

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: **2ACWIE2SW5018**

EUT Specification

EUT	LED TV
Frequency band (Operating)	<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
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	16.94dBm for 802.11b; 14.36dBm for 802.11g; 11.59dBm for 802.11n(HT20); 9.46dBm for 802.11n(HT40);
Antenna gain (Max)	4.0dBi (for per antenna port Max) 7.01dBi 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm², P_{out} =output power to antenna in Mw

G = gain of antenna in linear scale, $\pi=3.1416$

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

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)			Limit (dBm)	Verdict
			Ant1	Ant2	Sum		
802.11b	1	2412	15.12	15.77	--	30	PASS
	6	2437	16.94	15.15	--	30	PASS
	11	2462	15.31	15.16	--	30	PASS
802.11g	1	2412	14.05	13.24	--	30	PASS
	6	2437	14.12	14.36	--	30	PASS
	11	2462	13.41	12.75	--	30	PASS
802.11n (HT20)	1	2412	10.35	11.59	14.02	28.99	PASS
	6	2437	9.49	10.46	13.01	28.99	PASS
	11	2462	9.57	8.38	12.03	28.99	PASS
802.11n (HT40)	3	2422	8.85	9.46	12.18	28.99	PASS
	6	2437	7.36	9.38	11.50	28.99	PASS
	9	2452	7.12	7.49	10.32	28.99	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)
802.11b	1	15±1	16	39.811	4	2.512	0.019894	1
	6	17±1	18	63.096	4	2.512	0.031530	1
	11	15±1	16	39.811	4	2.512	0.019894	1
802.11g	1	14±1	15	31.623	4	2.512	0.015803	1
	6	14±1	15	31.623	4	2.512	0.015803	1
	11	13±1	14	25.119	4	2.512	0.012552	1
802.11n (HT20)	1	10±1	11	12.589	4	2.512	0.006291	1
	6	9±1	10	10.000	4	2.512	0.004997	1
	11	10±1	11	12.589	4	2.512	0.006291	1
802.11n (HT40)	3	9±1	10	10.000	4	2.512	0.004997	1
	6	7±1	8	6.310	4	2.512	0.003153	1
	9	7±1	8	6.310	4	2.512	0.003153	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)
802.11b	1	16±1	17	50.119	4	2.512	0.025045	1
	6	15±1	16	39.811	4	2.512	0.019894	1
	11	15±1	16	39.811	4	2.512	0.019894	1
802.11g	1	13±1	14	25.119	4	2.512	0.012552	1
	6	14±1	15	31.623	4	2.512	0.015803	1
	11	13±1	14	25.119	4	2.512	0.012552	1
802.11n (HT20)	1	12±1	13	19.953	4	2.512	0.009971	1
	6	10±1	11	12.589	4	2.512	0.006291	1
	11	8±1	9	7.943	4	2.512	0.003969	1
802.11n (HT40)	3	9±1	10	10.000	4	2.512	0.004997	1
	6	9±1	10	10.000	4	2.512	0.004997	1
	9	7±1	8	6.310	4	2.512	0.003153	1

MPE Result:

Operation Mode	Channel Number	Channel Frequency (MHz)	Power density at 20cm (mW/ cm ²)			Power density Limits (mW/cm ²)
			Ant1	Ant2	Sum	
802.11b	1	2412	0.019894	0.025045	--	1
	6	2437	0.031530	0.019894	--	1
	11	2462	0.019894	0.019894	--	1
802.11g	1	2412	0.015803	0.012552	--	1
	6	2437	0.015803	0.015803	--	1
	11	2462	0.012552	0.012552	--	1
802.11n (HT20)	1	2412	0.006291	0.009971	0.016262	1
	6	2437	0.004997	0.006291	0.011288	1
	11	2462	0.006291	0.003969	0.010260	1
802.11n (HT40)	3	2422	0.004997	0.004997	0.009994	1
	6	2437	0.003153	0.004997	0.008150	1
	9	2452	0.003153	0.003153	0.006306	1

Signature:



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 Date: 2018-04-25