Prüfbericht-Nr.: *Test report no.:*	**CN22DVPW 001**	**Auftrags-Nr.:** *Order no.:*	180217677	Seite 1 von 15 *Page 1 of **15***
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2021.11.12	
Auftraggeber: *Client:*	Swann Communications Pty Ltd. Unit 5B, 706 Lorimer Street Port Melbourne, Vic 3207, Australia			
Prüfgegenstand: *Test item:*	Add-on Wireless Motion Sensor Spotlight			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	SWALPH-B400G2W			
Auftrags-Inhalt: *Order content:*	Test Report			
Prüfgrundlage: *Test specification:*	FCC 47 CFR Part 15.203 FCC 47 CFR Part 15.231 FCC 47 CFR Part 2.1091			

Wareneingangsdatum: *Date of sample receipt:*	2021.11.15	Refer to Photo Documentation
Prüfmuster-Nr.: *Test sample no:*	A003171032-005	
Prüfzeitraum: *Testing period:*	2021.11.17 to 2022.03.04	
Ort der Prüfung: *Place of testing:*	Refer to section 2.1	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland /CCIC(Ningbo) Co., Ltd.	
Prüfergebnis*: *Test result*:*	Pass	

geprüft von: *tested by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* 2022.03.15	Season Yang	**Ausstellungsdatum:** *Issue date:* 2022.03.15	Feng Liang
Stellung / *Position:*	**Season Yang/PE**	**Stellung** / *Position:*	**Feng Liang/TC**

Sonstiges / *Other:* FCC ID: VMIB400G2W

FCC 47 CFR Part 2.1091 is not in the A2LA accreditation scope, because the product complies with requirements of test standard FCC 47 CFR Part 2.1091 by calculated method, not involves testing.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

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

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 2.1091
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: 2021.11.17 to 2022.03.04

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	2021.11.09	2022.11.08
2.	Spectrum analyzer	FSV40	101412	2021.11.09	2022.11.08
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	2021.11.09	2022.11.08

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 basics 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 an Add-on Wireless Motion Sensor Spotlight, which supports 433MHz wireless function.
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:	Add-on Wireless Motion Sensor Spotlight
Type Designation:	SWALPH-B400G2W
FCC ID:	VMIB400G2W
Operating Frequency Band:	433.77-434.07MHz
Operating Frequencies:	433.968MHz
Modulation Type:	ASK
Antenna Type:	Integral Antenna(PCB Antenna)
Antenna Number and Gain:	Antenna number: 1 Antenna Gain: 2.0dBi
Operating Voltage:	Battery 6V (operating voltage range: DC 3.8-6.0V)
Operating Temperature Range:	-20°C to +50°C

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

A. Transmitting with Operating Frequency Band: 433.77-434.07MHz
B. Idle

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual
☒ Circuit Diagram
☒ Block Diagram
☒ Schematics
☐ Model Difference Letter
☒ Rating Label
☒ PCB Layout
☒ Photo Document
☐ Parts List

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	6V	57.3%

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
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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

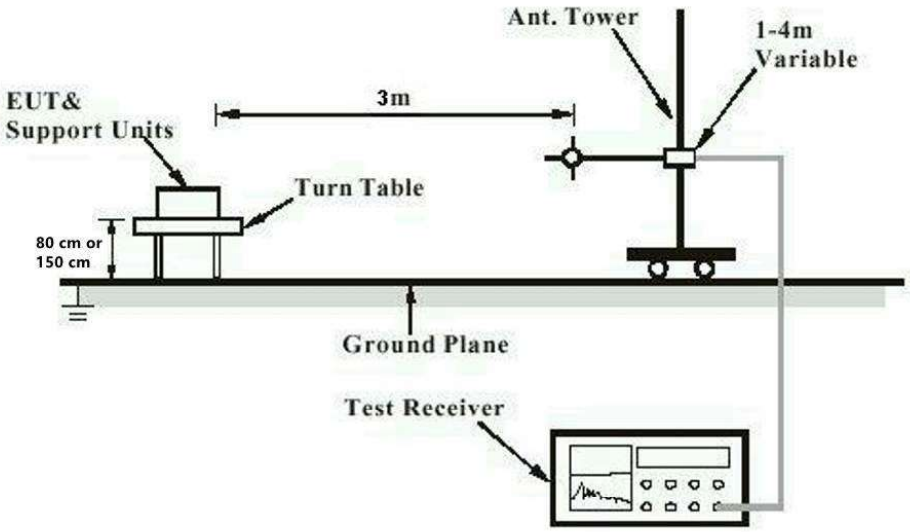
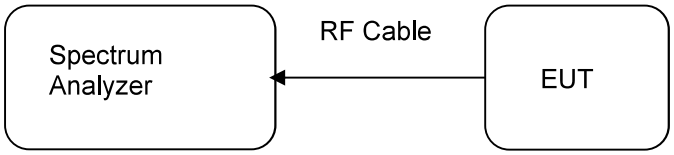


Diagram of Measurement Equipment Configuration for Transmitter Measurement



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, Antenna Gain: 2.0dBi), 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.

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. A transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test suite	:	Shielding Room

Test Setup

Date of testing	:	2022.03.04
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	21.4°C
Relative humidity	:	57.3%
Atmospheric pressure	:	102.1kPa

Conclusion:

Refer to attached Appendix A for details of test results.

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	:	2021.11.23
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	21.4°C
Relative humidity	:	57.3%
Atmospheric pressure	:	102.1kPa

Conclusion:

Refer to attached Appendix A for details of test results.

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	:	2021.11.17
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	21.4°C
Relative humidity	:	57.3%
Atmospheric pressure	:	102.1kPa

Conclusion:

Refer to attached Appendix A for details of test results.

5.1.5 Radio Frequency Exposure Compliance

RESULT: **Pass**

Test Specification

Test standard : CFR47 FCC Part 2.1091

Limit : CFR47 FCC Part 1.1310

TABLE 1 TO § 1.1310(E)(1)—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842/f	4.89/f	*($900/f^2$)	<6
30–300	61.4	0.163	1.0	<6
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824/f	2.19/f	*($180/f^2$)	<30
30–300	27.5	0.073	0.2	<30
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

MPE Calculation:

The power Density (mW/CM^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

S=power density (mW/CM^2)
P=power input to the antenna (mW)
G=power input to the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna (CM)

FCC MPE

Frequency *(MHz)*	Maximum Electric Field dBuV/m@3m	E.I.R.P. Power (mW)	Distance (*CM*)	Power Density (mW/CM^2)	Power Density limit (mW/CM^2)
433MHz Band	60.16	0.00031	20	6.19×10^{-8}	0.289

Conclusion:
EUT is compliance with FCC's 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

---The End---