



Radio Test Report

Report No.: STS2512386W01

Issued for

WELLPOWER (shenzhen) electronics co.,LTD

2002, 20/F, Block C, Bairuida Building,
Vanke City Community, Bantian Street, Longgang District,
Shenzhen, China

Product Name: Li-ion Power Bank

Brand Name:



W&P/微尔普

Model Name: WPD45W

Series Model(s): N/A

FCC ID: 2BMUE-WPD45W

Test Standards: FCC Part 15 Subpart C

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**TEST REPORT**

Applicant's Name.....: WELLPOWER (shenzhen) electronics co.,LTD

Address.....: 2002, 20/F, Block C, Bairuida Building, Vanke City Community,
Bantian Street, Longgang District, Shenzhen, China

Manufacturer's Name.....: SHENZHEN CAGER DIGITAL TECHNOLOGY CO.,LTD.

Address.....: 5/F, 3/F, No.19, Langkou Industrial Park, Langkou Community,
Dalang Sub-District, Longhua District, Shenzhen City,
Guangdong Province, P.R.China

Product Description

Product Name.....: Li-ion Power Bank

Brand.....: 

Model Number.....: WPD45W

Series Model(s).....: N/A

Test Standards.....: FCC Part 15 Subpart C

Test Procedure.....: ANSI C63.10-2020

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test.....:

Date of receipt of test item.....: 03 Dec. 2025

Date (s) of performance of tests.: 03 Dec. 2025 to 19 Dec. 2025

Date of Issue.....: 19 Dec. 2025

Test Result.....: **Pass**

Testing Engineer : _____

(Aaron Bu)

Technical Manager : _____

(Skylar Li)

Authorized Signatory : _____

(Bovey Yang)





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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	19 Dec. 2025	STS2512386W01	ALL	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209(a)	Radiated emission, Spurious Emission	PASS	
2.1049	20 dB Bandwidth	PASS	
15.203	Antenna Requirement	PASS	

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.755\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.874\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.18\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.90\text{dB}$
6	All emissions, radiated >6G	$\pm 5.24\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.19\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.53\text{dB}$
9	Occupied Channel Bandwidth	$\pm 3.5\%$
10	Power Spectral Density, conducted	$\pm 1.245\text{dB}$
11	Duty Cycle	$\pm 3.2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Li-ion Power Bank
Brand	 W&P/微尔普
Model Number	WPD45W
Series Model(s)	N/A
Model Difference	N/A
Equipemnt Category	Non-ISM frequency
Antenna Type	loop coil antenna
Operating frequency	115-205kHz; 300-350kHz
Modulation Type	ASK
Power Rating	Adapter Mode: AC Input: AC 100V-240V, 50Hz-60Hz, 0.5A(Max) Type C cable output:DC 5V/3A Max Lightning cable&USB port output: DC 5V/2.4A(Max) Total Output: DC 5V/3A Max Power Bank Mode: Type C port Input: DC 5V/3A, DC 9V/2A(18W Max) Type C cable Input: DC 5V/3A, DC 9V/3A(27W Max) Type C cable Output: DC 5V/3A, DC 9V/3A, DC 12V/3A, DC 15V/3A, DC 20V/2.25A(45W Max) Lightning cable Output: DC 5V/2.4A, DC 9V/3A(27W Max) USB-A output: DC 5V/3A, DC 9V/2A, DC 10V/2.25A(SSCP), DC 12V/1.5A(22.5W Max) Phone wireless Output: DC 5V/1A, DC 7.5V/1A, DC 9V/1.12A, DC 9V/1.66A (15W Max) iWatch wireless Output: DC 5V/0.5A (2.5W Max) Total Output: DC 5V/3A(15W Max) Battery: DC 11.55V
Adapter	N/A
Battery	DC 11.55V
Wireless charging power	15W
Hardware version number	N/A
Software version number	N/A
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	NOTE
1	N/A	N/A	Coil	N/A	Antenna



2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	AC Plug in+15W(115-205kHz)
Mode 2	Type C in+15W(115-205kHz)
Mode 3	AC Plug in+2.5W(300-350kHz)
Mode 4	Type C in+2.5W(300-350kHz)
Mode 5	15W(115-205kHz)
Mode 6	2.5W(300-350kHz)

For Conducted Emission	
Final Test Mode	Description
Mode 1	AC Plug in+15W(115-205kHz)
Mode 2	Type C in+15W(115-205kHz)
Mode 3	AC Plug in+2.5W(300-350kHz)
Mode 4	Type C in+2.5W(300-350kHz)

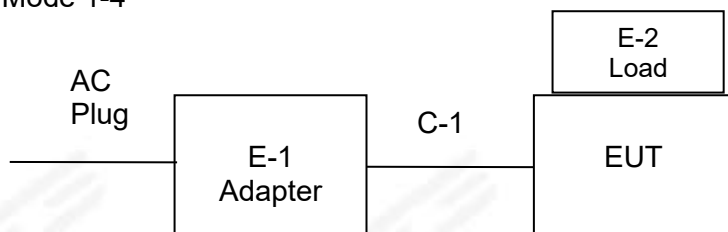
For Radiated Emission	
Final Test Mode	Description
Mode 1	AC Plug in+15W(115-205kHz)
Mode 2	Type C in+15W(115-205kHz)
Mode 3	AC Plug in+2.5W(300-350kHz)
Mode 4	Type C in+2.5W(300-350kHz)
Mode 5	15W(115-205kHz)
Mode 6	2.5W(300-350kHz)



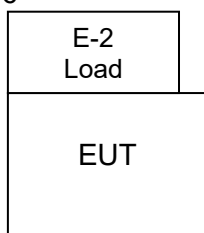
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Emission Test Mode 1-4

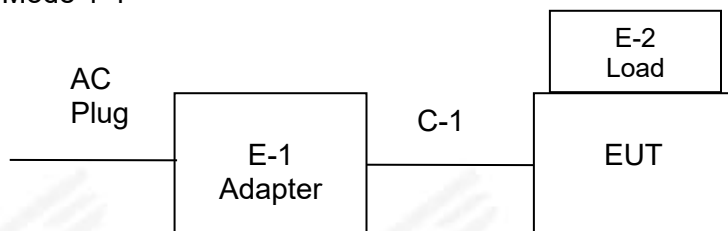


Mode 5-6



Conducted Emission Test

Mode 1-4





2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Adapter	ZTC	NB-A515A	N/A
E-2	Load	N/A	N/A	N/A
C-1	DC Cable	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	0.8m	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “with core”; “NO” is means “without core”.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2025.09.25	2026.09.24
Signal Analyzer	R&S	FSV 40-N	101823	2025.09.26	2026.09.25
Active loop Antenna	ZHINAN	ZN30900C	16035	2025.02.25	2026.02.24
Bilog Antenna	TESEQ	CBL6111D	34678	2025.09.27	2027.09.26
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2025.09.25	2026.09.24
Limtter	CYBERTEK	EM5010	N/A	2025.09.25	2026.09.24
LISN	R&S	ENV216	101242	2025.09.25	2026.09.24
LISN	EMCO	3810/2NM	23625	2025.09.25	2026.09.24
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2025.02.22	2026.02.21
Power detector group	Keysight	NW2021031	N/A	2025.09.23	2026.09.22
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2025.02.22	2026.02.21
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Test SW	MW	MTS 8310_2.0.0.0			



3. CONDUCTED EMISSION TEST RESULT (SECTION 15.207)

3.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “*” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

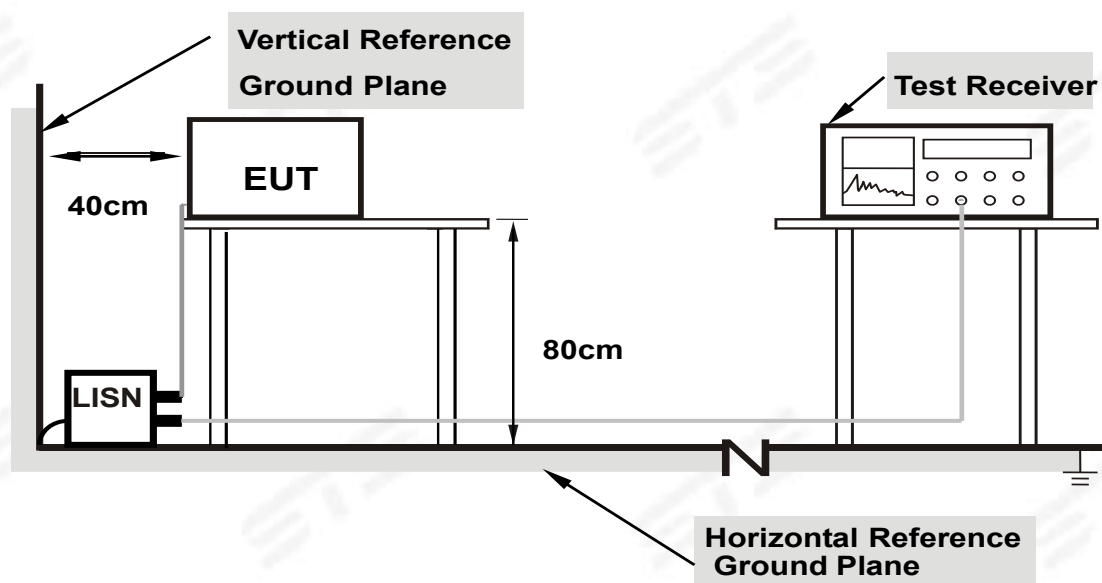
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

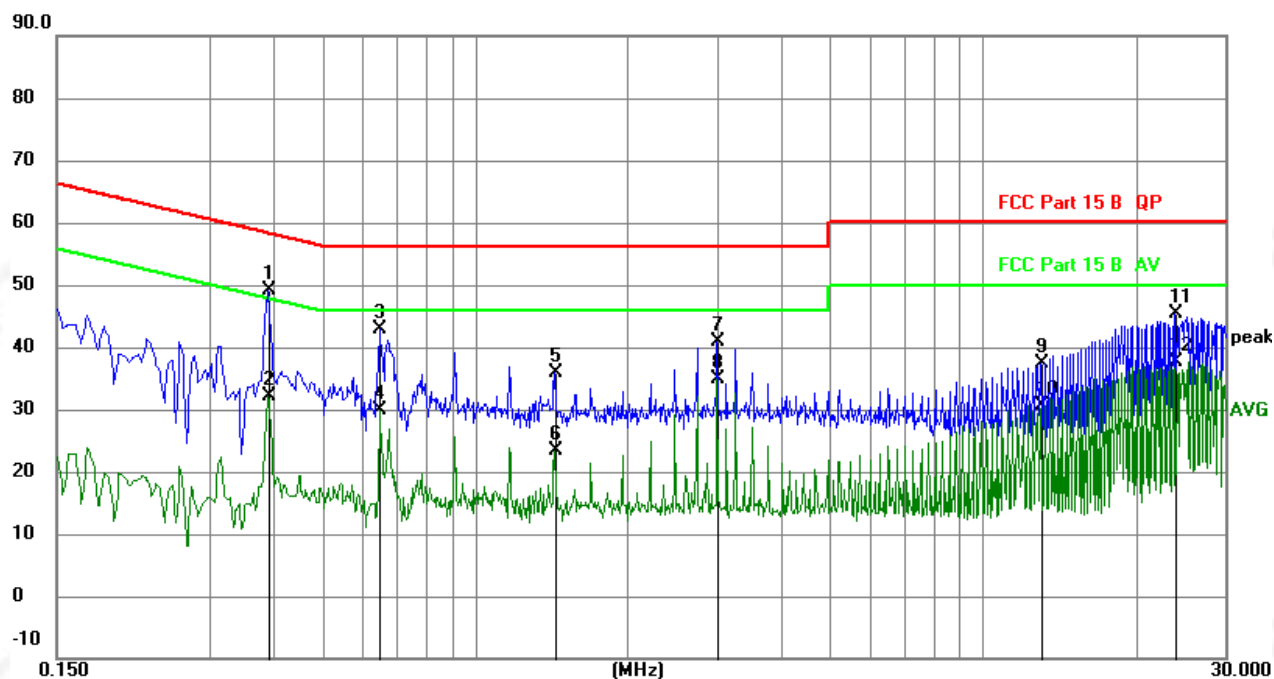
3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.5 TEST RESULTS

Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 1		



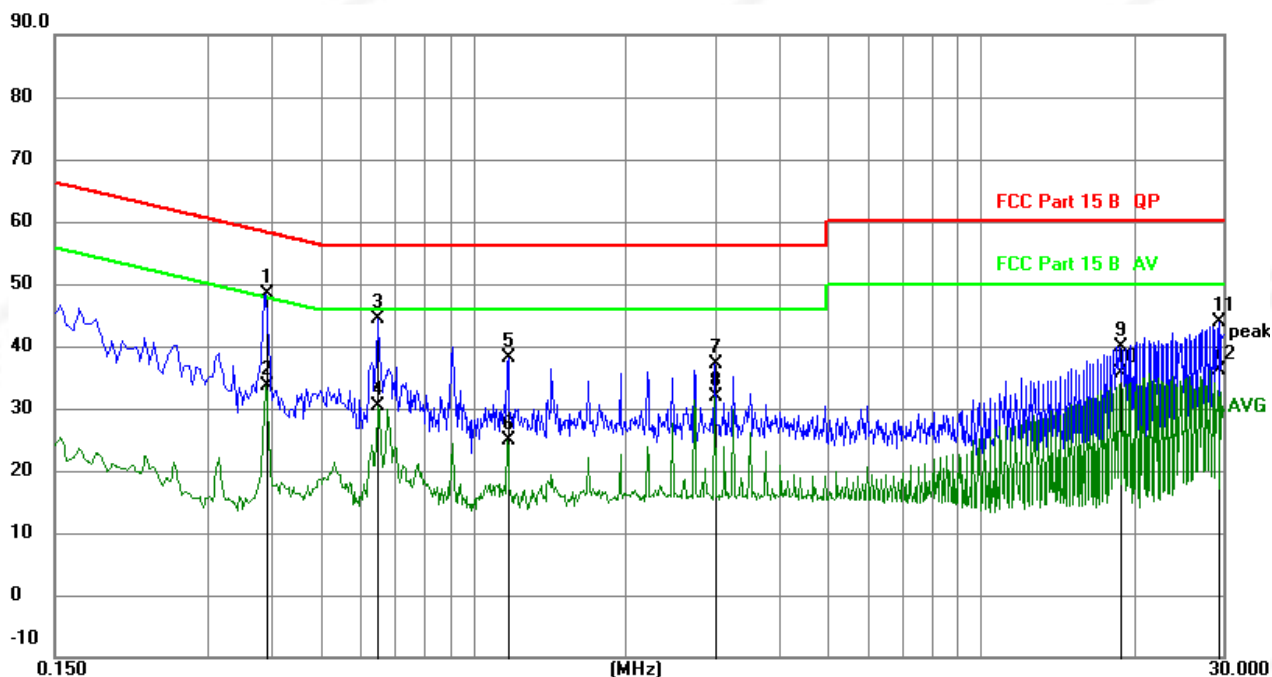
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.3930	29.08	20.05	49.13	58.00	-8.87	QP
2		0.3930	12.20	20.05	32.25	48.00	-15.75	AVG
3		0.6495	22.67	20.21	42.88	56.00	-13.12	QP
4		0.6495	9.69	20.21	29.90	46.00	-16.10	AVG
5		1.4370	15.74	20.23	35.97	56.00	-20.03	QP
6		1.4370	3.19	20.23	23.42	46.00	-22.58	AVG
7		2.9985	20.56	20.39	40.95	56.00	-15.05	QP
8		2.9985	14.45	20.39	34.84	46.00	-11.16	AVG
9		13.0470	15.22	22.04	37.26	60.00	-22.74	QP
10		13.0470	8.62	22.04	30.66	50.00	-19.34	AVG
11		24.0045	21.24	24.07	45.31	60.00	-14.69	QP
12		24.0045	13.44	24.07	37.51	50.00	-12.49	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 1		



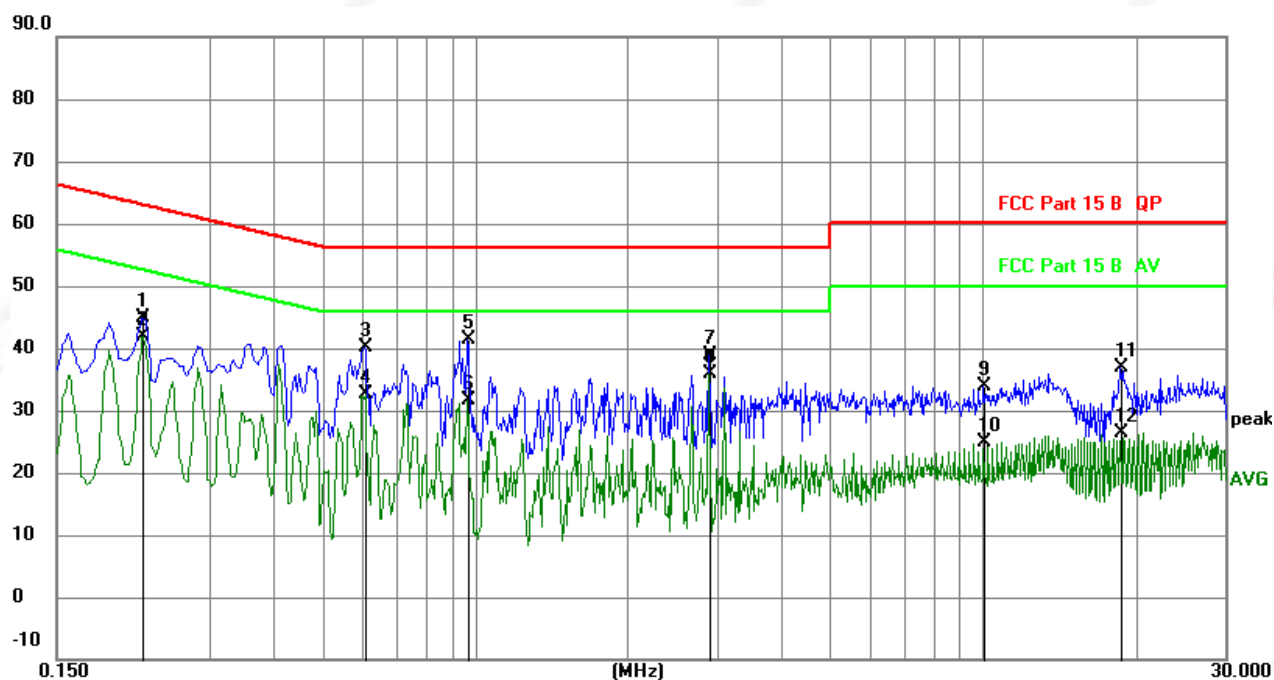
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.3930	28.42	20.05	48.47	58.00	-9.53	QP
2		0.3930	13.58	20.05	33.63	48.00	-14.37	AVG
3		0.6495	24.13	20.21	44.34	56.00	-11.66	QP
4		0.6495	10.21	20.21	30.42	46.00	-15.58	AVG
5		1.1760	17.79	20.25	38.04	56.00	-17.96	QP
6		1.1760	4.75	20.25	25.00	46.00	-21.00	AVG
7		2.9940	16.78	20.39	37.17	56.00	-18.83	QP
8		2.9940	11.60	20.39	31.99	46.00	-14.01	AVG
9		18.7845	16.66	23.32	39.98	60.00	-20.02	QP
10		18.7845	12.21	23.32	35.53	50.00	-14.47	AVG
11		29.4810	19.17	24.74	43.91	60.00	-16.09	QP
12		29.4810	11.39	24.74	36.13	50.00	-13.87	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 2		



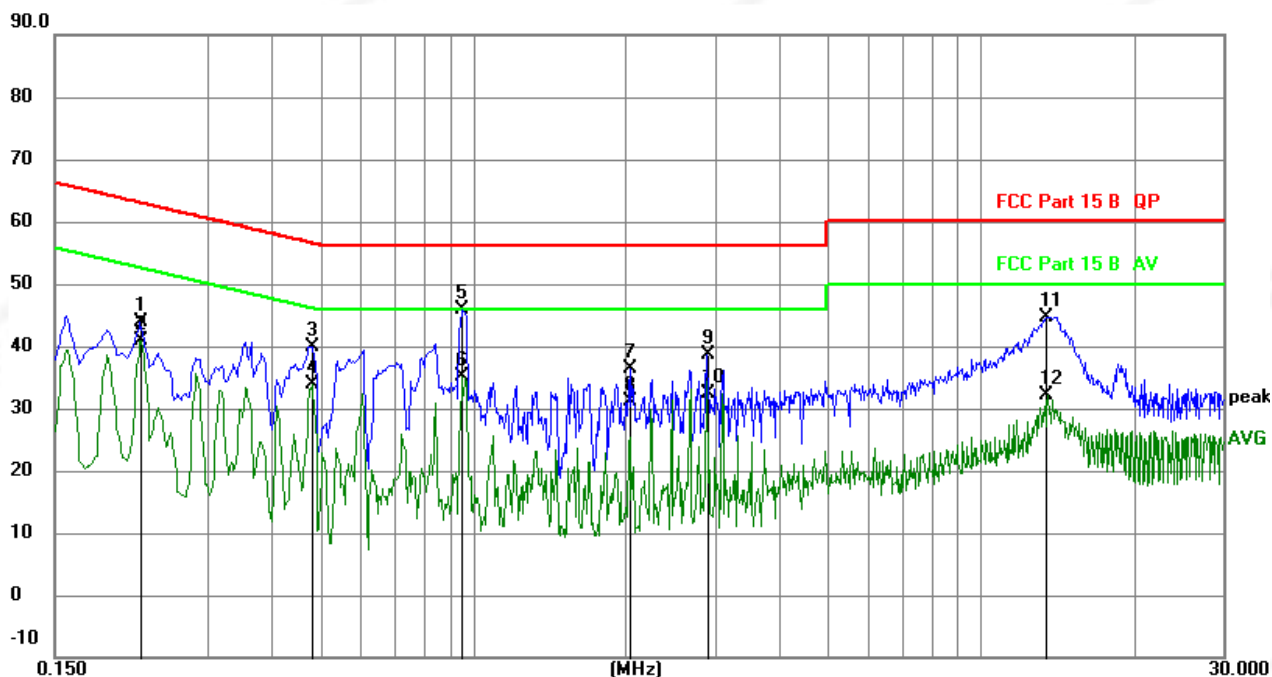
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2220	24.77	20.04	44.81	62.74	-17.93	QP
2		0.2220	21.73	20.04	41.77	52.74	-10.97	AVG
3		0.6045	19.86	20.16	40.02	56.00	-15.98	QP
4		0.6045	12.47	20.16	32.63	46.00	-13.37	AVG
5		0.9645	21.01	20.27	41.28	56.00	-14.72	QP
6		0.9645	11.42	20.27	31.69	46.00	-14.31	AVG
7		2.8905	18.63	20.37	39.00	56.00	-17.00	QP
8	*	2.8905	15.46	20.37	35.83	46.00	-10.17	AVG
9		10.0680	12.59	21.37	33.96	60.00	-26.04	QP
10		10.0680	3.45	21.37	24.82	50.00	-25.18	AVG
11		18.6315	13.62	23.29	36.91	60.00	-23.09	QP
12		18.6315	3.15	23.29	26.44	50.00	-23.56	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 2		



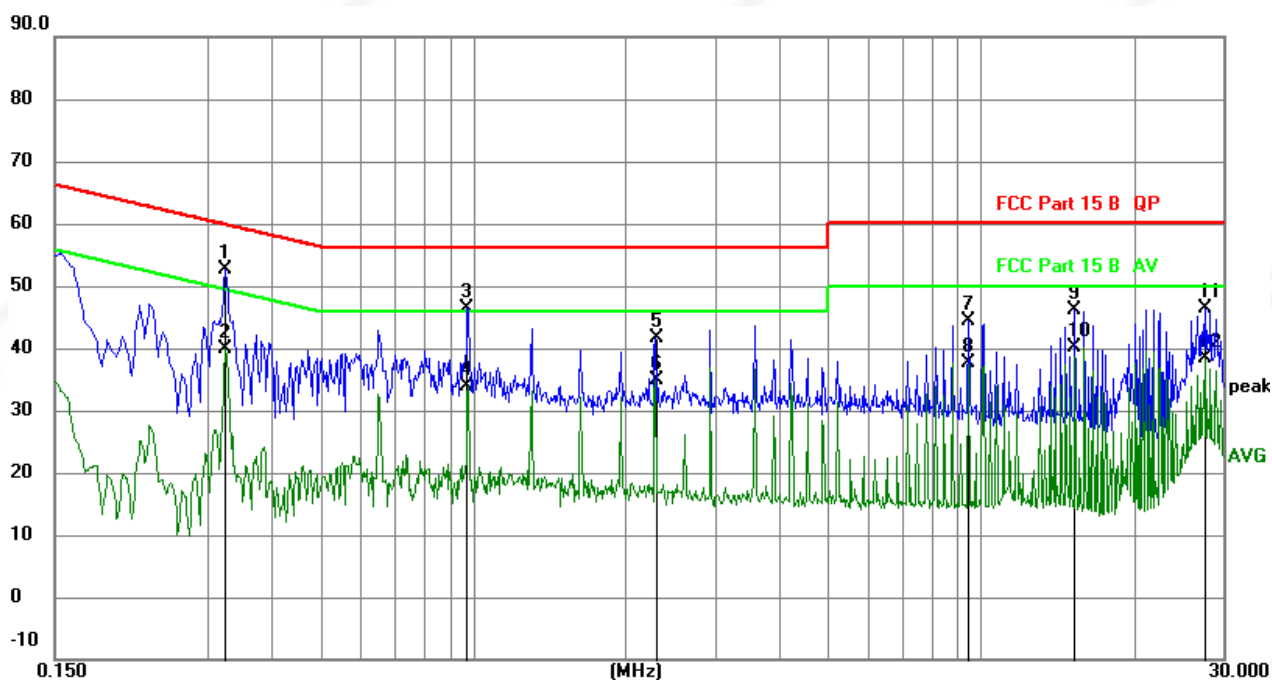
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2220	23.77	20.04	43.81	62.74	-18.93	QP
2		0.2220	20.75	20.04	40.79	52.74	-11.95	AVG
3		0.4830	19.92	20.06	39.98	56.29	-16.31	QP
4		0.4830	13.81	20.06	33.87	46.29	-12.42	AVG
5	*	0.9510	25.53	20.27	45.80	56.00	-10.20	QP
6		0.9510	14.85	20.27	35.12	46.00	-10.88	AVG
7		2.0355	16.19	20.19	36.38	56.00	-19.62	QP
8		2.0355	11.06	20.19	31.25	46.00	-14.75	AVG
9		2.8905	18.33	20.37	38.70	56.00	-17.30	QP
10		2.8905	12.07	20.37	32.44	46.00	-13.56	AVG
11		13.4295	22.52	22.13	44.65	60.00	-15.35	QP
12		13.4295	9.95	22.13	32.08	50.00	-17.92	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 3		



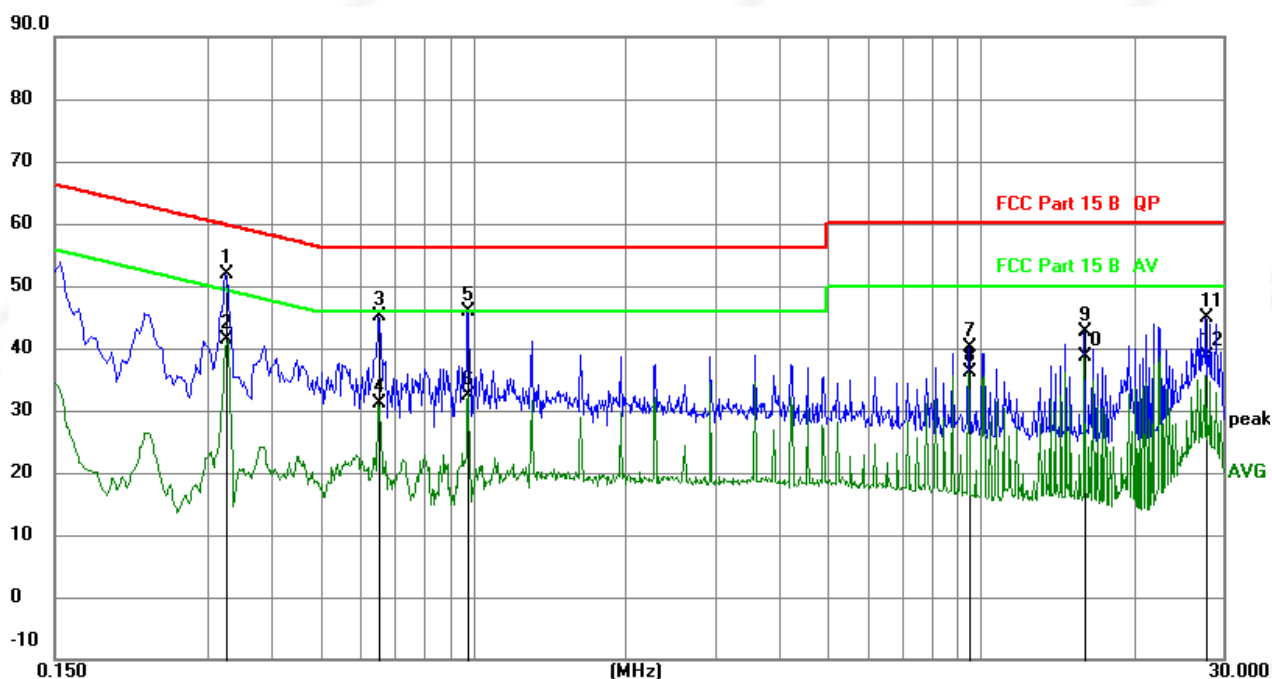
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.3251	32.64	20.05	52.69	59.58	-6.89	QP
2		0.3251	19.89	20.05	39.94	49.58	-9.64	AVG
3		0.9735	26.08	20.27	46.35	56.00	-9.65	QP
4		0.9735	13.59	20.27	33.86	46.00	-12.14	AVG
5		2.2847	21.35	20.24	41.59	56.00	-14.41	QP
6		2.2847	14.59	20.24	34.83	46.00	-11.17	AVG
7		9.4514	23.08	21.27	44.35	60.00	-15.65	QP
8		9.4514	16.44	21.27	37.71	50.00	-12.29	AVG
9		15.3070	23.65	22.55	46.20	60.00	-13.80	QP
10		15.3070	17.62	22.55	40.17	50.00	-9.83	AVG
11		27.7080	21.97	24.52	46.49	60.00	-13.51	QP
12		27.7080	13.83	24.52	38.35	50.00	-11.65	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 3		



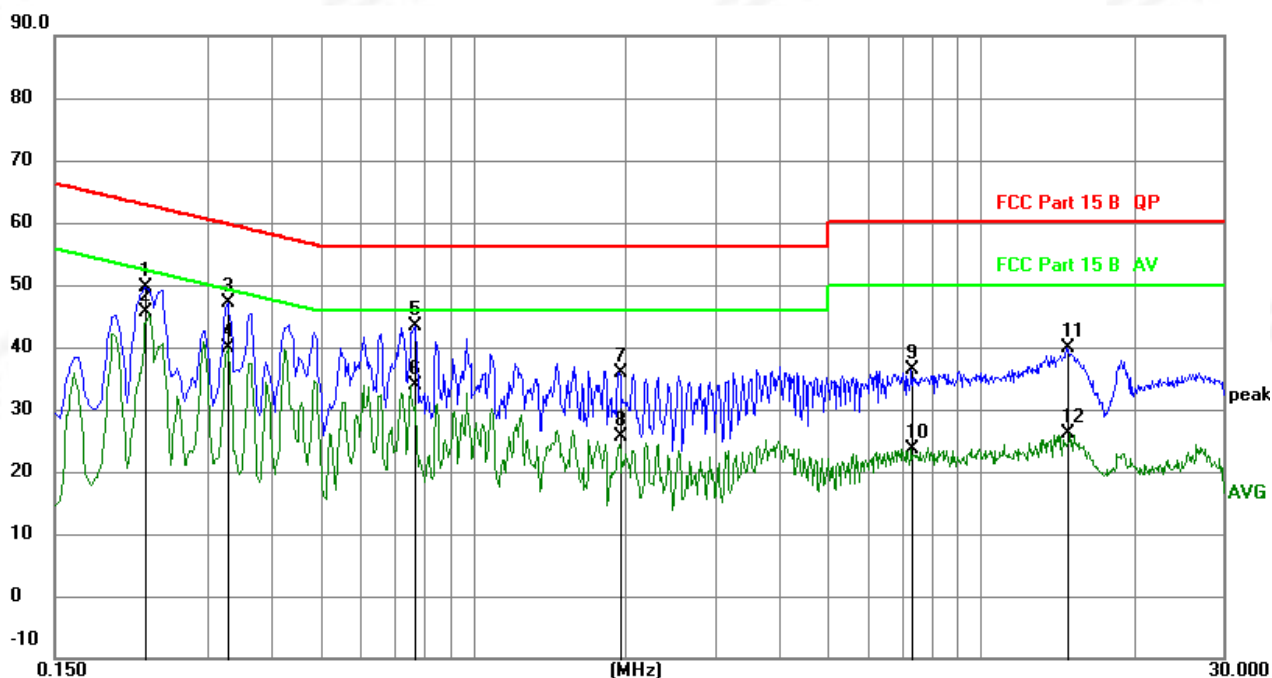
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.3255	31.94	20.05	51.99	59.57	-7.58	QP
2		0.3255	21.23	20.05	41.28	49.57	-8.29	AVG
3		0.6540	24.80	20.21	45.01	56.00	-10.99	QP
4		0.6540	10.87	20.21	31.08	46.00	-14.92	AVG
5		0.9780	25.61	20.27	45.88	56.00	-10.12	QP
6		0.9780	12.23	20.27	32.50	46.00	-13.50	AVG
7		9.4740	18.93	21.28	40.21	60.00	-19.79	QP
8		9.4740	14.81	21.28	36.09	50.00	-13.91	AVG
9		16.0035	19.83	22.70	42.53	60.00	-17.47	QP
10		16.0035	15.91	22.70	38.61	50.00	-11.39	AVG
11		27.7620	20.30	24.53	44.83	60.00	-15.17	QP
12		27.7620	14.22	24.53	38.75	50.00	-11.25	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		



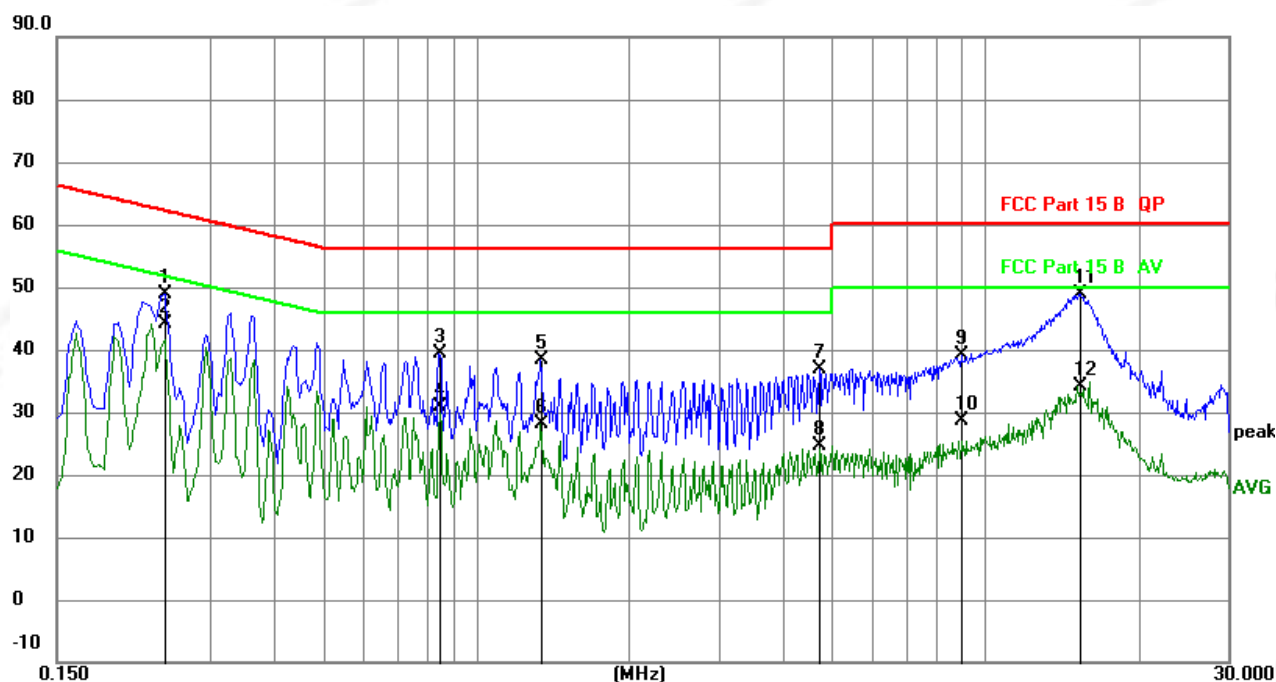
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz		dB	dBuV	dBuV	dB	
1		0.2265	29.60	20.04	49.64	62.58	-12.94	QP
2	*	0.2265	25.60	20.04	45.64	52.58	-6.94	AVG
3		0.3300	27.07	20.05	47.12	59.45	-12.33	QP
4		0.3300	19.82	20.05	39.87	49.45	-9.58	AVG
5		0.7710	23.01	20.26	43.27	56.00	-12.73	QP
6		0.7710	13.63	20.26	33.89	46.00	-12.11	AVG
7		1.9410	15.60	20.19	35.79	56.00	-20.21	QP
8		1.9410	5.55	20.19	25.74	46.00	-20.26	AVG
9		7.3230	15.35	20.98	36.33	60.00	-23.67	QP
10		7.3230	2.75	20.98	23.73	50.00	-26.27	AVG
11		14.7750	17.42	22.43	39.85	60.00	-20.15	QP
12		14.7750	3.69	22.43	26.12	50.00	-23.88	AVG



Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2442	28.83	20.04	48.87	61.95	-13.08	QP
2	*	0.2442	24.17	20.04	44.21	51.95	-7.74	AVG
3		0.8438	19.05	20.26	39.31	56.00	-16.69	QP
4		0.8438	10.51	20.26	30.77	46.00	-15.23	AVG
5		1.3379	18.04	20.24	38.28	56.00	-17.72	QP
6		1.3379	7.90	20.24	28.14	46.00	-17.86	AVG
7		4.7213	16.27	20.69	36.96	56.00	-19.04	QP
8		4.7213	3.85	20.69	24.54	46.00	-21.46	AVG
9		8.9637	17.82	21.20	39.02	60.00	-20.98	QP
10		8.9637	7.55	21.20	28.75	50.00	-21.25	AVG
11		15.3883	26.29	22.57	48.86	60.00	-11.14	QP
12		15.3883	11.46	22.57	34.03	50.00	-15.97	AVG



4. RADIATED& FIELD EMISSION TEST RESULT (SECTION 15.209)

4.1 LIMIT

Frequency [MHz]	Field Strength [uV/m]	Measurement Distance [Meters]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

§ 15.209(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.2 TEST PROCEDURE

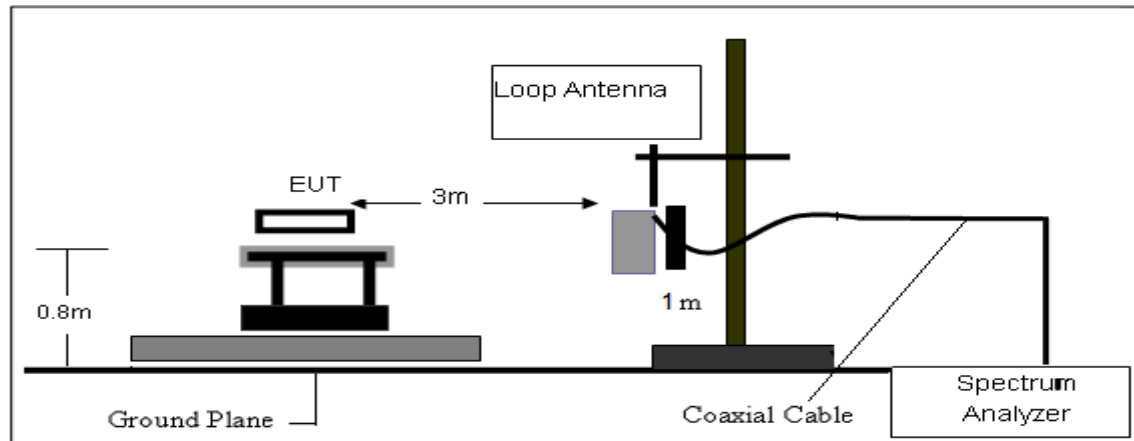
- a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

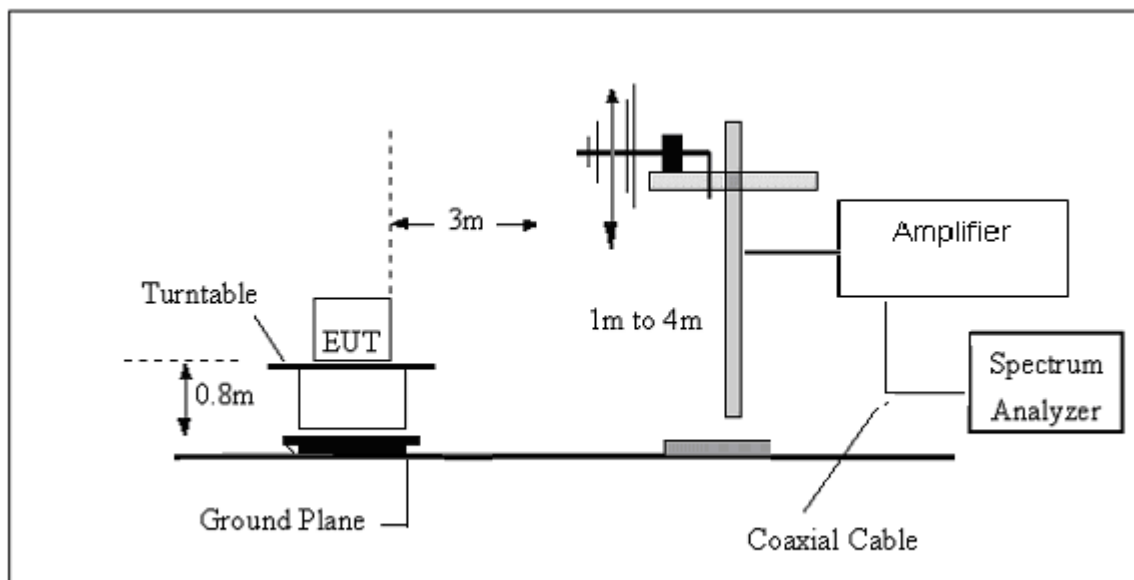
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



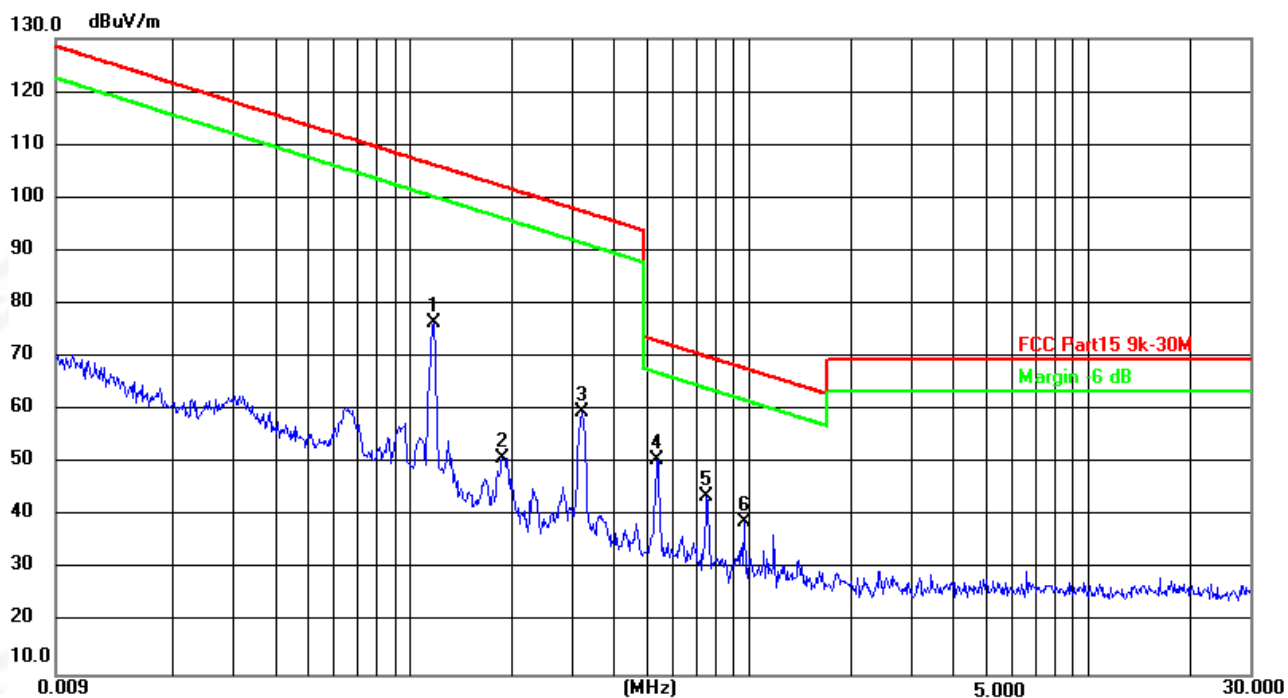


4.4 TEST RESULTS

4.4.1 Spurious Radiated Emission Below 30 MHz

Temperature :	24.3℃	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz

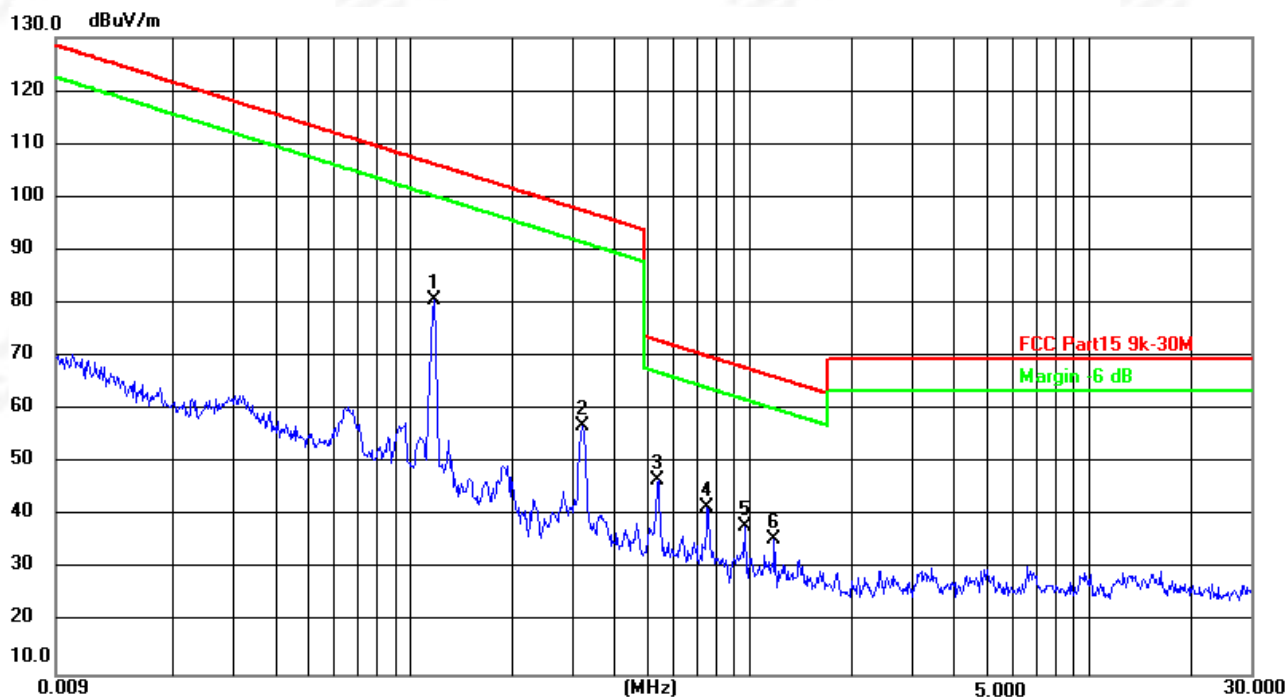


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1168	84.10	-7.52	76.58	106.26	-29.68	peak
2	0.1870	58.71	-7.73	50.98	102.17	-51.19	peak
3	0.3194	67.24	-7.70	59.54	97.52	-37.98	peak
4 *	0.5367	58.28	-7.53	50.75	73.01	-22.26	peak
5	0.7485	51.06	-7.36	43.70	70.13	-26.43	peak
6	0.9625	46.29	-7.36	38.93	67.95	-29.02	peak



Temperature :	24.3℃	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 2
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz

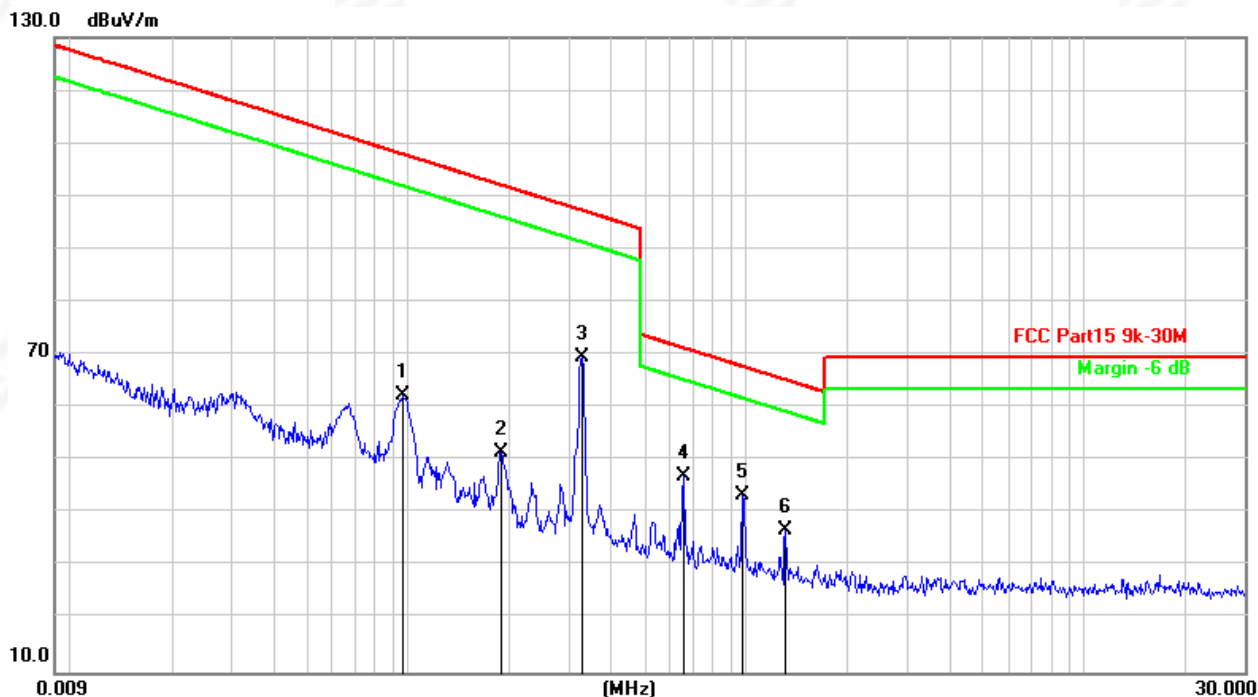


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	0.1168	88.10	-7.52	80.58	106.26	-25.68	peak
2	0.3220	64.67	-7.69	56.98	97.45	-40.47	peak
3	0.5367	54.28	-7.53	46.75	73.01	-26.26	peak
4	0.7485	49.06	-7.36	41.70	70.13	-28.43	peak
5	0.9625	45.29	-7.36	37.93	67.95	-30.02	peak
6	1.1789	42.94	-7.35	35.59	66.20	-30.61	peak



Temperature :	24.3℃	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 3
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz

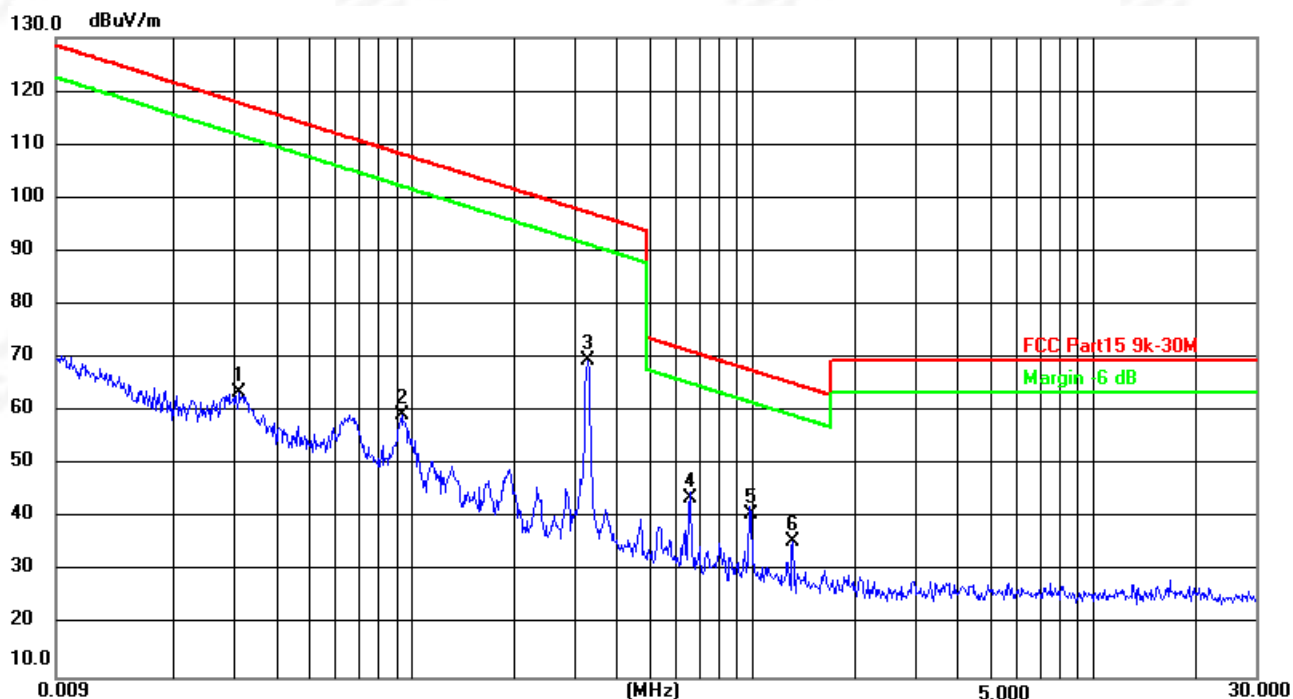


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		0.0969	69.75	-7.51	62.24	107.8	-45.64	peak
2		0.1884	59.40	-7.73	51.67	102.1	-50.43	peak
3		0.3272	77.12	-7.69	69.43	97.31	-27.88	peak
4	*	0.6521	54.38	-7.41	46.97	71.32	-24.35	peak
5		0.9783	50.74	-7.36	43.38	67.81	-24.43	peak
6		1.3101	44.11	-7.35	36.76	65.28	-28.52	peak



Temperature :	24.3℃	Relative Humidity :	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz

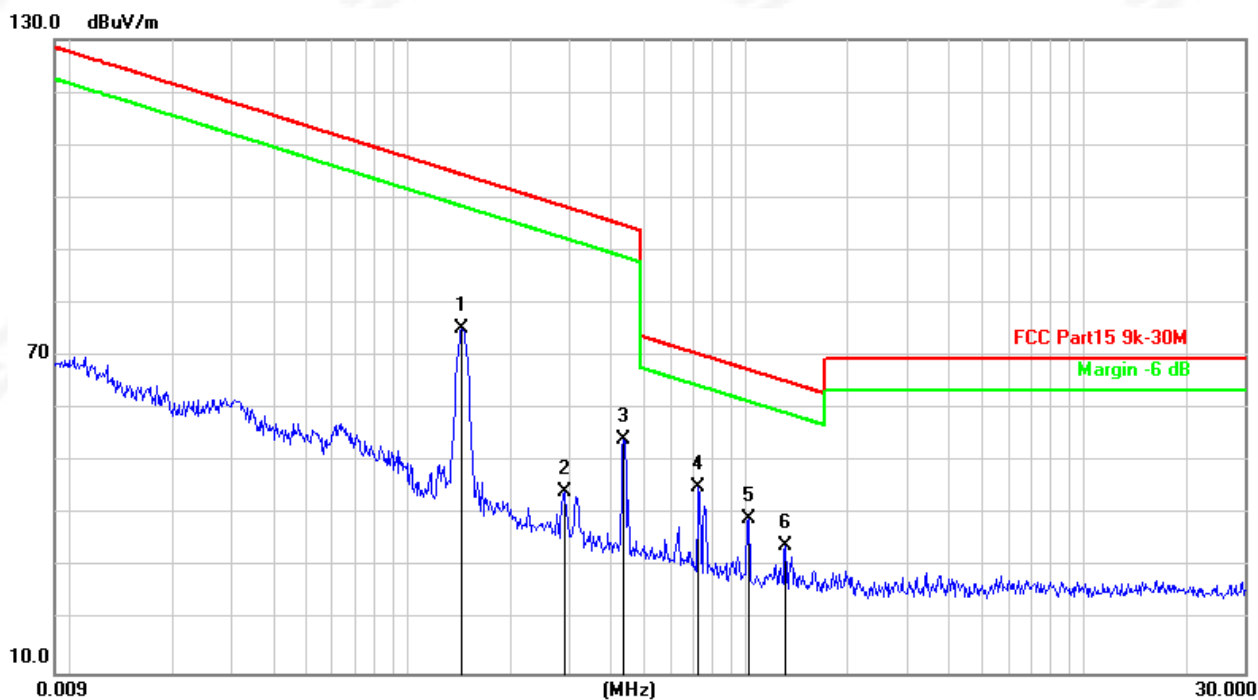


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0310	70.95	-7.42	63.53	117.78	-54.25	peak
2	0.0931	66.92	-7.54	59.38	108.23	-48.85	peak
3	0.3271	77.12	-7.69	69.43	97.31	-27.88	peak
4	0.6573	51.29	-7.40	43.89	71.26	-27.37	peak
5 *	0.9862	48.24	-7.36	40.88	67.74	-26.86	peak
6	1.3101	43.11	-7.35	35.76	65.28	-29.52	peak



Temperature :	24.3℃	Relative Humidity :	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 5
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz

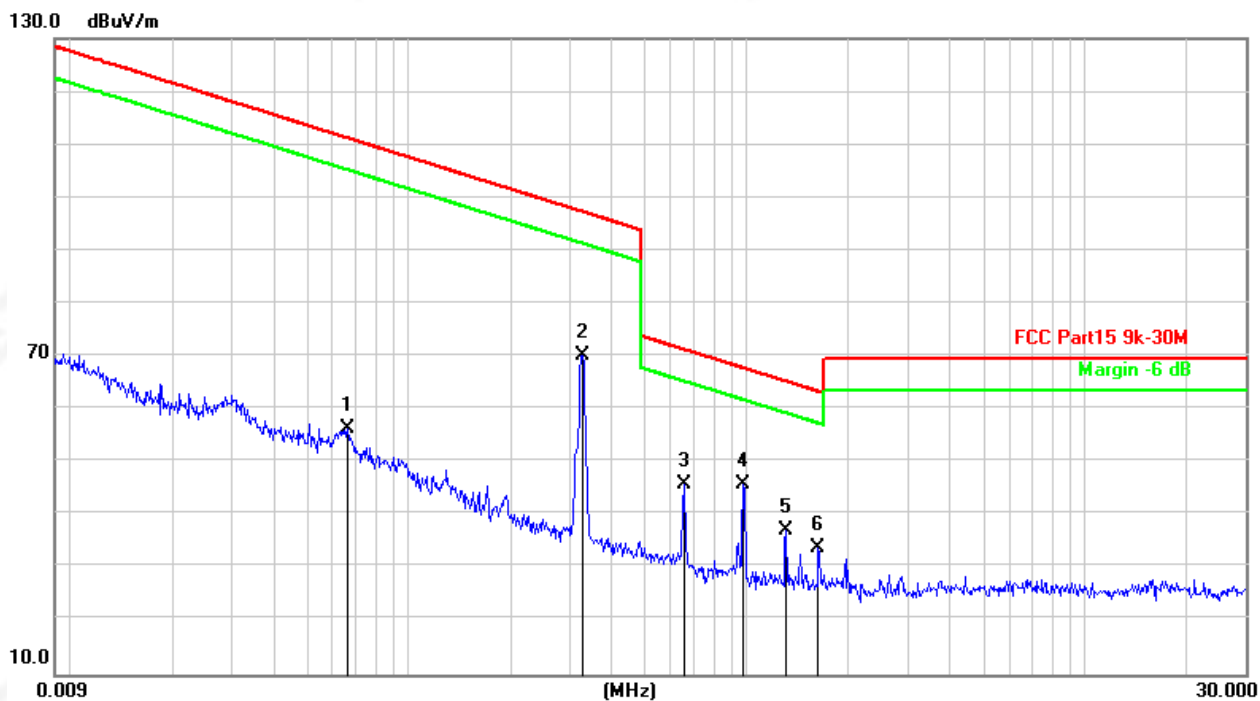


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		0.1442	82.68	-7.57	75.11	104.4	-29.31	peak
2		0.2898	51.94	-7.72	44.22	98.36	-54.14	peak
3		0.4347	61.98	-7.62	54.36	94.84	-40.48	peak
4	*	0.7246	52.55	-7.36	45.19	70.41	-25.22	peak
5		1.0188	46.54	-7.36	39.18	67.46	-28.28	peak
6		1.3101	41.65	-7.35	34.30	65.28	-30.98	peak



Temperature :	24.3°C	Relative Humidity :	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 6
Polarization:	Coplanar(the worst mode)		

9KHz- 30MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		0.0662	63.92	-7.61	56.31	111.1	-54.88	peak
2		0.3272	77.90	-7.69	70.21	97.31	-27.10	peak
3		0.6521	53.30	-7.41	45.89	71.32	-25.43	peak
4	*	0.9783	53.18	-7.36	45.82	67.81	-21.99	peak
5		1.3101	44.42	-7.35	37.07	65.28	-28.21	peak
6		1.6308	41.18	-7.33	33.85	63.39	-29.54	peak

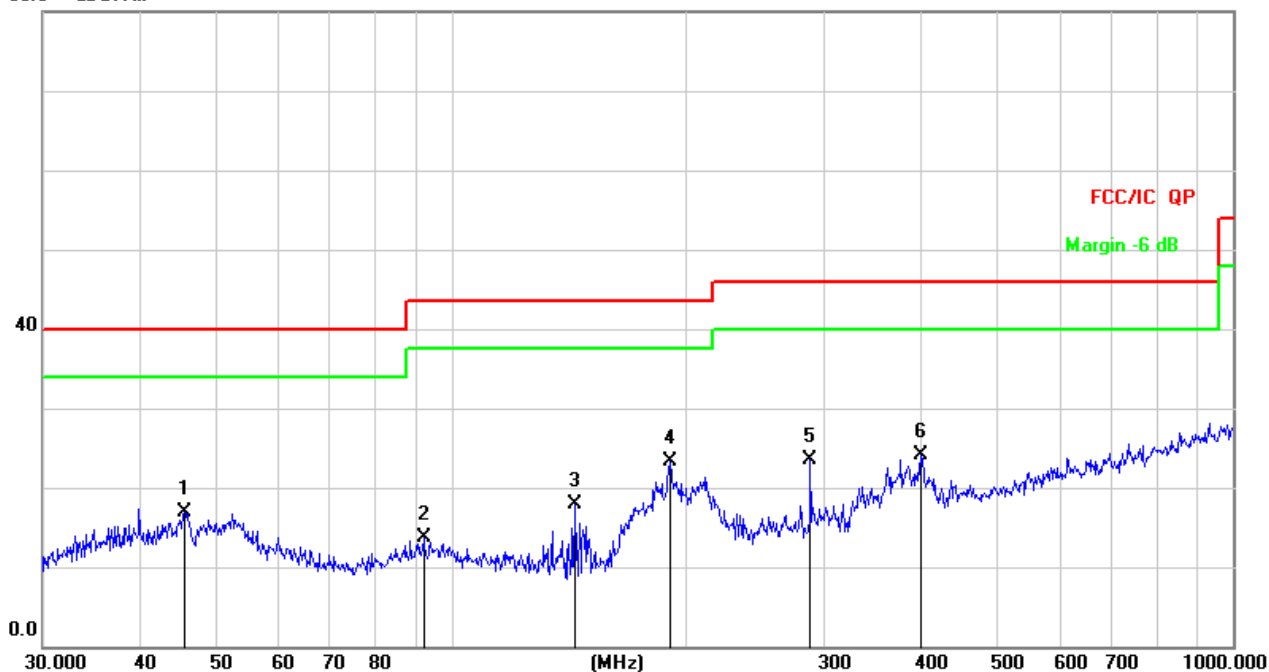


4.4.2 Spurious Radiated Emission below 1 GHz

Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1

The following table shows the highest levels of radiated emissions on polarizations of horizontal

80.0 dBuV/m



Remark:

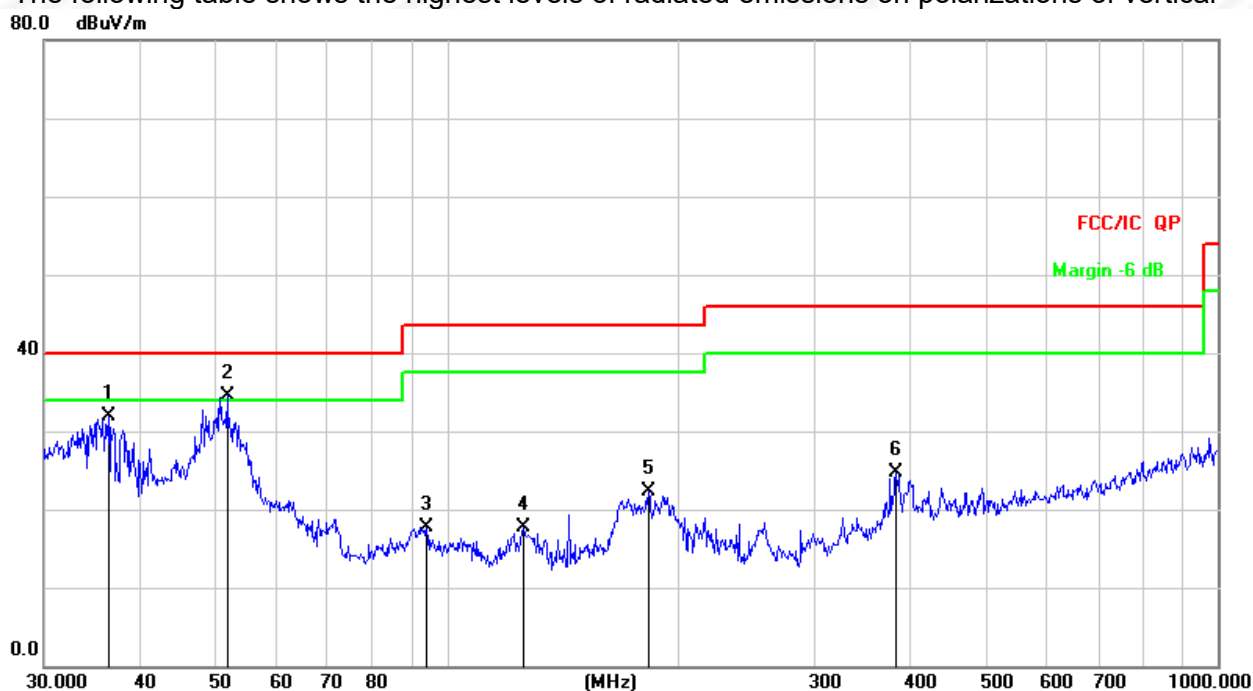
1. Margin = Result (Result = Reading + Factor) - Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		45.5348	27.81	-10.98	16.83	40.00	-23.17	QP
2		92.1388	26.52	-12.75	13.77	43.50	-29.73	QP
3		143.8295	32.98	-15.04	17.94	43.50	-25.56	QP
4	*	190.4050	35.95	-12.63	23.32	43.50	-20.18	QP
5		287.9904	34.18	-10.59	23.59	46.00	-22.41	QP
6		399.0302	31.43	-7.40	24.03	46.00	-21.97	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

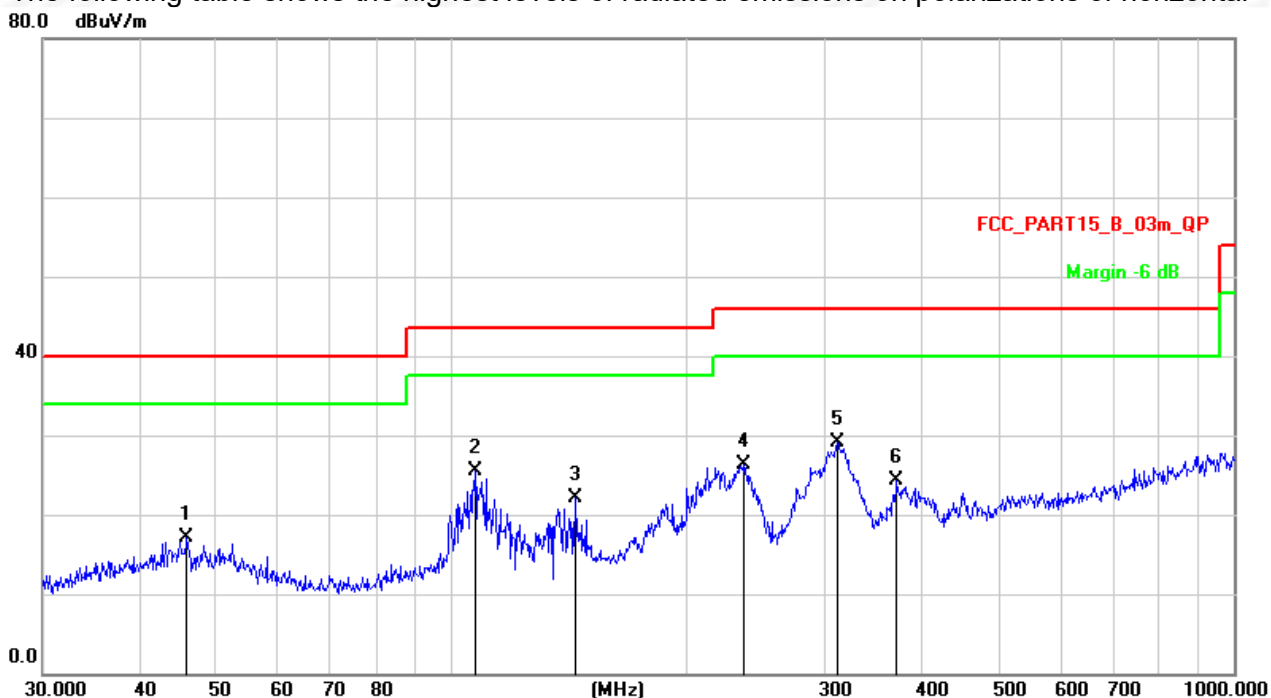
1. Margin = Result (Result = Reading + Factor) - Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		36.3814	43.87	-11.94	31.93	40.00	-8.07	QP
2	*	51.8430	45.25	-10.83	34.42	40.00	-5.58	QP
3		94.0979	30.28	-12.63	17.65	43.50	-25.85	QP
4		125.4457	31.63	-14.00	17.63	43.50	-25.87	QP
5		182.5592	35.46	-13.17	22.29	43.50	-21.21	QP
6		382.5879	32.51	-7.89	24.62	46.00	-21.38	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 2

The following table shows the highest levels of radiated emissions on polarizations of horizontal



Remark:

3. Margin = Result (Result = Reading + Factor) - Limit

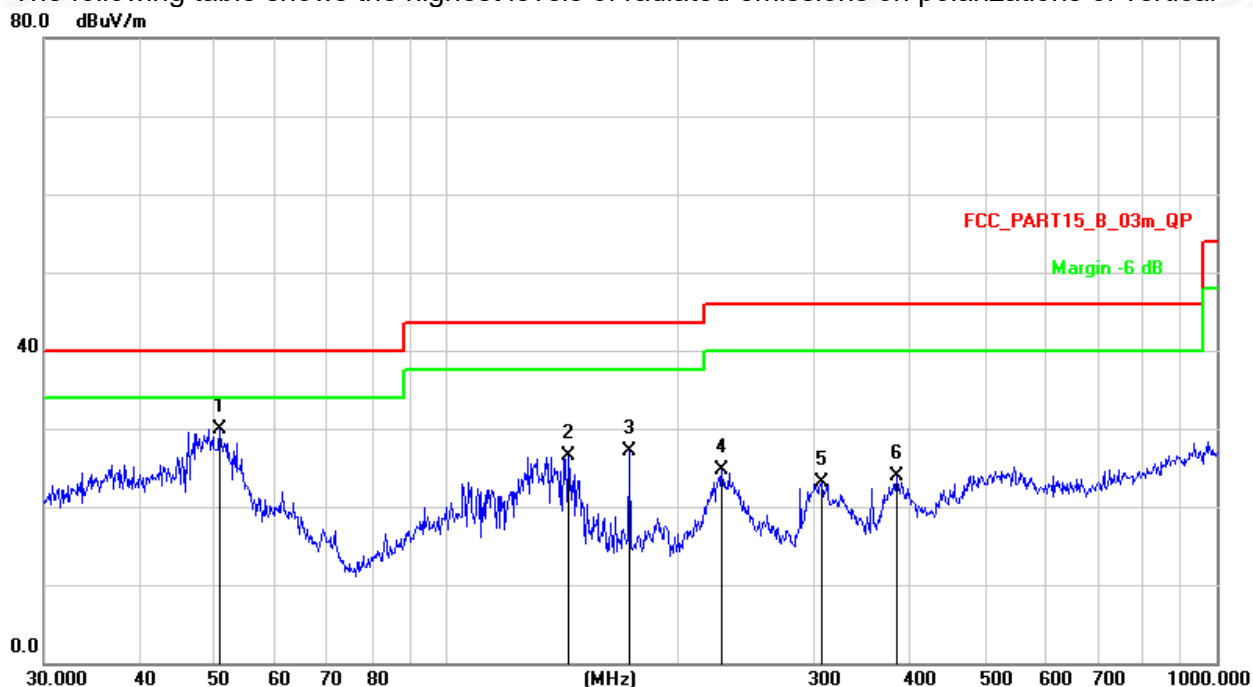
4. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1		45.8553	27.98	-10.95	17.03	40.00	-22.97	QP
2		107.1337	38.23	-12.80	25.43	43.50	-18.07	QP
3		143.8295	37.12	-15.04	22.08	43.50	-21.42	QP
4		236.6447	37.73	-11.47	26.26	46.00	-19.74	QP
5	*	311.0867	39.15	-10.04	29.11	46.00	-16.89	QP
6		370.7023	32.63	-8.25	24.38	46.00	-21.62	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 2

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

3. Margin = Result (Result = Reading + Factor) - Limit

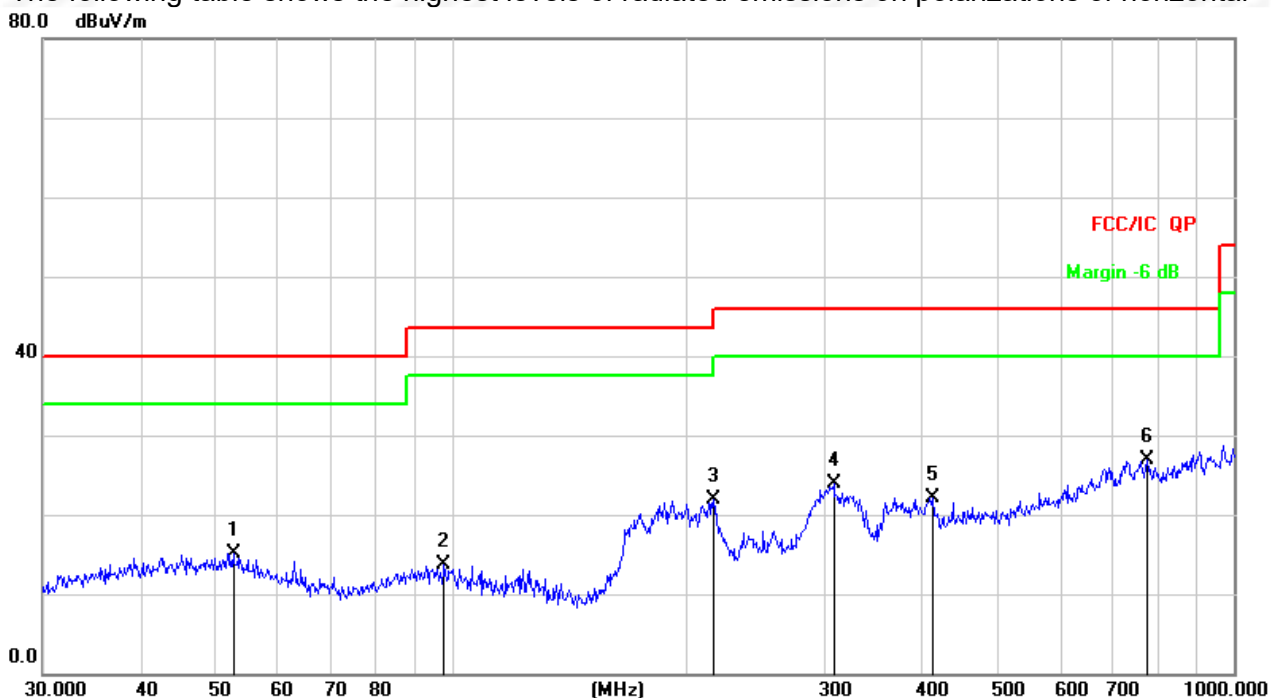
4. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	50.7637	40.59	-10.64	29.95	40.00	-10.05	QP
2		143.8295	41.55	-15.04	26.51	43.50	-16.99	QP
3		172.5988	40.92	-13.85	27.07	43.50	-16.43	QP
4		227.6906	36.24	-11.59	24.65	46.00	-21.35	QP
5		306.7537	33.34	-10.17	23.17	46.00	-22.83	QP
6		383.9318	31.72	-7.85	23.87	46.00	-22.13	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 3

The following table shows the highest levels of radiated emissions on polarizations of horizontal



Remark:

5. Margin = Result (Result = Reading + Factor) - Limit

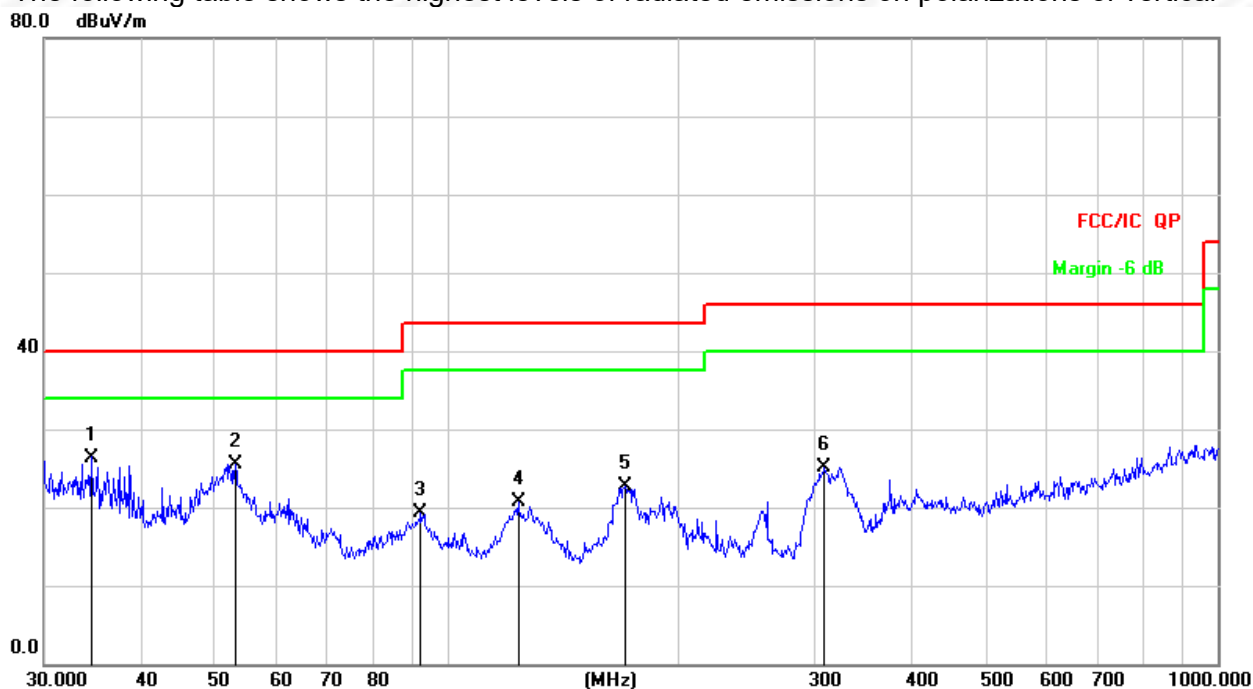
6. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		52.5753	26.02	-10.96	15.06	40.00	-24.94	QP
2		97.7983	26.09	-12.42	13.67	43.50	-29.83	QP
3		216.0240	33.67	-11.76	21.91	46.00	-24.09	QP
4		307.8313	34.10	-10.13	23.97	46.00	-22.03	QP
5		411.8240	29.37	-7.20	22.17	46.00	-23.83	QP
6	*	774.1584	28.94	-1.96	26.98	46.00	-19.02	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 3

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

5. Margin = Result (Result = Reading + Factor) - Limit

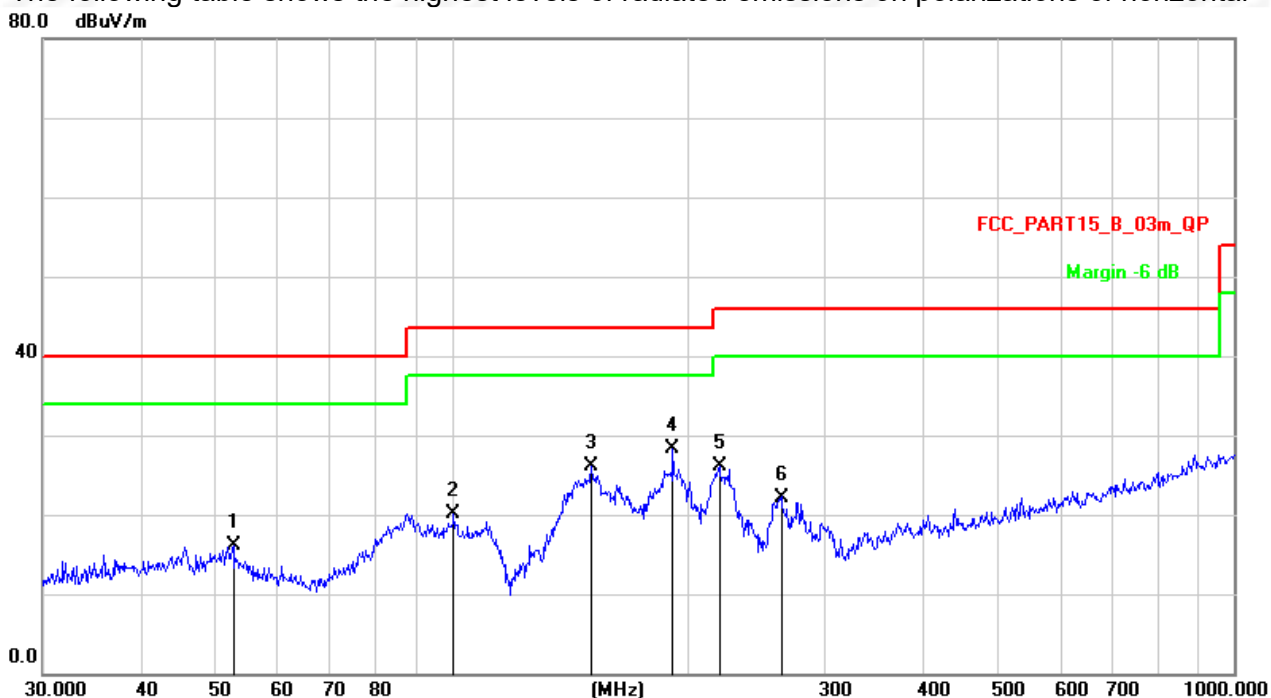
6. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	34.5173	38.54	-12.14	26.40	40.00	-13.60	QP
2		53.1313	36.56	-11.06	25.50	40.00	-14.50	QP
3		92.4624	31.97	-12.73	19.24	43.50	-24.26	QP
4		123.6985	34.56	-13.90	20.66	43.50	-22.84	QP
5		170.1948	36.65	-14.01	22.64	43.50	-20.86	QP
6		308.9126	35.25	-10.10	25.15	46.00	-20.85	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4

The following table shows the highest levels of radiated emissions on polarizations of horizontal



Remark:

7. Margin = Result (Result = Reading + Factor) - Limit

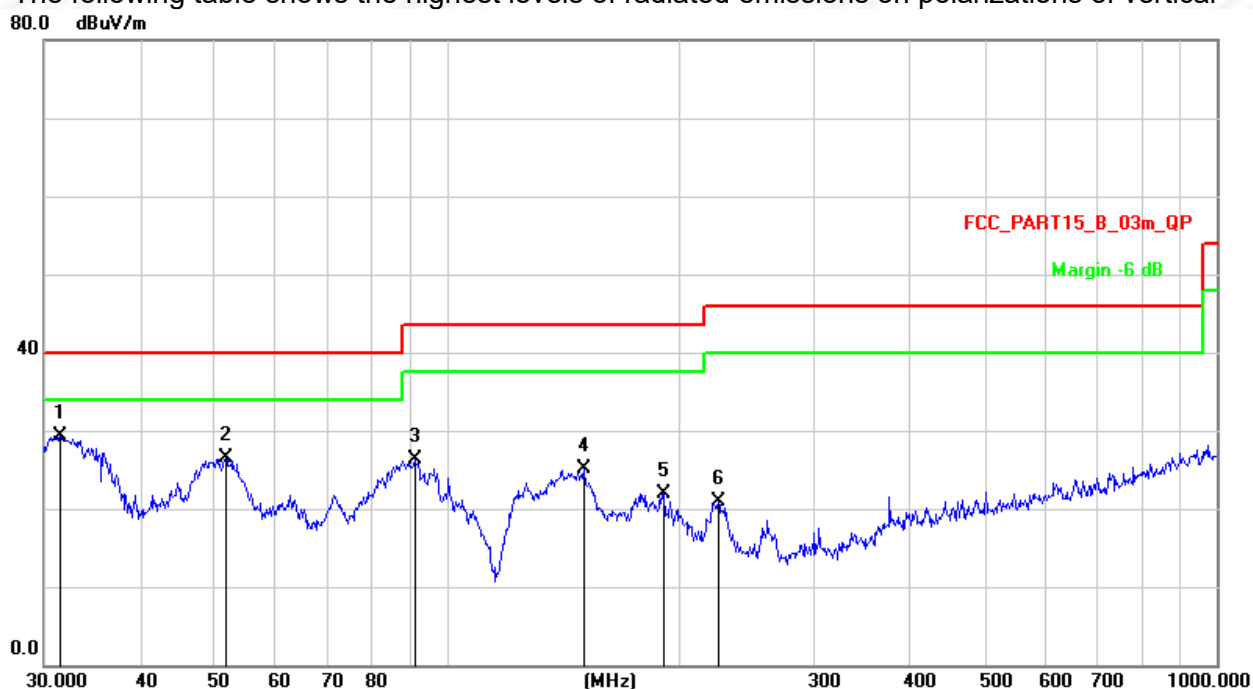
8. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1		52.5753	27.06	-10.96	16.10	40.00	-23.90	QP
2		100.5806	32.51	-12.34	20.17	43.50	-23.33	QP
3		150.5378	41.51	-15.35	26.16	43.50	-17.34	QP
4	*	191.7450	40.83	-12.54	28.29	43.50	-15.21	QP
5		219.8449	37.77	-11.70	26.07	46.00	-19.93	QP
6		263.8190	33.23	-11.03	22.20	46.00	-23.80	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

7. Margin = Result (Result = Reading + Factor) - Limit

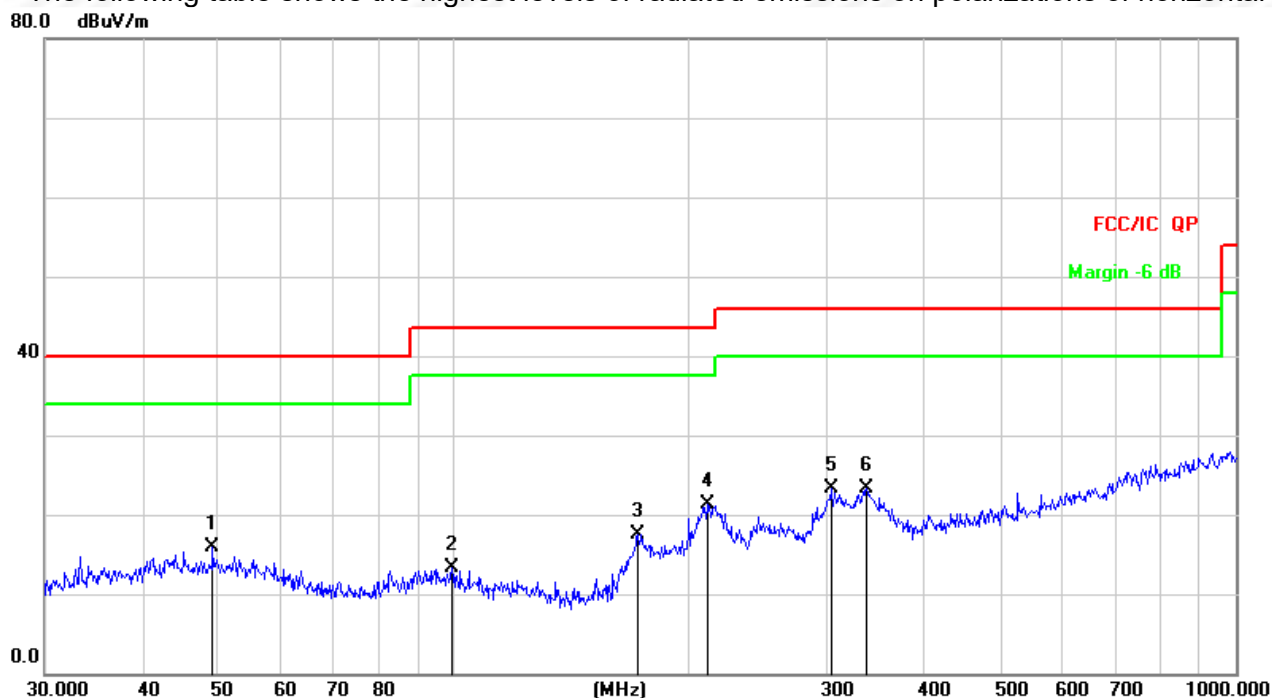
8. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1	*	31.5095	41.78	-12.45	29.33	40.00	-10.67	QP
2		51.6616	37.26	-10.80	26.46	40.00	-13.54	QP
3		90.8554	39.16	-12.82	26.34	43.50	-17.16	QP
4		150.5378	40.54	-15.35	25.19	43.50	-18.31	QP
5		191.7450	34.50	-12.54	21.96	43.50	-21.54	QP
6		225.3080	32.56	-11.63	20.93	46.00	-25.07	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 5

The following table shows the highest levels of radiated emissions on polarizations of horizontal



Remark:

9. Margin = Result (Result = Reading + Factor) - Limit

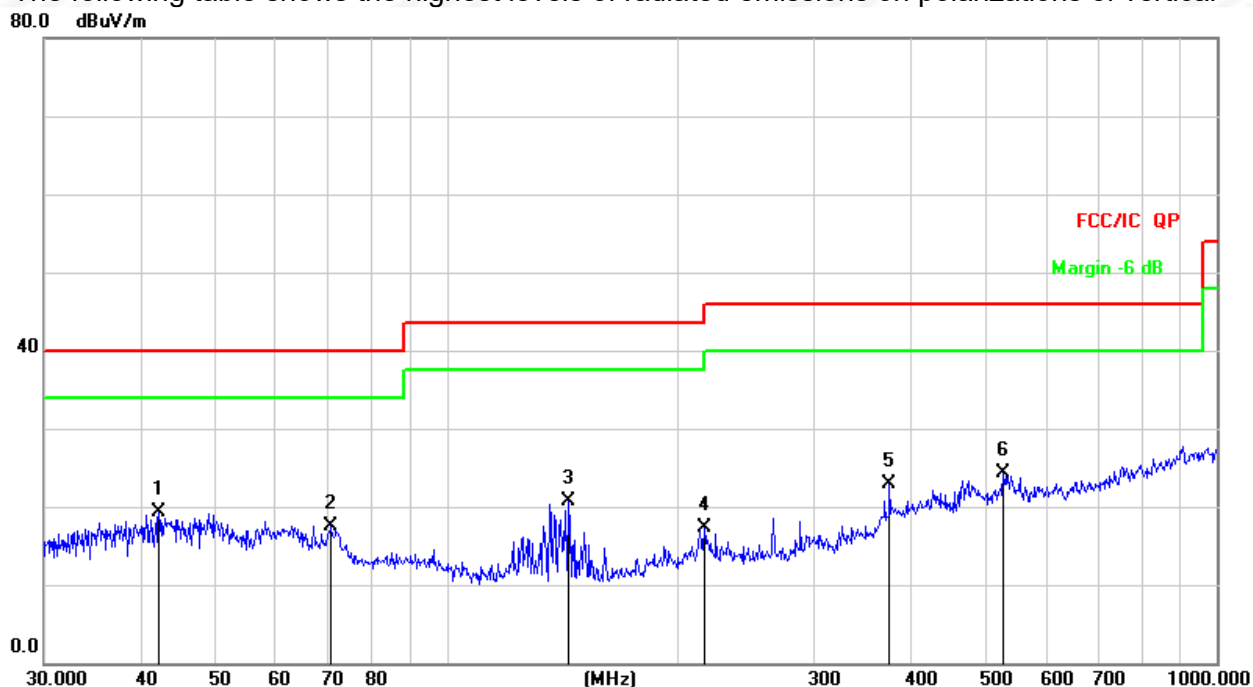
10. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		49.1865	26.51	-10.60	15.91	40.00	-24.09	QP
2		99.5281	25.65	-12.33	13.32	43.50	-30.18	QP
3		171.9946	31.34	-13.89	17.45	43.50	-26.05	QP
4	*	210.7860	33.23	-11.83	21.40	43.50	-22.10	QP
5		303.5437	33.56	-10.26	23.30	46.00	-22.70	QP
6		337.2155	32.64	-9.25	23.39	46.00	-22.61	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 5

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

9. Margin = Result (Result = Reading + Factor) - Limit

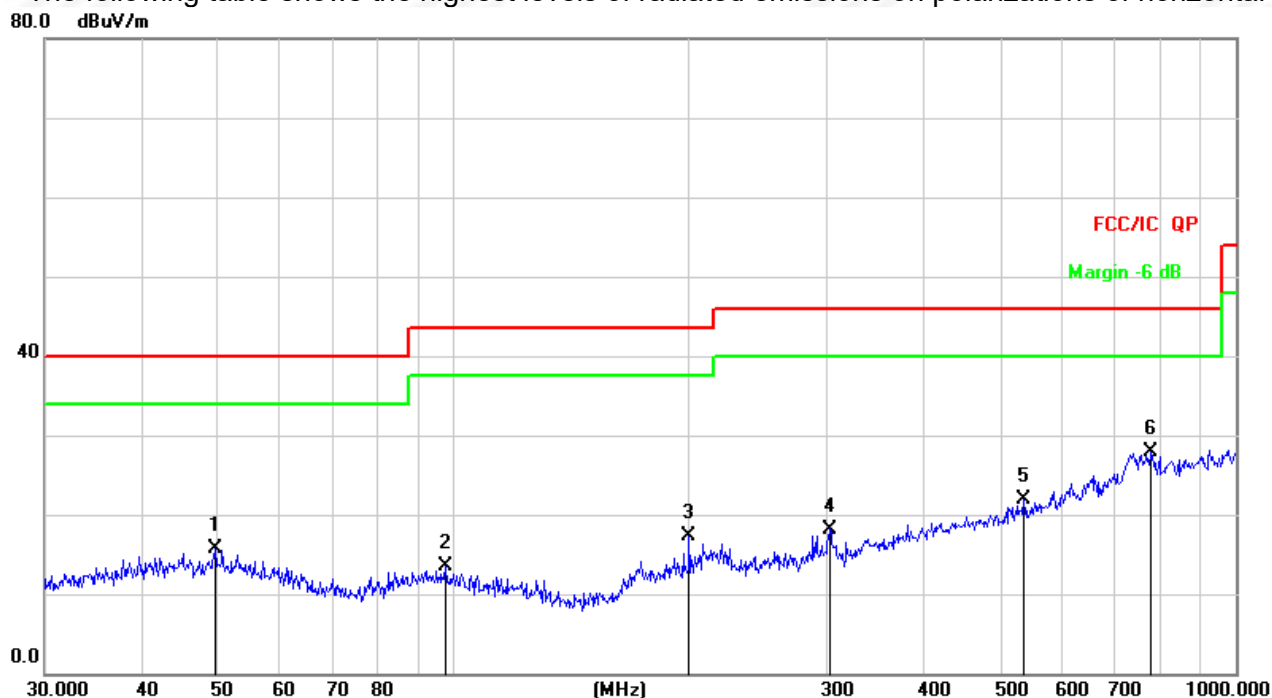
10. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	42.3022	30.53	-11.32	19.21	40.00	-20.79	QP
2		70.8315	31.47	-13.95	17.52	40.00	-22.48	QP
3		143.8295	35.69	-15.04	20.65	43.50	-22.85	QP
4		216.0240	29.14	-11.76	17.38	46.00	-28.62	QP
5		375.9385	31.04	-8.09	22.95	46.00	-23.05	QP
6		528.2458	29.70	-5.45	24.25	46.00	-21.75	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 6

The following table shows the highest levels of radiated emissions on polarizations of horizontal



Remark:

11. Margin = Result (Result = Reading + Factor) - Limit

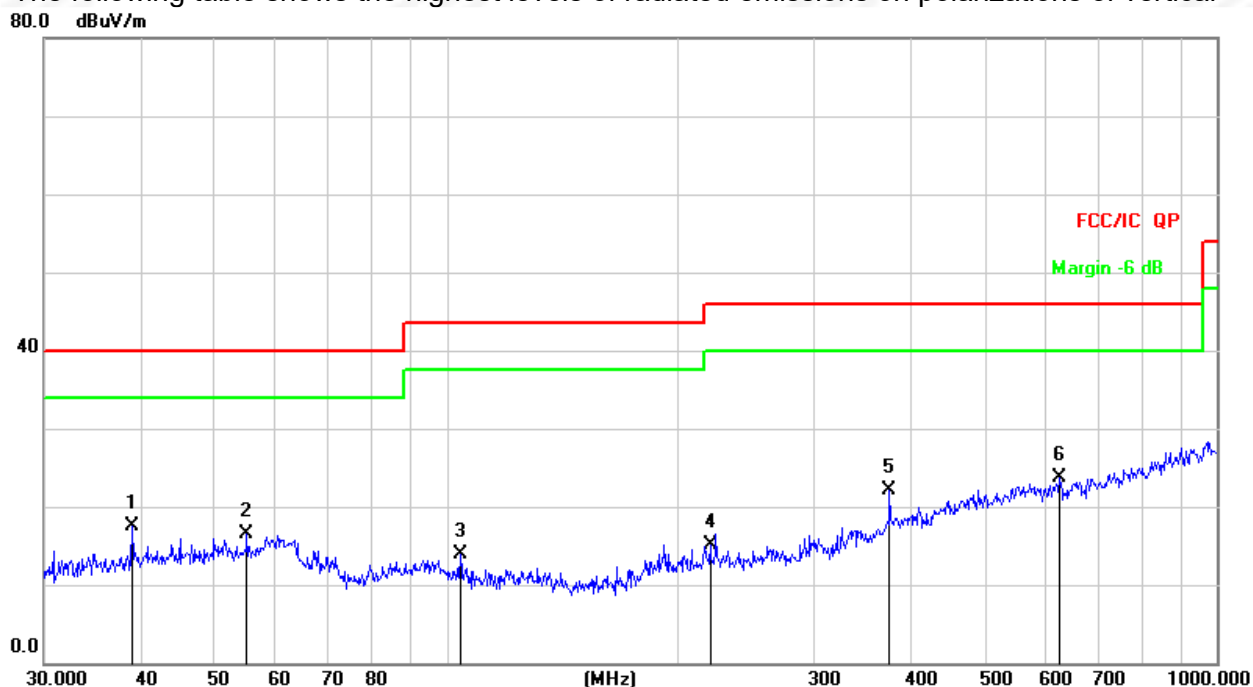
12. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		49.5328	26.17	-10.56	15.61	40.00	-24.39	QP
2		97.7983	25.87	-12.42	13.45	43.50	-30.05	QP
3		199.9856	29.21	-11.98	17.23	43.50	-26.27	QP
4		302.4812	28.50	-10.30	18.20	46.00	-27.80	QP
5		535.7073	27.15	-5.31	21.84	46.00	-24.16	QP
6	*	779.6068	29.78	-1.88	27.90	46.00	-18.10	QP



Temperature :	26°C	Relative Humidity:	54%
Test Voltage :	DC 11.55V	Test Mode :	Mode 6

The following table shows the highest levels of radiated emissions on polarizations of vertical



Remark:

11. Margin = Result (Result = Reading + Factor) - Limit

12. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		39.0245	29.17	-11.66	17.51	40.00	-22.49	QP
2		55.0274	27.89	-11.39	16.50	40.00	-23.50	QP
3		104.1701	26.41	-12.59	13.82	43.50	-29.68	QP
4		219.8449	26.83	-11.70	15.13	46.00	-30.87	QP
5		375.9385	30.20	-8.09	22.11	46.00	-23.89	QP
6	*	625.0780	27.57	-3.89	23.68	46.00	-22.32	QP



5. 20 DB BANDWIDTH TEST

5.1 Limit

FCC Part 2.1049, Only applicable to report.

5.2 TEST SETUP

1. Set RBW = 1%~5% OBW.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.





5.3 TEST RESULTS

Operating Frequency (kHz)	20 dB Bandwidth (Hz)
124.9	82
325.6	326

124.9kHz



325.6kHz





6. ANTENNA REQUIREMENTS

6.1 Limit

For intentional device, according to FCC 47 CFR Section 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

6.2 TEST RESULTS

The antenna used for this product is Inductive Loop coil antenna.



APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※