FCC 47 CFR MPE REPORT

Telly,Inc.

LED TV

Model Number: TY55-1

FCC ID: 2BBQXTY55-1

Applicant:	Telly,Inc.
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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

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

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)
GFSK	2402		10.97	12.503
	2441		10.13	10.304
	2480		10.22	10.520
π/4-DQPSK	2402		9.99	9.977
	2441		9.18	8.279
	2480		8.71	7.430
8-DPSK	2402		10.19	10.447
	2441		9.56	9.036
	2480		9.1	8.128
BLE 1M	2402		11	12.589
	2440		10.18	10.423
	2480		10.15	10.351
BLE 2M	2402		11.23	13.274
	2440		10.47	11.143
	2480		10.49	11.194
IEEE 802.11b	2412	ant 1	13.81	24.044
		ant 2	14.85	30.549
	2437	ant 1	13.6	22.909
		ant 2	15.67	36.898
	2462	ant 1	13.16	20.701
		ant 2	15.14	32.659
IEEE 802.11g	2412	ant 1	20.32	107.647
		ant 2	22.13	163.305
	2437	ant 1	20.42	110.154
		ant 2	22.75	188.365
	2462	ant 1	19.32	85.507
		ant 2	22.25	167.880
IEEE 802.11n HT20	2412	ant 1	20.23	105.439
		ant 2	22.04	159.956
	2437	ant 1	20.2	104.713
		ant 2	22.61	182.390
	2462	ant 1	19.24	83.946
		ant 2	22.12	162.930

IEEE 802.11ax HE20	2412	ant 1	21.68	147.231
		ant 2	21.66	146.555
	2437	ant 1	21.7	147.911
		ant 2	22.08	161.436
	2462	ant 1	20.56	113.763
		ant 2	21.52	141.906
IEEE 802.11a	5180	ant 1	9.32	8.551
		ant 2	11.43	13.900
	5200	ant 1	9.42	8.750
		ant 2	11.88	15.417
	5240	ant 1	10.16	10.375
		ant 2	11.78	15.066
	5745	ant 1	11.21	13.213
		ant 2	10.89	12.274
	5785	ant 1	10.73	11.830
		ant 2	9.99	9.977
	5825	ant 1	11.11	12.912
		ant 2	9.44	8.790
IEEE 802.11n20	5180	ant 1	9.17	8.260
		ant 2	11.63	14.555
	5200	ant 1	9.57	9.057
		ant 2	12.12	16.293
	5240	ant 1	10.49	11.194
		ant 2	12.5	17.783
	5745	ant 1	11.11	12.912
		ant 2	10.9	12.303
	5785	ant 1	10.93	12.388
		ant 2	9.92	9.817
	5825	ant 1	11.07	12.794
		ant 2	9.38	8.670

Mode	Frequency (MHz)	Antena	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11ac VHT20	5180	ant 1	9	7.943
		ant 2	11.69	14.757
	5200	ant 1	9.41	8.730
		ant 2	12.11	16.255
	5240	ant 1	10.32	10.765
		ant 2	12.39	17.338
	5745	ant 1	11.11	12.912
		ant 2	10.88	12.246
	5785	ant 1	10.72	11.803
		ant 2	9.72	9.376
	5825	ant 1	10.98	12.531
		ant 2	9.33	8.570
IEEE 802.11ax HE20	5180	ant 1	9.24	8.395
		ant 2	11.96	15.704
	5200	ant 1	9.61	9.141
		ant 2	12.31	17.022
	5240	ant 1	10.51	11.246
		ant 2	12.76	18.880
	5745	ant 1	11.23	13.274
		ant 2	10.98	12.531
	5785	ant 1	10.73	11.830
		ant 2	9.93	9.840
	5825	ant 1	11	12.589
		ant 2	9.48	8.872
IEEE 802.11n HT40	5190	ant 1	9.73	9.397
		ant 2	12.18	16.520
	5230	ant 1	10.63	11.561
		ant 2	12.92	19.588
	5755	ant 1	11.66	14.655
		ant 2	11.25	13.335
	5795	ant 1	11.44	13.932
		ant 2	10.25	10.593

Mode	Frequency (MHz)	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
IEEE 802.11ac VHT40	5190	ant 1	9.76	9.462
		ant 2	12.47	17.660
	5230	ant 1	10.59	11.455
		ant 2	14.15	26.002
	5755	ant 1	11.76	14.997
		ant 2	11.31	13.521
	5795	ant 1	11.82	15.205
		ant 2	10.41	10.990
IEEE 802.11ax HE40	5190	ant 1	9.94	9.863
		ant 2	12.79	19.011
	5230	ant 1	10.72	11.803
		ant 2	13.15	20.654
	5755	ant 1	11.81	15.171
		ant 2	11.35	13.646
	5795	ant 1	11.83	15.241
		ant 2	10.41	10.990
IEEE 802.11ac VHT80	5210	ant 1	9.66	9.247
		ant 2	12.32	17.061
	5775	ant 1	11.43	13.900
		ant 2	10.77	11.940
IEEE 802.11ax HE80	5210	ant 1	10.08	10.186
		ant 2	12.82	19.143
	5775	ant 1	11.76	14.997
		ant 2	10.96	12.474

3. Calculated Result and Limit

1. SISO

The Worst Mode	Antenna	Peak output power (dBm)	Target power（dBm）	MAX Target power（dBm）	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
					(dBi)	(Linear)			
2.4G Band									
GFSK		10.97	10 ±1	11	7.98	6.281	0.0157	1	Complies
π/4-DQPSK		9.99	9 ±1	10	7.98	6.281	0.0125	1	Complies
8-DPSK		10.19	10 ±1	11	7.98	6.281	0.0157	1	Complies
BLE		11.23	11 ±1	12	7.98	6.281	0.0198	1	Complies
IEEE 802.11b	ant 1	13.81	13 ±1	14	7.98	6.281	0.0314	1	Complies
	ant 2	15.67	15 ±1	16	7.98	6.281	0.0497	1	Complies
IEEE 802.11g	ant 1	20.42	20 ±1	21	7.98	6.281	0.1573	1	Complies
	ant 2	22.75	22 ±1	23	7.98	6.281	0.2493	1	Complies
IEEE 802.11n HT20	ant 1	20.23	20 ±1	21	7.98	6.281	0.1573	1	Complies
	ant 2	22.61	22 ±1	23	7.98	6.281	0.2493	1	Complies
IEEE 802.11ax HE20	ant 1	21.7	21 ±1	22	7.98	6.281	0.1980	1	Complies
	ant 2	22.08	22±1	23	7.98	6.281	0.2493	1	Complies
5G Band									
IEEE 802.11a	ant 1	11.95	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.22	12±1	13	7.23	5.2845	0.0210	1	Complies
IEEE 802.11n HT20	ant 1	11.11	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.5	12±1	13	7.23	5.2845	0.0210	1	Complies
IEEE 802.11ac VHT20	ant 1	11.11	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.39	12±1	13	7.23	5.2845	0.0210	1	Complies
IEEE 802.11ax HE20	ant 1	11.23	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.76	12±1	13	7.23	5.2845	0.0210	1	Complies
IEEE 802.11n HT40	ant 1	11.66	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.92	12±1	13	7.23	5.2845	0.0210	1	Complies

IEEE 802.11ac VHT40	ant 1	11.82	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	14.15	14±1	15	7.23	5.2845	0.0332	1	Complies
IEEE 802.11ax HE40	ant 1	11.83	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	13.15	13±1	14	7.23	5.2845	0.0264	1	Complies
IEEE 802.11ac VHT80	ant 1	11.43	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.32	12±1	13	7.23	5.2845	0.0210	1	Complies
IEEE 802.11ax HE80	ant 1	11.76	11±1	12	7.23	5.2845	0.0167	1	Complies
	ant 2	12.82	12±1	13	7.23	5.2845	0.0210	1	Complies

2.MIMIO

Mode	Power Density (S) (mW /cm2) Antenna 1	Power Density (S) (mW /cm2) Antenna 2	Power Density (S) (mW /cm2) Total	Limited of Power Density (S) (mW /cm2)	Test Result
2.4G Band					
IEEE 802.11n HT20	0.1573	0.2493	0.4066	1	Complies
IEEE 802.11 ax HE20	0.1980	0.2493	0.4473	1	Complies
5G Band					
IEEE 802.11n HT20	0.0167	0.0210	0.0376	1	Complies
IEEE 802.11ac VHT20	0.0167	0.0210	0.0376	1	Complies
IEEE 802.11 ax HE20	0.0167	0.0210	0.0376	1	Complies
IEEE 802.11n HT40	0.0167	0.0210	0.0376	1	Complies
IEEE 802.11ac VHT40	0.0167	0.0332	0.0499	1	Complies
IEEE 802.11 ax HE40	0.0167	0.0264	0.0431	1	Complies
IEEE 802.11ac VHT80	0.0167	0.0210	0.0376	1	Complies
IEEE 802.11 ax HE80	0.0167	0.0210	0.0376	1	Complies

BT+WIFI

MAX Power Density (S) (mW/cm2) Bluetooth	MAX Power Density (S) (mW/cm2) WiFi	Total Ratio	Limit Ratio	Test Result
0.0198	0.4473	0.4671	1	Complies

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

End of Test Report