

**SGS-CSTC Standards
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Report No.: SHEMO10110145903
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TEST REPORT

Application No.: SHEMO10110145903
Applicant: Sierra Wireless Inc.
FCC ID: N7NAC319U
IC ID: 2417C-AC319U

Equipment Under Test (EUT):

NOTE: The following sample(s) submitted was/were identified on behalf of the client as

Product Name: USB Wireless Modem

Brand Name: **Sierra Wireless**

Model Name: AirCard 319U

Standards: FCC PART 15: 2009 Subpart B

Date of Receipt: Aug 25, 2010

Date of Test: Nov. 29, 2010

Date of Issue: Dec. 31, 2010

| | |
|----------------------|--------------|
| Test Result : | PASS* |
|----------------------|--------------|

* In the configuration tested, the EUT complied with the standards specified above.



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E&E Section Manager
SGS-CSTC(Shanghai) Co., Ltd.



Jim Xu
E&E Project Engineer
SGS-CSTC(Shanghai)Co.,Ltd

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2 Test Summary

| Test | Test Requirement | Test Method | Class / Severity | Result |
|------------------------------------|--------------------|------------------|------------------|--------|
| Radiated Emission 30MHz-1000MHz | CFR 47 Part 15.109 | ANSI C63.4: 2003 | Class B | PASS |
| Conducted Emission 150KHz-30MHz | CFR 47 Part 15.107 | ANSI C63.4: 2003 | Class B | PASS |

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4 General Information

4.1 Client Information

Applicant: Sierra Wireless Inc.
Address of Applicant: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.
Manufacturer: Sierra Wireless Inc.
Address of Manufacturer: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.

4.2 General Description of E.U.T.

Product Name: AirCard 319U
Brand Name: **Sierra Wireless**
Support Frequency Band: GSM 850/900/1800/1900, WCDMA Band I/II/V/VIII
Test Frequency Bands: GSM 850/1900, WCDMA Band II/V
Hardware Version: V1.0
Software Version: T2.0.1.0
IMEI: 354089040000312

4.3 Details of E.U.T.

Power Supply: 5VDC (USB port supply)

4.4 Details of support units

| Name / Function | Model No. | Remark |
|------------------------|------------------|---------------|
| Laptop | ThinkPad X100e | N/A |
| AC Adapter | Lenovo 65W 20V | N/A |
| Mouse | Lenovo M-UAE119 | N/A |

4.5 Standards Applicable for Testing

The standards used were CFR 47 Part 15B:

Table 1 : Tests Carried Out Under CFR 47 Part 15B :

| Standard | | Status |
|-----------------------|--------------------|---------------|
| FCC Part 15 Subpart B | Radiated Emission | √ |
| FCC Part 15 Subpart B | Conducted Emission | √ |

× Indicates that the test is not applicable
√ Indicates that the test is applicable

4.6 Test Location

All the tests were performance at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

4.7 Test Confident level

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

4.8 Measurement Uncertainty

According to CISPR 16-4-2.

| Test Item | Frequency Range | Measurement Uncertainty |
|--------------------|------------------------|--------------------------------|
| Conducted Emission | 150KHz – 30MHz | 3.5dB |
| Radiated Emission | 30MHz – 1000MHz | 4.0dB |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Equipment Used during Test

Radiated Emission

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal.Due date |
|------|--------------------------------------|-----------------|-------------|------------|------------|--------------|
| 1 | EMI test receiver | Rohde & Schwarz | ESU40 | 100109 | 2010-06-03 | 2011-06-02 |
| 2 | ANTENNA | SCHWARZBECK | VULB9168 | 9168-313 | 2010-06-03 | 2011-06-02 |
| 3 | ANTENNA | SCHWARZBECK | BBHA9120D | 9120D-679 | 2010-06-03 | 2011-06-02 |
| 4 | ANTENNA | SCHWARZBECK | BBHA9170 | 9170-373 | 2010-06-03 | 2011-06-02 |
| 5 | TURNTABLE | INNCO | DS 2000S-1T | / | / | / |
| 6 | UNIVERSAL RADIO COMMUNICATION TESTER | Rohde & Schwarz | CMU 200 | 112012 | 2010-08-25 | 2011-08-24 |

Conducted Emission

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due date |
|------|--------------------------------------|-----------------|-----------|------------|------------|---------------|
| 1 | EMI test receiver | Rohde & Schwarz | ESCS30 | 100086 | 2010-06-04 | 2011-06-03 |
| 2 | Line impedance stabilization network | SCHWARZBECK | NSLK8127 | 8127-490 | 2010-05-07 | 2011-05-06 |
| 4 | UNIVERSAL RADIO COMMUNICATION TESTER | Rohde & Schwarz | CMU 200 | 112012 | 2010-08-25 | 2011-08-24 |

General Equipment

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal.Due date |
|------|--------------------------------|--------------------------------------|-----------|------------|------------|--------------|
| 1 | Atmosphere pressure meter | Shanghai ZhongXuan Electronic Co;Ltd | BY-2003P | / | 2010-10-15 | 2011-10-14 |
| 2 | Digital Multimeter | FLUKE | 17B | 10560713 | 2010-09-16 | 2011-09-15 |
| 3 | Temperature& humidity recorder | ShangHai weather meter work | ZJ 1-2B | 0804181 | 2010-07-22 | 2011-07-21 |
| 4 | Digital illuminance meter | TES electrical electronic Corp. | TES-1330A | 050602219 | 2010-10-16 | 2011-10-15 |

6 Emission Test Results

6.1 Radiated Emissions

Test Requirement: CFR 47 Part 15.109
Test Method: ANSI C63.4:2003
Test Date: Nov. 29, 2010
Frequency Range: 30MHz to 1GHz
Measurement Distance: 3m
Class: Class B
Detector: Peak for pre-scan (120kHz resolution bandwidth)
Result: **PASS**

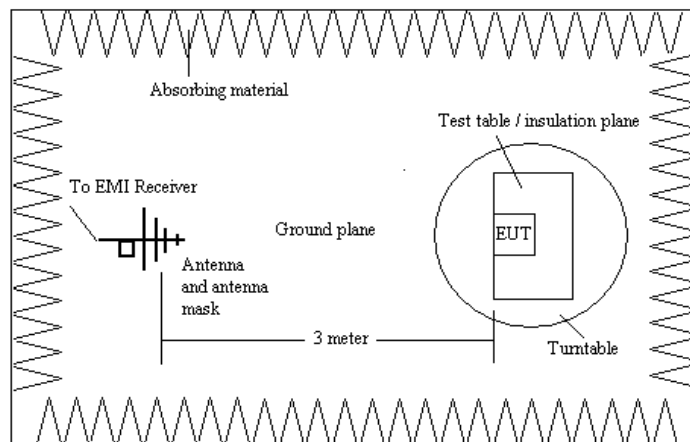
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0°C Humidity: 48 % RH Atmospheric Pressure: 1012 mbar

EUT Operation: Test EUT connected with laptop in GSM 850/1900, WCDMA Band II/V idle mode and memory card mode.

6.1.2 Test setup:



Note: All test modes have been tested.

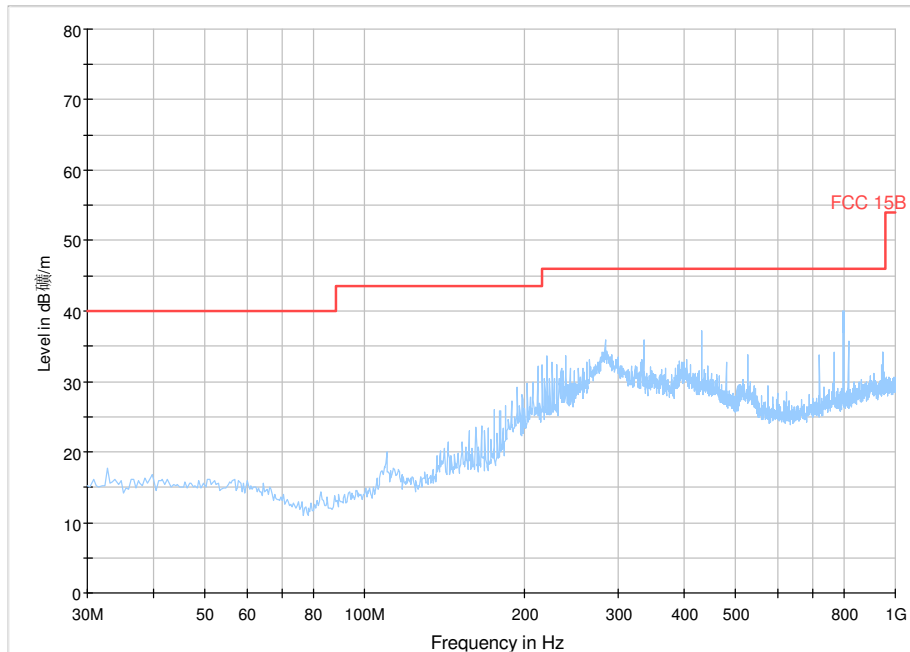
Below is the worst case for idel mode and memory card mode.

6.1.3 Measurement Data:

Note: Red limit line - Quasi-peak limit;
Blue plots - Peak detector scan plots.

Test in idle mode.

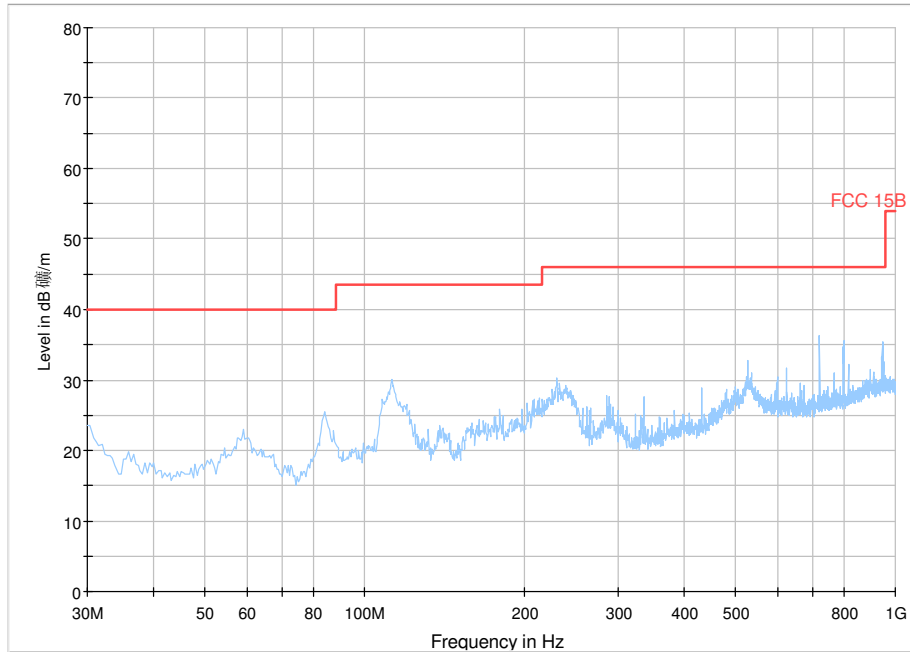
Horizontal(30MHz -1GHz)



| Frequency (MHz) | Actual Level QP (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|--------------------|--------------------------------|-------------------|----------------|
| 30.00 | * | 40.0 | * |
| 100.00 | * | 43.5 | * |
| 160.00 | * | 43.5 | * |
| 200.00 | * | 43.5 | * |
| 800.00 | * | 46.0 | * |
| 1000.00 | * | 54.0 | * |

“*” means the emission level is 6dB lower than the relevant limit.

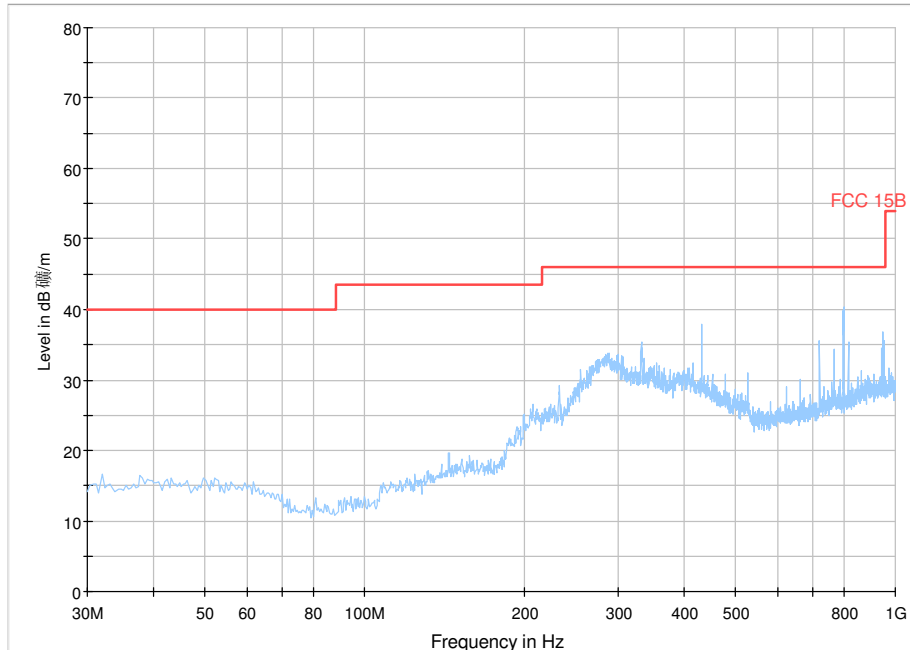
Vertical (30MHz -1GHz):



| Frequency (MHz) | Actual Level QP (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|--------------------|--------------------------------|-------------------|----------------|
| 30.00 | * | 40.0 | * |
| 100.00 | * | 43.5 | * |
| 160.00 | * | 43.5 | * |
| 200.00 | * | 43.5 | * |
| 800.00 | * | 46.0 | * |
| 1000.00 | * | 54.0 | * |

“*” means the emission level is 6dB lower than the relevant limit.

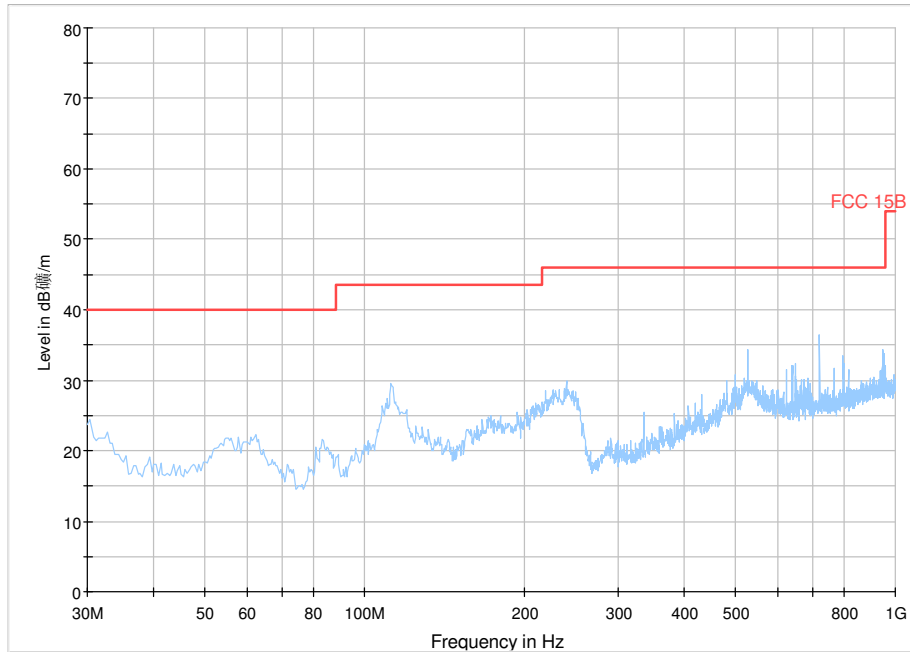
Test in Memory Card mode.
Horizontal(30MHz -1GHz)



| Frequency (MHz) | Actual Level QP (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|--------------------|--------------------------------|-------------------|----------------|
| 30.00 | * | 40.0 | * |
| 100.00 | * | 43.5 | * |
| 160.00 | * | 43.5 | * |
| 200.00 | * | 43.5 | * |
| 800.00 | * | 46.0 | * |
| 1000.00 | * | 54.0 | * |

“*” means the emission level is 6dB lower than the relevant limit.

Vertical (30MHz -1GHz):



| Frequency (MHz) | Actual Level QP (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|--------------------|--------------------------------|-------------------|----------------|
| 30.00 | * | 40.0 | * |
| 100.00 | * | 43.5 | * |
| 160.00 | * | 43.5 | * |
| 200.00 | * | 43.5 | * |
| 800.00 | * | 46.0 | * |
| 1000.00 | * | 54.0 | * |

“*” means the emission level is 6dB lower than the relevant limit.

6.2 Conducted Emissions

Test Requirement: CFR 47 part 15.107
Test Method: ANSI C63.4:2003
Test Date: Sep 06, 2010
Frequency Range: 150kHz to 30MHz
Class: Class B
Limit:

| Frequency of Emission (MHz) | Conducted Limit (dBμV) | |
|-----------------------------|------------------------|-----------------------|
| | 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.

Result: **PASS**

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0°C Humidity: 45% RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test EUT connected with laptop in GSM 850/1900, WCDMA Band II/V
idle mode and memory card mode.

6.2.2 Test Result and Measurement Data

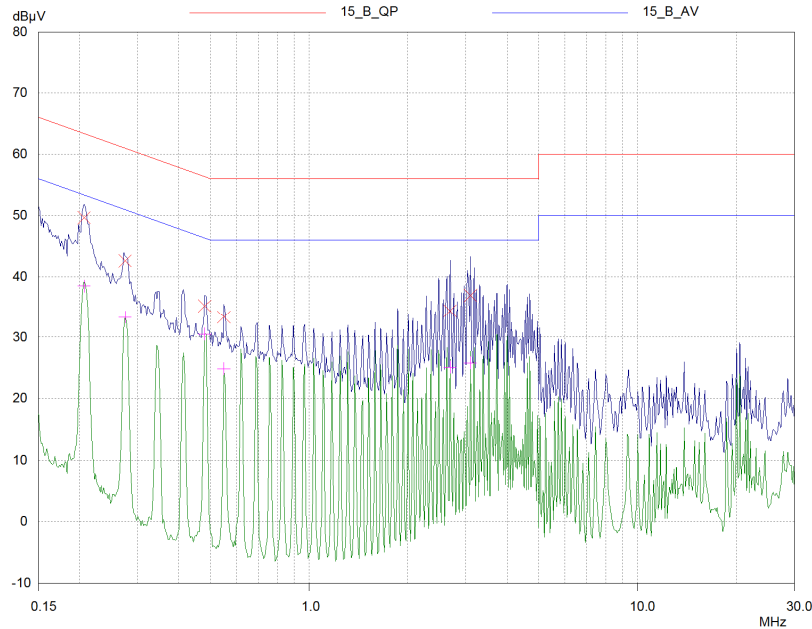
Note: All test modes have been tested.

Below is the worst case for idel mode and memory card mode.

Note: Blue limit line - AV limit, Red limit line - Quasi-peak limit;
Blue plots - Peak detector scan plots, Green plots - AV detector scan plots.

Test in idle mode.

L Line(for the adapter of the laptop):

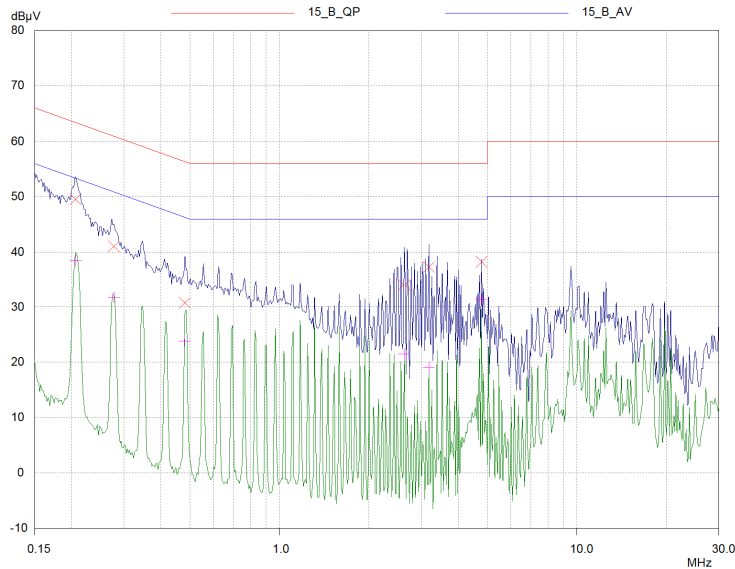


Final Measurement Results

| Frequency MHz | QP Level dBμV | QP Limit dBμV | QP Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 49.62 | 63.35 | 13.73 |
| 0.27484 | 42.59 | 60.97 | 18.38 |
| 0.48009 | 35.18 | 56.34 | 21.16 |
| 0.54974 | 33.31 | 56.00 | 22.69 |
| 2.68413 | 34.35 | 56.00 | 21.65 |
| 3.09808 | 36.95 | 56.00 | 19.05 |

| Frequency MHz | AV Level dBμV | AV Limit dBμV | AV Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 38.46 | 53.35 | 14.89 |
| 0.27484 | 33.28 | 50.97 | 17.69 |
| 0.48009 | 30.52 | 46.34 | 15.82 |
| 0.54974 | 24.85 | 46.00 | 21.15 |
| 2.68413 | 25.10 | 46.00 | 20.90 |
| 3.09808 | 25.78 | 46.00 | 20.22 |

N Line(for the adapter of the laptop):



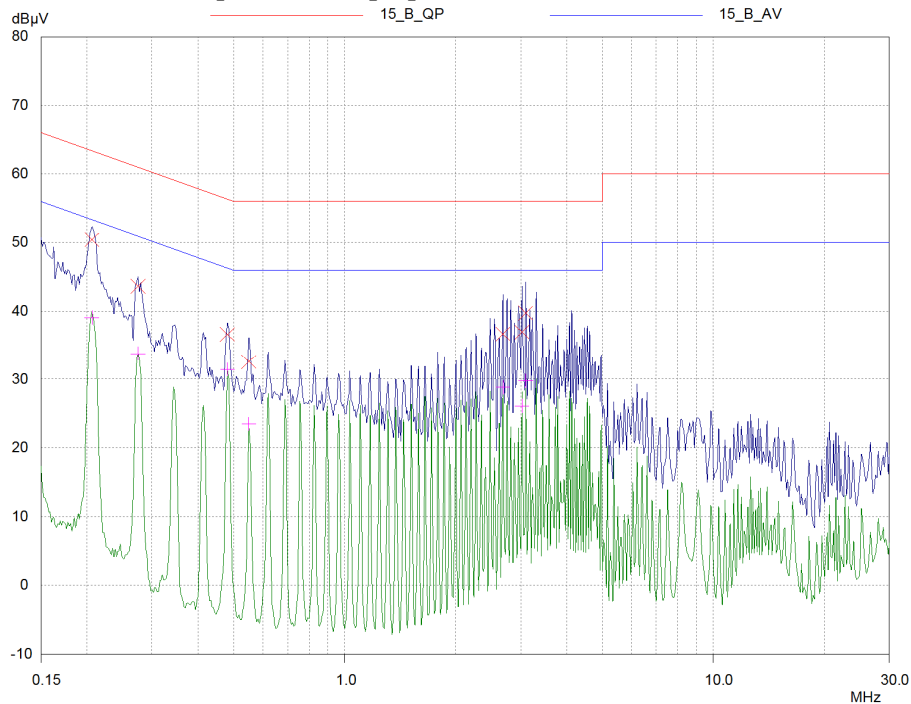
Final Measurement Results

| Frequency MHz | QP Level dBμV | QP Limit dBμV | QP Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 49.56 | 63.35 | 13.79 |
| 0.27704 | 41.09 | 60.90 | 19.81 |
| 0.48009 | 30.72 | 56.34 | 25.62 |
| 2.62073 | 34.07 | 56.00 | 21.93 |
| 3.17303 | 37.35 | 56.00 | 18.65 |
| 4.76389 | 38.29 | 56.00 | 17.71 |

| Frequency MHz | AV Level dBμV | AV Limit dBμV | AV Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 38.52 | 53.35 | 14.83 |
| 0.27704 | 31.66 | 50.90 | 19.24 |
| 0.48009 | 23.80 | 46.34 | 22.54 |
| 2.62073 | 21.46 | 46.00 | 24.54 |
| 3.17303 | 19.08 | 46.00 | 26.92 |
| 4.76389 | 31.31 | 46.00 | 14.69 |

Test in Memory Card mode.

L Line(for the adapter of the laptop):



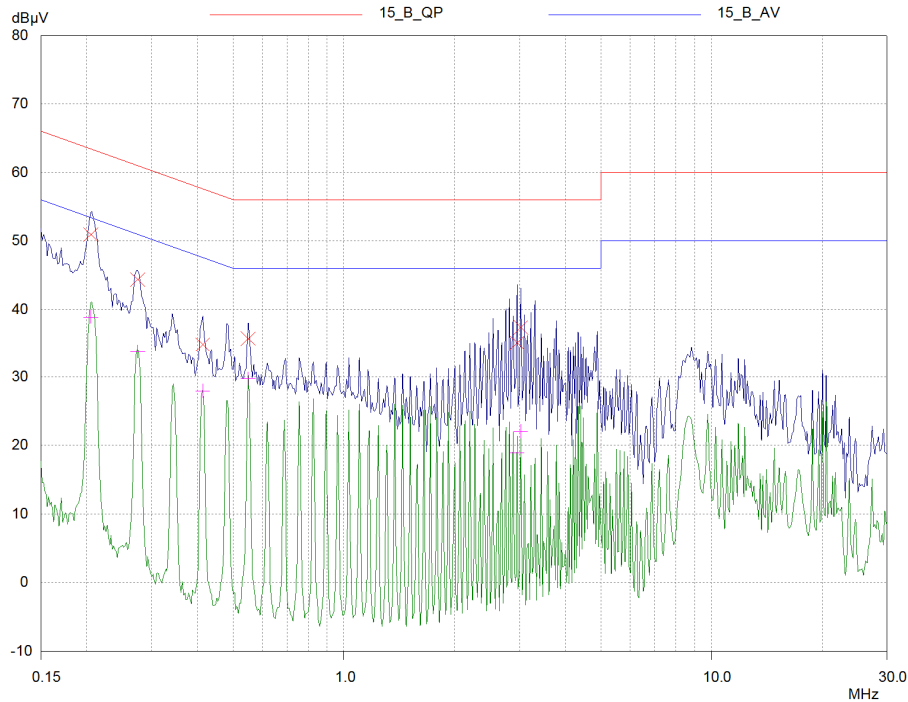
Final Measurement Results

| Frequency MHz | QP Level dBμV | QP Limit dBμV | QP Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 50.48 | 63.35 | 12.87 |
| 0.27484 | 43.65 | 60.97 | 17.32 |
| 0.48009 | 36.64 | 56.34 | 19.70 |
| 0.54974 | 32.61 | 56.00 | 23.39 |
| 2.68413 | 36.69 | 56.00 | 19.31 |
| 3.0249 | 36.99 | 56.00 | 19.01 |
| 3.09808 | 39.79 | 56.00 | 16.21 |

| Frequency MHz | AV Level dBμV | AV Limit dBμV | AV Delta dB |
|------------------|------------------|------------------|----------------|
| 0.2063 | 39.09 | 53.35 | 14.26 |
| 0.27484 | 33.76 | 50.97 | 17.21 |
| 0.48009 | 31.49 | 46.34 | 14.85 |
| 0.54974 | 23.51 | 46.00 | 22.49 |
| 2.68413 | 28.81 | 46.00 | 17.19 |
| 3.0249 | 26.12 | 46.00 | 19.88 |
| 3.09808 | 29.75 | 46.00 | 16.25 |

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N Line(for the adapter of the laptop):



Final Measurement Results

| Frequency MHz | QP Level dBμV | QP Limit dBμV | QP Delta dB |
|------------------|------------------|------------------|----------------|
| 0.20466 | 50.90 | 63.42 | 12.52 |
| 0.27484 | 44.33 | 60.97 | 16.64 |
| 0.41264 | 34.84 | 57.59 | 22.75 |
| 0.54974 | 35.71 | 56.00 | 20.29 |
| 2.95345 | 35.11 | 56.00 | 20.89 |
| 3.0249 | 37.33 | 56.00 | 18.67 |

| Frequency MHz | AV Level dBμV | AV Limit dBμV | AV Delta dB |
|------------------|------------------|------------------|----------------|
| 0.20466 | 38.89 | 53.42 | 14.53 |
| 0.27484 | 33.71 | 50.97 | 17.26 |
| 0.41264 | 27.94 | 47.59 | 19.65 |
| 0.54974 | 29.75 | 46.00 | 16.25 |
| 2.95345 | 18.96 | 46.00 | 27.04 |
| 3.0249 | 22.06 | 46.00 | 23.94 |