

SZCCS-TRF-01 Rev. A/0 Aug01,2022

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# TEST REPORT

| Application No.:          | FYCR2210000409AT  |
|---------------------------|---|
| Applicant:                | Spigen Korea Co., Ltd.  |
| Address of Applicant:     | Spigen HQ-A, 446, Bongeunsa-ro, Gangnam-gu, Seoul, 06153, South Korea   |
| Manufacturer:             | Shenzhen Wireless Technology Co., Ltd.  |
| Address of Manufacturer:  | Floor 2,3,4 building A4, Fangxing Science and Technology park, NO.13 Baonan Road, Longgang street, Longgang District          |
| Factory:                  | Shenzhen Wireless Technology Co., Ltd.  |
| Address of Factory:       | Floor 2,3,4 building A4, Fangxing Science and Technology park, NO.13 Baonan Road, Longgang street, Longgang District          |
| Equipment Under Test (EUT | ):  |
| EUT Name:                 | * ITS12W Spigen OneTap Pro Wireless Car Charger   |
|                           | *ITS35W Spigen OneTap Pro Wireless Car Charger  |
|                           | *S310W Spigen OneTap Pro Wireless Magnetic Charging Stand   |
|                           | *ITS68W   |
|                           | Spigen OneTap Pro Wireless Car Charger for iPhone MagSafe Cup Holder<br>Mount   |
|                           | *ITT90W   |
|                           | Spigen OneTap Pro Wireless Car Charger for Tesla (Screen Mount)<br>*ITS35W-3  |
|                           | Spigen OneTap Pro 3 Wireless Car Charger Dashboard  |
| Model No.:                | ITS12W/ITS35W/S310W/ITS68W/ITT90W/ITS35W-3  |
| *                         | Please refer to section 2 of this report which indicates which model was actual tested and which were electrically identical. |
| Trade Mark:               | Spigen  |
| FCC ID:                   | 2AFKNITS12W   |
| Standard(s) :             | 47 CFR Part 15, Subpart C   |
| Date of Receipt:          | 2022-10-20  |
| Date of Test:             | 2023-02-07 to 2023-02-20  |
| Date of Issue:            | 2023-02-21  |
| Test Result:              | Pass*   |

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

WinkeyWang

Winkey Wang EMC Technical Manager



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|         | Revision Record |            |          |          |  |  |
|---------|-----------------|------------|----------|----------|--|--|
| Version | Chapter         | Date       | Modifier | Remark   |  |  |
| 01      |                 | 2023-02-21 |          | Original |  |  |
|         |                 |            |          |          |  |  |
|         |                 |            |          |          |  |  |

| Authorized for issue by: |                            |   |  |
|--------------------------|----------------------------|---|--|
|                          | Gree Zhan                  |   |  |
|                          | Tree Zhan/Project Engineer | _ |  |
|                          | WinkeyWang                 |   |  |
|                          | Winkey Wang/Reviewer       | - |  |



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 88663988
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 (86–755)
 26710594
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 (86–755)
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## 2 Test Summary

| Radio Spectrum Matter Part         |                 |                                   |  |        |  |
|------------------------------------|-----------------|-----------------------------------|--|--------|--|
| Item                               | Standard        | Method                            | Requirement                                  | Result |  |
| Radiated Emissions<br>(30MHz-1GHz) | 47 CFR Part 15, | ANSI C63.10 (2013)<br>Section 6.5 | 47 CFR Part 15, Subpart<br>C 15.205 & 15.209 | Pass   |  |
| Radiated Emissions<br>(9kHz-30MHz) | Subpart C       | ANSI C63.10 (2013)<br>Section 6.4 | 47 CFR Part 15, Subpart<br>C 15.205 & 15.209 | Pass   |  |

#### Remark:

Model No.: ITS12W/ITS35W/S310W/ITS68W/ITT90W/ITS35W-3

Only the model ITS35W-3 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on back shell and accessories material quality.

This test report (Ref. No.: FYCR22100004091) is only valid with the original certificate FCC ID: 2AFKNITS12W

Considering to the difference, pre-scans were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore the test item in this report of section 2 was fully retested on model ITS35W-3 and shown the data in this report, other tests please refer to original certificate FCC ID: 2AFKNITS12W



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## 4 General Information

#### 4.1 Details of E.U.T.

| Power supply:        | Input: DC5.0V/2A, DC9.0V/1.67V |
|----------------------|--------------------------------|
|                      | Output: WPC: 5W/7.5W           |
| Cable(s):            | Type-C cable: 113cm unshielded |
| Operation frequency: | 110.1kHz to 150.16kHz          |
| Modulation type:     | Load modulation                |
| Antenna type:        | Loop Antenna                   |

Remark: The information in this section is provided by the applicant or manufacturer, CCS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

#### 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No.        |
|-------------|--------------|-----------|-------------------|
| Adapter     | Apple        | A2167     | REF. No.SEA05B04D |
| iPhone 12   | Apple        | MGGU3CH/A | N/A               |

#### 4.3 Measurement Uncertainty

| Test Item                       | Measurement Uncertainty |
|---------------------------------|-------------------------|
| Radiated Emissions (30MHz-1GHz) | ± 5.6dB                 |
| Radiated Emissions (9kHz-30MHz) | ± 2.7dB                 |



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#### 4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark, Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China Tel: +86 755 8866 3988 Fax: +86 755 2671 0594 No tests were sub-contracted.

#### 4.5 Test Facility

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

#### A2LA (Certificate No. 6606.01)

Compliance Certification Services (Kunshan) Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

#### FCC – Designation Number: CN1322

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

#### Innovation, Science and Economic Development Canada

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

4.6 Deviation from Standards

#### None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

| Radiated Emissions (30MHz-1GHz) |                 |                     |               |           |              |
|---------------------------------|-----------------|---------------------|---------------|-----------|--------------|
| Equipment                       | Manufacturer    | Model No.           | Inventory No. | Cal Date  | Cal Due Date |
| 3m Anechoic Chamber             | CRT             | N/A                 | SEM001-13     | 2021/7/13 | 2024/7/12    |
| MXE EMI receiver                | Agilent         | N9038A              | SEM004-05     | 2022/7/12 | 2023/7/11    |
| Broad-Band Horn<br>Antenna      | Schwarzbeck     | BBHA 9170           | SEM003-15     | 2021/7/11 | 2024/7/10    |
| Broad-Band Horn<br>Antenna      | Schwarzbeck     | BBHA 9120D          | SEM003-32     | 2021/9/26 | 2024/9/25    |
| Double-ridged<br>waveguide horn | ETS-LINDGREN    | 3117                | SEM003-34     | 2021/9/25 | 2024/9/24    |
| MXA Signal Analyzer             | KEYSIGHT        | N9020A              | SEM004-23     | 2022/4/24 | 2023/4/23    |
| Pre-amplifier                   | Rohde & Schwarz | CH14-H052           | SEM005-17     | 2022/7/12 | 2023/7/11    |
| Measurement software            | AUDIX           | e3 V8.2014-6-<br>27 | N/A           | N/A       | N/A          |

| Radiated Emissions (9kHz-30MHz) |              |                     |               |           |              |
|---------------------------------|--------------|---------------------|---------------|-----------|--------------|
| Equipment                       | Manufacturer | Model No.           | Inventory No. | Cal Date  | Cal Due Date |
| 3m Anechoic Chamber             | CRT          | N/A                 | SEM001-13     | 2021/7/13 | 2024/7/12    |
| Loop Antenna                    | ETS-LINDGREN | 6502                | SEM003-36     | 2021/9/26 | 2024/9/25    |
| MXE EMI receiver                | Agilent      | N9038A              | SEM004-05     | 2022/7/12 | 2023/7/11    |
| Measurement software            | AUDIX        | e3 V8.2014-6-<br>27 | N/A           | N/A       | N/A          |

| General used equipment             | t            |           |               |           |              |
|------------------------------------|--------------|-----------|---------------|-----------|--------------|
| Equipment                          | Manufacturer | Model No. | Inventory No. | Cal Date  | Cal Due Date |
| Humidity/ Temperature<br>Indicator | Mingle       | TH607     | SEM002-22     | 2022/7/12 | 2023/7/11    |
| Humidity/ Temperature<br>Indicator | Mingle       | TH607     | SEM002-23     | 2022/7/12 | 2023/7/11    |
| Barometer                          | DUMAI        | DYM3      | SEM002-24     | 2022/7/12 | 2023/7/11    |



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## 6 Radio Spectrum Matter Test Results

#### 6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement47 CFR Part 15, Subpart C 15.205 & 15.209Test Method:ANSI C63.10 (2013) Section 6.5Measurement Distance:3m

Limit:

| Frequency(MHz)  | Field<br>strength(microvolts/meter) | Measurement<br>distance(meters) |  |  |
|---|-------------------------------------|---------------------------------|--|--|
| 30-88   | 100                                 | 3                               |  |  |
| 88-216  | 150                                 | 3                               |  |  |
| 216-960   | 200                                 | 3                               |  |  |
| Above 960   | 500                                 | 3                               |  |  |
| Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector. |                                     |                                 |  |  |

#### 6.1.1 E.U.T. Operation

Operating Environment: Temperature: 23.8 °C Humidity: 56.8 % RH Atmospheric Pressure: 1020 mbar

#### 6.1.2 Test Mode Description

| Pre-scan /<br>Final test | Mode<br>Code | Description                             |
|--------------------------|--------------|---|
| Final test               | 00           | Charge mode_Keep the EUT charging(5W)   |
| Final test               | 01           | Charge mode_Keep the EUT charging(7.5W) |



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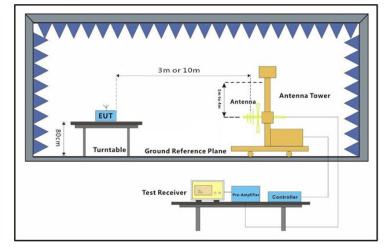
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#### 6.1.3 Test Setup Diagram



#### 6.1.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.

i. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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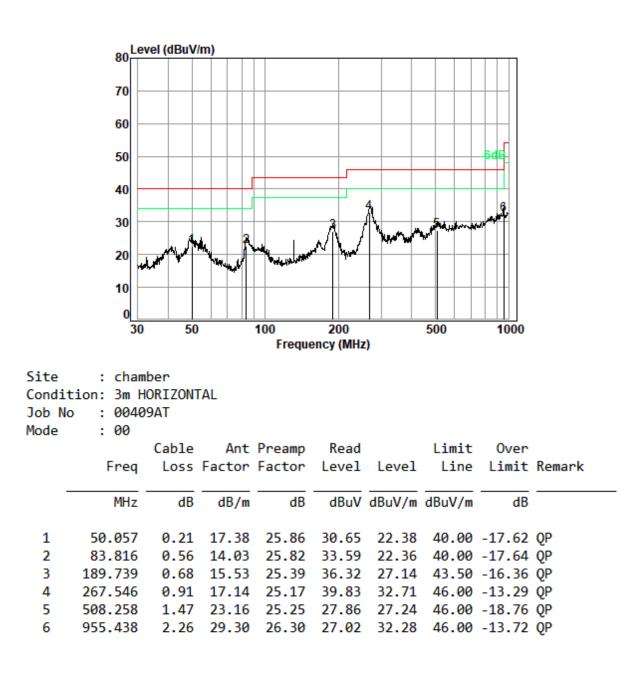
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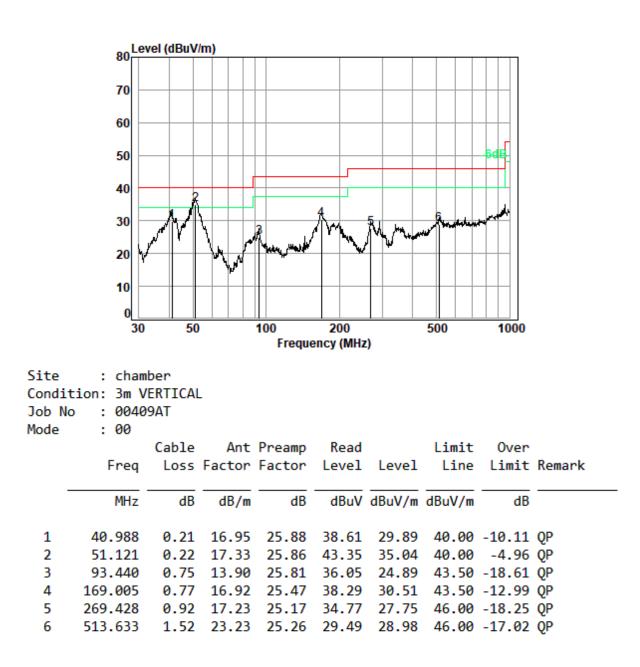
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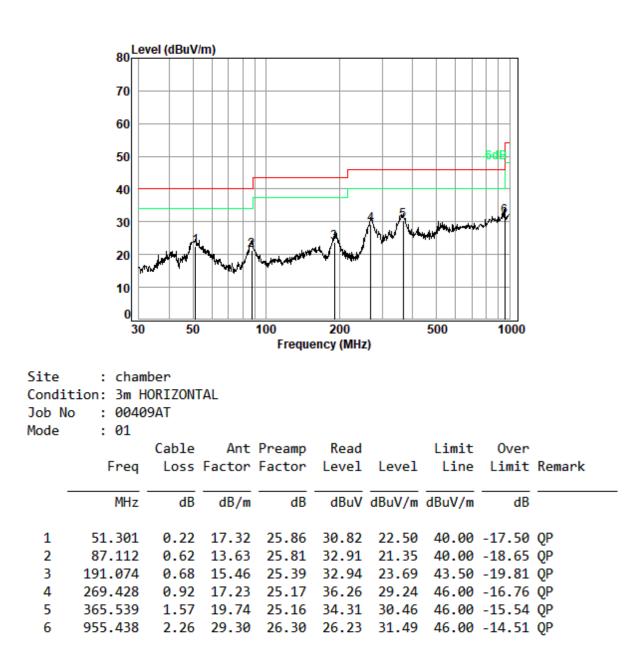
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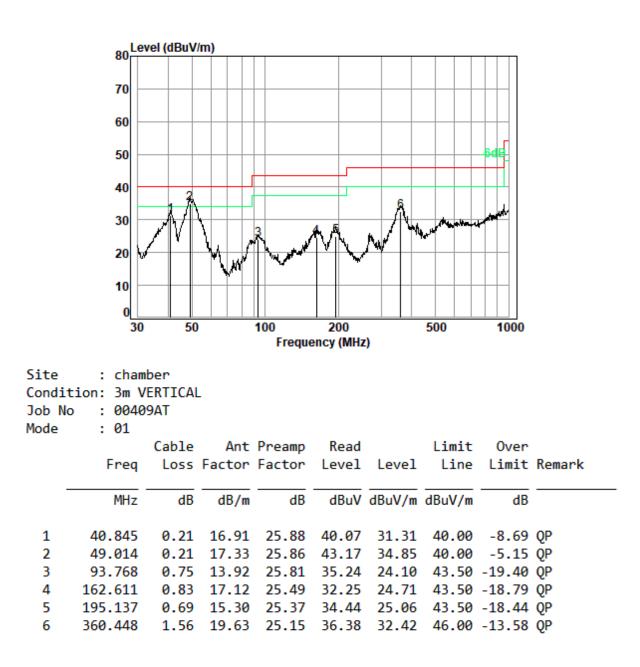
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#### 6.2 Radiated Emissions (9kHz-30MHz)

| Test Requirement      | 47 CFR Part 15, Subpart C 15.205 & 15.209 |
|-----------------------|---|
| Test Method:          | ANSI C63.10 (2013) Section 6.4            |
| Measurement Distance: | 3m  |

Limit:

| Frequency(MHz)  | Field strength(microvolts/meter) | Measurement distance(meters) |  |  |  |  |
|---|----------------------------------|------------------------------|--|--|--|--|
| 0.009-0.490   | 2400/F(kHz)                      | 300                          |  |  |  |  |
| 0.490-1.705   | 24000/F(kHz)                     | 30                           |  |  |  |  |
| 1.705-30.0  | 30                               | 30                           |  |  |  |  |
| Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. |                                  |                              |  |  |  |  |

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

(2)

 $FS_{(10m)} = FS_{(30/300m)} + 40log\{d_{(near \ field)}/d_{(10m)}\} + 20log\{d_{(30/300m)}/d_{(near \ field)}\}$ 

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20log\{d_{(30/300m)}/d_{(10m)}\}$$
(3)

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\}$$
(4)

Remark:

 $d_{\text{near field}} = 47.77 \ / \ f_{\text{MHz}}$  where  $f_{\text{MHz}}$  is the frequency of the emission being measured in MHz.



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#### 6.2.1 E.U.T. Operation

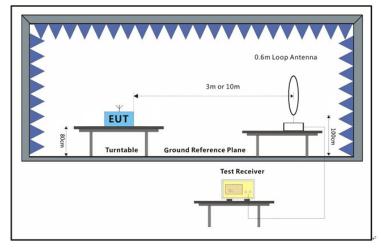
| Operating Environment: |
|------------------------|
|------------------------|

Temperature: 23.4 °C Humidity: 56.2 % RH Atmospheric Pressure: 1020 mbar

#### 6.2.2 Test Mode Description

| Pre-scan /<br>Final test | Mode<br>Code | Description                             |
|--------------------------|--------------|---|
| Final test               | 00           | Charge mode_Keep the EUT charging(5W)   |
| Final test               | 01           | Charge mode_Keep the EUT charging(7.5W) |

#### 6.2.3 Test Setup Diagram



#### 6.2.4 Measurement Procedure and Data

a. All radiated emission measurements in terms of magnetic field strength shall be performed with a shielded loop antenna.

b. For all radiated emission measurements in terms of magnetic field strength, the loop antenna were placed such that:

i. its centre shall be at 1.3 m height above the ground plane;

ii. the projection of its centre onto the ground plane shall be at the specified measurement distance from the projection on the ground plane of the closest point on the boundary of the equipment under test (EUT); and

iii. measurements shall be performed with the loop antenna placed vertically, in turn, in two polarizations (the measurement axis specified below is the line segment connecting the projections on the ground plane of the centre of the loop antenna and the centre of the EUT arrangement):

· coaxial (loop plane perpendicular to the ground plane and to the measurement axis); and

· coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis).



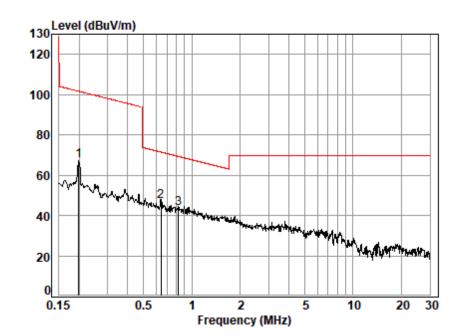
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| Site :     | chamber |
|------------|---------|
| Condition: | 3m      |
| Job No. :  | 00409AT |
| Test Mode: | 00      |

|        | Freq  |      |       | Preamp<br>Factor |       |        |        |        | Remark |
|--------|-------|------|-------|------------------|-------|--------|--------|--------|--------|
|        | MHz   | dB   | dB/m  | dB               | dBuV  | dBuV/m | dBuV/m | dB     |        |
| 1<br>2 | 0.644 | 0.38 | 10.29 | 31.82            | 67.91 | 46.76  | 71.43  | -24.67 | -      |
| 3      | 0.826 | 0.33 | 10.29 | 31.81            | 64.67 | 43.48  | 69.26  | -25./8 | QP     |



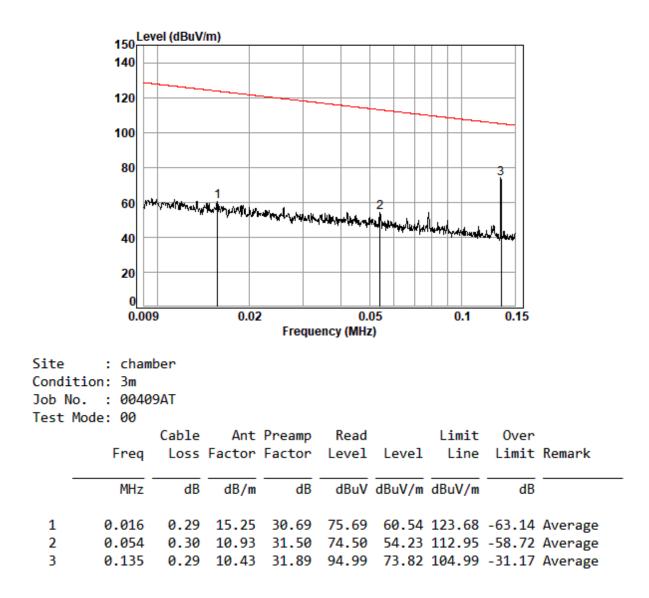
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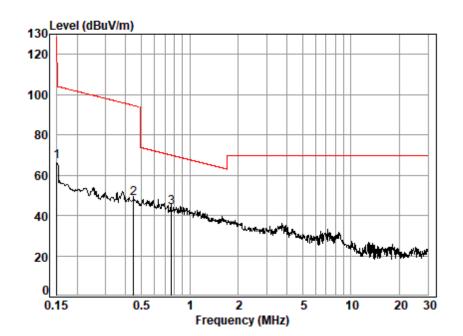
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Site : chamber Condition: 3m Job No. : 00409AT Test Mode: 01

|             | Freq  |      |       | Preamp<br>Factor |       |        |        |        | Remark                   |  |
|-------------|-------|------|-------|------------------|-------|--------|--------|--------|--------------------------|--|
| -           | MHz   | dB   | dB/m  | dB               | dBuV  | dBuV/m | dBuV/m | dB     |                          |  |
| 1<br>2<br>3 | 0.449 | 0.41 | 10.31 |                  | 69.32 | 48.21  | 94.56  | -46.35 | Average<br>Average<br>QP |  |



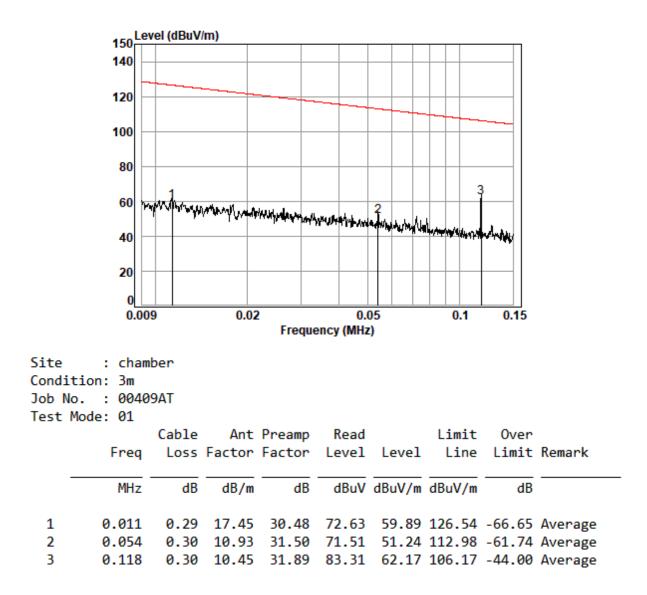
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## 7 Test Setup Photo

Refer to Setup Photos for FYCR2210000409AT

## 8 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for FYCR2210000409AT

- End of the Report -



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