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TEST REPORT

Report No.: **CTC20210202E07**

FCC ID:: **2APWA-Z23G**


Applicant.....: **ZULTYS, INC**

Address.....: 785 Lucerne Drive, Sunnyvale, CA 94085 USA

Manufacturer.....: Fanvil Technology Co., Ltd

Address.....: 10/F Block A, Dualshine Global Science Innovation Center,
Honglang North 2nd Road, Bao'an District, Shenzhen, China

Product Name.....: **Gigabit SIP IP Phone**

Trade Mark.....: ZULTYS  ZULTYS

Model/Type reference.....: Z 23G

Listed Model(s): N/A

Standard.....: **47 CFR FCC Part 15 Subpart B - Unintentional Radiators**

Date of receipt of test sample...: Mar. 19, 2021

Date of testing.....: Mar. 19, 2021 to Mar. 22, 2021

Date of issue.....: Mar. 25, 2021

Result.....: **PASS**

Compiled by: (Printed name+signature)	Lucy Lan	
Supervised by: (Printed name+signature)	Miller Ma	
Approved by: (Printed name+signature)	Walter Chen	

Testing Laboratory Name.....: **CTC Laboratories, Inc.**

Address.....: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park,
Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

[47 CFR FCC Part 15 Subpart B](#): Unintentional Radiators.

[ICES-003](#): Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement

[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 40GHz.

1.2. Report version

Revised No.	Date of issue	Description
01	Mar. 25, 2021	Original



1.3. Test Description

FCC CFR Title 47 FCC Part 15 Subpart B / ICES-003 Issue 6				
Test Item	Standard Section		Result	Test Engineer
	FCC	IC		
Conducted Emissions	15.107	6.1	Pass	Jon Huang
Radiated Emission	15.109	6.2	Pass	Terry Su

Note: "N/A" is no application.
The measurement uncertainty is not included in the test result.



1.4. Test Facility

CTC Laboratories, Inc.

Add: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)

Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature	25°C
Relative Humidity	55 %
Air Pressure	101kPa




2. GENERAL INFORMATION

2.1. Client Information

Applicant:	ZULTYS, INC
Address:	785 Lucerne Drive, Sunnyvale, CA 94085 USA
Manufacturer:	Fanvil Technology Co., Ltd
Address:	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, China

2.2. General Description of EUT

Product Name:	Gigabit SIP IP Phone
Marketing Name:	ZULTYS, INC  ZULTYS
Model/Type reference:	Z 23G
Listed Model(s):	N/A
Power supply:	Supplied from POE 5Vdc/2A from AC/DC Adapter
Adapter Model:	F12W8-050200SPAU Input: AC100-240V 50/60Hz 0.3A Output:5V/2A
Hardware version:	N/A
Software version:	N/A



2.3. Accessory Equipment information

Equipment Information			
Name	Model	S/N	Manufacturer
IP Phone	X7	JGB28B000005	Fanvil
POE Supply	H3C S1208-PWR	219801A0SYM17B0000LS	H3C
Router	FAST 5280	253703944	Sagemcom
Headset	---	X18033620	Fanvil
Cable Information			
Name	Shielded Type	Ferrite Core	Length
Lan Cable	N/A	N/A	1M

2.4. Description of Test Modes

Test mode	Communicate by hands free	Communicate by telephone receiver	Communicate by Headset	AC/DC Adapter	POE Supply
1	■			■	
2		■		■	
3			■	■	
4	■				■
5		■			■
6			■		■

Note:

1. ■ is operation mode.

Pre-scan above all test mode, found below test mode which it was worse case mode, so only show the test data for worse case mode on the test report.

Test item	Test mode
Conducted emission	2
Radiated emission	2, 4

Note: "N/A" is no application.



2.5. Measurement Instruments List

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	Rohde & Schwarz	ENV216	101112	Dec. 25, 2021
2	LISN	Rohde & Schwarz	ENV216	101113	Dec. 25, 2021
3	EMI Test Receiver	Rohde & Schwarz	ESCI	100920	Dec. 25, 2021
4	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Dec. 25, 2021

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 25, 2021
2	Spectrum Analyzer	HP	8563E	02052	Dec. 25, 2021
3	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec. 25, 2021
4	Pre-Amplifier	HP	8447D	1937A03050	Dec. 25, 2021
5	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 25, 2021
6	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 25, 2021
7	Antenna Mast	UC	UC3000	N/A	N/A
8	Turn Table	UC	UC3000	N/A	N/A
9	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Dec. 25, 2021

Note: The Cal. Interval was one year.

3. EMC EMISSION TEST

3.1. Radiated Emission

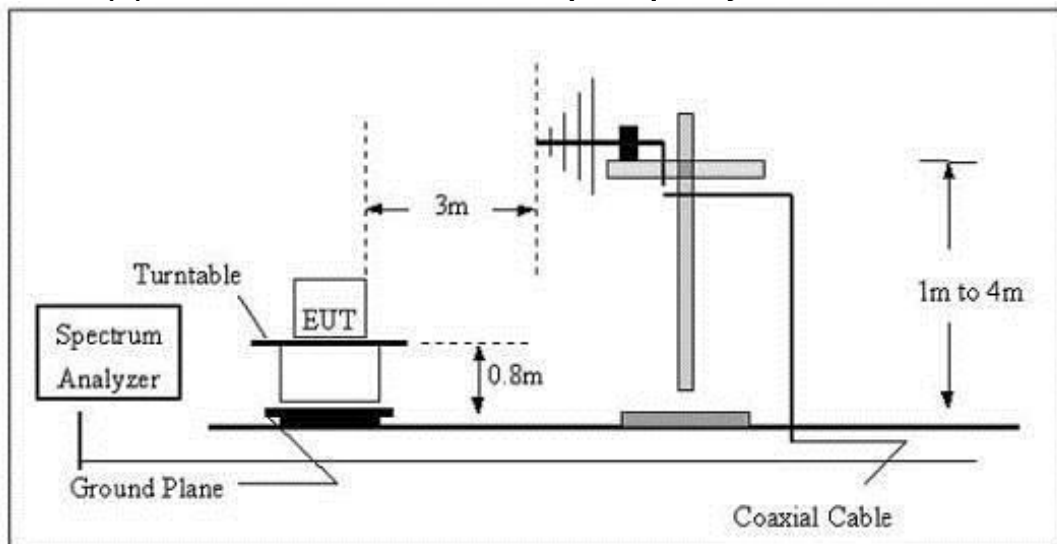
LIMIT

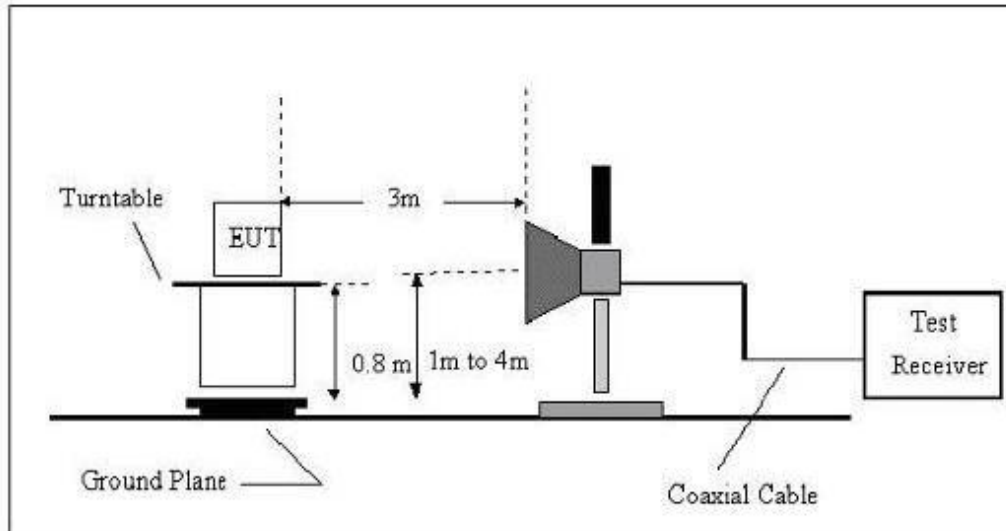
FCC CFR Title 47 Part 15 Subpart B Section 15.109/ ICES 003 Section 6.2 :

Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

(A) Radiated Emission Test Set-Up Frequency below 1 GHz



(B) Radiated Emission Test Set-Up Frequency above 1GHz**TEST PROCEDURE**

1. The EUT was tested according to ANSI C63.4:2014.
2. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
Span shall wide enough to fully capture the emission being measured;
 - 1) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;
 - 2) If the emission level of the EUT measured by the peak detectors 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - 3) Above 1GHz, RBW=1MHz, VBW=3MHz

TEST MODE

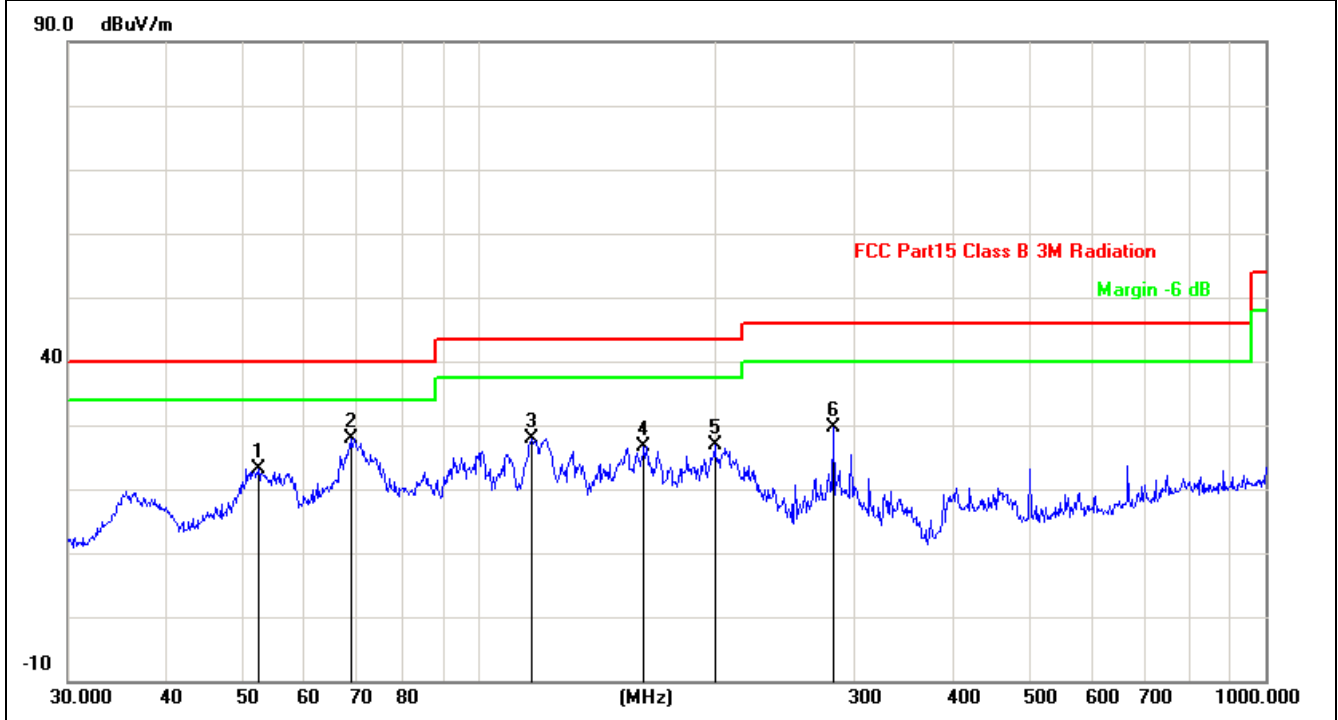
Please refer to the clause 2.4

TEST RESULTS



30MHz-1GHz

Test mode	2	Polarization	Horizontal
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	52.3912	-17.95	41.15	23.20	40.00	-16.80	QP
2	68.8721	-20.19	48.01	27.82	40.00	-12.18	QP
3	116.5400	-19.59	47.48	27.89	43.50	-15.61	QP
4	162.0413	-17.79	44.42	26.63	43.50	-16.87	QP
5	199.2855	-20.83	47.60	26.77	43.50	-16.73	QP
6	281.9945	-18.30	47.97	29.67	46.00	-16.33	QP

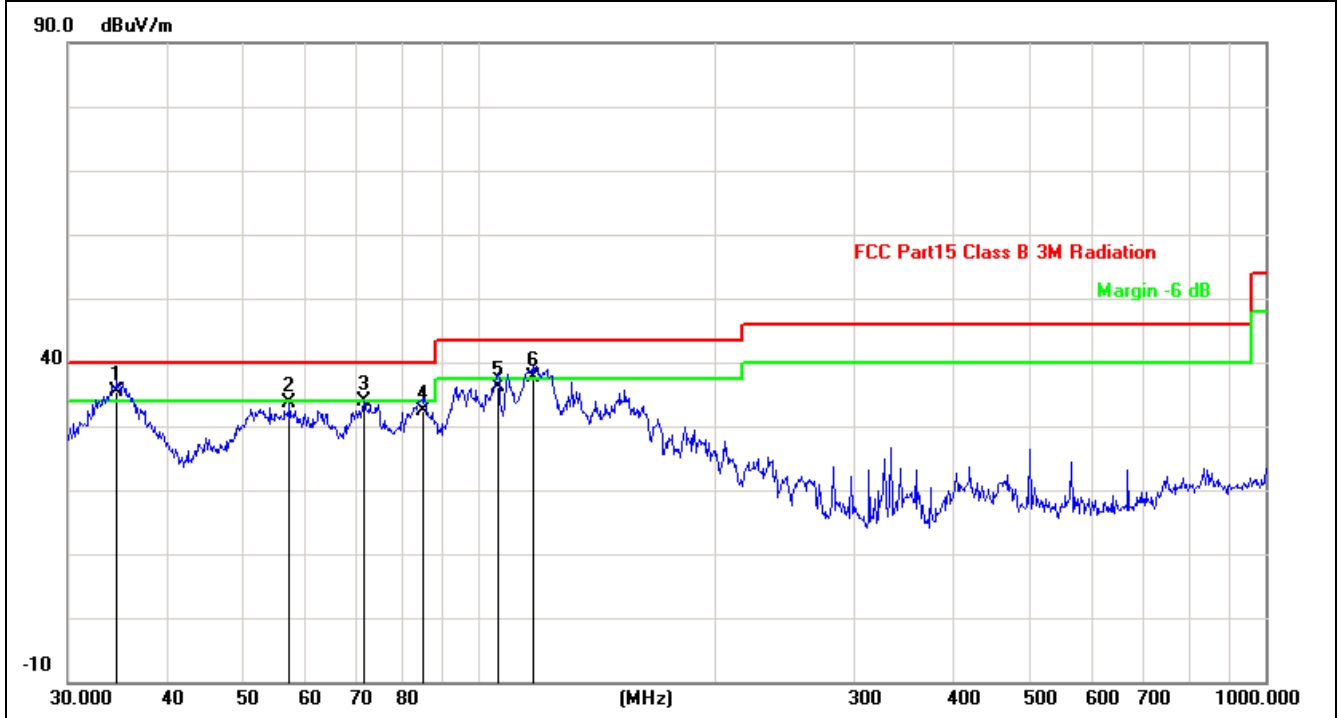
Remark:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value





Test mode	2	Polarization	Vertical
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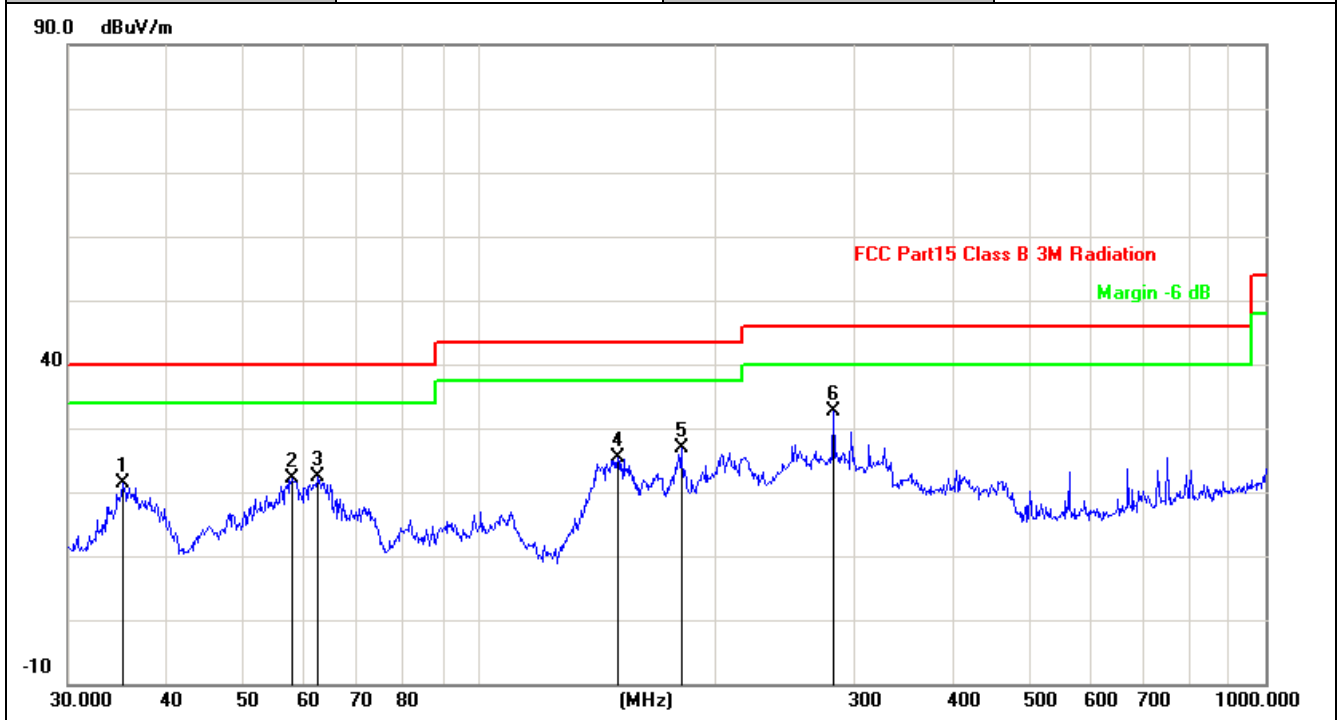


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.6385	-18.01	53.31	35.30	40.00	-4.70	QP
2	57.3923	-18.32	51.86	33.54	40.00	-6.46	QP
3	71.3300	-20.61	54.61	34.00	40.00	-6.00	QP
4	84.7019	-21.83	54.13	32.30	40.00	-7.70	QP
5	105.6415	-20.50	56.60	36.10	43.50	-7.40	QP
6	116.9495	-19.56	57.16	37.60	43.50	-5.90	QP

Remark:
 1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
 2. Margin value = Level -Limit value



Test mode	4	Polarization	Horizontal
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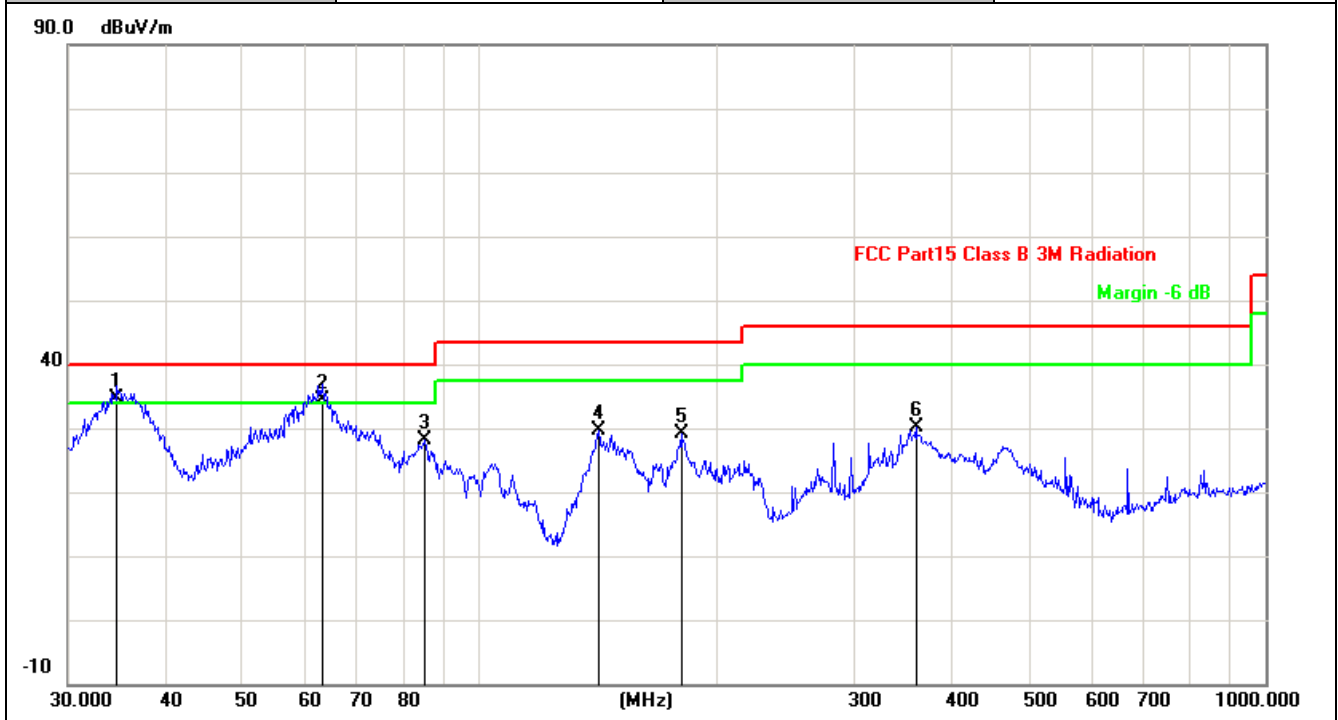
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.2512	-17.97	39.26	21.29	40.00	-18.71	QP
2	57.7962	-18.35	40.37	22.02	40.00	-17.98	QP
3	62.4314	-18.97	41.31	22.34	40.00	-17.66	QP
4	150.0108	-16.77	42.15	25.38	43.50	-18.12	QP
5	180.6488	-19.30	46.08	26.78	43.50	-16.72	QP
6	281.9946	-18.30	50.92	32.62	46.00	-13.38	QP

Remark:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value



Test mode	4	Polarization	Vertical
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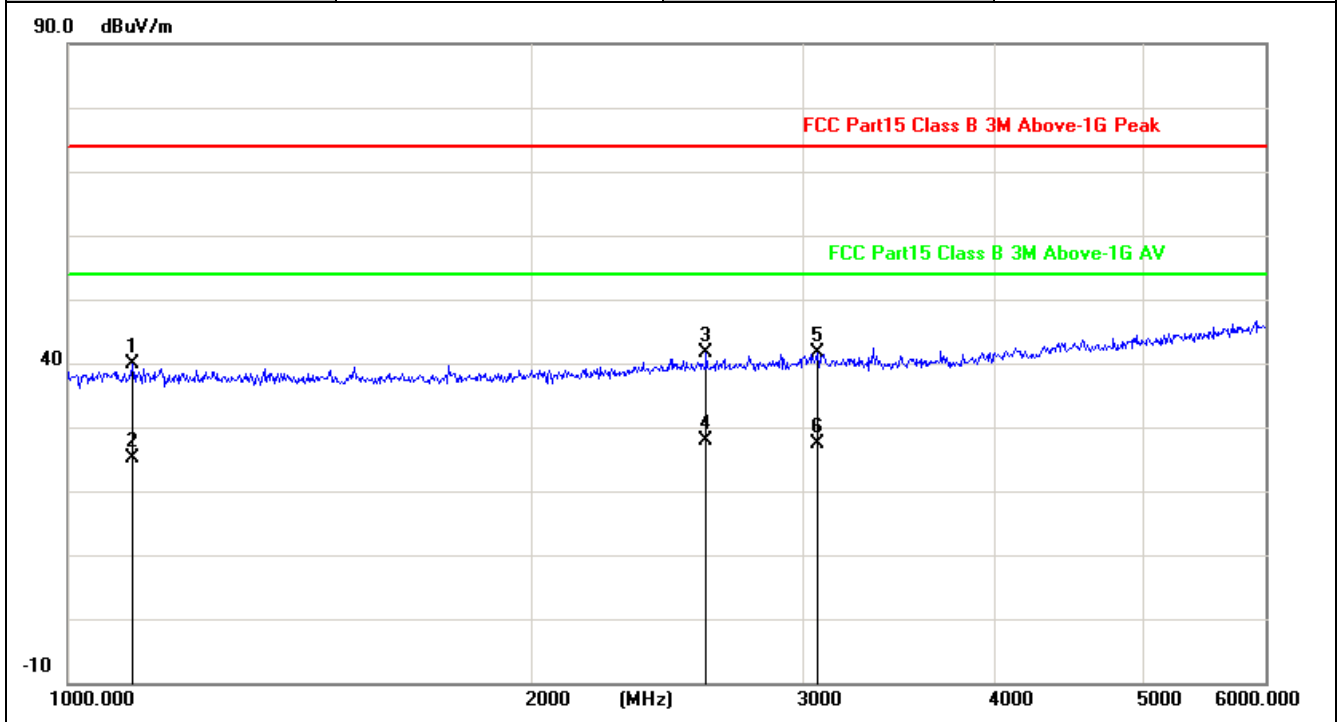
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.6385	-18.01	52.71	34.70	40.00	-5.30	QP
2	63.3132	-19.14	53.54	34.40	40.00	-5.60	QP
3	85.2980	-21.82	49.84	28.02	40.00	-11.98	QP
4	141.8262	-17.49	47.01	29.52	43.50	-13.98	QP
5	180.6488	-19.30	48.38	29.08	43.50	-14.42	QP
6	359.1860	-16.55	46.79	30.24	46.00	-15.76	QP

Remark:
 1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
 2. Margin value = Level -Limit value



1GHz-6GHz

Test mode	2	Polarization	Horizontal
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1101.590	-12.27	52.17	39.90	74.00	-34.10	peak
2	1101.590	-12.27	37.37	25.10	54.00	-28.90	AVG
3	2598.691	-7.39	49.01	41.62	74.00	-32.38	peak
4	2598.691	-7.39	35.19	27.80	54.00	-26.20	AVG
5	3069.889	-6.54	48.29	41.75	74.00	-32.25	peak
6	3069.889	-6.54	34.04	27.50	54.00	-26.50	AVG

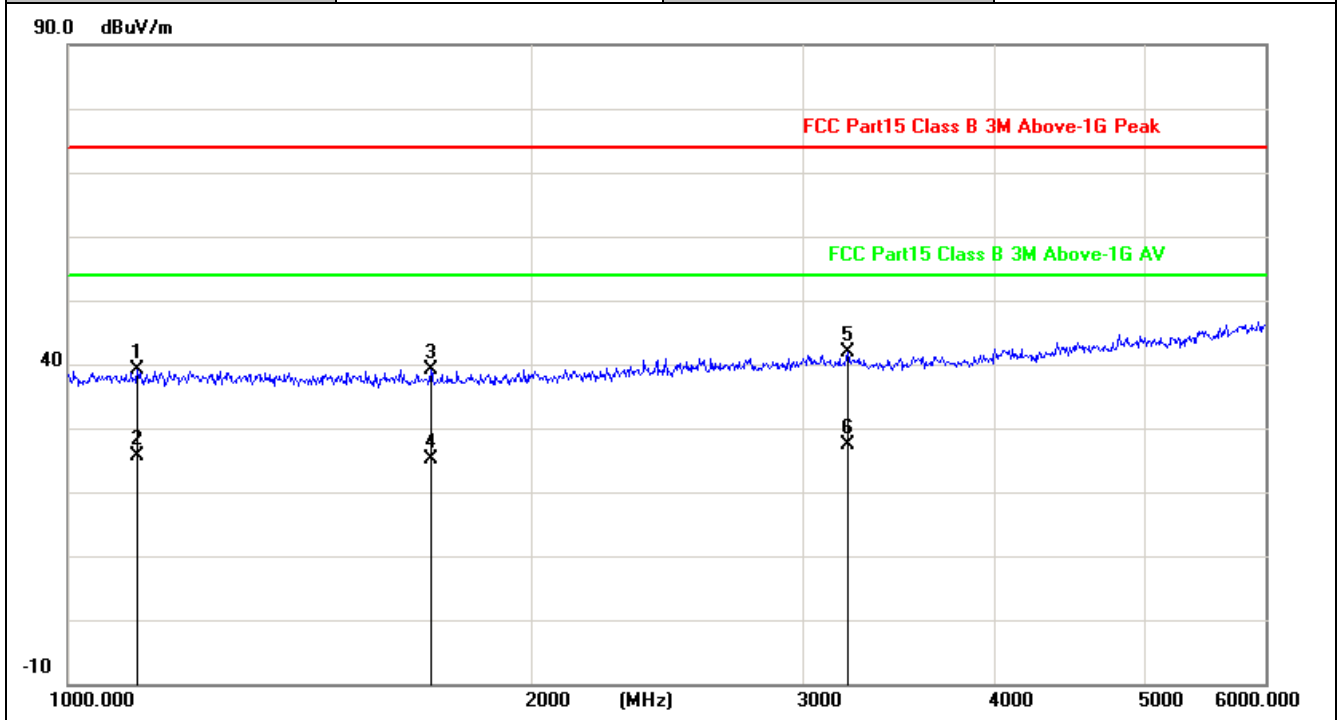
Remark:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value





Test mode	2	Polarization	Vertical
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1109.514	-12.27	51.40	39.13	74.00	-34.87	peak
2	1109.514	-12.27	37.97	25.70	54.00	-28.30	AVG
3	1720.996	-11.03	50.12	39.09	74.00	-34.91	peak
4	1720.996	-11.03	36.13	25.10	54.00	-28.90	AVG
5	3210.528	-6.53	48.50	41.97	74.00	-32.03	peak
6	3210.528	-6.53	33.83	27.30	54.00	-26.70	AVG

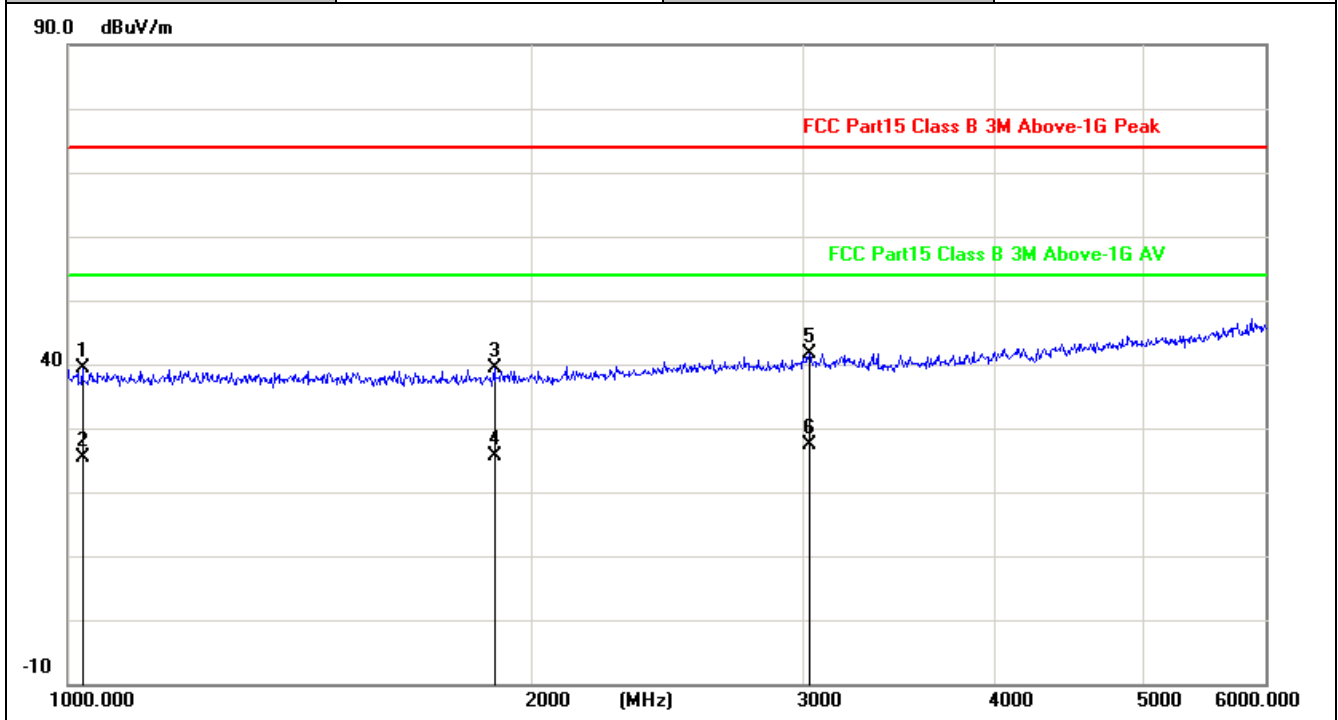
Remark:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value





Test mode	4	Polarization	Horizontal
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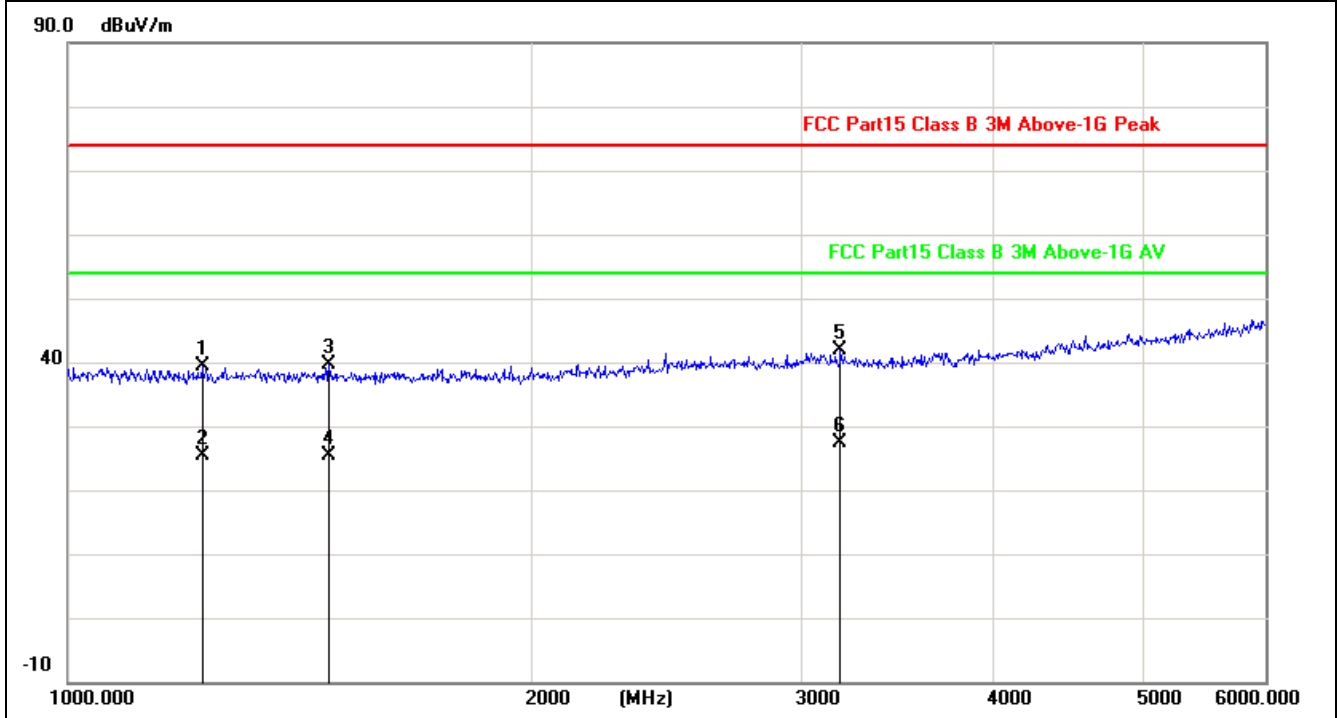
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1021.734	-12.41	51.88	39.47	74.00	-34.53	peak
2	1021.734	-12.41	37.71	25.30	54.00	-28.70	AVG
3	1892.439	-10.44	49.80	39.36	74.00	-34.64	peak
4	1892.439	-10.44	36.04	25.60	54.00	-28.40	AVG
5	3031.626	-6.53	48.12	41.59	74.00	-32.41	peak
6	3031.626	-6.53	33.93	27.40	54.00	-26.60	AVG

Remark:

- 1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2. Margin value = Level -Limit value



Test mode	4	Polarization	Vertical
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1222.230	-12.01	51.46	39.45	74.00	-34.55	peak
2	1222.230	-12.01	37.51	25.50	54.00	-28.50	AVG
3	1477.872	-11.19	50.76	39.57	74.00	-34.43	peak
4	1477.872	-11.19	36.49	25.30	54.00	-28.70	AVG
5	3176.198	-6.52	48.39	41.87	74.00	-32.13	peak
6	3176.198	-6.52	33.82	27.30	54.00	-26.70	AVG

Remark:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value

3.2. Conducted Emission (AC Mains)

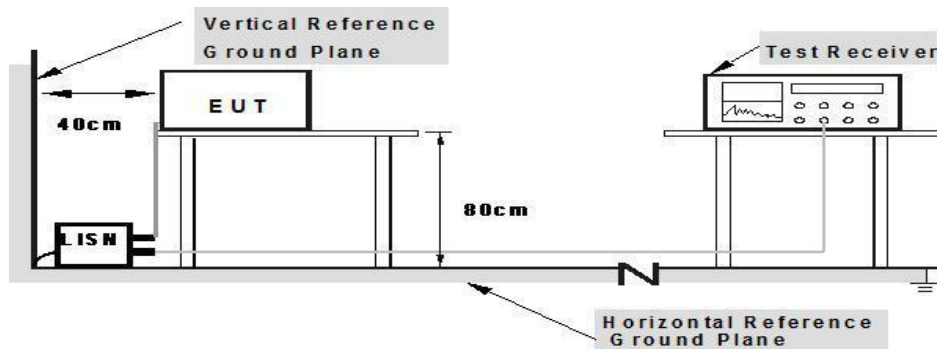
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.107/ ICES 003 Section 6.1:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



**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**

TEST PROCEDURE

1. The EUT was setup according to ANSI C63.4-2014.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

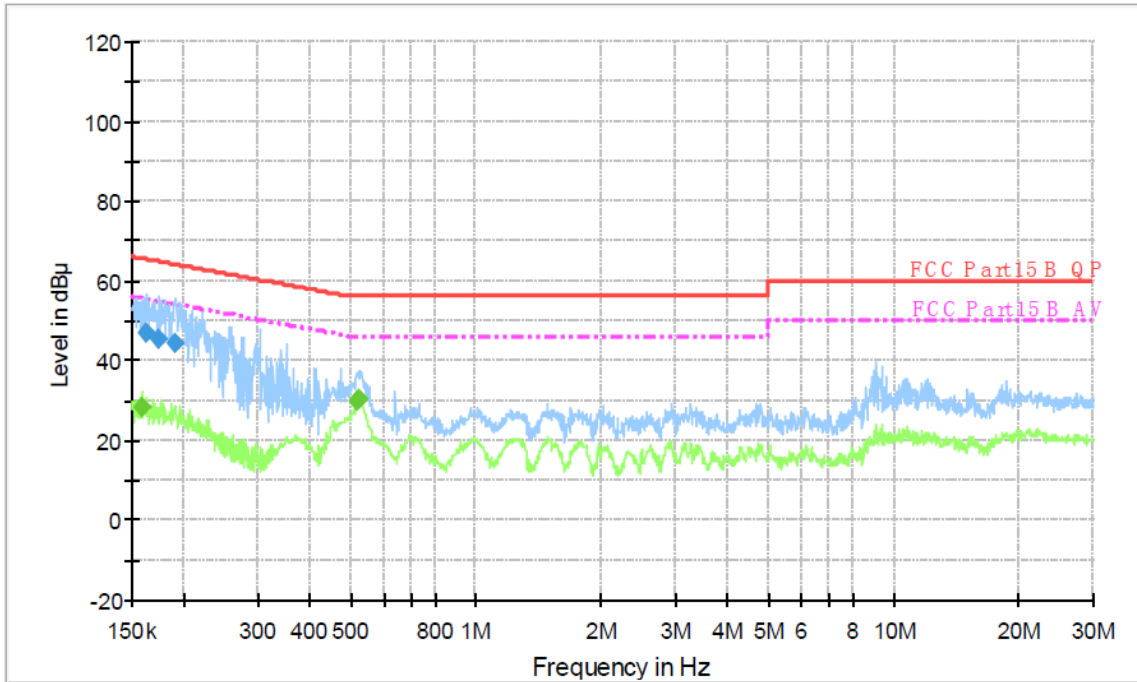
TEST MODE

Please refer to the clause 2.4

TEST RESULTS



Test mode	2	Terminal	Line
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Final Measurement Detector 1

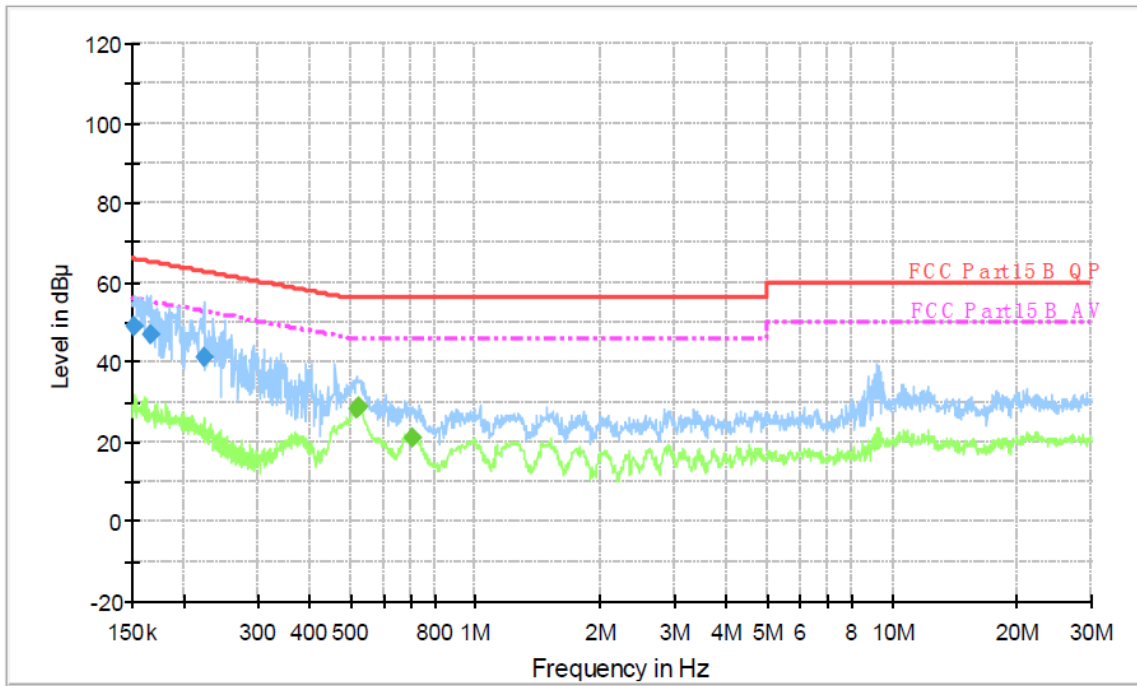
Frequency (MHz)	QuasiPeak (dBμ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.163124	47.0	1000.00	9.000	On	L1	10.1	18.3	65.3	
0.174236	45.5	1000.00	9.000	On	L1	10.1	19.3	64.8	
0.191191	44.0	1000.00	9.000	On	L1	10.1	20.0	64.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.158310	28.0	1000.00	9.000	On	L1	10.1	27.6	55.6	
0.518415	29.6	1000.00	9.000	On	L1	10.1	16.4	46.0	
0.526238	30.4	1000.00	9.000	On	L1	10.1	15.6	46.0	



Test mode	2	Terminal	Neutral
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Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.151808	48.9	1000.00	9.000	On	N	10.1	17.0	65.9	
0.166082	47.0	1000.00	9.000	On	N	10.1	18.2	65.2	
0.222748	41.4	1000.00	9.000	On	N	10.1	21.3	62.7	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)	Comment
0.518415	28.5	1000.00	9.000	On	N	10.1	17.5	46.0	
0.524664	28.9	1000.00	9.000	On	N	10.1	17.1	46.0	
0.705787	21.0	1000.00	9.000	On	N	10.1	25.0	46.0	

*****THE END*****