EMCE Engineering

1726 Ringwood Avenue, San Jose, CA 95131 USA
Tel. +1(510)490-4307 / Fax +1(510)490-3441
http://www.universalcompliance.com

RF EXPOSURE EVALUATION REPORT

Applicant Name: Stem Innovation, LLC dBa Iconoscope, LLC 21 G Street, Salt Lake City, UT 84102 USA	**Date of Issue :** 11/27/2017 **Test Site/Location:** EMCE ENGINEERING 1726 Ringwood Avenue, San Jose, CA 95131 USA **Report No.:** 4325-4 **EMCE FRN:** 0007198120

FCC ID : **IC :**	**YM780-9500** **9637A-809500**
Application Type	Certification
Model:	80-9500
Additional Model(s):	N/A
EUT Type:	IP Camera
Frequency Range:	2402 MHz – 2480 MHz(BT) 2412 MHz – 2462 MHz (802.11b/g/n) 5180 MHz – 5240 MHz(UNII-1) / 5260 MHz – 5320 MHz(UNII-2A) / 5500 MHz – 5700 MHz(UNII-2C) / 5745 MHz – 5825 MHz(UNII-3)
FCC Classification	Spread Spectrum Transmitter (DSS) Digital Transmission System(DTS) Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s) **ISED Rule Part(s)**	Part 15.247 and 407 RSS-247 Issue 2(Feb. 2017) / RSS-GEN Issue 4 (Nov. 2014)

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this Equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. **EMCE Engineering** Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by
: Amy Jones
Administrative Assistant,
EMCE Engineering

Approved by
: Bob Cole
President
EMCE Engineering

Version

TEST REPORT NO.	DATE	DESCRIPTION
4325-4	11/27/17	- First Approval Report

Table of Contents

1.GENERAL INFORMATION

Applicant	Stem Innovation, LLC dBa Iconoscope, LLC
Applicant Address	21 G Street, Salt Lake City, UT 84102 USA
FCC ID	YM780-9500
EUT Type	IP Camera
Model name(s)	80-9500
Additional Model name(s):	N/A
Date(s) of Tests:	07/10/2017 – 10/05/2017
Place of Tests:	EMCE ENGINEERING 1726 Ringwood Avenue, San Jose, CA 95131 USA

2. EUT DESCRIPTION

EUT Type	IP Camera
Model Name	80-9500
Additional Model Name(s)	N/A
Power Supply	DC 5.0 vdc
Battery type	Li-ion Battery(Standard)
Frequency Range(TX/RX)	2402 MHz – 2480 MHz(BT) 2412 MHz – 2462 MHz (802.11b/g/n(20 MHz)) 5180 - 5240 MHz (UNII-1 Band - 20 / 40 MHz), 5260 - 5320 MHz (UNII-2A Band - 20 / 40 MHz), 5500 - 5700 MHz (UNII-2C Band - 20 / 40 MHz), 5745 - 5825 MHz (UNII-3 Band - 20 / 40 MHz)
Max. RF Output Power	BT (6.11dBm) 4.08 mW Wi-Fi 802.11b (15.61 dBm) 36.39 mW Wi-Fi 802.11g (15.71 dBm) 37.23 mW Wi-Fi 802.11n (10.03 dBm) 10.06 mW UNII-1 802.11n-20 MHz BW (5.62 dBm), UNII-1 802.11n-40 MHz BW (7.32 dBm) UNII-2A 802.11n-20 MHz BW (8.32 dBm), UNII-2A 802.11n-40 MHz BW (6.77 dBm), UNII-2C 802.11n-20 MHz BW (10.49 dBm), UNII-2C 802.11n-40 MHz BW (6.53 dBm), UNII-3 802.11n-20 MHz BW (10.89 dBm), UNII-3 802.11n-40 MHz BW (6.37 dBm)
Antenna Specification	Manufacturer: MOLEX Antenna type: 2.4 / 5 GHz Balance Flex Antenna 1461530100 Peak Gain : 3.2 dBi (2.4 GHz Band), 4.75 dBi (5.8 GHz Band)

3. SUMMARY OF TEST RESULTS

3-1. Maximum Permissible Exposure

A. FCC Limits for Occupational / Controlled Exposure

Frequency Range	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (s) mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S minutes
0.3-3.0	614	1.63	100*	6
3.0-30	1842/f	4.89/f	900/f*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

B. FCC Limits for General Population / Uncontrolled Exposure

Frequency Range	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (s) mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S minutes
0.3-3.0	614	1.63	100*	6
3.0-30	1842/f	4.89/f	900/f*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

Note: F = frequency in MHz; plane wave equivalent power density

C. ISED Limits (per IC RSS102)

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[2,1]	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21 \times 10^{-4}f^{0.5}$	$6.67 \times 10^{-5}f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
* Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

3..2 **MPE Calculation Method**

The MPE was calculated at 31 cm to show compliance with the power density limit.

The following formula was used to calculate the power density.

(According to the FCC OET Bulletin 65 (Edition 97-01))

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

Where:

S = Power Density (in appropriate units, e.g., mW/cm^2)

P = Power input to antenna (in appropriate units, e.g., mW)

G = Power Gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of he antenna (in appropriate units, e.g., cm)

3.3 Results

Bluetooth

Max Peak Output Power at antenna input terminal	6.11	dBm
Max Peak Output Power at antenna input terminal	4.08	mW
Prediction Distance	20	cm
Prediction Frequency	2440	MHz
Antenna Gain	3.2	dBi
Antenna Gain	2.089	Numeric
Power Density at Prediction Frequency (S)	0.00169	mW/cm^2
MPE Limit for Uncontrolled Exposure at Prediction Frequency	1	mW/cm^2

2.4GHz Band

Max Peak Output Power at antenna input terminal	15.71	dBm
Max Peak Output Power at antenna input terminal	37.23	mW
Prediction Distance	20	cm
Prediction Frequency	2437	MHz
Antenna Gain	3.2	dBi
Antenna Gain	2.089	Numeric
Power Density at Prediction Frequency (S)	0.01547	mW/cm^2
MPE Limit for Uncontrolled Exposure at Prediction Frequency	1	mW/cm^2

5GHz Band

Max Peak Output Power at antenna input terminal	10.89	dBm
Max Peak Output Power at antenna input terminal	12.27	mW
Prediction Distance	20	cm
Prediction Frequency	5745	MHz
Antenna Gain	4.75	dBi
Antenna Gain	2.985	Numeric
Power Density at Prediction Frequency (S)	0.00729	mW/cm^2
MPE Limit for Uncontrolled Exposure at Prediction Frequency	1	mW/cm^2

Simultaneous Transmission Operations

=(0.01547/1)+(0.00169/1)+(0.00729) = 0.02445 < 1