MAXIMUM PERMISSIBLE EXPOSURE

KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

EUT Specification

FCC ID	2AK7XWS2GW-R
EUT	Smart Gateway
Frequency band (Operating)	☒ BLE: 2.402GHz ~ 2.480GHz ☒ WLAN: 2.412GHz ~ 2.462GHz ☐ RLAN: 5.180GHz ~ 5.240GHz ☐ RLAN: 5.260GHz ~ 5.320GHz ☐ RLAN: 5.500GHz ~ 5.700GHz ☐ RLAN: 5.745GHz ~ 5.825GHz ☒ Others: 915MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ___
Exposure classification	☐ Occupational/Controlled exposure ☒ General Population/Uncontrolled exposure
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	915MHz: 0dBi BLE: 0dBi WLAN: 0dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
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
1500-100000	--	--	1	30

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in Mw

G= gain of antenna in linear scale

Pi=3.1416

R= distance between observation point and center of the radiator in cm

Pd the limit of MPE. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Operating Mode	Maximum output power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
BLE	-0.90	-0.90 ±1	0.10	0	0.0002	1
WLAN	14.31	14.31 ±1	15.31	0	0.0068	1
915MHz	-3.78	-3.58 ±1	-2.58	0	0.00011	0.61

Note: 915MHz Maximum output=Feild strength-95.2

The Maximum simultaneous transmission for WLAN+915MHz:

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

=S_{WLAN}/S_{limit} + S_{915MHz}/S_{limit}

=0.0068/1+0.00011/0.61

=0.0068671

< 1.0

Result: No Standalone SAR test is required.