


 MOTOROLA SOLUTIONS	    <p>SAMM 086 CERTIFICATE 2518.05</p>		
DECLARATION OF COMPLIANCE: MPE ASSESSMENT			
<p style="text-align: center;"> Motorola Solutions, Inc. EME Test Laboratory Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia. </p>	<p style="text-align: center;"> Date of Report: 08/24/2023 Report Revision: A </p>		
<table border="0" style="width: 100%;"> <tr> <td style="width: 40%; vertical-align: top;"> Responsible Engineer: Report Author: Assessment Date(s) Manufacturer: DUT Description: Test TX mode(s): Max. Power output: Tx Frequency Bands: Model(s) Tested: Model(s) Certified: Classification: Firmware Version: Applicant Name: Applicant Address: FCC ID: FCC Test Firm Registration Number: IC: ISED Test Site Registration: </td> <td style="width: 60%; vertical-align: top;"> Puteri Alifah Ilyana Binti Nor Rahim Puteri Alifah Ilyana Binti Nor Rahim 08/14/2023 Avigilon Corporation Bullet Security Camera Z-wave 5.0 mW 902-928MHz ACBUSRNE ACBUSRNE General Population / Uncontrolled environment 4.61.0.1 Avigilon Corporation Box 378, 101-1001 W. Broadway Vancouver, BC, V6H 4E4, Canada 2ANC5-ZWB1 823256 23071-ZWB1 24843 </td> </tr> </table>		Responsible Engineer: Report Author: Assessment Date(s) Manufacturer: DUT Description: Test TX mode(s): Max. Power output: Tx Frequency Bands: Model(s) Tested: Model(s) Certified: Classification: Firmware Version: Applicant Name: Applicant Address: FCC ID: FCC Test Firm Registration Number: IC: ISED Test Site Registration:	Puteri Alifah Ilyana Binti Nor Rahim Puteri Alifah Ilyana Binti Nor Rahim 08/14/2023 Avigilon Corporation Bullet Security Camera Z-wave 5.0 mW 902-928MHz ACBUSRNE ACBUSRNE General Population / Uncontrolled environment 4.61.0.1 Avigilon Corporation Box 378, 101-1001 W. Broadway Vancouver, BC, V6H 4E4, Canada 2ANC5-ZWB1 823256 23071-ZWB1 24843
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<p> fBased on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report (no deviation from standard methods). This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc. EME Laboratory. I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested guidelines of the TIA TSB-159 April 2006 The results and statements contained in this report pertain only to the device(s) evaluated herein. </p>			
<div style="text-align: center;">  Saw Sun Hock (Approved Signatory) Approval Date: 08/24/2023 </div>			

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Report Revision History

Date	Revision	Comments
08/24/2023	A	Initial release

1.0 Introduction

This report contains calculated Maximum Permissible Exposure (MPE) results for product model ACBUSRNE with antenna part number 2195835-1 from TE Connectivity.

2.0 Abbreviations / Definitions

DUT: Device Under Test
EME: Electromagnetic Energy
MPE: Maximum Permissible Exposure

3.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 1.1307, § 1.1310, § 2.1091 (d) and § 2.1093 for RF Exposure, where applicable.
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65 (Edition 97-01), FCC, Washington, D.C.: August 1997.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1999
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1992. Specific to FCC rules and regulations.
- Institute of Electrical and Electronics Engineers (IEEE) C95.3-2002
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6 (2015), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- RSS-102 (Issue 5) – Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
- FCC KDB – 447498 D04 Interim General RF Exposure Guidance v01
- FCC KDB – 865664 D02 RF Exposure Reporting v01r02

4.0 Product and System Description

The ACBUSRNE camera model is part of Avigilon's new flagship camera line. The ACBUSRNE camera is in a bullet form factor.

The ACBUSRNE camera contains a Z-wave radio. The Z-Wave radio will act as a sensor hub to connect to wireless sensors and switches that can trigger alerts or send out commands via the video management software.

The Z-Wave radio in the ACBUSRNE camera is configured for use in the 902-928 MHz band which is suitable for use in North America. The radio utilizes three frequency channels: CH0 916.00 MHz, CH1 908.40 MHz and CH2 908.42 MHz.

CH0 uses a 2GFSK modulation with a 100 kbit/s data rate. CH1 uses a 2FSK modulation with a 40 kbit/s data rate. CH2 uses a 2FSK modulation with a 9.6 kbit/s data rate. Z-Wave communications are limited to a maximum 1% duty cycle.

The Z-Wave radio is certified under FCC Part 15.249 for use in the USA and RSS-210 for use in Canada. Both standards limit the field strength of the fundamental to 94 dB μ V/m when measured at a 3-meter distance with a quasi-peak detector.

The camera is a fixed-use device mounted to walls or ceilings with a wired power connection and wired Ethernet connection for video streaming.

The ACBUSRNE camera has cutting-edge sensor technologies that are embedded with features such as smart analytics to help focus attention on the events that matter most. The ACBUSRNE camera can be used to monitor indoor and outdoor spaces. It combines high-quality images, a wide field of view and efficient in a compact design. The ACBUSRNE camera includes an infrared (IR) illuminator to help see in dark and low light environments.

Table 1

Technology	Transmit Bands (MHz)	Duty Cycle (%)	Max Power
Z-wave	902 - 928	1	5.0 mW

The ACBUSRNE camera offered with the 2195835-1 antenna. The antenna info can be referred to Table 2 below.

Table 2

Antenna Model	Type	Frequency Range (MHz)	Antenna gain (dBi)
2195835-1	FPC with double side adhesive tape	863-928	1.4

5.0 FCC MPE Assessment Exemption

Per guidelines in KDB 447498 D04 Interim General RF Exposure Guidance v01, MPE-based effective radiated power (ERP) thresholds are derived based on frequency and separation distance of the RF source.

The MPE-based exemption formula indicated below, applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, or less than or equal to the threshold Pth (mW) refer to Table B.1.

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES
SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R ²
1.34	–	30	35.6 m	–	1.6 m	3,450 R ² /f ²
30	–	300	1.6 m	–	159 mm	3.83 R ²
300	–	1,500	159 mm	–	31.8 mm	0.0128 R ² f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R ²
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

Since the device is operating at the frequency 902MHz with 0.2m separation distance, formula below is applied.

$$\text{Threshold ERP} = 0.0128 R^2 f$$

Where: R = Separation distance (m)
F = frequency (MHz)

$$R = 0.2 \text{ m}$$

$$f = 902 \text{ MHz}$$

$$\begin{aligned} \text{Threshold ERP} &= 0.0128 R^2 f \\ &= 0.0128 * 0.2^2 * 902 \\ &= 0.4612 \text{ W} \\ &= 462 \text{ mW} \end{aligned}$$

Based on the calculation above, ERP power threshold at 902 MHz is 462 mW. Maximum transmit power for DUT is 5.0 mW. Since the maximum transmit power of the device is lower than the power threshold, routine evaluation can be exempted.

6.0 ISED MPE Assessment Exemption

The ACBUSRNE device has a transmit power of 5.0 mW and an antenna with a 1.4 dBi gain. Assuming no cable losses as a worst-case scenario. Therefore,

$$\begin{aligned}\text{EIRP} &= \text{Tx power} + \text{Antenna gain} - \text{cable loss} \\ &= (5.0 \text{ mW} = 7 \text{ dBm}) + 1.4 \text{ dBi} - 0 \\ \text{EIRP} &= 8.4 \text{ dBm} = 6.92 \text{ mW} = 0.0069 \text{ W}\end{aligned}$$

$$\text{Threshold EIRP (W)} = 1.31 \times 10^{-2} f^{0.6834}$$

Where: f = frequency (MHz)

$$f = 902 \text{ MHz}$$

$$\begin{aligned}\text{Threshold EIRP} &= 1.31 \times 10^{-2} f^{0.6834} \\ &= 1.31 \times 10^{-2} (902)^{0.6834} \\ &= 1.370 \text{ W}\end{aligned}$$

Therefore, since 0.0069 W is less than 1.370 W the EUT can be exempt from a routine RF exposure evaluation.

7.0 Conclusion

The MPE assessment presented in this report concludes that model ACBUSRNE when transmitting at a minimum separation distance of 20 cm from nearby persons is compliant to the FCC and ISED General Population/Uncontrolled RF exposure limits.