

RF EXPOSURE EVALUATION

Applicant	Samsung Electronics Co., Ltd.
Applicant Address	19 Chapin Rd, Building D. Pine Brook, New Jersey, United States
FCC ID	A3LWDH210S
Certification Number ISED	649E-WDH210S
Product Description	Wi-Fi Transceiver
Basic model (HVIN)	WDH210S

Standard Requirement [FCC]

The following FCC Rule Parts and procedures are applicable :

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			<u>1.0</u>	30

f = frequency in MHz

* = Plane-wave equivalent power density

Standard Requirement [ISED]

RSS-102(Issue 6) 6.6 Field reference level exposure exemption limits – RF Exposure Evaluation

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where *f* is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where *f* is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

MPE calculation[FCC]

$$S = \text{EIRP} / (4\pi R^2)$$

Where S : Power density (mW/cm² or or W/m²)
 EIRP : P + T + G (dBm)
 P : Maximum transmitter power (dBm)
 G : Antenna gain (dBi)
 R : distance to the centre of radiation of the antenna
 T : Power tolerance (dB)

Safety distance(R) : 20 cm or 0.2 m

Mode	Frequency [MHz]	Conducted Output power [dBm]	Antenna Gain [dBi]	Power tolerance [dB]	Power density [mW/cm ²]	Limit [mW/cm ²]
802.11b	2 442	13.00	1.73	2	0.01	1
802.11g	2 412	16.43	1.73	2	0.01	1
802.11n_HT20	2 417	16.13	1.73	2	0.01	1

Conclusion

This confirms compliance to the required Radio frequency radiation exposure limit.

RF exposure evaluation[ISED]

EIRP : P + G (dBm)
 P : Maximum transmitter power (dBm)
 G : Antenna gain (dBi)

$$\text{Limit} : 1.31 \times 10^{-2} \times f^{0.6834} \text{W} \quad (f : 2\,401 \text{ MHz})$$

Mode	Frequency [MHz]	Conducted Output power [dBm]	Antenna Gain [dBi]	Power tolerance [dB]	EIRP [dBm]	EIRP [W]	Limit [W]
802.11b	2 442	13.00	1.73	2	16.73	0.05	2.71
802.11g	2 412	16.43	1.73	2	20.16	0.10	2.68
802.11n_HT20	2 417	16.13	1.73	2	19.86	0.10	2.69

Conclusion

This confirms compliance to the required Radio frequency radiation exposure limit.

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