

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21FZOW 001	Auftrags-Nr.: <i>Order no.:</i>	180208879	Seite 1 von 16 Page 1 of 16
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-06-01	
Auftraggeber: <i>Client:</i>	Forest Group Nederland B.V. Teugseweg42,7418AM,Deventer,The Netherlands			
Prüfgegenstand: <i>Test item:</i>	Remote Control			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	5201091470, 5201096470			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47 CFR Part 15.203 FCC 47 CFR Part 15.231 FCC 47 CFR Part 2.1093			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021.07.01	Refer to Photo Documentation		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003095786-001			
Prüfzeitraum: <i>Testing period:</i>	2021-07-05 to 2021-07-22			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 2.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland /CCIC(Ningbo) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	<i>Season Yang</i>		genehmigt von: <i>authorized by:</i>	<i>Teng Liang</i>
Datum: <i>Date:</i>	2021-10-11		Ausstellungsdatum: <i>Issue date:</i>	2021-10-11
Stellung / Position:	Season Yang/PE		Stellung / Position:	Feng Liang/TC
Sonstiges / Other:	FCC ID: 2AFO8520109X470 FCC 47 CFR Part 2.1093 is not in the A2LA accreditation scope, because the product complies with requirements of test standard FCC 47 CFR Part 2.1093 by calculated method, not involves testing.			
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:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient 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 a. m. 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>				

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 Field strength of fundamental and Unwanted Emissions in the Spurious Domain

RESULT: Pass

5.1.5 Radio Frequency Exposure Compliance

RESULT: Pass

CONTENTS

1. GENERAL REMARKS	4
1.1 COMPLEMENTARY MATERIALS	4
1.2 TEST STANDARD(S)	4
2. TEST SITES	4
2.1 TEST FACILITIES	4
2.2 TEST DATE	4
2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS	5
2.4 TRACEABILITY	6
2.5 CALIBRATION	6
2.6 LOCATION OF ORIGINAL DATA	6
2.7 STATUS OF FACILITY USED FOR TESTING	6
3. GENERAL PRODUCT INFORMATION	7
3.1 PRODUCT FUNCTION AND INTENDED USE	7
3.2 RATINGS AND SYSTEM DETAILS	7
3.3 INDEPENDENT OPERATION MODES	7
3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS	7
3.5 SUBMITTED DOCUMENTS	7
4. TEST SET-UP AND OPERATION MODES	9
4.1 PRINCIPLE OF CONFIGURATION SELECTION	9
4.2 TEST OPERATION AND TEST SOFTWARE	9
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	9
4.4 COUNTERMEASURES TO ACHIEVE ERM COMPLIANCE	9
4.5 TEST SETUP DIAGRAM	10
5. TEST RESULTS	11
5.1 ESSENTIAL REQUIREMENTS OF STANDARD	11
5.1.1 Antenna Requirement	11
5.1.2 Deactivation of the Transmission	12
5.1.3 20dB Emission Bandwidth	13
5.1.4 Field strength of fundamental and Unwanted Emissions in the Spurious Domain	14
5.1.5 Radio Frequency Exposure Compliance	15
6. SYSTEM MEASUREMENT UNCERTAINTY	16
7. LIST OF TABLES	16

Prüfbericht - Nr.: CN21FZOW 001
Test Report No.Seite 4 von 16
Page 4 of 16

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: Test Results of radio spectrum

Appendix B: Photographs of the Test Set-Up

1.2 TEST STANDARD(S)

Applied Rules: FCC 47 CFR Part 15.203
FCC 47 CFR Part 15.231
FCC 47 CFR Part 2.1093

Test Method: ANSI C63.10:2013

2. TEST SITES

2.1 TEST FACILITIES

Test Facilities: TÜV Rheinland /CCIC(Ningbo) Co., Ltd.

Address: No. 1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China.

2.2 TEST DATE

Date: 2021-07-05 to 2021-07-22

Prüfbericht - Nr.: CN21FZOW 001

Test Report No.

Seite 5 von 16

Page 5 of 16

2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

No.	Equipment	Model	Inventory no.	Last cal. date	Cal. due date
1.	EMI test receiver	ESR7	101929	2020-11-12	2021-11-11
2.	Spectrum analyzer	FSV40	101412	2020-11-12	2021-11-11
3.	Bilog Antenna	CBL6112D	49033	2021-03-15	2024-03-14
4.	Horn antenna	HF907	102653	2020-07-22	2023-07-21
5.	Pre-amplifier	SCU-18F	180051	2020-11-12	2021-11-11

2.4 TRACEABILITY

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.5 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.

2.6 LOCATION OF ORIGINAL DATA

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

2.7 STATUS OF FACILITY USED FOR TESTING

TÜV Rheinland / CCIC (Ningbo) Co., Ltd. facility located at 1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 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 Remote Control.

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

3.2 RATINGS AND SYSTEM DETAILS

Table 2: Technical Characteristics of EUT

General Information of EUT	Description
Kind of Equipment:	Remote Control
Type Designation:	5201091470, 5201096470
FCC ID:	2AFO8520109X470
Operating Frequency Band:	433.92MHz
Operating Frequencies:	433.92MHz
Modulation Type:	ASK
Antenna Type:	Integral Antenna(PCB Antenna)
Antenna Number and Gain:	Antenna number: 1 Antenna Gain: 0dBi
Operating Voltage:	DC 3V, Battery (AAA x 2)
Operating Temperature Range:	-10°C ~ +50°C
*Remark: 1) As declared by manufacturer, 5201091470 and 5201096470 are identical in electronics/electrical designs, including software & firmware, PCB layout .The only differences are the model name and colour of appearance. Hence the product with model 5201096470 is chosen for testing.	

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

- A. Transmitting with operating frequency 433.92MHz
- B. Idle

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual

☒ Rating Label

Prüfbericht - Nr.: CN21FZOW 001
Test Report No.

Seite 8 von 16
Page 8 of 16

- | | |
|---|--|
| ☒ Circuit Diagram | ☒ PCB Layout |
| ☒ Block Diagram | ☒ Photo Document |
| ☒ Schematics | ☒ Parts List |
| ☐ Model Difference Letter | |

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.

Table 3: Test Environments

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage (Battery)	Relative Humidity
Normal (NTNV)	21.4°C	3V	57%

4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

The EUT was tested together with the following accessories:

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
--	--	--	--

4.4 COUNTERMEASURES TO ACHIEVE ERM 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

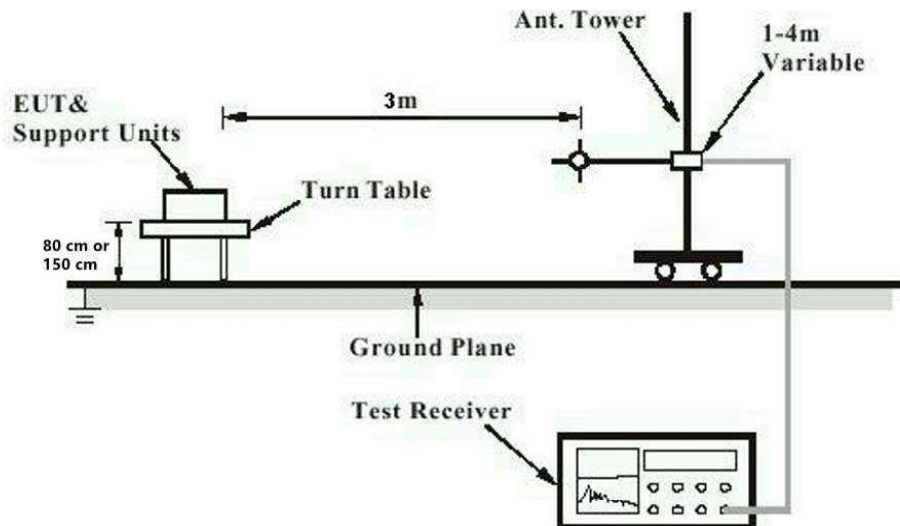
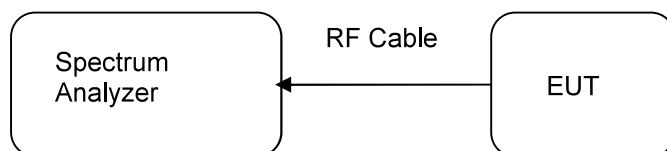


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. TEST RESULTS

5.1 Essential Requirements of Standard

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard	:	CFR47 FCC Part 15.203
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an integral antenna (PCB antenna), and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

Prüfbericht - Nr.: CN21FZOW 001

Test Report No.

Seite 12 von 16

Page 12 of 16

5.1.2 Deactivation of the Transmission

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

Test standard	:	CFR47 FCC Part 15.231
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (a)(1)
Limit	:	A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
Test suite	:	Shielding Room

Test Setup

Date of testing	:	2021.07.05
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	21.4°C
Relative humidity	:	57%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

Prüfbericht - Nr.: CN21FZOW 001
Test Report No.Seite 13 von 16
Page 13 of 16

5.1.3 20dB Emission Bandwidth

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

Test standard	:	CFR47 FCC Part 15.231
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (c)
Limit	:	CFR47 FCC Part 15.231 (c)
Test suite	:	3m Semi Anechoic Room

Test Setup

Date of testing	:	2021.07.05
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	21.4°C
Relative humidity	:	57%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

Prüfbericht - Nr.: CN21FZOW 001

Test Report No.

Seite 14 von 16

Page 14 of 16

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

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

Test standard	:	CFR47 FCC Part 15.231 CFR47 FCC Part 15.205 CFR47 FCC Part 15.209
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (b)(1)(2)(3)
Limit	:	CFR47 FCC Part 15.231 (b)
Test suite	:	3m Semi Anechoic Room

Test Setup

Date of testing	:	2021.07.21-2021.07.22
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	Refer to test data.
Relative humidity	:	Refer to test data.
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

Prüfbericht - Nr.: CN21FZOW 001

Test Report No.

Seite 15 von 16

Page 15 of 16

5.1.5 Radio Frequency Exposure Compliance

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

Test standard : CFR47 FCC Part 2.1093
Limit : FCC KDB Publication 447498 D01 v06

Measurement Record for CFR47 FCC Part 2.1093

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

The maximum specified e.r.p.: 80.9dBuV/m@3m, i.e. -16.477dBm=0.0225mW, much lower than the threshold power.

According to KDB 447498 D01 v06 appendix A

Exempted Power for this device: 22mW, hence the EUT is compliance with the RF exposure.

6. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 5: System Measurement Uncertainty

Items		Extended Uncertainty
RE	Radiated Emission (30-1000MHz)	4.39dB
	Radiated Emission (1-18GHz)	4.67dB
Remark: 95% Confidence Levels, K=2.		

7. LIST OF TABLES

Table 1: List of Test and Measurement Equipment	5
Table 2: Technical Characteristics of EUT	7
Table 3: Test Environments	9
Table 4: List of Accessories and Auxiliary Equipment	9
Table 5: System Measurement Uncertainty.....	16