Maximum Permissible Exposure Evaluation

FCC ID: 2A23L-NBD-P-10

1. Client Information

Applicant	:	NBDair Inc
Address	:	1023 Walnut Street, #100, Boulder, CO 80302 U.S.A
Manufacturer	:	NBDair Inc
Address	:	1023 Walnut Street, #100, Boulder, CO 80302 U.S.A

2. General Description of EUT

EUT Name	:	Display Panel	
HVIN/Models No.	:	2A23L-NBD-P-10, 2A23L-NBD-P-11, 2A23L-NBD-P-12, 2A23L-NBD-P-13, 2A23L-NBD-P-14, 2A23L-NBD-P-15, 2A23L-NBD-P-16, 2A23L-NBD-P-17, 2A23L-NBD-P-18	
Model Different	:	All these models are the same in the same PCB, layout and circuit, the only difference is the model name and appearance.	
Brand Name	:	welSPACE	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
		Number of Channel:	802.11b/g/n(HT20):11 channels 802.11n(HT40): 7 channels
		RF Output Power:	802.11b: 17.958dBm (MAX) 802.11g: 16.034dBm (MAX) 802.11n(HT20): 15.756dBm (MAX) 802.11n(HT40): 12.583dBm (MAX)
		Antenna Gain:	1.8dBi PCB Antenna
Power Rating	:	Input: 100-240V~, 50/60Hz, 0.65A MAX Output: DC 12V/1.5A	
Software Version	:	N/A	
Hardware Version	:	R35	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the evaluation report used the EUT(20210517-24_01-2#).	

MPE Calculations for WIFI

1. **Antenna Gain:**
   PIFA Antenna:1.8dBi.

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:**

2.4G WiFi

Mode	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]	Limit of Power Density (mW/ cm^2) (S)
802.11B	17.958	18±1	19	1.8	20	0.0239	1
802.11G	16.034	16±1	17	1.8	20	0.0151	1
802.11N(HT20)	15.756	16±1	17	1.8	20	0.0151	1
802.11N(HT40)	12.583	13±1	14	1.8	20	0.0076	1

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 2.4WIFI:2412~2462 MHz
MPE limit S: 1mW/ cm^2
The MPE is calculated as **0.0239*mW / cm²* < *limit 1mW / cm²***. 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-----