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Maximum Permissible Exposure

FCC ID: 2AAUL-WARPPLE-LS5

APPLICANT: Ovomedia Creative Inc.

Application Type: Certification

Product: Smart Projector

Model No.: OVO-L1

Serial Model No.: OVO-L1S, LS5, LS5 Pro

Brand Name: OVO, warpple

FCC Rule Part(s): Part 2.1093 (Portable)

Test Date: June 10, 2022

Reviewed By

:

Paddy Chen

(Paddy Chen)

Approved By

:

Chenz Ker

(Chenz Ker)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Smart Projector
Model No.	OVO-L1
Serial Model No.	OVO-L1S, LS5,LS5 Pro
Brand Name	OVO, warpple
Supports Radios Spec.	WLAN: 2.4G: 802.11b/g/n-20/n-40 5G: 802.11a/n-20/ac-20/n-40/ac-40, Band 1,4 WPAN: Bluetooth Single Mode: V5.0
Wi-Fi Specification	802.11a/n/ac (1TX / 1RX)
Antenna gain	2.4G: 2.13dBi, 5G: 2.08dBi, BLE: 1.88dBi
Frequency Range	<u>2.4GHz:</u> For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz <u>5GHz:</u> For 802.11a/n-HT20/ac-VHT-20: 5180~5240MHz, 5745~5825MHz For 802.11n-HT40/ ac-VHT40: 5190~5230MHz, 5755~5795MHz
Modulation Type	BT: FHSS (GFSK, $\pi/4$ DQPSK,8DPSK) BLE: GFSK (1Mbps / 2Mbps) 802.11b: DSSS, DBPSK, DQPSK, CCK 802.11g/n-20M/n-40M: OFDM, BPSK, QPSK, 16QAM, 64QAM 802.11a/n-20/ac-20/n-40/ac-40: OFDM (BPSK, QPSK, 16QAM, 64QAM,256QAM)

2. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1. FCC 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 ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control 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 Exposures				
0.3-1.4	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

Note : (1) f= Frequency in MHz , (2) * = Plane-wave equivalent power density

Calculation Formula:

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

Where

Pd = power density in mW/cm²

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

Under normal use condition, is at least 20cm away from the body of the user .

So, this device is classified as **Mobile Device**.

2.2. Test Result

Band (MHz)	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
BLE 5.0	2402 ~ 2480	2.91	1.95	1.88	20	0.0006	1
Wi-Fi 2.4G_g	2412 ~ 2462	20.75	118.85	2.13	20	0.0386	1
Wi-Fi 5G_a	5180 ~ 5825	15.75	37.58	2.08	20	0.0121	1

Conclusion :

$$CPD1/LPD1 + CPD2/LPD2 + \dots + CPDN/LPDN \leq 1$$

CPD : Calculation Power Density

LPD : Limit of Power Density

Mode	Power Density	Limit	Conclusion	Result (≤ 1)
BLE 5.0	0.0006	1	0.0513	1
Wi-Fi 2.4G	0.0386	1		
Wi-Fi 5G	0.0121	1		

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