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 Part15E, RSS-Gen Issue 5, RSS-247 Issue 3

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

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1. Summary of Test Report

1.1 Test Standard(s)

No.	Test Standard	Title	Version
1	FCC Part15E	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	--
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 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
2	KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Information Infrastructure (U-NII) Devices - Part 15, Subpart E	--
3	KDB 484596 D01 Referencing Test Data v02r03	Test Reductions Via Data Referencing	--
Note: The standard of KDB 789033 D02 General UNII Test Procedures New Rules v02r01 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 Output Power	15.407(a)	RSS-247 6.2	Pass (Note3)
2	Power Spectral Density	15.407(a)	RSS-247 6.2	Pass (Note4)
3	99% Occupied Bandwidth	N/A	RSS-247 6.2	Pass (Note4)
4	-26dB Occupied Bandwidth	15. 407(a)	RSS-Gen 6.7	Pass (Note4)
5	Band edge compliance	15.407(b)	RSS-247 6.2	Pass (Note3)
6	Transmitter spurious emissions radiated	15.407(b)	RSS-Gen 8.9, RSS-247 6.2	Pass (Note3)
7	Frequency Stability	15.407(g)	RSS-Gen 8.9, RSS-247 6.2	Pass (Note3)
8	Transmit Power Control	15.407(h)	RSS-Gen 8.11	Pass (Note4)
9	AC Powerline Conducted	15.207	RSS-247 6.2	Pass

	Emission			
10	Antenna requirement	15.203	RSS-Gen 8.8	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-SRD04-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:

5G RLAN used a FPC antenna with max Gain 0.78/0.88/0.93 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	0.78/0.88/0.93 dBi
Note: The data of aantenna 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 19,2024

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 17302160204s

4. General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

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

WLAN Frequency	U-NII-1: 5180-5240MHz U-NII-2A: 5260-5320MHz U-NII-2C: 5500MHz-5700MHz
Occupied Channel Bandwidth	20 MHz: 802.11 a/n/ac 40 MHz: 802.11 n/ac 80 MHz: 802.11 ac
WLAN type of modulation	OFDM

Test frequency list:

UNII-1 and UNII-2A:

BW_20M	Channel	36	40	44	48	52	56	60	64
	Freq. (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
BW_40M	Channel	38		46		54		62	
	Freq. (MHz)	5190		5230		5270		5310	
BW_80M	Channel	42				58			
	Freq. (MHz)	5210				5290			

UNII-2C:

BW_20M	Channel	100	104	108	112	116	120	124	128	132	136	140
	Freq. (MHz)	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700
BW_40M	Channel	102		110		118		126		134		/
	Freq. (MHz)	5510		5550		5590		5630		5670		/
BW_80M	Channel	106				122				/		
	Freq. (MHz)	5530				5610				/		
Note：“/” Represents empty												

Note:

1. This report is for WLAN UNII-1, UNII-2A and UNII-2C only.
2. The test data with the frequencies in 5600-5650MHz are only used for FCC certification.

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
Emission Bandwidth	5150-5850MHz	95%	±1.9%
Maximum Conduct Output Power	5150-5850MHz	95%	± 1.18 dB
Power Spectral Density	5150-5850MHz	95%	±0.98 dB
Band Edge Measurements	5150-5850MHz	95%	±1.21dB
Unwanted Emissions Measurement	9kHz-40GHz	95%	9kHz-7GHz:±1.21dB 7GHz-40GHz: ±3.31dB

Frequency Stability	5150-5850MHz	95%	±1.9%

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. Measurement Results

6.1. Duty Cycle

6.1.1. Measurement Limit and Method

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)	NA
RSS-247 6.2	N/A

6.1.2. Test Procedure

The measurement method is made according to KDB 789033 B

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

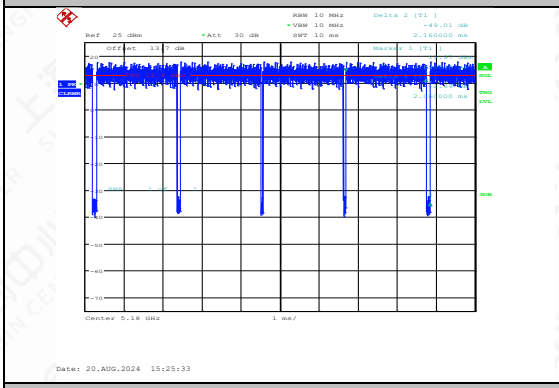
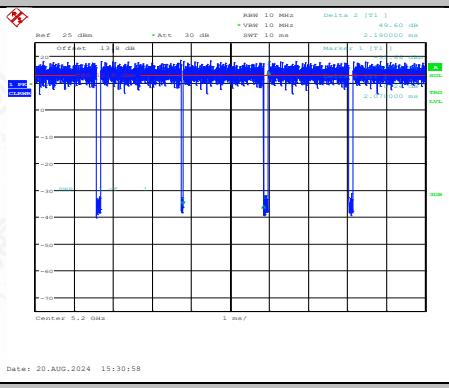
a) A diode detector and an oscilloscope that together have sufficiently short response time topermit accurate measurements of the on and off times of the transmitted signal.

b) The zero-span mode on a spectrum analyzer or EMl receiver, if the response time andspacing between bins on the sweep are sufficient to permit accurate measurements of the onand off times of the transmitted signal. Set the center frequency of the instrument to thecenter frequency of the transmission, Set RBW> EBW if possible: otherwise. set RBW tothe largest available value. Set VBW > RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T. where 7is defined in II.B.1.a), and the number of sweep points across duration Texceeds 100. (Forexample. if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuringduty cycle shall not be used if 7 < 16.7 microseconds.)

6.1.3. Measurement Results

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	2.06	2.16	95.37
11A	Ant1	5200	2.07	2.19	94.52
11A	Ant1	5240	2.06	2.23	92.38
11A	Ant1	5260	2.07	2.20	94.09
11A	Ant1	5280	2.06	2.22	92.79
11A	Ant1	5320	2.06	2.49	82.73
11A	Ant1	5500	2.06	2.22	92.79
11A	Ant1	5580	2.06	2.21	93.21
11A	Ant1	5700	2.07	2.24	92.41

Test Graphs

NTNV-11A-Ant1-5180	NTNV-11A-Ant1-5200
	
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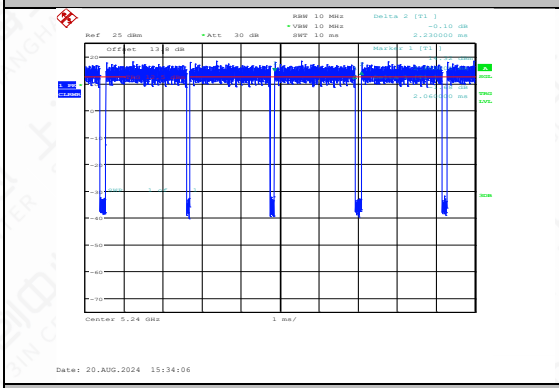	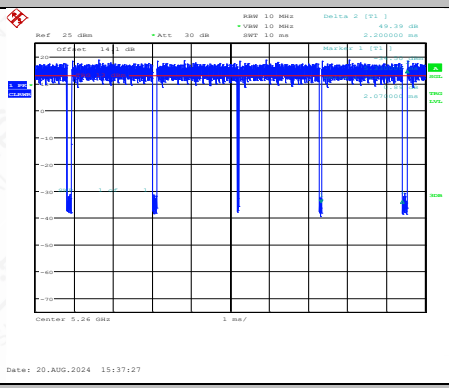
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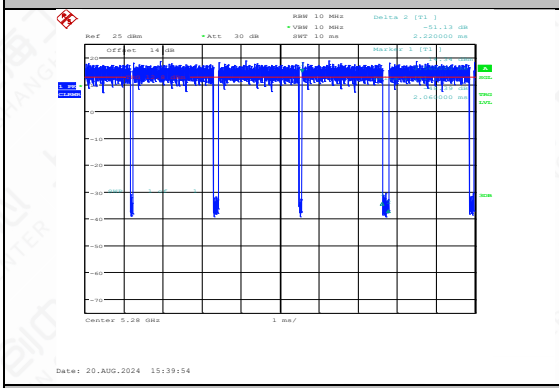	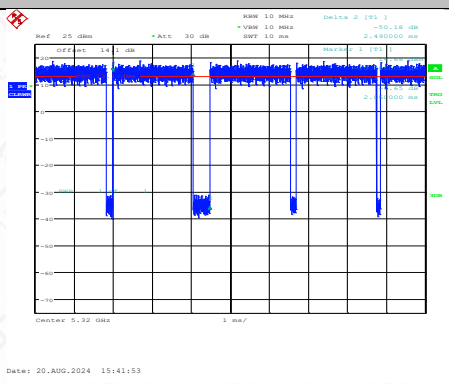
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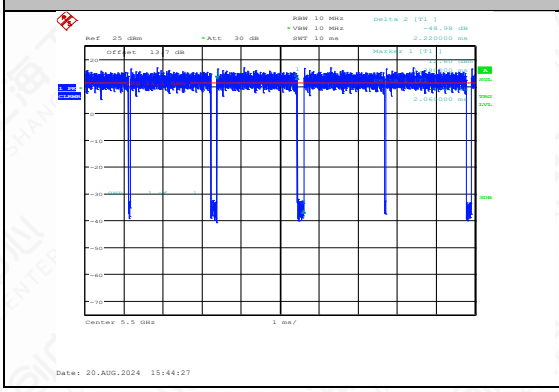	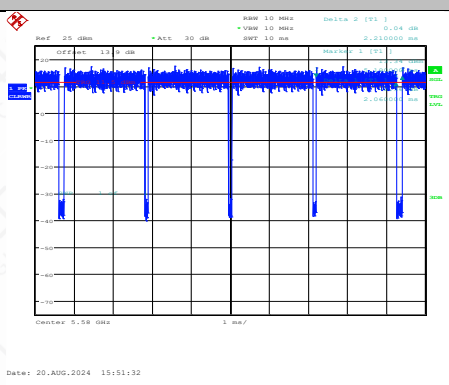

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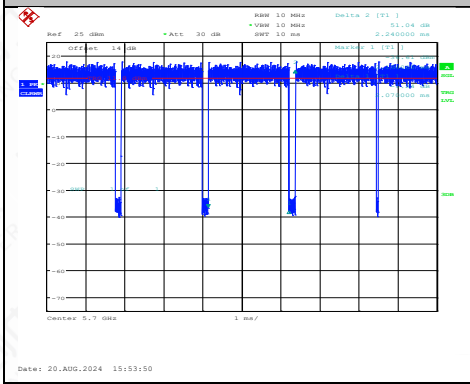
	/

6.2. Occupied 26dB Bandwidth(conducted)

6.2.1 Measurement Limt

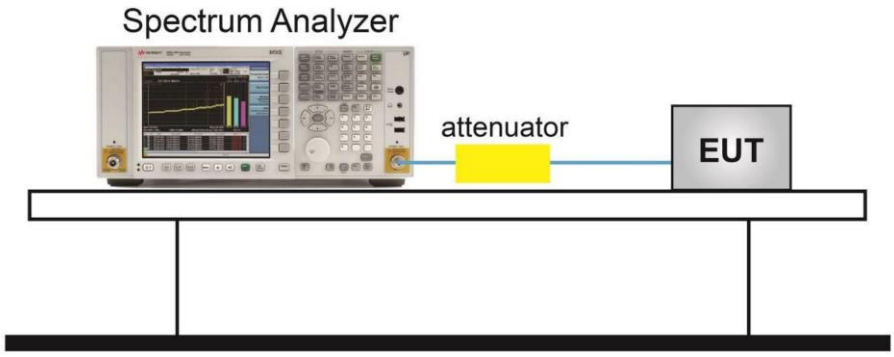
Standard	Limit(MHz)
FCC 47 CFR Part 15.407(a)	N/A
RSS-247 6.2	N/A

6.2.2 Test Procedure

The measurement method is made according to KDB 789033 C

1. Set RBW = approximately 1% of the emission bandwidth
2. Set the VBW > RBW
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.2.3 Test Setup

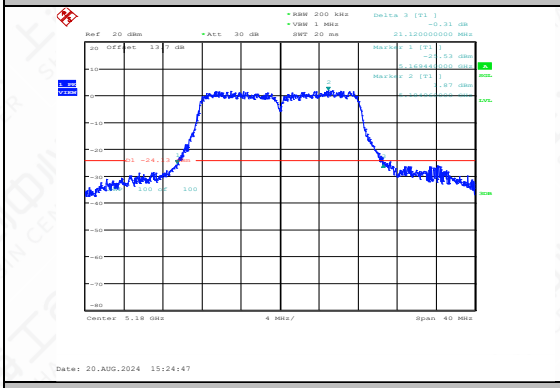
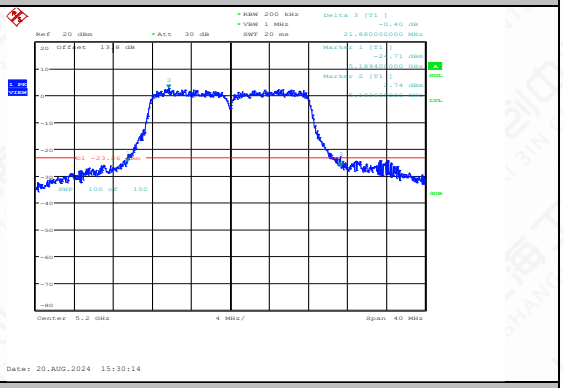


6.2.4 Measurement Results

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	21.12	5169.44	5190.56	---	---
11A	Ant1	5200	21.88	5189.40	5211.28	---	---
11A	Ant1	5240	21.44	5229.28	5250.72	---	---
11A	Ant1	5260	27.24	5248.16	5275.40	---	---
11A	Ant1	5280	27.20	5268.16	5295.36	---	---
11A	Ant1	5320	25.68	5308.24	5333.92	---	---
11A	Ant1	5500	21.56	5489.24	5510.80	---	---
11A	Ant1	5580	25.72	5568.24	5593.96	---	---

11A	Ant1	5700	20.80	5689.40	5710.20	---	---

Test Graphs

11A-Ant1-5180	11A-Ant1-5200
	
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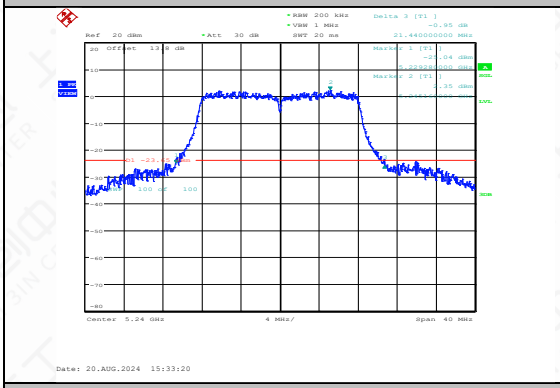
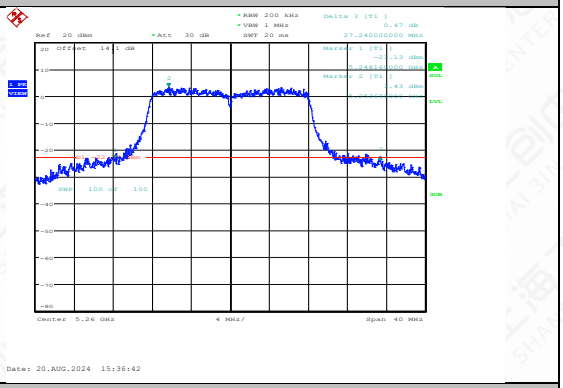
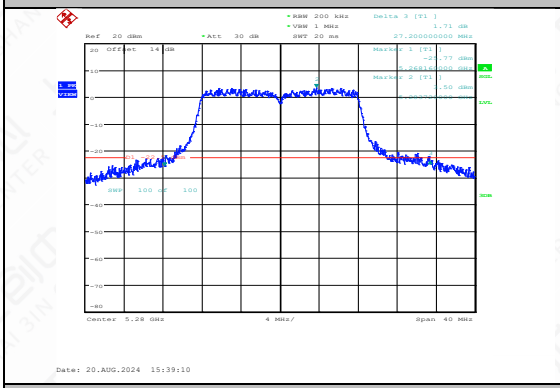
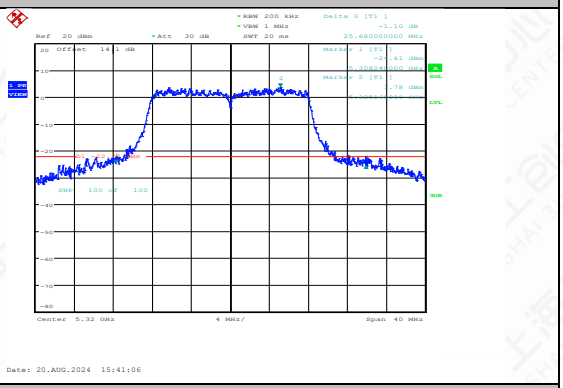
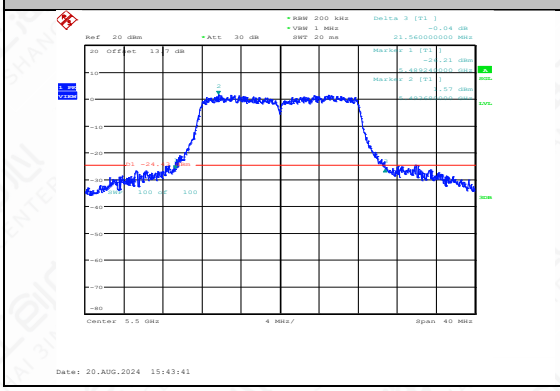
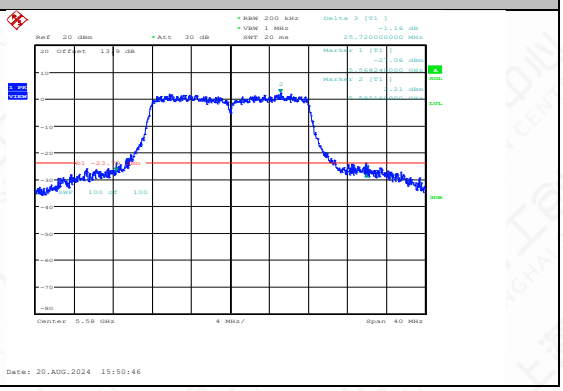
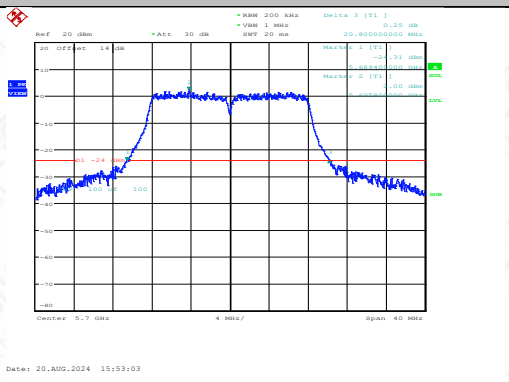
	
11A-Ant1-5280	11A-Ant1-5320
	
11A-Ant1-5500	11A-Ant1-5580
	

11A-Ant1-5700	/
	/

6.3. Maximum Output Power-Conducted

6.3.1. Measurement Limit and Method

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3.2. Test Procedure

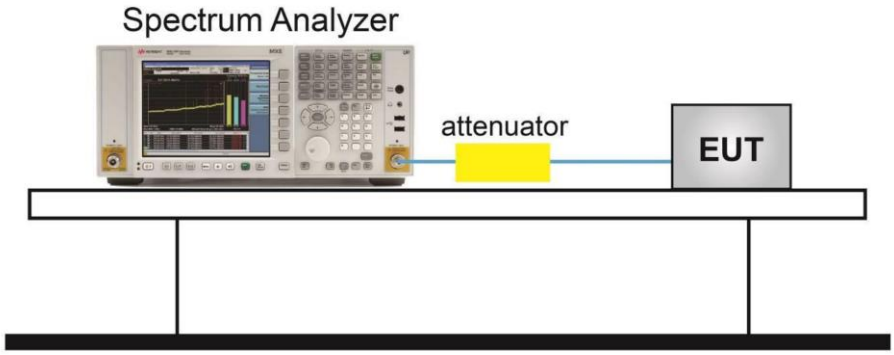
The measurement method SA-2 is made according to KDB 789033 E

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

1. Measure the duty cycle, x, of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz. (iv) Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
9. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

Add 10 log (1/x), where x is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25%

6.3.3. Test setup



6.3.4. Measurement Results

Test Mode	Frequency [MHz]	Set Power	Duty Cycle [%]	DC Factor [dBm]	Original Power [dBm]	Validation Power [dBm]	d_{dB} Note6	Limit [dBm]	Gain [dBi]	EIRP [dBm]
11A	5180	49	95.37	0.21	12.69	12.14	0.55	≤23.98	0.78	12.92
11A	5200	49	94.52	0.24	12.31	12.20	0.11	≤23.98	0.78	12.98
11A	5240	49	92.38	0.34	12.59	12.27	0.32	≤23.98	0.78	13.05
11A	5260	49	94.09	0.26	12.88	12.96	-0.08	≤23.98	0.88	13.84
11A	5280	49	92.79	0.32	13.19	13.90	-0.71	≤23.98	0.88	14.78
11A	5320	49	82.73	0.82	13.66	13.97	-0.31	≤23.98	0.88	14.85
11A	5500	44	92.79	0.32	11.46	10.51	0.95	≤23.98	0.93	11.44
11A	5580	44	93.21	0.31	12.01	12.30	-0.29	≤23.98	0.93	13.23
11A	5700	37	92.41	0.34	9.43	9.60	-0.17	≤23.98	0.93	10.53

Note：

1.The Duty Cycle Factor is compensated in the graph.

2. In the graph, the Center frequency = (Low frequency of 26dB OBW + High frequency of 26dB OBW) /2.

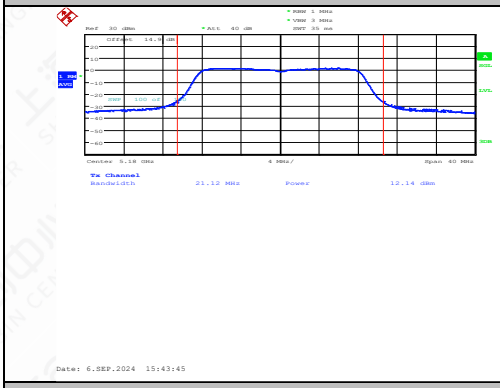
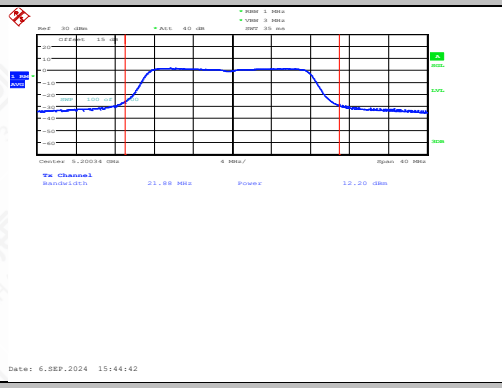
3.The 11a data rate 6Mbps is selected as worse condition, 11n/11ac data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

4. For client devices in the 5.15–5.25 GHz band, Limit =250mW; For the 5.25–5.35 GHz and 5.47–5.725 GHz bands: Limit = Min (250mW, 11dBm+10log B), B is the 26 dB emission bandwidth in megahertz.

Note5: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.

Note6: $d_{dB}=|Verified_{dB}-original_{dB}|$

Test Graphs Channel Power

11A-Ant1-5180-PASS	11A-Ant1-5200-PASS
	
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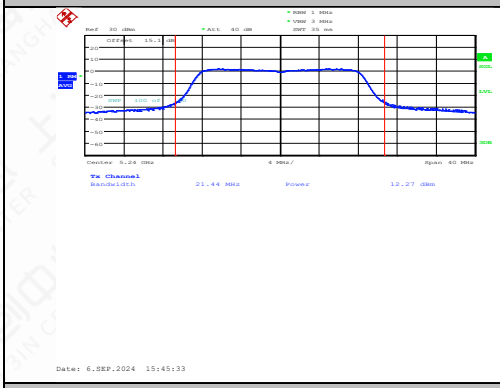	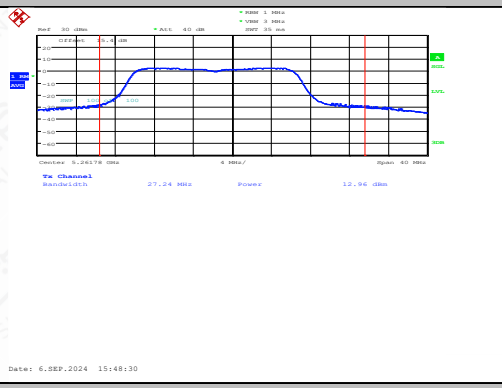
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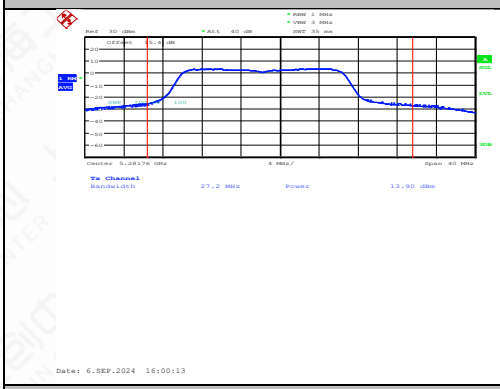	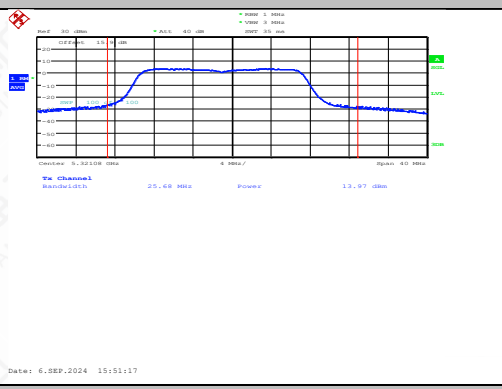
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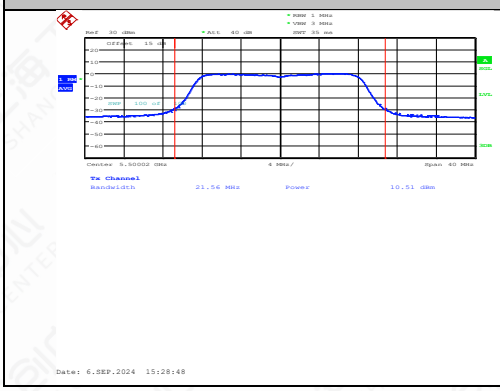
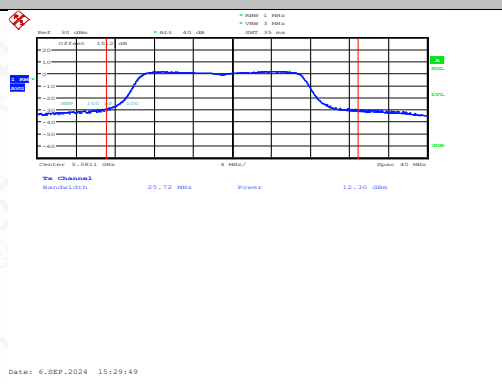
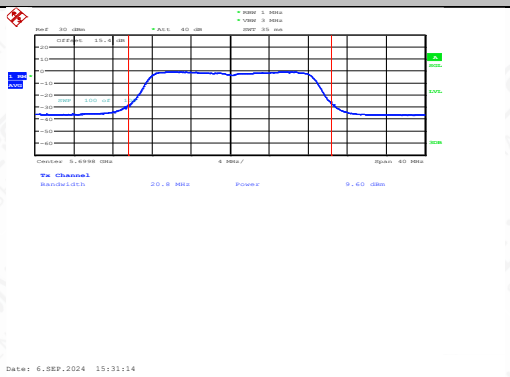
	

11A-Ant1-5700-PASS	/
	/

6.4. Band Edges Compliance

6.4.1 Measurement Limit

Above 1G, non-restricted band

Standard	EIRP Limit
15.407(b)	＜-27dBm/MHz
RSS-247 6.2	EIRP ＜-27dBm/MHz

Above 1G, Restricted band

Standard	EIRP Limit	
15.407(b)	＜-27dBm/MHz	
15.209	Peak	74dBμV/m
	Average	54dBμV/m
RSS-247 6.2	EIRP ＜-27dBm/MHz	
RSS-Gen 8.9	Peak	74dBμV/m
	Average	54dBμV/m

EIRP[dBm] = E[dBμV/m] + 20 log (d[m]) − 104.7

E[dBμV/m] = EIRP[dBm] - 20 log (d[m]) + 104.7

E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2， for d = 3m

6.4.2 Test Procedure

The measurement is made according to KDB 789033.

Marker-Delta Method: The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

Procedure for peak unwanted emissions measurements above 1000 MHz

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:

a) Follow the requirements in 12.7.4.

b) Peak emission levels are measured by setting the instrument as follows:

1) RBW = 1 MHz.

2) VBW ≥ [3 × RBW].

3) Detector = peak.

4) Sweep time = auto.

5) Trace mode = max hold.

6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous,

then the time required for the trace to stabilize will increase by a factor of approximately 1 / D, where D is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

Procedures for average unwanted emissions measurements above 1000 MHz

a) RBW = 1 MHz.

b) Video bandwidth:

1) If the EUT is configured to transmit with $D \geq 98\%$, then set VBW ≤ RBW / 100 (i.e., 10 kHz), but not less than 10 Hz.

2) If the EUT D is < 98%, then set VBW ≥ 1 / T, where T is defined in item a1) of 12.2.

c) Video bandwidth mode or display mode:

1) The instrument shall be set with video filtering applied in the power domain. Typically, this requires setting the detector mode to RMS (power averaging) and setting the average-VBW type to power (rms).

2) As an alternative, the instrument may be set to linear detector mode. Video filtering shall be applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode to accomplish this. Others have a setting for average-VBW type, which can be set to "voltage" regardless of the display mode.

d) Detector = peak.

e) Sweep time = auto.

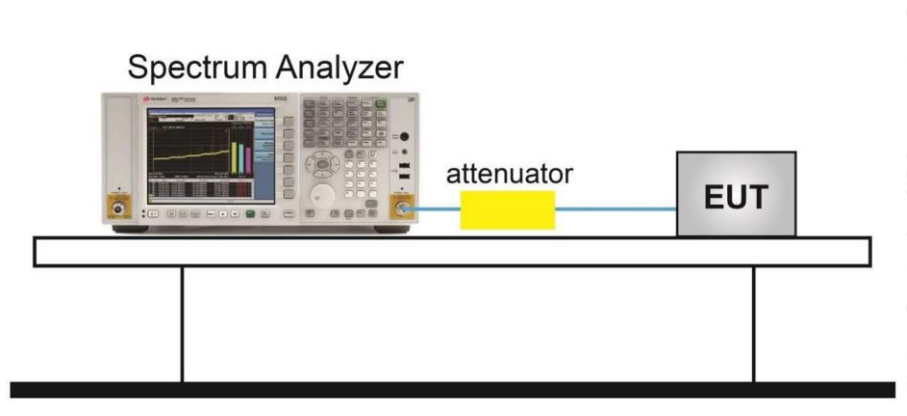
f) Trace mode = max hold.

g) Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where D is the duty cycle. For example, use at least 200 traces if the duty cycle is 25%. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 50 traces should be averaged.)

The measurement was applied in a fully anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna. Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. During the tests, the antenna height varied from 1m to 4m and the EUT azimuth were varied from 0° to 360° in order to identify the maximum level of

emissions from the EUT. 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. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

6.4.3 Test Setup



6.4.4 Measurement Result

Mainly Supply (S01aa)

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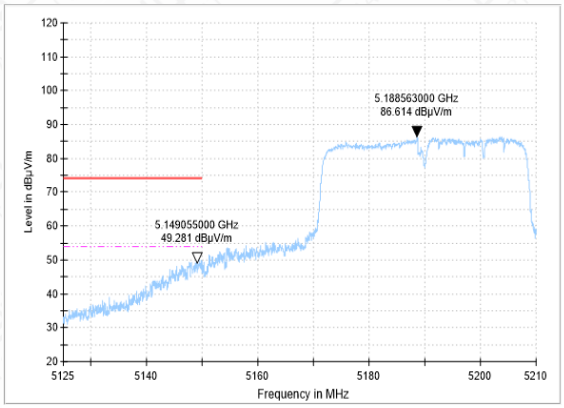	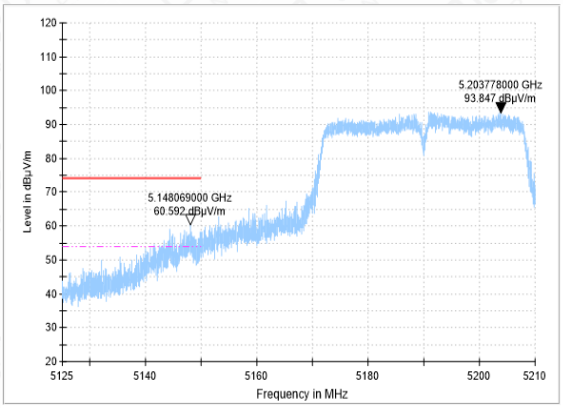

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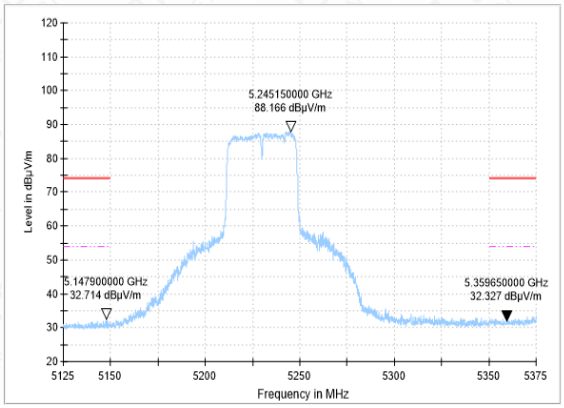	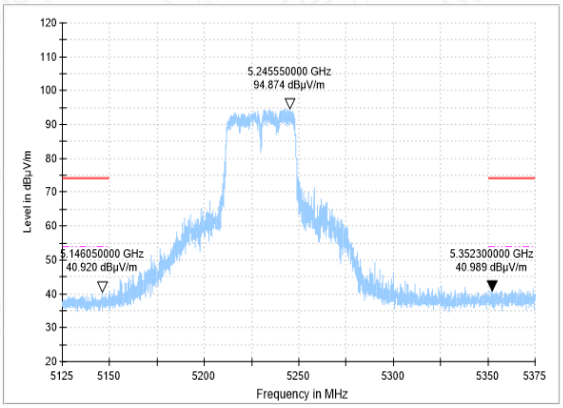
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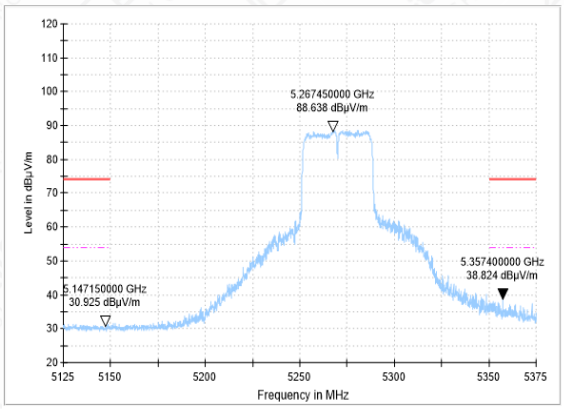	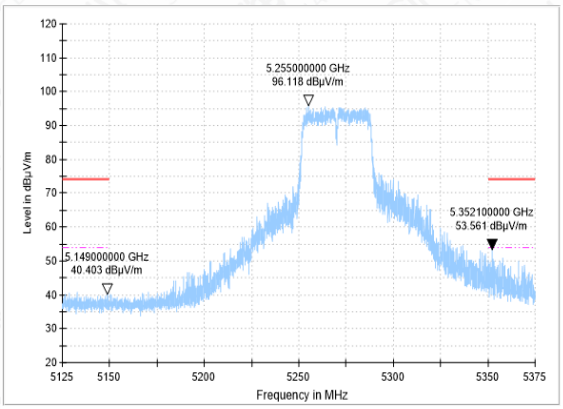
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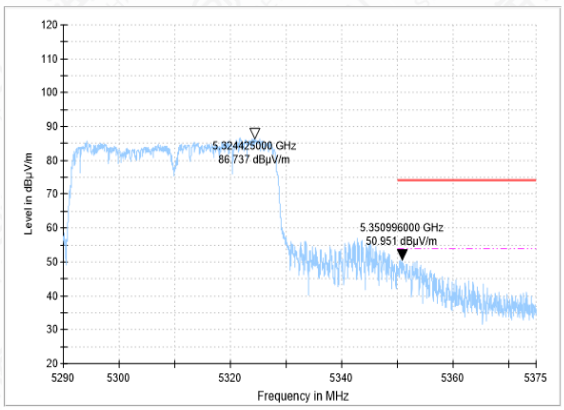	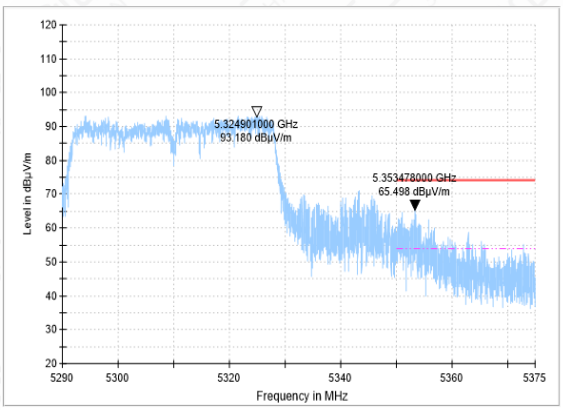

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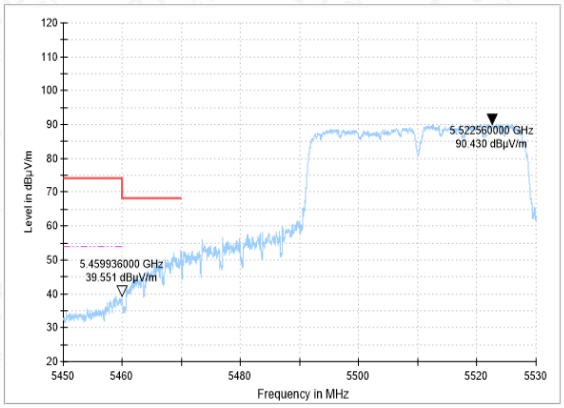	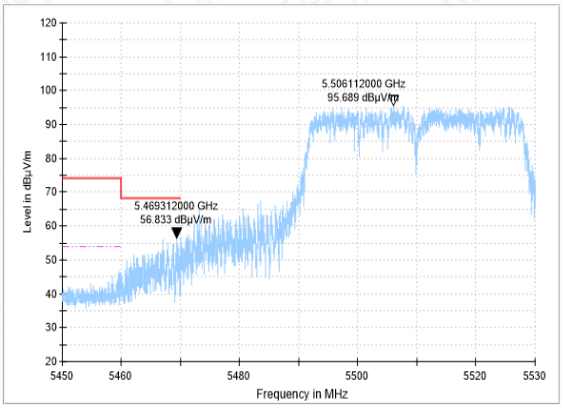
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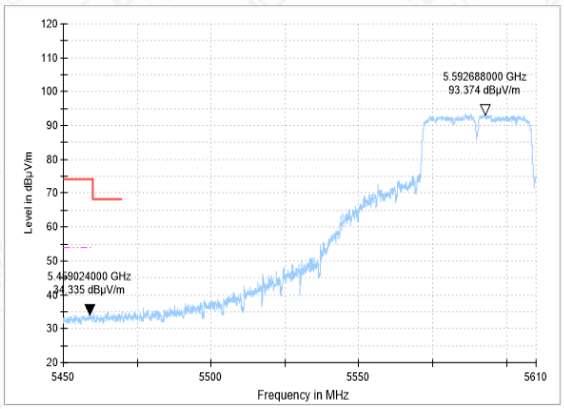	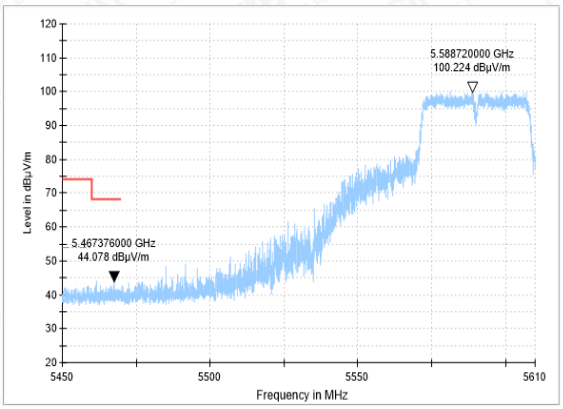
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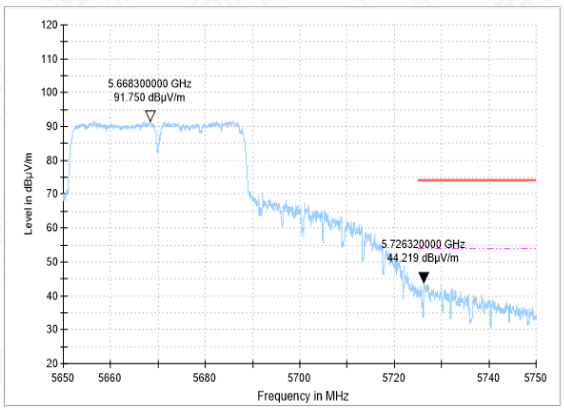	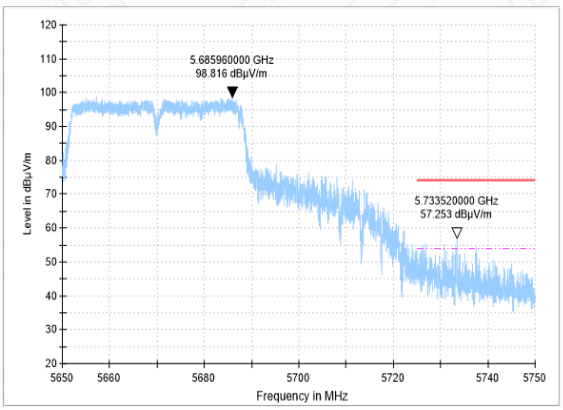

Secondary supply (S05aa)

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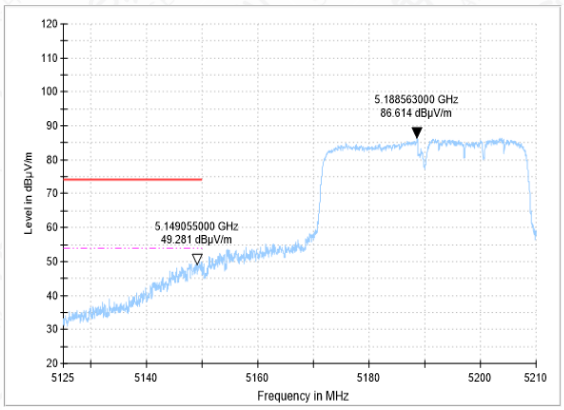	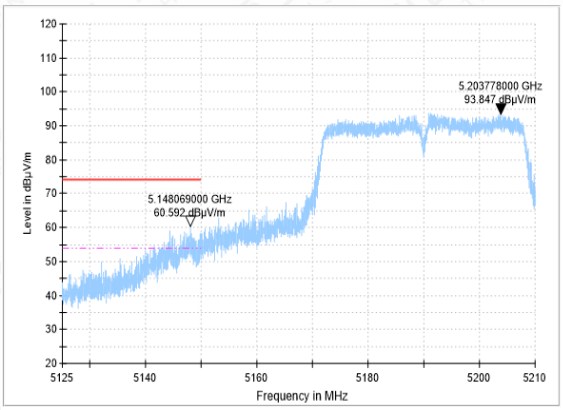
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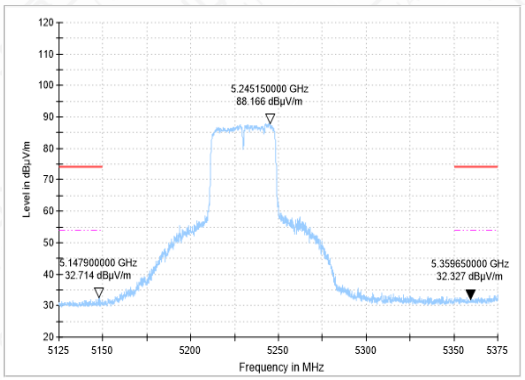	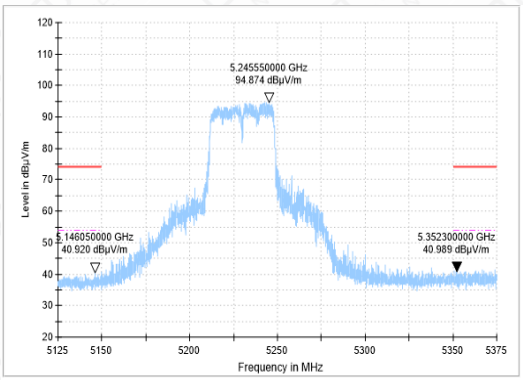
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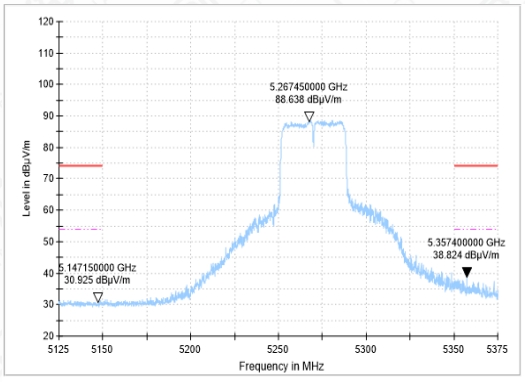	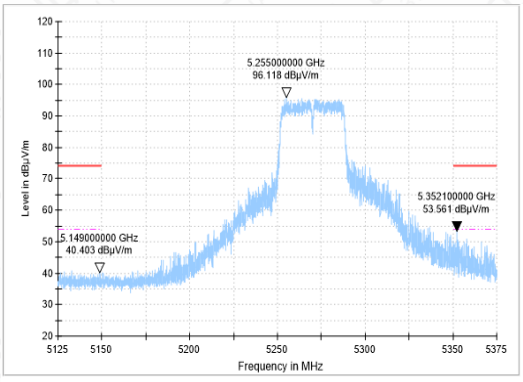

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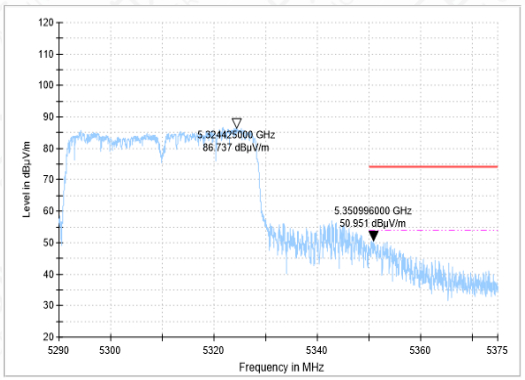	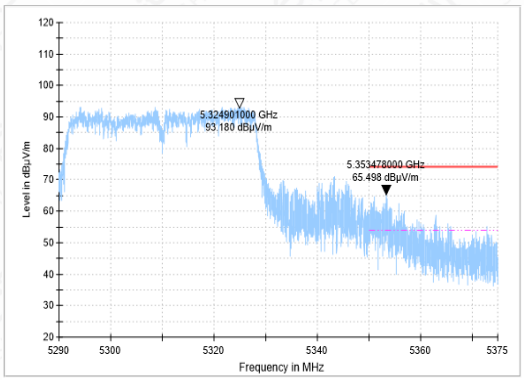
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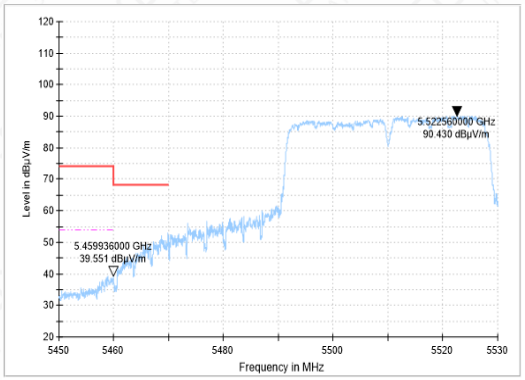	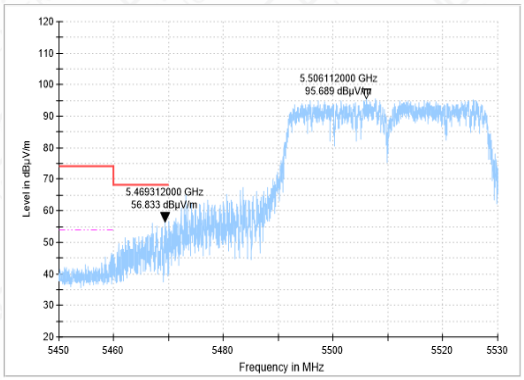
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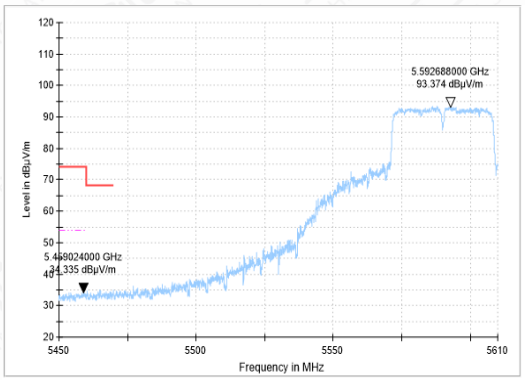	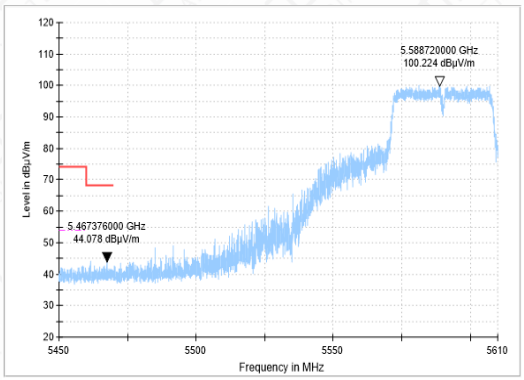

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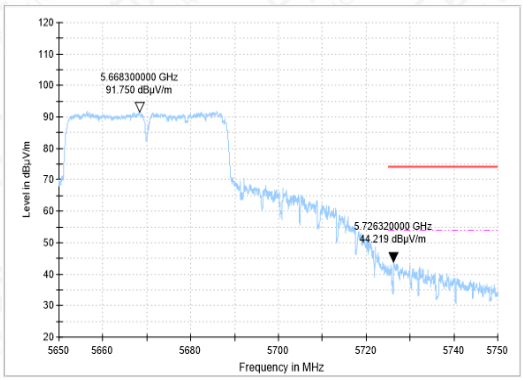
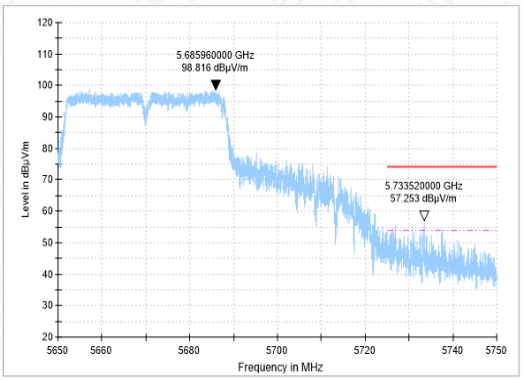
	

Note: Only data in worst mode is provided.

6.5. Transmitter Spurious Emission

6.5.1 Measurement Limit

Below 1G Limit:

Frequency of emission (MHz)	Field strength(dBμV/m)	Measurement distance(m)
0.009-0.490	129-94	3
0.490-1.705	74-63	3
1.705-30	70	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

Above 1G, non-restricted band

Standard	EIRP Limit
15.407(b)	-27dBm/MHz
RSS-247 6.2	-27dBm/MHz

Above 1G, Restricted band

Standard	EIRP Limit	
15.407(b)	-27dBm/MHz	
15.209	Peak	74dBμV/m
	Average	54dBμV/m
RSS-247 6.2	-27dBm/MHz	
RSS-Gen 8.9	Peak	74dBμV/m
	Average	54dBμV/m

EIRP[dBm] = E[dBμV/m] + 20 log (d[m]) − 104.7

E[dBμV/m] = EIRP[dBm] - 20 log (d[m]) + 104.7

E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2， for d = 3m

6.5.2 Test Procedure

The measurement is made according to KDB 789033

Set the spectrum analyzer in the following:

Procedure for Unwanted Emissions Measurements below 1000 MHz:

a) Follow the requirements in II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b)Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

Detector: Peak and Quasi-Peak

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz:

a) Follow the requirements in II.G.3, "General Requirements for Unwanted Emissions Measurements."

b) Maximum emission levels are measured by setting the analyzer as follows:

(i) RBW = 1 MHz.

(ii) VBW ≥ 3 MHz.

(iii) Detector = Peak.

(iv) Sweep time = auto.

(v) Trace mode = max hold.

(vi) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

Procedures for Average Unwanted Emissions Measurements above 1000 MHz:

a) Follow the requirements in section II.G.3., "General Requirements for Unwanted Emissions Measurements."

b) Average emission levels shall be measured using one of the following two methods.

c) Method AD (Average Detection): Primary method

(i) RBW = 1 MHz.

(ii) VBW ≥ 3 MHz.

(iii) Detector = power averaging (rms), if span/(# of points in sweep) ≤ RBW/2. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.

(iv) Averaging type = power averaging (rms)

As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

(v) Sweep time = auto.

(vi) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission

is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—rather than turning on and off with the transmit cycle, at least 100 traces shall be averaged.)

(vii) If tests are performed with the EUT transmitting at a duty cycle less than 98%, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

If power averaging (rms) mode was used in step (iv) above, the correction factor is 10 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.

If linear voltage averaging mode was used in step (iv) above, the correction factor is 20 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB must be added to the measured emission levels.

If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

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. Below 18GHz , the measurement antenna was placed at a distance of 3 meters from the EUT. Above 18GHz , the measurement antenna was placed at a distance of 1 meter from the EUT. During the tests, the antenna height varied from 1m to 4m and the EUT azimuth were varied from 0° to 360° 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.

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)

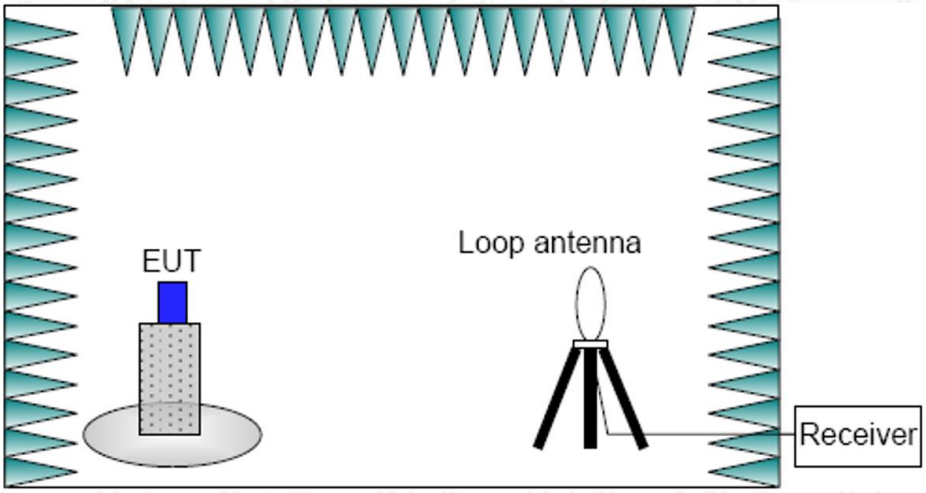
2. Measured level= Original Receiver Reading + Factor

3. Margin = Limit – Measured level

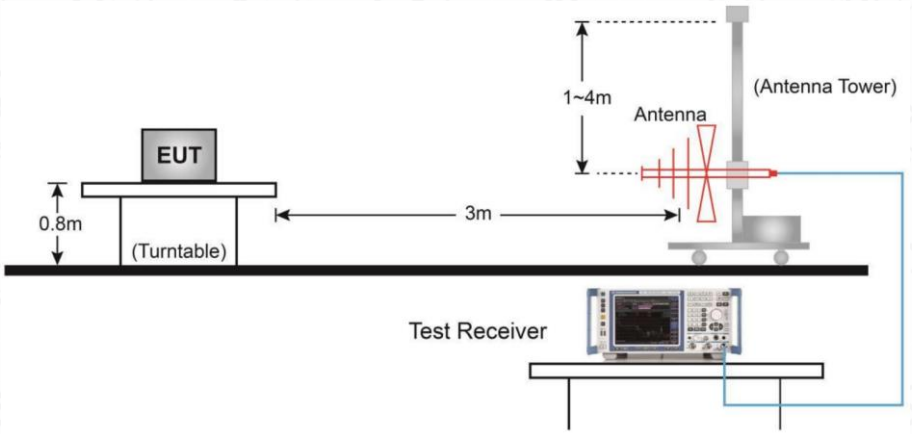
4. If the PK measured level is lower than AV limit, the AV test can be elided

6.5.3 Test Setup

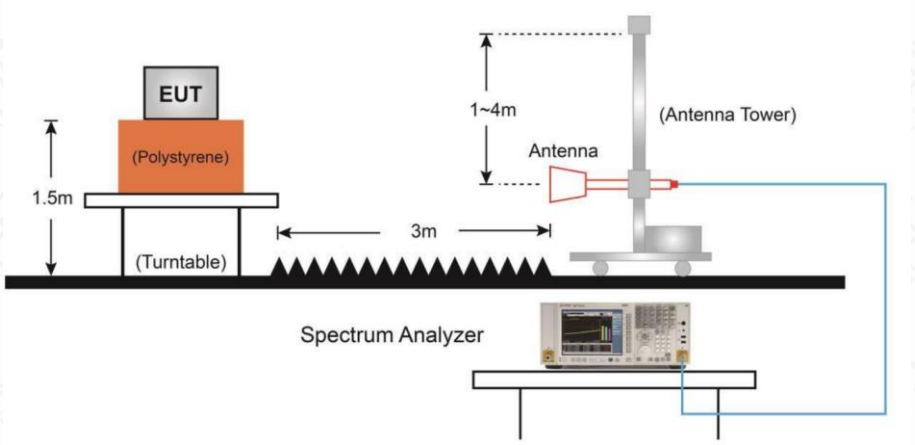
Below 30MHz Test Setup



Below 1GHz Test Setup



Above 1GHz Test Setup



6.5.4 Measurement Results

Mainly Supply (S01aa)

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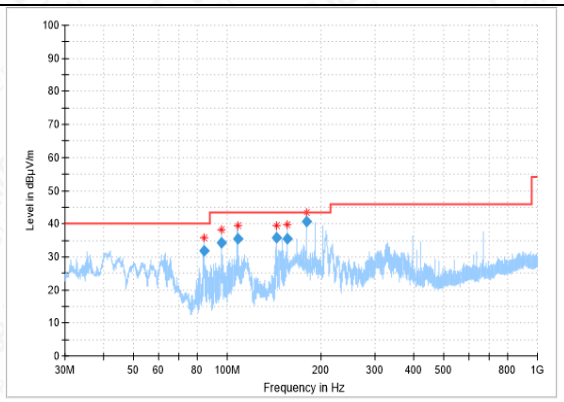
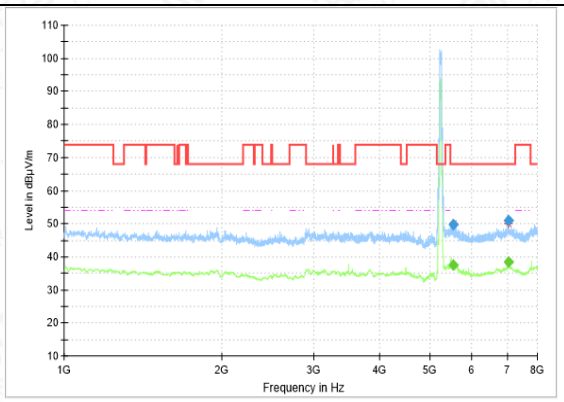
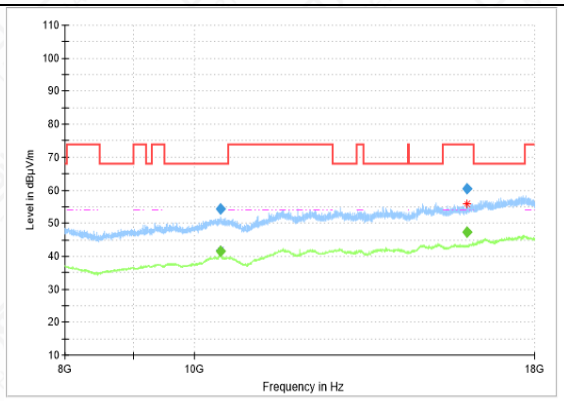
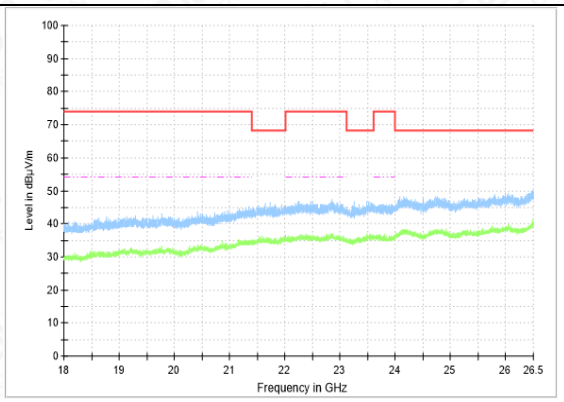
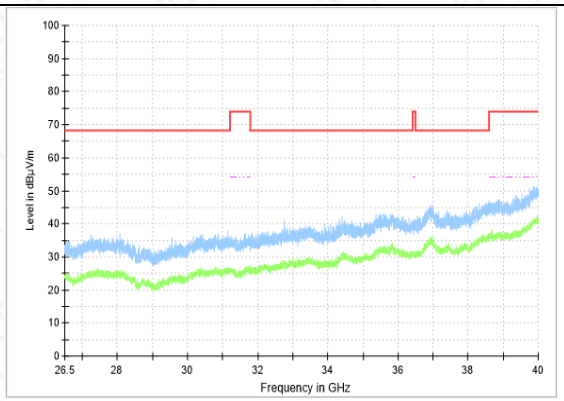
	
RSE-11N(40M)-CH46-8GHz-18GHz	RSE-11N(40M)-CH46-18GHz-26.5GHz
	

RSE-11N(40M)-CH46-26.5GHz-40GHz



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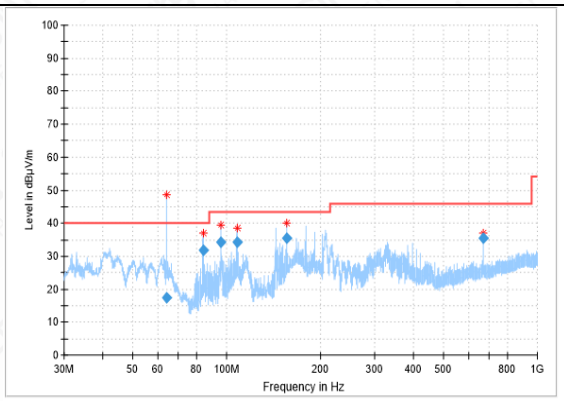
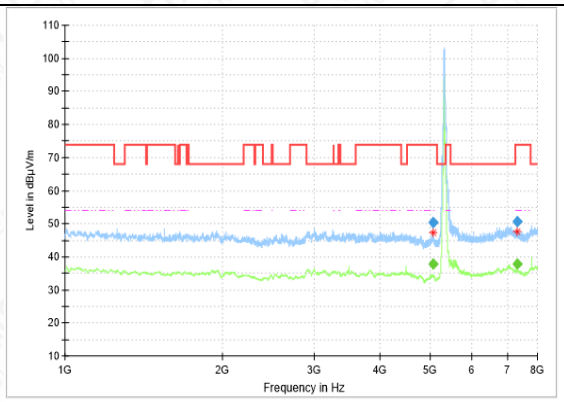
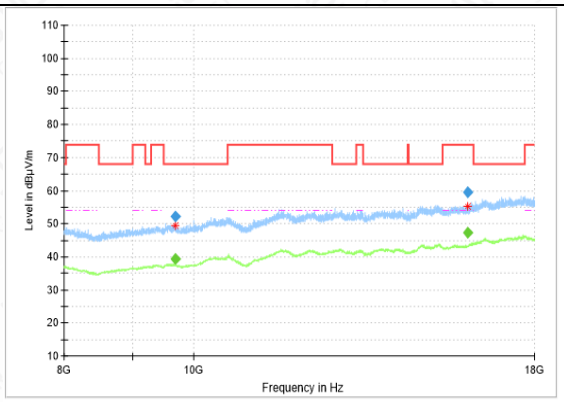


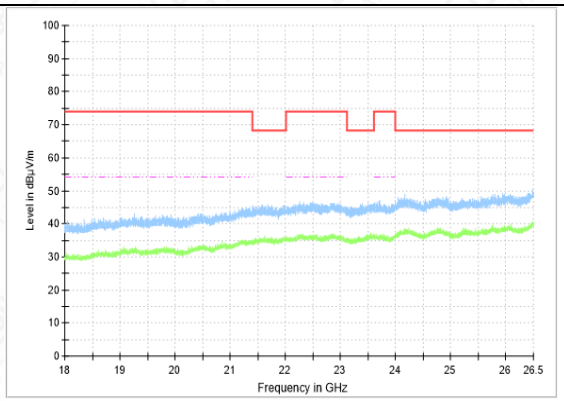
RSE-11N(40M)-CH62-1GHz-8GHz



RSE-11N(40M)-CH62-8GHz-18GHz



RSE-11N(40M)-CH62-18GHz-26.5GHz



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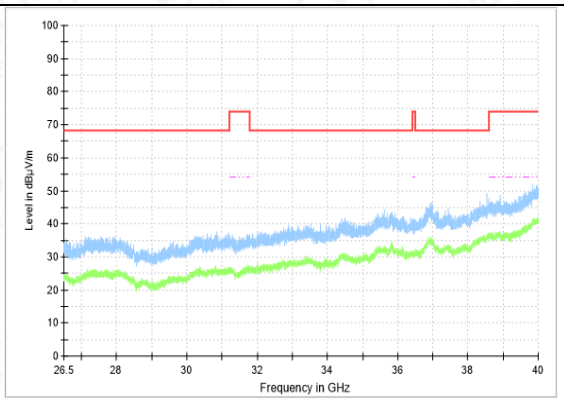
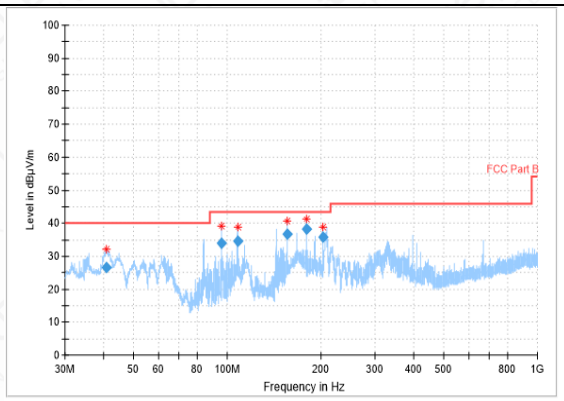
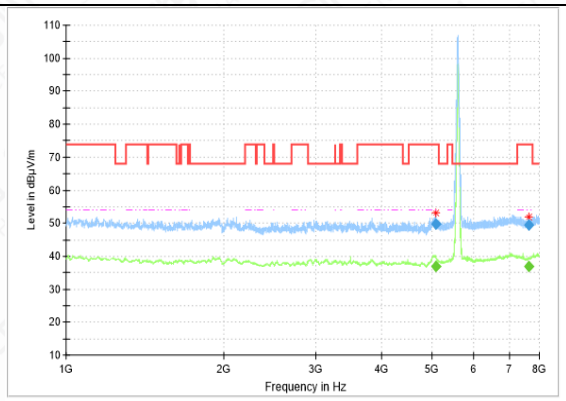


RSE-11N(40M)-CH118-30MHz-1GHz	RSE-11N(40M)-CH118-1GHz-8GHz
	
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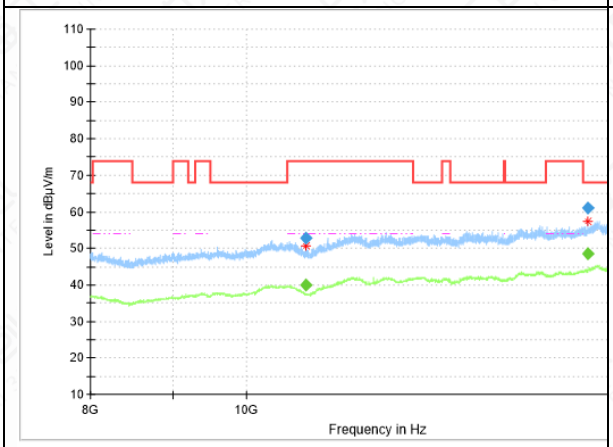	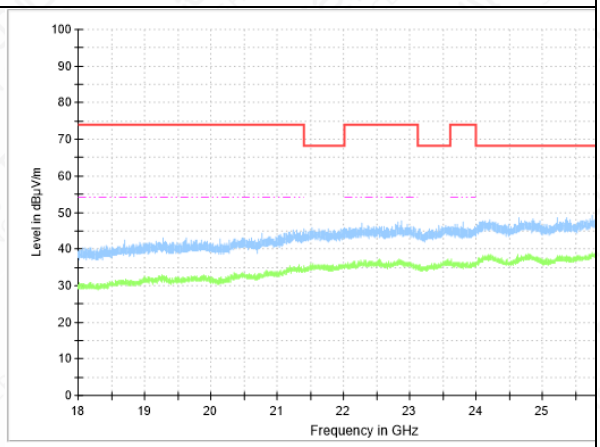
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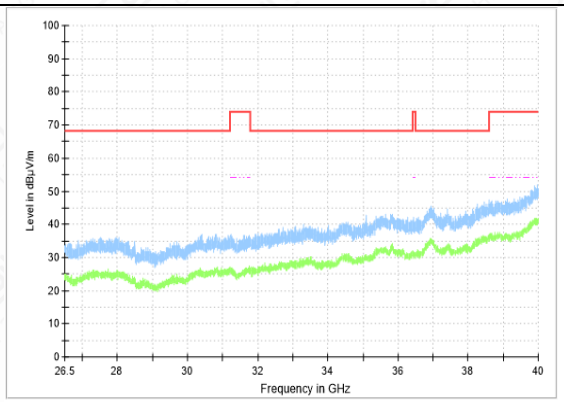
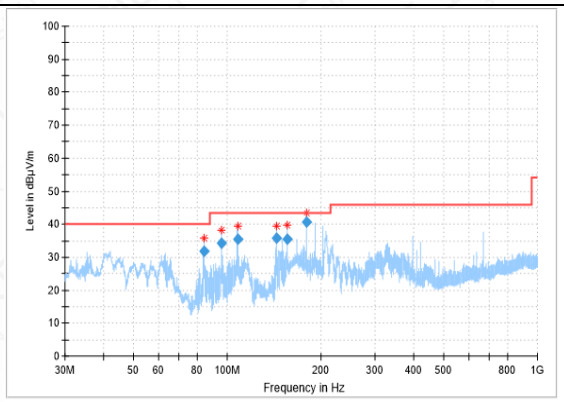
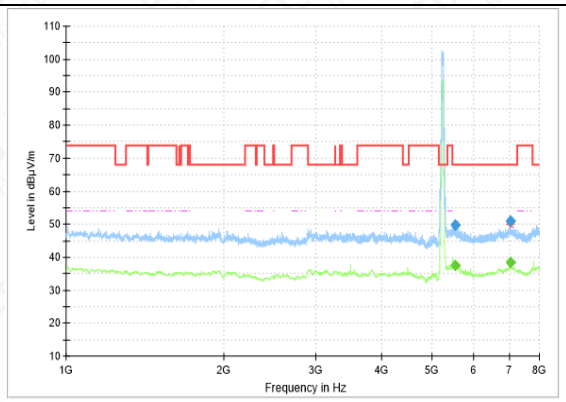
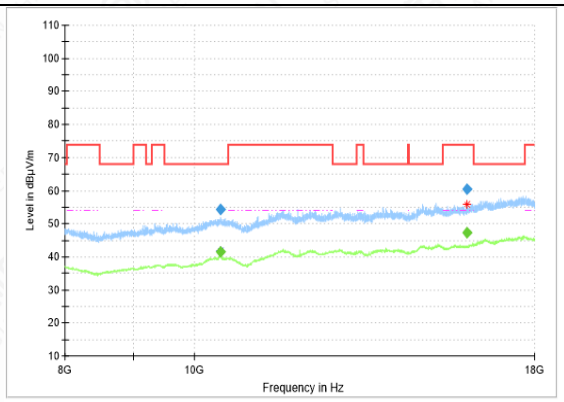
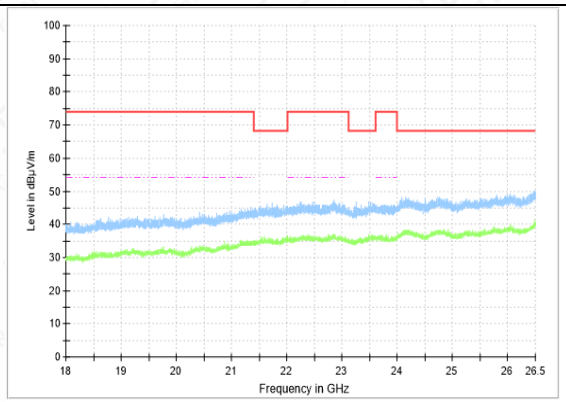
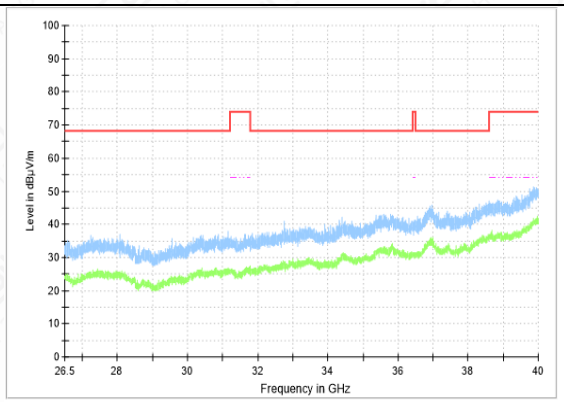
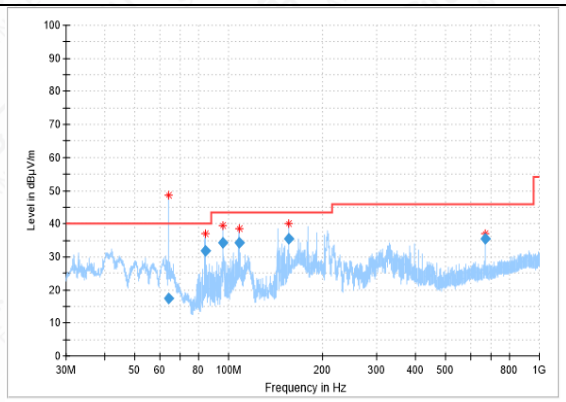
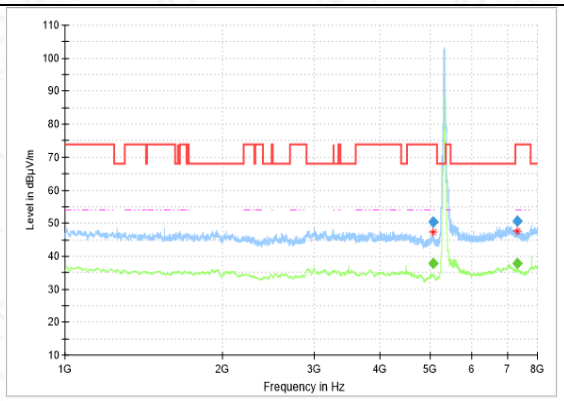
	/

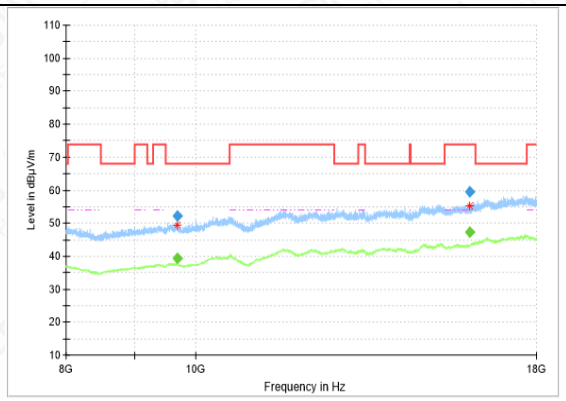
Secondary supply (S05aa)

RSE-11N(40M)-CH46-30MHz-1GHz	RSE-11N(40M)-CH46-1GHz-8GHz
	
RSE-11N(40M)-CH46-8GHz-18GHz	RSE-11N(40M)-CH46-18GHz-26.5GHz
	
RSE-11N(40M)-CH46-26.5GHz-40GHz	RSE-11N(40M)-CH62-30MHz-1GHz
	

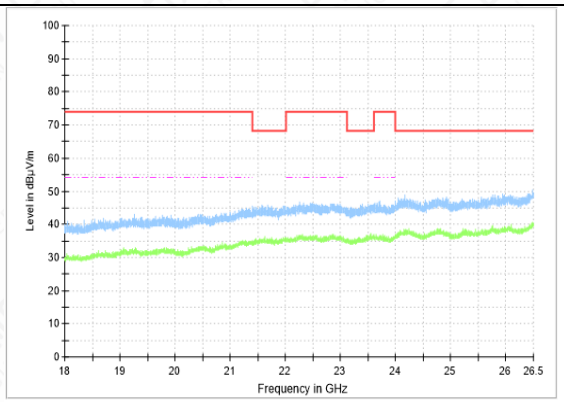
RSE-11N(40M)-CH62-1GHz-8GHz



RSE-11N(40M)-CH62-8GHz-18GHz



RSE-11N(40M)-CH62-18GHz-26.5GHz



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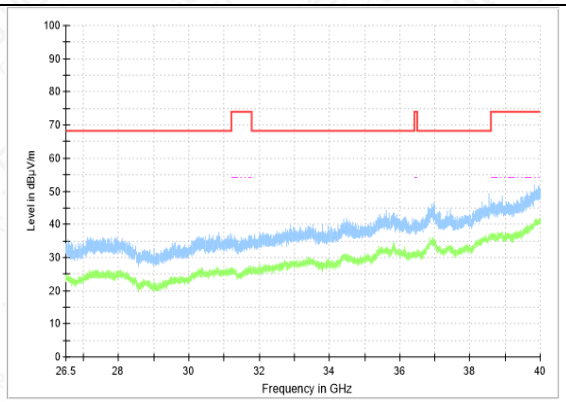
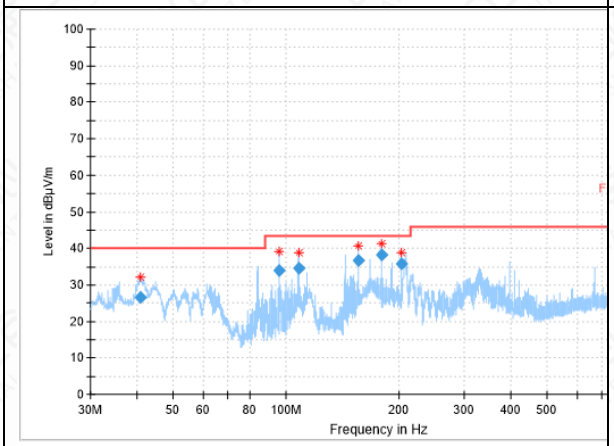


RSE-11N(40M)-CH118-30MHz-1GHz



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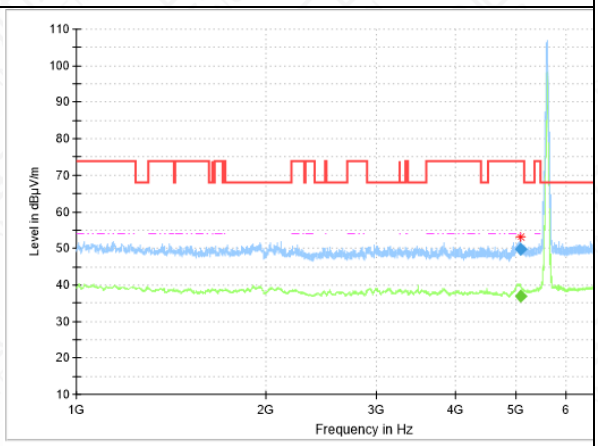

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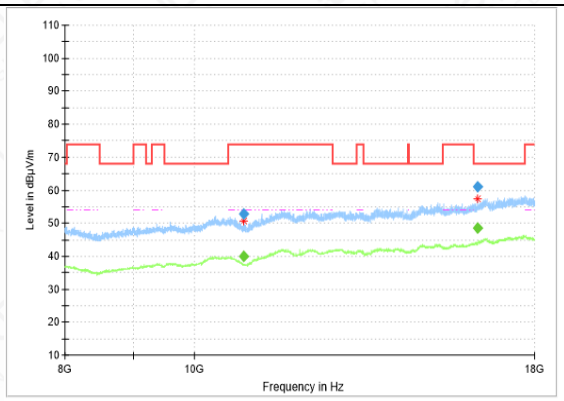

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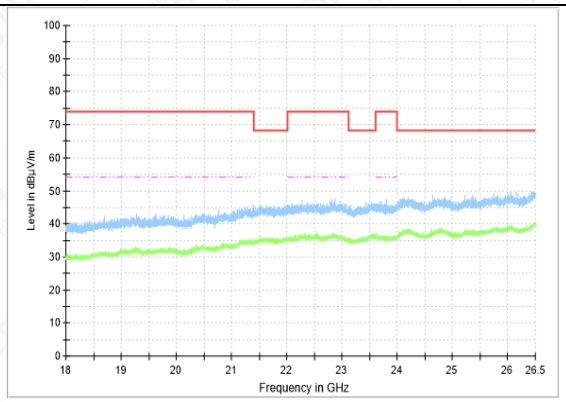

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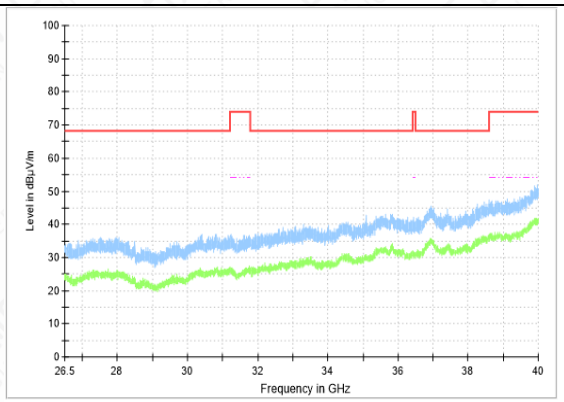
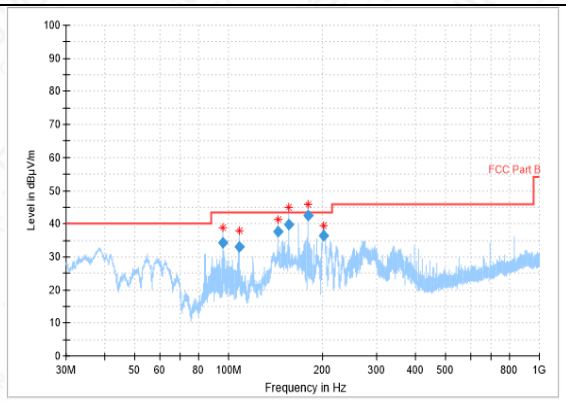
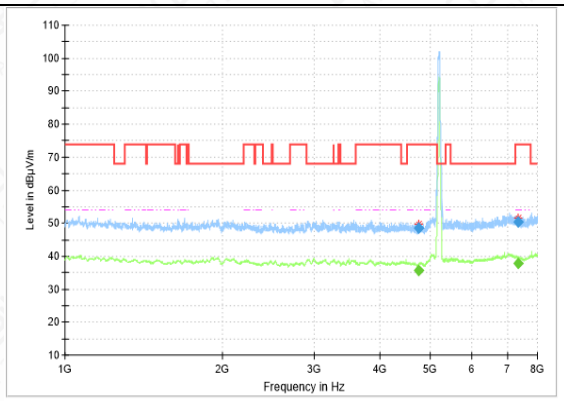


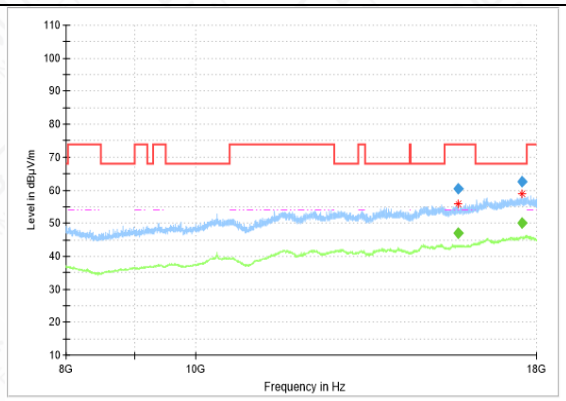
RSE-11N(40M)-CH38-30MHz-1GHz



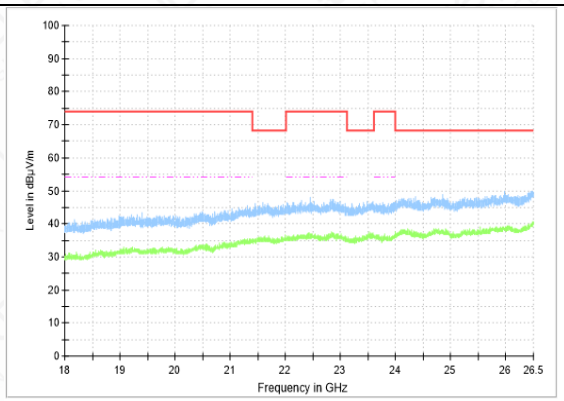
RSE-11N(40M)-CH38-1GHz-8GHz



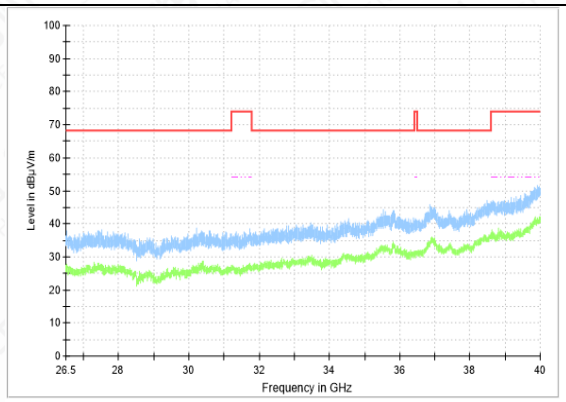
RSE-11N(40M)-CH38-8GHz-18GHz



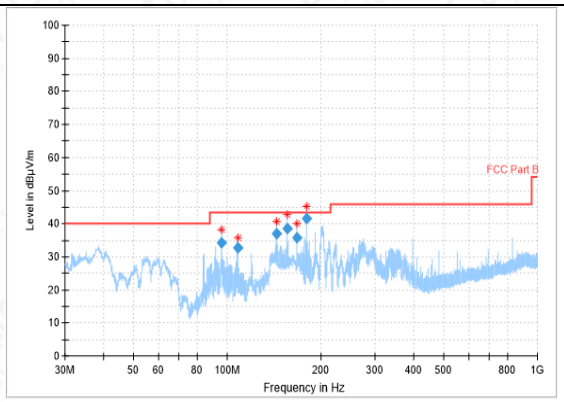
RSE-11N(40M)-CH38-18GHz-26.5GHz



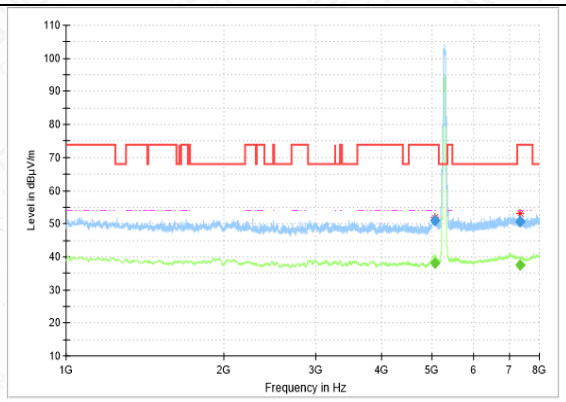
RSE-11N(40M)-CH38-26.5GHz-40GHz



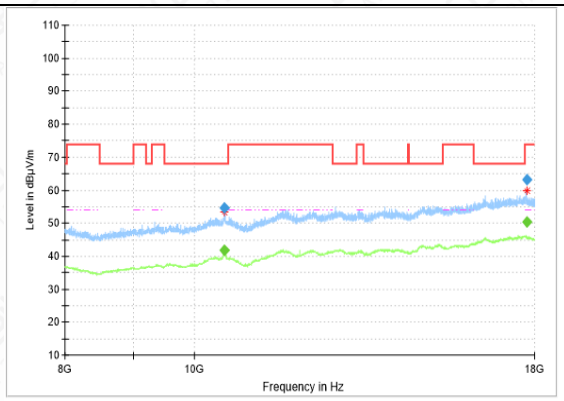
RSE-11N(40M)-CH54-30MHz-1GHz



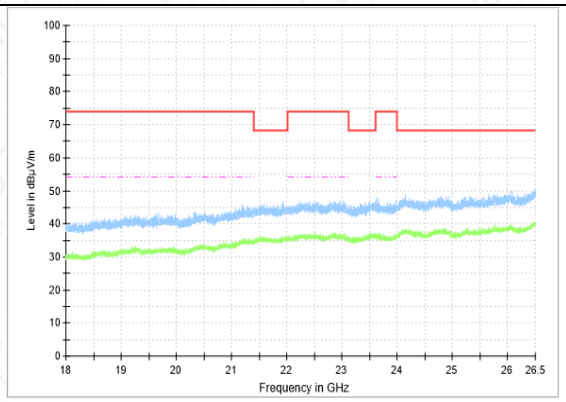
RSE-11N(40M)-CH54-1GHz-8GHz



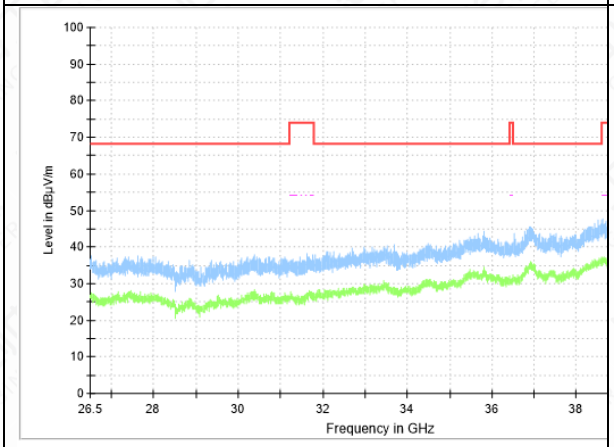
RSE-11N(40M)-CH54-8GHz-18GHz



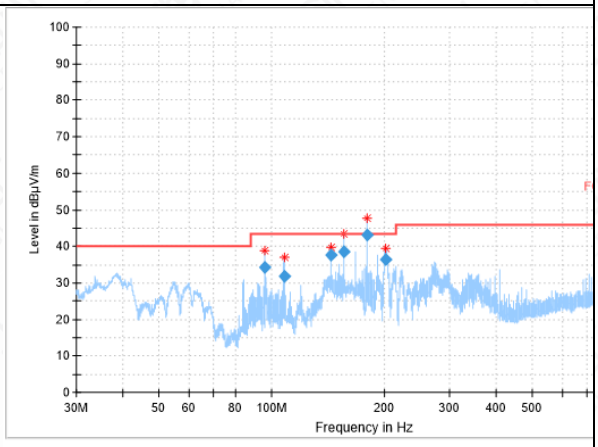
RSE-11N(40M)-CH54-18GHz-26.5GHz



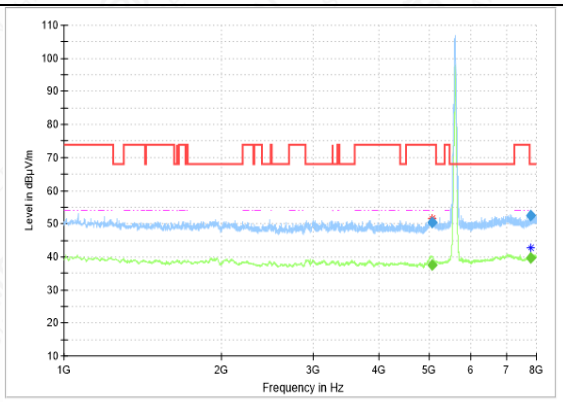
RSE-11N(40M)-CH54-26.5GHz-40GHz



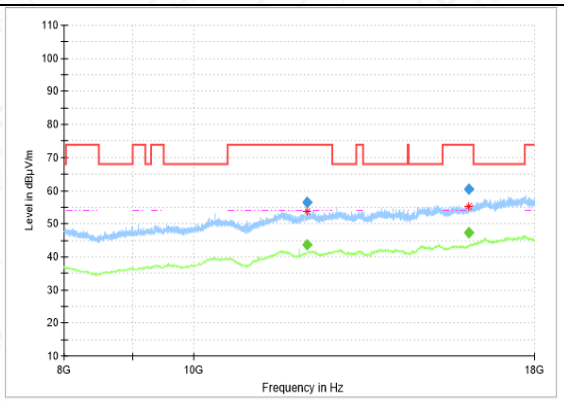
RSE-11N(40M)-CH118-30MHz-1GHz



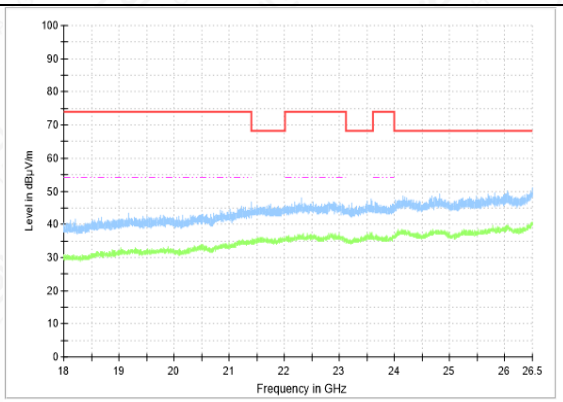
RSE-11N(40M)-CH118-1GHz-8GHz



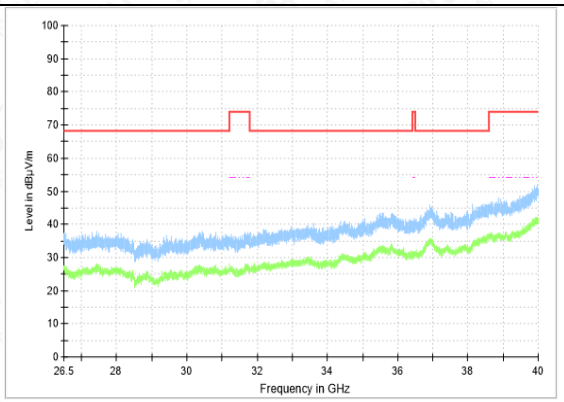
RSE-11N(40M)-CH118-8GHz-18GHz



RSE-11N(40M)-CH118-18GHz-26.5GHz



RSE-11N(40M)-CH118-26.5GHz-40GHz



Note：

1. The out-of- limit signal in the picture is the main frequency signal.
2. Only data in worst mode is provided.
3. The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.
4. Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

Mainly Supply (S01aa)

RSE-11N(40M)-CH46-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
84.0	31.96	-17	48.96	8.04	40.00	V
96.1	34.25	-14	48.25	9.25	43.50	V
108.0	35.51	-13	48.51	7.99	43.50	V
144.0	35.68	-17	52.68	7.82	43.50	V
155.9	35.61	-16	51.61	7.89	43.50	H
180.0	40.71	-14	54.71	2.79	43.50	H

RSE-11N(40M)-CH46-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5520.6	49.87	2	47.87	18.33	68.20	H
7038.8	50.99	4	46.99	17.21	68.20	H

RSE-11N(40M)-CH46-1GHz-8GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5520.6	37.4	2	35.4	---	---	H
7038.8	38.37	4	34.37	---	---	H

RSE-11N(40M)-CH46-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10460.0	54.41	8	46.41	13.79	68.20	H
16012.8	60.35	15	45.35	13.65	74.00	H

RSE-11N(40M)-CH46-8GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10460.0	41.54	8	33.54	---	---	H
16012.8	47.32	15	32.32	6.68	54.00	H

RSE-11N(40M)-CH62-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
64.1	17.44	-14	31.44	22.56	40.00	V
84.0	31.85	-17	48.85	8.15	40.00	V

95.9	34.21	-14	48.21	9.29	43.50	V
108.0	34.22	-13	47.22	9.28	43.50	V
156.0	35.39	-16	51.39	8.11	43.50	V
670.3	35.59	-1	36.59	10.41	46.00	V

RSE-11N(40M)-CH62-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
5059.2	50.47	5	45.47	23.53	74.00	H
7320.6	50.7	4	46.7	23.30	74.00	H

RSE-11N(40M)-CH62-1GHz-8GHz

Frequency (MHz)	Average(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
5059.2	37.88	5	32.88	16.12	54.00	H
7320.6	37.75	4	33.75	16.25	54.00	H

RSE-11N(40M)-CH62-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
9691.0	52.05	6	46.05	16.15	68.20	H
16053.5	59.69	15	44.69	14.31	74.00	H

RSE-11N(40M)-CH62-8GHz-18GHz

Frequency (MHz)	Average(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
9691.0	39.28	6	33.28	---	---	H
16053.5	47.4	15	32.4	6.60	54.00	H

RSE-11N(40M)-CH118-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBµV/m)	ARpl (dB)	PMea (dBµV/m)	Margin(dB)	Limit(dBµV/m)	Polarity
40.9	26.64	-13	39.64	13.36	40.00	V
96.1	33.91	-14	47.91	9.59	43.50	V
107.9	34.68	-13	47.68	8.82	43.50	V
156.0	36.69	-16	52.69	6.81	43.50	V
180.0	38.16	-14	52.16	5.34	43.50	H
204.0	35.91	-13	48.91	7.59	43.50	H

RSE-11N(40M)-CH118-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5084.6	49.83	4	45.83	24.17	74.00	H
7647.2	49.4	4	45.4	24.60	74.00	H

RSE-11N(40M)-CH118-1GHz-8GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5084.6	36.94	4	32.94	17.06	54.00	H
7647.2	36.96	4	32.96	17.04	54.00	H

RSE-11N(40M)-CH118-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10901.2	52.87	7	45.87	21.13	74.00	H
16306.8	61.02	16	45.02	7.18	68.20	H

RSE-11N(40M)-CH118-8GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10901.2	40.05	7	33.05	13.95	54.00	H
16306.8	48.51	16	32.51	---	---	H

Secondary supply (S05aa)

RSE-11N(40M)-CH38-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	34.18	-14	48.18	9.32	43.50	V
108.0	33	-13	46	10.50	43.50	V
144.0	37.61	-17	54.61	5.89	43.50	V
156.0	39.66	-16	55.66	3.84	43.50	H
180.0	42.45	-14	56.45	1.05	43.50	H
202.4	36.47	-13	49.47	7.03	43.50	V

RSE-11N(40M)-CH38-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4740.8	48.43	1	47.43	25.57	74.00	H
7343.4	50.31	4	46.31	23.69	74.00	H

RSE-11N(40M)-CH38-1GHz-8GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
4740.8	35.56	1	34.56	18.44	54.00	H
7343.4	37.76	4	33.76	16.24	54.00	H

RSE-11N(40M)-CH38-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
15724.5	60.55	15	45.55	13.45	74.00	V
17564.8	62.61	18	44.61	5.59	68.20	V

RSE-11N(40M)-CH38-8GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
15724.5	47.09	15	32.09	6.91	54.00	V
17564.8	50.17	18	32.17	---	---	V

RSE-11N(40M)-CH54-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.0	34.34	-14	48.34	9.16	43.50	V
108.0	32.59	-13	45.59	10.91	43.50	V
143.9	36.87	-17	53.87	6.63	43.50	V
155.9	38.46	-16	54.46	5.04	43.50	H
168.0	35.81	-15	50.81	7.69	43.50	H
180.0	41.71	-14	55.71	1.79	43.50	H

RSE-11N(40M)-CH54-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5057.4	51.1	5	46.1	22.90	74.00	H
7342.0	50.52	4	46.52	23.48	74.00	H

RSE-11N(40M)-CH54-1GHz-8GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5057.4	38.15	5	33.15	15.85	54.00	H
7342.0	37.67	4	33.67	16.33	54.00	H

RSE-11N(40M)-CH54-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10538.5	54.68	8	46.68	13.52	68.20	H
17746.8	63.31	18	45.31	10.69	74.00	H

RSE-11N(40M)-CH54-8GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
10538.5	41.75	8	33.75	---	---	H
17746.8	50.45	18	32.45	3.55	54.00	H

RSE-11N(40M)-CH118-30MHz-1GHz

Frequency (MHz)	QuasiPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
96.1	34.25	-14	48.25	9.25	43.50	V
108.0	31.84	-13	44.84	11.66	43.50	V
144.0	37.54	-17	54.54	5.96	43.50	V
156.0	38.6	-16	54.6	4.90	43.50	V
180.0	43.19	-14	57.19	0.31	43.50	H
202.4	36.35	-13	49.35	7.15	43.50	H

RSE-11N(40M)-CH118-1GHz-8GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5050.9	50.43	5	45.43	23.57	74.00	V
7799.6	52.54	4	48.54	15.66	68.20	H

RSE-11N(40M)-CH118-1GHz-8GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
5050.9	37.51	5	32.51	16.49	54.00	V
7799.6	39.62	4	35.62	---	---	H

RSE-11N(40M)-CH118-8GHz-18GHz

Frequency (MHz)	MaxPeak(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
12161.0	56.39	11	45.39	17.61	74.00	V
16063.5	60.35	15	45.35	13.65	74.00	H

RSE-11N(40M)-CH118-8GHz-18GHz

Frequency (MHz)	Average(dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Margin(dB)	Limit(dBμV/m)	Polarity
12161.0	43.59	11	32.59	10.41	54.00	V
16063.5	47.33	15	32.33	6.67	54.00	H

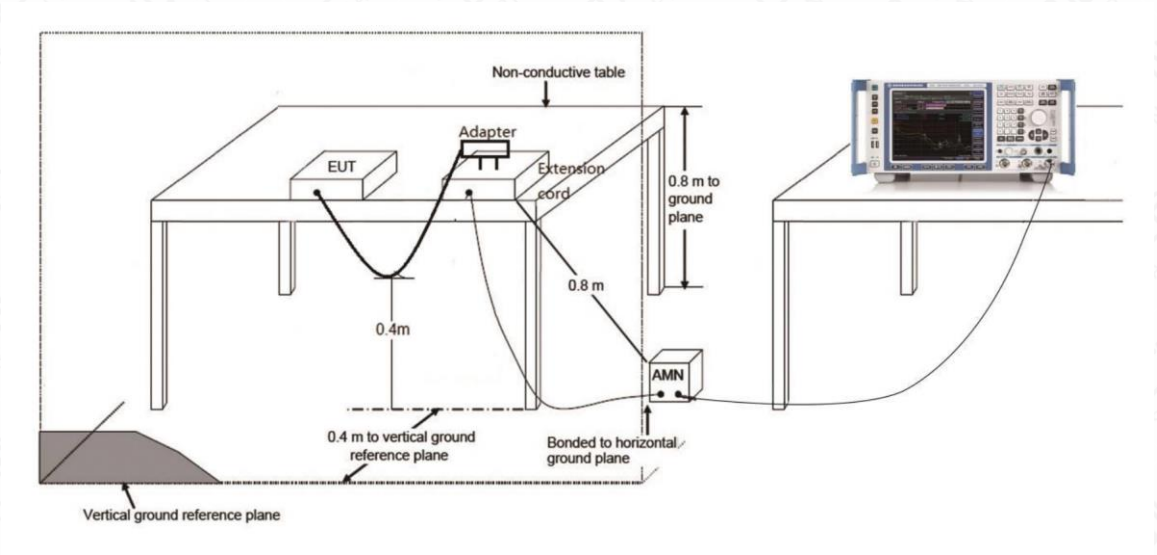
6.6. AC Powerline Conducted Emission

6.6.1. 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.

6.6.2. Test Setup



6.6.3. Test Condition

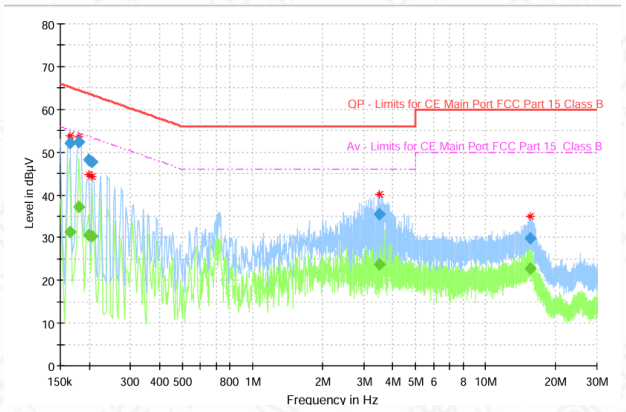
Voltage（V）	Frequency（Hz）
120	60

6.6.4. 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.			

6.6.5. Measurement Result

11A-5180MHz	/
	/

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.153731	---	42.37	55.80	13.42	15000.0	9.000	L1	ON	9.6
0.153731	56.76	---	65.80	9.03	15000.0	9.000	L1	ON	9.6
0.176119	---	35.98	54.67	18.69	15000.0	9.000	L1	ON	9.6
0.176119	51.95	---	64.67	12.71	15000.0	9.000	L1	ON	9.6
0.187313	---	33.56	54.16	20.60	15000.0	9.000	L1	ON	9.6
0.187313	49.59	---	64.16	14.57	15000.0	9.000	L1	ON	9.6
0.202238	---	29.78	53.52	23.74	15000.0	9.000	L1	ON	9.6
0.202238	47.66	---	63.52	15.86	15000.0	9.000	L1	ON	9.6
3.586481	---	24.02	46.00	21.98	15000.0	9.000	L1	ON	9.6
3.586481	35.12	---	56.00	20.88	15000.0	9.000	L1	ON	9.6
15.664538	---	22.82	50.00	27.18	15000.0	9.000	L1	ON	9.9
15.664538	29.79	---	60.00	30.21	15000.0	9.000	L1	ON	9.9

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