

## 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: **2ACWIWE43UB453**

### EUT Specification

EUT	LED TV
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<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
<b>Max. output power</b>	16.49dBm for 802.11b; 14.58dBm for 802.11g; 11.34dBm for 802.11n(HT20); 9.62 dBm for 802.11n(HT40);
<b>Antenna gain (Max)</b>	1.21dBi ( for per antenna port Max) 4.22dBi for MIMO(Ant1+Ant2 Directional Gain)
<b>Evaluation applied</b>	<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 <sup>2</sup> )	Average Time
<b>(A) Limits for Occupational/Control Exposures</b>				
<b>300-1500</b>	--	--	<b>F/300</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>5</b>	<b>6</b>
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
<b>300-1500</b>	--	--	<b>F/1500</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>1</b>	<b>30</b>

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

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

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)			Limit (dBm)	Verdict
			Ant1	Ant2	Sum		
802.11b	1	2412	15.05	15.73	--	30	PASS
	6	2437	16.13	15.63	--	30	PASS
	11	2462	<b>16.49</b>	16.07	--	30	PASS
802.11g	1	2412	14.12	14.05	--	30	PASS
	6	2437	13.72	14.58	--	30	PASS
	11	2462	13.44	12.26	--	30	PASS
802.11n (HT20)	1	2412	10.26	11.34	13.84	30	PASS
	6	2437	9.38	10.49	12.98	30	PASS
	11	2462	9.55	8.77	12.19	30	PASS
802.11n (HT40)	3	2422	8.46	9.62	12.09	30	PASS
	6	2437	7.32	9.15	11.34	30	PASS
	9	2452	8.03	7.39	10.73	30	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 <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11b	1	15±1	16	39.8107	1.21	1.321	0.010465	1
	6	16±1	17	50.1187	1.21	1.321	0.013174	1
	11	16±1	17	50.1187	1.21	1.321	0.013174	1
802.11g	1	14±1	15	31.6228	1.21	1.321	0.008312	1
	6	14±1	15	31.6228	1.21	1.321	0.008312	1
	11	13±1	14	25.1189	1.21	1.321	0.006603	1
802.11n (H20)	1	10±1	11	12.5893	1.21	1.321	0.003309	1
	6	9±1	10	10.0000	1.21	1.321	0.002629	1
	11	10±1	11	12.5893	1.21	1.321	0.003309	1
802.11n (H40)	3	8±1	9	7.9433	1.21	1.321	0.002088	1
	6	7±1	8	6.3096	1.21	1.321	0.001659	1
	9	8±1	9	7.9433	1.21	1.321	0.002088	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 <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11b	1	16±1	17	50.1187	1.21	1.321	0.013174	1
	6	16±1	17	50.1187	1.21	1.321	0.013174	1
	11	16±1	17	50.1187	1.21	1.321	0.013174	1
802.11g	1	14±1	15	31.6228	1.21	1.321	0.008312	1
	6	15±1	16	39.8107	1.21	1.321	0.010465	1
	11	12±1	13	19.9526	1.21	1.321	0.005245	1
802.11n (HT20)	1	11±1	12	15.8489	1.21	1.321	0.004166	1
	6	10±1	11	12.5893	1.21	1.321	0.003309	1
	11	9±1	10	10.0000	1.21	1.321	0.002629	1
802.11n (HT40)	3	10±1	11	12.5893	1.21	1.321	0.003309	1
	6	9±1	10	10.0000	1.21	1.321	0.002629	1
	9	7±1	8	6.3096	1.21	1.321	0.001659	1

MPE Result:

Operation Mode	Channel Number	Channel Frequency (MHz)	Power density at 20cm (mW/ cm <sup>2</sup> )			Power density Limits (mW/cm <sup>2</sup> )	Verdict
			Ant1	Ant2	Sum		
802.11b	1	2412	0.010465	0.013174	--	1	PASS
	6	2437	0.013174	0.013174	--	1	PASS
	11	2462	0.013174	0.013174	--	1	PASS
802.11g	1	2412	0.008312	0.008312	--	1	PASS
	6	2437	0.008312	0.010465	--	1	PASS
	11	2462	0.006603	0.005245	--	1	PASS
802.11n (HT20)	1	2412	0.003309	0.004166	0.007475	1	PASS
	6	2437	0.002629	0.003309	0.005938	1	PASS
	11	2462	0.003309	0.002629	0.005938	1	PASS
802.11n (HT40)	3	2422	0.002088	0.003309	0.005397	1	PASS
	6	2437	0.001659	0.002629	0.004288	1	PASS
	9	2452	0.002088	0.001659	0.003747	1	PASS

Signature:



Print: Lisa Wang

Title: Manager

Date: 2018-06-27