5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

According to §1.1307(b)(3)(i)

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20\,cm}(d/20\,cm)^x & d \leq 20\,cm \\ ERP_{20\,cm} & 20\,cm < d \leq 40\,cm \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm} \text{ (mW)} = \begin{cases} 2040f & 0.3\,GHz \leq f < 1.5\,GHz \\ 3060 & 1.5\,GHz \leq f \leq 6\,GHz \end{cases}$$

d = the separation distance (cm);

According to KDB 447498 D04 Interim General RF Exposure Guidance v01:

2.2.2 Simultaneous Transmission with both SAR-based and MPE-Based Test Exemptions

This case is described in detail in § 1.1307(b)(3)(ii)(B) and covers the situations where both SAR-based and MPE-based exemption may be considered for test exemption in fixed, mobile, or portable device exposure conditions. For these cases, a device with multiple RF sources transmitting simultaneously will be considered an RF exempt device if the condition of Formula (1) is satisfied.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\,Limit_k} \leq 1$$

5.2 Measurement Result

Operation Modes	Frequency (MHz)	Distance (mm)	P_{th} (mW)	P_{th} (dBm)	Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain including Beamforming Gain (dBi)	ERP (P) (dBm)	ERP (P) (mW)	Exemption
WLAN 2.4G	2412-2462	200	3060	**34.86**	27	8.0	32.85	1928	Compliant
WLAN 5.2G	5150-5250	200	3060	**34.86**	21	9.0	27.85	610	Compliant
WLAN 5.8G	5725-5850	200	3060	**34.86**	23	9.0	29.85	966	Compliant

Note: the Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.

WLAN 2.4G and 5G can transmit simultaneously:

$$\sum_{i=1}^{a}\left(\frac{P_i}{P_{th\_i}}\right) + \sum_{j=1}^{b}\left(\frac{ERP_j}{ERP_{th\_j}}\right) + \sum_{k=1}^{c}\left(\frac{Evaluated_k}{Exposure\ Limit_k}\right)$$

$= \mathbf{P_{2.4G}/P_{th\text{-}2.4G} + P_{5G}/P_{th\text{-}5G}}$
$\mathbf{=1928/3060+966/3060}$
$\mathbf{=0.95}$

Result: The device compliant the Exemption at 20cm distances.

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