

RF EXPOSURE EVALUATION

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)

FCC ID: **2ADFS-D10**

EUT Specification

EUT	AUTOMOTIVE DIAGNOSTIC & ANALYSIS SYSTEM
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☒ WLAN: 5.18GHz ~ 5.24GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others: 2.402GHz~2.480GHz (BT2.1)
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	12.25 dBm (0.0168W)
Antenna gain (Max)	1.5 dBi (two antennas are the same)
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				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in Mw

G = gain of antenna in linear scale

π = 3.1416

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

P_d the limit of MPE, 1mW/cm². 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

5 GHz WiFi:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm2)	
802.11n(HT 20)	5180	11.02	11.02 ± 1	12.02	1.5	0.0045	1
	5200	12.25	12.25 ± 1	13.25	1.5	0.0059	1
	5240	11.99	11.99 ± 1	12.99	1.5	0.0056	1
802.11ac(H T20)	5180	12.25	12.25 ± 1	13.25	1.5	0.0059	1
	5200	11.78	11.78 ± 1	12.78	1.5	0.0053	1
	5240	10.77	10.77 ± 1	11.77	1.5	0.0042	1
802.11n(HT 40)	5190	11.36	11.36 ± 1	12.36	1.5	0.0048	1
	5230	12.09	12.09 ± 1	13.09	1.5	0.0057	1
802.11ac(H T40)	5190	11.81	11.81 ± 1	12.81	1.5	0.0054	1
	5230	11.20	11.20 ± 1	12.20	1.5	0.0047	1
802.11ac(H T80)	5210	10.71	10.71 ± 1	11.71	1.5	0.0042	1