

RF Exposure Evaluation Report

APPLICANT : Akteena
EQUIPMENT : Akteena LumosX AI Dashcam
BRAND NAME : Akteena
MODEL NAME : A9-2299D
FCC ID : 2BL79-A922
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

The product evaluation date was started from Apr. 03, 2025 and completed on Apr. 03, 2025. We, Sporton International Inc. (Kunshan), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.



Approved by: Si Zhang

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA4O2401	Rev. 01	Initial issue of report.	May 08, 2025



1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-KS	CN1257	314309

Applicant	
Company Name	Akteena
Address	Akteena INC, 41369 Vincenti Ct., Novi Michigan 48375, U.S.A

Manufacturer	
Company Name	VVDN Technologies Pvt Ltd
Address	Plot No: CP-07, Sector-8,IMT Manesar, Gurugram-122050,Haryana,INDIA

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Akteena LumosX AI Dashcam
Brand Name	Akteena
Model Name	A9-2299D
FCC ID	2BL79-A922
Wireless Technology and Frequency Range	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850 MHz ~ 1910 MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GPRS/EGPRS RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is not supported) LTE: QPSK, 16QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
Antenna Gain	GSM850: -2.2 dBi GSM1900: 1.6 dBi WCDMA Band II: 1.6 dBi WCDMA Band IV: 2.1 dBi WCDMA Band V: -2.2 dBi LTE Band 2 : 1.6 dBi LTE Band 4 : 2.1 dBi LTE Band 5 : -2.2 dBi LTE Band 7 : 2.20 dBi LTE Band 12 : -2.2 dBi LTE Band 13 : -2.2 dBi LTE Band 26: -2.2 dBi LTE Band 38: 2.2 dBi LTE Band 41: 2.2 dBi LTE Band 66 : 2.1 dBi WLAN2.4GHz/Bluetooth: 1.17 dBi WLAN5.2GHz: 6.09 dBi WLAN5.3GHz: 6.09 dBi WLAN5.5GHz: 4.32 dBi WLAN5.8GHz: 4.32 dBi

Antenna Type	WWAN/WLAN/Bluetooth: FPC Antenna NFC: Flex Antenna
HW Version	C1
SW Version	Thermal-DCV2.7
EUT Stage	Identical Prototype
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Comments and Explanations:	
1.	The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2.	The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

3. Maximum RF average output tune up power among production units

<GSM>

Mode	Burst average power(dBm)	
	GSM 850	GSM 1900
GPRS (GMSK, 1 Tx slot)	35.00	32.00
GPRS (GMSK, 2 Tx slots)	32.00	30.00
GPRS (GMSK, 3 Tx slots)	30.00	28.00
GPRS (GMSK, 4 Tx slots)	28.00	27.00
EDGE (8PSK, 1 Tx slot)	30.00	29.00
EDGE (8PSK, 2 Tx slots)	26.00	25.00
EDGE (8PSK, 3 Tx slots)	24.00	23.00
EDGE (8PSK, 4 Tx slots)	22.00	22.00

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	25.00
	Band IV	25.00
	Band V	25.00

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	25.00
	Band 4	25.00
	Band 5	25.00
	Band 7	25.00
	Band 12	25.00
	Band 13	25.00
	Band 26	25.00
	Band 38	25.00
	Band 41	25.00
	Band 66	25.00

<WLAN 2.4GHz >

Mode		Maximum Average Power (dBm)
2.4GHz	802.11b	18.00
	802.11g	13.00
	802.11n-HT20	12.00

< Bluetooth>

Mode		Maximum Average Power (dBm)
Bluetooth BR/EDR		7.00
Bluetooth LE		6.00

**<WLAN 5GHz >**

Mode		Maximum Average Power (dBm)
5.2GHz	802.11a	16.0
	802.11n-HT20	16.0
	802.11n-HT40	15.0
	802.11ac-VHT20	16.0
	802.11ac-VHT40	15.0
	802.11ac-VHT80	12.0
5.3GHz	802.11a	18.0
	802.11n-HT20	17.0
	802.11n-HT40	16.0
	802.11ac-VHT20	17.0
	802.11ac-VHT40	16.0
	802.11ac-VHT80	13.0
5.5GHz	802.11a	14.5
	802.11n-HT20	17.0
	802.11n-HT40	13.0
	802.11ac-VHT20	17.0
	802.11ac-VHT40	13.0
	802.11ac-VHT80	13.5
5.8GHz	802.11a	14.0
	802.11n-HT20	15.0
	802.11n-HT40	12.5
	802.11ac-VHT20	15.0
	802.11ac-VHT40	12.5
	802.11ac-VHT80	12.0

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
300-1500			f/300	6
1500-100,000			5	6
(B) 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
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
GPRS 850 (1 Tx slot)	824.0	-2.20	35.00	32.800	239.883	0.048	0.549	0.087
GPRS 850 (2 Tx slots)	824.0	-2.20	32.00	29.800	239.883	0.048	0.549	0.087
GPRS 850 (3 Tx slots)	824.0	-2.20	30.00	27.800	225.944	0.045	0.549	0.082
GPRS 850 (4 Tx slots)	824.0	-2.20	28.00	25.800	190.546	0.038	0.549	0.069
EGPRS 850 (1 Tx slot)	824.0	-2.20	30.00	27.800	75.858	0.015	0.549	0.027
EGPRS 850 (2 Tx slots)	824.0	-2.20	26.00	23.800	60.256	0.012	0.549	0.022
EGPRS 850 (3 Tx slots)	824.0	-2.20	24.00	21.800	56.754	0.011	0.549	0.021
EGPRS 850 (4 Tx slots)	824.0	-2.20	22.00	19.800	47.863	0.010	0.549	0.017
GPRS 1900 (1 Tx slot)	1850.0	1.60	32.00	33.600	288.403	0.057	1.000	0.057
GPRS 1900 (2 Tx slots)	1850.0	1.60	30.00	31.600	363.078	0.072	1.000	0.072
GPRS 1900 (3 Tx slots)	1850.0	1.60	28.00	29.600	341.979	0.068	1.000	0.068
GPRS 1900 (4 Tx slots)	1850.0	1.60	27.00	28.600	363.078	0.072	1.000	0.072
EGPRS 1900 (1 Tx slot)	1850.0	1.60	29.00	30.600	144.544	0.029	1.000	0.029
EGPRS 1900 (2 Tx slots)	1850.0	1.60	25.00	26.600	114.815	0.023	1.000	0.023
EGPRS 1900 (3 Tx slots)	1850.0	1.60	23.00	24.600	108.143	0.022	1.000	0.022
EGPRS 1900 (4 Tx slots)	1850.0	1.60	22.00	23.600	114.815	0.023	1.000	0.023
WCDMA Band 2	1850.0	1.60	25.00	26.600	457.088	0.091	1.000	0.091
WCDMA Band 4	1710.0	2.10	25.00	27.100	512.861	0.102	1.000	0.102
WCDMA Band 5	824.0	-2.20	25.00	22.800	190.546	0.038	0.549	0.069
LTE Band 2	1850.0	1.60	25.00	26.600	457.088	0.091	1.000	0.091
LTE Band 4	1710.0	2.10	25.00	27.100	512.861	0.102	1.000	0.102
LTE Band 5	824.0	-2.20	25.00	22.800	190.546	0.038	0.549	0.069
LTE Band 7	2500.0	2.20	25.00	27.200	524.807	0.104	1.000	0.104
LTE Band 12	699.0	-2.20	25.00	22.800	190.546	0.038	0.466	0.081
LTE Band 13	777.0	-2.20	25.00	22.800	190.546	0.038	0.518	0.073
LTE Band 26	814.0	-2.20	25.00	22.800	190.546	0.038	0.543	0.070
LTE Band 38	3570.0	2.20	25.00	27.200	524.807	0.104	1.000	0.104
LTE Band 41	2496.0	2.20	25.00	27.200	524.807	0.104	1.000	0.104
LTE Band 66	1710.0	2.10	25.00	27.100	512.861	0.102	1.000	0.102
2.4GHz WLAN	2412.0	1.17	18.00	19.170	82.604	0.016	1.000	0.016
5.2GHz WLAN	5180.0	6.09	16.00	22.090	161.808	0.032	1.000	0.032
5.3GHz WLAN	5260.0	6.09	18.00	24.090	256.448	0.051	1.000	0.051
5.5GHz WLAN	5500.0	4.32	17.00	21.320	135.519	0.027	1.000	0.027
5.8GHz WLAN	5745.0	4.32	15.00	19.320	85.507	0.017	1.000	0.017
Bluetooth	2402.0	1.17	7.00	8.170	6.561	0.001	1.000	0.001
NFC	13.56			-44.340	0.00004	0.0000000	0.979	0.00000001

Note:

- For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
- Chose the maximum power to do MPE analysis.
- NFC maximum EIRP power calculate from NFC E-Field level from RF test report which can be referred to Sproton No: FR4O2401D.
 - This device maximum E-Field level is 50.89dBuV/m at 3m, so the EIRP power is -44.34dBm(0.00004mW).
 - Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)

5.2. Collocated Power Density Calculation

WWAN Power Density / Limit	WLAN 2.4GHz Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN 2.4GHz
0.104	0.016	0.120

WWAN Power Density / Limit	Bluetooth Power Density / Limit	WLAN 5GHz Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN 5GHz + Bluetooth
0.104	0.001	0.032	0.137

Note:

1. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
2. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
3. According to the EUT characteristic, WLAN 2.4GHz and WLAN 5GHz can't transmit simultaneously.
4. According to the EUT characteristic, WLAN (or Bluetooth) and NFC can't transmit simultaneously.
5. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN 2.4GHz, WWAN + WLAN 5GHz + Bluetooth.
6. Considering all the transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of collocated transmitters is compliant.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----