TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15B

TEST REPORT

For

Xiamen Apt Electronic Tech. Co., Ltd

202,No.46 He Ning Li, Huli District,Xiamen China

FCC ID: 2AWQ6CB821

Report Type:	**Product Type:**
Original Report	thermal printer

Report Number:	RXM200617054-00A
Report Date:	2020-07-18
Reviewed By:	Ivan Cao Assistant Manager
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TABLE OF CONTENTS

General Information **3**
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 3
OBJECTIVE 3
RELATED SUBMITTAL(S)/GRANT(S) 3
TEST METHODOLOGY 3
MEASUREMENT UNCERTAINTY 4
TEST FACILITY 4
DECLARATIONS 4
System Test Configuration **5**
DESCRIPTION OF TEST CONFIGURATION 5
EQUIPMENT MODIFICATIONS 5
EUT EXERCISE SOFTWARE 5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS 5
SUPPORT CABLE LIST AND DETAILS 5
BLOCK DIAGRAM OF TEST SETUP 6
TEST EQUIPMENT LIST 7
ENVIRONMENTAL CONDITIONS 7
Summary of Test Results **8**
Conducted emissions **9**
EUT SETUP 9
EMI TEST RECEIVER SETUP 9
TEST PROCEDURE 9
CORRECTED AMPLITUDE & MARGIN CALCULATION 10
TEST DATA 11
Radiated emissions **13**
EUT SETUP 13
EMI TEST RECEIVER SETUP 13
TEST PROCEDURE 14
CORRECTED AMPLITUDE & MARGIN CALCULATION 14
TEST DATA 15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		thermal printer
EUT Model:		CB821-USEB
Multiple Model:		CB821-USE,CB821-UE,CB821-UEB,AP80B-USEB, AP80B-USE,AP80B-UEB,AP80B-UE,CB835-USEB, CB835-USE,CB835-UE,CB835-UEB
Highest Operation Frequency:		2480MHz
Rated Input Voltage:		DC 24.0V from adapter
Adapter Information	**Model:**	XH2400-2000
	Input:	AC100-240V, 50/60Hz,1.5A
	Output:	DC24.0V 2.0A
Serial Number:		RXM200617054-RF-S1
EUT Received Date:		2020.06.19
EUT Received Status:		Good

Notes: Model CB821-USEB was selected for fully testing, the detailed information about the difference among CB821-USE,CB821-UE,CB821-UEB,AP80B-USEB,AP80B-USE,AP80B-UEB,AP80B-UE,CB835-USEB, CB835-USE,CB835-UE,CB835-UEB and model CB821-USEB can be referred to the declaration letter which was stated and guaranteed by the manufacturer.

Objective

This report is prepared on behalf of *Xiamen Apt Electronic Tech. Co., Ltd* in accordance with Part 2, Part J, and Part 15, Subpart A and B of the Federal Communications Commission's rules..

The objective is to determine the compliance of EUT with: FCC Part 15B.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AWQ6CB821
FCC Part 15C DSS submissions with FCC ID: 2AWQ6CB821

Test Methodology

All measurements contained in this report were 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 was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.
The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.
The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "△". Customer model name, addresses, names, trademarks etc. are not considered data.

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

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Printing and transmitting

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

Software `Lan Test.exe` was used in test, which was provided by manufacturer.

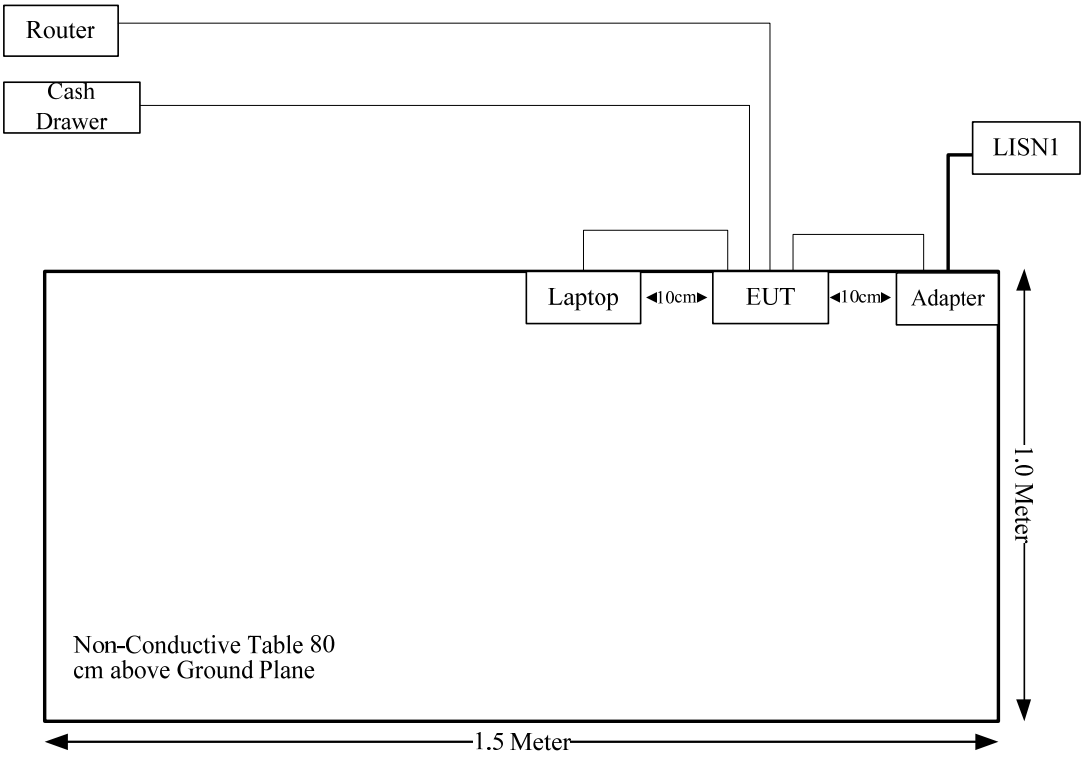
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	D610	HLKYG81
Tenda	Router	AC11	RDG200612007-RF-S2
Lotus	Cash Drawer	L8MF-W	114A297001782

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	Yes	No	10	EUT	Router
RJ11 Cable	No	No	10	EUT	Cash Drawer
USB Cable	Yes	No	1.0	Laptop	EUT

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted emission					
R&S	LISN	ENV 216	101614	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-05-09	2021-05-09
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
Radiated Emission					
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESR3	102453	2019-09-12	2020-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2020-05-06	2021-05-06
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-05-09	2021-05-09
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2019-09-05	2020-09-05

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

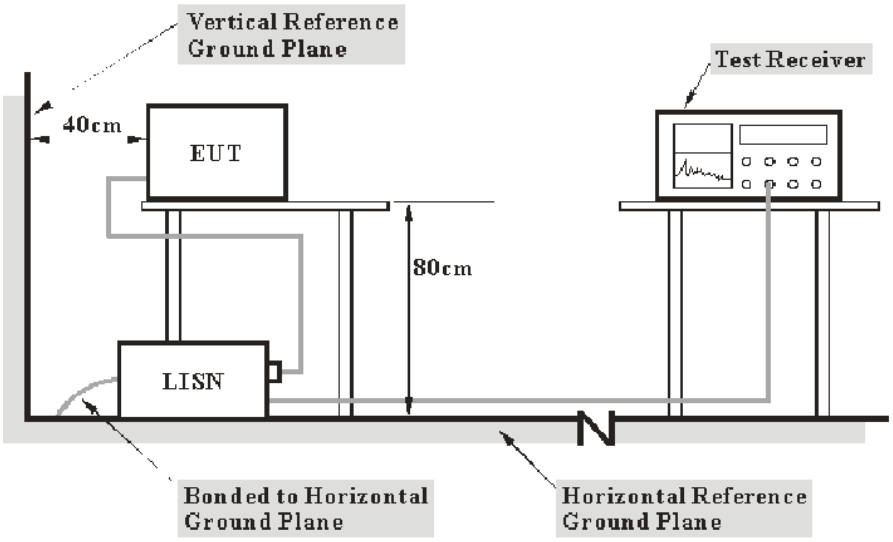
Test Items	AC Line Conducted emission	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	28.2 °C	28.1°C	29°C
Relative Humidity:	64%	46 %	56 %
ATM Pressure:	100.3 kPa	100.3kPa	100.5kPa
Tester:	Barry Yang	Joker Chen	Joker Chen
Test Date:	2020-07-02	2020-07-12	2020-07-09

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	FCC §15.107	Conducted emissions	Compliance
2	FCC §15.109	Radiated emissions	Compliance

CONDUCTED EMISSIONS

EUT Setup



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 setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the Main LISN with 120V/60Hz AC 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

During the conducted emission test, the PC was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT, the report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

All data was recorded in the Quasi-peak and average detection mode.

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

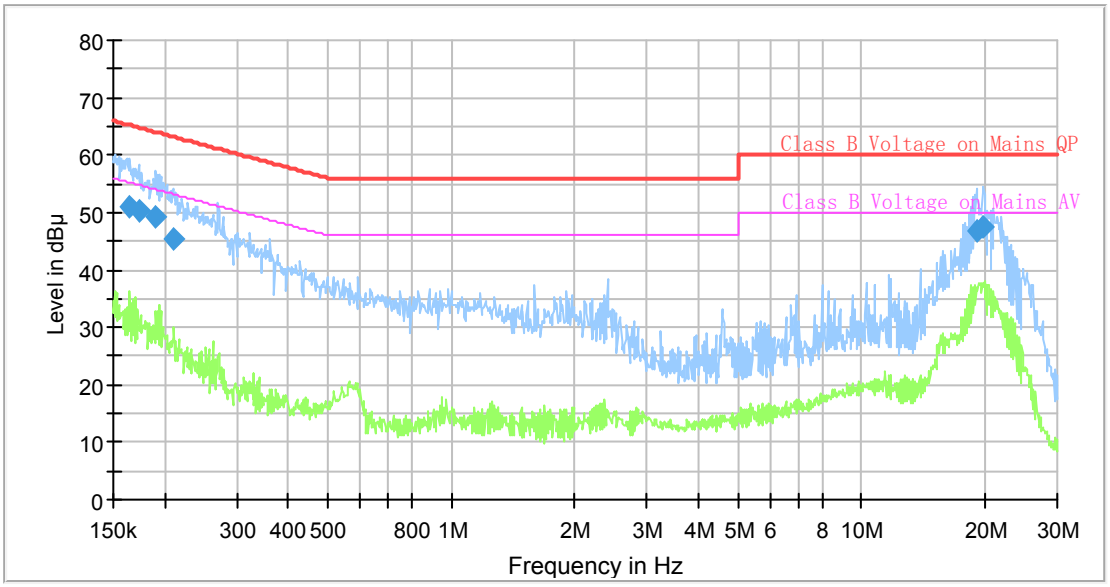
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Data

Please refer to following table and plots:

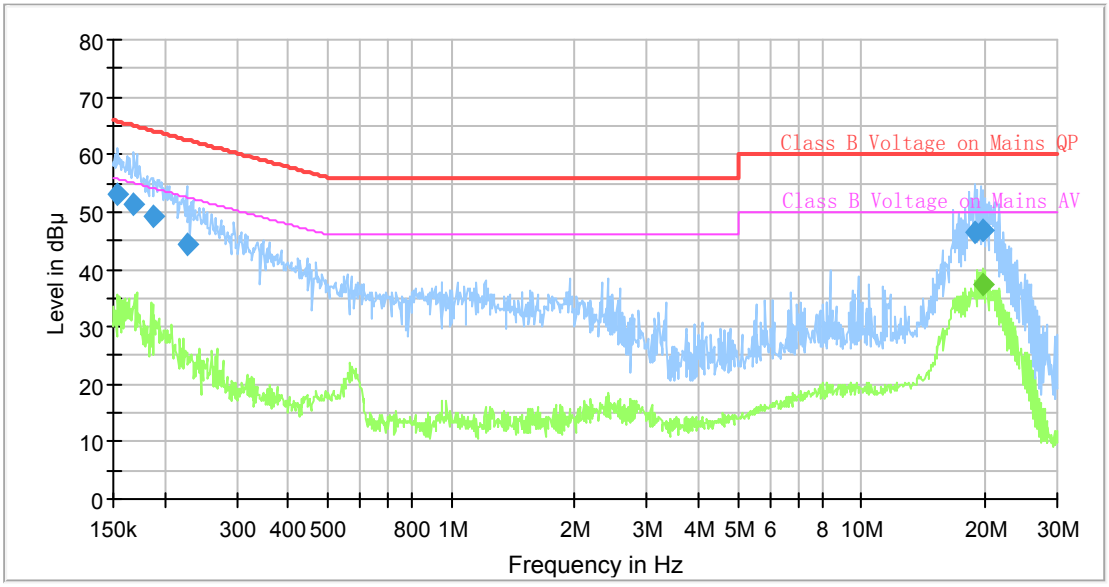
Port:	L
Test Mode:	Printing and Transmitting
Power Source:	AC 120V/60Hz
Note:	



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.164910	50.84	---	65.21	14.37	9.000	L1	9.7
0.173343	50.37	---	64.80	14.43	9.000	L1	9.7
0.190573	49.24	---	64.01	14.77	9.000	L1	9.7
0.209516	45.43	---	63.22	17.79	9.000	L1	9.7
19.025550	46.83	---	60.00	13.17	9.000	L1	10.1
19.800024	47.35	---	60.00	12.65	9.000	L1	10.1

Port: N
Test Mode: Printing and Transmitting
Power Source: AC 120V/60Hz
Note:



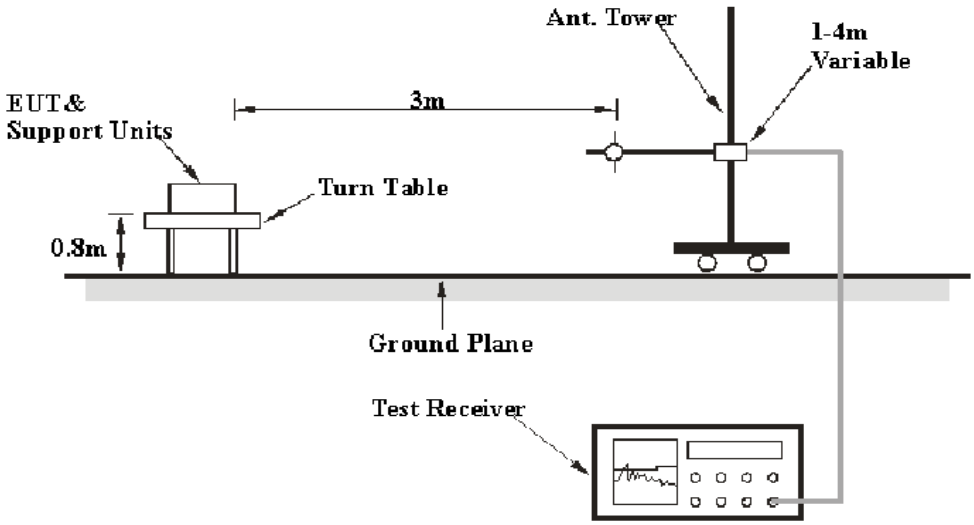
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.153788	53.01	---	65.79	12.78	9.000	N	9.7
0.168233	51.32	---	65.05	13.73	9.000	N	9.7
0.186809	49.16	---	64.18	15.02	9.000	N	9.7
0.226921	44.36	---	62.56	18.20	9.000	N	9.7
18.930896	46.44	---	60.00	13.56	9.000	N	10.1
19.701517	---	37.29	50.00	12.71	9.000	N	10.1

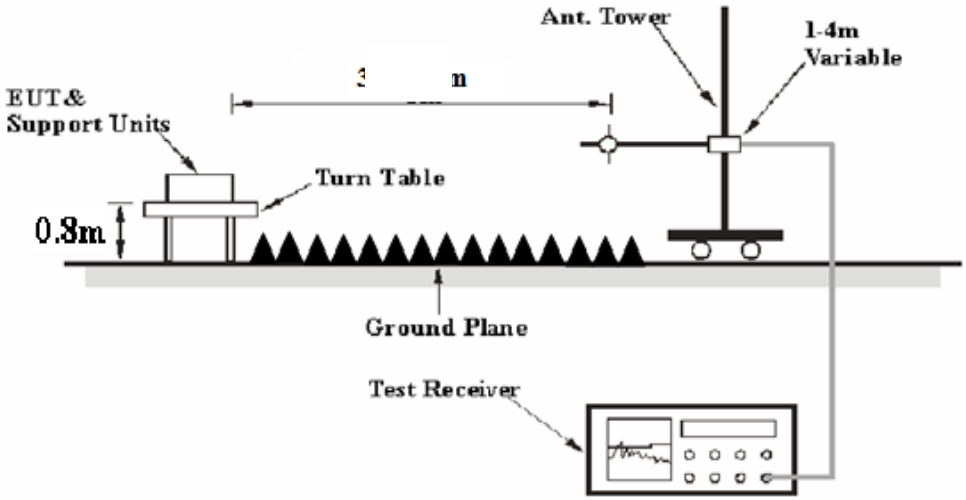
RADIATED EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 13 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced VBW	/	AVG

If the maximized peak measured value complies with under the limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain

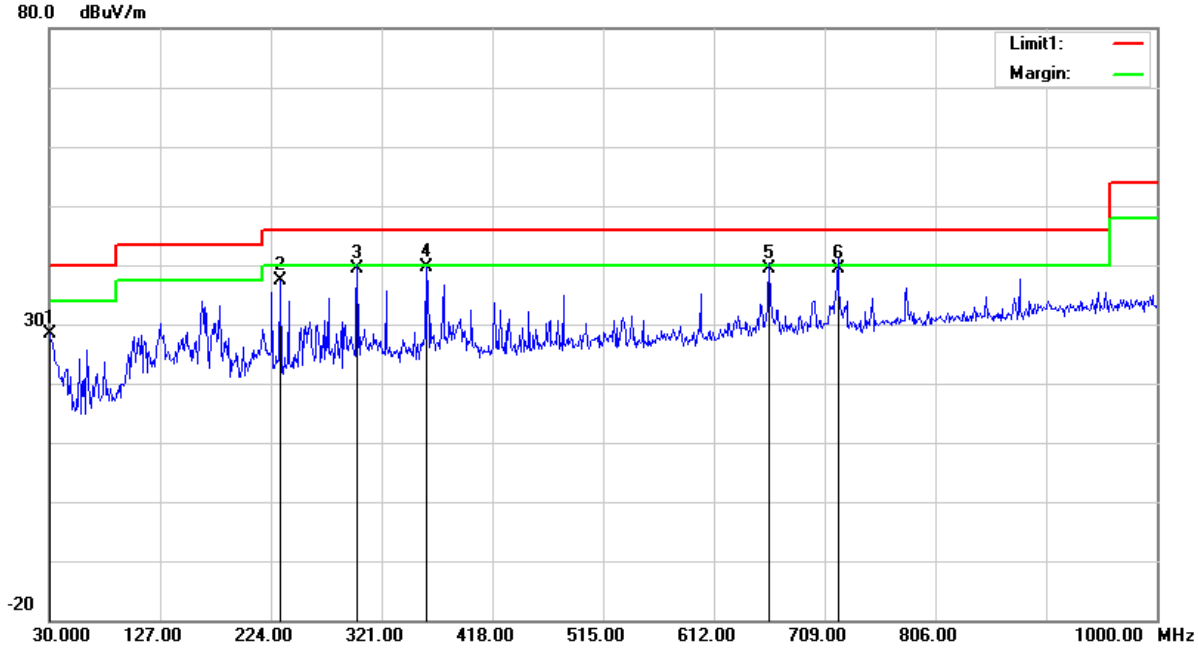
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

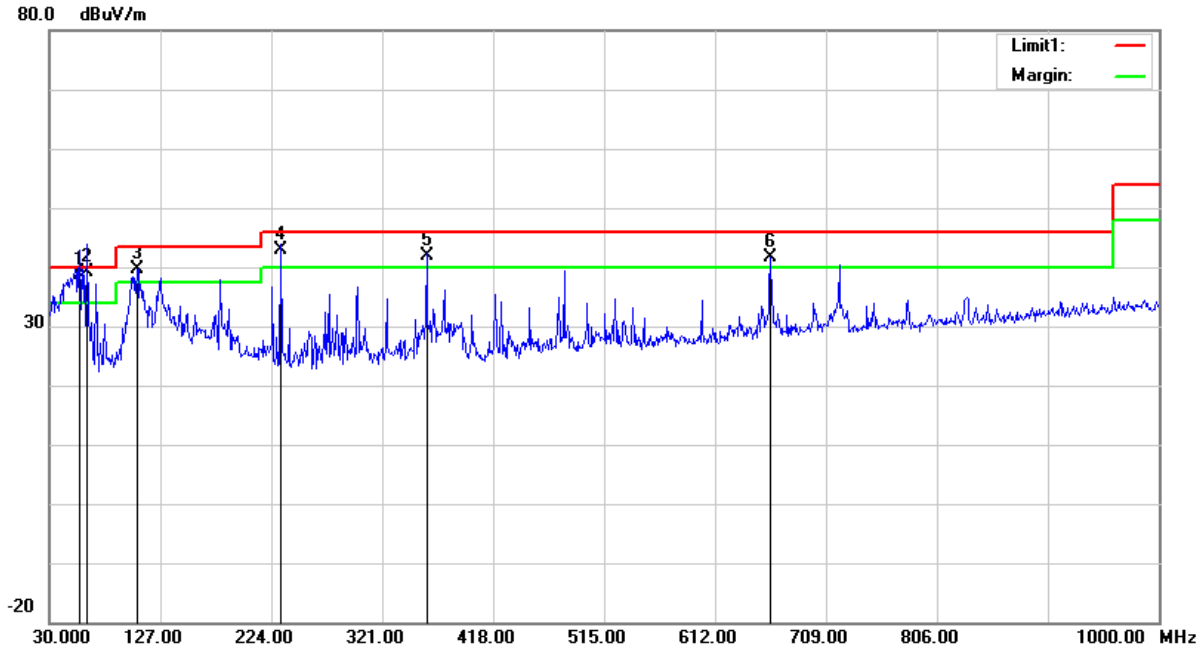
Please refer to following table and plots:

Condition:	FCC Part 15B Class B	**Polarization:**	Horizontal
Test Mode:	Printing and Transmitting	**Power:**	AC 120V/60Hz
		Distance:	3m



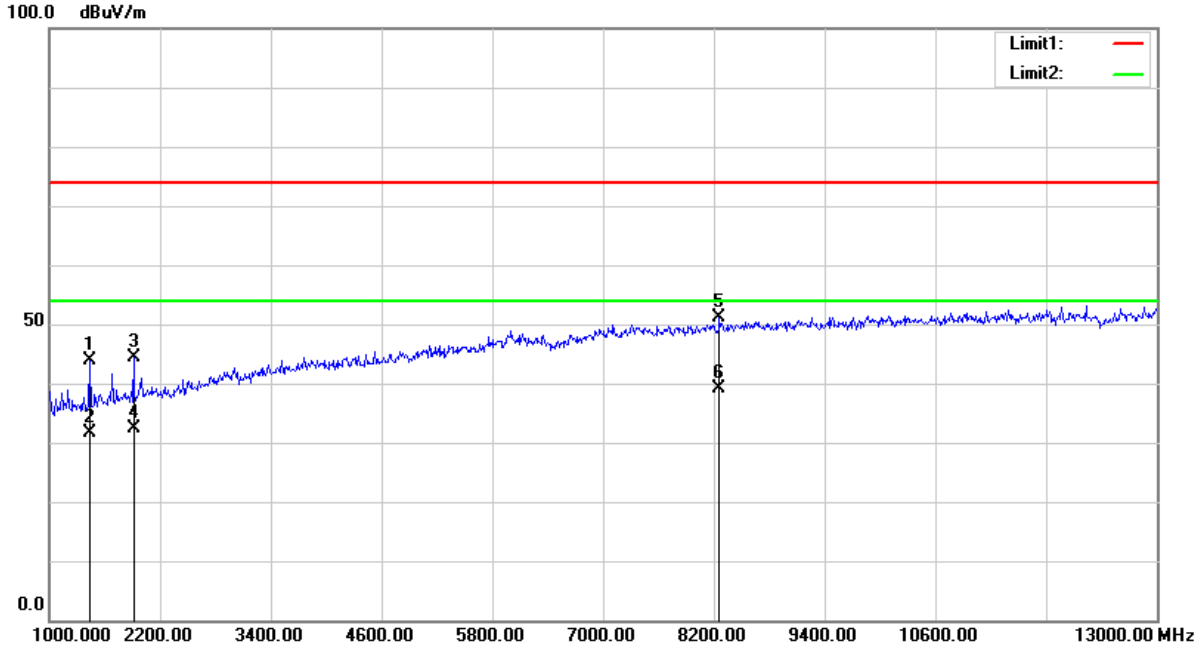
No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	30.0000	26.57	peak	1.72	28.29	40.00	11.71
2	232.7300	43.74	peak	-6.31	37.43	46.00	8.57
3	299.6600	43.10	QP	-3.83	39.27	46.00	6.73
4	359.8000	42.37	peak	-2.80	39.57	46.00	6.43
5	660.5000	37.12	QP	2.15	39.27	46.00	6.73
6	720.6400	36.22	QP	3.27	39.49	46.00	6.51

Condition:	FCC Part 15B Class B	**Polarization:**	Vertical
Test Mode:	Printing and Transmitting	**Power:**	AC 120V/60Hz
		Distance:	3m



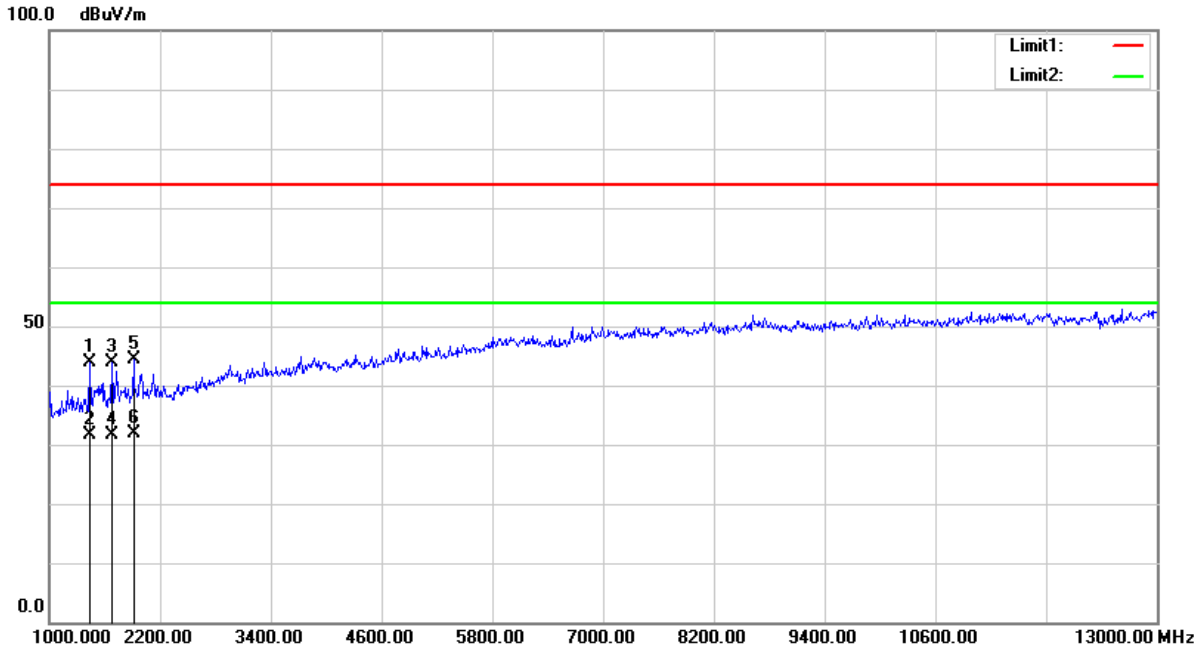
No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	56.1900	50.78	QP	-12.14	38.64	40.00	1.36
2	62.9800	50.89	QP	-11.86	39.03	40.00	0.97
3	106.6300	46.82	QP	-7.10	39.72	43.50	3.78
4	232.7300	49.30	QP	-6.31	42.99	46.00	3.01
5	359.8000	44.76	QP	-2.80	41.96	46.00	4.04
6	660.5000	39.37	QP	2.15	41.52	46.00	4.48

Condition:	FCC Part 15B Class B	**Polarization:**	Horizontal
Test Mode:	Printing and Transmitting	**Power:**	AC 120V/60Hz
		Distance:	3m



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	1438.000	43.21	peak	0.64	43.85	74.00	30.15
2	1438.000	31.02	AVG	0.64	31.66	54.00	22.34
3	1918.000	41.87	peak	2.58	44.45	74.00	29.55
4	1918.000	29.74	AVG	2.58	32.32	54.00	21.68
5	8266.000	35.10	peak	16.04	51.14	74.00	22.86
6	8266.000	23.02	AVG	16.04	39.06	54.00	14.94

Condition:	FCC Part 15B Class B	**Polarization:**	Vertical
Test Mode:	Printing and Transmitting	**Power:**	AC 120V/60Hz
		Distance:	3m



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	1438.000	43.13	peak	0.64	43.77	74.00	30.23
2	1438.000	31.02	AVG	0.64	31.66	54.00	22.34
3	1684.000	42.02	peak	1.78	43.80	74.00	30.20
4	1684.000	29.89	AVG	1.78	31.67	54.00	22.33
5	1918.000	41.69	peak	2.58	44.27	74.00	29.73
6	1918.000	29.41	AVG	2.58	31.99	54.00	22.01

*******END OF REPORT*******