



Maximum Permissible Exposure Evaluation

FCC ID: 2A8J5-WFD55H40

1. Client Information

Applicant	:	HIBRIGHT LCD SOLUTION LIMITED
Address	:	ROOM A1, 11/F WINNER BUILDING, 36 MAN YUE STREET, HUNG HOM, KOWLOON, HONG KONG
Manufacturer	:	HIBRIGHT LCD SOLUTION LIMITED
Address	:	ROOM A1, 11/F WINNER BUILDING, 36 MAN YUE STREET, HUNG HOM, KOWLOON, HONG KONG

2. General Description of EUT

EUT Name	:	WINDOW FACING LCD DISPLAY
Models No.	:	WFD55H40, WFD320H25, WFD320H30, WFD320H40, WFD430H25, WFD430H30, WFD430H40, WFD490H25, WFD490H30, WFD490H40, WFD550H25, WFD550H30, WFD550H50, WFD650H25, WFD650H30, WFD650H40, WFD750H25, WFD750H30, WFD750H40, WFD860H25, WFD860H30, WFD860H40, WFD320H15, WFD430H15, WFD490H15, WFD550H15, WFD650H15, WFD750H15, WFD860H15
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is size.
Product Description	:	Operation Frequency: Bluetooth V4.2:2402MHz~2480MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
	:	Number of Channel: BT: 79 channels BLE: 40 channels 802.11b/g/n(HT20):11 channels 802.11n(HT40): 7 channels
	:	RF Output Power: BLE: 6.4dBm BT: 6.22dBm 802.11b:17.77dBm 802.11g:17.45dBm 802.11n20:17.84dBm 802.11n24:17.60dBm
	:	Antenna Gain: 3.0dBi Monopole Antenna for Bluetooth 3.0dBi Monopole Antenna for 2.4G WiFi
Power Rating	:	Input: AC 135-240V~
Software Version	:	ANDROID 7.1.2
Hardware Version	:	DS3288A-V2

Connecting I/O Port(S)	:	Please refer to the User's Manual
Remark	:	The adapter and antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.



MPE Calculations for 2.4G

1. Antenna Gain:

Bluetooth Internal Antenna: 3.0dBi
2.4G WiFi Internal Antenna: 3.0dBi.

2. EUT Operation Condition:

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

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the 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

4. Test Result:

Bluetooth Worst Maximum MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
GFSK	1	2402	4.95	5±1	6	3.0	20	0.0016
		2441	3.96	4±1	5	3.0	20	0.0013
		2480	3.74	4±1	5	3.0	20	0.0013
π/4-DQPSK	1	2402	5.84	6±1	7	3.0	20	0.0020
		2441	5.08	5±1	6	3.0	20	0.0016
		2480	4.59	5±1	6	3.0	20	0.0016
8-DPSK	1	2402	6.22	6±1	7	3.0	20	0.0020
		2441	5.33	5±1	6	3.0	20	0.0016
		2480	5.15	5±1	6	3.0	20	0.0016

Note:
NTX= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Peak Output Power.



Bluetooth LE Worst Maximum MPE Result

Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
GFSK	1	2402	5.84	6±1	7	3.0	20	0.0020
		2440	5.87	6±1	7	3.0	20	0.0020
		2480	6.4	6±1	7	3.0	20	0.0020

Note:

N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.

2.4G WiFi Worst Maximum MPE Result

Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11b	1	2412	17.77	18±1	19	3.0	20	0.0315
		2437	17.45	17±1	18	3.0	20	0.0250
		2462	17.37	17±1	18	3.0	20	0.0250
802.11g	1	2412	17.45	17±1	18	3.0	20	0.0250
		2437	17.23	17±1	18	3.0	20	0.0250
		2462	17.19	17±1	18	3.0	20	0.0250
802.11n (HT20)	1	2412	17.84	18±1	19	3.0	20	0.0315
		2437	17.22	17±1	18	3.0	20	0.0250
		2462	17.46	17±1	18	3.0	20	0.0250
802.11n (HT40)	1	2422	17.60	18±1	19	3.0	20	0.0315
		2437	17.39	17±1	18	3.0	20	0.0250
		2452	17.25	17±1	18	3.0	20	0.0250

Note:

N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.



5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For 2.4G:2412~2480 MHz

MPE limit S: 1mW/ cm²

The MPE is calculated as $0.0335 \text{ mW} / \text{cm}^2 < \text{limit } 1 \text{mW} / \text{cm}^2$. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

6. Conclusion:

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

-----END OF REPORT-----

