

Prüfbericht-Nr.: <i>Test report no.:</i>	NN23I70S 001	Auftrags-Nr.: <i>Order no.:</i>	168447259	Seite 1 von 27 Page 1 of 27
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2023-09-19	
Auftraggeber: <i>Client:</i>	Volex (Asia) Pte Ltd 37A TAMPINES STREET 92, #08-01, SINGAPORE 528886			
Prüfgegenstand: <i>Test item:</i>	NACS EV Charging Connector			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	5220323,5220331,5220317 (Trademark: Volex)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.231 CFR47 FCC Part 15: Subpart C Section 15.209 RSS-210 Issue 10 December 2019 RSS-Gen Issue 5 March 2019			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2023-09-19	Please refer to Photo Document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003598648-001 A003598648-002			
Prüfzeitraum: <i>Testing period:</i>	2023-11-16 - 2023-11-17			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	<u>X</u>	genehmigt von: <i>authorized by:</i>	<u>X</u>	
Datum: <i>Date:</i>	2023-12-06	Ausstellungsdatum: <i>Issue date:</i>	2023-12-07	
Stellung / Position:	Sachverständige(r)/Expert	Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / <i>Other:</i>	FCC ID: 2BDAP-5220323 IC: 31498-5220323, HVIN: V1.0			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 DEACTIVATION OF THE TRANSMISSION

RESULT: Pass

5.1.3 20dB EMISSION BANDWIDTH

RESULT: Pass

5.1.4 99%dB BANDWIDTH

RESULT: Pass

5.1.5 FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix A: Photographs of the Test Set-up.

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Accreditation Designation No.: 694916

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equipment	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2024-07-25
Signal Analyzer	R&S	FSV 40	101439	2024-07-25
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2024-07-25
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2024-07-25
Amplifier	R&S	SCU-18F	180070	2024-07-25
Amplifier	R&S	SCU40A	100475	2024-07-25
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-08-06
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2024-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Table 2: Measurement Uncertainty

Parameter	Uncertainty (k=2)
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
All emissions, radiated	± 4.17 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were in this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a NACS EV Charging Connector with 315MHz and 433.92MHz transmitter.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	NACS EV Charging Connector
Type Designation:	5220323,5220331,5220317
Trademark:	Volex
FCC ID:	2BDAP-5220323
IC:	31498-5220323
HVIN:	V1.0
Operating Voltage:	DC 5V~12V
Testing Voltage:	DC 12V
Technical Specification of 433MHz	
Operating Frequencies:	315MHz, 433.92MHz
Modulation Type:	OOK
Antenna Type:	Integral Antenna
Antenna Gain :	-0.71dBi for 315MHz, -10.12dBi for 433MHz

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Transmitting with operating frequency 315MHz
- B. On, Transmitting with operating frequency 433.92MHz
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- User Manual
- ID Label and Location Info
- Operation Description

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model 5220323 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
DC power supply	KIKUSUI	PAN35-5A	YM002997

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

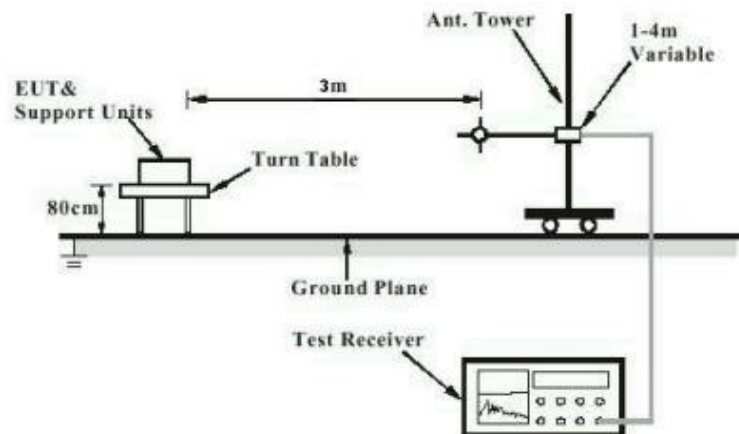


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

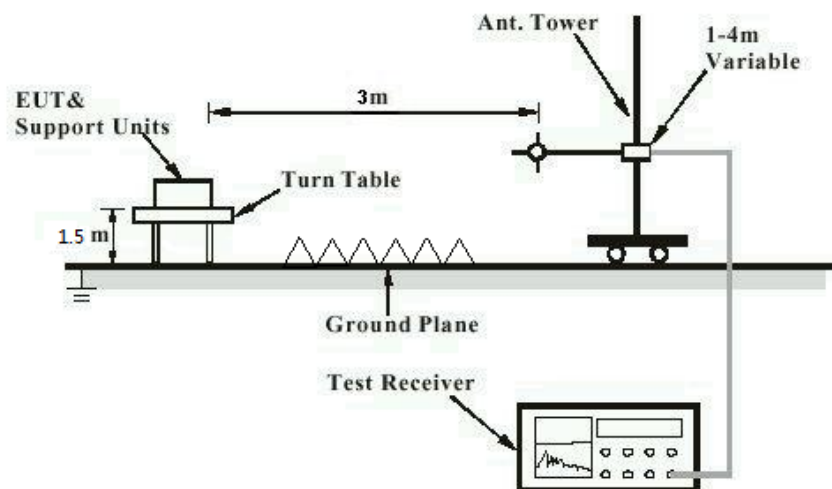


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Essential Requirements of Standard

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard	:	FCC Part 15.203 RSS-Gen Clause 6.8
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the antenna test sheet, the EUT has a PCB Layout Antenna, the directional gain of antenna are -0.71dBi for 315MHz, -10.12dBi for 433MHz. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Deactivation of the Transmission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.231, RSS-210 Issue 10 RSS-Gen Issue 5
Basic standard	: ANSI C63.10: 2013
Test requirement	: FCC Part 15.231 (a)(1), RSS-210 A1.1 (a) A manually operated transmitter shall employ a switch that
Limits	: will automatically deactivate the transmitter within not more than 5 seconds of being released.
Kind of test site	: Shielded Room

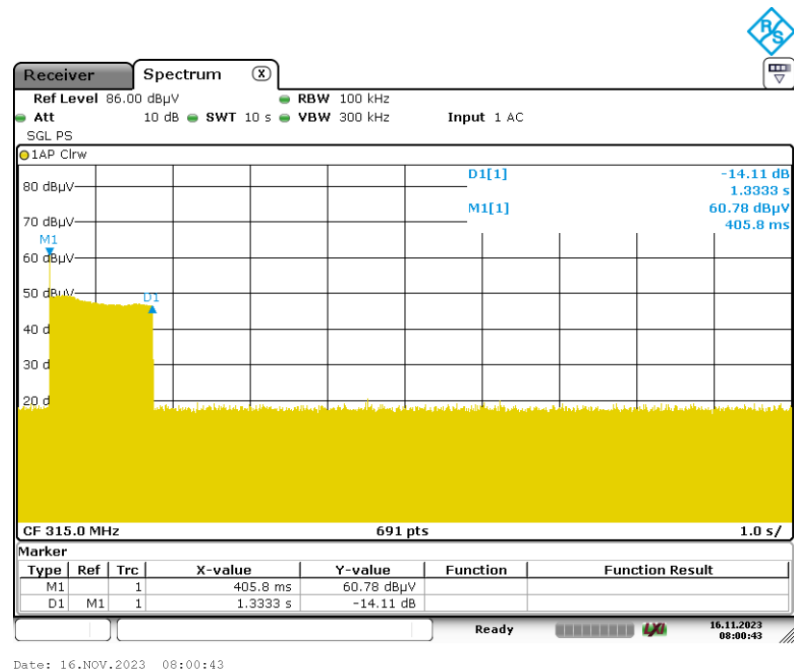
Test Setup

Date of testing	: 2023-11-16
Input voltage	: DC 12V
Operation mode	: A, B
Ambient temperature	: 19.8 °C
Relative humidity	: 54 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to nex page.

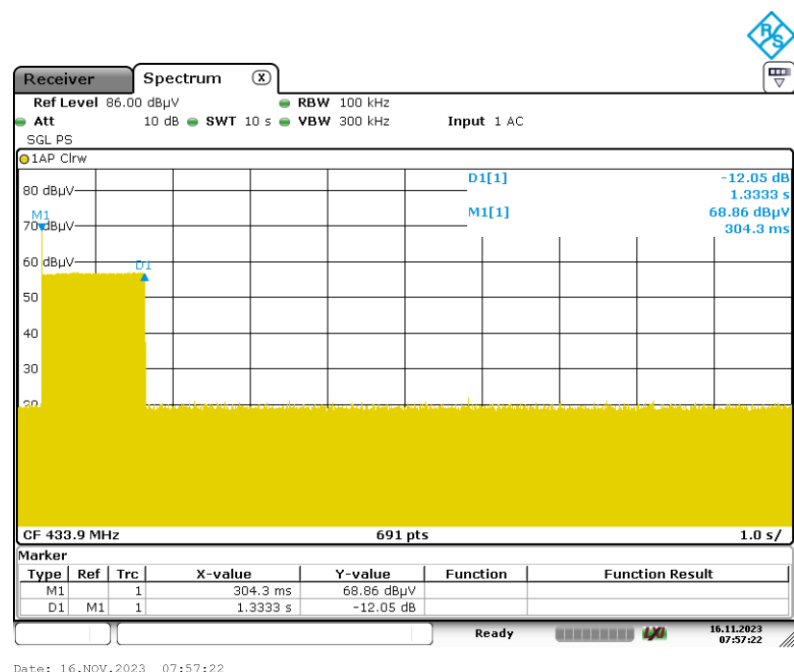
315MHz Transmitter:

Carrier Frequency	Shutdown Time	Limit
315MHz	1.33s	≤5s



433MHz Transmitter:

Carrier Frequency	Shutdown Time	Limit
433.92MHz	1.33s	≤5s



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5.1.3 20dB Emission Bandwidth

RESULT:**Pass****Test Specification**

Test standard	:	FCC Part 15.231 RSS-Gen Issue 5
Basic standard	:	ANSI C63.10: 2013
Test requirement	:	FCC Part 15.231 (c)
Limit	:	FCC Part 15.231 (c)
Kind of test site	:	Shielded Room

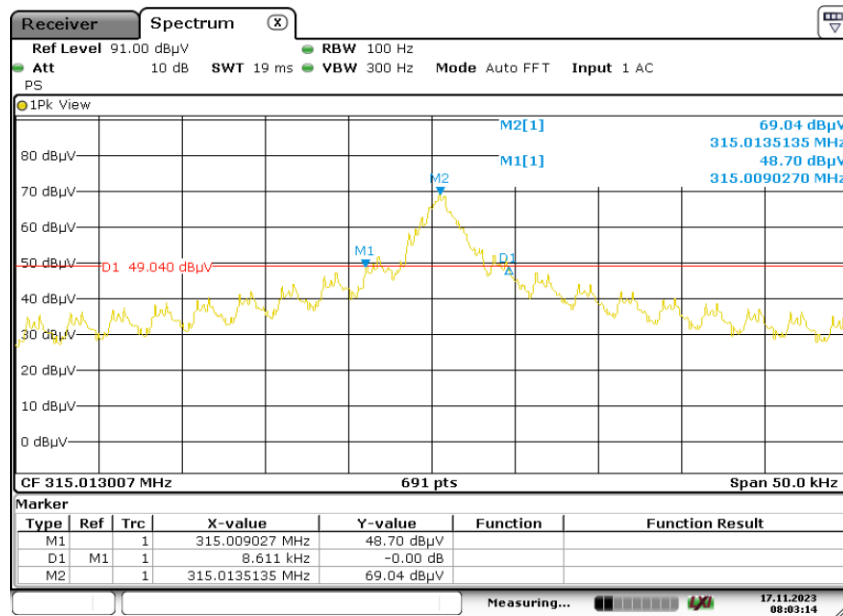
Test Setup

Date of testing	:	2023-11-17
Input voltage	:	DC 12V
Operation mode	:	A, B
Ambient temperature	:	20.6 °C
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the next page.

315MHz Transmitter:

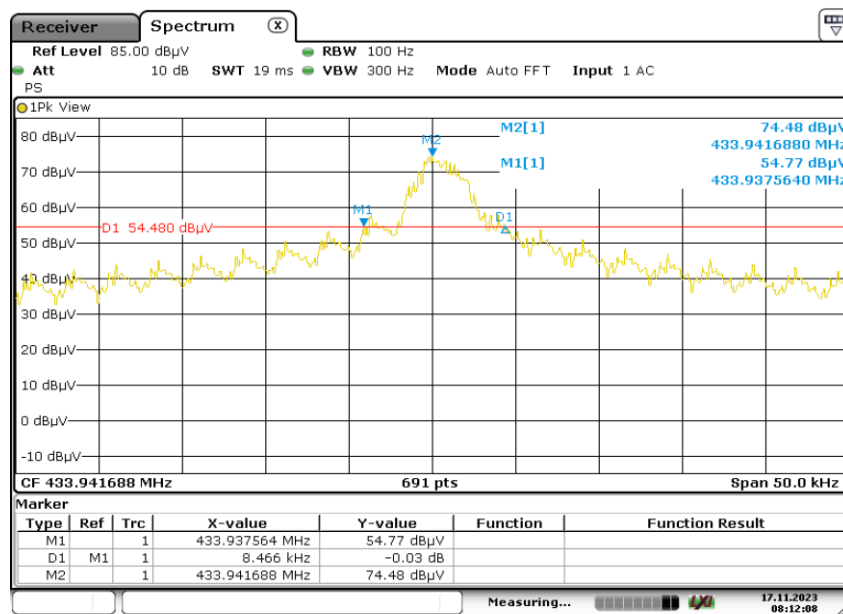
Test Channel (MHz)	20dB Bandwidth (kHz)	Limit (MHz)
315	8.61	$315 * 0.25\% = 0.788$



Date: 17.NOV.2023 08:03:14

433MHz Transmitter:

Test Channel (MHz)	20dB Bandwidth (kHz)	Limit (MHz)
433.92	8.47	$433.92 * 0.25\% = 1.08$



Date: 17.NOV.2023 08:12:08

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5.1.4 99%dB Bandwidth

RESULT:

Pass

Test Specification

Test standard	: RSS-Gen clause 6.7
Basic standard	: ANSI C63.10: 2013
Kind of test site	: Shielded Room

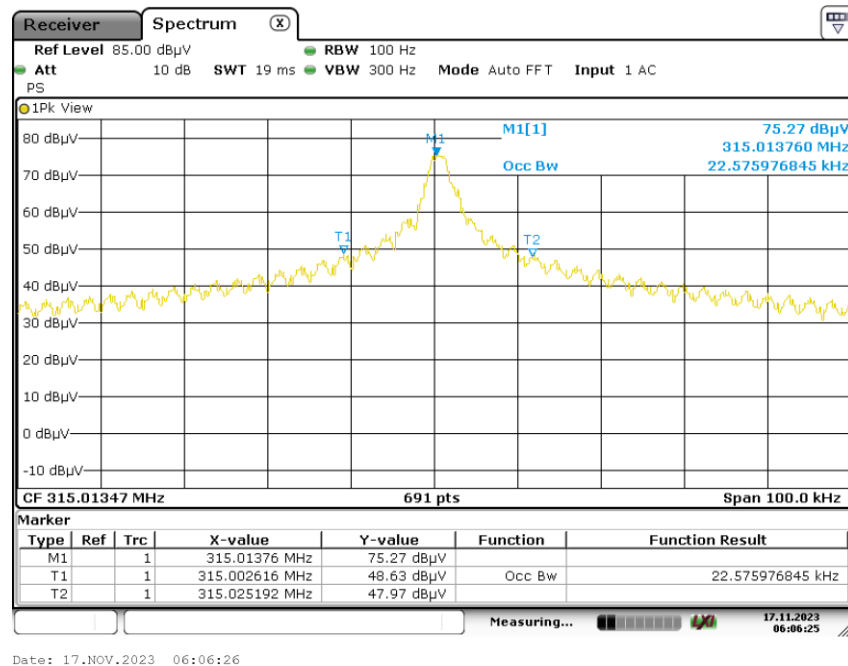
Test Setup

Date of testing	: 2023-11-17
Input voltage	: DC 12V
Operation mode	: A, B
Ambient temperature	: 20.6 °C
Relative humidity	: 39 %
Atmospheric pressure	: 54 kPa

For the measurement records, refer to the next page.

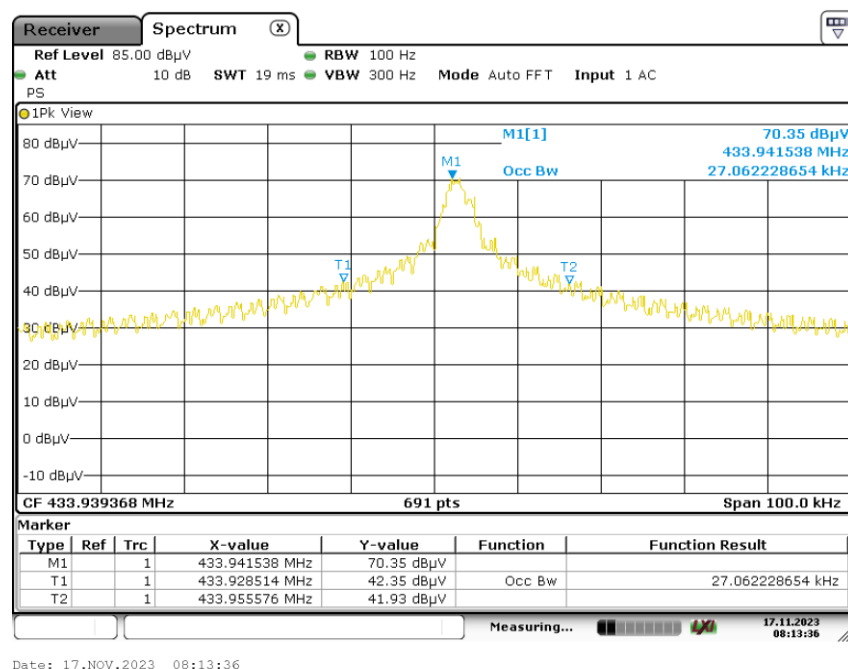
315MHz Transmitter:

Test Channel (MHz)	99% Bandwidth (kHz)	Limit (MHz)
315	22.58	--



433MHz Transmitter:

Test Channel (MHz)	99% Bandwidth (kHz)	Limit (MHz)
433.92	27.06	--



5.1.5 Field strength of fundamental and Unwanted Emissions in the Spurious Domain

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.231 & FCC Part 15.205 & FCC Part 15.209 RSS-210 Issue 10 & RSS-Gen Issue 5
Basic standard	: ANSI C63.10: 2013
Test requirement	: FCC Part 15.231 (b)(1)(2)(3) RSS-Gen Table 5
Limit	: FCC Part 15.231 (b), RSS-210 A1.2
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2023-11-16
Input voltage	: DC 12V
Operation mode	: A
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: 101 kPa

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

The measurement results below 30MHz was greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 5GHz were reported.

For the measurement records, refer to the following pages.

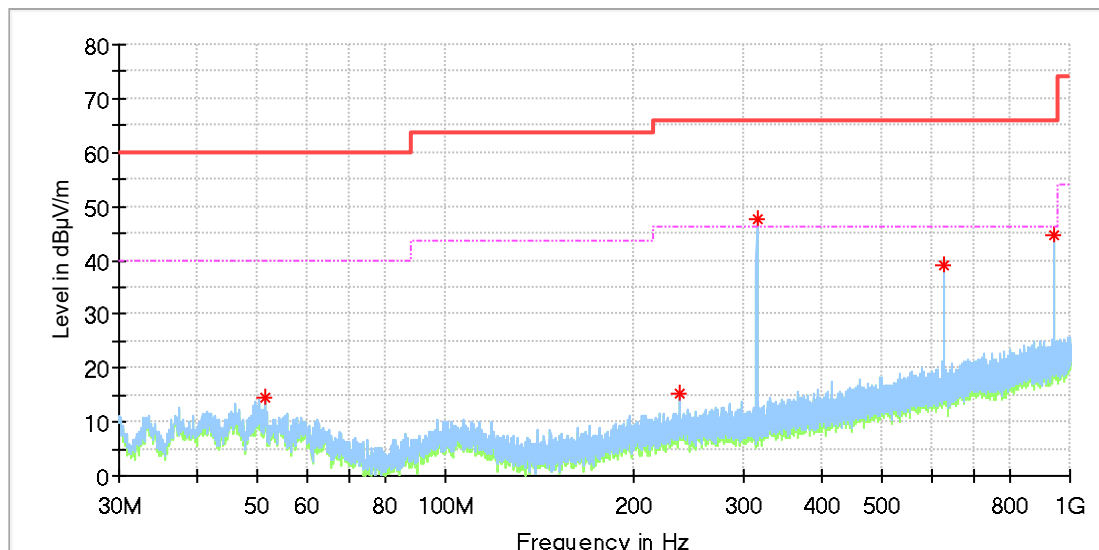
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315MHz Transmitter:

Up to 1GHz

EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 315MHz
Order No/Sample No: 168447259/A003598648-001
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
51.414615	14.36	---	40.00	25.64	100.0	H	116.0	-18.6
236.236923	15.40	---	46.00	30.60	100.0	H	328.0	-18.2
315.030769	47.74	---	95.62	47.88	100.0	H	273.0	-16.2
315.030769	---	42.15	75.62	33.47	100.0	H	273.0	-16.2
630.056923	39.23	---	75.62	36.39	100.0	H	140.0	-9.7
630.056923	---	33.64	55.62	21.98	100.0	H	140.0	-9.7
945.083077	44.76	---	75.62	30.86	100.0	H	239.0	-4.9
945.083077	---	39.17	55.62	16.45	100.0	H	239.0	-4.9

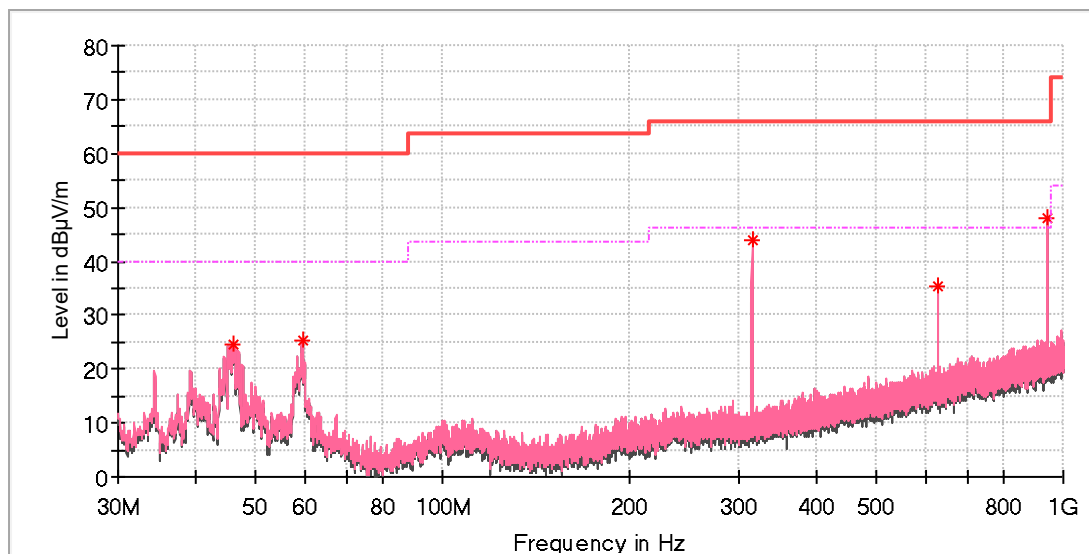
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

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EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 315MHz
Order No/Sample No: 168447259/A003598648-001
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
46.154231	24.69	---	40.00	15.31	100.0	V	130.0	-19.0
59.398462	25.12	---	40.00	14.88	100.0	V	303.0	-19.2
315.030769	43.75	---	95.62	51.87	100.0	V	293.0	-16.2
315.030769	---	38.16	75.62	37.46	100.0	V	293.0	-16.2
630.056923	35.28	---	75.62	40.34	100.0	V	238.0	-9.7
630.056923	---	29.69	55.62	25.93	100.0	V	238.0	-9.7
945.083077	48.10	---	75.62	27.52	100.0	V	70.0	-4.9
945.083077	---	42.51	55.62	13.11	100.0	V	70.0	-4.9

Final_Result

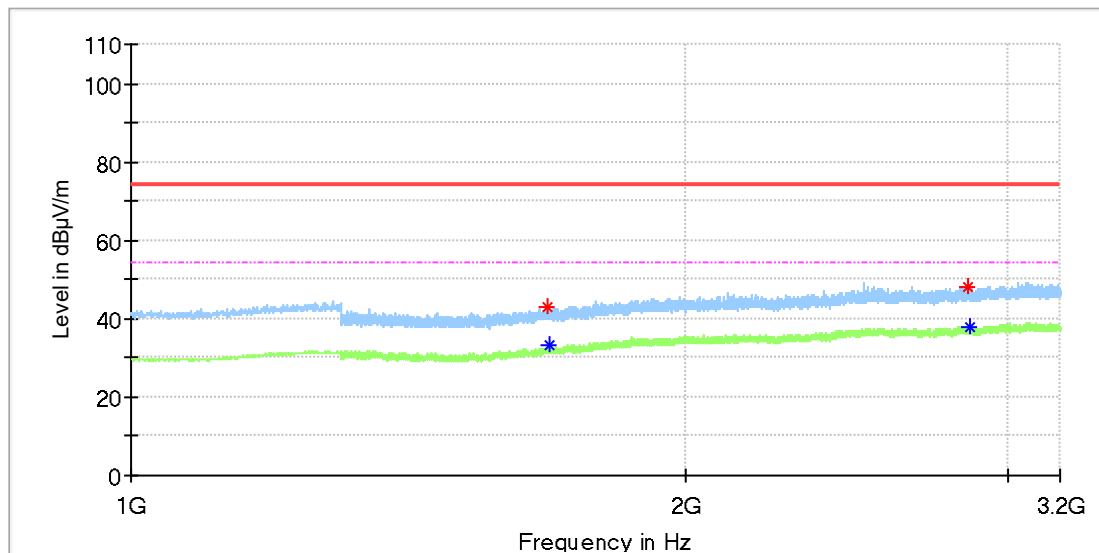
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---	---	---

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Above 1GHz

EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 315MHz
Order No/Sample No: 168447259/A003598648-001
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1684.275000	43.08	---	74.00	30.92	150.0	H	158.0	3.1
1689.025000	---	33.17	54.00	20.83	150.0	H	268.0	3.2
2854.991667	47.86	---	74.00	26.14	150.0	H	355.0	8.1
2858.791667	---	37.81	54.00	16.19	150.0	H	148.0	8.2

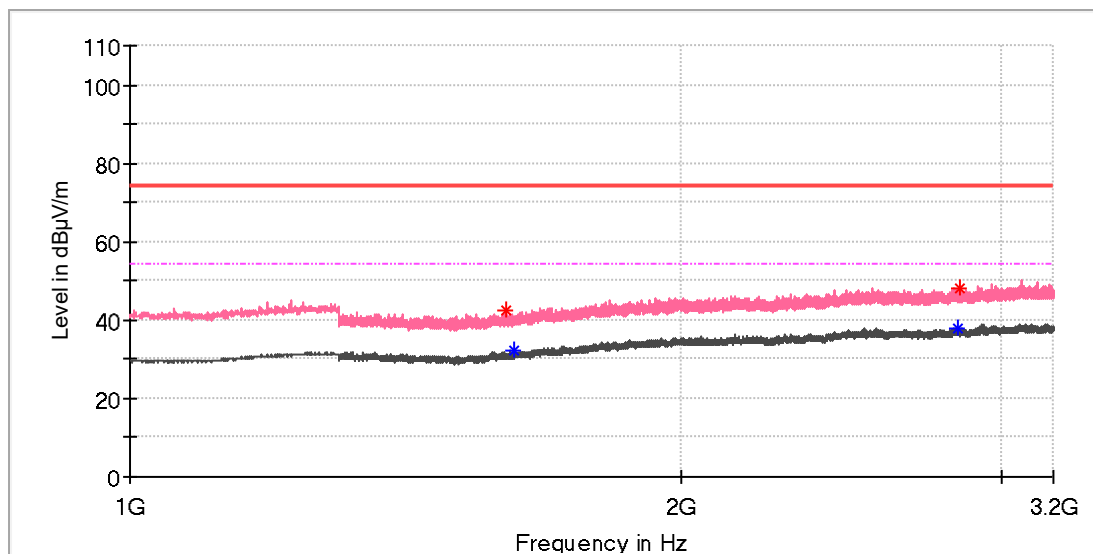
Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

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Test Report No.:

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EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 315MHz
Order No/Sample No: 168447259/A003598648-001
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1606.850000	42.26	---	74.00	31.74	150.0	V	89.0	2.2
1622.050000	---	32.39	54.00	21.61	150.0	V	285.0	2.3
2838.841667	---	37.94	54.00	16.06	150.0	V	31.0	8.1
2847.075000	47.95	---	74.00	26.05	150.0	V	171.0	8.1

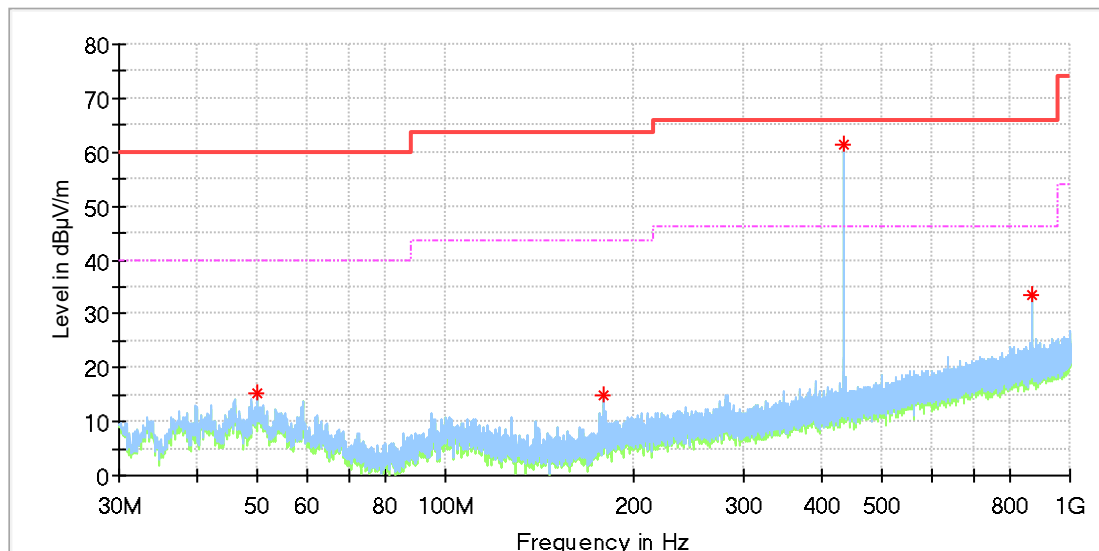
Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

433.92MHz Transmitter:

Up to 1GHz

EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 433MHz
Order No/Sample No: 168447259/A003598648-002
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.996923	15.41	---	40.00	24.59	100.0	H	300.0	-18.6
179.081539	15.05	---	43.50	28.45	100.0	H	179.0	-20.9
433.967692	61.54	---	100.82	39.28	100.0	H	346.0	-13.5
433.967692	---	55.95	80.82	24.87	100.0	H	346.0	-13.5
867.893462	33.57	---	80.82	47.25	100.0	H	335.0	-5.7
867.893462	---	27.98	60.82	32.84	100.0	H	335.0	-5.7

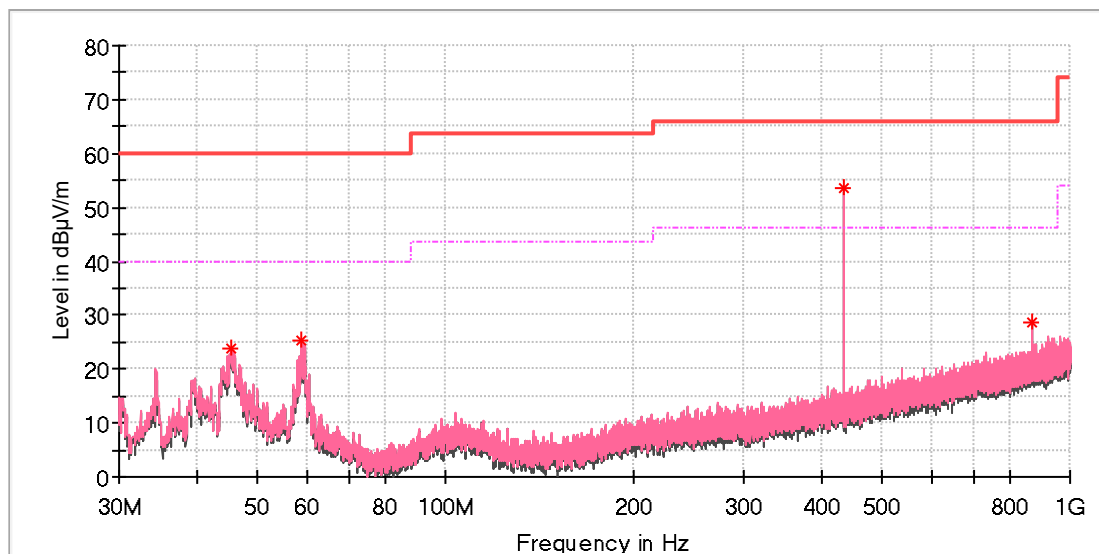
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---	---	---

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 Test Report No.:

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EUT Name: NACS EV Charging Connector
 Model: 5220323
 Test Mode: 433MHz
 Order No/Sample No: 168447259/A003598648-002
 Test Voltage:: DC 12V From DC Source
 Remark: Temp 22 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.445385	23.73	---	40.00	16.27	100.0	V	228.0	-19.1
58.764231	25.31	---	40.00	14.69	100.0	V	359.0	-19.2
433.967692	53.49	---	100.82	47.33	100.0	V	359.0	-13.5
433.967692	---	47.90	80.82	32.92	100.0	V	359.0	-13.5
867.930769	28.74	---	80.82	52.08	100.0	V	84.0	-5.7
867.930769	---	23.15	60.82	37.67	100.0	V	84.0	-5.7

Final_Result

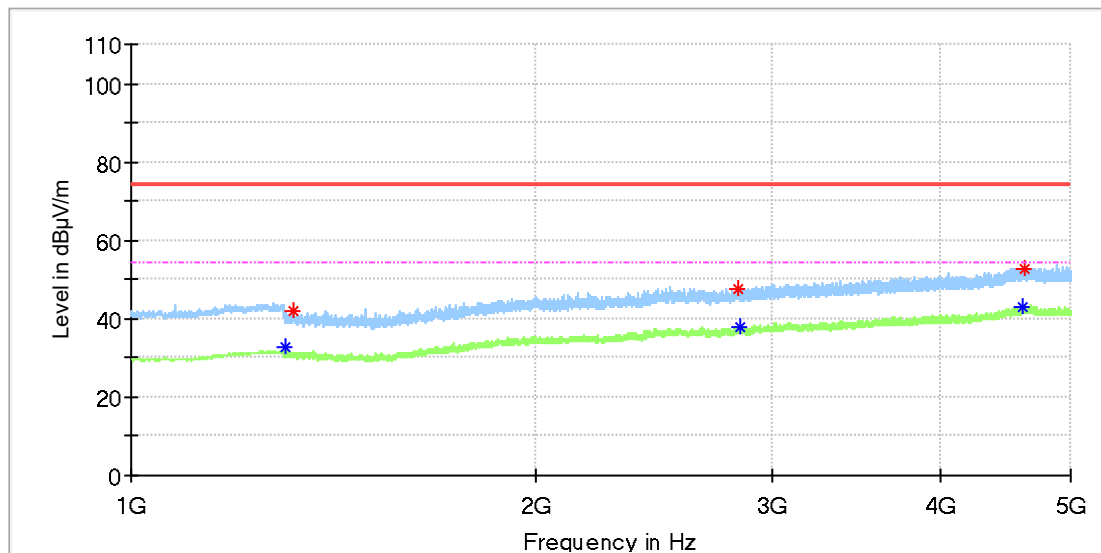
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

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Above 1GHz

EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 433MHz
Order No/Sample No: 168447259/A003598648-002
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1301.541667	---	32.61	54.00	21.39	150.0	H	33.0	1.9
1319.116667	41.72	---	74.00	32.28	150.0	H	187.0	2.0
2828.100000	47.70	---	74.00	26.30	150.0	H	268.0	8.1
2841.358333	---	37.78	54.00	16.22	150.0	H	221.0	8.1
4600.091667	---	42.76	54.00	11.24	150.0	H	230.0	12.0
4618.900000	52.75	---	74.00	21.25	150.0	H	112.0	12.0

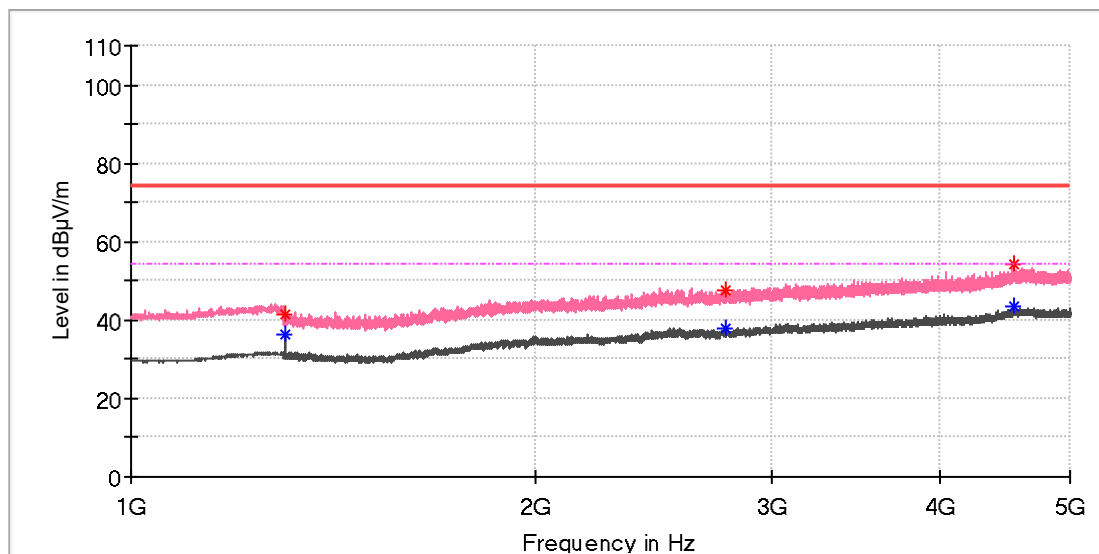
Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

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Test Report No.:

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EUT Name: NACS EV Charging Connector
Model: 5220323
Test Mode: 433MHz
Order No/Sample No: 168447259/A003598648-002
Test Voltage:: DC 12V From DC Source
Remark: Temp 22 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1301.541667	41.51	---	74.00	32.49	150.0	V	18.0	1.9
1301.541667	---	36.10	54.00	17.90	150.0	V	18.0	1.9
2774.450000	47.65	---	74.00	26.35	150.0	V	150.0	7.9
2775.066667	---	37.86	54.00	16.14	150.0	V	233.0	7.9
4537.808333	53.99	---	74.00	20.01	150.0	V	225.0	11.8
4548.600000	---	43.34	54.00	10.66	150.0	V	61.0	11.9

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:
Pass
Test Specification

Test standard

 : CFR47 FCC Part 2: Section 2.1093
 CFR47 FCC Part 1: Section 1.1310
 FCC KDB Publication 447498 D01 v06
 RSS-102 Issue 5 2.5.1

FCC/IC requirements

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1093 this device has been defined as a portable device. SAR test exclusion considerations per KDB 447498 D01 v06 4.3.1 a)

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

IC requirement: SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output level below.

 Table 1: SAR evaluation — Exemption limits for routine evaluation based on frequency and separation distance⁴²

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤ 5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Measurement Record

The minimum distance for the EUT is less than 5mm.

The maximum time averaged e.i.r.p. of 315MHz: 42.15dBuV/m @3m = -55.23dBm < 1mW

The maximum time averaged e.i.r.p. of 433.92MHz: 55.95dBuV/m @3m = -41.43dBm < 1mW

According to KDB 447498 D01 v06 4.3.1 a) and RSS-102 Issue 5 clause 2.5.1

EUT is compliance with the RF exposure.

7 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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