FCC 47 CFR MPE REPORT

Moka Technology(Guangdong) Co., Ltd.

Interactive Flat Panel

Model Number: TVULTRA65-G5

Additional Model: TVULTRA75-G5, TVULTRA86-G5, *******65***,

*******75***, *******86*** (*can be A-Z,0-9 or“-”or blank)

FCC ID: 2BFQX-RK3588

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Maximum Permissible Exposure

1. Applicable Standards

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 level 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.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
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
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
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
1500-10000			1.o	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

1.2. MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: Pd (W/m^2) = $\frac{E^2}{377}$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Antenna	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11b	2412	ant 1	20.63	115.611
		ant 2	16.49	44.566
	2437	ant 1	20.09	102.094
		ant 2	16.88	48.753
	2462	ant 1	19.93	98.401
		ant 2	17.05	50.699
IEEE 802.11g	2412	ant 1	22.01	158.855
		ant 2	18.17	65.615
	2437	ant 1	21.45	139.637
		ant 2	18.3	67.608
	2462	ant 1	21.21	132.130
		ant 2	18.48	70.469
IEEE 802.11n HT20	2412	ant 1	20.18	104.232
		ant 2	16.22	41.879
	2437	ant 1	19.66	92.470
		ant 2	16.63	46.026
	2462	ant 1	19.53	89.743
		ant 2	16.78	47.643
IEEE 802.11n HT40	2422	ant 1	20.06	101.391
		ant 2	16.48	44.463
	2437	ant 1	19.85	96.605
		ant 2	16.71	46.881
	2452	ant 1	19.11	81.470
		ant 2	15.03	31.842
IEEE 802.11a	5180	ant 1	15.85	38.459
		ant 2	14.04	25.351
	5200	ant 1	15.28	33.729
		ant 2	13.45	22.131
	5240	ant 1	14.77	29.992
		ant 2	12.19	16.558
	5745	ant 1	14.84	30.479
		ant 2	12.25	16.788
	5785	ant 1	14.15	26.002
		ant 2	12.43	17.498

	5825	ant 1	14.08	25.586
		ant 2	13.96	24.889
IEEE 802.11n20	5180	ant 1	14.03	25.293
		ant 2	11.64	14.588
	5200	ant 1	13.6	22.909
		ant 2	11.81	15.171
	5240	ant 1	13.08	20.324
		ant 2	14.23	26.485
	5745	ant 1	12.63	18.323
		ant 2	13.79	23.933
	5785	ant 1	14.46	27.925
		ant 2	12.93	19.634
	5825	ant 1	14.36	27.290
		ant 2	12.62	18.281
IEEE 802.11ac VHT20	5180	ant 1	14.11	25.763
		ant 2	13.51	22.439
	5200	ant 1	13.54	22.594
		ant 2	12.77	18.923
	5240	ant 1	12.87	19.364
		ant 2	11.3	13.490
	5745	ant 1	13.76	23.768
		ant 2	12.24	16.749
	5785	ant 1	13.12	20.512
		ant 2	11.59	14.421
	5825	ant 1	13.4	21.878
		ant 2	12.25	16.788
IEEE 802.11n HT40	5190	ant 1	14.15	26.002
		ant 2	13.45	22.131
	5230	ant 1	13.03	20.091
		ant 2	11.8	15.136
	5755	ant 1	13.61	22.961
		ant 2	12.41	17.418
	5795	ant 1	13.22	20.989
		ant 2	12.56	18.030
IEEE 802.11ac VHT40	5190	ant 1	14.29	26.853
		ant 2	12.39	17.338
	5230	ant 1	13.17	20.749
		ant 2	11.88	15.417

	5755	ant 1	13.67	23.281
		ant 2	11.97	15.740
	5795	ant 1	13.39	21.827
		ant 2	12.14	16.368
IEEE 802.11ac VHT80	5210	ant 1	14.25	26.607
		ant 2	11.65	14.622
	5775	ant 1	14.24	26.546
		ant 2	12.09	16.181

3. Calculated Result and Limit

1.Module NXP-88W8997-SISO

The Worst Mode	Antenna	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm^2)	Limited of Power Density (S) (mW /cm^2)	Test Result
					(dBi)	(Linear)			
2.4G Band									
IEEE 802.11b	ant 1	20.63	20 ±1	21	1.72	1.486	0.0372	1	Complies
	ant 2	17.05	17 ±1	18	1.72	1.486	0.0187	1	Complies
IEEE 802.11g	ant 1	22.01	22 ±1	23	1.72	1.486	0.0590	1	Complies
	ant 2	18.48	18 ±1	19	1.72	1.486	0.0235	1	Complies
IEEE 802.11n HT20	ant 1	20.18	20 ±1	21	1.72	1.486	0.0372	1	Complies
	ant 2	16.78	16±1	17	1.72	1.486	0.0148	1	Complies
IEEE 802.11n HT40	ant 1	20.06	20 ±1	21	1.72	1.486	0.0372	1	Complies
	ant 2	16.71	16 ±1	17	1.72	1.486	0.0148	1	Complies
5G Band									
IEEE 802.11a	ant 1	15.85	15 ±1	16	2.57	1.8072	0.0143	1	Complies
	ant 2	14.04	14 ±1	15	2.57	1.8072	0.0114	1	Complies
IEEE 802.11n HT20	ant 1	14.46	14 ±1	15	2.57	1.8072	0.0114	1	Complies
	ant 2	14.23	14 ±1	15	2.57	1.8072	0.0114	1	Complies
IEEE 802.11ac VHT20	ant 1	14.11	14 ±1	15	2.57	1.8072	0.0114	1	Complies
	ant 2	13.51	13 ±1	14	2.57	1.8072	0.0090	1	Complies
IEEE 802.11n HT40	ant 1	14.15	14 ±1	15	2.57	1.8072	0.0114	1	Complies
	ant 2	13.45	13 ±1	14	2.57	1.8072	0.0090	1	Complies
IEEE 802.11ac VHT40	ant 1	14.29	14±1	15	2.57	1.8072	0.0114	1	Complies
	ant 2	12.39	12 ±1	13	2.57	1.8072	0.0072	1	Complies
IEEE 802.11ac VHT80	ant 1	14.25	14 ±1	15	2.57	1.8072	0.0114	1	Complies
	ant 2	12.09	12 ±1	13	2.57	1.8072	0.0072	1	Complies

2.Module NXP-88W8997-MIMIO

Mode	Power Density (S) (mW /cm^2) Antenna 0	Power Density (S) (mW /cm^2) Antenna 1	Power Density (S) (mW/cm^2) Total	Limited of Power Density (S) (mW/cm^2)	Test Result
2.4G Band					
IEEE 802.11n HT20	0.0372	0.0148	0.0520	1	Complies
IEEE 802.11n HT40	0.0372	0.0148	0.0520	1	Complies
5G Band					
IEEE 802.11n HT20	0.0114	0.0114	0.0227	1	Complies
IEEE 802.11ac VHT20	0.0114	0.0090	0.0204	1	Complies
IEEE 802.11n HT40	0.0114	0.0090	0.0204	1	Complies
IEEE 802.11ac VHT40	0.0114	0.0072	0.0185	1	Complies
IEEE 802.11ac VHT80	0.0114	0.0072	0.0185	1	Complies

3.Module NXP-88W8997+RTL8852BE

MAX Power Density (S) (mW/cm^2) NXP-88W8997	MAX PowerDensity (S) (mW/cm^2) RTL8852BE	Total Ratio	Limit Ratio	Test Result
0.0520	0.44553	0.49753	1	Complies

Note: 2.4 and 5GHz bands are share an antenna, Cann't both the 2.4 and 5 GHz bands operate simultaneously.

End of Test Report