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Prüfbericht - Nr.: 50090511 001
Test Report No.

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TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 CONDUCTED EMISSION

RESULT: N/A

5.1.3 RADIATED SPURIOUS EMISSIONS

RESULT: PASS

5.1.4 20dB BANDWIDTH

RESULT: Pass

5.1.5 DEACTIVATION TIME

RESULT: Pass

5.1.6 DUTY CYCLE

RESULT: Pass

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1. General Remarks

1.1 Complementary Materials

Null.

2. Test Sites

2.1 Test Facilities

MRT Technology (Suzhou) Co., Ltd.

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 809388.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment**Radiated Test Equipments**

Instrument	Manufacturer	Type No.	Asset No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MY45300136	08.12.2017
EMI Test Receiver	R&S	ESR7	101209	03.11.2017
Preamplifier	Schwarzbeck	BBV 9721	9721-008	15.04.2018
Preamplifier	Agilent	83017A	MY53270040	28.03.2018
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	14.12.2017
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	07.11.2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	07.11.2017
Broadband Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170549	03.01.2018
Digital Thermometer & Hygrometer	Minggao	N/A	N/A	30.11.2017

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY52090106	08.05.2018
USB Wideband Power Sensor	Boonton	55006	8911	08.05.2018
Temperature/Humidity Meter	Yuhuaze	N/A	N/A	20.12.2017

2.3 Traceability

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

2.4 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

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Radiated Emission	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) contains a STRERCH REFLE Air2.0 and Remote Control.

The STRERCH REFLE Air2.0 contains a 433.92MHz receiver.

The Remote Control contains a 433.92MHz transmitter.

The aim of this report is to evaluate the RF performance of the Remote Controller.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

STRERCH REFLE Air2.0 (Receiver)

Model name	: NCC-002
Frequency band	: 433.05-434.79 MHz
Operating Frequency	: 433.92 MHz
Modulation Type	: ASK
Operation Voltage	: DC 3.7V Re-chargable battery
Charger Voltage	: Input AC 100-240V ,50-60Hz 0.3A, output DC 5V, 1200mA

Remote control(Transmitter)

Rated Voltage	: DC 3V(CR2025)
Modulation Type	: ASK
Frequency band	: 433.05-434.79 MHz
Operating Frequency	: 433.92 MHz

3.3 Independent Operation Modes

The basic operation modes are:

- A. On-The transmitter was powered on and kept transmitting during the test.

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- | | |
|--------------------|----------------------|
| - Bill of Material | - Circuit Diagram |
| - PCB Layout | - Instruction Manual |
| - Photo Document | - Rating Label |

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power 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.

Software used for testing: Null.

4.3 Special Accessories and Auxiliary Equipment

Null.

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

According to the manufacturer declared, the EUT has one PCB antenna, the directional gain of antenna is 2.5dBi and the PCB antenna is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Table 3: Antenna Requirement

FCC 15.203 – Antenna Requirement 1	
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device. ☒ Use of a permanently attached antenna, or ☐ Use an antenna that uses a unique coupling to the intentional radiator.
Results:	Antenna type: PCB antenna
Verdict:	PASS

FCC 15.204 – Antenna Requirement 2	
Requirement:	An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.
Results:	Only one type antenna can be used
Verdict:	PASS

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5.1.2 Conducted Emission

RESULT:**N/A**

Test standard : FCC Part 15.207

Note:

This device is powered by battery, so the conducted emission test is not required.

5.1.3 Radiated Spurious Emissions

RESULT:
PASS

Date of testing : 27.05.2017
 Test standard : FCC Part 15.205
 FCC Part 15.209
 FCC Part 15.231(b)
 Kind of test site : 3m Semi-Anechoic Chamber
 Operation Mode : A

Table 4: Radiated Emission of Fundamental Emission

Frequency [MHz]	Reading Level [dBuV]	Factor [dB]	Duty Cycle Factor [dB]	Measure Level [dBuV/m]	Limit [dBuV/m]	Over Limit [dB]	Type	Pol.
434.005	41.667	17.427	N/A	59.094	95.600	-36.506	PK	H
434.005	33.640	17.427	N/A	51.067	95.600	-44.533	PK	V

Table 5: Spurious Radiated Emission 30MHz-6GHz

Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type	Pol.
325.365	30.841	15.838	-15.159	46.000	15.002	PK	H
1302.500	52.081	60.309	-21.919	74.000	-8.229	PK	H
1735.000	46.287	53.605	-27.713	74.000	-7.319	PK	H
2170.000	49.129	53.069	-24.871	74.000	-3.940	PK	H
314.695	24.368	9.660	-21.632	46.000	14.708	PK	V
1302.500	45.030	53.258	-28.970	74.000	-8.229	PK	V
1735.000	43.020	50.338	-30.980	74.000	-7.319	PK	V
2170.000	47.400	51.340	-26.600	74.000	-3.940	PK	V

Note: Below 30MHz no spurious radiated emission, so no frequency list in the table.

5.1.4 20dB Bandwidth

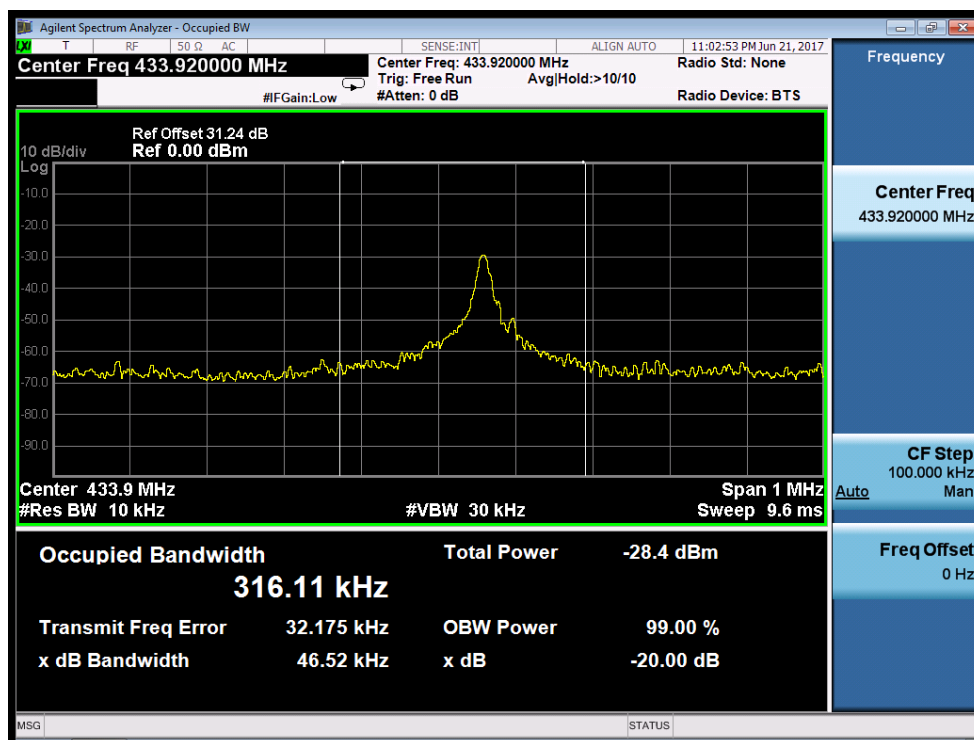
RESULT:
Pass

Date of testing : 21.06.2017
 Test standard : FCC Part 15.231(c)

Kind of test site : Shielded room
 Operation Mode : A

Table 6: Test result of 20dB Bandwidth

Channel Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Result
433.92	0.31611	$0.25\% \cdot 433.92 = 1.0848$	PASS

Figure 1: Test Plot of 20dB Bandwidth


5.1.5 Deactivation Time

RESULT:
Pass

Date of testing : 21.06.2017
 Test standard : FCC part 15.231(a)
 Kind of test site : Shield room
 Operation Mode : A

Table 7: Deactivation Time

Frequency [MHz]	On Transmission Time [s]	Limit [s]	Result
433.92	4.764	5	PASS

Figure 2: Deactivation Time

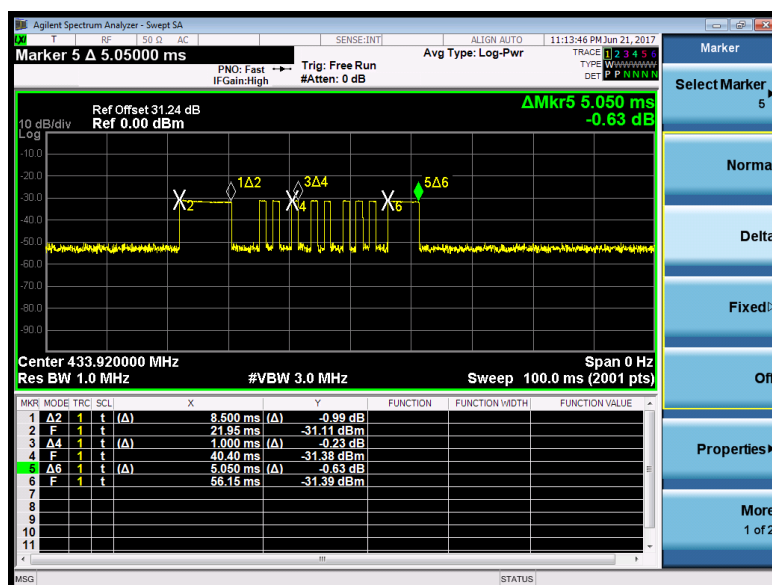

5.1.6 Duty Cycle

RESULT:

Pass

Date of testing : 21.06.2017
 Test standard : FCC part 15.231(a)
 Kind of test site : Shield room
 Operation Mode : A

Figure 3: Test Plot of Duty Cycle



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Duty Cycle:

$$0.0085 + 0.001 \cdot 8 + 0.005 = 0.0215$$

$$0.0215 / 0.296 = 7.26\%$$

Duty Cycle Factor:

$$20 \cdot \log(\text{Duty Cycle}) = 20 \cdot \log(0.0726) = -22.78\text{dB}$$

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