FCC RF Exposure Evaluation

1. Product Information

Product Information					
FCC ID	2A4FVLJD003NFBLWH				
Product name	3 Inch BLE Narrow Flood Recessed Down Light				
Model number	LJD003NFBLWH				
Additional Model No.	LJD003NFBLBK, LJD003NFBLORB, LJD003NFBLXX, XX = other Finish color				
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested				
Power supply	Input: AC 120V				
Channel Number	40 channels for Bluetooth V5.1(DTS)				
Channel Spacing	2MHz for Bluetooth V5.1(DTS)				
Modulation Type	GFSK for Bluetooth V5.1(DTS)				
Antenna Type	PCB Antenna				
Antenna Gain	1.28dBi(Max.)				
Hardware version	/				
Software version	/				
FCC Operation frequency	2402MHz-2480MHz				
Exposure category	General population/uncontrolled environment				
EUT Type	Production Unit				
Device Type	Mobile Devices				

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.





3. Limit

3.1 Refer Evaluation Method

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits. FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

3. 2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

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Frequency	Electric Field	Magnetic Field Power Density		Averaging Time			
Range(MHz)	Strength(V/m)	Strength(A/m)	(mW/cm²)	(minute)			
Limits for Occupational/Controlled Exposure							
0.3 – 3.0	0.3 – 3.0 614		1.63 (100)_*				
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6			
30 - 300	61.4	0.163	1.0	6			
300 – 1500	00 – 1500 /		/ f/300				
1500 - 100,000	500 – 100,000 /		/ 5				
Limits for	Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure						
Frequency	Frequency Electric Field		Magnetic Field Power Density				
Range(MHz)	Strength(V/m)	Strength(A/m) (mW/cm ²)		(minute)			
Limits for Occupational/Controlled Exposure							
0.3 – 3.0	614	1.63	(100)_*	30			
3.0 – 30	3.0 – 30 824/f		(180/f ²)*	30			
30 - 300	27.5	0.073	0.2	30			
300 – 1500	NSA Tos Testins	/	f/1500	30			
1500 – 100,000	The All	/	1.0	30			

F=frequency in MHz *=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance Equation from page 18 of OET Bulletin 65, Edition 97-01

S=PG/4πR²

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator R=distance to the center of radiation of the antenna

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

InternalAntenna type andIdentificationantenna number		Operate frequency band	Maximum antenna gain	Note	
Antenna	PCB Antenna	2400MHz-2500MHz	1.28dBi	BT Antenna	



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Scan code to check authenticity



6. Conducted Power

Conducted Power >					
	Mada	Channel	Frequency(MHz)	Max Conducted Power	
	Mode			(dBm)	
		0	2402	0.21	
	GFSK	19	2440	-0.55	
		39	2480	-1.16	

7. Manufacturing Tolerance

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GFSK (Peak)					
Channel	Channel 0	Channel 19	Channel 39		
Target (dBm)	0	0	-1.0		
Tolerance ±(dB)	1.0	1.0	1.0		

8. Measurement Results

8.1 Standalone MPE

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r = 20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[Antenna]

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	RF output power		Antenna	Antenna	MPE	MPE
Band/Mode	dBm	mW	Gain	Gain	(mW/cm2)	Limits
	dBill		(dBi)	(linear)	(11117)01112)	(mW/cm2)
GFSK	1.0	1.2589	1.28	1.3428	0.0003	1.0000

Remark:

1. Output power including tune-up tolerance;

2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

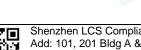
8.2 Simultaneous Transmission MPE Evaluation

The EUT equiped with one module and one antenna. So no need consider simultaneous transmission.

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

.....THE END OF REPORT.....



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