



## RF Exposure Evaluation Declaration

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**FCC ID:** PBR-SZG3ACWC

**APPLICANT:** The Kroger Co.

**Application Type:** Certification

**Product:** GEN3Z Camera and WiFi\_Wave2\_Zigbee Access Point  
Unit

**Model No.:** SRG3ACWC

**FCC Classification:** Digital Transmission System (DTS)  
Unlicensed National Information Infrastructure (NII)

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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## Revision History

Report No.	Version	Description	Issue Date	Note
1901RSU031-U4	Rev. 01	Initial Report	01-22-2019	Invalid
1901RSU031-U4	Rev. 02	Revised the product model number from SZG3ACWC into SRG3ACWC	03-27-2019	Valid

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name:	GEN3Z Camera and WiFi_Wave2_Zigbee Access Point Unit
Model No.:	SRG3ACWC
ZigBee Specification:	802.15.4 (Module, FCC ID: PBR-SZMDLNR1)
	802.15.4 (Module, FCC ID: PBR-SZMDLM3BR1)
Bluetooth Specification:	v5.0 single mode (Module, FCC ID: PBR-SZMDLBTNR1)
Wi-Fi 1# Specification:	802.11b/g
Wi-Fi 2# Specification:	802.11a/ac

Note: MRT test lab provide one POE adapter (Manufacturer: H3C & Model: EWPAM1UPOE2) for approval testing, it is not for sale.

### 1.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T <sub>x</sub> Paths	Max Antenna Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
PIFA Antenna	2412 ~ 2462	4	2.00	6.02	2.00	8.02
	5150 ~ 5850	4	3.00	6.02	3.00	9.02

Note:

The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows,  $N_{ANT} = 4$ ,  $N_{SS} = 1$ .

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,  
Array Gain =  $10 \log (N_{ANT} / N_{SS})$  dB = 6.02;
- For power measurements on IEEE 802.11 devices,  
Array Gain = 0 dB for  $N_{ANT} \leq 4$ ;

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

Product	GEN3Z Camera and WiFi_Wave2_Zigbee Access Point Unit
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.2.

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
802.11b/g	2412 ~ 2462	21.04	2	23.04
802.11a/ac	5150 ~ 5250	18.72	3	23.38
	5725 ~ 5825	20.38		
One Bluetooth module (FCC ID: PBR-SZMDLBTR1)				
Bluetooth	2402 ~ 2480	0.57	2	2.57
One ZigBee module (FCC ID: PBR-SZMDLNR1)				
802.15.4	2405 ~ 2480	1.12	2	3.12
Two ZigBee modules (FCC ID: PBR-SZMDLM3BR1)				
802.15.4	2405 ~ 2480	19.93	3.27	23.20

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11b/g	2412 ~ 2462	23.04	0.0401	1
802.11a/ac	5150 ~ 5250	23.38	0.0433	1
	5725 ~ 5825			
Bluetooth	2402 ~ 2480	2.57	0.0004	1
802.15.4	2405 ~ 2480	3.12	0.0004	1
802.15.4	2405 ~ 2480	23.20	0.0416	1

### CONCLUSION:

All of 2.4GHz WLAN, 5GHz WLAN, Bluetooth and ZigBee can transmit simultaneously.

The max Power Density at R (20 cm) =  $0.0401\text{mW/cm}^2 + 0.0433\text{mW/cm}^2 + 0.0004\text{mW/cm}^2 + 0.0004\text{mW/cm}^2 + 0.0416\text{mW/cm}^2 + 0.0416\text{mW/cm}^2 = 0.1674\text{mW/cm}^2 < 1\text{mW/cm}^2$ .

Therefore, the Min Safety Distance is 20cm.

— The End —

## **Appendix A - Test Setup Photograph**

Refer to “1901RSU031-UT” file.

## **Appendix B - EUT Photograph**

Refer to "1901RSU031-UE" file.