

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: 2ABC5-E0052

EUT Specification

EUT	Android Tablet
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☒ WLAN: 5.150GHz ~ 5.250GHz ☒ WLAN: 5.725GHz ~ 5.850GHz ☒ Others: 2.402GHz~2.480GHz BT
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others _____
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	BLE: 8.54dBm (0.0071W) BT: 8.53dBm (0.0071W) 2.4G WiFi: ANT 1: 17.98dBm (0.0628W) ANT 2: 18.41dBm (0.0693W) MIMO: 20.28dBm (0.1067W) 5.1G WiFi: ANT 1: 13.67dBm (0.0233W) ANT 2: 12.65dBm (0.0184W) MIMO: 16.17dBm (0.0414W) 5.8G WiFi: ANT 1: 15.79dBm (0.0379W) ANT 2: 15.69dBm (0.0371W) MIMO: 18.66dBm (0.0735W)
Antenna gain (Max)	BLE&BT: 2.66 dBi 2.4G WiFi: ANT 1: 2.90 dBi; ANT 2: 2.66 dBi 5.1G WiFi: ANT 1: 1.52 dBi; ANT 2: 0.83 dBi 5.8G WiFi: ANT 1: 1.33 dBi; ANT 2: 2.87 dBi
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

2.4GHz WiFi

ANT 1:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
802.11b	2412	17.09	17.09±1	18.09	2.9	0.0250	1
	2437	17.59	17.59±1	18.59	2.9	0.0280	1
	2462	17.45	17.45±1	18.45	2.9	0.0271	1
802.11g	2412	16.12	16.12±1	17.12	2.9	0.0200	1
	2437	16.43	16.43±1	17.43	2.9	0.0215	1
	2462	16.44	16.44±1	17.44	2.9	0.0215	1
802.11n (HT20)	2412	16.29	16.29±1	17.29	2.9	0.0208	1
	2437	16.03	16.03±1	17.03	2.9	0.0196	1
	2462	16.10	16.10±1	17.10	2.9	0.0199	1
802.11ax (HEW20)	2412	17.69	17.69±1	18.69	2.9	0.0287	1
	2437	17.98	17.98±1	18.98	2.9	0.0307	1
	2462	17.92	17.92±1	18.92	2.9	0.0303	1

ANT 2:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
802.11b	2412	18.32	18.32±1	19.32	2.66	0.0314	1
	2437	18.41	18.41±1	19.41	2.66	0.0320	1
	2462	18.39	18.39±1	19.39	2.66	0.0319	1
802.11g	2412	14.68	14.68±1	15.68	2.66	0.0136	1
	2437	14.98	14.98±1	15.98	2.66	0.0145	1
	2462	14.63	14.63±1	15.63	2.66	0.0134	1
802.11n (HT20)	2412	14.29	14.29±1	15.29	2.66	0.0124	1
	2437	15.35	15.35±1	16.35	2.66	0.0158	1
	2462	14.84	14.84±1	15.84	2.66	0.0141	1
802.11ax (HEW20)	2412	16.32	16.32±1	17.32	2.66	0.0198	1
	2437	16.41	16.41±1	17.41	2.66	0.0202	1
	2462	16.31	16.31±1	17.31	2.66	0.0198	1

2.4G WIFI Max MIMO:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
802.11ax (HEW20)	2437	20.28	20.28±1	21.28	2.78	0.0507	1

5GHz WiFi**ANT 1:**

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
802.11a	5180	13.67	13.67 ± 1	14.67	1.52	0.0083	1
	5200	12.81	12.81 ± 1	13.81	1.52	0.0068	1
	5240	12.99	12.99 ± 1	13.99	1.52	0.0071	1
	5745	15.07	15.07 ± 1	16.07	1.33	0.0109	1
	5785	15.63	15.63 ± 1	16.63	1.33	0.0124	1
	5825	15.26	15.26 ± 1	16.26	1.33	0.0114	1
802.11n (HT20)	5180	13.45	13.45 ± 1	14.45	1.52	0.0079	1
	5200	12.75	12.75 ± 1	13.75	1.52	0.0067	1
	5240	12.93	12.93 ± 1	13.93	1.52	0.0070	1
	5745	15.08	15.08 ± 1	16.08	1.33	0.0110	1
	5785	15.54	15.54 ± 1	16.54	1.33	0.0122	1
	5825	15.11	15.11 ± 1	16.11	1.33	0.0110	1
802.11n (HT40)	5190	11.75	11.75 ± 1	12.75	1.52	0.0053	1
	5230	11.32	11.32 ± 1	12.32	1.52	0.0048	1
	5755	14.10	14.10 ± 1	15.10	1.33	0.0087	1
	5795	14.70	14.70 ± 1	15.70	1.33	0.0100	1
802.11ac (VHT20)	5180	13.62	13.62 ± 1	14.62	1.52	0.0082	1
	5200	12.76	12.76 ± 1	13.76	1.52	0.0067	1
	5240	12.98	12.98 ± 1	13.98	1.52	0.0071	1
	5745	15.33	15.33 ± 1	16.33	1.33	0.0116	1
	5785	15.76	15.76 ± 1	16.76	1.33	0.0128	1
	5825	15.45	15.45 ± 1	16.45	1.33	0.0119	1
802.11ac (VHT40)	5190	12.82	12.82 ± 1	13.82	1.52	0.0068	1
	5230	12.65	12.65 ± 1	13.65	1.52	0.0065	1
	5755	15.08	15.08 ± 1	16.08	1.33	0.0110	1
	5795	15.51	15.51 ± 1	16.51	1.33	0.0121	1
802.11ac (VHT80)	5210	12.53	12.53 ± 1	13.53	1.52	0.0064	1
	5775	14.46	14.46 ± 1	15.46	1.33	0.0095	1

802.11ax (HEW20)	5180	13.61	13.61 ± 1	14.61	1.52	0.0082	1
	5200	13.07	13.07 ± 1	14.07	1.52	0.0072	1
	5240	13.11	13.11 ± 1	14.11	1.52	0.0073	1
	5745	15.46	15.46 ± 1	16.46	1.33	0.0120	1
	5785	15.79	15.79 ± 1	16.79	1.33	0.0129	1
	5825	15.61	15.61 ± 1	16.61	1.33	0.0124	1
802.11ax (HEW40)	5190	13.06	13.06 ± 1	14.06	1.52	0.0072	1
	5230	12.61	12.61 ± 1	13.61	1.52	0.0065	1
	5755	15.14	15.14 ± 1	16.14	1.33	0.0111	1
	5795	15.36	15.36 ± 1	16.36	1.33	0.0117	1
802.11ax (HEW80)	5210	12.70	12.70 ± 1	13.70	1.52	0.0066	1
	5775	14.81	14.81 ± 1	15.81	1.33	0.0103	1

ANT 2:

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)	(mW/cm2)
802.11a	5180	12.38	12.38 $\pm$ 1	13.38	0.83	0.0052	1
	5200	11.27	11.27 $\pm$ 1	12.27	0.83	0.0041	1
	5240	11.05	11.05 $\pm$ 1	12.05	0.83	0.0039	1
	5745	14.11	14.11 $\pm$ 1	15.11	2.87	0.0125	1
	5785	15.18	15.18 $\pm$ 1	16.18	2.87	0.0160	1
	5825	15.16	15.16 $\pm$ 1	16.16	2.87	0.0159	1
802.11n (HT20)	5180	12.38	12.38 $\pm$ 1	13.38	0.83	0.0052	1
	5200	11.22	11.22 $\pm$ 1	12.22	0.83	0.0040	1
	5240	10.89	10.89 $\pm$ 1	11.89	0.83	0.0037	1
	5745	13.89	13.89 $\pm$ 1	14.89	2.87	0.0119	1
	5785	15.07	15.07 $\pm$ 1	16.07	2.87	0.0156	1
	5825	15.18	15.18 $\pm$ 1	16.18	2.87	0.0160	1
802.11n (HT40)	5190	10.00	10.00 $\pm$ 1	11.00	0.83	0.0030	1
	5230	9.48	9.48 $\pm$ 1	10.48	0.83	0.0027	1
	5755	13.18	13.18 $\pm$ 1	14.18	2.87	0.0101	1
	5795	14.12	14.12 $\pm$ 1	15.12	2.87	0.0125	1
802.11ac (VHT20)	5180	12.59	12.59 $\pm$ 1	13.59	0.83	0.0055	1
	5200	11.40	11.40 $\pm$ 1	12.40	0.83	0.0042	1
	5240	11.26	11.26 $\pm$ 1	12.26	0.83	0.0041	1
	5745	14.29	14.29 $\pm$ 1	15.29	2.87	0.0130	1
	5785	15.27	15.27 $\pm$ 1	16.27	2.87	0.0163	1
	5825	15.48	15.48 $\pm$ 1	16.48	2.87	0.0171	1
802.11ac (VHT40)	5190	11.41	11.41 $\pm$ 1	12.41	0.83	0.0042	1
	5230	10.76	10.76 $\pm$ 1	11.76	0.83	0.0036	1
	5755	14.10	14.10 $\pm$ 1	15.10	2.87	0.0125	1
	5795	14.85	14.85 $\pm$ 1	15.85	2.87	0.0148	1
802.11ac (VHT80)	5210	10.79	10.79 $\pm$ 1	11.79	0.83	0.0036	1
	5775	13.66	13.66 $\pm$ 1	14.66	2.87	0.0113	1

802.11ax (HEW20)	5180	12.65	12.65 ± 1	13.65	0.83	0.0056	1
	5200	11.62	11.62 ± 1	12.62	0.83	0.0044	1
	5240	11.04	11.04 ± 1	12.04	0.83	0.0039	1
	5745	14.26	14.26 ± 1	15.26	2.87	0.0129	1
	5785	15.28	15.28 ± 1	16.28	2.87	0.0164	1
	5825	15.69	15.69 ± 1	16.69	2.87	0.0180	1
802.11ax (HEW40)	5190	11.25	11.25 ± 1	12.25	0.83	0.0040	1
	5230	10.64	10.64 ± 1	11.64	0.83	0.0035	1
	5755	14.12	14.12 ± 1	15.12	2.87	0.0125	1
	5795	14.93	14.93 ± 1	15.93	2.87	0.0151	1
802.11ax (HEW80)	5210	10.83	10.83 ± 1	11.83	0.83	0.0037	1
	5775	14.00	14.00 ± 1	15.00	2.87	0.0122	1

5G WIFI MAX MIMO:

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)	(mW/cm2)
802.11ax (HEW20)	5180	16.17	16.17 ± 1	17.17	1.19	0.0136	1
	5825	18.66	18.66 ± 1	19.66	2.17	0.0303	1

Max BT&BLE:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm ²)
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	
BDR& EDR	2480	8.53	8.53±1	9.53	2.66	0.0033	1
BLE 1M	2480	8.54	8.54±1	9.54	2.66	0.0033	1

Note: BT and WIFI, 2.4G WIFI and 5G WIFI not support simultaneous transmission.

Result: No Standalone SAR test is required.