

## 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: **2ACWIWD40FE221**

### EUT Specification

<b>EUT</b>	<b>LED TV</b>
<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>	17.02dBm for 802.11b; 14.72dBm for 802.11g; 11.37dBm for 802.11n(HT20); 9.24Bm 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>				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

## Friis transmission formula: $P_d = \frac{P_{out} \cdot G}{4 \cdot \pi \cdot R^2}$

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	<b>17.02</b>	16.09	--	30	PASS
	6	2437	16.11	15.79	--	30	PASS
	11	2462	15.49	15.58	--	30	PASS
802.11g	1	2412	14.72	14.07	--	30	PASS
	6	2437	14.36	14.15	--	30	PASS
	11	2462	12.94	12.68	--	30	PASS
802.11n (HT20)	1	2412	10.85	11.37	14.13	30	PASS
	6	2437	9.54	10.71	13.17	30	PASS
	11	2462	9.36	8.56	11.99	30	PASS
802.11n (HT40)	3	2422	8.42	9.24	11.86	30	PASS
	6	2437	7.33	9.02	11.27	30	PASS
	9	2452	7.46	8.19	10.85	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	17±1	18	63.096	1.21	1.321	0.016586	1
	6	16±1	17	50.119	1.21	1.321	0.013174	1
	11	15±1	16	39.811	1.21	1.321	0.010465	1
802.11g	1	15±1	16	39.811	1.21	1.321	0.010465	1
	6	14±1	15	31.623	1.21	1.321	0.008312	1
	11	13±1	14	25.119	1.21	1.321	0.006603	1
802.11n (H20)	1	11±1	12	15.849	1.21	1.321	0.004166	1
	6	10±1	11	12.589	1.21	1.321	0.003309	1
	11	9±1	10	10.000	1.21	1.321	0.002629	1
802.11n (H40)	3	8±1	9	7.943	1.21	1.321	0.002088	1
	6	7±1	8	6.310	1.21	1.321	0.001659	1
	9	7±1	8	6.310	1.21	1.321	0.001659	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	50.119	1.21	1.321	0.013174	1
	6	16±1	17	50.119	1.21	1.321	0.013174	1
	11	16±1	17	50.119	1.21	1.321	0.013174	1
802.11g	1	14±1	15	31.623	1.21	1.321	0.008312	1
	6	14±1	15	31.623	1.21	1.321	0.008312	1
	11	13±1	14	25.119	1.21	1.321	0.006603	1
802.11n (HT20)	1	11±1	12	15.849	1.21	1.321	0.004166	1
	6	11±1	12	15.849	1.21	1.321	0.004166	1
	11	9±1	10	10.000	1.21	1.321	0.002629	1
802.11n (HT40)	3	9±1	10	10.000	1.21	1.321	0.002629	1
	6	9±1	10	10.000	1.21	1.321	0.002629	1
	9	8±1	9	7.943	1.21	1.321	0.002088	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	0.016586	0.013174	--	1	PASS
	6	2437	0.013174	0.013174	--	1	PASS
	11	2462	0.010465	0.013174	--	1	PASS
802.11g	1	2412	0.010465	0.008312	--	1	PASS
	6	2437	0.008312	0.008312	--	1	PASS
	11	2462	0.006603	0.006603	--	1	PASS
802.11n (HT20)	1	2412	0.004166	0.004166	0.008332	1	PASS
	6	2437	0.003309	0.004166	0.007475	1	PASS
	11	2462	0.002629	0.002629	0.005258	1	PASS
802.11n (HT40)	3	2422	0.002088	0.002629	0.004717	1	PASS
	6	2437	0.001659	0.002629	0.004288	1	PASS
	9	2452	0.001659	0.002088	0.003747	1	PASS

Signature:



Print: Lisa Wang

Title: Manager

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