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RF EXPOSURE EVALUATION

1. PRODUCT INFORMATION

Product Description	Panel PC
Model Name	PA1000-R, PA1000-X(X is A-Z)
FCC ID	2A639-P1000-R

2. EVALUATION METHOD AND LIMIT

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

§ 1.1310(e)(1) LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE

Frequency Range (MHz)	E-field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (Minutes)
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

*Note:

1. f= Frequency in MHz

*=Plane-wave Equivalent Power Density

2. The MPE limit for General Population/Uncontrolled exposure to fixed transmitters is not applicable for portable transmitters. Portable devices evaluation shall be performed according to the SAR provisions in 47 CFR § 2.1093.

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

Where:

S=power density (in appropriate units, e.g. mw/cm^2)

P=power input to antenna (in appropriate units , e.g. , mW)

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 (in appropriate units ,e.g., cm)

3. CALCULATION

A minimum test separation distance ⩾ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be at least 20 cm and fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated.

WIFI PART(Can not transmit at different band simultaneously)

Antenna 1:

802.11n(HT20) Single mode(Worst case) For 2.4GHz WIFI

Antenna Gain=3.30dBi (Numeric 2.14), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
2437	13.10	20.42	0.0087	1

802.11AC(HT20) Single mode(Worst case) For 5GHz WIFI U-NII Band 1

Antenna Gain=3.50dBi (Numeric 2.24), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
5220	10.55	11.35	0.0047	1

802.11AC(HT20) Single mode(Worst case) For 5GHz WIFI U-NII Band 3

Antenna Gain=4.20dBi (Numeric 2.63), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
5745	8.03	6.35	0.0033	1

BT (Worst case 2441MHz)

Antenna Gain=3.30dBi (Numeric 2.14), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
2441	7.10	5.13	0.0022	1

BLE (Worst case 2440MHz)

Antenna Gain=3.30dBi (Numeric 2.14), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
2440	7.03	5.05	0.0021	1

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Antenna 2:

802.11n(HT20) Single mode(Worst case) For 2.4GHz WIFI

Antenna Gain=3.30dBi (Numeric 2.14), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
2412	11.86	15.35	0.0080	1

802.11A Single mode(Worst case) For 5GHz WIFI U-NII Band 1

Antenna Gain=3.50dBi (Numeric 2.24), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
5180	10.23	10.54	0.0055	1

802.11A Single mode(Worst case) For 5GHz WIFI U-NII Band 3

Antenna Gain=4.20dBi (Numeric 2.63), π=3.14

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm2	mW/cm2
5745	9.13	8.18	0.0043	1

NFC Coil Antenna Gain=0dBi (Numeric 1.0), π=3.14

Frequency	Output Power	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBuV/m	dBm	mW	mW/cm2	mW/cm2
13.56	68.33	-26.87	0.0021	0.00	0.98

Note:

1. Antenna gain provided by the applicant.Can affect the validity of results.
2. Only the worst case recorded.
3. 2.4G WIFI and 5G WIFI can not simultaneous transmission .
4. BT and BLE can not simultaneous transmission.
5. The NFC, WIFI and BT/BLE can transmit simultaneously and

MPE ratio (NFC+BT/BLE + 2.4GWIFI/5GWIFI)=0.00/0.98+ 0.0022/1+0.0087/1

= 0.0109< 1

6.WIFI Antenna1 and Antenna 2 does not supporting MIMO transmitting.

it satisfy the RF exposure requirements for simultaneous transmission that the sum of the MPE radios < 1.

Result: Compliant

--THE END--