RF EXPOSURE EVALUATION

EUT Specification

EUT	LED TV
FCC ID	2ACWIWE42UC420
Frequency band (Operating)	☒WLAN: 2.412GHz ~ 2.462GHz ☐WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐WLAN: 5.745GHz ~ 5825GHz ☐Others
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	14.85dBm for 802.11b; 13.40dBm for 802.11g; 12.99dBm for 802.11n(HT20); 12.30dBm for 802.11n(HT40);
Antenna gain (Max)	2.0dBi (for per antenna port Max) 5.01dBi for MIMO(Ant1+Ant2 Directional Gain)
Evaluation applied	☒MPE Evaluation ☐SAR Evaluation

Applicable Standard:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J. Section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m Normally can be maintained between the user and the device.

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				
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	F/1500	30
1500-100000	--	--	1	30

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

Where
Pd= Power density in mW/cm^2, Pout=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
Pd 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

Max power Result:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)			Limit (dBm)	Verdict
			Ant1	Ant2	Sum		
802.11b	1	2412	12.62	11.42	--	30	PASS
	6	2437	13.46	12.74	--	30	PASS
	11	2462	14.85	13.24	--	30	PASS
802.11g	1	2412	11.47	11.69	--	30	PASS
	6	2437	12.9	12.48	--	30	PASS
	11	2462	13.4	13.13	--	30	PASS
802.11n (HT20)	1	2412	8.49	8.06	11.29	28	PASS
	6	2437	9.32	9.25	12.30	28	PASS
	11	2462	10.47	9.43	12.99	28	PASS
802.11n (HT40)	3	2422	7.46	7.56	10.52	28	PASS
	6	2437	8.05	8.14	11.11	28	PASS
	9	2452	9.36	9.22	12.30	28	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/ cm2)	Power density Limits (mW/cm2)
802.11b	1	13±1	14	25.12	2	1.585	0.007921	1
	6	13±1	14	25.12	2	1.585	0.007921	1
	11	15±1	16	39.81	2	1.585	0.012553	1
802.11g	1	11±1	12	15.85	2	1.585	0.004998	1
	6	12±1	13	19.95	2	1.585	0.006292	1
	11	13±1	14	25.12	2	1.585	0.007921	1
802.11n (HT20)	1	8±1	9	7.94	2	1.585	0.002505	1
	6	9±1	10	10.00	2	1.585	0.003153	1
	11	10±1	11	12.59	2	1.585	0.003970	1
802.11n (HT40)	3	7±1	8	6.31	2	1.585	0.001990	1
	6	8±1	9	7.94	2	1.585	0.002505	1
	9	9±1	10	10.00	2	1.585	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	11±1	12	15.85	2	1.585	0.004998	1
	6	13±1	14	25.12	2	1.585	0.007921	1
	11	13±1	14	25.12	2	1.585	0.007921	1
802.11g	1	12±1	13	19.95	2	1.585	0.006292	1
	6	12±1	13	19.95	2	1.585	0.006292	1
	11	13±1	14	25.12	2	1.585	0.007921	1
802.11n (HT20)	1	8±1	9	7.94	2	1.585	0.002505	1
	6	9±1	10	10.00	2	1.585	0.003153	1
	11	9±1	10	10.00	2	1.585	0.003153	1
802.11n (HT40)	3	8±1	9	7.94	2	1.585	0.002505	1
	6	8±1	9	7.94	2	1.585	0.002505	1
	9	9±1	10	10.00	2	1.585	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)	Verdict
			Ant1	Ant2	Sum		
802.11b	1	2412	0.007921	0.004998	--	1	PASS
	6	2437	0.007921	0.007921	--	1	PASS
	11	2462	0.012553	0.007921	--	1	PASS
802.11g	1	2412	0.004998	0.006292	--	1	PASS
	6	2437	0.006292	0.006292	--	1	PASS
	11	2462	0.007921	0.007921	--	1	PASS
802.11n (HT20)	1	2412	0.002505	0.002505	0.005010	1	PASS
	6	2437	0.003153	0.003153	0.006306	1	PASS
	11	2462	0.003970	0.003153	0.007123	1	PASS
802.11n (HT40)	3	2422	0.001990	0.002505	0.004495	1	PASS
	6	2437	0.002505	0.002505	0.005010	1	PASS
	9	2452	0.003153	0.003153	0.006306	1	PASS