Radiofrequency radiation exposure evaluation: mobile devices

RESULT : **Pass**

Test Specification

Test item	:	MAKI Live
Identification / Type No.	:	BDMKLB, BDMKLW
FCC ID	:	2A6CJ-BDMKLB
Test standard	:	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 D04

➢ **FCC requirements**

FCC requirement: 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 limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to KDB 447498 D04

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES
SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 $R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\,\text{cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases} \qquad \text{(B. 1)}$$

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\text{ cm}}(d/20\text{ cm})^{x} & d \le 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \le 40\text{ cm} \end{cases} \quad \text{(B. 2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\text{ cm}}\sqrt{f}}\right)$$

a) EUT RF Exposure Evaluation operations, Worst Case mode

Test Mode	Measured Power (dBm)	ERP (dBm)	ERP (㎽)	Minimum Separation Distances (cm)	Limit (mW)
BLE	1.908	3.838	2.42	20	768
BR+EDR	2.872	4.802	3.02		
2.4GHz band Wi-Fi	23.056	24.986	315.2		
5GHz band Wi-Fi	15.131	17.921	61.95		

ERP=Conduct power + Antenna gain - 2.15
Antenna gain:
2.4G: 4.08dBi
5G: 4.94dBi

The product also has multiple transmitters. The Simultaneous Transmission Possibilities are as below

Mode	Configuration
1	2.4G WLAN + BT
2	5G WLAN + BT

Total Exposure Ratio:
Mode 1: 0.414
Mode 2: 0.084