



RF Exposure Evaluation Report

Application No.: SZEM2004003232CR
Applicant: SZ DJI TECHNOLOGY CO., LTD.
Address of Applicant: 14th floor, West Wing, Skyworth Semiconductor Design Building NO.18
Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China
Manufacturer: SZ DJI TECHNOLOGY CO., LTD.
Address of Manufacturer: 14th floor, West Wing, Skyworth Semiconductor Design Building NO.18
Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China
Factory: SZ DJI TECHNOLOGY CO., LTD.
Address of Factory: 14th floor, West Wing, Skyworth Semiconductor Design Building NO.18
Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China
Equipment Under Test (EUT):
EUT Name: RoboMaster EP Core
Model No.: RMEPCORE
FCC ID: SS3-RMEPCORE
Standards: 47 CFR PART 1.1310
47 CFR PART 2.1091
Date of Receipt: 2020-04-29
Date of Test: 2020-05-08 to 2020-05-19
Date of Issue: 2020-05-21

Test Result:	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



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Shenzhen Branch

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-05-21		Original

Authorized for issue by:			
			
		Calvin Weng /Project Engineer	
			
		Eric Fu /Reviewer	



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4 General Information

4.1 General Description of EUT

Power Supply:	DC10.8V by Lithium-ion battery(2400mAh) Recharge input: DC12.6V 2.2A by power adapter adapter input: AC100-240V, 1A, 50/60Hz adapter M/N: E1C28			
Cable:	AC power cable: 1m unshielded cable without ferrite core Micro USB cable: 0.6m unshielded cable			
For 2.4G:				
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz			
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)			
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7			
Channel Spacing:	5MHz			
Antenna Type:	Integral antenna			
Antenna Gain:	4.5dBi			
For 5G:				
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	IEEE 802.11a	5180-5240	4
		IEEE 802.11n 20MHz	5180-5240	4
		IEEE 802.11n 40MHz	5190-5230	2
	UNII Band III	IEEE 802.11a	5745-5825	5
		IEEE 802.11n 20MHz	5745-5825	5
		IEEE 802.11n 40MHz	5755-5795	2
Modulation Type:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM)			
TPC Function:	Not support			
Antenna Type:	Integral antenna			
Antenna Gain:	4dBi			



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4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually.



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5.1.3 EUT RF Exposure Evaluation

For 2.4G band:

Antenna Gain: 4.5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.82 in linear scale.

Directional gain: $4.5+10\log 2=7.51\text{dBi}$, and 5.64 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Stand-alone:

Channel	Frequency (MHz)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
Mid	2437	20.28	106.66	0.0598	1.0	PASS

Simultaneous transmission:

Channel	Frequency (MHz)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
Mid	2437	23.05	201.84	0.2263	1.0	PASS

Note: Refer to report No. SZEM200400323202 for EUT test Max Conducted Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 5G band:

Antenna Gain: 4dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.51 in linear scale.

Directional gain: $4+10\log 2=7.01\text{dBi}$, and 5.02 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Stand-alone

Channel	Frequency (MHz)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
High	5230	19.15	82.22	0.0411	1.0	PASS
Mid	5785	21.19	131.52	0.0657	1.0	PASS



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Simultaneous transmission:

Channel	Frequency (MHz)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
High	5230	21.73	82.22	0.1488	1.0	PASS
Mid	5785	24.05	254.10	0.2539	1.0	PASS

Note: Refer to report No. SZEM200400323203 for EUT test Max Conducted Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

- End of the Report -



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