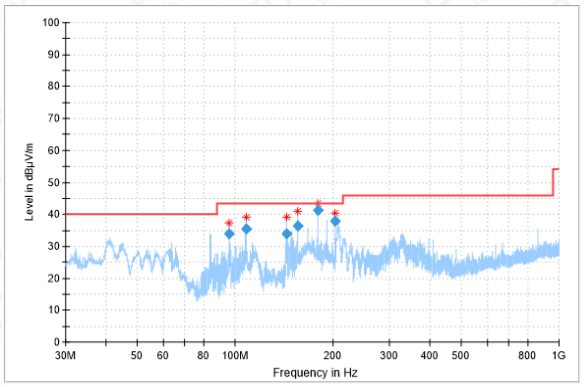
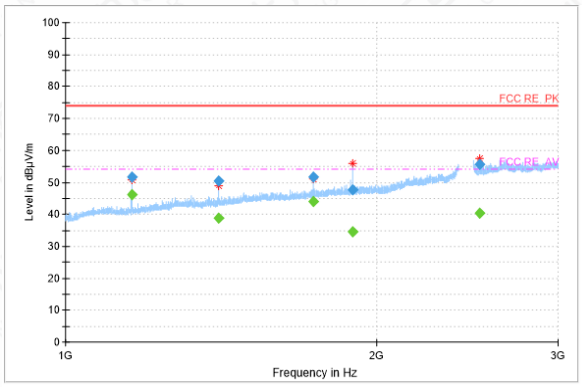
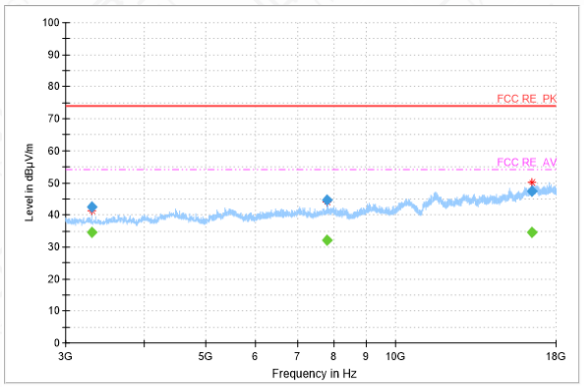
The measurement results are obtained as described below:

A_{Rpi} = Cable loss + Antenna Factor-Preamplifier gain

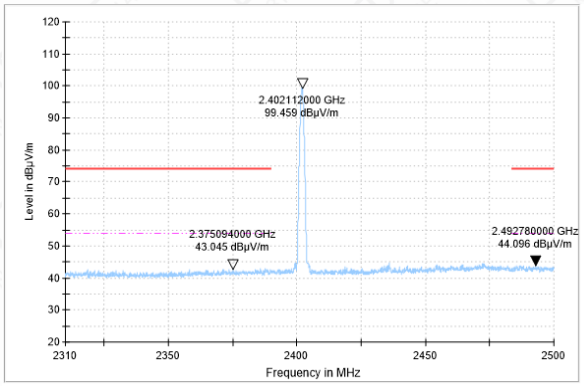
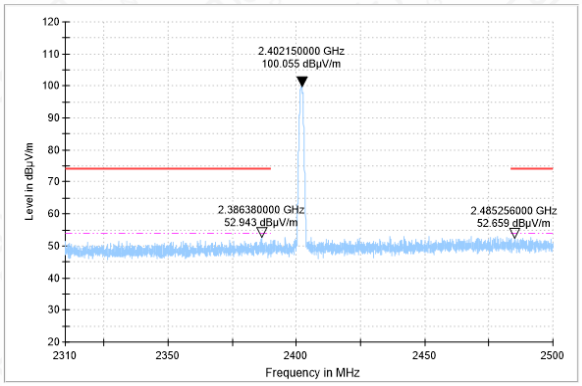
Result=P_{Mea} + A_{Rpi}

Mainly Supply (S01aa)

RSE-DH5-CH0-30MHz-1GHz	RSE-DH5-CH0-1GHz-3GHz
	
RSE-DH5-CH0-3GHz-18GHz	**RSE-DH5-CH39-30MHz-1GHz**
	
RSE-DH5-CH39-1GHz-3GHz	**RSE-DH5-CH39-3GHz-18GHz**
	

RSE-DH5-CH78-30MHz-1GHz	RSE-DH5-CH78-1GHz-3GHz
	
RSE-DH5-CH78-3GHz-18GHz	/
	/

Bandedge

BANDEDGE-DH5-CH0-AV	BANDEDGE-DH5-CH0-PK
	

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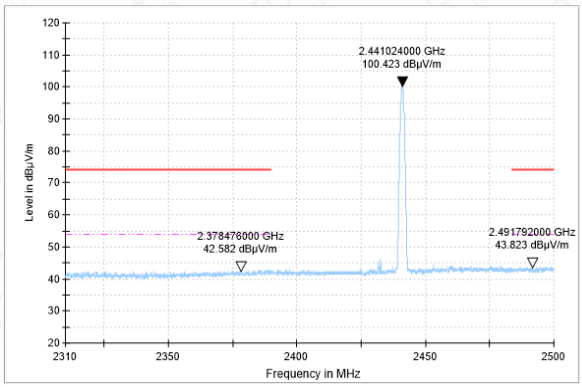
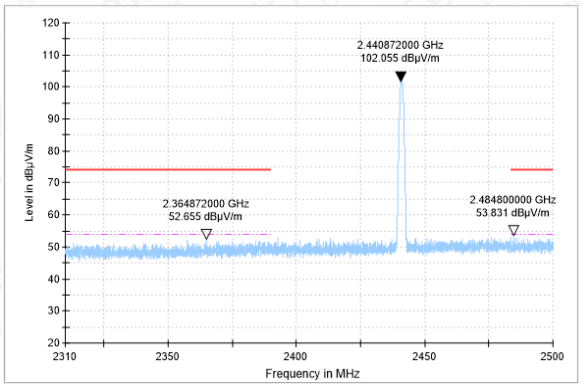
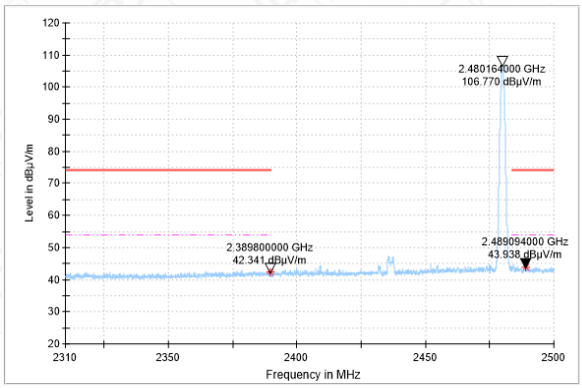
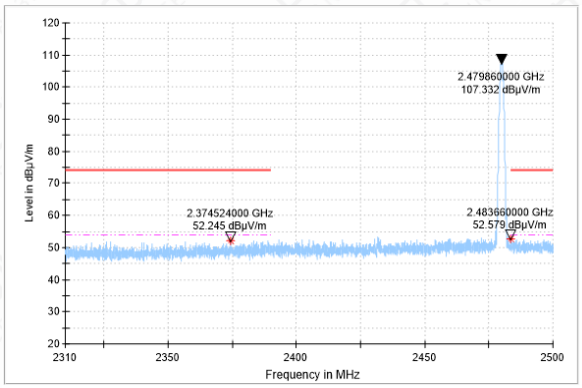
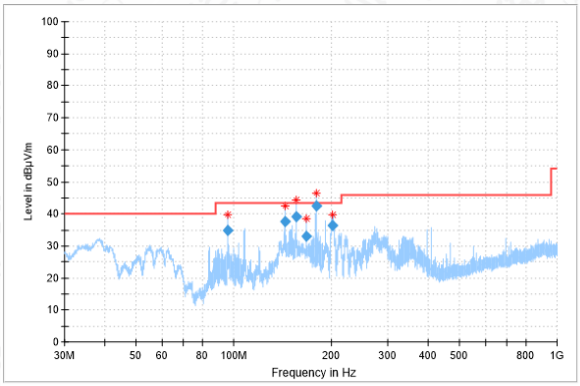
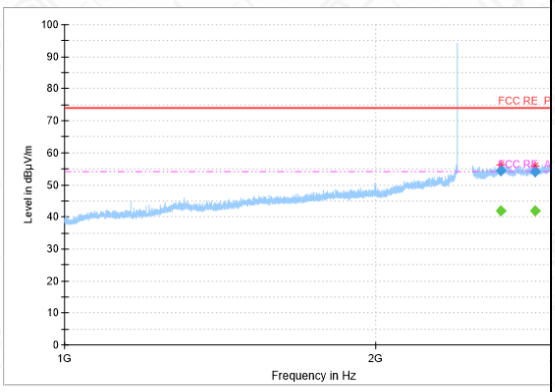
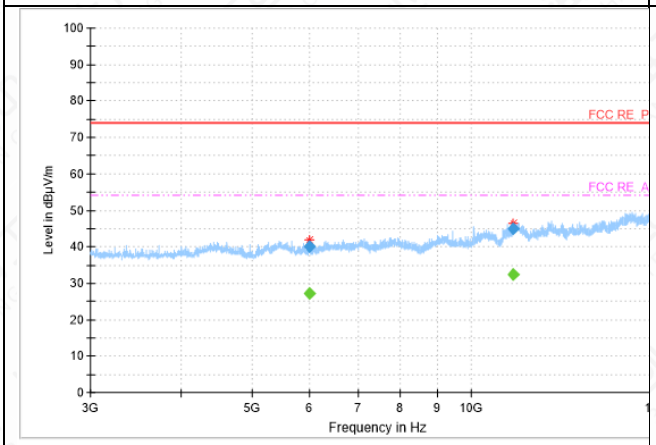
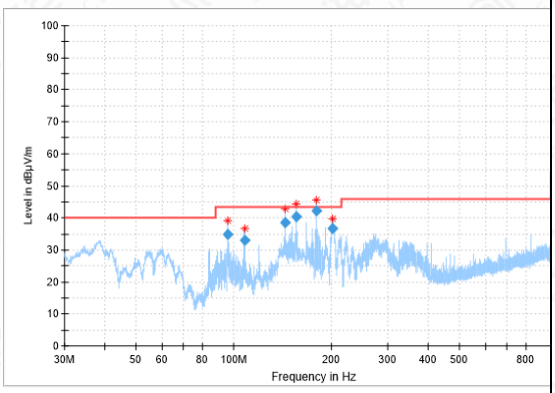
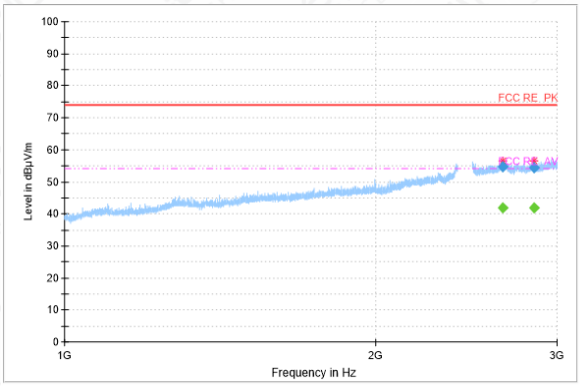
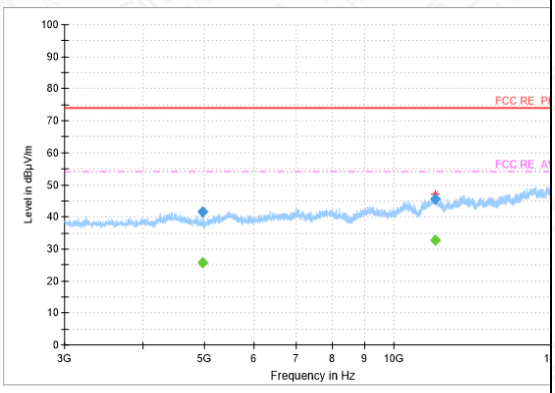
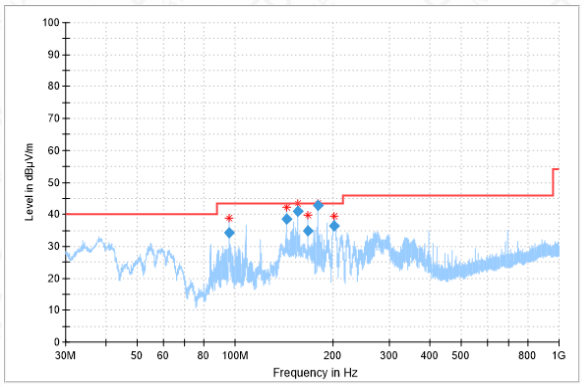
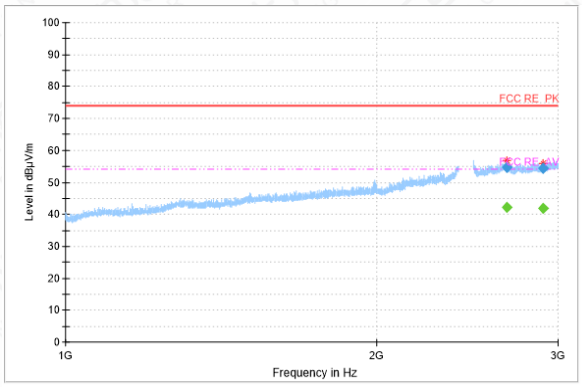
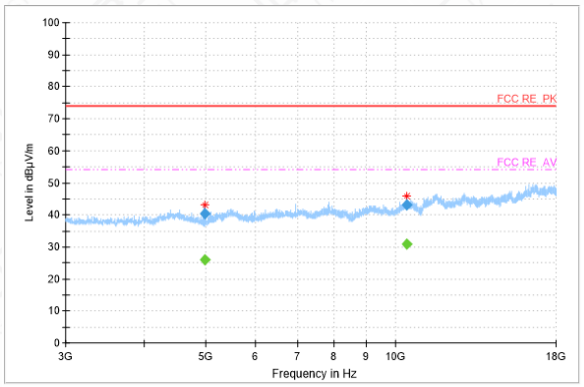
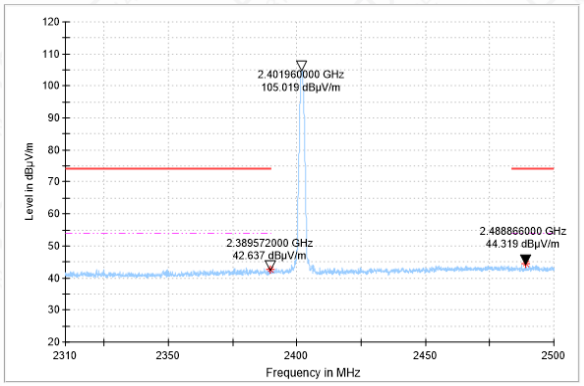
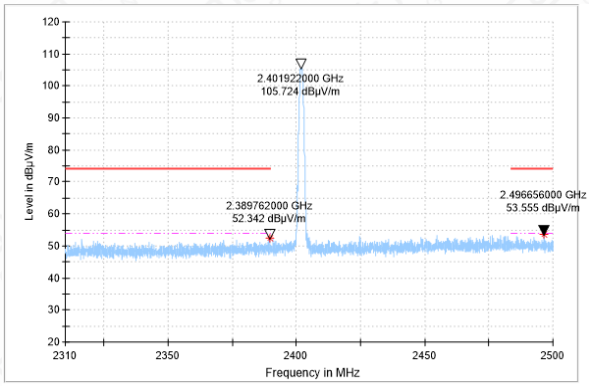
	
BANDEDGE-DH5-CH78-AV	BANDEDGE-DH5-CH78-PK
	

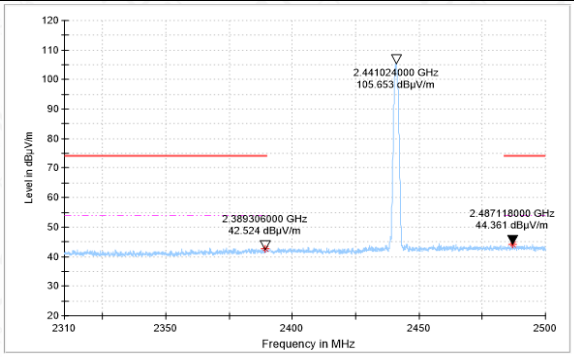
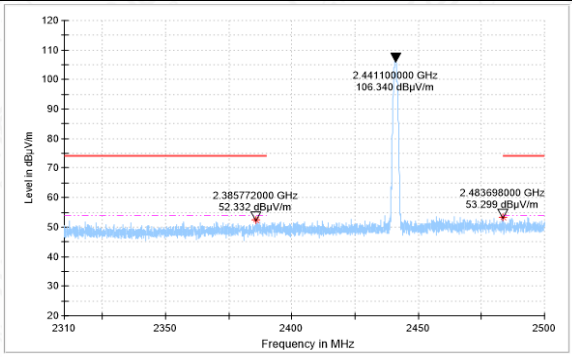
Secondary supply(S05aa)

RSE-DH5-CH0-30MHz-1GHz	RSE-DH5-CH0-1GHz-3GHz
	
RSE-DH5-CH0-3GHz-18GHz	**RSE-DH5-CH39-30MHz-1GHz**
	
RSE-DH5-CH39-1GHz-3GHz	**RSE-DH5-CH39-3GHz-18GHz**
	

RSE-DH5-CH78-30MHz-1GHz	RSE-DH5-CH78-1GHz-3GHz
	
RSE-DH5-CH78-3GHz-18GHz	/
	/

Bandedge

BANDEDGE-DH5-CH0-AV	BANDEDGE-DH5-CH0-PK
	

BANDEDGE-DH5-CH39-AV	BANDEDGE-DH5-CH39-PK
	
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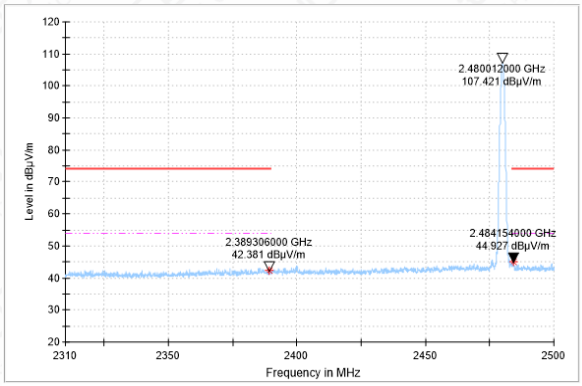
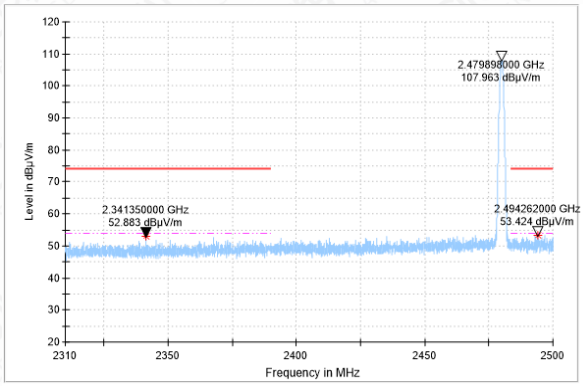
	

Note:

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 (S01aa)

RSE-DH5-CH0-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	33.79	-14	47.79	9.71	43.50	V
108.0	34.95	-13	47.95	8.55	43.50	V
144.0	35.8	-17	52.8	7.70	43.50	V
156.0	36.68	-16	52.68	6.82	43.50	V
180.0	38.94	-14	52.94	4.56	43.50	H
204.0	35.29	-13	48.29	8.21	43.50	H

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	50.51	3	47.51	23.49	74.00	V
1407.6	50.34	6	44.34	23.66	74.00	H
2669.0	55.12	18	37.12	18.88	74.00	H

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	44.84	3	41.84	9.16	54.00	V
1407.6	38.52	6	32.52	15.48	54.00	H
2669.0	42.07	18	24.07	11.93	54.00	H

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5477.9	43.43	-3	46.43	30.57	74.00	V
16507.5	47.77	10	37.77	26.23	74.00	H

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5477.9	30.69	-3	33.69	23.31	54.00	V
16507.5	34.43	10	24.43	19.57	54.00	H

RSE-DH5-CH39-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
84.0	32.37	-17	49.37	7.63	40.00	V
96.0	33.89	-14	47.89	9.61	43.50	V
108.1	35.19	-13	48.19	8.31	43.50	V
144.0	35.69	-17	52.69	7.81	43.50	V
156.0	36.55	-16	52.55	6.95	43.50	V
180.0	38.97	-14	52.97	4.53	43.50	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	50.88	3	47.88	23.12	74.00	H
1407.3	50.95	6	44.95	23.05	74.00	H
1738.9	52.35	9	43.35	21.65	74.00	H
2660.9	55.25	18	37.25	18.75	74.00	V

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	45.72	3	42.72	8.28	54.00	H
1407.3	39.17	6	33.17	14.83	54.00	H
1738.9	44.77	9	35.77	9.23	54.00	H
2660.9	41.93	18	23.93	12.07	54.00	V

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3254.1	41.49	-7	48.49	32.51	74.00	H
4481.2	42.68	-4	46.68	31.32	74.00	V
11640.9	45.56	3	42.56	28.44	74.00	V

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3254.1	31.55	-7	38.55	22.45	54.00	H

4481.2	31.17	-4	35.17	22.83	54.00	V
11640.9	32.84	3	29.84	21.16	54.00	V

RSE-DH5-CH78-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	33.95	-14	47.95	9.55	43.50	V
108.0	35.46	-13	48.46	8.04	43.50	V
143.9	33.96	-17	50.96	9.54	43.50	V
156.0	36.31	-16	52.31	7.19	43.50	V
180.0	41.15	-14	55.15	2.35	43.50	H
204.0	38.05	-13	51.05	5.45	43.50	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	51.55	3	48.55	22.45	74.00	H
1407.5	50.36	6	44.36	23.64	74.00	H
1738.9	51.68	9	42.68	22.32	74.00	H
1896.0	47.78	10	37.78	26.22	74.00	H
2517.6	55.71	16	39.71	18.29	74.00	V

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
1159.1	46.22	3	43.22	7.78	54.00	H
1407.5	38.78	6	32.78	15.22	54.00	H
1738.9	44.07	9	35.07	9.93	54.00	H
1896.0	34.6	10	24.6	19.40	54.00	H
2517.6	40.46	16	24.46	13.54	54.00	V

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3306.6	42.4	-7	49.4	31.60	74.00	V
7799.5	44.8	-2	46.8	29.20	74.00	V

16454.5	47.51	10	37.51	26.49	74.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
3306.6	34.44	-7	41.44	19.56	54.00	V
7799.5	32.13	-2	34.13	21.87	54.00	V
16454.5	34.65	10	24.65	19.35	54.00	H

Secondary supply(S05aa)

RSE-DH5-CH0-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	34.74	-14	48.74	8.76	43.50	V
144.0	37.74	-17	54.74	5.76	43.50	V
155.9	39.12	-16	55.12	4.38	43.50	H
167.9	33.04	-15	48.04	10.46	43.50	H
180.0	42.56	-14	56.56	0.94	43.50	H
202.0	36.47	-13	49.47	7.03	43.50	V

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2646.1	54.46	17	37.46	19.54	74.00	H
2854.7	54.23	18	36.23	19.77	74.00	V

RSE-DH5-CH0-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2646.1	41.78	17	24.78	12.22	54.00	H
2854.7	41.77	18	23.77	12.23	54.00	V

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5993.9	39.92	-4	43.92	34.08	74.00	H
11428.1	44.82	3	41.82	29.18	74.00	V

RSE-DH5-CH0-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity

5993.9	27.25	-4	31.25	26.75	54.00	H
11428.1	32.27	3	29.27	21.73	54.00	V

RSE-DH5-CH39-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	35.01	-14	49.01	8.49	43.50	V
108.0	33.06	-13	46.06	10.44	43.50	V
144.0	38.52	-17	55.52	4.98	43.50	V
156.0	40.38	-16	56.38	3.12	43.50	H
180.0	42.31	-14	56.31	1.19	43.50	H
202.4	36.63	-13	49.63	6.87	43.50	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2659.4	54.68	18	36.68	19.32	74.00	V
2850.7	54.59	18	36.59	19.41	74.00	H

RSE-DH5-CH39-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2659.4	41.95	18	23.95	12.05	54.00	V
2850.7	41.85	18	23.85	12.15	54.00	H

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4977.2	41.74	-2	43.74	32.26	74.00	V
11670.0	45.66	3	42.66	28.35	74.00	H

RSE-DH5-CH39-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4977.2	25.65	-2	27.65	28.35	54.00	V
11670.0	32.63	3	29.63	21.37	54.00	H

RSE-DH5-CH78-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity

96.0	34.29	-14	48.29	9.21	43.50	V
144.0	38.57	-17	55.57	4.93	43.50	V
156.0	41.01	-16	57.01	2.49	43.50	H
168.0	34.72	-15	49.72	8.78	43.50	H
180.0	42.74	-14	56.74	0.76	43.50	H
202.1	36.24	-13	49.24	7.26	43.50	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2676.5	54.78	18	36.78	19.22	74.00	V
2899.1	54.52	17	37.52	19.48	74.00	H

RSE-DH5-CH78-1GHz-3GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
2676.5	42.08	18	24.08	11.92	54.00	V
2899.1	41.8	17	24.8	12.20	54.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4982.9	40.48	-2	42.48	33.52	74.00	V
10439.1	43.12	2	41.12	30.88	74.00	H

RSE-DH5-CH78-3GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4982.9	26.03	-2	28.03	27.97	54.00	V
10439.1	30.94	2	28.94	23.06	54.00	H

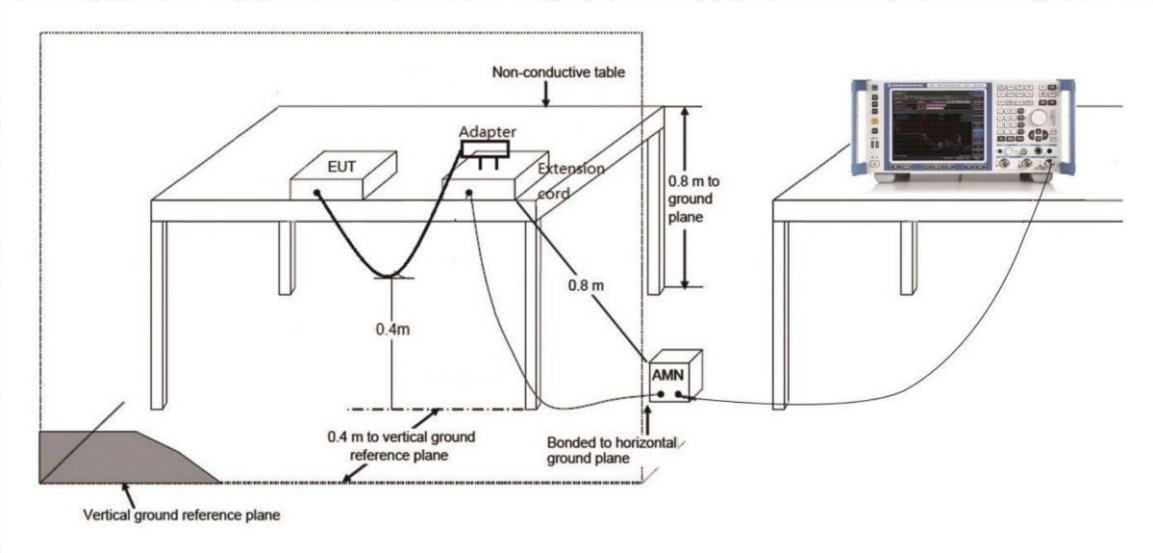
6.3 AC Powerline Conducted Emission

6.3.1 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.

6.3.2 Test Setup



6.3.3 Test Condition

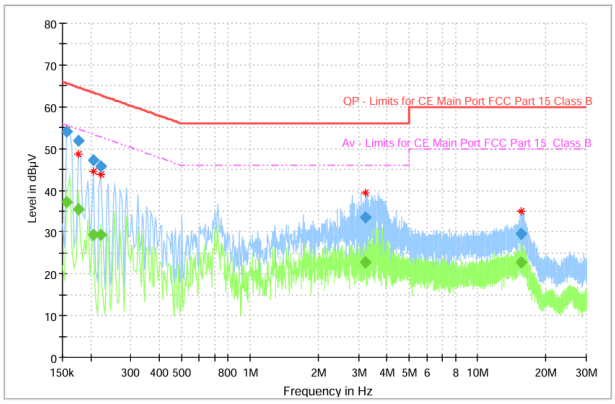
Voltage（V）	Frequency（Hz）
120	60

6.3.4 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.			

6.3.5 Measurement Result

BT DH5 CH2441	/
	/

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.157463	54.16	---	65.60	11.44	15000.0	9.000	N	ON	8.9
0.157463	---	37.30	55.60	18.30	15000.0	9.000	N	ON	8.9
0.176119	51.80	---	64.67	12.87	15000.0	9.000	L1	ON	9.6
0.176119	---	35.58	54.67	19.09	15000.0	9.000	L1	ON	9.6
0.205969	47.33	---	63.37	16.04	15000.0	9.000	L1	ON	9.6
0.205969	---	29.41	53.37	23.95	15000.0	9.000	L1	ON	9.6
0.220894	45.73	---	62.79	17.05	15000.0	9.000	L1	ON	9.6
0.220894	---	29.29	52.79	23.49	15000.0	9.000	L1	ON	9.6
3.205894	33.52	---	56.00	22.48	15000.0	9.000	L1	ON	9.6
3.205894	---	22.77	46.00	23.23	15000.0	9.000	L1	ON	9.6
15.589913	29.59	---	60.00	30.41	15000.0	9.000	L1	ON	9.9
15.589913	---	22.80	50.00	27.20	15000.0	9.000	L1	ON	9.9

Note:

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

2.L1 and N is all have been tested, the result of them is synthesized in the above data diagram.

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