RF EXPOSURE EVALUATION

Applicant	SOLUM CO.,LTD.
Applicant Address	7F, 2354, Yonggu-daero, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Product Description	VLMS-TAG-AP
FCC ID	2AFWN-CG16HSS33B
RF power	Wi-Fi HaLow : 25.00 dBm (Conducted) *Declared power
Antenna type	Wi-Fi HaLow : Dipole Antenna
Antenna Gain	Wi-Fi HaLow : 2.86 dBi
Frequency Range	Wi-Fi HaLow : 1M Bandwidth : 903.5 MHz - 926.5 MHz 2M Bandwidth : 905 MHz - 925 MHz 4M Bandwidth : 906 MHz - 922 MHz
Number of channels	Wi-Fi HaLow : 1M Bandwidth : 24 Channels 2M Bandwidth : 11 Channels 4M Bandwidth : 5 Channels

Standard Requirement

The following RF exposure procedures are applicable :

- FCC Rules
  Part 1.1310 Radiofrequency radiation exposure limits

  Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			**1.0**	30

f = frequency in MHz
** = Plane-wave equivalent power density*

MPE Calculations

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G

Where,
P = Power input to the antenna (mW)
G = Power gain of the antenna (dBi)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (dB antenna gain / 10)

Power density at the specific separation:

$S = PG/(4R^2\pi)$

Where,
S = Maximum power density (mW/cm^2)
P = Power input to the antenna (mW)
G = Numeric power gain of the antenna
R = Distance to the center of the radiation of the antenna
(20cm = limit for MPE)

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$

Where,
P = Power input to the antenna (mW)
G = Numeric power gain of the antenna
R = Distance to the center of the radiation of the antenna
(20cm = limit for MPE)

RF Exposure Results

Mode	Declared Max Output Power (dBm)	G (dBi)	Power tolerance (dB)	P (dBm)	P (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	R (cm)
Wi-Fi HaLow	25.0	2.9	+1.5	29.4	871.0	0.17	1.0	20.0

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