

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: 2ACWIE4STA5517

EUT Specification

EUT	LED TV
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> WLAN: 5.18GHz ~ 5.240GHz <input checked="" type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	18.12 dBm for UNII Band I; 16.97 dBm for UNII Band III
Antenna gain (Max)	5.0 dBi (for per antenna port Max) 8.01dBi for MIMO(Ant1+Ant2 Directional Gain)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> 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: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

P_d = Power density in mW/cm^2 , P_{out} = 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

P_d the limit of MPE, $1mW/cm^2$. 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

For 5GHz Band:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)			Limit (dBm)	Verdict
			Ant1	Ant2	Sum		
802.11a	CH36	5180	18.12	13.93		24	PASS
	CH40	5200	17.87	13.43		24	PASS
	CH48	5240	17.74	13.74		24	PASS
	CH149	5745	15.86	15.35		30	PASS
	CH157	5785	15.79	15.79		30	PASS
	CH165	5825	16.23	15.73		30	PASS
802.11n (VHT20)	CH36	5180	16.19	12.11	17.62	21.99	Pass
	CH40	5200	16.30	11.91	17.65	21.99	Pass
	CH48	5240	15.90	12.85	17.65	21.99	Pass
	CH149	5745	14.29	13.81	17.07	27.99	Pass
	CH157	5785	14.05	13.86	16.97	27.99	Pass
	CH165	5825	14.71	13.92	17.34	27.99	Pass
802.11n (VHT40)	CH38	5190	15.88	11.07	17.12	21.99	Pass
	CH46	5230	15.78	12.21	17.36	21.99	Pass
	CH151	5755	13.34	13.10	16.23	27.99	Pass
	CH159	5795	14.03	13.41	16.74	27.99	Pass
802.11ac (VHT20)	CH36	5180	16.24	11.96	17.62	21.99	Pass
	CH40	5200	16.25	11.70	17.56	21.99	Pass
	CH48	5240	15.95	12.74	17.65	21.99	Pass
	CH149	5745	14.00	13.85	16.94	27.99	Pass
	CH157	5785	14.06	13.86	16.97	27.99	Pass
	CH165	5825	14.43	14.22	17.34	27.99	Pass
802.11ac (VHT40)	CH38	5190	15.59	11.09	16.91	21.99	Pass
	CH46	5230	15.61	12.33	17.28	21.99	Pass
	CH151	5755	13.62	13.14	16.40	27.99	Pass
	CH159	5795	13.86	13.24	16.57	27.99	Pass
802.11ac (VHT80)	CH42	5210	14.67	10.42	16.06	21.99	Pass
	CH155	5775	13.01	12.38	15.72	27.99	Pass

Antenna 1

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
802.11a	CH36	18±1	19	79.4328	5	3.162	0.0499723	1
	CH40	18±1	19	79.4328	5	3.162	0.0499723	1
	CH48	18±1	19	79.4328	5	3.162	0.0499723	1
	CH149	16±1	17	50.1187	5	3.162	0.0315304	1
	CH157	16±1	17	50.1187	5	3.162	0.0315304	1
	CH165	16±1	17	50.1187	5	3.162	0.0315304	1
802.11n (VHT20)	CH36	16±1	17	50.1187	5	3.162	0.0315304	1
	CH40	16±1	17	50.1187	5	3.162	0.0315304	1
	CH48	16±1	17	50.1187	5	3.162	0.0315304	1
	CH149	14±1	15	31.6228	5	3.162	0.0198943	1
	CH157	14±1	15	31.6228	5	3.162	0.0198943	1
	CH165	15±1	16	39.8107	5	3.162	0.0250455	1
802.11n (VHT40)	CH38	16±1	17	50.1187	5	3.162	0.0315304	1
	CH46	16±1	17	50.1187	5	3.162	0.0315304	1
	CH151	13±1	14	25.1189	5	3.162	0.0158026	1
	CH159	14±1	15	31.6228	5	3.162	0.0198943	1
802.11ac (VHT20)	CH36	16±1	17	50.1187	5	3.162	0.0315304	1
	CH40	16±1	17	50.1187	5	3.162	0.0315304	1
	CH48	16±1	17	50.1187	5	3.162	0.0315304	1
	CH149	14±1	15	31.6228	5	3.162	0.0198943	1
	CH157	14±1	15	31.6228	5	3.162	0.0198943	1
	CH165	14±1	15	31.6228	5	3.162	0.0198943	1
802.11ac (VHT40)	CH38	16±1	17	50.1187	5	3.162	0.0315304	1
	CH46	16±1	17	50.1187	5	3.162	0.0315304	1
	CH151	14±1	15	31.6228	5	3.162	0.0198943	1
	CH159	14±1	15	31.6228	5	3.162	0.0198943	1
802.11ac (VHT80)	CH42	15±1	16	39.8107	5	3.162	0.0250455	1
	CH155	13±1	14	25.1189	5	3.162	0.0158026	1

Antenna 2:

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
802.11a	CH36	14±1	15	31.6228	5	3.162	0.0198943	1
	CH40	13±1	14	25.1189	5	3.162	0.0158026	1
	CH48	14±1	15	31.6228	5	3.162	0.0198943	1
	CH149	15±1	16	39.8107	5	3.162	0.0250455	1
	CH157	16±1	17	50.1187	5	3.162	0.0315304	1
	CH165	16±1	17	50.1187	5	3.162	0.0315304	1
802.11n (VHT20)	CH36	12±1	13	19.9526	5	3.162	0.0125525	1
	CH40	12±1	13	19.9526	5	3.162	0.0125525	1
	CH48	13±1	14	25.1189	5	3.162	0.0158026	1
	CH149	14±1	15	31.6228	5	3.162	0.0198943	1
	CH157	14±1	15	31.6228	5	3.162	0.0198943	1
	CH165	14±1	15	31.6228	5	3.162	0.0198943	1
802.11n (VHT40)	CH38	11±1	12	15.8489	5	3.162	0.0099708	1
	CH46	12±1	13	19.9526	5	3.162	0.0125525	1
	CH151	13±1	14	25.1189	5	3.162	0.0158026	1
	CH159	13±1	14	25.1189	5	3.162	0.0158026	1
802.11ac (VHT20)	CH36	12±1	13	19.9526	5	3.162	0.0125525	1
	CH40	12±1	13	19.9526	5	3.162	0.0125525	1
	CH48	13±1	14	25.1189	5	3.162	0.0158026	1
	CH149	14±1	15	31.6228	5	3.162	0.0198943	1
	CH157	14±1	15	31.6228	5	3.162	0.0198943	1
	CH165	14±1	15	31.6228	5	3.162	0.0198943	1
802.11ac (VHT40)	CH38	11±1	12	15.8489	5	3.162	0.0099708	1
	CH46	12±1	13	19.9526	5	3.162	0.0125525	1
	CH151	13±1	14	25.1189	5	3.162	0.0158026	1
	CH159	13±1	14	25.1189	5	3.162	0.0158026	1
802.11ac (VHT80)	CH42	10±1	11	12.5893	5	3.162	0.0079201	1
	CH155	12±1	13	19.9526	5	3.162	0.0125525	1

MPE Result:

Operation Mode	Channel Number	Channel Frequency (MHz)	Power density at 20cm (mW/ cm ²)			Power density Limits (mW/c m ²)	Verdict
			Ant1	Ant2	Sum		
802.11a	CH36	5180	0.0499723	0.0198943		1	PASS
	CH40	5200	0.0499723	0.0158026		1	PASS
	CH48	5240	0.0499723	0.0198943		1	PASS
	CH149	5745	0.0315304	0.0250455		1	PASS
	CH157	5785	0.0315304	0.0315304		1	PASS
	CH165	5825	0.0315304	0.0315304		1	PASS
802.11n (VHT20)	CH36	5180	0.0315304	0.0125525	0.0440829	1	Pass
	CH40	5200	0.0315304	0.0125525	0.0440829	1	Pass
	CH48	5240	0.0315304	0.0158026	0.0473330	1	Pass
	CH149	5745	0.0198943	0.0198943	0.0397886	1	Pass
	CH157	5785	0.0198943	0.0198943	0.0397886	1	Pass
	CH165	5825	0.0250455	0.0198943	0.0449398	1	Pass
802.11n (VHT40)	CH38	5190	0.0315304	0.0099708	0.0415012	1	Pass
	CH46	5230	0.0315304	0.0125525	0.0440829	1	Pass
	CH151	5755	0.0158026	0.0158026	0.0316052	1	Pass
	CH159	5795	0.0198943	0.0158026	0.0356969	1	Pass
802.11ac (VHT20)	CH36	5180	0.0315304	0.0125525	0.0440829	1	Pass
	CH40	5200	0.0315304	0.0125525	0.0440829	1	Pass
	CH48	5240	0.0315304	0.0158026	0.0473333	1	Pass
	CH149	5745	0.0198943	0.0198943	0.0397886	1	Pass
	CH157	5785	0.0198943	0.0198943	0.0397886	1	Pass
	CH165	5825	0.0198943	0.0198943	0.0397886	1	Pass
802.11ac (VHT40)	CH38	5190	0.0315304	0.0099708	0.0415012	1	Pass
	CH46	5230	0.0315304	0.0125525	0.0440829	1	Pass
	CH151	5755	0.0198943	0.0158026	0.0356969	1	Pass
	CH159	5795	0.0198943	0.0158026	0.0356969	1	Pass
802.11ac (VHT80)	CH42	5210	0.0250455	0.0079201	0.0329656	1	Pass
	CH155	5775	0.0158026	0.0125525	0.0283551	1	Pass

Signature:



Print: Lisa Wang

Title: Manager

Date: 2018-04-20