

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 Mount
	*ITT90W
	Spigen OneTap Pro Wireless Car Charger for Tesla (Screen Mount) *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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## 2 Test Summary

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15,	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	
Radiated Emissions (9kHz-30MHz)	Subpart C	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart 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 Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2021/7/11	2024/7/10
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
Double-ridged 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- 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- 27	N/A	N/A	N/A

General used equipment	t				
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-22	2022/7/12	2023/7/11
Humidity/ Temperature 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 strength(microvolts/meter)	Measurement 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 / Final test	Mode 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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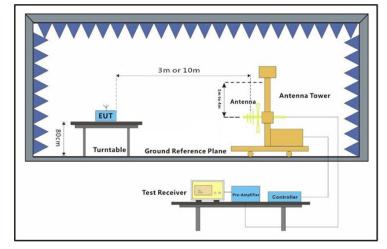
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#### 6.1.3 Test Setup Diagram



#### 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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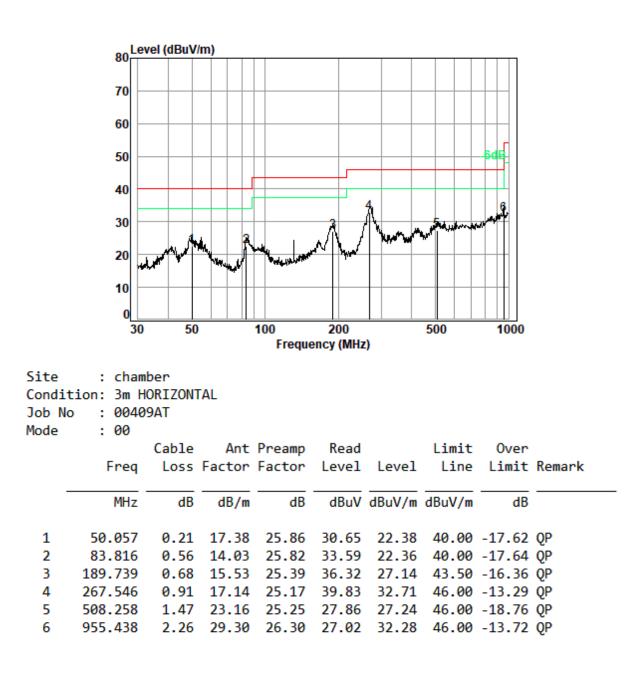
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Test Mode: 00; Polarity: Horizontal





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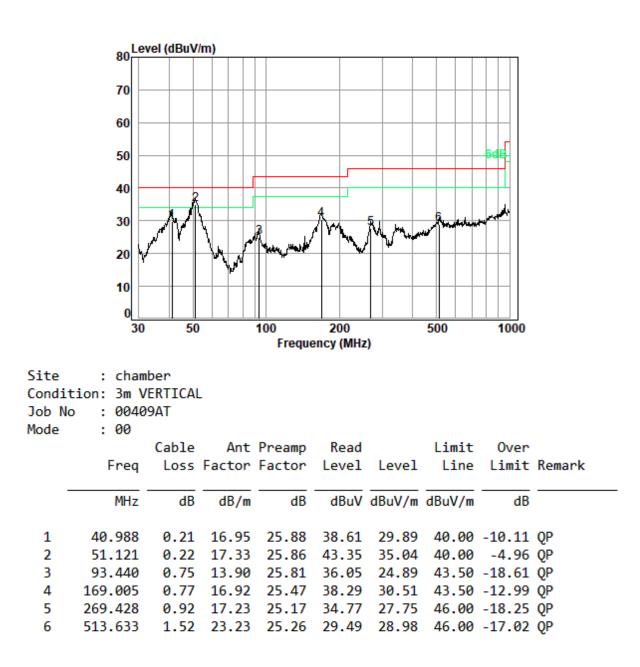
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Test Mode: 00; Polarity: Vertical





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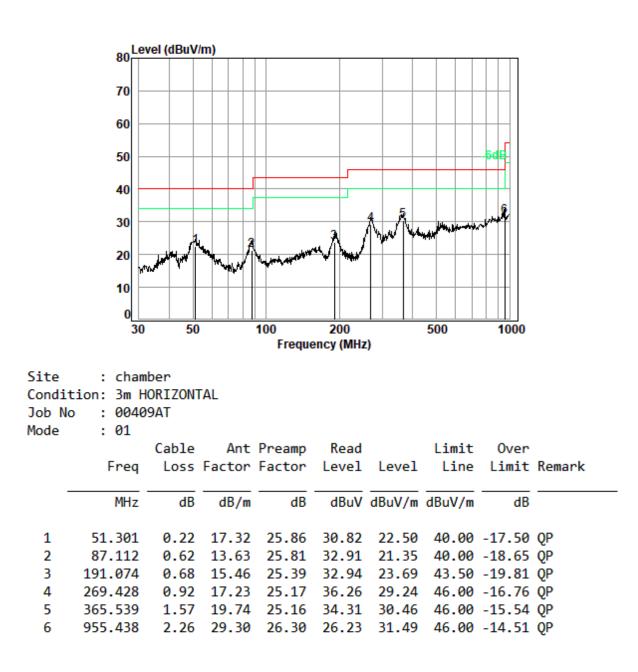
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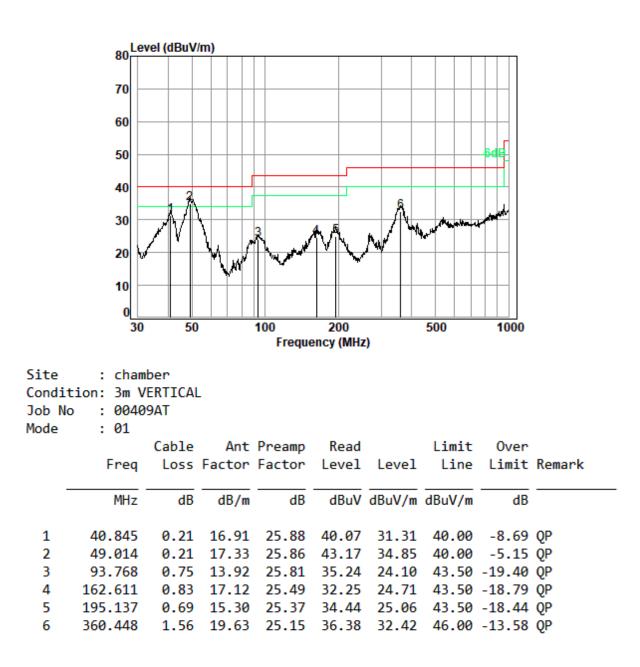
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#### 6.2 Radiated Emissions (9kHz-30MHz)

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

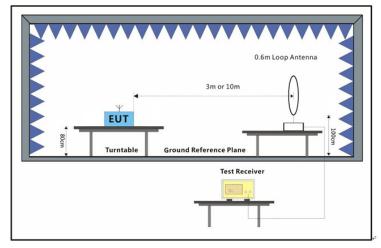
Operating Environment:
------------------------

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

#### 6.2.2 Test Mode Description

Pre-scan / Final test	Mode 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).



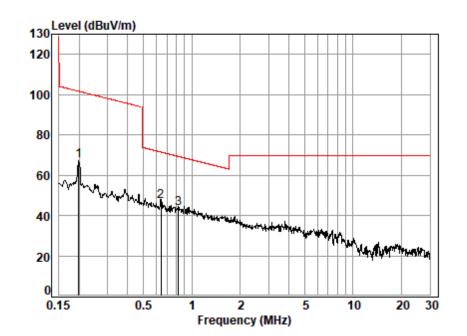
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Site :	chamber
Condition:	3m
Job No. :	00409AT
Test Mode:	00

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 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



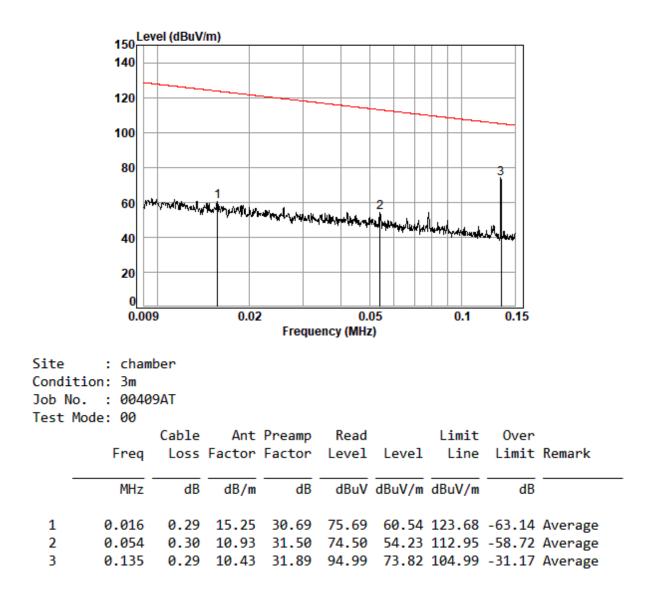
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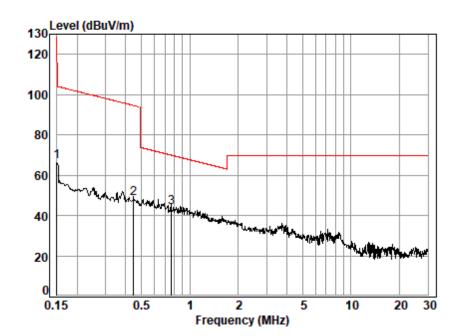
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Site : chamber Condition: 3m Job No. : 00409AT Test Mode: 01

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



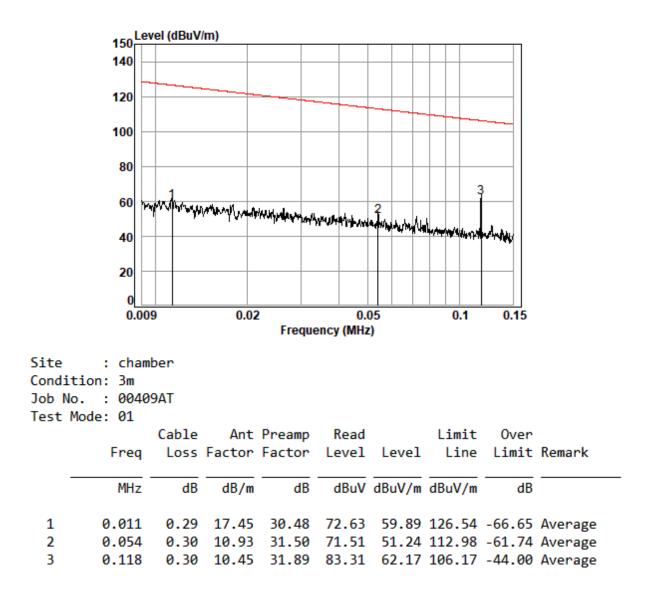
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## 7 Test Setup Photo

Refer to Setup Photos for FYCR2210000409AT

## 8 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for FYCR2210000409AT

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