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:

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

Where

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

and

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

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.

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

5.2 Measurement Result

Operation Modes	Frequency (MHz)	Distance (mm)	(mW)	(dBm)	Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Exemption
WLAN 2.4G	2412-2462	200	3060	34.86	16	5.59	19.44	87.9	Compliant
WLAN 5.2G	5150-5250	200	3060	34.86	19	5.55	22.4	173.78	Compliant
WLAN 5.8G	5725-5850	200	3060	34.86	23	5.12	25.97	395.37	Compliant

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Note: Maximum Conducted Power including Tune-up Tolerance(dBm) was declared by customer.

WLAN 2.4G and 5G can transmit simultaneously:

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

 $= EPR_{-2.4G}/P_{th-2.4G} + EPR_{-5G}/P_{th-5G} \\ = 87.9/3060 + 395.37/3060$

=0.16

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

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