

FCC PART 15 SUBPART B CLASS B MEASUREMENT AND TEST REPORT

For

Chongqing Jinou Science & Technology Development Co., Ltd.

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**Tested Model: BTS4504C1H
FCC ID: SI8BTS4504C1H**

Report Type: Original Report	Product Name: 100M Wireless RS232 Serial Adapter
Report Number:	RSC191106002-0B
Date of Report Issue:	2019-12-06
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Chongqing Jinou Science & Technology Development Co., Ltd.
Product	100M Wireless RS232 Serial Adapter
Tested Model	BTS4504C1H
FCC ID	SI8BTS4504C1H
Highest operating frequency	2480MHz
Voltage Range	DC 6V
Measure approximately	99 mm (L) x 34 mm (W) x 17 mm (H)
Sample serial number	191106002/01 (assigned by the BACL, Chengdu)
Sample/EUT Status	The test sample was in good condition and received : 2019-11-06

Note: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Objective

The report was prepared on behalf of Chongqing Jinou Science & Technology Development Co., Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 15 Subpart B Class B limit.

Related Submittal(s)/Grant(s)

No.

Measurement Uncertainty

Item		Uncertainty	
Power line conducted emission		2.24 dB	
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.47 dB
		V	4.73 dB
	200MHz-1GHz	H	4.87 dB
		V	5.93 dB
	1GHz-6GHz		4.74 dB
	6GHz-18GHz		4.76 dB

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the corresponding inclusion factor K when the inclusion probability is about 95%.

Test Methodology

All measurements contained in this report are conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement is performed at BACL. The radiated testing is performed at an antenna-to-EUT distance of 3 Meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4324.01) and the FCC designation No. CN1186 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

The system is configured for testing in a typical fashion (as a normally used by a typical user).

EUT Exercise Software

BluetoothChat

Special Accessories

No special accessories were supplied by BAACL.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

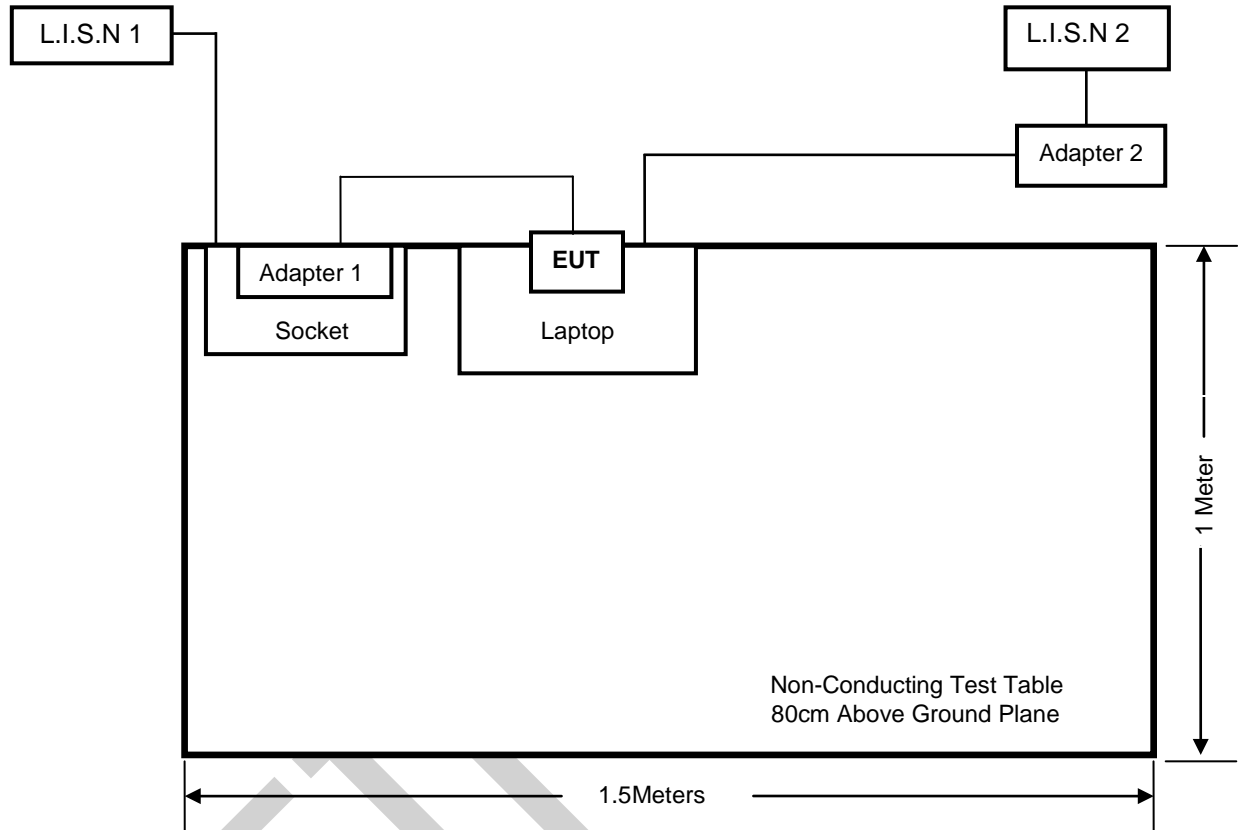
Manufacturer	Description	Model Number	Serial Number
Shantou Yuewei Co.,Ltd	Adapter 1	YW506	Unknown
DELL	Laptop	PP01L	3F438A01
DELL	Adapter 2	ADP-90FB REV.B	Unknown

External I/O Cable

Cable Description	Length (m)	From	To
Unshielded Power Cable	1.2	Adapter 1	EUT
Unshielded Power Cable	1.8	Adapter 2	Laptop

Block Diagram of Test Setup

Conducted Emissions



SUMMARY OF TEST RESULTS

Standard	Description	Result
FCC §15.107	Conducted Emission	Compliance
FCC §15.109	Radiated Emission	Compliance

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

FINAL

TEST EQUIPMENTS LIST

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2019-04-15	2020-04-14
ROHDE&SCHWARZ	L.I.S.N.	ENV216	3560.6550.16	2019-02-25	2020-02-24
EMCO	L.I.S.N.	3810/2BR	9509-1102	NCR	NCR
HP	RF Limiter	11947A	3107A01270	2019-10-18	2020-10-17
Unknown	Conducted Cable	L-E003	000003	2019-08-05	2020-08-04
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	NCR	NCR
Radiated Emissions Test					
EMCT	Semi-Anechoic Chamber	966	001	2017-05-18	2020-05-17
SONOMA INSTRUMENT	Amplifier	310 N	186684	2019-09-06	2020-09-05
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2017-05-19	2020-05-18
INMET	Attenuator	18N-6dB	N/A	2019-10-17	2020-10-16
Rohde & Schwarz	EMI Test Receiver	ESR3	102456	2019-04-15	2020-04-14
Unknown	RF Cable (Below 1GHz)	L-E005	000005	2019-09-06	2020-09-05
Unknown	RF Cable (Below 1GHz)	T-E128	000128	2019-10-17	2020-10-16
Unknown	RF Cable (Below 1GHz)	T-E129	000129	2018-11-27	2019-11-26
Rohde & Schwarz	Spectrum Analyzer	FSU26	200835	2019-04-15	2020-04-14
EMCO	Horn Antenna	3115	2192	2019-09-25	2021-09-24
A.H. Systems, Inc	Amplifier	PAM-0118P	467	2019-08-30	2020-08-29
Unknown	RF Cable (Above 1GHz)	T-E069	000069	2019-07-24	2020-07-23
Micro-coax	RF Cable (Above 1GHz)	T-E209	MFR 64639 2310	2019-07-19	2020-07-18
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR

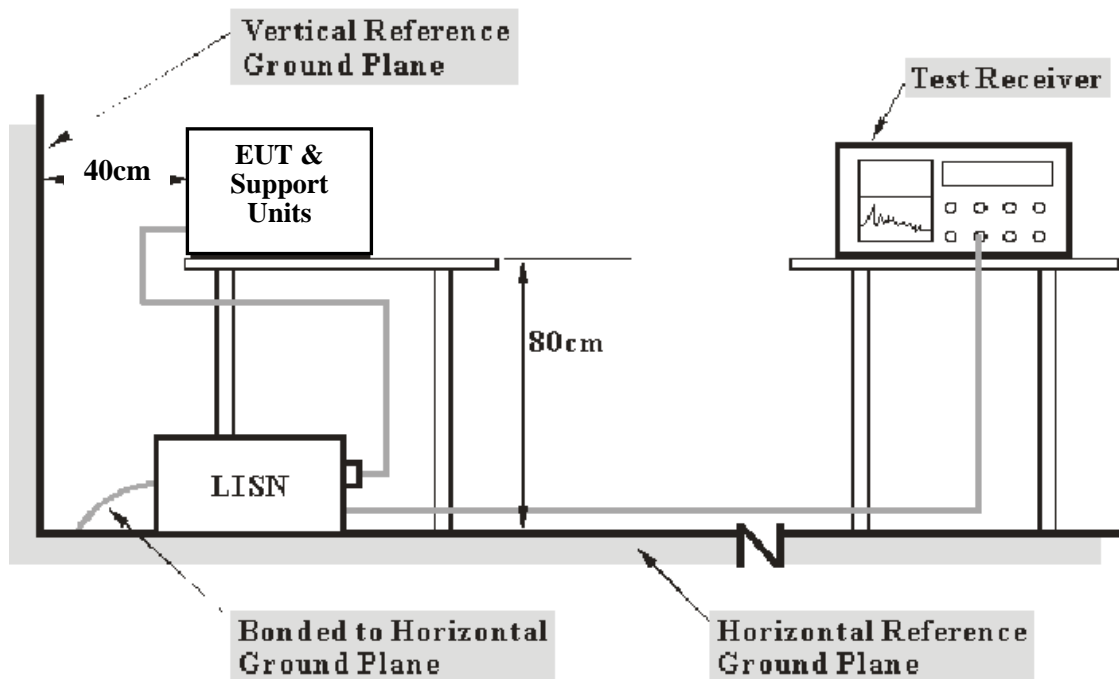
FCC §15.107 CONDUCTED EMISSION TEST

Applicable Standard

FCC §15.107

EUT Setup

The setup of EUT was in accordance with ANSI C63.4-2014 measurement procedure. The specification used was the FCC Part 15 Subpart B Class B limits.



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

The power cables and excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

The adapter was connected to AC120V/60Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combination.

All data are recorded in the Quasi-peak and Average detection mode. Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with an "AV".

The EUT is in the normal operating mode during the final qualification test to represent the worst cases results.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF : voltage division factor of AMN or ISN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Summary of Test Results

According to the data in the following, the EUT complied with FCC Part 15 Subpart B Class B limit.

Test Data

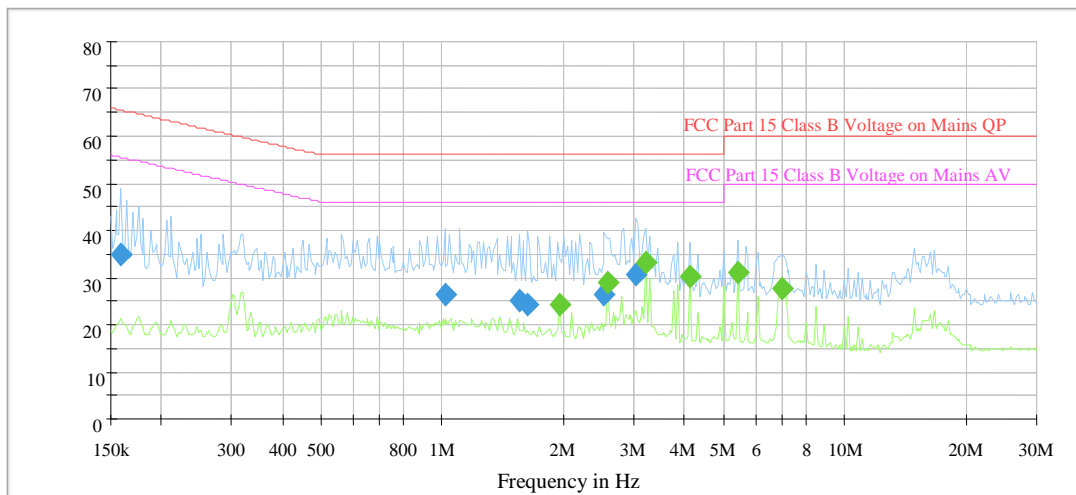
Test Environment Conditions

Temperature:	20 °C
Relative Humidity:	57 %
ATM Pressure:	95.3 kPa

The testing was performed by Tian Maofan on 2019-11-11.

Test Mode: Operating

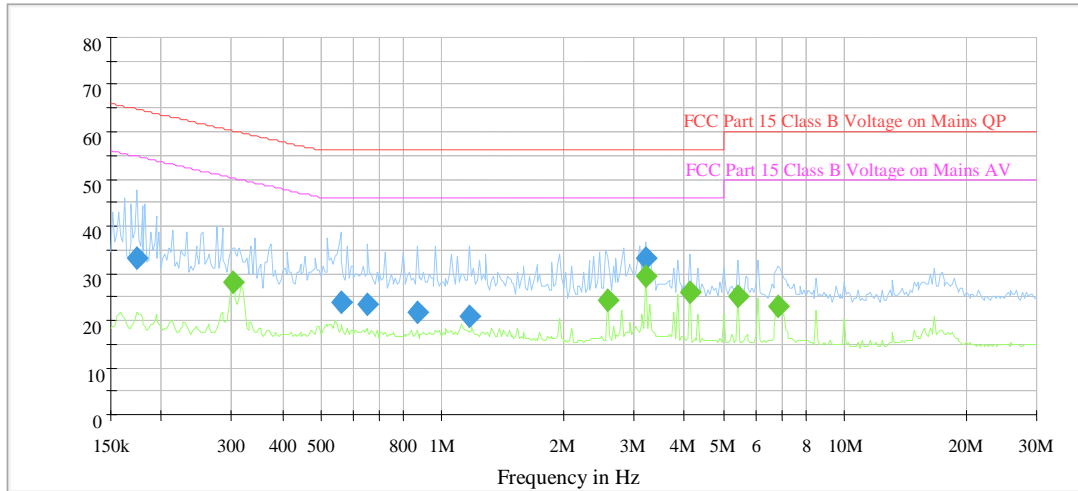
AC120V/60Hz, Line



Frequency (MHz)	QuasiPeak (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.159228	34.7	9.000	L1	19.6	30.8	65.5
1.013434	26.6	9.000	L1	19.6	29.4	56.0
1.554585	25.2	9.000	L1	19.6	30.8	56.0
1.633884	24.2	9.000	L1	19.6	31.8	56.0
2.531405	26.4	9.000	L1	19.6	29.6	56.0
3.027934	30.6	9.000	L1	19.6	25.4	56.0

Frequency (MHz)	Average (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
1.954366	24.2	9.000	L1	19.6	21.8	46.0
2.582287	28.8	9.000	L1	19.6	17.2	46.0
3.214213	33.3	9.000	L1	19.6	12.7	46.0
4.122010	30.2	9.000	L1	19.7	15.8	46.0
5.446374	31.2	9.000	L1	19.7	18.8	50.0
6.984605	27.5	9.000	L1	19.7	22.5	50.0

AC120V/60Hz, Neutral



Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.174145	33.1	9.000	N	19.6	31.7	64.8
0.557844	23.9	9.000	N	19.6	32.1	56.0
0.654116	23.3	9.000	N	19.6	32.7	56.0
0.864278	21.9	9.000	N	19.6	34.1	56.0
1.164916	21.1	9.000	N	19.7	34.9	56.0
3.214213	33.2	9.000	N	19.7	22.8	56.0

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.301015	28.0	9.000	N	19.6	22.2	50.2
2.582287	24.1	9.000	N	19.7	21.9	46.0
3.214213	29.4	9.000	N	19.7	16.6	46.0
4.122010	25.7	9.000	N	19.7	20.3	46.0
5.446374	25.0	9.000	N	19.7	25.0	50.0
6.846980	23.1	9.000	N	19.8	26.9	50.0

Note:

- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter
- 3) Margin = Limit – Corrected Amplitude

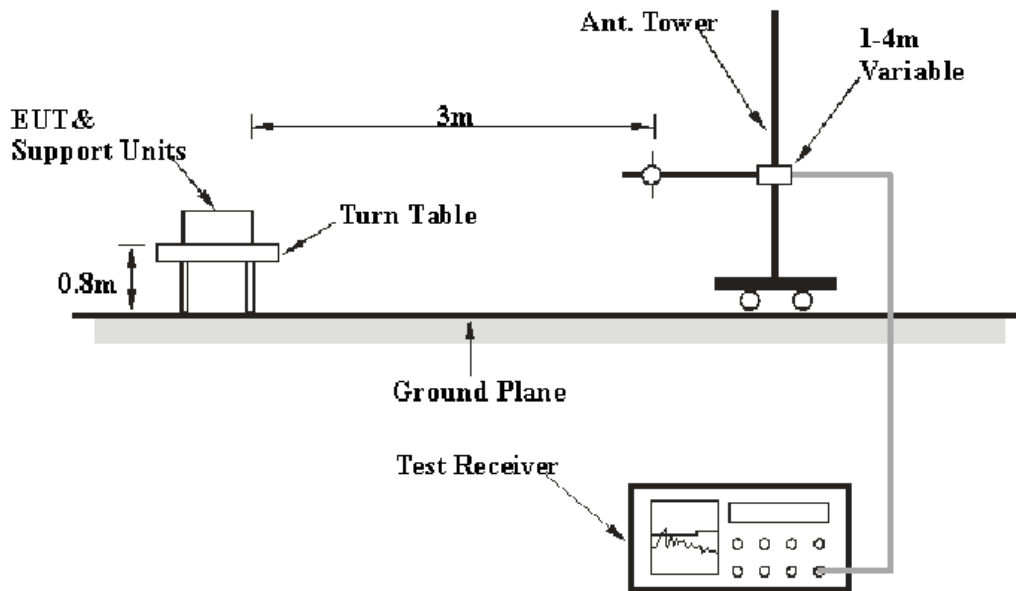
FCC §15.109 RADIATED EMISSION TEST

Applicable Standard

FCC §15.109

EUT Setup

The radiated emission tests were performed in the 3 meter Semi Anechoic Chamber, using the setup in accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15 Subpart B Class B limits.



The excess cables shall be folded at the cable center into a bundle no longer than 40 cm.

The spacing between the peripherals unit & EUT was 10 cm.

The adapter was connected to AC120V/60Hz power source.

EMI Test Receiver Setup

The frequency range is investigated from 30 MHz to 13GHz.

During the radiated emission test, the EMI test receiver is set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz–1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	/	Ave

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz. Peak and average detection mode above 1 GHz.

The EUT was in the normal operating mode during the final qualification test to represent the worst case results.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Summary of Test Results

According to the data in the following, the EUT complied with FCC Part 15 Subpart B Class B limit.

Test Data

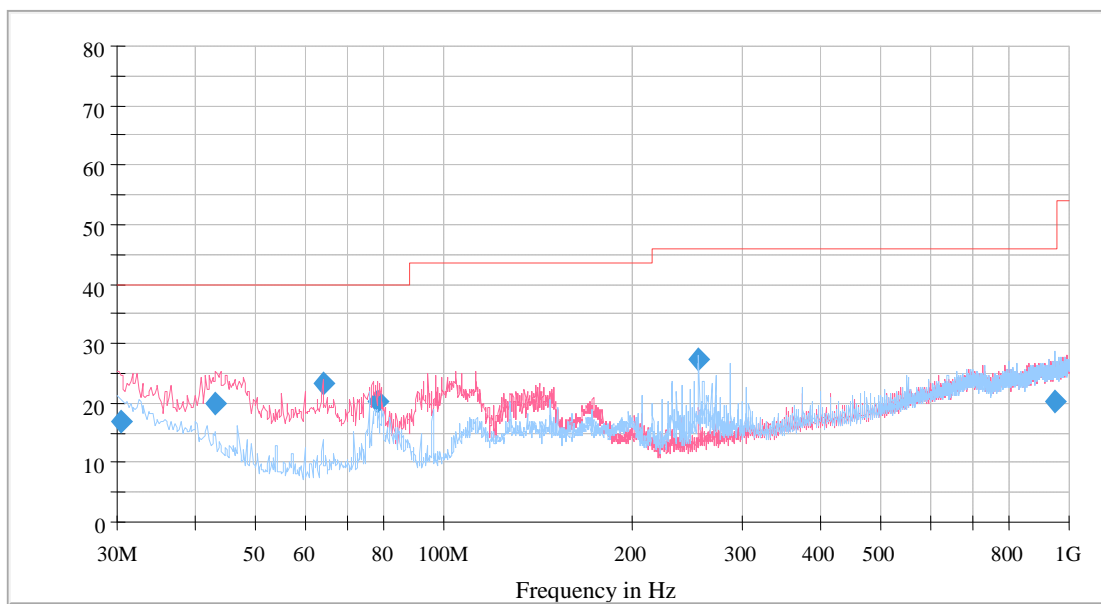
Test Environment Conditions

Temperature:	21 °C
Relative Humidity:	58 %
ATM Pressure:	95.3 kPa

The testing was performed by Tian Maofan on 2019-11-11.

Test Mode: Operating

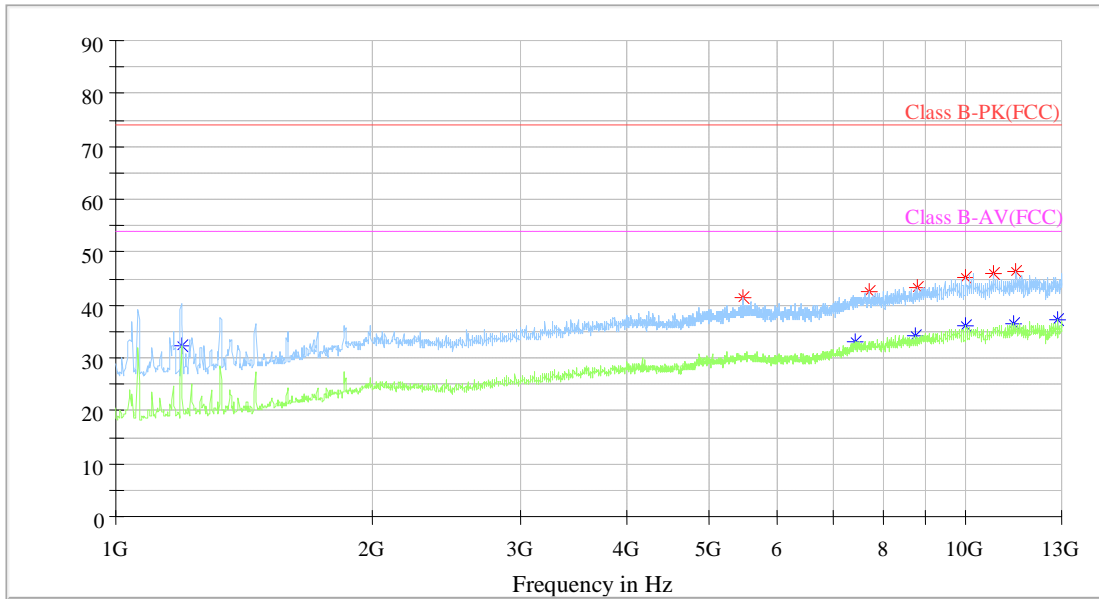
30 MHz-1GHz:



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.482621	16.72	40.00	23.28	120.000	103.0	V	112.0	-5.2
43.026300	20.08	40.00	19.92	120.000	124.0	V	323.0	-12.9
63.984200	23.22	40.00	16.78	120.000	103.0	V	88.0	-17.2
78.124800	20.12	40.00	19.88	120.000	117.0	V	109.0	-16.8
255.980300	27.43	46.00	18.57	120.000	123.0	H	42.0	-12.4
952.237200	20.10	46.00	25.90	120.000	161.0	H	225.0	-0.3

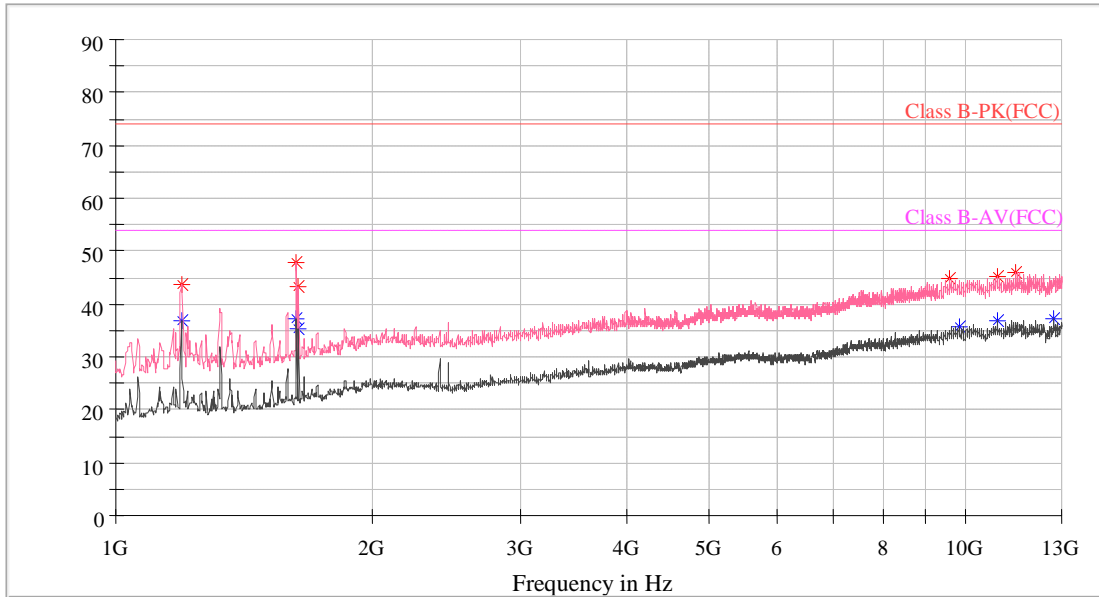
1GHz-13GHz:

Horizontal



Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	PoI	Azimuth (deg)	Corr. (dB/m)
1194.400000	---	32.29	54.00	21.71	100.0	H	103.0	-14.7
5476.000000	41.23	---	74.00	32.77	150.0	H	251.0	-3.4
7420.000000	---	33.21	54.00	20.79	150.0	H	25.0	-0.8
7700.800000	42.44	---	74.00	31.56	150.0	H	25.0	-0.4
8766.400000	---	34.21	54.00	19.79	100.0	H	343.0	0.8
8773.600000	43.47	---	74.00	30.53	100.0	H	176.0	0.8
10031.200000	45.09	---	74.00	28.91	100.0	H	109.0	2.2
10038.400000	---	35.92	54.00	18.08	150.0	H	76.0	2.2
10818.400000	45.94	---	74.00	28.06	150.0	H	31.0	2.4
11432.800000	---	36.50	54.00	17.50	100.0	H	210.0	3.2
11502.400000	46.21	---	74.00	27.79	100.0	H	356.0	3.3
12870.400000	---	37.05	54.00	16.95	100.0	H	210.0	4.6

Vertical



Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1194.400000	---	36.80	54.00	17.20	150.0	V	0.0	-14.7
1196.800000	43.58	---	74.00	30.42	150.0	V	0.0	-14.7
1633.600000	47.67	---	74.00	26.33	100.0	V	347.0	-12.1
1633.600000	---	37.30	54.00	16.70	100.0	V	347.0	-12.1
1643.200000	43.14	---	74.00	30.86	150.0	V	240.0	-12.0
1643.200000	---	35.34	54.00	18.66	150.0	V	240.0	-12.0
9580.000000	44.74	---	74.00	29.26	150.0	V	2.0	1.5
9844.000000	---	35.79	54.00	18.21	150.0	V	0.0	2.0
10904.800000	---	36.98	54.00	17.02	150.0	V	273.0	2.6
10924.000000	45.27	---	74.00	28.73	150.0	V	183.0	2.6
11488.000000	46.09	---	74.00	27.91	100.0	V	191.0	3.3
12721.600000	---	37.26	54.00	16.74	150.0	V	302.0	4.4

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corrected Amplitude

END OF REPORT