5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

According to subpart 15.247(i)and subpart §1.1310, systems operating under the provisions of this 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.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
S = PG/4πR² = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

5.2 Measurement Result

Mode	Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance	Power Density	MPE Limit
		(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm2)	(mW/cm^2)
WLAN	2412-2462	6.04	4.02	21	125.89	20	0.101	1
CSS-DSS	902.3-927.6	5	3.16	11	12.59	20	0.008	0.6
CSS-DTS	903-926.9	5	3.16	10	10.00	20	0.006	0.6
WCDMA B2	1850-1910	4.41	2.76	25	316.23	20	0.174	1
WCDMA B4	1710-1755	4.41	2.76	25	316.23	20	0.174	1
WCDMA B5	824-849	1.17	1.31	25	316.23	20	0.082	0.55
LTE B2	1850-1910	4.41	2.76	25	316.23	20	0.174	1
LTE B4	1710-1755	4.41	2.76	25	316.23	20	0.174	1
LTE B5	824-849	1.17	1.31	25	316.23	20	0.082	0.55
LTE B12	699-716	1.17	1.31	25	316.23	20	0.082	0.47
LTE B13	777-787	1.17	1.31	25	316.23	20	0.082	0.52
LTE B14	788-798	1.17	1.31	25	316.23	20	0.082	0.53
LTE B66	1710-1780	4.41	2.76	25	316.23	20	0.174	1
LTE B71	663-698	1.17	1.31	25	316.23	20	0.082	0.44

Note:
1. The device contains a certified WWAN Module, FCC ID: XMR201909EC25AFX.
2.The WWAN Conducted output power comes from the module report.

The WLAN 2.4G, CSS and WWAN can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$=S_{WLAN}/S_{limit\text{-}WLAN}+ S_{WWAN}/S_{limit\text{-}WWAN}+ S_{CSS}/S_{limit\text{-}CSS}$

$=0.101/1+0.082/0.44+0.008/0.60$

$=0.301$

< 1.0

Result: The device meets FCC MPE at **20 cm** distance

===== **END OF REPORT** =====