RF EXPOSURE EVALUATION

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)

FCC ID: 2A22Z-W302

EUT Specification

EUT	Botslab Outdoor Dual-Lens Camera
Model Number	W302
Rating	Adapter: MODEL: SA0122-1201000UB INPUT: 100-240V~ 50-60Hz 0.5A Max OUTPUT: 12.0V 1.0A 12.0W
Frequency band (Operating)	☒BT: 2.402GHz ~ 2.480GHz ☒WLAN: 2.412GHz ~ 2.462GHz ☒WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☒WLAN: 5.745GHz ~ 5825GHz
Device category	☐Portable (<20cm separation) ☒Mobile (>20cm separation)
Exposure classification	☐Occupational/Controlled exposure (S = 5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☒Single antenna ☐Multiple antennas ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Max. output power（peak power）	BLE: 4.94dBm 802.11b: 15.09dBm 802.11g: 16.13dBm 802.11n-HT20: 16.13dBm 802.11n-HT40: 15.78dBm 802.11ax-HE20: 16.74dBm 802.11ax-HE40: 16.33dBm 5180 MHz to 5240 MHz: 15.80dBm 5260 MHz to 5320 MHz: 14.87dBm 5500 MHz to 5700 MHz: 14.75dBm 5745 MHz to 5825 MHz: 14.84dBm
Antenna gain (Max)	BT: 4.21dBi 2.4GHz WIFI: 4.21dBi 5.8G WIFI:4.84dBi

Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

Where
Pd= Power density in mW/cm^2, Pout=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=20cm
Pd the limit of MPE, 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Mode	Max Measured Power (dBm)	Tune up Power (dBm)	Max tune up power(dBm)	Power Density(mW/cm2)	Limit (mW/cm2)
BLE	**4.94**	**5±1**	**6**	**0.002088**	**1**

2.4GHz WIFI:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
802.11b	1	2412	15.09	30	PASS
	6	2437	14.44	30	PASS
	11	2462	14.29	30	PASS
802.11g	1	2412	16.13	30	PASS
	6	2437	15.5	30	PASS
	11	2462	15.31	30	PASS
802.11n (HT20)	1	2412	16.13	30	PASS
	6	2437	15.52	30	PASS
	11	2462	15.27	30	PASS
802.11n (HT40)	3	2422	15.78	30	PASS
	6	2437	15.55	30	PASS
	9	2452	12.68	30	PASS
802.11ax (HE20)	1	2412	16.74	30	PASS
	6	2437	16.16	30	PASS
	11	2462	15.84	30	PASS
802.11ax (HE40)	3	2422	13.63	30	PASS
	6	2437	13.16	30	PASS
	9	2452	16.33	30	PASS

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/ cm2)	Power density Limits (mW/ cm2)
802.11b	1	15±1	16	39.811	4.21	2.636	0.020879	1
	6	14±1	15	31.623	4.21	2.636	0.016585	1
	11	14±1	15	31.623	4.21	2.636	0.016585	1
802.11g	1	16±1	17	50.119	4.21	2.636	0.026286	1
	6	16±1	17	50.119	4.21	2.636	0.026286	1
	11	15±1	16	39.811	4.21	2.636	0.020879	1
802.11n (HT20)	1	16±1	17	50.119	4.21	2.636	0.026286	1
	6	16±1	17	50.119	4.21	2.636	0.026286	1
	11	15±1	16	39.811	4.21	2.636	0.020879	1
802.11n (HT40)	3	16±1	17	50.119	4.21	2.636	0.026286	1
	6	16±1	17	50.119	4.21	2.636	0.026286	1
	9	13±1	14	25.119	4.21	2.636	0.013174	1
802.11ax (HE20)	1	17±1	18	63.096	4.21	2.636	0.033092	1
	6	16±1	17	50.119	4.21	2.636	0.026286	1
	11	16±1	17	50.119	4.21	2.636	0.026286	1
802.11ax (HE40)	3	14±1	15	31.623	4.21	2.636	0.016585	1
	6	13±1	14	25.119	4.21	2.636	0.013174	1
	9	16±1	17	50.119	4.21	2.636	0.026286	1

5.8GHz WIFI:

UNII-1:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
			Ant1		
802.11a	36	5180	15.59	24	PASS
	40	5200	15.8	24	PASS
	48	5240	15.46	24	PASS
11n HT20	36	5180	11.19	24	PASS
	40	5200	12.98	24	PASS
	48	5240	13.52	24	PASS
11n HT40	38	5190	12.56	24	PASS
	46	5230	13.15	24	PASS
11ac VHT20	36	5180	11.2	24	PASS
	40	5200	13.15	24	PASS
	48	5240	13.65	24	PASS
11ac VHT40	38	5190	12.45	24	PASS
	46	5230	13.2	24	PASS
11ax HE20	36	5180	11.29	24	PASS
	40	5200	12.92	24	PASS
	48	5240	13.32	24	PASS
11ax HE40	38	5190	12.59	24	PASS
	46	5230	13.24	24	PASS

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm2)	Power density Limits (mW/cm2)
802.11a	36	16±1	17	50.119	4.84	3.048	0.030389	1
	40	16±1	17	50.119	4.84	3.048	0.030389	1
	48	15±1	16	39.811	4.84	3.048	0.024139	1
802.11n HT20	36	11±1	12	15.849	4.84	3.048	0.009610	1
	40	13±1	14	25.119	4.84	3.048	0.015231	1
	48	14±1	15	31.623	4.84	3.048	0.019174	1
802.11n HT40	38	13±1	14	25.119	4.84	3.048	0.015231	1
	46	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ac VHT20	36	11±1	12	15.849	4.84	3.048	0.009610	1
	40	13±1	14	25.119	4.84	3.048	0.015231	1
	48	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ac VHT40	38	12±1	13	19.953	4.84	3.048	0.012098	1
	46	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ax HE20	36	11±1	12	15.849	4.84	3.048	0.009610	1
	40	13±1	14	25.119	4.84	3.048	0.015231	1
	48	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ax HE40	38	13±1	14	25.119	4.84	3.048	0.015231	1
	46	13±1	14	25.119	4.84	3.048	0.015231	1

UNII-2A:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
			Ant1		
802.11a	52	5260	12.49	24	PASS
	56	5280	14.13	24	PASS
	64	5320	14.43	24	PASS
11n HT20	52	5260	12.97	24	PASS
	56	5280	14.16	24	PASS
	64	5320	14.87	24	PASS
11n HT40	54	5270	13.89	24	PASS
	62	5310	14.15	24	PASS
11ac VHT20	52	5260	12.4	24	PASS
	56	5280	14.18	24	PASS
	64	5320	14.54	24	PASS
11ac VHT40	54	5270	13.41	24	PASS
	62	5310	13.65	24	PASS
11ax HE20	52	5260	12.56	24	PASS
	56	5280	14.04	24	PASS
	64	5320	14.82	24	PASS
11ax HE40	54	5270	13.38	24	PASS
	62	5310	13.41	24	PASS

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11a	52	12±1	13	19.953	4.84	3.048	0.012098	1
	56	14±1	15	31.623	4.84	3.048	0.019174	1
	64	14±1	15	31.623	4.84	3.048	0.019174	1
802.11n HT20	52	12±1	13	19.953	4.84	3.048	0.012098	1
	56	14±1	15	31.623	4.84	3.048	0.019174	1
	64	14±1	15	31.623	4.84	3.048	0.019174	1
802.11n HT40	54	13±1	14	25.119	4.84	3.048	0.015231	1
	62	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ac VHT20	52	12±1	13	19.953	4.84	3.048	0.012098	1
	56	14±1	15	31.623	4.84	3.048	0.019174	1
	64	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ac VHT40	54	13±1	14	25.119	4.84	3.048	0.015231	1
	62	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ax HE20	52	12±1	13	19.953	4.84	3.048	0.012098	1
	56	14±1	15	31.623	4.84	3.048	0.019174	1
	64	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ax HE40	54	13±1	14	25.119	4.84	3.048	0.015231	1
	62	13±1	14	25.119	4.84	3.048	0.015231	1

UNII-2C:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
			Ant1		
802.11a	100	5500	13.27	24	PASS
	116	5600	13.14	24	PASS
	140	5700	13.49	24	PASS
11n HT20	100	5500	13.39	24	PASS
	116	5600	13.21	24	PASS
	140	5700	13.64	24	PASS
11n HT40	102	5510	13.44	24	PASS
	118	5590	12.17	24	PASS
	134	5670	14.75	24	PASS
11ac VHT20	100	5500	13.56	24	PASS
	116	5600	13.12	24	PASS
	140	5700	13.81	24	PASS
11ac VHT40	102	5510	13.41	24	PASS
	118	5590	12.64	24	PASS
	134	5670	14.72	24	PASS
11ax HE20	100	5500	13.87	24	PASS
	116	5600	13.19	24	PASS
	140	5700	13.69	24	PASS
11ax HE40	102	5510	13.53	24	PASS
	118	5590	12.09	24	PASS
	134	5670	14.51	24	PASS

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11a	100	13±1	14	25.119	4.84	3.048	0.015231	1
	116	13±1	14	25.119	4.84	3.048	0.015231	1
	140	13±1	14	25.119	4.84	3.048	0.015231	1
802.11n HT20	100	13±1	14	25.119	4.84	3.048	0.015231	1
	116	13±1	14	25.119	4.84	3.048	0.015231	1
	140	14±1	15	31.623	4.84	3.048	0.019174	1
802.11n HT40	102	13±1	14	25.119	4.84	3.048	0.015231	1
	118	12±1	13	19.953	4.84	3.048	0.012098	1
	134	15±1	16	39.811	4.84	3.048	0.024139	1
802.11ac VHT20	100	14±1	15	31.623	4.84	3.048	0.019174	1
	116	13±1	14	25.119	4.84	3.048	0.015231	1
	140	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ac VHT40	102	13±1	14	25.119	4.84	3.048	0.015231	1
	118	13±1	14	25.119	4.84	3.048	0.015231	1
	134	15±1	16	39.811	4.84	3.048	0.024139	1
802.11ax HE20	100	14±1	15	31.623	4.84	3.048	0.019174	1
	116	13±1	14	25.119	4.84	3.048	0.015231	1
	140	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ax HE40	102	14±1	15	31.623	4.84	3.048	0.019174	1
	118	12±1	13	19.953	4.84	3.048	0.012098	1
	134	13±1	14	25.119	4.84	3.048	0.015231	1

UNII-3:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
			Ant1		
802.11a	149	5745	14.25	30	PASS
	157	5785	13.69	30	PASS
	165	5825	12.99	30	PASS
11n HT20	149	5745	14.75	30	PASS
	157	5785	13.62	30	PASS
	165	5825	13.09	30	PASS
11n HT40	151	5755	13.63	30	PASS
	159	5795	13.73	30	PASS
11ac VHT20	149	5745	14.68	30	PASS
	157	5785	13.79	30	PASS
	165	5825	12.93	30	PASS
11ac VHT40	151	5755	14.53	30	PASS
	159	5795	13.59	30	PASS
11ax HE20	149	5745	14.84	30	PASS
	157	5785	13.63	30	PASS
	165	5825	13.28	30	PASS
11ax HE40	151	5755	14.42	30	PASS
	159	5795	14.11	30	PASS

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11a	149	14±1	15	31.623	4.84	3.048	0.019174	1
	157	14±1	15	31.623	4.84	3.048	0.019174	1
	165	13±1	14	25.119	4.84	3.048	0.015231	1
802.11n HT20	149	15±1	16	39.811	4.84	3.048	0.024139	1
	157	14±1	15	31.623	4.84	3.048	0.019174	1
	165	13±1	14	25.119	4.84	3.048	0.015231	1
802.11n HT40	151	14±1	15	31.623	4.84	3.048	0.019174	1
	159	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ac VHT20	149	15±1	16	39.811	4.84	3.048	0.024139	1
	157	14±1	15	31.623	4.84	3.048	0.019174	1
	165	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ac VHT40	151	15±1	16	39.811	4.84	3.048	0.024139	1
	159	14±1	15	31.623	4.84	3.048	0.019174	1
802.11ax HE20	149	15±1	16	39.811	4.84	3.048	0.024139	1
	157	14±1	15	31.623	4.84	3.048	0.019174	1
	165	13±1	14	25.119	4.84	3.048	0.015231	1
802.11ax HE40	151	14±1	15	31.623	4.84	3.048	0.019174	1
	159	14±1	15	31.623	4.84	3.048	0.019174	1

The Product unsupported at the same time to Transmitting. According to KDB 447498, and no simultaneous SAR measurement is required.

Signature:

Tiger Xu

Tiger Xu

Date: 2023-07-17