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RF Exposure Evaluation Report

Report No. : CQASZ20210300359E-03

Applicant: JXD TECHNOLOGY CO.,LTD

Address of Applicant: OFFICE NO.12 19/F ,HO KING COMMERCIAL CENTRE,NO.2-16 FA YUEN STREET ,MONGKOK KOWLOON,HONGKONG

Manufacturer: JXD TECHNOLOGY CO.,LTD

Address of Manufacturer: OFFICE NO.12 19/F ,HO KING COMMERCIAL CENTRE,NO.2-16 FA YUEN STREET ,MONGKOK KOWLOON,HONGKONG

Equipment Under Test (EUT):

Product: LTE CPE

Model No.: A311-ZEV

Series Model: A311-ZIV(The just a different model)

Brand Name: N/A

FCC ID: 2AZG9-JXDA311

Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2021-03-23 to 2021-04-6

Date of Issue: 2021-04-6

Test Result : PASS*

Tested By:

Juh Li

(Martin Lee)

Reviewed By:

Sheek, Luo

(Sheek Luo)

Approved By:

Jack Ai

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210300359E-03	Rev.01	Initial report	2021-04-20

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4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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.

4.1.2 Test Procedure

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

4.2 EUT RF Exposure Evaluation

1) For 2.4G WIFI

Antenna Gain: ANT1: 2.0dBi , ANT2: 2.0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Calculated Result and Limit

Mode	Frequency (MHz)	output power (dBm)	output power (mW)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
IEEE 802.11b (ANT 1)	2412	13.64	23.12	13 ± 2	2	1.59	0.00729	1	Compiles
	2437	13.06	20.23	13 ± 2	2	1.59	0.00638	1	Compiles
	2462	12.71	18.66	13 ± 2	2	1.59	0.00588	1	Compiles
IEEE 802.11g (ANT 1)	2412	11.91	15.52	11 ± 1.5	2	1.59	0.00489	1	Compiles
	2437	11.78	15.07	11 ± 1.5	2	1.59	0.00475	1	Compiles
	2462	11.87	15.38	11 ± 1.5	2	1.59	0.00485	1	Compiles
IEEE 802.11b (ANT 2)	2412	11.73	14.89	13 ± 2	2	1.59	0.00470	1	Compiles
	2437	11.66	14.66	13 ± 2	2	1.59	0.00462	1	Compiles
	2462	10.71	11.78	13 ± 2	2	1.59	0.00371	1	Compiles
IEEE 802.11g (ANT 2)	2412	10.07	10.16	11 ± 1.5	2	1.59	0.00320	1	Compiles
	2437	9.89	9.75	11 ± 1.5	2	1.59	0.00307	1	Compiles
	2462	9.64	9.20	11 ± 1.5	2	1.59	0.00290	1	Compiles
IEEE 802.11n HT20 (ANT 1)	2412	10.26	10.61	9 ± 1.5	2	1.59	0.00335	1	Compiles
	2437	8.80	7.59	9 ± 1.5	2	1.59	0.00239	1	Compiles
	2462	8.76	7.52	9 ± 1.5	2	1.59	0.00237	1	Compiles
IEEE 802.11n HT20 (ANT 2)	2412	9.17	8.26	9 ± 1.5	2	1.59	0.00260	1	Compiles
	2437	9.42	8.75	9 ± 1.5	2	1.59	0.00276	1	Compiles
	2462	8.66	7.35	9 ± 1.5	2	1.59	0.00232	1	Compiles
IEEE 802.11n HT40 (ANT 1)	2422	9.52	8.95	8 ± 1.5	2	1.59	0.00282	1	Compiles
	2437	7.58	5.73	8 ± 1.5	2	1.59	0.00181	1	Compiles
	2452	7.44	5.55	8 ± 1.5	2	1.59	0.00175	1	Compiles

IEEE 802.11n HT40 (ANT 2)	2422	6.99	5.00	8 ± 1.5	2	1.59	0.00158	1	Compiles
	2437	7.73	5.92	8 ± 1.5	2	1.59	0.00187	1	Compiles
	2452	6.57	4.54	8 ± 1.5	2	1.59	0.00143	1	Compiles

Mode	Frequency (MHz)	Power Density (S) (mW/cm ²)			Limited of Power Density (S) (mW/cm ²)	Test Result
		ANT a	ANT b	Sum		
IEEE 802.11n HT20 (ANT 1+2)	2412	0.00335	0.00260	0.00595	1	Compiles
	2437	0.00239	0.00276	0.00515	1	Compiles
	2462	0.00237	0.00232	0.00469	1	Compiles
IEEE 802.11n HT40 (ANT 1+2)	2422	0.00282	0.00158	0.00440	1	Compiles
	2437	0.00181	0.00187	0.00368	1	Compiles
	2452	0.00175	0.00143	0.00313	1	Compiles

1) For LTE Band 4

Antenna Gain: ANT: 2.0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	output power (dBm)	output power (W)	Target power (dBm)	Antenna gain		Power Density (S) (mW/cm ²)	Limited of Power Density (S) (mW/cm ²)	Test Result
					(dBi)	(Linear)			
Highest	1745	23.96	0.2489	21.5 ± 2.5	2	1.59	0.07873	1	Compiles

LTE and WLAN Sync Transport Power Density (s)(mW/cm²)

	Channel	Frequency (MHz)	output power (dBm)	Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Transport Power Density (s)(mW/cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
					(dBi)	(Linear)				
LTE Band 4	Highest	1745	23.96	21.5 ± 2.5	2	1.59	0.07873	0.08468	1	Compiles
WLAN		2412	10.26	9 ± 1.5	2	1.59	0.00595			

Note: 1) Refer to report No. CQASZ20210300359E-02 and CQASZ20210300359E-03 for EUT test Conducted peak Output Power value.

2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$